Upgrading and Servicing Guide

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Safety Information

This product has not been evaluated for connection to an "IT" power system (an AC distribution system with no direct connection to earth, according to IEC 60950).

WARNING: Please read "Safety Information" in the beginning of the *User's Guide* before installing and connecting your system to the electrical power system.

The *Upgrading and Servicing Guide* provides instructions on how to remove and replace hardware components of your PC.

Opening and Closing the PC

Preparing the PC

Before you upgrade any component in your PC, you need to prepare the PC so that you can safely handle it and the components.

Read the following items before attempting to upgrade or service the PC.

- These procedures assume familiarity with the general terminology associated with personal computers and with the safety practices and regulatory compliance required for using and modifying electronic equipment.
- Write down and save the system model and serial numbers, all installed options and other information about the system. It will be easier to consult this information than to open up and examine the PC.
- HP recommends that you use an antistatic wrist strap and a conductive foam pad when working on the system.

WARNING: Always disconnect the modem cable from the telephone system, and then disconnect the PC from the power source before removing the front and side panels of the PC. Failure to do so before you open the PC, or do any procedures, can result in personal injury or equipment damage.

Before Opening the PC

To avoid injury and equipment damage, always follow this procedure in this order before opening the PC:

1. Remove any diskette or optical disc (CD or DVD) from the PC.
2. Click the **Start** button, and then click **Turn Off Computer**. Click **Turn Off**.

3 Disconnect the modem/telephone cable, if present.

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

4 Disconnect the power cable from the electrical outlet, and then from the PC.

5 Disconnect all other attached cables (such as the keyboard, mouse, and monitor) and all external devices.

CAUTION: Static electricity can damage the electronic components of the PC or optional equipment. Ensure that you are discharged of static electricity by briefly touching a grounded metal object.

After Closing the PC

To avoid injury and equipment damage, always follow this procedure in this order after closing the PC:

1 Reconnect the power cable.

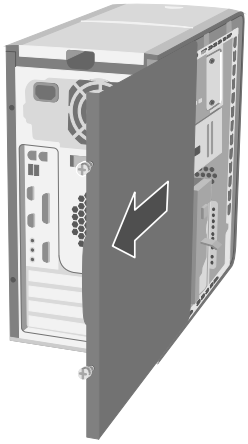
WARNING: To reduce the risk of electrical shock, fire, or damage to the equipment, do not plug telecommunications or telephone connectors into the network interface card (NIC) (labelled as an Ethernet connector).

2 Reconnect the modem/telephone cable and all other attached cables (such as the keyboard, mouse, and monitor) and external devices.

3 Turn on the PC and all peripherals.

4 If you installed an add-in card, install any software drivers supplied by the card manufacturer.

Removing the Side Panel



1 See "Before Opening the PC" on page 1.

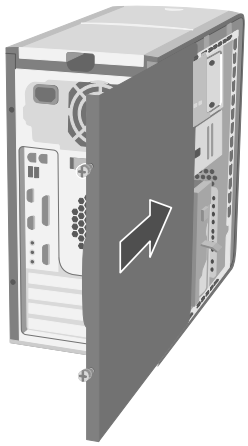
2 Loosen the two thumbscrews on the right side of the back panel. The first time you loosen these screws, you may need to use a Phillips screwdriver.

WARNING: Beware of sharp edges inside the chassis.

3 Slide the panel back about 2.5 cm (1 inch), lift it off the unit, and set it aside.

NOTE: You do not need to remove the other side panel to replace the hardware listed in this guide.

Replacing the Side Panel



1 Align the notches inside the side panel with the holes on the chassis frame.

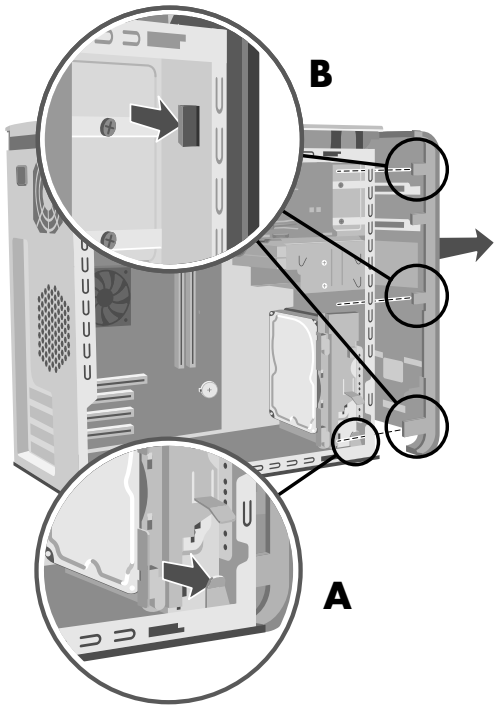
2 Slide the side panel forward on the frame until it locks into place, and then tighten the thumbscrews on the side panel.

3 See "After Closing the PC" on page 2.

Removing the Front Panel

This procedure is necessary only when removing or replacing an optical drive, a memory card reader or a diskette drive.

1. Remove the side panel. See "Removing the Side Panel" on page 2.
2. Unlock or pull back the front panel release tab (**A**), located at the bottom of the front panel. Pull the tab all the way back. The arrow mark on the chassis points to *unlock* when the tab is in the unlock position.



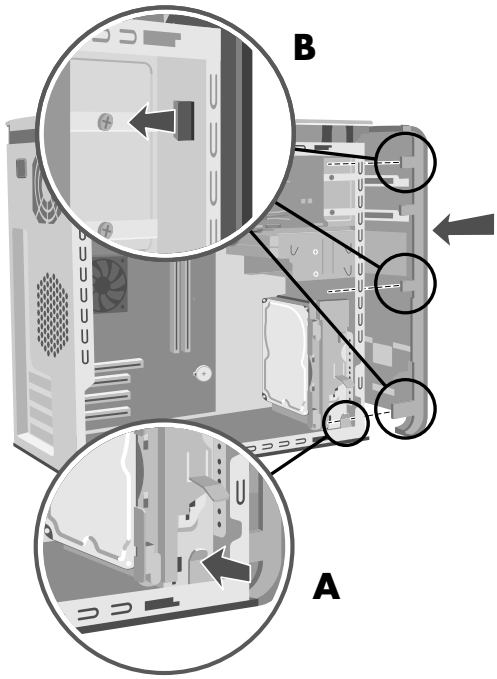
3. Locate the three small tabs (**B**) attached to the front panel on the side of the chassis. Press each tab away from the center of the chassis. Press the top, the middle and the bottom tab, and then gently remove the front panel.

