

# Hardware Reference Guide

HP Pro 2000 and 3000 Series Microtower Business  
PCs

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#### **Hardware Reference Guide**

HP Pro 2000 and 3000 Series Microtower Business PCs

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## About This Book

This guide provides basic information for upgrading these computer models. The model illustrated in this guide may look different than your computer model.

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- ⚠ **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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# Hardware Upgrades

## 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, hot surfaces, or fire:

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

Disconnect the RJ-11 cable to the equipment before removing the enclosure.

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>.

**WARNING!** Energized and moving parts inside.

Disconnect power to the equipment before removing the enclosure.

Replace and secure the enclosure before re-energizing the equipment.

△ **CAUTION:** To reduce the risk of fire, use only No. 26 AWG or larger (e.g., 24 AWG) UL Listed or CSA Certified Telecommunication Line Cord.

**CAUTION:** Do not leave this equipment in an unconditioned environment with storage temperatures above 35°C (120°F).

Extreme heat may damage the equipment.

The unit should be operated under a maximum ambient temperature of 35°C (120°F).

**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. See [Electrostatic Discharge on page 35](#) for more information.

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.

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## Additional Information

For more information on removing and replacing hardware components, desktop management, the Computer Setup utility, and troubleshooting, refer to the *Maintenance and Service Guide* (available in English only) for your computer model at <http://www.hp.com>.

## Removing the Computer Access Panel

1. Remove/disengage any security devices that prohibit opening the computer.
  2. Remove all removable media, such as compact discs or USB flash drives, 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. Loosen the screw (1) that secures the access panel to the computer chassis.
  6. Slide the access panel back (2) about 1.3 cm (1/2 inch), then lift it off the unit.
- 
- 📄 **NOTE:** You may want to lay the computer on its side to install internal parts. Be sure the side with the access panel is facing up.
- 

**Figure 1** Removing the Computer Access Panel





## Replacing the Computer Access Panel

Place the access panel on the chassis with about 1.3 cm (1/2 inch) of the panel hanging off the back of the chassis and slide it into place (1). Ensure that the hole for the screw is aligned with the hole in the chassis and tighten the screw (2).

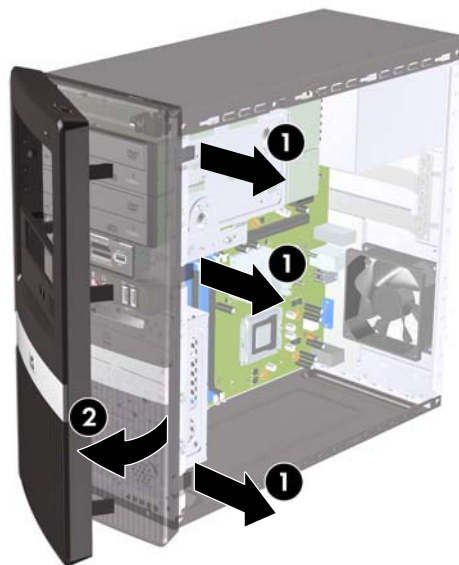
**Figure 2** Replacing the Computer Access Panel



## Removing the Front Bezel

1. Remove/disengage any security devices that prohibit opening the computer.
  2. Remove all removable media, such as compact discs or USB flash drives, 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. Press outward on the three latches on the right side of the bezel (1), then rotate the right side of the bezel off the chassis (2) followed by the left side.

**Figure 3** Removing the Front Bezel



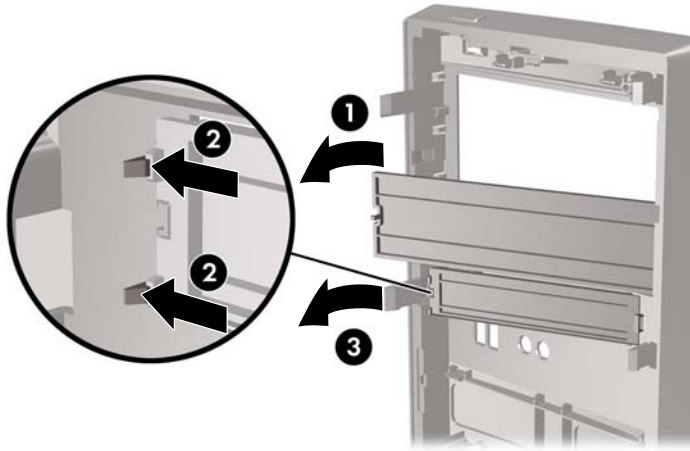
## Removing Bezel Blanks

On some models, there are bezel blanks covering the 3.5-inch and 5.25-inch external drive bays that need to be removed before installing a drive.

1. Remove the front bezel.
2. To remove the lower 5.25-inch bezel blank, gently twist and pull on the bezel blank until it breaks free from the front bezel (1), then discard the bezel blank. If the blank needs to be replaced at a later date, you can order a replacement blank from HP.

3. To remove the 3.5-inch bezel blank, press the two retaining tabs towards the outer left edge of the bezel (2) and pull the bezel blank inwards to free it from the front bezel (3).

**Figure 4** Removing a Bezel Blank

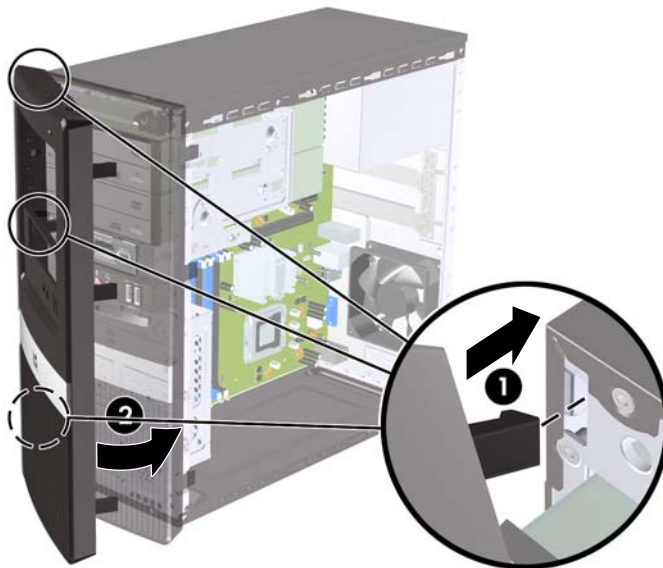


4. Replace the front bezel.

## Replacing the Front Bezel

Insert the three hooks on the left side of the bezel into the slots on the chassis (1) and rotate the bezel on from left to right (2) so that it snaps in place.

**Figure 5** Replacing the Front Bezel



# Installing Additional Memory

The computer comes with double data rate 3 synchronous dynamic random access memory (DDR3-SDRAM) dual inline memory modules (DIMMs).

## DIMMs

The memory sockets are populated with at least one preinstalled DIMM. To achieve the maximum memory support, you can populate the system board with up to 4GB of memory on HP Pro 2000 series models or 8GB of memory on HP Pro 3000 series models.

