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COMPAQ

Compaq CD Storage System

Maintenance and Service Guide

Notice

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Compaq CD Storage System
Maintenance and Service Guide

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Preface
About This Guide

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing the Compaq CD Storage System. Only authorized technicians trained by Compaq should attempt to repair this equipment.

> ⚠ **WARNING:** To reduce the risk of personal injury from electrical shock, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

> ⚠ **WARNING:** The installation of options and the servicing of this product shall be performed by individuals that are knowledgeable of the procedures, precautions, and hazards associated with this equipment.

Compaq Computer Corporation reserves the right to make changes to Compaq CD Storage System without notice. This document contains the following chapters:

■ **Chapter 1 - Illustrated Parts Catalog**
Contains Compaq CD Storage System exploded views and spares parts list.

■ **Chapter 2 - Removal and Replacement Procedures**
Contains steps for removing and replacing Compaq CD Storage System spare parts.

■ **Chapter 3 - Diagnostic Tools and Troubleshooting**
Describes software and firmware diagnostic tools available for Compaq server products relevant to the Compaq CD Storage System.

■ **Chapter 4 - Connectors, Switches, and Jumpers**
Provides connector, switch, and jumper information for the Compaq CD Storage System.

■ **Chapter 5 - Physical and Operating Specifications**
Provides the physical and operating specifications for the Compaq CD Storage System.

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Symbols

The following text and symbols mark special information throughout this guide:

⚠ **WARNING:**   Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

⚠ **CAUTION:**   Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.

IMPORTANT: Text set off in this manner presents clarifying information or
specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technician Notes

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⚠ **WARNING:** To reduce the risk of personal injury from electrical shock, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that are hazardous.

⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:

- ■ Do not disable the power cord grounding plug. The ground plug is an important safety feature.

- ■ Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

⚠ **CAUTION**: If a third-party rack is used, the following minimum requirements should be observed to ensure adequate airflow and to prevent damage to the equipment:
- ■ <u>Front</u>: The front must have a minimum of 25 inches of unrestricted ventilation.
- ■ <u>Side</u>: The clearance between the installed module and the side panels of the rack should be a minimum of 2.75 inches.
- ■ <u>Rear</u>: The clearance between the back of the rack and the wall should be a minimum of 30 inches.
- ■ The equipment should not be operated without a rear door.

⚠ **CAUTION**: To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the CD Storage System.

IMPORTANT: Any indication of repair at the component level or modification of a printed wiring board may void any warranty.

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Where to Go for Help

Sources of additional information described in this section include:

■   Server Integrated Management Display

■   Electronic services

■   Compaq CDs

■   Other information sources

Integrated Management Display

The Compaq Integrated Management Display (IMD) is an integrated, 16x4 character
display mounted on the front of many Compaq servers. This display provides easy-to-use,
menu-driven access to server information, including model number, LCD firmware
revision, and POST operations.

Electronic Services

Users can download drivers, patches, and Compaq service updates from the
following sources:

■   Internet: Questions can be submitted to Compaq Technical Support staff using the
electronic mail address: support@compaq.com. Compaq files can be accessed
using the address: FTP.COMPAQ.COM. Enter "anonymous" for the user name at
the log-in prompt and enter your full Internet electronic mail address for the
password. You can access the Compaq World Wide Web site through the Uniform
Resource Locator (URL): http://www.compaq.com.

■   Other online services: CompuServe, Prodigy, and America Online can be used if
you are a member. Use the keywords below to access Compaq materials:

❏   CompuServe - The keywords are "GO COMPAQ".

❏   Prodigy - Choose the "Jump" navigation command, then enter the keyword
"COMPAQ".

❏   America Online - Enter the keyword "COMPAQ".

■   Compaq Download Facility: Call 1-281-518-1418

Compaq CDs

Compaq offers the following CDs, which contain Compaq documentation and other information.

SCSI Express CD

The SCSI Express CD is sent as an insert and is located in the *Hardware Installation Guide*.

■ Software Users Guide/Troubleshooting Guide

■ SCSI Express software

■ Novell Patch (Service Paq)

Compaq Systems Reference Library CD

The Compaq Systems Reference Library CD includes the following online documents:

■ Diagnostics

■ Insight Manager documentation

■ Integration TechNotes

■ Part number lists

■ SCSI and other options guides

■ Security Management

■ Maintenance and Service Guides (MSGs)

■ Reference guides

Compaq SmartStart and Support Software CD

Compaq SmartStart and Support Software CD contains:

■ System Configuration Utility software

■ ROMPaq

■ Drivers

Compaq Management CD

Compaq Management CD contains:

■ Insight Manager Utility software

■ Online Help for the Insight Manager Utility

Other Information Sources

In addition to this guide, the following information sources are available:

- User Documentation

- *Compaq Service Quick Reference Guide*

- Service Training Guides

- Compaq Service Advisories and Bulletins

- Compaq QuickFind

- Compaq Insight Manager

Chapter 1
Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and a spares parts list for the Compaq CD Storage System. See Table 1-1 for the names of referenced spare parts.

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1-2   *Illustrated Parts Catalog*

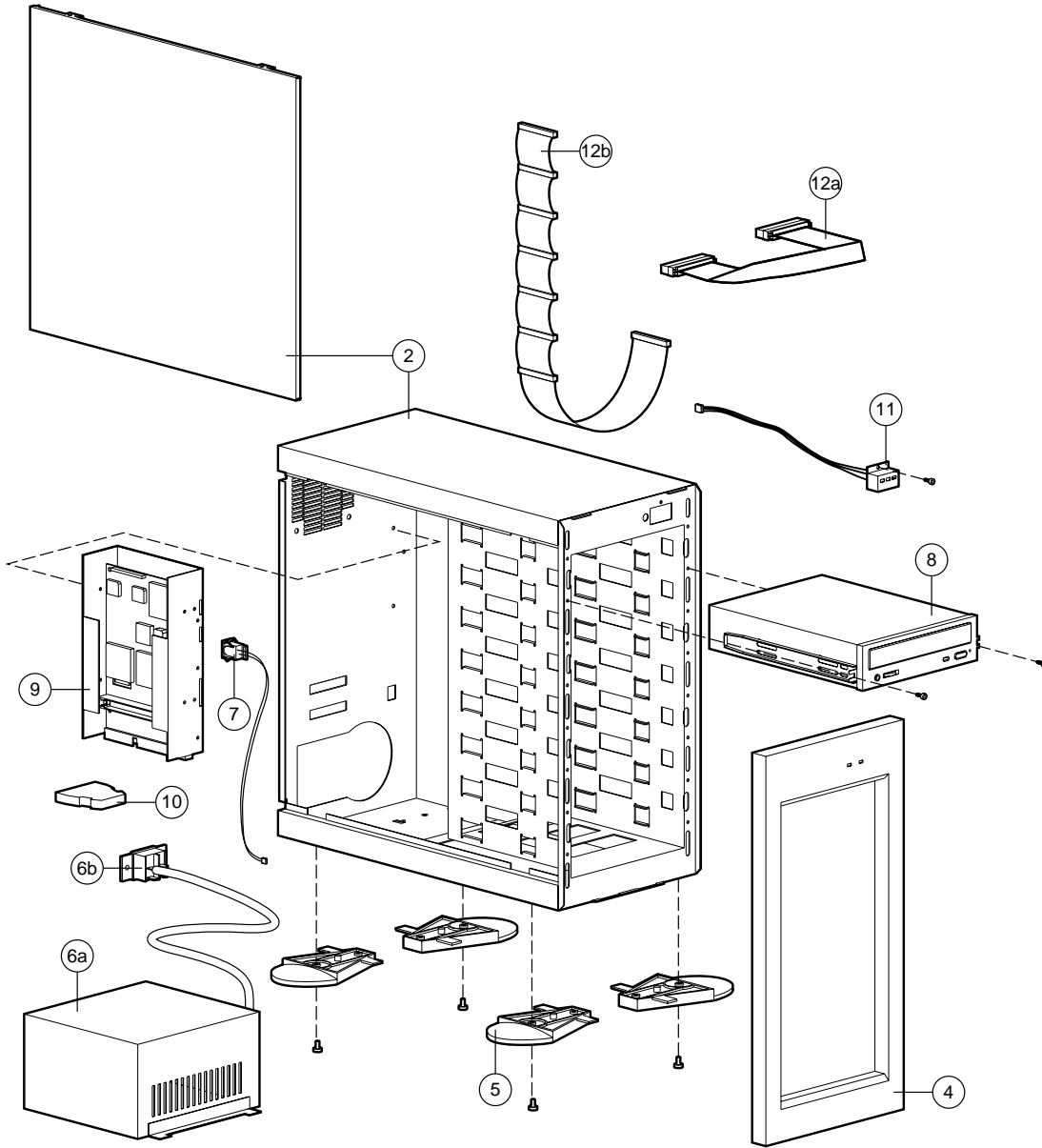# Tower Model Components Exploded View

Figure 1-1.   Exploded View of the Compaq CD Storage System Tower Model

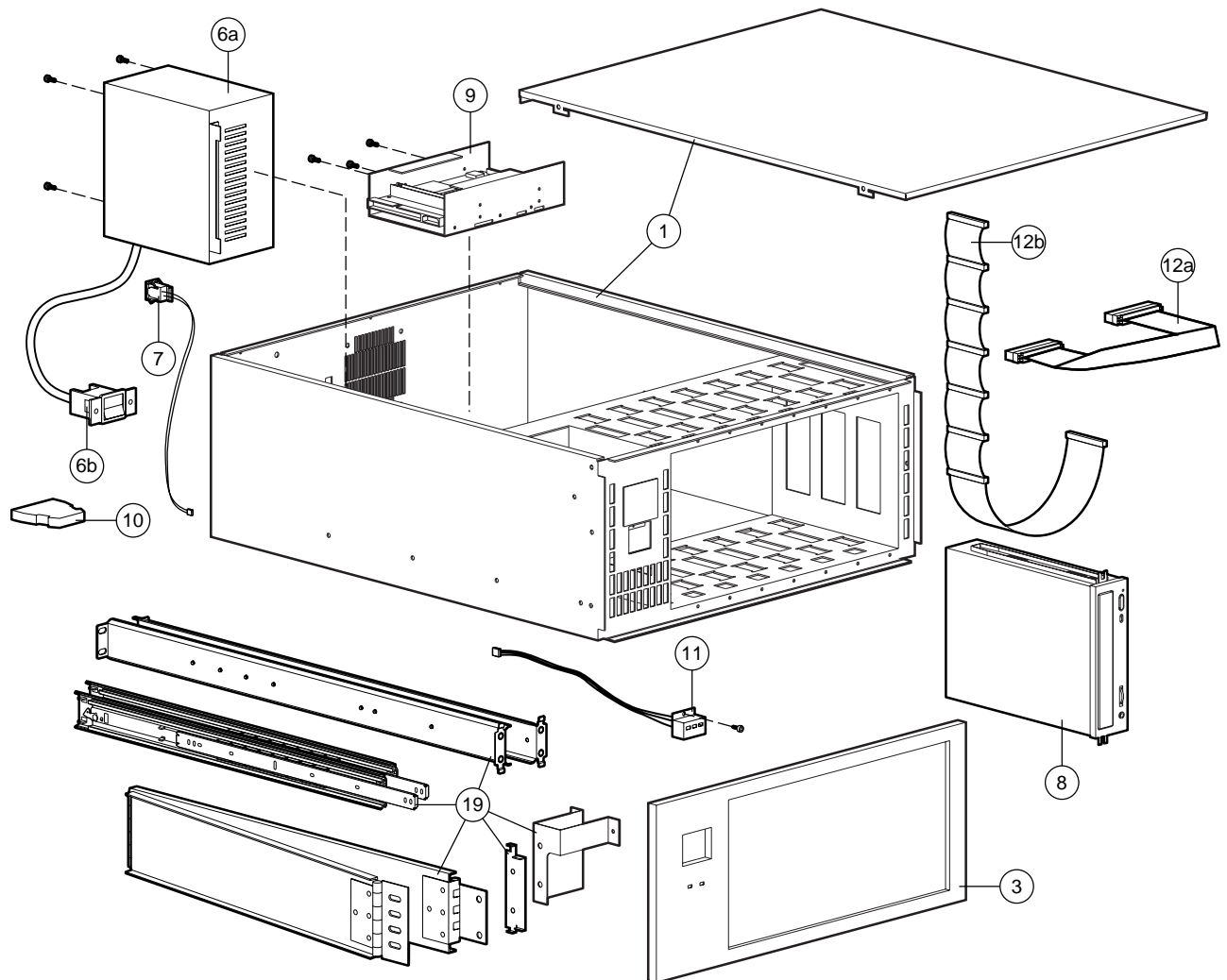## Rack-Mountable Model Components
Exploded View

