XPS 8960

Service Manual

Regulatory Model: D30M
Regulatory Type: D30M004
August 2023
Rev. A01

Notes, cautions, and warnings

NOTE: A NOTE indicates important information that helps you make better use of your product.

CAUTION: A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

WARNING: A WARNING indicates a potential for property damage, personal injury, or death.

Contents

1

Working inside your computer

Before working inside your computer

About this task

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start** > **Power** > **Shut down**.

   NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.
3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.

   CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.
5. Remove any media card and optical disc from your computer, if applicable.

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that shipped with your computer.

WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

WARNING: Disconnect your computer from all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting your computer to an electrical outlet.

CAUTION: To avoid damaging the computer, ensure that the work surface is flat, dry, and clean.

CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.

CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that is shipped with the product or at www.dell.com/regulatory_compliance.

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity which could harm internal components.

CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable.

When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.

CAUTION: Press and eject any installed card from the media-card reader.

CAUTION: Exercise caution when handling rechargeable Li-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.

NOTE: The color of your computer and certain components may appear differently than shown in this document.

Safety precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructions.

Observe the following safety precautions before you perform any installation or break/fix procedures involving disassembly or reassembly:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any tabletnotebookdesktop to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power are essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing and holding the power button for 20 seconds should discharge residual power in the system board. Remove the battery from tablets.notebooks.

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done through the use of a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

Electrostatic discharge—ESD protection

ESD is a major concern when you handle electronic components, especially sensitive components such as expansion cards, processors, memory DIMMs, and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product life span. As the industry pushes for lower power requirements and increased density, ESD protection is an increasing concern.

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

Two recognized types of ESD damage are catastrophic and intermittent failures.

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to

the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

The unmonitored Field Service kit is the most commonly used service kit. Each Field Service kit includes three main components: anti-static mat, wrist strap, and bonding wire.

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended to use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical to keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

CAUTION: Do not lift greater than 50 pounds. Always obtain additional resources or use a mechanical lifting device.

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
3. Lift with your legs, not your back.
4. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
5. Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
6. Follow the same techniques in reverse to set the load down.

After working inside your computer

About this task

CAUTION: Leaving stray or loose screws inside your computer may severely damage your computer.

Steps

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

2

Removing and installing components

NOTE: The images in this document may differ from your computer depending on the configuration you ordered.

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #1
- Phillips screwdriver #2
- Plastic scribe

Screw list

NOTE: When removing screws from a component, it is recommended to note the screw type, the quantity of screws, and then place them in a screw storage box. This is to ensure that the correct number of screws and correct screw type is restored when the component is replaced.

NOTE: Some computers have magnetic surfaces. Ensure that the screws are not left attached to such surfaces when replacing a component.

NOTE: Screw color may vary with the configuration ordered.

Table 1. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Power-button bracket	Chassis	#6-32	1	
Solid-state drive	System board	M2x3	1 per solid-state drive installed	
Wireless-card bracket	System board	M2x3	1	
Power-supply cage	Chassis	#6-32	2	
Power-supply unit	Chassis	#6-32	4	
Voltage-regulator heat sink	Chassis	Captive screw M2.5	2 per voltage-regulator heat sink	

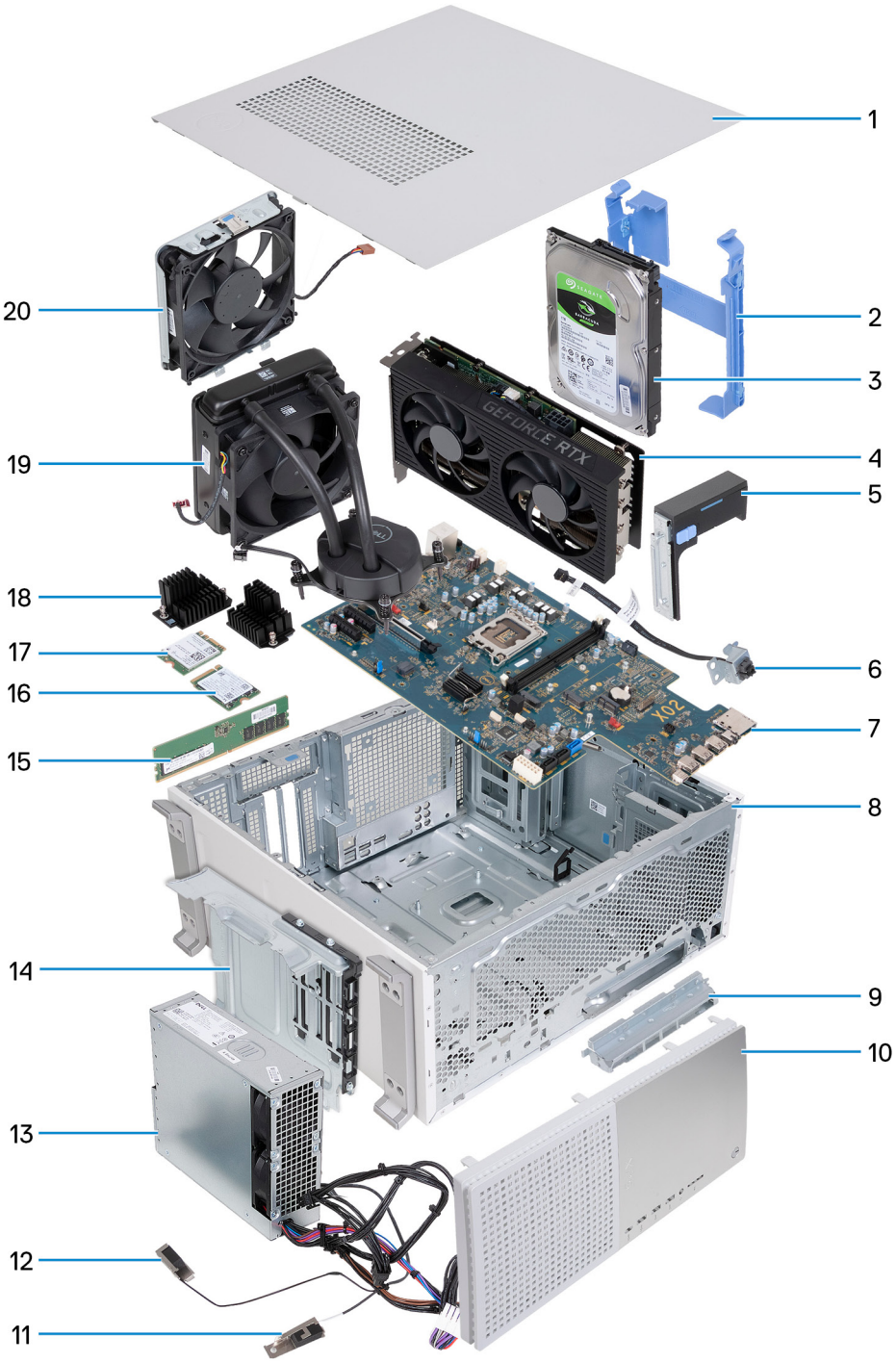
Table 1. Screw list (continued)

