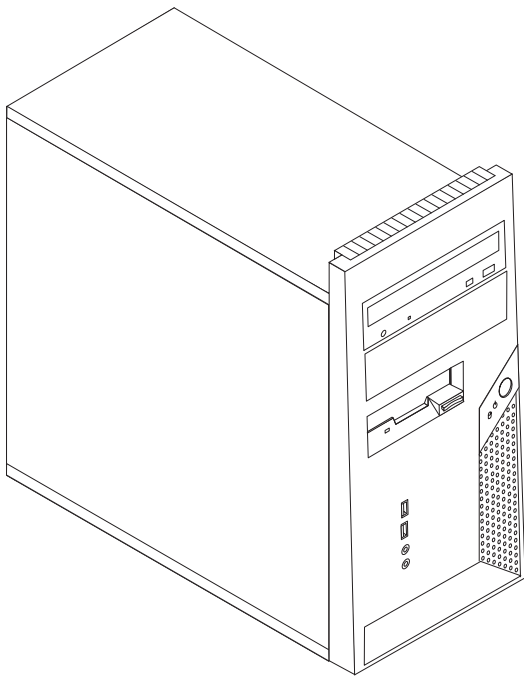


ThinkCentre

Hardware Replacement Guide

Types 8288, 8297, 8326
Types 8329, 8342, 8380



ThinkCentre

Hardware Replacement Guide

Types 8288, 8297, 8326

Types 8329, 8342, 8380

First Edition (November 2005)

© Copyright Lenovo 2005.

Portions © Copyright International Business Machines Corporation 2005.

All rights reserved.

U.S. GOVERNMENT USERS – RESTRICTED RIGHTS: Our products and/or services are provided with RESTRICTED RIGHTS. Use, duplication or disclosure by the Government is subject to the GSA ADP Schedule contract with Lenovo Group Limited, if any, or the standard terms of this commercial license, or if the agency is unable to accept this Program under these terms, then we provide this Program under the provisions set forth in Commercial Computer Software–Restricted Rights at FAR 52.227-19, when applicable, or under Rights in Data-General, FAR 52.227.14 (Alternate III).

Contents

Overview	v
Safety information for replacing CRUs.	v
Safety information for replacing FRUs.	v
Additional information resources	vi
Tools required	vi
Handling static-sensitive devices	vi
Chapter 1. Locations	1
Locating components	1
Locating connectors on the front of the computer	2
Locating connectors on the rear of the computer	3
Identifying parts on the system board	4
Chapter 2. Replacing hardware.	5
Removing the computer cover	5
Removing and replacing the front bezel	7
Replacing the power supply	8
Replacing the system board assembly	9

Replacing the microprocessor	14
Replacing a memory module	19
Replacing an adapter	20
Replacing the hard disk drive	21
Replacing an optical drive	23
Replacing the diskette drive	24
Replacing the system fan assembly	25
Replacing the front audio/USB panel.	26
Replacing the keyboard	27
Replacing the mouse	28
Replacing the internal speaker	28
Completing the installation	29
Updating (flashing) BIOS from a diskette or CD-ROM	31
Appendix. Notices.	33
Television output notice	34
Trademarks	34

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 guide, CRUs and FRUs will often 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.

Note: Use only parts provided by Lenovo™.

This guide contains procedures for replacing the following parts:

- Power supply
- System board
- Microprocessor
- Memory modules
- Adapter
- Hard disk drive
- Optical drive
- Diskette drive
- System fan
- Front audio/USB panel
- Keyboard
- Mouse
- Internal speaker

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

Safety information for replacing FRUs

Do not attempt any repair before reading the “Important safety information” in the *Hardware Maintenance Manual* (HMM) for the computer. You can find the HMM on the Support Web site at <http://www.lenovo.com/think/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/think/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:

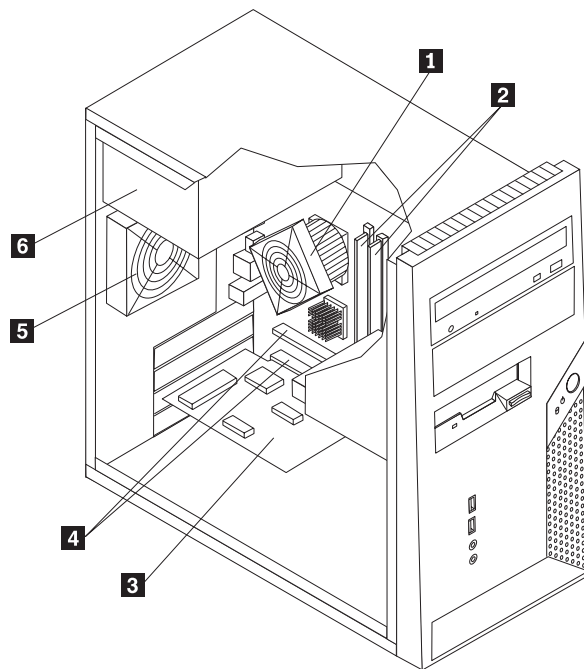
- Limit your movement. Movement can cause static-electricity to build up around you.
- Always handle parts and other computer components carefully. Handle adapters, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the parts 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 5.

Locating components

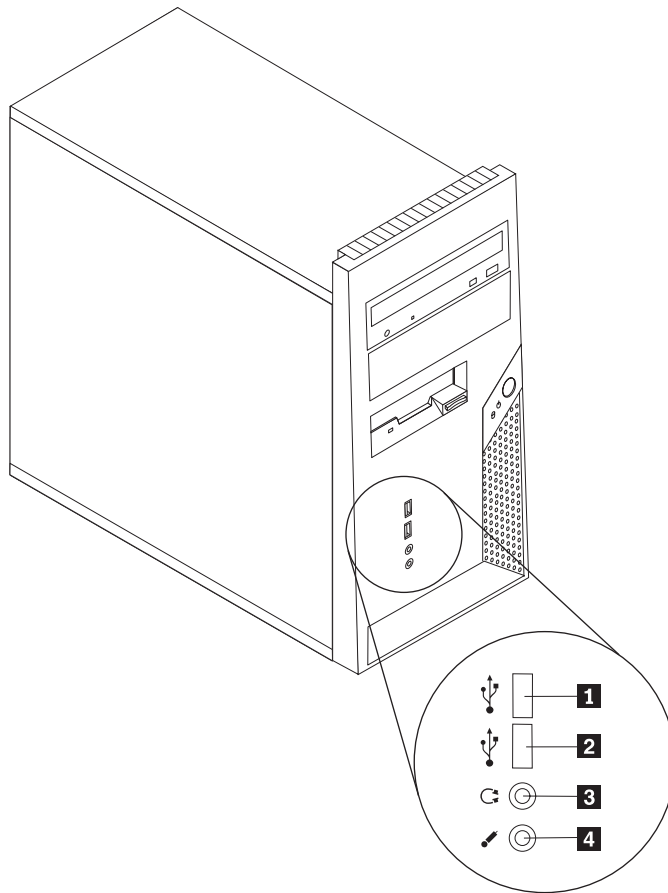
The following illustration will help you locate the various components in your computer.



- | | | | |
|----------|----------------------------------|----------|------------------------|
| 1 | Microprocessor fan and heat sink | 4 | 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.

