

Hardware Reference Guide - dx2300 Series Microtower Models

HP Compaq Business PC



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Hardware Reference Guide

HP Compaq Business PC

dx2300 Series Microtower Models

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About This Book

This guide provides basic information for upgrading this computer model.



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.



NOTE: Text set off in this manner provides important supplemental information.

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1 Product Features

Standard Configuration Features



Figure 1-1 HP Compaq dx2300 Series Microtower



NOTE: The drive configuration shown above may be different than your computer model.

The illustration shown above may look different than your computer model.

Serviceability Features

The Microtower computer includes features that make it easy to upgrade and service. A Torx T-15 screwdriver is needed for many of the installation procedures described in this chapter.

Warnings and Cautions

Before performing upgrades be sure to carefully read all of the applicable instructions, cautions, and warnings in this guide.



WARNING! To reduce the risk of personal injury from electrical shock, rotating fans, hot surfaces, and/or fire:

Disconnect the power cord from the wall outlet and allow the internal system components to cool before touching.

Do not plug telecommunications or telephone connectors into the network interface controller (NIC) receptacles.

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

Plug the power cord in a grounded (earthed) outlet that is easily accessible at all times.

To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation, setup, posture, and health and work habits for computer users, and provides important electrical and mechanical safety information. This guide is located on the Web at <http://www.hp.com/ergo> and on the *Documentation and Diagnostics CD*.



CAUTION: Static electricity can damage the electrical 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.

When the computer is plugged into an AC power source, voltage is always applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent damage to internal components.

2 Hardware Upgrades

Removing the Computer Access Panel and Front Bezel

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer (1), and disconnect any external devices.

 **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

3. Remove the two screws that secure the access panel to the computer chassis (2).
4. Slide the access panel back about 1.3 cm (1/2 inch), then lift it away from and off the unit (3).

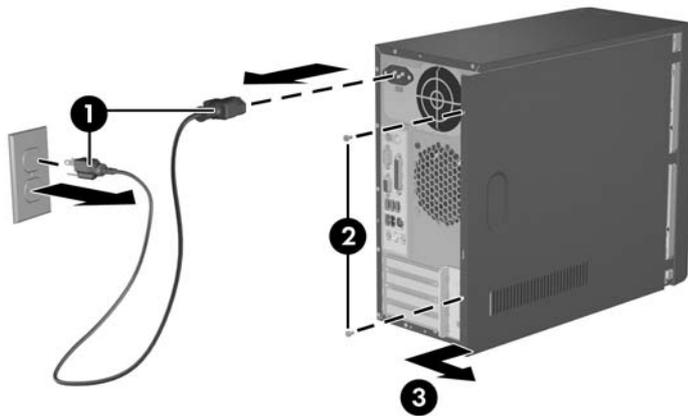


Figure 2-1 Removing the Power Cord and Access Panel



NOTE: To replace the access panel, reverse the removal steps.

5. To remove the front bezel, pull outward on all three tabs on the left side of the bezel (1) then rotate the bezel off the chassis (2), beginning with the left side then the right side.

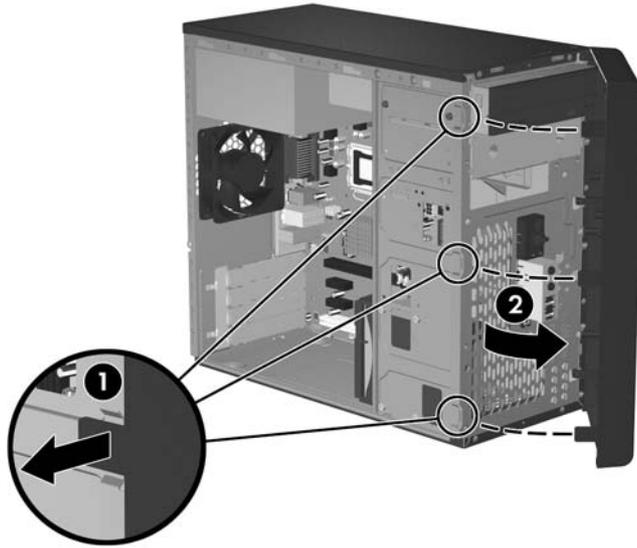


Figure 2-2 Removing the Front Bezel



NOTE: To replace the front bezel, insert the three hooks on the right side of the bezel into the rectangular holes on the chassis then rotate the bezel into place so that the catches on the three tabs on the left side of the bezel snap into place on the chassis.