Component	Secured to	Screw type	Quantity	Screw image
Processor fan and heat-sink assembly	Chassis	Captive screw M3	4	
Front-chassis fan	Chassis	M3x5	1	
Back-chassis fan **NOTE:** This back-chassis fan is only present on computers shipped with a processor fan and heat sink assembly (125 W, air cooling).	Chassis	M3x5	1	
Radiator fan **NOTE:** This radiator fan is only present on computers shipped with a processor fan and heat sink assembly (125 W, liquid cooler).	Chassis	M3x5	1	
Front I/O bracket	Chassis	#6-32	1	
System board	Chassis	#6-32	9	

Major components of XPS 8960

The following image shows the major components of XPS 8960.

NOTE: Depending on the configuration ordered, some components may or may not be present in your computer.



1. Left-side cover
2. Hard-drive cage
3. Hard drive
4. Graphics card
5. Graphic-card middle holder
6. Power button and power-button bracket
7. System board
8. Chassis
9. Front I/O-bracket
10. Front cover
11. Antenna module (1)
12. Antenna module (2)

13. Power-supply unit
14. Power-supply cage
15. Memory module
16. Solid-state drive
17. Wireless card
18. Voltage-regulator heat sink
19. Fan and heat-sink assembly
20. Front-chassis fan

Left-side cover

Removing the left-side cover

Prerequisites

1. Follow the procedure in Before working inside your computer.

About this task

The following image(s) indicate the location of the left-side cover and provides a visual representation of the removal procedure.

1x

Steps

1. Loosen the captive screw that secures the left-side cover latch to the chassis.
2. Pull on the left-side cover latch to release the left-side cover from the chassis.
3. Holding the left-side cover firmly on both sides, remove and lift the left-side cover from the chassis.

Installing the left-side cover

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the left-side cover and provides a visual representation of the installation procedure.

1x

Steps

1. Holding the left-side cover firmly on both sides, slide the bottom edge of the left-side cover into the chassis and push the left-side cover into place.
2. Tighten the captive screw that secures the left-side cover latch to the chassis.

