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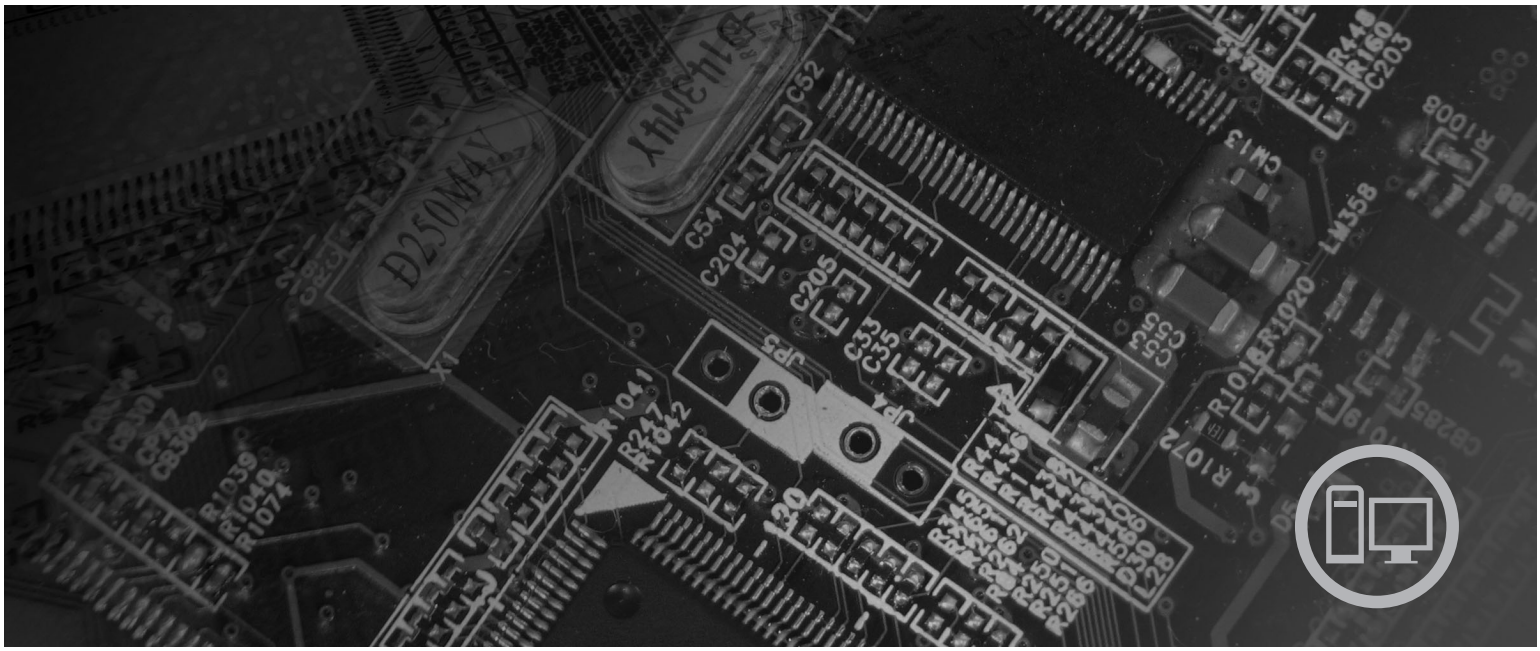
ThinkCentre
Hardware Installation and Replacement Guide



Machine Types 6019, 6064, 6066, 6067, 6072, 6073, 6077, 6078, 6087, 6088, 9181, 9196, 9325, 9330

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ThinkCentre Hardware Installation and Replacement Guide

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 47.

Second Edition (November 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 the safety information reduces the risk of personal injury and damage to your product.**

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Chapter 2. Overview

This guide provides information about replacing Customer Replaceable Units (CRUs).

This guide does not include procedures for all parts. It is expected that cables, switches, and certain mechanical parts be replaced by trained service personnel without the need for step-by-step procedures.

Note: Use only parts provided by Lenovo™.

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

- Battery
- Power supply
- Heat sink
- Hard disk drive
- Optical drive
- Diskette drive
- Memory modules
- PCI adapter
- System 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 will have the following controls and connections.

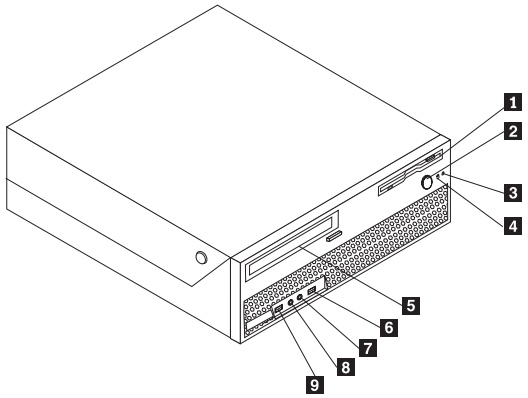

Figure 1. Controls and connectors

1	Diskette drive (some models)	6	USB connector
2	Power button	7	Microphone connector
3	Hard-disk-drive activity indicator	8	Headphone connector
4	Power-on indicator	9	USB connector
5	Optical drive (some models)		

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.

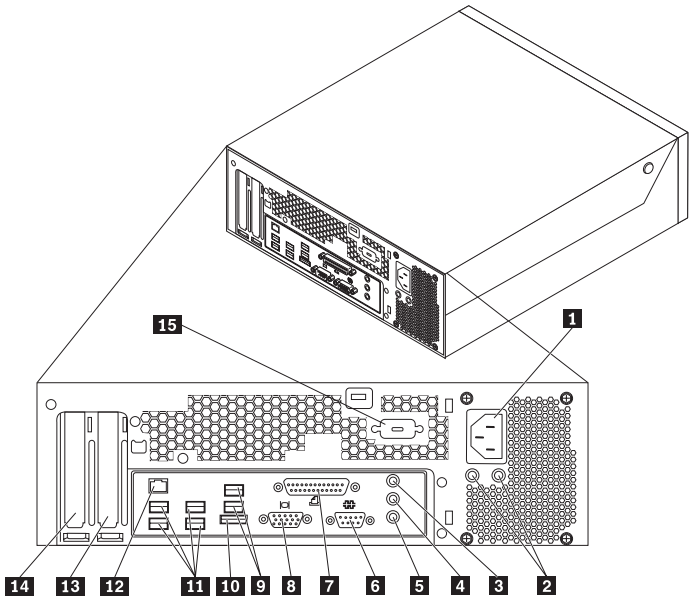

Figure 2. Connector locations

1	Power cord connector	9	USB connectors (2)
2	Power-supply-diagnostic LEDs	10	External SATA connector
3	Audio-line-in connector	11	USB connectors (4)
4	Audio-line-out connector	12	Ethernet connector
5	Microphone	13	PCI Express x16 graphics adapter connector
6	Serial connector	14	PCI adapter connector
7	Parallel connector	15	Serial connector (some models)
8	VGA-monitor connector		

Connector	Description
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 “Opening the cover” on page 12.

Figure 3 on page 8 shows the location of the various components in your computer.

