ideacentre 620SHardware Maintenance Manual

Machine Types: 90HC [620S-03IKL/Energy Star]
ideacentre 620SHardware Maintenance Manual

Machine Types: 90HC [620S-03IKL/Energy Star]
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Chapter 1. About this manual

This manual contains service and reference information for Lenovo ideacentre 620S desktop computers listed on the cover. It is intended only for trained servicers who are familiar with Lenovo computer products.

Before servicing a Lenovo product, be sure to read the Safety Information.

The description of the TV card in this manual is only used for the machines which have the TV card. It is invalid for those machines which do not have TV card.

Important Safety Information

Be sure to read all caution and danger statements in this book before performing any of the instructions.

Veuillez lire toutes les consignes de type DANGER et ATTENTION du présent document avant d’exécuter les instructions.

Lesen Sie unbedingt alle Hinweise vom Typ “ACHTUNG” oder “VORSICHT” in dieser Dokumentation, bevor Sie irgendwelche Vorgänge durchführen

Leggere le istruzioni introdotte da ATTENZIONE e PERICOLO presenti nel manuale prima di eseguire una qualsiasi delle istruzioni

Certifique-se de ler todas as instruções de cuidado e perigo neste manual antes de executar qualquer uma das instruções

Es importante que lea todas las declaraciones de precaución y de peligro de este manual antes de seguir las instrucciones.

执行任何说明之前，请确保已阅读本书中的所有警告和危险声明。

執行任何指示前，請確實閱讀本書中的所有警告及危險聲明。
Chapter 2. Safety information

This chapter contains the safety information that you need to be familiar with before servicing a computer.

General safety

Follow these rules to ensure general safety:

• Observe good housekeeping in the area of the machines during and after maintenance.
• When lifting any heavy object:
  1. Ensure you can stand safely without slipping.
  2. Distribute the weight of the object equally between your feet.
  3. Use a slow lifting force. Never move suddenly or twist when you attempt to lift.
  4. Lift by standing or by pushing up with your leg muscles; this action removes the strain from the muscles in your back.
     Do not attempt to lift any objects that weigh more than 16 kg (35 lb) or objects that you think are too heavy for you.
• Do not perform any action that causes hazards to the customer, or that makes the equipment unsafe.
• Before you start the machine, ensure that other service representatives and the customer’s personnel are not in a hazardous position.
• Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the machine.
• Keep your tool case away from walk areas so that other people will not trip over it.
• Do not wear loose clothing that can be trapped in the moving parts of a machine. Ensure that your sleeves are fastened or rolled up above your elbows. If your hair is long, fasten it.
• Insert the ends of your necktie or scarf inside clothing or fasten it with a nonconductive clip, approximately 8 centimeters (3 inches) from the end.
• Do not wear jewelry, chains, metal-frame eyeglasses, or metal fasteners for your clothing. Remember: Metal objects are good electrical conductors.
• Wear safety glasses when you are: hammering, drilling soldering, cutting wire, attaching springs, using solvents, or working in any other conditions that might be hazardous to your eyes.
• After service, reinstall all safety shields, guards, labels, and ground wires. Replace any safety device that is worn or defective.
• Reinstall all covers correctly before returning the machine to the customer.

Electrical safety

CAUTION:
Electrical current from power, telephone, and communication cables can be hazardous. To avoid personal injury or equipment damage, disconnect the attached power cords, telecommunications systems, networks, and modems before you open the computer covers, unless instructed otherwise in the installation and configuration procedures.
Observe the following rules when working on electrical equipment.

**Important:** Use only approved tools and test equipment. Some hand tools have handles covered with a soft material that does not insulate you when working with live electrical currents. Many customers have, near their equipment, rubber floor mats that contain small conductive fibers to decrease electrostatic discharges. Do not use this type of mat to protect yourself from electrical shock.

- Find the room emergency power-off (EPO) switch, disconnecting switch, or electrical outlet. If an electrical accident occurs, you can then operate the switch or unplug the power cord quickly.
- Do not work alone under hazardous conditions or near equipment that has hazardous voltages.
- Disconnect all power before:
  - Performing a mechanical inspection
  - Working near power supplies
  - Removing or installing Field Replaceable Units (FRUs)
- Before you start to work on the machine, unplug the power cord. If you cannot unplug it, ask the customer to power-off the wall box that supplies power to the machine and to lock the wall box in the off position.
- If you need to work on a machine that has exposed electrical circuits, observe the following precautions:
  - Ensure that another person, familiar with the power-off controls, is near you.
    **Remember:** Another person must be there to switch off the power, if necessary.
  - Use only one hand when working with powered-on electrical equipment; keep the other hand in your pocket or behind your back.
    **Remember:** There must be a complete circuit to cause electrical shock. By observing the above rule, you may prevent a current from passing through your body.
  - When using a tester, set the controls correctly and use the approved probe leads and accessories for that tester.
  - Stand on suitable rubber mats (obtained locally, if necessary) to insulate you from grounds such as metal floor strips and machine frames.

Observe the special safety precautions when you work with very high voltages; these instructions are in the safety sections of maintenance information. Use extreme care when measuring high voltages.

