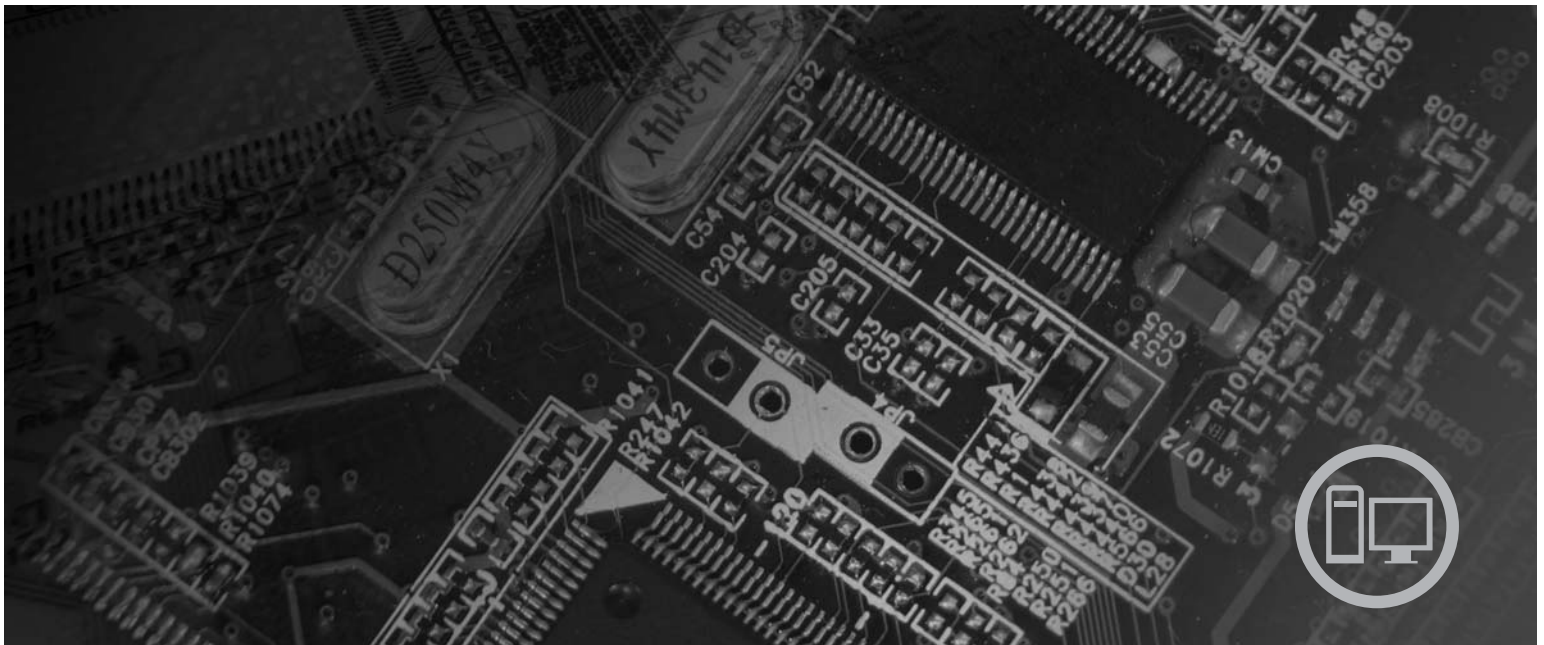


lenovo

ThinkCentre Hardware Installation and Replacement Guide



Machine Types 6062, 6065, 6071, 6076, 6089, 9011, 9014, 9071, 9089,
9162, 9182, 9303

ThinkCentre

**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 45.

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Contents

Figures	v	Replacing the optical drive	23
Chapter 1. Important safety information	1	Replacing a memory module	26
Chapter 2. Overview	3	Replacing a PCI adapter	28
Additional information resources	3	Replacing the system fan	29
Handling static-sensitive devices.	4	Replacing the rear fan bracket assembly	32
Locations	5	Replacing the internal speaker	34
Locating connectors on the front of your computer	5	Replacing a keyboard	36
Locating connectors on the rear of your computer	6	Replacing a mouse	37
Locating components	7	Chapter 4. Completing the parts	
Identifying parts on the system board	9	replacement	39
Chapter 3. Installing options and		Recovering from a POST/BIOS update failure.	41
replacing hardware	11	Obtaining device drivers	41
Installing external options	11	Chapter 5. Security features	43
Installing internal options	12	Integrated cable lock	43
Opening the cover	12	Password protection	43
Replacing the battery	13	Appendix. Notices	45
Replacing the power supply.	13	Television output notice	46
Replacing the heat sink	17	Trademarks	46
Replacing the hard disk drive	20		

Figures

1. Connectors	5	5. Pivoting the cover	12
2. Connector locations	6	6. Removing the battery	13
3. Component locations.	8	7. Cable routing	39
4. System board parts locations	9	8. Integrated cable lock	43

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.

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
- Front Bezel
- Power supply
- System board
- Heat sink
- Hard disk drive
- Optical drive
- Diskette drive
- Memory modules
- PCI adapter
- System fan assembly
- Rear fan assembly
- Internal speaker
- 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>

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 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.

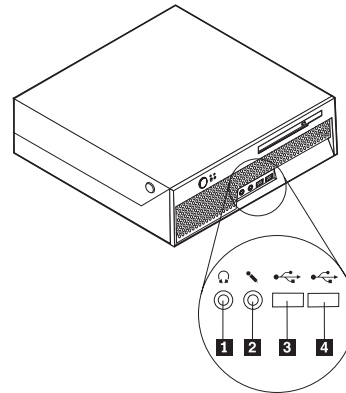


Figure 1. Connectors

- | | | | |
|----------|----------------------|----------|--------------------|
| 1 | Headphone connector | 3 | USB connectors (1) |
| 2 | Microphone connector | 4 | USB connectors (2) |

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.

