ideacentre All-In-One 720 Computer Hardware Maintenance Manual

Machine Types: F0CM [AIO 720-24IKB/Energy Star]

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Chapter 1. About this manual

This manual contains service and reference information for Lenovo All-In-One 720 series 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-tuner card in this manual applies only to computers with a TV-tuner card installed. It does not apply to computers without a TV-tuner card.

Important Safety Information

Be sure to read all CAUTION and DANGER sections in this manual before following 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。

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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:

- Keep the areas around the computer clear and clean 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 across both feet.
  3. Lift slowly. 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 would create a hazard for the customer, or would make the computer unsafe.
- Before you start the computer, ensure that other service representatives and customer personnel are not in a position that would create a hazard for them.
- Place removed covers and other parts in a safe place, away from all personnel, while you are servicing the computer.
- Keep your tool case away from areas that people may walk through to ensure no-one trips 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, tie or fasten it back.
- Insert the ends of your necktie or scarf inside clothing or fasten it with a non-conductive 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.
- Reattach all covers correctly before returning the computer 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 any attached power cords, telecommunication cables, network cables, and modem cables before you open the computer covers, unless instructed otherwise in the installation and configuration procedures.

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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 rubber floor mats near their equipment that contain small conductive fibers to decrease electrostatic discharge.

- 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 computer, unplug the power cord. If you cannot unplug it, ask the customer to power-off the electrical outlet that supplies power to the machine and to lock the electrical outlet in the off position.
- If you need to work on a computer 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 the maintenance information. Use extreme care when measuring high voltages.
- Regularly inspect and maintain your electrical hand tools to ensure they are safe to use.
- 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 wet floors, non-grounded power extension cables, conditions that may cause or allow power surges, and missing safety grounds.
- Do not touch live electrical circuits with the reflective surface of a plastic dental mirror. This surface is conductive, and touching a live circuit can cause personal injury and damage to the computer.
- Do not service the following parts with the power on when they are removed from their normal operating positions in a computer:
  - 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 potential hazards posed by these products. Each computer, 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 hazards are present, you must determine how serious the apparent hazard could be and whether you can continue without first resolving the problem.

Consider the following items 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 as 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 hazards, 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 computer, 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 any equipment that will be attached to this product to a properly wired outlet.**
- **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 cables, network cables, and modem cables 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	To Disconnect
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.	1. Turn everything OFF. 2. First, remove power cords from outlets. 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 into or immerse in 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:

These diodes emit radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.



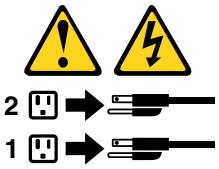
		
≥18 kg (37 lbs)	≥32 kg (70.5 lbs)	≥55 kg (121.2 lbs)

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 computer models covered by this manual.

Specifications

This section lists the physical specifications for your computer.

This section lists the physical specifications for your computer.

Type Lenovo All-In-One 720

This section lists the physical specifications.

Environment

Air temperature:

- Operating: 10° to 35°C
- Transit: -20° to 55°C

Humidity:

- Operating: 35% to 80%
- Transit: 20% to 90% (40°C)
- Altitude: 86KPa to 106KPa

Electrical input:

- Input voltage: 90V-264V(AC)
- Input frequency: 47Hz-63Hz

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Chapter 4. General Checkout

Attention: The drives in the computer you are servicing might have been rearranged or the drive startup sequence may have been 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, 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 did receive the correct response, proceed to step 7.
6. If one of the following happens, follow the instruction given:
   - 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.

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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 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 will not be 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 characters (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:

- For a strong password, use 7-16 characters and a mix of letters and numbers.
- Do not use your name or your user name.
- Do not use a common word or a common name.
- Use something significantly different from your previous password.

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

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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:

Note: A password can be any combination of letters and numbers up to 16 characters (a-z and 0-9). For more information, see “Password considerations” on page 13.

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 then press the **Enter** key.
4. Re-type the password to confirm, then press the **Enter** key. If you typed 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 then press the **Enter** key.
4. Type the new password, then press the **Enter** key. Re-type the password to confirm the new password. If you typed the new password correctly, the new password will be installed. A Setup Noticed confirming that changes have been saved will be displayed.

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**, leave each new password line item blank, then press the **Enter** key. A Setup Notice confirming that changes have been saved will be displayed.
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 characters (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, then press the **Enter** key.
4. Re-type the password to confirm. If you typed 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 then press the **Enter** key.
4. Type the new password, then press the **Enter** key. Re-type the password to confirm the new password. If you typed the new password correctly, the new password will be installed. A Setup Noticed confirming that changes have been saved will be displayed.

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**, leave each new password line item blank, then press Enter. A Setup Notice confirming that changes have been saved will be displayed.
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

The **Devices** options is used to enable or disable user access to the following devices:	
USB Functions	Select whether to enable or disable **USB** (Universal Serial Bus) functions. If the functions are disabled, no **USB** devices can be used.
SATA Mode	When this feature is set to **Disabled**, all devices connected to the SATA connectors (e.g. hard disk drives or the optical disk drive) are disabled and cannot be accessed.
Onboard Audio Controller	Select whether to enable or disable the **Onboard Audio Controller**. When this feature is set to **Disabled** all devices connected to the audio connectors (e.g. headphones or a microphone) are disabled and cannot be used.
Onboard Ethernet Controller or LAN Boot Agent	Select whether to enable or disable the **Onboard Ethernet Controller**, or select whether to enable or disable load onboard **PXE** (**Preboot Execution Environment**).

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 an option as follows:

   Select **USB Setup**, press the **Enter** key, then select **USB Functions**.

Select **ATA Device Setup**, press the **Enter** key, then select **SATA Mode**.

Select **Audio Setup**, press the **Enter** key, then select **Onboard Audio Controller**.

Select **Network Setup**, press the **Enter** key, then select **Onboard Ethernet Support** or **LAN Boot Agent**.

4. Select **Disabled** or **Enabled** and 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.

Notes:

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

b. Select IDE/AHCI Mode: Device driver support is required for ACHI. Depending on how the hard disk image was installed, changing this setting may prevent the system from booting.

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 start up 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 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 **<x>** 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 Lenovo BIOS 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 be caused by the following.

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

Power Supply Problems

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

Check/Verify	FRU/Action
Check that the following are properly installed: • Power Cord • On/Off Switch connector • System Board Power Supply connectors • Microprocessor connections	Reseat connectors
Check the power cord.	Power Cord
Check the power-on switch.	Power-on Switch

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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 motherboard operations
- Checks that the memory is working correctly
- Starts video operations
- Verifies that the boot drive is working

POST Error Message	Description/Action
Keyboard error	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** and set the option to **Enabled**. The BIOS then ignores the missing keyboard during POST.
Reboot and Select proper Boot device or Insert Boot Media in selected Boot device	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.

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.