## DDR3-SDRAM DIMMs

For proper system operation, the DDR3-SDRAM DIMMs must be:

- industry-standard 240-pin
- unbuffered non-ECC PC3-10600 DDR3-1333 MHz-compliant
- 1.5 volt DDR3-SDRAM DIMMs


The DDR3-SDRAM DIMMs must also:

- support CAS latency 9 DDR3 1333 MHz (9-9-9 timing)
- contain the mandatory JEDEC SPD information

In addition, the computer supports:

- 512-Mbit, 1-Gbit, and 2-Gbit 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

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 **NOTE:** The system will not operate properly if you install unsupported DIMMs.

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## 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.

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. For more information, refer [Electrostatic Discharge on page 35](#).

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

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1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as compact discs or USB flash drives, 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:** 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.

5. Remove the computer access panel.
6. 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.

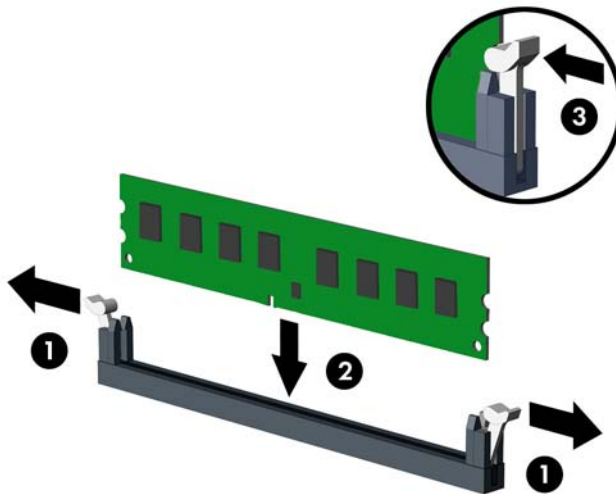
7. Open both latches of the memory module socket (1), and insert the memory module into the socket (2).

📝 **NOTE:** On HP Pro 2000 systems, populate the DIMM sockets in the following order: DIMM1 then DIMM2.

On HP Pro 3000 systems with Intel processors, populate the DIMM sockets in the following order: DIMM1, DIMM3, DIMM2, then DIMM4.

On HP Pro 3000 systems with AMD processors, populate the DIMM sockets in the following order: DIMM1, DIMM2, DIMM3, then DIMM4

**Figure 6** 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.

8. Push the DIMM module down firmly into the socket, ensuring that the module is fully inserted and properly seated. The DIMM must be pushed all the way down into the socket and sit evenly in the socket to avoid memory corruption. Make sure the latches are in the closed position (3).
9. Repeat steps 7 and 8 to install any additional modules.
10. Replace the computer access panel.

11. Reconnect the power cord and any external devices, then turn on the computer. The computer should automatically recognize the additional memory when you turn on the computer.
12. Lock any security devices that were disengaged when the access panel was removed.


# Removing or Installing an Expansion Card

Depending on the model, the computer may include PCI Express x1 expansion slots, PCI Express x16 expansion slots, and standard PCI expansion slots.

 **NOTE:** You can install a PCI Express x1, x4, x8, or x16 expansion card in the PCI Express x16 expansion slot.

To remove, replace, or add an expansion card:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as compact discs or USB flash drives, 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 correct vacant expansion socket on the system board and the corresponding expansion slot on the back of the computer chassis.
7. On the rear of the computer, a slot cover lock secures the expansion card brackets in place. Remove the screw from the slot cover lock then slide the slot cover lock up to remove it from the chassis.

**Figure 7** Opening the Slot Cover Lock

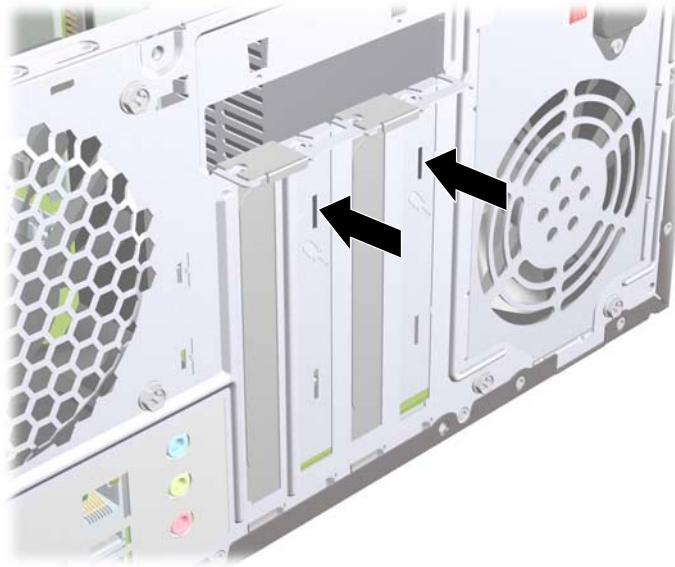


8. Before installing an expansion card, remove the expansion slot cover or the existing expansion card.

 **NOTE:** Before removing an installed expansion card, disconnect any cables that may be attached to the expansion card.

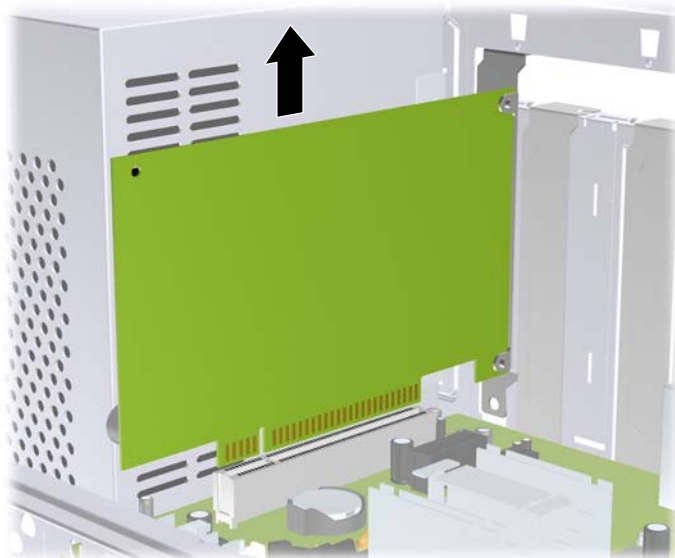
- a. If you are installing an expansion card in a vacant socket, you must use a flatblade screwdriver to pry out the metal shield on the rear panel that covers the expansion slot. Be sure to remove the appropriate shield for the expansion card you are installing.

**Figure 8** Removing an Expansion Slot Cover



- b. If you are removing a standard PCI card or PCI Express x1 card, hold the card at each end, and carefully rock it back and forth until the connectors pull free from the socket. Pull the expansion card straight up from the socket then away from the inside of the chassis to release it from the chassis frame. Be sure not to scrape the card against the other components.

