

ThinkCentre®

M725s User Guide and Hardware Maintenance Manual

Think

Lenovo™

Energy Star Machine Types: 10VT, 10VU, 10VV, and 10VX

Note: Before using this information and the product it supports, be sure to read and understand the *Important Product Information Guide* and Appendix A “Notices” on page 63.

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Chapter 1. Overview

This chapter provides basic information to help you get familiar with your computer.

Front view

Note: Your computer model might look slightly different from the illustration.

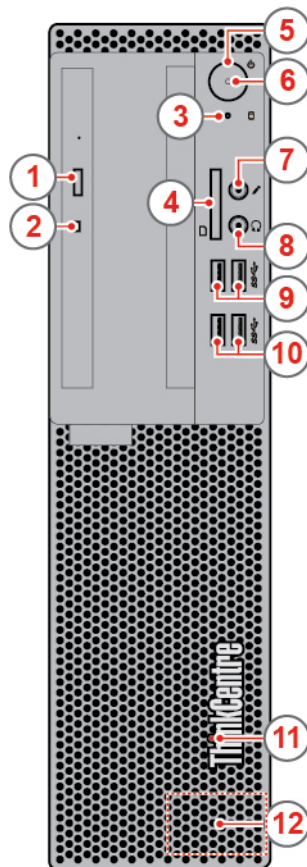


Figure 1. Front view

1 Optical drive eject button	2 Optical drive activity indicator
3 Storage drive activity indicator	4 Card reader slot (optional)
5 Power button	6 Power indicator
7 Microphone connector	8 Headphone connector
9 USB 3.1 Gen 2 connectors (2)	10 USB 3.1 Gen 1 connectors (2)
11 Illuminated red dot	12 Internal speaker (optional)

1 Optical drive eject button

Used to eject the tray of the optical drive.

2 Optical drive activity indicator

This indicator is on when the optical drive is in use.

3 Storage drive activity indicator

This indicator is on when the storage drive is in use.

4 Card reader slot

Used to read data from a supported memory card.

5 Power button

Used to turn on your computer. When you cannot shut down the computer from the operating system, press and hold the power button for four or more seconds to turn off the computer.

6 Power indicator

This indicator is on when the computer is on.

7 Microphone connector

Used to connect a microphone to your computer when you want to record sound or interact with the computer using speech recognition software.

8 Headphone connector

Used to connect headphones to your computer.

9 USB 3.1 Gen 2 connector

Used to connect a USB-compatible device. For optimal data transfer, connect a USB 3.1 Gen 2 device to a USB 3.1 Gen 2 connector instead of a USB 3.1 Gen 1 or USB 2.0 connector.

10 USB 3.1 Gen 1 connector

Used to connect a USB-compatible device. For optimal data transfer, connect a USB 3.1 Gen 1 device to a USB 3.1 Gen 2 or USB 3.1 Gen 1 connector instead of a USB 2.0 connector.

11 Illuminated red dot

This indicator is on when the computer is on.

12 Internal speaker

Used to listen to the sounds from your computer without using a headset or headphones.

Rear view

Note: Your computer model might look slightly different from the illustration.

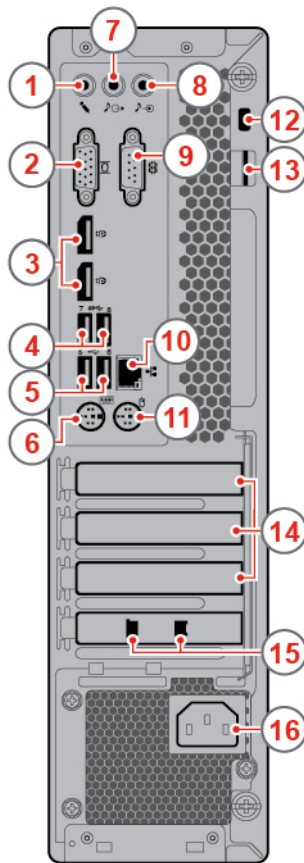


Figure 2. Rear view

1 Microphone connector	2 VGA-out connector
3 DisplayPort® 1.2 out connectors (2)	4 USB 3.1 Gen 1 connectors (2)
5 USB 2.0 connectors (2)	6 PS/2 keyboard connector
7 Audio line-out connector	8 Audio line-in connector
9 Serial connector	10 Ethernet connector
11 PS/2 mouse connector	12 Security-lock slot
13 Padlock loop	14 PCI-Express card area
15 Smart cable clip slots (2) (optional)	16 Power cord connector

1 Microphone connector

Used to connect a microphone to your computer when you want to record sound or interact with the computer using speech recognition software.

2 VGA-out connector

Used to send video signals from the computer to another video device, such as a monitor.

3 DisplayPort 1.2 out connector

Used to send audio and video signals from the computer to another audio or video device, such as a high-performance monitor.

4 USB 3.1 Gen 1 connector

Used to connect a USB-compatible device. For optimal data transfer, connect a USB 3.1 Gen 1 device to a USB 3.1 Gen 2 or USB 3.1 Gen 1 connector instead of a USB 2.0 connector.

5 USB 2.0 connector

Used to connect a device that requires a USB 2.0 connection.

6 PS/2 keyboard connector

Used to connect a keyboard that uses a Personal System/2 (PS/2) keyboard connector.

7 Audio line-out connector

Used to send audio signals from the computer to external devices, such as powered stereo speakers, headphones, or multimedia keyboards. To connect a stereo system or other external recording device, connect a cable between the audio line-in connector of the device and the audio line-out connector of the computer.

Note: If your computer has both an audio line-out connector and a headset or headphone connector, always use the headset or headphone connector for earphones, headphones, or a headset. The headphone connector does not support headset microphones.

8 Audio line-in connector

Used to receive audio signals from an external audio device, such as a stereo system. To connect an external audio device, connect a cable between the audio line-out connector of the device and the audio line-in connector of the computer.

9 Serial connector

Used to connect an external modem, a serial printer, or other devices that use a serial connector.

10 Ethernet connector

Used to connect an Ethernet cable for network access.

11 PS/2 mouse connector

Used to connect a mouse, a trackball, or other pointing devices that use a PS/2 mouse connector.

12 Security-lock slot

Used to secure a Kensington-style cable lock.

13 Padlock loop

Used to secure a padlock.

14 PCI-Express card area

To improve the operating performance of the computer, you can connect PCI-Express cards into this area. Depending on the computer model, the connectors in this area vary.

15 Smart cable clip slots

Used to secure a smart cable clip.

16 Power cord connector

Used to connect the power cord to your computer for power supply.

System board

Note: See “Front view” and “Rear view” for additional component descriptions.

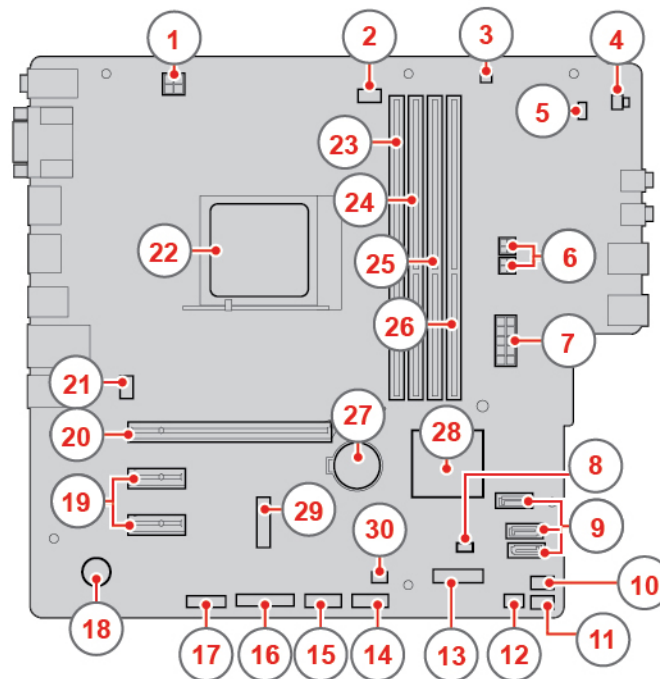


Figure 3. System board

1 4-pin power connector	2 Microprocessor fan connector
3 Internal speaker connector	4 Storage drive activity indicator
5 Power button board connector	6 SATA power connectors (2)
7 10-pin power connector	8 Clear CMOS /Recovery jumper
9 SATA 3.0 connectors (3)	10 Auxiliary fan connector 1
11 Illuminated red dot connector	12 Thermal sensor connector
13 M.2 solid-state drive slot	14 Front USB 2.0 connector (card reader connector)
15 Front USB 2.0 connector	16 Parallel connector

17 Serial (COM2) connector	18 Buzzer
19 PCI Express x1 card slots (2)	20 PCI Express x16 graphics card slot
21 System fan connector	22 Microprocessor socket
23 Memory slot (DIMM1)	24 Memory slot (DIMM2)
25 Memory slot (DIMM3)	26 Memory slot (DIMM4)
27 Coin-cell battery	28 PCH
29 M.2 Wi-Fi card slot	30 Cover presence switch connector (intrusion switch connector)

Machine type and model label

The machine type and model label identifies the computer. When you contact Lenovo for help, the machine type and model information helps support technicians to identify the computer and provide faster service. The machine type and model label is attached to the computer as shown.

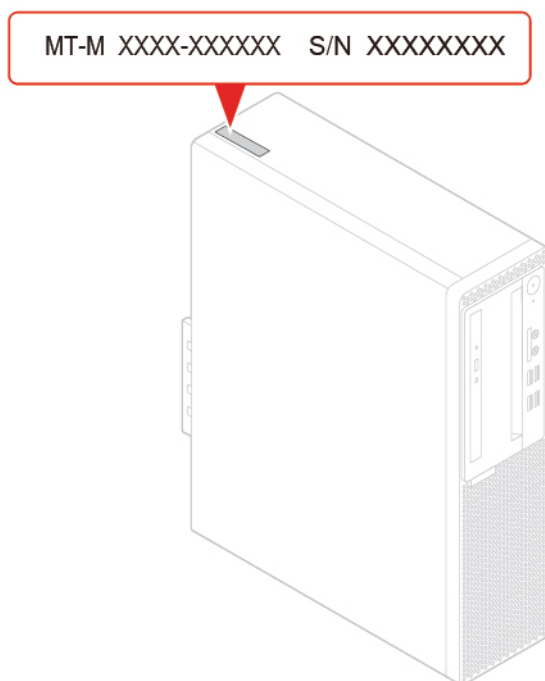


Figure 4. Machine type and model label

Chapter 2. Specifications

Power supply

- 180-watt automatic voltage-sensing power supply
- 210-watt automatic voltage-sensing power supply

Storage drives

- 3.5-inch storage drive (optional)
- 2.5-inch storage drive (optional)
- M.2 solid-state drive (optional)

Video features

- The integrated graphics card supports the following:
 - DisplayPort 1.2 out connector
 - VGA-out connector
- The optional discrete graphics card provides an enhanced video experience and extended capabilities.

Audio features

- The integrated audio card supports the following:
 - Audio line-in connector
 - Audio line-out connector
 - Headphone connector
 - Internal speaker (optional)
 - Microphone connector
- The optional discrete audio card provides an enhanced audio experience and extended capabilities.

Input/Output (I/O) features

- Audio connectors (audio line-in, audio line-out, headphone, and microphone)
- Card reader slot (optional)
- Display connectors (DisplayPort 1.2 out and VGA-out)
- Ethernet connector
- PS/2 keyboard connector
- PS/2 mouse connector
- Serial connector
- USB connectors

Expansion

- Card reader (optional)
- Memory slots
- Optical drive
- PCI Express x1 card slot
- PCI Express x16 graphics card slot

- Storage drive bay

Network features

- Ethernet LAN
- Wireless LAN (optional)
- Bluetooth (optional)

Physical dimensions

- Width: 92.5 mm (3.6 inches)
- Height: 343.5 mm (13.5 inches)
- Depth: 290.5 mm (11.4 inches)

Weight (without the package)

Maximum configuration as shipped: 6.0 kg (13.2 lb)

Chapter 3. Computer locks

Locking the computer cover

Locking the computer cover helps prevent unauthorized access to the inside of your computer. Your computer features a padlock loop so that the computer cover cannot be removed when a padlock is installed.

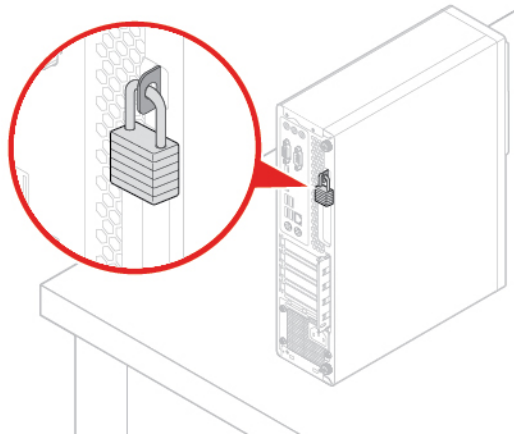


Figure 5. Locking the computer cover

Attaching a Kensington-style cable lock

You can use a Kensington-style cable lock to secure your computer to a desk, table, or another nonpermanent fixture. The cable lock connects to the security-lock slot at the rear of your computer. Depending on the type selected, the cable lock can be operated with a key or a combination. The cable lock also locks the buttons used to open the computer cover. This is the same type of lock used with many notebook computers. You can order such a cable lock directly from Lenovo by searching for *Kensington* at: <http://www.lenovo.com/support>

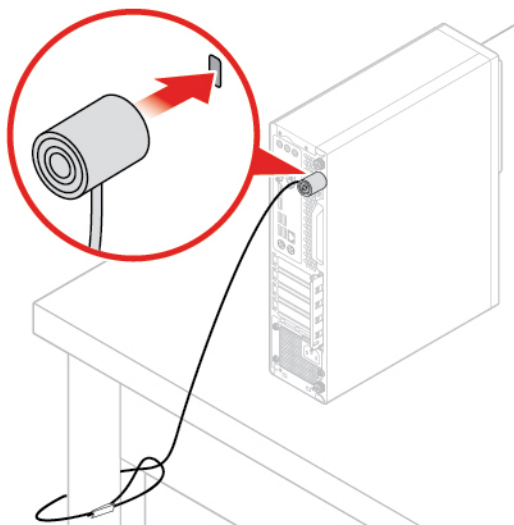


Figure 6. Attaching a Kensington-style cable lock

Attaching a smart cable clip

A smart cable clip can be used to secure devices, such as the keyboard and the mouse, by locking the device cables to the computer. The smart cable clip connects to the cable-lock slots on the rear of the computer. To install a smart cable clip, do the following:

1. Insert the clip **1** into the cable-lock slot **4**.
2. Pull the cables you want to lock through the dents in the smart cable clip.
3. Press the clip **2** into the cable-lock slot **3** until it snaps into position.

