Sun Ultra™ 5/Ultra 10 CD-ROM Drive and Hard Drive Installation Guide

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Contents

Installing the Sun Ultra 5/Ultra 10 CD-ROM Drive or Hard Drive

This guide provides the following instructions and information for the Sun™ Ultra™ 5 and Ultra 10 systems:

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- Installing a Hard Drive—page 13
- Finishing the Installation—page 31
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Preparing for Installation

Preparing to install a CD-ROM or hard drive in the Ultra 5 and Ultra 10 system involves three steps:

1. Powering off the system.
2. Removing the system top cover.
3. Attaching an antistatic wrist strap.

Powering Off an Ultra 5 or Ultra 10 System

Caution – Prior to turning off the system power, exit from the operating environment. Failure to do so may result in data loss.

Caution – Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system components, attach an ESD strap to your wrist, then to a metal area on the chassis; then disconnect the power cord from the system and the wall receptacle. Following this caution equalizes all electrical potentials within the system.

To power off the system:

1. **Back up system files as necessary.**

   See the *Solaris Handbook for Sun Peripherals.*

Caution – Pressing the standby switch or pressing the Sun Type-5 keyboard Standby key (Power key on Type-6 keyboards) does not remove all power from the system; a trickle voltage remains in the power supply. To remove all power from the system, set the power switch to the off position.

2. **Press the standby switch (**FIGURE 1**) or press the Sun Type-5 keyboard Standby key (**FIGURE 2**) or Power key on the Type-6 keyboard (**FIGURE 3**).**

3. **Set the power switch to the off position** *(*FIGURE 4*).*

4. **Verify the following:**

   a. **The power indicator LED is off.**

b. The power supply fan is not spinning.

5. **Turn off the power to the monitor and any peripheral equipment.**

6. **Disconnect cables to any peripheral equipment.**

Note – For the system to be gracefully shut down using the standby switch or the Sun Type-5 keyboard Standby key (or Sun Type-6 keyboard Power key), UNIX must be operating. If the system is in POST, the standby switch or the Standby key are inoperative.
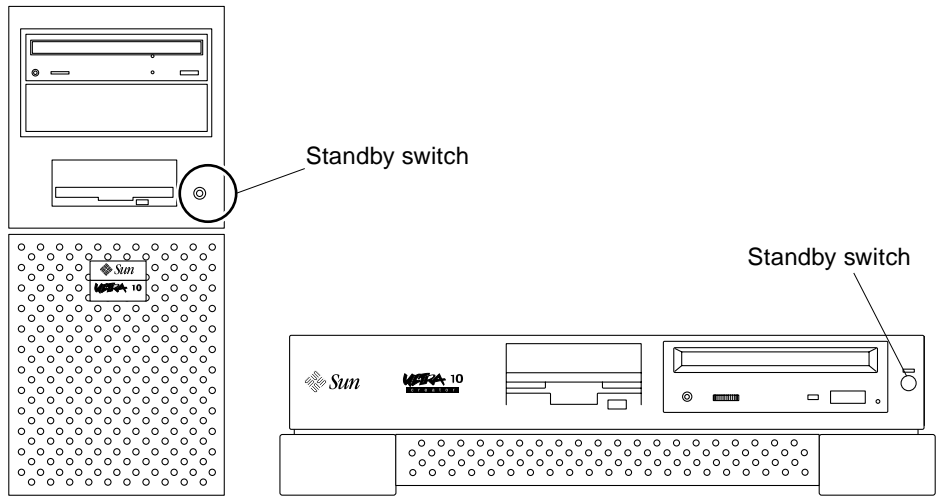
FIGURE 1   Standby Switches
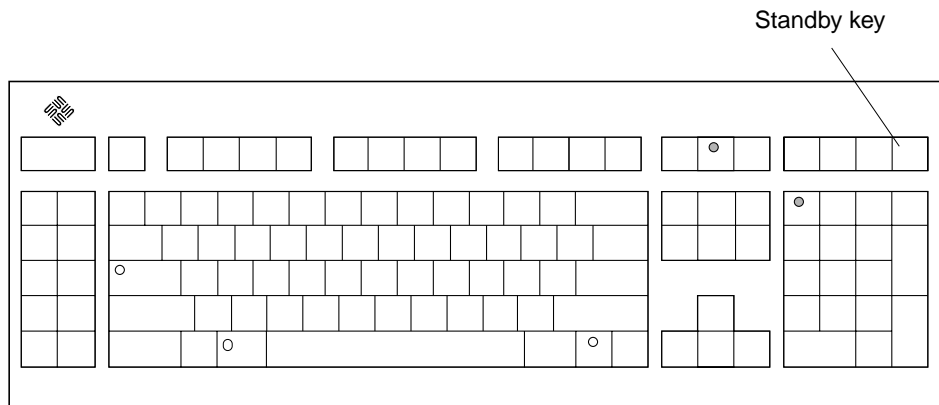
FIGURE 2   Sun Type-5 Keyboard Standby Key
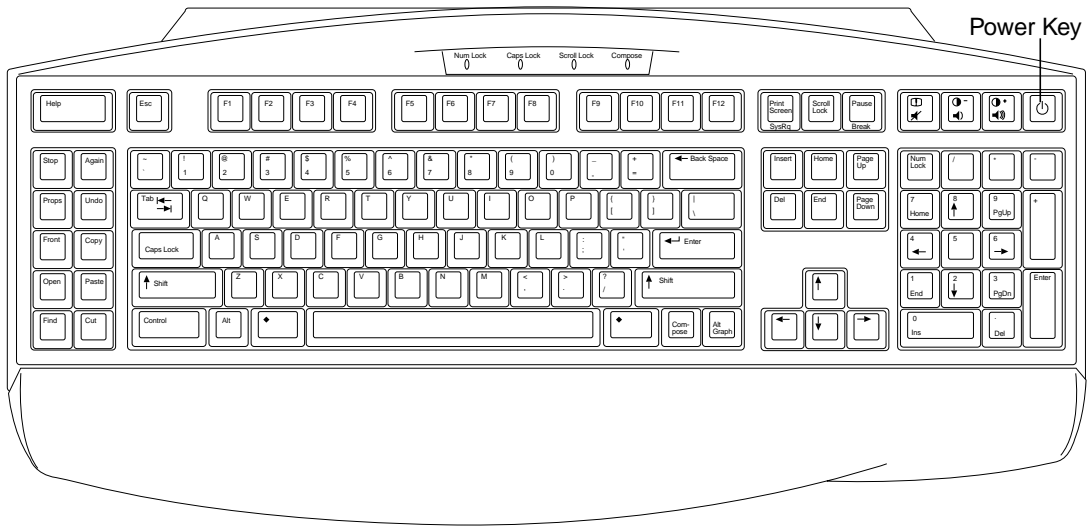
FIGURE 3   Sun Type-6 Keyboard Power Key
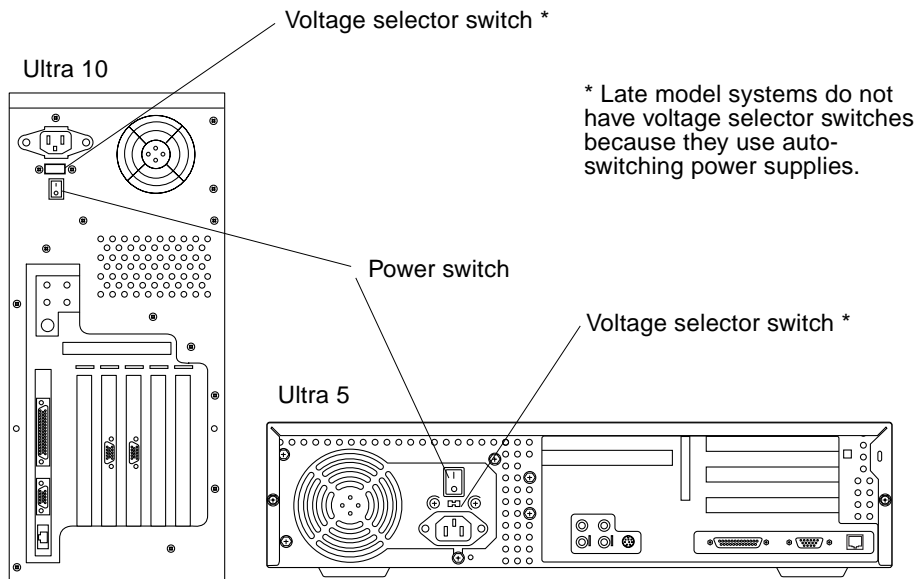
FIGURE 4   Power Switch and Voltage Selector Switch

Removing the Top Cover From an Ultra 5 System

1. **Using a No. 2 Phillips screwdriver, remove the two screws securing the top cover to the chassis (**FIGURE 5**).**

2. **Grasp the center front edge of the top cover. Slide the top cover toward the rear of the system unit until the top cover tabs release.**

