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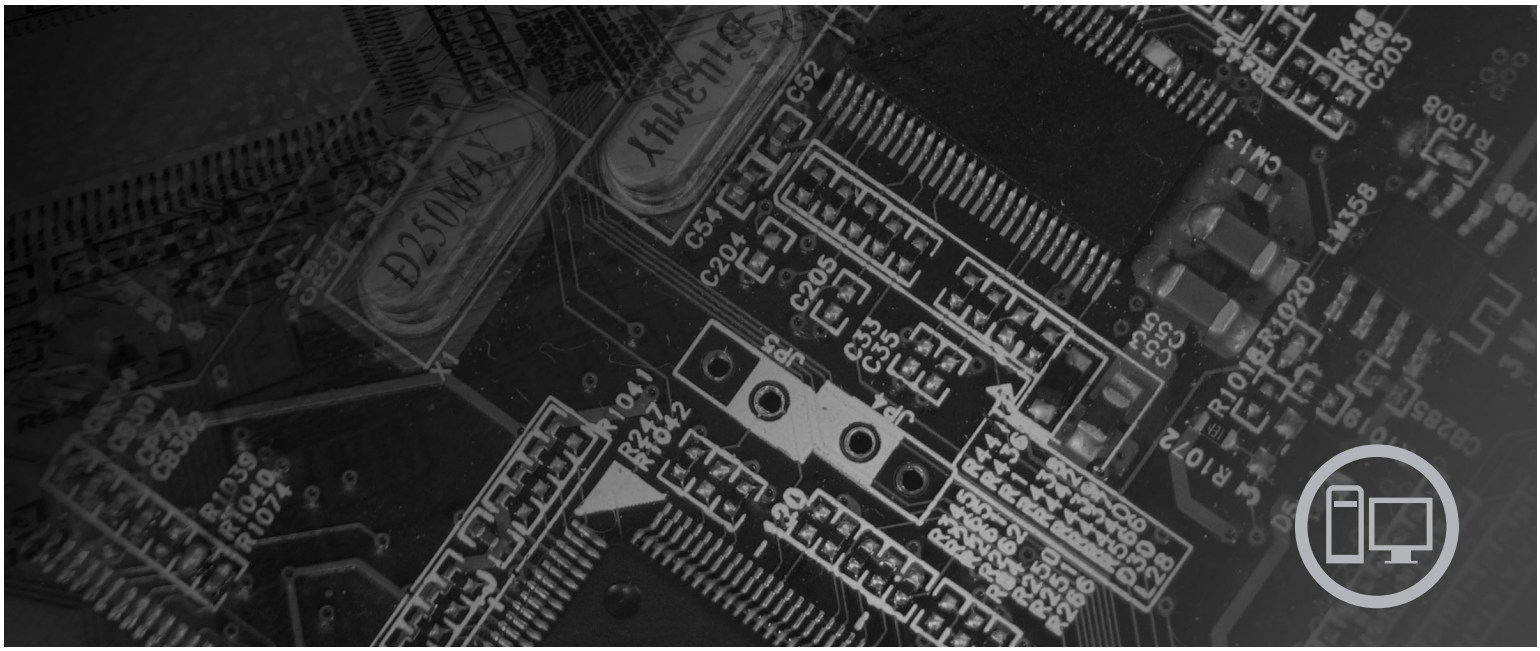
Lenovo 3000
Hardware Installation and Replacement Guide



Machine Types 9686, 9687, 9688, 9689, 9690, 9691

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Lenovo 3000

Note

Before using this information and the product it supports, be sure to read and understand the *Safety and Warranty Guide* for this product and "Notices," on page 53.

Third Edition (September 2007)

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Chapter 1. Important safety information

CAUTION:
Before using this manual, it is important that you read and understand all the related safety information for this product. Refer to the *Safety and Warranty Guide* **that you received with this product for the latest safety information. Reading and understanding this safety information reduces the risk of personal injury and or damage to your product.**

If you no longer have a copy of the *Safety and Warranty Guide*, you can obtain one online from the Lenovo Support Web site at:
http://www.lenovo.com/support.

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Chapter 2. Overview

This guide provides procedures for replacing Customer Replaceable Units (CRUs).

This guide does not include procedures for all parts. Cables, switches, and certain mechanical parts are expected to be replaced by trained service personnel who do not need step-by-step procedures.

Note: Use only parts provided by Lenovo™.

This guide contains instructions for installing and or replacing the following parts:

- Battery
- Front Bezel
- Power supply
- Heat sink
- Hard disk drive
- Optical drive
- Diskette drive
- Memory modules
- PCI adapter
- Front fan assembly
- Rear fan assembly
- Keyboard
- Mouse

Additional information resources

If you have Internet access, the most up-to-date information for your computer is available from the World Wide Web.

You can find:

- CRU removal and installation information
- CRU removal and installation videos
- Publications
- Troubleshooting information
- Parts information
- Downloads and drivers
- Links to other useful sources of information
- Support phone list

To access this information, point your browser to:
http://www.lenovo.com/support

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Handling static-sensitive devices

Do not open the static-protective package containing the new part until the defective part has been removed from the computer and you are ready to install the new part. Static electricity, although harmless to you, can seriously damage computer components and parts.

When you handle parts and other computer components, take these precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle parts and other computer components carefully. Handle adapters, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the parts and other computer components.
- Before you replace a new part, touch the static-protective package containing the part to a metal expansion-slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity in the package and your body.
- When possible, remove the new part from the static-protective packaging, and install it directly in the computer without setting the part down. When this is not possible, place the static-protective package that the part came in on a smooth, level surface and place the part on it.
- Do not place the part on the computer cover or other metal surface.

Locations

This chapter provides illustrations to help locate the various connectors, controls, and components of the computer.

Locating controls and connectors on the front of your computer

Figure 1 shows the location of the controls and connectors on the front of your computer.

Note: Not all computer models have the following controls and connections.

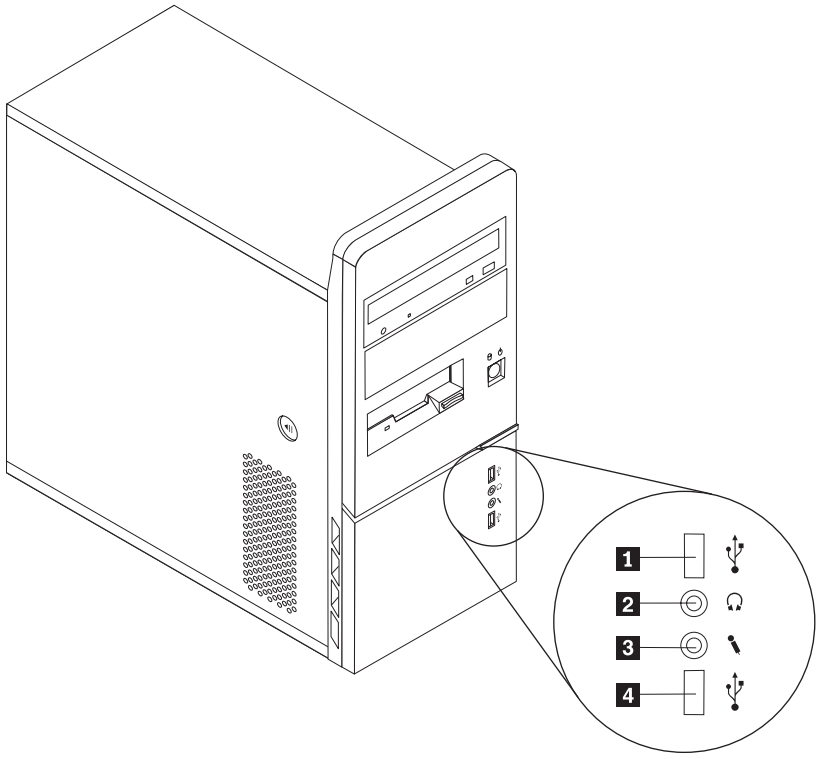

Figure 1. Controls and connectors

1	USB connector	3	Microphone connector
2	Headphone connector	4	USB connector

Locating connectors on the rear of your computer

Figure 2 shows the location of connectors on the rear of your computer. Some connectors on the rear of your computer are color-coded to help you determine where to connect the cables on your computer.

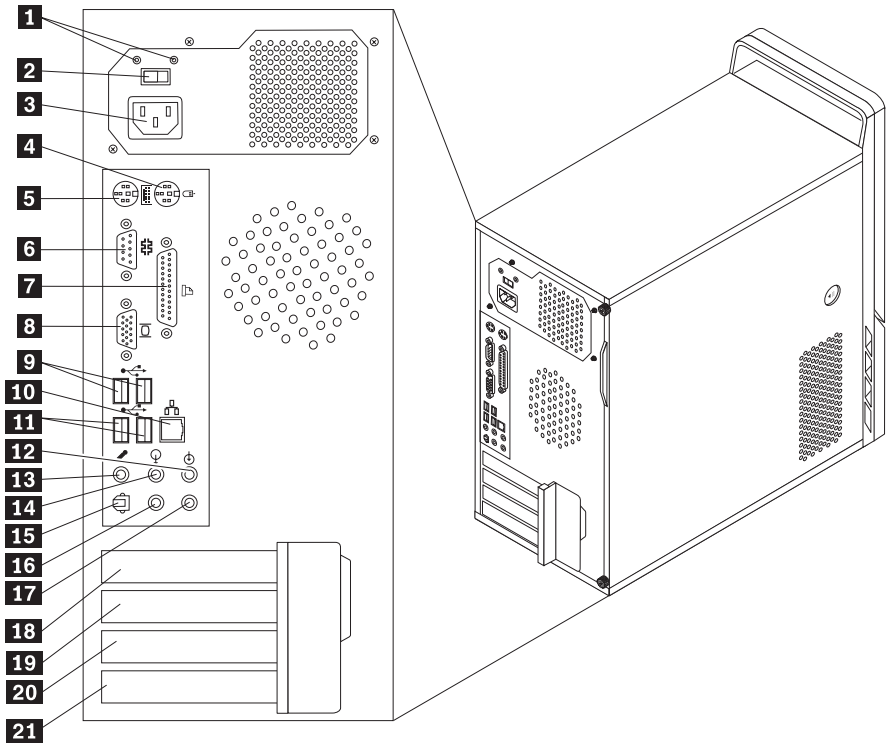

Figure 2. Connector locations

1	Power supply diagnostic LEDs	12	Audio line in connector
2	Voltage selection switch (some models)	13	Microphone connector
3	Power connector	14	Audio line out connector
4	Standard mouse connector	15	SPDIF out connector
5	Standard keyboard connector	16	C/LFE connector
6	Serial connector	17	Back surround connector
7	Parallel connector	18	PCI Express x1 or PCI Express x16 graphics adapter connector
8	VGA monitor connector	19	PCI Express x1 or PCI Express x16 graphics adapter connector
9	USB connectors (2)	20	PCI adapter or PCI Express x1 adapter connector
10	Ethernet connector	21	PCI adapter connector
11	USB connectors (2)		

Connector	Description
Standard mouse connector	Used to attach a mouse, trackball, or other pointing device that uses a standard mouse connector.
Standard keyboard connector	Used to attach a keyboard that uses a standard keyboard connector.
USB connectors	Used to attach a device that requires a Universal Serial Bus (USB) connection, such as a USB keyboard, USB mouse, USB scanner or USB printer. If you have more than eight USB devices, you can purchase a USB hub, which you can use to connect additional USB devices.
Ethernet connector	Used to attach an Ethernet cable for a local area network (LAN). **Note:** To operate the computer within FCC Class B limits, use a Category 5 Ethernet cable.
Serial connector	Used to attach an external modem, serial printer, or other devices that use a 9-pin serial connector.
Parallel connector	Used to attach a parallel printer, parallel scanner, or other devices that use a 25-pin parallel connector.
Audio-line-in connector	Used to receive audio signals from an external audio device, such as a stereo system. When you attach an external audio device, a cable is connected between the audio line out connector of the device and the audio line in connector of the computer.
Audio-line-out connector	Used to send audio signals from the computer to external devices, such as powered stereo speakers (speakers with built-in amplifiers), headphones, multimedia keyboards, or the audio line in connector on a stereo system or other external recording device.