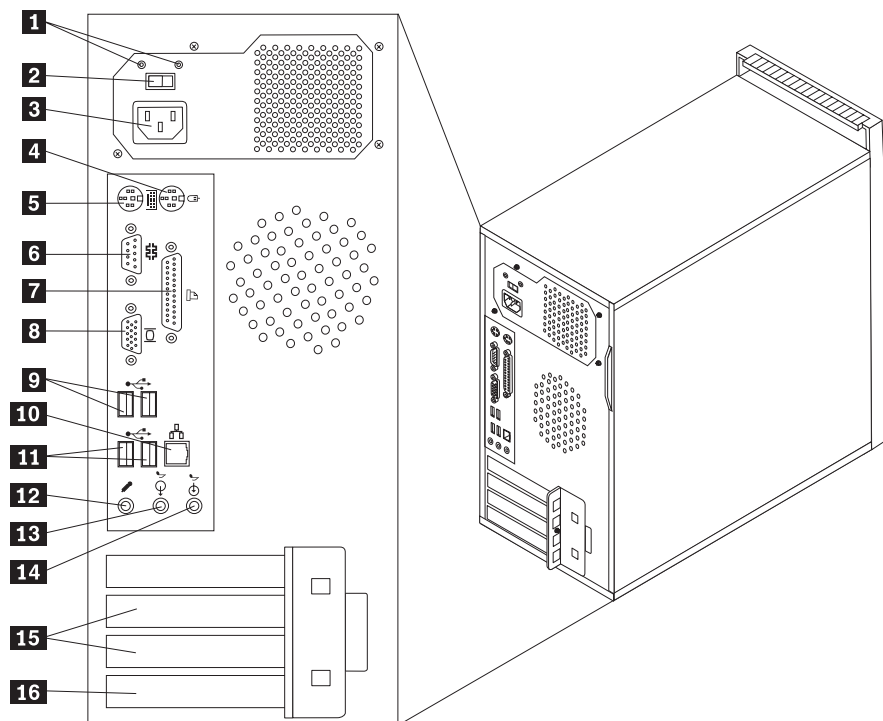


1 USB connector
2 USB connector

3 Headphone connector
4 Microphone connector

Locating connectors on the rear of the computer

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

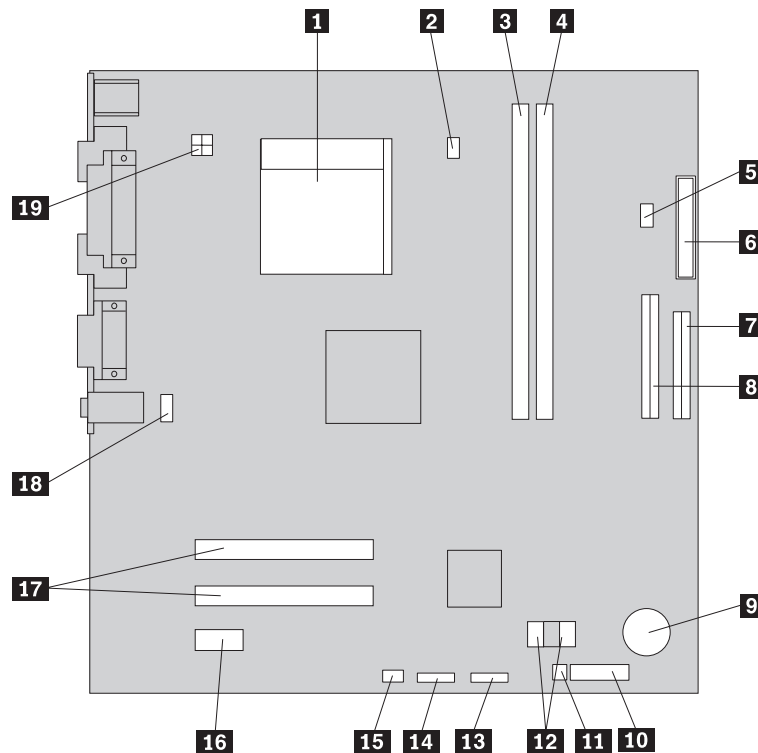


- | | | | |
|----------|-------------------------------|-----------|----------------------------------|
| 1 | Power supply diagnostics LEDs | 9 | USB connectors (2) |
| 2 | Voltage selection switch | 10 | Ethernet connector |
| 3 | Power connector | 11 | USB connectors (2) |
| 4 | Standard mouse connector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

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.



- | | | | |
|-----------|------------------------------|-----------|----------------------------------|
| 1 | Microprocessor | 11 | Clear CMOS/Recovery jumper |
| 2 | Microprocessor fan connector | 12 | SATA IDE connectors (2) |
| 3 | Memory connector 1 | 13 | Front panel USB connector |
| 4 | Memory connector 2 | 14 | USB Memory Card Reader |
| 5 | Internal speaker connector | 15 | System fan connector |
| 6 | Power connector | 16 | PCI Express x1 adapter connector |
| 7 | Diskette drive connector | 17 | PCI adapter connectors |
| 8 | PATA IDE connector | 18 | Front audio connector |
| 9 | Battery | 19 | 12V power connector |
| 10 | Front panel connector | | |

Chapter 2. Replacing hardware

Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

Note: Use only parts provided by Lenovo.

Removing the computer cover

Important

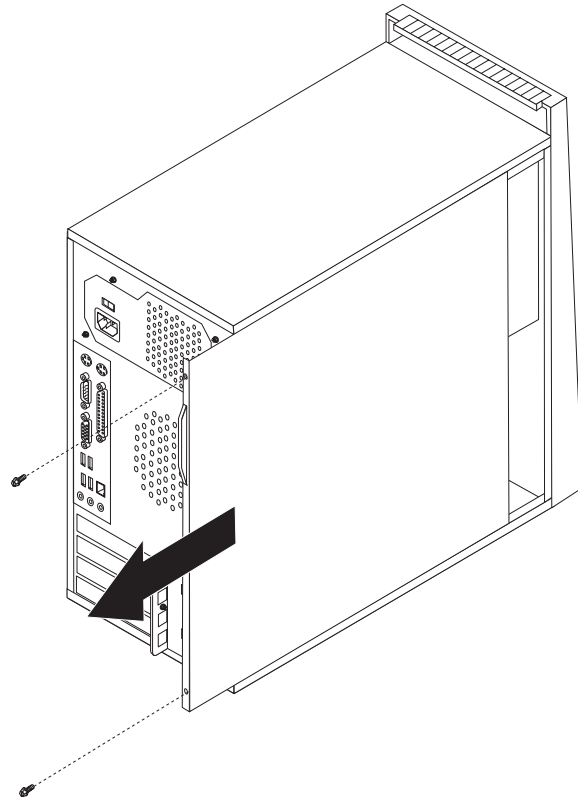


Turn off the computer and wait 3 to 5 minutes to let the computer cool before removing the computer cover.

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.

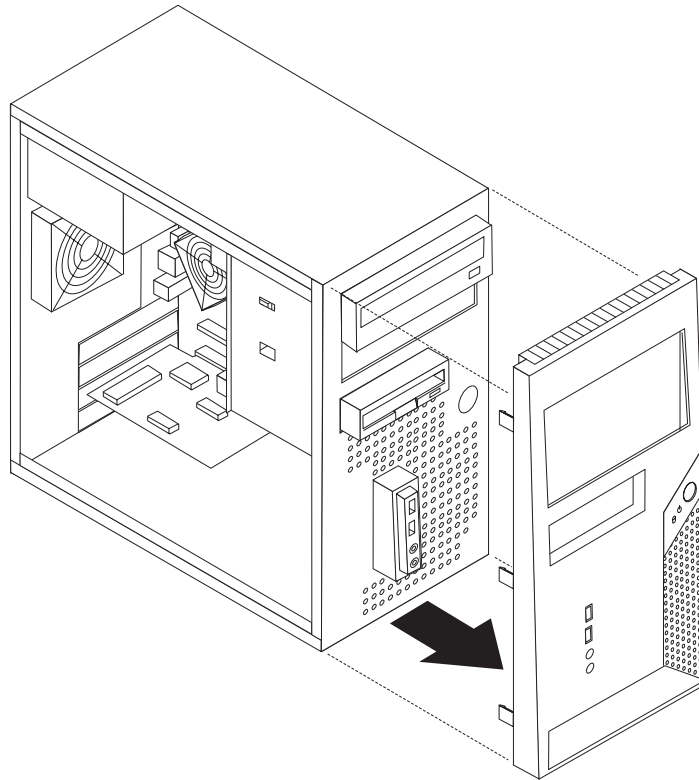
5. Remove the two screws on the right side cover, slide the cover to the rear, and remove.



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 5.
2. Remove the front bezel by releasing the three plastic tabs inside the chassis and push the bezel outward as shown.



3. To reinstall the bezel, align the plastic tabs on the bottom of the bezel with the corresponding holes in the chassis, then snap it into position at the bottom and top of the chassis.
4. Go to “Completing the installation” on page 29.