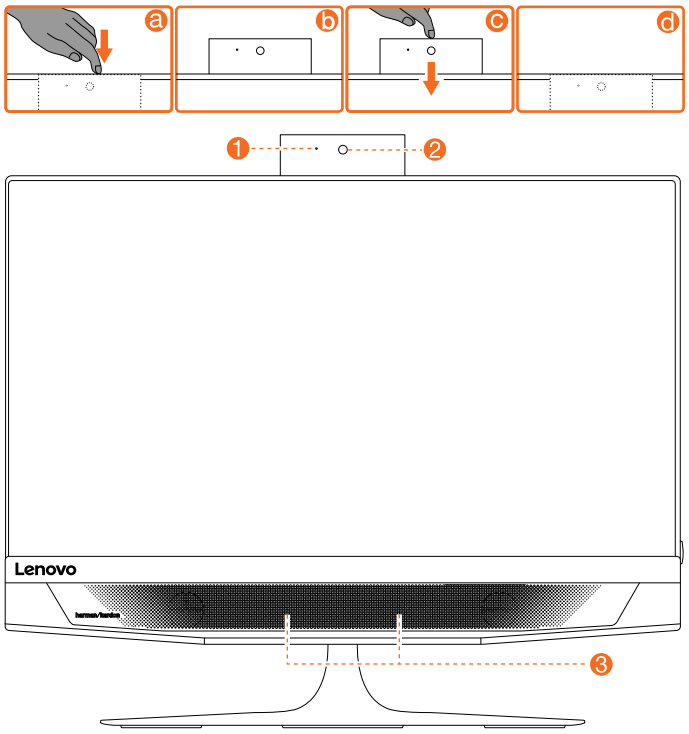
Chapter 7. Locating connectors, controls and components

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

Font view

The following illustration shows the location of controls and components on the front of the computer.

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

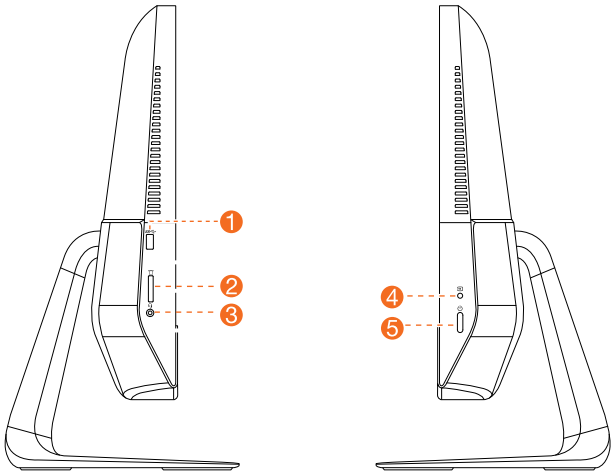


1. Camera LED indicator	3. Built-in microphone
2. Built-in camera	

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Left and right view

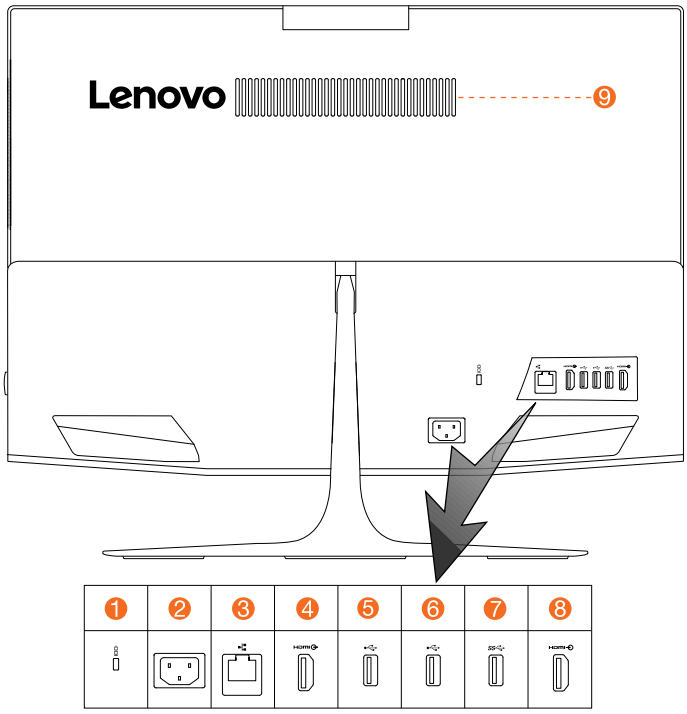
The following illustration shows the location of connectors, controls and components on the left and right side of the computer.



1. USB 3.0 connectors	4. HDMI-in switch
2. Memory card reader	5. Power button
3. Combo audio jack	

Rear view

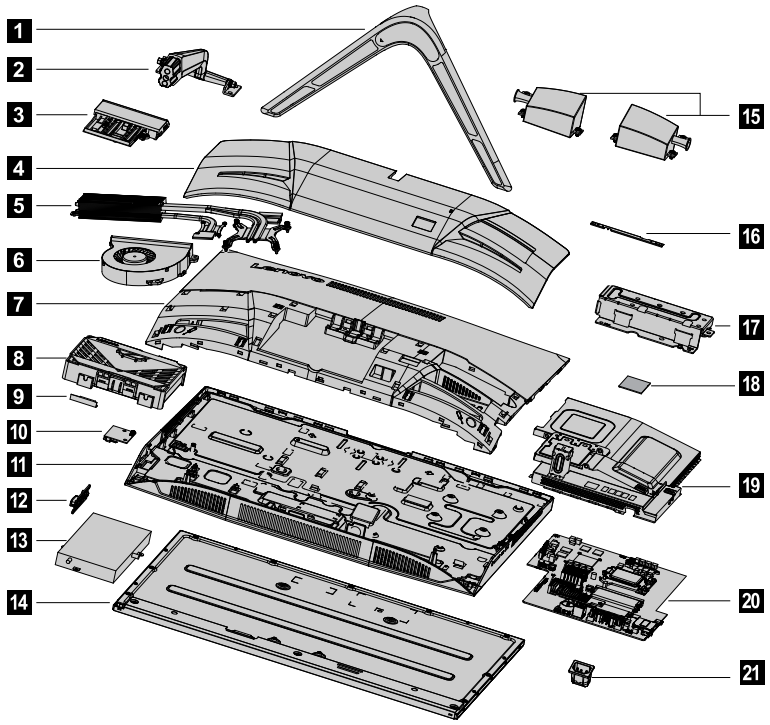
The following illustration shows the location of connectors and components on the rear of the computer.



1. Security cable slot	6. USB 2.0 connector
2. Power connector	7. USB 3.0 connector
3. Ethernet connector	8. HDMI-in connector
4. HDMI-out connector	9. Air vents
5. USB 2.0 connector	