3. **Lift the top cover straight up. Set it aside in a safe place.**
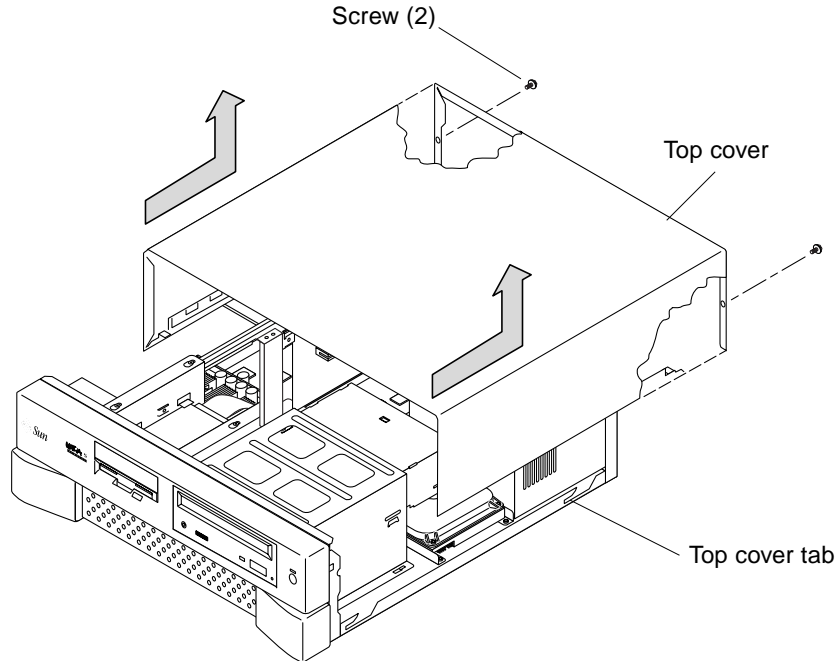
FIGURE 5   Removing the Ultra 5 Top Cover

Removing the Top Cover From an Ultra 10 System

1. **Position the system upside down on its top** (FIGURE 6)**.**

2. **Using a No. 2 Phillips screwdriver, remove the four screws securing the top cover to the chassis.**

3. **Disengage the top cover from the chassis tabs.**

4. **Lift the top cover straight up. Set it aside in a safe place.**

Top cover

Screw (4)

Chassis tab
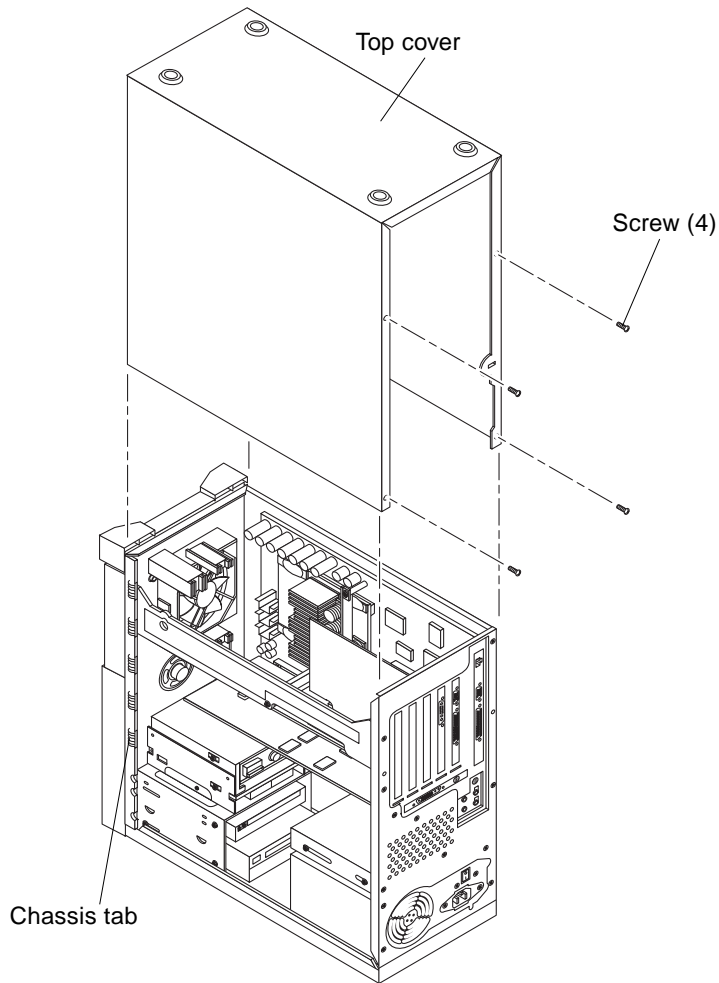
FIGURE 6 Removing the Ultra 10 Top Cover

Attaching the Wrist Strap on an Ultra 5 or Ultra 10 System

⚠️ **Caution –** Wear an antistatic wrist strap and use an electrostatic discharge (ESD)-protected mat when handling components. When servicing or removing system components, attach an ESD strap to your wrist, then to a metal area on the chassis; then disconnect the power cord from the system unit and the wall receptacle. Following this caution equalizes all electrical potentials within the system unit.

1. **Unwrap the first two folds of the wrist strap; wrap the adhesive side firmly against your wrist.**

2. **Peel the liner from the copper foil at the opposite end of the wrist strap.**

3. **Attach the copper end of the wrist strap to the chassis.**

4. **Disconnect the power cord from the system.**

⚠️ **Caution –** Disconnect the power cord prior to servicing system components.

Installing CD-ROM Drives

CD-ROM drives are available for both Sun Ultra 5 and Ultra 10 systems:

- For an Ultra 5, see "Installing or Replacing a CD-ROM Drive in an Ultra 5 System" on page **8**.
- For an Ultra 10, see "Installing or Replacing a CD-ROM Drive in an Ultra 10 System" on page **11**.

Note – Sun Ultra 5 and Ultra 10 systems are normally shipped with a CD-ROM installed.

Installing or Replacing a CD-ROM Drive in an Ultra 5 System

1. **Remove the diskette drive:**

   a. **Using a No. 2 Phillips screwdriver, loosen but do not remove the three screws securing the diskette drive bracket to the chassis (**FIGURE 7**).**

Note – Do not remove the three screws securing the diskette drive bracket to the chassis.
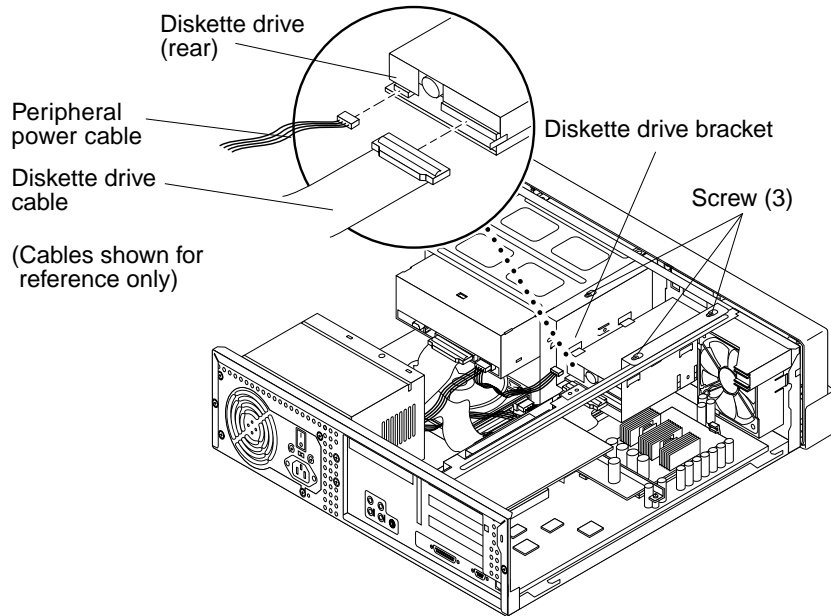
FIGURE 7   Removing or Replacing the Diskette Drive (Ultra 5)

b. Remove the diskette drive bracket from the chassis by sliding it back and lifting it out.

c. Set the diskette drive bracket on top of the power supply (it is not necessary to remove the diskette drive cables).

2. Remove an existing CD-ROM drive from an Ultra 5 as follows (if you are not replacing an existing CD-ROM drive, skip to Step 3).

a. Remove the following from the rear of the CD-ROM drive:
   - CD-ROM drive cable connector
   - Peripheral power cable connector
   - Audio cable connector

b. Using a No. 2 Phillips screwdriver, remove the four screws securing the CD-ROM drive to the CD-ROM drive bracket.

c. Place your fingers on the rear of the CD-ROM drive. Push the CD-ROM drive toward the chassis front and remove.

d. Place the CD-ROM drive on an antistatic mat.

Installing the Sun Ultra 5/Ultra 10 CD-ROM Drive or Hard Drive   **9**

3. Using a thin bladed screwdriver pry out the CD-ROM filler panel and remove the chassis knock-out plate (skip this step if you are replacing an existing CD-ROM drive).

Note – Prior to installing the CD-ROM drive, verify that its back panel mode-select jumper is set to MA.