Figure 1-2.   Exploded View of the Compaq CD Storage System Rack-Mountable Model

Spares Parts List

Table 1-1
Spares Parts List - Compaq CD Storage System

Item	Description	Spares Part #
CHASSIS		
1	Chassis with Top Cover (Rack-Mountable Model only)	306270-001
2	Chassis with Side Cover (Tower Model only)	306275-001
3	Front Bezel (Rack-Mountable Model only)	306271-001
4	Front Bezel (Tower Model only)	306277-001
5	Feet (Tower Model only)	149106-001
ASSEMBLIES		
6	Power Supply Assembly	306257-001
	a) Power Supply	
	b) Power ON/OFF Switch	
SYSTEM COMPONENTS		
7	SCSI Selector Switch with Cable	306274-001
8	SCSI CD-ROM Drive and Mounting Rails	306259-001
	BOARDS	
9	SCSI Interface Board	306258-001
10	SCSI Terminator	306278-001
	CABLES	
11	Cable Kit, Miscellaneous Power/Fault with LEDs	306272-001
12	Cable Kit, Miscellaneous SCSI Signal	306273-001
	a) Host/LUN Cable	
	b) 50-Pin CD-ROM Drive Ribbon Cable	
13	Exterior Cable, 3-foot	146776-003 *
14	Exterior Cable, 6-foot	146776-001 *
15	Exterior Cable Wide/Standard SCSI, 12-foot	189636-003 *
16	Exterior Cable Wide/Standard SCSI, 6-foot	189636-002 *
	MISCELLANEOUS	
17	AC Adapter. 6-foot	129827-001 *
18	AC Adapter. 12-foot	187335-001 *
19	Mounting Hardware Kit, RM7U (Rack-Mountable Model only)	165689-003
20	SCSI Express CD Software	306291-001 *
21	Maintenance and Service Guide	306292-001 *
22	Illustrated Parts Map	306293-001 *
23	Return Kit (NA, Tower Model only)	306294-001 *
24	Carton with Buns (International, Tower Model only)	306294-002 *
25	Return Kit (NA, Rack-Mountable Model only)	298401-001 *
26	Carton with Buns (International, Rack-Mountable Model only)	298401-002 *
*	Not Shown	

Chapter 2
Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the Compaq CD Storage System. After completing all necessary removal and replacement procedures, run the Diagnostics program to verify that all components are operating properly.

To service the Compaq CD Storage System, you might need the following:

■ Torx 15 screwdriver

■ Flat-head screwdriver

■ Channel locks

■ SCSI Express CD

■ From the Compaq SmartStart and Support Software CD:

❏ System Configuration Utility software

❏ Drive Array Advanced Diagnostics software

❏ Diagnostics software

Electrostatic Discharge Information

To avoid damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage or reduce the life expectancy of system boards and other static-sensitive devices. This type of damage may reduce the life expectancy of the device or render the product inoperable.

Precautions

To avoid electrostatic damage, observe the following precautions:

■   Avoid hand contact by transporting and storing products in static-safe containers.

■   Keep electrostatic-sensitive parts in their containers until they arrive at a static-free workstation.

■   Place parts on a grounded surface before removing them from their containers.

■   Avoid touching pins, leads, or circuitry.

■   Make sure you are always properly grounded when touching a static-sensitive component or assembly.

■   Make sure the chassis is properly grounded.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

■   Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megaohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

■   Use heel straps, toe straps, or boot straps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats. Ensure there is contact between the straps and the legs.

■   Use conductive field service tools.

■   Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, contact an Authorized Compaq Reseller for grounding equipment.

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Symbols in Equipment

⚠ 🔥	**WARNING:** Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.
	WARNING: To reduce risk of injury from a hot component, allow the surface to cool before touching.
⚠ ⚡	**WARNING:** Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. The enclosed area contains no operator serviceable parts.
	WARNING: To reduce risk of injury from electrical shock hazards, do not open this enclosure.
CLASS 1 LASER PRODUCT	**WARNING:** This label or equivalent is located on the surface of your CD-ROM drive. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

Preparation Procedures

Before beginning any of the removal and replacement procedures:

1. Turn the unit off.

2. Disconnect the AC power cord from the AC outlet, then from the Compaq CD Storage System.

3. Disconnect all external peripheral devices from the CD storage system.

4. Remove any compact discs installed in the CD-ROM Storage System.

> **WARNING:** Because the rack allows you to stack computer components on a vertical rather than horizontal plane, you must take precautions to provide for rack stability and safety. It is important that you follow these precautions to provide for rack stability and safety, and to protect both personnel and property. Heed all cautions and warnings throughout the installation instructions that came with the server.

> **CAUTION:** Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure.See the section titled "Electrostatic Discharge Information" for more information.

General Warnings and Precautions

> **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

> **CAUTION:** Protect the unit from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

> **CAUTION:** The unit must always be operated with the system unit cover on. Proper cooling will not be achieved if the system unit cover is removed.

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Rack Considerations

Before installing the unit in a Compaq rack cabinet, make sure you read and understand the following warnings, cautions, and environmental requirements for Compaq rack cabinets and rack-mountable components.

> ⚠ **WARNING:** To reduce the risk of personal injury, always make sure that the rack is adequately stabilized before extending a component outside the rack. A rack may become unstable if more than one component is extended for any reason. Extend only one component at a time.

> ⚠ **WARNING:** To reduce the risk of personal injury or damage to the equipment, be sure that:
>
> - The leveling jacks are extended to the floor
> - The full weight of the rack rests on the leveling jacks
> - The stabilizers are attached to the rack if it is a single rack installation
> - The racks are coupled together in multiple rack installations

> ⚠ **WARNING:** To reduce the risk of electric shock or damage to the equipment:
>
> - Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
> - Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

> △ **CAUTION:** The Compaq CD Storage System must always be operated with the system unit cover on. Proper cooling will not be achieved if the system unit cover is removed.

Space Requirements

The following spatial needs should be considered:

- Clearance in the front of the rack should be a minimum of 25 inches (64 cm) for the front door to open all the way and for adequate air flow.

- Clearance in the back of the rack should be a minimum of 30 inches (76 cm) to allow for servicing and for adequate air flow.

- To service the tower model, allow 15 inches (38 cm) of side clearance.

Power Requirements

⚠️ **WARNING:**   To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack. Consult the electrical authority having jurisdiction over your facility wiring and installation requirements.

■   The power load needs to be balanced between available AC supply branch circuits.

■   The overall system AC current load must not exceed 80 percent of the branch circuit AC current rating.

■   If power strips are used, the load should not exceed 80 percent of the power strips marked electrical current rating.

The installation of this equipment shall be in accordance with Local/Regional electrical regulations governing the installation of Information Technology Equipment by licensed electricians. This equipment is designed to operate in installations covered by the National Electric Code (ANSI/NFPA 70, 1993) and the code for Protection of Electronic Computer/Data Processing Equipment (NFPA-75, 1992).

For specific electrical power ratings, refer to the product's rating label or user documentation.

Grounding Requirements

For proper operation and safety, this equipment is required to be properly grounded in accordance with NFPA 70-1993, Article 250. All power distribution devices, branch wiring, and receptacles must be "Listed" grounding type devices.

When using power strips for electrical distribution, make sure that ground integrity is maintained for each connection made. Plug each component into a reliably grounded outlet.

Temperature Requirements

For safe and reliable operation of the equipment, locate the system in a well-ventilated, climate-controlled environment.

The Compaq Maximum Recommended Ambient Operating Temperature (Tmra) for most server products is 35°C (95°F). Therefore, the temperature in the room where the rack is located should not exceed 35°C (95°F).

The operating temperature inside the rack will always be higher than the room temperature, and is dependent on the configuration of equipment in your rack. The Tmra for each piece of equipment should be checked before installation.

The maximum internal rack temperature for your configuration should not exceed the values in the following table:

Table 2-1
Rack Internal Temperature Maximums

Equipment Included	Maximum Internal Rack Temperature
Rack-Mountable ProLiant Servers	50°C/122°F
Compaq Rack-Mountable options	40°C/104°F
Other manufacturers' options	See other manufacturers' specifications

⚠ **CAUTION**: To reduce the risk of damage to the equipment when installing third-party options:

■ Make sure that the option equipment does not impede airflow to the rack-mountable products already installed in the rack cabinet nor increase the internal rack temperature beyond the Compaq specified maximum rating.

■ Make sure that the Manufacturer's Maximum Recommended Ambient Operating Temperature for the option equipment will not be exceeded if the option equipment is installed in a Compaq rack.

Airflow Requirements

Compaq rack-mountable products typically draw in cool air through the front and exhaust warm air out the rear. The front door of the rack cabinet, therefore, must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to allow the warm air to escape the cabinet. Do not block the ventilation apertures.

> ⚠ **CAUTION**: If a third-party rack is used, the following minimum requirements should be observed to ensure adequate airflow and to prevent damage to the equipment:
>
> ■ <u>Front</u>: The front must have a minimum of 25 inches (60 cm) of unrestricted ventilation.
>
> ■ <u>Side</u>: The clearance between the installed module and the side panels of the rack should be a minimum of 2.75 inches (7 cm).
>
> ■ <u>Rear</u>: The clearance between the back of the rack and the wall should be a minimum of 30 inches (76 cm).
>
> ■ The equipment should not be operated without a rear door.

Feet (Tower Model only)

To remove a foot on a tower model:

1. Perform the preparation procedures. See page 2-4.

2. Turn the unit on its side.

3. Remove the T-15 screw from the foot.

4. Pull the foot away from the chassis.
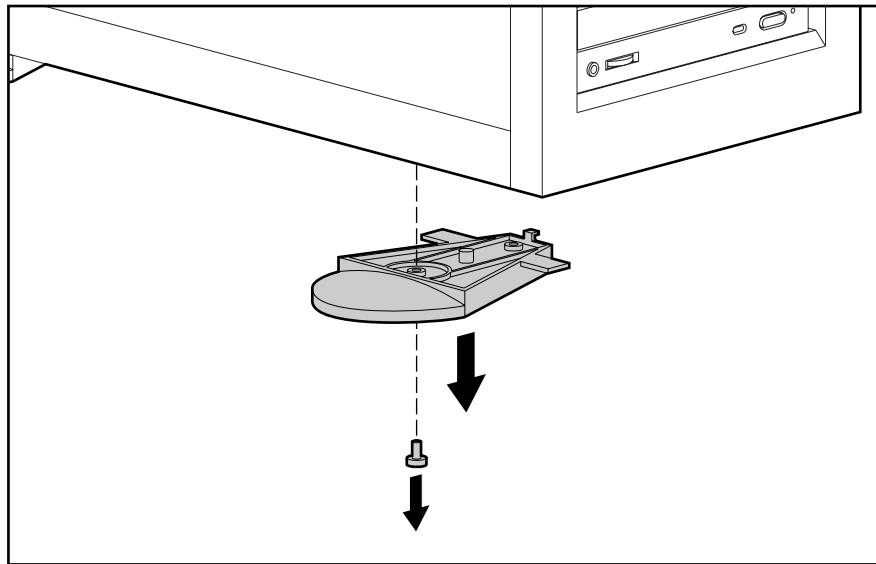
Figure 2-1. Removing a Foot from a Tower Model

Reverse steps 1 through 4 to replace a foot on a tower model.