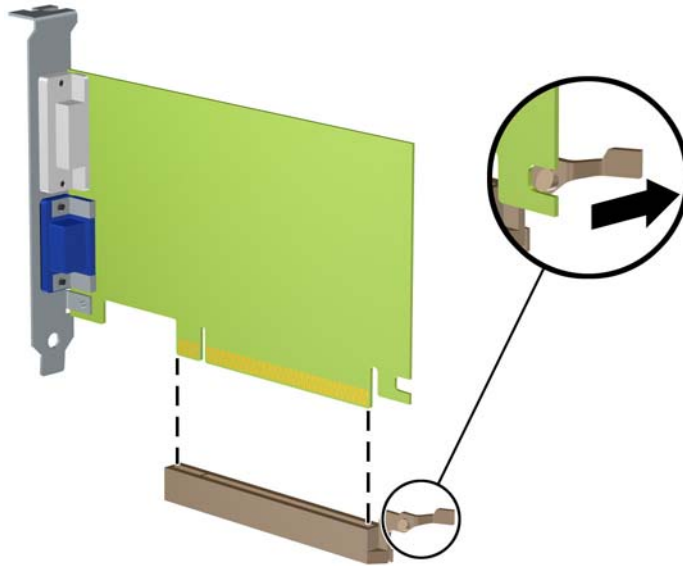
**Figure 9** Removing a PCI or PCI Express x1 Expansion Card





- c. If you are removing a PCI Express x16 card, pull the retention arm on the back of the expansion socket away from the card and carefully rock the card back and forth until the connectors pull free from the socket. Be sure not to scrape the card against the other components.

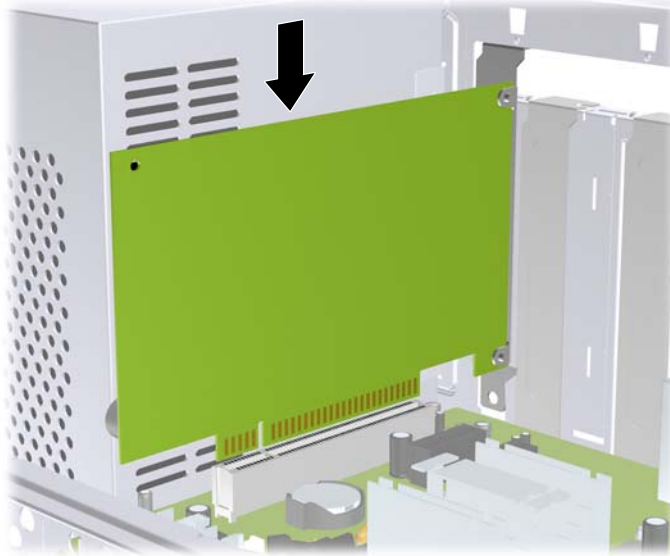
**Figure 10** Removing a PCI Express x16 Expansion Card




9. Store the removed card in anti-static packaging.
  10. If you are not installing a new expansion card, install an expansion slot cover to close the open slot.
- 
- △ **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.

11. To install a new expansion card, hold the 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 11** 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.

12. Replace the slot cover lock and secure it in place with the screw that was previously removed.


**Figure 12** Securing the Expansion Cards and Slot Covers



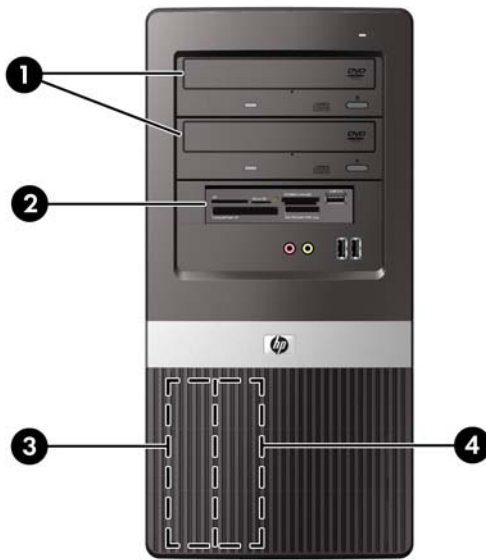
13. Connect external cables to the installed card, if needed. Connect internal cables to the system board, if needed.
14. Replace the computer access panel.
15. Reconnect the power cord and any external devices, then turn on the computer.

16. Lock any security devices that were disengaged when the access panel was removed.
17. Reconfigure the computer, if necessary. Refer to the *Computer Setup (F10) Utility Guide* for instructions on using Computer Setup.

## Drive Positions

 **NOTE:** Your computer model may look different than the model shown below.

**Figure 13** Drive Positions



- |   |  |
|---|--|
| 1 | Two 5.25-inch external drive bays for optional drives (optical drives shown) |
| 2 | One 3.5-inch external drive bay for optional drive (media card reader shown) |
| 3 | Primary 3.5-inch internal hard drive bay                                     |
| 4 | Secondary 3.5-inch internal hard drive bay for optional hard drive           |

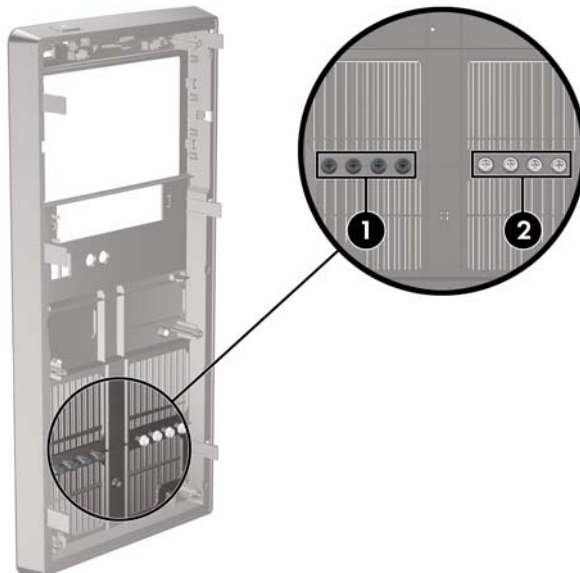
To verify the type, size, and capacity of the storage devices installed in the computer, run Computer Setup. Refer to the *Computer Setup (F10) Utility Guide* for more information.

# Installing Additional Drives

When installing additional drives, follow these guidelines:

- The primary Serial ATA (SATA) hard drive must be connected to the dark blue primary SATA connector on the system board.
- Connect the first SATA optical drive to the white SATA connector on the system board.
- Always populate the dark blue and white connectors before the light blue and orange connectors.
- The system does not support Parallel ATA (PATA) optical drives or PATA hard drives.
- If needed, HP has provided extra drive retainer screws on the interior of the front bezel that are used to secure the drives in the drive cage. Hard drives use 6-32 standard screws. All other drives use M3 metric screws. The HP-supplied M3 metric guide screws (1) are black. The HP-supplied 6-32 standard screws (2) are silver.

**Figure 14** Extra Drive Retainer Screws Location



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

If you are inserting or removing a drive, shut down the operating system properly, turn off the computer, and unplug the power cord. Do not remove a 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, refer to Appendix A, [Electrostatic Discharge on page 35](#).

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 protective packaging and label the package "Fragile: Handle With Care."

## Removing an Optical Drive

- △ **CAUTION:** All removable media should be taken out of a drive before removing the drive from the computer.

