COMPAQ

Hardware Reference Guide

Compaq Evo Desktop Family: Small Form Factor Models - Intel Celeron Versions

Document Part Number: 243848-002

January 2002

This book provides basic information for upgrading this series of computers.

WARNING: Text set off in this manner indicates that failure to follow directions 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 information.

Printed in the U.S.A.

Hardware Reference Guide
Second Edition (January 2002)
Document Part Number: 243848-002

Contents

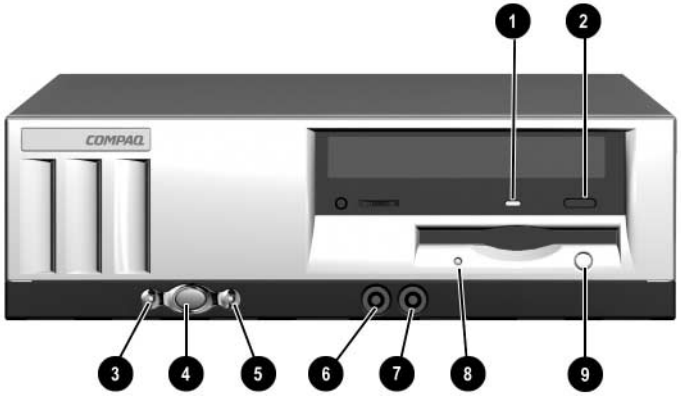
1

Product Features

Standard Configuration Features

The Compaq *Evo*™ Small Form Factor Personal Computer comes with features that may vary depending on your model. For a complete listing of the hardware and software installed in your computer, run Compaq Diagnostics for Windows or the INSPECT utility (available on some models). Instructions for using these utilities are provided in the *Troubleshooting Guide* on the Reference Library CD.

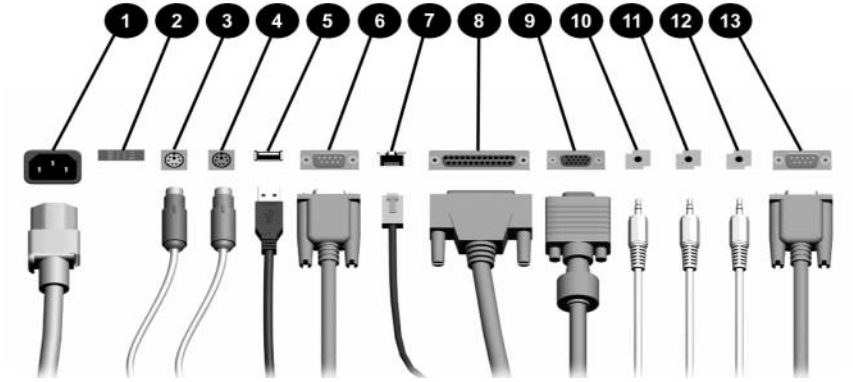
Front Panel Components



Front Panel Components

❶	CD-ROM Drive Busy Indicator	❻	Microphone Connector
❷	CD-ROM Eject Button	❼	Stereo Headphone Jack (system)
❸	Power-On Light	❽	Diskette Drive Activity Light
❹	Dual-State Power Button	❾	Diskette Eject Button
❺	Hard Drive Activity Light		

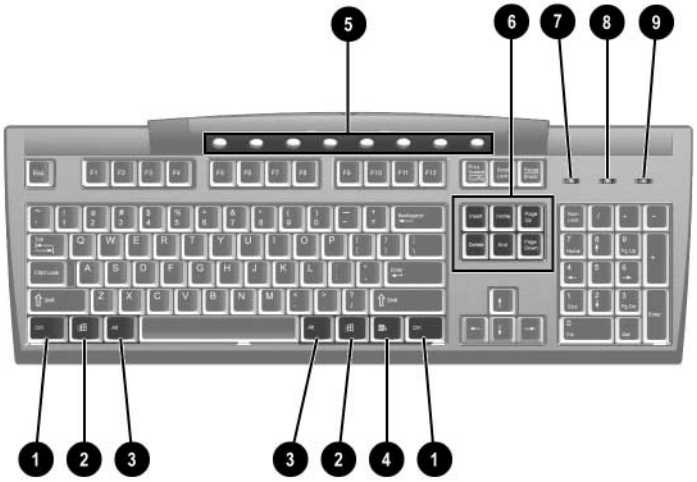
Rear Panel Components



Rear Panel Components

❶	Power Cord Connector	❽	Parallel Connector
❷	Voltage Select Switch	❾	Monitor Connector
❸	Mouse Connector	❿	Headphone/Line-out Connector
❹	Keyboard Connector	⓫	Line-in Audio Connector
❺	Universal Serial Bus (USB) Connector	⓬	Microphone Connector
❻	Serial Connector (COM1)	⓭	Serial Connector (COM2)
❼	Ethernet RJ-45 Connector		

Easy Access Keyboard



Compaq Easy Access Keyboard Components

❶	Ctrl Key	Used in combination with another key; its effect depends on the application software you are using.
❷	Windows Logo Key*	Used to open the Start menu in Microsoft Windows. Used in combination with other keys to perform other functions.
❸	Alt Key	Used in combination with another key; its effect depends on the application software you are using.
❹	Application Key*	Used (like the right mouse button) to open pop-up menus in a Microsoft Office application. May perform other functions in other software applications.
❺	Internet Keys	Provides quick access to specific Internet destinations.

Compaq Easy Access Keyboard Components *(Continued)*

❻	Editing Keys	Includes the following: Insert, Home, Page Up, Delete, End, and Page Down. ✎ Holding down Ctrl and Alt while pressing Delete allows you to restart your computer.
❼	Num Lock light	Indicates whether the Num Lock feature is on or off.
❽	Caps Lock light	Indicates whether the Caps Lock feature is on or off.
❾	Scroll Lock light	Indicates whether the Scroll Lock feature is on or off.

*Keys available in select geographic regions.

Easy Access Software

Your Easy Access Keyboard Buttons are programmed to default assignments. The pre installed Easy Access Software allows you to reprogram the Easy Access Buttons to reflect your personal preferences. The buttons can be reprogrammed to any program or service of your choice or to any Web site (URL).

Reprogramming the Easy Access Buttons

The Easy Access Keyboard icon is located on the Windows desktop status bar. Refer to the Readme-user.txt file for instructions about reprogramming the Easy Access Buttons.

Locking and Unlocking the Easy Access Buttons

The System Administrator can lock and unlock the Easy Access Buttons. Once locked, the buttons can only be reprogrammed by modifying the .bcf file. For administrative privileges, which require control of the Easy Access Button destinations, refer to the Readme-admin.txt file.

Easy Access Paper Icon Insert

The paper icon insert functions as a visual aid in identifying the programmed destination of each Easy Access Button. Whenever you reprogram an Easy Access Button, use the Paper Insert Template document to select and print an icon that reflects the new button assignment. The Paper Insert Template.doc is installed, by default, under C:\Program files\Compaq\Easy Access Keyboard.

For proper alignment, the spacing around the icons may require adjustment.

Windows Logo Key

Use the Windows Logo Key in combination with other keys to perform certain functions available in the Windows operating systems.