Top Cover (Rack-Mountable Model)

> ⚠ **WARNING:** To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

To remove the top cover:

1. Perform the preparation procedures. See page 2-4.

2. Remove the three thumbscrews located on the back of the chassis.

3. Pull the top cover back and lift it from the chassis.
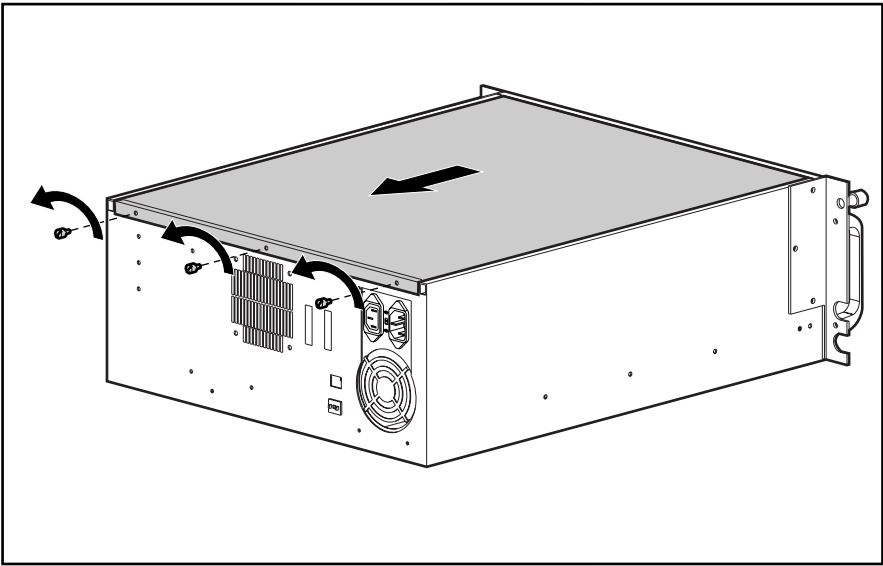
Figure 2-2. Removing the Top Cover

Reverse steps 1 through 3 to replace the top cover.

Side Cover (Tower Model)

> ⚠ **WARNING**: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching them.

To remove the side cover:

1. Perform the preparation procedures. See page 2-4.

2. Remove the three thumbscrews located on the back of the chassis.

3. Pull the side cover back and lift it from the chassis.
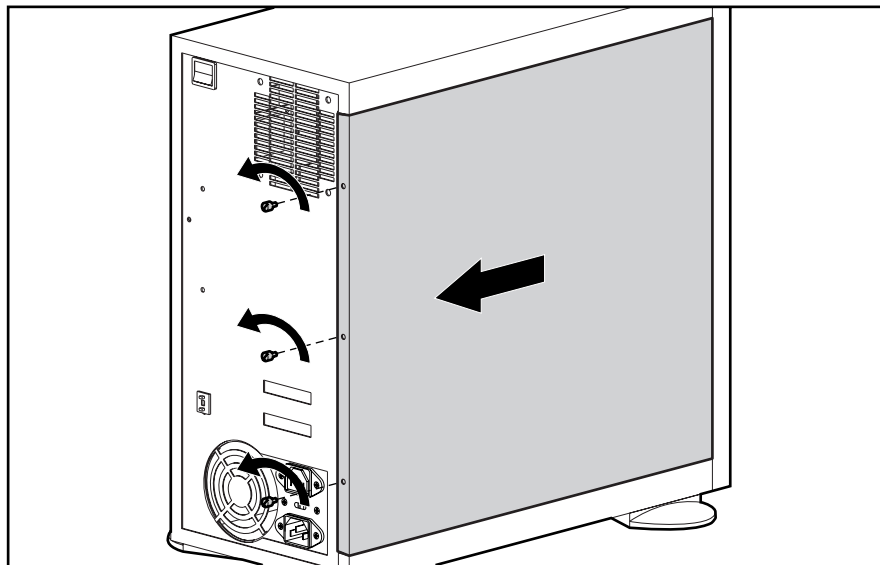
Figure 2-3. Removing the Side Cover

Reverse steps 1 through 3 to replace the side cover.

Front Bezel (Rack-Mountable Model)

To remove the front bezel on a rack-mountable model:

1. Perform the preparation procedures. See page 2-4.

2. Remove the top cover. See page 2-10.

3. Insert the tip of the flat-head screwdriver in the slots located on the top, front edge of the chassis ❶.

4. Push the bezel off the chassis with the screwdriver ❷.
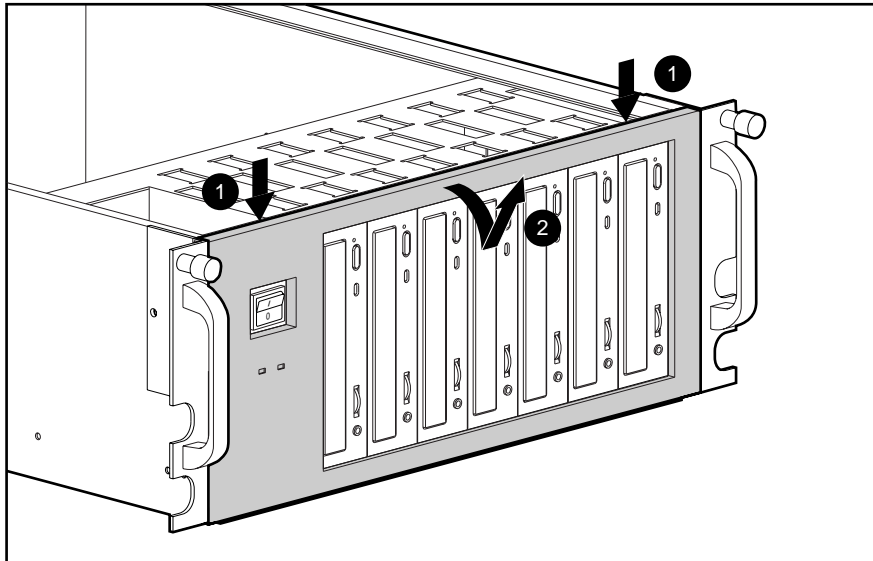
Figure 2-4. Removing the Front Bezel on a Rack-Mountable Model

Reverse steps 1 through 4 to replace the front bezel on a rack-mountable model. When replacing the bezel on the rack-mountable model, align the bottom of the bezel with the bottom of the chassis. Rotate the top of the bezel back and press firmly into place.

Front Bezel (Tower Model)

To remove the front bezel on a tower model:

1. Perform the preparation procedures. See page 2-4.

2. Remove the side cover. See page 2-11.

3. Insert the tip of the flat-head screwdriver in the slot located on the side edge of the front bezel and loosen the bezel ❶.

4. Insert the tip of the flat-head screwdriver at the top of the bezel ❷ and pull the bezel away from the chassis ❸.
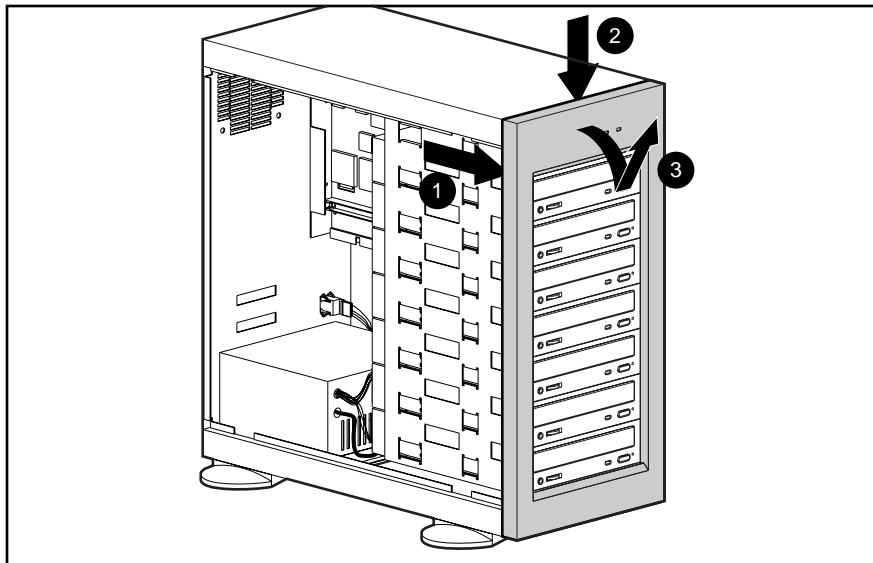

Figure 2-5. Removing the Front Bezel (Tower Model)

Reverse steps 1 through 4 to replace the front bezel on a tower model. When replacing the bezel on a tower model, make certain the guide tabs at the bottom of the bezel slide correctly into the corresponding slots at the bottom of the chassis before snapping the bezel into place.

SCSI CD-ROM Drives

Seven CD-ROM drives ship standard in the Compaq CD Storage System. Make sure to remove any compact discs from the drives before repairing the unit.

To remove a SCSI CD-ROM drive:

1. Perform the preparation procedures. See page 2-4.

2. Remove the top cover/side cover. See page 2-10 or 2-11.

3. Remove the front bezel. See page 2-12 or 2-13.

4. Disconnect the SCSI ribbon cable and power cable from the CD-ROM drive.

> △ **CAUTION**:   Use care when disconnecting the SCSI ribbon cable from the
> CD-ROM drives. If possible, disconnect the cable by grasping the connector.
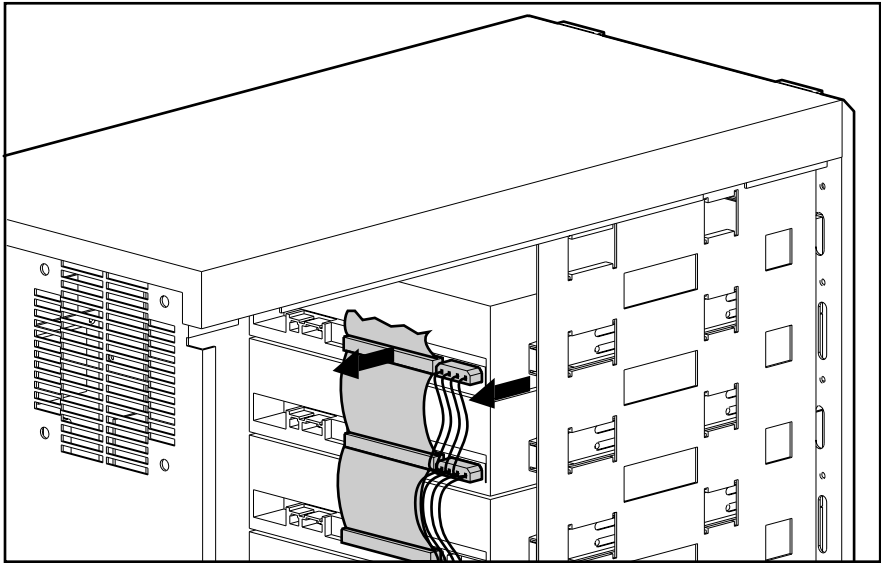
Figure 2-6. Disconnecting the SCSI Ribbon and Power Cables from the CD-ROM Drive

5. Remove the two T-15 screws on the sides of the CD-ROM drive.

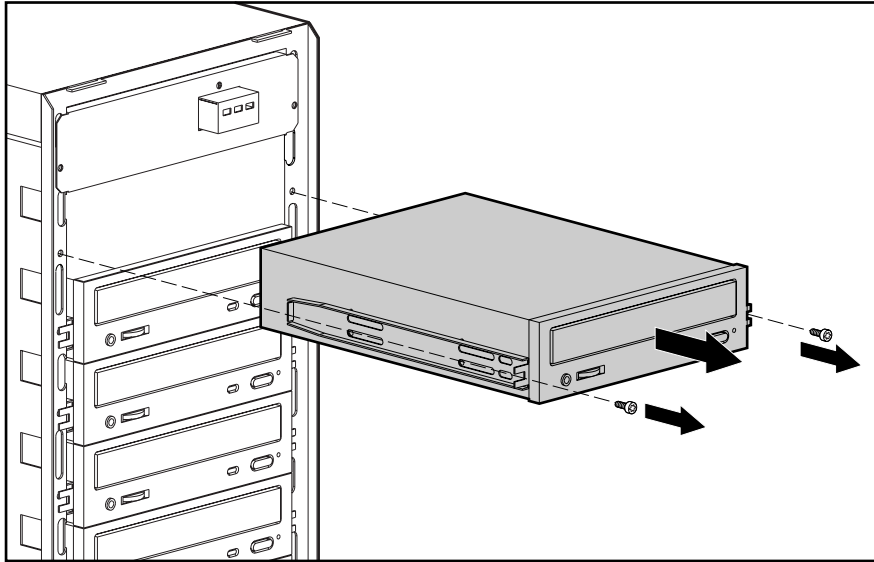6. Slide the drive out the front of the chassis.