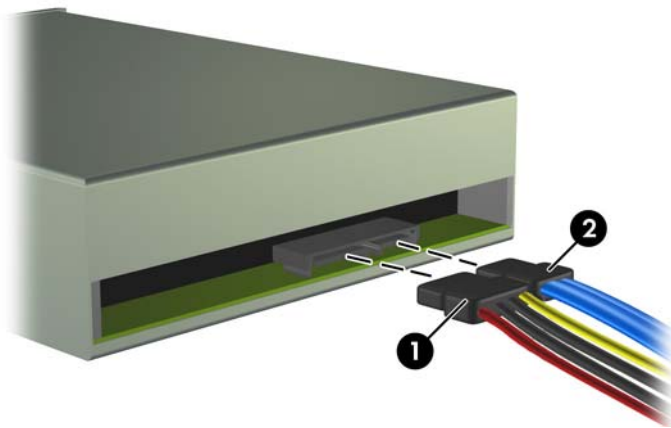
To remove an optical drive:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as compact discs or USB flash drives, 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.

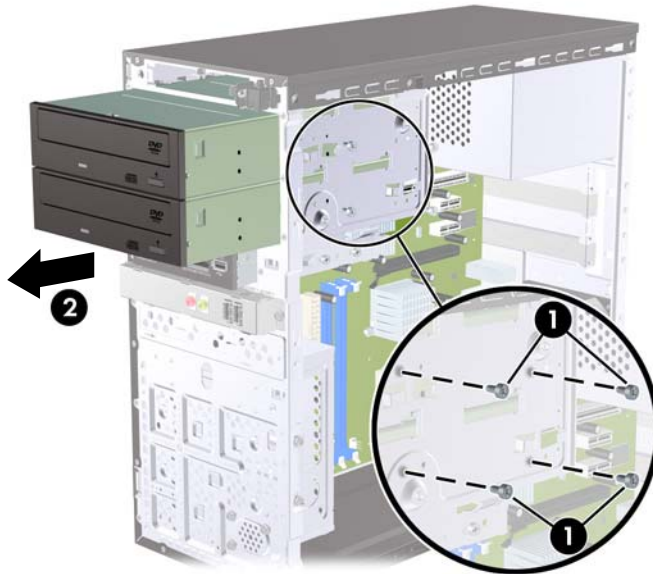
5. Remove the access panel and front bezel.
6. Disconnect the power cable (1) and data cable (2) from the rear of the optical drive.

**Figure 15** Disconnecting the Power and Data Cables



7. Remove the two screws that secure the drive to the drive cage (1), then slide the drive out of the front of the chassis (2).

**Figure 16** Removing the Optical Drive



## Installing an Optical Drive into the 5.25-inch Drive Bay

To install an optional 5.25-inch optical drive:

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as compact discs or USB flash drives, 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.  

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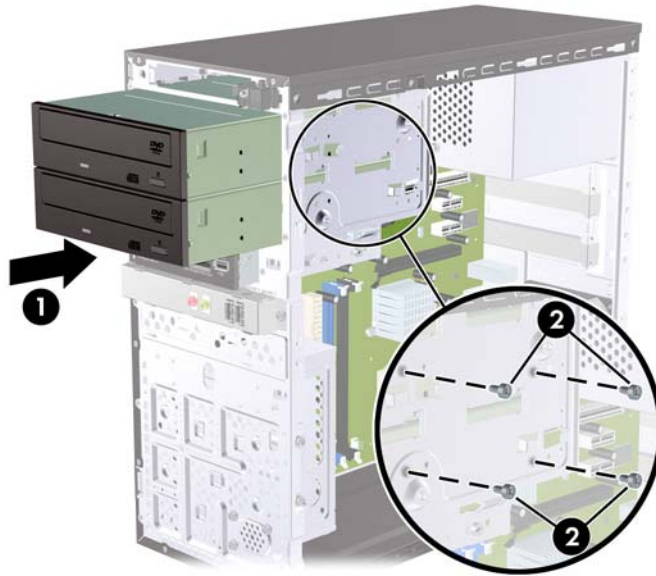
△ **CAUTION:** Regardless of the power-on state, voltage is always present on the system board as long as the system is plugged into an active AC outlet. You must disconnect the power cord to avoid damage to the internal components of the computer.

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5. Remove the access panel and front bezel.
6. If you are installing a drive in a bay covered by a bezel blank, remove the front bezel then remove the bezel blank. See [Removing Bezel Blanks on page 4](#) for more information.
7. If you are adding a drive to an empty lower optical drive bay, you must remove the knockout plate from the bay. To do so, insert a flat screwdriver into the knockout plate slot and rotate the screwdriver to break the knockout plate out of the chassis. Discard the knockout plate.
8. If the new drive has screws installed on the sides of the drive, remove the screws before inserting the drive into the chassis.

- Slide the drive in through the front of the chassis (1) until the bezel on the drive is evenly aligned with the computer front bezel and install the two M3 metric retainer screws (2) as shown in the illustration below.

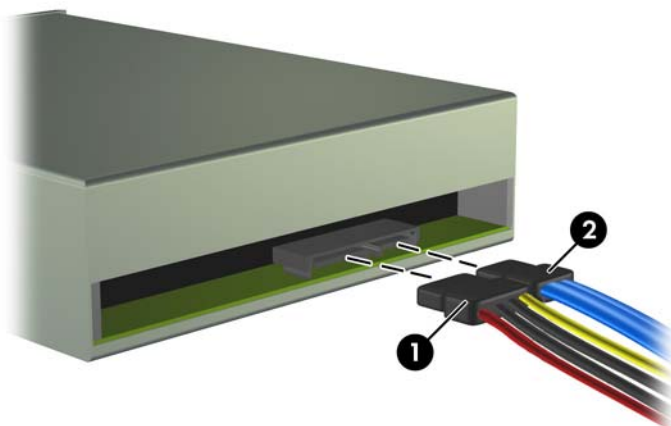
**NOTE:** Extra drive retainer screws are provided on the interior of the front bezel if needed. The M3 metric retainer screws for optical drives are black. Refer to [Installing Additional Drives on page 14](#) for an illustration of the retainer screws location.

**Figure 17** Installing the Optical Drive



- If the system configuration includes only one optical drive, connect the SATA data cable to the white system board connector. If you are adding a second optical drive, connect the SATA data cable to the light blue or orange system board connector.
- Connect the power cable (1) and data cable (2) to the rear of the optical drive.

**Figure 18** Connecting the Power and Data Cables



- Replace the front bezel and access panel.
- Reconnect the power cord and turn on the computer.
- Lock any security devices that were disengaged when the access panel was removed.

The system automatically recognizes the drive and reconfigures the computer.