Removing a 5.25" Drive Bezel Blank

If the computer was not shipped with a drive in the 5.25" option bay, the bay will be covered by a bezel blank. If you add a drive to the option bay, you must first remove the bezel blank.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the access panel and front bezel. Refer to [Removing the Computer Access Panel and Front Bezel on page 3](#).
4. While facing the inside of the front bezel, press the two retaining tabs on the right towards the outer edge of the bezel (1) and pull the bezel blank inwards to remove it (2).

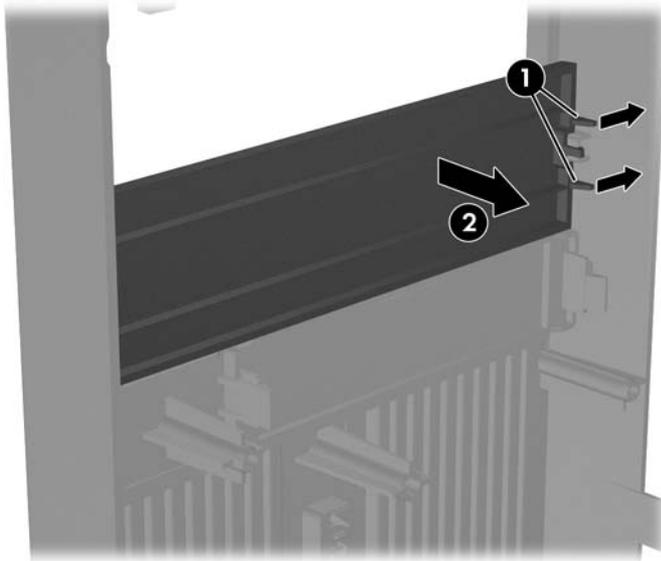


Figure 2-3 Removing a 5.25" Bezel Blank



NOTE: To install a 5.25" bezel blank, slide the left side of the blank into the two retainer slots on the left side of the front bezel then snap the right side of the blank into place.

Removing a 3.5" Drive Bezel Blank

If the computer was not shipped with a device in the 3.5" bay, the bay will be covered by a bezel blank. If you install a device in the 3.5" bay, you must first remove the bezel blank.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the access panel and front bezel. Refer to [Removing the Computer Access Panel and Front Bezel on page 3](#).
4. While facing the inside of the front bezel, press outward on the two retaining tabs on each side of the bezel blank (1) and pull the bezel blank inwards to remove it (2).

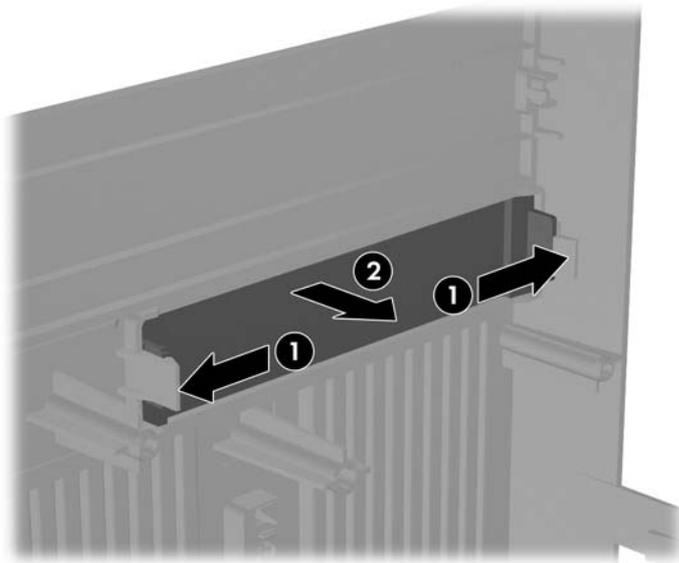


Figure 2-4 Removing a 3.5" Bezel Blank



NOTE: To install a 3.5" bezel blank, press the blank inward from inside the front bezel so that it snaps into place.