---

4. Position the CD-ROM drive into the CD-ROM drive bracket by aligning the bracket holes with the CD-ROM mounting holes. (FIGURE 8**).**

5. Using a No. 2 Phillips screwdriver, install the four screws securing the CD-ROM drive to the bracket.

Screw (4)

CD-ROM filler panel and chassis knock-out plate (If installing a CD-ROM for the first time)

Audio cable

CD-ROM data cable

Peripheral power cable
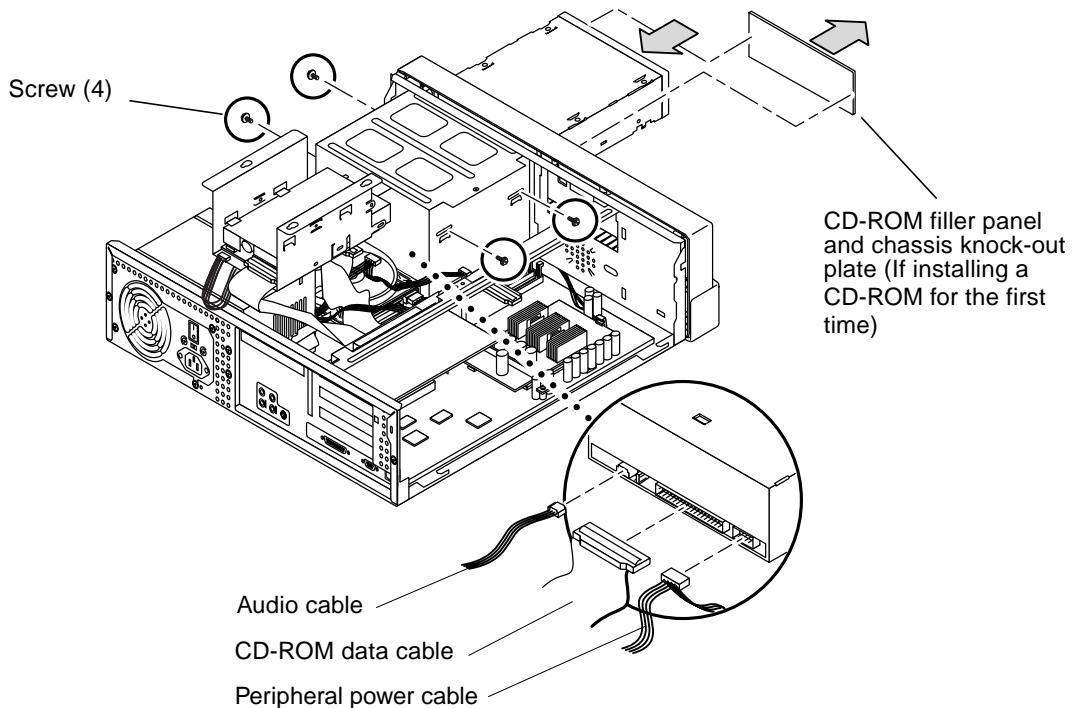
FIGURE 8   Installing or Replacing a CD-ROM Drive (Ultra 5)

6. Replace the diskette drive (FIGURE 7**).**

a. Position the diskette drive bracket into the chassis.

b. Push the bracket forward to a full stop.

c. **Using a No. 2 Phillips screwdriver, tighten the three screws securing the diskette drive bracket to the chassis.**

7. **Connect the following cables to the rear of the CD-ROM drive (**FIGURE 8**):**
   - CD-ROM drive cable connector
   - Peripheral power cable connector
   - Audio cable connector

   Note – The audio, data, and power connectors on all peripherals are keyed to prevent incorrect installation.

   ---

8. **Connect cables as follows:**
   - CD-ROM data cable: connect to motherboard connector J14
   - Audio cable: connect to motherboard connector J9
   - Power to power supply connector P2

   For motherboard connector placement, refer to "Reference Information" on page 33.

9. **Remove your wrist strap and finish the installation as described in "Finishing the Installation" on page 31.**

Installing or Replacing a CD-ROM Drive in an Ultra 10 System

1. **Remove the existing CD-ROM drive from the Ultra 10 as follows (if you are not replacing an existing CD-ROM drive, start with Step 2):**

   a. **Remove the following from the rear of the CD-ROM drive (**FIGURE 9**):**
   - Audio cable connector
   - CD-ROM data cable connector
   - Peripheral power cable connector

   b. **Using a No. 2 Phillips screwdriver, remove the four screws securing the CD-ROM drive to the CD-ROM drive bracket.**

   c. **Place your fingers on the back of the CD-ROM drive. Push the CD-ROM drive toward the chassis front and remove.**

2. **Using a thin bladed screwdriver pry out the CD-ROM filler panel and remove the chassis knock-out plate (skip this step if you are replacing an existing CD-ROM drive).**

> **Note –** Prior to installing the CD-ROM drive, verify that its back panel mode-select jumper is set to MA.

3. **Position the CD-ROM drive into the CD-ROM drive bracket by aligning the mounting holes. Push the CD-ROM drive toward the back of the chassis.**

4. **Using a No. 2 Phillips screwdriver, install the four screws securing the CD-ROM drive to the bracket.**

5. **Connect the following to the back of the CD-ROM drive:**
   - CD-ROM drive cable connector
   - Peripheral power cable connector
   - Audio cable connector

> **Note –** The audio, data, and power connectors on all peripherals are keyed to prevent incorrect installation.

6. **Connect two of the cables to the system motherboard as follows:**
   - CD-ROM drive cable: connect to motherboard connector J14
   - Audio cable: connect to motherboard connector J9

   For motherboard connector placement, refer to "Reference Information" on page 33.

7. **Remove your wrist strap and finish the installation as described in "Finishing the Installation" on page 31.**
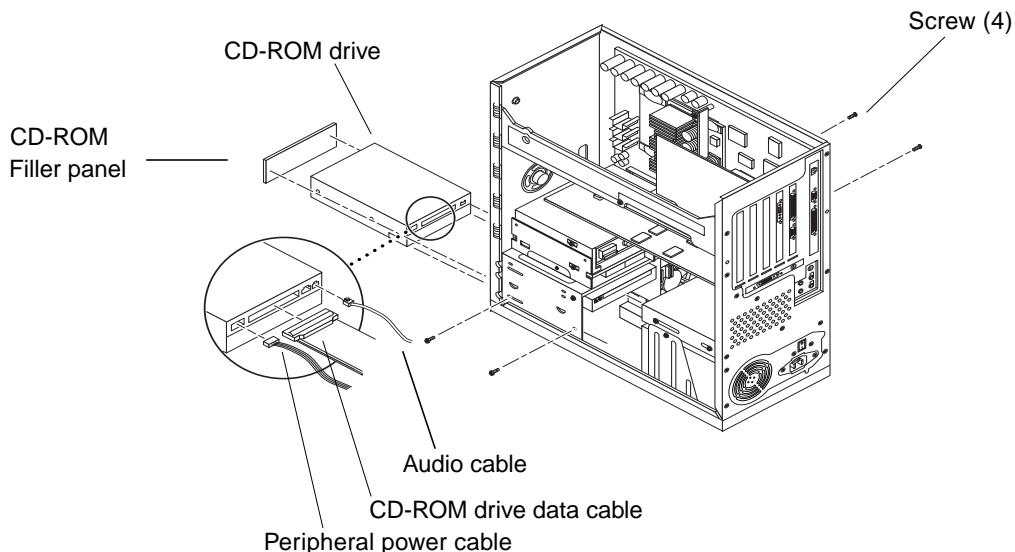
FIGURE 9   Installing or Replacing a CD-ROM Drive (Ultra 10)

Installing Hard Drives

Replacement and upgrade hard drives are available for both Ultra 5 and Ultra 10 systems. The systems have provisions for two hard drives.

■ For an Ultra 5 system, see "Installing Hard Disk Drives in an Ultra 5" on page 13.
■ For an Ultra 10 system, see "Installing Hard Drives in an Ultra 10 System" on page 19.

Installing Hard Disk Drives in an Ultra 5

The Ultra 5 system comes with one hard drive in the rear position. There are provisions for a second optional drive in the front position. The optional 7200 RPM, 9.1 GByte hard drive for the Ultra 5 system ships with a special bracket and a new data cable with labeled connectors for the "master" (default) drive and the "slave" (optional) drive, and "motherboard".

Installing or Replacing the Master Hard Drive in an Ultra 5 System

1. **Remove the existing hard drive from the Ultra 5 system as follows (if you are not replacing an existing hard drive, start with Step 2.) See** FIGURE 10.

   a. **Disconnect the power cable connector, audio cable, and the CD-ROM data cable connector from the back of the CD-ROM drive (see** FIGURE 8**). Move the power and CD-ROM drive cables out of the way.**

   b. **Disconnect the hard drive data cable connector and the power cable connector from the hard drive. Move the hard drive and power cables out of the way.**

   c. **Using a No. 2 Phillips screwdriver, remove the two screws securing the hard drive bracket to the chassis. Lift the hard drive and hard drive bracket from the chassis.**

   d. **Using a No. 2 Phillips screwdriver, remove the four screws securing the hard drive to the hard drive bracket. Remove the hard drive.**

   e. **Place the hard drive on an antistatic mat.**

Note – Before installing the hard drive into the system, verify that the drive's back-panel mode-select jumper is set to CS.

