

Hardware Replacement Guide

Types 6490, 8700, 8701, 8705

Types 8717, 8973, 8975, 8979

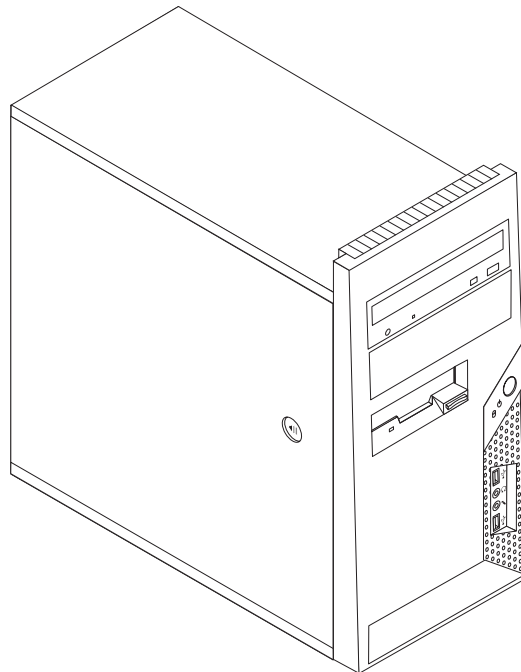
Types 8983, 8985, 8991, 8995

Types 9265, 9269, 9277, 9279

Types 9283, 9287, 9379, 9383

Types 9387, 9389, 9631, 9635

Types 9637, 9646, 9648, 9694



ThinkCentre

Hardware Replacement Guide

Third Edition (February 2007)

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Overview

This guide is intended for use by customers who are replacing Customer Replaceable Units (CRUs).

Note: Use only parts provided by Lenovo™.

This guide contains procedures for replacing the following parts:

- Power supply
- Heat sink assembly
- Memory modules
- Adapter
- Hard disk drive
- Optical drive
- Diskette drive
- System fan assembly
- 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
- Publications
- Troubleshooting information
- Parts information
- Downloads and drivers
- Links to other useful sources of information
- Support phone list

To access this information, go to <http://www.lenovo.com/support>.

Tools required

To replace some parts in your computer, you will 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.

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:

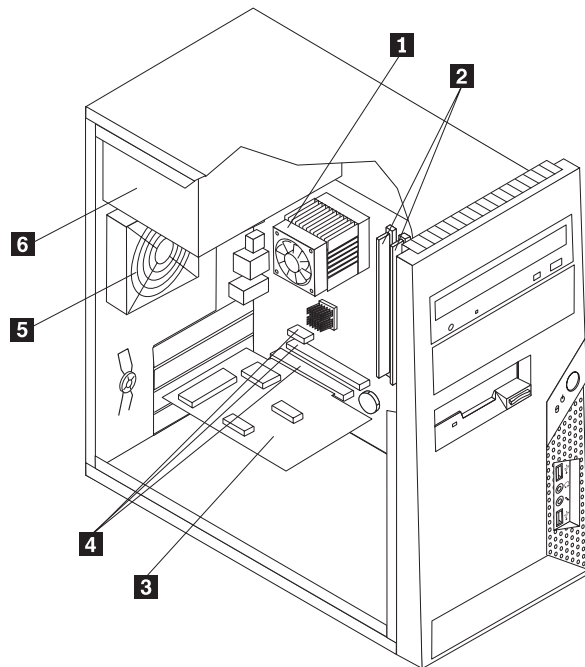
- Limit your movement. Movement can cause static-electricity to build up around you.
- Always handle parts and other computer components carefully. Handle adapters, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the parts 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 remove the computer cover, see “Removing the computer cover” on page 7.

Locating components

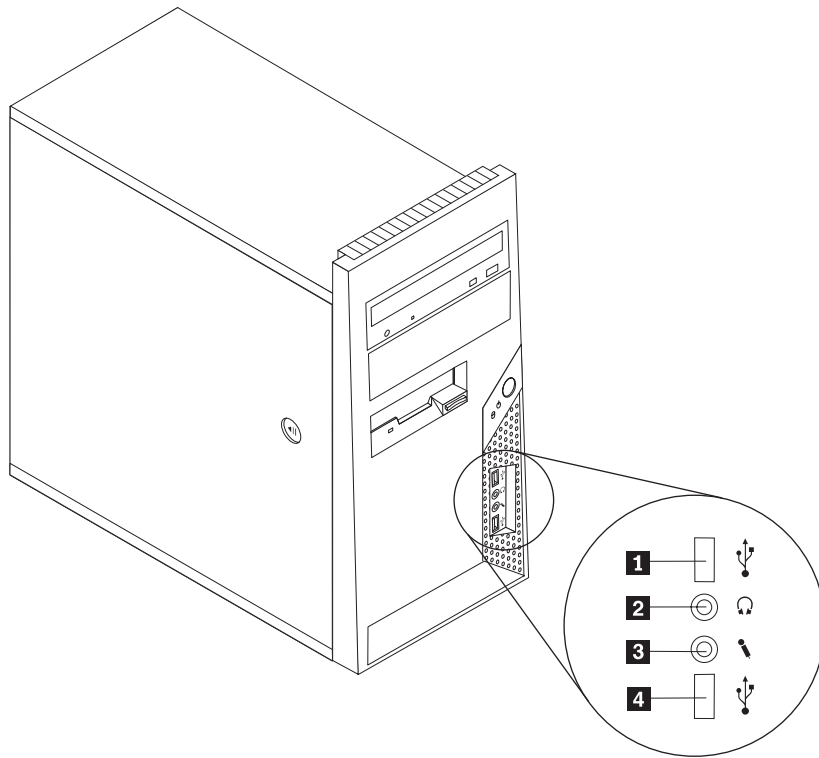
The following illustration will help you locate the various components in your computer.



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

Locating connectors on the front of the computer

The following illustration shows the location of connectors on the front of the computer.

