

Hardware Replacement Guide

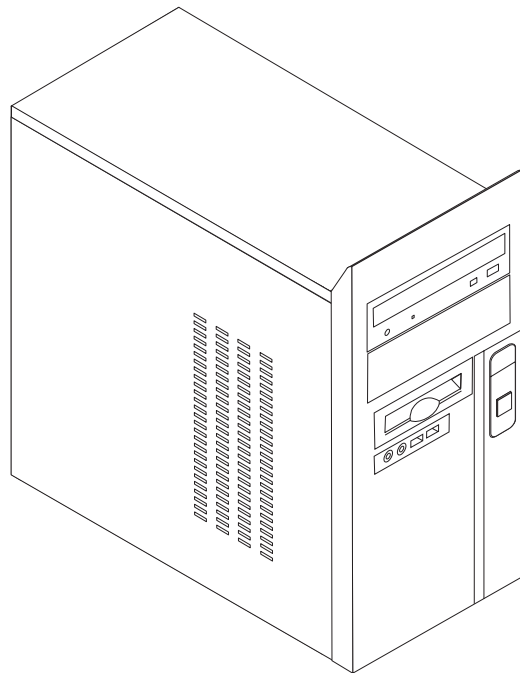
Types 8290, 8291, 8292, 8463, 8464

Types 8465, 8469, 8472, 8708, 8709

Types 8712, 8713, 8719, 8771, 8772

Types 8776, 8777, 8817, 9214

Types 9215, 9216



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Types 8465, 8469, 8472, 8708, 8709

Types 8712, 8713, 8719, 8771, 8772

Types 8776, 8777, 8817, 9214

Types 9215, 9216

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Contents

Overview	v
Safety information for replacing CRUs.	v
Safety information for replacing FRUs.	v
Additional information resources	v
Tools required	vi
Handling static-sensitive devices	vi
Chapter 1. Locations	1
Locating the connectors on the front of your computer	1
Locating the connectors on the rear of your computer	2
Locating components	3
Identifying parts on the system board	4

Chapter 2. Replacing hardware	9
Removing the cover	9
Replacing a memory module	10
Replacing a PCI adapter	11
Replacing a keyboard	12
Replacing a mouse	13
Completing the parts replacement.	14
Appendix. Notices	15
Television output notice	16
Trademarks	16

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 Replaceable Units (FRUs). In this document, CRUs and FRUs will be referred to as parts.

Note: Trained service personnel should refer to the *Hardware Maintenance Manual* (HMM) for parts ordering information.

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.

This guide contains instructions for replacing the following parts:

Note: Use only the parts provided by Lenovo™.

- Memory module
- PCI adapter card
- Keyboard
- Mouse

Safety information for replacing CRUs

Do not open your computer or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer. To obtain a copy of the *Quick Reference* go to the World Wide Web at <http://www.lenovo.com/support>.

Safety information for replacing FRUs

Do not open your computer or attempt any repair before reading the “Important safety information” in the *Hardware Maintenance Manual* (HMM) for the computer. To obtain a copy of the *HMM*, go to the World Wide Web 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 instructions
- 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 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:

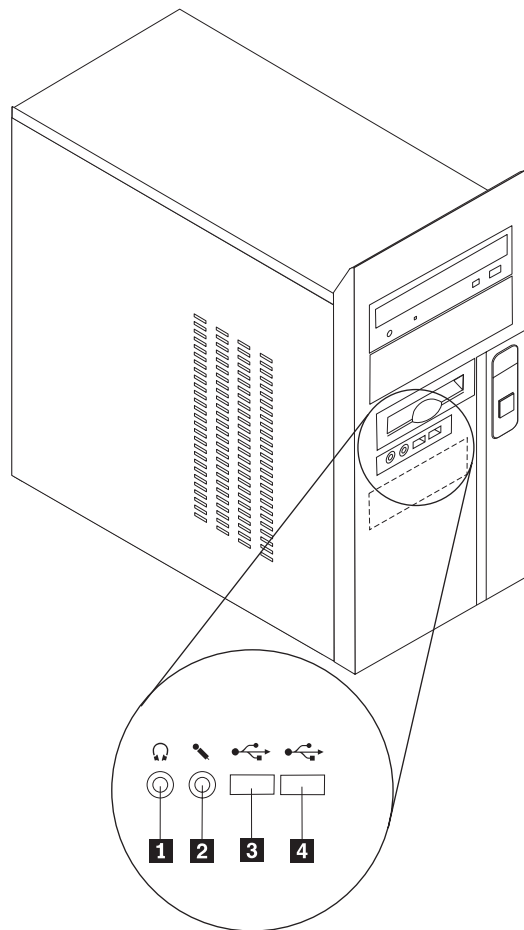
- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle parts and other computer components carefully. Handle adapters, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the parts 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 “Removing the cover” on page 9.

