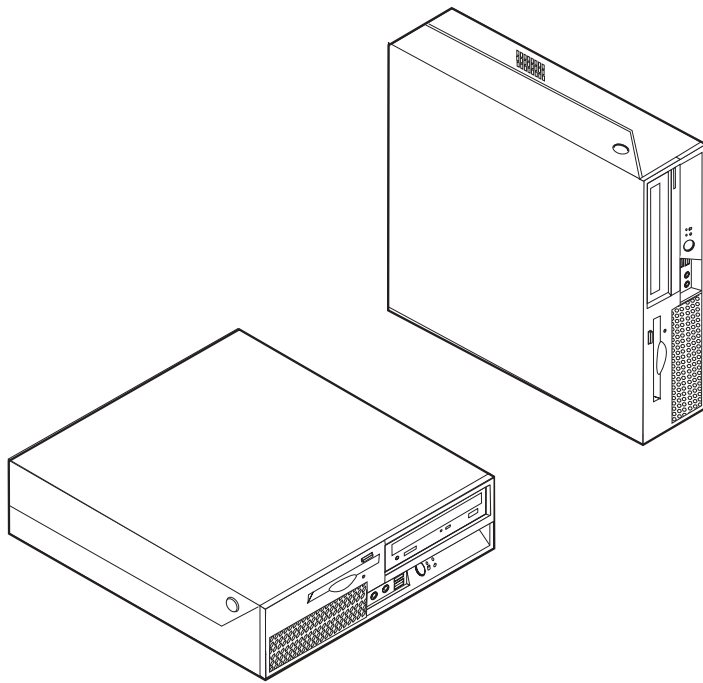


ThinkCentre

Hardware Replacement Guide

Types 9300, 9301, 9636, 9638, 9640

Types 9641, 9642, 9643, 9644, 9645



ThinkCentre

Hardware Replacement Guide

Types 9300, 9301, 9636, 9638, 9640

Types 9641, 9642, 9643, 9644, 9645

Third Edition (April 2007)

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Overview

This guide is intended to be used by customers who are replacing Customer Replaceable Units (CRUs) as well as trained service personnel who are replacing Field Replacement Units (FRUs). In this guide, CRUs will often be referred to as parts.

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

Note: Use only the parts provided by Lenovo™.

This guide contains instructions for replacing the following parts:

- Power supply
- System board
- Heat sink
- Hard disk drive
- Optical drive
- Diskette drive
- Memory modules
- PCI adapter
- Fan assembly
- Internal speaker
- Keyboard
- Mouse

Safety information

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

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 the following information:

- 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>

Tools required

To replace some parts in your computer, you might need a flat-blade or Phillips screwdriver. Additional tools might be needed for certain parts.

Handling static-sensitive devices

Static electricity, although harmless to you, can seriously damage computer components and parts.

When you are replacing a part, 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.

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

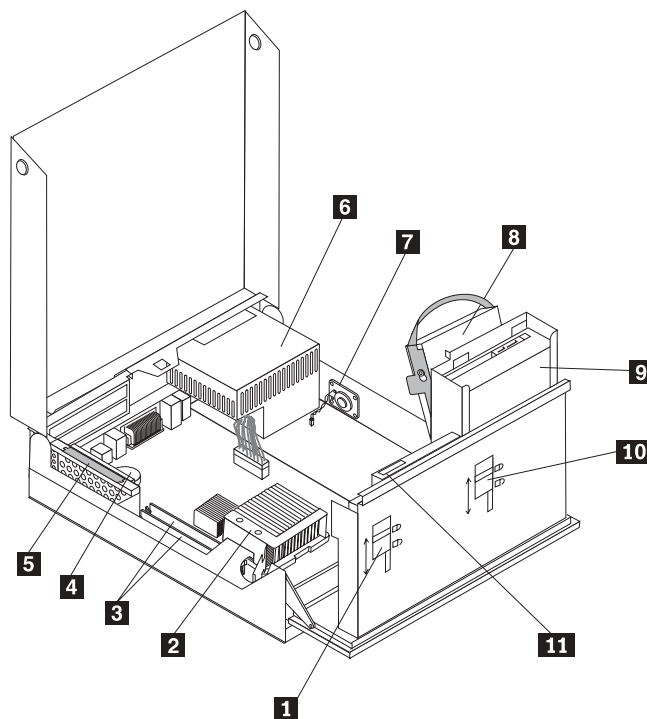
- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle parts and other computer components carefully. Handle adapters, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the parts 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.

Chapter 1. Locations

This chapter provides illustrations to help locate the various connectors, controls, and components of the computer. To open the computer cover, see “Opening the cover” on page 5.

Locating components

The following illustration will help you locate the various components in your computer.

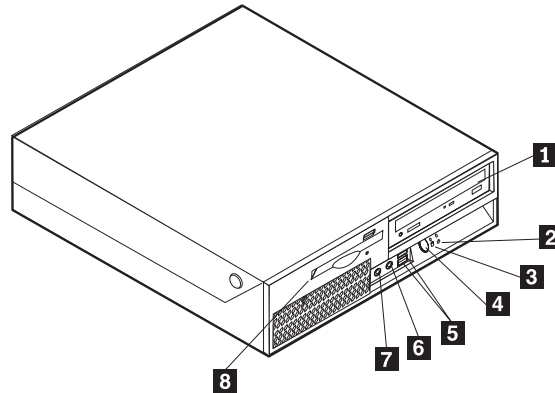


- | | | | |
|----------|------------------------------|-----------|---|
| 1 | Diskette drive lock | 7 | Internal speaker |
| 2 | Microprocessor and heat sink | 8 | Hard disk drive |
| 3 | Memory connectors (2) | 9 | Optical drive (such as a CD or DVD drive) |
| 4 | Battery | 10 | Optical drive lock |
| 5 | PCI riser assembly | 11 | Diskette drive |
| 6 | Power supply assembly | | |

Locating controls and connectors on the front of your computer

The following illustration shows locations of the controls and connectors on the front of your computer.

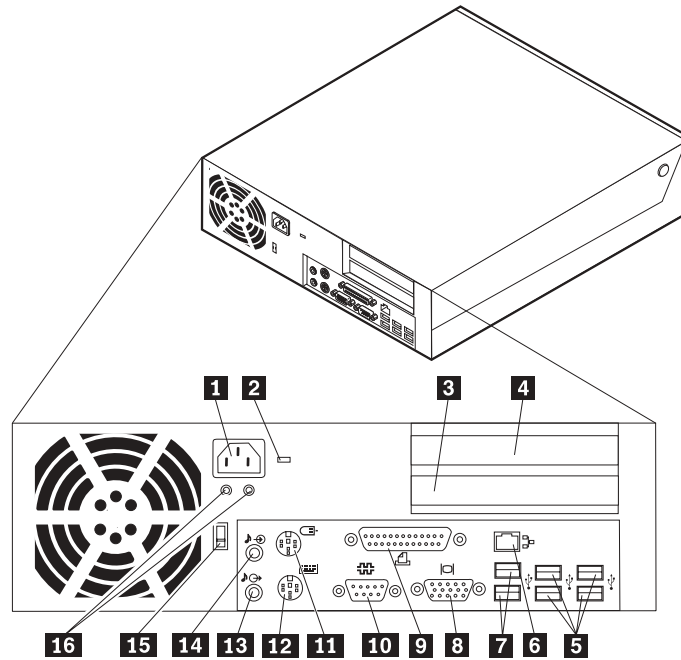
Note: Not all computer models will have the following controls and connections.