Next steps

1. Follow the procedure in After working inside your computer.

Front cover

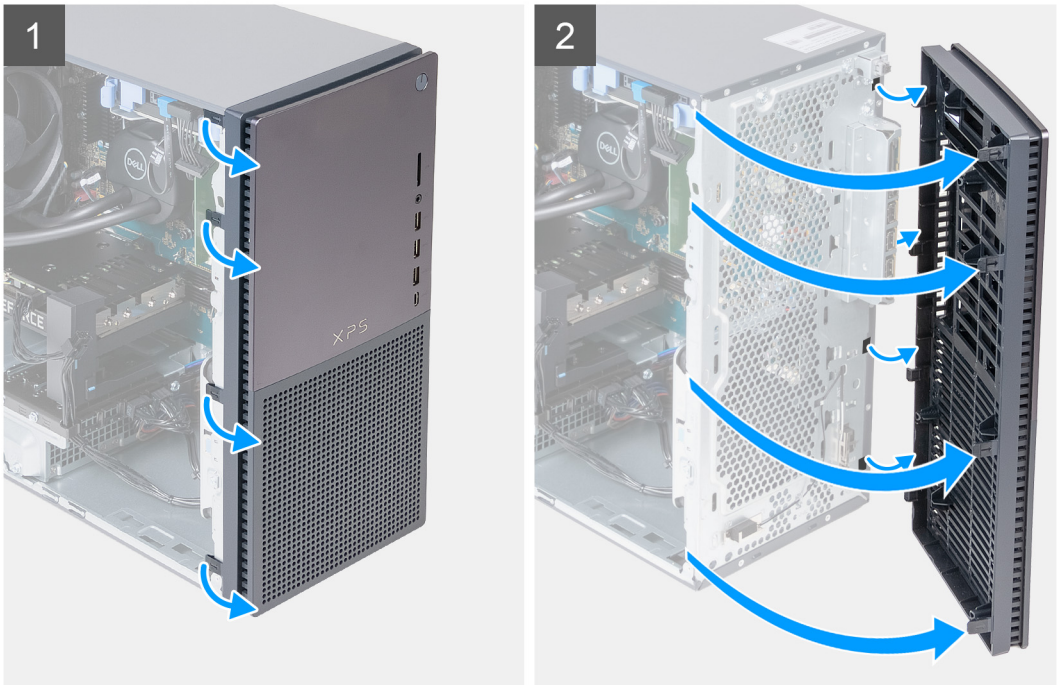
Removing the front cover

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

The following image(s) indicate the location of the front cover and provides a visual representation of the removal procedure.



Steps

1. Gently pry and release the front-cover tabs from the top, working down sequentially to the bottom-left tab.
2. Swing the front cover outwards, away from the chassis, and remove the cover.

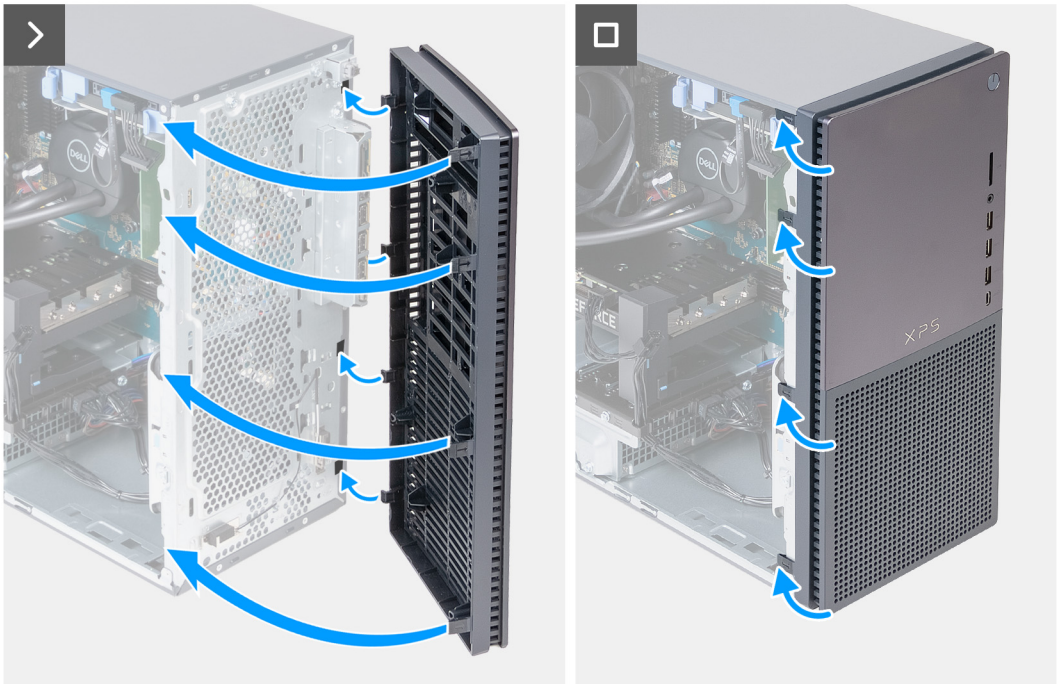
Installing the front cover

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the front cover and provides a visual representation of the installation procedure.



Steps

1. Insert the right-side front-cover tabs into the corresponding slots on the chassis.
2. Push the left-side of the front cover towards the chassis, snapping the slots into position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Power button