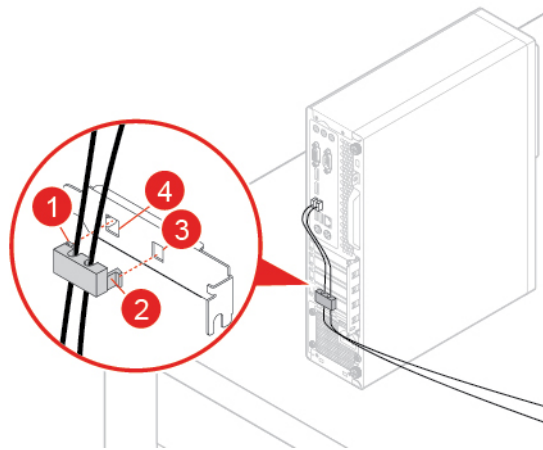


Figure 7. Attaching a smart cable clip

Chapter 4. Replacing hardware

This chapter provides instructions on how to replace hardware for your computer.

Before replacing hardware

Attention: Do not open your computer or attempt any repairs before reading this section and the *Important Product Information Guide*.

Notes before replacing hardware

- Use computer components provided only by Lenovo.
- When installing or replacing an option, use the appropriate instructions explained in this manual along with the instructions that come with the option.
- In most areas of the world, Lenovo requires the return of defective CRUs. Information about this will come with the CRU or will come a few days after the CRU arrives.

Notes when handling static-sensitive devices

Do not open the static-protective package containing the new part until the defective part has been removed and you are ready to install the new part. Static electricity, although harmless to you, can seriously damage computer components and options.

When you handle options and other computer components, take these precautions to avoid static-electricity damage:

- Limit your movement. Movement can cause static electricity to build up around you.
- Always handle options and other computer components carefully. Handle PCI/PCIe cards, memory modules, system boards, and microprocessors by the edges. Never touch any exposed circuitry.
- Prevent others from touching the options and other computer components.
- Touch the static-protective package containing the part to a metal expansion-slot cover or other unpainted metal surface on the computer for at least two seconds. This reduces static electricity from the package and your body before you install or replace a new part.
- When possible, remove the new part from the static-protective package, and install it directly in the computer without setting the part down. When this is not possible, place the static-protective package on a smooth, level surface and place the part on the package.
- Do not place the part on the computer cover or other metal surface.

Knowing FRUs (including CRUs)

- Field Replaceable Units (FRUs) are computer parts that a trained technician can upgrade or replace. FRUs include all CRUs. For detailed FRU information, such as the FRU part numbers and supported computer models, go to:
<http://www.lenovo.com/serviceparts-lookup>
- Customer Replaceable Units (CRUs) are computer parts that a user can upgrade or replace.
 - Self-service CRUs: You can install self-service CRUs easily. These CRUs might be stand-alone, latched, or secured by up to two screws. Examples of self-service CRUs include the keyboard, mouse, and any USB device. You are responsible for replacing all self-service CRUs.
 - Optional-service CRUs: Handling optional-service CRUs requires some technical skills and simple tools (such as a screwdriver). These CRUs are isolated parts within the computer. They are usually

concealed by an access panel that is secured by more than two screws. You must remove the screws and panel to access the specific CRU. Optional-service CRUs can be removed and installed by users or, during the warranty period, by a Lenovo service technician.

Before replacing FRUs

Before replacing any FRU, read the following:

- Only certified and trained personnel can service the computer.
- Before replacing an FRU, read the entire section about replacing the part.
- Be extremely careful during writing operations such as copying, saving, or formatting.

The sequence of the drives in the computer that you are servicing might have been altered. If you select an incorrect drive, data or programs might be overwritten.

- Replace an FRU only with another FRU of the correct model.

When you replace an FRU, ensure that the model of the machine and the FRU part number are correct.

- An FRU should not be replaced because of a single, unreproducible failure.

Single failures can occur for a variety of reasons that have nothing to do with a hardware defect, such as cosmic radiation, electrostatic discharge, or software errors. Consider replacing an FRU only when a problem recurs. If you suspect that an FRU is defective, clear the error log and run the test again. If the error does not recur, do not replace the FRU.

- Only replace a defective FRU.

Locating FRUs (including CRUs)

Notes:

- Some of the following components are optional.
- To replace a component that is not in the list below, contact a Lenovo service technician. For a list of Lenovo Support phone numbers, go to:
<http://www.lenovo.com/support/phone>

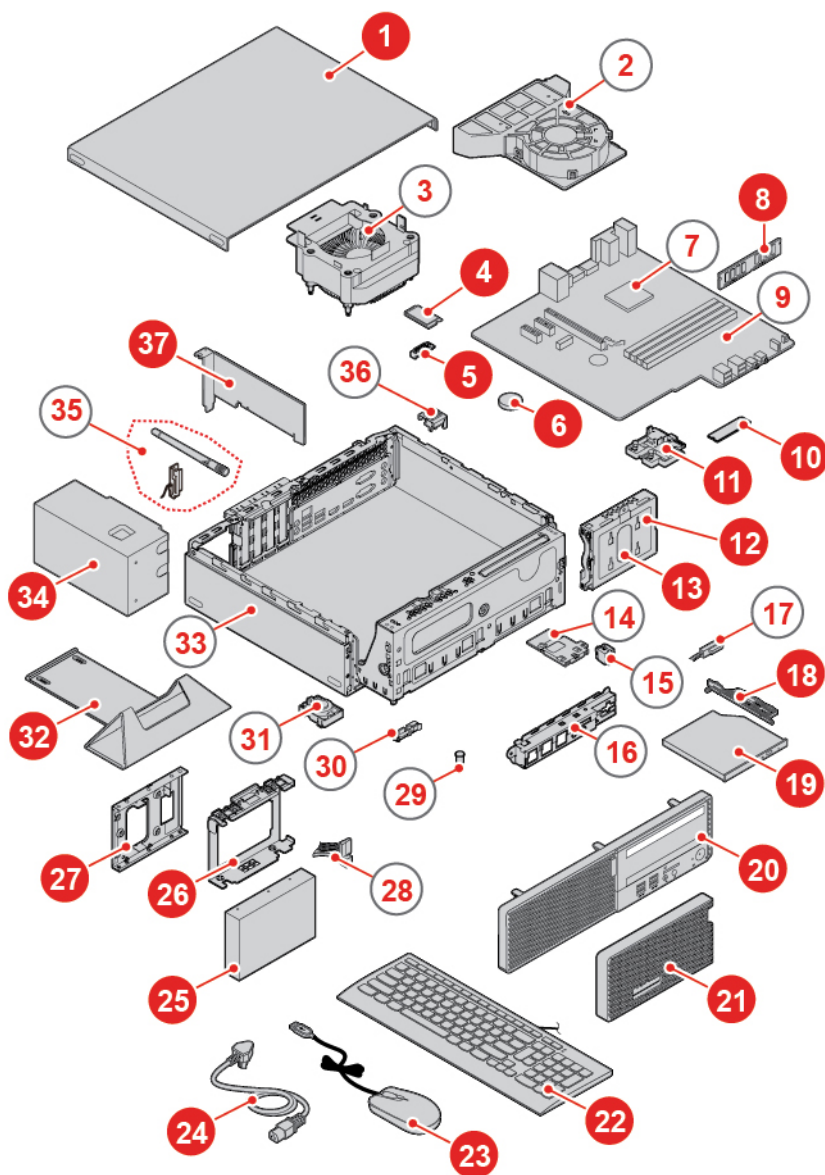


Figure 8. Locating FRUs (including CRUs)

Self-service CRUs	Optional-service CRUs	Non-CRUs
1 Computer cover 6 Coin-cell battery 8 Memory module 10 M.2 solid-state drive 11 M.2 solid-state drive bracket 12 Secondary storage drive bracket 13 Secondary storage drive (a 2.5-inch storage drive)	4 Wi-Fi card 5 Wi-Fi card shield 34 Power supply assembly	2 Heat sink fan duct 3 Heat sink and fan assembly 7 Microprocessor 9 System board 14 Card reader 15 Power button board 16 Front I/O bracket

Self-service CRUs	Optional-service CRUs	Non-CRUs
18 Optical drive bracket 19 Optical drive 20 Front bezel 21 Dust shield 22 Keyboard 23 Mouse 24 Power cord 25 Primary storage drive (a 2.5-inch or 3.5-inch storage drive) 26 Primary storage drive bracket 27 Storage converter 32 Vertical stand 37 PCI Express card		17 Optical drive cable 28 Storage drive cable 29 Illuminated red dot 30 Thermal sensor 31 Internal speaker 33 Chassis 35 Wi-Fi antennas (2) 36 Cover presence switch (intrusion switch)

Replacing external options

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Replace external options.
 - Vertical stand

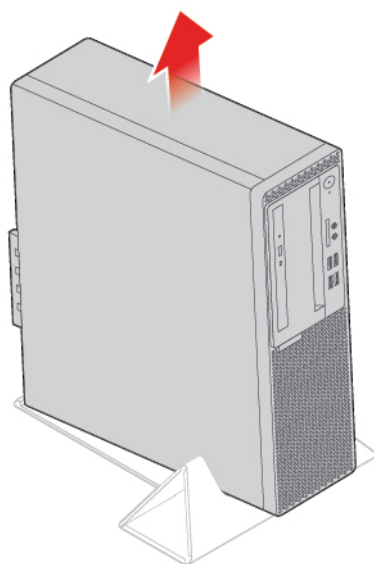


Figure 9. Removing the vertical stand

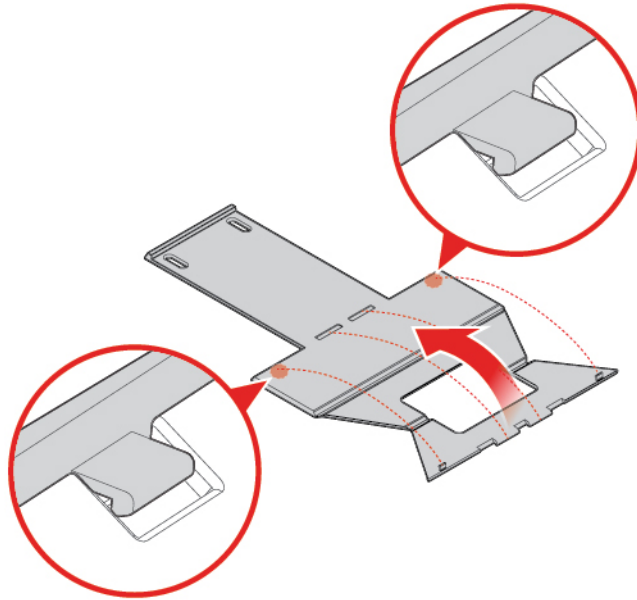


Figure 10. Assembling the vertical stand

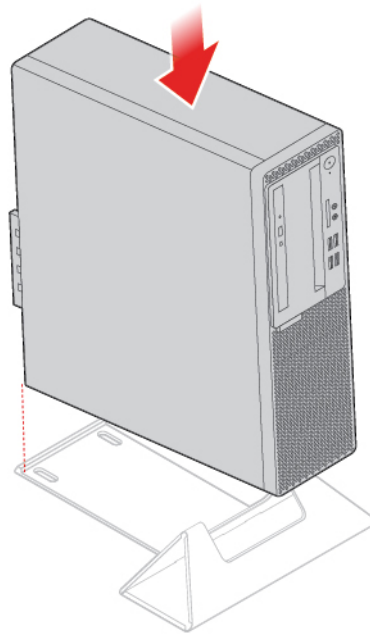


Figure 11. Installing the vertical stand

- Dust shield

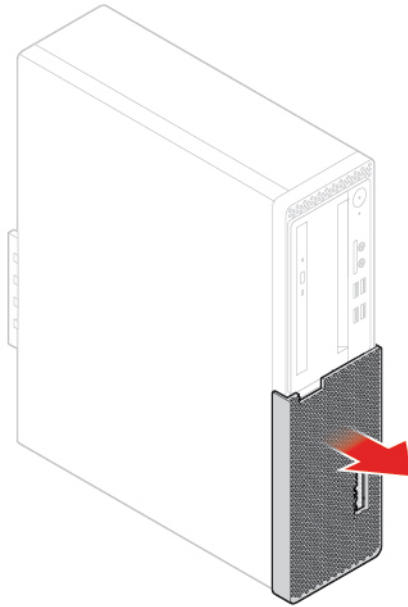


Figure 12. Removing the dust shield

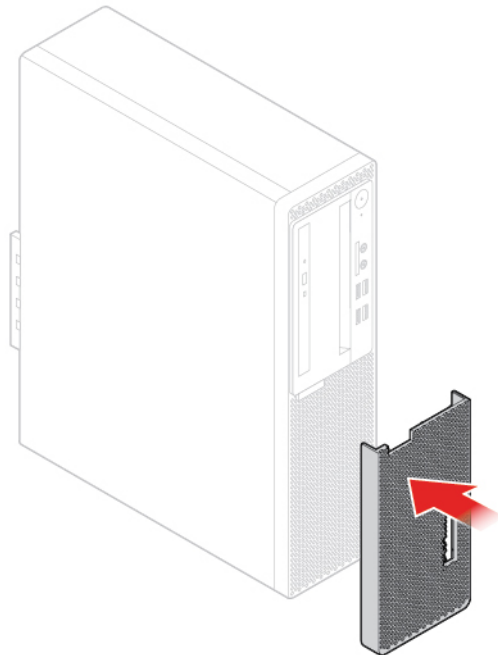


Figure 13. Installing the dust shield

4. Reconnect the external cables and power cords to the corresponding connectors on the computer.

Removing the computer cover

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

CAUTION:



Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

1. Remove any media from the drives and turn off all connected devices and the computer.
2. Disconnect all power cords from electrical outlets and disconnect all cables from the computer.
3. Unlock any locking device that secures the computer cover.
4. Remove external options. See “Replacing external options” on page 14.
5. Remove the computer cover.