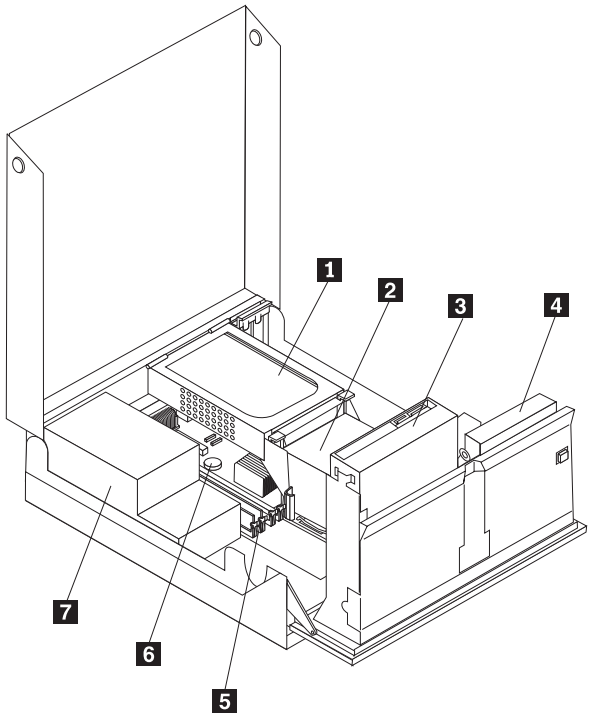

Figure 3. Component locations

1	Hard disk drive	5	Memory connectors (4)
2	Microprocessor and heat sink	6	Battery
3	Optical drive (such as a CD or DVD drive)	7	Power-supply assembly
4	Diskette drive		

Identifying parts on the system board

Figure 4 shows the location of parts on the system board.

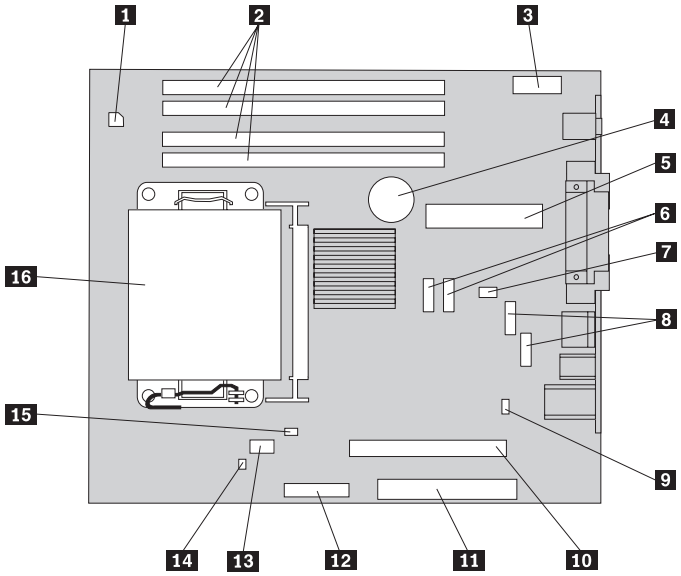

Figure 4. System board parts locations

1	4 - Pin power connector	9	Clear CMOS/Recovery jumper
2	Memory connectors	10	PCI-e X16 connector
3	Front audio connector	11	PCI connector
4	Battery	12	Diskette drive connector
5	24-Pin power connector	13	Microprocessor fan
6	SATA connector	14	Cover presence switch (Tamper switch)
7	System fan	15	Temperature sensor connector
8	USB connector (front)	16	Microprocessor and heat sink

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.

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Installing internal options

Important

Read “Handling static-sensitive devices” on page 4 before opening the computer cover.

Opening the cover

Important

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

To open 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. Press the buttons on the sides of the computer and pivot the cover upward to open the computer.

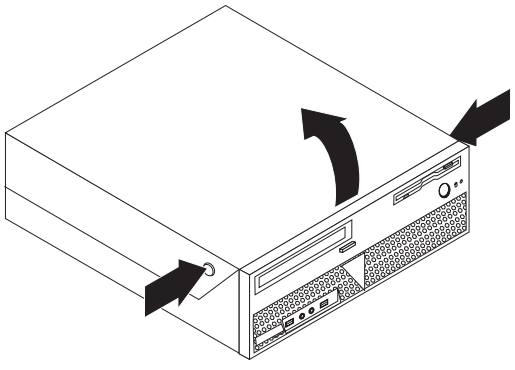


Figure 5. Pivoting the cover

Accessing system board components and drives

To access system board components and the drives:

1. Open the computer cover. See “Opening the cover” on page 12.
2. On some models, you might need to pivot the drive-bay assembly upward and pivot the hard disk drive upward to access the internal components, see Figure 6.

   Note: Make sure you note the location of any cables that you disconnect from the drives or the system board.
   Attention: You must return the hard disk drive assembly to the latched position before you close the cover to prevent damage to the hard disk drive assembly.

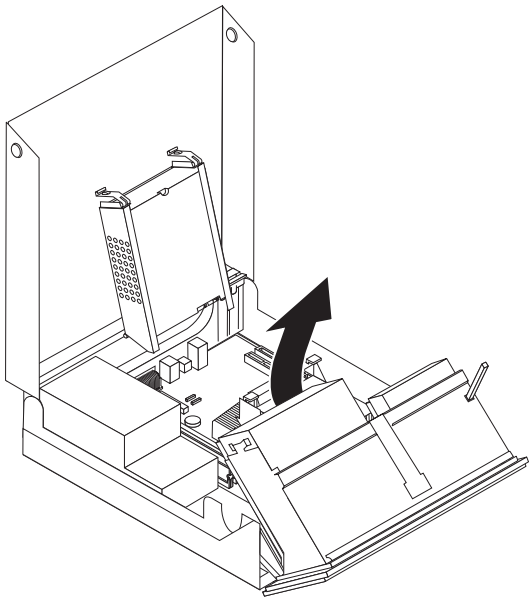


Figure 6. Pivoting the drive bay

Installing adapter cards

This section provides information and instructions for installing and removing PCI adapters. Your computer has one PCI adapter connector and one PCI Express x1 adapter connector.

To install a PCI adapter:

1. Open the computer cover. See “Opening the cover” on page 12.
2. While holding the rear of the computer chassis down, rotate the adapter retainer **1** to the open position. Remove any adapters **2** that are currently installed. See Figure 7.

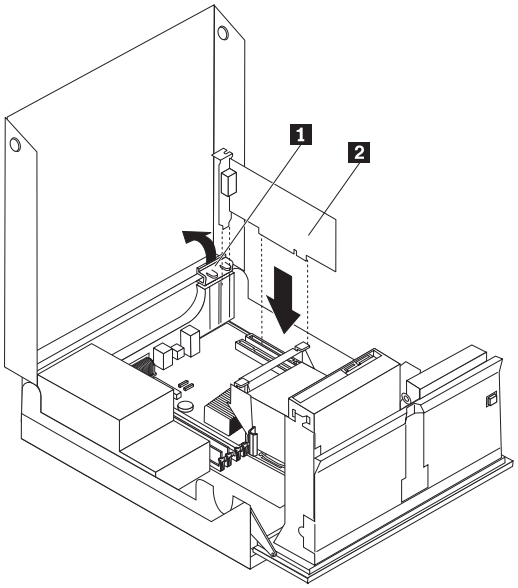


Figure 7. Installing the adapter card

3. Remove the new adapter card from its static-protective package.

4. Install the adapter card into the appropriate connector in the adapter card connector on the system board.

   Note: The white connector is for the PCI adapter and the black connector is for the PCI Express x1 adapter.
5. Rotate the adapter retainer to the closed position.

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 41.

Installing internal drives

This section provides information and instructions for installing and removing 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) or External Serial Advanced Technology Attachment (ESATA) 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 drive in bay 2 (some models)
- A 5.25-inch hard disk drive

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

Figure 8 shows the location of the drive bays.