## Removing an External 3.5-inch Drive

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

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as compact discs or USB flash drives, 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 access panel and front bezel.
6. Disconnect the drive cables.
  - a. If you are removing a diskette drive (available on some models only), disconnect the data cable and power cable from the back of the drive.
  - b. If you are removing a media card reader, disconnect the USB cable from the system board.
7. 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 19** Removing a 3.5-inch Device (Media Card Reader Shown)





## Installing a Drive into the 3.5-inch External Drive Bay


1. Remove/disengage any security devices that prohibit opening the computer.
  2. Remove all removable media, such as compact discs or USB flash drives, 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 access panel and front bezel.
  6. If you are installing a drive in a bay covered by a bezel blank, remove the front bezel then remove the bezel blank. See [Removing Bezel Blanks on page 4](#) for more information.
  7. If you are adding a drive to an empty drive bay for the first time, you must remove the knockout plate from the bay. To do so, insert a flat screwdriver into the knockout plate slot and rotate the screwdriver to break the knockout plate out of the chassis. Discard the knockout plate.
  8. If the new drive has screws installed on the sides of the drive, remove them before inserting the drive into the chassis.
  9. Slide the drive in through the front of the chassis (1) until the bezel on the drive is evenly aligned with the computer front bezel and install the two M3 metric retainer screws (2) as shown in the illustration below.
- 
- 📝 **NOTE:** Extra drive retainer screws are provided on the interior of the front bezel if needed. The M3 metric retainer screws for diskette drives or media card readers are black. Refer to [Installing Additional Drives on page 14](#) for an illustration of the retainer screws location.
- 

**Figure 20** Installing a 3.5-inch Device (Media Card Reader Shown)




10. Connect the appropriate drive cables:
  - a. If installing a diskette drive (available on some models only), connect the power and data cables to the rear of the drive and connect the other end of the data cable to the connector on the system board.
  - b. If installing a media card reader, connect the USB cable from the media card reader to the USB connector on the system board.
11. Replace the front bezel and access panel.
12. Reconnect the power cord and turn on the computer.
13. Lock any security devices that were disengaged when the access panel was removed.

## Removing an Internal 3.5-inch Hard Drive

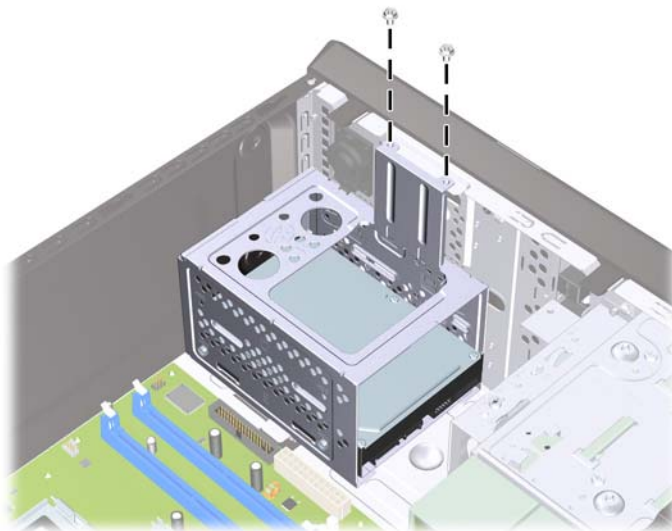
 **NOTE:** Before you remove the old hard drive, be sure to back up the data from the old hard drive so that you can transfer the data to the new hard drive.

1. Remove/disengage any security devices that prohibit opening the computer.
2. Remove all removable media, such as compact discs or USB flash drives, 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.

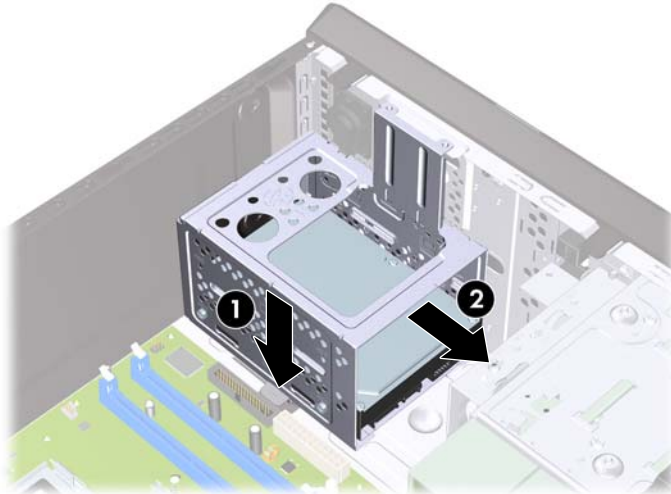
5. Remove the computer access panel.
6. Remove the two screws that secure the hard disk drive cage to the chassis.

**Figure 21** Removing the Hard Drive Cage Screws



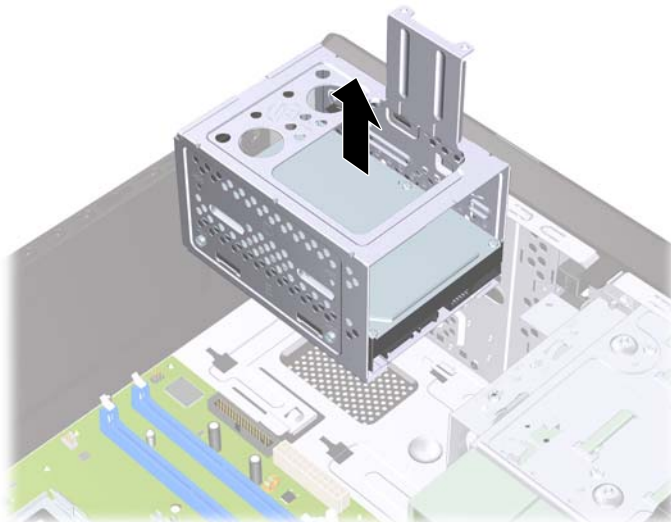
7. Push down the latch on the side of the hard disk drive cage (1), then slide the hard disk drive cage away from the bottom of the chassis (2) as shown below.

**Figure 22** Releasing the Hard Drive Cage



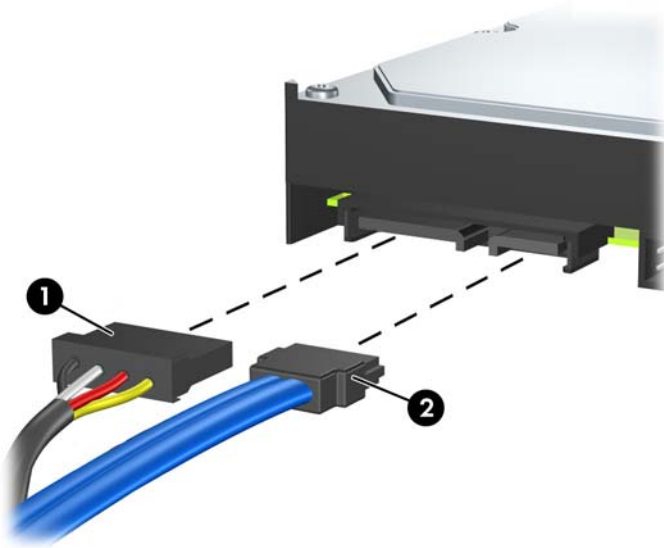
8. Lift the hard disk drive cage out of the chassis.