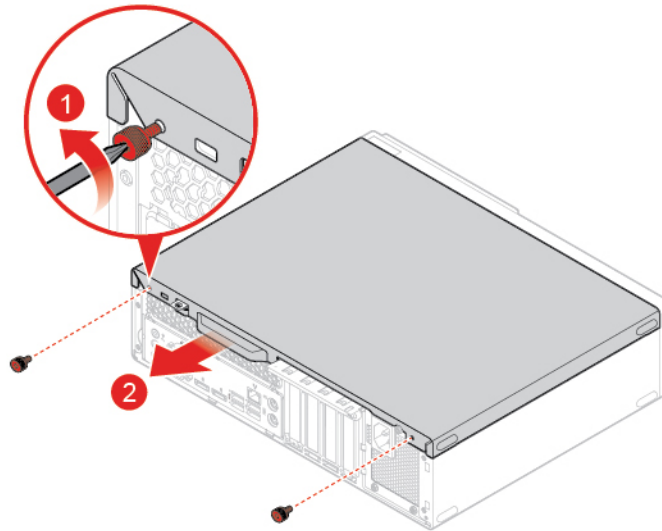


Figure 14. Removing the computer cover

6. Complete the replacement. See “Completing the parts replacement” on page 60.

Replacing the front bezel

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Replace the front bezel.

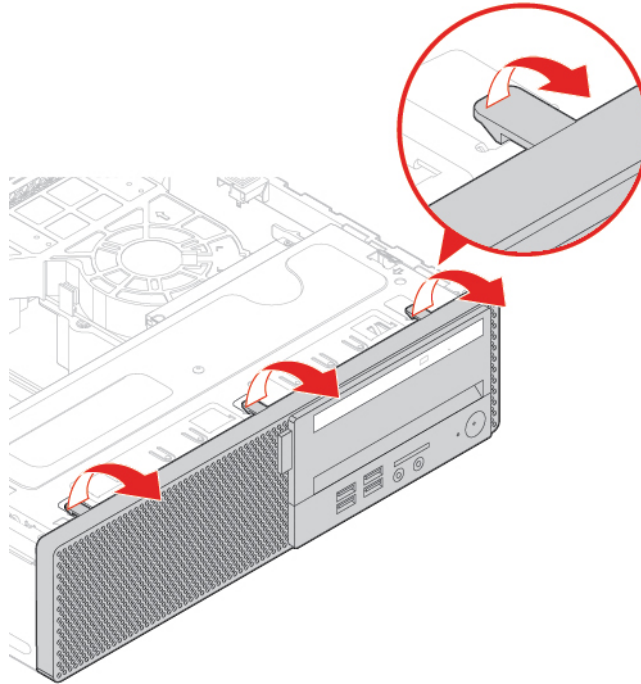


Figure 15. Removing the front bezel

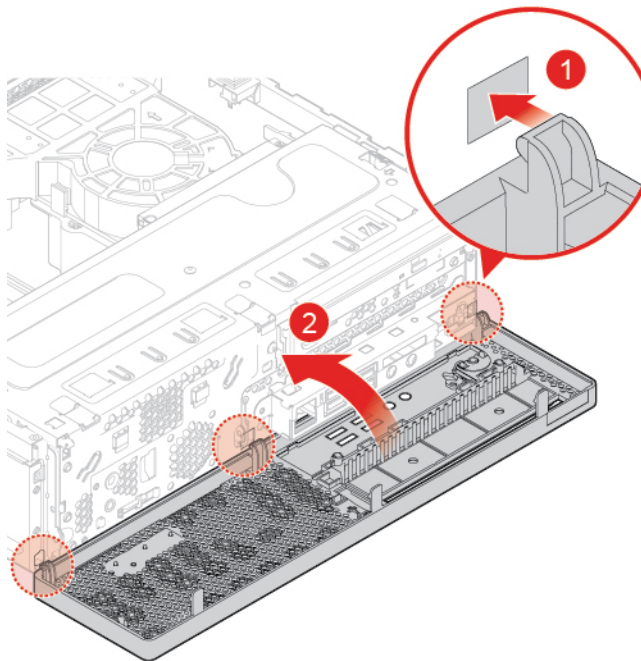


Figure 16. Installing the front bezel

4. Complete the replacement. See “Completing the parts replacement” on page 60.

Replacing the optical drive

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Disconnect the signal cable and the power cable from the optical drive.
5. Replace the optical drive.

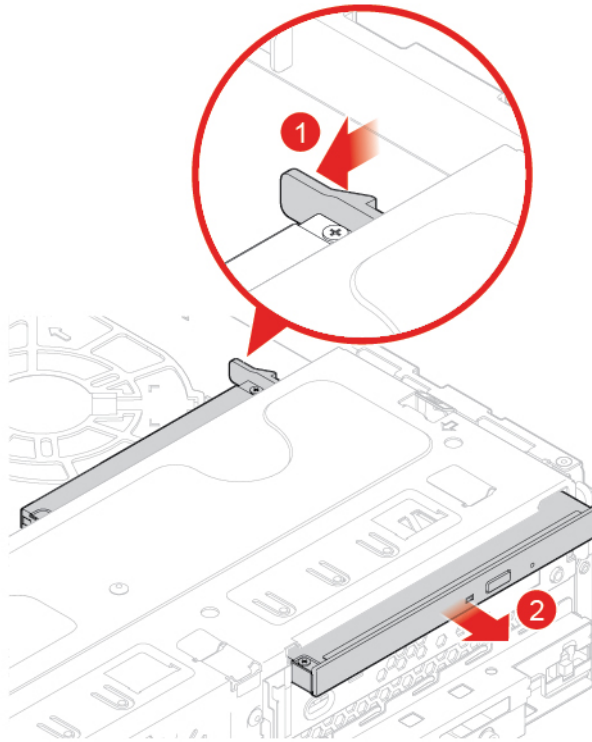


Figure 17. Removing the optical drive

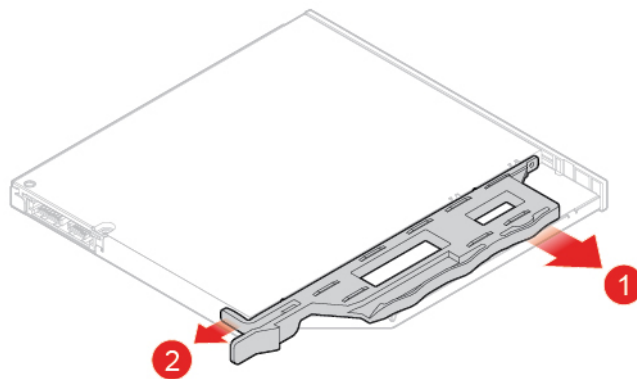


Figure 18. Removing the optical drive bracket

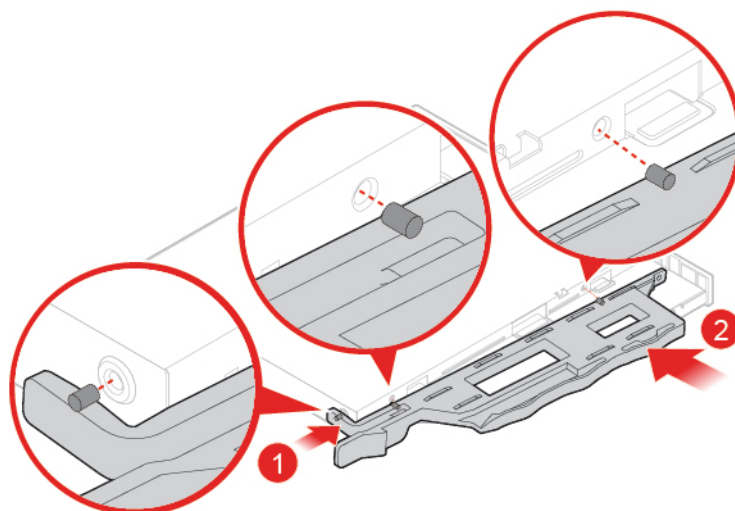


Figure 19. Installing the optical drive bracket

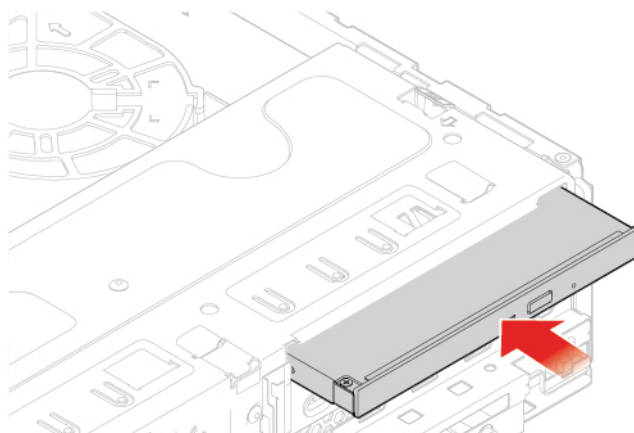


Figure 20. Installing the optical drive

6. Connect the signal cable and the power cable to the new optical drive.
7. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Pivoting the drive bay assembly upward and downward

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward and downward.

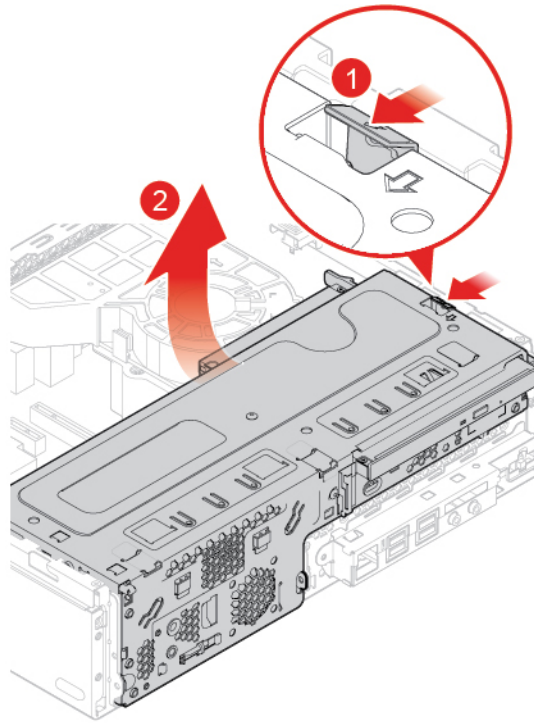


Figure 21. Pivoting the drive bay assembly upward

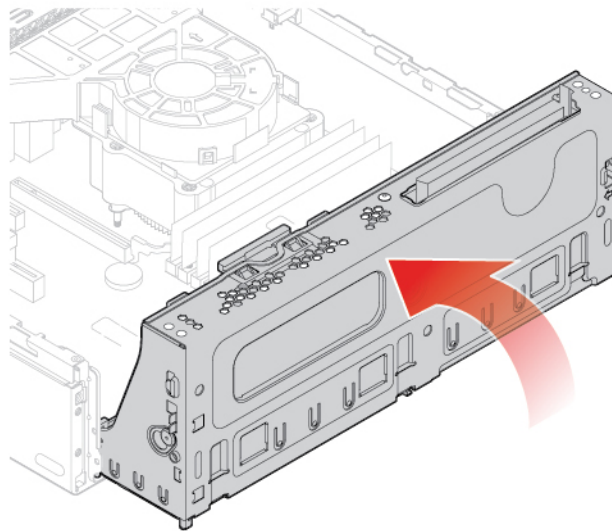


Figure 22. Pivoting the drive bay assembly downward

5. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the storage drive

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Disconnect the signal cable and the power cable from the storage drive.
6. Replace the storage drive.
 - 2.5-inch or 3.5-inch primary storage drive

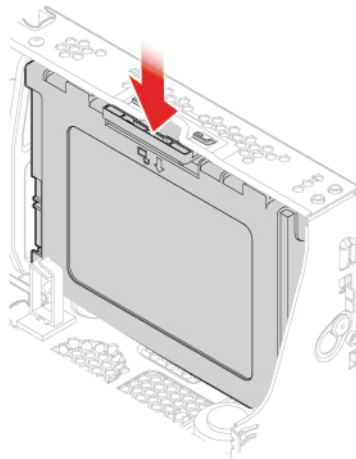


Figure 23. Removing the primary storage drive bracket

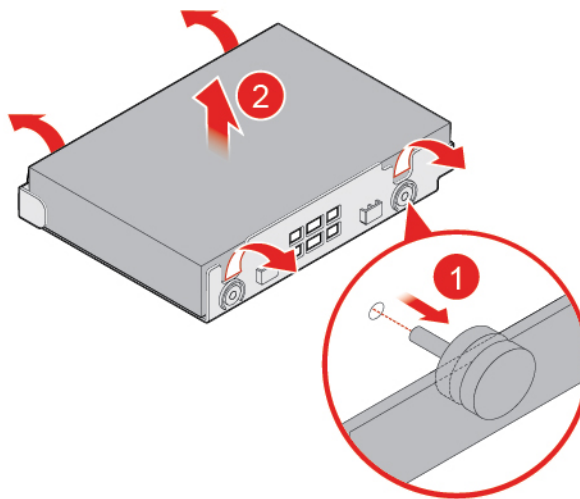


Figure 24. Removing the 3.5-inch primary storage drive or storage converter

Note: If you replace the 3.5-inch primary storage drive, skip this step.

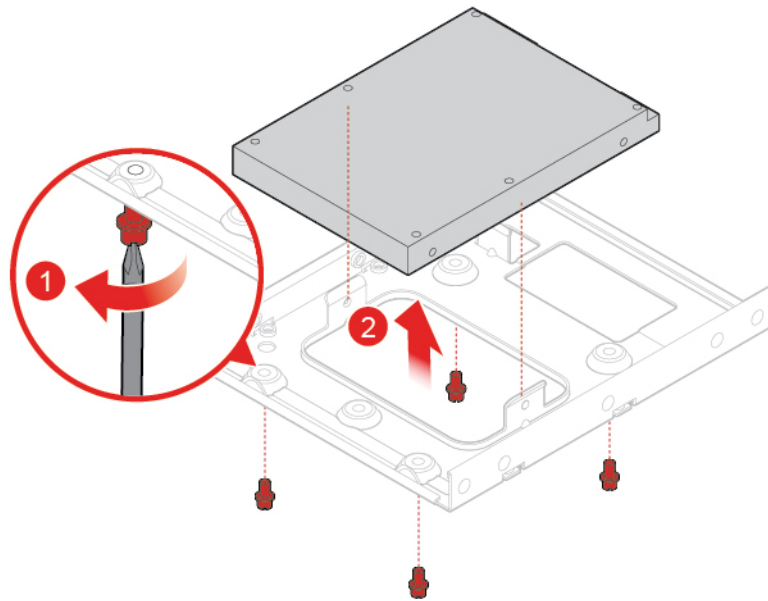


Figure 25. Removing the 2.5-inch primary storage drive from the storage converter

Note: If you replace the 3.5-inch primary storage drive, skip this step.