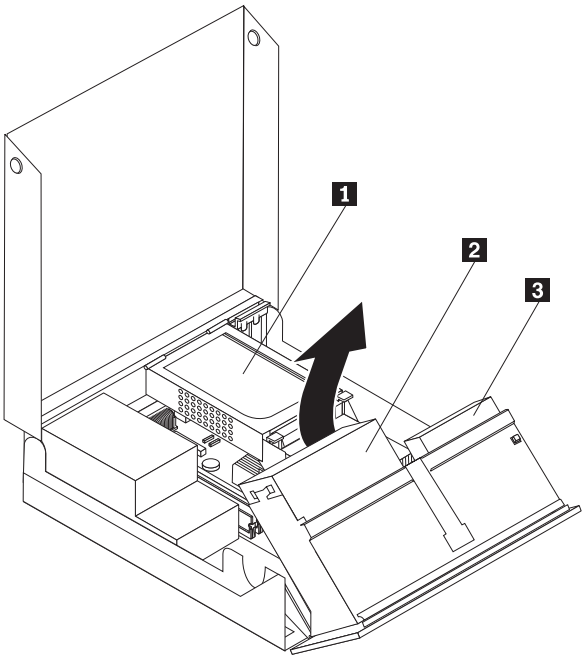


Figure 8. Drive bay locations

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 drives, such as CD drive or DVD drive (preinstalled in some models) 3.5-inch hard disk drive (requires a Universal Adapter Bracket, 5.25 to 3.5-inch) * 5.25-inch hard disk drive
2 Bay 2 - Maximum height: 12.7 mm (0.5 in.)	3.5-inch diskette drive (preinstalled in some models)
3 Bay 3 - Internal hard disk drive	5.25-inch 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

To install an optical drive in bay 1:

1. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive bay assembly upward to gain access to the cable connections and remove the drive cables from the drive. See Figure 9.

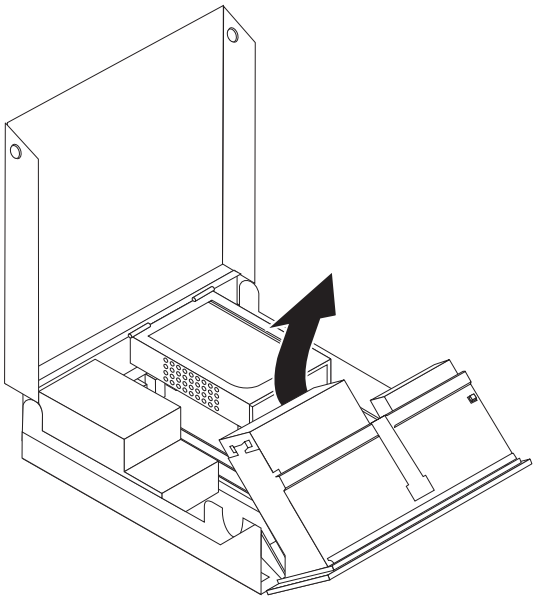


Figure 9. Pivoting the drive bay

3. Remove the metal shield from the drive bay by using a flat-blade screwdriver to gently pry it loose.
4. If you are installing a drive with accessible media, such as an optical drive, remove the plastic panel in the bezel by squeezing the plastic tabs that secure the panel on the inside of the bezel.

   Note: If you are installing a 3.5-inch hard disk drive you must use a Universal Adapter Bracket, 5.25 to 3.5-inch. You can obtain this bracket from a local computer retailer or by contacting the Customer Support Center.
5. Slide the drive **3** into the bay until it locks in position. See Figure 10 on page 18.

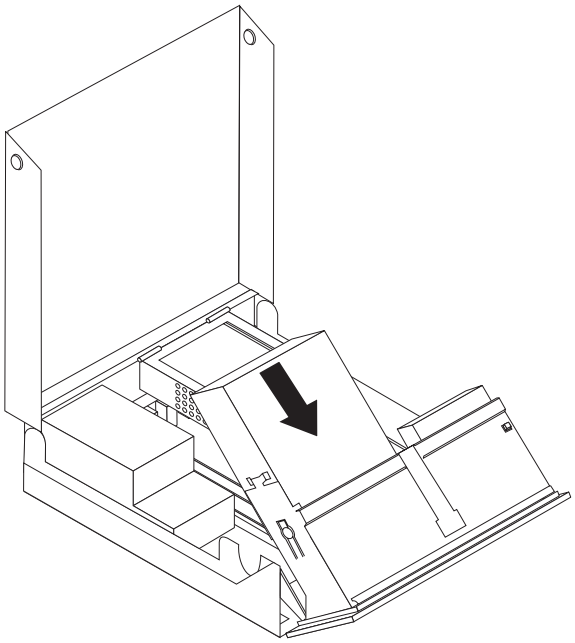


Figure 10. Locking the optical drive

6. Pivot the drive-bay assembly upward to gain access to the cable connections and connect the drive cables.
7. Reinstall the front bezel.
8. Continue at "Connecting a SATA drive."

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

1. Locate the available SATA connector on the system board. See "Identifying parts on the system board" on page 9.
2. Using the signal cable that came with the new drive, connect one end of the signal cable to the drive and the other to the available SATA connector on the system board.

3. Locate one of the extra five-wire power connectors and connect it to the drive. See Figure 11.

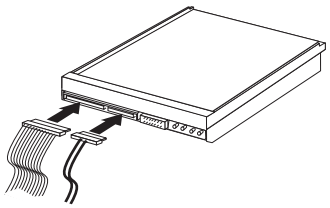


Figure 11. Connecting the five-wire power connector to the drive

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 41.

Installing a diskette drive in bay 2

To install a diskette drive in bay 2:

1. Open the computer cover. See "Opening the cover" on page 12.
2. Remove the front bezel by releasing the three tabs as shown and pivoting the bezel outward from the top. See Figure 12.

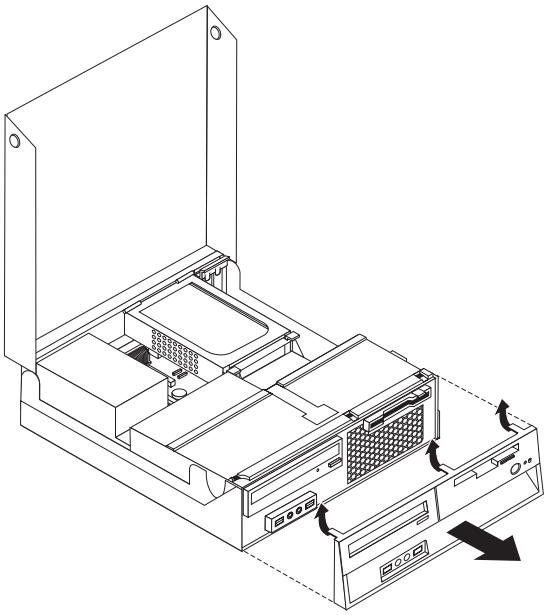


Figure 12. Removing the front bezel

3. Pivot the drive bay assembly upward to gain access to the cable connections and disconnect the drive bay cables.. See Figure 13 on page 20.

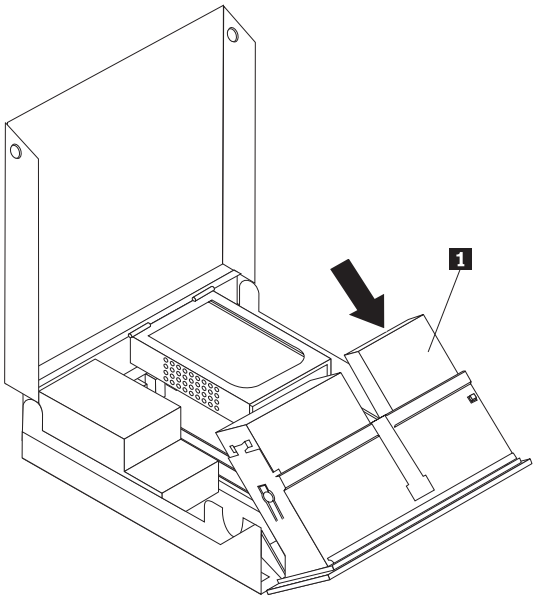


Figure 13. Accessing the cable connections

4. Remove the metal shield from the diskette drive bay by using a flat-blade screwdriver to gently pry it loose.
5. Remove the plastic panel in the bezel by squeezing the plastic tabs that secure the panel on the inside of the bezel.
6. Slide the diskette drive lock to the unlock position. See “Locating components” on page 7.
7. Connect the flat cable to the new drive.