Installing Additional Memory

The computer comes with double data rate 2 synchronous dynamic random access memory (DDR2-SDRAM) dual inline memory modules (DIMMs).

DIMMs

The memory sockets on the system board can be populated with up to two industry-standard DIMMs. These memory sockets are populated with at least one preinstalled DIMM. The sockets are labeled DIMM1 and DIMM2. To achieve the maximum memory support, you can populate the system board with up to 2GB (2 x 1GB) of memory.

DDR2-SDRAM DIMMs

For proper system operation, the DDR2-SDRAM DIMMs must be:

- industry-standard 240-pin
- unbuffered PC2-5300 667 MHz-compliant
- 1.9 volt DDR2-SDRAM DIMMs

The DDR2-SDRAM DIMMs must also:

- support CAS latency 4 (CL = 4) for PC2-5300 667 MHz
- contain the mandatory JEDEC SPD information

In addition, the computer supports:

- 256Mbit, 512Mbit, and 1Gbit non-ECC memory technologies
- single-sided and double-sided DIMMs
- DIMMs constructed with x8 and x16 DDR devices; DIMMs constructed with x4 SDRAM are not supported



NOTE: The system will not start if you install unsupported DIMMs.

Installing DIMMs

CAUTION: You must disconnect the power cord and wait approximately 30 seconds for the power to drain before adding or removing memory modules. Regardless of the power-on state, voltage is always supplied to the memory modules as long as the computer is plugged into an active AC outlet. Adding or removing memory modules while voltage is present may cause irreparable damage to the memory modules or system board. If you see an LED light on the system board, voltage is still present.

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

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.

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

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the computer access panel.
4. Locate the memory module sockets on the system board.

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

5. Open both latches of the memory module socket (1), and insert the memory module into the socket (2).

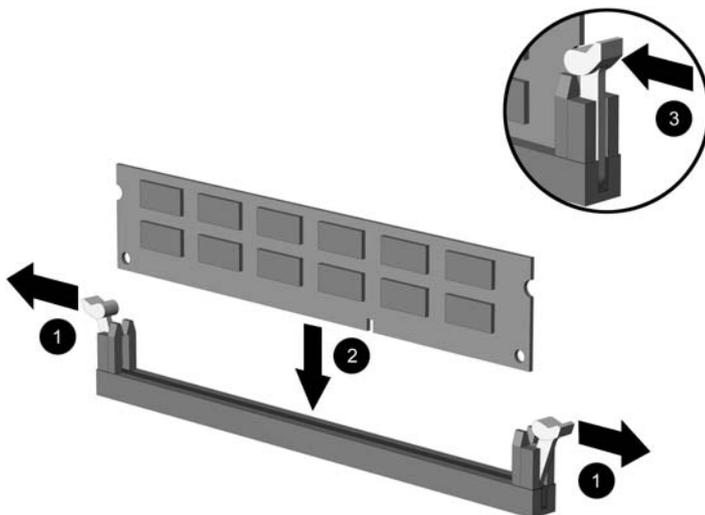


Figure 2-5 Installing a DIMM



NOTE: A memory module can be installed in only one way. Match the notch on the module with the tab on the memory socket.

6. Push the module down into the socket, ensuring that the module is fully inserted and properly seated. Make sure the latches are in the closed position (3).
7. Replace the computer access panel.
8. Reconnect the power cord and turn on the computer. The computer should automatically recognize the additional memory the next time you turn on the computer.

Installing an Expansion Card

The computer has two standard PCI expansion slots that can accommodate an expansion card up to 17.46 cm (6.875 inches) in length. The computer also has one PCI Express x1 expansion slot and one PCI Express x16 expansion slot.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the access panel and lay the computer on its side with the opening to internal parts facing up.
4. On the rear panel of the computer, remove the screw that secures the slot cover lock in place (1) and slide the slot cover lock up and away from the slots to remove it from the computer (2).