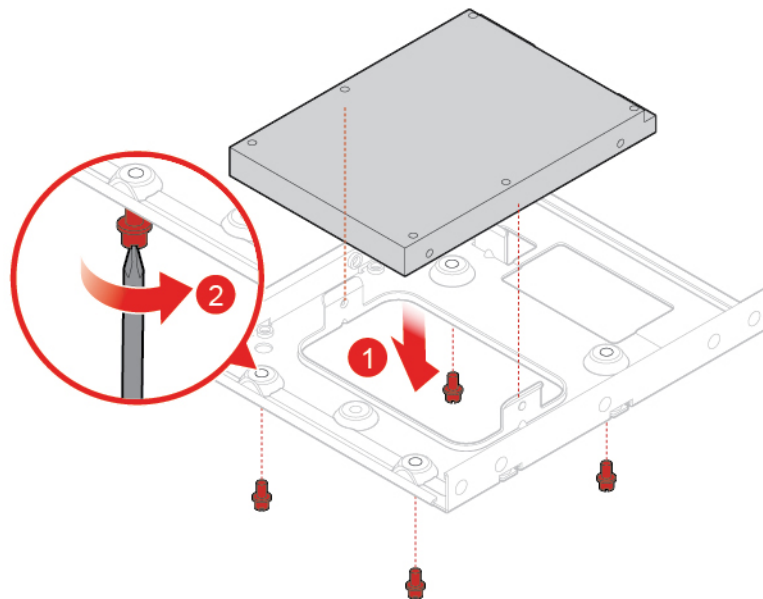


Figure 26. Installing the 2.5-inch primary storage drive into the storage converter

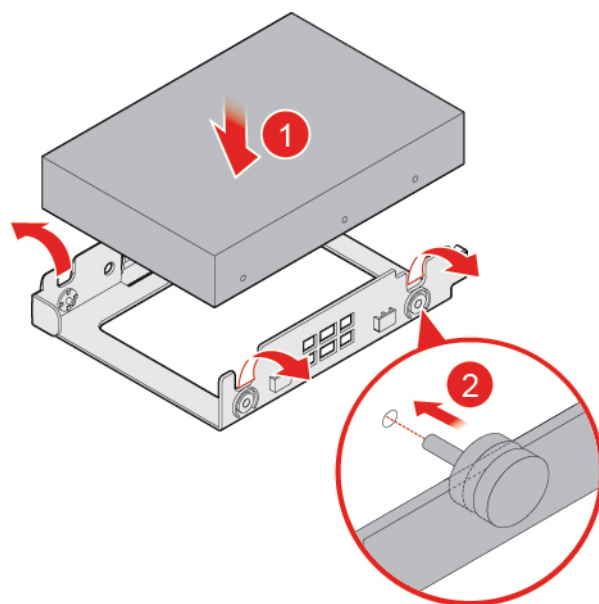


Figure 27. Installing the 3.5-inch primary storage drive or storage converter

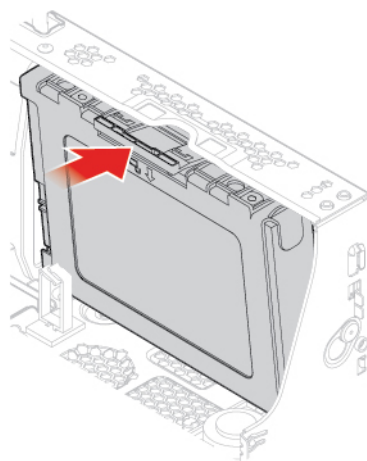


Figure 28. Installing the primary storage drive bracket

- 2.5-inch secondary storage drive

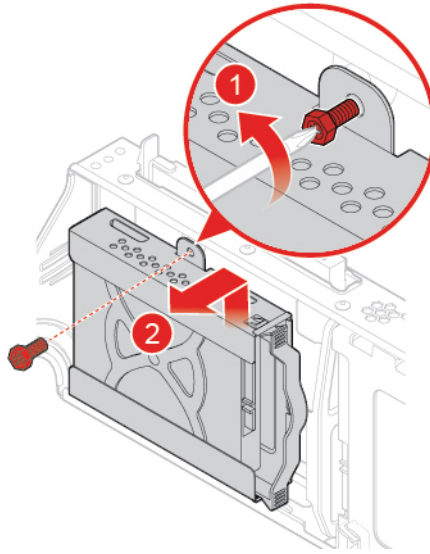


Figure 29. Removing the outer 2.5-inch secondary storage drive bracket

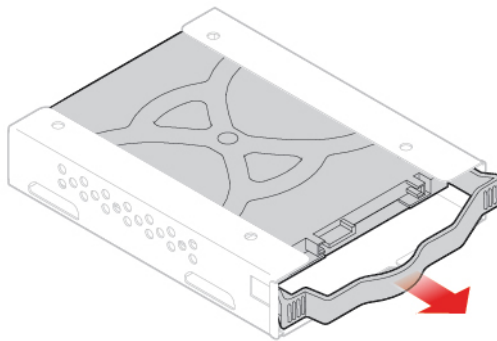


Figure 30. Removing the inner 2.5-inch secondary storage drive bracket

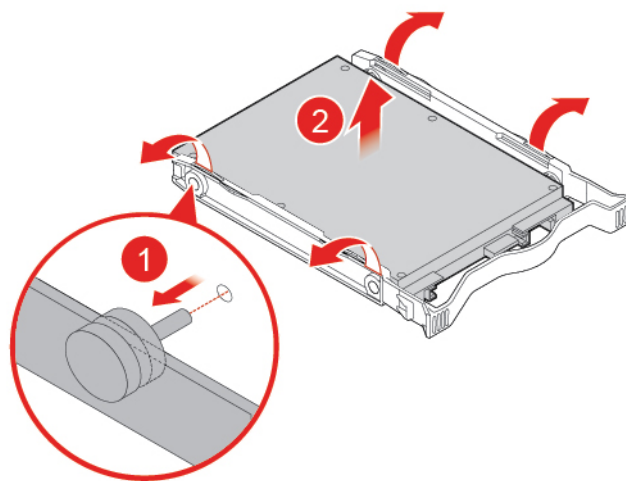


Figure 31. Removing the 2.5-inch secondary storage drive

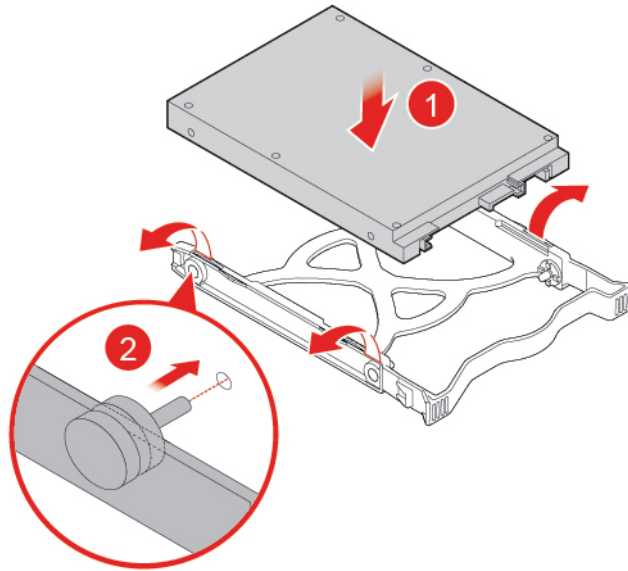


Figure 32. Installing the 2.5-inch secondary storage drive

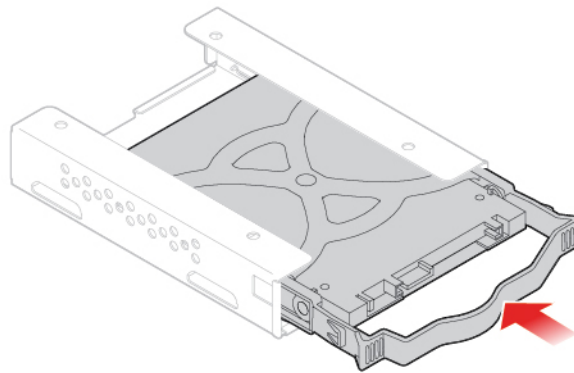


Figure 33. Installing the inner 2.5-inch secondary storage drive bracket

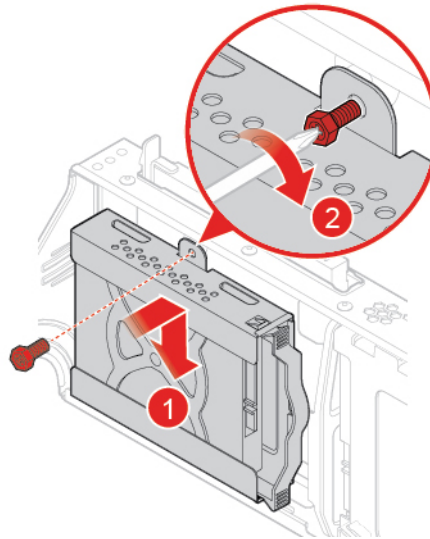


Figure 34. Installing the outer 2.5-inch secondary storage drive bracket

7. Connect the signal cable and the power cable to the new storage drive.
8. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the power button board and the card reader

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Disconnect the power button board cable and the card reader cable from the system board.
5. Replace the power button board and the card reader.