Figure 2-7. Removing a Drive from the Removable Media Area

Reverse steps 1 through 6 to replace a CD-ROM drive. When replacing a drive, make sure the jumper setting on the replacement drive is the same as on the drive being removed. See Chapter 4 for CD-ROM drive jumper settings.
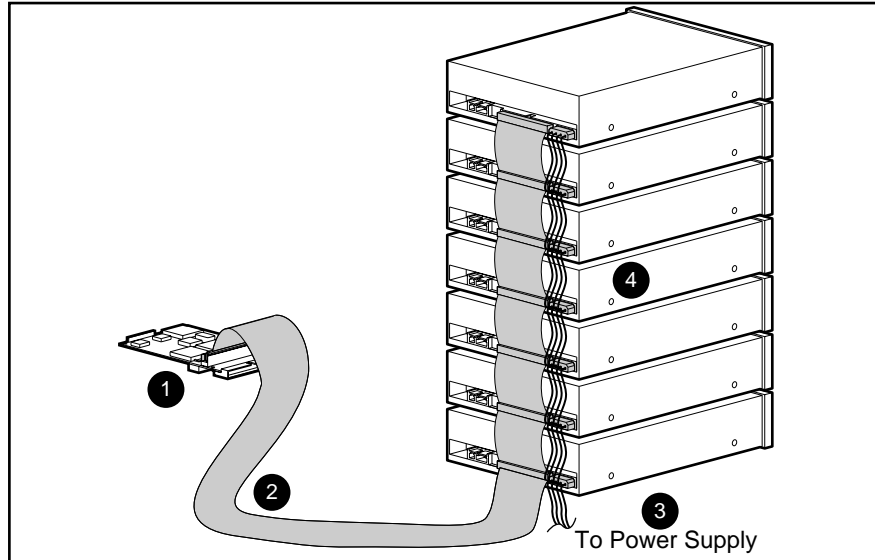
Cable Folding and Routing Diagram

Figure 2-8. CD-ROM Drive Cable Folding and Routing Diagram

Table 2-2
CD-ROM Drive Cable Folding and Routing Descriptions

Reference	Component
❶	SCSI Interface Board
❷	SCSI Data Cable
❸	Power Cable
❹	CD-ROM Drives

See Chapter 4 for information on CD-ROM jumper settings and termination requirements.

Power Supply Assembly

Power Switch (Tower Model)

The power switch and power supply must be removed from the chassis as a single unit. To remove the power switch in a tower model:

1. Perform the preparation procedures. See page 2-4.

2. Remove the side cover. See page 2-11.

3. Remove the nut from the threaded stud attaching the ground wire to the chassis, and pull the ground wire off the threaded stud.
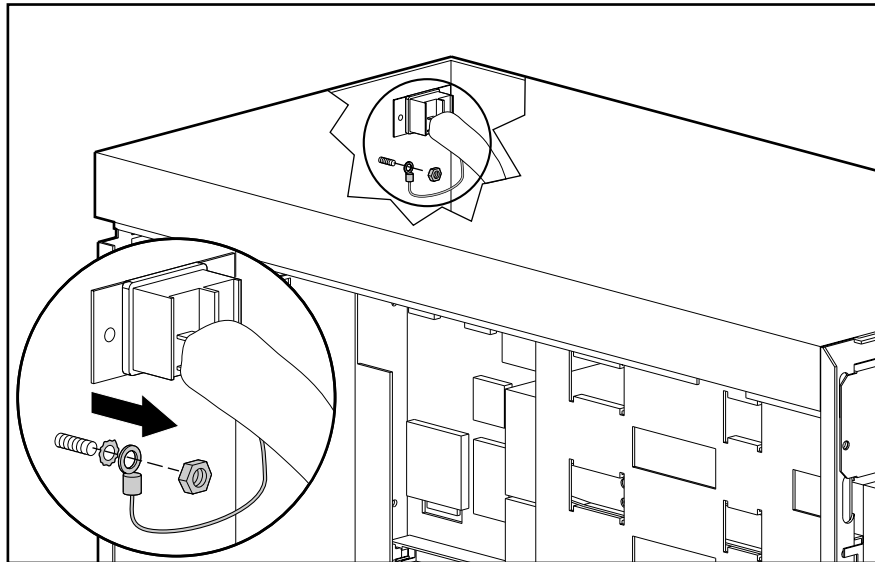

Figure 2-9. Disconnecting the Ground Wire

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2-18   *Removal and Replacement Procedures*

4. Remove the two T-15 screws attaching the power switch to the back of the chassis.

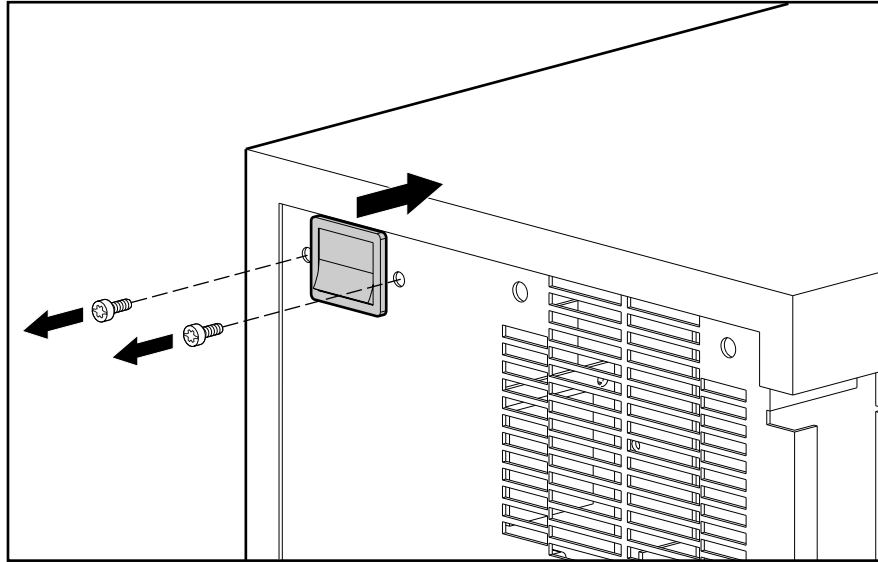5. Pull the switch to the inside of the unit and remove it through the side of the chassis.

Figure 2-10. Removing the Power Switch in a Tower Model

To remove the power supply, see page 2-21.

> ⚠ **WARNING:** To reduce the risk of electrical shock, the power switch ground wire must be completely reassembled in the server as originally installed.

Power Switch (Rack-Mountable Model)

The power switch and power supply must be removed from the chassis as a single unit. To remove the power switch in a rack-mountable model:

1. Perform the preparation procedures. See page 2-4.

2. Remove the top cover. See page 2-10.

3. Remove the front bezel. See page 2-12.

4. Remove the nut from the threaded stud attaching the ground wire to the chassis, and pull the ground wire off the threaded stud.
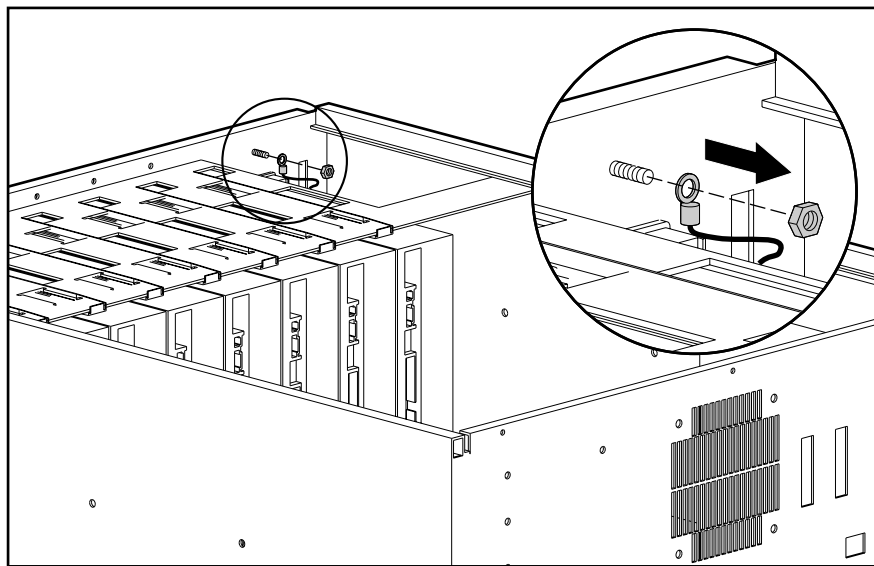

Figure 2-11. Disconnecting the Ground Wire

5. Remove the two inner T-15 screws attaching the power switch to the front of the chassis.
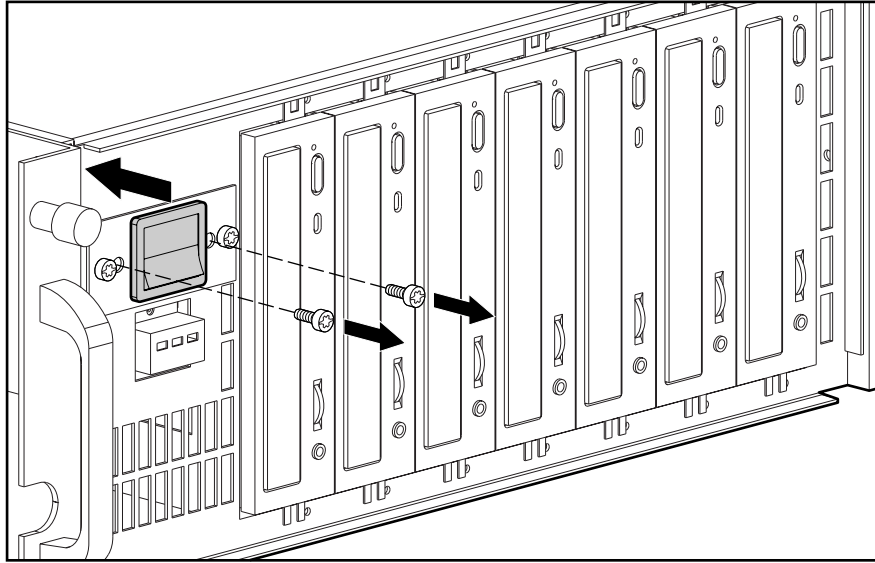
6. Pull the switch to the inside of the unit.