Hardware components

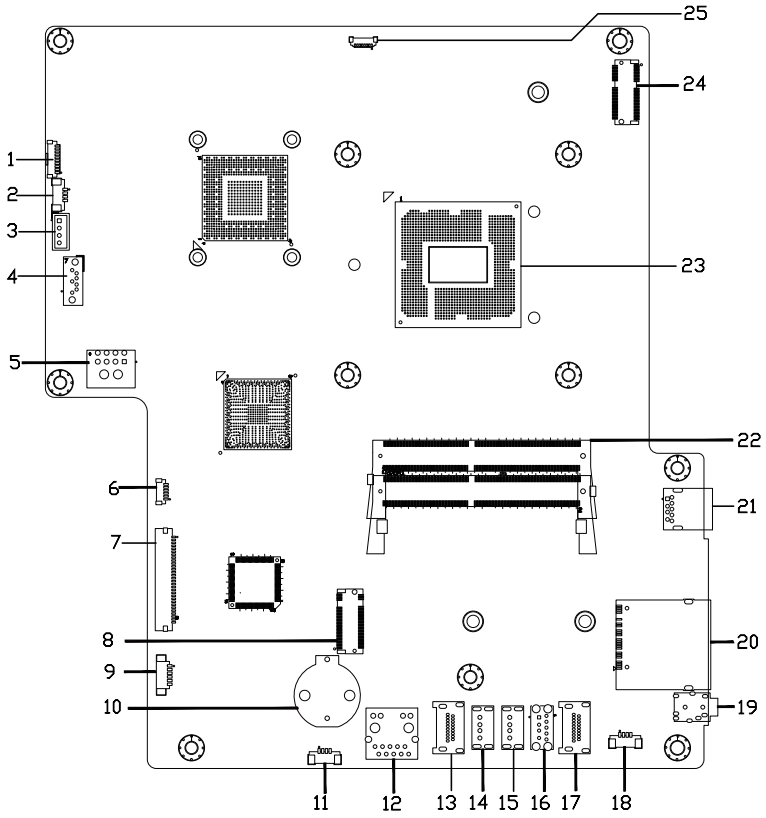
The following illustration shows the components that make up your computer.



1. Stand base	12. Power button
2. Stand holder	13. Power supply unit
3. Camera module	14. LCD panel
4. Rear cover	15. Speaker system
5. Heat-sink	16. Mic board
6. System fan	17. VESA mount bracket
7. Middle cover	18. Wi-Fi card
8. Hard disk drive	19. EMI cover
9. Wi-Fi antenna	20. Motherboard
10. Power switch board	21. Power socket
11. Main frame	

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.



1. Backlight connector	14. USB 2.0 connector
2. System fan connector	15. USB 2.0 connector
3. SATA power cable	16. USB 3.0 connector
4. SATA HDD connector	17. HDMI-in connector
5. Power supply unit connector	18. Speaker connector
6. Touch panel connector	19. Combo audio jack
7. LVDS connector	20. Card reader connector
8. M.2 solid state drive connector	21. USB 3.0 connector
9. Power switch board connector	22. Memory slots
10. Battery	23. CPU
11. Mic connector	24. Wi-Fi card connector
12. Ethernet connector	25. Camera connector
13. HDMI-out connector	

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 starting 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.

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Replacing the keyboard and mouse

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

To replace the keyboard and mouse:

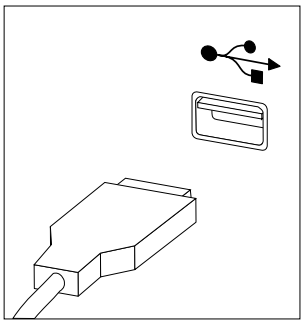
Step 1. Remove any media from the drives, shut down the computer, and turn off all attached devices.

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. .

Step 4. Locate the connector for the keyboard. Refer to Locating connectors, controls and components to locate the various connectors.

Step 5. Disconnect the defective keyboard cable from the computer and connect the new keyboard cable to the same connector.



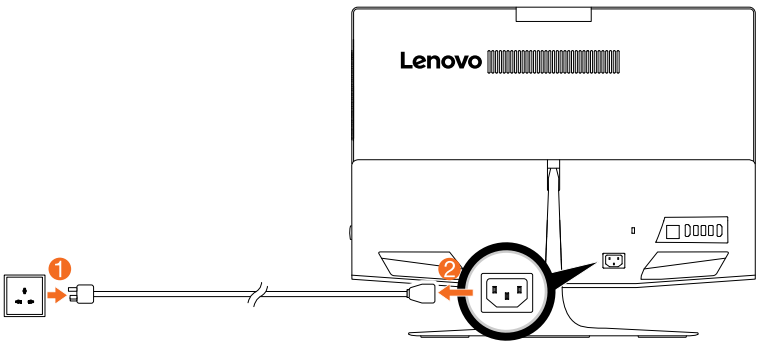
Step 6. The mouse can be replaced using the same method.

Replacing the adapter

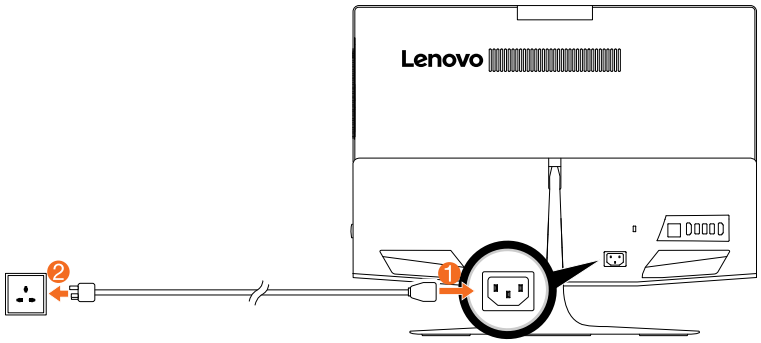
Attention: Turn off the computer and wait 3 to 5 minutes to let it cool down before removing the cover.

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

Step 2. Disconnect the adapter from the connector on the computer, then unplug the adapter from electrical outlet.



Step 3. Connect the new adapter as shown.



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. Lenovo recommends that you use a blanket, towel, or other soft cloth to protect the touch screen from scratches or other damage.

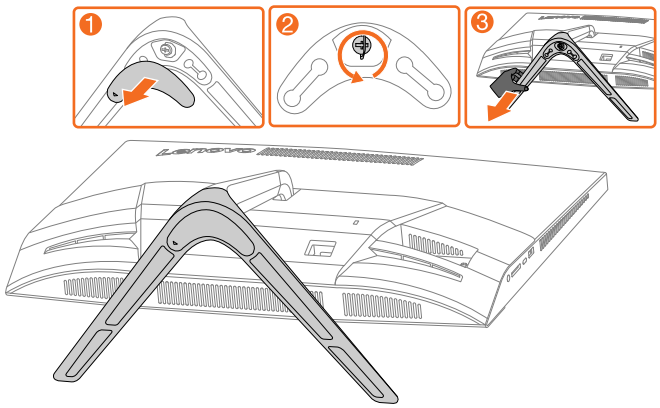
Step 1. Remove any media from the drives, shut down the operating system, and turn off the computer and all attached devices.

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 rubber, and then twist the hand screw ring counter-clockwise until the stand base is loosened. **1** **2**