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

Locating connectors on the rear of your computer

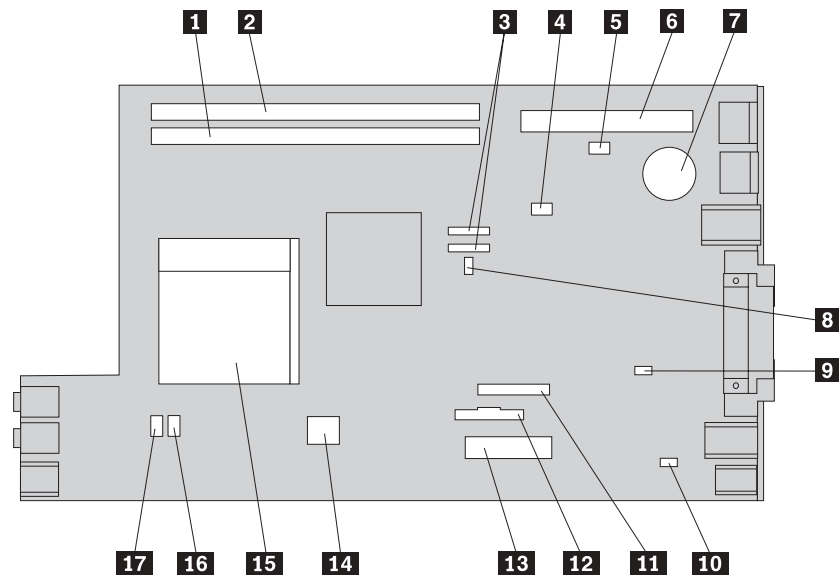
The following illustration shows locations of connectors on the rear of your computer.



- | | | | |
|----------|----------------------------------|-----------|--|
| 1 | Power cord connector | 9 | Parallel connector |
| 2 | Cable lock latch | 10 | Serial connector |
| 3 | PCI Express x1 adapter connector | 11 | Mouse connector |
| 4 | PCI adapter connector | 12 | Keyboard |
| 5 | USB connectors (4) | 13 | Audio line out connector |
| 6 | Ethernet connector | 14 | Audio line in connector |
| 7 | USB connectors (2) | 15 | Voltage-selection switch (some models) |
| 8 | VGA monitor connector | 16 | Power supply diagnostic LEDs |

Identifying parts on the system board

The following illustration shows the locations of parts on the system board.



- | | | | |
|----------|---|-----------|------------------------------|
| 1 | Memory connector 1 | 10 | Internal speaker connector |
| 2 | Memory connector 2 | 11 | Diskette drive connector |
| 3 | SATA IDE connectors (2) | 12 | Front panel connector |
| 4 | BIOS WP | 13 | Power supply connector |
| 5 | Cover presence switch (Tamper SW) connector | 14 | 12v power connector |
| 6 | PCI riser connector | 15 | Microprocessor and heat sink |
| 7 | Battery | 16 | Fan connector 2 |
| 8 | Clear CMOS/Recovery jumper | 17 | Fan connector 1 |
| 9 | Temperature sensor connector | | |

Chapter 2. Replacing hardware

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.

Opening the cover

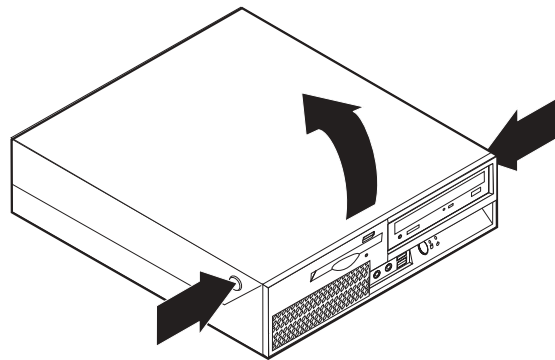
Important



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, do the following:

1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system, 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 2 and “Locating connectors on the rear of your computer” on page 3.
4. Remove any locking devices, such as a cable lock that secure the computer cover.
5. Press the buttons on the sides of the computer and pivot the cover upward to open the computer as shown.



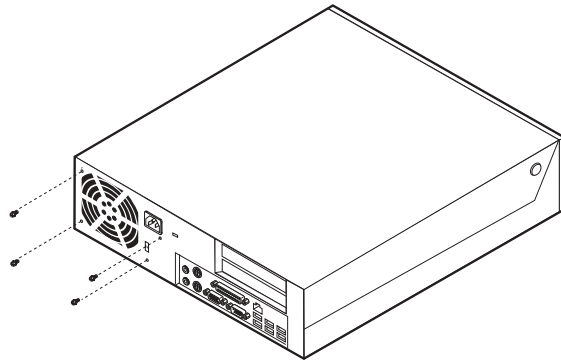
Replacing the power supply assembly

Attention

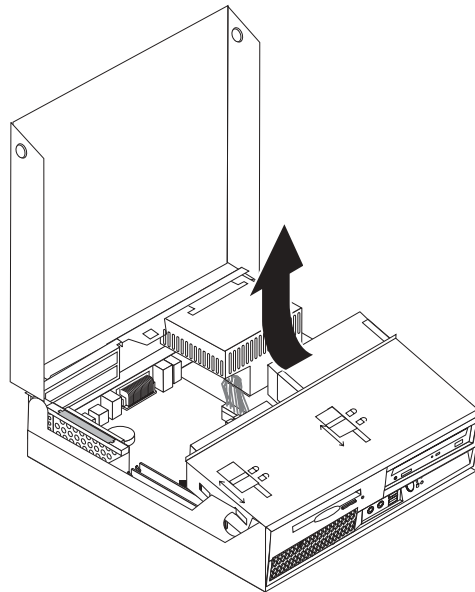
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

To replace the power supply assembly, do the following:

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

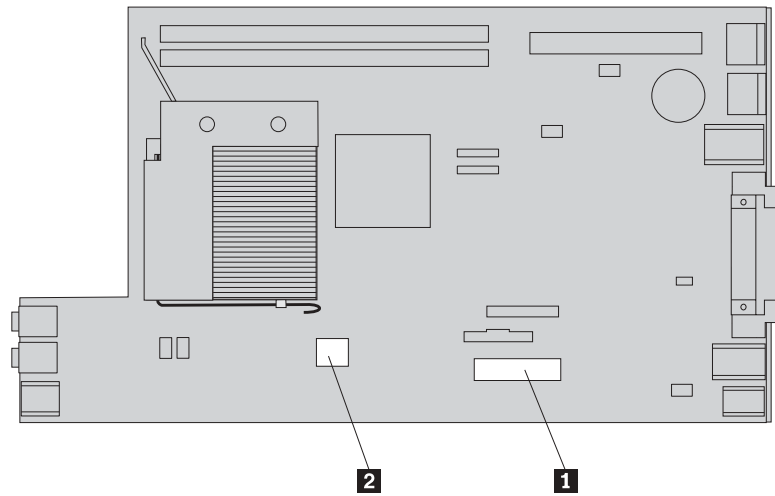


2. Open the computer cover. See the “Opening the cover” on page 5.
3. Pivot the drive bay assembly upward to gain access to the system board.

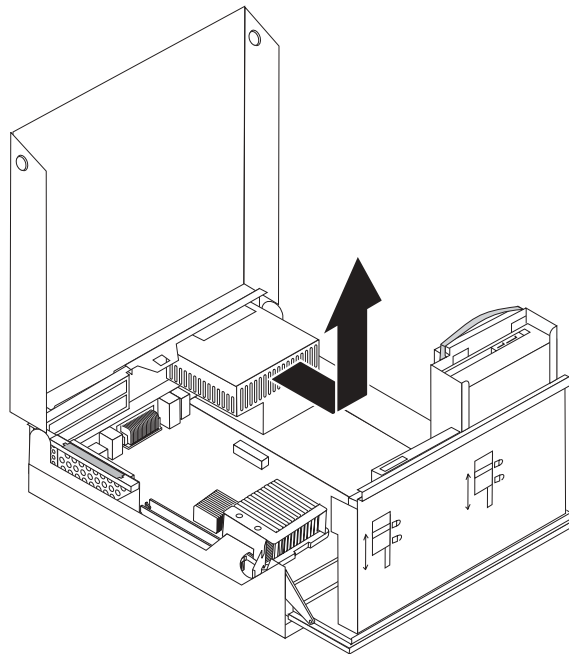


4. Locate the power supply assembly. See “Locating components” on page 1.

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



6. Remove the power supply cables from the cable clips and ties.
7. Slide the power supply assembly forward and remove it 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 provided by Lenovo.