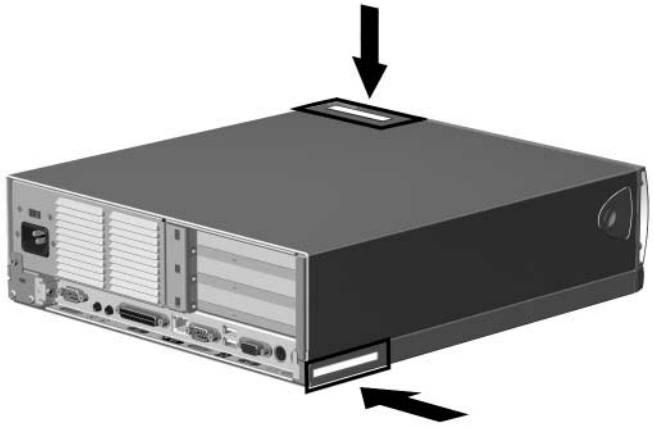
Windows Logo Key + **F1**	Displays a pop-up menu for the selected object
Windows Logo Key + **Tab**	Activates the next Taskbar button
Windows Logo Key + **e**	Launches Explore My Computer
Windows Logo Key + **f**	Launches Find Document
Windows Logo Key + **Ctrl** + **f**	Launches Find Computer
Windows Logo Key + **m**	Minimizes all open applications
Shift + Windows Logo Key + **m**	Undoes Minimize All
Windows Logo Key + **r**	Displays the Run dialog box

Special Mouse Functions

Most software applications support the use of a mouse. The functions assigned to each mouse button depend on the software applications you are using.

Serial Number Location

Each computer has a unique serial number which may be located on the cover top or the side panel of the computer. Keep this number available for use when contacting Compaq customer service for assistance.



Serial Number Location

2

Hardware Upgrades

Installation Sequence

It is very important that you follow this sequence of steps to ensure the proper installation of any optional equipment.

1. If your computer includes the Smart Cover Lock feature and you have set the lock, use Computer Setup to unlock the lock and disable the Smart Cover Sensor.

For more information about Computer Setup, refer to the *Computer Setup Guide.*

2. If the computer is already on, turn it off and disconnect the power cord from the wall outlet.

WARNING: To reduce the risk of personal injury from electrical shock and/or hot surfaces, be sure to disconnect the power cord from the wall outlet, and allow the internal system components to cool before touching.

WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

CAUTION: Static electricity can damage the electronic components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See Appendix E, “Electrostatic Discharge,” for more information.

3. Open the computer by removing its outside cover. See the section “Removing the Computer Cover” in this chapter.

4. Install any optional equipment. See the applicable sections of this guide or refer to the documentation provided with the optional equipment for instructions.
5. Replace the computer cover.
6. Turn on the monitor, computer, and any devices you want to test.
7. Reconfigure the computer, if necessary. Refer to the *Computer Setup Guide* for instructions about using Computer Setup.

   If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the cover removal sensor.

Drawer Installation Method

When installing the computer chassis in a drawer, the following conditions must be met to ensure proper air flow:

- At least 3 inches (7.6 cm) of clear space between the back of the drawer and anything behind it, such as a wall or the back panel of a desk.
- At least two 2-inch (5.1-cm) diameter holes in the back of the drawer. One hole must be immediately behind the power supply for exhaust air, and the other should be used for routing the cables.

CAUTION: Cables should not be run through the exhaust air hole.

- At least nine holes in the front drawer panel or in the bottom of the drawer in front of the chassis for fresh air intake. The diameter of the holes must be between 0.38 and 0.5 inch (1.0 and 1.3 cm).
- At least 1 inch (2.54 cm) of clear space below the drawer to ensure proper air flow if vent holes are located in the bottom of the mounting drawer.
- At least 1 inch (2.54 cm) of clear space above the top of the chassis.

Smart Cover Lock

The Smart Cover Lock is an optional feature and is available on select models only.

The Smart Cover Lock is a software-controllable cover lock, controlled by the setup password. This lock prevents unauthorized access to the internal components. The computer ships with the Smart Cover Lock in the unlocked position. For more information about locking the Smart Cover Lock, refer to the *Desktop Management* guide.

Using the Smart Cover FailSafe Key

If you enable the Smart Cover Lock and cannot enter your password to disable the lock, you will need a Smart Cover FailSafe Key to open the computer cover. You will need the key in any of the following circumstances:

- Power outage
- Startup failure
- PC component (for example, processor or power supply) failure
- Forgotten password

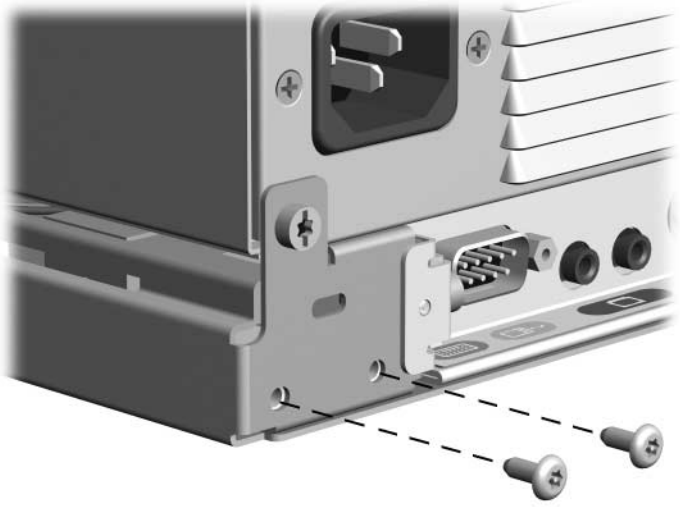
CAUTION: The Smart Cover FailSafe Key is a specialized tool available from Compaq. Be prepared; order this key before you need one.

To obtain a FailSafe Key:

- Contact your authorized Compaq reseller or service provider.
- Refer to the Compaq Web site (www.compaq.com) for ordering information.
- Call the appropriate number listed in the warranty.

To open the computer cover:

1. Turn off the computer and any external devices.
2. Disconnect the power cord from the power outlet, and disconnect any external devices.
3. Using the Smart Cover FailSafe Key, remove the two tamper-proof screws that secure the Smart Cover Lock to the chassis.



Removing the Smart Cover Lock Screws

4. Remove the Smart Cover Lock.

To reattach the Smart Cover Lock, secure the lock in place with the tamper-proof screws.

Removing the Computer Cover

To install optional equipment, you must remove the computer cover to gain access to internal components. The quick release cover latches located on the sides of the computer allow easy removal of the computer cover without the use of tools. To remove the cover, follow these steps:

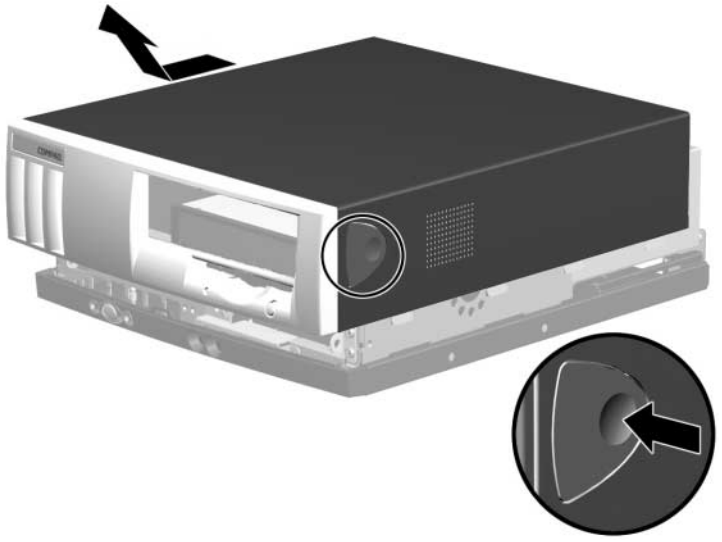
1. If you have locked the Smart Cover Lock, see the previous section on Smart Cover Lock or use Computer Setup to unlock it.
2. Turn off the computer and any external devices.
3. Disconnect the power cord from the power outlet, and disconnect any external devices.