Replacing the Front Panel

1. Place the chassis upright, and then align the bottom of the front panel with the ridge on the bottom of the chassis.

   Or

   Slide the bottom of the front panel under the bottom of the chassis, making sure the tab on the bottom of the front panel is inserted into the slot on the bottom of the chassis.
2. Guide the three small tabs (**B**) on each side of the front panel into the correct holes until the panel snaps into place.



3. Lock the front panel release tab (**A**) by pushing it forward. The arrow mark on the chassis points to *lock* when the tab is in the lock position.

Locating Components Inside the PC

A Upper optical drive bay, may be a CD-ROM, CD-RW, DVD-ROM, DVD+RW or combination drive

B Lower optical drive bay, may be empty (blank plate) or a CD-ROM, CD-RW, DVD-ROM, DVD+RW or combination drive

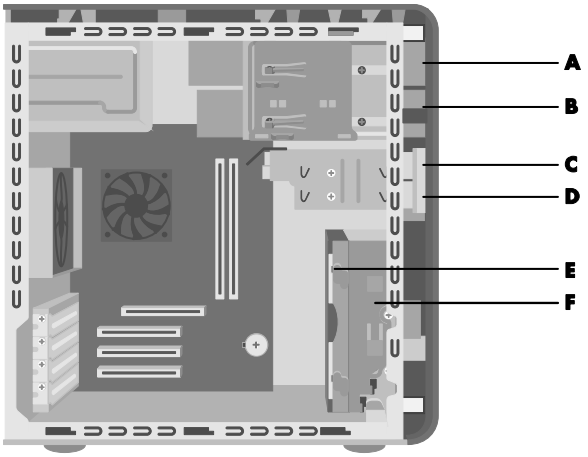
C Diskette (floppy) drive (select models)

D Memory card reader (select models)

E Hard disk drive with an expansion bay for second hard disk drive (select models)

F Hard disk drive or an expansion bay for second hard disk drive (select models)

NOTE: If your PC comes with a cage around your hard disk drive, (**E**) is the primary hard disk drive, and (**F**) is an expansion bay for a second hard disk drive. If your PC does not come with this cage, (**F**) is your primary hard disk drive.



Removing and Replacing Drives

Your PC includes several drives that you can replace or upgrade. See "Locating Components Inside the PC" on page 4.

CAUTION: Back up your personal files on the hard disk drive to an external storage device, such as a CD, before removing the hard disk drive. Failure to do so will result in data loss. After replacing the hard disk drive, you need to run System Recovery using the recovery discs to load the factory-installed files. See the *User's Guide* for details about the recovery procedure.

You can add an optical drive to an empty lower optical bay.

IMPORTANT: Before adding a new optical drive, make sure that it is compatible with the Microsoft® Windows® XP operating system. Also, make sure you have the correct software and drivers for the optical drive to work with the operating system.

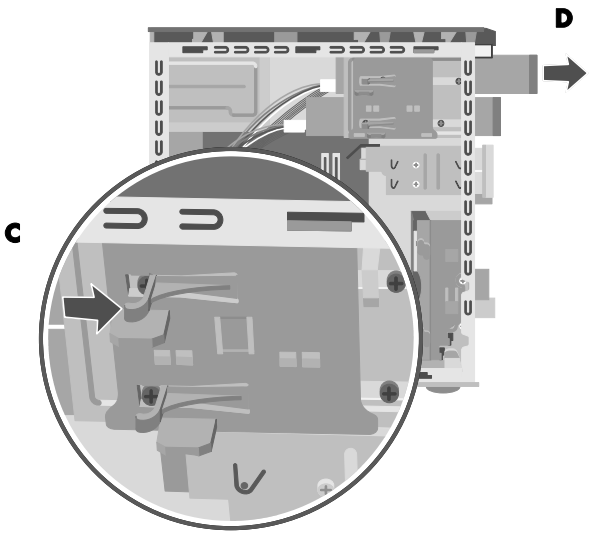
You can replace the (primary) hard disk drive or install a second hard disk drive in the PC.

Removing an Optical Drive

1 Complete the procedures to prepare the PC and to remove the side panel. See "Opening and Closing the PC" on page 1.

2 Remove the front panel. See "Removing the Front Panel" on page 3.

3 Gently lay the PC on its side.



4 Lift the plastic tab (**C**) on the side of the optical drive you want to remove. Push the drive partway out through the front of the PC (**D**).

NOTE: You do not need to remove the screws on the side of the optical drive to remove it from the PC.

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5 Make a note of the location of each cable and plug, attached to the back of the optical drive you want to replace, before removing the cables.

6 Disconnect the power cable and data cable from the back of the optical drive, using a gentle rocking motion. Disconnect the sound cable, if present.

7 Pull the drive out through the front of the PC (**D**).

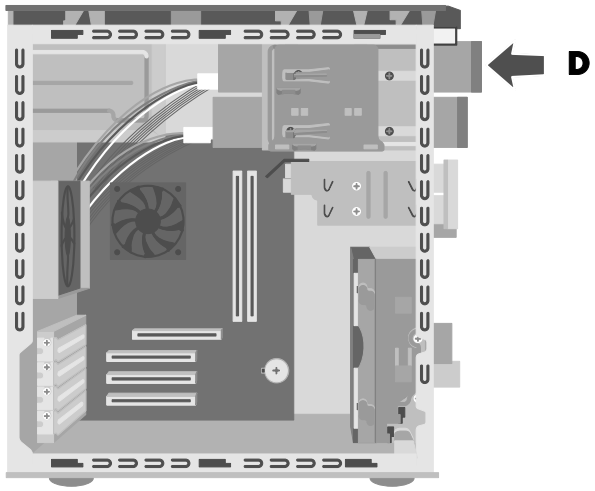
Replacing or Adding an Optical Drive

1 Complete the procedures to prepare the PC and to remove the side panel. See "Opening and Closing the PC" on page 1.

2 Remove the front panel. See "Removing the Front Panel" on page 3.

3 If your optical drive bay is empty, remove the drive cover by pressing the tabs on each side of the drive cover, and then pulling it toward you and out of the PC.

4 Slide the new optical drive through the front of the PC. Don't slide the drive in all the way; you need room to attach the cables.



5 Connect the power cable and data cable to the back of the optical drive. Some drive models may have a sound cable. If so, connect the sound cable.