---

2. **Install the new hard drive into the Ultra 5 system as follows (**FIGURE 10**):**

   a. **Position the new hard drive into the hard drive bracket by aligning the mounting holes.**

   b. **Using a No. 2 Phillips screwdriver, replace the four screws securing the hard drive to the hard drive bracket.**

   c. **Position the hard drive and hard drive bracket into the chassis.**

      There are two tabs on the front of the bracket and on the chassis that aligns and positions the drive and bracket in the chassis. Position the drive bracket tab into the chassis tab until it is secure to prevent the drive from moving around in the chassis.

   d. **Using a No. 2 Phillips screwdriver, replace the two screws securing the hard drive bracket to the chassis.**

   e. **Connect the hard drive data cable connector and the power cable connector to the hard drive. Dress cables.**

   Note – The data, audio, and power connectors on all peripherals are keyed to prevent incorrect installation.

   ---

   f. **Connect the hard drive data cable to motherboard connector J15.**

      For motherboard connector placement, refer to "Reference Information" on page 33.

   g. **Connect the power cable connector, audio connector, and the CD-ROM drive data connector to the back of the CD-ROM drive (see** FIGURE 8**). Dress cables.**

3. **Remove your wrist strap and finish the installation as described in "Finishing the Installation" on page 31.**

Hard drive (connector side)

Peripheral power cable

Hard drive data cable assembly

Screw (2)

Hard drive

Screw (4)
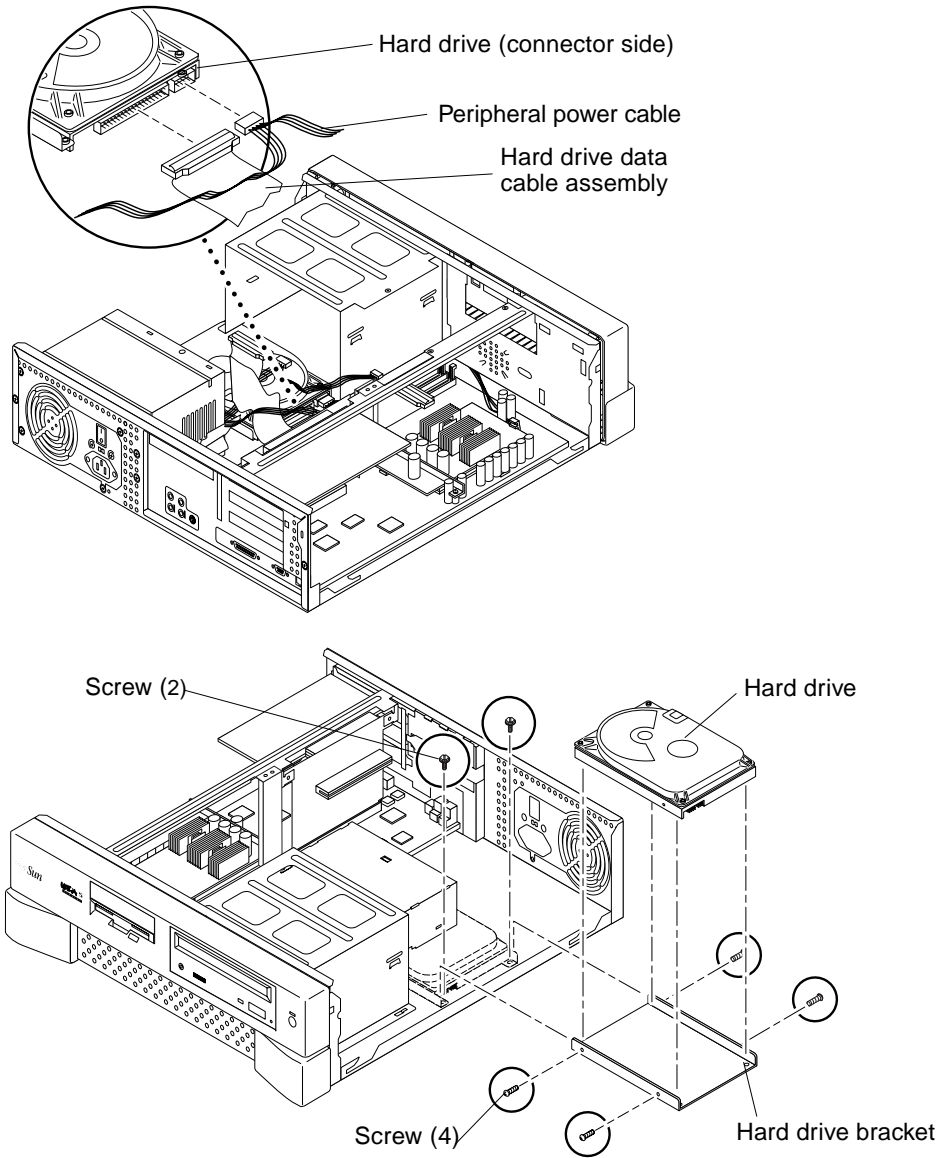
Hard drive bracket

FIGURE 10 Installing or Replacing the Rear Hard Drive (Ultra 5)

Installing the Optional Hard Drive in an Ultra 5 System

The optional hard drive replaces the diskette drive and its bracket (FIGURE 11).
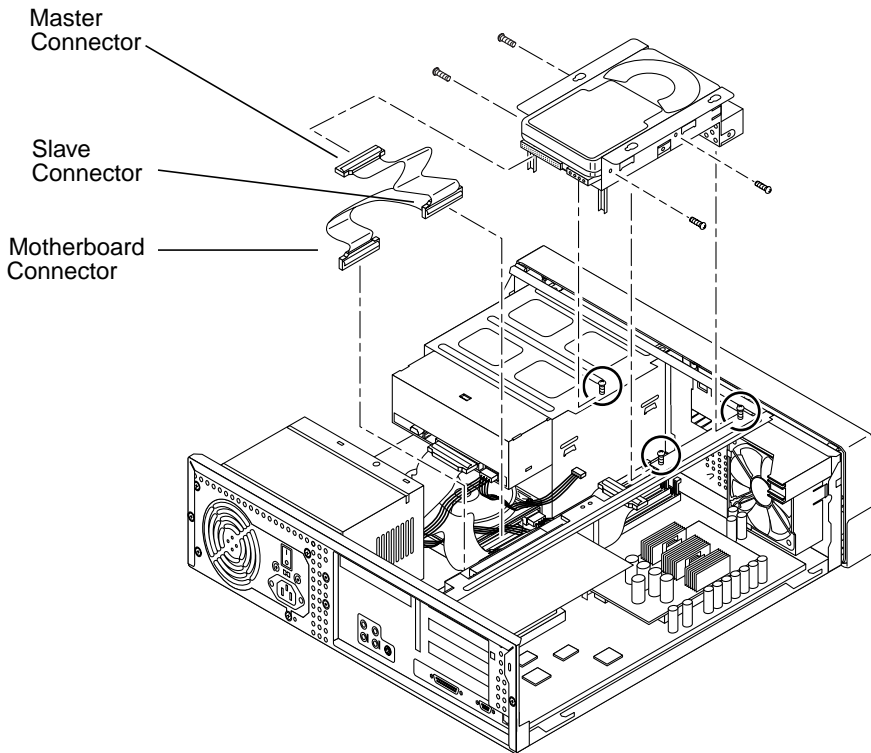
FIGURE 11   Installing an Optional Hard Drive in the Front Position (Ultra 5)

1. **Power off the system, remove the cover, and attach an antistatic wrist strap as described in "Preparing for Installation" on page 2.**

2. **Disconnect all cables from the back of the diskette drive (or any other 3.5-inch form-factor devices installed in the diskette drive bracket).**

3. **Loosen but do not remove the three screws that hold the diskette drive bracket to the chassis.**

4. **Remove the diskette drive bracket from the chassis by sliding it back and lifting it free of the three screws. Set the bracket aside.**

5. **Remove any installed PCI card from PCI slot 2 as follows:**

   a. **Remove the screw that holds the card bracket tab adapter to the chassis.**

   b. **Remove the card bracket tab adapter.**

c. **Pull the card evenly from the PCI riser board connector.**

d. **Pull the card bracket tab free of the chassis back panel opening and remove it from the chassis.**

e. **Place the PCI card on an antistatic mat.**

6. **Disconnect the diskette drive cable from the motherboard and set the cable aside.**

7. **Disconnect the existing hard drive data cable from the back of the master hard drive and from motherboard connector J15.**

8. **Place the new second hard drive into the second hard drive bracket and install the four screws that hold the drive to the bracket.**

Note – Before installing the hard drive into the system, verify that the drive's back-panel mode-select jumper is set to CS.

---

9. **Place the new hard drive bracket and hard drive on top of the power supply.**

Note – Be sure that you use the new cable labeled "Ultra 5" which is included in your new hard drive kit. The kit may contain another cable which you do not need.