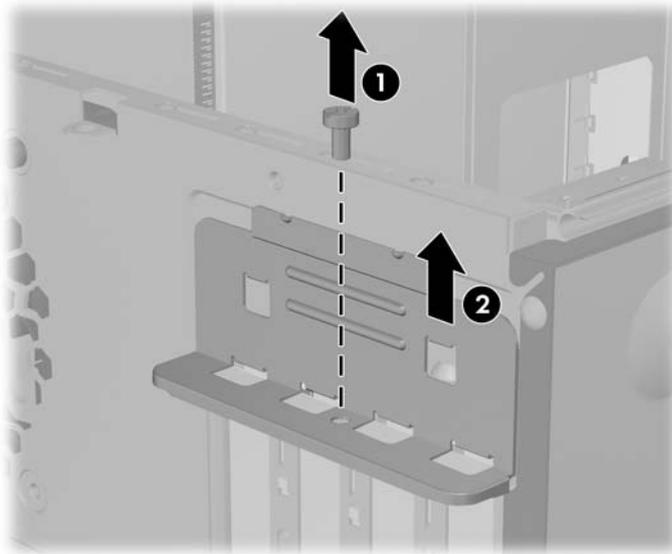


Figure 2-6 Releasing the Slot Cover Lock

5. If you are installing an expansion card for the first time, you must use a flatblade screwdriver to pry out the metal shield on the rear panel that covers the expansion slot. Be sure to remove the appropriate shield for the expansion card you are installing.

| Removable Shield | Expansion Card Type |
|------------------|---------------------|
| Top shield | PCI Express x16 |
| Second shield | PCI Express x1 |
| Third shield | PCI Express x1 |
| Bottom shield | PCI |

6. Hold the expansion card just above the expansion socket on the system board then move the card toward the rear of the chassis so that the bottom of the bracket on the card slides into the small slot on the chassis. Press the card straight down into the expansion socket on the system board.

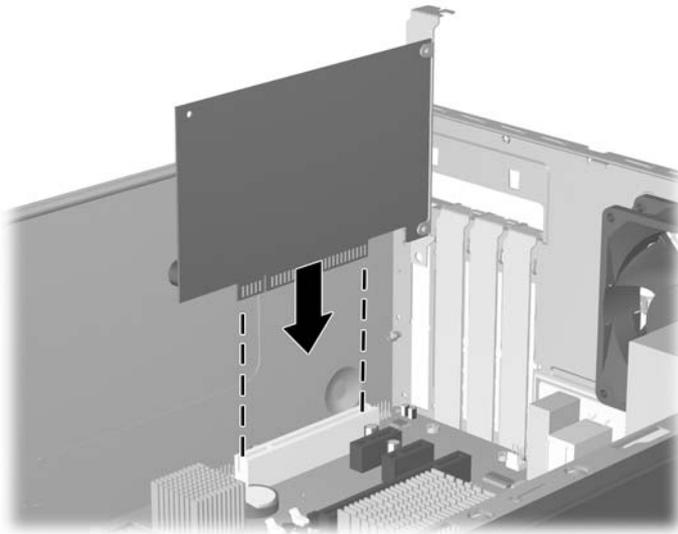


Figure 2-7 Installing an Expansion Card



NOTE: When installing an expansion card, press firmly on the card so that the whole connector seats properly in the expansion card slot.

7. While holding the expansion card bracket against the chassis, slide the slot cover lock down toward the expansion card brackets and slot covers to secure them in place then replace the screw that secures the slot cover lock.
8. Connect external cables to the installed card, if needed. Connect internal cables to the system board, if needed.
9. Replace the computer access panel and reconnect the power cord.



NOTE: To remove an expansion card, reverse the installation procedure.



CAUTION: After removing an expansion card, you must replace it with a new card or expansion slot cover for proper cooling of internal components during operation.

Replacing or Upgrading a Drive

The computer supports up to five drives that may be installed in various configurations.