WARNING: Before removing the computer cover, ensure that the computer is turned off and that the power cord is disconnected from the electrical outlet.

4. Press in the button on each side of the front bezel to release the quick release cover latches.

5. As you slide the computer cover forward, release the buttons and allow them to return to the original position, then lift the cover up and off the unit.

To replace the cover, reverse this procedure.



Removing the Computer Cover

Installing Additional Memory

The computer comes with synchronous dynamic random access memory (SDRAM) dual inline memory modules (DIMMs).

DIMMs

The memory sockets on the Intel 815e chipset-based system board can be populated with industry-standard DIMMs. These memory module slots are populated with at least one preinstalled memory module. To achieve the maximum memory support, you may be required to replace the preinstalled DIMM with a higher capacity DIMM.

For proper system operation, the DIMMs must be industry-standard 168-pin, unbuffered PC100- or PC133-compliant SDRAM DIMMs, depending on the model. The SDRAM DIMMs must support CAS Latency 2 or 3 (CL = 2 or CL = 3). They must also contain the mandatory Joint Electronic Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information. DIMMs constructed with x4 SDRAM are not supported; the system will not start using unsupported DIMMs.

The Intel 815e chipset supports both PC100 and PC133 SDRAM DIMMs. PC133 DIMMs should be used for optimal operation. If both PC100 and PC133 SDRAM DIMMs are installed in a computer, the system memory will run at the lower 100Mhz speed. Some configurations of PC133 SDRAMs may run at 100Mhz, instead of 133Mhz.

CAUTION: Some models support ECC memory and some support non-ECC memory. For those systems that do support ECC, Compaq does not support mixing ECC and non-ECC memory. Doing so will cause the system to blink the NUMLOCK LED on the keyboard continuously and, if a speaker is installed in the system, there will be a short beep followed by 2 long beeps. In addition, the system will not boot the operating system.

Memory Module Installation

CAUTION: Your memory module sockets have gold metal contacts. When upgrading your memory, it is important to use memory modules with gold metal contacts to prevent corrosion and/or oxidation resulting from having incompatible metals in contact with each other.

CAUTION: Static electricity can damage the electronic components of the computer or optional cards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object. See Appendix E, “Electrostatic Discharge,” for more information.

CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

1. If you have locked the Smart Cover Lock, use Computer Setup to unlock the lock.
2. Shut down the operating system properly, then turn off the computer and any external devices, then disconnect the power cord from the power outlet.
3. Remove the computer cover.
4. Rotate the easy access drive bay to an upright position.

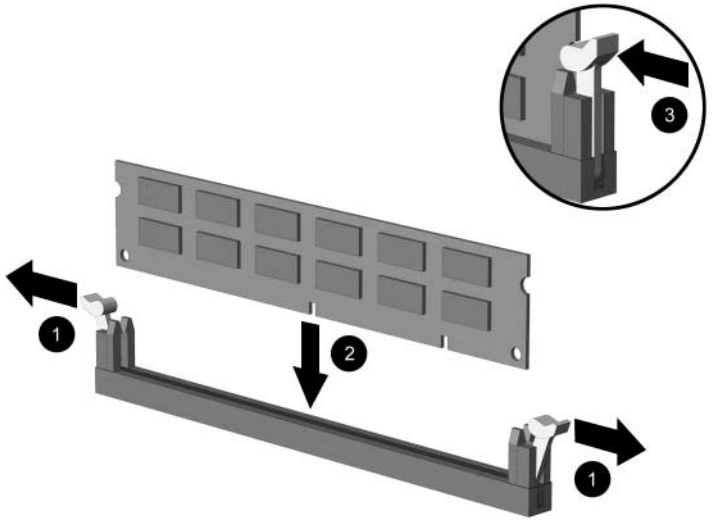
CAUTION: Check the position of all cables and wires before raising or lowering the easy access drive bay to prevent damage.

Rotating the Easy Access Drive Bay

5. Locate the memory module sockets.

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

6. Open both latches of the memory module socket ❶, and insert the memory module into the socket ❷.



Installing a DIMM

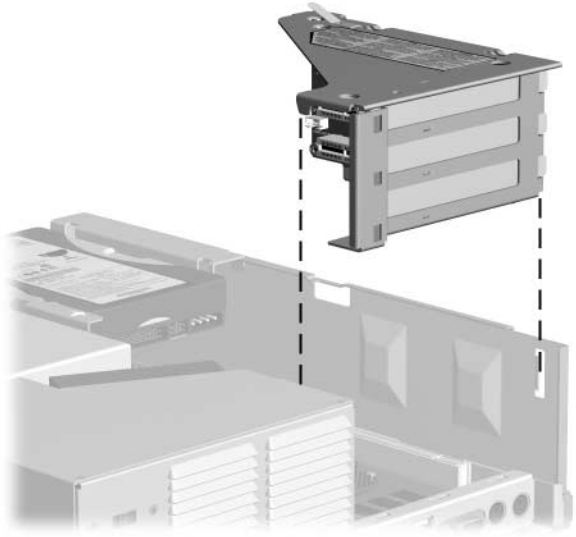
7. Begin by installing a module into the socket nearest the preinstalled module, and install the modules following the numerical order of the sockets.
8. A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket. Push the module down into the socket, ensuring that the module is fully inserted and properly seated ❸.
9. Repeat steps 6 through 8 for any additional modules that you want to install.
10. Replace the computer cover.
11. If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

The computer should automatically recognize the additional memory the next time you power on the computer.

Removing the Expansion Card Cage

To remove the expansion card cage:

1. If you have locked the Smart Cover Lock, use Computer Setup to unlock it.
2. Turn off the computer and any external devices.
3. Disconnect the power cord from the power outlet, and disconnect any external devices that are connected to the expansion card cage.
4. Remove the computer cover.
5. Disconnect all cables attached to the expansion cards.
6. Pull the expansion card cage straight up to remove it from the chassis.



Removing the Expansion Card Cage

When reinstalling the expansion card cage, ensure that the tab on the brace latches into the slot on the side of the power supply.

Installing an Expansion Card

Your computer has three PCI expansion slots ❶. Each slot can accommodate an expansion card up to 6.875 inches (17.46 cm) in length. To install an expansion card:

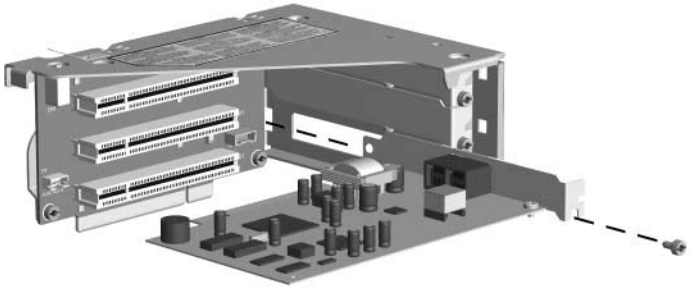
1. If you have locked the Smart Cover Lock, use Computer Setup to unlock it.
2. Turn off the computer and any external devices.
3. Disconnect the power cord from the power outlet, then disconnect any external devices.
4. Remove the computer cover.
5. Remove the expansion card cage and identify the slot into which you want to insert the expansion card.