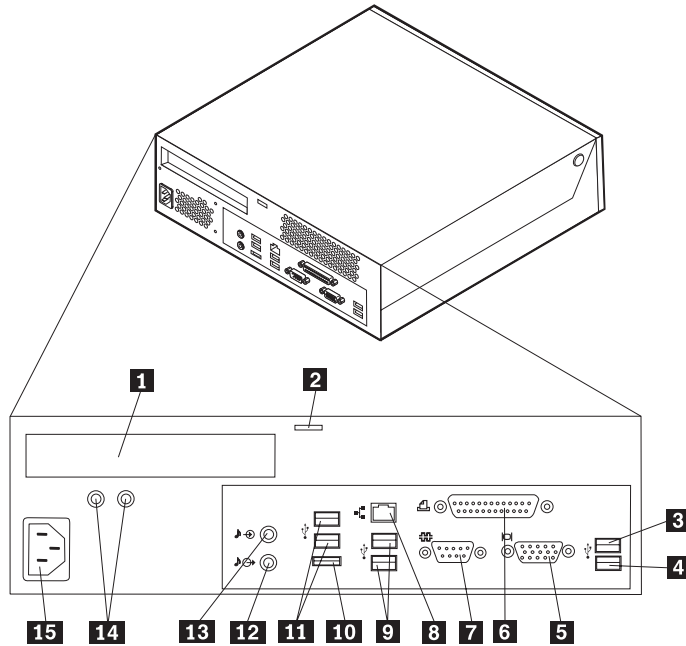


Figure 2. Connector locations

- | | | | |
|----------|-----------------------------|-----------|------------------------------|
| 1 | PCI adapter connector | 9 | USB connectors |
| 2 | Integrated cable-lock latch | 10 | External SATA connector |
| 3 | USB connector | 11 | USB connectors |
| 4 | USB connector | 12 | Audio-line-out connector |
| 5 | VGA monitor connector | 13 | Audio-line-in connector |
| 6 | Parallel connector | 14 | Power-supply-diagnostic LEDs |
| 7 | Serial connector | 15 | Power cord connector |
| 8 | Ethernet 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.

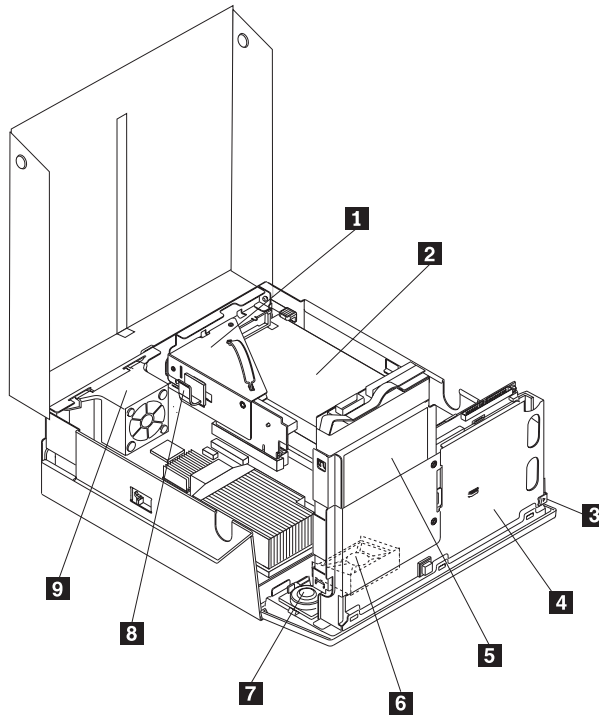


Figure 3. Component locations

- | | | | |
|----------|---|----------|---------------------------|
| 1 | Optical drive (such as a CD or DVD drive) | 6 | System fan |
| 2 | Power supply assembly | 7 | Internal speaker |
| 3 | Optical drive eject button | 8 | Cable clip |
| 4 | Optical drive | 9 | Rear fan bracket assembly |
| 5 | Hard disk drive | | |

Identifying parts on the system board

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

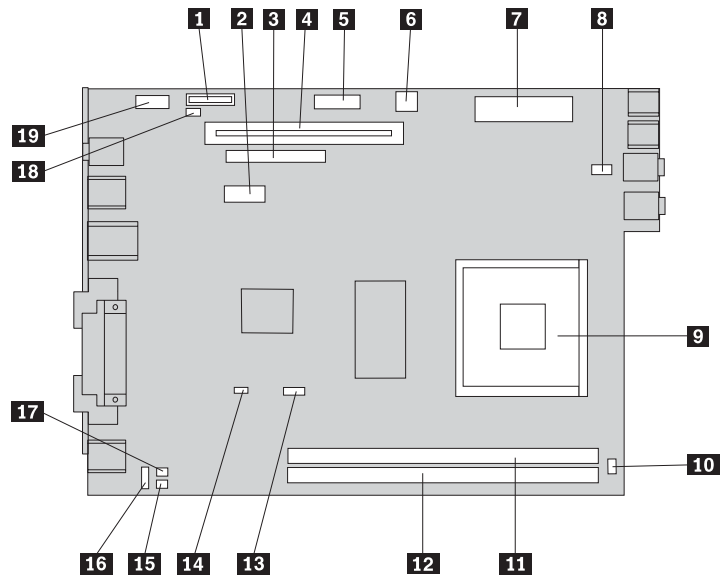


Figure 4. System board parts locations

1	Battery	11	Memory connector 1
2	Serial Advanced Technology Attachment (SATA) IDE connector	12	Memory connector 2
3	Optical drive connector	13	Microprocessor fan connector
4	PCI riser connector	14	Clear CMOS/Recovery jumper
5	Front panel connector	15	Temperature sensor connector
6	12 V power connector	16	Rear fan connector
7	Power connector	17	KB and MS connector
8	System fan connector	18	Cover presence switch connector
9	Microprocessor	19	USB connector
10	Internal speaker 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 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.

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 connectors on the front of your computer” on page 5 and “Locating connectors on the rear of your computer” on page 6.
4. Remove the floor stand, if attached
5. Remove any locking devices, such as a cable lock that secures the computer cover.
6. Press the buttons on the sides of the computer and pivot the cover upward to open the computer.

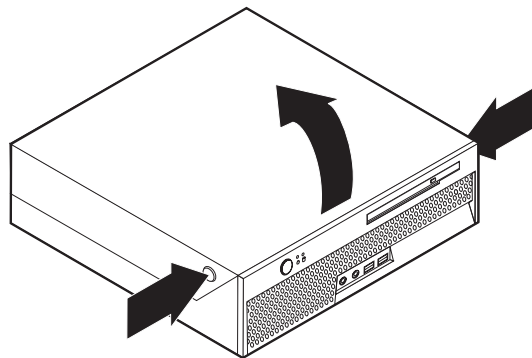
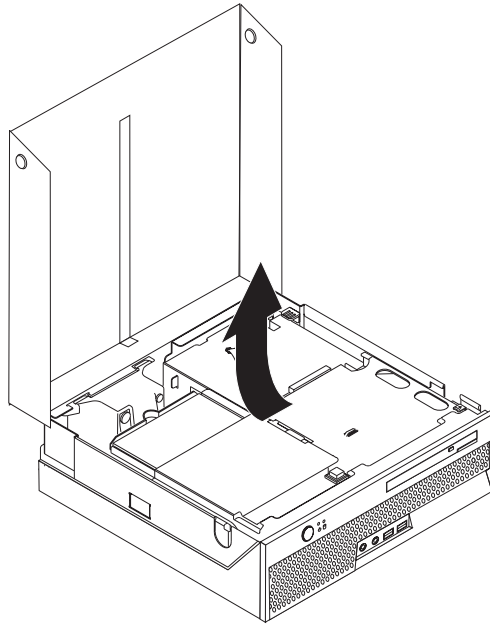


Figure 5. Pivoting the cover

Replacing the battery

1. Open the computer cover. See “Opening the cover” on page 12.
2. Pivot the drive bay assembly upward to gain access to the inside of the computer.