8. Install the new drive 1 from the rear of the drive-bay assembly and slide the diskette-drive 1 to the locked position. See Figure 14.

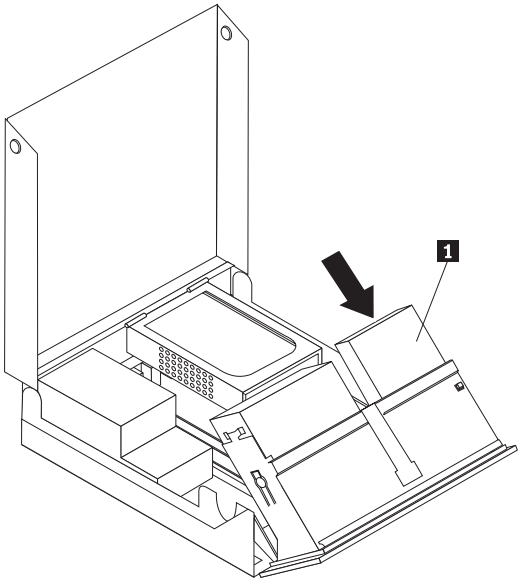


Figure 14. Installing a new drive

9. Reinstall the front bezel.

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 41.

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 ThinkVantage Productivity Center program.

To erase a forgotten password:

1. Open the computer cover. See "Opening the cover" on page 12.
2. Access the system board. See "Accessing system board components and drives" on page 13.
3. Locate the Clear CMOS/Recovery jumper on the system board. See "Identifying parts on the system board" on page 9.
4. Move the jumper from the standard position (pins 1 and 2) to the maintenance or configure position (pins 2 and 3).
5. Reinstall the PCI-riser assembly if removed.
6. Lower the drive-bay assembly and reconnect any cables that were disconnected.
7. Close the computer cover and connect the power cord. See Chapter 4, "Completing the parts replacement," on page 41.

8. 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.
9. Repeat steps 1 through 3 on page 22.
10. Move the Clear CMOS/Recovery jumper back to the standard position (pins 1 and 2).
11. Reinstall the PCI-riser assembly if removed.
12. Close the computer cover and connect the power cord. See Chapter 4, "Completing the parts replacement," on page 41.

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. Open the computer cover. See "Opening the cover" on page 12.
3. Access the system board. See "Accessing system board components and drives" on page 13.
4. Locate the battery. See "Identifying parts on the system board" on page 9.
5. Remove the old battery. See Figure 15.

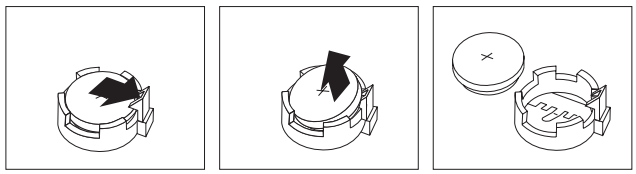


Figure 15. Battery removal

6. Install the new battery. See Figure 16.

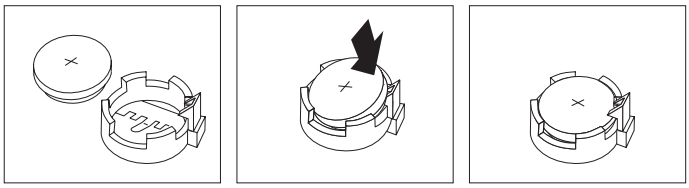


Figure 16. Battery installation

7. Close the computer cover, and connect the cables. See Chapter 4, "Completing the parts replacement," on page 41.

   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.
8. Turn on the computer and all attached devices.
9. Use the Setup Utility program to set the date and time and any passwords. See *ThinkCentre User Guide*, "Using the Setup Utility".

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.

To replace the power supply assembly:

1. Remove the four screws at the rear of the chassis that secure the power supply. See Figure 17.

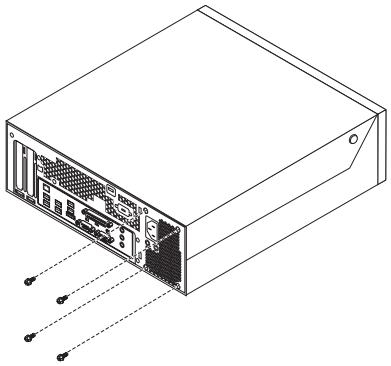


Figure 17. Power-supply-retaining screws

2. Open the computer cover. See "Opening the cover" on page 12.
3. Pivot the drive bay assembly upward to gain access to the system board. See Figure 18.

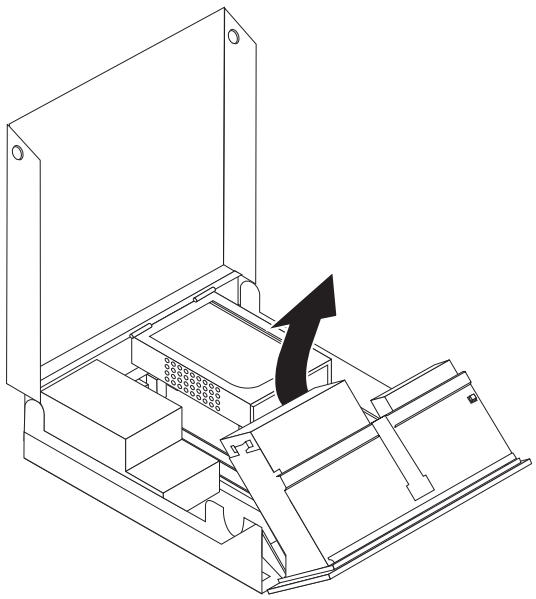


Figure 18. Accessing the system board

4. Remove the hard disk drive. See "Replacing a hard disk drive" on page 29.
5. Locate the power-supply assembly. See "Locating components" on page 7.

6. Disconnect the power supply cables 1 and 2 from the system-board connectors and from all drives. See Figure 19.

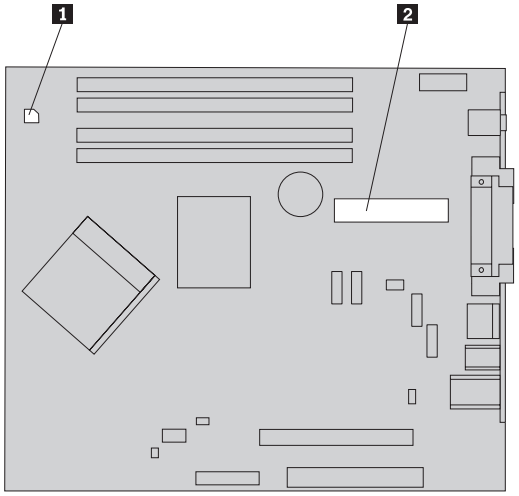


Figure 19. System-board connectors

7. Remove the power-supply cables from the cable clips and ties.
8. Slide the power-supply assembly away from the chassis and remove it from the computer. See Figure 20.