This section describes the procedure for replacing or upgrading the storage drives. A Torx T-15 screwdriver is needed to remove and install the guide screws and retainer screws on a drive.

Locating Drive Positions



NOTE: The drive configuration shown below may be different than your computer model.

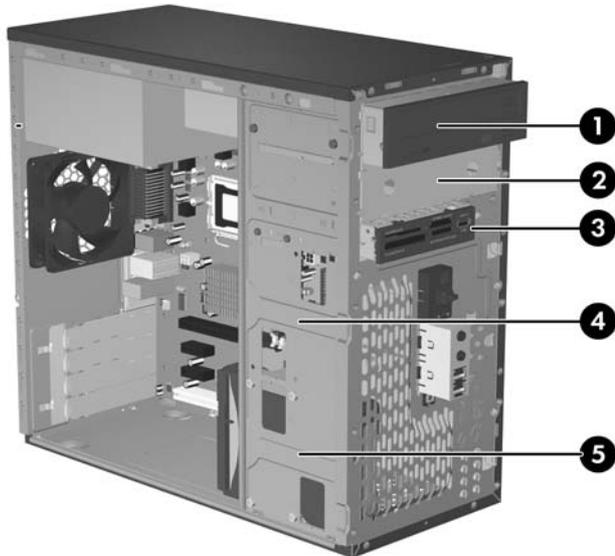


Figure 2-8 Drive Positions

- | | |
|---|---|
| 1 | External 5.25-inch half-height optical drive bay |
| 2 | External 5.25-inch half-height option drive bay |
| 3 | External 3.5-inch option drive bay (media card reader shown) ¹ |
| 4 | Internal 3.5-inch one-third height bay for optional secondary hard drive |
| 5 | Internal 3.5-inch one-third height bay for primary hard drive |

¹ The external 3.5" option drive bay accommodates a diskette drive or a media card reader.

System Board Drive Connections

Follow the guidelines in the illustration and table below when connecting drives to the system board.

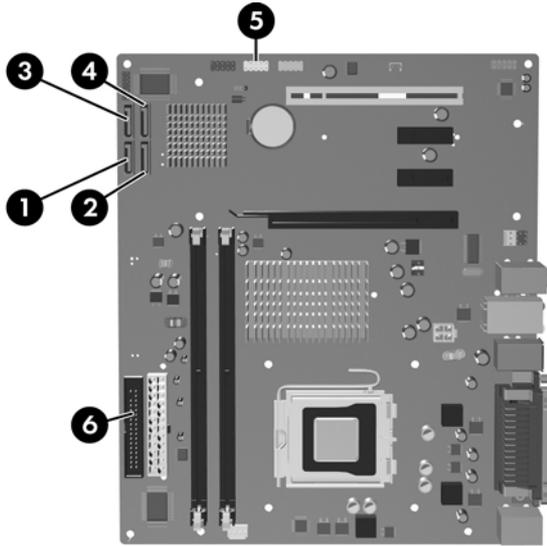


Figure 2-9 System Board Drive Connections

| Drive Configuration | System Board Connectors |
|---------------------|--|
| 1 hard drive | primary hard drive: (1) SATA1 |
| 1 optical drive | optical drive: (2) SATA2 |
| 1 hard drive | primary hard drive: (1) SATA1 |
| 2 optical drives | first optical drive: (2) SATA2 second optical drive: (4) SATA4 |
| 2 hard drives | primary hard drive: (1) SATA1 |
| 1 optical drive | secondary hard drive: (3) SATA3 optical drive: (2) SATA2 |
| 2 hard drives | primary hard drive: (1) SATA1 |
| 2 optical drives | secondary hard drive: (3) SATA3 first optical drive: (2) SATA2 second optical drive: (4) SATA4 |
| media card reader | (5) USB connector (white) |
| diskette drive | (6) PATA connector (black) |

Removing a 5.25" Optical Drive

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the access panel and front bezel. Refer to [Removing the Computer Access Panel and Front Bezel on page 3](#).
4. Disconnect the power and data cables from the back of the drive.
5. Remove the two retainer screws that secure the drive to the bay (1) then slide the drive forward and out of the bay (2).