Step 5. Remove the stand base from the stand holder and put it aside. **3**



Removing the rear cover

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

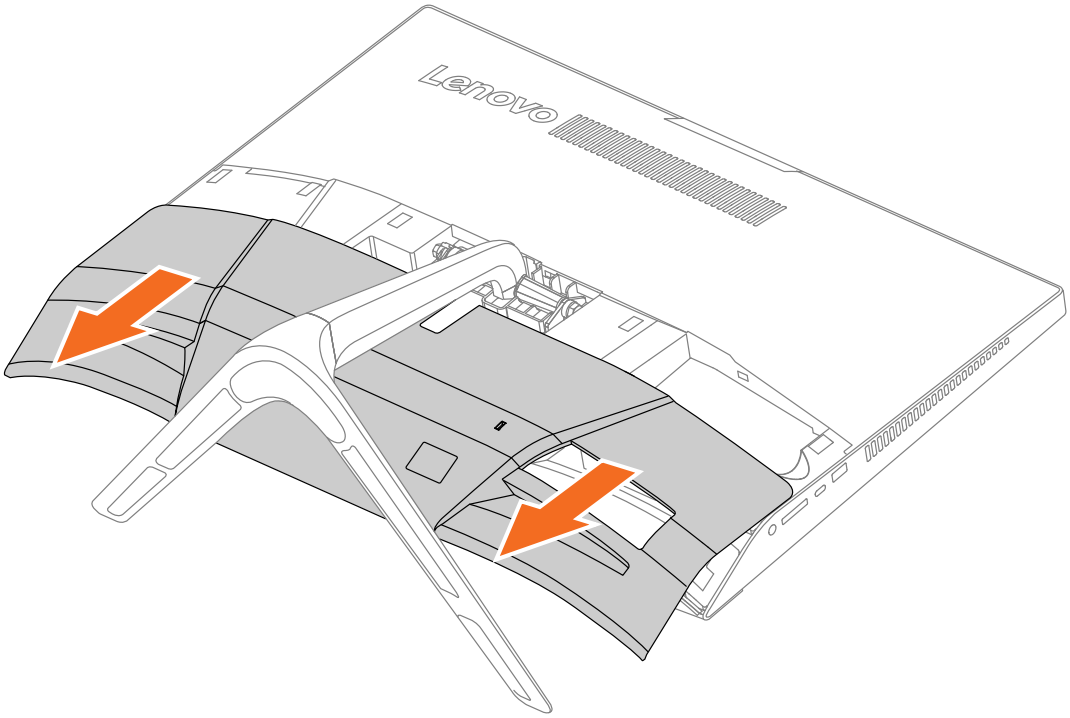
Note: It may be helpful to place the computer face-down on a soft flat surface for this procedure. Lenovo recommends that you use a blanket, towel, or other soft cloth to protect the touch screen from scratches or other damage.

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. Slide out the rear cover.



Step 5. To reattach the rear cover:

a. Line up the rear cover with mounting holes on the back of the computer, then slide it back into position.

Replacing the hard disk drive

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.

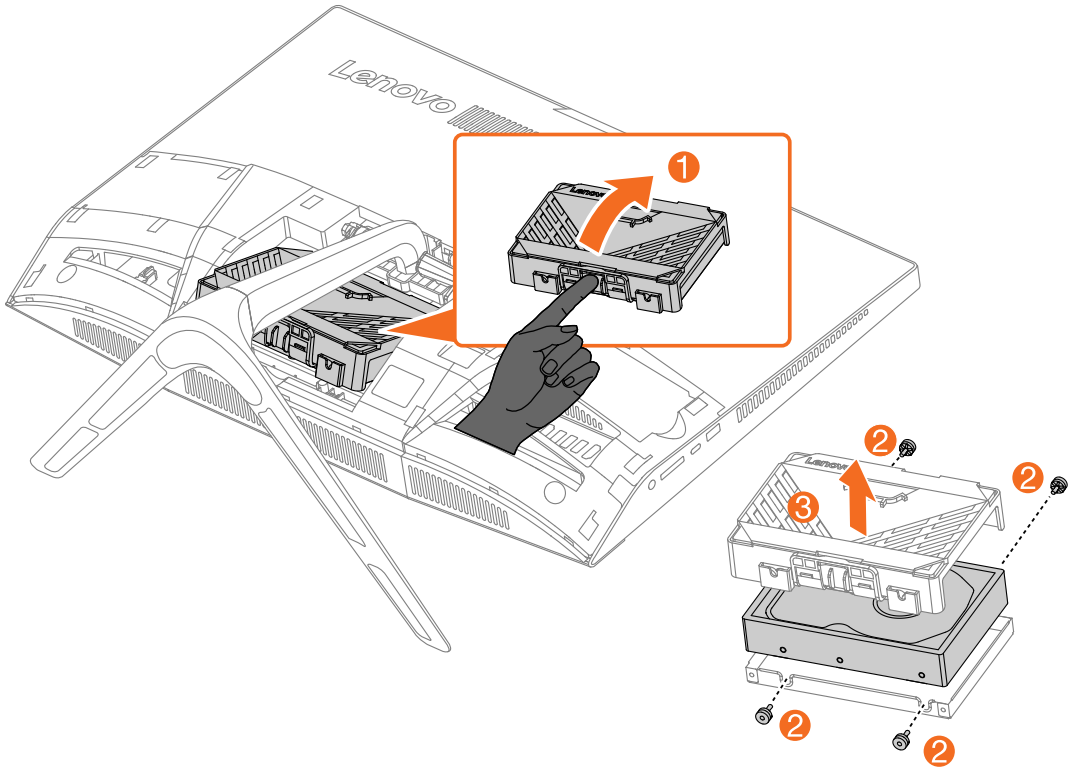
Step 4. Remove the rear cover. Refer to Removing the rear cover.

Step 5. Press the locking pin and then lift up the hard disk drive module from the computer. 1

Step 6. Disconnect the signal cable from the hard disk drive.

Step 7. Remove the four screws that secure the hard disk drive to the bracket. 2

Step 8. Lift up the bracket from the hard disk drive. 3



Step 9. To install the new hard disk drive:

a. Line up the new hard disk drive with the bracket and secure it with four screws.

b. Connect the data and power cables to the new hard disk drive.

c. Slide the hard disk drive module back into position.

Step 10. Reinstall the removed parts.

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.

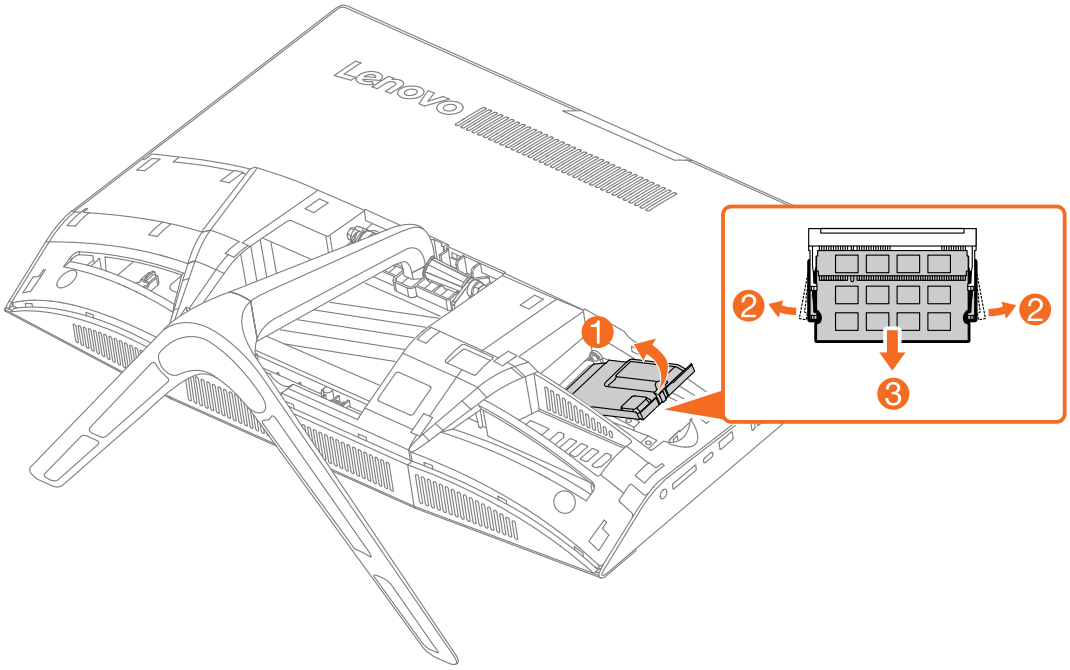
Step 2. Unplug all power cords from electrical outlets.