9. Install and tighten the four screws at the rear of the chassis to secure the power supply assembly.
10. Reconnect all the power supply cables to the drives and the system board.
11. Go to “Completing the parts replacement” on page 30.

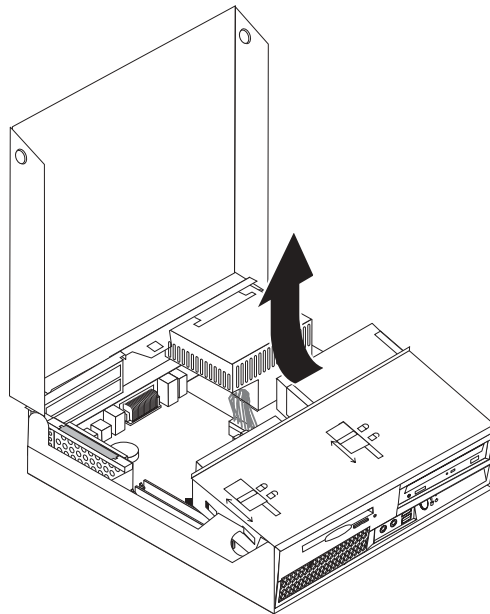
Replacing the system board

Attention

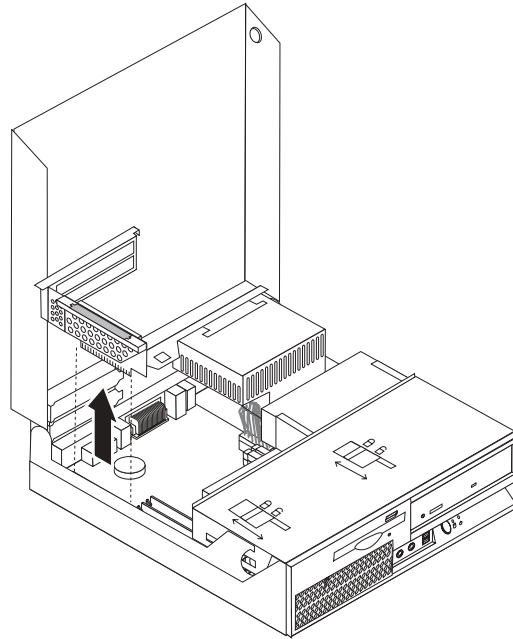
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

To replace the system board, do the following:

1. Turn off the computer and allow the computer to cool for one hour.
2. Open the computer cover. See “Opening the cover” on page 5.
3. Pivot the drive bay assembly upward to gain access to the system board.



4. While holding the rear of the computer chassis down, pull upward on the handle provided to remove the PCI riser assembly and any adapters that are currently installed.



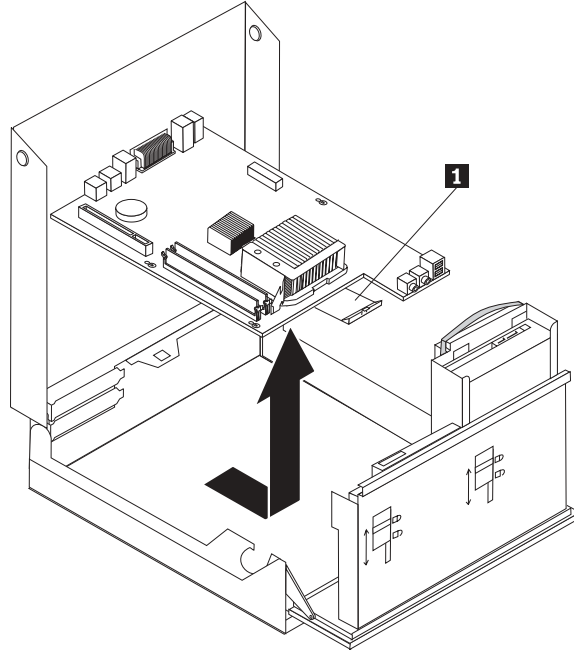
5. Carefully take note of the location of all cable connections on the system board. It will be necessary to reconnect them properly when installing a new system board.
6. Disconnect all cables connected to the system board. See “Identifying parts on the system board” on page 4.

Important

Note the cable routing. It is important to route the cables the same way after you install the new system board.

7. Pull upward on the handle **1** to release the system board from the front latch, slide the system board toward the drive bay assembly, and then carefully lift the system board out of the chassis.

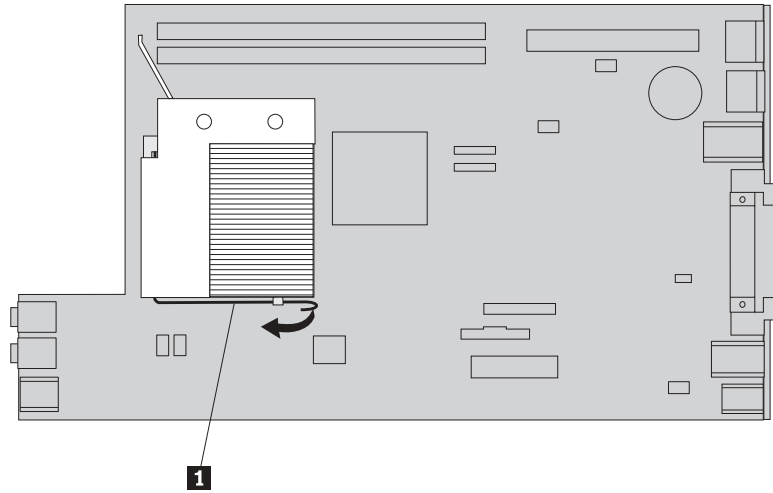
Note: You might have to tilt the front end of the system board between the diskette drive and the fan assembly to remove it completely from the chassis.



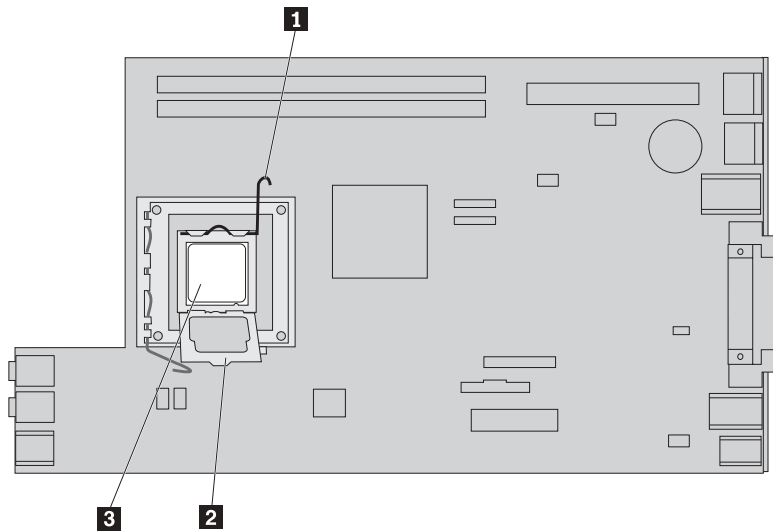
8. Place the failing system board next to the new system board on a clean, flat surface.
9. Remove all memory modules from the failing system board and install them in the same connectors on the new system board. See “Replacing a memory module” on page 21. Return here after installing the memory modules on the new system board.

10. Remove the heat sink from the failing 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 failing system board.

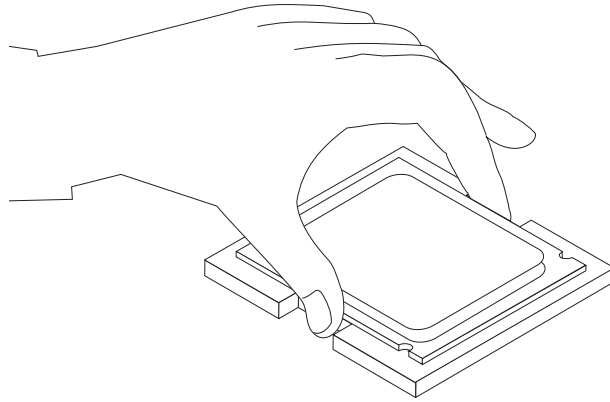
Note: Place the heat sink on its side on a clean, flat surface so the thermal grease on the bottom of the heat sink does not touch the surface and become contaminated.