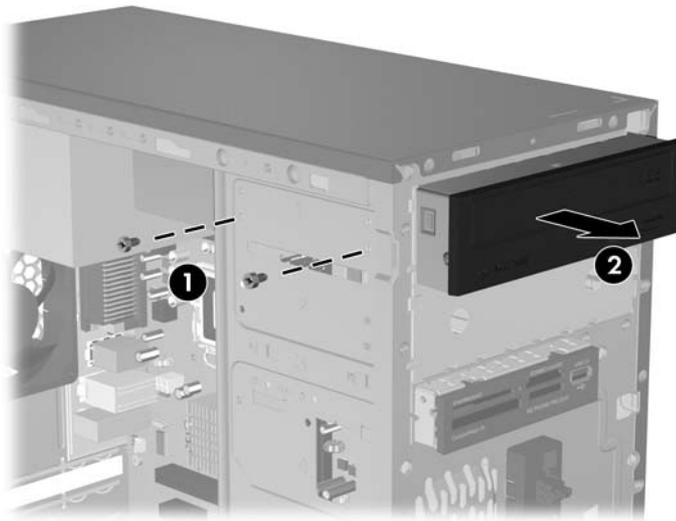


Figure 2-10 Removing a 5.25" External Drive

To install a drive, reverse the removal procedure. Be sure to install a guide screw on the front right side of a new drive. The guide screw helps secure the drive in place.



NOTE: If you are installing a drive in the bottom 5.25" drive bay, remove the metal shield that covers the bay by pressing inward on the silver tab on the left side of the chassis then pulling the shield out from the front of the chassis.

There are a total of eight extra guide/retainer screws on the front of the chassis behind the bezel. Four have 6-32 standard threads and four have M3 metric threads. Standard screws are used for hard drives and have a silver finish. Metric screws are used for all other drives and have a black finish. Be sure to install the appropriate guide screws into the drive.

Removing a 3.5" Media Card Reader or Diskette Drive

The 3.5" external drive bay may be populated with a diskette drive or a media card reader. The removal procedure is the same for both devices.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the access panel and front bezel. Refer to [Removing the Computer Access Panel and Front Bezel on page 3](#).
4. If the device is a media card reader, disconnect the internal USB cable from the system board. If the device is a diskette drive, disconnect the power and data cables from the back of the drive.
5. Remove the two retainer screws that secure the drive to the bay (1) then slide the drive forward and out of the bay (2).

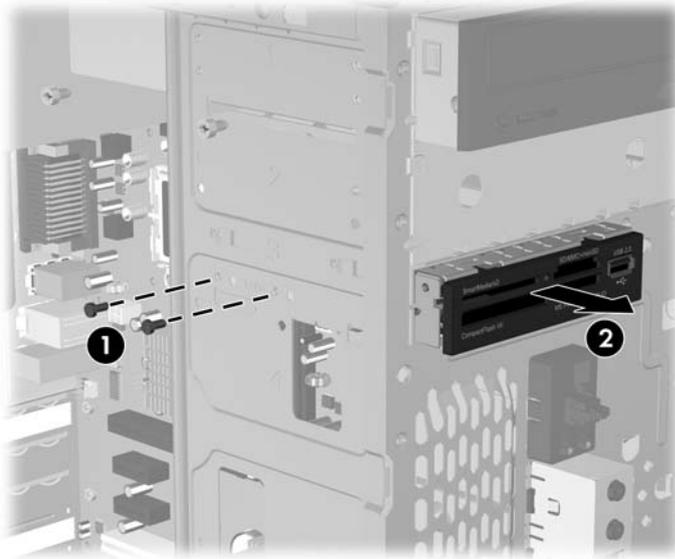


Figure 2-11 Removing a 3.5" Device (Media Card Reader Shown)

To install a drive, reverse the removal procedure. Refer to the following table for proper retainer and guide screw locations.

| Device | Retainer Screws | Guide Screws |
|-------------------|------------------------------|------------------------------|
| Diskette Drive | 2 (labeled "FDD" on chassis) | 1 (front left side of drive) |
| Media Card Reader | 2 (labeled "CR" on chassis) | none |



NOTE: If you are installing a drive in the external 3.5" drive bay for the first time, use a flatblade screwdriver to pry out the metal shield covering the bay.