Locating components

To open the computer cover, see “Removing the cover” on page 13.

Figure 3 shows the location of the various components in your computer.

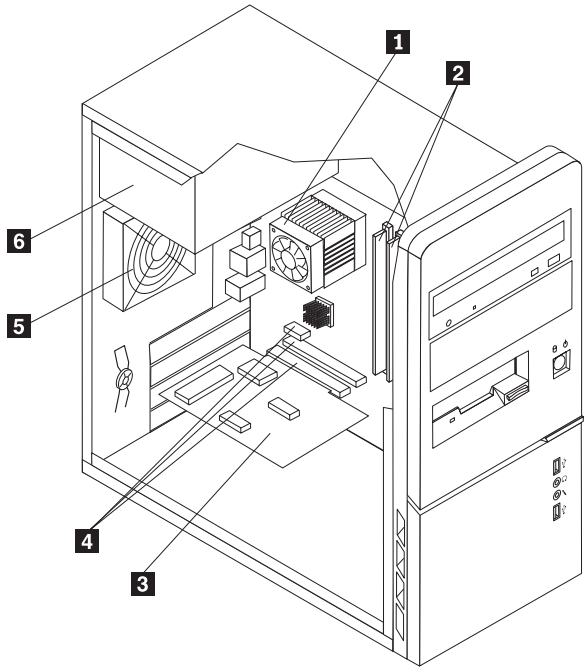

Figure 3. Component locations

1	Microprocessor fan and heat sink	4	PCI Express and PCI adapter connectors
2	Memory modules (2)	5	Rear fan assembly
3	PCI adapter card	6	Power supply

Identifying parts on the system board

The system board (also known as the planar or motherboard) is the main circuit board in your computer. It provides basic computer functions and supports a variety of devices. Your computer contains one of the three system board types shown in the following three figures.

Figure 4 shows the locations of parts on the system board for some computer models.

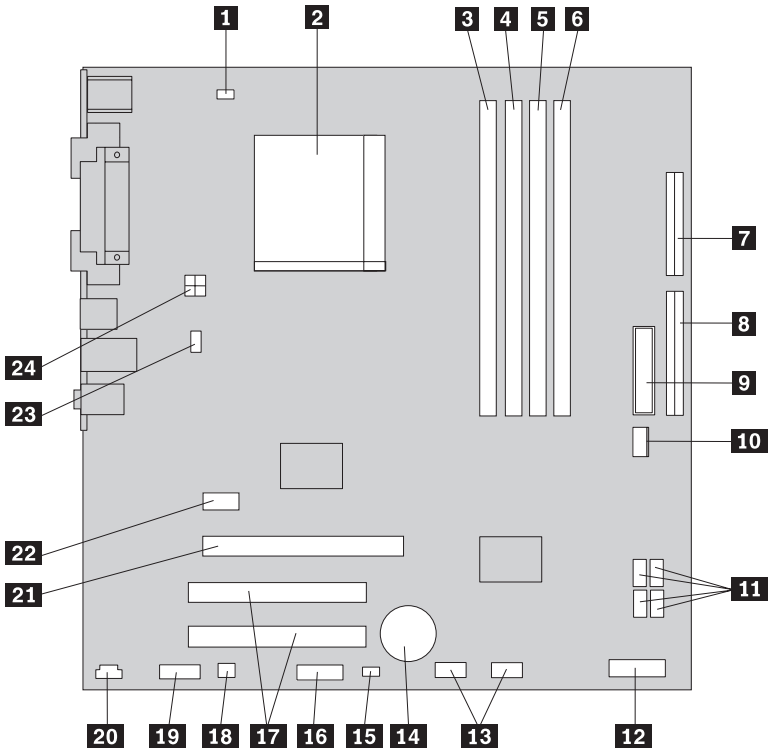

Figure 4. System board parts locations

1	Microprocessor fan connector	13	Front USB connectors (2)
2	Microprocessor and heat sink	14	Battery
3	Memory connector 1	15	Clear CMOS/Recovery jumper
4	Memory connector 2	16	Serial (COM) connector
5	Memory connector 3	17	PCI adapter connectors (2)
6	Memory connector 4	18	Mono (speaker) connector
7	Diskette drive connector	19	Front audio connector
8	IDE connector	20	CD-IN connector
9	Power connector	21	PCI Express x16 graphics adapter connector
10	Power fan connector	22	PCI Express x1 adapter connector
11	SATA IDE connectors (4)	23	System fan connector
12	Front panel connector	24	12 V power connector

Figure 5 shows the locations of parts on the system board for some computer models.

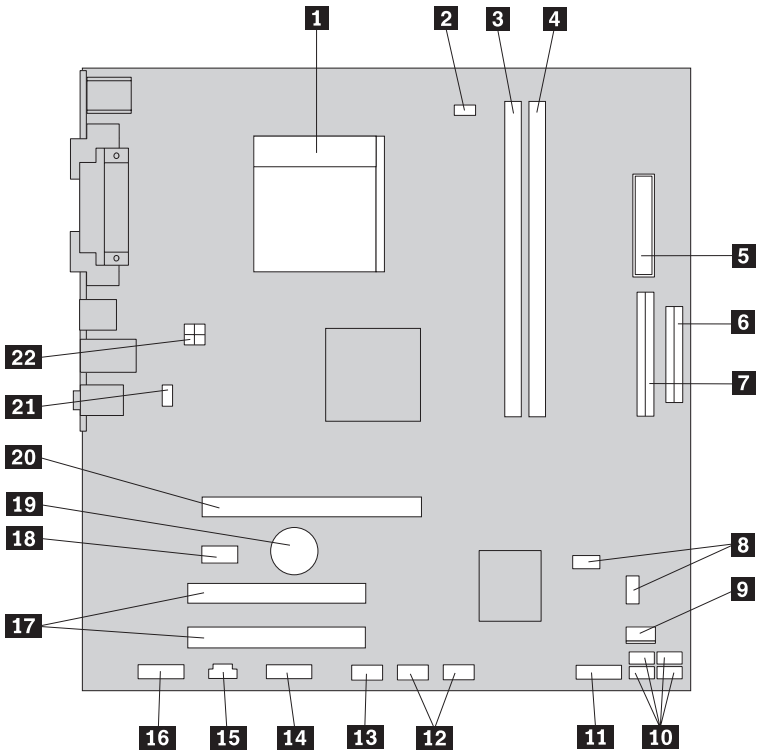

Figure 5. System board parts locations

1	Microprocessor and heat sink	12	Front USB connectors (2)
2	Microprocessor fan connector	13	Serial (COM) connector
3	Memory connector 1	14	Leo connector
4	Memory connector 2	15	CD-IN connector
5	Power connector	16	Front audio connector
6	Diskette drive connector	17	PCI adapter connectors (2)
7	IDE connector	18	PCI Express x1 adapter connector
8	Clear CMOS/Recovery jumpers (2)	19	Battery
9	Power fan connector	20	PCI Express x16 graphics adapter connector
10	SATA IDE connectors (4)	21	System fan connector
11	Front panel connector	22	12 V power connector

Figure 6 shows the locations of parts on the system board for some computer models.

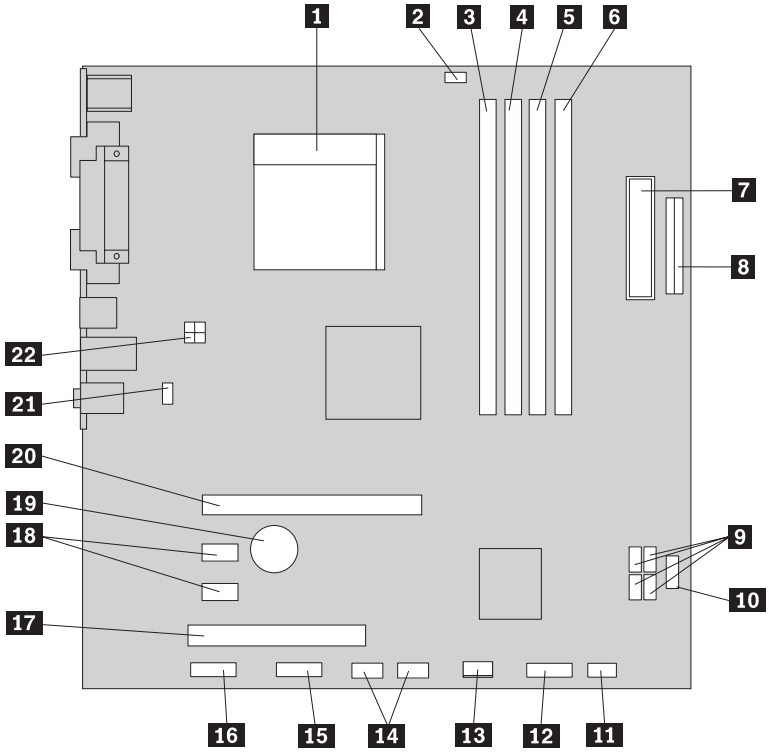

Figure 6. System board parts locations

1	Microprocessor and heat sink	12	Front panel connector
2	Microprocessor fan connector	13	Power fan connector
3	Memory connector 1	14	Front USB connectors (2)
4	Memory connector 2	15	Serial (COM) connector
5	Memory connector 3	16	Front audio connector
6	Memory connector 4	17	PCI adapter connector
7	Power connector	18	PCI Express x1 adapter connectors (2)
8	Diskette drive connector	19	Battery
9	SATA IDE connectors (4)	20	PCI Express x16 graphics adapter connector
10	Front USB connector	21	System fan connector
11	Clear CMOS/Recovery jumper	22	12 V power connector

Chapter 3. Installing options and replacing hardware

This chapter provides an introduction to the features and options that are available for your computer. You can expand the capabilities of your computer by adding memory, adapters, or drives. When installing an option, use these instructions along with the instructions that come with the option.

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

Note: Use only parts provided by Lenovo.

Installing external options

External speakers, a printer, or a scanner can be connected to your computer. For some external options, you must install additional software in addition to making the physical connection. When adding an external option, see "Locating connectors on the rear of your computer" on page 6 and "Locating controls and connectors on the front of your computer" on page 5 to identify the required connector, and then use the instructions that are included with the option to help you make the connection and install any software or device drivers that are required for the option.

Removing the cover

Important

Turn off the computer and wait 3 to 5 minutes to let the computer cool before removing the computer cover.

To remove the computer cover:

1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system, and turn off all attached devices and the computer.
2. Unplug all power cords from electrical outlets.
3. Disconnect the cables attached to the computer. This includes power cords, input/output (I/O) cables, and any other cables that are connected to the computer. See "Locating controls and connectors on the front of your computer" on page 5 and "Locating connectors on the rear of your computer" on page 6.
4. Remove any locking devices, such as a cable lock that secures the computer cover.
5. If there are thumbscrews securing the cover, remove them.

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6. Press the cover-release button on the side of the cover and slide the computer cover to the rear to and remove.