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 rear cover. Refer to Removing the rear cover.

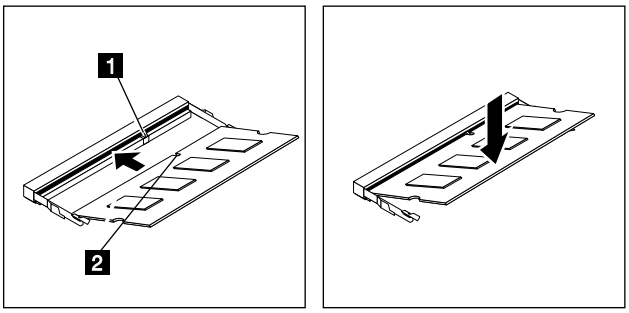
Step 5. Remove the memory cover. 1

Step 6. Open the retaining clips 2 and gently pull the memory module out of the memory slot. 3



Step 7. To install the new memory module:

a. Position the new memory module over the memory slot. Ensure that the notch 2 on the memory module aligns correctly with the slot key 1 in the memory slot. Press the memory module down until snaps into position.



b. Reinstall the memory cover.

Step 8. Reinstall the removed parts.

Replacing the solid state drive

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.

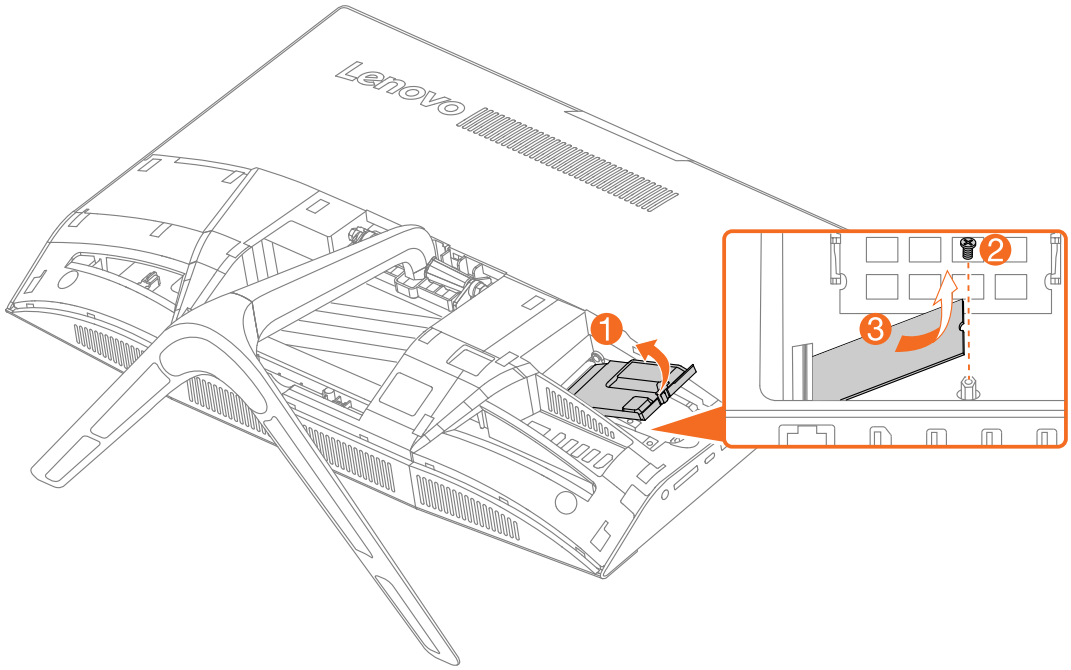
Step 2. Unplug all power cords from electrical outlets.

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 rear cover. Refer to Removing the rear cover.

Step 5. Remove the memory cover. 1

Step 6. Remove the screw that secure the solid state drive to the motherboard 2, and then slide out the solid state drive. 3



Step 7. To install the new solid state drive:

a. Insert the solid state drive into the slot.

b. Secure the new solid state drive to motherboard with one screw.

c. Reinstall the memory cover.

Step 8. Reinstall the removed parts.

Removing the stand holder

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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the four screws that secure the stand holder to the chassis, and then lift up the stand holder to remove it.



Step 7. To reattach the stand holder:

a. Align the holes in the stand holder with the corresponding holes in the chassis.

b. Secure the stand holder to the chassis with four screws.

Removing the middle cover

Note: 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 middle 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 rear cover. Refer to Removing the rear cover.

Step 6. Loose the two screws that secure the middle cover to the main frame.



Step 7. Remove the stand holder. Refer to Removing the stand holder.

Step 8. Lift up the middle cover as shown.



Step 9. To reattach the middle cover:

a. Line up the middle cover with the main frame, and then press the middle cover until it snaps into position.

b. Secure the middle cover to the main frame with two screws.

Replacing the front bezel

Note: 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 front bezel

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 rear cover. Refer to Removing the rear cover.

Step 5. Remove the hard disk drive. Refer to Replacing the hard disk drive.

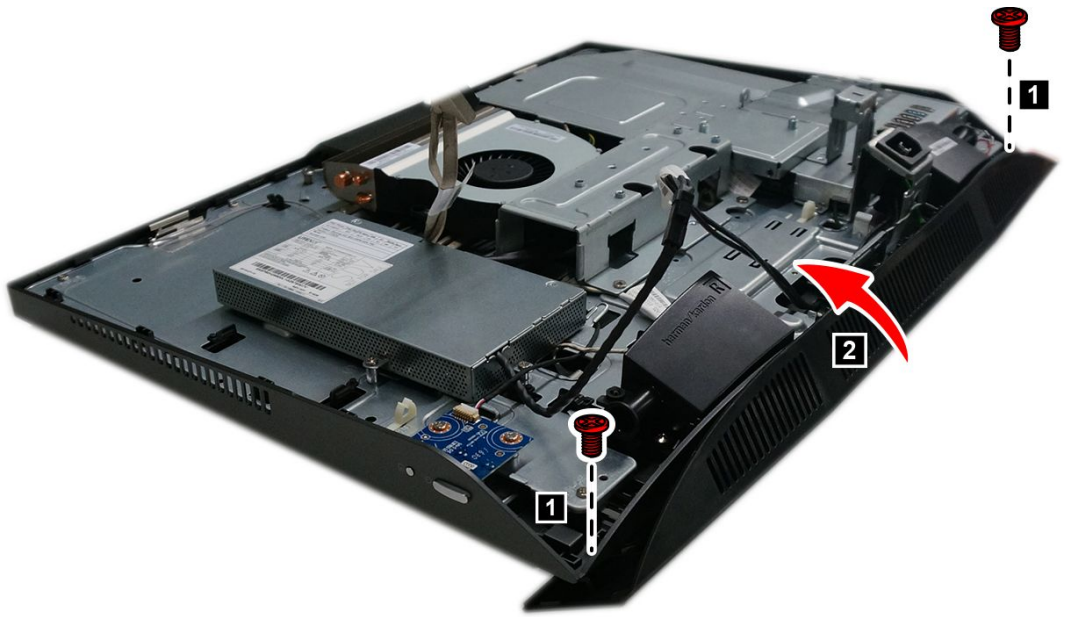
Step 6. Remove the stand base. Refer to Removing the stand base.