Replacing the power supply

Attention:

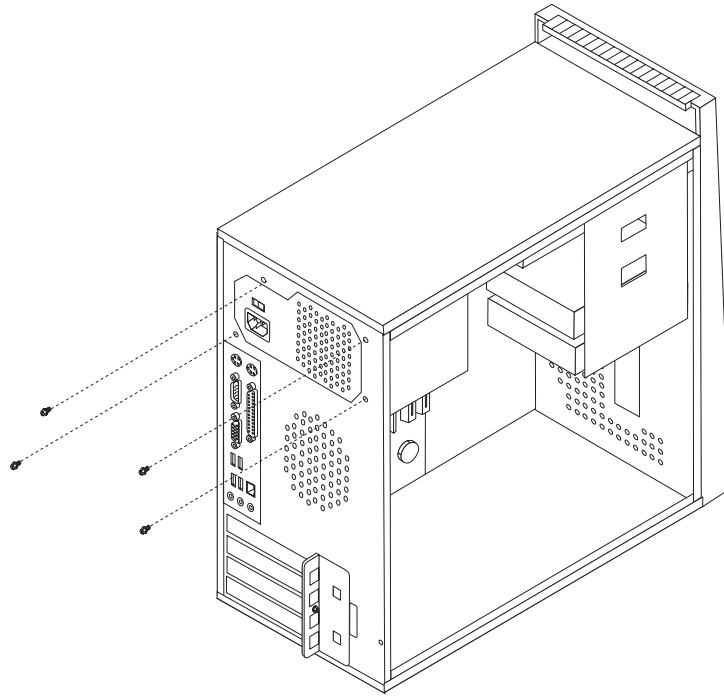
Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to the Support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

To replace the power supply:

1. Remove the computer cover. See “Removing the computer cover” on page 5.

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 29.

Replacing the system board assembly

Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

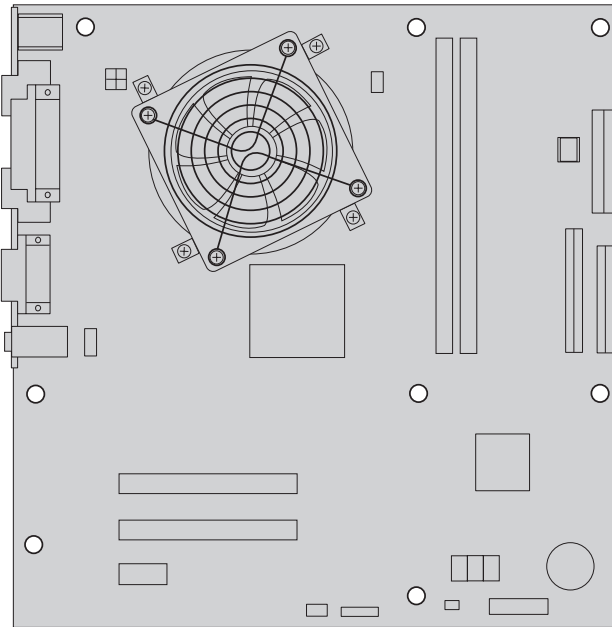
To replace the system board assembly:

1. Remove the computer cover. See “Removing the computer cover” on page 5.
2. Lay the computer on its side.
3. Disconnect the cables connected to the system board. See “Identifying parts on the system board” on page 4.

Important

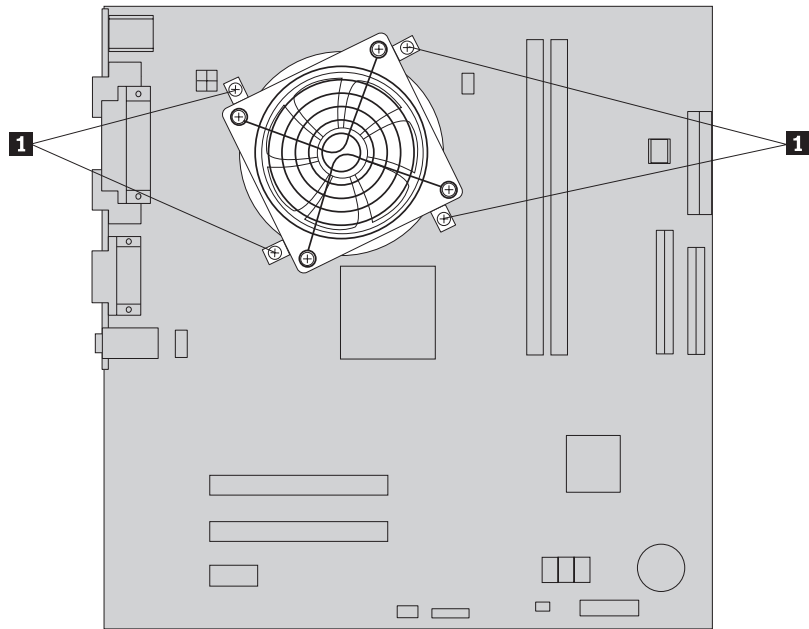
Note the cable routing. It is important to route the cables the same way after you install the new system board.

4. Remove the system fan assembly. See “Replacing the system fan assembly” on page 25.
5. Remove the screws securing the system board.

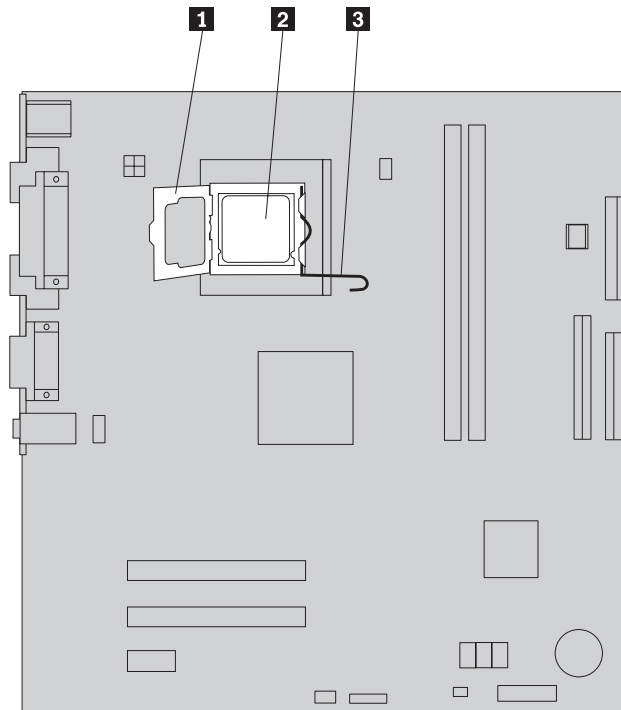


6. Lift the system board toward the front of the computer to disengage it from the mounting tabs and lift it out.
7. Place the defective system board next to the new system board on a clean, flat surface.

8. Remove the heat sink **1** from the system board by removing the four screws. Then, carefully lift up the heat sink off the mounting brackets. Place the heat sink on its side on a clean, flat surface so the thermal material on the bottom of the heat sink does not touch the surface and become contaminated.



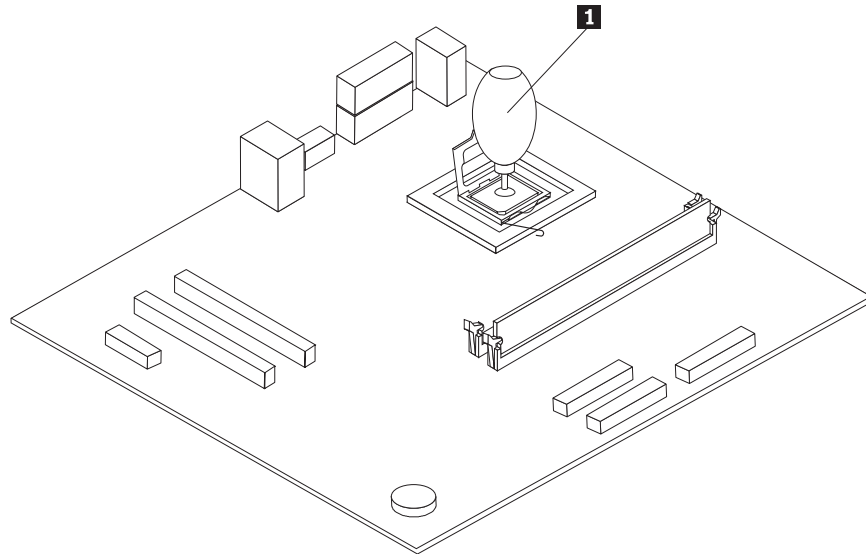
9. Release the lever **3** holding the microprocessor **2** and pivot the microprocessor retainer **1** until it is open.