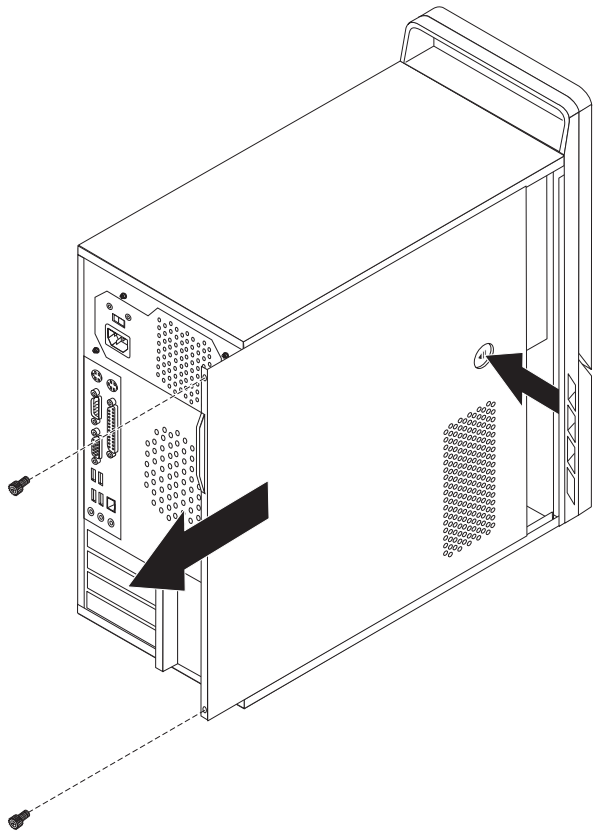

Figure 7. Removing the computer cover

Removing and replacing the front bezel

To remove and replace the front bezel:

1. Remove the computer cover. See "Removing the cover" on page 13.

2. Remove the front bezel by releasing the three plastic tabs on the left side and pivoting the bezel outward. Carefully set the bezel to the side without disconnecting the power switch and LED assembly cable.

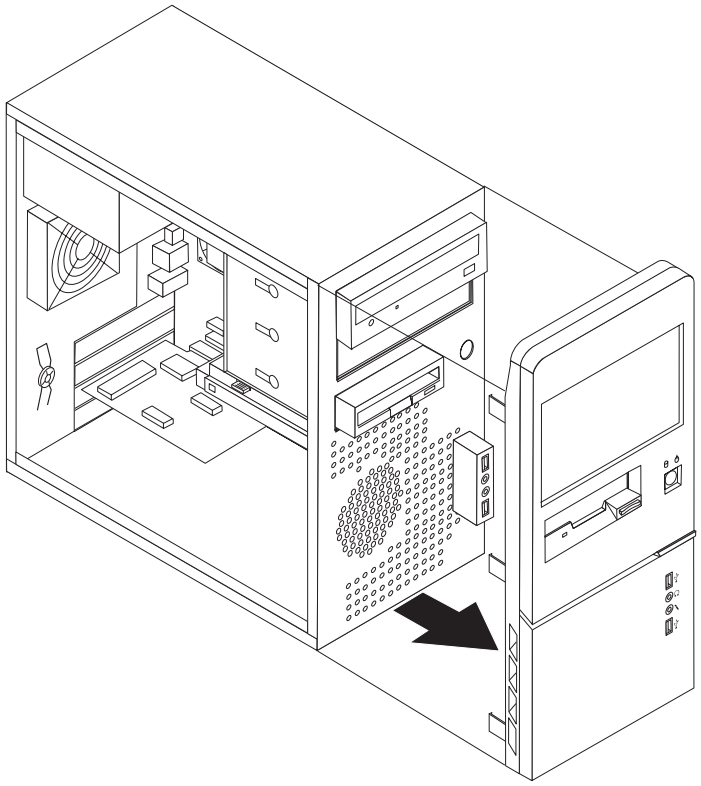

Figure 8. Removing the front bezel

3. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot it inward until it snaps into position on the left side.
4. To complete the installation, go to Chapter 4, "Completing the parts replacement," on page 47

Installing internal options

Important
Read "Handling static-sensitive devices" on page 4 before opening the computer cover.

Installing memory

Your computer either has two or four connectors for installing double data rate 2 dual inline memory modules (DDR2 DIMMs). System boards with two connectors can accommodate up to a maximum of 2.0 GB of system memory. System boards with four connectors can accommodate up to a maximum of 4.0 GB of system memory.

When installing memory modules, the following rules apply:

- If you are adding or replacing a memory module on a system board with four memory connectors, at least one memory module must be installed in the first memory channel (in either memory connector 1 or memory connector 2). See "Identifying parts on the system board" on page 9 for more information.
- Use 1.8 V, 240-pin, double data rate 2 synchronous dynamic random access memory (DDR2 SDRAM).
- Use 256 MB, 512 MB, or 1 GB memory modules in any combination.

Note: Only DDR2 SDRAM DIMMs can be used.

To install a memory module:

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Locate the memory connectors. See "Identifying parts on the system board" on page 9.
3. Open the retaining clips.

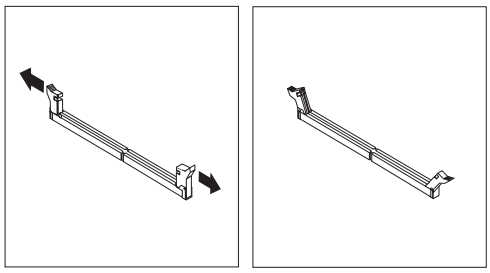

Figure 9. Opening retaining clips

4. Make sure that the notch 1 on the memory module aligns correctly with the connector key 2 on the system board. Push the memory module straight down into the connector until the retaining clips close.

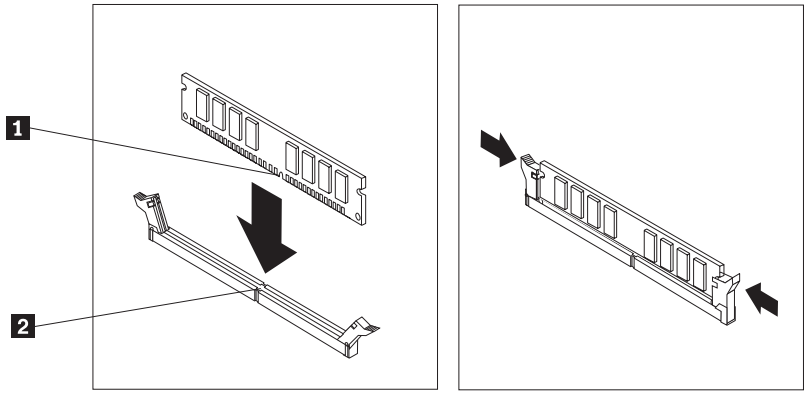

Figure 10. Positioning the memory module

What to do next:

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 4, "Completing the parts replacement," on page 47.

Installing PCI adapters

This section provides information and instructions for installing PCI adapters. This section provides information and instructions for installing adapters. Your computer has four expansion connectors. On some system boards, there are two connectors for PCI adapters, one PCI Express x1 adapter connector, and one for a PCI Express x16 graphics adapter connector. On some system boards, there are two PCI Express x1 adapter connectors, one PCI adapter connector, and one for a PCI Express x16 graphics adapter connector.

To install a PCI adapter:

1. Remove the computer cover. See "Removing the cover" on page 13.

2. At the rear of the computer, press the release button **1** to open the adapter latch **2** and remove the slot cover. .

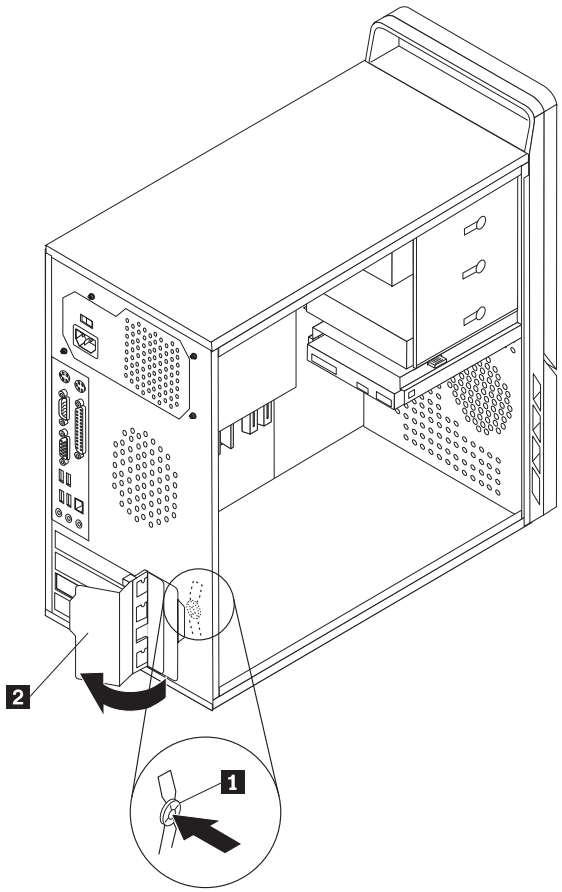

Figure 11. Opening the adapter latch

3. Remove the adapter from its static-protective package.
4. Install the adapter into the appropriate connector on the system board.
5. Pivot the adapter latch to the closed position to secure the adapters.

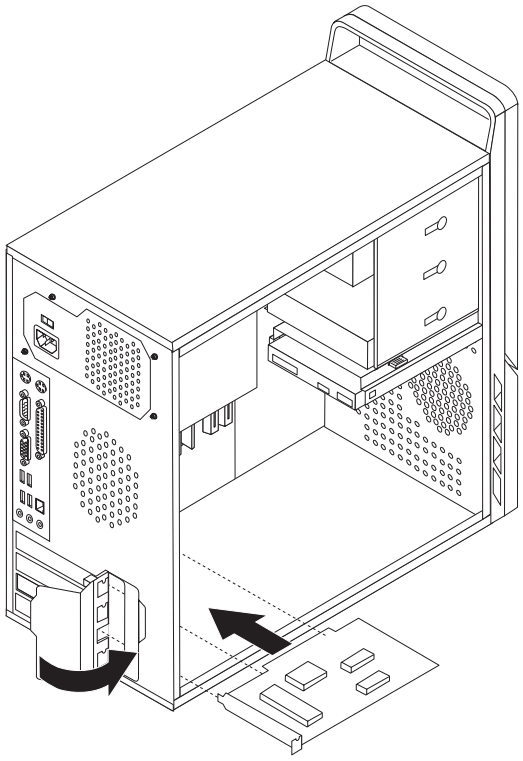

Figure 12. Closing the adapter latch

What to do next:

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 4, "Completing the parts replacement," on page 47.

Installing internal drives

This section provides information and instructions for installing internal drives.

Internal drives are devices that your computer uses to read and store data. You can add drives to your computer to increase storage capacity and to enable your computer to read other types of media. Some of the types of drives that are available for your computer are:

- Serial Advanced Technology Attachment (SATA) hard disk drives
- SATA optical drives, such as CD drives or DVD drives
- Removable media drives

Note: These types of drives are also referred to as integrated drive electronics (IDE) drives.

Internal drives are installed in *bays*. In this book, the bays are referred to as bay 1, bay 2, and so on.

When you install an internal drive, it is important to note the type and size of drive that you can install in each bay. Also, it is important to correctly connect the internal drive cables to the installed drive.

Drive specifications

Your computer comes with the following factory-installed drives:

- An optical drive in bay 1 (some models)
- A 3.5-inch diskette disk drive in bay 3 (some models)
- A 3.5-inch hard drive in bay 4

Any bay that does not have a drive installed has a static shield and bay panel installed.

Figure 13 shows the location of the drive bays.