Removing the power button

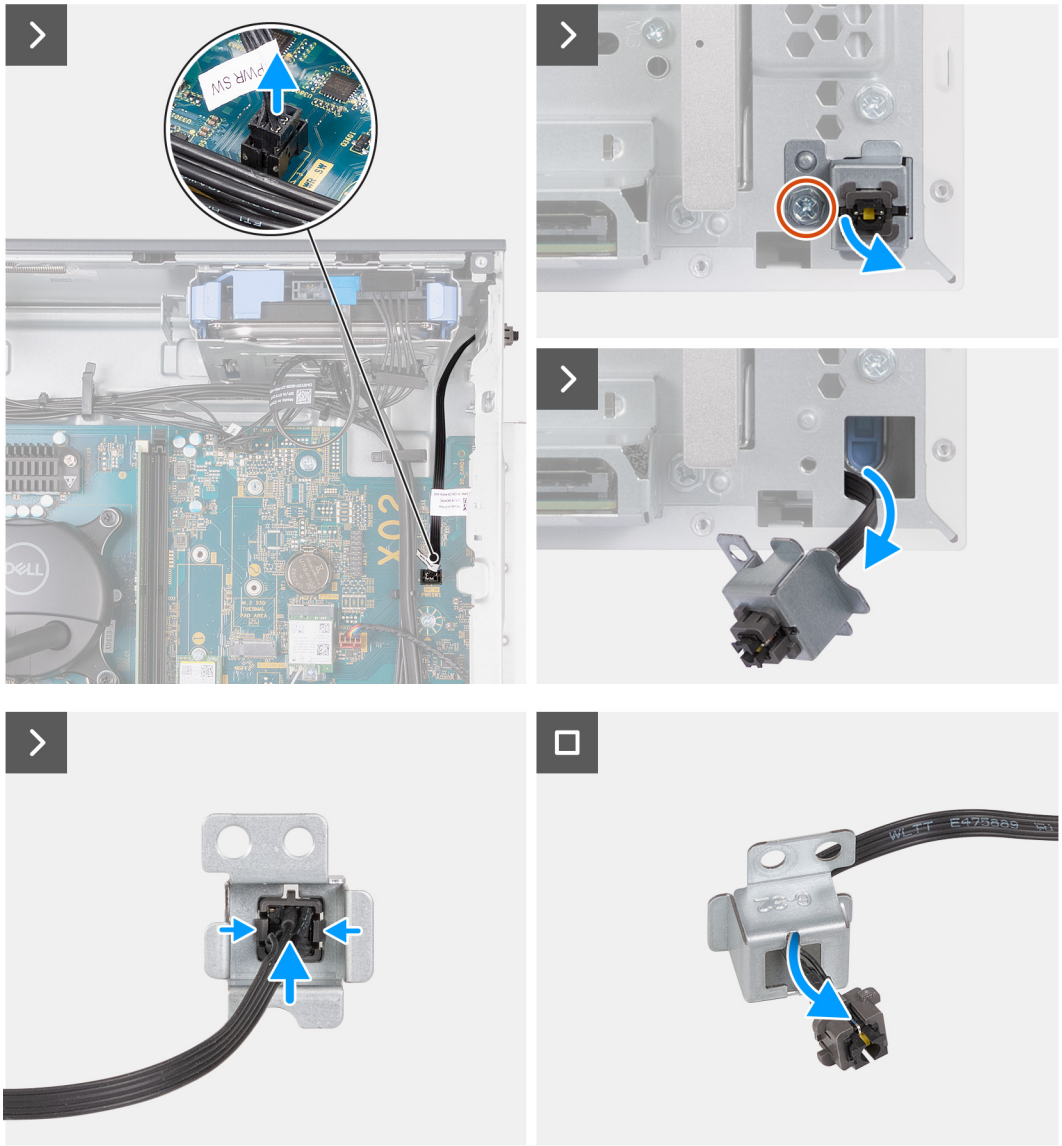
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.

About this task

The following image(s) indicate the location of the power button and provides a visual representation of the removal procedure.

1x
#6-32



Steps

1. Place the computer on its side with the left side facing up.
2. Disconnect the power-button cable from the system board.
3. Remove the screw (#6-32) that secures the power-button bracket to the chassis.
4. Remove the power button and its bracket from the slot on the chassis and thread the power-button cable through the slot on the chassis.
5. Press the release tabs on the sides of power button to release it from the power-button bracket. If necessary, use the flat-side of a scribe to lever the power button off the bracket.
6. Thread the power-button cable through the slot on the power-button bracket.