6 Push the optical drive all the way in through the front of the PC until it snaps into place (**D**).

7 Replace the front panel. See "Replacing the Front Panel" on page 3.

8 Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

Removing a Memory Card Reader or a Diskette (Floppy) Drive

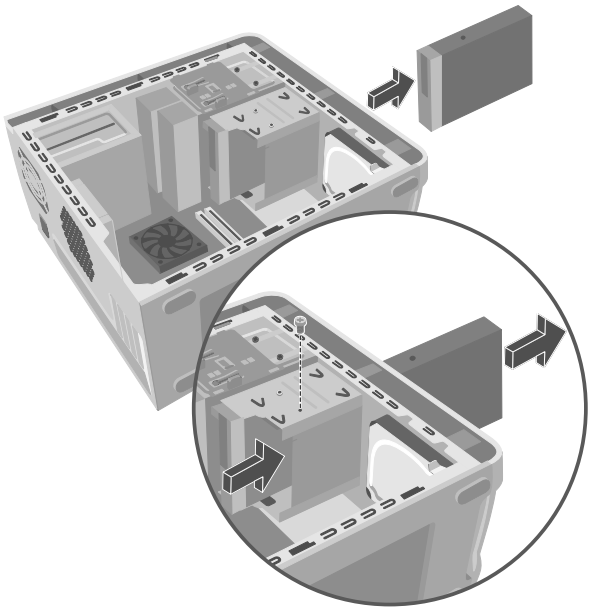
Your PC has a drive cage that can hold a memory card reader and a diskette drive. You can replace either of these drives if they are included with your model.

The PC may have a fixed or a removable drive cage that holds the memory card reader and the diskette drive. If the drive cage is fixed, follow the first set of instructions, "To remove a drive (with a fixed drive cage) (select models)" on page 6. If the drive cage is removable, follow the second set of instructions, "To remove a drive (with a removable drive cage) (select models)" on page 6.

To ensure that the drive fits properly into the PC, be sure to purchase the replacement diskette drive from HP. Refer to the *Warranty and Support Guide* for contact information.

To remove a drive (with a fixed drive cage) (select models)

1. Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
2. Remove the front panel. See "Removing the Front Panel" on page 3.
3. Gently lay the PC on its side.
4. Make a note of each cable attached to the drive you want to replace.
5. Remove the screw from the side of the drive cage to remove the memory card reader or the diskette drive.

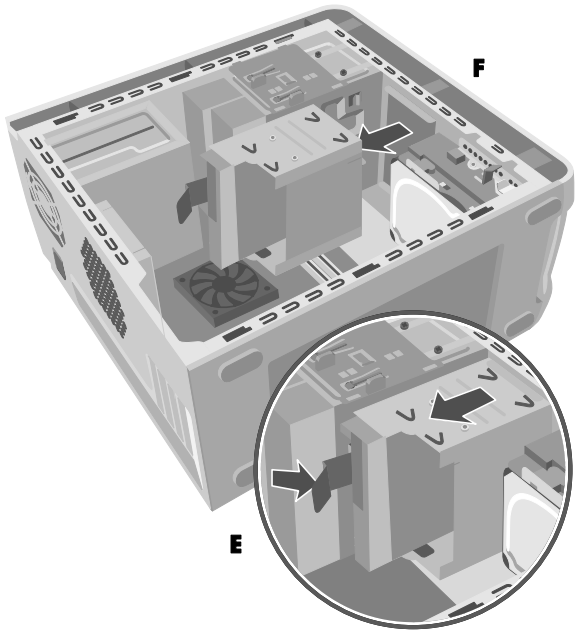


6. Remove the cables attached to the back of the drive in the drive cage.
7. Push the memory card reader or the diskette drive towards the front of the PC, and pull the drive out through the front of PC.

To remove a drive (with a removable drive cage) (select models)

1. Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
2. Gently lay the PC on its side.
3. Make a note of each cable attached to the drives.
4. Push down on the drive cage release tab (**E**).

5 Hold the release tab down as you pull the cage towards the back of the chassis, and then lift it out (**F**). Removing the drive cage provides more space to remove the cables.

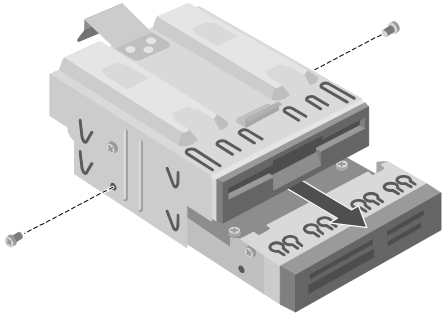


6 Remove the cables attached to the back of the drives in the drive cage.

7 Remove the screw from each side of the drive cage to remove the memory card reader.

Or

Remove the screw from each side of the drive cage to remove the diskette drive.



8 Pull the drive out through the front of the drive cage.

Installing a Memory Card Reader or a Diskette (Floppy) Drive

The PC may have a fixed or a removable drive cage that holds the memory card reader and the diskette drive. If the drive cage is fixed, follow the first set of instructions, "To install a drive (with a fixed drive cage) (select models)" on page 7. If the drive cage is removable, follow the second set of instructions, "To install a drive (with a removable drive cage) (select models)" on page 8.

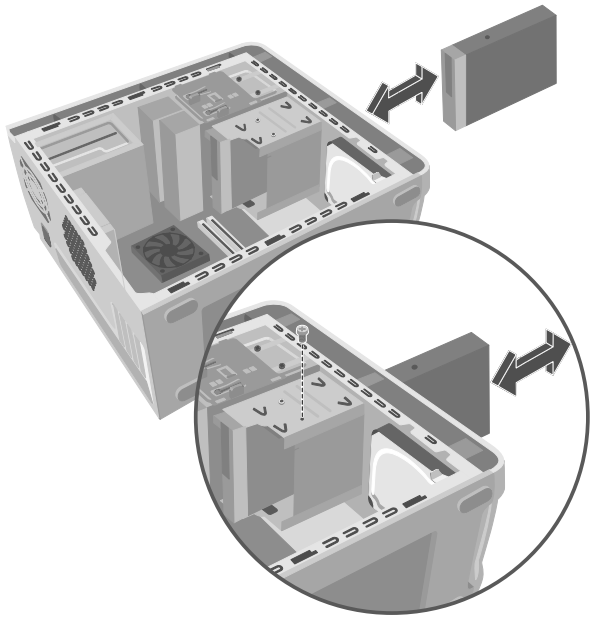
To install a drive (with a fixed drive cage) (select models)

1 See "Removing a Memory Card Reader or the Diskette (Floppy) Drive" on page 6.

Or

Remove the faceplate of the drive bay.