11. To remove the microprocessor from the failing system board, release the lever **1** securing the microprocessor **3** then pivot the microprocessor retainer **2** until it is fully open.



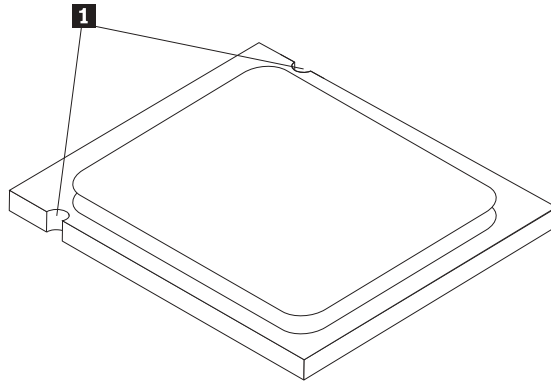
12. Lift the microprocessor straight up and out of the socket.



Important

Do not touch the gold contacts on the bottom of the microprocessor. When handling the microprocessor, touch only the sides.

- a. Note the orientation of the notches **1** on the microprocessor. This is important when installing the microprocessor on the new system board.

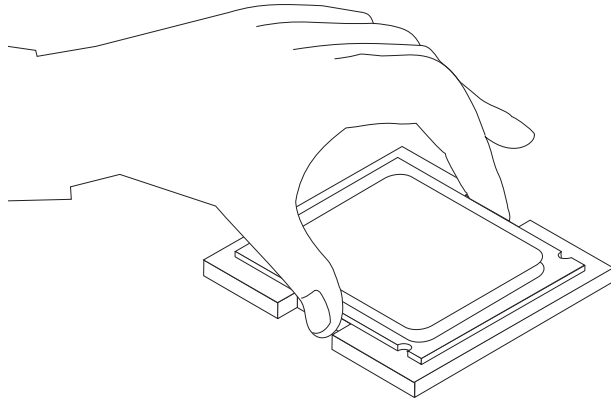


- b. Do not drop anything on the socket while it is open. Keep all contacts as clean as possible.
13. On the new system board, release the lever securing the microprocessor retainer and then pivot the retainer until it is fully open.
14. Position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket on the new system board.

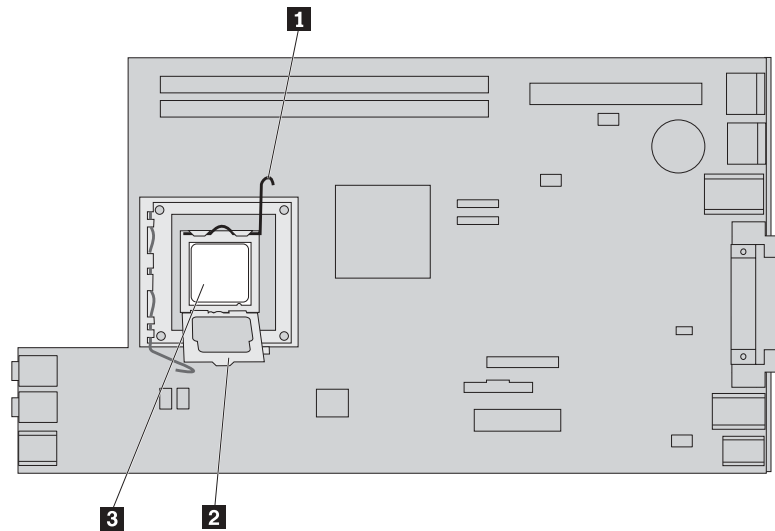
Important

To avoid damaging the microprocessor, do not tilt the microprocessor when installing it into the microprocessor socket.

15. Lower the microprocessor straight down into the microprocessor socket.



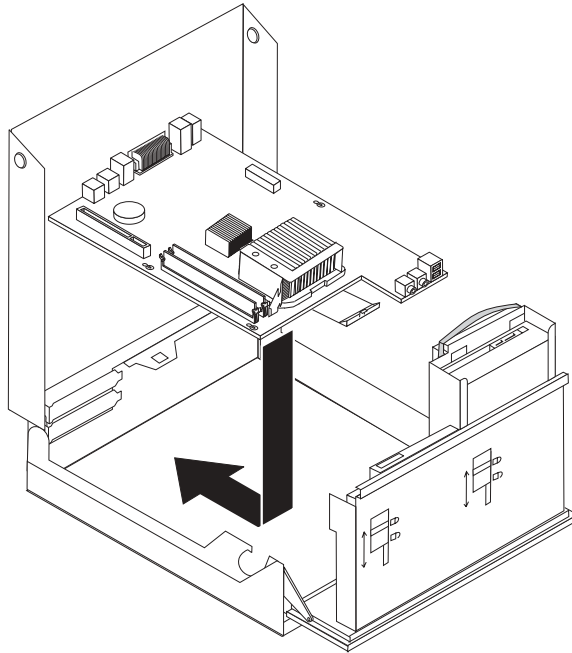
16. Lower the microprocessor retainer **2** and then lower the lever **1** to secure the retainer. Make sure the lever is securely locked into position.



Note: There will be a black plastic cover on the microprocessor retainer to protect the socket on the new system board. When you lock the microprocessor in position, remove the black plastic cover. Place the black plastic cover on the microprocessor retainer of the failing system board.

17. Place the heat sink into position and lower the lever to secure the heat sink.
18. To install the new system board into the chassis, tilt the front end of the system board between the diskette drive and the fan assembly, and position it so that the slots in the new system board are aligned with the pins on the chassis.

- Slide the system board toward the rear of the computer until the front latch snaps into position.



- Reconnect the cables that were disconnected from the system board. Make sure all cables are routed correctly. See “Identifying parts on the system board” on page 4.
- Reinstall the PCI riser assembly and adapters.
- Go to “Completing the parts replacement” on page 30.

Replacing the heat sink

Attention

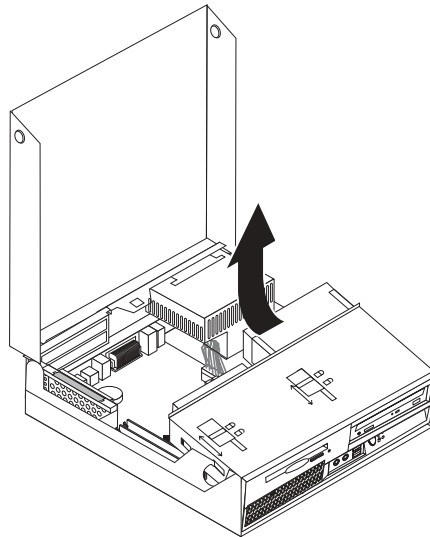
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

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

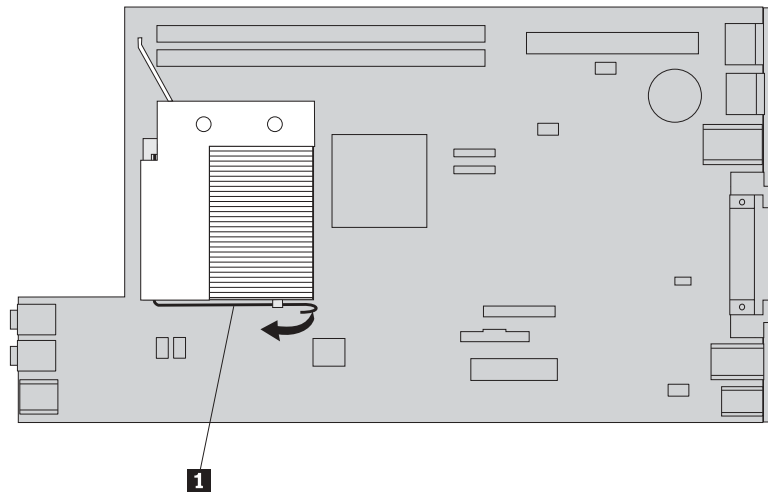
To replace the heat sink, do the following:

- Open the computer cover. See “Opening the cover” on page 5.