Locating the connectors on the front of your computer

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

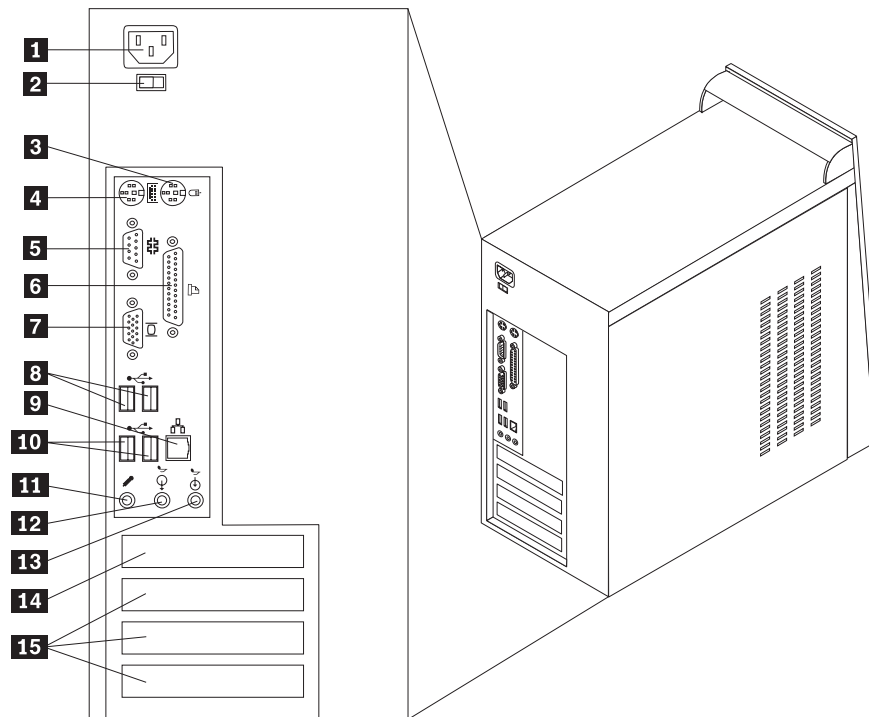


1 Headphone connector
2 Microphone connector

3 USB connector
4 USB connector

Locating the connectors on the rear of your computer

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

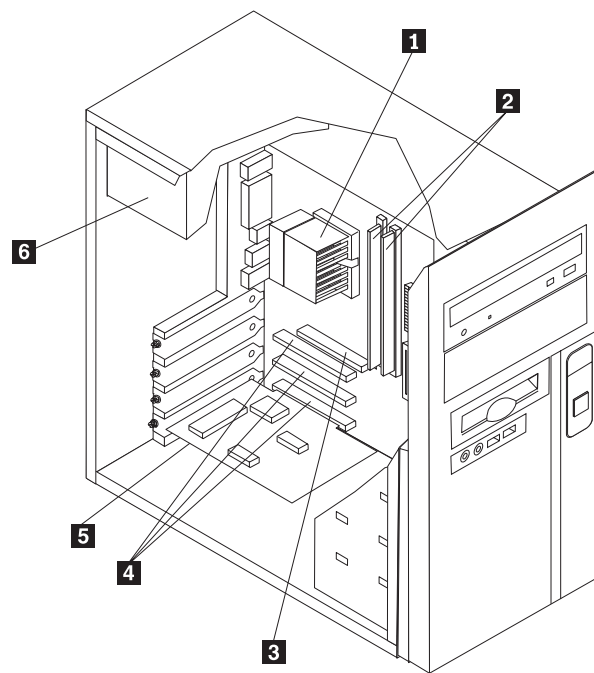


- 1** Power connector
- 2** Voltage switch
- 3** Mouse connector
- 4** Keyboard connector
- 5** Serial connector
- 6** Parallel connector
- 7** VGA monitor connector
- 8** USB connectors

- 9** Ethernet connector
- 10** USB connectors
- 11** Microphone connector
- 12** Audio line out connector
- 13** Audio line in connector
- 14** AGP adapter or PCI Express x16 graphics adapter connector (some models)
- 15** PCI adapter connectors

Locating components

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

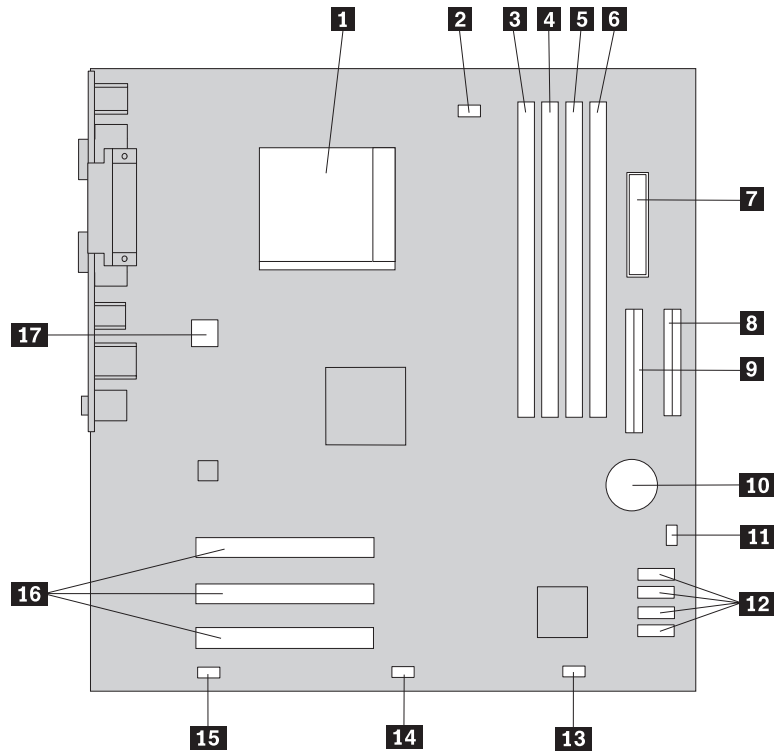


- | | |
|--|-------------------------|
| 1 Microprocessor and heat sink | 4 PCI connectors |
| 2 Memory modules | 5 PCI adapter |
| 3 AGP adapter or PCI Express
x16 graphics adapter connector
(some models) | 6 Power supply |

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.

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



1 Microprocessor and heat sink

2 Fan connector

3 Memory connector 1

4 Memory connector 2

5 Memory connector 3

6 Memory connector 4

7 Power connector

8 Diskette drive connector

9 Primary IDE connector

10 Battery

11 Clear CMOS/Recovery jumper

Note: This part may be a two-pin header.