2 Slide the drive inside of the drive cage through the front of the PC. Make sure the connectors face toward the back.



3 Attach the cables to the drive you are installing.

4 Insert the screw to secure the drive you are installing to the drive cage.

5 Replace the front panel. See "Replacing the Front Panel" on page 3.

6 Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

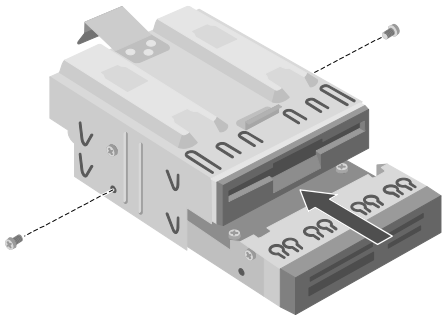
To install a drive (with a removable drive cage) (select models)

1 To remove the drive or the drive cage when you are adding a drive, see "To remove a drive (with a removable drive cage) (select models)" on page 6.

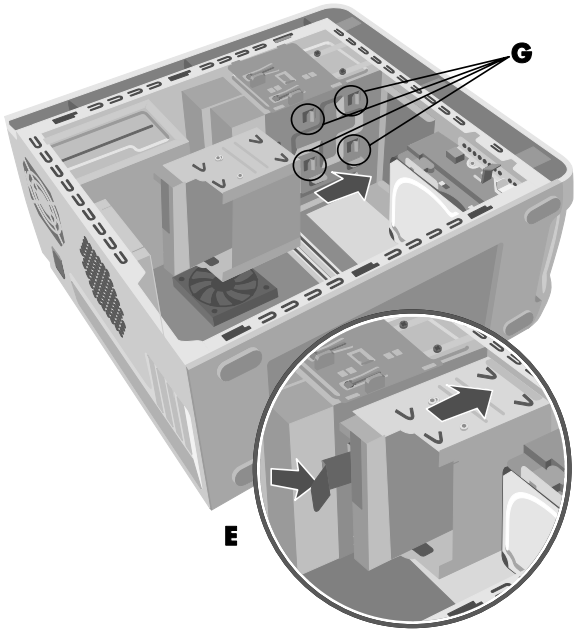
2 If you are adding a drive, remove the faceplate of the drive bay.

3 Slide the replacement drive into the drive cage until the two screw holes on each side are aligned.

4 Insert the screws on each side of the drive cage.



5 Pull the drive cage release tab (**E**) back. Align the four holes on the top of the drive cage with the four hooks (**G**) on the bottom of the optical drive bracket. Slide the drive cage so that the hooks go into the holes on the drive cage, and then push the drive cage forward until it snaps into place.



6 Connect the cable to the back of the drives.

7 Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

Removing a Hard Disk Drive

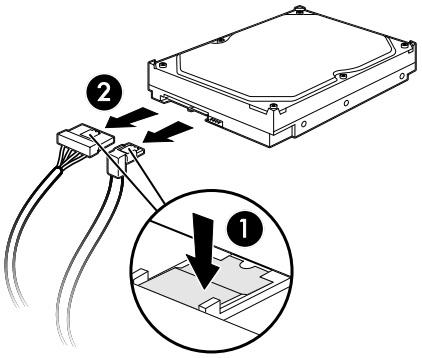
The hard disk drive is preloaded with the system recovery partition of your PC.

One of two types of hard disk drive is installed in your PC: a Serial ATA (advanced technology attachment) drive that uses a narrow data cable, or a Parallel ATA drive that uses a wide data cable.

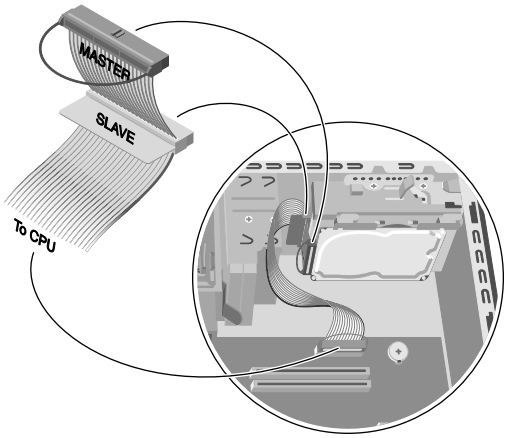
The hard disk drive of your PC may be located inside a cage. If it is, follow the first set of instructions, "To remove a hard disk drive (with a hard disk drive cage)" on page 9. If your hard disk drive is not located inside a cage, follow the second set of instructions, "To remove a hard disk drive (without a hard disk drive cage)" on page 10.

To remove a hard disk drive (with a hard disk drive cage) (select models)

1. Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
2. Gently lay the PC on its side.
3. Make a note of each cable attached to the hard disk drive before removing the cables.
4. Remove the power and data cables from the back of the hard disk drive. For Serial ATA hard disk drive cables, press the latch (**1**) (select models only) in the center of each plug and pull the plug (**2**) from the drive connector. For Parallel ATA hard disk drive cables, use a gentle rocking motion to free the plugs.

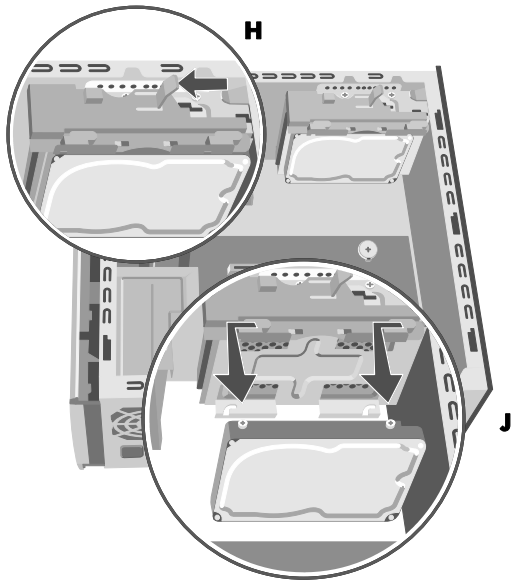


Disconnecting the Serial ATA hard disk drive cables



Disconnecting the Parallel ATA hard disk drive data cable

5. Push the release tab attached to the hard disk drive bracket (**H**) until it is unlocked. Gently push the hard disk drive in the same direction, and then pull it out of the hard disk drive bracket (**J**).



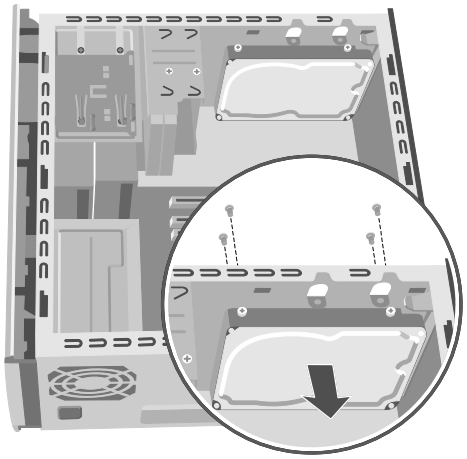
To remove a hard disk drive (without a hard disk drive cage) (select models)

1 Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.