**Figure 23** Removing the Hard Drive Cage



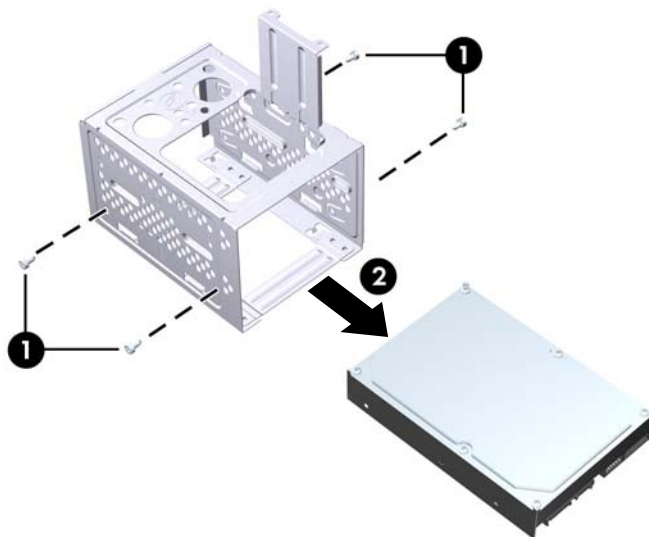
9. Disconnect the power cable (1) and data cable (2) from the back of the hard drive.

**Figure 24** Disconnecting the Hard Drive Cables




10. Remove the four screws that secure the hard disk drive to the hard disk drive cage (1), then slide the hard disk drive out of the hard disk drive cage (2).

**Figure 25** Removing the Hard Drive



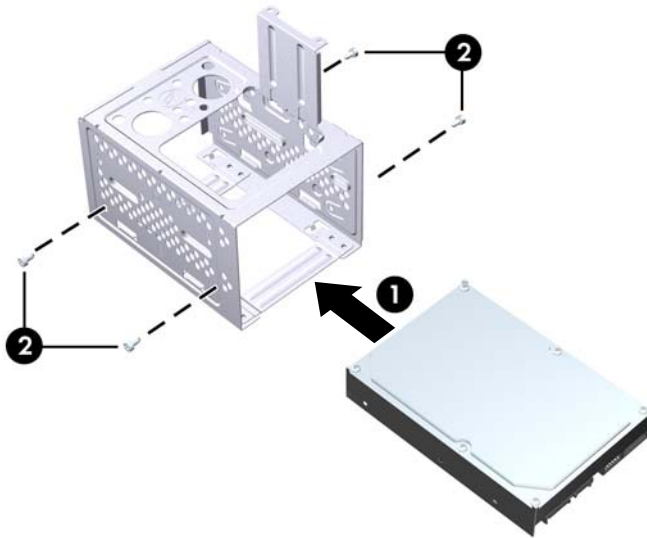
## Installing an Internal 3.5-inch Hard Drive

1. Follow the steps in [Removing an Internal 3.5-inch Hard Drive on page 20](#) to remove the hard drive cage and, if necessary, the existing hard drive.
2. Slide the new drive into the hard disk drive cage (1), aligning the drive with the four screw holes on the cage. Install the four 6-32 standard screws that secure the hard disk drive to the hard disk drive cage (2). Make sure the hard disk drive cables are facing the top of the drive cage.

 **NOTE:** If you are replacing an old drive with a new drive, use the four retainer screws from the old drive to install the new drive.

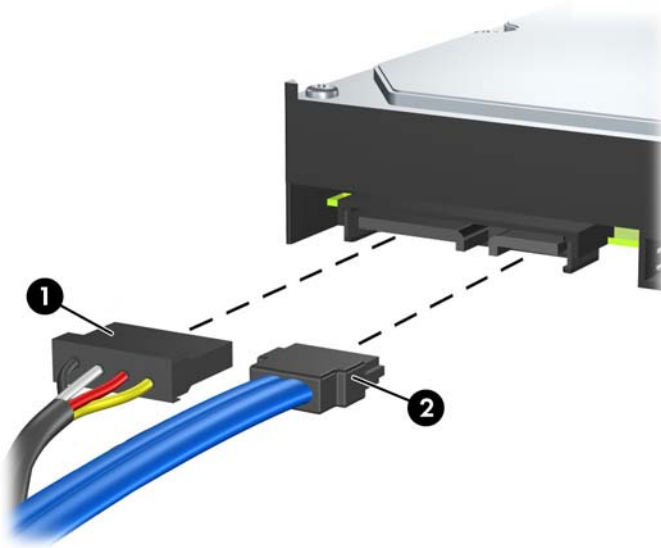
**NOTE:** If you are installing a second hard drive, use four of the extra standard 6-32 screws that are installed on the interior of the front bezel. The 6-32 screws are silver. Refer to [Installing Additional Drives on page 14](#) for an illustration of the retainer screws location.

**Figure 26** Installing the Hard Drive in the Drive Cage



3. Connect the power cable (1) and data cable (2) to the back of the hard drive.

**Figure 27** Connecting the Hard Drive Cables



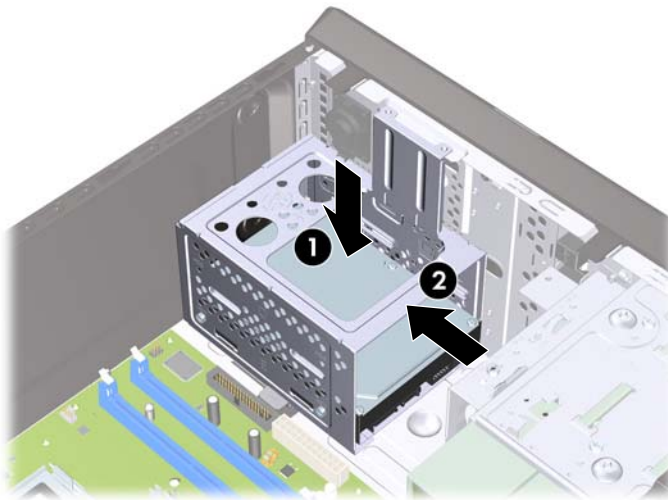
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△ **CAUTION:** Never crease or bend a SATA data cable tighter than a 30 mm (1.18 in) radius. A sharp bend can break the internal wires.

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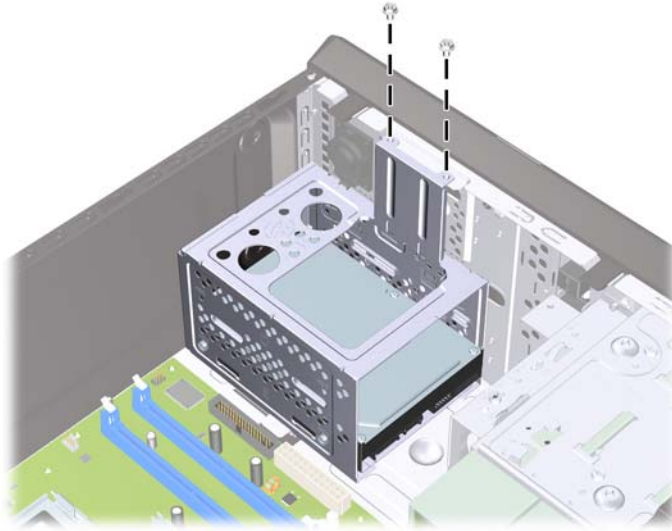
4. Place the hard disk drive cage into the chassis (1), then slide it down toward the bottom of the chassis until it locks into place (2).