10. Using the vacuum pen **1**, remove the microprocessor from the system board socket by lifting it straight up and out of the socket.

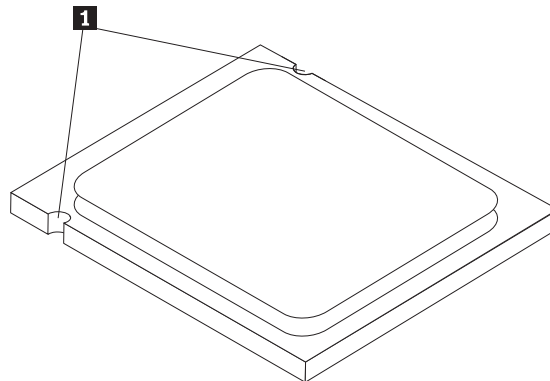
Important

Do not touch the gold contacts on the bottom of the microprocessor. If you must touch the microprocessor, touch only the sides.



Notes:

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



- b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.

11. On the new system board, release and pivot the locking lever, then pivot the microprocessor retainer until it is open.

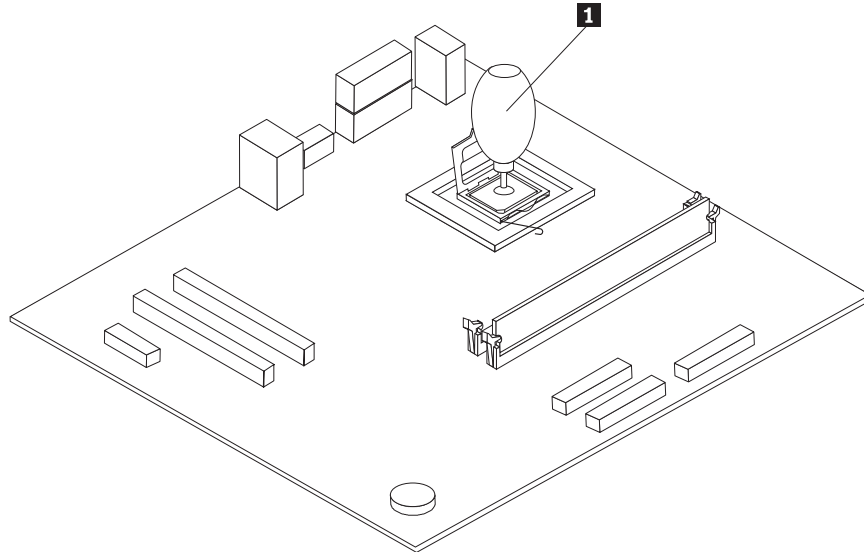
Note: There will be a black plastic cover on the retainer to protect the microprocessor socket. As you close the microprocessor retainer, remove the black plastic cover. Place the black plastic cover on the microprocessor retainer of the defective system board.

12. Position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.

Important

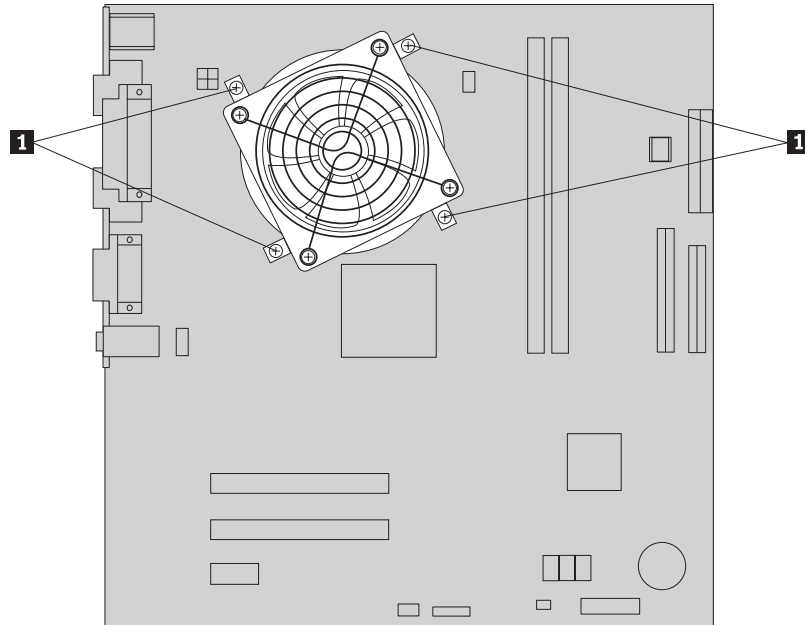
To avoid damaging the microprocessor contacts, do not tilt the microprocessor when installing it into the socket.

13. Using the vacuum pen **1**, lower the microprocessor straight down into the microprocessor socket, and secure the microprocessor.

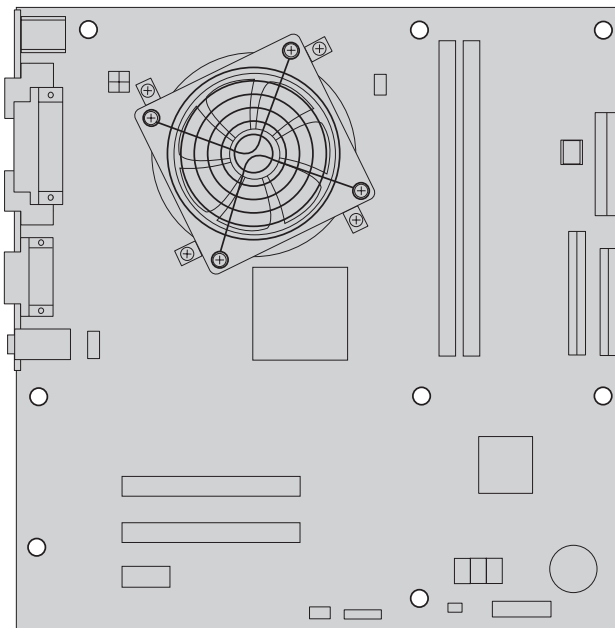


14. Position the heat sink on the heat sink mounting bracket and align the four holes of the heat sink with the holes on the system board.

15. Install the four screws **1** to secure the heat sink.



16. Install the new system board assembly into the computer chassis, align the screw holes, and install the screws.



Note: Use only the screws provided by Lenovo.

17. Reconnect all 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 for cable locations.
18. Go to "Completing the installation" on page 29.

Replacing the microprocessor

Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

Important

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

Important

Do not touch the gold contacts on the bottom of the microprocessor. Use the vacuum pen provided to remove and install the microprocessor. If you must touch the microprocessor, touch only the sides.

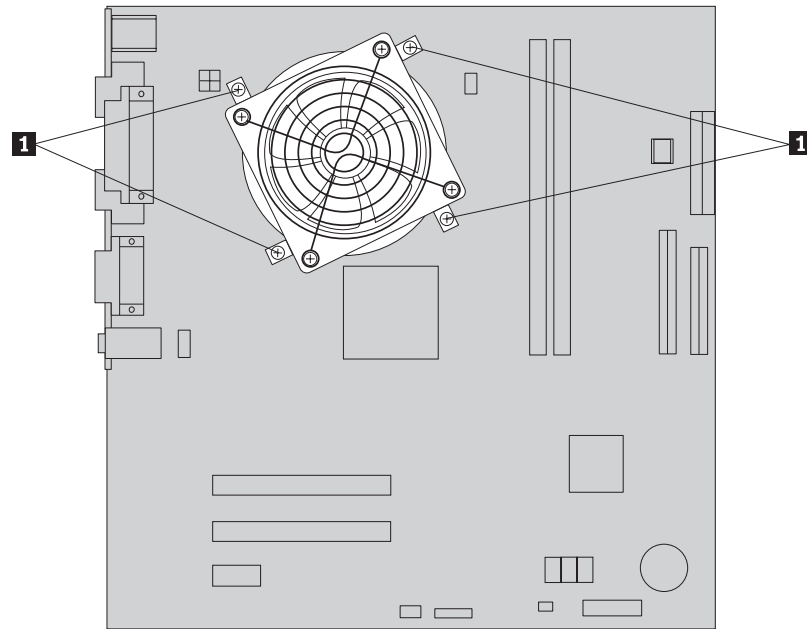
Important

A grease syringe is required to complete the new microprocessor installation. Make sure the grease syringe is available before beginning the procedure. Trained service personnel should refer to the *HMM* for parts ordering information.