Figure 2-12. Removing the Power Switch in a Rack-Mountable Model

To remove the power supply, see page 2-21.

Power Supply

The power switch and power supply must be removed from the chassis as a single unit.

1. Remove the power switch. See page 2-17 or page 2-19.

2. Unplug the power supply from all the drives and the SCSI interface board**.**

3. Remove the T-15 screw(s) attaching the power supply to the chassis.

NOTE: The power supply in the rack-mountable model is attached to the chassis by
two T-15 screws. The power supply in the tower model is attached to the chassis by one T-15 screw. The tower model is illustrated below.
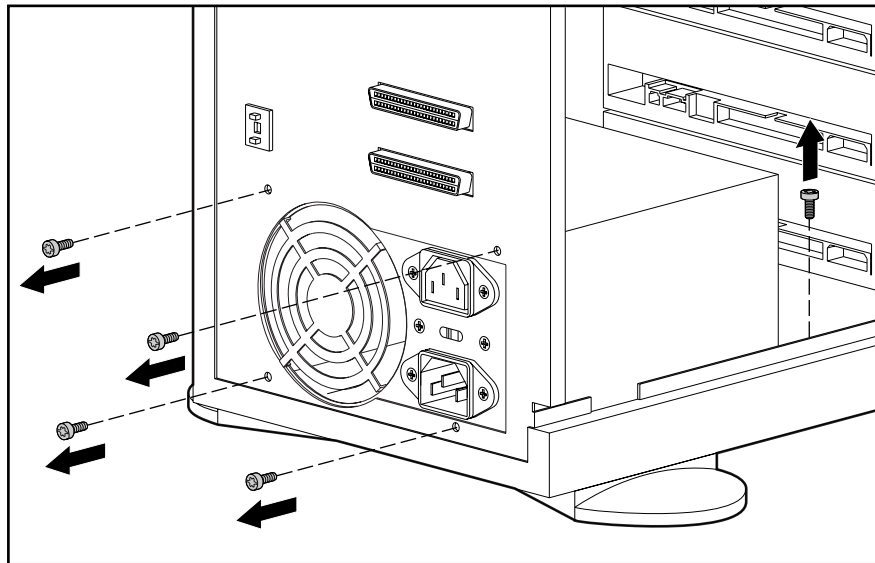

Figure 2-13. Removing the T-15 Screws from the Power Supply

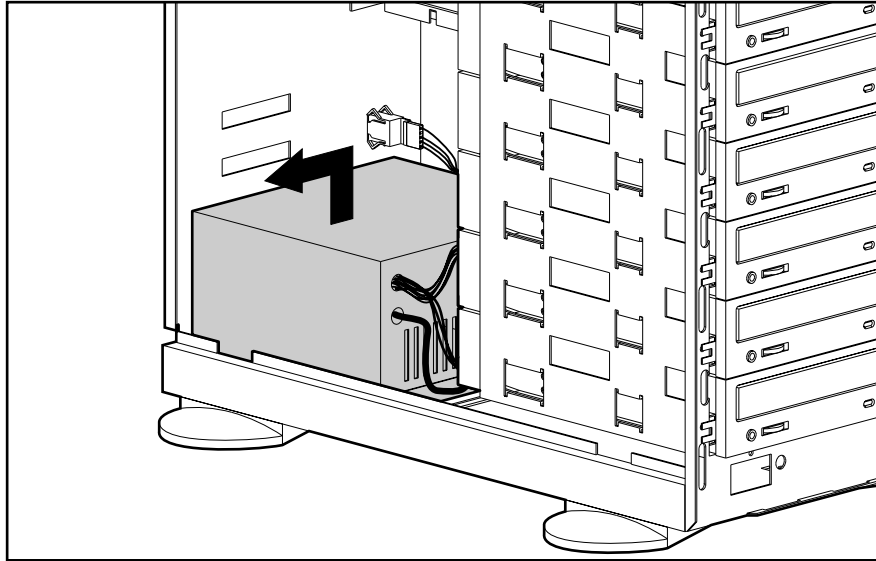4.   Lift the power supply and power switch out of the chassis.

Figure 2-14. Removing the Power Supply

Reverse steps 1 through 4 to replace the power supply and power switch.

Power Supply/Fault LEDs

To remove the power supply/fault LEDs:

1. Perform the preparation procedures. See page 2-4.

2. Remove the top cover/side cover. See page 2-10 or 2-11.

3. Remove the front bezel. See page 2-12 or 2-13.

4. Disconnect the power supply/fault LED cables from the SCSI interface board and power supply.

5. Remove the T-15 screw attaching the power supply/fault LEDs to the chassis.

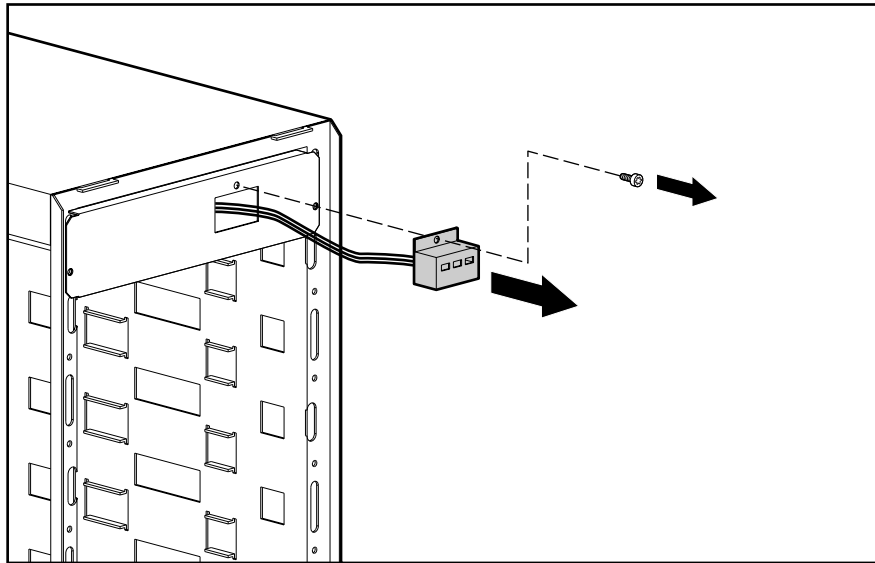6. Pull the power supply/fault LEDs with cables through the front of the chassis.

Figure 2-15. Removing the Power Supply/Fault LEDs

Reverse steps 1 through 6 to replace the power supply/fault LEDs.

SCSI Interface Board with Bracket

To remove the SCSI interface board with bracket:

1. Perform the preparation procedures. See page 2-4.

2. Remove the top cover/side cover. See page 2-10 or 2-11.

3. Disconnect all cables from the SCSI interface board with bracket.

4. Remove the three T-15 screws attaching the SCSI interface board to the back of the chassis.
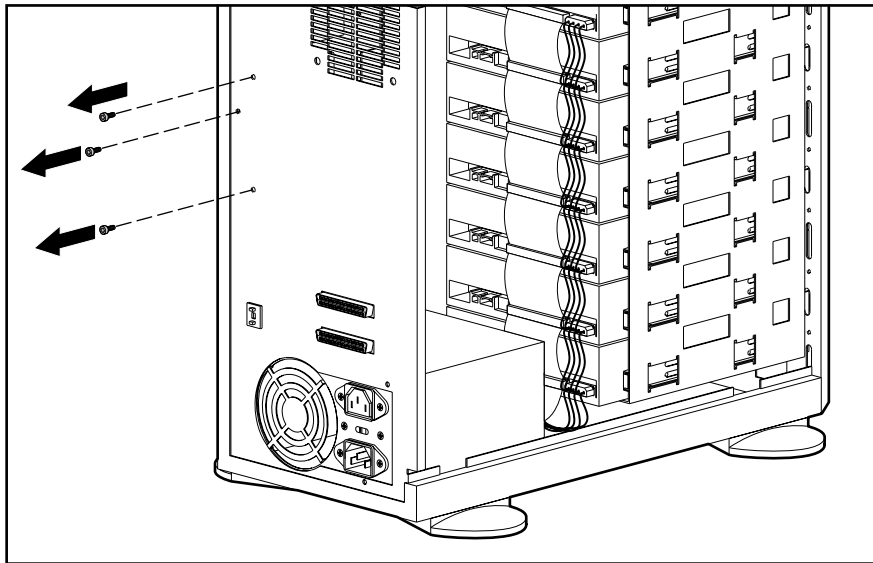

Figure 2-16. Removing the T-15 Screws from the SCSI Interface Board with Bracket

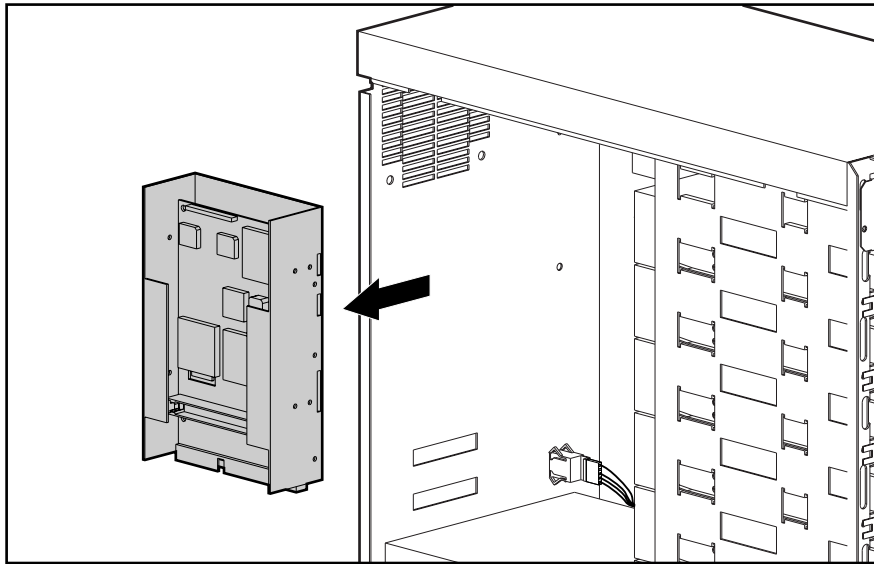5. Lift the SCSI interface board with bracket from the chassis.

Figure 2-17. Removing the SCSI Interface Board with Bracket

Reverse steps 1 through 5 to replace the SCSI interface board. See Chapter 4 for information on the SCSI interface board connections.

SCSI Selector Switch

To remove the SCSI selector switch:

1. Perform the preparation procedures. See page 2-4.

2. Remove the top cover/side cover. See page 2-10 or 2-11.

3. Unplug the SCSI selector switch cable from the SCSI selector switch ❶.

4. From inside the chassis, use channel locks to pinch the two sets of tension clamps on the SCSI selector switch ❷.

5. Push the SCSI selector switch out the back of the chassis ❸.

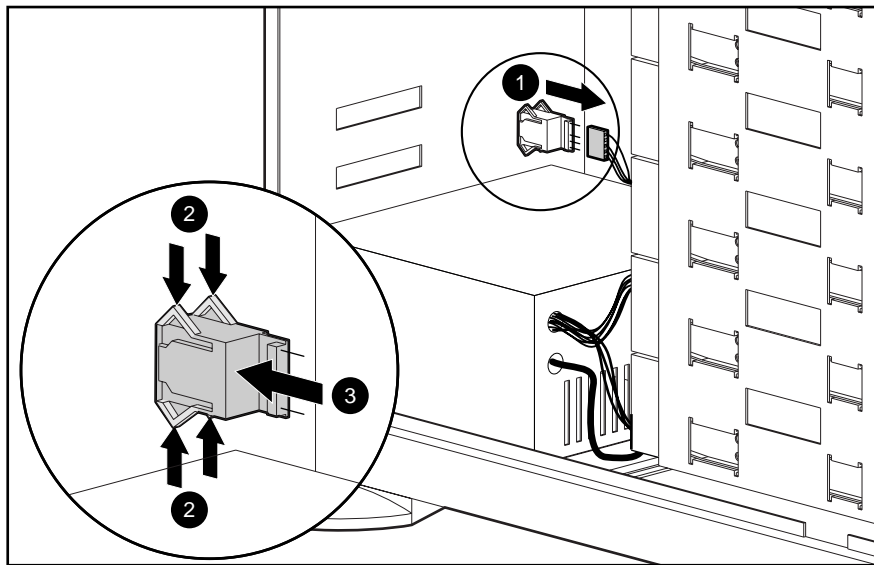**Figure 2-18.** Removing the SCSI Selector Switch

Reverse steps 1 through 5 to replace the SCSI selector switch.