12 SATA connectors (4)

13 Front panel connector

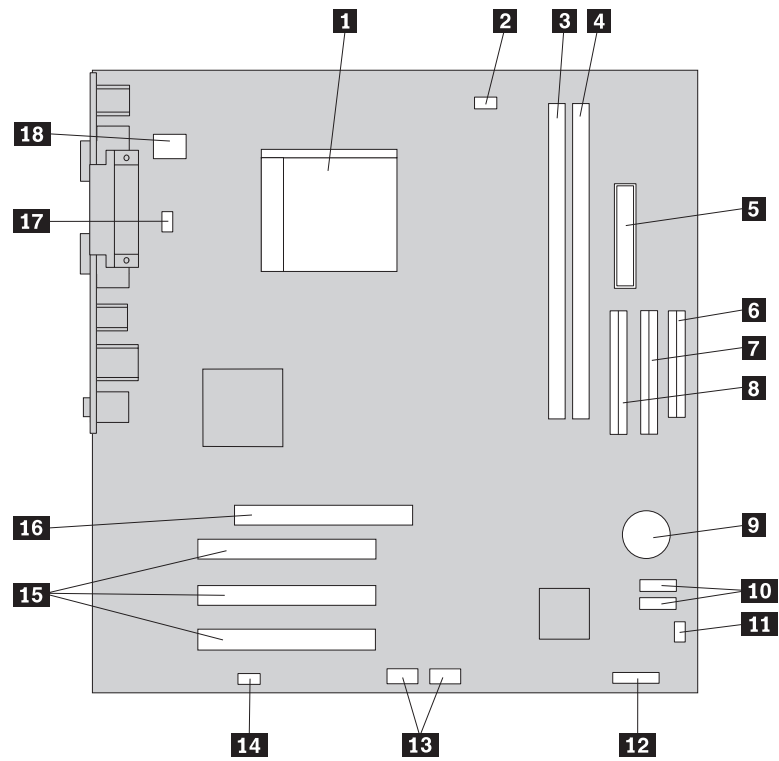
14 Front USB connector

15 Front audio connector

16 PCI adapter connectors

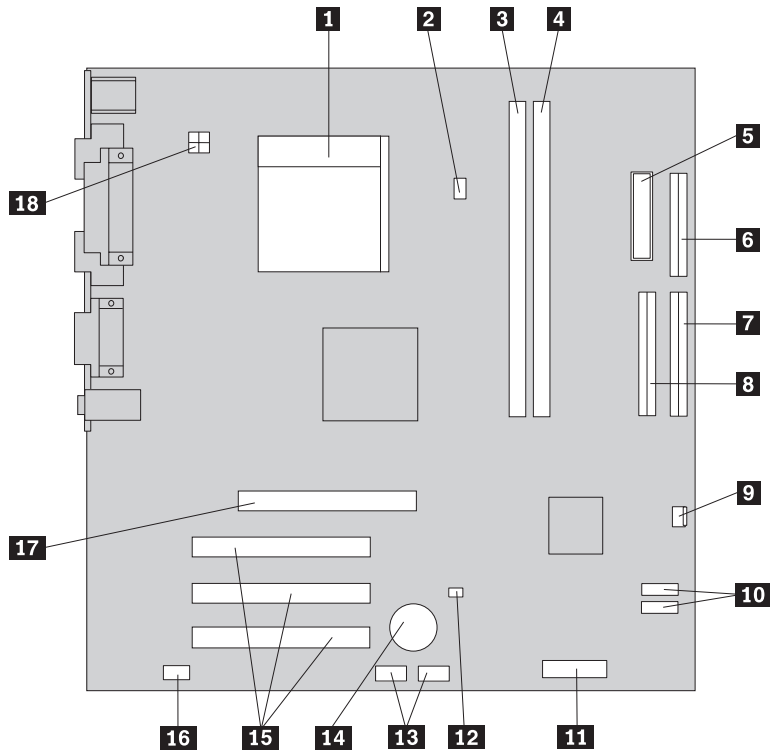
17 12v power connector

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



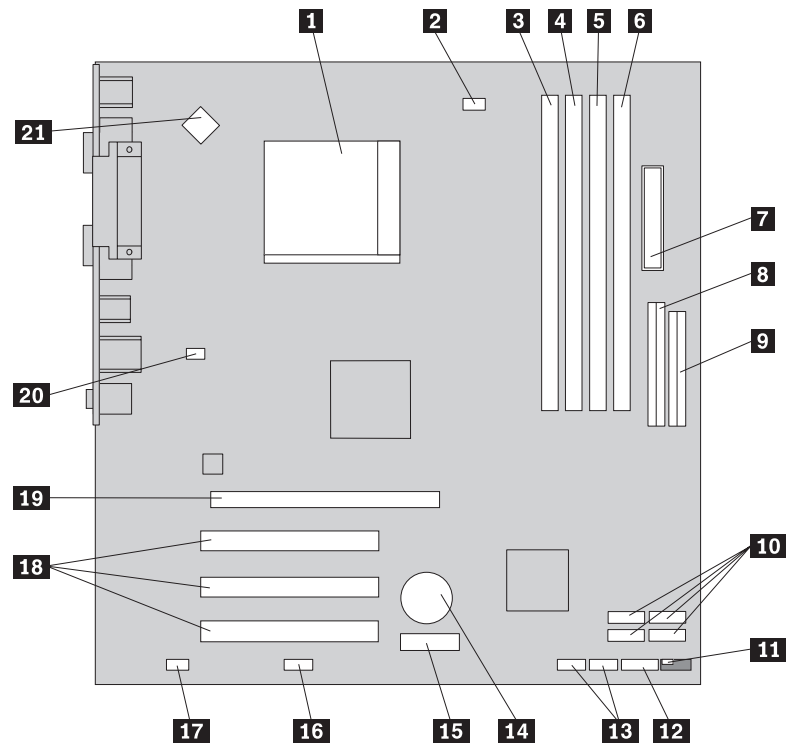
- | | |
|---------------------------------------|--------------------------------------|
| 1 Microprocessor and heat sink | 10 SATA connectors (2) |
| 2 Microprocessor fan connector | 11 Clear CMOS/Recovery jumper |
| 3 Memory connector 1 | 12 Power LED connector |
| 4 Memory connector 2 | 13 Front USB connector |
| 5 Power connector | 14 Front audio connector |
| 6 Diskette drive connector | 15 PCI adapter connectors |
| 7 Secondary IDE connector | 16 AGP adapter connector |
| 8 Primary IDE connector | 17 System fan connector |
| 9 Battery | 18 12v power connector |

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



- | | |
|---------------------------------------|---|
| 1 Microprocessor and heat sink | 10 SATA connectors (2) (some models) |
| 2 Microprocessor fan connector | 11 Front panel connector |
| 3 Memory connector 1 | 12 Clear CMOS/Recovery jumper |
| 4 Memory connector 2 | 13 Front USB connectors (2) |
| 5 Power connector | 14 Battery |
| 6 Diskette drive connector | 15 PCI adapter connectors |
| 7 Primary IDE connector | 16 Front audio connector |
| 8 Secondary IDE connector | 17 AGP adapter connector |
| 9 System fan connector | 18 12v power connector |

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



- | | |
|---------------------------------------|--|
| 1 Microprocessor and heat sink | 12 Front panel connector |
| 2 Microprocessor fan connector | 13 Front USB connectors (2) |
| 3 Memory connector 1 | 14 Battery |
| 4 Memory connector 2 | 15 PCI Express x1 adapter connector |
| 5 Memory connector 3 | 16 Serial (COM2) connector |
| 6 Memory connector 4 | 17 Front audio connector |
| 7 Power connector | 18 PCI connectors |
| 8 IDE connector | 19 PCI Express x16 adapter connector
(some models) |
| 9 Diskette drive connector | 20 System fan |
| 10 SATA connectors (4) | 21 12v power connector |
| 11 Clear CMOS/Recovery jumper | |

Chapter 2. Replacing hardware

Attention

Do not open your computer or attempt any repair before reading the "Important safety information" in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual* (HMM) for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to <http://www.lenovo.com/support>.