- Regularly inspect and maintain your electrical hand tools for safe operational condition.
- Do not use worn or broken tools and testers.
- *Never assume* that power has been disconnected from a circuit. First, check that it has been powered-off.
- Always look carefully for possible hazards in your work area. Examples of these hazards are moist floors, nongrounded power extension cables, power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. The surface is conductive; such touching can cause personal injury and machine damage.
- Do not service the following parts with the power on when they are removed from their normal operating places in a machine:
  - Power supply units
  - Pumps
  - Blowers and fans
  - Motor generators
  and similar units. (This practice ensures correct grounding of the units.)
- If an electrical accident occurs:
  - Use caution; do not become a victim yourself.
  - Switch off power.
Send another person to get medical aid.

Safety inspection guide

The intent of this inspection guide is to assist you in identifying potentially unsafe conditions on these products. Each machine, as it was designed and built, had required safety items installed to protect users and service personnel from injury. This guide addresses only those items. However, good judgment should be used to identify potential safety hazards due to attachment of features or options not covered by this inspection guide.

If any unsafe conditions are present, you must determine how serious the apparent hazard could be and whether you can continue without first correcting the problem.

Consider these conditions and the safety hazards they present:

- **Electrical hazards**, especially primary power (primary voltage on the frame can cause serious or fatal electrical shock).
- **Explosive hazards**, such as a damaged CRT face or bulging capacitor
- **Mechanical hazards**, such as loose or missing hardware

The guide consists of a series of steps presented in a checklist. Begin the checks with the power off, and the power cord disconnected.

**Checklist:**

1. Check exterior covers for damage (loose, broken, or sharp edges).
2. Power-off the computer. Disconnect the power cord.
3. Check the power cord for:
   a. A third-wire ground connector in good condition. Use a meter to measure third-wire ground continuity for 0.1 ohm or less between the external ground pin and frame ground.
   b. The power cord should be the appropriate type as specified in the parts listings.
   c. Insulation must not be frayed or worn.
4. Remove the cover.
5. Check for any obvious alterations. Use good judgment as to the safety of any alterations.
6. Check inside the unit for any obvious unsafe conditions, such as metal filings, contamination, water or other liquids, or signs of fire or smoke damage.
7. Check for worn, frayed, or pinched cables.
8. Check that the power-supply cover fasteners (screws or rivets) have not been removed or tampered with.

Handling electrostatic discharge-sensitive devices

Any computer part containing transistors or integrated circuits (ICs) should be considered sensitive to electrostatic discharge (ESD). ESD damage can occur when there is a difference in charge between objects. Protect against ESD damage by equalizing the charge so that the machine, the part, the work mat, and the person handling the part are all at the same charge.

**Notes:**

1. Use product-specific ESD procedures when they exceed the requirements noted here.
2. Make sure that the ESD protective devices you use have been certified (ISO 9000) as fully effective.

When handling ESD-sensitive parts:
• Keep the parts in protective packages until they are inserted into the product.
• Avoid contact with other people while handling the part.
• Wear a grounded wrist strap against your skin to eliminate static on your body.
• Prevent the part from touching your clothing. Most clothing is insulative and retains a charge even when you are wearing a wrist strap.
• Use the black side of a grounded work mat to provide a static-free work surface. The mat is especially useful when handling ESD-sensitive devices.
• Select a grounding system, such as those listed below, to provide protection that meets the specific service requirement.

  Note: The use of a grounding system is desirable but not required to protect against ESD damage.
  – Attach the ESD ground clip to any frame ground, ground braid, or green-wire ground.
  – Use an ESD common ground or reference point when working on a double-insulated or battery-operated system. You can use coax or connector-outside shells on these systems.
  – Use the round ground-prong of the ac plug on ac-operated computers.

Grounding requirements

Electrical grounding of the computer is required for operator safety and correct system function. Proper grounding of the electrical outlet can be verified by a certified electrician.

Safety notices

The caution and danger safety notices in this section are provided in the language of English.

⚠️ ⚡

DANGER

Electrical current from power, telephone and communication cables is hazardous.

To avoid a shock hazard:

• Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
• Connect all power cords to a properly wired and grounded electrical outlet.
• Connect to properly wired outlets any equipment that will be attached to this product.
• When possible, use one hand only to connect or disconnect signal cables.
• Never turn on any equipment when there is evidence of fire, water, or structural damage.
• Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
• Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.
To Connect

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

CAUTION:
When replacing the lithium battery, use only Part Number 45C1566 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:
- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

CAUTION:
When laser products (such as CD-ROMs, DVD-ROM drives, fiber optic devices, or transmitters) are installed, note the following:
- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following: Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.
≥18 kg (37 lbs)  ≥32 kg (70.5 lbs)  ≥55 kg (121.2 lbs)

CAUTION:
Use safe practices when lifting.

CAUTION:
The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.

CAUTION:
Do not place any object weighing more than 82 kg (180 lbs.) on top of rack-mounted devices.
## Chapter 3. General information

This chapter provides general information that applies to all machine types supported by this publication.

### Specifications

This section lists the physical specifications for your computer.

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<td><strong>Air temperature</strong></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>10° to 35°C</td>
</tr>
<tr>
<td>Transit</td>
<td>-20° to 55°C</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td></td>
</tr>
<tr>
<td>Operating</td>
<td>35% to 80%</td>
</tr>
<tr>
<td>Transit</td>
<td>20% to 90% (40°C)</td>
</tr>
<tr>
<td><strong>Altitude</strong></td>
<td>86KPa to 106KPa</td>
</tr>
<tr>
<td><strong>Electrical input</strong></td>
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<tr>
<td>Input voltage</td>
<td>90V-264V(AC)</td>
</tr>
<tr>
<td>Input frequency</td>
<td>47Hz-63Hz</td>
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</table>
Chapter 4. General Checkout

Attention: The drives in the computer you are servicing might have been rearranged or the drive startup sequence changed. Be extremely careful during write operations such as copying, saving, or formatting. Data or programs can be overwritten if you select an incorrect drive.