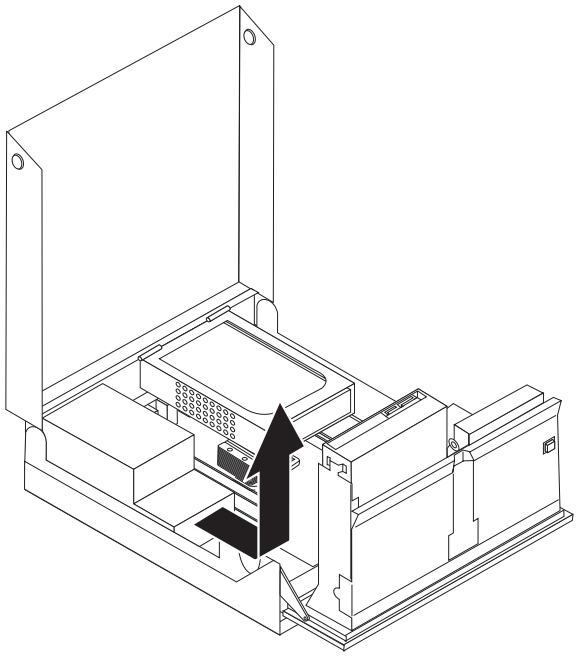


Figure 20. Removing the power supply

9. Install the new power-supply assembly into the chassis so that the screw holes in the power-supply assembly align with those in the chassis.

   Note: Use only the screws provided by Lenovo.
10. Install and tighten the four screws at the rear of the chassis to secure the power-supply assembly.

11. Check the position of the voltage-selection switch on the rear of the computer. Use a ballpoint pen to slide the switch, if necessary.

    Note: Some computers do not have a voltage switch. These computers automatically control the voltage.
    - If the voltage supply range is 100–127 V ac, set the switch to 115 V.
    - If the voltage supply range is 200–240 V ac, set the switch to 230 V.
12. Reconnect all the power supply cables to the drives and the system board.
13. Go to Chapter 4, "Completing the parts replacement," on page 41.

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.

To replace the heat sink:

1. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive-bay assembly upward to gain access to the heat sink. See Figure 21.

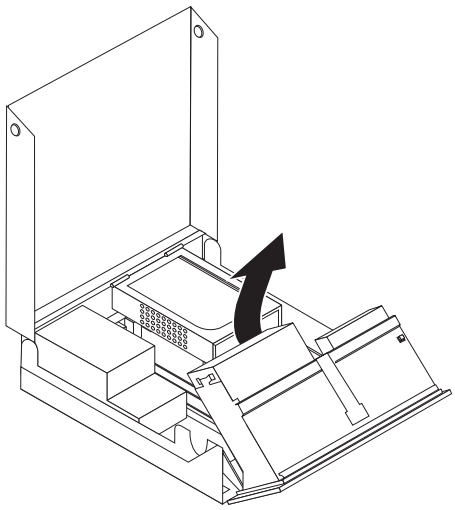


Figure 21. Accessing the heat sink

3. Remove the heat sink from the system board by pivoting the lever **1** securing the heat sink until it is fully in the up position. Carefully lift the heat sink off of the system board. See Figure 22 on page 28.

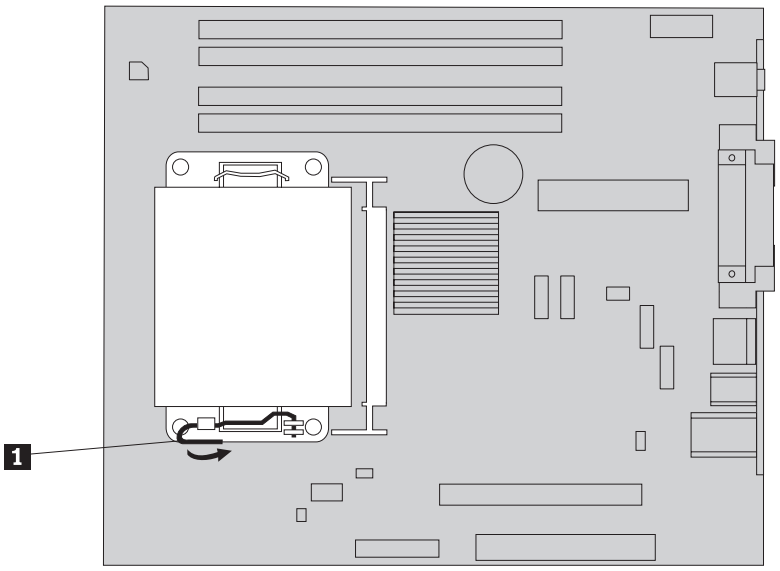


Figure 22. Removing the heat sink

4. Place the new heat sink into position and lower the lever to secure the heat sink.
5. Go to Chapter 4, “Completing the parts replacement,” on page 41.

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 CDs*. The set of *Product Recovery CDs* 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 *ThinkCentre User Guide*.

To replace the hard disk drive:

1. Open the computer cover. See "Opening the cover" on page 12.
2. Locate the hard disk drive. See Figure 23.

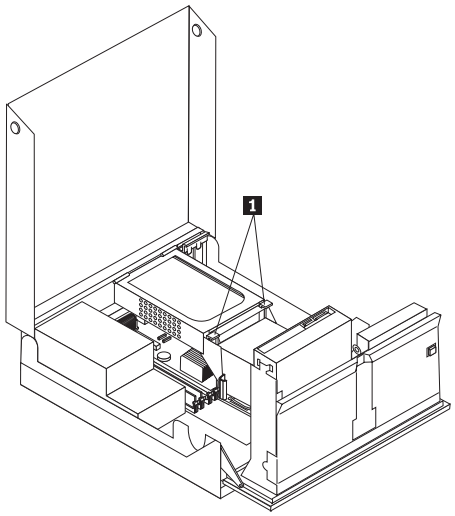


Figure 23. Accessing the hard drive

3. Unlatch the hard disk drive front retainers **1** and rotate the hard disk drive upwards and lift up to remove the hard disk drive from the computer.

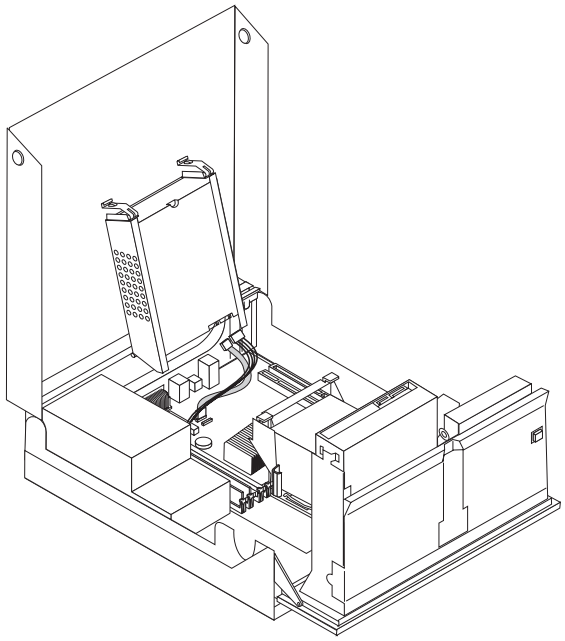


Figure 24. Removing the hard disk drive

4. Disconnect the signal and power cables from the rear of the hard disk drive.

5. Remove the failing hard disk drive from the bracket by flexing the bracket.

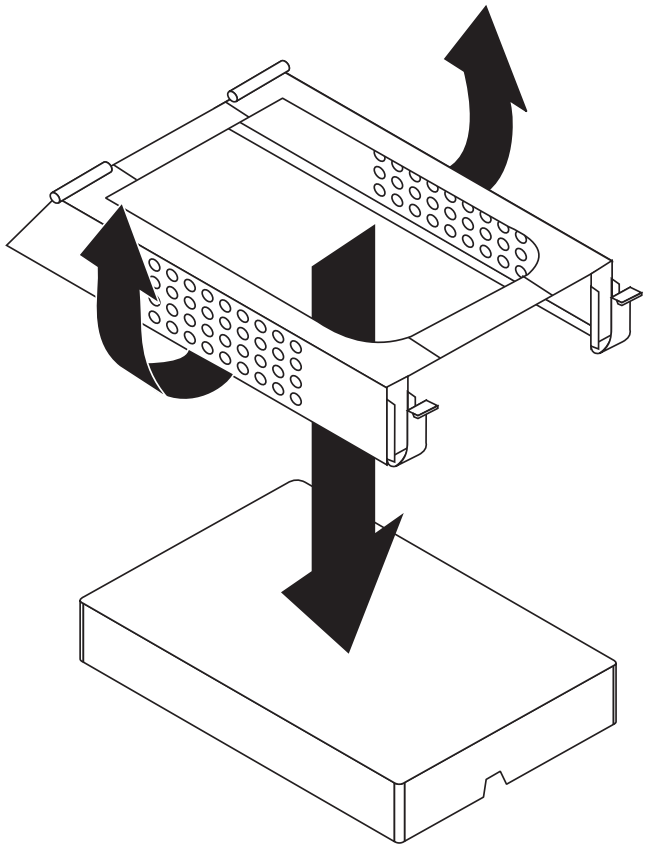


Figure 25. Removing the hard disk drive and disconnecting the cables

6. Install the new drive, flex the bracket, and align the pins on the bracket with the recesses in the hard disk drive bracket.