Location of Expansion Slots in the Expansion Card Cage

6. Remove the retaining screws that secure the slot cover to the expansion card cage.
7. Remove the slot cover from the expansion card cage.

Removing the Expansion Slot Cover

8. Install the expansion card.

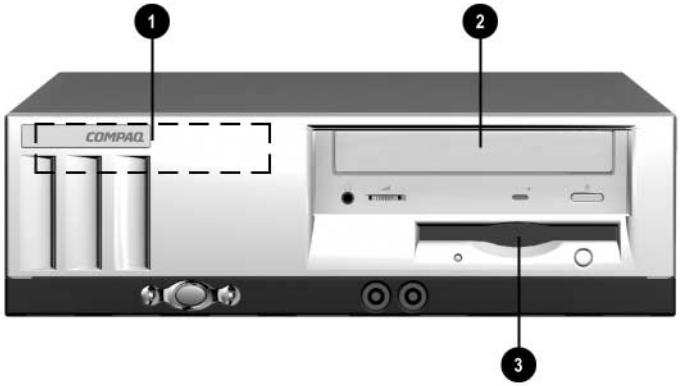


Installing an Expansion Card

When you install an expansion card, make sure you press firmly on the card so that the whole connector seats properly in the expansion card slot.

9. Reinstall the retaining screws to secure the card.

Drive Positions



Desktop Drive Positions

❶ 3.5-inch, internal, third-height, standard hard drive bay

❷ 5.25-inch drive bay for optional drives

❸ 3.5-inch, third-height, standard, 1.44-MB diskette drive

To verify the type, size, and capacity of the storage devices installed in your computer, run Compaq Computer Setup. Refer to the *Computer Setup Guide* for more information.

Installing Additional Drives

The computer has two external drive bays. The first external bay contains a preinstalled diskette drive.

When installing additional drives, follow these guidelines:

- For optimal performance, connect hard drives to the primary controller. Connect expansion devices, such as CD-ROM, IDE tape, and diskette drives, to the secondary controller using an 80-conductor IDE cable.
- You may install either a third-height or a half-height drive into a half-height bay.
- You must install guide screws to ensure the drive will line up correctly in the drive cage. Compaq has provided extra guide screws, installed in the front of the computer chassis, behind the front bezel. Some options use metric hardware. The Compaq supplied metric screws are black.

CAUTION: To prevent loss of work and damage to the computer or drive:

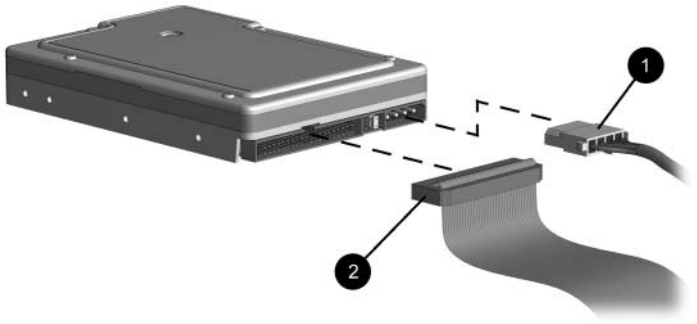
- If you are inserting or removing a hard drive, shut down the operating system properly, then turn off the computer. Do not remove a hard drive while the computer is on or in standby mode.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector. For more information about preventing electrostatic damage, see Appendix E, “Electrostatic Discharge.”
- Handle a drive carefully; do not drop it.
- Do not use excessive force when inserting a drive.
- Avoid exposing a hard drive to liquids, temperature extremes, or products that have magnetic fields such as monitors or speakers.

Upgrading the Hard Drive

The 3.5-inch hard drive is located on the left side of the computer. To remove and replace the drive:

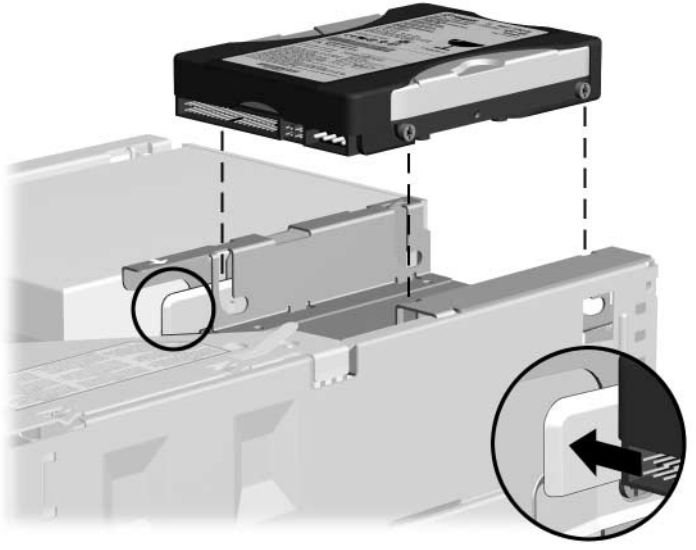
1. If you have locked the Smart Cover Lock, use Computer Setup to unlock it.
2. Turn off the computer and any external devices.
3. Disconnect the power cord from the power outlet.

4. Remove the computer cover.
5. Disconnect the ❶ power cable and ❷ signal cable from the back of the drive.



Disconnecting Cables from the Hard Drive

6. Push the locking lever on the right side of the drive to the right (facing the front of the computer). Slide the drive to the rear of the bay, then lift the drive from the bay.



Removing the Hard Drive (Shown from the Rear of the Chassis)

When replacing the hard drive, transfer the four screws from the old drive to the new one. The screws take the place of drive rails.

If you have installed a hard drive that is not automatically recognized by the computer, see Appendix B, "Hard Drive Installation Guidelines."

CAUTION: To prevent loss of work and damage to the computer or drive:

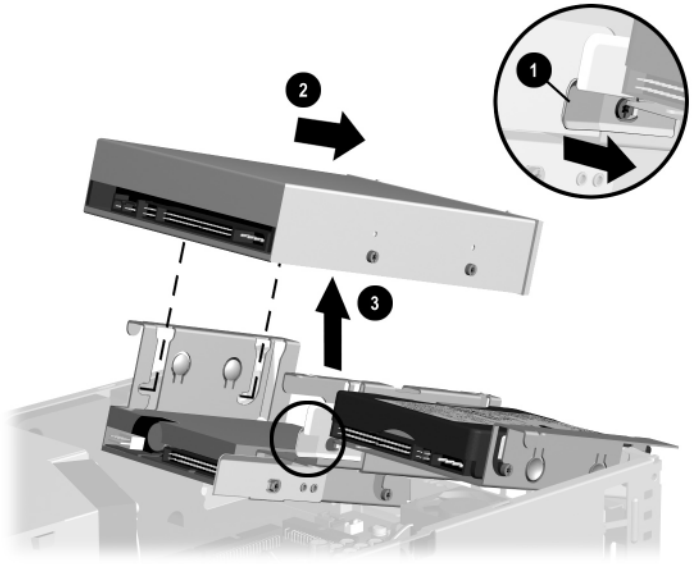
- If you are inserting or removing a hard drive, turn off the computer. Do not remove a hard drive while the computer is on or in standby mode.
- Before handling a drive, ensure that you are discharged of static electricity. While handling a drive, avoid touching the connector. For more information about preventing electrostatic damage, see Appendix E, "Electrostatic Discharge."
- Handle a drive carefully; do not drop it.
- Do not use excessive force when inserting a drive.
- Avoid exposing a hard drive to liquids, temperature extremes, or products that have magnetic fields such as monitors or speakers.
- If a drive must be mailed, place the drive in a bubble-pack mailer or other suitable protective packaging and label the package "Fragile: Handle With Care."