General error messages appear if a problem or conflict is found by an application program, the operating system, or both. For an explanation of these messages, refer to the information supplied with that software package.

Use the following procedure to help determine the cause of the problem:

1. Power-off the computer and all external devices.
2. Check all cables and power cords.
3. Set all display controls to the middle position.
4. Power-on all external devices.
5. Power-on the computer.
   - Look for displayed error codes
   - Look for readable instructions or a main menu on the display.
     - If you did not receive the correct response, proceed to step 6.
     - If you do receive the correct response, proceed to step 7.
6. Look at the following conditions and follow the instructions:
   - If the computer displays a POST error, go to “POST error codes”.
   - If the computer hangs and no error is displayed, continue at step 7.
7. If the test stops and you cannot continue, replace the last device tested.
Chapter 5. Using the Setup Utility

The Setup Utility program is used to view and change the configuration settings of your computer, regardless of which operating system you are using. However, the operating-system settings might override any similar settings in the Setup Utility program.

Starting the Lenovo BIOS Setup Utility program

To start the Lenovo BIOS Setup Utility program, do the following:

1. If your computer is already on when you start this procedure, shut down the operating system and turn off the computer.
2. Press and hold the F1 key, and then turn on the computer. When the Lenovo BIOS Setup Utility program is displayed, release the F1 key.

Note: If a Power-On Password or an Administrator Password has been set, the Setup Utility program menu is not displayed until you type your password. For more information, see “Using passwords.”

Viewing and changing settings

System configuration options are listed in the Lenovo BIOS Setup Utility program menu. To view or change settings, see “Starting the Setup Utility program.”

You must use the keyboard when using the Lenovo BIOS Setup Utility menu. The keys used to perform various tasks are displayed on the bottom of each screen.

Using passwords

You can use the Lenovo BIOS Setup Utility program to set passwords to prevent unauthorized persons from gaining access to your computer and data. See “Starting the Setup Utility program.” The following types of passwords are available:

- Administrator Password
- Power-On Password

You do not have to set any passwords to use your computer. However, if you decide to set passwords, read the following sections.

Password considerations

A password can be any combination of letters and numbers up to 16 character (a-z, and 0-9). For security reasons, it is a good idea to use a strong password that cannot be easily compromised. We suggest that passwords should follow these rules:

- Strong passwords contain 7-16 characters, combine letters and numbers.
- Do not use your name or your user name.
- Do not use a common word or a common name.
- Be significantly different from your previous password.

Attention: Administrator and Power-On passwords are not case sensitive
Administrator Password

Setting an Administrator Password deters unauthorized persons from changing configuration settings. You might want to set an Administrator Password if you are responsible for maintaining the settings of several computers.

After you set an Administrator Password, a password prompt is displayed every time you access the Lenovo BIOS Setup Utility program.

If both the Administrator and Power-On Password are set, you can type either password. However, you must use your Administrator Password to change any configuration settings.

Setting, changing, or deleting an Administrator password

To set an Administrator Password, do the following:

1. Start the Lenovo BIOS Setup Utility program (see “Starting the Lenovo BIOS Setup Utility program” on page 13).
2. From the Security menu, select Set Administrator Password and press the Enter key.
3. The password dialog box will be displayed. Type the password, and then press the Enter key.
4. Re-type the password to confirm, and then press the Enter key. If you type the password correctly, the password will be installed.

To change an Administrator Password, do the following:

1. Start the Lenovo BIOS Setup Utility program (see “Starting the Lenovo BIOS Setup Utility program” on page 13).
2. From the Security menu, select Set Administrator Password and press the Enter key.
3. The password dialog box will be displayed. Type the current password, and then press Enter key.
4. Type the new password, and then press Enter key. Re-type the password to confirm the new password, if you type the new password correctly, the new password will be installed. A Setup Notice will display that changes have been saved.

To delete a previously set Administrator Password, do the following:

1. From the Security menu, select Set Administrator Password and press the Enter key.
2. The password dialog box will be displayed. Type the current password and press the Enter key.
3. To delete an Administrator Password, Enter blank fields for each new password line item. A setup notice will display that changes have been saved.
4. Return to the Lenovo BIOS Setup Utility program menu and select the Exit option.
5. Select Save changes and Exit from the menu.

Power-On Password

When a Power-On Password is set, you cannot start the Lenovo BIOS Setup Utility program until a valid password is typed from the keyboard.

Setting, changing, or deleting a Power-On Password
**Note:** A password can be any combination of letters and numbers up to 16 character (a-z, and 0-9).

To set a Power-On Password, do the following:
1. Start the Lenovo BIOS Setup Utility program (See "Starting the Lenovo BIOS Setup Utility program” on page 13.)
2. From the **Security** menu, select **Set Power-On Password** and press the **Enter** key.
3. The password dialog box will be displayed. Type the password, and press the **Enter** key.
4. Re-type the password to confirm, if you type the password correctly, the password will be installed.

To change a Power-On Password, do the following:
1. Start the Lenovo BIOS Setup Utility program (See "Starting the Lenovo BIOS Setup Utility program” on page 13.)
2. From the **Security** menu, select **Set Power-On Password** and press the **Enter** key.
3. The password dialog box will be displayed. Type the current password, and then press the **Enter** key.
4. Type the new password, and then press the **Enter** key. Re-type the password to confirm the new password, if you type the new password correctly, the new password will be installed. A setup notice will display that changes have been saved.