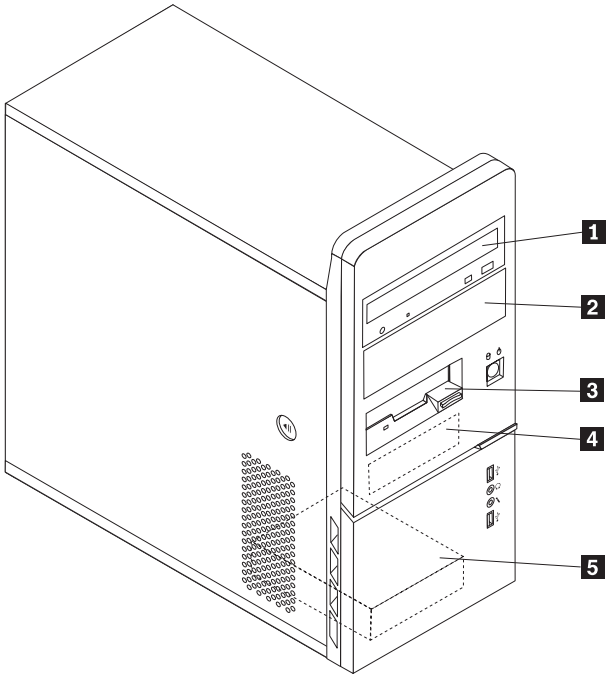

Figure 13. Drive bay locations

The following list describes the types and size of drives that you can install in each bay:

1 Bay 1 - Maximum height: 43.0 mm (1.7 in.)	• Optical drive such as CD drive or DVD drive (preinstalled in some models) • 5.25-inch hard disk drive • 3.5-inch hard disk drive (requires a Universal Adapter Bracket, 5.25 to 3.5-inch)*
2 Bay 2 - Maximum height: 43.0 mm (1.7 in.)	• Optical drive such as CD drive or DVD drive • 5.25-inch removable media drive • 3.5-inch hard disk drive (requires a Universal Adapter Bracket, 5.25 to 3.5-inch)*
3 Bay 3 - Maximum height: 25.8 mm (1.0 in.)	3.5-inch diskette drive (some models preinstalled)
4 Bay 4 - Maximum height: 25.8 mm (1.0 in.)	3.5-inch SATA hard disk drive (preinstalled)
5 Bay 5 - Maximum height: 25.8 mm (1.0 in.)	3.5-inch SATA hard disk drive

* You can obtain a Universal Adapter Bracket, 5.25 to 3.5-inch from a local computer retailer or by contacting the Customer Support Center.

Installing a drive in bay 1 or bay 2

To install a drive in bay 1 or bay 2:

1. Remove the computer cover. See “Removing the cover” on page 13.

2. Remove the front bezel by releasing the three plastic tabs on the left side and pivoting the bezel outward. Carefully set the bezel to the side without disconnecting the power switch and LED assembly cable.

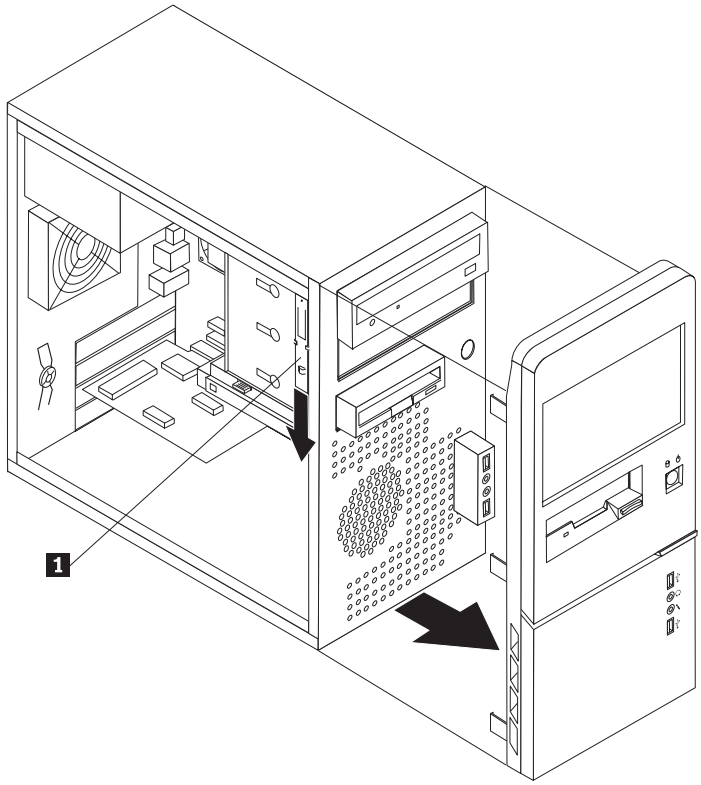

Figure 14. Locating the spare retainer bracket

3. Remove the metal static shield from the drive bay using your fingers to pull it outward.
4. If you are installing a drive with accessible media, such as an optical drive, remove the plastic panel in the bezel from the bay by squeezing the plastic tabs that secure the panel on the inside of the bezel.
5. If you are installing any type of drive other than a serial ATA hard drive, make sure the drive that you are installing is set correctly as either a master or a slave device.

   Note: A serial ATA hard disk drive does not need to be set as either a master or a slave device.

   If you are installing an optical drive or a parallel ATA hard disk drive, set it as a master device. Refer to the documentation that comes with your drive for master/slave jumper information.
6. Remove the retainer bracket from the upper driver cage by sliding it downward.

7. For a 5.25-inch drive, install a retainer bracket on the side of the drive.

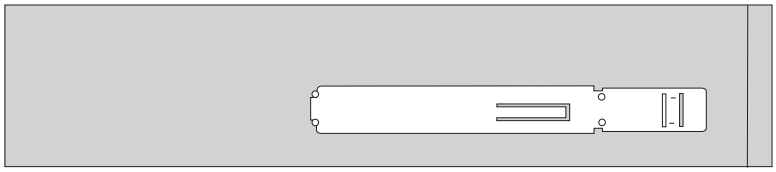

Figure 15. Installing a retainer bracket

8. For a 3.5-inch drive, you must use a Universal Adapter Bracket, 5.25 to 3.5-inch. You can obtain a Universal Adapter Bracket, 5.25 to 3.5-inch from a local computer retailer or by contacting the Customer Support Center. Install a retainer bracket on the side of the Universal adapter bracket.
9. Install the 5.25-inch drive or the adapter bracket and 3.5-inch drive into the bay.

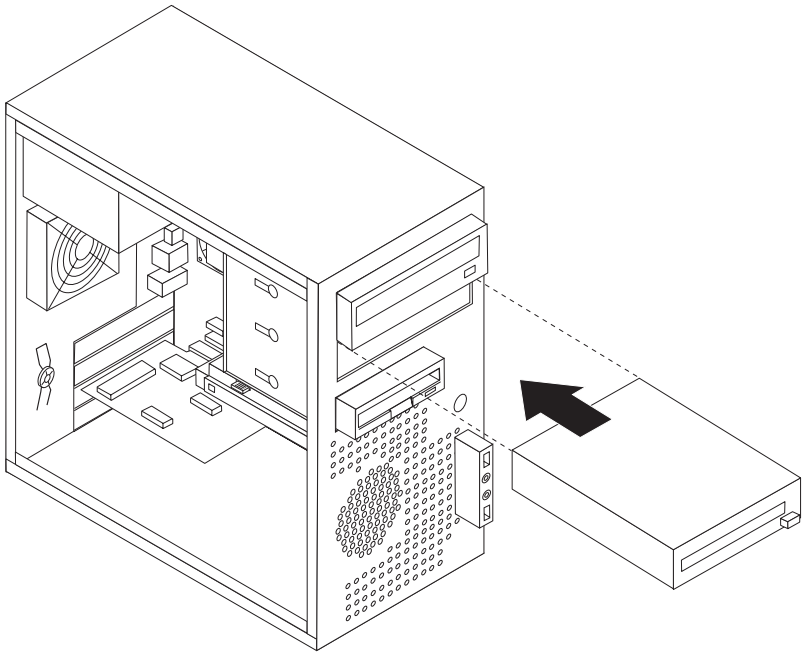

Figure 16. Installing a new drive

10. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot it inward until the three plastic tabs snap into position on the left side.
11. Continue at "Connecting drives."

Connecting drives

The steps to connect a drive are different depending on the type of drive. Use one of the following procedures for your drive connection.

Connecting the first optical drive

1. The drive requires two cables; a power cable that connects to the power supply and a signal cable that connects to the system board.
2. Locate the three-connector signal cable that comes with your computer or with the new drive.

3. Locate the IDE connector on the system board. See “Identifying parts on the system board” on page 9.
4. Connect one end of the signal cable to the drive and the other to the IDE connector on the system board. To reduce electronic noise, use the connectors at the end of the cable only.
5. Locate the extra four-wire power connector labelled P4 and connect it to the drive.

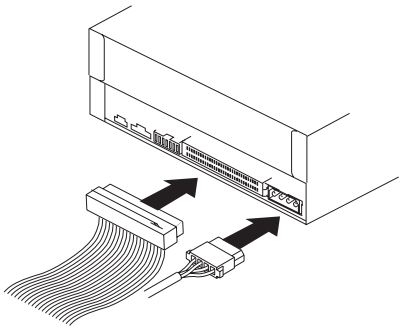

Figure 17. Installing the first optical drive

Connecting a parallel ATA drive

1. Locate the extra connector on the three-connector signal cable that is attached to the IDE connector on the system board. See “Identifying parts on the system board” on page 9.
2. Connect the extra connector on the signal cable to the new drive.
3. Locate the extra four-wire power connector and connect it to the drive.

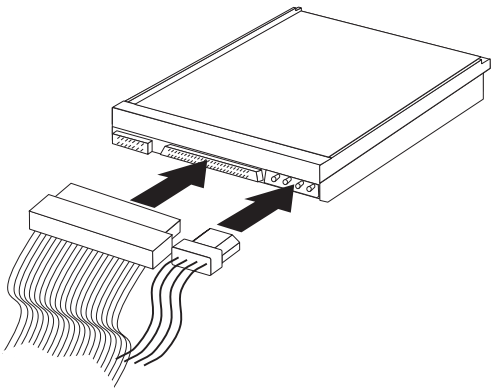

Figure 18. Installing a parallel ATA drive

Connecting a serial ATA drive

A serial optical or additional hard disk drive can be connected to any available SATA connector.

1. Locate the signal cable that comes with the new drive.
2. Locate an available SATA connector on the system board. See “Identifying parts on the system board” on page 9.
3. Connect one end of the signal cable to the drive and the other to an available SATA connector on the system board.

4. Locate one of the extra five-wire power connectors and connect it to the drive.

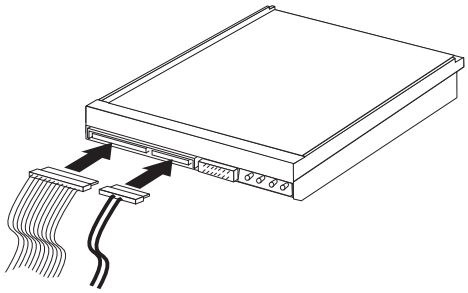

Figure 19. Installing a serial ATA drive

What to do next

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the battery

Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as parallel-port assignments (configuration). A battery keeps this information active when you turn off the computer.

The battery normally requires no charging or maintenance throughout its life; however, no battery lasts forever. If the battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

Refer to the "Lithium battery notice" in the *Safety and Warranty Guide* for information about replacing and disposing of the battery.

To change the battery:

1. Turn off the computer and disconnect the power cord from the electrical outlet and from the computer.
2. Remove the computer cover. See "Removing the cover" on page 13.
3. Locate the battery. See "Identifying parts on the system board" on page 9.
4. Remove the old battery.

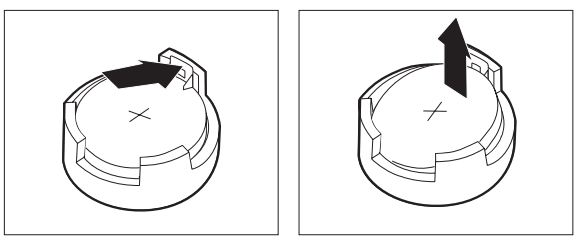

Figure 20. Battery removal

5. Install the new battery.

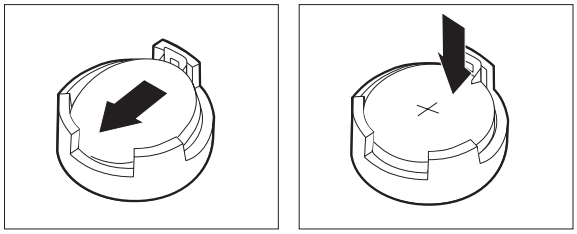

Figure 21. Battery installation

6. Replace the computer cover, and connect the cables. See Chapter 4, “Completing the parts replacement,” on page 47.

   Note: When the computer is turned on for the first time after battery replacement, an error message might be displayed. This is normal after replacing the battery.
7. Turn on the computer and all attached devices.
8. Use the Setup Utility program to set the date and time and any passwords. See "Using the Setup Utility" in your *User Guide*.