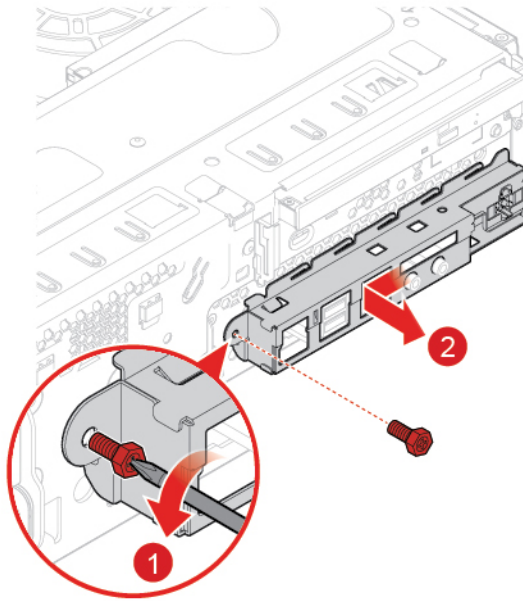


Figure 35. Removing the front I/O bracket

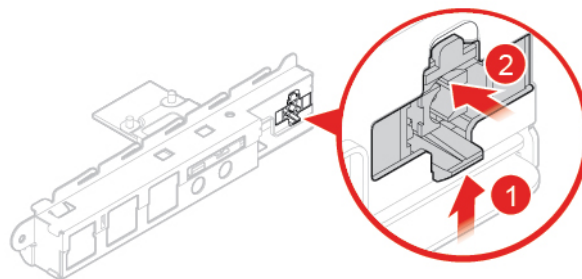


Figure 36. Removing the power button board

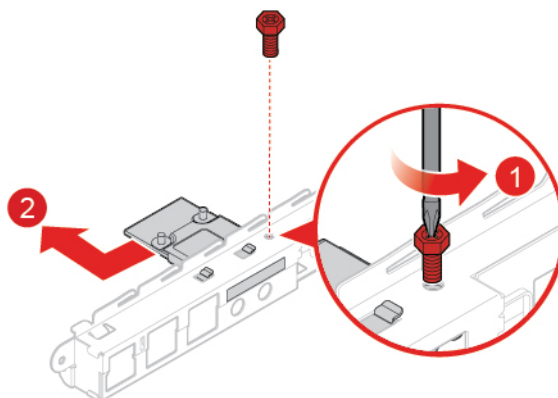


Figure 37. Removing the card reader bracket

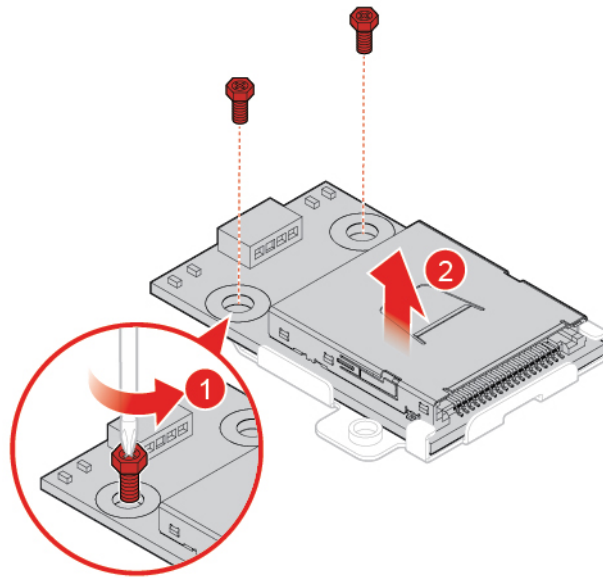


Figure 38. Removing the card reader

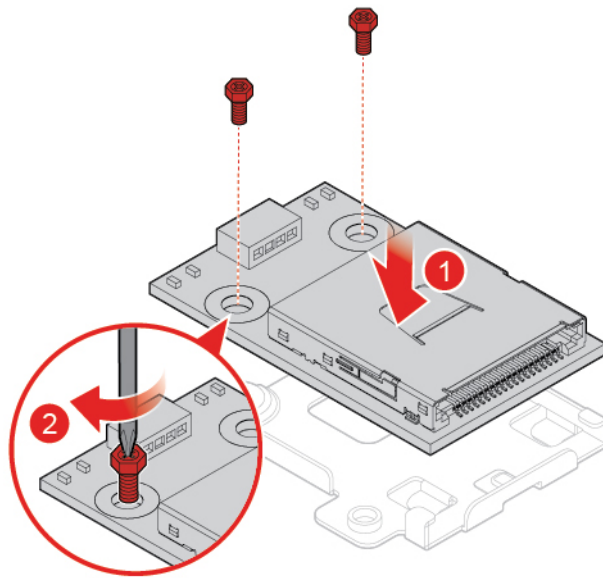


Figure 39. Installing the card reader

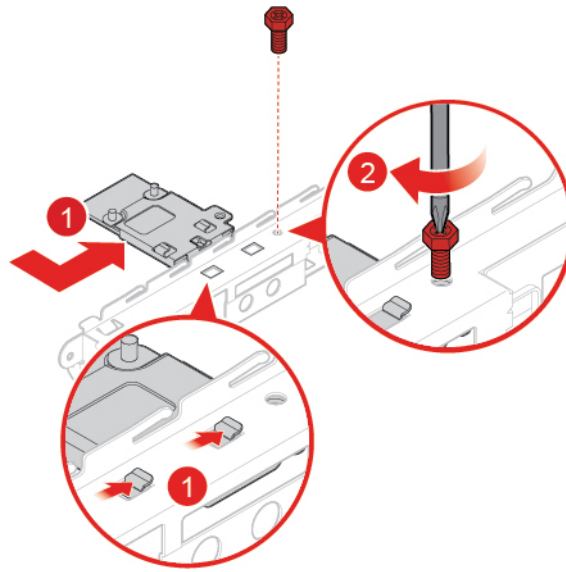


Figure 40. Installing the card reader bracket

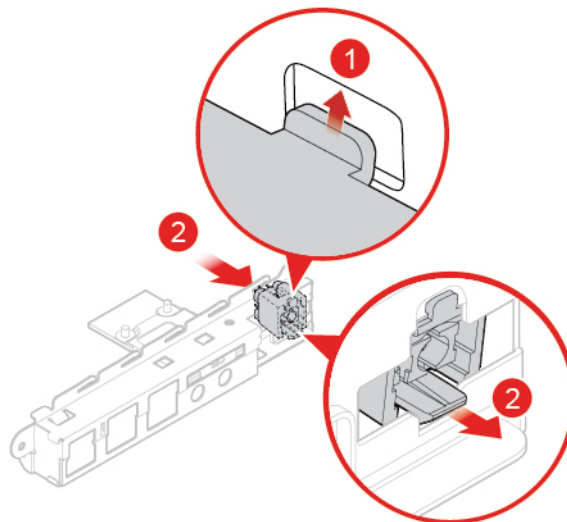


Figure 41. Installing the power button board

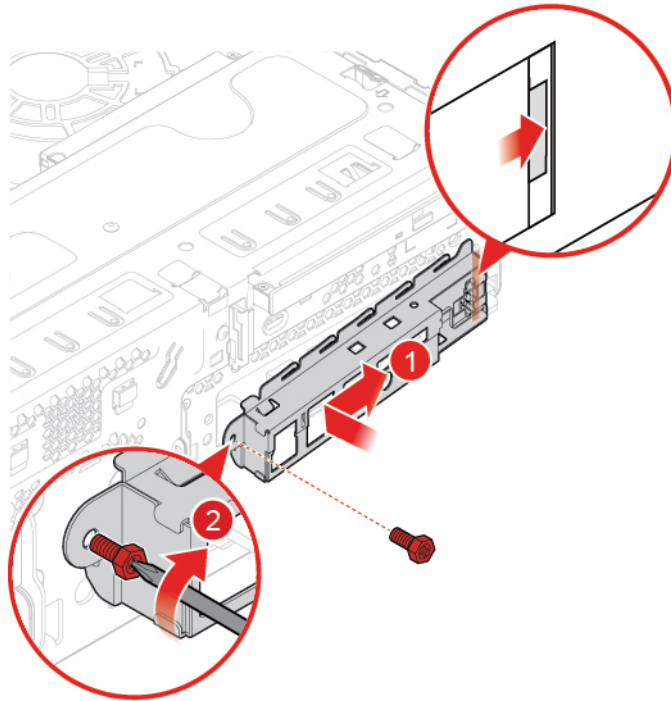


Figure 42. Installing the front I/O bracket

6. Connect the new power button board cable and the new card reader cable to the system board.
7. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the illuminated red dot

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Disconnect the illuminated red dot cable from the system board.
6. Replace the illuminated red dot.

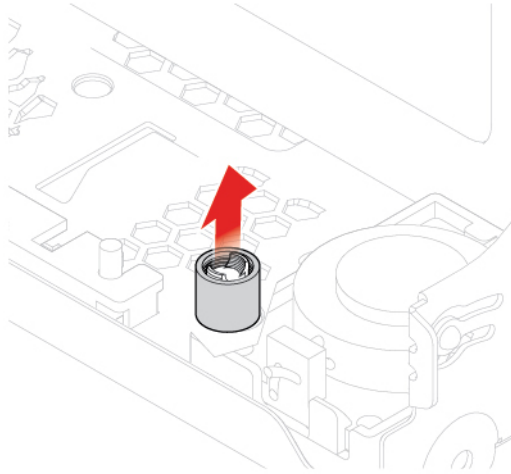


Figure 43. Removing the illuminated red dot cover

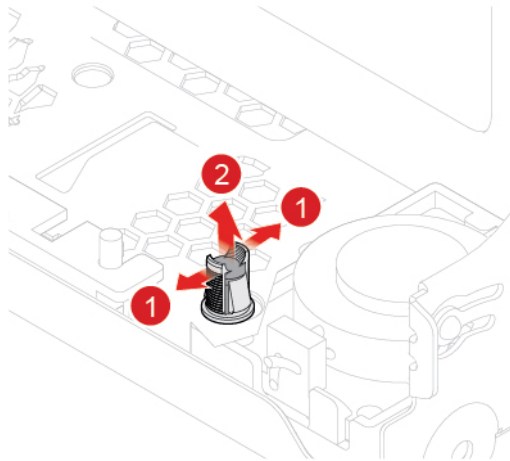


Figure 44. Removing the illuminated red dot

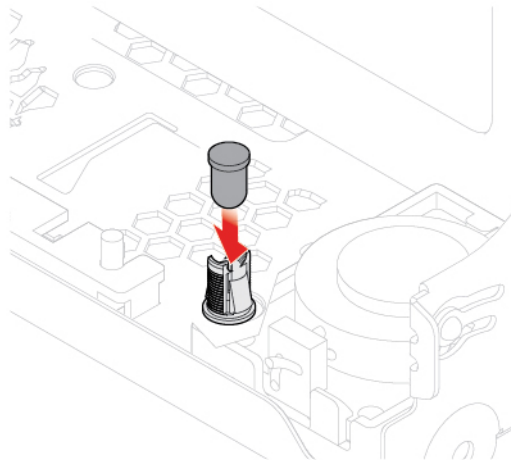


Figure 45. Installing the illuminated red dot

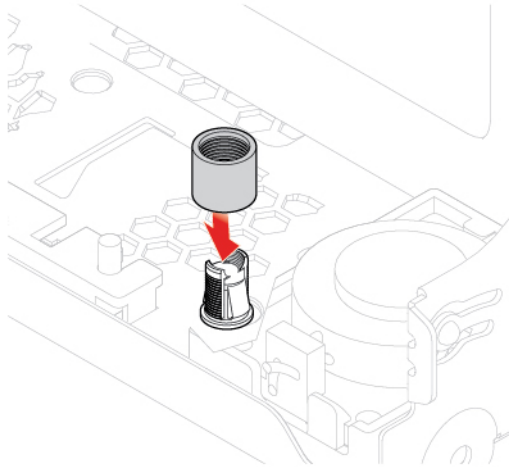


Figure 46. Installing the illuminated red dot cover

7. Connect the new illuminated red dot cable to the system board.
8. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the internal speaker

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Disconnect the internal speaker cable from the system board.
5. Replace the internal speaker.

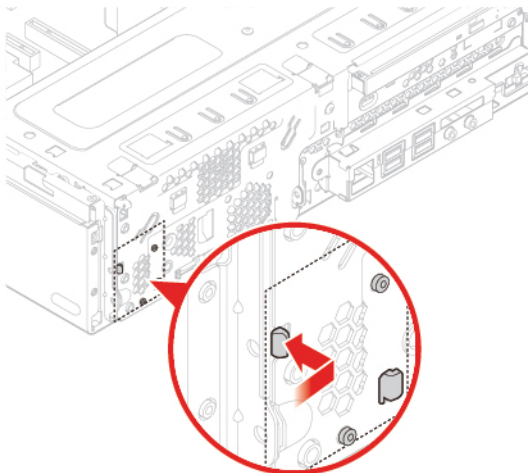


Figure 47. Pressing the tab

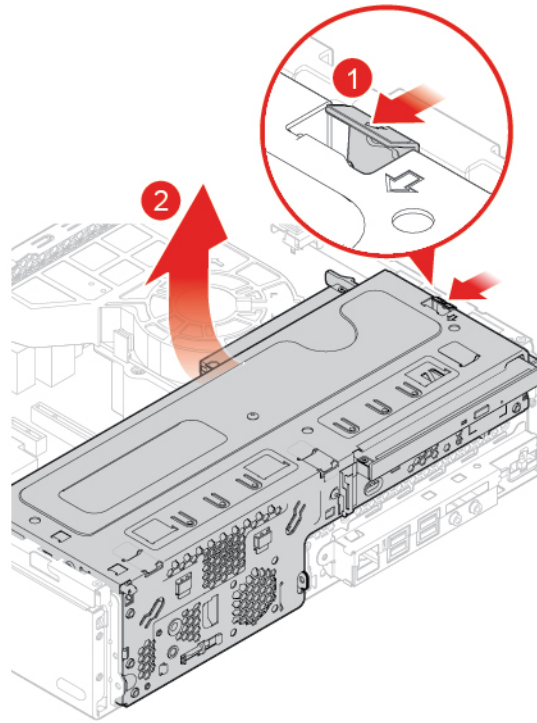


Figure 48. Pivoting the drive bay assembly upward

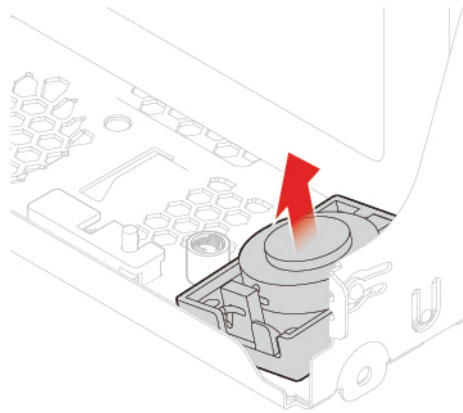


Figure 49. Removing the internal speaker

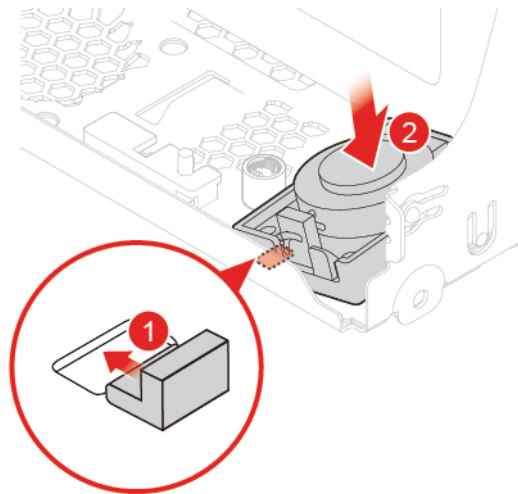


Figure 50. Installing the internal speaker

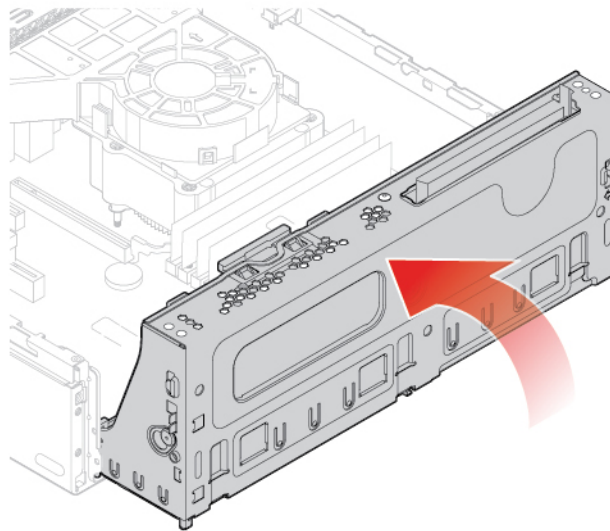


Figure 51. Pivoting the drive bay assembly downward

6. Connect the new internal speaker cable to the system board.
7. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the thermal sensor

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Disconnect the thermal sensor cable from the system board.

5. Replace the thermal sensor.

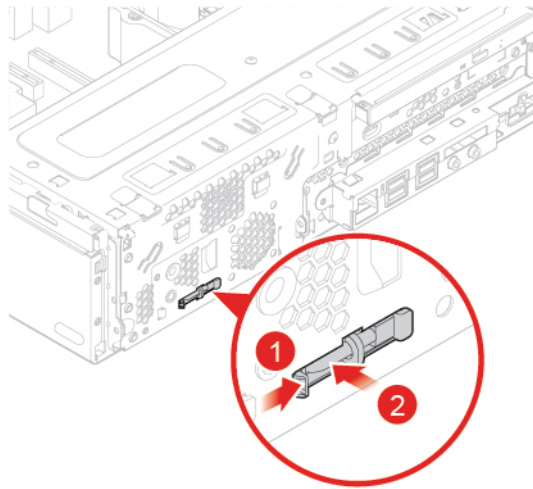


Figure 52. Pressing the tab

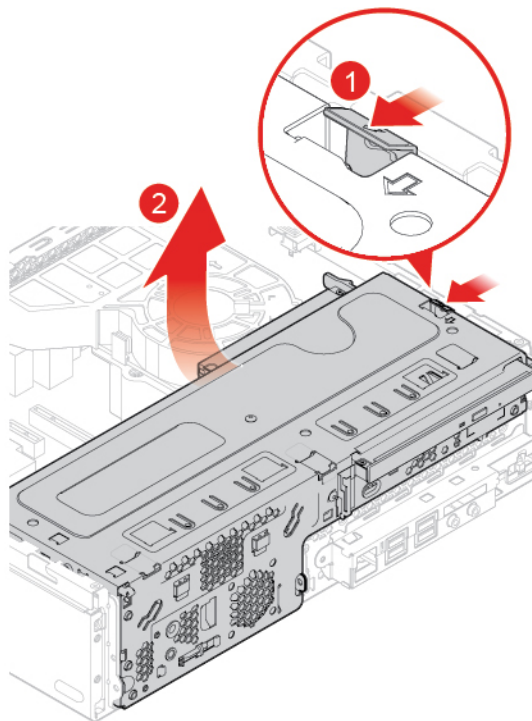


Figure 53. Pivoting the drive bay assembly upward

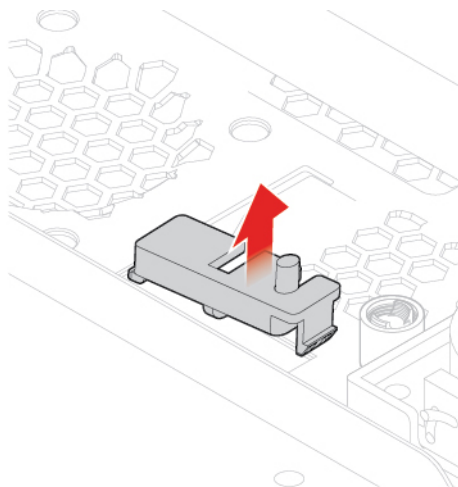


Figure 54. Removing the thermal sensor

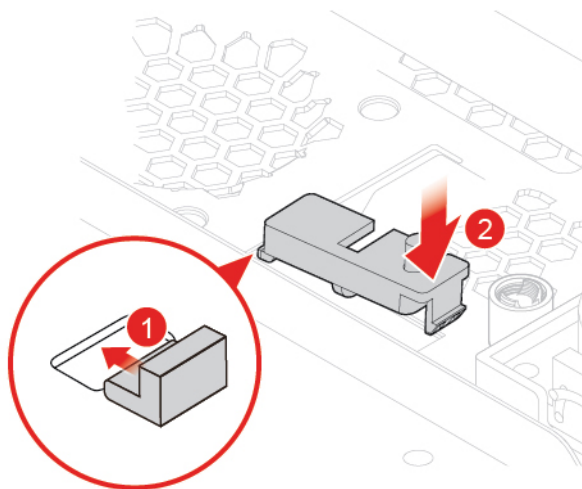


Figure 55. Installing the thermal sensor

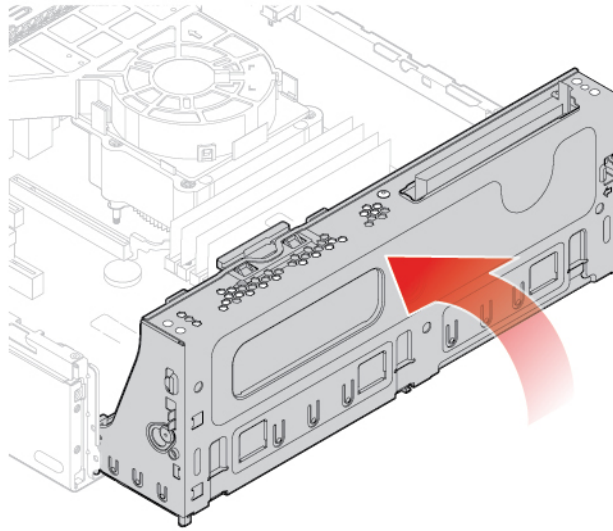


Figure 56. Pivoting the drive bay assembly downward

6. Connect the new thermal sensor cable to the system board.
7. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the Wi-Fi card

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Replace the Wi-Fi card.