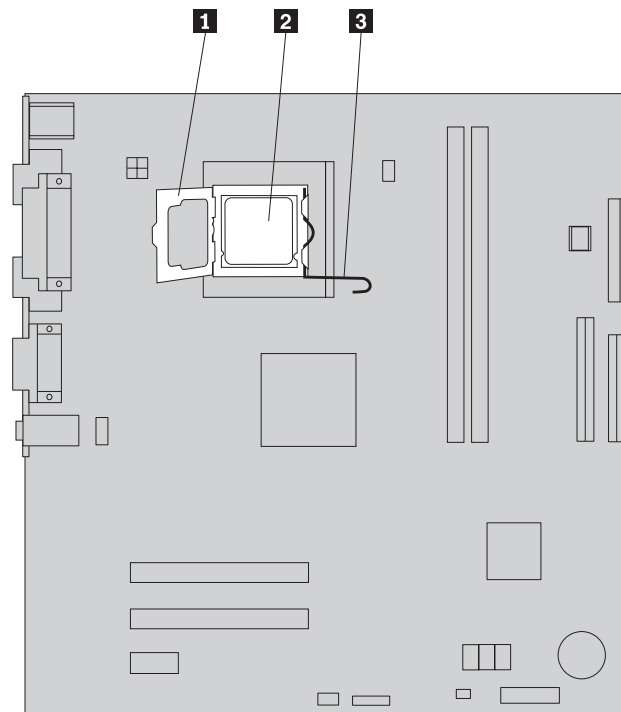
To replace the microprocessor:

1. Remove the computer cover. See “Removing the computer cover” on page 5.
2. Lay the computer on its side.

3. Remove the heat sink **1** from the system board by removing the four screws. Then, carefully lift up the heat sink off the mounting brackets. Place the heat sink on its side on a clean, flat surface so the thermal material on the bottom of the heat sink does not touch the surface and become contaminated.



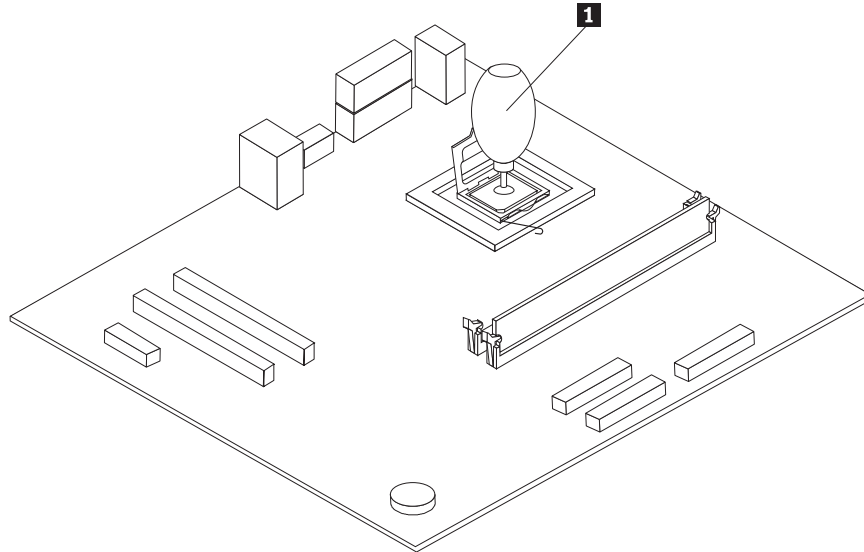
4. Release the lever **3** holding the microprocessor **2** and pivot the microprocessor retainer **1** until it is open.



5. Using the vacuum pen **1**, remove the microprocessor from the system board socket by lifting it straight up and out of the socket.

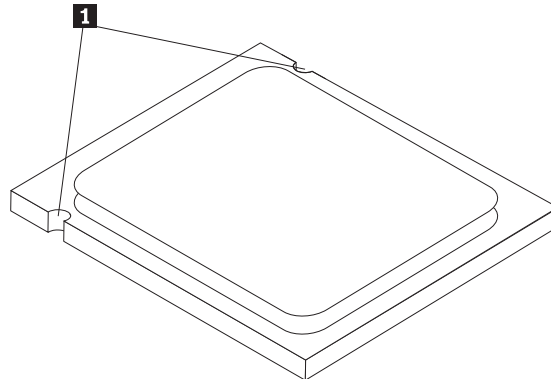
Important

Do not touch the gold contacts on the bottom of the microprocessor. If you must touch the microprocessor, touch only the sides.



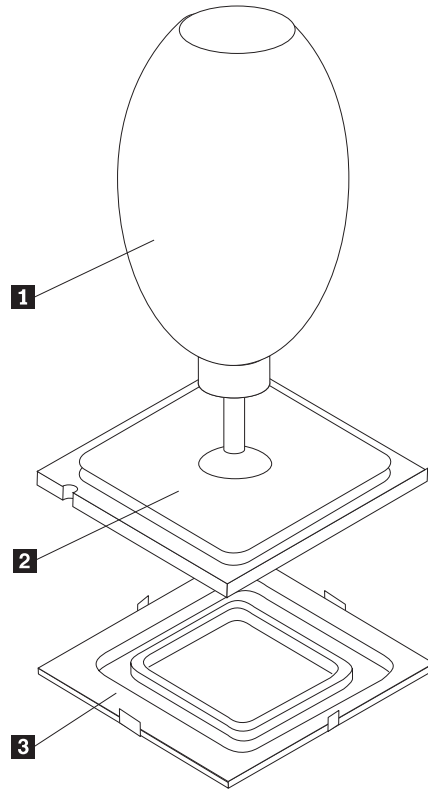
Notes:

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

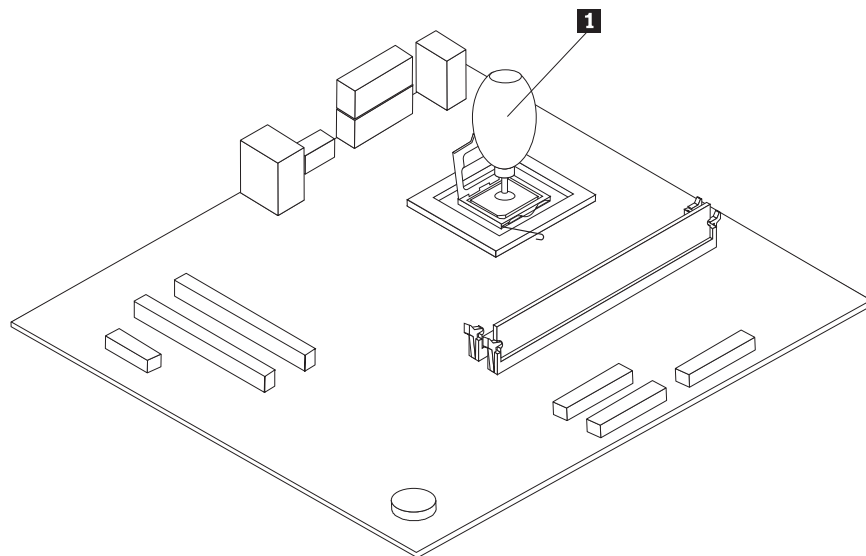


- b. Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.

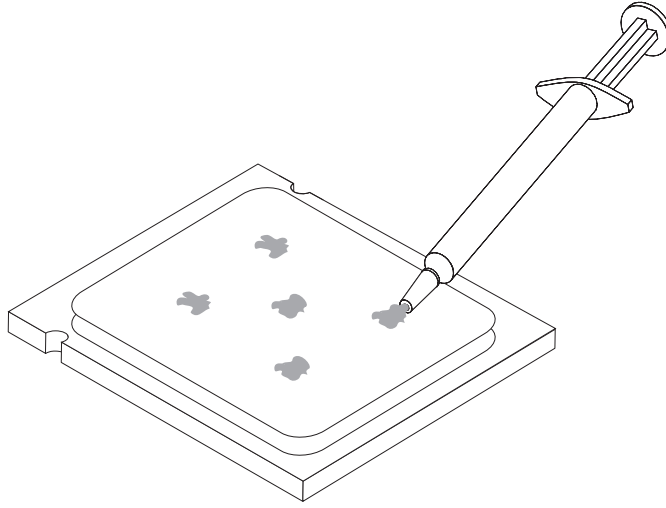
6. On the system board, release and pivot the locking lever, then pivot the microprocessor retainer until it is open.
7. Loosen the protective cover **3** that protects the gold contacts on the new microprocessor **2** but do not remove it. Use the vacuum pen **1** to pick up the microprocessor then completely remove the protective cover.