> ⚠ **WARNING:** Make sure the SCSI ID on the replacement SCSI selector switch is the same as the SCSI ID on the removed SCSI selector switch.

SCSI Terminator

The SCSI terminator is used to terminate a SCSI interface bus. A SCSI terminator ships standard with every unit and must be installed on the second SCSI connector on the SCSI bus.

To remove the SCSI terminator:

1. Perform the preparation procedures. See page 2-4.

2. Squeeze the clips on each side of the SCSI terminator.
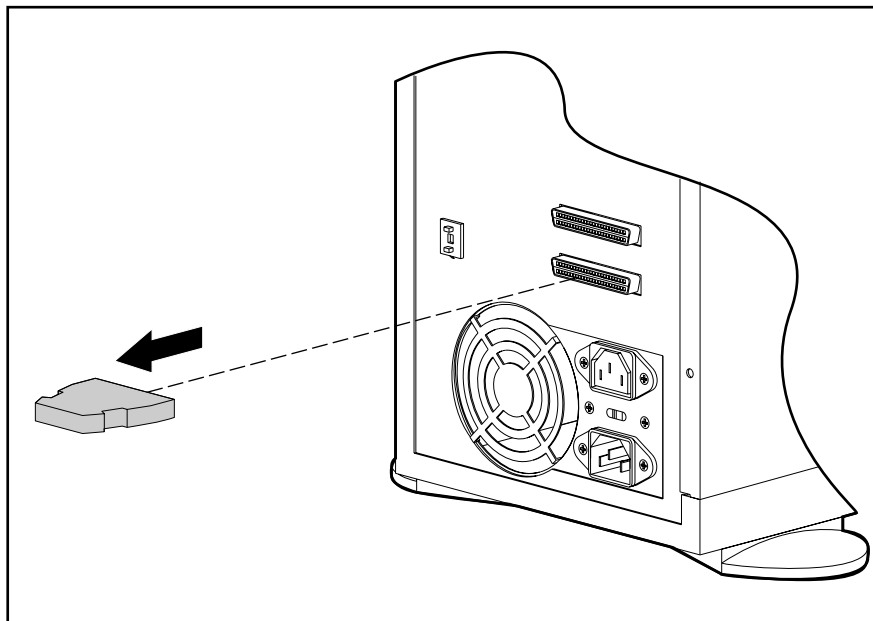
3. Pull the SCSI terminator off the connector.

Figure 2-19. Removing the SCSI Terminator

Reverse steps 1 through 3 to replace the SCSI terminator.

Chapter 3
Diagnostic Tools and Troubleshooting

This chapter describes software and firmware diagnostic tools available for Compaq server products and the Compaq CD Storage System. The sections in this chapter are:

■　General Checklist

■　Internal Drive Reassignment

■　CD-ROM Drive Busy Indicator

■　CD-ROM Drive Jumper Settings

■　Utility Access

■　Power-On Self-Test (POST)

■　Diagnostics Software

■　Integrated Management Log

■　ROMPaq

■　Compaq Insight Manager

General Checklist

If the Compaq CD Storage System is not operating, verify the following items before proceeding:

■　The AC power cord is plugged into the unit and a grounded AC outlet.

■　The power switch is in the ON position, and the power LED is illuminated.

■　You might need to upgrade the system ROM using the ROMPaq utility on the SmartStart and Support Software CD that was shipped with the unit.

■　The correct cables are attached.

❏　If the unit is connected to a server, make sure the SCSI cable is attached to the server and one of the SCSI connectors on the rear panel of the unit.

❏　If you are connecting the unit to other SCSI devices (such as one or more Compaq CD Storage Systems), make sure one end of the SCSI cable is attached to one of the SCSI connectors on the rear panel of the unit and that the other end of the cable is attached to the connecting SCSI device.

❏　If the unit is the last device in a group of connected SCSI devices, make sure the standard SCSI terminator is attached to the remaining SCSI connector on the rear panel of the unit.

■ You can chain only standard (narrow) SCSI devices from the Compaq CD Storage System. If you have attached a Wide-Ultra device to the Compaq CD Storage System as the next device in the chain, the Wide-Ultra SCSI device will not function correctly.

■ The total cable length of the SCSI bus (internal and external) does not exceed 18 feet (5 meters). Adding a repeater into the chain can alleviate the problem.

■ The compact discs in the drive are loaded and can be read by the Compaq CD Storage System.

■ Each compact disc that is loaded in the unit must be assigned its own properties. If you load a new compact disc in a CD-ROM drive that is identical to a disc already loaded in a drive in that same unit, the properties will not carry over. You need to assign specific properties for the new disc.

■ The unit must have a unique SCSI ID number. If the unit is part of a group of connected SCSI devices, it requires a SCSI ID number different from any other device in that chain. The unit ships with the SCSI ID set to 2. You can select 0 through 7 on the rear panel.

■ If you changed the SCSI ID for the unit, turn the unit off and on for the change to be recognized.

Internal Drive Reassignment

If you did not load an operating system and configure the system before attaching the Compaq CD Storage System, the drive letter of your internal CD-ROM drive might have been reassigned during the SmartStart configuration process.

To correct this:

1. Disconnect the Compaq CD Storage System from your server.

2. Load an operating system.

3. Install all additional hardware and options.

4. Reattach the Compaq CD Storage System.

5. Cycle the power on the server.

The drive assignments should now be correct.

CD-ROM Drive Busy Indicator

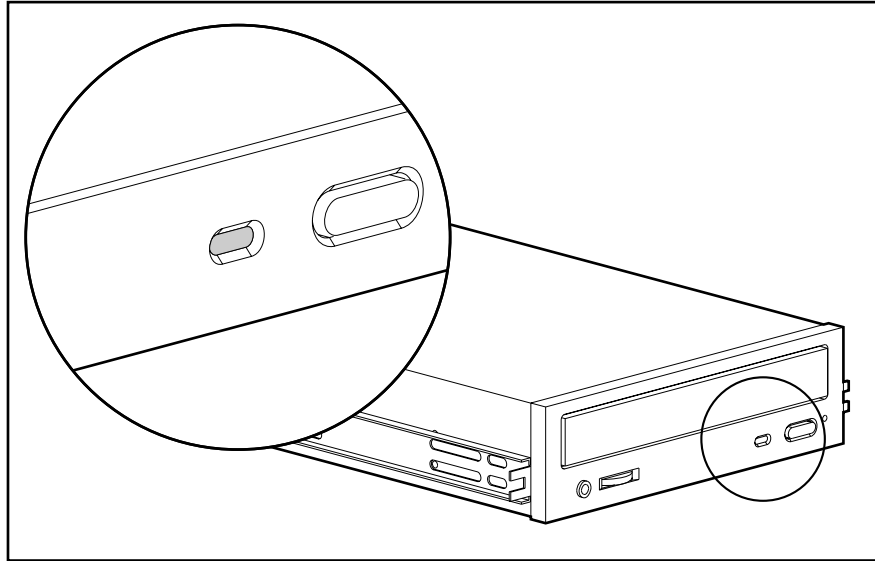The busy indicator illuminates when the CD-ROM is active.

Figure 3-1. CD-ROM Drive Busy Indicator

Two conditions can indicate the CD-ROM is experiencing a fault condition.

■   If the busy indicator blinks at 3-second intervals, there is a problem with the optics. Usually this can be alleviated by cleaning the compact disc and/or the optics in the drive.

■   If the busy indicator illuminates and stays on continuously, there is a problem with the media. Make sure the compact disc is the correct format to be read by the drive, and that it is loaded correctly.

CD-ROM Drive Jumper Settings

If the system does not recognize one or more of the CD-ROM drives, there may be a problem with the CD-ROM drive Logical Unit Number (LUN) IDs. Verify that each CD-ROM drive has a unique jumper setting. For more information, see Chapter 4, "Connectors, Switches, and Jumpers."

Utility Access

The Compaq SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain your system, including:

- System Configuration Utility

- ROMPaq Firmware Upgrade Utilities

- Advanced User Diagnostics Utility

> **CAUTION:** Do not select the Erase Utility when running the SmartStart and Support Software CD. This will result in data loss to the entire system.

There are several ways to access these utilities:

- **Run the Utilities on the system partition.**

  If the system was installed using SmartStart, the Compaq utilities will automatically be available on the system partition. The system partition could also have been created during a manual system installation.

  To run the utilities on the system partition, boot the system and press **F10** when you see the following message: "Press F10 for system partition utilities." Then select the utilities from the menu.

    - System Configuration Utility is available under System Configuration menu.

    - ROMPaq Firmware Upgrade Utility is available under the Diagnostics and Utilities menu.

    - Advanced User Diagnostics Utility is available under the Diagnostics and Utilities menu.

- **Run the Utilities from diskette.**

  You can also run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.

  You can also create a diskette version of the utility from the SmartStart and Support Software CD. To create diskette versions of the utilities from the CD:

    1. Boot the Compaq SmartStart and Support Software CD.

    2. From the Compaq System Utilities screen, select *Create Support Software* and select *Next*.

    3. Select the diskette you would like to create from the list and follow the instructions on the screen.

■ **Run the Utilities from the Compaq SmartStart and Support Software CD.**

> **IMPORTANT:** Only the System Configuration Utility and the Array Configuration Utility can be executed from the Compaq SmartStart and Support Software CD. All other utilities can be executed only from the system partition or from diskette.

To run these utilities directly from the Compaq SmartStart and Support Software CD:

1. Boot the Compaq SmartStart and Support Software CD.

2. From the Compaq System Utilities screen, select the utility you wish to run and select *Next*.

Power-On Self-Test (POST)

POST is a series of diagnostic tests that runs automatically on Compaq computers when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

■ Keyboard

■ Power supply

■ System board

■ Memory

■ Memory expansion boards

■ Controllers

■ Diskette drives

■ Hard drives

If the system ROM has been upgraded using ROMPaq included in the Compaq SmartStart and Support Software CD version 3.42 or later, POST reports the Compaq CD Storage System as a SCSI device found.

Diagnostics Software

The error messages and codes listed in this section are codes generated by Compaq server products relevant to the Compaq CD Storage System.

When you select Diagnostics and Utilities from the System Configuration Utility main menu, the utility prompts you to test, inspect, upgrade, and diagnose the server.

Diagnostics and Utilities are located on the system partition on the server hard drive and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST). Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD. You can create a Diagnostics diskette from the SmartStart CD, and run Diagnostics from diskette.

The following options are available from the Diagnostics and Utilities menu:

■ Test Computer

■ Inspect Computer

■ Upgrade Firmware

■ Remote Utilities

■ Diagnose Drive Array

Diagnostic error codes are generated when the Diagnostics software recognizes a problem. These error codes help identify possible defective subassemblies. The following tables list possible error codes, a description of the error condition, and the action required to resolve the error condition.

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the Diagnostics program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the Diagnostics program again. Follow this procedure until the Diagnostics program no longer detects an error condition.