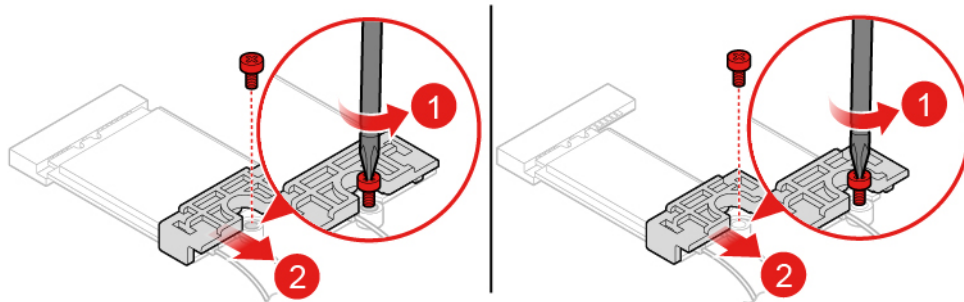


Figure 57. Removing the Wi-Fi card shield

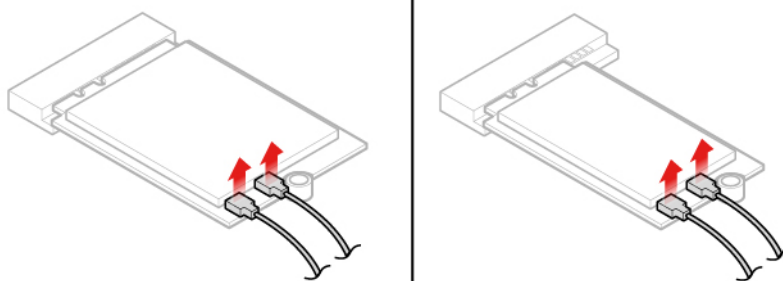


Figure 58. Disconnecting the Wi-Fi antenna cables

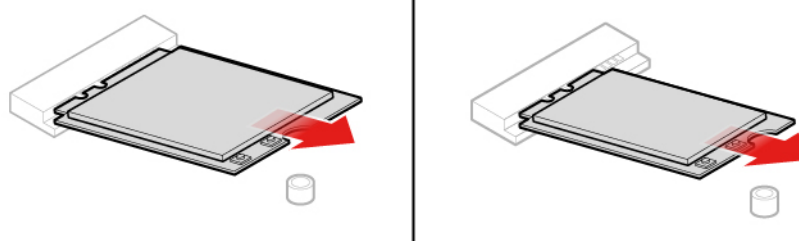


Figure 59. Removing the Wi-Fi card

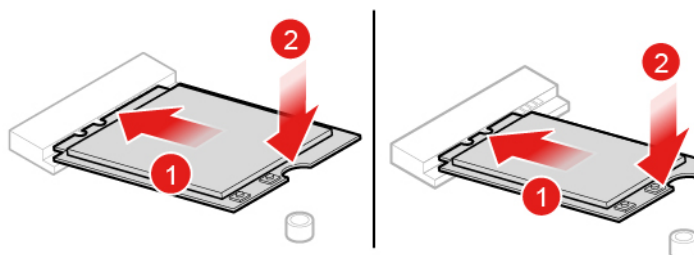


Figure 60. Installing the Wi-Fi card

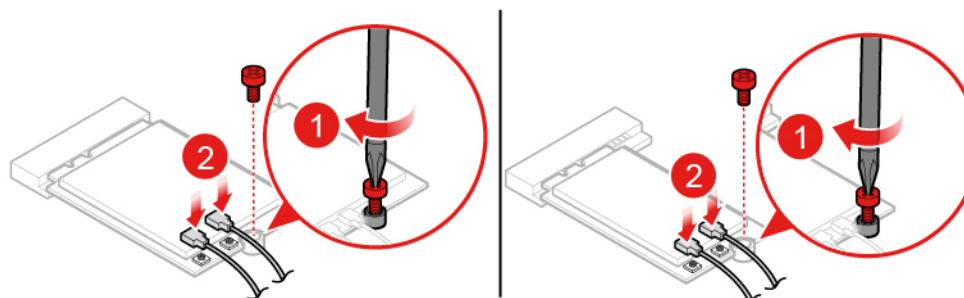


Figure 61. Connecting the Wi-Fi antenna cables

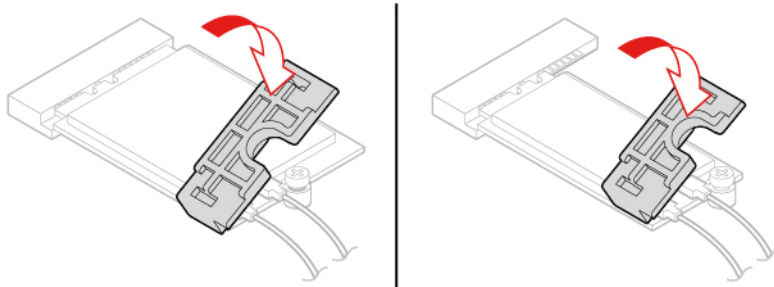


Figure 62. Installing the Wi-Fi card shield

6. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the Wi-Fi antennas

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Disconnect the Wi-Fi antenna cables from the Wi-Fi card. See “Replacing the Wi-Fi card” on page 38.
5. Replace the Wi-Fi antennas.
 - Front Wi-Fi antenna

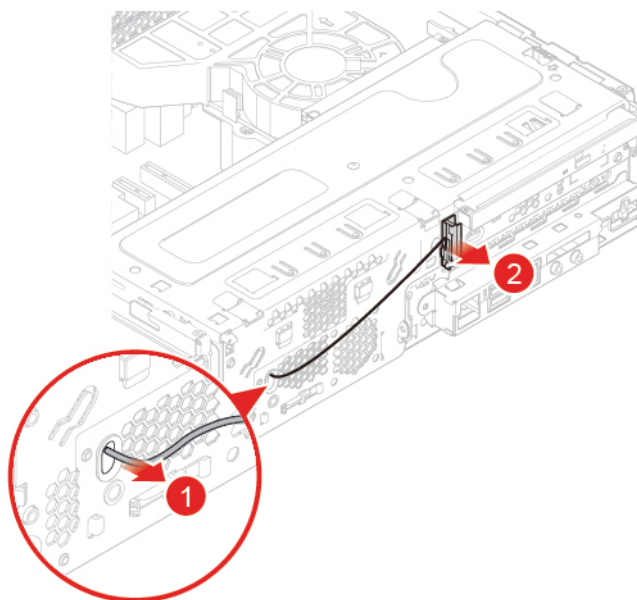


Figure 63. Removing the front Wi-Fi antenna

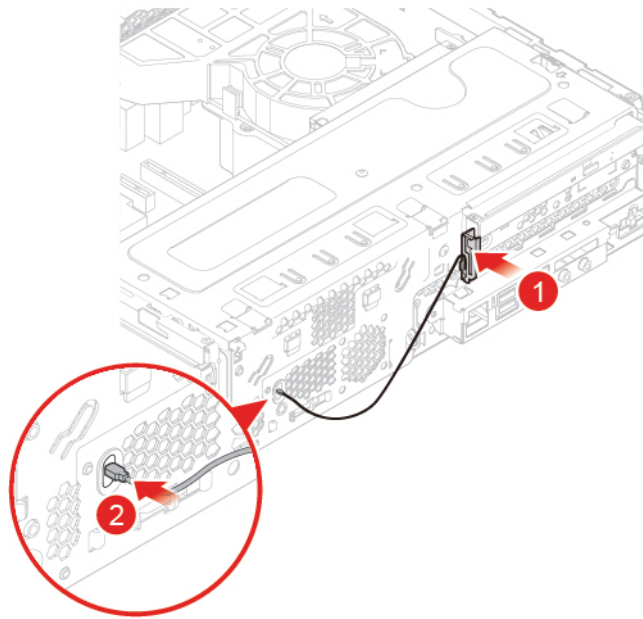


Figure 64. Installing the front Wi-Fi antenna

- Rear Wi-Fi antenna

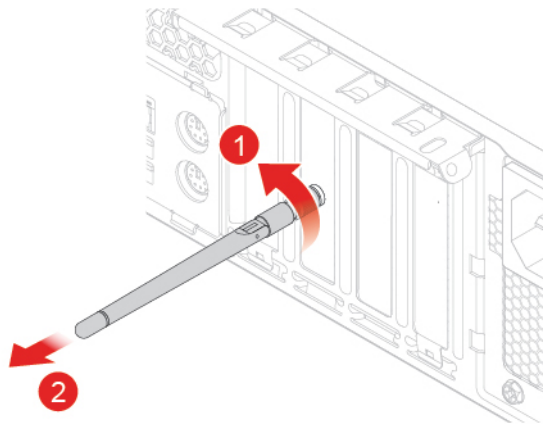


Figure 65. Removing the rear Wi-Fi antenna

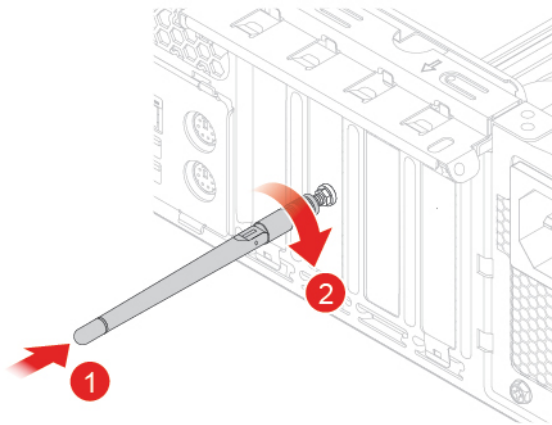


Figure 66. Installing the rear Wi-Fi antenna

6. Connect the new Wi-Fi antenna cables to the Wi-Fi card.
7. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the M.2 solid-state drive

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Depending on your computer model, refer to one of the following to replace the M.2 solid-state drive.
 - Type 1

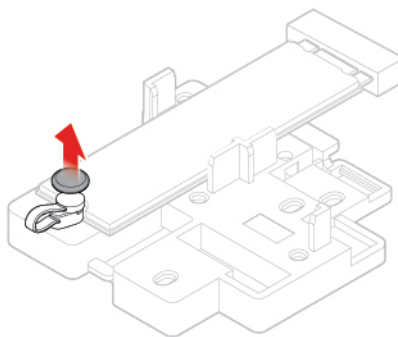


Figure 67. Pulling out the stopper

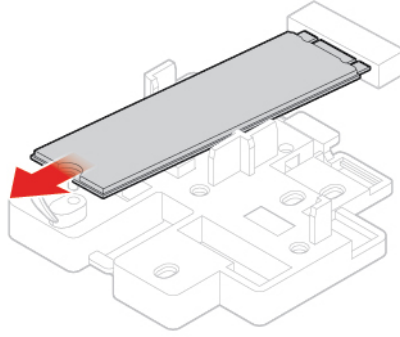


Figure 68. Removing the M.2 solid-state drive

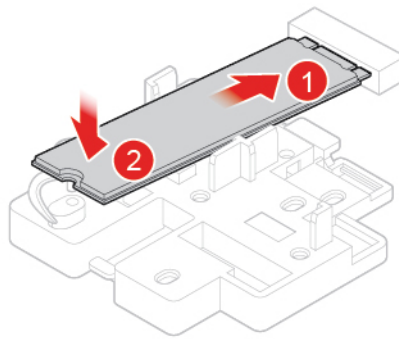


Figure 69. Installing the M.2 solid-state drive

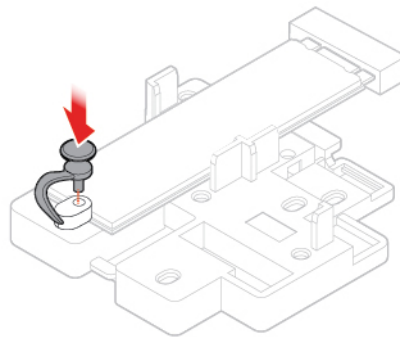


Figure 70. Inserting the stopper

- Type 2

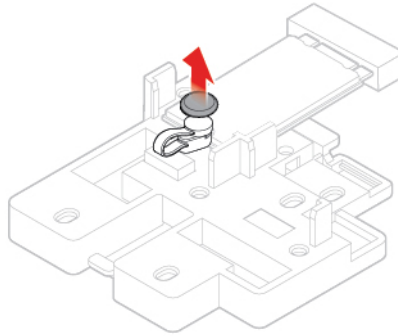


Figure 71. Pulling out the stopper

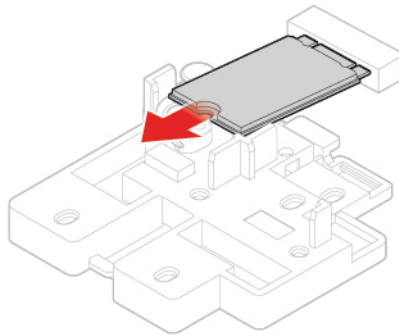


Figure 72. Removing the M.2 solid-state drive

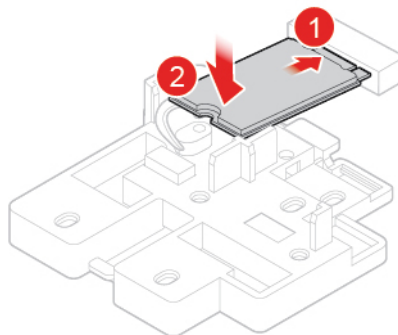


Figure 73. Installing the M.2 solid-state drive

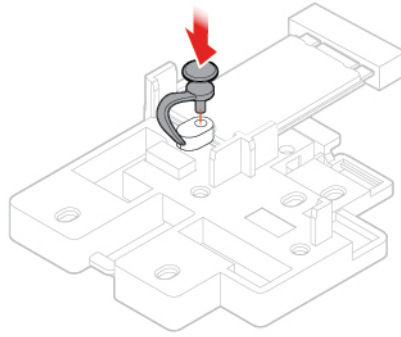


Figure 74. Inserting the stopper

6. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the M.2 solid-state drive bracket

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Remove the M.2 solid-state drive. See “Replacing the M.2 solid-state drive” on page 42.
6. Replace the M.2 solid-state drive bracket.