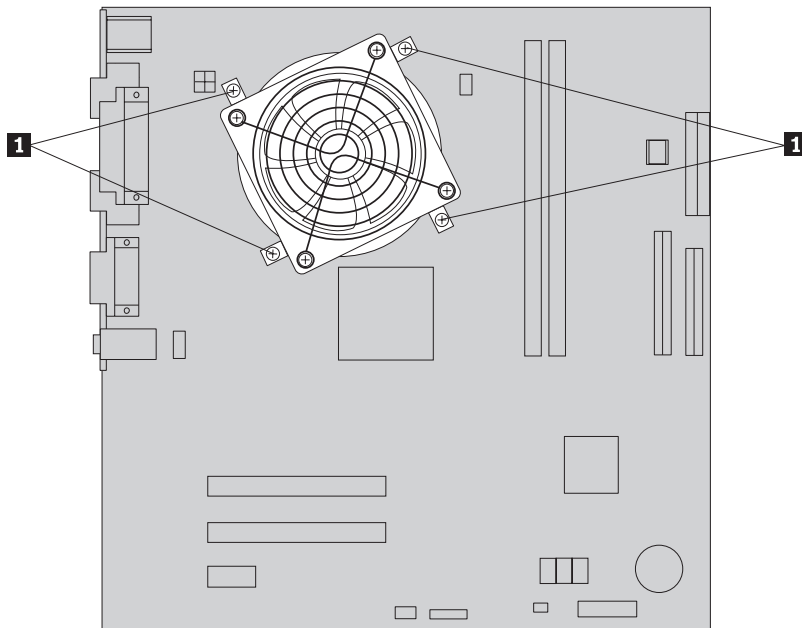
8. Position the microprocessor so that the notches on the microprocessor are aligned with the tabs in the microprocessor socket.
9. Using the vacuum pen **1**, lower the microprocessor straight down into the microprocessor socket.



10. 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).



11. Position the heat sink on the heat sink mounting bracket and align the four holes of the heat sink with the holes on the system board.
12. Install the four screws **1** to secure the heat sink.



13. Go to "Completing the installation" on page 29.

Replacing a memory module

Attention:

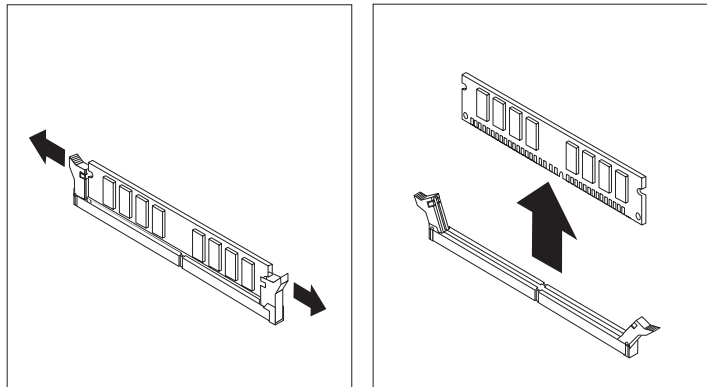
Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to the Support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

To replace a memory module:

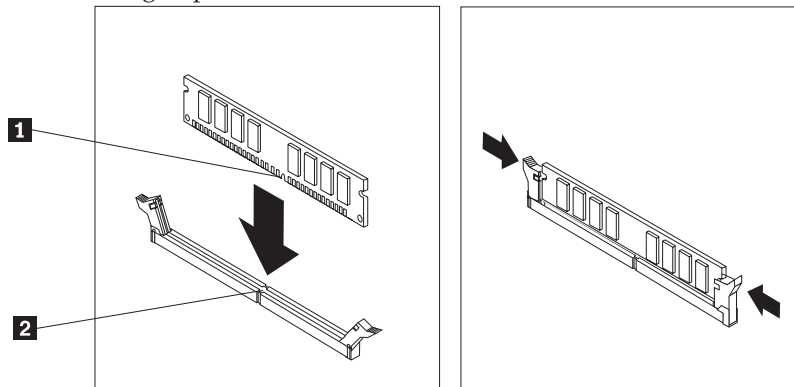
1. Remove the computer cover. See “Removing the computer cover” on page 5.

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 29.

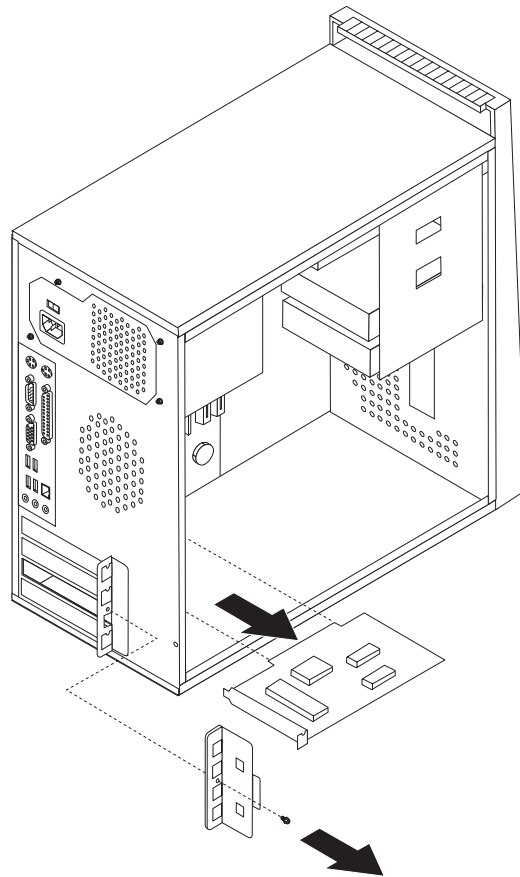
Replacing an adapter

Attention:

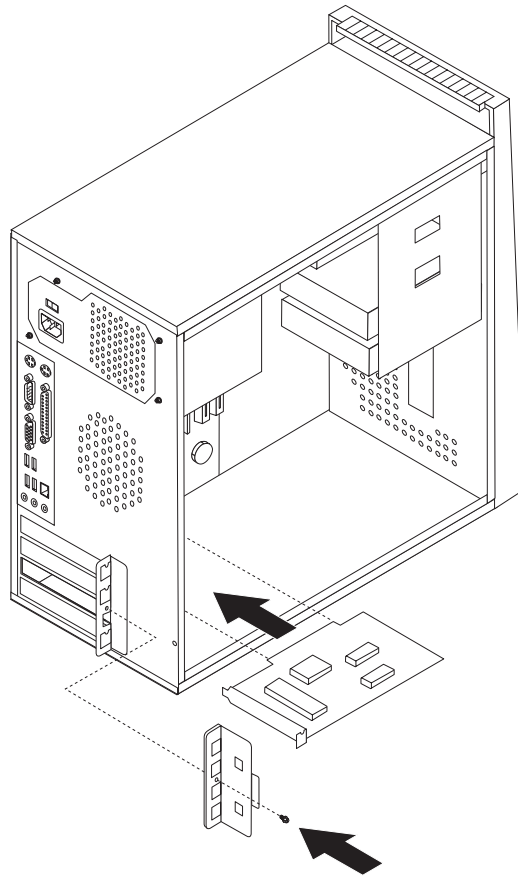
Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to the Support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

To replace an adapter:

1. Remove the computer cover. See “Removing the computer cover” on page 5.
2. At the rear of the computer, remove the screw securing the adapter latch 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, align the screw hole and install the screw to secure the adapter.
6. Go to "Completing the installation" on page 29.