To delete a previously set Power-On Password, do the following:
1. From the **Security** menu, select **Set Power-On Password** and press the **Enter** key.
2. The password dialog box will be displayed. Type the current password and press the **Enter** key.
3. To delete the **Power-On Password**, enter blank fields for each new password line item. A setup notice will display that changes have been saved.
4. Return to the Lenovo BIOS Setup Utility program menu and select the **Exit** option.
5. Select **Save changes and Exit** from the menu.

### Enabling or disabling a device

<table>
<thead>
<tr>
<th><strong>Serial Port Setup</strong></th>
<th>Select this option to enable or disable <strong>Serial Port</strong> (com).</th>
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<tbody>
<tr>
<td><strong>USB Functions</strong></td>
<td>Select whether to enable or disable <strong>USB</strong> (Universal Serial Bus) functions. If it is disabled, the <strong>USB</strong> keyboard and/or <strong>USB</strong> mouse may be not able to be used without device driver support.</td>
</tr>
<tr>
<td><strong>ATA Drive Setup</strong></td>
<td>Select IDE, ACHI mode or disable SATA controller. Device driver support is required for ACHI mode. Depending on how the hard disk image was installed, changing this setting may prevent the system from booting.</td>
</tr>
<tr>
<td><strong>Video Setup</strong></td>
<td>To configure video related functions. This option allows you to configure system’s initiate graphic adapter from either IGD (Integrated Graphics Device) or PEG (PCI Express Graphics). Keep on the IGD enabled based on the setup options.</td>
</tr>
</tbody>
</table>
Onboard Audio Controller

Select whether to enable or disable the Onboard Audio Controller, when feature is set to Disabled all devices connected to the audio connectors (e.g. a headphone or a microphone) are disabled and can’t be used.

Onboard Ethernet Controller or LAN Boot Agent

Select whether to enable or disable Onboard Ethernet Controller, or select whether to enable or disable load onboard PXE (Preboot Execution Environment), or SMC (Secure Managed Client). This feature will allow the computer to boot from a server image.

To enable or disable a device, do the following:
1. Start the Setup Utility program (see “Starting the Setup Utility program” on page 13).
2. From the Setup Utility program menu, select Devices.
3. Select:
   - Serial Port Setup press the Enter key, and then select Serial Port Setup.
   - USB Setup press the Enter key, and then select USB Functions.
   - ATA Device Setup press the Enter key. Select Configure SATA as, press the Enter key, and then select SATA mode.
   - Video Setup press the Enter key, and then select Video Setup.
   - Audio Setup press the Enter key, and then select Onboard Audio Controller.
   - Network Setup press the Enter key, and then select Onboard Ethernet Support or LAN Boot Agent.
4. Select Disabled or Enabled and then press the Enter key.
5. Return to the Lenovo BIOS Setup Utility program menu and select the Exit option.
6. Select Save changes and Exit from the menu.

Note: If you do not want to save the settings, select Discard changes and Exit from the menu.

Selecting a startup device

If your computer does not boot from a device such as the CD/DVD-ROM drive disk or hard disk as expected, follow one of the procedures below.

Selecting a temporary startup device

Use this procedure to startup from any boot device.

Note: Not all CDs, DVDs or hard disk drives are bootable.
1. Turn off your computer.
2. Press and hold the F12 key, and then turn on the computer. When the Startup Device Menu appears, release the F12 key.

   Note: If the Startup Device Menu does not display using these steps, repeatedly press and release the F12 key rather than keeping it pressed when turning on the computer.
3. Use ↑ and ↓ arrows to select the desired startup device from the Startup Device Menu and press the Enter key to begin.

   Note: Selecting a startup device from the Startup Device Menu does not permanently change the startup sequence.
Selecting or changing the startup device sequence

To view or permanently change the configured startup device sequence, do the following:

1. Start the Lenovo BIOS Setup Utility program (see “Starting the Lenovo BIOS Setup Utility program” on page 13).
2. From the Lenovo BIOS Setup Utility program main menu, select the **Startup** option.
3. Press the **Enter** key, and select the devices for the **Primary Boot Sequence**. Read the information displayed on the right side of the screen.
4. Use ↑ and ↓ arrows to select a device. Use the <+> or <-> keys to move a device up or down. Use the <×> key to exclude the device from or include the device in the boot sequence.
5. Return to the Lenovo BIOS Setup Utility program menu and select the **Exit** option.
6. Select **Save changes and Exit** from the menu.

**Notes:**

a. If you do not want to save the settings, select **Discard changes and Exit** from the menu.

b. If you have changed these settings and want to return to the default settings, select **Load Optimal Defaults** from the menu.

Exiting the Lenovo BIOS Setup Utility program

After you finish viewing or changing settings, press the **Esc** key to return to the Lenovo BIOS Setup Utility program main menu. You might have to press the **Esc** key several times. Do one of the following:

- If you want to save the new settings, select **Save changes and Exit** from the menu. When the **Save & reset** window shows, select the **Yes** button, and then press the **Enter** key to exit the Lenovo BIOS Setup Utility program.
- If you do not want to save the settings, select **Discard changes and Exit** from the menu. When the **Reset Without Saving** window shows, select the **Yes** button, and then press the **Enter** key to exit the Setup Utility program.
Chapter 6. Symptom-to-FRU Index

The Symptom-to-FRU index lists error symptoms and possible causes. The most likely cause is listed first. Always begin with Chapter 4, “General Checkout,” on page 11. This index can also be used to help you decide which FRUs to have available when servicing a computer. If you are unable to correct the problem using this index, go to “Undetermined problems” on page 20.