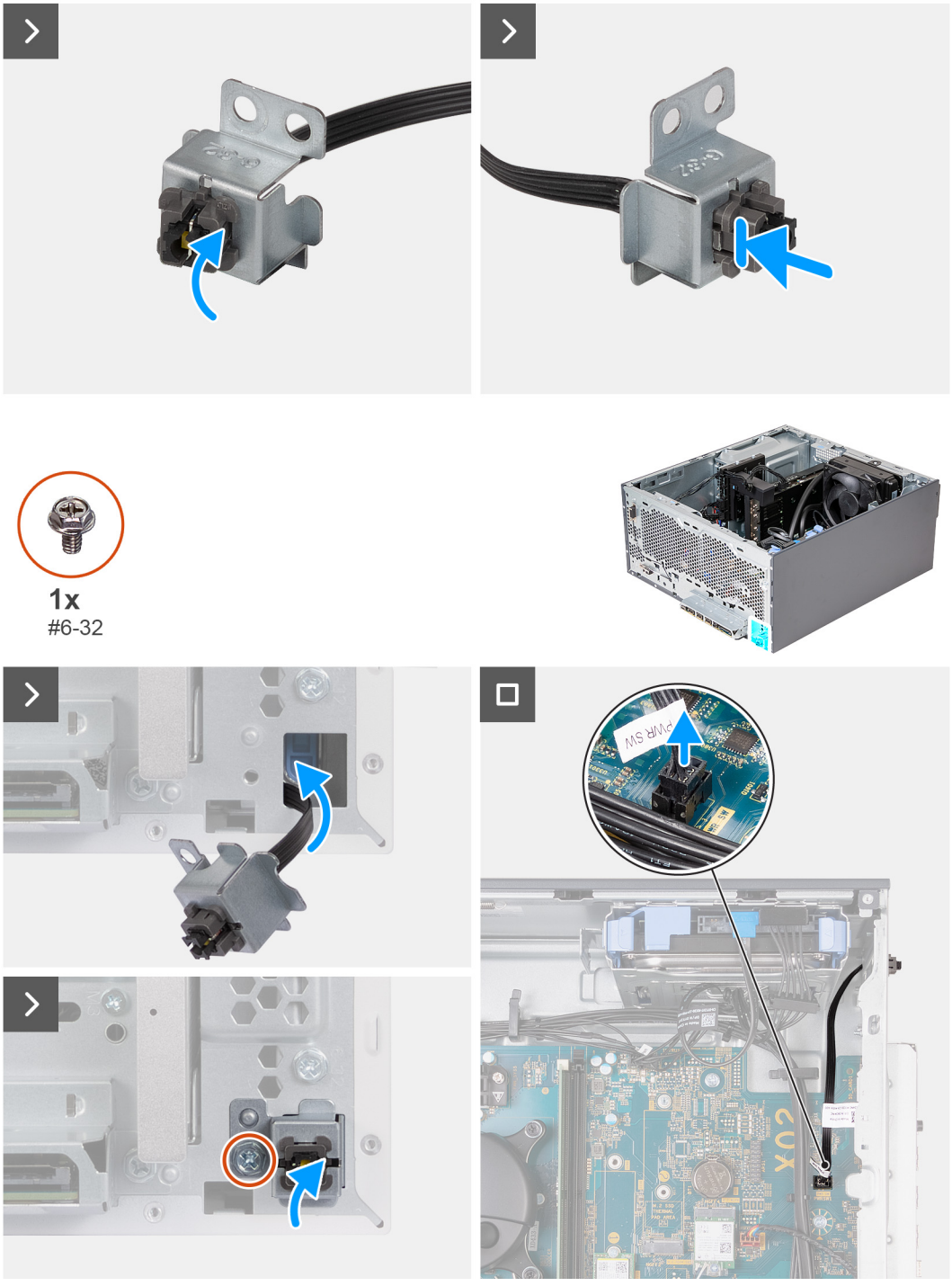
Installing the power button

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the power button and provides a visual representation of the installation procedure.



Steps

1. Thread the power-button cable through the slot on the power-button bracket.

2. Press down on the securing tabs to push the power button into the slot on the power-button bracket.
3. Thread the power-button cable through the slot on the chassis.
4. Insert the top tabs on the power-button bracket into the slot in the chassis, then align the screw hole on the bracket with the screw hole on the chassis.
5. Replace the screw (#6-32) that secures the power-button bracket to the chassis.
6. Connect the power-button cable to the system board.
7. Place the computer in an upright position.

Next steps

1. Install the front cover.
2. Install the left-side cover.
3. Follow the procedure in After working inside your computer.

3.5-inch hard drive

Removing the 3.5-inch hard drive

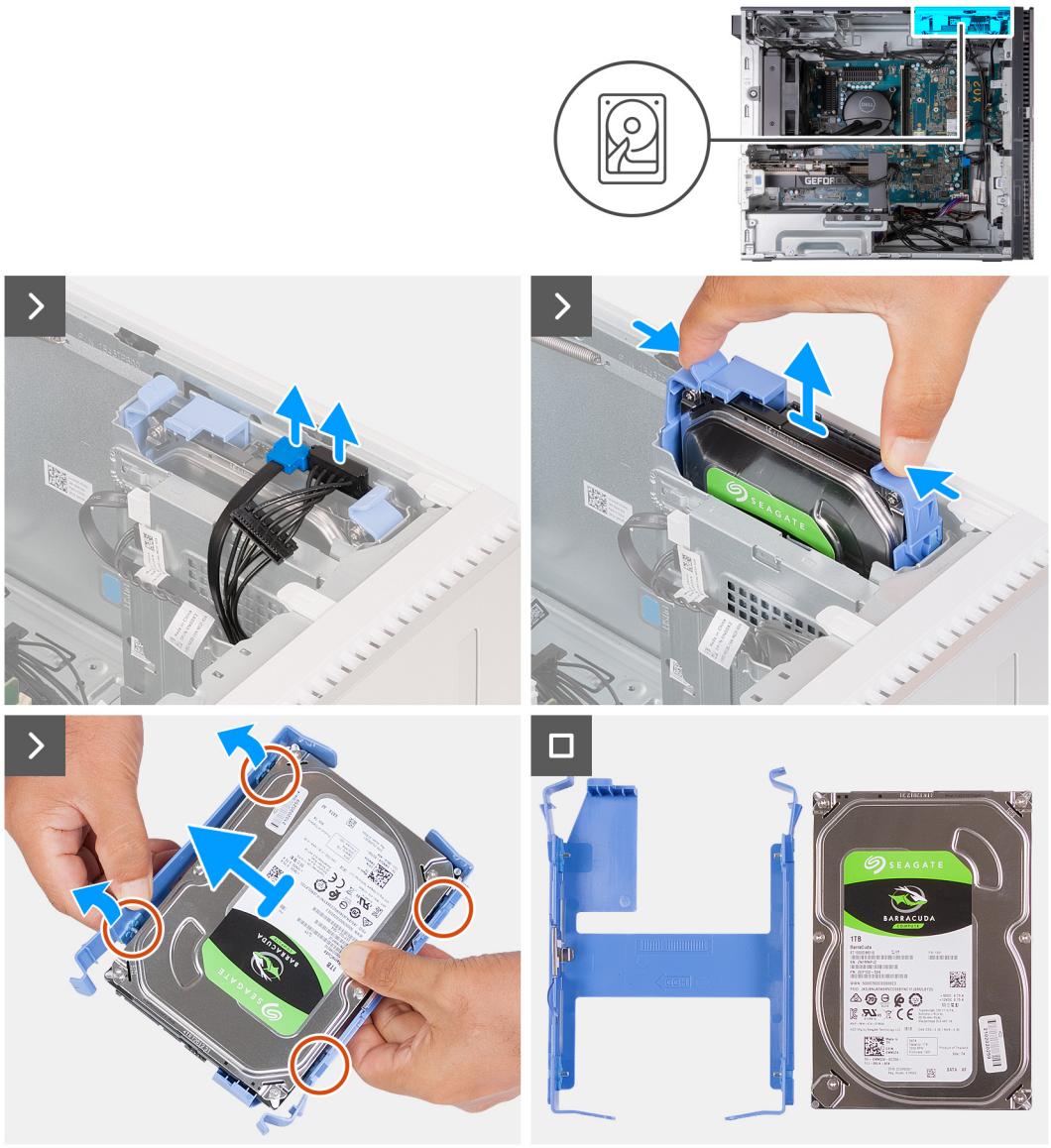
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