**Figure 28** Installing the Hard Drive Cage




5. Attach the two screws that secure the hard disk drive cage to the chassis.

**Figure 29** Securing the Hard Drive Cage



6. If installing a new drive, connect the opposite end of the data cable to the appropriate system board connector. If your system has only one SATA hard drive, you must connect the hard drive data cable to the dark blue connector to avoid any hard drive performance problems. If you are adding a second hard drive, connect the data cable to the next available (unpopulated) SATA connector on the system board.

 **NOTE:** If your system has only one SATA hard drive, you must connect the hard drive data cable to the dark blue SATA on the system board to avoid any hard drive performance problems. If you are adding a second hard drive, connect the data cable to the next available (unpopulated) SATA connector on the system board.

7. Replace the computer access panel.
8. Reconnect the power cord and any external devices, then turn on the computer.
9. Lock any security devices that were disengaged when the access panel was removed.



# 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* 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 compact discs or USB flash drives, 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.

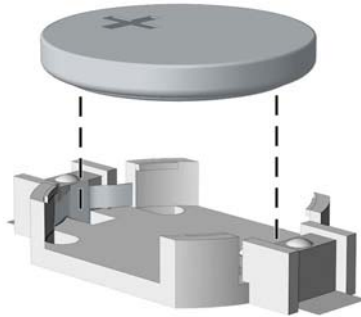
7. Depending on the type of battery holder on the system board, complete the following instructions to replace the battery.



### Type 1

- a. Lift the battery out of its holder.

**Figure 30** Removing a Coin Cell Battery (Type 1)

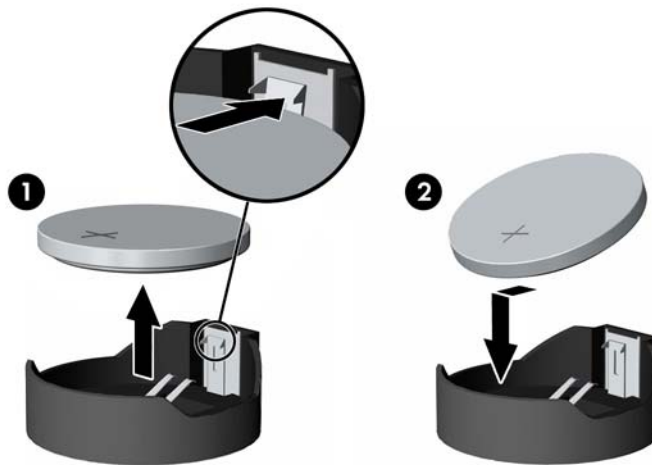


- b. Slide the replacement battery into position, positive side up. The battery holder automatically secures the battery in the proper position.

### 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 31** Removing and Replacing a Coin Cell Battery (Type 2)

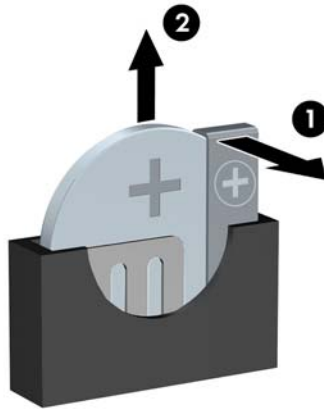



### Type 3

- 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 32** Removing a Coin Cell Battery (Type 3)



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

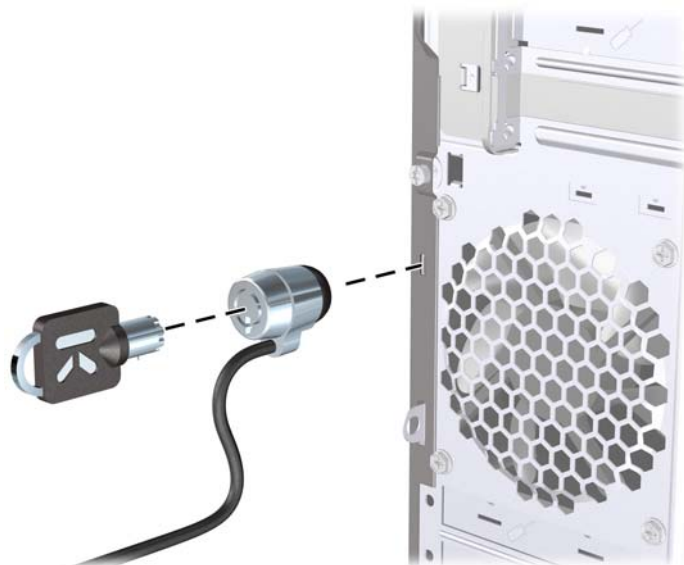
8. Replace the computer access panel.
9. Plug in the computer and turn on power to the computer.
10. Reset the date and time, your passwords, and any special system setups using Computer Setup.
11. Lock any security devices that were disengaged when the access panel was removed.

## Installing a Security Lock

The security locks displayed below and on the following pages can be used to secure the computer.

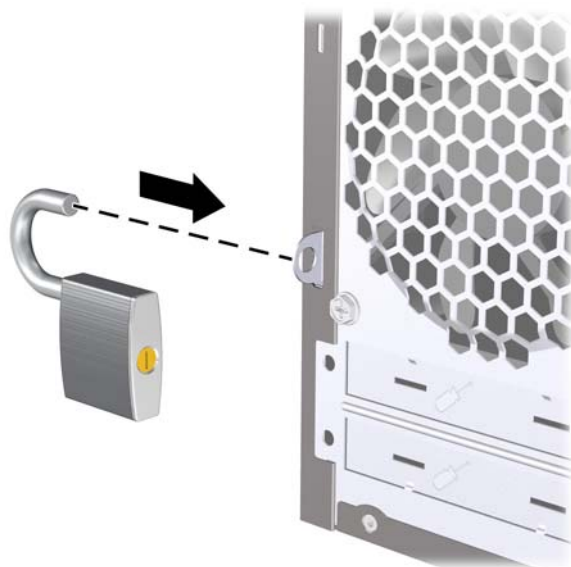
## HP/Kensington MicroSaver Security Cable Lock

Figure 33 Installing a Cable Lock



## Padlock

Figure 34 Installing a Padlock



## HP Business PC Security Lock

1. Fasten the security cable by looping it around a stationary object.

**Figure 35** Securing the Cable to a Fixed Object



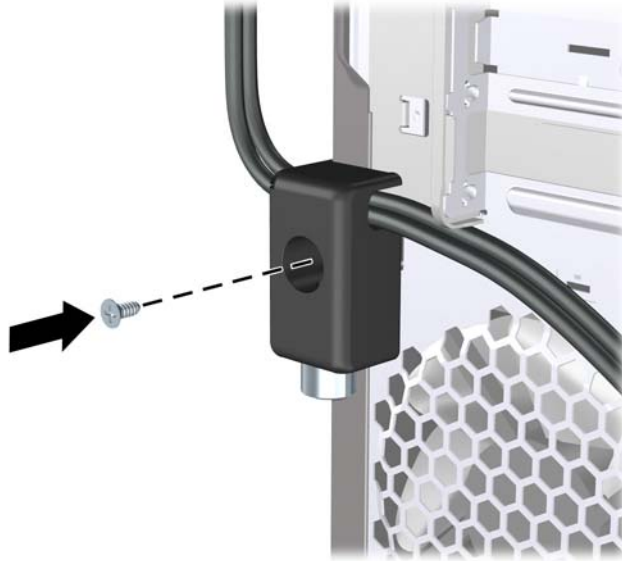
2. Thread the keyboard and mouse cables through the lock.