Notes:
• If you have both an error message and an incorrect audio response, diagnose the error message first.
• If you cannot run the diagnostic tests or you get a diagnostic error code when running a test but did receive a POST error message, diagnose the POST error message first.
• If you did not receive any error message look for a description of your error symptoms in the first part of this index.

Hard disk drive boot error

A hard disk drive boot error can have the following causes.

<table>
<thead>
<tr>
<th>Error</th>
<th>FRU/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>The startup drive is not included in the boot sequence in configuration.</td>
<td>Check the configuration and ensure the startup drive is in the boot sequence.</td>
</tr>
<tr>
<td>No operating system installed on the boot drive.</td>
<td>Install an operating system on the boot drive.</td>
</tr>
<tr>
<td>The boot sector on the startup drive is corrupted.</td>
<td>The drive must be formatted. Do the following:</td>
</tr>
<tr>
<td></td>
<td>1. Attempt to back-up the data on the failing hard disk drive.</td>
</tr>
<tr>
<td></td>
<td>2. Use the operating system to format the hard disk drive.</td>
</tr>
<tr>
<td>The drive is defective.</td>
<td>Replace the hard disk drive.</td>
</tr>
</tbody>
</table>

Power Supply Problems

Follow these procedures if you suspect there is a power supply problem.

<table>
<thead>
<tr>
<th>Check/Verify</th>
<th>FRU/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check that the following are properly installed:</td>
<td>Reseat connectors</td>
</tr>
<tr>
<td>• Power Cord</td>
<td></td>
</tr>
<tr>
<td>• On/Off Switch connector</td>
<td></td>
</tr>
<tr>
<td>• System Board Power Supply connectors</td>
<td></td>
</tr>
<tr>
<td>• Microprocessor(s) connection</td>
<td></td>
</tr>
<tr>
<td>Check the power cord.</td>
<td>Power Cord</td>
</tr>
<tr>
<td>Check the power-on switch.</td>
<td>Power-on Switch</td>
</tr>
</tbody>
</table>
POST error codes

Each time you turn the computer on, it performs a series of tests to check that the system is operating correctly and that certain options are set. This series of tests is called the Power-On Self-Test, or POST. POST does the following:

• Checks some basic system-board operations
• Checks that the memory is working correctly
• Starts video operations
• Verifies that the boot drive is working

<table>
<thead>
<tr>
<th>POST Error Message</th>
<th>Description/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keyboard error</td>
<td>Cannot initialize the keyboard. Make sure the keyboard is properly connected to the computer and that no keys are held pressed during POST. To purposely configure the computer without a keyboard, select Keyboardless operation in Startup option to Enabled. The BIOS then ignores the missing keyboard during POST.</td>
</tr>
<tr>
<td>Reboot and Select proper Boot device or Insert Boot Media in selected Boot device</td>
<td>The BIOS was unable to find a suitable boot device. Make sure the boot drive is properly connected to the computer. Make sure you have bootable media in the boot device.</td>
</tr>
</tbody>
</table>

Undetermined problems

1. Power-off the computer.
2. Remove or disconnect the following components (if connected or installed) one at a time.
   a. External devices (modem, printer, or mouse)
   b. Extended video memory
   c. External Cache
   d. External Cache RAM
   e. Hard disk drive
   f. Disk drive
3. Power-on the computer to re-test the system.
4. Repeat steps 1 through 3 until you find the failing device or component.

If all devices and components have been removed and the problem continues, replace the system board.
Chapter 7. Locating connectors, controls and components

This section provides illustrations to help locate the various connectors, controls and components of the computer.

Overview
The following illustration shows the location of connectors, controls and components on the computer.

Attention: Be careful not to block any air vents on the computer. Blocked air vents can cause overheating.

<table>
<thead>
<tr>
<th>1. Microphone</th>
<th>2. Microphone</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Combo audio jack</td>
<td>4. Power button and power indicator</td>
</tr>
<tr>
<td>5. Ethernet connector</td>
<td>6. USB 3.0 connector</td>
</tr>
<tr>
<td>7. USB 3.0 connector</td>
<td>8. USB 3.0 connector</td>
</tr>
<tr>
<td>9. HDMI-out connector</td>
<td>10. USB 3.0 connector</td>
</tr>
<tr>
<td>11. DisplayPort connector</td>
<td>12 Power connector</td>
</tr>
</tbody>
</table>
Hardware components
The following illustration shows the components that make up your computer.