Step 7. Remove the stand holder. Refer to Removing the stand holder.

Step 8. Remove the middle cover. Refer to Removing the middle cover.

Step 9. Remove the two screws that secure the front bezel to the main frame. 1

Step 10. Remove the front bezel as shown. 2



Step 11. To install the new front bezel: attach the new front bezel to the main frame and secure it with two screws.

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

Replacing the power switch board

Note: 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 power switch 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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the stand holder. Refer to Removing the stand holder.

Step 7. Remove the middle cover. Refer to Removing the middle cover.

Step 8. Remove the two screws that secure the power switch board to the chassis.



Step 9. Disconnect the signal cable from the power switch board.

Step 10. To install the new power switch board:

a. Connect the signal cable to the new power switch board.

b. Align the new power switch board into position and secure it with two screws.

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

Removing the EMI cover

Note: 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 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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the stand holder. Refer to Removing the stand holder.

Step 7. Remove the middle cover. Refer to Removing the middle cover.

Step 8. Remove the six screws that secure the EMI cover to the chassis, and then lift it up.



Step 9. To install the new EMI cover:

a. Align the holes in the EMI cover with the mounting holes in the chassis.

b. Secure the EMI cover to the chassis with six screws.

Replacing the camera

Note: 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 camera:

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 rear cover. Refer to Removing the rear cover.

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

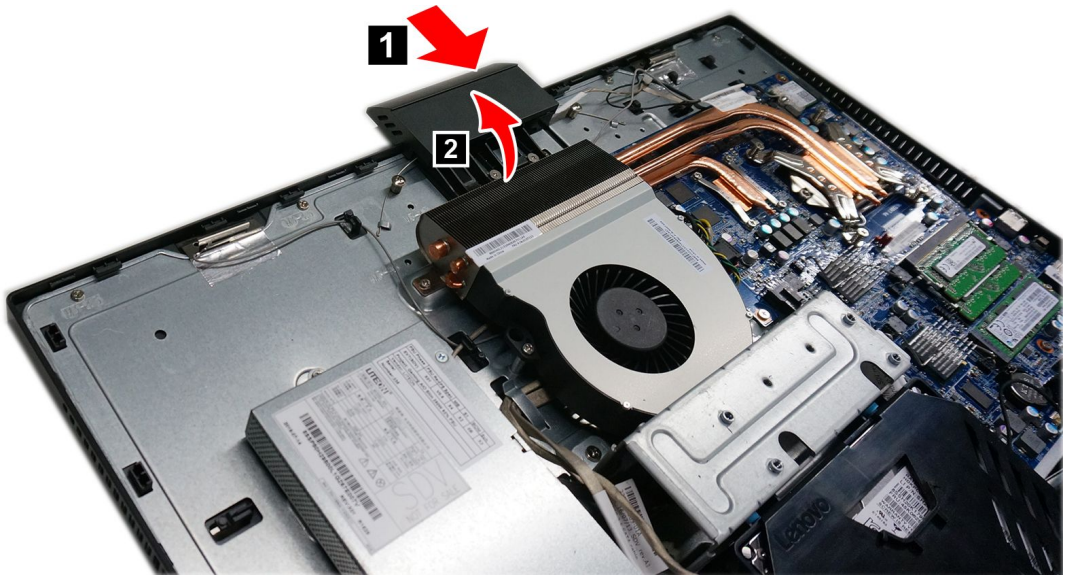
Step 6. Remove the stand holder. Refer to Removing the stand holder.

Step 7. Remove the middle cover. Refer to Removing the middle cover.

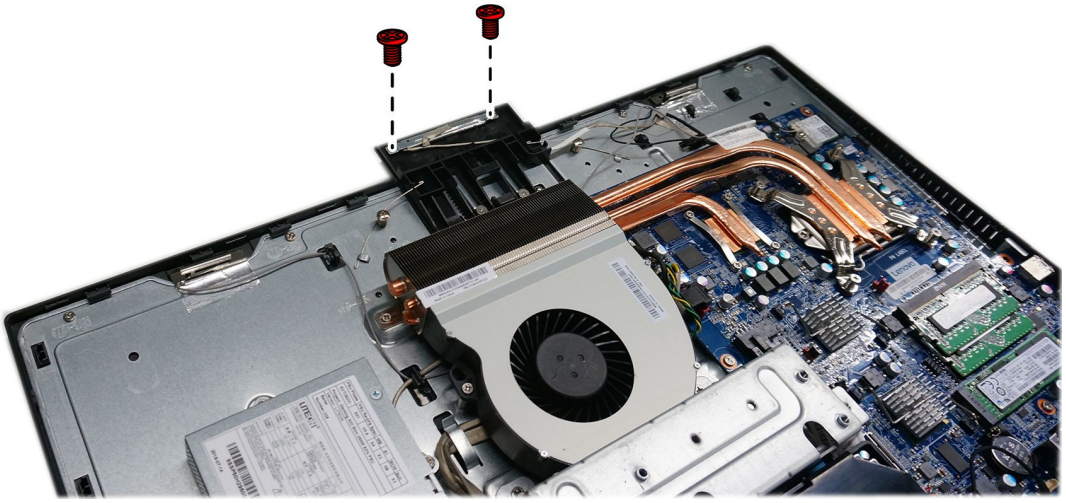
Step 8. Remove the EMI cover. Refer to Removing the EMI cover.

Step 9. Disconnect the camera cable form the corresponding connector on the motherboard. Refer to Locating connectors, controls and components.

Step 10. Press the camera module **1**, and then lift up the camera module cover **2**.



Step 11. Remove the two screws that secure the camera to the chassis, and then remove the camera.



Step 12. To install the new camera:

a. Align the new camera into position, and then secure it to the chassis with two screws.

b. Connect the camera cable to the motherboard.

c. Reinstall the camera cover.

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

Removing the mount bracket

Note: 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 mount bracket

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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the stand holder. Refer to Removing the stand holder.

Step 7. Remove the middle cover. Refer to Removing the middle cover.

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

Step 9. Remove the four screws that secure the mount bracket to the chassis, and then lift it up.



Step 10. To install the new mount bracket:

a. Align the holes in the new mount bracket with the mounting holes in the chassis.

b. Secure the mount bracket to the chassis with four screws.

Replacing the power supply unit

Note: 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 power supply unit

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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the hard disk drive. Refer to Replacing the hard disk drive.