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



4. Place the new heat sink into position and lower the lever to secure the heat sink.
5. Go to “Completing the parts replacement” on page 30.

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>.

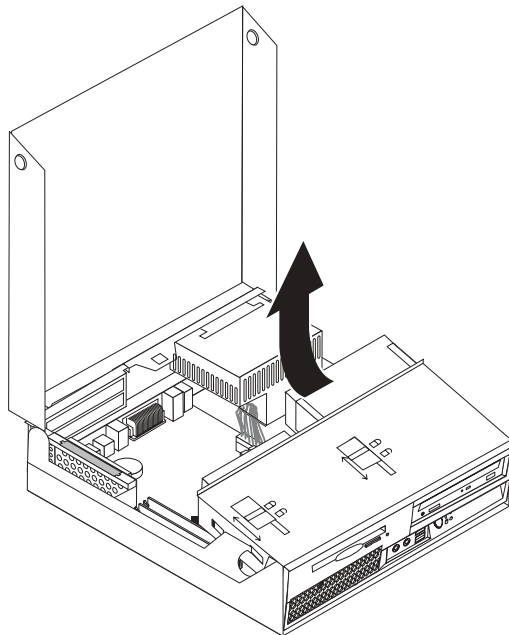
This section provides instructions on how to replace the hard disk drive.

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 *User Guide*.

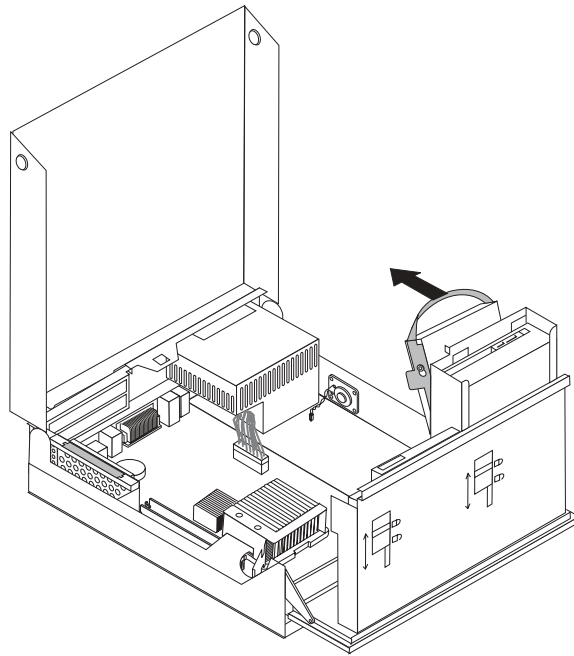
To replace the hard disk drive, do the following:

1. Open the computer cover. See “Opening the cover” on page 5.
2. Pivot the drive bay assembly upward to gain access to the system board.



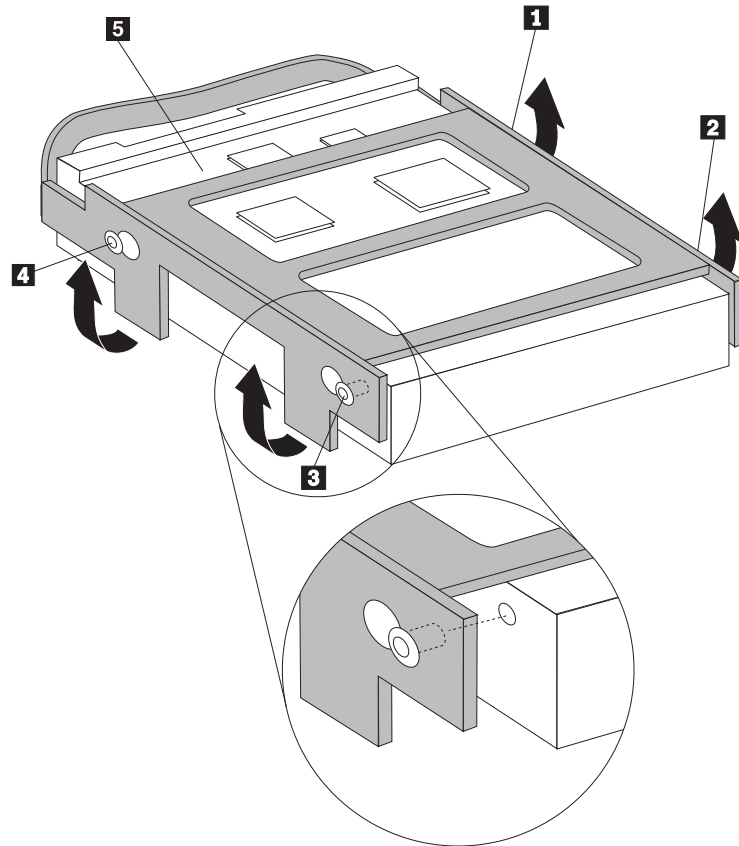
3. If an optical drive is installed, disconnect the signal cable from the drive to access the hard disk drive cables.
4. Disconnect the signal and power cables from the rear of the hard disk drive.

5. Pivot the hard disk drive and bracket to the rear, then pull the drive and bracket out of the drive bay by pulling on the blue handle.



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

7. Install the new 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.



8. Install the hard disk drive and bracket into the drive bay.
9. Pivot the drive and bracket towards the front of the computer and snap it into position.
10. Connect the signal and power cables to the rear of the new hard disk drive.
11. Go to “Completing the parts replacement” on page 30.

Replacing an optical drive

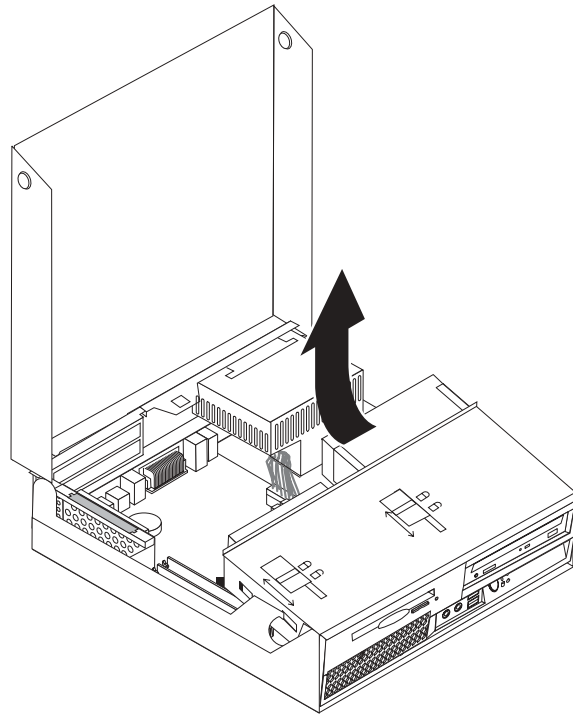
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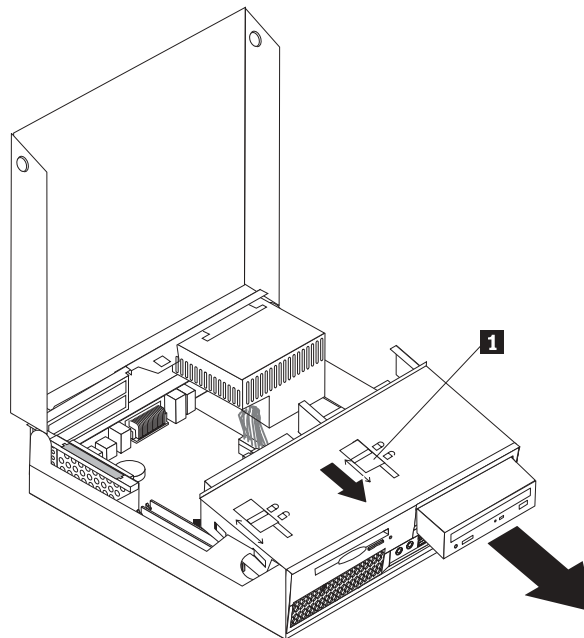
This section provides instructions on how to replace an optical drive.