1. Computer chassis
2. Power button board
3. Speaker system
4. Speaker bracket
5. Wi-Fi antennas (2)
6. Card reader
7. Main bracket
8. Mic boards (2)
9. Audio card
10. Microprocessor holder
11. Microprocessor
12. Battery
13. SATA cable (for connecting the storage drive)
14. Storage drive
15. Storage drive bracket
16. EMI cover
### Identifying parts on the motherboard

The motherboard (sometimes called the planar or system board) is the main circuit board in your computer. It provides basic computing functions and supports a variety of devices that are factory-installed or that you can install later. The following illustration shows the location of connectors and components on the front of the motherboard.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17. PCIe holder</td>
<td>18. PCIe card</td>
</tr>
<tr>
<td>19. M.2 storage drive</td>
<td>20. Wind shielding</td>
</tr>
<tr>
<td>23. Memory</td>
<td>24. Motherboard</td>
</tr>
<tr>
<td>25. Wi-Fi card</td>
<td>26. Wi-Fi card cover</td>
</tr>
<tr>
<td>27. Mouse</td>
<td>28. Keyboard</td>
</tr>
<tr>
<td>29. Power adapter</td>
<td>30. Power cord</td>
</tr>
<tr>
<td>29. Computer cover</td>
<td>30. Stand base</td>
</tr>
</tbody>
</table>
1. Clear CMOS pin connector
2. Card reader connector
3. Kabylake PCH
4. Microprocessor Socket
5. Battery
6. System fan connector
7. System thermal sensor
8. Combo audio connector
9. Speaker connector
10. SATA connector (for connecting the storage drive)
11. MIC card connector (White)
12. SATA power connector (for connecting the power adapter)
13. Power button connector
14. MIC card connector (Black)
15. M.2 Wi-Fi card slot
16. PClex8 card slot
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>17. M.2 storage drive connector</td>
<td>18. Memory card slot 1</td>
</tr>
<tr>
<td>19. Memory card slot 2</td>
<td></td>
</tr>
</tbody>
</table>
Chapter 8. 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://consumersupport.lenovo.com.

Note: Use only parts provided by Lenovo.

General information

Pre-disassembly instructions

Before proceeding with the disassembly procedure, make sure that you do the following:

1. Turn off the power to the system and all peripherals.
2. Unplug all power and signal cables from the computer.
3. Place the system on a flat, stable surface.
Replacing the keyboard and mouse

To replace the keyboard and mouse

Step 1. Remove any media (disks, CDs, DVDs or memory cards) from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to “Left and right view” and “Rear view” for help with locating the various connectors.

Note: Your keyboard will be connected to a USB connector on one side or at the rear of the computer.

Step 4. Disconnect the defective keyboard cable from the computer and connect the new keyboard cable to the same connector.

Note: The mouse can be replaced using the same method.

Removing the stand base

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

Note: It may be helpful to place the computer face-down on a soft flat surface for this procedure, with the bottom of the computer facing up. Lenovo recommends that you use a blanket, towel, or other soft cloth to protect the computer screen from scratches or other damage.

To remove the stand base:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. To remove the stand base, press and slide the stand base as shown.
Step 5. To reattach the stand base, refer to the following figure.

Removing the computer cover

**Attention:** Turn off the computer and wait 3 to 5 minutes to let it cool down before removing the cover.

**Note:** It may be helpful to place the computer face-down on a soft flat surface for this procedure. Lenovo recommends that you use a blanket, towel, or other soft cloth to protect the computer screen from scratches or other damage.

To remove the computer cover:
Step 1. Remove any media (disks, CDs, DVDs, or memory cards) from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to “Left and right view” and “Rear view” for help with locating the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the stand base. Refer to Removing the stand base.

Step 6. Remove the 5 screws that secure the computer cover at the bottom of the chassis.

Step 7. To reinstall the computer cover:
   a. Line up the computer cover with the chassis, and then press the new cover until it snaps into position.
   b. Secure the computer cover to the chassis with the screws.
Replacing the internal assembly

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

To replace the internal assembly:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the computer cover. Refer to Removing the computer cover.

Step 5. Remove the screw that secures the audio card to the chassis 1, and then slide the audio card out 2.

Step 6. Remove the four screws that secure the internal assembly to the chassis 3.
Step 7. Pull the internal assembly from the chassis.

Step 8. To install the internal assembly:
a. Put the internal assembly into the chassis, and then align the holes in the internal assembly with the holes in the chassis.

b. Insert the audio card to its slot and secure it with one screw 1.

c. Secure the internal assembly to the chassis with four screws 2.
Step 9. Reattach all other removed parts.

Replacing the storage drive

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

To replace the storage drive:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly from the chassis. Refer to Replacing the internal assembly.

Step 7. Disconnect the data and power cables from the storage drive.

Step 8. Remove the two screws that secure the storage drive assembly 1, and then lift up the storage drive assembly 2.
Step 9. Remove the four screws that secure the storage drive to the bracket, and then lift the storage drive upward to remove it.

Step 10. To install the new storage drive:
   a. Put the new inch storage drive into the storage drive bracket, and secure it with four screws.
Step 11. Reinstall all the removed parts, and then reconnect the cables.

Replacing the card reader

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

To replace the card reader:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the storage drive assembly. Refer to Replacing the storage drive.

Step 8. Remove the two screws that secure the card reader to the main bracket.

Step 9. Disconnect the cable from the connector on the card reader.
Step 10. Install the new card reader:
   a. Align the new card reader into position, and then secure it to the main bracket with two screws.
   b. Connect the cable to the connector on the card reader.

Step 11. Reinstall all the removed parts, and then reconnect the cables.

Replacing the mic board

Attention: Turn off the computer and wait 3 to 5 minutes to let it cool down before removing the cover.
Note: It may be helpful to place the computer face-down on a soft flat surface for this procedure. Lenovo recommends that you use a blanket, towel, or other soft cloth to protect the computer screen from scratches or other damage.

To replace the mic board:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Disconnect the cable from the mic board.

Step 8. Remove the two screws that secure the mic card to the main bracket, and then remove it.