> **Important**
> Do not touch the circuit board on the bottom of the hard disk drive.

7. Connect the signal and power cables to the rear of the new hard disk drive.
8. Install the hard disk drive and bracket into the rear retainer and rotate down until the hard disk drive front retainer latches snap in place.
9. Go to Chapter 4, "Completing the parts replacement," on page 41.

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.

To replace an optical drive:

1. Open the computer cover. See "Opening the cover" on page 12.

2. Pivot the drive-bay-assembly upward to gain access to the optical drive. See Figure 26.

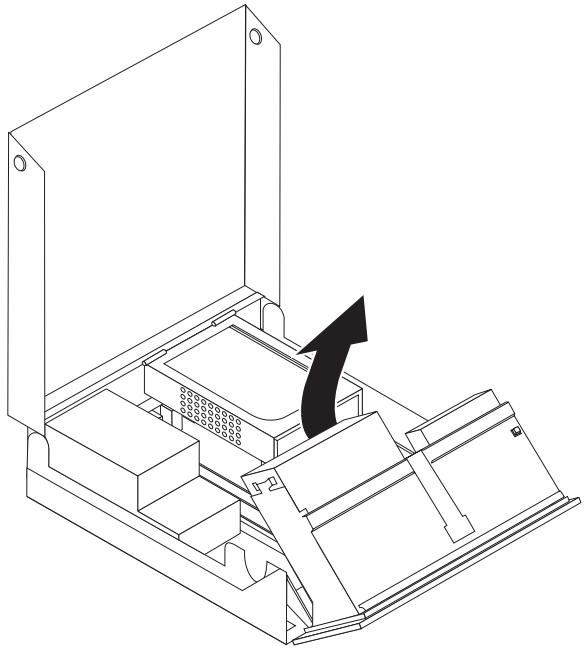


Figure 26. Accessing the optical drive

3. Disconnect the signal and power cables from the rear of the optical drive.
4. Press the optical-drive lock **1** .
5. Slide the optical drive up **3** out the drive bay assembly. See Figure 27.

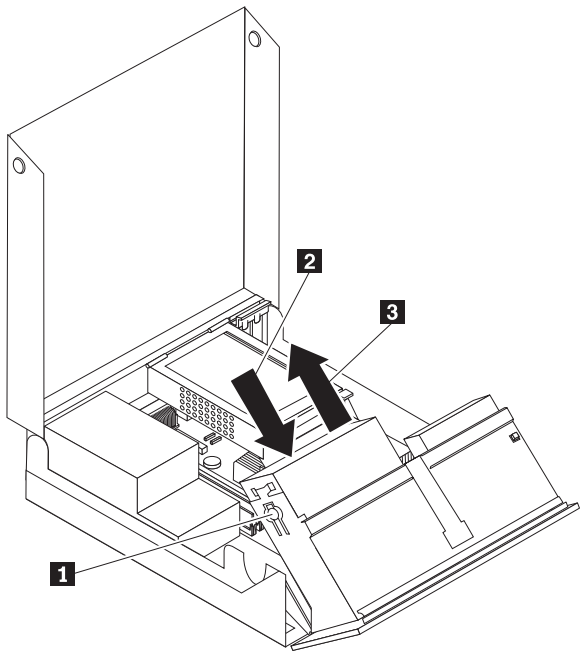


Figure 27. Removing the optical drive

6. Install the new optical drive into the bay.

7. Slide the optical-drive **2** to the locked position.
8. Connect the signal and power cables to the rear of the optical drive.
9. Go to Chapter 4, "Completing the parts replacement," on page 41.

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. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive-bay assembly upward to gain access to the diskette drive. See Figure 28.

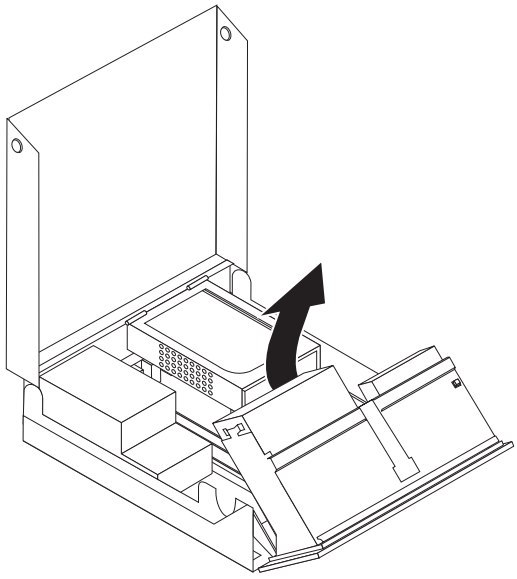


Figure 28. Accessing the diskette drive

3. Press the diskette-drive lock **1**.
4. Slide the diskette drive up and out of the drive bay assembly. See Figure 29 on page 34.

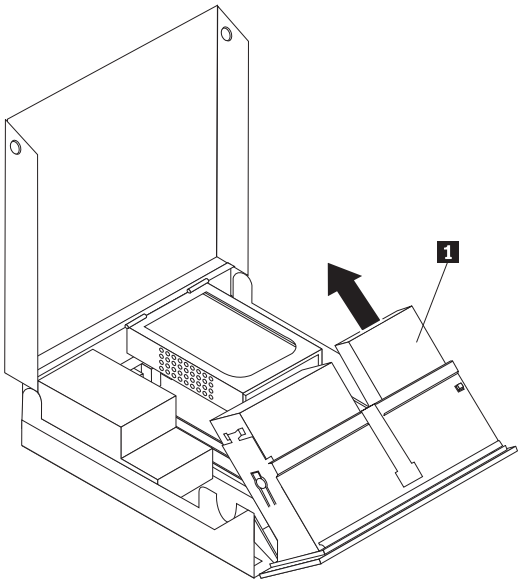


Figure 29. Removing the diskette drive

5. Disconnect the flat cable from the rear of the failing diskette drive.
6. Connect the flat cable to the new diskette drive.
7. Remove the diskette drive adapter from the lock side of the disk drive. Save the adapter to reuse when installing the new disk drive.
8. Position the disk drive adapter on the new disk drive (align the adapter with the holes in the disk drive).
9. Install the new drive from the rear of the drive-bay assembly and lock the drive into position.
10. Go to Chapter 4, "Completing the parts replacement," on page 41.