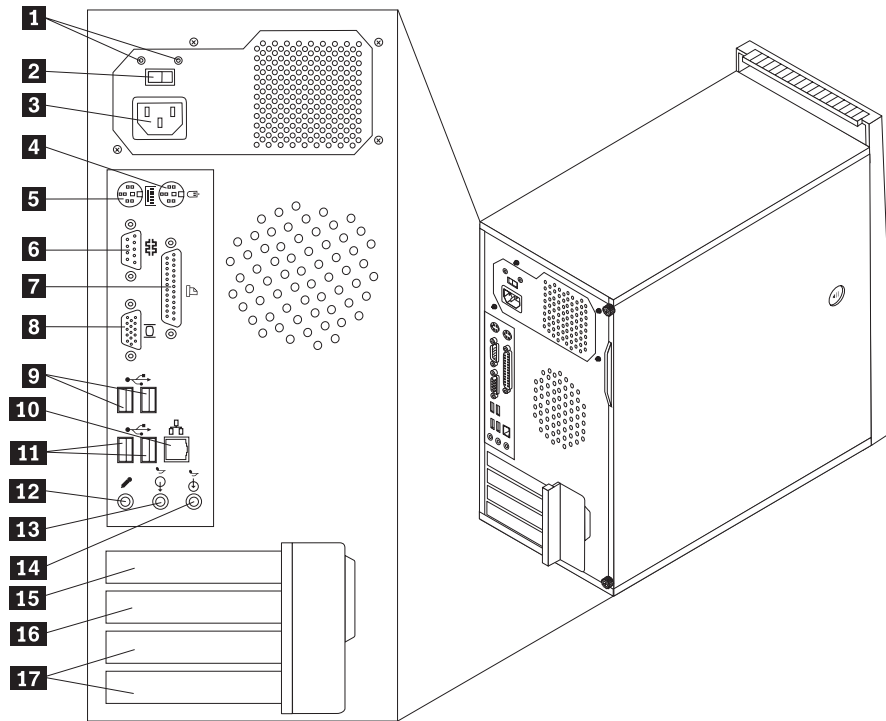


1 USB connector
2 Headphone connector

3 Microphone connector
4 USB connector

Locating connectors on the rear of the computer

The following illustration shows the location of connectors on the rear of the computer.

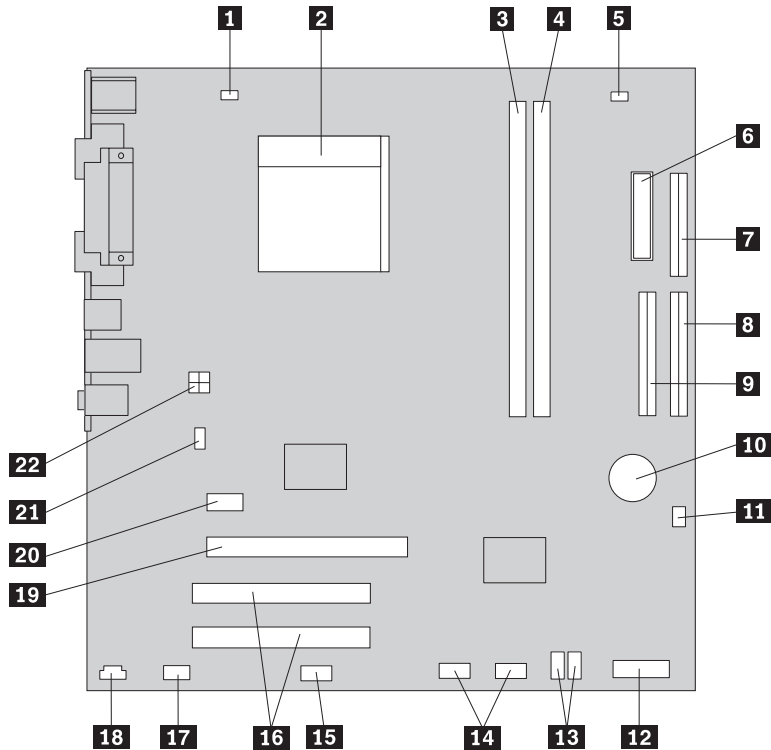


- | | | | |
|----------|--|-----------|--|
| 1 | Power supply diagnostic LEDs | 10 | Ethernet connector |
| 2 | Voltage selection switch (some models) | 11 | USB connectors (2) |
| 3 | Power connector | 12 | Microphone connector |
| 4 | Standard mouse connector | 13 | Audio line out connector |
| 5 | Standard keyboard connector | 14 | Audio line in connector |
| 6 | Serial connector | 15 | PCI Express x1 or PCI Express x16 graphics adapter connector |
| 7 | Parallel connector | 16 | PCI Express x1 or PCI Express x16 graphics adapter connector |
| 8 | VGA monitor connector | 17 | PCI Adapter connector |
| 9 | USB connectors (2) | | |

Identifying parts on the system board

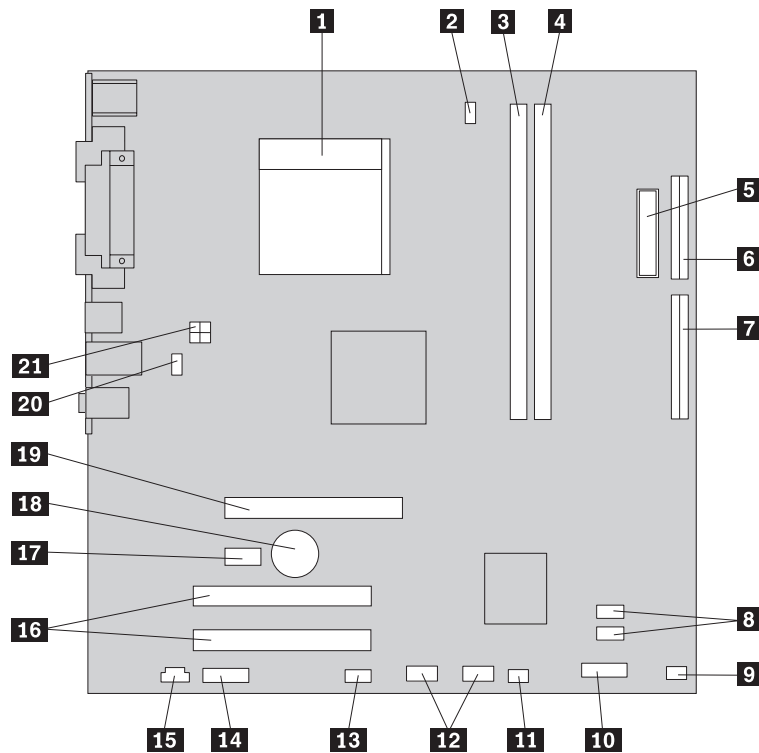
The system board (sometimes called the *planar* or *motherboard*) is the main circuit board in your computer. It provides basic computer functions and supports a variety of devices that are factory-installed or that you can install later.

The following illustration shows the locations of parts on the system board (some models).