3. Remove the PCI riser. See “Replacing a PCI adapter” on page 28.
4. Remove the battery.

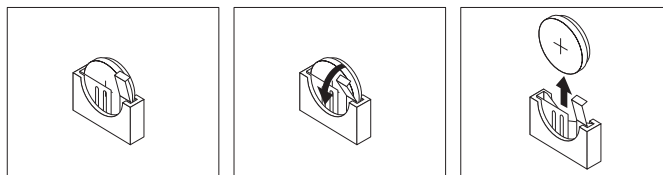


Figure 6. Removing the battery

5. Install the new battery and press into place until the battery retainer secures the battery in place.

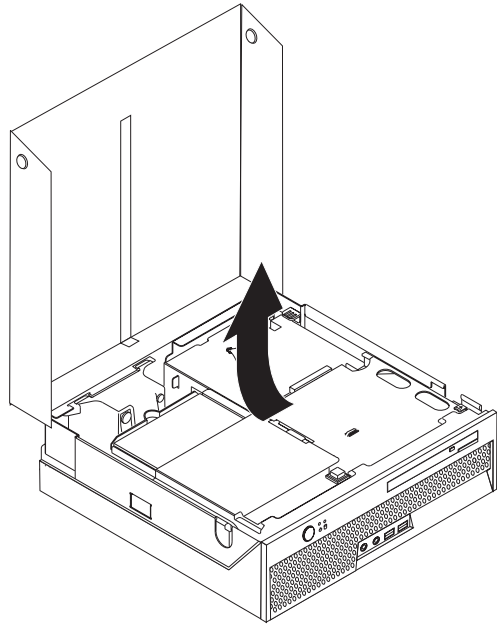
Replacing the power supply

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>.

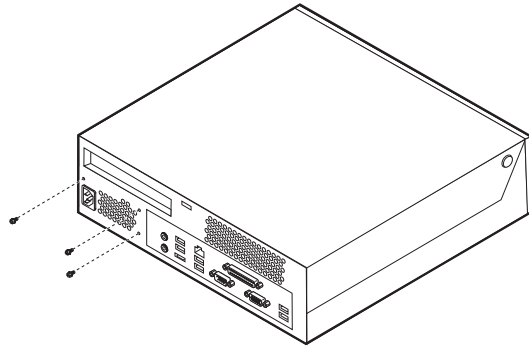
This section provides instructions on how to replace the power supply.

1. Open the computer cover. See “Opening the cover” on page 12.
2. Pivot the drive bay assembly upward to gain access to the power supply.

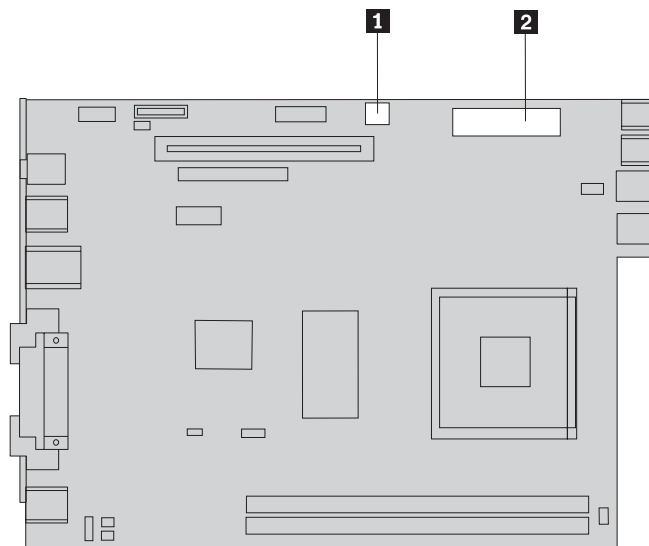


3. Remove the PCI riser. See “Replacing a PCI adapter” on page 28.

4. Remove the three screws at the rear of the chassis securing the power supply.

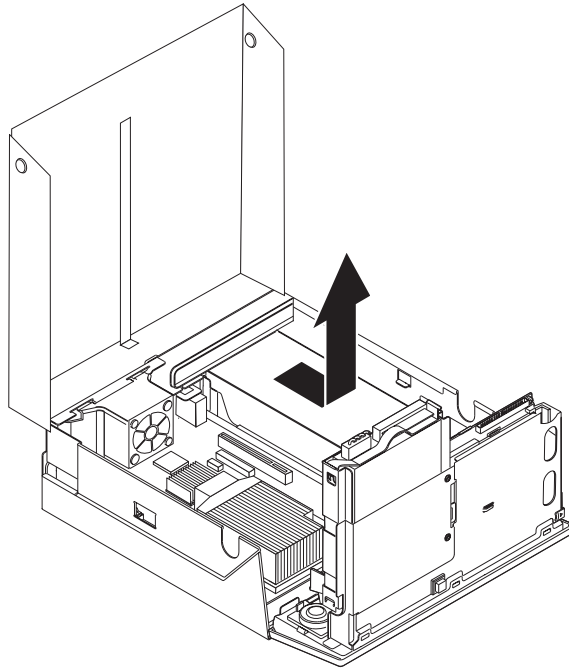


5. Disconnect the power supply cables from the system board connectors **1** and **2** and from all drives.



6. Disconnect the power supply cables from all the drives.

7. Remove the power supply assembly from the computer.



8. 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 that are provided by Lenovo.

9. Install and tighten the three screws at the rear of the chassis to secure the power supply assembly.
10. 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.
11. Reconnect all the power supply cables to the drives and the system board.
 12. Reinstall the PCI riser.
 13. Go to Chapter 4, “Completing the parts replacement,” on page 39.

Replacing the heat sink

Attention

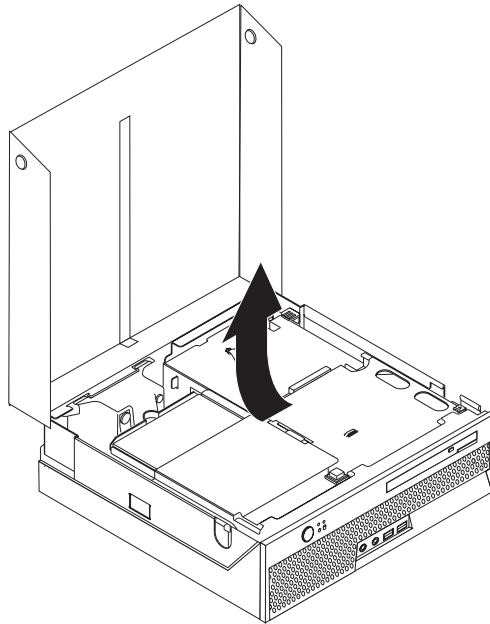
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

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

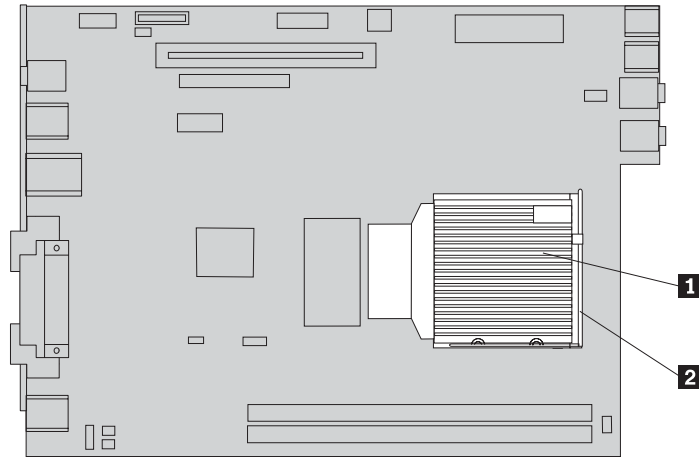
Important

Leave your computer turned off for at least one hour before removing the heat sink to allow the thermal interface between the microprocessor and the heat sink time to cool down.