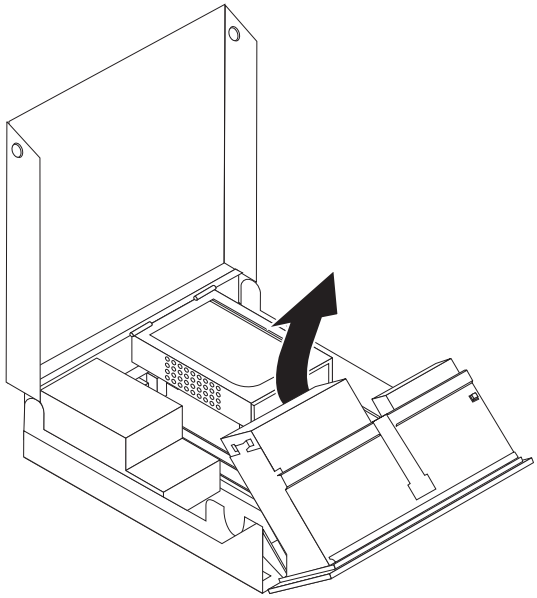
Installing or replacing a memory module

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. Your computer has support for two memory modules.

1. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive-bay assembly upward to gain access to the system board.



3. Locate the memory connectors. See “Identifying parts on the system board” on page 9.
4. Remove the memory module being replaced by opening the retaining clips as shown. See Figure 30.

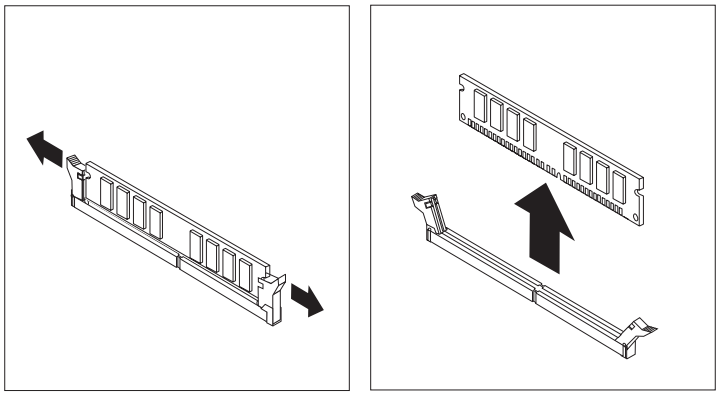


Figure 30. Removing the memory module

5. 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. See Figure 31 on page 36.

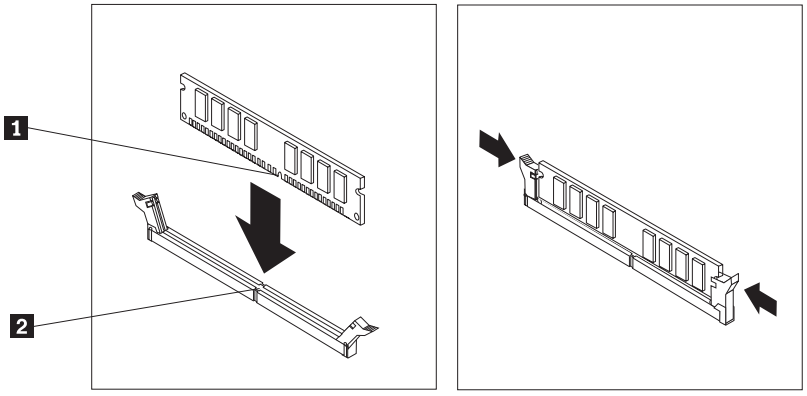


Figure 31. Installing the memory module

6. Go to Chapter 4, "Completing the parts replacement," on page 41.

Replacing a adapter card

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 adapter card.

1. Open the computer cover. See "Opening the cover" on page 12.
2. Rotate the adapter card retainer **1** to the open position to remove a failing adapter card or to add an adapter card. See Figure 32.

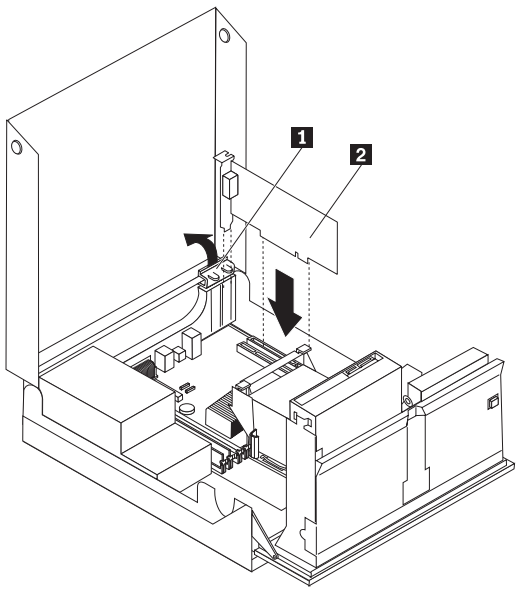


Figure 32. Opening the adapter card retainer and removing the adapter card

3. Remove the adapter card **2**.
4. Remove the new adapter from its static-protective package.

5. Install the new adapter card **2** in the adapter card connector.
6. Ensure the adapter is fully seated into the adapter connector.
7. Close the adapter card retainer.
8. Go to Chapter 4, "Completing the parts replacement," on page 41.

Replacing the 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 fan assembly.

1. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive-bay assembly upward to gain access to the fan assembly **1**. See Figure 33.

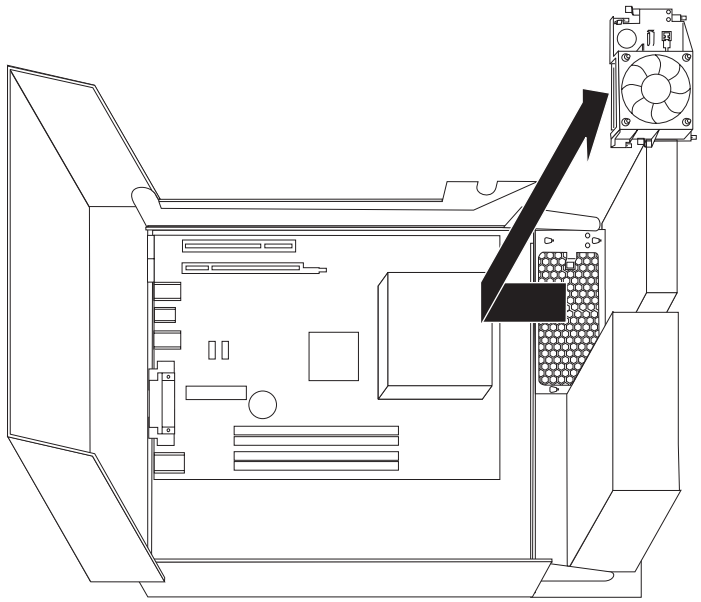


Figure 33. Accessing the fan assembly

3. Disconnect the fan-assembly cables from the system board. See "Identifying parts on the system board" on page 9.

   Note: Make sure you note the location of the fan cables when you disconnect the cables from the system board.
4. Remove the plastic fan insert behind the bezel by releasing the retaining tabs.
5. Install the new fan assembly and connect the fan cables to the system board.
6. Reinstall the plastic fan insert.
7. Reinstall the front bezel.
8. Go to Chapter 4, "Completing the parts replacement," on page 41.

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 34.

   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.

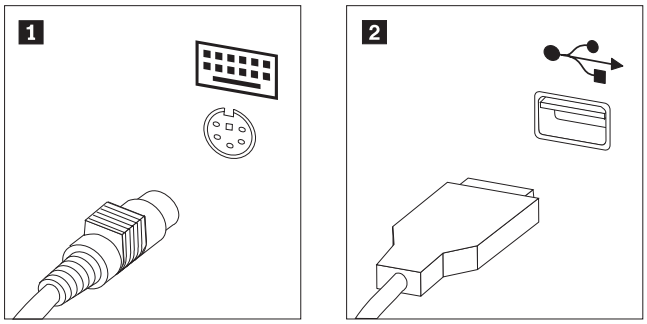


Figure 34. Keyboard connectors, standard and USB

4. Disconnect the failing keyboard cable from the computer.
5. Connect the new keyboard cable to one of the USB connectors.
6. Go to Chapter 4, "Completing the parts replacement," on page 41.