Replacing the power supply assembly

Attention

Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace the power supply assembly.

1. Remove the computer cover. See “Removing the cover” on page 13.

   Note: For this procedure, it helps to lay the computer on its side.
2. Disconnect the power supply cables from the system board and from all drives. See “Identifying parts on the system board” on page 9.

3. Remove the four screws at the rear of the chassis that secure the power supply.

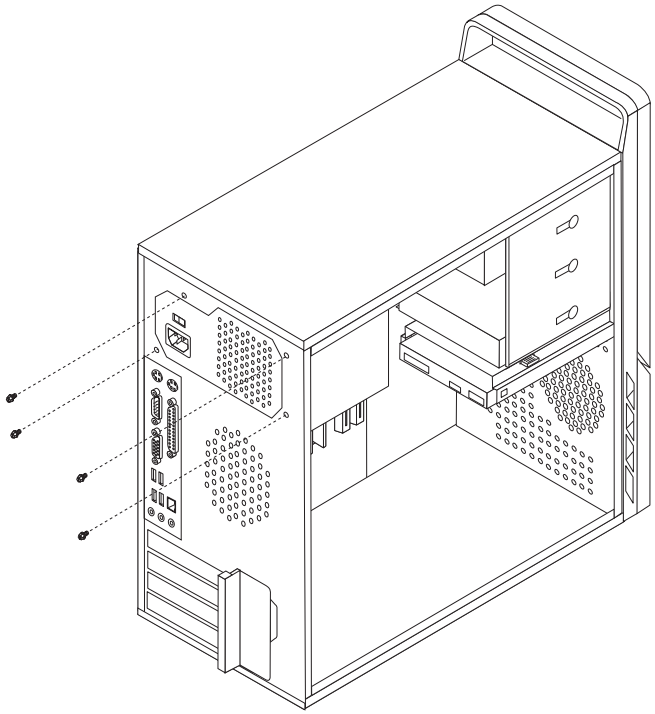

Figure 22. Removing the power-supply-retaining screws

4. Lift the power supply out of the chassis.
5. Install the new power supply into the chassis so that the screw holes in the power supply align with those in the chassis.
6. Install the four screws to secure the power supply.

   Note: Use only the screws provided by Lenovo.
7. Reconnect the power supply connectors to the system board.
8. Reconnect a power supply connector to each of the drives.
9. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the heat sink

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace the heat sink.

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Lay the computer on its side.
3. Locate the heat sink. See "Identifying parts on the system board" on page 9.
4. Disconnect the heat sink and the fan assembly cable from the system board.
5. Depending on which heat sink you are removing, do one of the following:

a. Pivot the handle **1** to release the heat sink clamp and then disengage the clamp from the plastic retention bracket.

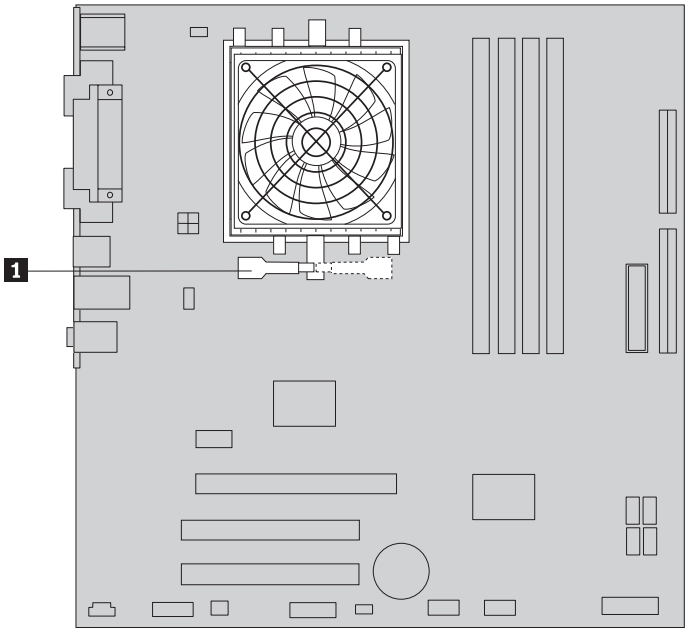

Figure 23. Removing a heat sink held in place by a clamp

b. Remove the four screws **1** securing the heat sink and fan assembly to the system board.

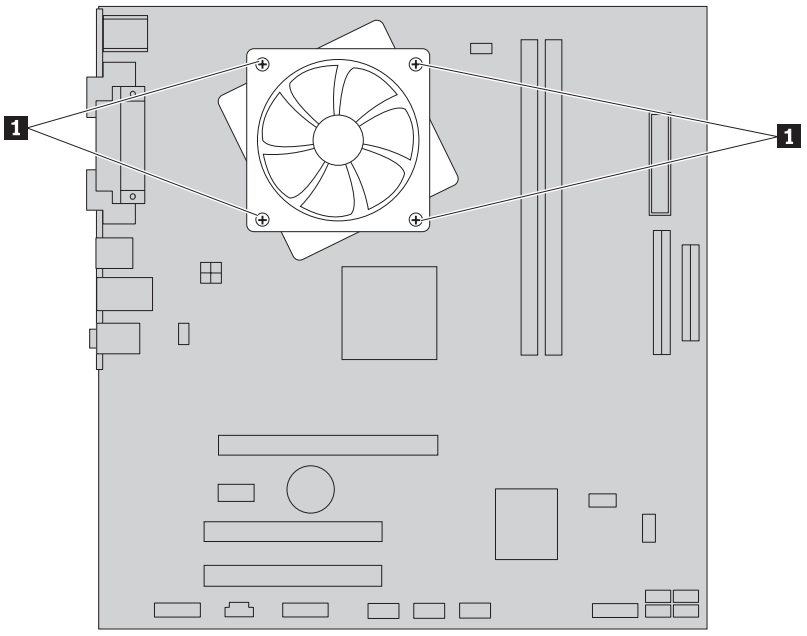

Figure 24. Removing a heat sink held in place by screws

Note: You might have to gently twist the heat sink to free it from the microprocessor.

6. Lift the failing heat sink and fan assembly off the system board.

7. Remove the mylar film that covers the greased side of the new heat sink that will face the processor.
8. Depending on which heat sink you are installing, do one of the following:
   a. Position the heat sink on the microprocessor socket and then position the clamp on the plastic retention bracket. Pivot the handle **1** to clamp the heat sink to the plastic retention bracket.

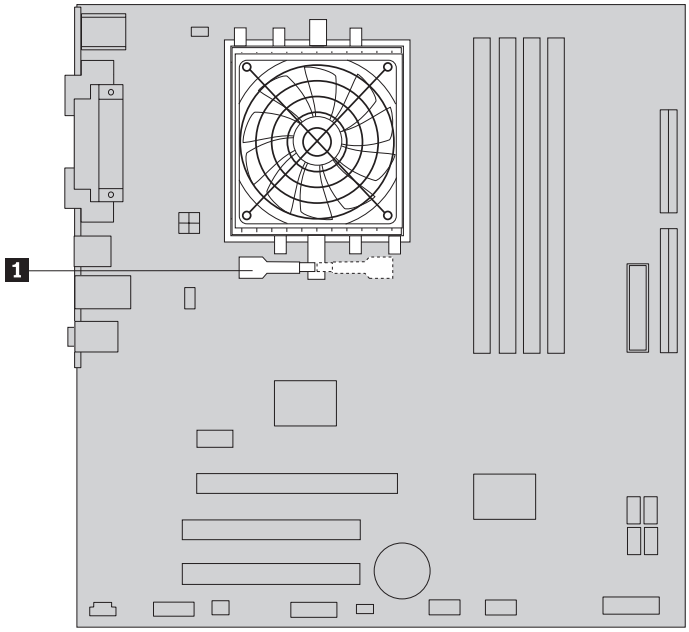

Figure 25. Clamping the heat sink to the plastic retention bracket

b. Position the heat sink on the plastic retention bracket so that the four screws are aligned with the posts on the system board. Tighten the four screws **1** to secure the heat sink and fan assembly to the system board.

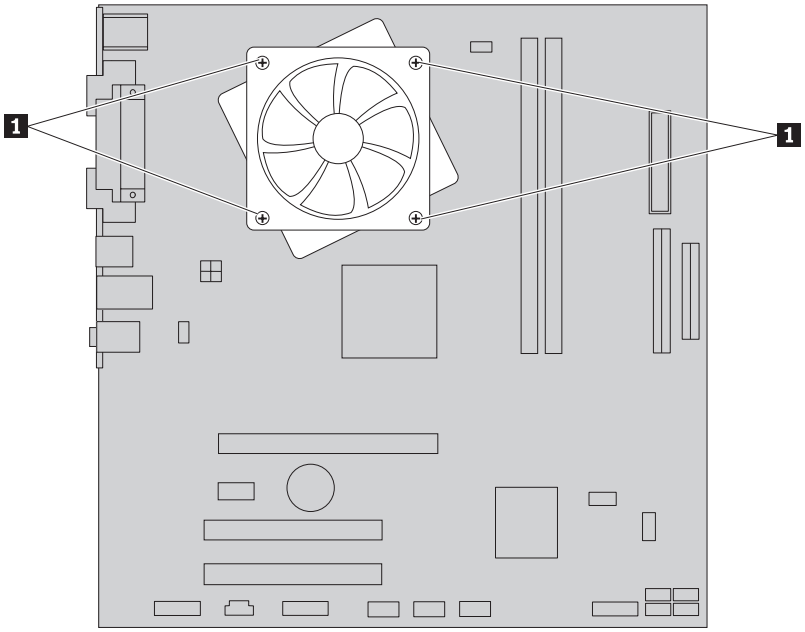

Figure 26. Replacing the screws to the heat sink and fan assembly

9. Reconnect the heat sink and the fan assembly cable to the system board.
10. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing a hard disk drive

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace the hard disk drive.

Important

When you receive a new hard disk drive, you also receive a set of *Product Recovery discs*. The set of *Product Recovery disccs* will enable you to restore the contents of the hard disk to the same state as when your computer was originally shipped from the factory. For more information on recovering factory-installed software, refer to "Recovering software" in your *User Guide*.

To replace the hard disk drive:

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Disconnect the signal and power cables from the hard disk drive.
3. Press the blue release tab **1** down, slide the hard drive cage **2** back, and pivot it outward.

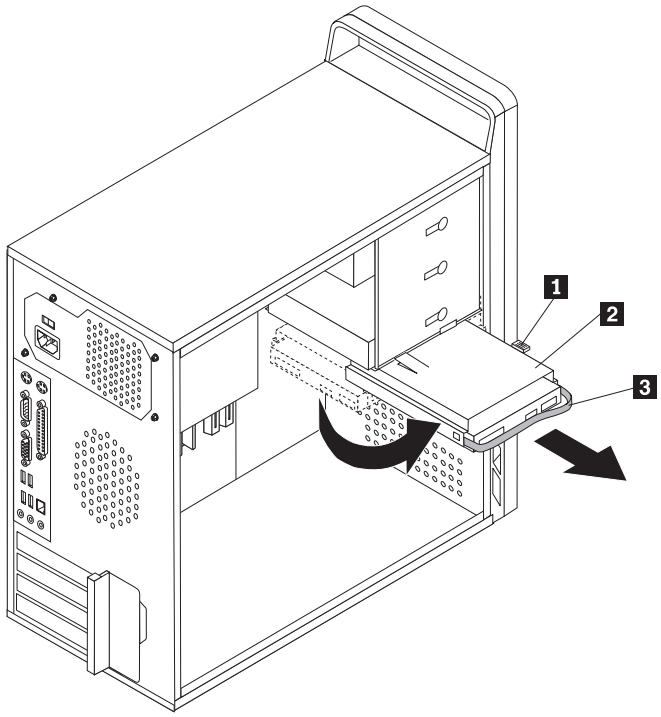

Figure 27. Removing the hard disk drive

4. Remove the hard disk drive cage from the chassis by simply sliding it outward.
5. Pull on the blue handle **3** to release and remove hard disk drive from drive cage.
6. Remove the hard disk drive from the blue plastic bracket by flexing the sides of the bracket enough to slide it free of the hard disk drive.