2 Remove the front panel. See "Removing the Front Panel" on page 3.

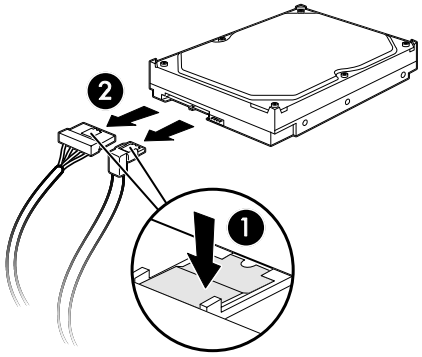
3 Gently lay the PC on its side.

4 Remove the four screws from the front of the chassis that secure the hard disk drive. Lift the hard disk drive out of the chassis.

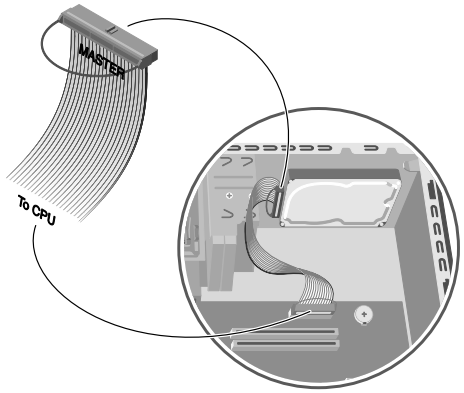


5 Make a note of each cable attached to the hard disk drive before removing the cables.

6 Remove the power and data cables from the back of the hard disk drive. For Serial ATA hard disk drive cables, press the latch (**1**) (select models only) in the center of each plug and pull the plug (**2**) from the drive connector. For Parallel ATA hard disk drive cables, use a gentle rocking motion to free the plugs.



Disconnecting the Serial ATA hard disk drive cables



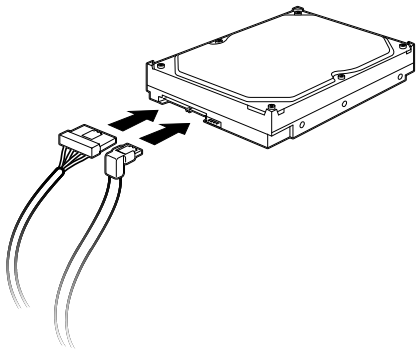
Disconnecting the Parallel ATA hard disk drive data cable

Replacing a Hard Disk Drive

The hard disk drive of your PC may be located inside a cage. If it is, follow the first set of instructions, "To replace a hard disk drive (with a hard disk drive cage)" on page 11. If your hard disk drive is not located inside a cage, follow the second set of instructions, "To replace a hard disk drive (without a hard disk drive cage)" on page 12.

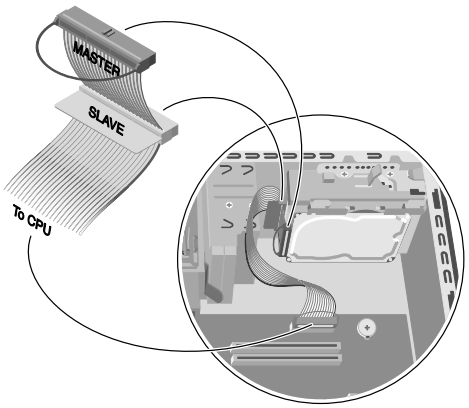
To replace a hard disk drive (with a hard disk drive cage)

1. Make sure the release tab on the hard disk drive bracket is in the unlocked position before you insert the new hard disk drive.
2. Connect the power and data cables to the back of the hard disk drive.



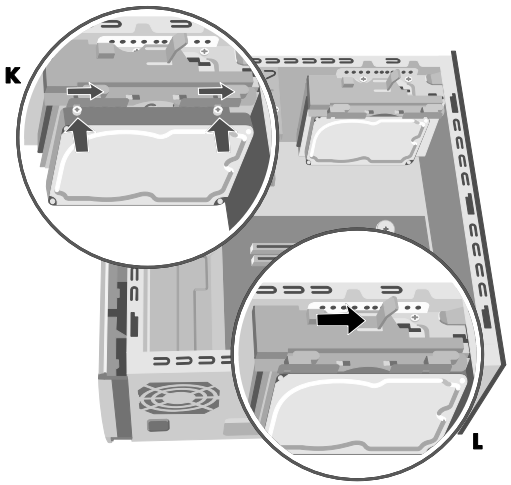
Connecting the Serial ATA hard disk drive cables

WARNING: For Parallel ATA drives, connect the data IDE cable end labelled *Master* to the primary hard disk drive. If you have a second hard disk drive, connect the data IDE cable plug labelled *Slave* to the second hard disk drive. If the IDE cable is not connected correctly, the PC will not be able to locate the hard disk drives and data may be lost.



Connecting the Parallel ATA hard disk drive data cable

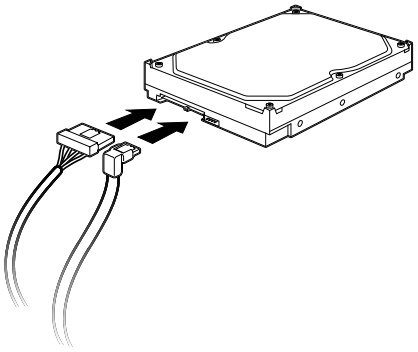
3. Align the two screws on the top and two screws on the bottom of the replacement hard disk drive with the screw head tracks on the top and bottom of the hard disk drive bracket. Slide the hard disk drive until it snaps into place (**K**).



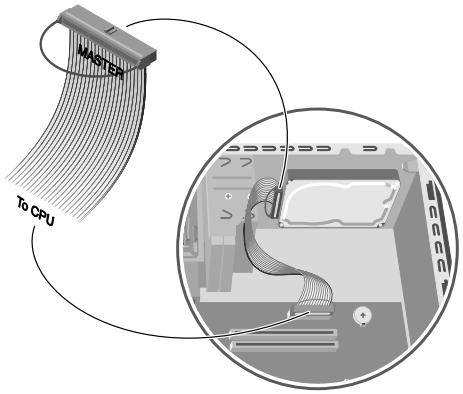
4. Push the release tab on the top of the hard disk drive bracket into the locked position (**L**).
5. Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

To replace a hard disk drive (without a hard disk drive cage)

1 Connect the power and data cables to the back of the hard disk drive. For a Parallel ATA hard disk drive, connect the data IDE cable end labelled *Master* to the drive.