If you encounter an error condition, complete the following steps for the server before starting problem isolation procedures:

1. Be sure that there is proper ventilation. The computer or storage system should have approximately 12 inches (30.5 cm) clearance at the front and back of the system unit.

2. Turn off the computer and peripheral devices.

3. Disconnect any peripheral devices not required for testing. Do not disconnect the printer if you want to test it or use it to log error messages.

4. Turn on the computer.

5. Delete the power-on password, if set. You will know that the power-on password is set when a key icon appears on the screen when POST completes. If this occurs, you must enter the password to continue. To delete the password, type the current password, a forward slash (/), and press the **Enter** key.

6. If you do not have access to the password, you must disable the power-on password by using the Password Disable switch on the system board.

7. When required by Diagnostics, install a loopback plug (Part Number 142054-001).

8. Run the latest version of Diagnostics.

SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of Diagnostic error codes identifies failures with the CD-ROM cabling, CD-ROM drive, adapter board, or system board assembly. Corrective action may require replacement of the CD-ROM cabling, CD-ROM drive, adapter board, or system board assembly.

Table 3-1
SCSI/IDE CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
6600-xx	CD-ROM ID failed	The following steps apply to error codes 6600-xx through 6605-xx:
6605-xx	CD-ROM Read failed	1. Replace the CD-ROM media and retest.
		2. Check and/or replace the signal cable and retest.
		3. Check the switch settings on the adapter board (if applicable).
		4. Replace the SCSI controller (if applicable) and retest.
		5. Replace the CD-ROM drive and retest.
		6. Replace the system board and retest.

Integrated Management Log

On servers supporting the Integrated Management Display, the Compaq Integrated Management Log replaces the Critical Error Log and Correctable Memory Logs, recording system events and storing them in an easily viewable form. It marks each event with a time-stamp with one-minute granularity.

Events listed in the Integrated Management Log are categorized as one of four event severity levels:

■   Status--indicates that the message is informational only.

■   Repaired--indicates that corrective action has been taken.

■   Caution--indicates a non-fatal error condition.

■   Critical--indicates a component failure.

The Integrated Management Log requires Compaq Operating System-dependent drivers. Refer to the Compaq Support Software CD for instructions on installing the appropriate drivers.

Multiple Ways of Viewing the Log

You can view an event in the Integrated Management Log in several ways:

■   On the Integrated Management Display

■   From within Compaq Insight Manager

■   From within Compaq Survey Utility

■   IML Management Utility

Integrated Management Display

The Integrated Management Display is an LCD display panel that presents information directly at the server, assisting in diagnosing and servicing the server without a keyboard and monitor.

Compaq Insight Manager

Compaq Insight Manager is a server management tool providing in-depth fault configuration and performance monitoring of hundreds of Compaq servers from a single management console. System parameters that are monitored describe the status of all key server components. By being able to view the events that may occur to these components, you can take immediate action. You can view and print the event list from within Insight Manager by following the instructions below. You can also mark a critical or caution event as repaired after the affected component has been replaced, for example, if a fan that has failed has been replaced. By marking as repaired, you can lower the severity of the event.

Viewing the Event List

1. From Compaq Insight Manager, select the appropriate server, then select View Device Data.

    The selected server is displayed with buttons around its perimeter.

2. Select the Recovery button.

3. Select Integrated Management Log.

    NOTE: You can only view the list from the Recovery/Integrated Management screen. To print the list, follow the instructions below.

4. If a failed component has been replaced, select the event from the list, then select Mark Repaired.

Printing the Event List

NOTE: You can only view the list from the Recovery/Integrated Management Log screen as described above. To print the list, follow the instructions below.

1. From the Insight Manager, select the appropriate server.

2. Select the Configuration button.

3. Select the Recovery button.

4. Select Print.

ROMPaq

Using flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the ROM:

■   Run the ROMPaq utility from the system partition, or

■   Insert a ROMPaq diskette into drive A and cold boot the system.

The ROMPaq utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

> △   **CAUTION:**   Do not turn the power off during a firmware upgrade. A loss of
> power during upgrade may corrupt the firmware and prevent the system from booting.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your servers.

Compaq Insight Manager recognizes the CD Storage System and indicates the revision of the SCSI Interface Board firmware.

Features of Compaq Insight Management

For Compaq servers, Compaq Insight Management features include:

■   Comprehensive Fault Management - For all major server subsystems, including pre-failure alerting for disks, memory, and Pentium Pro processors.

■   Integration Management - In conjunction with SmartStart, allows you to effectively deploy and manage configurations throughout the enterprise using the Integration Server and Insight Version Control.

■   Performance Management - Sets performance and capacity thresholds for management variables related to CPU and bus utilization, NIC throughput, logical disk capacity, and more.

■   Workstation Management - Monitors and manages Compaq Professional Workstations.

■   Client Management - Manages faults and assets on Compaq Deskpro computers.

■   Netelligent Management - Receives alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with Compaq Netelligent Management Software.

■ Asset Management - Exports asset information from the Compaq Insight Manager database to leading database and spreadsheet applications.

■ Remote Management - Manages in-band or out-of-band devices, online or offline, from location.

■ Reporting - Using Automatic Data Collection, gathers historic performance information for graphing or export purposes.

■ Integration with Enterprise Management Platforms - Provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.

Compaq Insight Management Software Architecture

The Compaq Insight Management software architecture is similar to other network management solutions. It has a client/server architecture and is composed of agent software (Compaq Insight Management Agents) and the management application software (Compaq Insight Manager).

Insight Management Agents

Insight Management Agents operate on Compaq systems (such as servers and workstations), performing in-depth monitoring of the system's state by collecting and measuring system parameters. These parameters indicate the current state of subsystems by counting the occurrence of particular events (for example, the number of read operations performed on a disk drive) or monitoring the state of a critical function (such as whether or not the cooling fan is operating).

Insight Desktop Agents operate on Compaq Deskpro computers monitoring functions that include temperature sensing and disk pre-failure alerting.

Insight Agents provide information to management applications such as Compaq Insight Manager, and can generate alarm notifications if significant changes occur in the fault or performance aspects of system operation. Information is delivered to and from the Insight Agents by the industry-standard Simple Network Management Protocol or SNMP.

Compaq Insight Manager

Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq hardware. In the unlikely event of hardware failures, Compaq Insight Manager also provides a full complement of remote maintenance and control facilities.

For additional information, refer to the online *Compaq Insight Manager User Guide* on the Systems Reference Library CD that accompanied your server.

Chapter 4
Connectors, Switches, and Jumpers

This chapter provides connector, switch, and jumper information for the Compaq CD Storage System tower and rack-mountable models.

Rear Panel (Tower Model)

The rear panel components of the Compaq CD Storage System tower model are illustrated below. See Table 4-1 for component names.
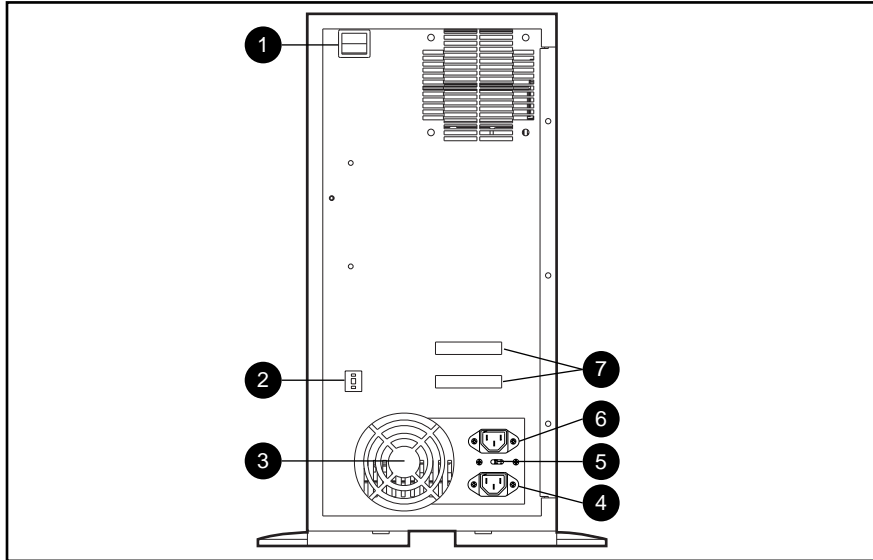

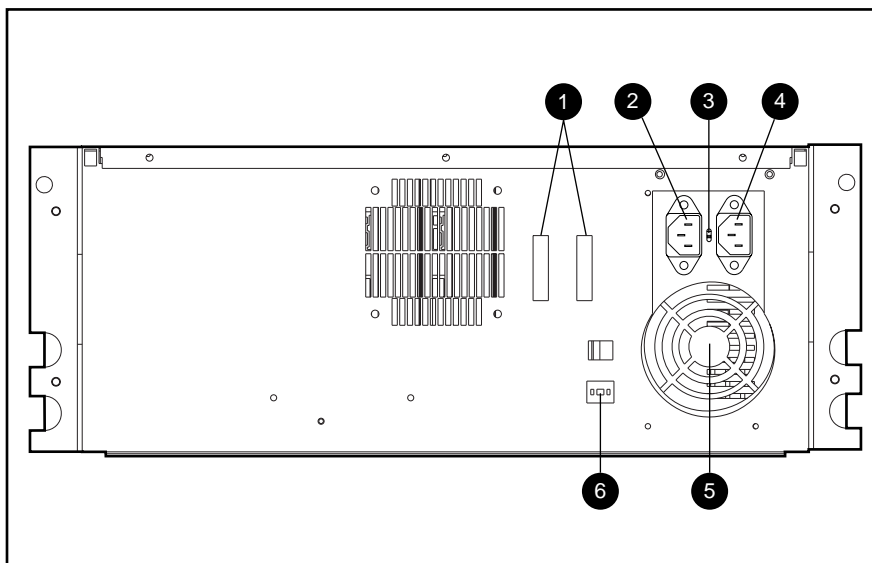**Figure 4-1.** Rear Panel Components (Tower Model)

Table 4-1
Rear Panel Components (Tower Model)

Reference	Component	Function
❶	Power Switch	Turns power to the unit ON and OFF.
❷	SCSI ID Selector Switch	Unit can be assigned SCSI ID 0 - 7. Default is 2.
❸	Power Supply Cooling Fan	Cools unit. Do not block opening.
❹	AC Power In (male)	Receptacle for an AC power cord. Switchable for 115/230V.
❺	Voltage Selector Switch	Switches voltage from 115V to 230V.
❻	AC Power Out (female)	Power connection to another device.
❼	50-Pin SCSI Connectors	Attach SCSI cables and/or terminator. For connecting unit to a server or other SCSI devices.

Rear Panel (Rack-Mountable Model)

The rear panel components of the Compaq CD Storage System rack-mountable model are illustrated below. See Table 4-2 for component names.