NOTE: This computer may have up to two 3.5-inch hard drives installed in the two hard-drive cages on the chassis.

The following image(s) indicate the location of the 3.5-inch hard drive and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Disconnect the hard-drive data and power cables from the 3.5-inch hard drive.
3. Press the release tabs on the hard-drive carrier and slide the hard-drive carrier out of the hard-drive cage.
4. Pry the hard-drive carrier to release the tabs on the carrier from the slots on the 3.5-inch hard drive.
5. Lift the 3.5-inch hard drive off the hard-drive carrier.

NOTE: Note the orientation of the hard drive so that you can replace it correctly.

Installing the 3.5-inch hard drive

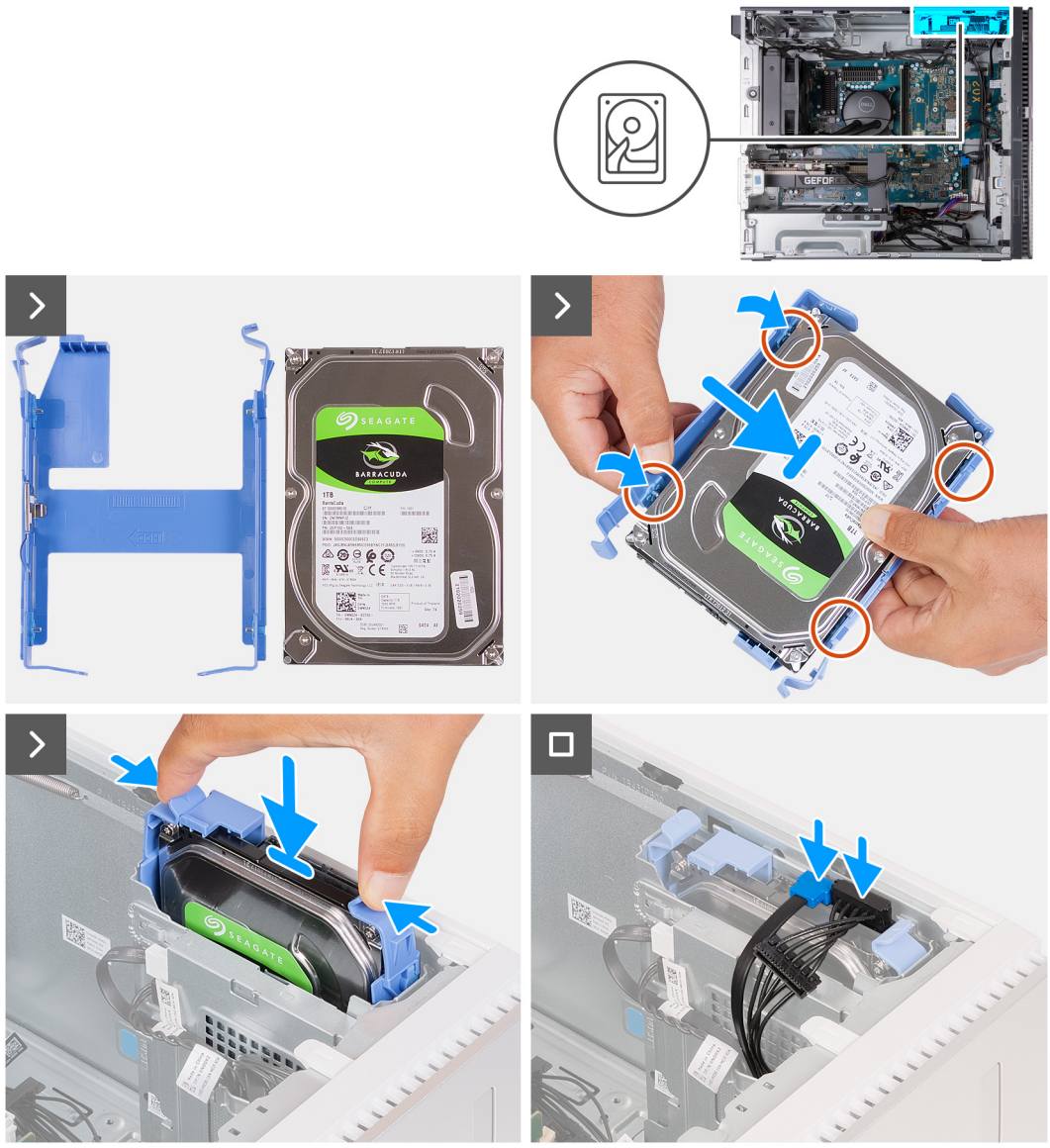
Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