**Figure 36** Threading the Keyboard and Mouse Cables



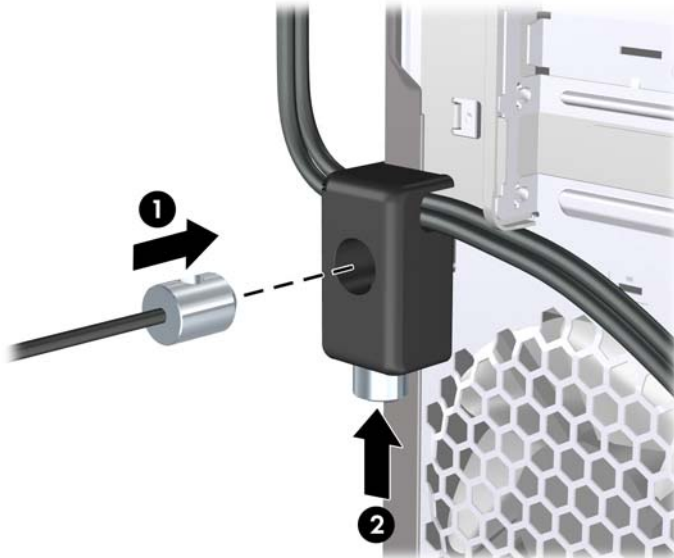
3. Screw the lock to the chassis using the screw provided.

**Figure 37** Attaching the Lock to the Chassis



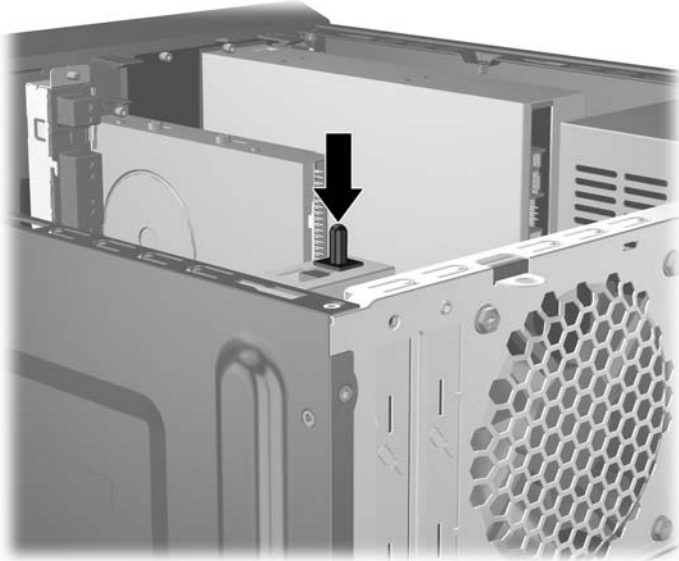
4. Insert the plug end of the security cable into the lock (1) and push the button in (2) to engage the lock. Use the key provided to disengage the lock.

**Figure 38** Engaging the Lock



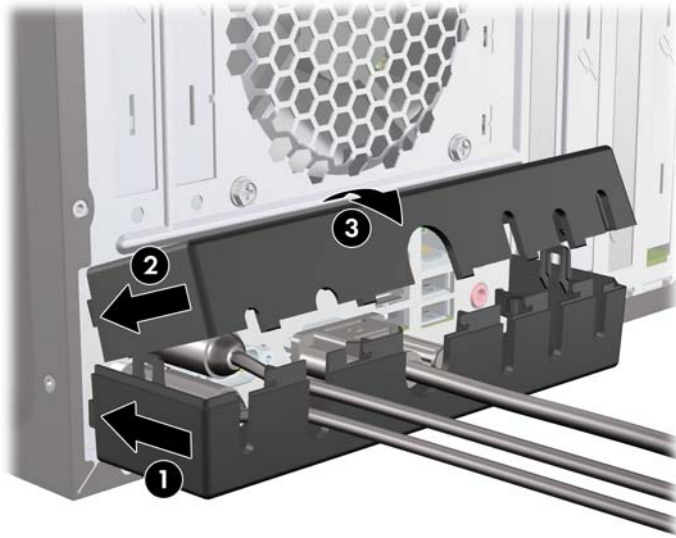
## Hood Sensor

If the access panel is removed while there is still power to the computer, the hood sensor will cause the system to stop and display the Error 912 message after system reboot and will beep 5 times for 5 seconds. If the alarm sounds, close the access panel, tighten the thumbscrew, then reboot the system. The system will enter the operating system successfully. If the error message persists, press the **F10** key immediately when the HP Logo screen is displayed to enter the Computer Setup menu. In the menu, select **Advanced > Hood Sensor > Reset Case Open Status** and make sure **Enable** is selected, then press the **F10** key to Save and Exit, then reboot the system.



## Port Cover

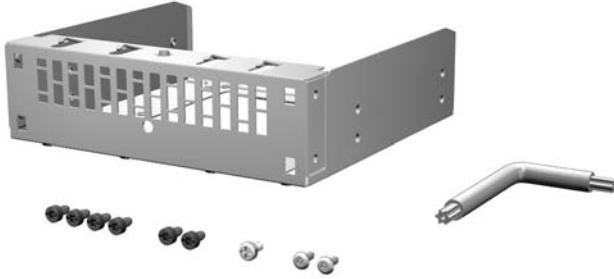
To install the port cover, slide the bottom half of the cover onto the chassis (1), then slide the top half of the cover onto the chassis at an angle (2) then rotate the top half down onto the bottom half (3). Ensure that the cables coming out of the rear of the computer are routed through the holes in the port cover.



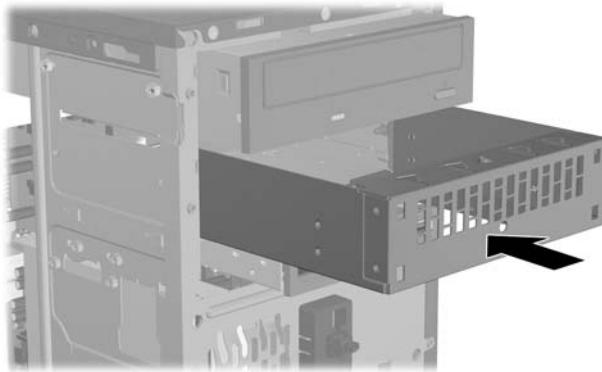
## HP Chassis Security Kit

An optional HP Chassis Security Kit prevents computer components from being removed through an open optical drive bay.

**Figure 39** HP Chassis Security Kit



**Figure 40** Installing the HP Chassis Security Kit





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# A 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.

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

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# B 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 access panel or any of the expansion card slot covers 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.


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

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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.

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

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