Replacing the hard disk drive

Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

Important

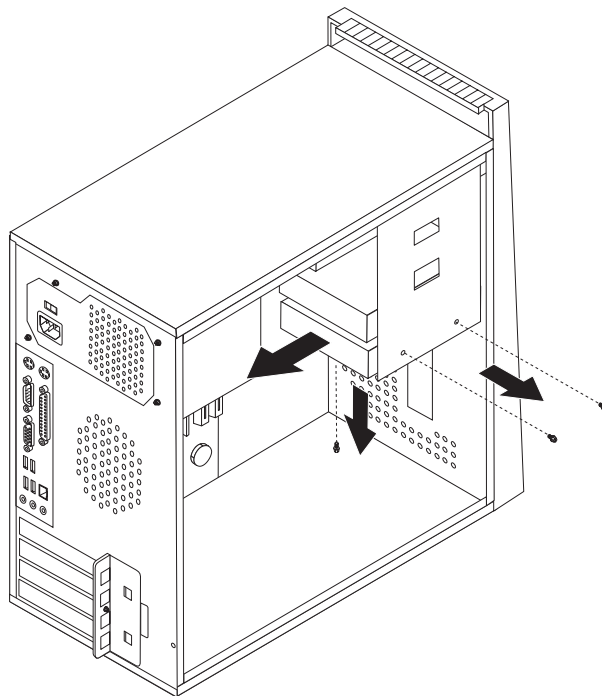
When you receive a new hard disk drive, you will also receive a set of *Product Recovery CD*. The set of *Product Recovery CD* will enable you to restore the contents of the hard disk to the same state as when your computer was originally shipped from the factory. For more information on recovering factory-installed software, refer to "Recovering Software" in the *Quick Reference*.

To replace the hard disk drive:

1. Remove the computer cover. See "Removing the computer cover" on page 5.

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

2. Remove the diskette drive. See "Replacing the diskette drive" on page 24.
3. Disconnect the signal and power cables from the hard disk drive.
4. Remove the two screws at the side of the bay, remove the screw at the bottom, and tilt up into the diskette drive bay to avoid the heat sink when removing the hard disk drive.



5. Slide the new hard disk drive into the drive bay so that the screw holes align with those in the drive bay.
6. Install the two screws to secure the hard disk drive.
7. Connect the power and signal cables to the hard disk drive. See "Identifying parts on the system board" on page 4.
8. Reinstall the diskette drive.
9. Connect the power and signal cables to the diskette drive. See "Identifying parts on the system board" on page 4.
10. Go to "Completing the installation" on page 29.

Replacing an optical drive

Attention:

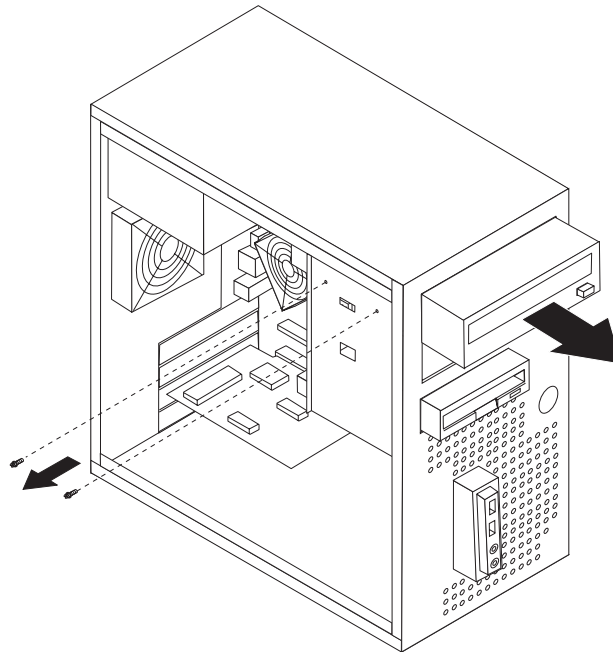
Do not remove the computer cover or attempt any repair before reading the “Important safety information” in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual (HMM)* for the computer. To obtain copies of the *Quick Reference* or *HMM*, go to the Support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

To replace an optical drive

1. Remove the computer cover. See “Removing the computer cover” on page 5.

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

2. Remove the front bezel. See “Removing and replacing the front bezel” on page 7.
3. Disconnect the signal and power cables from the rear of the optical drive.
4. Remove the two screws at the side of the optical drive bay and remove the optical drive out the front of the computer.



5. Slide the new optical drive into the bay from the front and install the two screws.
6. Connect the signal and power cables to the drive.
7. Install the front bezel. See “Removing and replacing the front bezel” on page 7.
8. Go to “Completing the installation” on page 29.

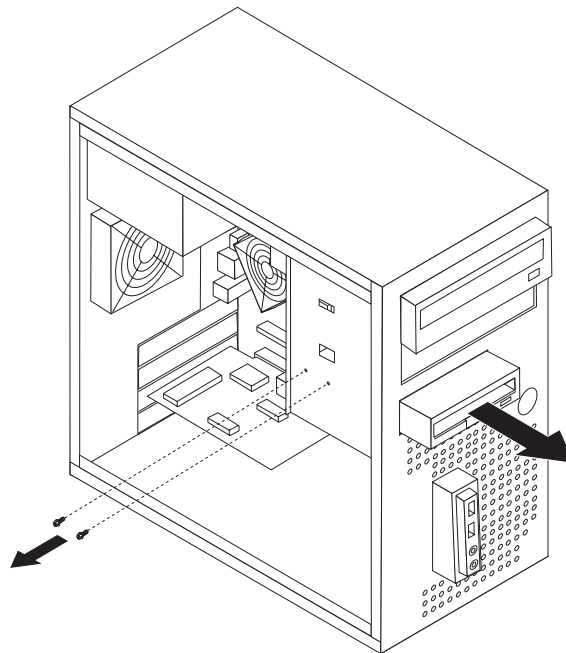
Replacing the diskette drive

Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

To replace the diskette drive:

1. Remove the computer cover. See "Removing the computer cover" on page 5.
2. Remove the front bezel. See "Removing and replacing the front bezel" on page 7.
3. Disconnect the signal and power cables from the rear of the diskette drive.
4. Remove the two screws at the side of the drive bay and slide the diskette drive out the front of the computer.



5. Slide the new diskette drive into the drive bay so that the screw holes align with those in the drive bay.
6. Install the two screws to secure the diskette drive.
7. Go to “Completing the installation” on page 29.

Replacing the system fan assembly

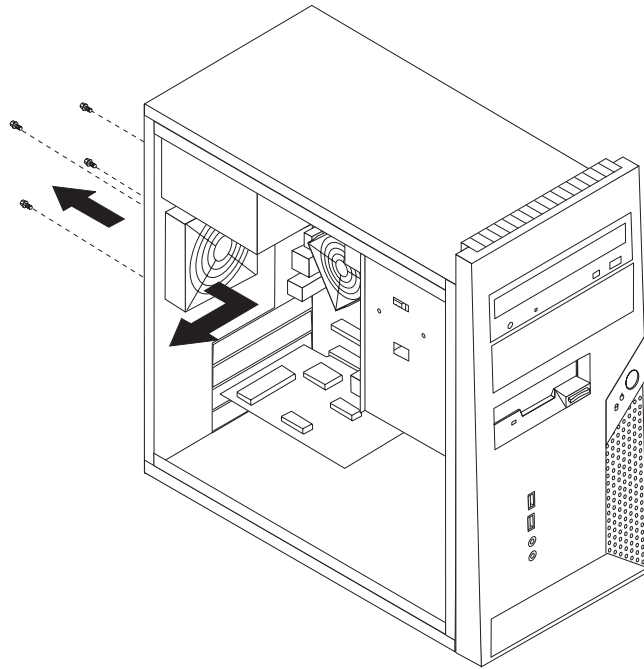
Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

To replace the system fan assembly:

1. Remove the computer cover. See “Removing the computer cover” on page 5.
2. Locate the system fan assembly. See “Locating components” on page 1.
3. Disconnect the system fan assembly cable from the system board. See “Identifying parts on the system board” on page 4.

4. Remove the four screws that secure the system fan assembly at the rear of chassis.



5. Lift the system fan assembly out of chassis.
6. Install the new system fan assembly into the chassis so that the screw holes in the system fan assembly align with those in the chassis.
7. Install the four screws to secure the system fan assembly.

Note: Use only the screws provided by Lenovo.