1. Open the computer cover. See “Opening the cover” on page 5.

2. Pivot the drive bay assembly upward to gain access to the optical drive.



3. Disconnect the signal and power cables from the rear of the optical drive.
4. Slide the optical drive lock **1** to the unlocked position.
5. Open the door at the front of the optical drive and slide it out the front of the computer.



6. Install the new optical drive into the bay.
7. Slide the optical drive lock to the locked position.
8. Connect the signal and power cables to the rear of the optical drive.
9. Go to “Completing the parts replacement” on page 30.

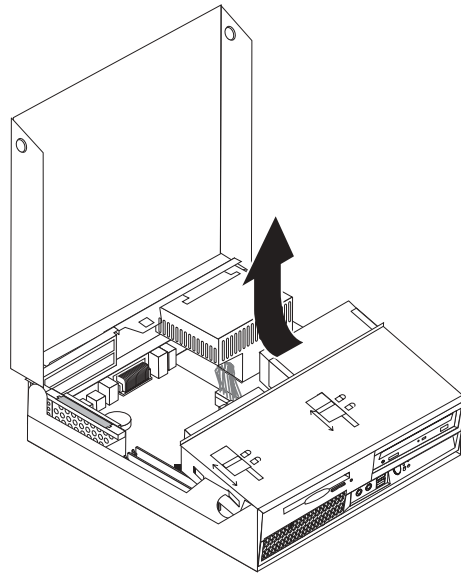
Replacing the diskette drive

Attention

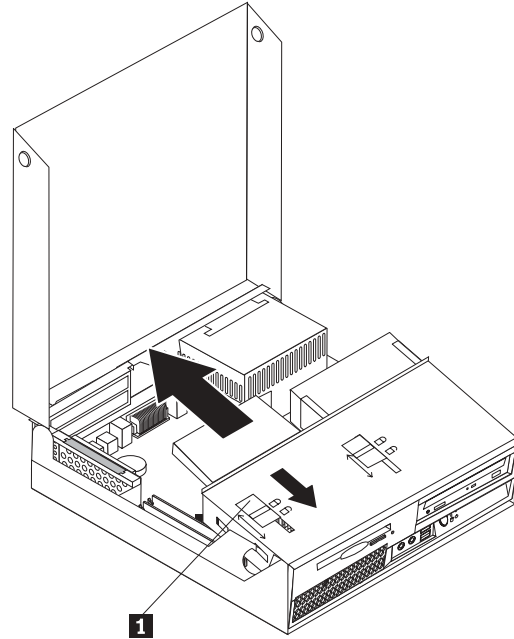
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

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

1. Open the computer cover. See “Opening the cover” on page 5.
2. Pivot the drive bay assembly upward to gain access to the diskette drive.



3. Slide the diskette drive lock **1** to the unlocked position.
4. Slide the diskette drive towards the rear of the computer and remove the 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. Install the new drive from the rear of the drive bay assembly and lock the drive into position.
8. Go to “Completing the parts replacement” on page 30.

Replacing a memory module

Attention

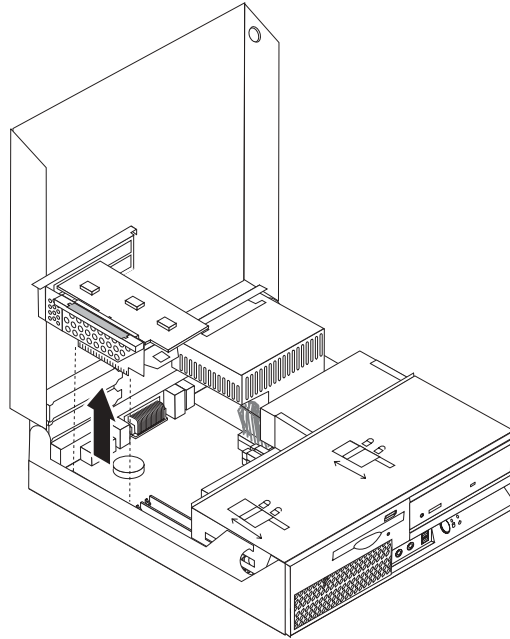
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain a copy of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

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

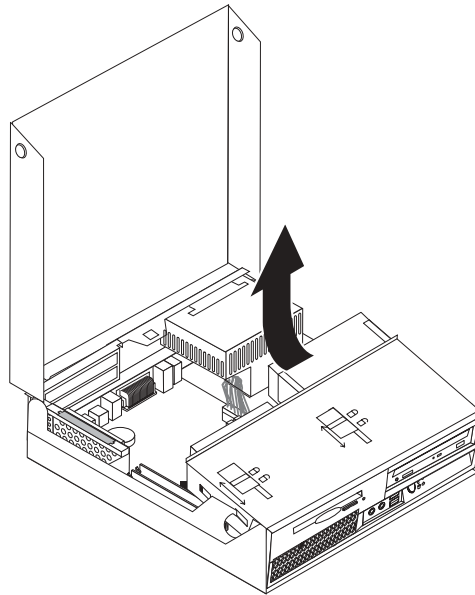
Note: Your computer has support for two memory modules.

1. Open the computer cover. See “Opening the cover” on page 5.

2. While holding the rear of the computer chassis down, pull upward on the handle provided to remove the PCI riser assembly and any adapters that are currently installed.

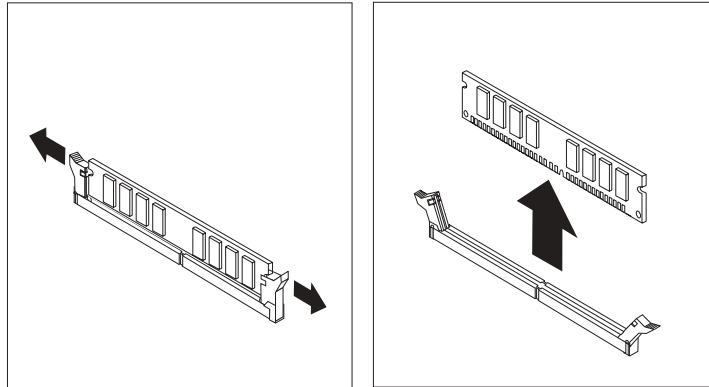


3. Pivot the drive bay assembly upward to gain access to the system board.

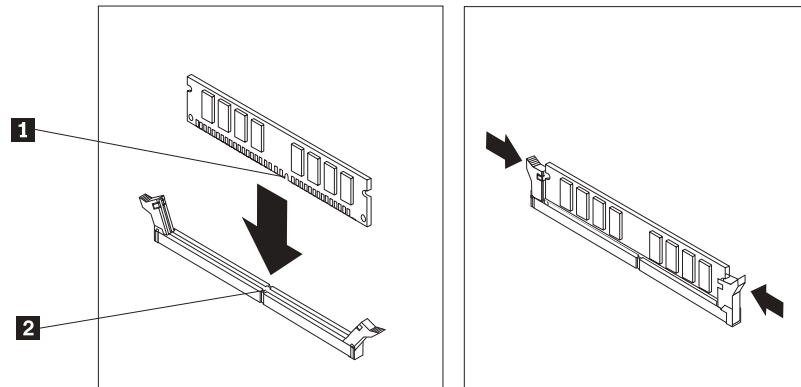


4. Locate the memory connectors. See “Identifying parts on the system board” on page 4.

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



6. 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.