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 connector for the mouse. See Figure 35 on page 39 and "Locating controls and connectors on the front of your computer" on page 5 or "Locating

connectors on the rear of your computer" on page 6.

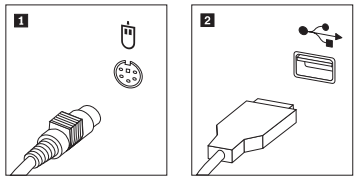


Figure 35. Replacing a mouse

4. Disconnect the failing mouse cable from the computer.
5. Connect the new mouse cable to one of the USB connectors.
6. Go to Chapter 4, "Completing the parts replacement," on page 41.

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 7 for the location of various components.
2. Make sure that the cables are routed correctly before lowering the drive-bay assembly.

> **Important**
> Correctly route all power supply cables to avoid interference with the drive bay assembly. Keep cables clear of the hinges and sides of the computer chassis.

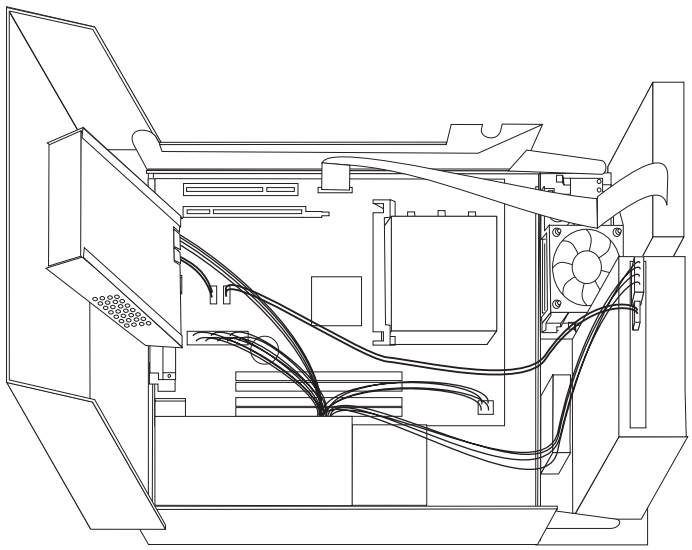


Figure 36. Cable routing

3. Lower the drive-bay assembly and position the drive locks to the locked position. Otherwise, you cannot close the computer cover.
4. Close the computer cover.
5. If a cover lock is installed, lock the cover.
6. Reconnect the external cables and power cords to the computer. See "Locating connectors on the rear of your computer" on page 6.

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7. If you are replacing the system board or microprocessor, you must update (flash) the BIOS. See “Updating (flashing) BIOS from a diskette or CD-ROM” on page 43.
8. To update your configuration, see ″Using the Setup Utility program″ in the *ThinkCentre User Guide*.

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.

Updating (flashing) BIOS from a diskette or CD-ROM

Important

Start the Setup Utility program to view your system information. See "Using the Setup Utility program" in the *User Guide* for this product. If the serial number and the machine type/model listed on the Main menu do not match what is printed on the label of your computer, you must update (flash) the BIOS to change the serial number and the machine type/model.

To update (flash) the BIOS from a diskette or CD-ROM, do the following:

1. Insert a system program update (flash) diskette or CD into the diskette drive or optical drive. System program updates are available at http://www.lenovo.com/support on the World Wide Web.

   Note: If you are inserting a CD-ROM into the optical drive, make sure that the computer is turned on.
2. Turn on the computer. If it is on already, you must turn it off and back on again. The update begins.
3. When you are prompted to select a language, press the number on your keyboard that corresponds to the language and then press **Enter**.
4. When prompted to change the serial number, press **Y**.
5. Type the seven-character serial number of your computer and then press **Enter**.
6. When prompted to change the machine type/model, press **Y**.
7. Type the seven-character machine type/model of your computer and then press **Enter**.
8. Follow the instructions on the screen to complete the update.

Recovering from a POST/BIOS update failure

If power to your computer is interrupted while POST/BIOS is being updated (flash update), your computer might not restart correctly. If this happens, perform the following procedure commonly called Boot-block Recovery.

1. Turn off the computer and any attached devices, such as printers, monitors, and external drives.
2. Unplug all power cords from electrical outlets, and open the computer cover. See "Opening the cover" on page 12.
3. Access the system board. See "Accessing system board components and drives" on page 13.
4. Locate the Clear CMOS/Recovery jumper on the system board. See "Identifying parts on the system board" on page 9.
5. Remove any cables that impede access to the Clear CMOS/Recovery jumper.
6. Move the jumper from the standard position (pins 1 and 2) to pins 2 and 3.
7. Reinstall the PCI-riser assembly if removed.
8. Close the computer cover and reconnect any cables that were disconnected.
9. Reconnect the power cords for the computer and monitor to electrical outlets.
10. Insert the POST/BIOS update (flash) diskette into drive A, and turn on the computer and the monitor.
11. The recovery session will take two to three minutes. During this time you will hear a series of beeps. After the update session is completed, there will be no

video, the series of beeps will end, and the system will automatically turn off. Remove the diskette from the diskette drive.

12. Repeat steps 2 through 5.
13. Replace the Clear CMOS/Recovery jumper to its original position.
14. Reinstall the PCI riser assembly if removed.
15. Close the computer cover and reconnect any cables that were disconnected.
16. Turn on the computer to restart the operating system.

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 37. 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*.

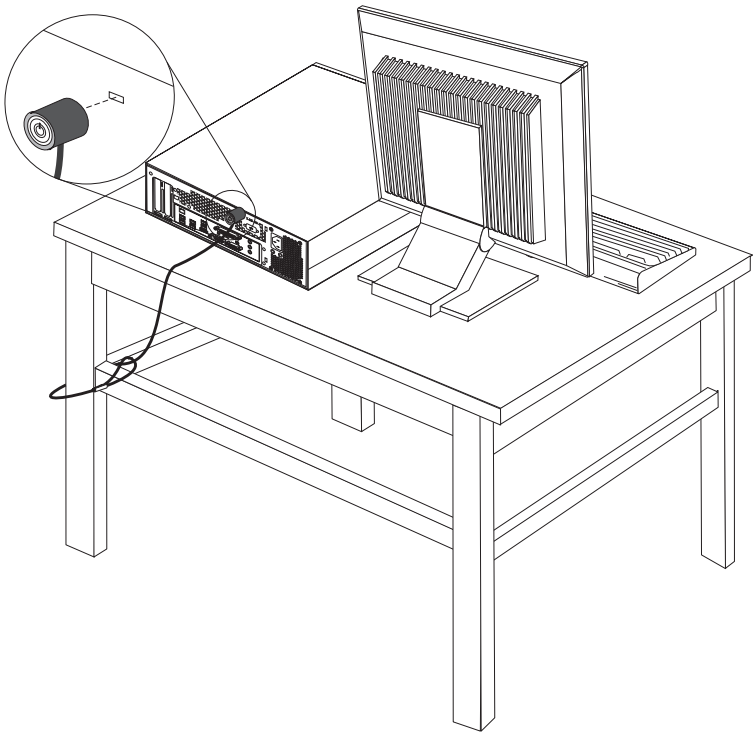

Figure 37. Integrated cable lock

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.

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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 41.

Appendix. Notices

Lenovo may not offer the products, services, or features discussed in this document in all countries. Consult your local Lenovo representative for information on the products and services currently available in your area. Any reference to a Lenovo product, program, or service is not intended to state or imply that only that Lenovo product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any Lenovo intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any other product, program, or service.

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Part Number: 43C6692

Printed in USA

(1P) P/N: 43C6692