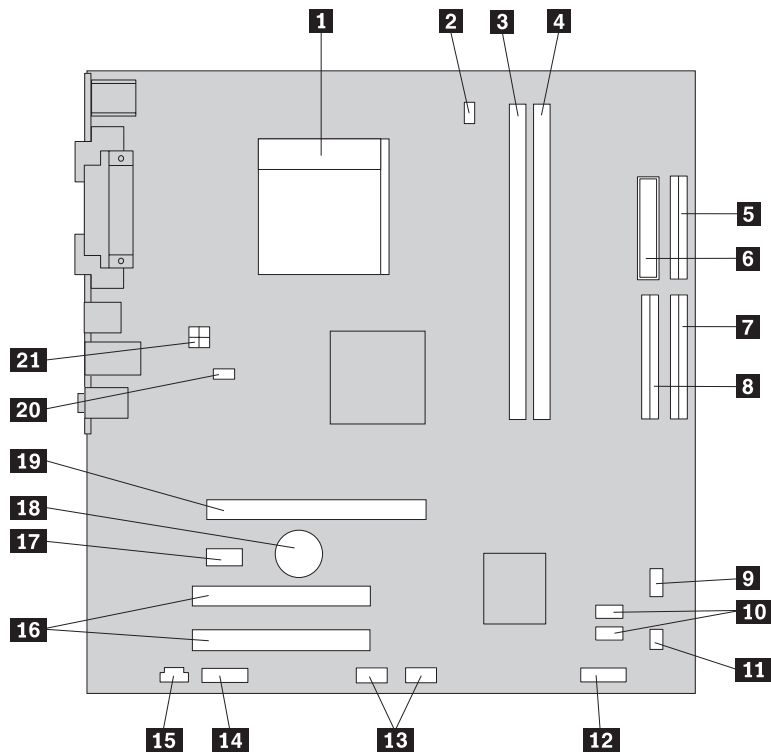
- | | | | |
|-----------|------------------------------|-----------|--|
| 1 | Microprocessor fan connector | 12 | Front panel connector |
| 2 | Microprocessor and heat sink | 13 | SATA IDE connectors (2) |
| 3 | Memory connector 1 | 14 | Front panel USB connectors (2) |
| 4 | Memory connector 2 | 15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

The following illustration shows the locations of parts on the system board (some models).



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

The following illustration shows the locations of parts on the system board (some models).



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

Chapter 2. Replacing hardware

Attention:

Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain copies 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.

Removing the computer cover

Important

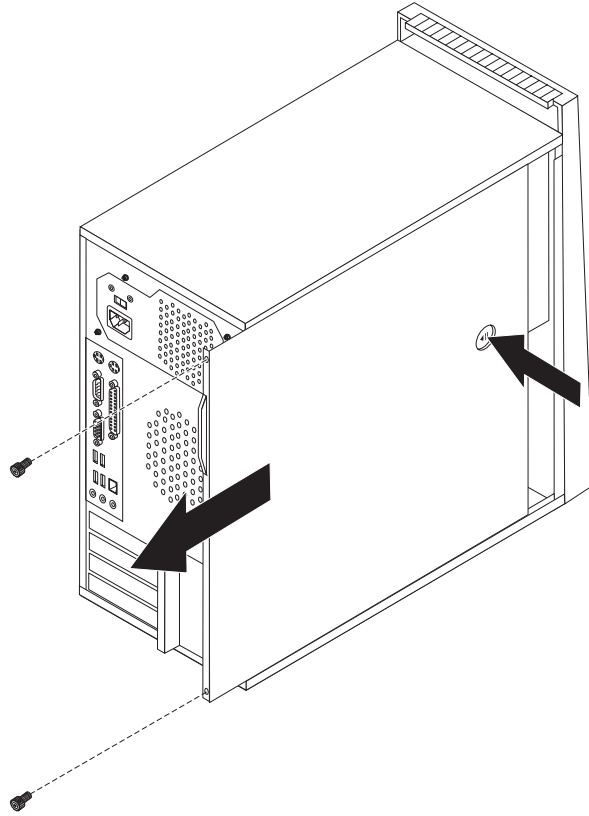


Turn off the computer and wait 3 to 5 minutes to let the computer cool before removing the computer cover.

To remove the computer cover:

1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system, turn off all attached devices, and the computer.
2. Unplug all power cords from electrical outlets.
3. Disconnect all 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 the computer” on page 2 and “Locating connectors on the rear of the computer” on page 3.
4. Remove any locking devices that secure the computer cover.
5. If there are thumbscrews securing the cover, remove them.

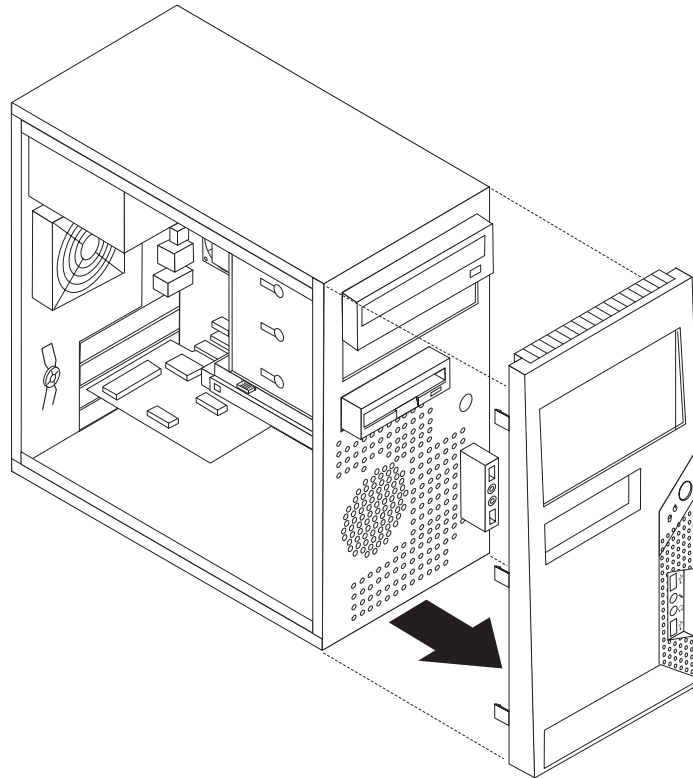
6. Press the cover-release button on the side of the cover and slide the computer cover to the rear to and remove.



Removing and replacing the front bezel

To remove and replace the front bezel:

1. Remove the computer cover. See “Removing the computer cover” on page 7.
2. Remove the front bezel by releasing the three plastic tabs on the left side and pivoting the bezel outward. Carefully set the bezel to the side without disconnecting the power switch and LED assembly cable.



3. To reinstall the bezel, align the plastic tabs on the right side of the bezel with the corresponding holes in the chassis, then pivot it inward until it snaps into position on the left side.
4. Go to “Completing the installation” on page 26.