Step 9. Use the way to remove the other mic card.
Step 10. To reattach the mic card:

a. Align the holes on the new mic card with the corresponding holes in the main bracket. Then, secure the mic card with two screws.

b. Use the same way to install the other mic card.
Step 11. Reinstall all the removed parts, and then reconnect the cables.

Replacing the EMI cover

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

To replace the EMI cover:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the two screws that secure the EMI cover to the main bracket.

Step 8. Slide the EMI cover out.
Step 9. To install the EMI cover:
   a. Slide the EMI cover and align the holes on the EMI cover with the mounting holes on the main bracket 1.
   b. Secure the EMI cover to the main bracket with two screws 2.

Step 10. Reinstall all the removed parts, and then reconnect the cables.

Reinstalling the audio card

To replace the audio card:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.
Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the screw that secure the audio card to the chassis.

Step 7. Pull the internal assembly out of the chassis. Refer to Replacing the internal assembly.

Step 8. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 9. Disconnect the audio cable from the corresponding connector on the motherboard.

Step 10. To install the new system fan:
a. Connect the audio cable to the corresponding connector on the motherboard.

b. Reinstall the EMI cover.

c. Reinstall the internal assembly.

d. Align the hole on the new audio card with the one on the internal assembly, and then secure it with one screw.

Step 11. Reinstall all the removed parts, and then reconnect the cables.

**Replacing the speaker**

**Note:** For this procedure, it helps to lay the computer flat.
To replace the speaker:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the three screws that secure the speaker to the main bracket.

Step 9. Disconnect the cable from the connector on the motherboard.

Step 10. To install the new speaker:
   a. Align the holes on the new speaker with the mounting holes on the main bracket, and then secure it with three screws.
b. Connect the cable to the connector on the motherboard.

Step 11. Reinstall all the removed parts, and then reconnect the cables.

### Replacing the power button board

**Note:** For this procedure, it helps to lay the computer flat.

**To replace the power button board:**

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Press the two clips on both sides of the power button board, and then push the power button board inward until it is released.

Step 9. Disconnect the signal cable from the corresponding connector on the motherboard.
Step 10. To install the new power button board:
   a. Connect the signal cable of the new power button board to the connector on the motherboard.
   b. Insert the new power button board into its hole until it snaps into position.

Step 11. Reinstall all the removed parts, and then reconnect the cables.

---

Replacing the PCIe card

To replace the PCIe card:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the screws that secure PCIe card bracket to the main bracket.

Step 9. Pivot the PCIe card upward.
Step 10. Press the card retaining latch 1 as shown to disengage the latch. Grasp the card and gently pull it out of the slot 2.

Step 11. To install the new PCIe card:
   a. Insert the new PCIe card into the PCIe card slot on the motherboard.
   b. Pivot the PCIe card downward 1.
   c. Secure the PCIe card to the main bracket with screws.
Step 12. Reinstall all the removed parts, and then reconnect the cables.

**Replacing the Wi-Fi card**

**Note:** For this procedure, it helps to lay the computer flat.

To replace the Wi-Fi card:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the screw that secures the Wi-Fi card to the motherboard.

Step 9. Remove the Wi-Fi card cover.

Step 10. Disconnect the 2 antenna cables from the Wi-Fi card.

Step 11. Pull the Wi-Fi card out of the slot.
Step 12. To install the new Wi-Fi card:
   a. Insert it into the same card slot.
   b. Connect the 2 antenna cables to the new Wi-Fi card.
   c. Secure the Wi-Fi card to the motherboard with one screw.

Step 13. Reinstall all the removed parts, and then reconnect the cables.

Replacing the Wi-Fi antenna

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

To replace the Wi-Fi antenna:
Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly from the chassis. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Disconnect the Wi-Fi antenna cables from the Wi-Fi card. Refer to Replacing the Wi-Fi card.

Step 9. Remove the screw that secures the Wi-Fi antenna to the main bracket 1.

Step 10. Peel off the two Wi-Fi antennas from the main bracket 2.

Step 11. Install the new Wi-Fi antenna:
   a. Peel off the release paper on the adhesive surface of the new Wi-Fi antennas.
   b. Stick the new Wi-Fi antenna to the corresponding position.
   c. Secure the Wi-Fi antennas to the main bracket with one screw.
d. Connect the new Wi-Fi antenna cables to the Wi-Fi card.

Step 12. Reinstall all the removed parts, and then reconnect the cables.

---

**Replacing the system fan**

To replace the system fan:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Disconnect the system fan power cable from the motherboard.

Step 9. Remove the wind shielding.

Step 10. Remove the three screws that secure the system fan bracket to the motherboard.
Step 11. Lift up the system fan to remove it

Step 12. To install the new system fan:
   a. Place the new system fan into position, and then secure it to the motherboard with three screws.
   b. Reinstall the wind shielding.
   c. Connect the system fan power cable to the connector on the motherboard.

Step 13. Reinstall all the removed parts, and then reconnect the cables.
Replacing the heat-sink

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

To replace the heat-sink:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Remove the internal assembly. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the system fan. Refer to Replacing the system fan.

Step 9. Remove the wind shielding.

Step 10. Loosen the three screws that secure the heat-sink to the motherboard, and then lift up the heat-sink to remove it.

Attention: Place the heat-sink upside down on a flat surface to prevent thermal grease from contaminating other components.

Attention: Use an alcohol pad to wipe the thermal grease off the CPU.