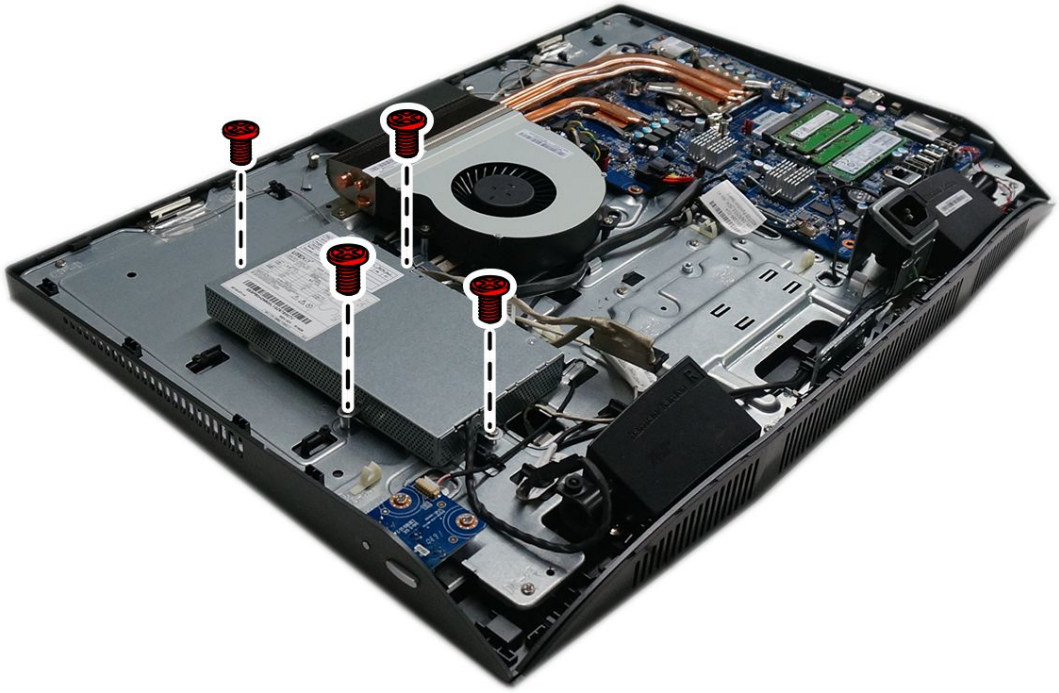
Step 7. Remove the stand holder. Refer to Removing the stand holder.

Step 8. Remove the middle cover. Refer to Removing the middle cover.

Step 9. Remove the EMI cover. Refer to Removing the EMI cover.

Step 10. Remove the mount bracket. Refer to Removing the mount bracket.

Step 11. Remove the four screws that secure the power supply unit to the chassis.



Step 12. Disconnect the cable from the motherboard and the power socket.

Step 13. To install the new power supply unit:

a. Connect the cable of the new power supply unit to the corresponding connector on the motherboard and power socket.

b. Align the new power supply unit into position and secure it with four screws.

Step 14. Reinstall all the removed parts, and then reconnect all the disconnected cables.

Replacing the speaker system

Note: 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 speaker system:

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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the stand holder. Refer to Removing the stand holder.

Step 7. Remove the middle cover. Refer to Removing the middle cover.

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

Step 9. Remove the four screws that secure the speaker system to the chassis, and then disconnect the speaker cable from the connector on the motherboard.

Step 10. Lift up the speaker system to remove it.



Step 11. To install the new speaker system:

a. Align the new speaker system into position, and then secure it to the chassis with four screws.

b. Connect the cable to the motherboard.

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

Replacing the Wi-Fi card

Note: 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 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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the stand holder. Refer to Removing the stand holder.

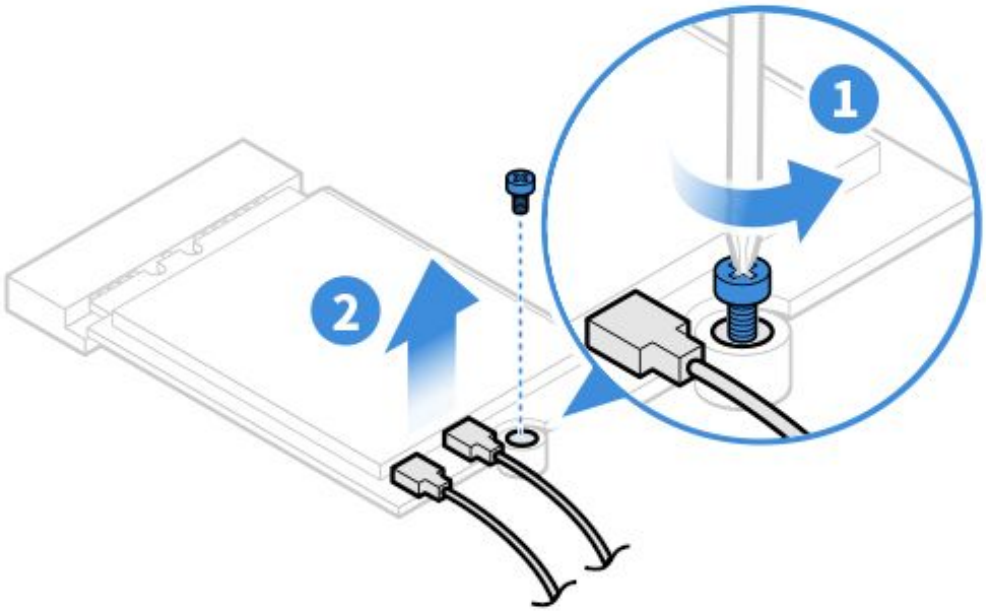
Step 7. Remove the middle cover. Refer to Removing the middle cover.

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

Step 9. Remove the screw that secures the Wi-Fi card to the motherboard. 1

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

Step 11. Pull the Wi-Fi card out of the slot.



Step 12. To install the new Wi-Fi card:

a. Insert the new Wi-Fi card into the Wi-Fi card slot.

b. Connect the antenna cables to the new Wi-Fi card.

c. Secure new the Wi-Fi card to the motherboard with the screw.

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

Replacing the heat-sink

Note: 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 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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the stand holder. Refer to Removing the stand holder.

Step 7. Remove the middle cover. Refer to Removing the middle cover.

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

Step 9. Loosen the nine screws that secure the heat-sink to the motherboard, and then lift up the heat-sink and 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 10. To install the new heat-sink:

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

b. Tighten the screws in numeric order to secure the new heat-sink to the motherboard.

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

Replacing the system fan

Note: 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 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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the hard disk drive. Refer to Replacing the hard disk drive.

Step 7. Remove the stand holder. Refer to Removing the stand holder.

Step 8. Remove the middle cover. Refer to Removing the middle cover.

Step 9. Remove the EMI cover. Refer to Removing the EMI cover.

Step 10. Remove the mount bracket. Refer to Removing the mount bracket.

Step 11. Remove the three screws that secure the system fan to the chassis.



Step 12. Disconnect the system fan power cable from the motherboard.

Step 13. Lift the system fan up to remove it.

Step 14. To install the new system fan:

a. Place the new system fan into position, and then secure it to the chassis with three screws.

b. Connect the system fan power cable to the connector on the motherboard.

Step 15. Reinstall all the removed parts, and then reconnect all the disconnected cables.

Replacing the motherboard

Note: 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 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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the hard disk drive. Refer to Replacing the hard disk drive.

Step 7. Remove the stand holder. Refer to Removing the stand holder.

Step 8. Remove the middle cover. Refer to Removing the middle cover.

Step 9. Remove the EMI cover. Refer to Removing the EMI cover.

Step 10. Remove the mount bracket. Refer to Removing the mount bracket.

Step 11. Remove the system fan. Refer to Replacing the system fan.