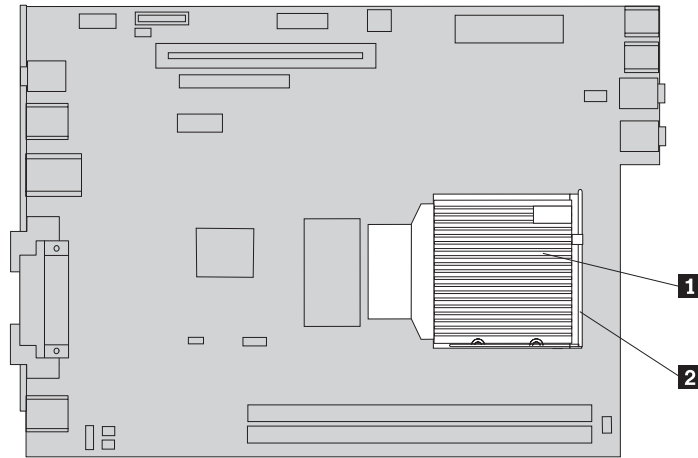
1. Open the computer cover. See “Opening the cover” on page 12.
2. Pivot the drive bay assembly upward to gain access to the system board.



3. Locate the microprocessor fan connector on the system board. See “Identifying parts on the system board” on page 9.
4. Disconnect the microprocessor fan cable from the system board.
5. Remove the heat sink **1** from the system board by pivoting the lever **2** securing the heat sink until it is fully in the up position. Lift the heat sink off of the system board.



6. Place the new heat sink **1** into position and lower the lever **2** to secure the heat sink.



7. Reconnect the microprocessor fan cable to the system board.
8. Go to Chapter 4, "Completing the parts replacement," on page 39.

Replacing the 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.

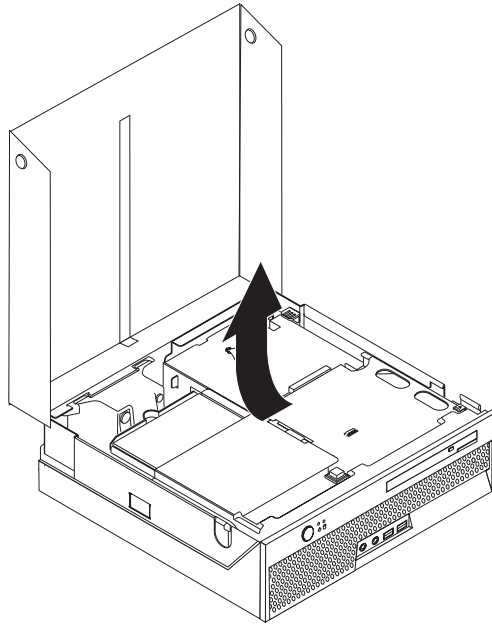
Important

When you receive a new hard disk drive, you also receive a set of *Product Recovery discs*. The set of *Product Recovery discs* 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 *Safety and Warranty Guide*.

To replace a hard disk drive, do the following:

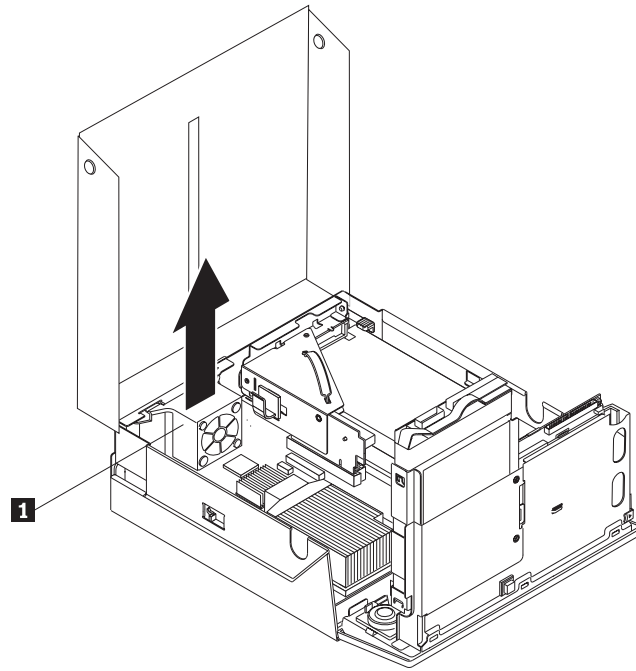
1. Open the computer cover. See “Opening the cover” on page 12.

2. Pivot the drive bay assembly upward to gain access to the hard disk drive.



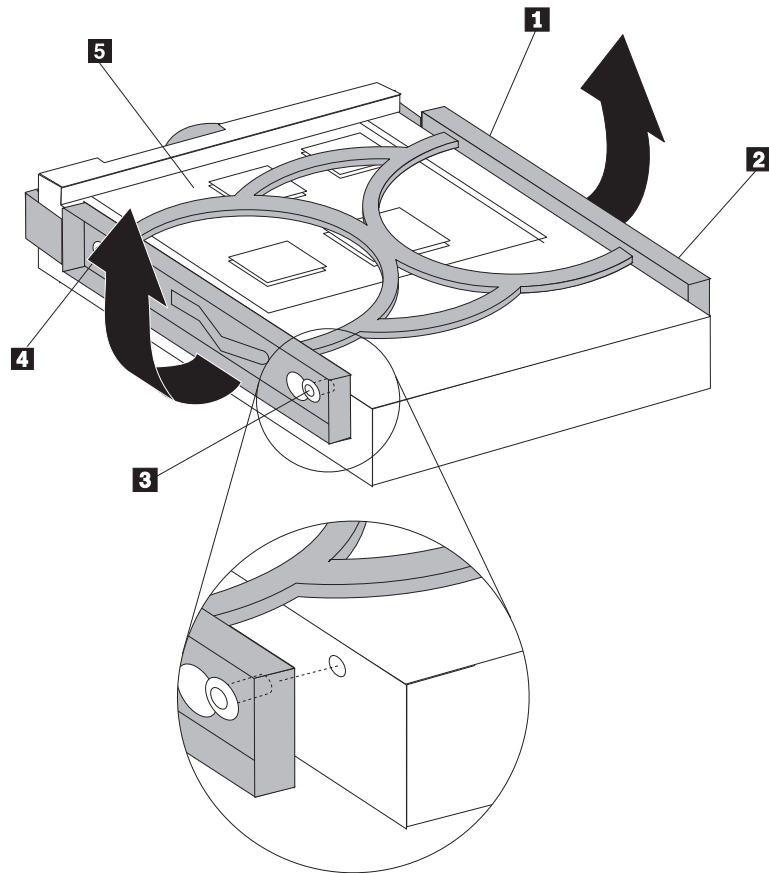
3. Disconnect the signal and power cables from the rear of the hard disk drive.