Note: Use only the parts provided by Lenovo.

Removing the cover

Important

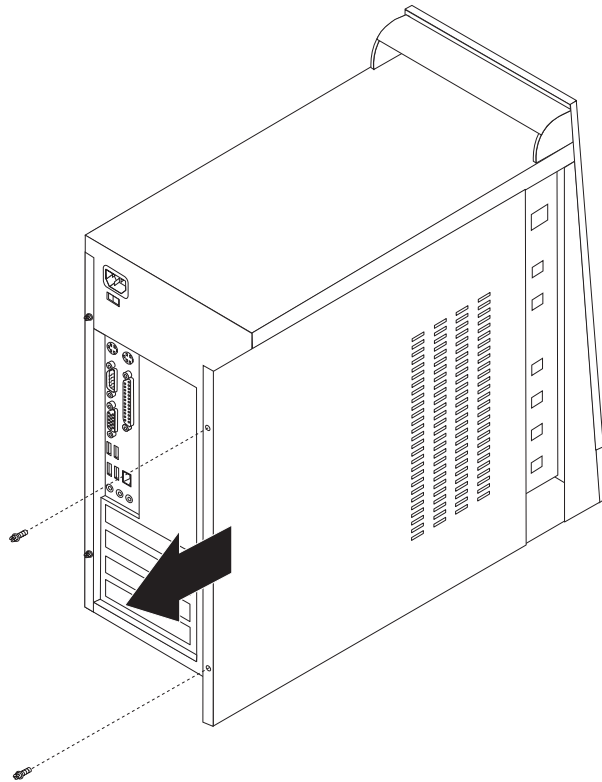


Turn off the computer and wait 3 to 5 minutes to let the computer cool before opening the computer cover.

To remove the cover:

1. Shut down your operating system, remove any media (diskettes, CDs, or tapes) from the drives, and 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.

4. Remove the two screws at the rear of the left side cover and slide the cover to the rear to remove.



Replacing a memory module

Attention

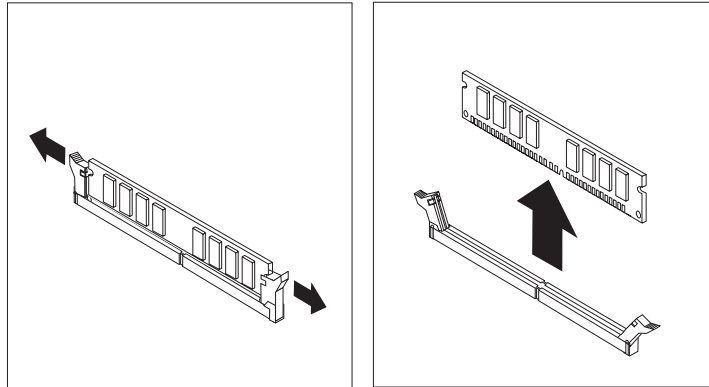
Do not open your computer or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to <http://www.lenovo.com/support>.

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

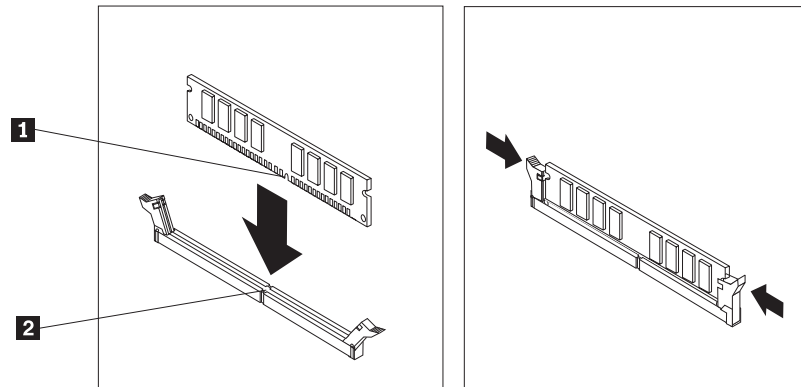
Note: Your computer has support for two or four memory modules.