Replacing the power supply

Attention:

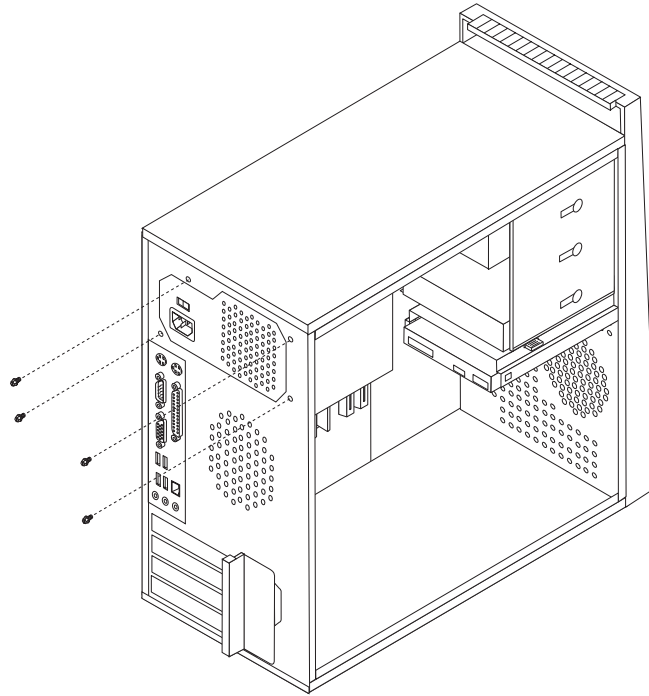
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To replace the power supply:

1. Remove the computer cover. See “Removing the computer cover” on page 7.

Note: For this procedure, it helps to lay the computer on its side.

2. Disconnect the power supply cables from the system board and from all drives. See “Identifying parts on the system board” on page 4.
3. Remove the four screws that secure the power supply at the rear of the chassis.



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

Note: Use only the screws provided by Lenovo.

7. Reconnect the power supply connectors to the system board.
8. Reconnect a power supply connector to each of the drives.
9. Go to “Completing the installation” on page 26.

Replacing the heat sink assembly

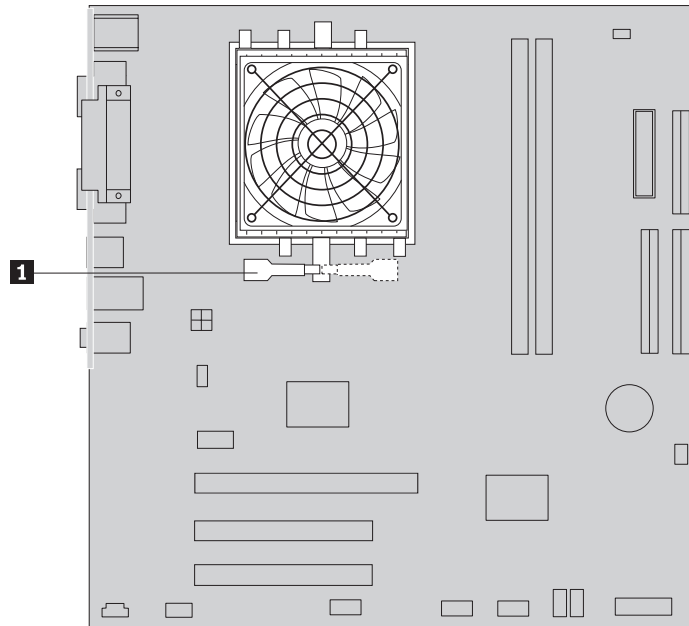
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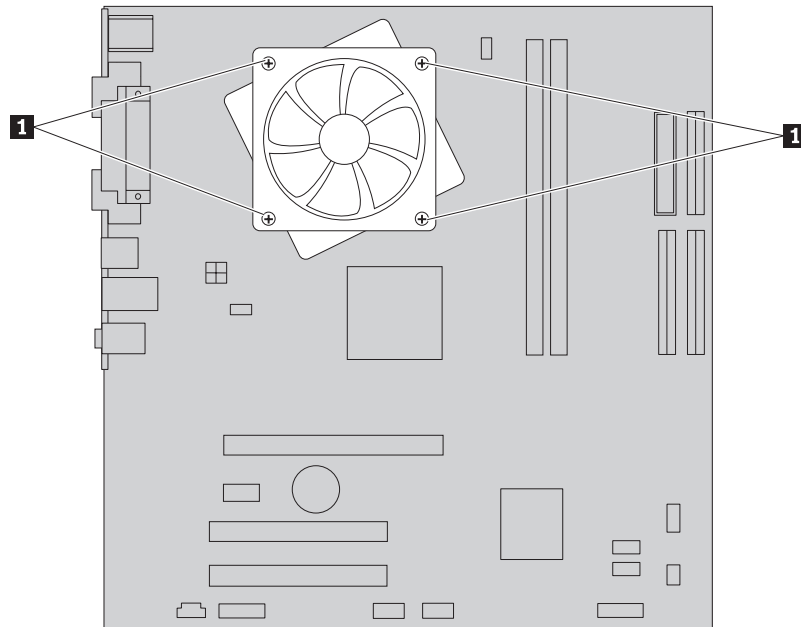
To replace the heat sink assembly:

1. Remove the computer cover. See “Removing the computer cover” on page 7.
2. Lay the computer on its side.
3. Locate the heat sink. See “Identifying parts on the system board” on page 4.
4. Disconnect the heat sink and the fan assembly cable from the system board.
5. Depending on which heat sink you are removing, do one of the following:

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



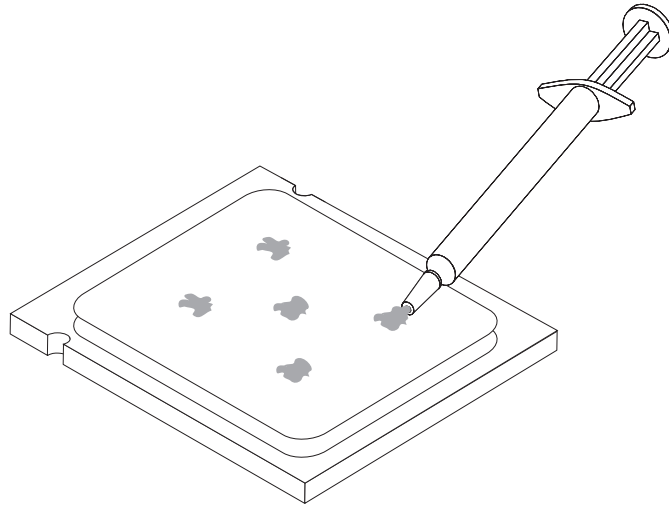
- b. Remove the four screws **1** securing the heat sink and fan assembly to the system board.



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

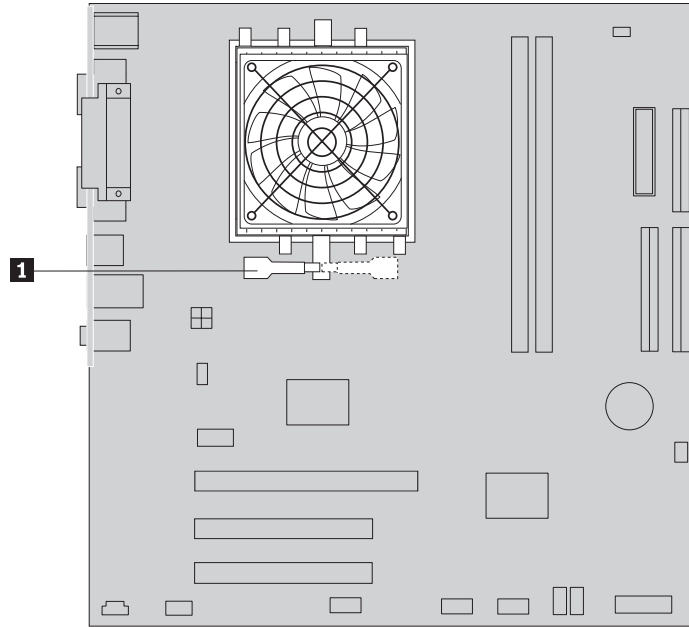
6. Lift the failing heat sink and fan assembly off the system board.