4. Lift the hard disk drive and bracket up to remove it from the hard drive bay.



5. Remove the failing hard disk drive from the blue bracket by flexing the bracket enough to slide the drive out.

6. 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. Do not touch the circuit board **5** on the bottom of the hard disk drive.



7. Insert the new hard disk drive into the hard drive bay until it snaps into position.
8. Connect the signal and power cables to the rear of the hard disk drive.
9. Go to Chapter 4, "Completing the parts replacement," on page 39.

Replacing the optical drive

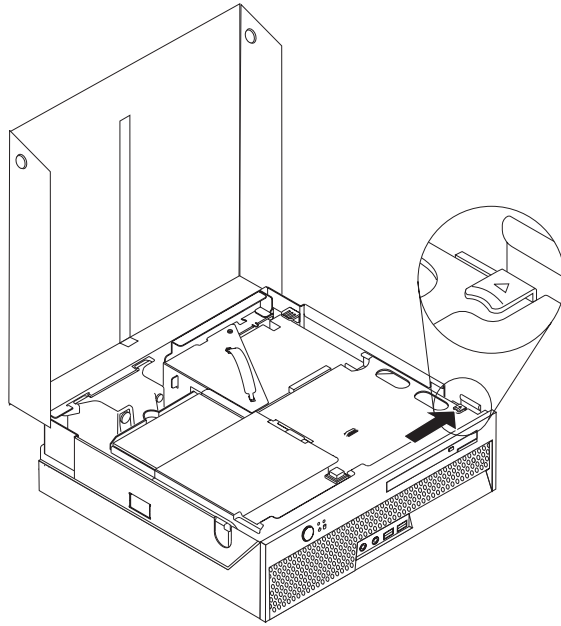
Attention

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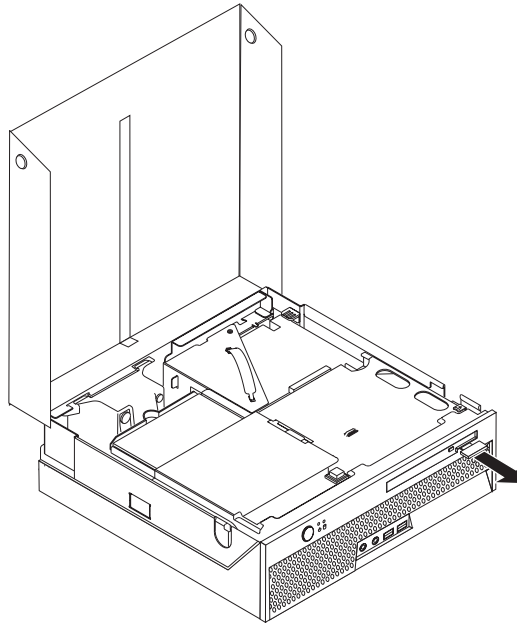
This section provides instructions on how to replace an optical drive.

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

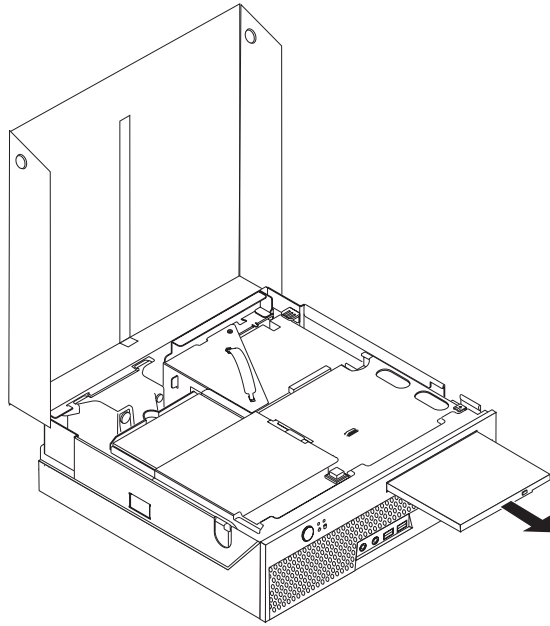
2. Push the optical drive eject button.



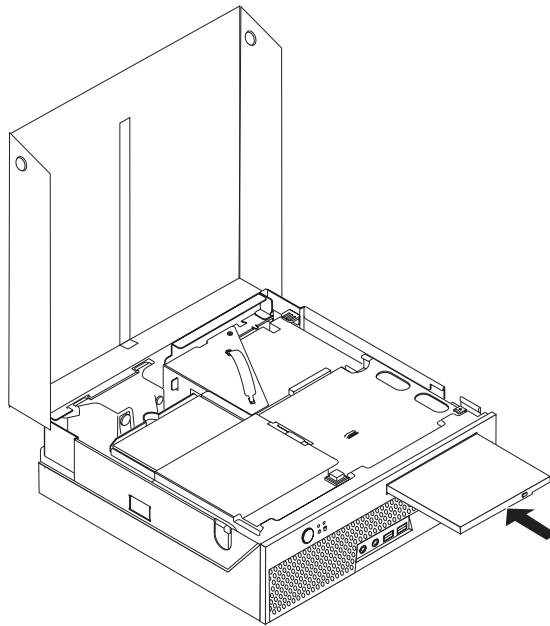
3. Pull the eject bar.



4. Slide the optical drive out of the front of the computer.



5. Slide the new optical drive into the bay until it locks into position.



6. Go to Chapter 4, "Completing the parts replacement," on page 39.

Replacing a memory module

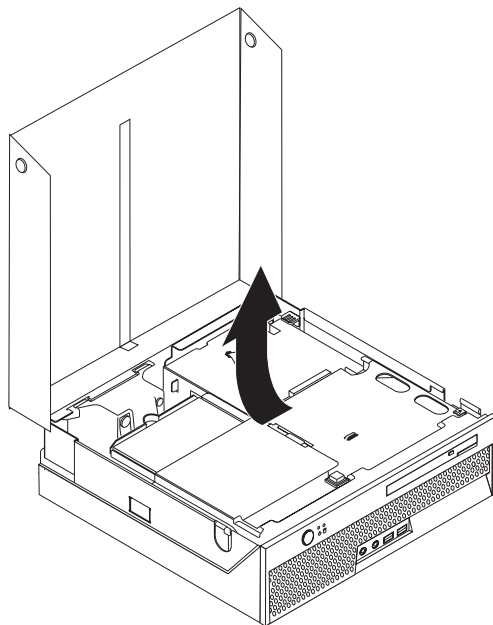
Attention

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.