7. To install the new hard disk drive into the blue bracket, flex the bracket and align the pins **1** through **4** on the bracket with the holes in the hard disk drive. See Figure 28. Do not touch the circuit board **5** on the bottom of the hard disk drive.

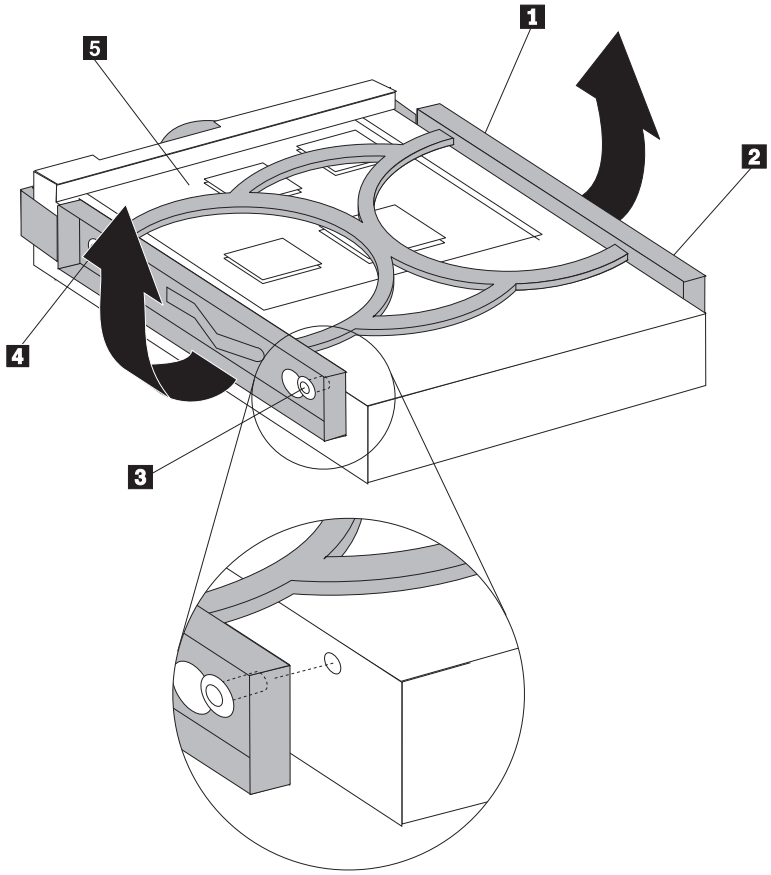

Figure 28. Installing the hard disk drive into bracket

8. Slide the new hard disk drive into the drive cage until it snaps into position.

9. Align the drive cage pivot pin with the slot **1** in the upper drive cage and slide the hard disk drive cage into the chassis.
10. Connect the signal and power cables to the rear of the new hard disk drive.

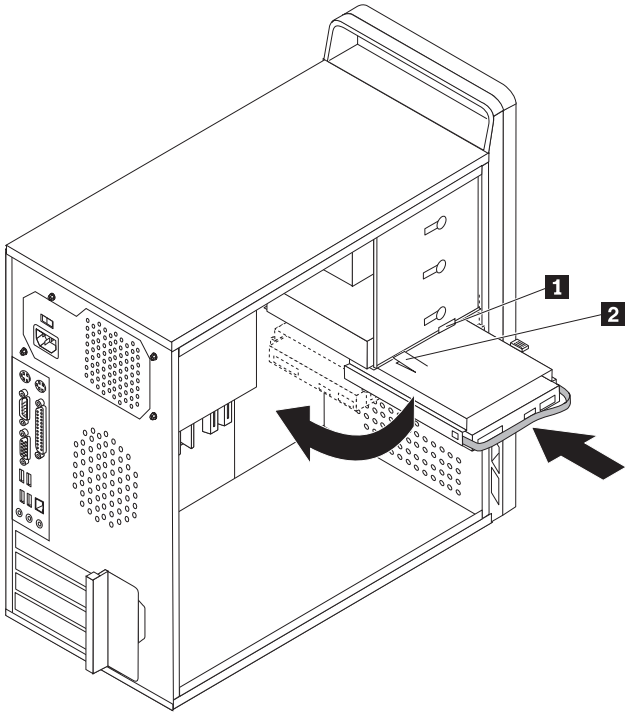

Figure 29. Installing the hard disk drive and bracket

11. Press down on the metal latch **2** and pivot in the drive cage into place and then slide it forward until it snaps into position.

    Note: There are two arrows, one on the upper drive cage and one on the hard disk drive cage. The arrows are aligned when the hard disk drive is in the proper position.
12. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing an optical drive

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace an optical drive.

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Remove the front bezel by releasing the three plastic tabs on the left side and pivoting the bezel outward. Carefully set the bezel to the side without disconnecting the power switch and LED assembly cable.
3. Disconnect the signal and power cables from the rear of the optical drive.

4. Press the blue release button and remove the optical drive out the front of the computer.

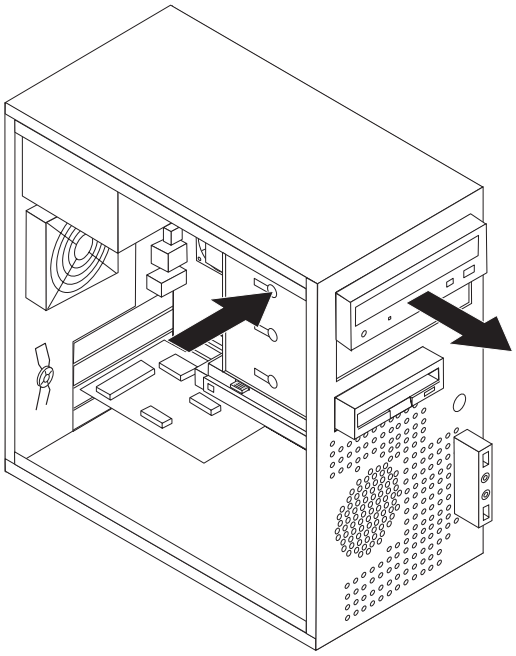

Figure 30. Removing the optical drive

5. Remove the retainer bracket from the drive being replaced and install it on the new drive.

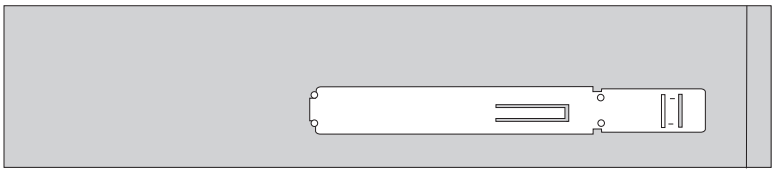

Figure 31. Retainer bracket for optical drive

6. Slide the new optical drive into the bay from the front until it snaps into position.

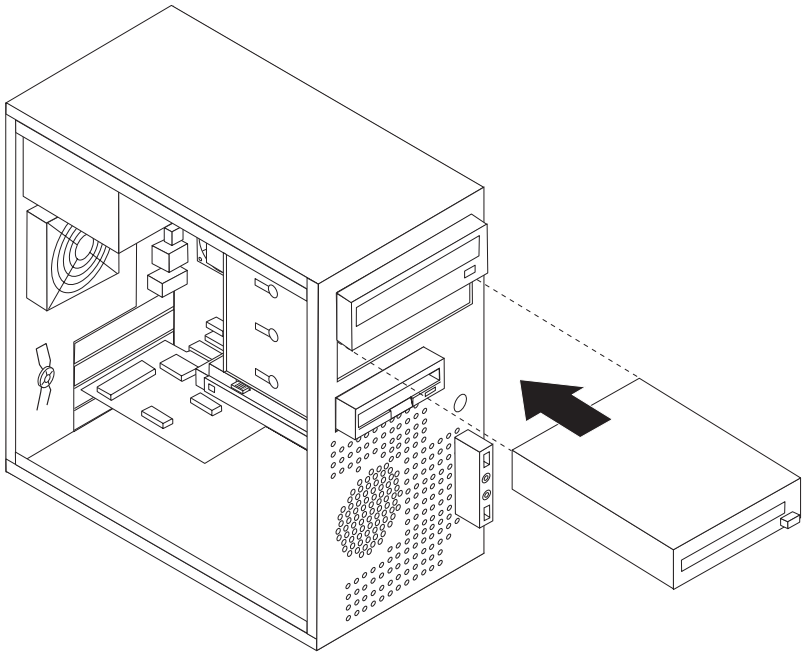

Figure 32. Installing a new drive

7. Connect the signal and power cables to the drive.
8. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot it inward until the three plastic tabs snap into position on the left side.
9. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the diskette drive

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace the diskette drive.

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Remove the front bezel. See "Removing and replacing the front bezel" on page 14.
3. Disconnect the signal and power cables from the rear of the diskette drive.
4. Press the release button and slide the diskette drive out the front of the computer.

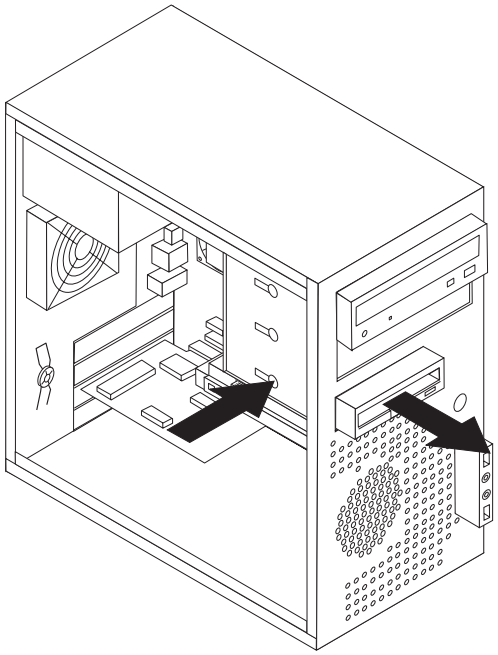

Figure 33. Removing the diskette drive

5. Remove the retainer bracket from the failing diskette drive and install it on the new diskette drive.

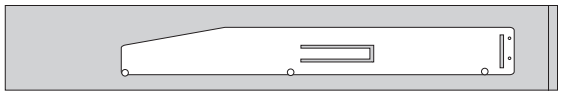

Figure 34. Retainer bracket for diskette drive

6. Slide the new diskette drive into the drive bay until it snaps into position.
7. Connect the flat cable to the new diskette drive.
8. Replace the front bezel.
9. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing a memory module

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace a memory module.

Note: Your computer has support for two or four memory modules.

1. Remove the computer cover. See "Removing the cover" on page 13.

   Note: For this procedure, it helps to lay the computer on its side.
2. Locate the memory connectors. See "Identifying parts on the system board" on page 9.
3. Remove the memory module being replaced by opening the retaining clips as shown.