Removing a CD-ROM Drive

CAUTION: All removable media should be taken out of the drives before removing the drive from the computer.

1. If you have locked the Smart Cover Lock, use Computer Setup to unlock it.
2. Turn off the computer and any external devices.
3. Disconnect the power cord from the power outlet.
4. Remove the computer cover.
5. Rotate the drive cage to the upright position.
6. Rotate the power supply to the upright position.

7. Disconnect the audio, signal, and drive power cables. The other end of the audio cable should remain connected to the audio connector on the system board.
8. Pull the drive release latch away from the drive ❶.
9. Slide the drive toward the front of the drive cage ❷, then lift the drive out of the computer ❸.



Removing the CD-ROM Drive

To replace the drive, reverse the removal procedures.

When replacing the drive, transfer the four screws from the old drive to the new one. The screws take the place of drive rails.

Installing an optional CD-ROM or DVD-ROM Drive

To install an optional CD-ROM or DVD-ROM drive:

1. Remove the CD-ROM drive if present.
2. Install two guide screws on each side of the drive.

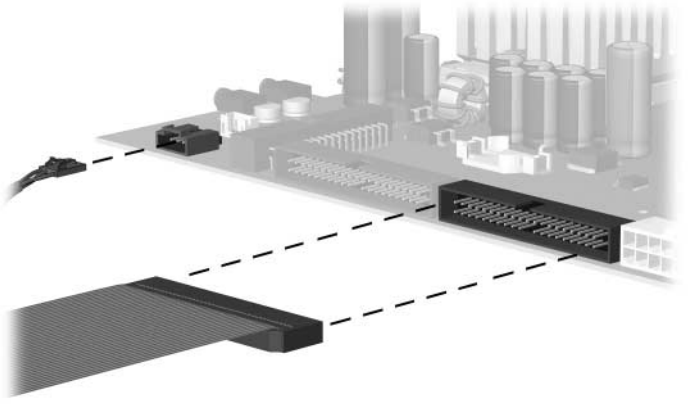
CAUTION: Use only 3/16-inch or 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

Installing Guide Screws in the CD-ROM or DVD-ROM Drive

3. Position the guide screws on the drive into the J-slots in the drive bay. Slide the drive toward the front of the computer.

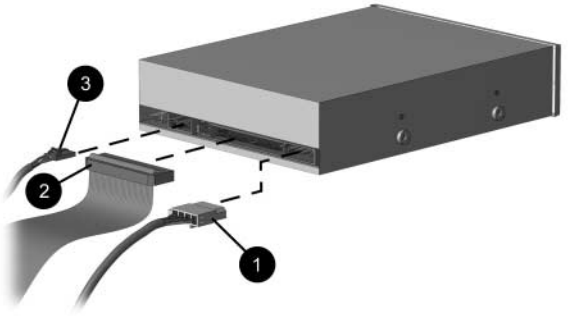
Ensure that the spring-loaded locking lever properly secures the drive.

4. Raise the easy access drive bay to the upright position and connect the flat ribbon cable and audio cable to the system board.



Connecting the Flat Ribbon Cable and Audio Cable

5. Connect the power cable ❶, flat ribbon cable ❷, and audio cable ❸ to the rear of the CD-ROM or DVD-ROM drive.
6. Return the easy access drive bay to the normal position.



Connecting the Flat Ribbon, Audio, and Power Cables to the CD-ROM or DVD-ROM Drive

7. Remove the bezel blank from the front bezel, if necessary.
8. Replace the computer cover.
9. The system will automatically recognize the drive and reconfigure the computer.

CAUTION: When servicing the computer, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

A

Specifications

Compaq *Evo* Small Form Factor		
Desktop Dimensions		
Height	3.8 in	9.7 cm
Width	12.5 in	31.8 cm
Depth	14.6 in	37.1 cm
Approximate Weight	20.0 lb	9.1 kg
Weight Supported (maximum distributed load)	100.0 lb	45.5 kg
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Nonoperating	-4° to 140°F	-20° to 60°C
Relative Humidity (noncondensing)		
Operating	8-90%	8-90%
Nonoperating	5-95%	5-95%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Power Supply		
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-127 VAC	200-240 VAC
Rated Line Frequency	50-60 Hz	50-60 Hz
Power Output	120 W	120 W
Rated Input Current (maximum)	4 A	2 A
Heat Dissipation		
Maximum	630 BTU/hr	160 kg-cal/hr
Nominal	315 BTU/hr	80 kg-cal/hr

B

Hard Drive Installation Guidelines

Using the Cable-Select Feature with Ultra ATA Devices

Optional drives are available from Compaq in kits that include a special drive cable. The configuration of the drive employs a cable-select feature that identifies the drive as device 0 (primary drive) or device 1 (secondary drive).

Device 1 is the drive connected to the cable's middle connector. Device 0 is the drive connected to the cable's end connector (applies only to 80-conductor ATA cables). See "Guidelines for Installing Ultra ATA Devices" in this appendix for an example of an Ultra ATA cable.

Compaq hard drives ship with jumpers preset to cable-select mode; therefore, no jumper setting changes on the existing or optional drives are required. If you purchase a third-party hard drive, refer to the documentation included with the kit to ensure proper installation and configuration of cables.

If installing a second device on the primary controller, you must use an 80-conductor Ultra ATA cable for optimal performance. This cable is standard on select models.

Guidelines for Installing Ultra ATA Devices

When installing additional Ultra ATA drives, follow these guidelines:

- If using multiple Ultra ATA devices, Compaq recommends that the devices be split between the primary and secondary Ultra ATA channels for optimum performance. Use an additional Ultra ATA cable to connect the additional device to the system board.
- 80-conductor Ultra ATA cable:
  - 18 inches maximum total length, 80-conductor cable with maximum spacing of 6 inches between Device 0 and Device 1.

80-Conductor Ultra ATA Cable

❶ Device 0 (master drive) connector

❷ Device 1 (slave drive) connector

❸ System board connector

- For optimal performance, connect hard drives to the primary controller. Connect expansion devices, such as ATA CD-ROM and DVD-ROM drives, tape drives, and diskette drives, to the secondary controller.
- Install either a third-height or a half-height drive into a half-height bay.
- Install guide screws to ensure that the drive lines up correctly in the drive cage. Compaq has provided extra guide screws installed in the front of the computer chassis behind the front bezel. Some options use M3 metric hardware. Compaq supplied metric screws are black.
- If only one device is connected to a cable, that device must be attached to the end (Device 0) connector.

SCSI Devices

This section contains information relating to SCSI device guidelines and installation.