Figure 4-2. Rear Panel Components (Rack-Mountable Model)

Table 4-2
Rear Panel Components (Rack-Mountable Model)

Reference	Component	Function
❶	50-Pin SCSI Connectors	Attach SCSI cables and/or terminator. For connecting unit to a server or other SCSI devices.
❷	AC Power Out (Female)	Convenience Power Receptacle for another device. Any product connected at this receptacle must have the same input voltage rating that is selected on the voltage select switch
❸	Voltage Selector Switch	Switches voltage from 115V to 230V.
❹	AC Power In (male)	Receptacle for an AC power cord. Switchable for 115/230V.
❺	Power Supply Cooling Fan	Cools unit. Do not block opening.

| ❻ | SCSI ID Selector Switch | Unit can be assigned SCSI ID 0-7. Default is 2. |

SCSI Interface Board

The Compaq CD Storage System SCSI interface board components are illustrated below. See Table 4-3 for component names.
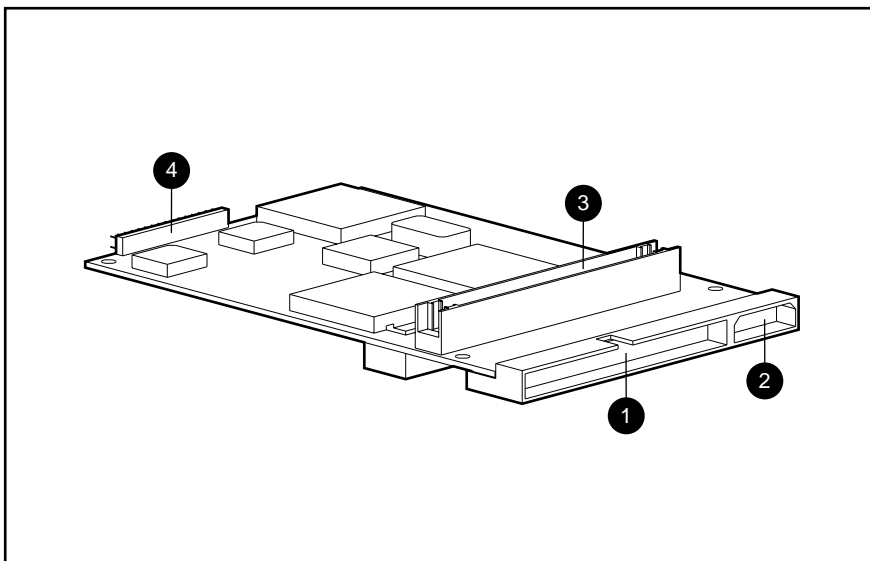
Figure 4-3. SCSI Interface Board Components

Table 4-3
SCSI Interface Board Components

Reference	Component
❶	Host SCSI Bus Connector
❷	Power Connector
❸	CD-ROM Drive SCSI Bus Connector
❹	SCSI Interface ID Connector /Fault LED Connector (See Figure 4-4)

The SCSI interface ID connector/fault LED connector is illustrated below:
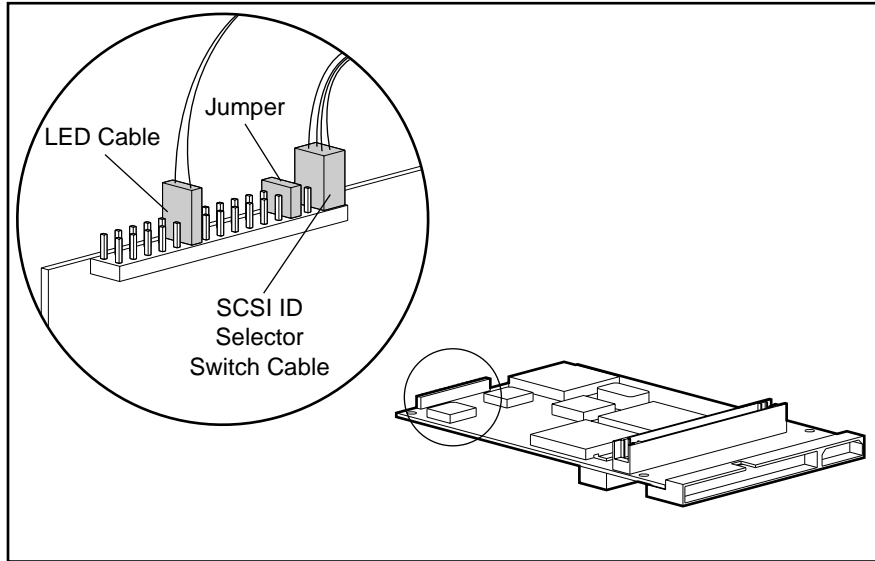
Figure 4-4. SCSI Interface ID Connector/Fault LED Connector
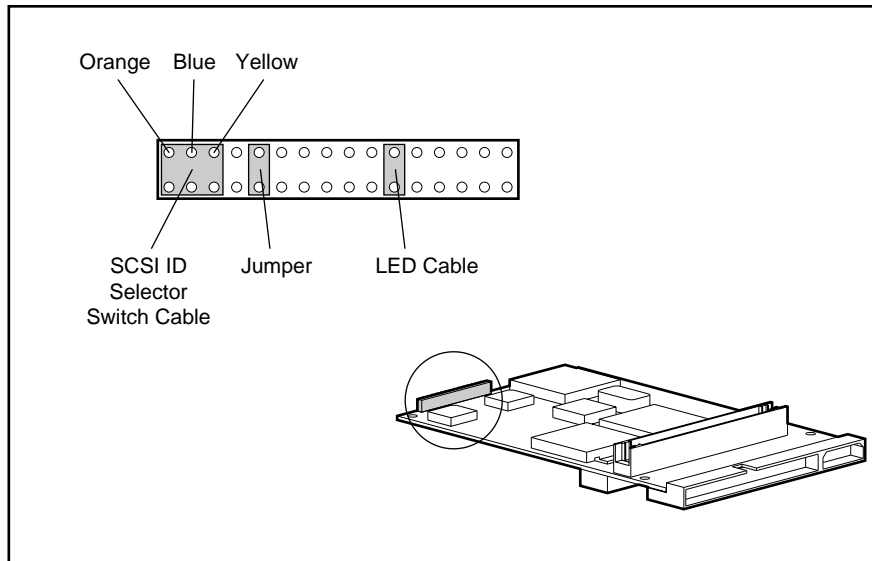
Figure 4-5. SCSI Selector Switch Cable Coloring Diagram

CD-ROM Drive Jumper Settings

The following figure illustrates the default jumper settings for the seven installed CD-ROM drives. The jumpers set the Logical Unit Number (LUN) ID for the drive. Each drive requires a unique LUN ID (1 - 7).

When replacing a CD-ROM drive, make sure the jumper settings on the new drive match the jumper settings on the drive you are replacing.

On the rack-mountable model, the CD-ROM drives are numbered 1 - 7, from left to right.

On the tower model, the CD-ROM drives are numbered 1 - 7, from bottom to top.
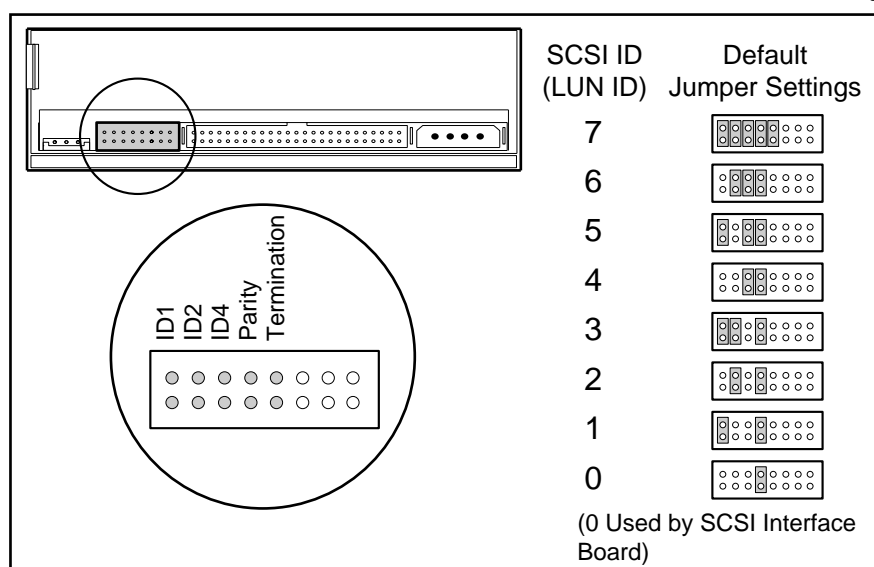
Figure 4-6. Default CD-ROM Drive Jumper Settings

Chapter 5
Physical and Operating Specifications

This section provides operating and performance specifications for the Compaq CD Storage System.

■ Rack-Mountable Model

■ Tower Model

■ Power Supply

■ CD-ROM Drives

System Unit

Tower Model

Table 5-1
Tower Model
System Unit Specifications

	U.S.	Metric
Dimensions		
Height	16 in	40.64 cm
Depth	16 in	40.64 cm
Width	7.5 in	19.05 cm
Weight	36.45 lb	16.53 kg
Input Requirements		
Rated Input Voltage		
Low range	115 V	
High range	230 V	
Rated Input Frequency		
Low range	50 to 60 Hz	
High range	50 to 60 Hz	
Rated Input Current		
Low range	5 A	
High range	3 A	
Temperature Range		
Operating	50° to 95° F	10° to 35° C
Non-operating	-22° to 122° F	-30° to 60° C
Relative Humidity (noncondensing)		
Operating		
Low range	20% to 80%	
High range	20% to 80%	
Nonoperating		
Low range	5% to 90%	
High range	5% to 90%	

Rack-Mountable Model

Table 5-2
Rack-Mountable Model
System Unit Specifications

	U.S.	Metric
Dimensions		
Height	7 in	17.78 cm
Depth	20.75 in	52.71 cm
Width	16.63 in	42.24 cm
Weight	40.56 lb	18.4 kg
Input Requirements		
Rated Input Voltage		
Low range	115 V	
High range	230 V	
Rated Input Frequency		
Low range	50 to 60 Hz	
High range	50 to 60 Hz	
Rated Input Current		
Low range	5 A	
High range	3 A	
Temperature Range		
Operating	50° to 95° F	10°to 35° C
Non-operating	-22° to 122° F	-30° to 60° C
Relative Humidity (noncondensing)		
Operating		
Low range	20% to 80%	
High range	20% to 80%	
Nonoperating		
Low range	5% to 90%	
High range	5% to 90%	

Power Supply

Table 5-3
Power Supply Specifications

Input Range	
	90 - 132 VAC 6.2 A @ full load
	180 - 265 VAC 3.1 A @ full load
Frequency Range	47 - 63 Hz
Efficiency	72% typ.
Peak Inrush	20 A Peak @ 115 VAC
	40 A Peak @ 230 VAC
Load Capacity	230 W
Output Minimum	3.0 A on +5 V
	0.5 A on +12 V
	0.0 A on -5 V
	0.0 A on -12 V
Output Maximum	23 A on +5 V
	9.0 on +12 V
	0.5 A on -5 V
	0.5 A on -12 V
Dielectric Voltage Withstand	
Primary to secondary	1500 VAC for 1 minute
Primary to secondary ground	1500 VAC for 1 minute
Insulation resistance @ 500 VDC	50 mohm minimum
Leakage current	700 µA max @125 VAC 60 Hz and 240 VAC 50 Hz
Safety Standards	UL 1950; CSA 22.2 #950; TUV EN 60950; NEMKO; Australia Standard, TS001
EMI Standards	FCC 47 CFR Part 15 Class B VFG 243 Class B

12X CD-ROM Drive

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Table 5-4
12X CD-ROM Drive Specifications

</div>

	U.S.	Metric
Dimensions		
Height	1.63 in	4.15 cm
Width	5.75 in	14.6 cm
Depth	7.6 in	19.3 cm
Rotational speed	Approx. 2400 - 6360 rpm	
Transfer rate		
Sustained block	Approx. 900 per second	
Sustained data		
Mode 1	Approx. 1800 KB/s	
Mode 2	Approx. 2052 KB/s	
Burst (SCSI Interface)		
Synchronous	10 MB/s	
Asynchronous	5 MB/s	
Access time		
Average random	125 ms typical	
Average random seek	115 ms typical	
Average full stroke	290 ms typical	
Data buffer capacity	256 KB	
Environmental conditions		
Temperature		
Operating	41°F to 122° F	5°C to 50° C
Storage	14°F to 140° F	-10°C to 60° C
Shipping	-40°F to 149° F	-40°C to 65° C
Humidity		
Operating	8% to 80% (wet bulb 27° C max)	
Storage	5 % to 95%	
Shipping	5 % to 95%	

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