---

10. **Connect the new hard drive data cable connector labeled "Mother Board" to motherboard connector J15.**

11. **Connect the new hard drive data cable connector labeled "Master" to the IDE connector on the back of the master hard drive.**

12. **Connect the new hard drive data cable connector labeled "Slave" to the IDE connector on the back of the new slave hard drive.**

The following diagram shows the cabling for the hard drives when two hard drives are installed.

hard drive data cable

Default hard drive (master device 0)	Second hard drive (slave device 1)	Motherboard J15 (primary channel)
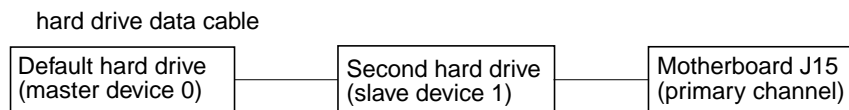
13. **Remove any DIMMs from the motherboard memory slots to provide clearance for removing the power connector from the master hard drive:**

Caution – Handle DIMMs only by the edges. Do not touch the DIMM components or metal parts. Always wear an antistatic wrist strap when handling a DIMM.

---

a. **Depress the ejection lever on the DIMM motherboard connector to release the DIMM.**

b. **Pull the DIMM evenly from the DIMM motherboard connector.**

c. **Place the DIMMs on an antistatic mat.**

Note – The data, audio, and power connectors on all peripherals are keyed to prevent incorrect installation.

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14. **Remove power cable connector P3 from the master hard drive.**

15. **Connect power cable connector P4 to the master hard drive.**

16. **Connect power cable connector P3 to the new slave hard drive.**

17. **Replace any DIMMs you removed from the motherboard:**

a. **Position the DIMM in the DIMM motherboard connector, ensuring that the notches on the bottom of the DIMM are aligned with the connector alignment bumps.**

Caution – If the DIMM is not seated into its slot evenly, it can cause shorts that will damage the system. Ensure that all contacts engage at the same time by pressing evenly on the top corners of the DIMM--do not rock the DIMM into place. A "click" sound indicates that the DIMM is properly seated.

---

b. **Press firmly on the DIMM top until the DIMM is properly seated.**

c. **Verify the ejection levers are closed toward the DIMM.**

18. **Place the three holes on the new hard drive bracket over the three securing screws on the chassis.**

19. **Carefully slide the hard drive bracket forward, ensuring that its plastic filler-button fits into the hole on the front bezel.**

20. **Tighten the three screws that secure the drive bracket to the chassis.**

21. **Reinstall any PCI card you removed from PCI slot 2:**

a. **Insert the PCI card so that its connector touches the riser board PCI connector 2.**

b. **Guide the PCI card bracket tab into the chassis back panel slot.**

c. **At the two corners of the card, push the card into the riser board connector until the card is fully seated.**

d. **Replace the PCI card bracket tab adapter and the screw that secures it to the system chassis.**

22. **Remove your wrist strap and continue with "Finishing the Installation" on page 31.**

Installing Hard Drives in an Ultra 10 System

The Ultra 10 has two hard drive positions:

- To install a hard drive to the front position, see "Installing or Replacing a Hard Drive in the Front Position in an Ultra 10 System" on page 19.

- The rear position is the default hard drive position for systems shipped from the factory. To install a replacement or upgrade hard drive to the rear position, see "Installing or Replacing a Hard Drive in the Rear Position in an Ultra 10 System" on page 22.

Note – If you are installing a 9.1 GByte (or larger capacity) replacement or upgrade hard drive in the rear position, a special bracket is required to ensure cooling. (This bracket is already installed in new Ultra 10 systems and can be identified by the part number, F370-3721, stamped on the side of the bracket.) See "Installing a Special Hard Drive Bracket in the Rear Position of an Ultra 10 System for 9.1 GByte and Larger Capacity Drives" on page 24.

Installing or Replacing a Hard Drive in the Front Position in an Ultra 10 System

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Note – Before removing or installing a front hard drive, you must remove the rear hard drive to provide clearance. For instructions on removing and replacing a rear hard drive, see "Installing or Replacing a Hard Drive in the Rear Position in an Ultra 10 System" on page 22.

---

1. **Remove an existing hard drive from the Ultra 10 chassis front as follows (if you are not replacing an existing drive, start with Step 2). See** FIGURE 12**.**

   a. **Remove the rear hard drive per Installing or Replacing a Hard Drive in the Rear Position in an Ultra 10 System on page 22.**

   b. **Disconnect the peripheral power cable connector and the hard drive data cable connector from the hard drive. Move the peripheral power and hard drive data cables out of the way.**

c. **Using a No. 2 Phillips screwdriver, remove the two screws securing the hard drive bracket to the chassis.**

d. **Slide the hard drive and the hard drive bracket toward the chassis back until it clears the chassis.**

e. **Remove the hard drive and hard drive bracket.**

f. **Using a No. 2 Phillips screwdriver, remove the four screws securing the hard drive to the hard drive bracket. Remove the hard drive.**

2. **Install the new hard drive into the Ultra 10 chassis front as follows (**FIGURE 12**):**

Note – Prior to installing the hard drive, verify that its back panel mode-select jumper is set to CS.

---

a. **Disconnect the power connector from the diskette drive.**

b. **Position the hard drive into the hard drive bracket as shown in** FIGURE 11**.**

c. **Using a No. 2 Phillips screwdriver, replace the four screws securing the hard drive to the hard drive bracket.**

d. **Position the hard drive and hard drive bracket into the chassis.**

e. **Slide the hard drive and hard drive bracket toward the chassis front.**

f. **Using a No. 2 Phillips screwdriver, replace the two screws securing the hard drive bracket to the chassis.**

Note – The data, audio, and power connectors on all peripherals are keyed to prevent incorrect installation.

---

g. **Connect the power and hard drive data connectors to the front hard drive. Dress cables.**

The hard drive data cable assembly must have one end of the IDE cable connected to motherboard connector J15; the middle connector of the IDE cable connected to front hard drive; and the other end of the IDE cable connected to the rear hard drive, as shown in the following diagram.

Ultra 10 IDE hard drive data cable

Rear hard drive (master device 0)		Front hard drive (slave device 1)		Motherboard J15 (primary channel)
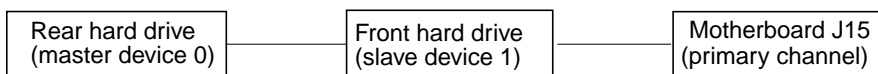
Ensure that the ribbon data connectors are fully seated. For motherboard connector placement, refer to "Reference Information" on page 33.

3. **Reinstall the rear hard drive and bracket per "Installing or Replacing a Hard Drive in the Rear Position in an Ultra 10 System" on page 22.**

4. **Remove your wrist strap and finish the installation as described in "Finishing the Installation" on page 31.**

Screw (2)

Hard drive

Hard drive bracket

Screw (4)

Hard drive cable assembly

Peripheral power cable
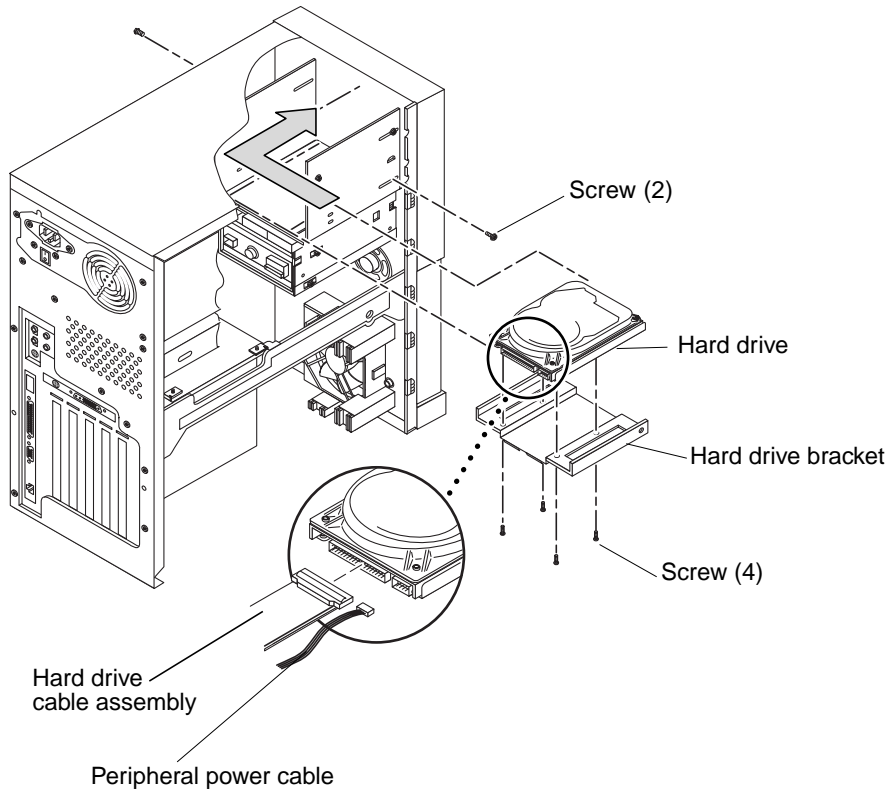
FIGURE 12   Installing or Replacing a Front Hard Drive (Ultra 10)