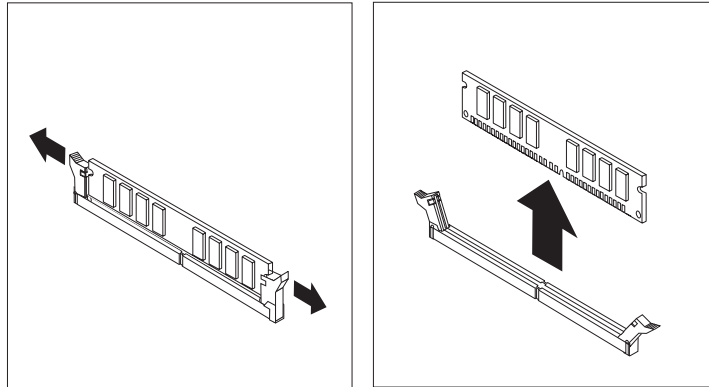
Note: Your computer has support for two memory modules.

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.

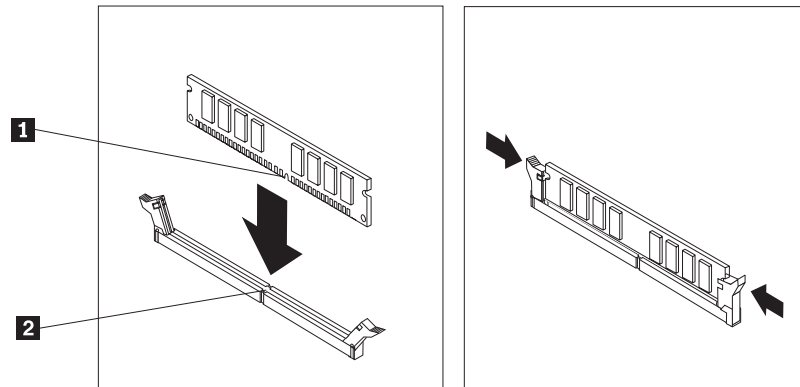


3. Remove any parts that might prevent access to the memory connectors.

4. Remove the memory module being replaced by opening the retaining clips as shown.



5. Position the replacement memory module over the memory connector. 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 memory connector until the retaining clips close.



6. Go to Chapter 4, "Completing the parts replacement," on page 39.

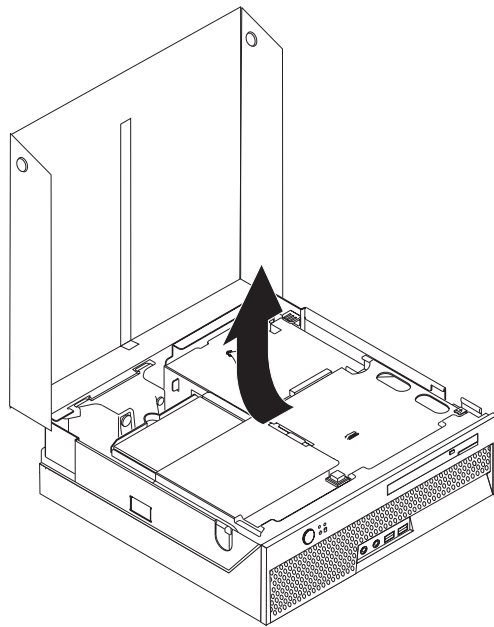
Replacing a PCI adapter

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>.

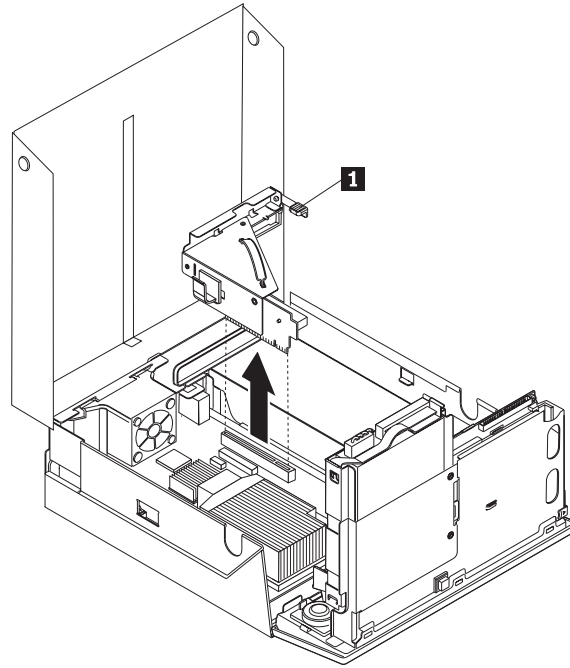
This section provides instructions on how to replace a PCI adapter.

1. 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.

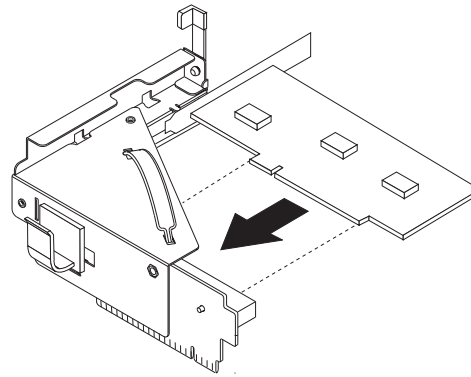


3. Locate the cable clip. See "Locating components" on page 7.
4. Remove all cables from the cable clip attached to the PCI riser.

5. Pull upward on the blue handle **1** to remove the PCI riser from the computer.



6. Pivot the adapter latch upward and remove the failing adapter.
7. Remove the new adapter from its static-protective package.
8. Install the new adapter into the expansion connector in the PCI riser.



9. Pivot the adapter latch down to retain the adapter.
10. Reinstall the PCI riser into the system board.
11. Go to Chapter 4, "Completing the parts replacement," on page 39.

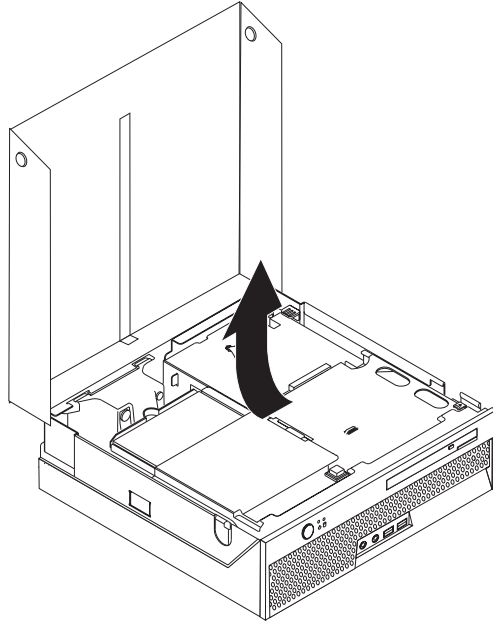
Replacing the system fan

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 system fan.