Guidelines for Using SCSI Devices

When installing and operating SCSI devices, you must follow these guidelines:

- A single Ultra SCSI controller supports up to seven SCSI devices per channel.
- Each Wide-Ultra SCSI, Ultra-Wide SCSI, Wide Ultra2 SCSI, Ultra 320 SCSI, or Ultra 160 SCSI controller supports up to 15 SCSI devices per channel.
- If using multiple SCSI devices, Compaq recommends that the devices be split between Channel A and Channel B, if available, for optimum performance.
- SCSI cable recommendation:
  - 53 inches maximum length twisted-pair, LVD cable with built-in terminator, maximum of 5 drives with a minimum driving spacing of 5.25 inches.
- The SCSI controller requires a unique SCSI ID (0-7 or 8-15) for each SCSI device installed. The controller identifies a SCSI device by its SCSI ID number rather than by its location. Moving a SCSI device from one position to another on the SCSI chain does not affect communication between the controller and the device. The reserved and available SCSI ID numbers for SCSI devices are:
  - 0—reserved for the primary hard drive
  - 7—reserved for the controller
  - 1 through 6 and 8 through 15—available for all other SCSI devices

- Every SCSI chain or circuit must be terminated (closed) at both ends. Termination can be accomplished through one of the following methods:
  - ❏ Using a cable with a built-in terminator. This cable was shipped with your computer.
  - ❏ Using a cable with a terminating resistor plug in the last connector.
  - ❏ Connecting a SCSI device with its termination enabled into the last connector.
  - ❏ Connecting an external SCSI device with its termination enabled to the external SCSI connector on the rear panel of the computer.
- Turn on all external SCSI devices before turning on the power to the computer. This action enables the SCSI controller to recognize the external devices.
- The system accommodates a combination of internal and external SCSI devices, such as hard drives, tape drives, and CD-ROM drives.
- Compaq does not recommend mixing different-width SCSI devices on the same SCSI chain or on the same SCSI channel. Mixing devices of different widths on the same chain or channel will always result in the data transfer rate of the slowest device in that chain. It is acceptable to mix Wide-Ultra2, Ultra 160, and Ultra 320 devices on a single channel. Do not put narrow devices on a channel with any device type other than another narrow device.

For additional information about optional SCSI devices, refer to the documentation included with the device or contact your Compaq authorized dealer, reseller, or service provider.

CAUTION: Do not route cables near the air intake to the power supply. Cables routed in this manner can block airflow to the power supply, causing it to overheat.

Guidelines for Installing Optional SCSI Devices

If you mix Ultra ATA and SCSI hard drives in the same system, the Ultra ATA drive will be the boot drive unless the boot order is changed in the F10 Setup.

When replacing a hard drive, the replacement drive should be of the same type as the drive being removed. If you are replacing an Ultra ATA hard drive with a SCSI hard drive, you will need a multimode Low Voltage Differential (LVD) SCSI cable option kit.

If only one SCSI hard drive is used, it should be installed in bay 4 if your computer has four or more bays.

Before installing a SCSI device:

- Verify the SCSI ID of the drive and, if necessary, set the SCSI ID to a unique number. See "Guidelines for Using SCSI Devices" in this appendix or refer to the documentation included with the device.
- Determine if the device requires that termination be enabled or disabled. Set the termination if necessary. See "Using a SCSI Cable" in this appendix or refer to the documentation included with the device.

Some devices may not have terminating jumpers on the device. Termination on these devices must be achieved with terminated cable.

Turn on an external SCSI device before turning on power to the computer. This enables the system board controller to recognize the external SCSI device and automatically reset. When an external SCSI device is connected to the external SCSI connector on the rear panel of the computer, that device becomes the end of the SCSI chain and must be terminated.

SCSI Controllers

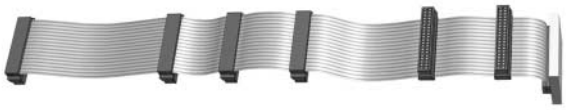
Select models such as workstations ship with an integrated single channel Ultra 160 SCSI controller with an internal connector on the system board.

SCSI Cables

The front drive bays are available for installing or connecting mass storage SCSI devices.

Using a SCSI Cable

Select models ship with a multimode SCSI cable that supports Low Voltage Differential (LVD) or single-ended devices. The cable accommodates up to three SCSI devices in the front drive bay area (UATA models do not have the SCSI cable).



Five-Device SCSI Cable with Terminator

The cable that shipped with your computer may look different than the one illustrated (a five-device cable).

For additional information about installing optional SCSI devices, refer to the documentation included with the device option kit or contact your Compaq authorized dealer, reseller, or service provider.

Using SCSI*Select* with SCSI Devices

The SCSI host adapter includes the SCSI*Select* utility to configure the host adapter and to run SCSI disk utilities. To run the SCSI*Select* utility:

- In Post Messages Enabled mode: Press **Ctrl+A** when the Press <Ctrl><A> for SCSI*Select* Utility message displays during POST.
- In Post Messages Disabled mode: When the Compaq logo screen displays, press any key to exit the logo screen. Immediately after exiting the logo screen, press **Ctrl+A** to access the SCSI*Select* utility.

A menu displays with the following options:

- Configure/View Host Adapter Settings
  - SCSI Bus Interface Definitions
    - Host Adapter SCSI ID
    - SCSI Parity Checking
    - Host Adapter SCSI Termination
  - Additional Options
    - Boot Device Options
    - SCSI Device Configuration
    - Advanced Configuration Options
- SCSI Disk Utilities

  Lists all SCSI devices and SCSI ID numbers

For additional information about configuring POST message display status, refer to the *Computer Setup Guide* on the Reference Library CD.

Choosing the Quiet Drive Options

The Quiet Drive is an optional feature and may or may not be included on your computer.

If this computer is equipped with a Quiet Drive or, if you choose to install a Quiet Drive, you may configure the drive to operate in Quiet mode or Performance mode (default). When idle, the Quiet Drive produces an acoustic noise level approximately 4 decibels (dB) lower than that of a standard drive. When configured to operate in Quiet mode, the Quiet Drive reads and writes data at an acoustic noise level approximately 7 dB lower than that of a standard drive.

When configured to operate in Quiet mode, the drive will not operate at maximum performance levels. For maximum drive performance, set the drive to operate in Performance mode.

To determine if your computer contains a Quiet Drive or to activate Quiet mode, complete the following steps:

1. Turn on or restart the computer. If you are in Windows, click Start > Shut Down > Restart the Computer.
2. When the F10 = Setup message displays in the lower-right corner of the screen, press the **F10** key.

If you do not press the **F10** key while the message is displayed, you must restart the computer to access the utility.

3. Select your language from the list and press the **Enter** key.
4. A choice of five headings displays in the Computer Setup Utilities menu. Using the arrow keys or the Tab key, select Storage > Device Configuration.
5. Select the drive from the list of devices. Press the **Enter** key.
6. Select Quiet Drive > Quiet (Performance is the factory-set default.)

If the Quiet Drive option is not displayed, your computer does not contain a Quiet drive.

7. To apply and save changes, select File > Save Changes.

C

Battery Replacement

The battery that comes with your computer provides power to the real-time clock and has a minimum lifetime of about three years. When replacing the battery, use a battery equivalent to the battery originally installed on your computer. Your computer comes with a 3-volt lithium coin cell battery.

The lifetime of the lithium battery can be extended by plugging the computer into a live AC wall socket. The lithium battery is only used when the computer is NOT connected to AC power.

WARNING: Your computer contains an internal lithium manganese dioxide battery. There is a risk of fire and burns if the battery is not handled properly. To reduce the risk of personal injury:

- Do not attempt to recharge the battery.
- Do not expose to temperatures higher than 60°C (140ºF).
- Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
- Replace the battery only with the Compaq spare designated for this product.

CAUTION: Before replacing the battery, it is important to back up the computer CMOS settings. When the battery is removed or replaced, the CMOS settings will be cleared. Refer to the *Troubleshooting Guide* for information on backing up the CMOS settings.

Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. In order to forward them to recycling or proper disposal, please use the public collection system or return them to Compaq, their authorized partners, or their agents.

CAUTION: Static electricity can damage the electronic components of the computer or optional equipment. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

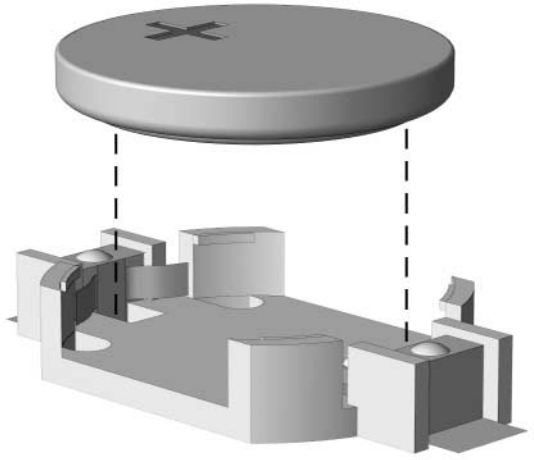
1. If you have locked the Smart Cover Lock, use Computer Setup to unlock the lock and disable the Smart Cover Sensor.
2. Shut down the operating system properly, turn off the computer and any external devices, disconnect the power cord from the electrical outlet, and remove the computer cover or access panel.

It may be necessary to remove an expansion card to gain access to the battery.

3. Locate the battery and battery holder on the system board.
4. Depending on the type of battery holder on your system board, complete the following instructions to replace the battery.

Type 1

a. Lift the battery out of its holder.



Removing a Coin Cell Battery (Type 1)

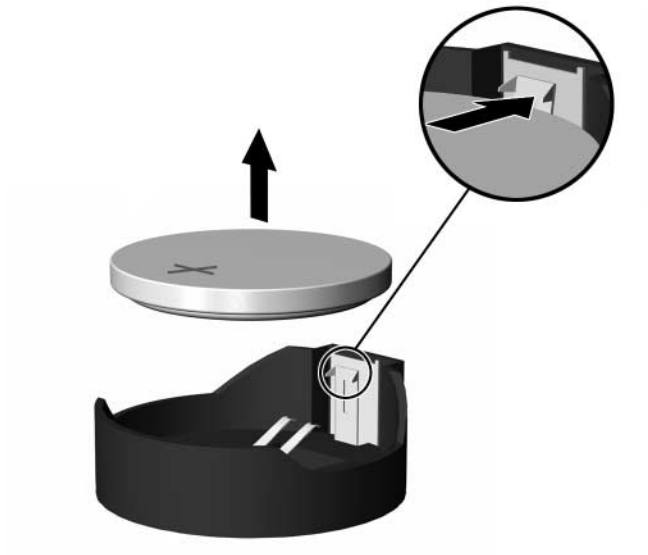
b. Slide the replacement battery into position, positive side up.

The battery holder automatically secures the battery in the proper position.

Type 2

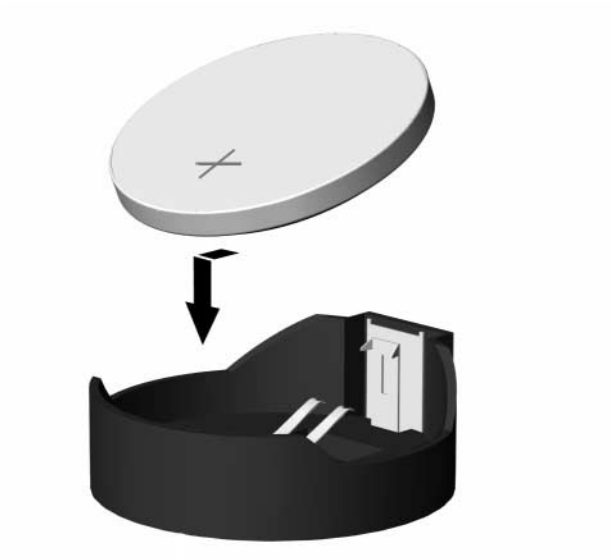
a. To release the battery from its holder, squeeze the metal clamp that extends above one edge of the battery.

b. When the battery pops up, lift it out.



Removing a Coin Cell Battery (Type 2)

c. To insert the new battery, slide one edge of the replacement battery under the holder's lip with the positive side up. Push the other edge down until the clamp snaps over the other edge of the battery.



Replacing a Coin Cell Battery (Type 2)

After the battery has been replaced, use the following steps to complete this procedure.

5. Replace the computer cover or access panel.
6. Plug in the computer and turn on power to the computer.
7. Reset the date and time, your passwords, and any special system setups, using Compaq Computer Setup. Refer to the *Computer Setup Guide.*

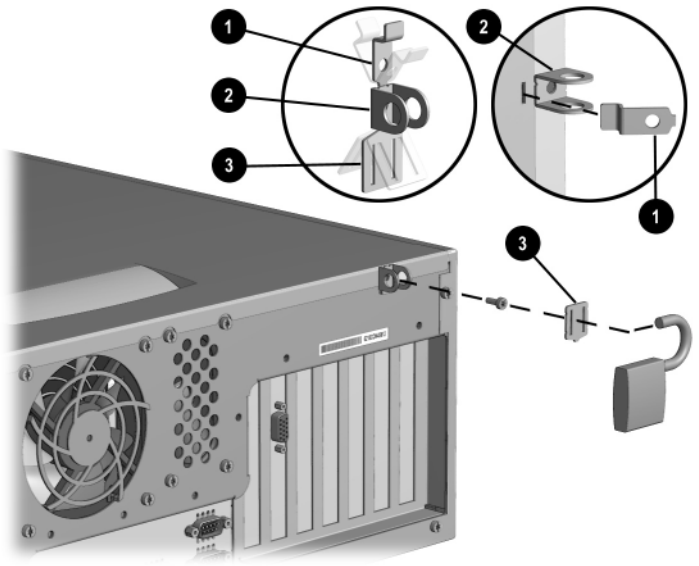
   If you normally lock the Smart Cover Lock, use Computer Setup to relock the lock and enable the Smart Cover Sensor.

D

Security Lock Provisions

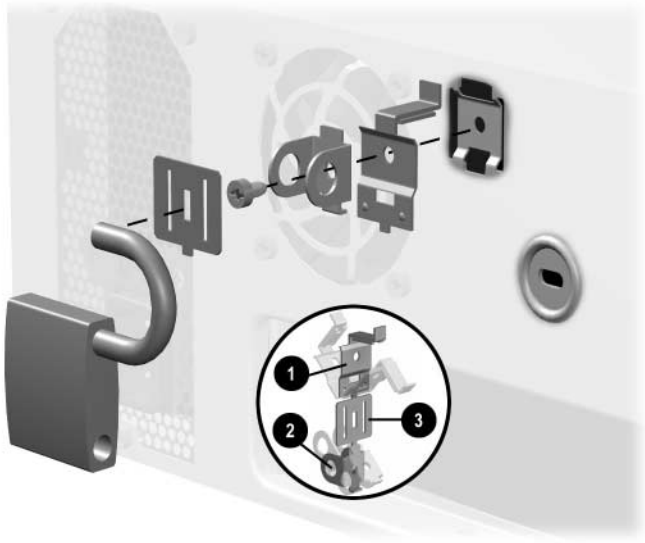
Installing a Security Lock

There are several different security locks that may be used to secure the computer. The following illustrations portray some of the available security provisions which vary by model. Because of chassis differences, the slots may be located in a different position than shown.