7. Reinstall the PCI riser assembly and adapters.
8. Go to “Completing the parts replacement” on page 30.

Replacing a PCI adapter

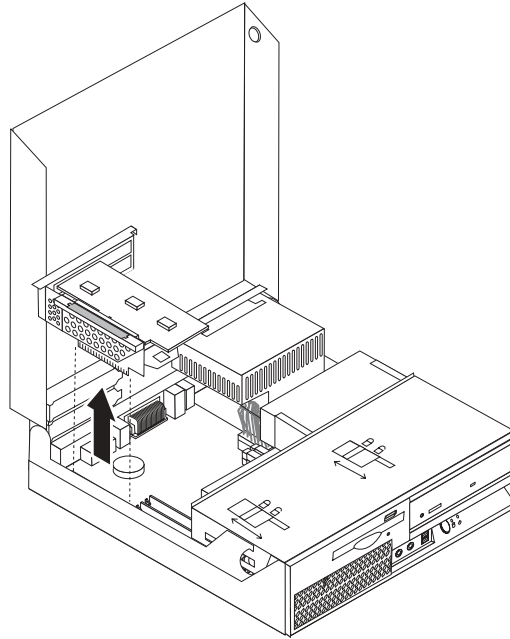
Attention

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>.

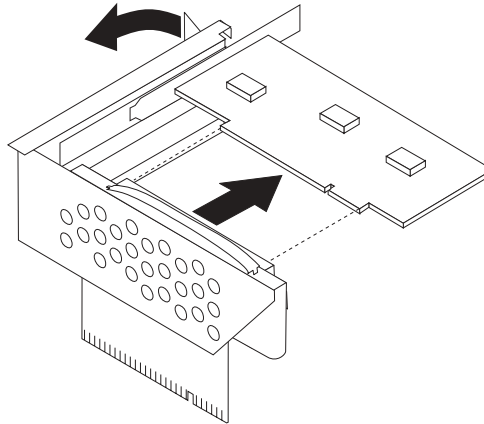
This section provides instructions on how to replace a PCI adapter.

1. Open the computer cover. See “Opening the cover” on page 5.

2. While holding the left rear of the computer chassis down, pull upward on the handle provided to remove the PCI riser assembly including any adapters that are already installed.

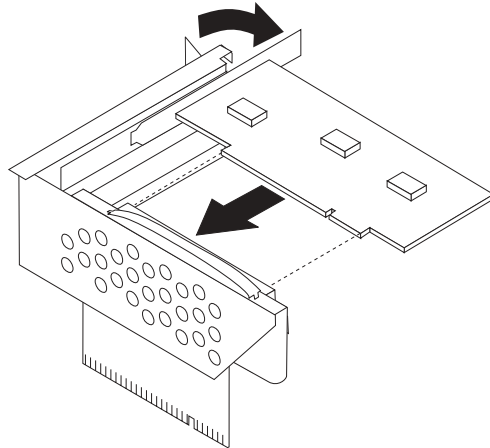


3. Open the adapter latch and remove the failing adapter.



4. Remove the new adapter from its static-protective package.
5. Install the new adapter into the expansion connector into the PCI riser.
6. Ensure the adapter is fully seated into the adapter connector.

7. Close the adapter latch to retain the adapter.



8. Reinstall the PCI riser assembly into the system board.
9. Go to “Completing the parts replacement” on page 30.

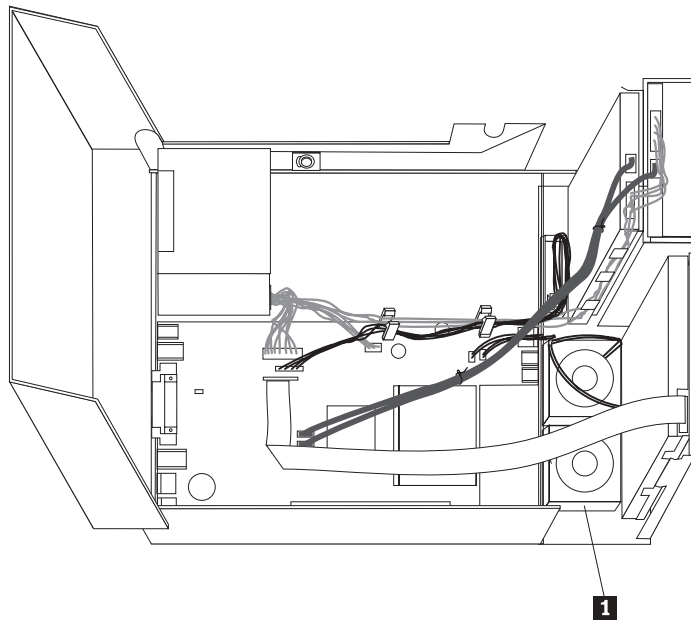
Replacing the fan assembly

Attention

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This section provides instructions on how to replace the fan assembly.

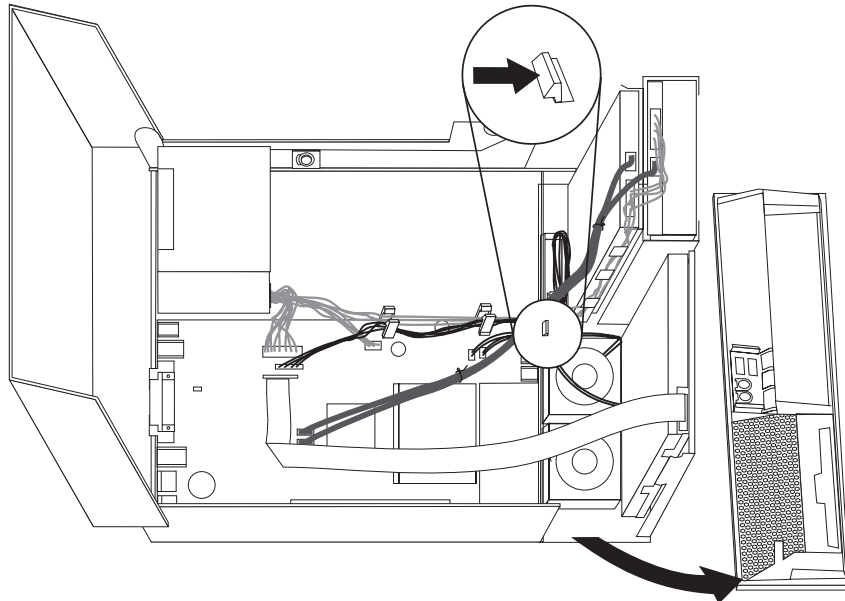
1. Open the computer cover. See “Opening the cover” on page 5.
2. Pivot the drive bay assembly upward to gain access to the fan assembly **1**.



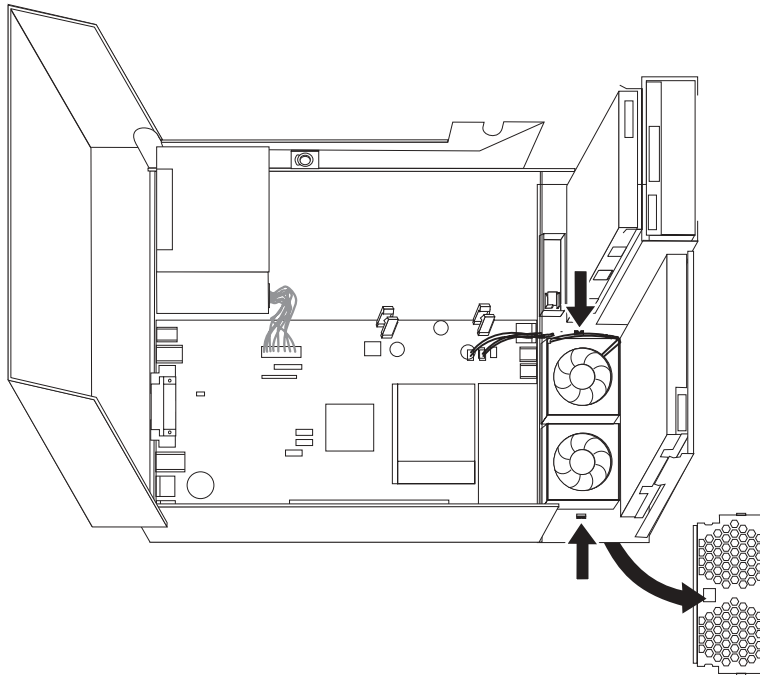
3. Disconnect the fan assembly cables from the system board. See “Identifying parts on the system board” on page 4.