Installing or Replacing a Hard Drive in the Rear Position in an Ultra 10 System

1. **Remove an existing hard drive from the Ultra 10 chassis rear as follows (if you are not replacing an existing hard drive, start with Step 2). See** FIGURE 13**:**

   a. **Disconnect the power cable connector and the hard drive ribbon data connector from the hard drive. Move the power and hard drive data cables out of the way.**

   b. **Using a No. 2 Phillips screwdriver, remove the screw securing the hard drive bracket to the trapezoidal brace.**

   c. **Remove the trapezoidal brace from the chassis.**

   d. **Support the hard drive bracket with one hand while using a No. 2 Phillips screwdriver, remove the two screws securing the hard drive bracket to the chassis.**

   e. **Remove the hard drive/bracket assembly.**

   f. **Using a No. 2 Phillips screwdriver, remove the four screws securing the hard drive to the hard drive bracket.**

   g. **Remove the hard drive from the hard drive bracket.**

   h. **Place the hard drive on an antistatic mat or plastic bag.**

2. **Install the new hard drive into the Ultra 10 chassis rear as follows (**FIGURE 13**):**

Note – If you are replacing an existing rear hard drive with a 9.1-Gbyte (or larger capacity) hard drive, be sure to remove the existing rear drive bracket and install the replacement drive bracket (part number F370-3721). (This bracket is already installed in new Ultra 10 systems and can be identified by the part number, F370-3721, stamped on the side of the bracket.) See "Installing a Special Hard Drive Bracket in the Rear Position of an Ultra 10 System for 9.1 GByte and Larger Capacity Drives" on page 24.

Note – Prior to installing the hard drive, verify that its back panel mode-select jumper is set to CS.

---

   a. **Position the hard drive into the hard drive bracket.**

   b. **Using a No. 2 Phillips screwdriver, replace the four screws securing the hard drive to the hard drive bracket.**

   c. **Install the hard drive/bracket assembly into the tabs on the back sheet metal.**

d. **Install the two back screws to attach the bracket assembly to the chassis.**

e. **Reinstall the trapezoidal side brace by sliding the tabs on the brace into the slots in the chassis.**

f. **Reinstall the single screw securing the trapezoidal brace to the hard drive/ bracket assembly.**

g. **Connect the power cable connector and the hard drive ribbon data connector to the hard drive. Dress cables.**

h. **Connect the hard drive data cable to motherboard connector J15.**

   For motherboard connector placement, refer to "Reference Information" on page 33.

3. **Remove your wrist strap and finish the installation as described in "Finishing the Installation" on page 31.**
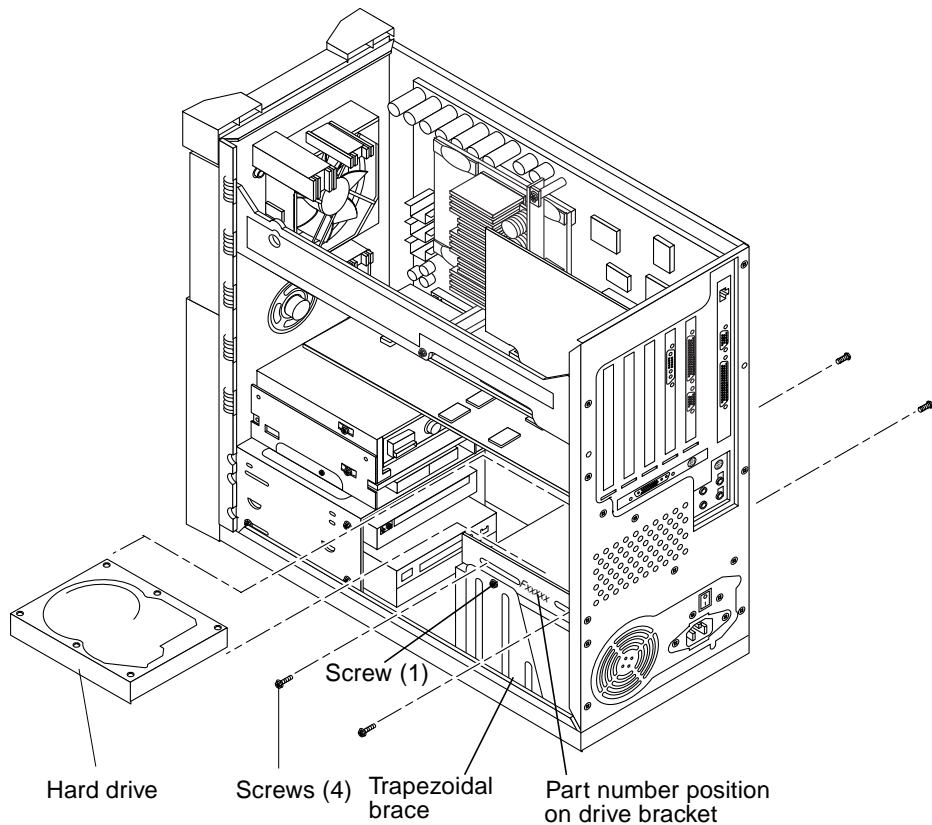
FIGURE 13 Installing or Replacing a Rear Hard Drive (Ultra 10)

Installing a Special Hard Drive Bracket in the Rear Position of an Ultra 10 System for 9.1 GByte and Larger Capacity Drives

When a 9.1 GByte (or larger capacity) hard drive is installed in the rear hard drive position, a special bracket (part number F370-3721) is required to ensure proper cooling. (This bracket is already installed in new Ultra 10 systems and can be identified by the part number, F370-3721, stamped on the side of the bracket.)

1. **Remove the existing rear drive bracket from the Ultra 10 system as follows (**FIGURE 14**):**

   a. **Use a No. 2 Phillips screwdriver to remove the screw securing the rear drive bracket to the trapezoidal brace.**

   b. **Remove the trapezoidal brace from the chassis.**

   c. **While placing your hand under the rear drive bracket for support, use a No. 2 Phillips screwdriver to remove the two screws securing the rear drive bracket to the chassis.**

   d. **Remove the rear drive bracket.**

2. **Install the new rear drive bracket into the Ultra 10 as follows (**FIGURE 14**):**

   a. **Position the rear drive bracket.**

   b. **While placing your hand under the rear drive bracket for support, use a No. 2 Phillips screwdriver to replace the screw securing the rear drive bracket to the trapezoidal brace.**

   c. **Using a No. 2 Phillips screwdriver, replace the two screws securing the rear drive bracket to the chassis.**

   d. **Insert the trapezoidal brace into the slots in the chassis.**

   e. **Use a No. 2 Phillips screwdriver to replace the screw securing the rear drive bracket to the trapezoidal brace**

3. **Remove your wrist strap and finish the installation according to "Finishing the Installation" on page 31.**
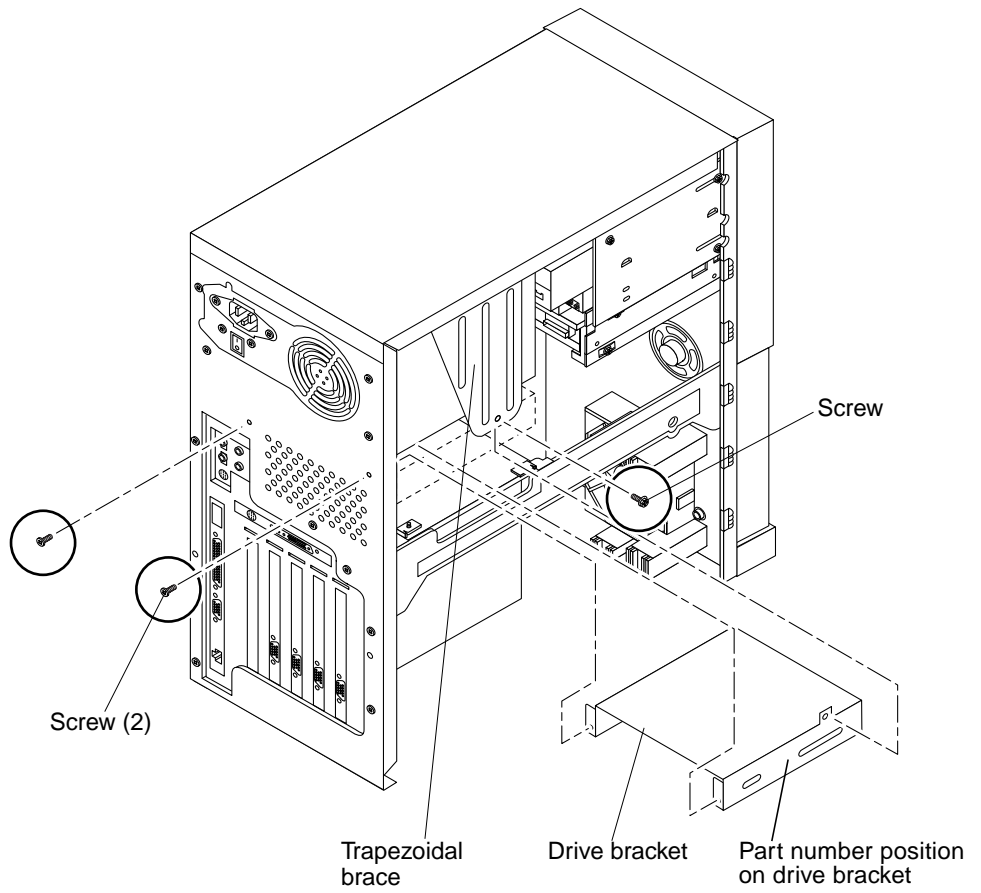
FIGURE 14 Installing or Replacing a Rear Hard Drive Bracket (Ultra 10)

Hard Drive Mirroring

This section describes the requirements and constraints of a hard drive mirroring solution that utilizes Solstice DiskSuite™ software.