7. Use the thermal grease syringe to place five drops of grease on the top of the microprocessor. Each drop of grease should be 0.03ml (3 tick marks on the grease syringe).

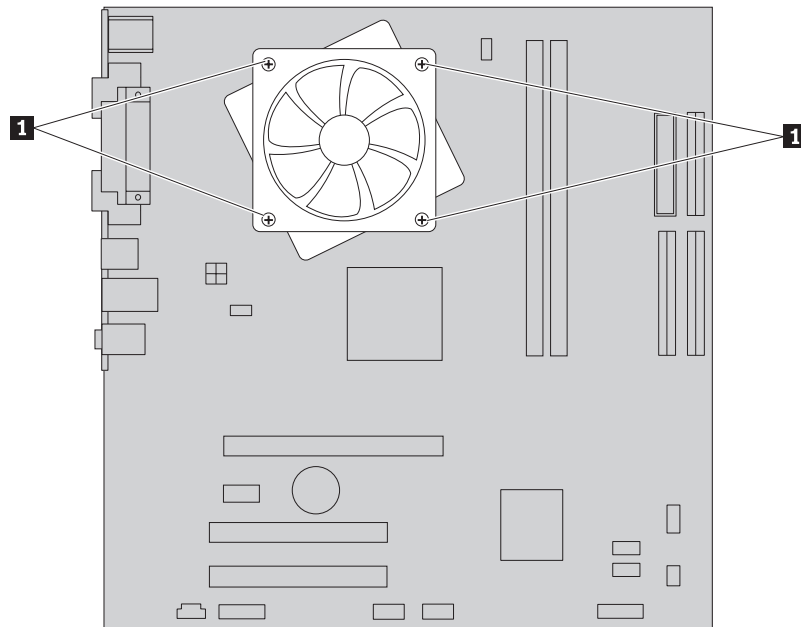


8. Depending on which heat sink you are installing, do one of the following:

- a. Position the heat sink on the microprocessor socket and then position the clamp on the plastic retention bracket. Pivot the handle **1** to clamp the heat sink to the plastic retention bracket.



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



9. Reconnect the heat sink and the fan assembly cable to the system board.
10. Go to “Completing the installation” on page 26.

Replacing a memory module

Attention:

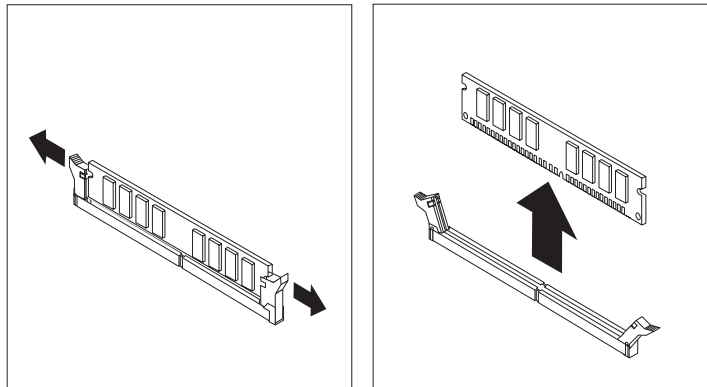
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To replace a memory module:

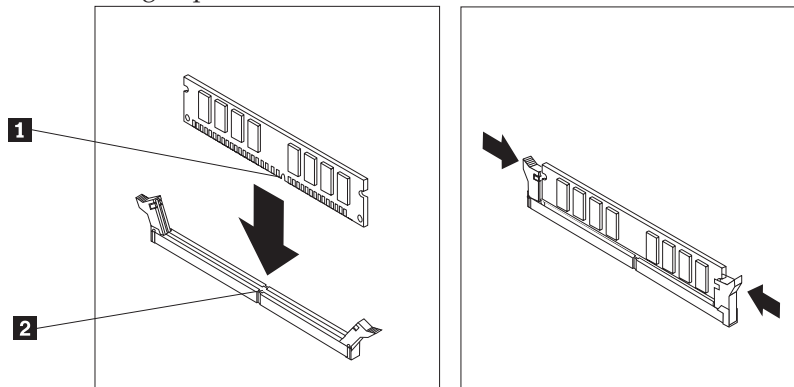
1. Remove the computer cover. See “Removing the computer cover” on page 7.

Note: For this procedure, it helps to lay the computer on its side.

2. Locate the memory module connectors. See “Locating components” on page 1.
3. Remove the memory module being replaced by opening the retaining clips as shown.



4. Position the new memory module over the memory connector. Make sure the notch **1** on the memory 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.



5. Go to “Completing the installation” on page 26.

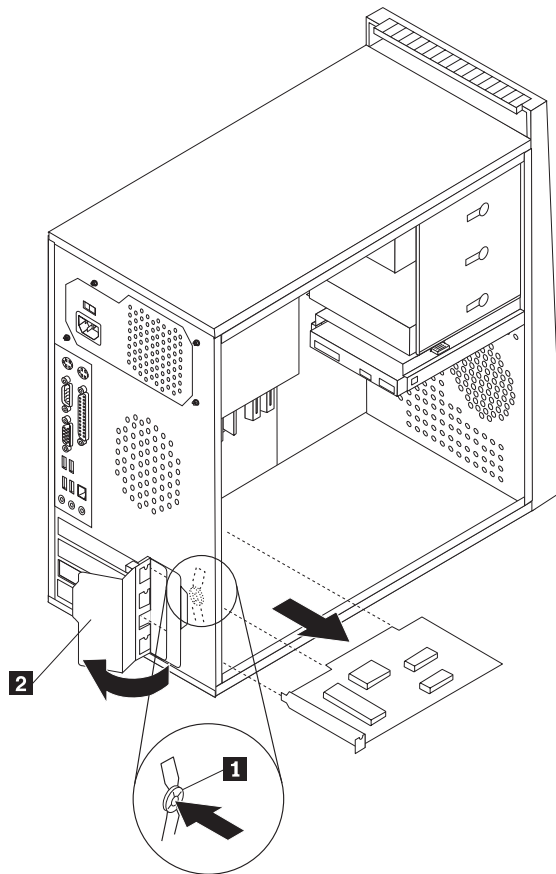
Replacing an adapter

Attention:

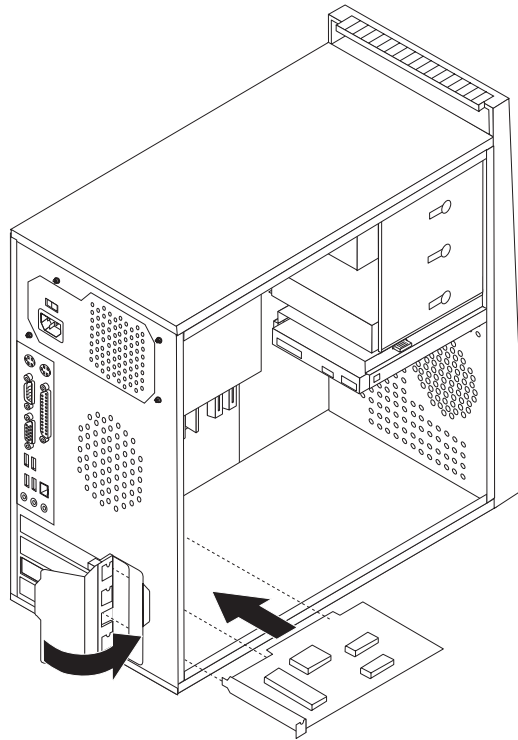
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To replace an adapter:

1. Remove the computer cover. See “Removing the computer cover” on page 7.
2. At the rear of the computer, press the release button **1** to open the adapter latch **2** and remove the adapter by pulling it straight out of the adapter connector.



3. Install the new adapter into the same adapter connector.



4. Ensure the adapter is fully seated into the adapter connector.
5. At the rear of the computer, pivot the adapter latch to the closed position to secure the adapter.
6. Go to “Completing the installation” on page 26.

Replacing the hard disk drive

Attention:

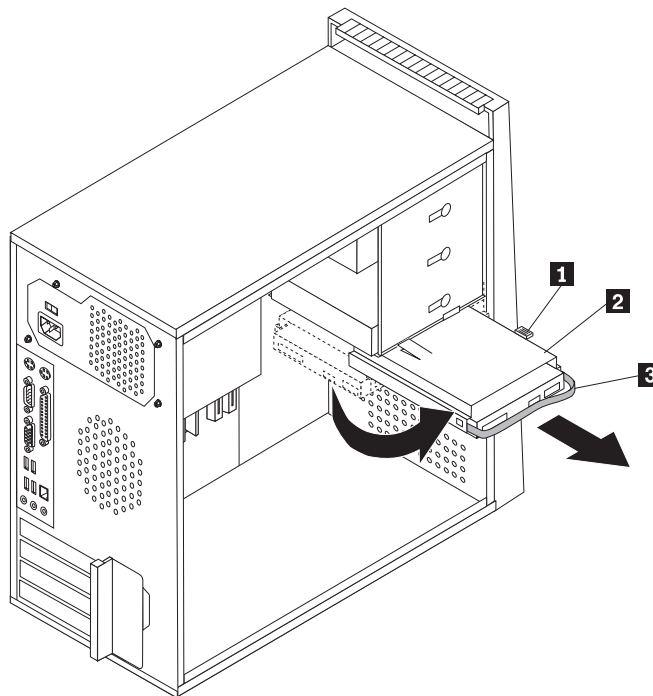
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Important

When you receive a new hard disk drive, you will also receive a set of *Product Recovery* discs. The *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 the *User Guide*.

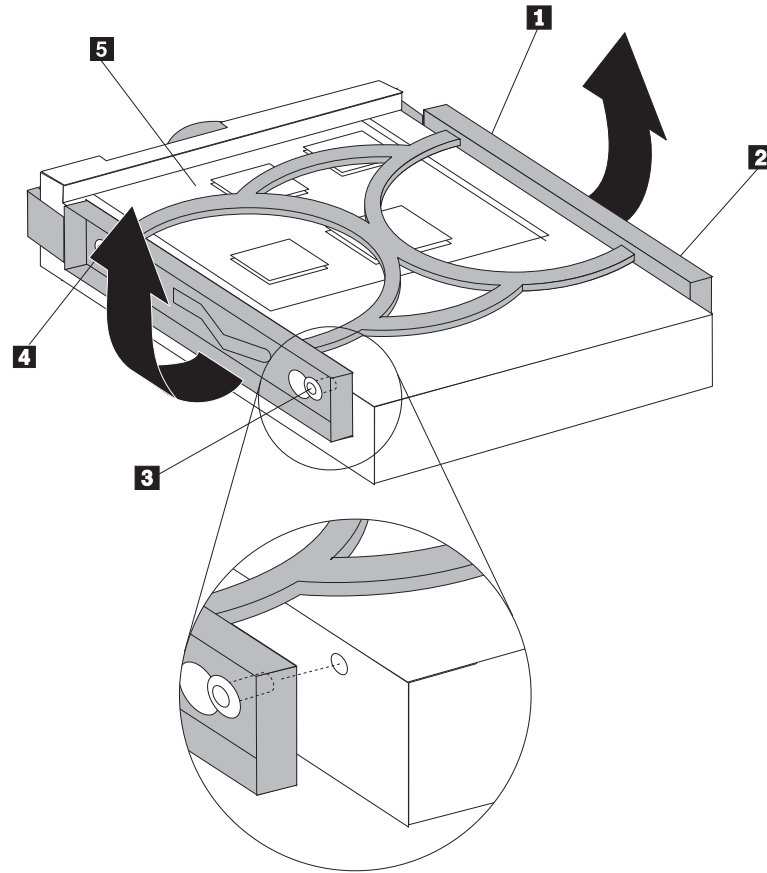
To replace the hard disk drive:

1. Remove the computer cover. See "Removing the computer cover" on page 7.
2. Disconnect the signal and power cables from the hard disk drive.
3. Press the blue release tab **1** down, slide the hard drive cage **2** back, and pivot it outward as shown.