NOTE: You may install two 3.5-inch hard drives into your computer, one into each hard-drive cage on the chassis.

The following image(s) indicate the location of the 3.5-inch hard drive and provides a visual representation of the installation procedure.



Steps

1. Noting the orientation of the hard drive and carrier in the image, place the 3.5-inch hard drive into the hard-drive carrier.
2. Flex the carrier on the sides to ensure the pins on the carrier fit snuggly into the screw holes on the sides of the hard drive.
3. Holding the hard-drive assembly securely, flip it round so that the top of the hard drive faces the bottom of the hard-drive cage as illustrated. Push the hard-drive assembly into the hard-drive cage until it locks into place.
4. Connect the hard-drive data cable and power cable to the 3.5-inch hard drive.
5. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Graphics card

Removing the graphics card

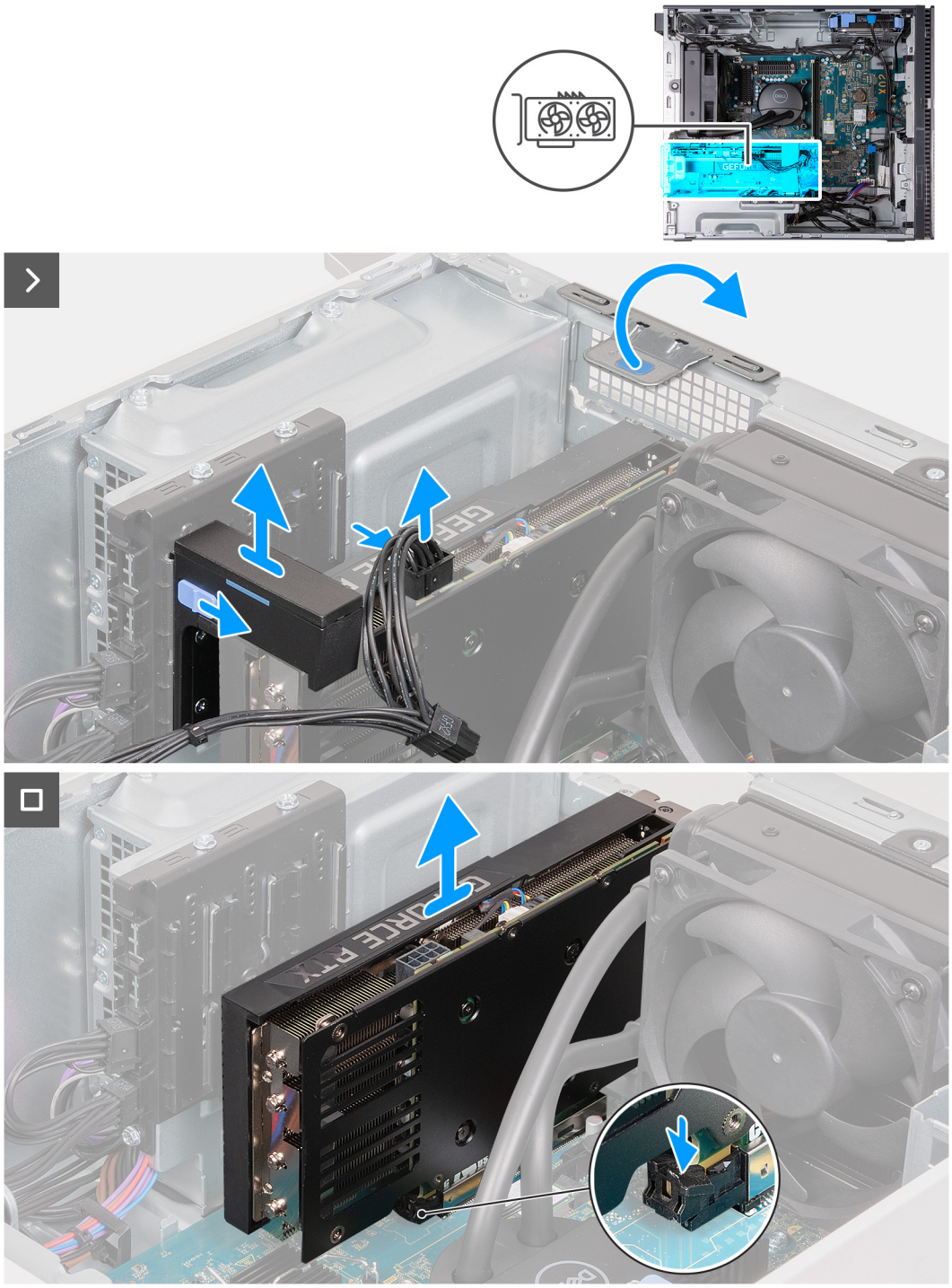
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

NOTE: Depending on the configuration ordered, your computer may not have a discrete graphics card installed.