1. Remove the computer cover. See “Removing the cover” on page 9.

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



- 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.



- Go to “Completing the parts replacement” on page 14.

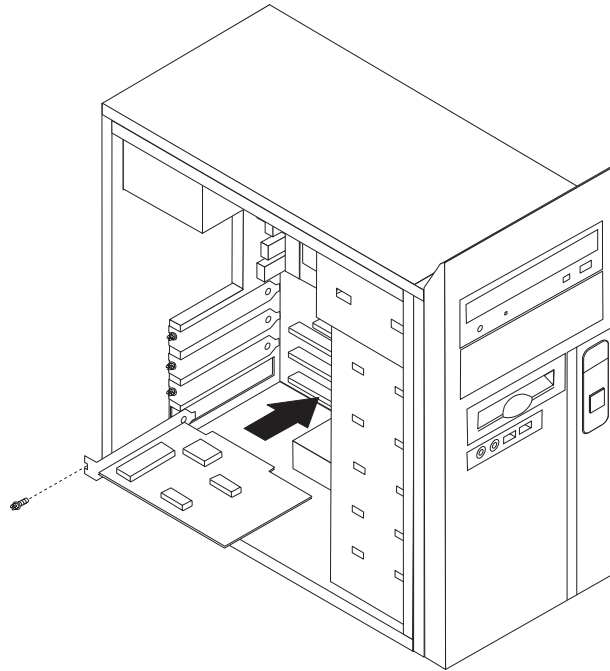
Replacing a PCI adapter

Attention

Do not open your computer or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to <http://www.lenovo.com/support>.

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

1. Remove the computer cover. See “Removing the cover” on page 9.
2. Remove screw from adapter.
3. Remove the adapter by pulling it straight out of the adapter connector.
4. Remove the new adapter from its static-protective package.
5. Install the new adapter into the appropriate slot on the system board.
6. Secure adapter with the screw as shown.



7. Go to “Completing the parts replacement” on page 14.

Replacing a keyboard

Attention

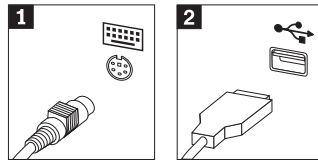
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This section provides instructions on how to replace a keyboard.

1. Remove any media (diskettes, CDs, or tapes) from the drives, shut down your operating system, and turn off all attached devices.
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 the connectors on the rear of your computer” on page 2 or “Locating the connectors on the front of your computer” on page 1.



4. Disconnect the failing keyboard cable from the computer.
5. Connect the new keyboard to the appropriate connector on the computer.
6. Go to “Completing the parts replacement” on page 14.

Replacing a mouse

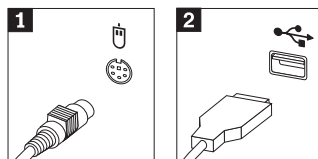
Attention

Do not open your computer or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to <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 might be connected to a standard mouse connector **1** or a USB connector **2** in the front or rear of your computer. See “Locating the connectors on the rear of your computer” on page 2 or “Locating the connectors on the front of your computer” on page 1.



4. Disconnect the failing mouse cable from the computer.

5. Connect the new mouse to the appropriate connector on the computer.
6. Go to "Completing the parts replacement."

Completing the parts replacement

After working with parts, you need to replace the computer cover and reconnect any 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.

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.
2. Reposition any cables that might impede the replacement of the cover.
3. Close the computer cover.
4. Install any locking devices such as a padlock as necessary.
5. Reconnect the external cables and power cords to the computer. See "Locating the connectors on the rear of your computer" on page 2.
6. To update the configuration, see "*Starting the Setup Utility*" in the *Quick Reference* that was included with your computer.

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.

Appendix. Notices

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