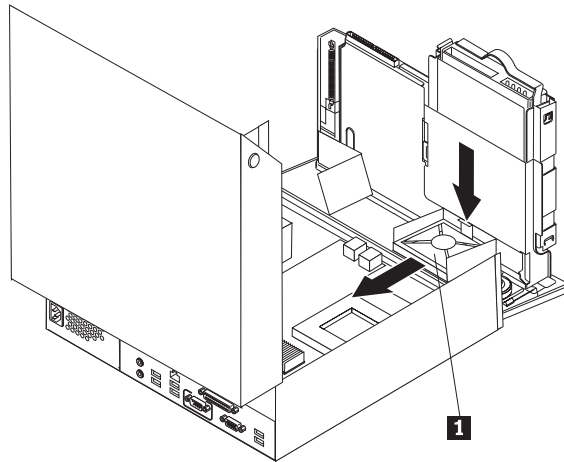
1. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive bay assembly upward to gain access to the system fan.



3. Locate the system fan. See "Locating components" on page 7.
4. Disconnect the system fan cable from the system board. See "Identifying parts on the system board" on page 9.

Note: Make sure you note the location of the system fan cable when you disconnect it from the system board.

5. Press the tab at the top front of the system fan.
6. Remove the system fan **1** by sliding the tabs out of the side slots and lifting out.



7. Install the new system fan and connect the system fan cable to the system board.
8. Go to Chapter 4, “Completing the parts replacement,” on page 39

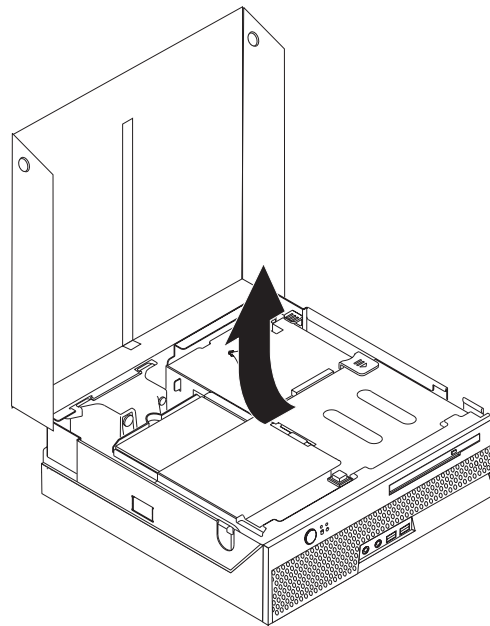
Replacing the rear fan bracket assembly

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 bracket 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 rear fan bracket assembly.

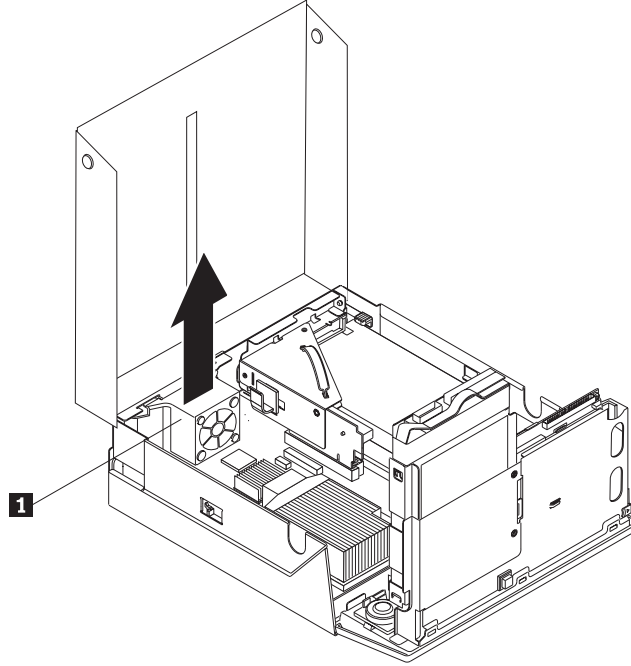


3. Locate the rear fan bracket assembly. See "Locating components" on page 7.

4. Disconnect the rear fan cable from the system board. See “Identifying parts on the system board” on page 9.

Note: Make sure you note the location of the rear fan cable when you disconnect it from the system board.

5. Lift the rear fan bracket assembly out of the slots **1**.



6. Install the new rear fan bracket assembly and connect the rear fan cable to the system board.
7. Go to Chapter 4, “Completing the parts replacement,” on page 39.

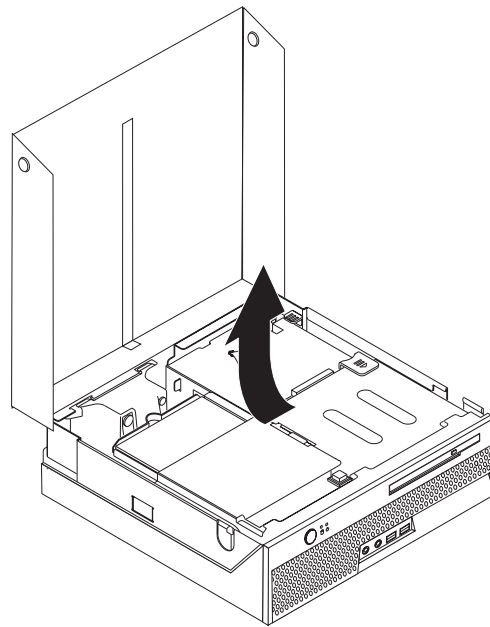
Replacing the internal speaker

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 internal speaker.