There are a total of eight extra guide/retainer screws on the front of the chassis behind the bezel. Four have 6-32 standard threads and four have M3 metric threads. Standard screws are used for hard drives and have a silver finish. Metric screws are used for all other drives and have a black finish. Be sure to install the appropriate guide screws into the drive.

Removing a 3.5" Hard Drive

CAUTION: Make sure to create a Recovery Disc Set through HP Backup and Recovery Manager and back up your personal files on the hard drive to an external storage device before removing the hard drive. Failure to do so will result in data loss. After replacing the primary hard drive, you will need to load the HP factory-installed files from the Recovery Disc Set.

1. Turn off the computer properly through the operating system, then turn off any external devices.
2. Disconnect the power cord from the power outlet and the computer, and disconnect any external devices.
3. Remove the access panel and front bezel. Refer to [Removing the Computer Access Panel and Front Bezel on page 3](#).
4. Disconnect the power and data cables from the back of the hard drive.
5. Remove the four retainer screws that secure the drive to the bay (1) then slide the drive back and out of the bay (2).

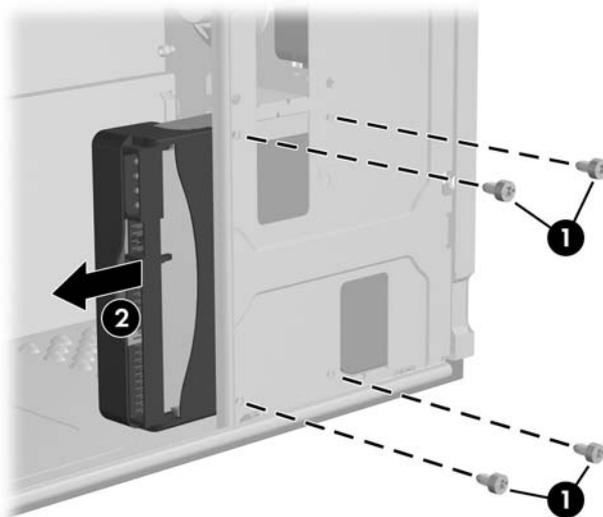


Figure 2-12 Removing a 3.5" Hard Drive



NOTE: To install a hard drive, reverse the removal procedure. No guide screws are required for drives installed in a 3.5" hard drive bay.

Installing a Security Lock

An optional security lock can be installed on the rear panel of the computer to provide physical computer security.



Figure 2-13 Installing a Security Lock



NOTE: The security lock slot may be in a different location on your computer model.

3 Battery Replacement

The battery that comes with the computer provides power to the real-time clock. When replacing the battery, use a battery equivalent to the battery originally installed in the computer. The computer comes with a 3-volt lithium coin cell battery.



WARNING! The 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 (140°F).

Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

Replace the battery only with the HP 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 *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics CD* for information on backing up the CMOS settings.

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.



NOTE: 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.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, go to <http://www.hp.com/recycle>.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as diskettes or compact discs, from the computer.
3. Turn off the computer properly through the operating system, then turn off any external devices.
4. Disconnect the power cord from the power outlet and disconnect any external devices.



CAUTION: Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

5. Remove the computer access panel.
6. Locate the battery and battery holder on the system board.



NOTE: On some computer models, it may be necessary to remove an internal component to gain access to the battery.

7. Depending on the type of battery holder on the system board, complete the following instructions to replace the battery.

Type 1

- a. Lift the battery out of its holder.