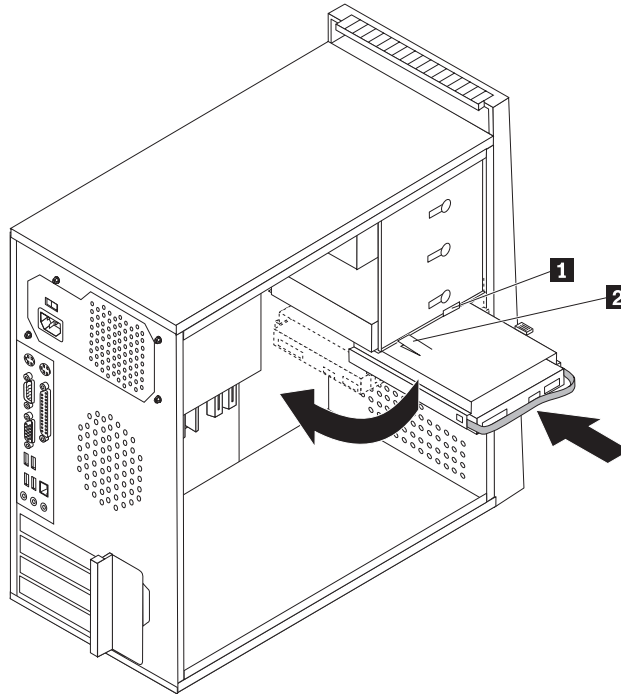
4. Remove the hard disk drive cage from the chassis by simply sliding it outward.
5. Pull on the blue handle **3** to release and remove hard disk drive from drive cage.
6. Remove the hard disk drive from the blue plastic bracket by flexing the sides of the bracket enough to slide it free of the hard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

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



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

9. Align the drive cage pivot pin with the slot **1** in the upper drive cage and slide the hard disk drive cage into the chassis.



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

Note: There are two arrows, one on the upper drive cage and one on the hard disk drive cage. The arrows are aligned when the hard disk drive is in the proper position.

11. Connect the power and signal cables to the hard disk drive.
12. Go to “Completing the installation” on page 26.

Replacing an optical drive

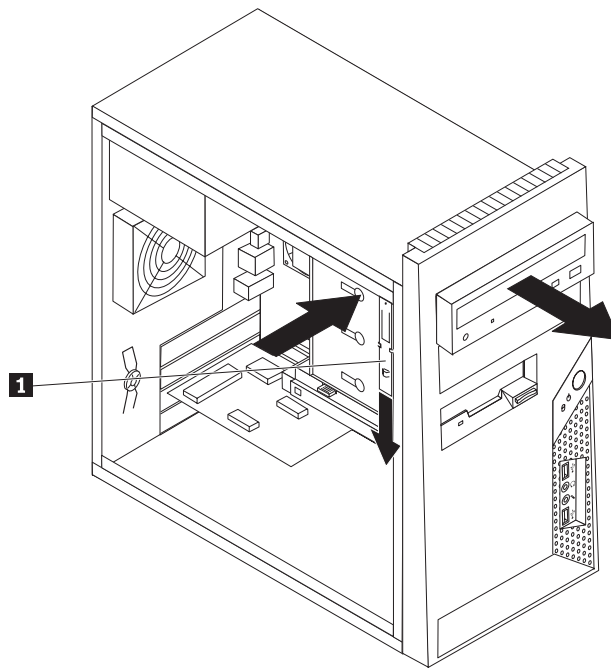
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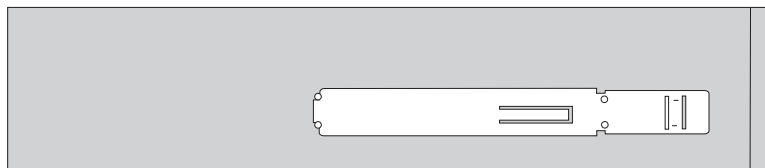
To replace an optical drive

1. Remove the computer cover. See “Removing the computer cover” on page 7.
2. Disconnect the signal and power cables from the rear of the optical drive.
3. Press the blue release button and remove the optical drive out the front of the computer.

Note: There is a spare retainer bracket **1** attached to the side of the upper drive cage.



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



5. Slide the new optical drive into the bay from the front until it snaps into position.
6. Connect the signal and power cables to the drive.
7. Go to “Completing the installation” on page 26.

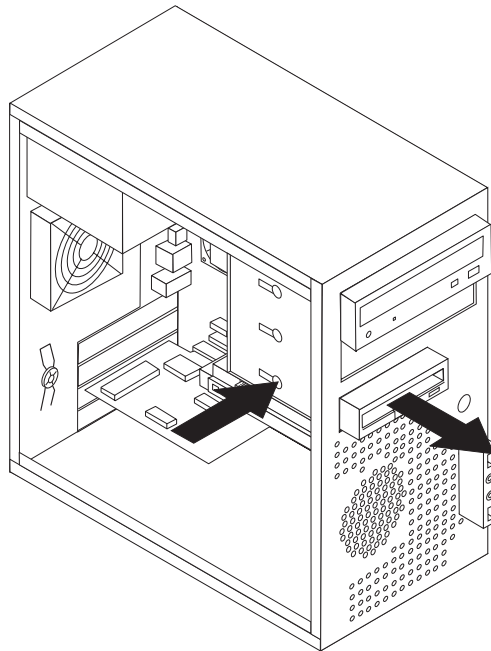
Replacing the diskette drive

Attention:

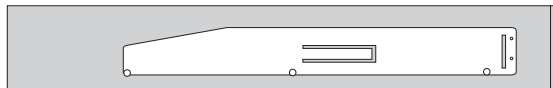
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To replace the diskette drive:

1. Remove the computer cover. See "Removing the computer cover" on page 7.
2. Remove the front bezel. See "Removing and replacing the front bezel" on page 9.
3. Disconnect the signal and power cables from the rear of the diskette drive.
4. Press the release button and slide the diskette drive out the front of the computer.



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



6. Slide the new diskette drive into the drive bay until it snaps into position.
7. Connect the power and signal cables to the diskette drive.
8. Go to “Completing the installation” on page 26.

Replacing the system fan assembly

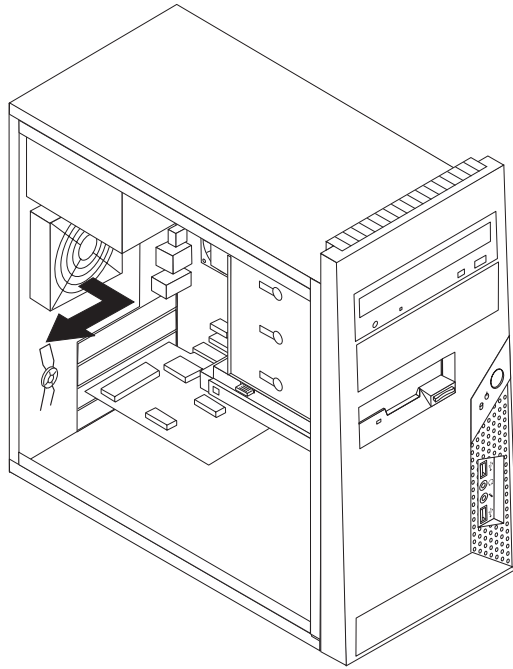
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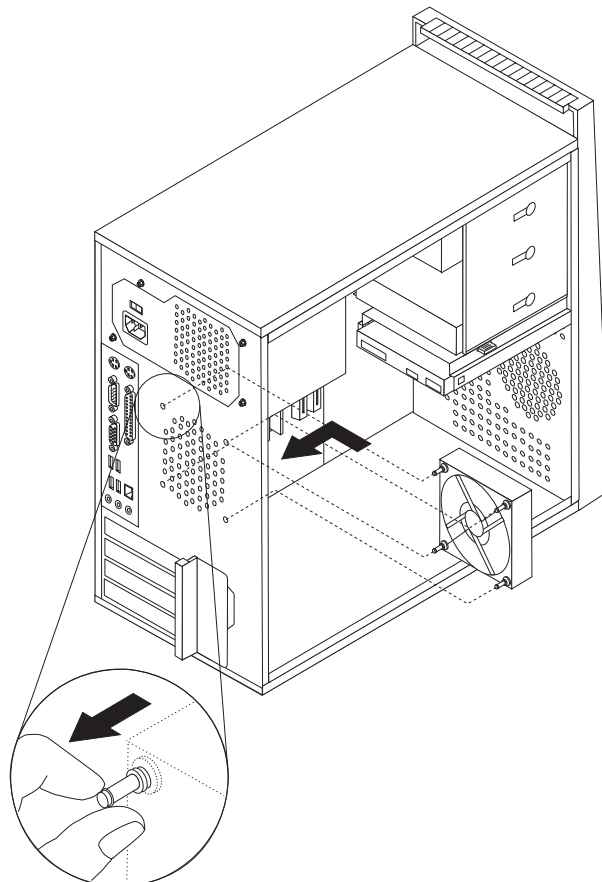
To replace the system fan assembly:

1. Remove the computer cover. See “Removing the computer cover” on page 7.
2. Locate the system fan assembly. See “Identifying parts on the system board” on page 4.
3. Disconnect the system fan assembly cable from the system board. See “Identifying parts on the system board” on page 4.

4. Pull the system fan assembly out of chassis.



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



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

7. Connect the system fan assembly cable to the system fan connector on the system board.
8. Go to “Completing the installation” on page 26.

Replacing the keyboard

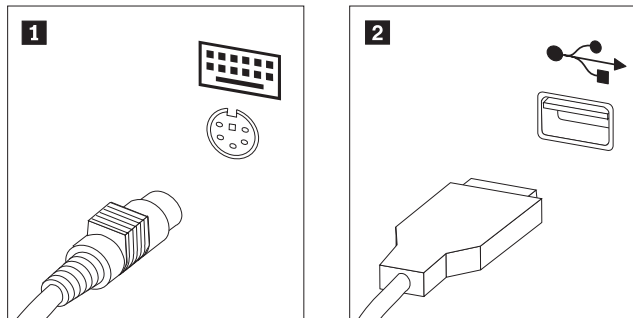
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To replace the keyboard:

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 connector for the keyboard. See “Locating connectors on the rear of the computer” on page 3 and “Locating connectors on the front of the computer” on page 2.

Note: Your keyboard might be connected to the standard keyboard connector **1** at the rear of the computer or to a USB connector **2** at either the front or rear of the computer.



4. Disconnect the failing keyboard cable from the computer and connect the new keyboard cable to the same connector.
5. Go to “Completing the installation” on page 26.

Replacing the mouse

Attention:

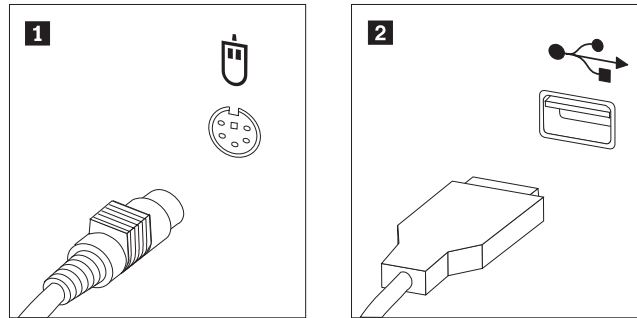
Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Safety and Warranty Guide* that was included with your computer. To obtain copies of the *Safety and Warranty Guide*, go to the Support Web site at <http://www.lenovo.com/support>.

To replace the 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 connectors on the front of the computer” on page 2 and “Locating connectors on the rear of the computer” on page 3.

Note: Your mouse might be connected to the standard mouse connector **1** at the rear of the computer or to a USB connector **2** at either the front or rear of the computer.



4. Disconnect the failing mouse cable from the computer.
5. Connect the new mouse cable to the connector.
6. Go to “Completing the installation.”

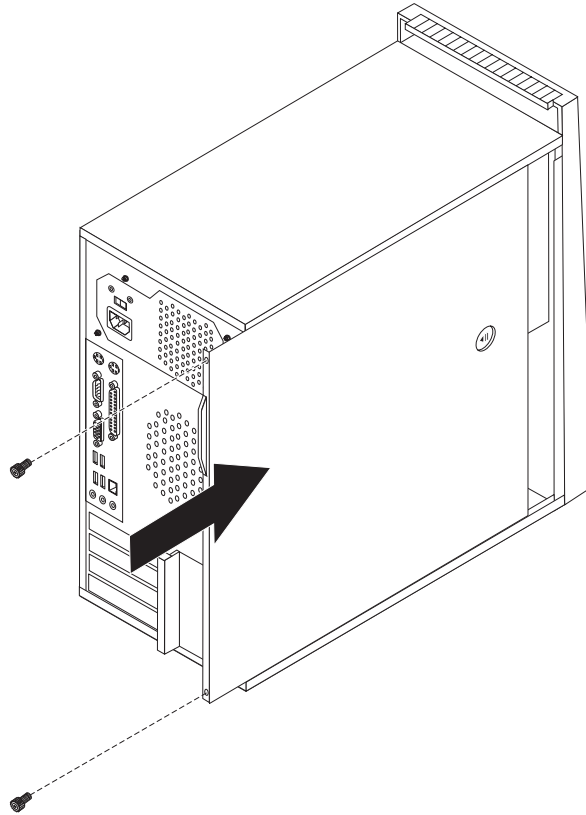
Completing the installation

After replacing the parts, you need to close the computer 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 “Starting the Setup Utility” in the *User Guide*.

To complete the part installation:

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 the various components.
2. Make sure that the cables are routed correctly before replacing the computer cover.

3. Position the computer cover on the chassis so that the rail guides on the bottom of the computer cover engage the rails. Then, push the computer cover closed until it snaps into position.



4. If the cover is secured with thumbscrews, install them.
5. If a cover lock is installed, lock the cover.
6. Reconnect the external cables and power cords into the computer. See "Locating connectors on the front of the computer" on page 2 and "Locating connectors on the rear of the computer" on page 3.
7. To update your configuration settings, see "Starting the Setup Utility" 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 "Starting the Setup Utility" in the *User Guide* or in the *Hardware Maintenance Manual*. 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-ROM into the diskette drive or optical drive. System program updates are available at <http://www.lenovo.com/support> on the World Wide Web.

Note: To insert a CD-ROM into the optical drive, the computer must be 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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