Step 11. To install the new heat-sink:

a. Position the new heat-sink on the motherboard so that the three screws are aligned with the holes on the motherboard.

b. Tighten the three screws to secure the new heat-sink to the motherboard.
Step 12. Reinstall all the removed parts, and then reconnect the cables.

Replacing the microprocessor

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

To replace the microprocessor

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Pull the internal assembly out of the chassis. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the system fan. Refer to Replacing the system fan.

Step 9. Remove the heat-sink. Refer to Replacing the heat-sink.

Step 10. Press the small handle downward to release it from the retainer, and then open the retainer to access the microprocessor.

Step 11. Lift the microprocessor straight up and out of the microprocessor socket.
Note:

a. Your microprocessor and socket might look different from the one illustrated.

b. Touch only the edges of the microprocessor. Do not touch the gold contacts on the bottom.

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

Step 12. To install the new microprocessor:

a. Ensure that the small handle is in the raised position and the microprocessor retainer is fully open.

b. Remove the protective cover that protects the gold contacts of the new microprocessor.

c. Note the orientation of the new microprocessor. Hold the new microprocessor by its edges and align the notches on it with the tabs in the microprocessor socket. Then, carefully lower the new microprocessor straight down into the microprocessor socket.

d. Close the microprocessor retainer and lock it into position with the small handle to secure the new microprocessor in the socket.

Step 13. Reinstall all the removed parts, and then reconnect the cables.

Replacing the motherboard

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

To replace the motherboard:

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.
Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Pull the internal assembly out of the chassis. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the system fan. Refer to Replacing the system fan.

Step 9. Remove the heat-sink. Refer to Replacing the heat-sink.

Step 10. Remove the microprocessor. Refer to Replacing the microprocessor.

Step 11. Remove the PCIe card. Refer to Replacing the PCIe card.

Step 12. Remove the Wi-Fi card. Refer to Replacing the Wi-Fi card.

Step 13. Disconnect all cables from the connectors on motherboard.

Step 14. Remove the five screws that secure the motherboard to the main bracket.

Step 15. Lift up the motherboard to remove it.

Step 16. Install the new motherboard:
   a. Line up the holes on the new motherboard with the mounting holes on the main bracket and secure it with five screws.

Step 17. Reinstall all the removed parts, and then reconnect the cables.
Replacing the memory module

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

Note: It may be helpful to place the computer face-down on a soft flat surface for this procedure. Lenovo recommends that you use a blanket, towel, or other soft cloth to protect the touch screen from scratches or other damage.

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Pull the internal assembly out of the chassis. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the system fan. Refer to Replacing the system fan.

Step 9. Remove the heat-sink. Refer to Replacing the heat-sink.

Step 10. Remove the motherboard from the main bracket. Refer to Replacing the motherboard.

Step 11. The memory module is on the back of the motherboard. Open the retaining clips and gently pull the memory module out of the memory slot.

Step 12. To install the new memory module:

   a. Position the new memory module over the memory slot. Ensure that the notch on the memory module aligns correctly with the slot key in the memory slot. Press the memory module down until snaps into position.
Step 13. Reinstall all the removed parts, and then reconnect the cables.

**Replacing the M.2 storage drive**

**Note:** For this procedure, it helps to lay the computer flat.

**To replace the M.2 storage drive:**

Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

Step 2. Unplug all power cords from electrical outlets.

Step 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. Refer to Locating connectors, controls and components to locate the various connectors.

Step 4. Remove the stand base. Refer to Removing the stand base.

Step 5. Remove the computer cover. Refer to Removing the computer cover.

Step 6. Pull the internal assembly out of the chassis. Refer to Replacing the internal assembly.

Step 7. Remove the EMI cover. Refer to Replacing the EMI cover.

Step 8. Remove the system fan. Refer to Replacing the system fan.

Step 9. Remove the heat-sink. Refer to Replacing the heat-sink.

Step 10. Remove the motherboard from the main bracket. Refer to Replacing the motherboard.

Step 11. The M.2 storage drive is on the back of the motherboard. Remove the screw that secures the M.2 storage drive to the motherboard.

Step 12. Pull the M.2 storage drive out.
Step 13. To install the new M.2 storage drive:
   a. Insert the new M.2 storage drive into the M.2 slot.
   b. Secure the new M.2 storage drive to the motherboard with one screw.

Step 14. Reinstall all the removed parts, and then reconnect the cables.
Chapter 9. FRU lists

This chapter lists the information on the field replaceable units (FRUs) for ideacentre 620S series computers.

**Attention:** Be sure to read and understand all the safety information before replacing any FRUs.

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Chapter 10. General information

This chapter provides general information that applies to all machine types supported by this publication.

Additional Service Information

This chapter provides additional information that the service representative might find helpful.

Power management

Power management reduces the power consumption of certain components of the computer such as the system power supply, processor, hard disk drives, and some monitors.

Advanced configuration and power interface (ACPI) BIOS

As this computer has an ACPI BIOS system, the operating system is allowed to control the power management features of the computer and the settings for Advanced Power Management (APM) BIOS mode is ignored. Not all operating systems support ACPI BIOS mode.

Automatic Power-On features

The Automatic Power-On features within the Power Management menu allow you to enable and disable features that turn on the computer automatically.

- Wake Up on Alarm: You can specify a date and time at which the computer will be turned on automatically. This can be either a single event, a daily event or a weekly event.
- Wake Up on LAN: This feature allows LAN adapter card to wake the System.