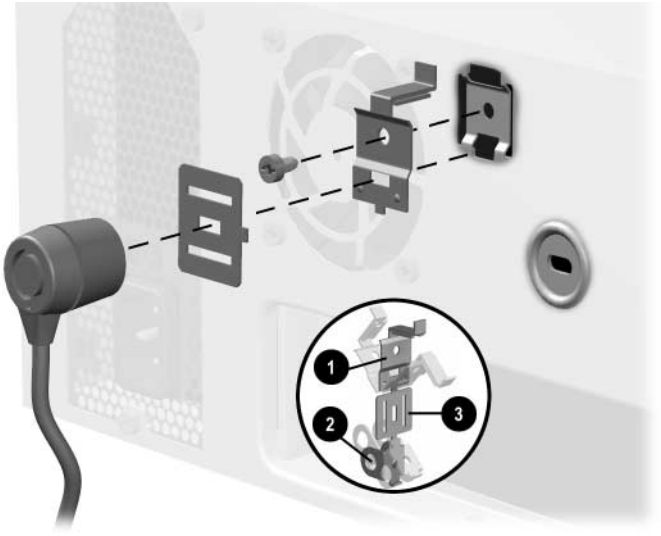
Installing Compaq Type 1 Security Bracket (may vary by model)

WARNING: To avoid injury, use care in handling the separated pieces of the security bracket; metal edges may be sharp. Be sure to install the bracket so that sharp edges do not extend from the edges of the computer chassis.



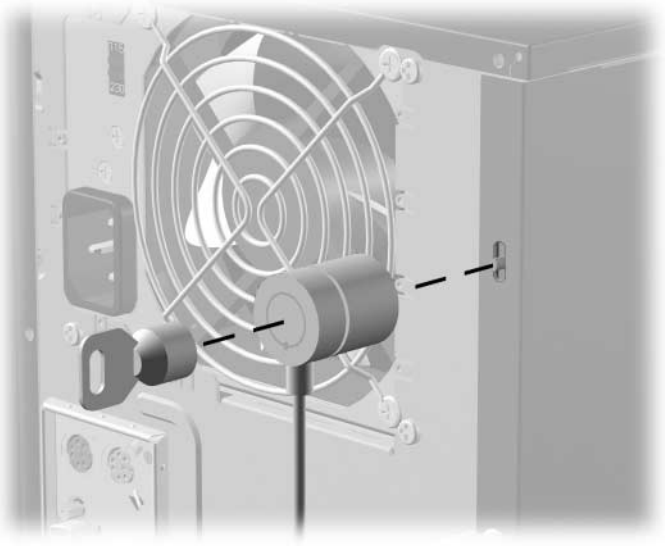
Installing Compaq Type 2 Security Bracket (may vary by model)

WARNING: To avoid injury, use care in handling the separated pieces of the security bracket; metal edges may be sharp. Be sure to install the bracket so that sharp edges do not extend from the edges of the computer chassis.

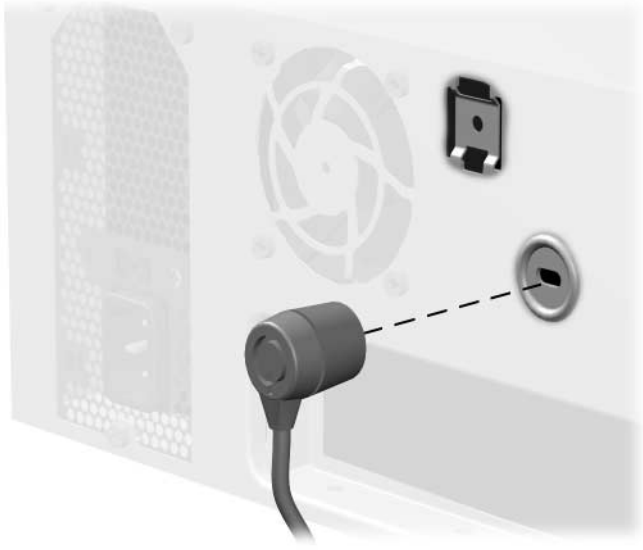


Installing a Kensington Cable Lock with a Compaq Type 2 Bracket (may vary by model)

WARNING: To avoid injury, use care in handling the separated pieces of the security bracket; metal edges may be sharp. Be sure to install the bracket so that sharp edges do not extend from the edges of the computer chassis.



Installing a Kensington Cable Lock (may vary by model)



Installing a Kensington Cable Lock (may vary by model)

E

Electrostatic Discharge

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing Electrostatic Damage

To prevent 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 static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

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 megohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.

- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- 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 your Compaq authorized dealer, reseller, or service provider.

For more information on static electricity, contact your Compaq authorized dealer, reseller, or service provider.

F

Routine Computer Care and Shipping Preparation

Routine Computer Care

Follow these suggestions to take care of your computer and monitor:

- Operate the computer on a sturdy, level surface. Leave a 3-inch (7.6-cm) clearance at the back of the system unit and above the monitor to permit the required airflow.
- Never operate the computer with the cover or side panel removed.
- Never restrict the airflow into the computer by blocking the front vents or air intake. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.
- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold. For information about the recommended temperature and humidity ranges for your computer, refer to Appendix A, "Specifications," in this guide.
- Keep liquids away from the computer and keyboard.
- Never cover the ventilation slots on the monitor with any type of material.
- Turn off the computer before you do either of the following:
  - ❏ Wipe the exterior of the computer with a soft, damp cloth as needed. Using cleaning products may discolor or damage the finish.
  - ❏ Occasionally clean the air vents on the front and back of the computer. Lint and other foreign matter can block the vents and limit the airflow.

CD-ROM Drive Precautions

Be sure to observe the following guidelines while operating or cleaning your CD-ROM drive.

Operation

- Do not move the drive during operation. This may cause it to malfunction during reading.
- Avoid exposing the drive to sudden changes in temperature, as condensation may form inside the unit. If the temperature suddenly changes while the drive is on, wait at least one hour before you turn off the power. If you operate the unit immediately, it may malfunction while reading.
- Avoid placing the drive in a location that is subject to high humidity, extreme temperatures, mechanical vibration, or direct sunlight.

Cleaning

- Clean the panel and controls with a soft, dry cloth or a soft cloth lightly moistened with a mild detergent solution. Never spray cleaning fluids directly on the unit.
- Avoid using any type of solvent, such as alcohol or benzene, which may damage the finish.

Safety

If any object or liquid falls into the drive, immediately unplug the computer and have it checked by an authorized Compaq service provider.

Shipping Preparation

Follow these suggestions when preparing to ship your computer:

1. Back up the hard drive files on PD discs, tape cartridges, or diskettes. Be sure that the backup media is not exposed to electrical or magnetic impulses while stored or in transit.

The hard drive locks automatically when the system power is turned off.

2. Remove and store any program diskettes from the diskette drives.
3. Insert a blank diskette into the diskette drive to protect the drive while in transit. Do not use a diskette on which you have stored or plan to store data.
4. Turn off the computer and external devices.
5. Disconnect the power cord from the electrical outlet, then from the computer.
6. Disconnect the system components and external devices from their power sources, then from the computer.

Ensure that all boards are seated properly and secured in the board slots before shipping the computer.

7. Pack the system components and external devices in their original packing boxes or similar packaging with sufficient packing material to protect them.

For environmental nonoperating ranges, see Appendix A, “Specifications,” in this guide.

Index

U

W