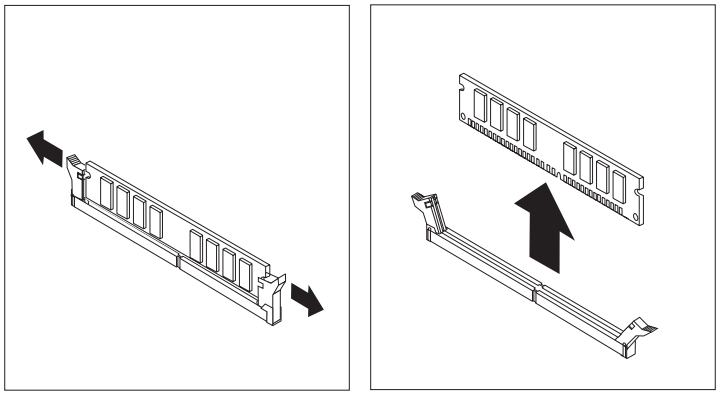

Figure 35. Removing the memory module

4. Position the replacement memory module over the memory connector. Make sure the notch 1 on the memory module aligns correctly with the connector key 2 on the system board. Push the memory module straight down into the connector until the retaining clips close.

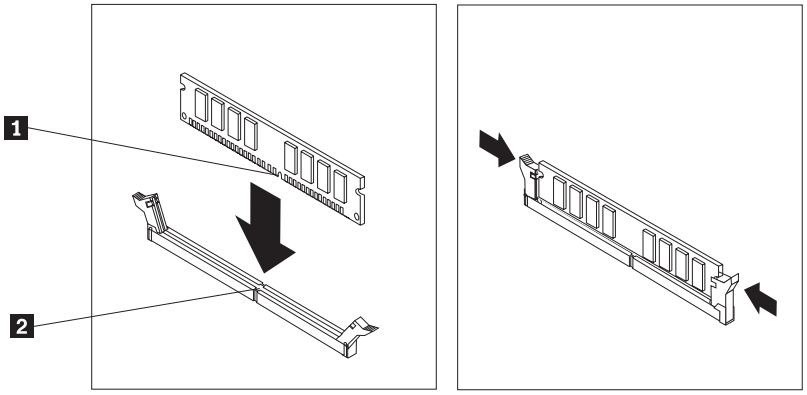

Figure 36. Installing the memory module

5. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing a PCI adapter

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace a PCI adapter.

1. Remove the computer cover. See "Removing the cover" on page 13.

2. At the rear of the computer, press the release button **1** to open the adapter latch **2** and remove the adapter by pulling it straight out of the adapter connector.

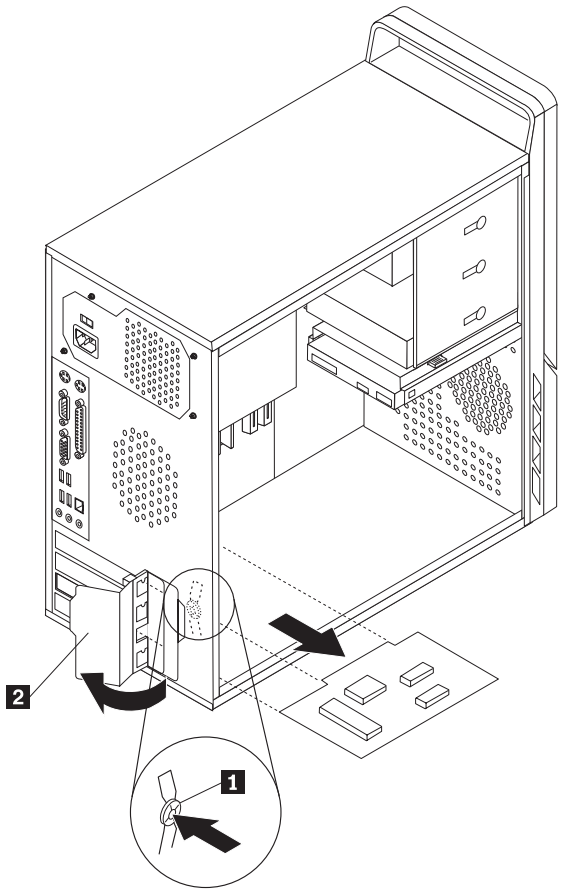

Figure 37. Removing the PCI adapter

3. Install the new adapter into the same adapter connector.
4. Ensure the adapter is fully seated into the adapter connector.
5. At the rear of the computer, pivot the adapter latch to the closed position to secure the adapter.

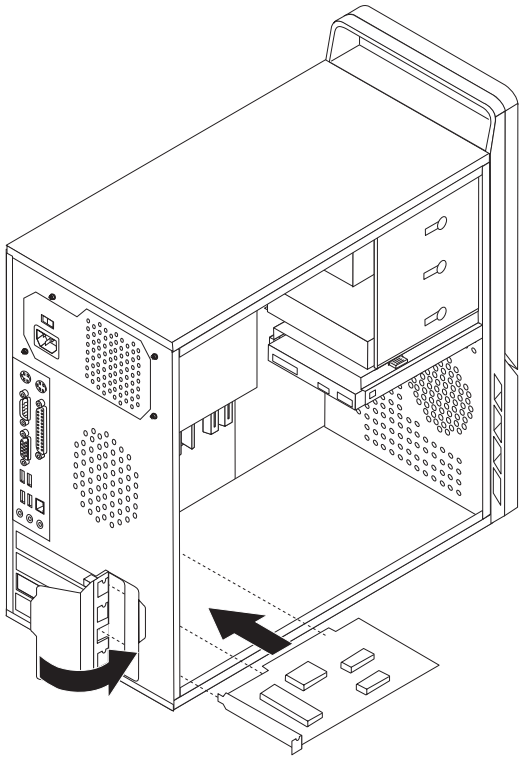

Figure 38. Install a new PCI adapter

6. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the front fan assembly

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace the front fan assembly. The front fan is located on the inside of the front panel of the computer, behind the front bezel.

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Remove the front bezel. See "Removing and replacing the front bezel" on page 14.
3. Locate the front fan assembly.
4. Note the routing of the fan assembly cable. Disconnect the front fan assembly cable from the power fan connector on the system board. See "Identifying parts on the system board" on page 9.
5. The fan assembly is attached by four rubber mounts. Remove the fan assembly by gently pulling it out the back of the front panel.

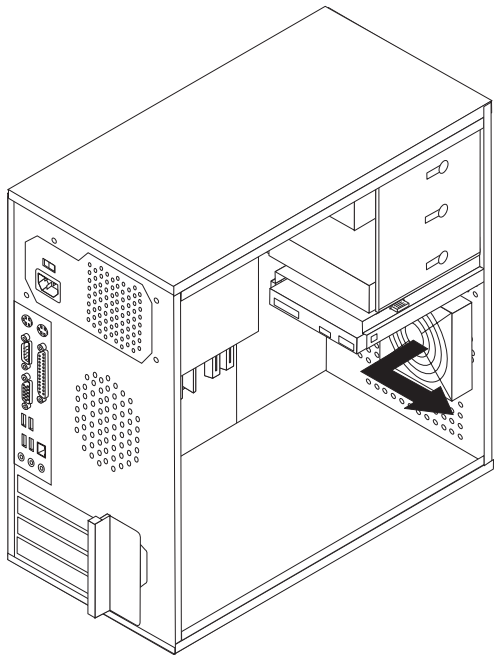

Figure 39. Removing the front fan assembly

6. Holding the new fan assembly in your hand against the back of the front panel, align the four rubber mounts with the holes in the front panel.

7. Gently pull on each of the rubber mount tips that are protruding through the front of the front panel until they each lock into place.

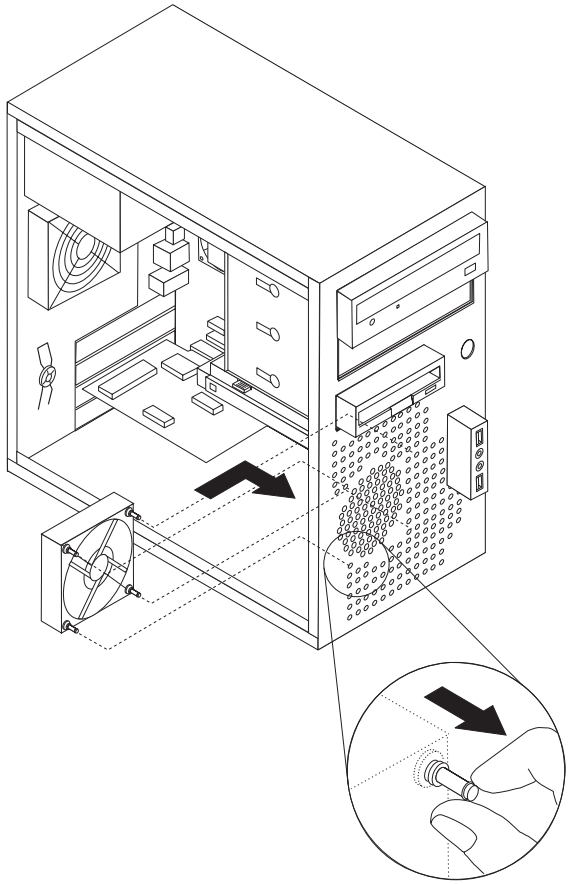

Figure 40. Replacing the front fan assembly

8. Connect the front fan assembly cable to the power fan connector on the system board.
9. Reinstall the front bezel.
10. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the rear fan assembly

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace the rear fan assembly. The rear fan is located on the inside of the rear panel of the computer.

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Locate the rear fan assembly.
3. Note the routing of the rear fan assembly cable.

4. Disconnect the rear fan assembly cable from the system fan connector on the system board. See “Identifying parts on the system board” on page 9.
5. Pull the rear fan assembly out of chassis.

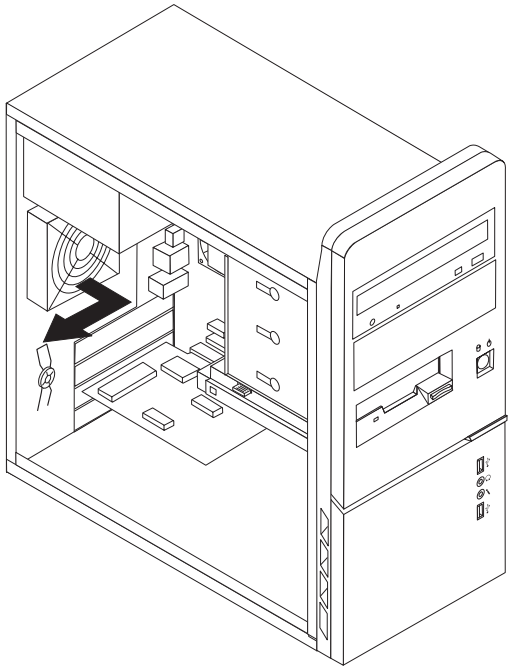

Figure 41. Removing the rear fan assembly

6. Install the new system fan assembly by aligning the rubber mounts of the system fan assembly with the holes on the chassis and pushing the rubber mounts through the holes.

7. Pull on the tips of the rubber mounts until the fan assembly is in place.

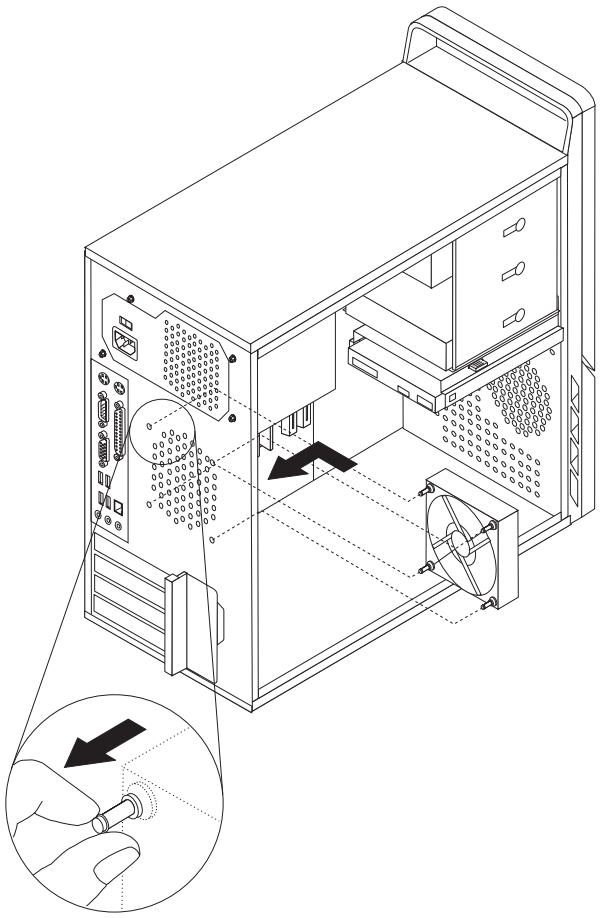

Figure 42. Replacing the rear fan assembly

8. Connect the rear fan assembly cable to the system fan connector on the system board.
9. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the keyboard

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace a keyboard.