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

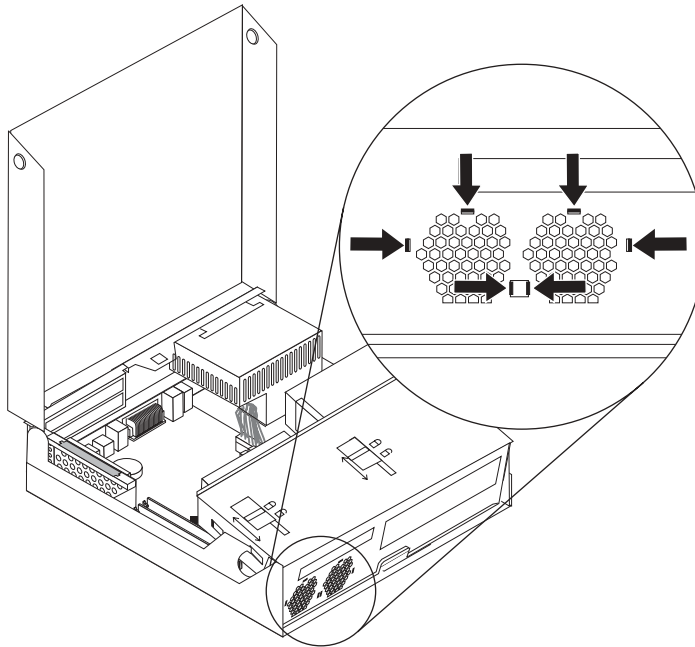
4. Remove the front bezel by releasing the tab as shown and pivoting the bezel outward from the bottom.



5. Remove the plastic fan insert behind the bezel by releasing the tabs as shown.



6. Remove the fan assembly by releasing the tabs as shown.



7. Install the new fan assembly and connect the fan cables to the system board.
8. Reinstall the plastic fan insert.
9. Reinstall the front bezel.
10. Go to “Completing the parts replacement” on page 30.

Replacing the internal speaker

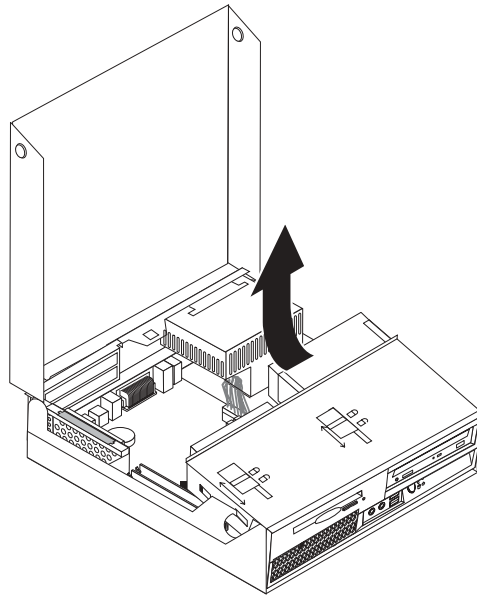
Attention

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 5.

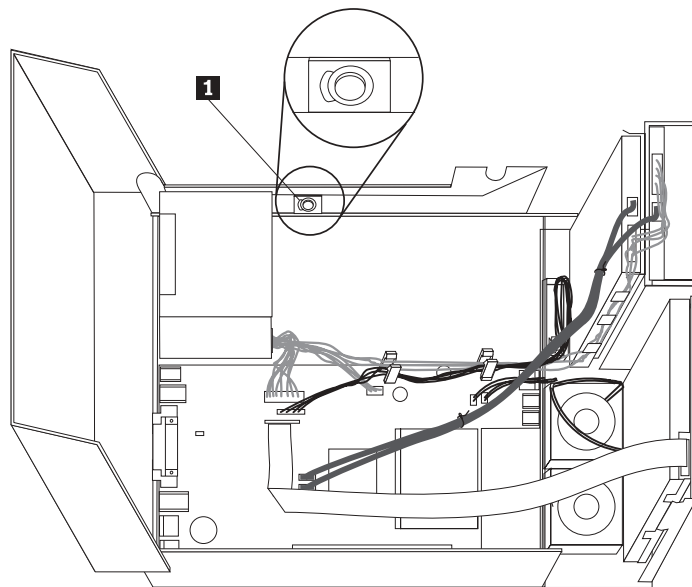
2. Pivot the drive bay assembly upward to gain access to the system board.



3. Locate the internal speaker connector on the system board. See “Locating components” on page 1.
4. Disconnect the internal speaker cable from the system board. See “Identifying parts on the system board” on page 4.

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

5. Slide the internal speaker **1** upward until the speaker is released from the metal tabs that secure it at the bottom. Then pivot the bottom of the internal speaker outward and remove the speaker from the chassis.



6. Position the bottom of the new internal speaker into the metal tabs and then pivot the top of the internal speaker inward until the speaker snaps into position.
7. Connect the speaker cable to the system board. See “Identifying parts on the system board” on page 4.
8. Go to “Completing the parts replacement” on page 30.

Replacing the keyboard

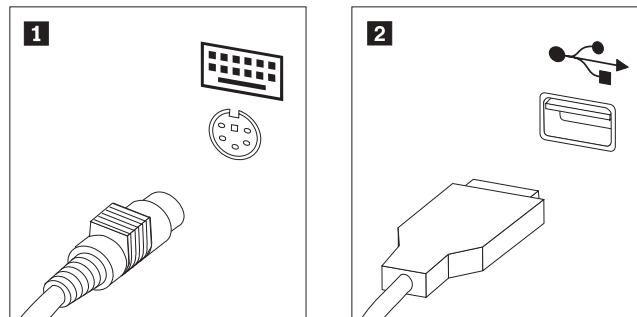
Attention

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.

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 3 or “Locating controls and connectors on the front of your computer” on page 2.



4. Disconnect the failing keyboard cable from the computer.
5. Connect the new keyboard cable to one of the USB connectors.
6. Go to “Completing the parts replacement” on page 30.

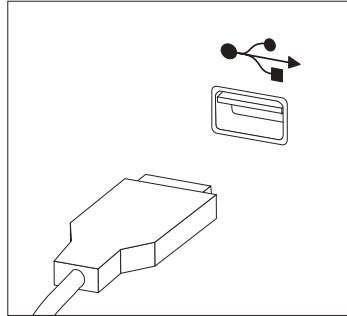
Replacing the mouse

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 “Locating controls and connectors on the front of your computer” on page 2 or “Locating connectors on the rear of your computer” on page 3.



4. Disconnect the failing mouse cable from the computer.
5. Connect the new mouse cable to one of the USB connectors.
6. Go to “Completing the parts replacement.”

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. See “Using the Setup Utility program” in your *User Guide*.

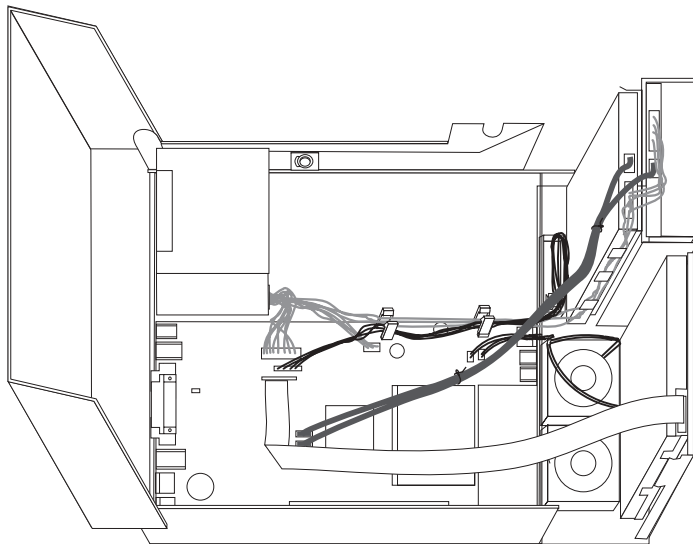
To complete the parts replacement:

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 1 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.



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 3.
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.”
8. 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.

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 your *User Guide*. 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 in 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 in the seven character machine type/model of your computer and then press Enter.
8. Follow the instructions on the screen to complete the update.

Appendix. Notices

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