Hard Drive Mirroring Configuration

The IDE subsystem of the Ultra 5 or Ultra 10 system has two independent channels designated "primary" and "secondary." On the system motherboard there are two separate connectors for each channel, allowing each channel to support two devices. One device may be jumpered as "master" (device 0) and the other as "slave" (device 1).

When mirroring hard drives in an Ultra 5 or Ultra 10 system, use this hardware configuration:

- Primary channel—One hard drive jumpered as master
- Secondary channel—One hard drive jumpered as master

Two IDE cables are required for this configuration. Each cable is connected to the motherboard at one end and to a hard drive (jumpered as master) at the "MASTER" connector. FIGURE 15 shows this hardware configuration (with an optional CD-ROM drive jumpered as a slave device on the secondary channel).

Primary IDE channel

| Primary hard drive (master-device 0) | Motherboard J15 (primary channel) |

Secondary IDE channel

| Primary hard drive (master-device 0) | Optional CD-ROM (slave-device 1) | Motherboard J14 (secondary channel) |

FIGURE 15   Hard Drive Mirroring Configuration

Hardware Considerations

This section describes special considerations and requirements for hardware when mirroring hard drives in an Ultra 5 or Ultra 10 system.

Note – The two hard drives that are mirrored cannot be on the same channel. Both hard drives must be jumpered as the master device on two separate channels.

Note – If a CD-ROM drive is included in a system with this hard drive mirroring configuration, the CD-ROM drive must be jumpered as a slave device on either the primary or the secondary channel.

Note – If a mirrored system includes a CD-ROM drive, the alias for the CD-ROM drive must be altered at the OBP level before a user can boot using the `boot cdrom` command. The procedure for altering the alias immediately follows this note.
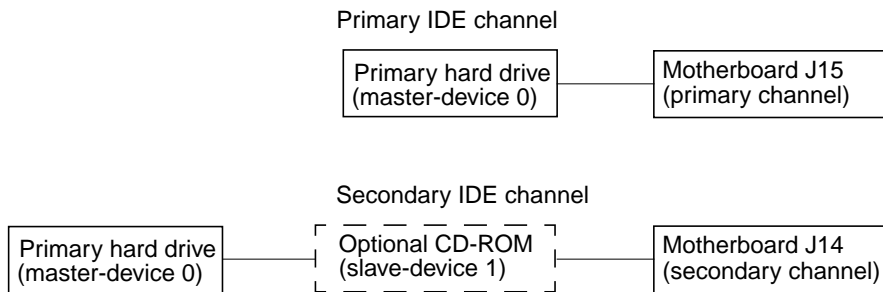
Changing a CD-ROM Drive Alias

If a mirrored system includes a CD-ROM drive, the alias for the CD-ROM drive must be altered at the OBP level before a user can boot using the `boot cdrom` command. This is because the alias for the CD-ROM drive is hard-coded with the assumption that the CD-ROM drive is connected as the master device on the secondary channel (`/pci@1f,0/pci@1,1/ide@3/cdrom@2,0:f`). In a mirrored configuration, this is not true because the CD-ROM is jumpered as the *slave* device on the primary or secondary channel. Therefore, the alias is incorrect and must be altered. Use the `nvalias` command to alter a CD-ROM drive alias as follows:

- To change the alias for a CD-ROM drive on the primary channel, type:
  `nvalias cdrom /pci@1f,0/pci@1,1/ide@3/cdrom@1,0:f`
- To change the alias for a CD-ROM drive on the secondary channel, type:
  `nvalias cdrom /pci@1f,0/pci@1,1/ide@3/cdrom@3,0:f`

Required Software and Patches

The supported software version number is Solstice DiskSuite 4.1.

The IDE drivers have been modified and made more robust for mirroring support on the system. The appropriate driver patch must be installed on the system before using the mirroring features of Solstice DiskSuite software. These required patch numbers are:

- For Solaris 7—Patch number 107121
- For Solaris 2.6—Patch number 106407
- For Solaris 2.5.1—Patch number 106197

The latest versions of these patches are available for download from SunSolve Online at: `http://sunsolve.Corp.Sun.COM`

Software Constraints

When using Solstice DiskSuite 4.1 software, it is recommended that you have a minimum of three metadevice databases to maintain a "quorum." It is further recommended that the databases be maintained on different disks, which would require three IDE hard drives in the system. Because the system can support only two hard drives, only two metadevice databases are possible. This limitation has a known impact.

Solstice DiskSuite software will function with only two disks and two database replicas. However, if one disk fails, there is not a quorum. No problem with the system will be seen until after the system is powered down. After the system is powered down, it will not power on and boot in multiuser mode without system administration intervention.

For example, if the quorum is not seen during boot due to a hard drive failure, the system boots in single-user mode. The problem is reported by the system when the machine is rebooted. The output is similar to the following example:

```
ok boot

Hostname: demo

metainit: demo: stale databases

Use metadb to delete databases which are broken.

Ignore any "Read-only file system" error messages.

Reboot the system when finished to reload the metadevice
database.  After reboot, repair any broken database replicas
which were deleted.

Type Ctrl-d to proceed with normal startup,(or give root
password for system maintenance):
```

If you see the message shown above, use the recovery procedure in the next section to replace broken database replicas.

Recovery Procedure for Broken Database Replicas

The high-level recovery steps are as follows:
- Delete the broken database replica and reboot.
- Repair or replace the problem hard drive.
- Add back the database replica.

Detailed instructions for the broken database recovery are as follows:

1. **After you see the error messages described in the previous section, type your root password to enter system maintenance mode at the following prompt:**

```
Type Ctrl-d to proceed with normal startup,
(or give root password for system maintenance): <root password>
```

The following message then displays:

```
Entering System Maintenance Mode
```

2. **Type the** metadb **command as follows to look at the databases to determine which database replica is broken.**

```
# usr/opt/SUNWmd/metadb i
flags    first blk    block count
a p l   1050         1034          /dev/dskc0t3d0s3
M p     unknown      unknown       /dev/dskc1t2d0s3
```

In the example shown above, the system can no longer detect the state database replica on slice /dev/dsk/c1t2d0s3, which is part of the failed disk. The metadb command flags the replicas on this slice as having a problem with the master blocks.

3. **Delete the database replica on the bad disk using the** -d **option of the** metadb **command as follows. Using the example, you would type:**

```
# usr/opt/SUNWmd/metadb -d -f /dev/dskc1t2d0s3
metadb: demo:/etc/opt/SUNWmd/mddb.cf.new: Read-only file system
```

At this point, the root (/) file system is read-only. You can ignore any mddb.cf error messages that are displayed.

4. **Verify that the replica was deleted using the** metadb **command again:**

```
# usr/opt/SUNWmd/metadb i
flags      first blk    block count
a m p lu  1050         1034             /dev/dskc0t3d0s3
```

5. **Reboot the system.**

6. **Halt the system and replace the failed hard drive (refer to "Installing Hard Drives" on page 13).**

```
# halt
```

7. After replacing the failed hard drive, power on and reboot the system.

```
ok boot
```

8. Use the format **or the** fmthard **command to partition the hard drive as it was before the failure. Using the example, you would type:**

```
# format /dev/rdskc1t2d0s0
```

9. Use the metadb **command to add back the state database replicas and to determine that the state database replicas are correct. Using the example, you would type:**

```
# usr/opt/SUNWmd/metadb -a /dev/dskc1t2d0s3
flags        first blk    block count
a m p luo    16           1034           /dev/dskc0t3d0s3
a     u      16           1034           /dev/dsk/c1t2d0s3
```

Finishing the Installation

Finishing installation of a CD-ROM or hard drive in an Ultra 5 or Ultra 10 system involves the following steps:

1. Replace the system top cover.

2. Power on the system.

Replacing the Top Cover

Replacing the Top Cover on an Ultra 5 System

1. **Position the top cover onto the system chassis. Slide the top cover toward the front of the system until the top cover tabs lock (see FIGURE 5 on page 5).**

2. **Using a No. 2 Phillips screwdriver, replace the two screws securing the top cover to the chassis.**

Replacing the Top Cover on an Ultra 10 System

1. **Position the system upside down, on its top (see FIGURE 6 page 6).**

2. **Position the top cover onto the system chassis. Press the top cover onto the chassis until the top cover tabs lock.**

3. **Using a No. 2 Phillips screwdriver, replace the four screws securing the top cover to the chassis.**

4. **Position the system upright.**

Powering On the System

1. **Turn on power to all connected peripherals.**

   Note – Peripheral power is activated prior to system power so the system can recognize the peripherals when it is activated.