1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system, and turn off all attached devices and the computer.
2. Unplug all power cords from electrical outlets.
3. Locate the keyboard connector. See Figure 43.

   Note: Your keyboard might be connected to a standard keyboard connector **1** or a USB connector **2** . Depending on where your keyboard is connected, see "Locating connectors on the rear of your computer" on page 6 or "Locating controls and connectors on the front of your computer" on page 5.

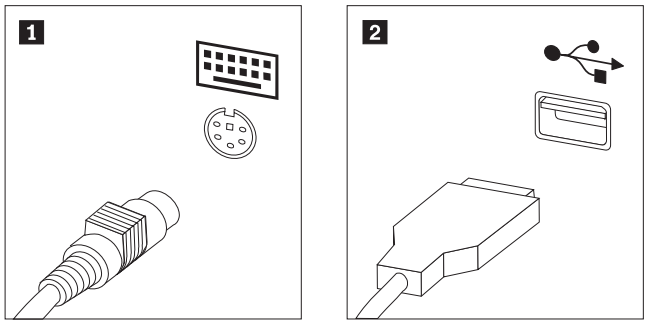

Figure 43. Keyboard connectors, standard and USB

4. Disconnect the failing keyboard cable from the computer.
5. Connect the new keyboard to the appropriate connector on the computer.
6. Go to Chapter 4, "Completing the parts replacement," on page 47.

Replacing the mouse

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at http://www.lenovo.com/support.

This section provides instructions on how to replace a mouse.

1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system, and turn off all attached devices and the computer.
2. Unplug all power cords from electrical outlets.
3. Locate the mouse connector. See Figure 44.

   Note: Your mouse might be connected to a standard mouse connector **1** or a USB connector **2**. Depending on where your mouse is connected, see "Locating connectors on the rear of your computer" on page 6 or "Locating controls and connectors on the front of your computer" on page 5.

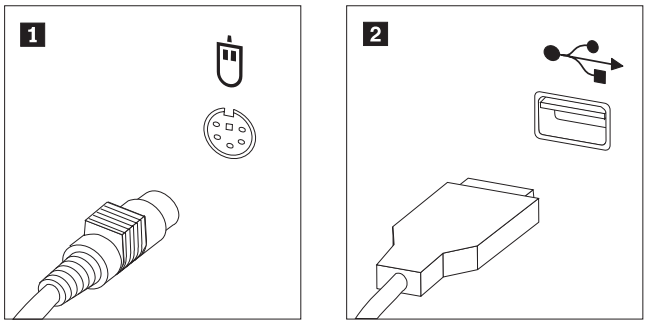

Figure 44. Mouse connectors, standard and USB

4. Disconnect the failing mouse cable from the computer.
5. Connect the new mouse to the appropriate connector on the computer.
6. Go to Chapter 4, "Completing the parts replacement," on page 47.

Chapter 4. Completing the parts replacement

After replacing the parts, you need to close the cover and reconnect cables, including telephone lines and power cords. Also, depending on the part that was replaced, you might need to confirm the updated information in the Setup Utility program. Refer to "Using the Setup Utility program" in the *User Guide* for this product.

To complete the parts replacement:

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer. See "Locating components" on page 8 for the location of various components.
2. Position the computer cover on the chassis so that the rail guides on the bottom of the computer cover engage the rails. Then, push the computer cover closed until it snaps into position.

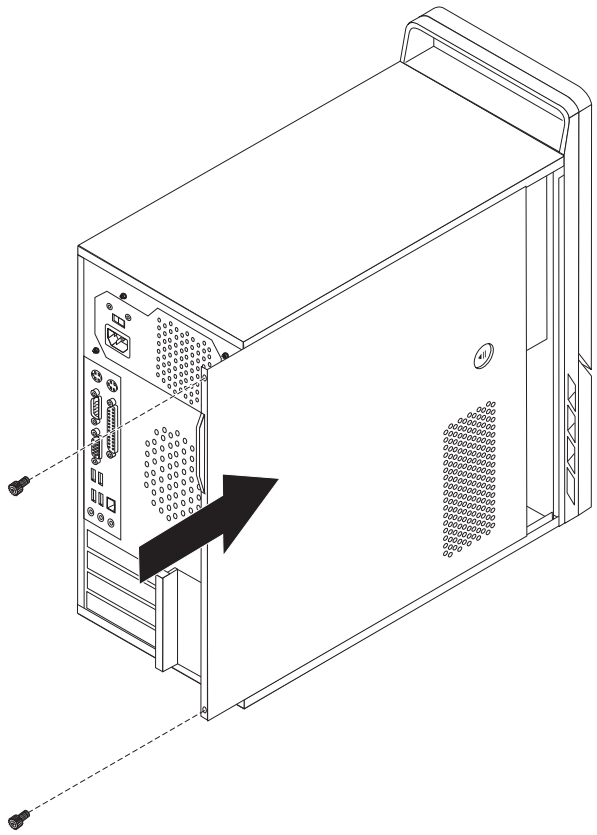

Figure 45. Replacing the computer cover

3. If the cover is secured with thumbscrews, install them.
4. If a cover lock is installed, lock the cover.
5. Reconnect the external cables and power cords to the computer. See "Locating connectors on the rear of your computer" on page 6.
6. To update your configuration, see "Using the Setup Utility program" in your *User Guide*.

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Note: In most areas of the world, Lenovo requires the return of the defective CRU. Information about this will come with the CRU or will come a few days after the CRU arrives.

Obtaining device drivers

You can obtain device drivers for operating systems that are not preinstalled at http://www.lenovo.com/support/ on the World Wide Web. Installation instructions are provided in README files with the device-driver files.

Chapter 5. Security features

To help prevent hardware theft and unauthorized access to your computer, several security lock options are available. In addition to a physical lock, unauthorized use of your computer can be prevented by a software lock that locks the keyboard until a correct password is typed in.

Make sure that any security cables that you install do not interfere with other computer cables.

Integrated cable lock

An integrated cable lock (sometimes referred to as the Kensington lock), can be used to secure your computer to a desk, table, or other non-permanent fixture. The cable lock attaches to a security slot at the rear of your computer and is operated with a key. See Figure 46. The cable lock also locks the buttons used to open the computer cover. This is the same type of lock used with many laptop computers. You can order a security cable directly from Lenovo. Go to http://www.lenovo.com/support/ and search on *Kensington*.

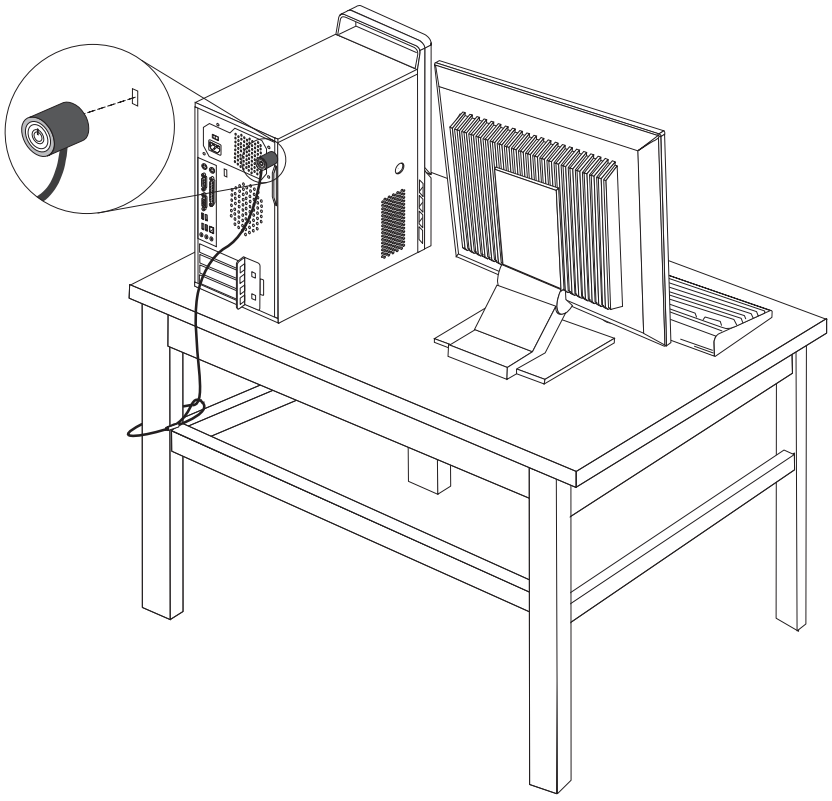

Figure 46. Integrated cable lock

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Padlock Loop

Your computer is equipped with a padlock loop that prevents the cover from being opened when a padlock is locked in the loop as shown in the following figure..

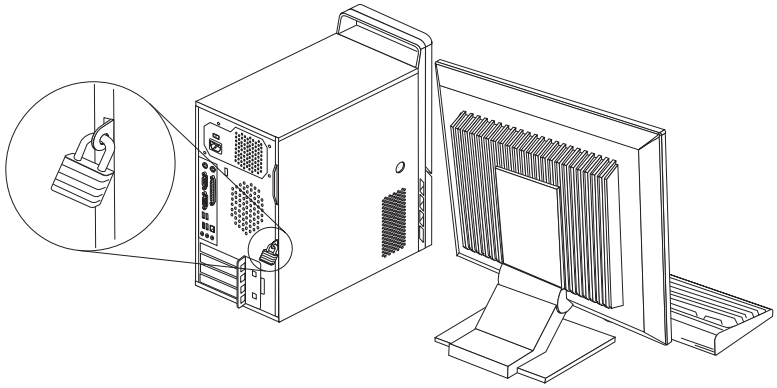

Figure 47. Padlock Loop

Password protection

To deter unauthorized use of your computer, you can use the Setup Utility program to set a password. When you turn on your computer, you are prompted to type the password to unlock the keyboard for normal use.

What to do next:

- To work with another option, go to the appropriate section.
- To complete the installation, go to Chapter 4, "Completing the parts replacement," on page 47.

Erasing a lost or forgotten password (clearing CMOS)

This section applies to lost or forgotten passwords. For more information about lost or forgotten passwords, go to the Lenovo Care [sm] program.

To erase a forgotten password:

1. Remove the computer cover. See "Removing the cover" on page 13.
2. Locate the Clear CMOS/Recovery jumper on the system board. See "Identifying parts on the system board" on page 9.
3. Move the jumper from the standard position (pins 1 and 2) to the maintenance or configure position (pins 2 and 3).
4. Replace the computer cover and connect the power cord. See Chapter 4, "Completing the parts replacement," on page 47.
5. Restart the computer, leave it on for approximately 10 seconds. Turn off the computer by holding the power switch for approximately 5 seconds. The computer will turn off.
6. Repeat steps 1 through 2 on page 50.
7. Move the Clear CMOS/Recovery jumper back to the standard position (pins 1 and 2).

8. Replace the computer cover and connect the power cord. See Chapter 4, “Completing the parts replacement,” on page 47.

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