8. Go to “Completing the installation” on page 29.

Replacing the front audio/USB panel

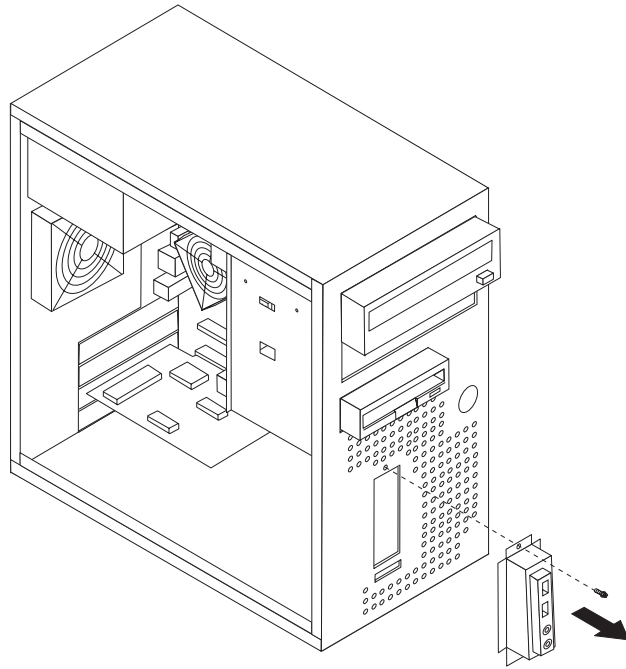
Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

To replace the front audio/USB panel:

1. Remove the computer cover. See “Removing the computer cover” on page 5.
2. Remove the front bezel. See “Removing and replacing the front bezel” on page 7.
3. Disconnect the front panel connector, front audio connector, and front panel USB connector cables from the system board. See “Identifying parts on the system board” on page 4.

4. Remove the screw that secures the front audio/USB panel card and lift the front audio/USB panel card out of the lower slot.



5. Insert bottom of the new front audio/USB panel in the lower slot.
6. Align the front audio/USB panel with the screw hole.
7. Install the screw to secure the front audio/USB panel.
8. Go to “Completing the installation” on page 29.

Replacing the keyboard

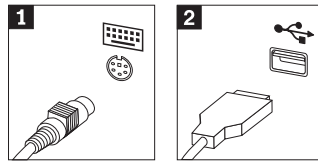
Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

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 29.

Replacing the mouse

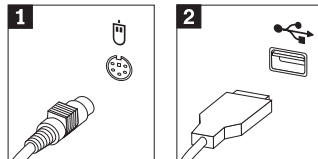
Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/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” on page 29.

Replacing the internal speaker

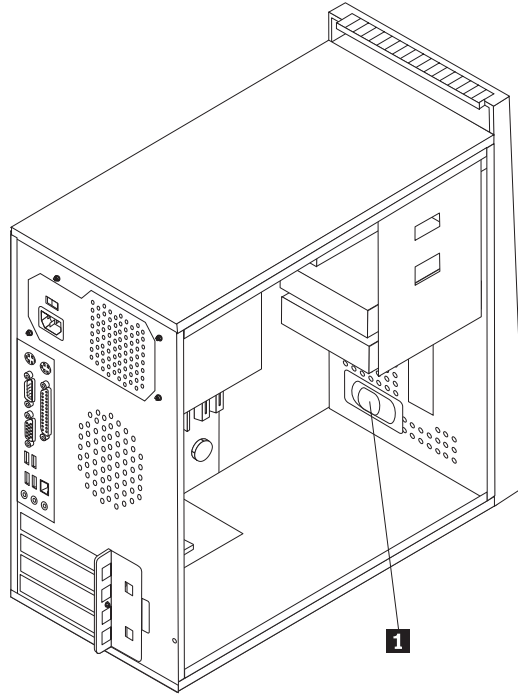
Attention:

Do not remove the computer cover 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 the Support Web site at <http://www.lenovo.com/think/support>.

To replace the internal speaker:

1. Remove the computer cover. See “Removing the computer cover” on page 5.

2. Locate the internal speaker **1**.



3. Locate the internal speaker connector, see "Identifying parts on the system board" on page 4.
4. Disconnect the speaker cable from the system board.
5. Remove the speaker by sliding it upward and out of the retaining bracket.
6. Install the new speaker.
7. Go to "Completing the installation."

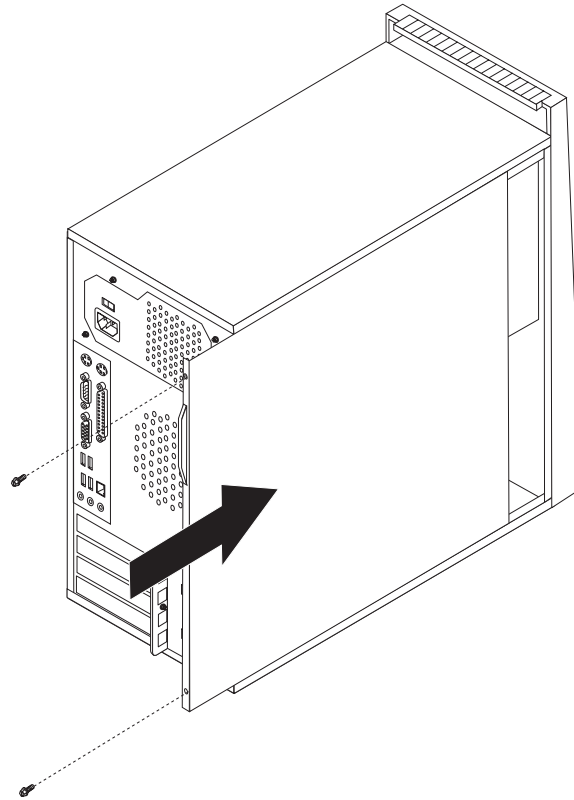
Completing the installation

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 your *Quick Reference* or in the *Hardware Maintenance Manual*.

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 and install the screws.



4. If a cover lock is installed, lock the cover.
5. 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.
6. If you are replacing the system board or microprocessor, you must update (flash) the BIOS. See "Updating (flashing) BIOS from a diskette or CD-ROM" on page 31.
7. To update your configuration, see "Starting the Setup Utility" in the *Quick Reference* that was included with your computer or in the *Hardware Maintenance Manual*.

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 your Quick Reference 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/think/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

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

Lenovo may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

*Lenovo (United States), Inc.
500 Park Offices Drive, Hwy. 54
Research Triangle Park, NC 27709
U.S.A.
Attention: Lenovo Director of Licensing*

LENOVO GROUP LTD. PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some jurisdictions do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. Lenovo may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

The products described in this document are not intended for use in implantation or other life support applications where malfunction may result in injury or death to persons. The information contained in this document does not affect or change Lenovo product specifications or warranties. Nothing in this document shall operate as an express or implied license or indemnity under the intellectual property rights of Lenovo or third parties. All information contained in this document was obtained in specific environments and is presented as an illustration. The result obtained in other operating environments may vary.

Lenovo may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any references in this publication to non-Lenovo Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this Lenovo product, and use of those Web sites is at your own risk.

Any performance data contained herein was determined in a controlled environment. Therefore, the result obtained in other operating environments may

vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Television output notice

The following notice applies to models that have the factory-installed television-output feature.

This product incorporates copyright protection technology that is protected by method claims of certain U.S. patents and other intellectual property rights owned by Macrovision Corporation and other rights owners. Use of this copyright protection technology must be authorized by Macrovision Corporation, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision Corporation. Reverse engineering or disassembly is prohibited.

Trademarks

The following terms are trademarks of Lenovo in the United States, other countries, or both:

Lenovo
ThinkCentre

IBM is a trademark of International Business Machines Corporation in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

ThinkCentre[®]

Part Number: 41D4474

Printed in USA

(1P) P/N: 41D4474



Free Manuals Download Website

<http://myh66.com>

<http://usermanuals.us>

<http://www.somanuals.com>

<http://www.4manuals.cc>

<http://www.manual-lib.com>

<http://www.404manual.com>

<http://www.luxmanual.com>

<http://aubethermostatmanual.com>

Golf course search by state

<http://golfingnear.com>

Email search by domain

<http://emailbydomain.com>

Auto manuals search

<http://auto.somanuals.com>

TV manuals search

<http://tv.somanuals.com>