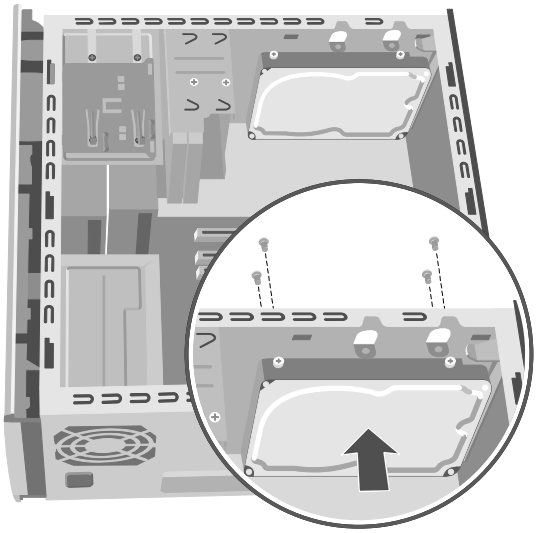


Connecting the Serial ATA hard disk drive cables



Connecting the Parallel ATA hard disk drive data cable

2 Place the hard disk drive inside the chassis. Align the drive with the four screw holes on the front of the PC to secure the hard disk drive. Insert and tighten the screws.



3 Connect the other end of the IDE cable to the motherboard.

4 Replace the front panel. See "Replacing the Front Panel" on page 3.

5 Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

Installing a Second Hard Disk Drive

Some PC models may have an empty bay to add a second hard disk drive. You must provide the drive and four 6/32 x ¼-inch screws to secure the drive to the chassis.

NOTE: If your PC does not include a cage around the hard disk drive and you want to install a second hard disk drive, please contact Customer-replaceable Parts Service, which is available in some countries/regions. For contact information, refer to the *Warranty and Support Guide*. If your PC does include a cage around the hard disk drive, use the following instructions.

---

1 Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.

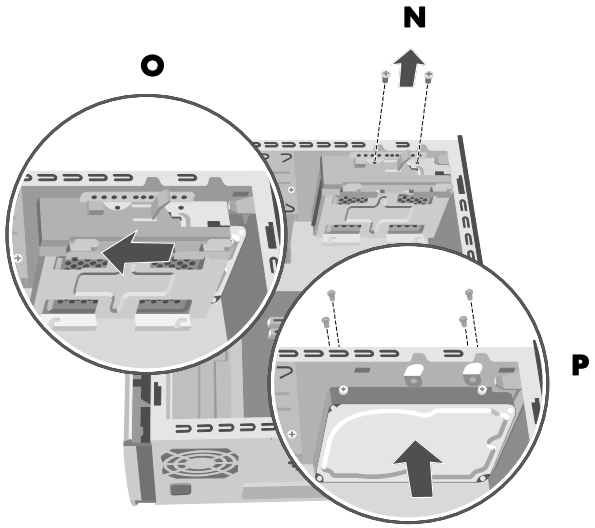
2 Remove the front panel. See "Removing the Front Panel" on page 3.

3 Gently lay the PC on its side.

4 If you are also removing the hard disk drive, see "Removing a Hard Disk Drive" on page 8.

NOTE: You do not need to remove the hard disk drive from the bracket when installing a second hard disk drive.

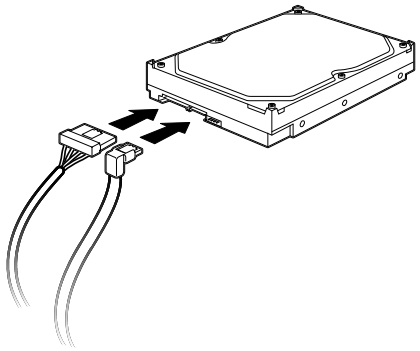
5 Remove the two screws on the hard disk drive bracket (**N**).



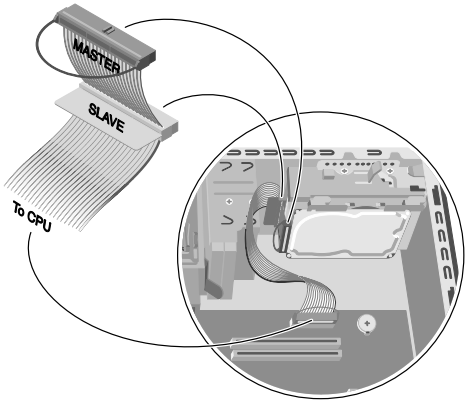
6 Slide the bracket away from the bottom of the chassis, and then pull it up and out of the chassis (**O**).

7 Connect the power and data cables to the back of the second hard disk drive. For a Parallel ATA hard disk drive, connect the data IDE cable end labelled *Slave* to the drive.

WARNING: For Parallel ATA drives, connect the data IDE cable end labelled *Master* to the primary hard disk drive; connect the data IDE cable plug labelled *Slave* to the second hard disk drive. If the IDE cable is not connected correctly, the PC will not be able to locate the hard disk drives and data may be lost.

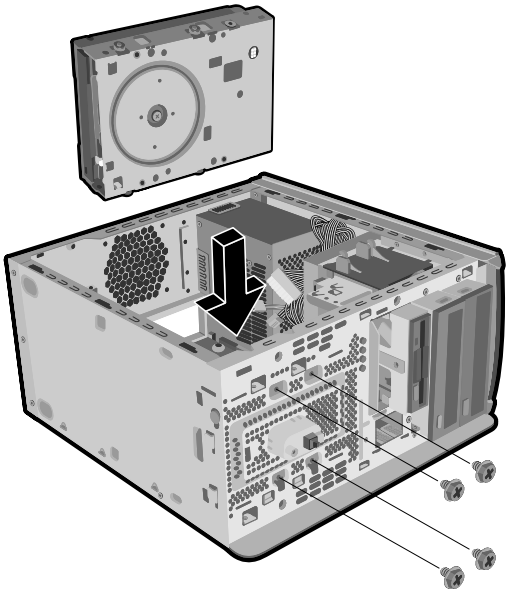


Connecting the Serial ATA hard disk drive cables

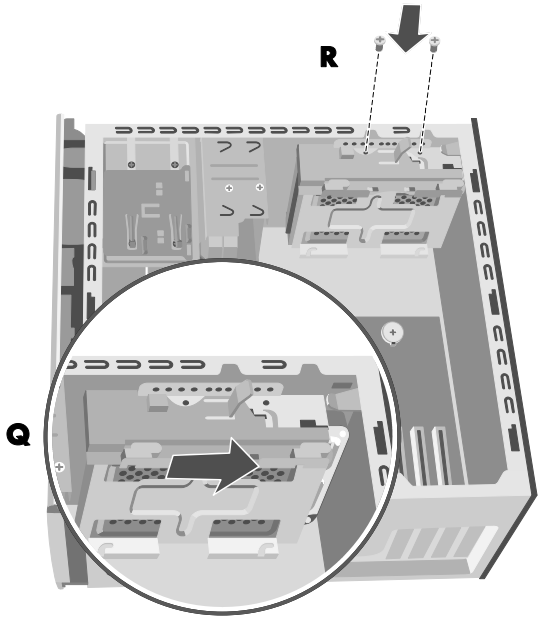


Connecting the Parallel ATA hard disk drive data cable

8 Place the second hard disk drive inside the chassis, and align it with the screw holes (**P**) on the front of the chassis. Use four regular 6/32 x ¼-inch screws (not included) to secure the hard disk drive to the front of the PC. Tighten the screws from the front of the PC chassis into the drive.