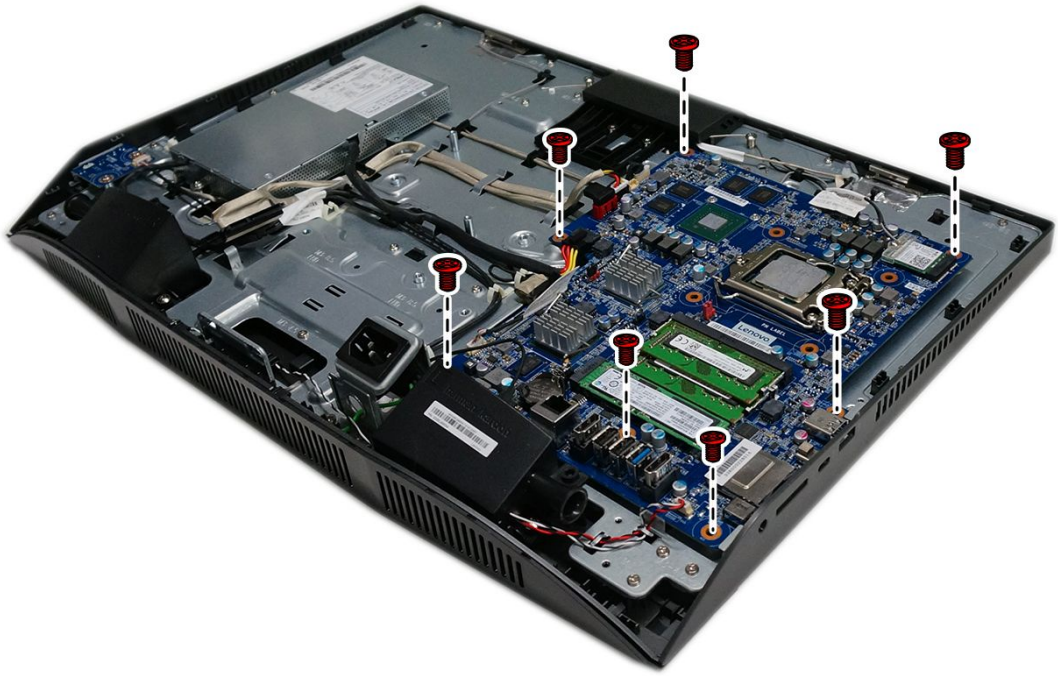
Step 12. Remove the memory modules. Refer to Replacing the memory module.

Step 13. Remove the heat-sink. Refer to Replacing the heat-sink.

Step 14. Remove the Wi-Fi card. Refer to Replacing the Wi-Fi card.

Step 15. Remove all the cables from the motherboard.

Step 16. Remove the six screws that secure the motherboard to the chassis, and then lift the motherboard up to remove it.



Step 17. To install the new motherboard:

a. Align the screw holes in the new motherboard with the corresponding holes in the chassis.

b. Secure the new motherboard to the chassis with six screws.

c. Connect all the cables to the new motherboard.

Step 18. Reinstall all the removed parts, and then reconnect all the disconnected cables.

Replacing the LCD panel module

Note: 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 LCD panel module:

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 rear cover. Refer to Removing the rear cover.

Step 6. Remove the hard disk drive. Refer to Replacing the hard disk drive.

Step 7. Remove the stand holder. Refer to Removing the stand holder.

Step 8. Remove the middle cover. Refer to Removing the middle cover.

Step 9. Remove the EMI cover. Refer to Removing the EMI cover.

Step 10. Remove the power switch board. Refer to Replacing the power switch board.

Step 11. Remove the mount bracket. Refer to Removing the mount bracket.

Step 12. Remove the system fan. Refer to Replacing the system fan.

Step 13. Remove the camera module. Refer to Replacing the camera.

Step 14. Remove the heat-sink. Refer to Replacing the heat-sink.

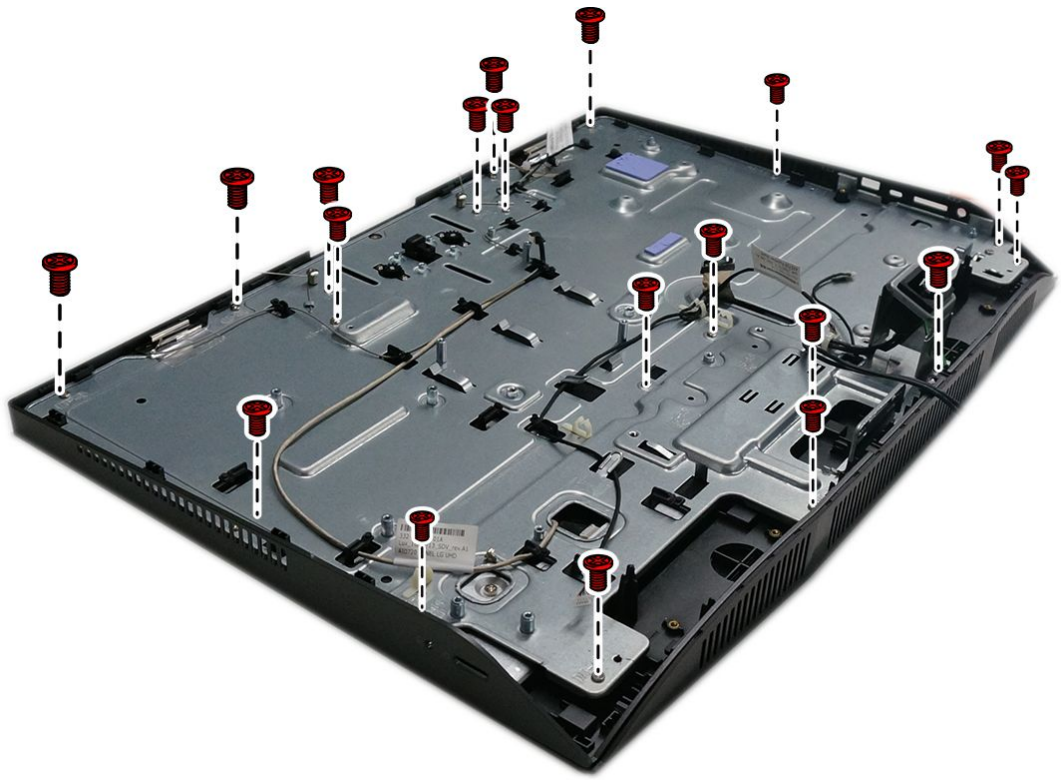
Step 15. Remove the power supply unit. Refer to Replacing the power supply unit.

Step 16. Disconnect the LVDS cable from the LCD panel.

Step 17. If your device is a touch computer, disconnect the touch cable from the touch panel connector on the motherboard. Otherwise, skip this step. Refer to Locating connectors, controls and components to locate the touch connector.

Step 18. Remove the motherboard. Refer to Replacing the motherboard.

Step 19. Remove the screws that secure the main bracket and frame assembly to the LCD panel.



Step 20. Lift up the main bracket and frame assembly as shown to separate them from the LCD panel.



Step 21. To install the new the LCD panel module:

a. Align the new LCD panel with the main bracket and frame assembly.

b. Secure the new LCD panel to the main bracket and frame assembly with screws.

c. Connect the touch (touch model only) and LVDS cables to the connectors in the new LCD panel.

Step 22. Reinstall all the removed parts, and then reconnect all the disconnected cables.

Chapter 9. General information

This chapter provides general information that applies to all computer models covered by this manual.

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.

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