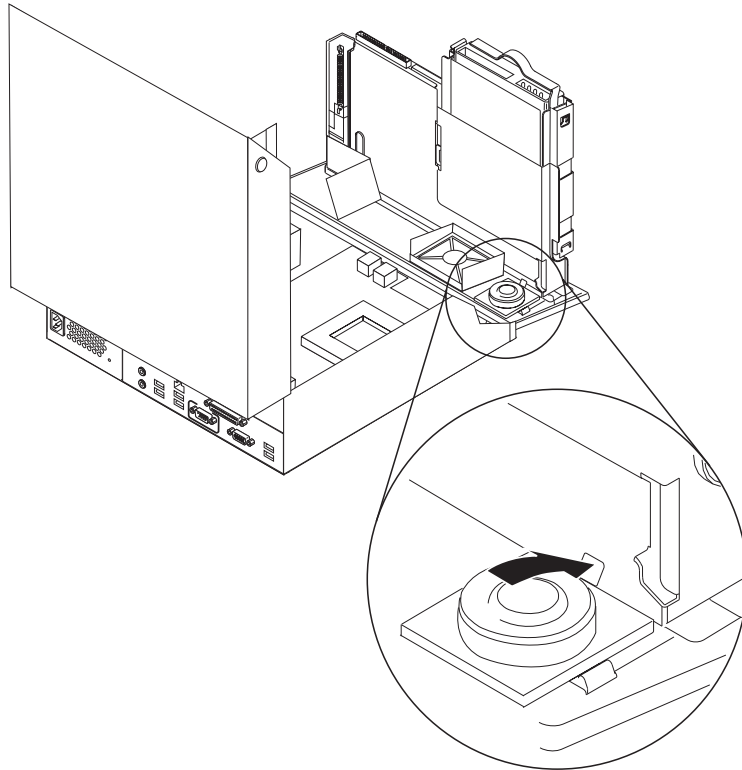
1. Open the computer cover. See "Opening the cover" on page 12.
2. Pivot the drive bay assembly upward to gain access to the speaker connector.



3. Locate the speaker connector on the system board. See "Identifying parts on the system board" on page 9.
4. Disconnect the speaker cable from the system board.

5. Push downward on the metal tab shown while lifting the speaker out from the computer.

Note: You might need a flat-blade screwdriver to gently pry the speaker from the metal tabs that secure it.



6. Position the bottom of the new speaker into the metal tabs then pivot the top of the speaker downward until it snaps into position.
7. Connect the speaker cable to the system board. See “Identifying parts on the system board” on page 9.
8. Go to Chapter 4, “Completing the parts replacement,” on page 39.

Replacing a keyboard

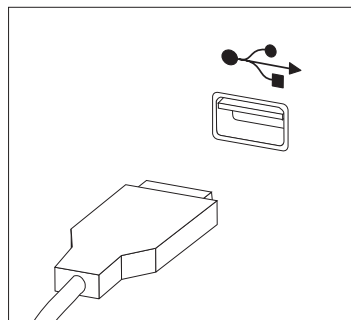
Attention

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 CDs or tapes from the drives, shut down your operating system, and turn off all attached devices.
2. Unplug all power cords from electrical outlets.
3. Locate the keyboard connector.

Note: Your keyboard may be connected to a USB connector. Depending on where your keyboard is connected, see "Locating connectors on the rear of your computer" on page 6 or "Locating connectors on the front of your computer" on page 5.



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 39.

Replacing a mouse

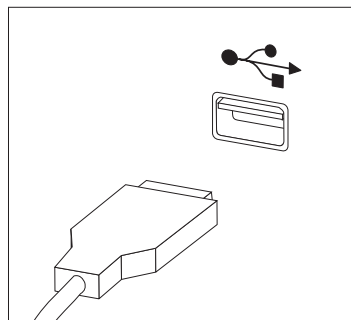
Attention

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.
2. Unplug all power cords from electrical outlets.
3. Locate the mouse connector.

Note: Your mouse may be a USB connector. Depending on where your mouse is connected, see "Locating connectors on the rear of your computer" on page 6 or "Locating connectors on the front of your computer" on page 5.



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 39.

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 through the cable clip **1** before lowering the drive-bay assembly. See Figure 7

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.

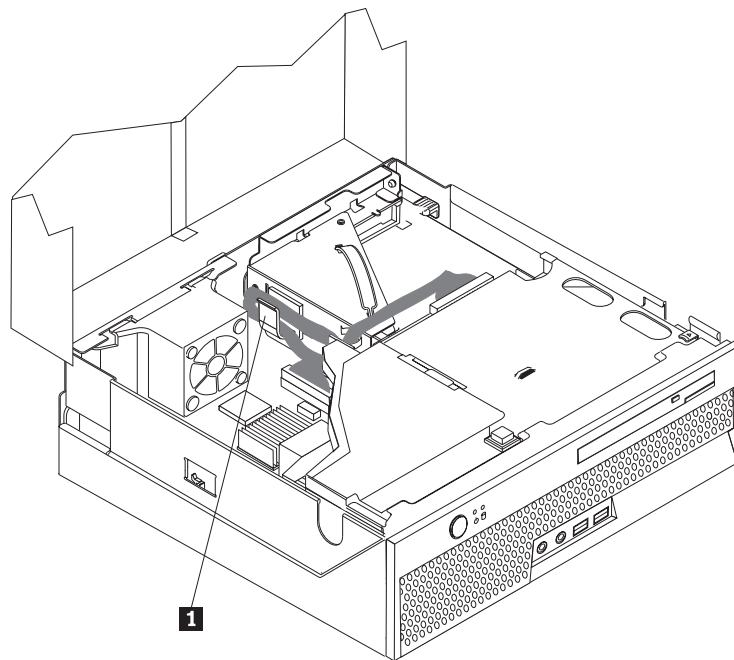


Figure 7. Cable routing

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.
7. To update your configuration, see "Using the Setup Utility program" in the *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.

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.
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 8. 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*.

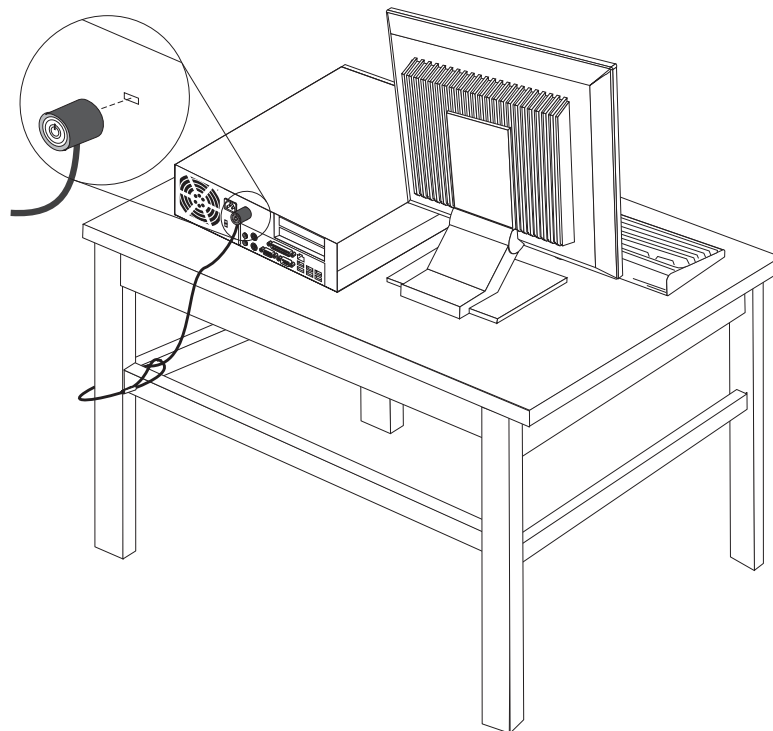


Figure 8. Integrated cable lock

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.

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 39.

Appendix. Notices

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