9 Place the hard disk drive bracket over the new second hard disk drive, align the four tabs with the holes on the front of the chassis, and then slide the bracket toward the bottom of the chassis until it snaps into place (**Q**).



10 Insert the two screws into the hard disk drive bracket (**R**).

11 Replace the hard disk drive. See "Replacing a Hard Disk Drive" on page 11.

12 Connect the end of the data cable to the motherboard:

- For Serial ATA drives, plug the free end of the narrow data cable from the second hard disk drive to the motherboard connector labelled *SATA2* and the narrow data cable from the primary hard disk drive plugs to the motherboard connector labelled *SATA1*.
- For Parallel ATA drives, connect the data IDE cable labelled *To CPU* to the motherboard connector *Primary*.

13 Replace the front panel. See "Replacing the Front Panel" on page 3.

14 Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

Removing a Second Hard Disk Drive

1. Complete the procedures to prepare the PC, and to remove the side panel. See "Opening and Closing the PC" on page 1.
2. Remove the front panel. See "Removing the Front Panel" on page 3.
3. Gently lay the PC on its side.
4. See "Removing a Hard Disk Drive" on page 8.

NOTE: You do not need to remove the hard disk drive from the bracket when removing a second hard disk drive.

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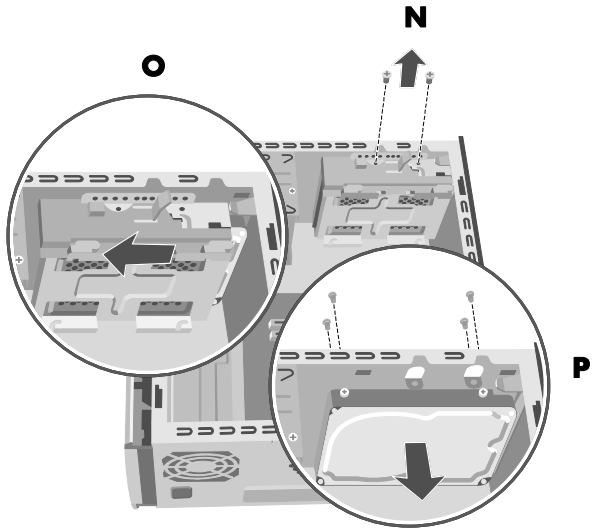
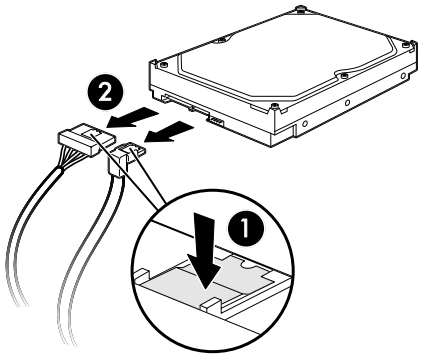
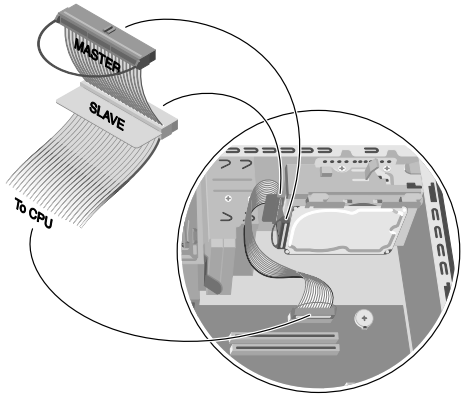
5. Remove the two screws on the hard disk drive bracket (**N**).



6. Slide the bracket away from the bottom of the chassis (**O**), and then pull it up and out of the chassis.
7. Remove the four screws on the front of the chassis to release the second hard disk drive from the front of the chassis (**P**). Lift the second hard disk drive out of the chassis.
8. Make a note of each cable attached to the second hard disk drive before removing the cables.
9. Remove the power and data cables from the back of the second hard disk drive. For Serial ATA hard disk drive cables, press the latch (**1**) (select models only) in the center of each plug, and pull the plug (**2**) from the drive connector. For Parallel ATA hard disk drive cables, use a gentle rocking motion to free the plugs.



Disconnecting the Serial ATA hard disk drive cables

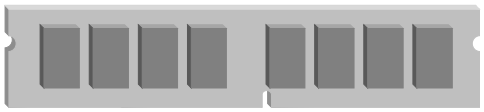


Disconnecting the Parallel ATA hard disk drive data cable

Adding Memory

The motherboard contains sockets for DDR DIMMs (double data rate dual in-line memory modules). The exact number of sockets depends on which model you have.

To determine which type of memory module your PC uses, and for specific memory module information and specifications, go to the Web site listed in your *Warranty and Support Guide* and click the Support link.



DDR DIMM

WARNING: Using the wrong type of memory module could damage the system.

Removing a Memory Module

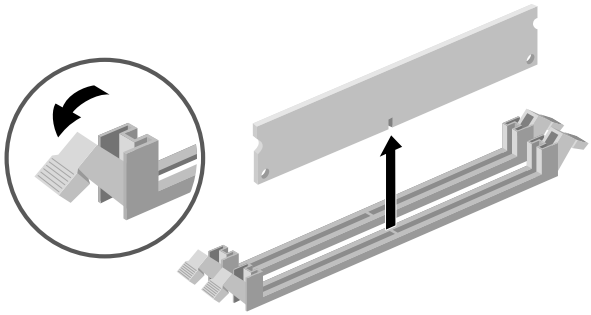
1. Complete the procedures to prepare the PC and remove the side panel. See "Opening and Closing the PC" on page 1.
2. Gently lay the PC on its side.
3. Locate the memory sockets on the motherboard.

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

4. Move any cabling out of the way, if necessary.

WARNING: Do not pull the memory module out of the socket. Use the retaining clips to eject the module.