2. **Verify that the voltage selector switch is set to the appropriate setting: 115V or 230V.**

   Note – Late model systems do not have voltage selector switches because they use autoswitching power supplies.

   Caution – Plugging a 115V power cord into a 230V connector will severely damage the system.

3. **Connect the power cord.**

4. **If necessary, set the power switch to the On position (**FIGURE 4**).**

5. **Press the standby switch (**FIGURE 1**) or press the Sun Type-5 keyboard Standby key (**FIGURE 2**).**

6. **Verify the following:**

   a. **The power indicator LED is on.**

   b. **The power supply fan is spinning.**

Reference Information

This section contains information on the following topics:

- Motherboard connectors
- Cabling configuration
- Jumper settings
- CD-ROM handling and use
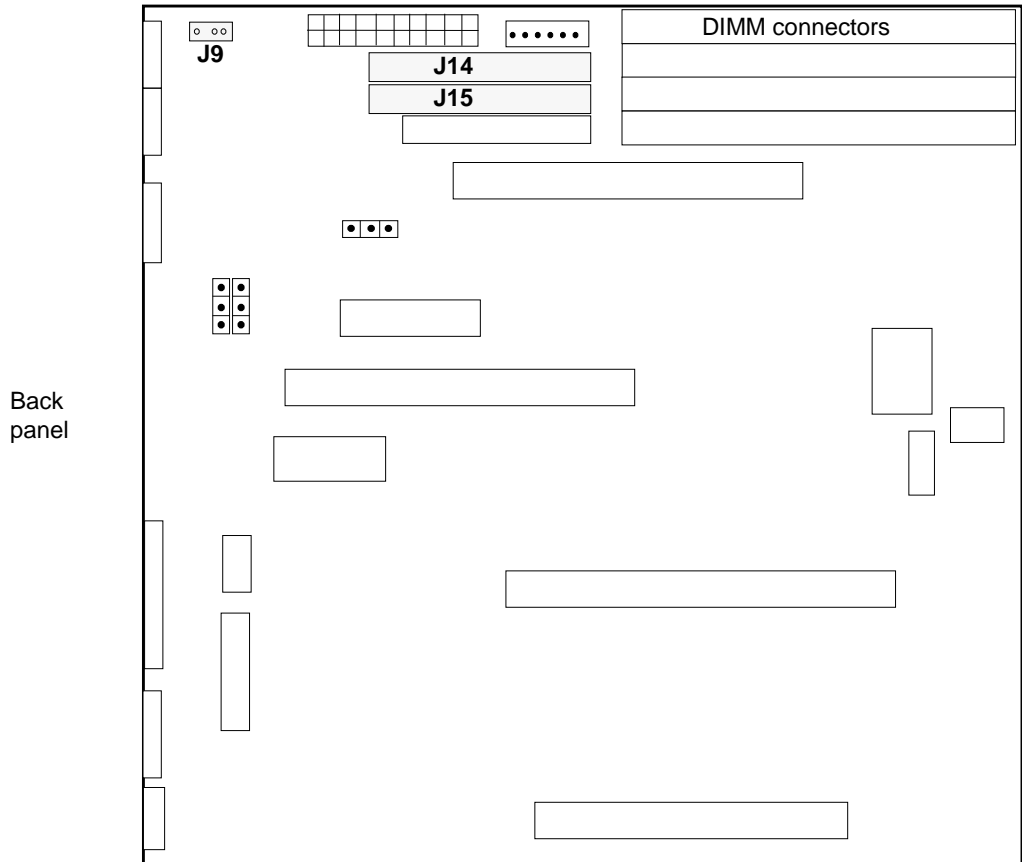
Sun Ultra 5/Ultra 10 Motherboard Connectors

FIGURE 16   Ultra 5/Ultra 10 Motherboard Connectors J9, J14, and J15

Cabling Configuration

Note – The data, audio, and power connectors on all peripherals are keyed to prevent incorrect installation.

Sun Ultra 5/Ultra10 CD-ROM Cabling

The CD-ROM cabling is the same for both Ultra 5 and Ultra 10 systems.

- CD-ROM data cable: connects to motherboard connector J14
- CD-ROM audio cable: connects to motherboard connector J9

The following block diagrams show the cabling for CD-ROM drives.

Ultra 5 and Ultra 10 CD-ROM Data Cable

| CD-ROM (device 2) | Motherboard J14 (secondary channel) |

Ultra 5 and Ultra 10 CD-ROM Audio Cable

| CD-ROM | Motherboard J9 |
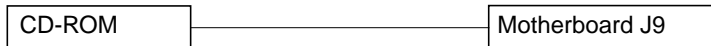
Sun Ultra 5 Hard Drive Cabling

- hard drive data cable: connects to motherboard connector J15.

The following block diagram shows the cabling for Ultra 5 hard disk drives.

Ultra 5 hard drive data cable

| Hard drive (device 0) | Motherboard J15 (primary channel) |

Sun Ultra 10 Hard Disk Drive Cabling

The cabling for Ultra 10 hard drives differs, depending on whether you have one or two hard drives.

■ hard drive data cable: connects to motherboard connector J15
■ If two hard drives are installed, the connection of the cable assembly is as shown in the following diagram.

Ultra 10 IDE hard drive data cable

Rear hard drive (master device 0)	Front hard drive (slave device 1)	Motherboard J15 (primary channel)
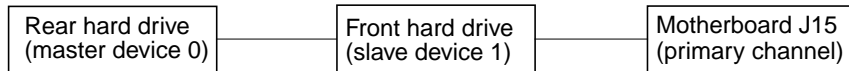
Hard Drive Cabling Configuration (With Two Mirrored Drives)

The following diagram shows the drive cabling configuration when the system contains two mirrored hard drives:

■ Primary channel—One hard drive jumpered as master
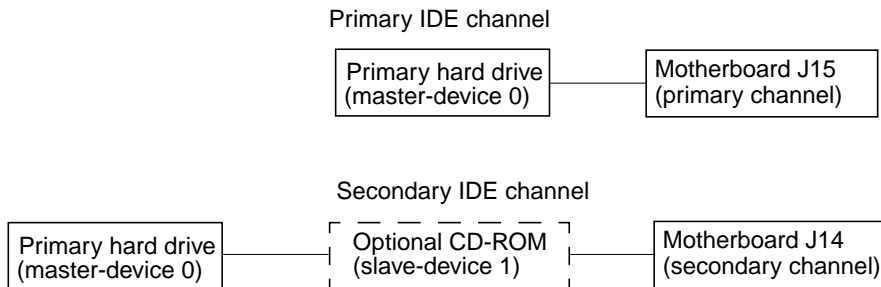■ Secondary channel—One hard drive jumpered as master

Primary IDE channel

Primary hard drive (master-device 0)	Motherboard J15 (primary channel)

Secondary IDE channel

Primary hard drive (master-device 0)	Optional CD-ROM (slave-device 1)	Motherboard J14 (secondary channel)

FIGURE 17   Hard Drive Mirroring Configuration

Note – The two hard drives that are mirrored cannot be on the same channel. Both hard drives must be jumpered as the master device on two separate channels.

Note – If a CD-ROM drive is included in an Ultra 5 system with this hard drive mirroring configuration, the CD-ROM drive must be jumpered as a slave device on either the primary or the secondary channel.

For more information on hard drive mirroring, see "Hard Drive Mirroring" on page 26.

Jumper Settings

Prior to installing a CD-ROM or hard disk drive in an Ultra 5 or Ultra 10 system, verify that the drive's rear panel mode-select jumper is set as follows:

- CD-ROM drive: set jumper to MA
- Hard disk drive: set jumper to CS

CD Handling and Use

Inserting a CD Into the Drive

1. **After the system is powered on, push the eject button to open the drive tray.**

   You may need to unmount the CD before manually ejecting it. You can also eject the CD by using software commands. Refer to the peripherals handbook that corresponds with your operating system.

2. **Place the CD (label side up) into the tray.**

   Ensure that the CD is properly set into the recessed area of the tray.

3. **If the drive is being installed in a vertical position, slide the two bottom tabs on the tray toward each other to hold the CD.**

Ejecting a CD

To eject a CD, press the eject button on the front of the CD-ROM drive.

If the motorized eject mechanism does not operate, you can insert a thin, stiff wire (such as a paper clip) into the hole next to the eject button to eject the CD.

Cleaning a CD

If your CD-ROM drive cannot read a CD, the cause may be a dirty CD. Follow these guidelines to clean a CD:

- Use a soft, clean, lint-free, dry cloth
- Clean the *non-labeled* side of the CD
- Wipe the CD *radially* from the center to the outside
- Use professional cleaning kits

Caution – Do not user solvents such as benzine, paint thinner, antistatic aerosol spray, or abrasive cleaners to clean CDs.

Handling and Storing CDs

Follow these guidelines when handling and storing CDs:

- Handle CDs only by their edges; avoid touching CD surfaces.
- Do not write on CDs with permanent marking pens.
- Do not use CDs in high-dust environments.
- Keep CDs out of direct sunlight, extreme sources of heat or cold, and away from dust and moisture.
- Make sure CDs are at room temperature before using them.
- Store CDs in storage boxes so that they remain clean and free of dust.