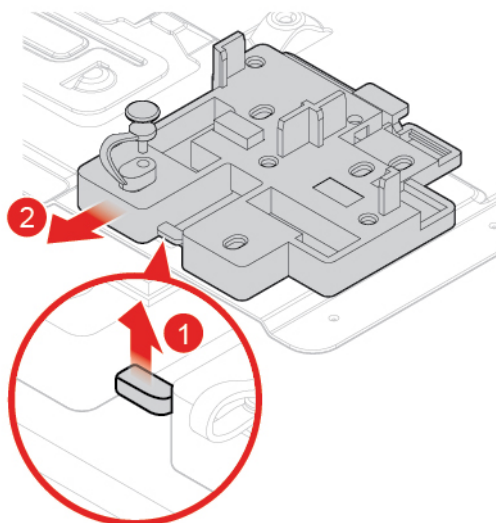


Figure 75. Removing the M.2 solid-state drive bracket

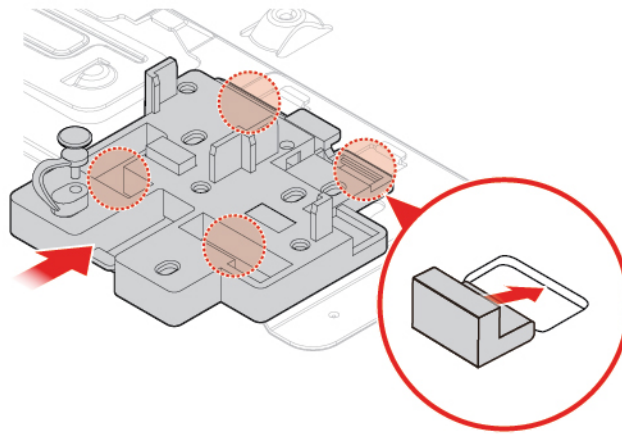


Figure 76. Installing the M.2 solid-state drive bracket

7. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the coin-cell battery

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

Note: To dispose of the coin-cell battery, refer to “Lithium coin-cell battery notice” in the *Safety and Warranty Guide*.

Your computer has a special type of memory that maintains the date, time, and settings for built-in features, such as parallel connector assignments (configurations). A coin-cell battery keeps this information active when you turn off the computer.

The coin-cell battery normally requires no charging or maintenance throughout its life; however, no coin-cell battery lasts forever. If the coin-cell battery fails, the date, time, and configuration information (including passwords) are lost. An error message is displayed when you turn on the computer.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Replace the coin-cell battery.

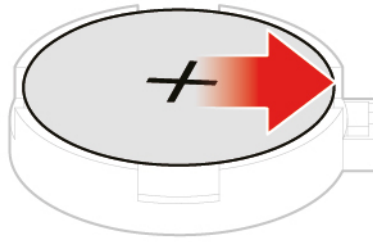


Figure 77. Disengaging the latch

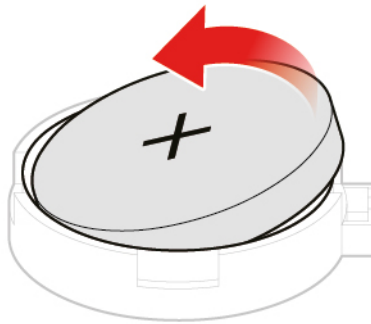


Figure 78. Removing the coin-cell battery

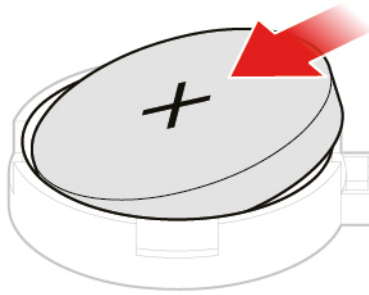


Figure 79. Installing the coin-cell battery

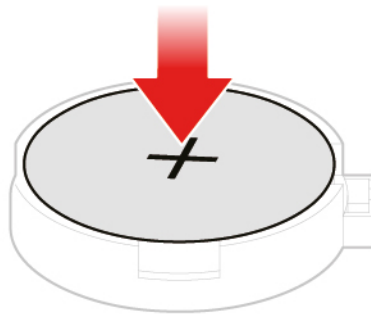


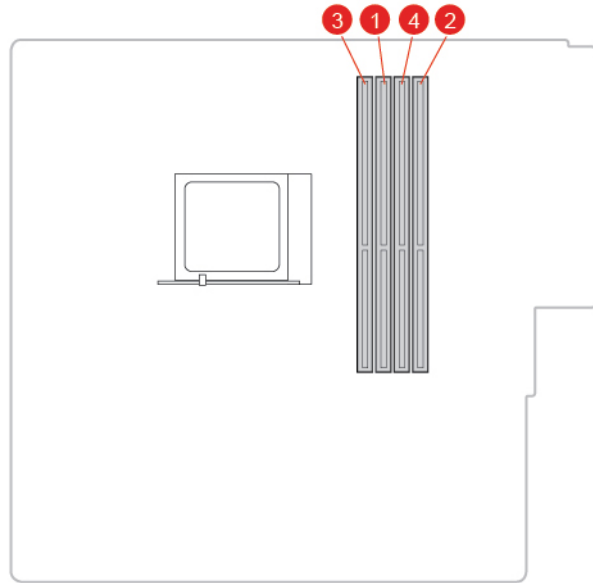
Figure 80. Securing the coin-cell battery with the latch

6. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing a memory module

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

Ensure that you follow the installation order for memory modules shown in the following figure.



1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Replace a memory module.

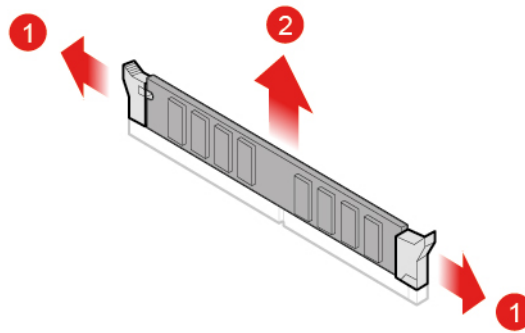


Figure 81. Removing a memory module

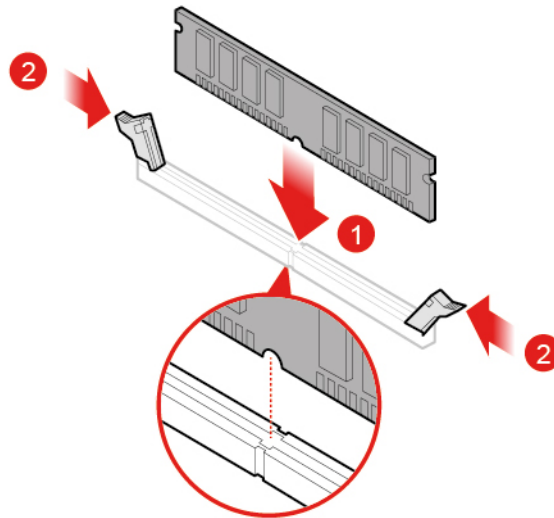


Figure 82. Installing a memory module

6. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the heat sink and fan assembly

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

CAUTION:



The heat sink and microprocessor might be very hot. Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Disconnect the microprocessor fan cable from the system board.
6. Replace the heat sink and fan assembly.

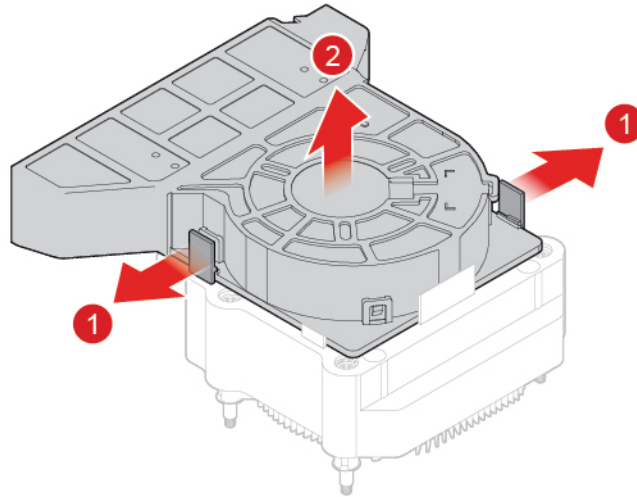


Figure 83. Removing the heat sink fan duct

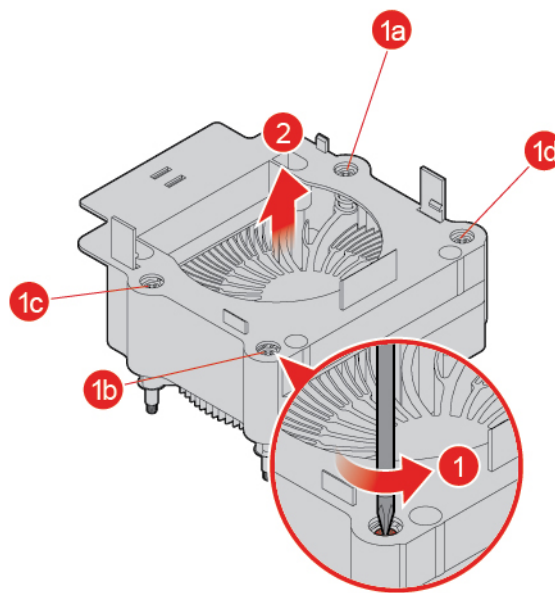


Figure 84. Removing the heat sink and fan assembly

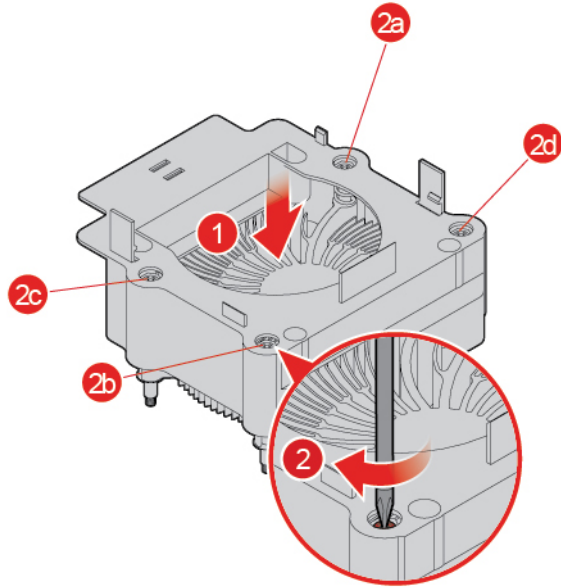


Figure 85. Installing the heat sink and fan assembly

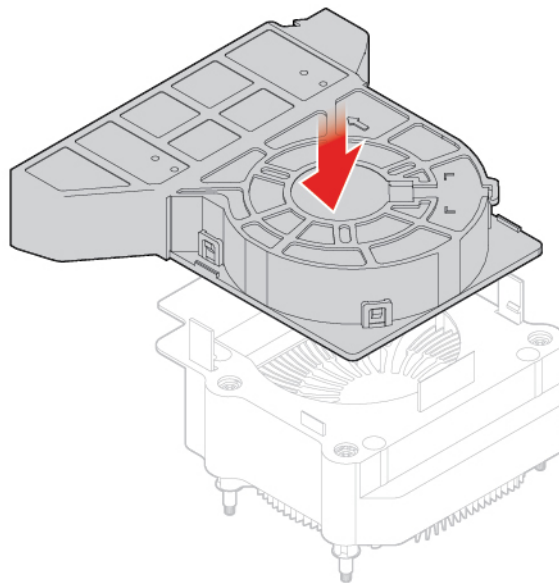


Figure 86. Installing the heat sink fan duct

7. Connect the new microprocessor fan cable to the system board.
8. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the microprocessor

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

CAUTION:

The heat sink and microprocessor might be very hot. Before you open the computer cover, turn off the computer and wait several minutes until the computer is cool.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Remove the heat sink and fan assembly. See “Replacing the heat sink and fan assembly” on page 50.
6. Record the cable routing and cable connections, and then disconnect all cables from the system board. See “System board” on page 5.
7. Replace the microprocessor.

Notes:

- Your microprocessor and socket might look different from the one illustrated.
- Touch only the edges of the microprocessor. Do not touch the gold contacts on the bottom.
- Do not drop anything onto the microprocessor socket while it is exposed. The socket pins must be kept as clean as possible.