5. Push down the two retaining clips on the ends of the socket until the memory module pops out of the socket.
6. Hold the memory module by its edges only, as you lift it away from the socket. Store it in its antistatic packaging.



Installing a Memory Module

Upgrade the memory in your PC with memory of the same type and speed as the memory originally installed in your PC.

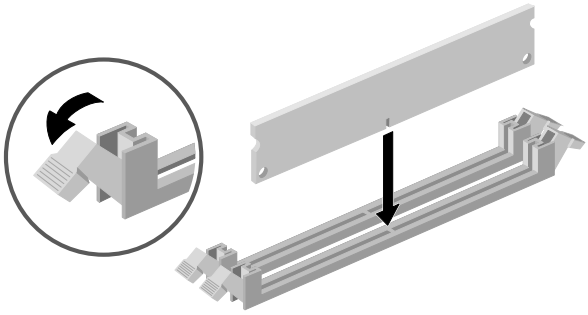
CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so may damage the module.

1. Open both latches of the memory module socket. See "Removing a Memory Module" on page 16.
   - If you are *replacing* a memory module, put the new memory module in the same memory slot from which the old memory was removed.

   Or

   - If you are *adding* a memory module, install the new module into the socket nearest the preinstalled module, and install additional modules in the next available sockets.
2. Hold the new memory module by its edges only as you remove it from the antistatic packaging. (Avoid touching the memory chips or the gold contacts on the module.)

3 The 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 carefully and firmly into the slot, ensuring that the latches on both ends snap into place.



4 Replace any cabling that was removed.

5 Complete the procedures to replace the side panel and close the PC. See "Opening and Closing the PC" page 1.

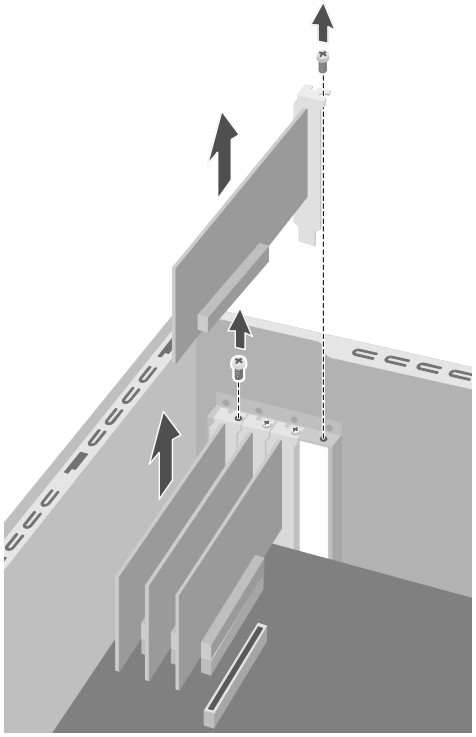
Removing or Installing an Add-in Card

An add-in card is a circuit board, such as a PCI or an AGP card that fits into a PC add-in card slot. Your PC contains several add-in card slots that can be used to add components to your PC. The PC component configurations vary by model.

WARNING: Do not overload the system by installing add-in cards that draw excessive current. The system is designed to provide 2 amps (average) of +5 V power for each board/card in the PC. The total +5 V current draw in a fully loaded system (one with all add-in card slots filled) must not exceed the total number of slots multiplied by 2 amps.

A Phillips screwdriver is needed to remove, replace or add an add-in card.

Removing an Add-in Card



1 Complete the procedures to prepare the PC, and remove the side panel. See "Opening and Closing the PC" on page 1.

2 Gently lay the PC on its side.

3 Inside the PC, locate the add-in card slots on the motherboard.

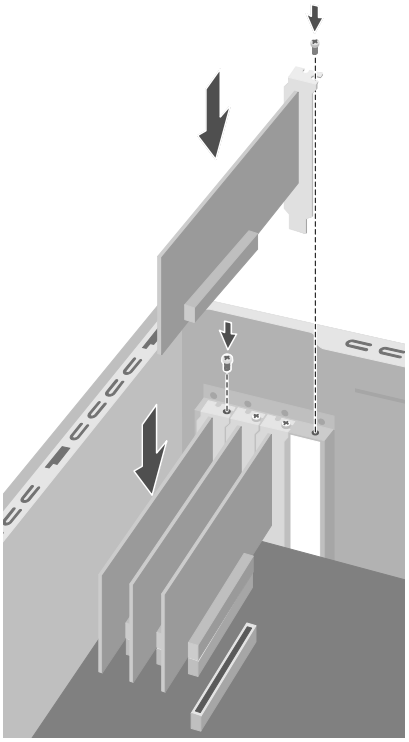
4 If you are replacing a card, make a note of any external or internal cables attached to the card, and then disconnect them.

5 Remove the add-in card slot cover by removing the screw, and then removing the cover from the chassis.

Or

Loosen the screw on the card you are replacing. Hold the card at the top, and carefully pull the card straight out of the add-in card slot.

Installing an Add-in Card



1. Align the edge of the add-in card with the slot on the chassis and gently but firmly press the card straight down into the add-in card slot. The whole connector should be seated properly in the card slot.
2. Insert the screw to secure the card you have replaced.
3. Connect any external or internal cables attached to the card.
4. Complete the procedures to replace the side panel and close the PC. See "Opening and Closing the PC" on page 1.

NOTE: If the new card or device isn't working, read through the card manufacturer's installation instructions, and recheck all connections, including those to the card, power supply, keyboard and monitor.

Replacing the Battery

A lithium battery on the motherboard provides backup power for the PC's timekeeping capability. The battery has an estimated life expectancy of seven years.

When the battery starts to weaken, the date and time may be incorrect. If the battery fails, replace it with a CR2032 lithium battery (3 volt, 220mAH rating) or an equivalent battery.

WARNING: There is danger of explosion if the battery is incorrectly replaced. Replace only with the same, or equivalent, type of battery. Discard used batteries according to the manufacturer's instructions.

1. Complete the procedures to prepare the PC and to remove the side panel. See "Opening and Closing the PC" on page 1.
2. Gently lay the PC on its side.
3. Remove any cabling, if necessary, to reach the battery.
4. Remove any memory modules, if necessary, to reach the battery. See "Adding Memory" on page 16.
5. Press the latch away from the battery and lift the battery from the socket to release the battery.
6. Install the new CR2032 battery in the socket, with the positive (+) side facing the latch.
7. Replace memory modules or cables you removed.
8. Set the chassis upright.
9. Complete the procedures to replace the side panel, and to close the PC. See "Opening and Closing the PC" on page 1.

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