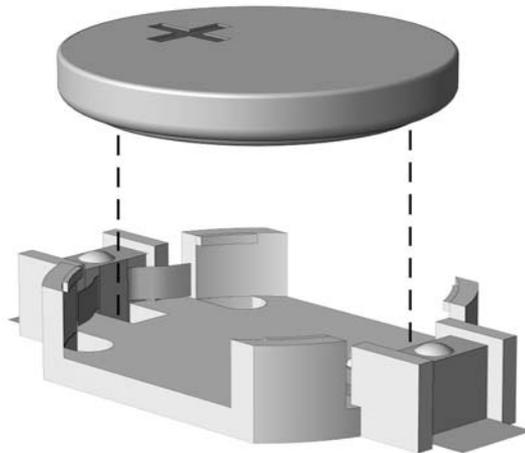


Figure 3-1 Removing a Coin Cell Battery (Type 1)

- 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. When the battery pops up, lift it out (1).

- b. 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 (2).

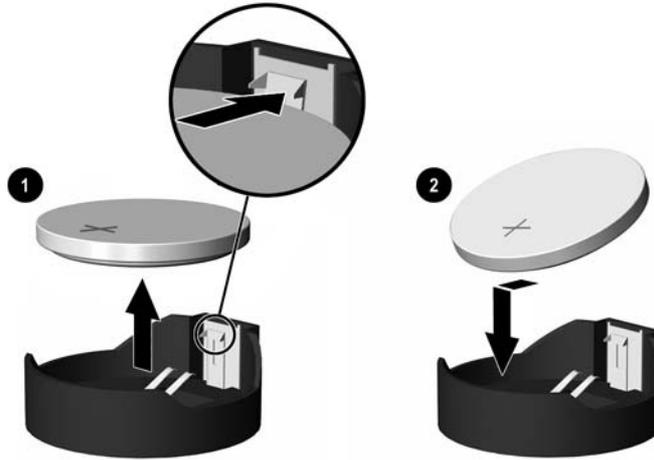


Figure 3-2 Removing and Replacing a Coin Cell Battery (Type 2)

Type 3

- a. Pull back on the clip (1) that is holding the battery in place, and remove the battery (2).
- b. Insert the new battery and position the clip back into place.

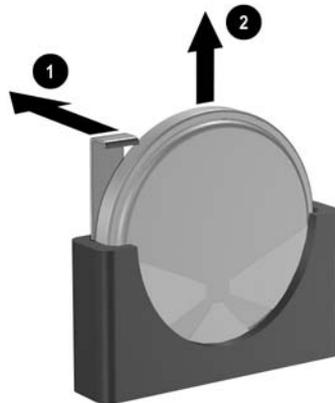


Figure 3-3 Removing a Coin Cell Battery (Type 3)



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

8. Replace the computer access panel.

9. Plug in the computer and turn on power to the computer.
10. Reset the date and time, your passwords, and any special system setups using Computer Setup. Refer to the *Computer Setup (F10) Utility Guide* on the *Documentation and Diagnostics CD*.
11. Lock any security devices that were disengaged when the computer access panel was removed.

4 Computer Operating Guidelines, Routine Care and Shipping Preparation

Computer Operating Guidelines and Routine Care

Follow these guidelines to properly set up and care for the computer and monitor:

- Keep the computer away from excessive moisture, direct sunlight, and extremes of heat and cold.
- Operate the computer on a sturdy, level surface. Leave a 10.2-cm (4-inch) clearance on all vented sides of the computer and above the monitor to permit the required airflow.
- Never restrict the airflow into the computer by blocking any vents or air intakes. Do not place the keyboard, with the keyboard feet down, directly against the front of the desktop unit as this also restricts airflow.
- Never operate the computer with the cover or side panel removed.
- Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air.
- If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.
- Keep liquids away from the computer and keyboard.
- Never cover the ventilation slots on the monitor with any type of material.
- Install or enable power management functions of the operating system or other software, including sleep states.
- 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 all vented sides of the computer. Lint, dust, and other foreign matter can block the vents and limit the airflow.

Optical Drive Precautions

Be sure to observe the following guidelines while operating or cleaning the optical 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 HP service provider.

Shipping Preparation

Follow these suggestions when preparing to ship the computer:

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



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

2. Remove and store all removable media.
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.



NOTE: 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.

5 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 an HP authorized dealer, reseller, or service provider.



NOTE: For more information on static electricity, contact an HP authorized dealer, reseller, or service provider.