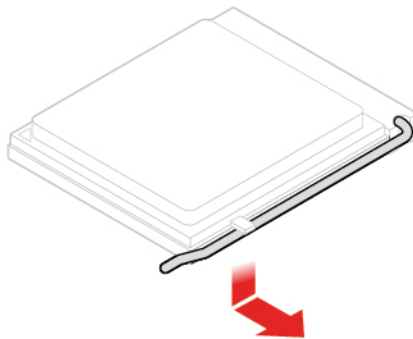


Figure 87. Releasing the handle

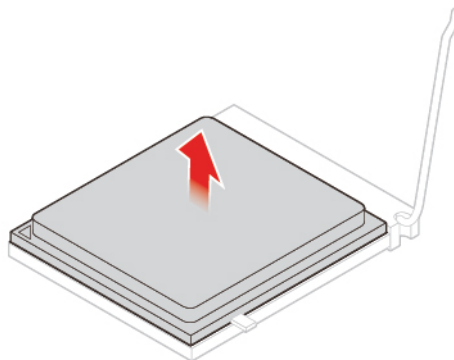


Figure 88. Removing the microprocessor

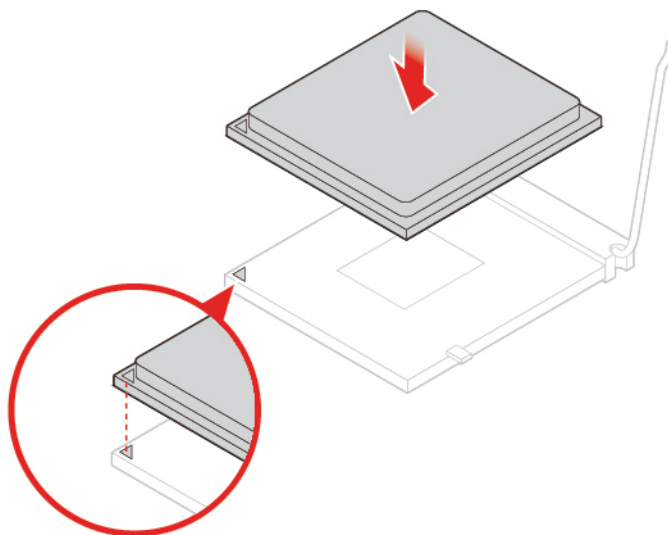


Figure 89. Installing the microprocessor

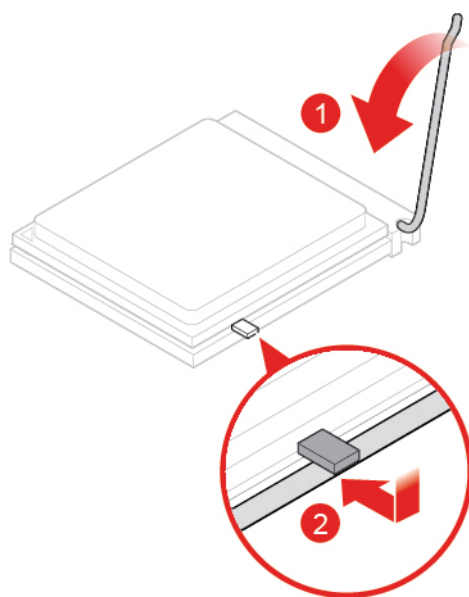


Figure 90. Securing the retainer with the handle

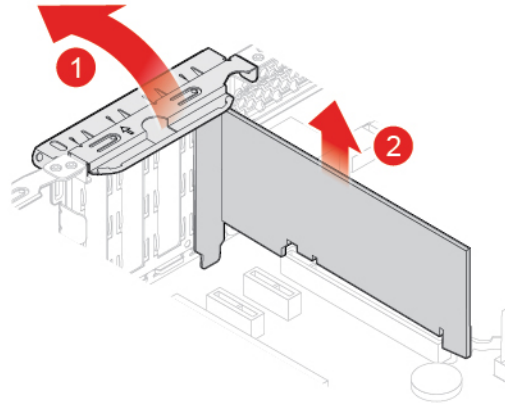
8. Route all the cables that you disconnected from the system board, and then reconnect the cables to the system board.
9. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing a PCI Express card

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.

3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Replace a PCI Express card.



Note: If the card is held in place by a retaining latch, press the latch as shown to disengage the latch. Then, gently remove the card from the slot.

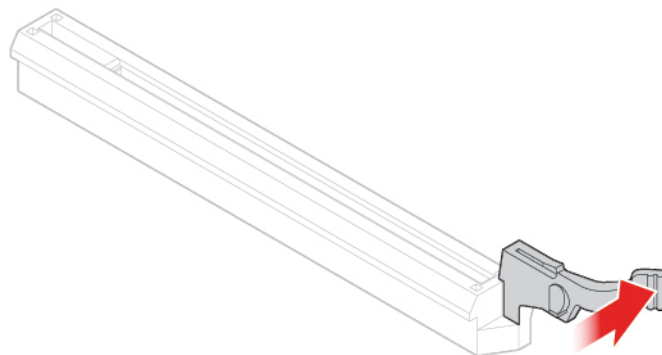


Figure 91. Removing a PCI Express card

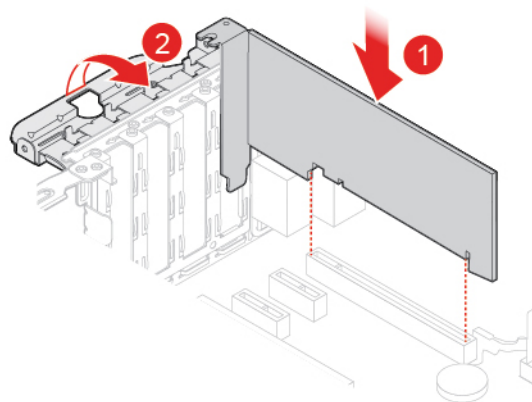


Figure 92. Installing a PCI Express card

6. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the cover presence switch

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Disconnect the cover presence switch cable from the system board.
4. Replace the cover presence switch.

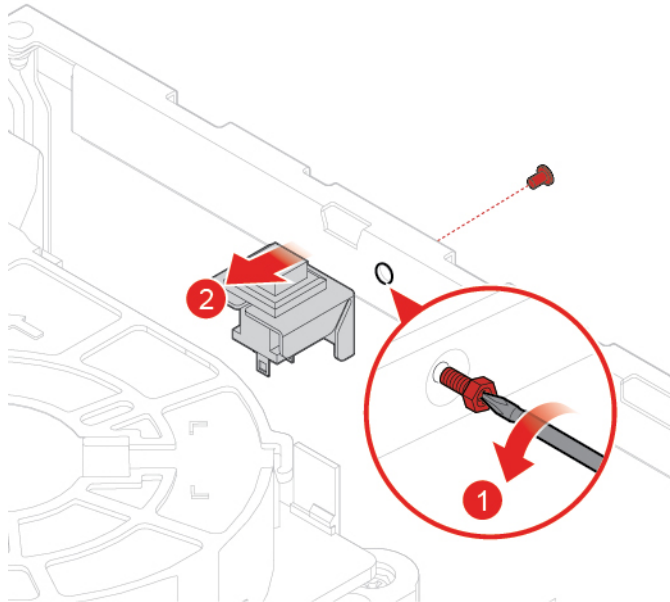


Figure 93. Removing the cover presence switch

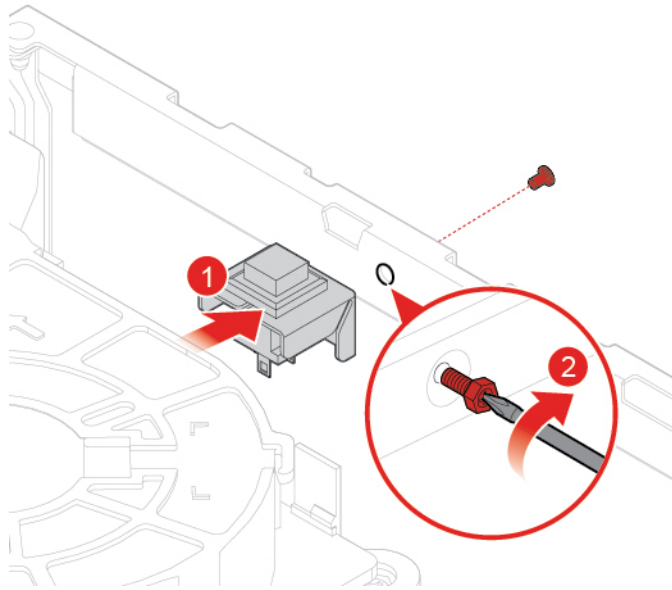


Figure 94. Installing the cover presence switch

5. Connect the new cover presence switch cable to the system board.
6. Reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Replacing the power supply assembly

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

Although there are no moving parts in the computer after the power cord has been disconnected, the following warnings are required for your safety and proper Underwriters Laboratories (UL) certification.

CAUTION:



Hazardous moving parts. Keep fingers and other body parts away.

CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
5. Disconnect the power supply assembly cables from the system board.
6. Replace the power supply assembly.

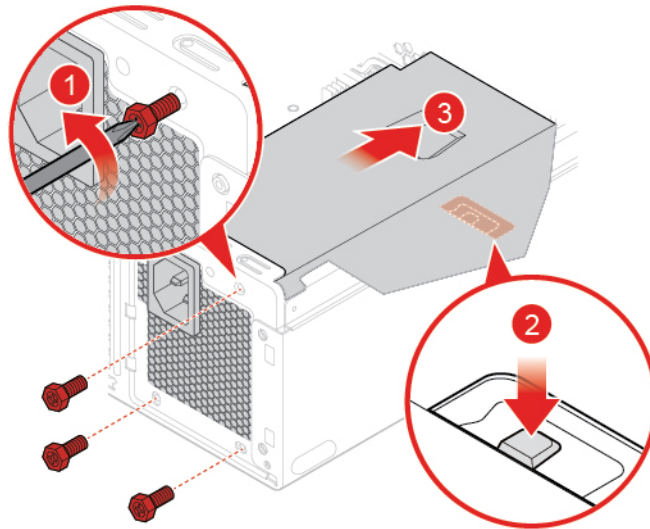


Figure 95. Removing the power supply assembly

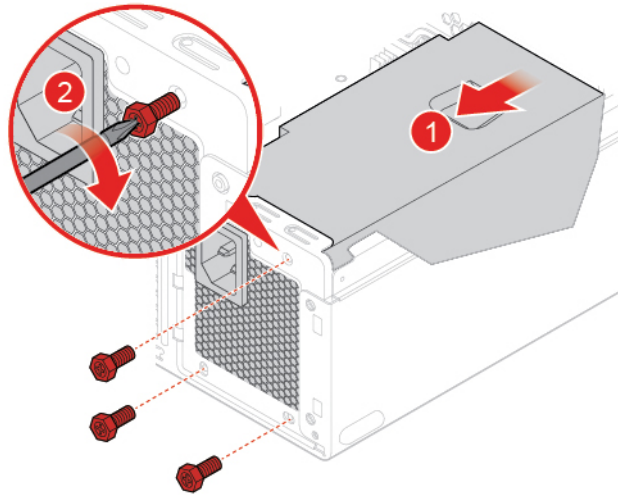


Figure 96. Installing the power supply assembly

7. Connect the new power supply assembly cables to the system board.
8. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

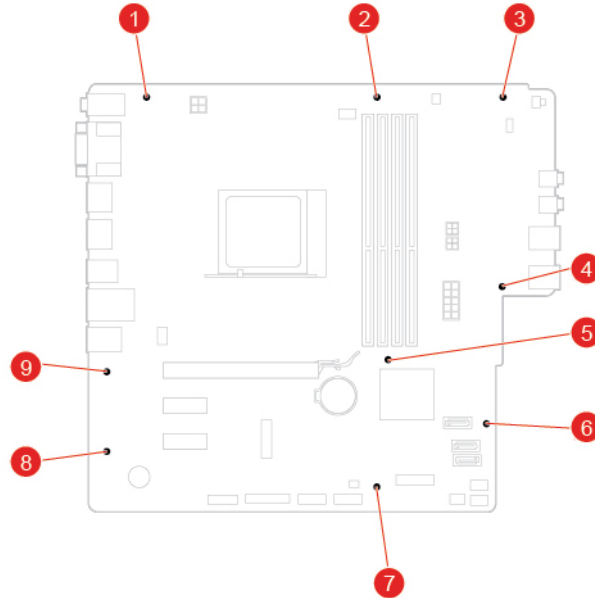
Replacing the system board

Attention: Do not open your computer or attempt any repairs before reading the *Important Product Information Guide*.

1. Remove external options. See “Replacing external options” on page 14.
2. Remove the computer cover. See “Removing the computer cover” on page 16.
3. Remove the front bezel. See “Replacing the front bezel” on page 17.
4. Remove the front I/O bracket. See “Replacing the power button board and the card reader” on page 27.
5. Pivot the drive bay assembly upward. See “Pivoting the drive bay assembly upward and downward” on page 20.
6. Remove all memory modules. See “Replacing a memory module” on page 48.
7. Remove the heat sink and fan assembly. See “Replacing the heat sink and fan assembly” on page 50.
8. Remove the microprocessor. See “Replacing the microprocessor” on page 52.
9. Remove all PCI Express cards. See “Replacing a PCI Express card” on page 54.
10. Remove the Wi-Fi card. See “Replacing the Wi-Fi card” on page 38.
11. Remove the M.2 solid-state drive. See “Replacing the M.2 solid-state drive” on page 42.
12. Record the cable routing and cable connections, and then disconnect all cables from the system board. See “System board” on page 5.
13. Replace the system board.

Notes:

- The numbers in the following figure show the locations of the screws instead of a specific order for removing and reinstalling the screws.
- Handle the system board carefully by its edges.
- The failing system board must be returned with a microprocessor socket cover to protect the pins during shipping and handling.



14. Route and connect all the cables to the new system board.
15. Pivot the drive bay assembly downward and reinstall the removed parts. To complete the replacement, see “Completing the parts replacement” on page 60.

Completing the parts replacement

After completing the installation or replacement for all parts, reinstall the computer cover and reconnect the cables.

1. Ensure that all components have been reassembled correctly and that no tools or loose screws are left inside your computer.
2. Ensure that the cables are routed correctly before reinstalling the computer cover. Keep cables clear of the hinges and sides of the computer chassis to avoid interference when reinstalling the computer cover.
3. Reinstall the computer cover.

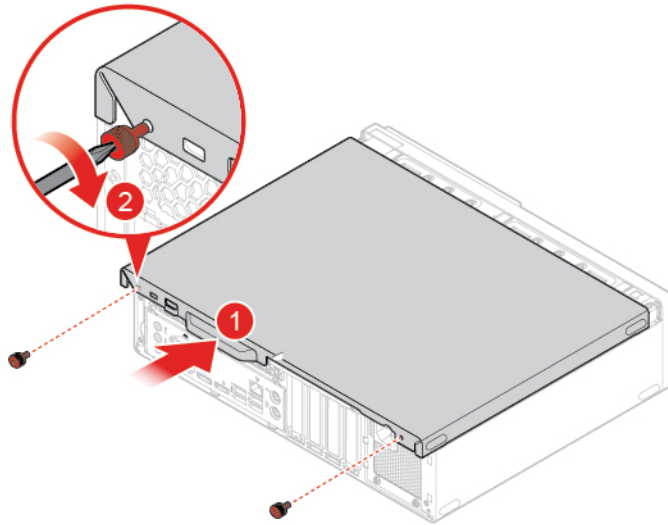


Figure 97. Reinstalling the computer cover

4. Reinstall external options. See “Replacing external options” on page 14.
5. Place the computer in an upright position.
6. If a locking device is available, use it to lock the computer.
7. Reconnect the external cables and power cords to the corresponding connectors on the computer.

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