The following image(s) indicate the location of the graphics card and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Press and hold the securing clip on the graphics card power cable, then pull the connector off the graphics card.
3. Slide and hold the locking mechanism on the graphics card support bracket, then pull it off the retaining rails on the chassis.

   NOTE: The size and location of the graphic-card middle holder may vary depending on the graphics card configuration on your computer.

4. Using the tab, lift and open the PCIe door.
5. While pressing down on the tab at the end of the graphics card slot, lift the graphics card off the system board.

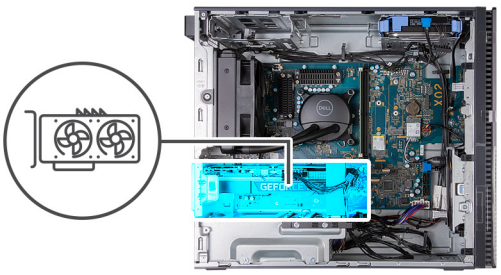
Installing the graphics card

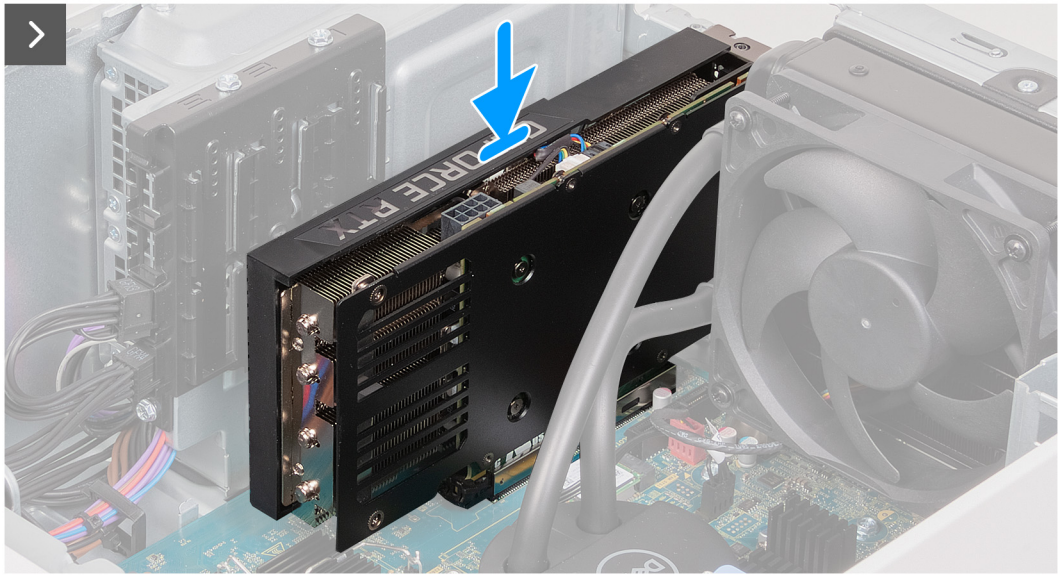
Prerequisites

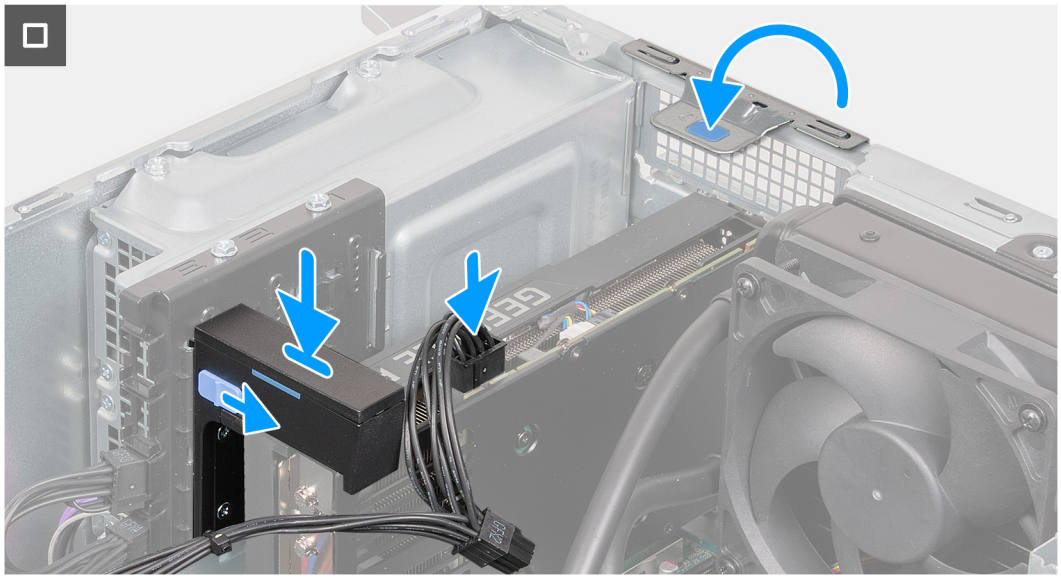
If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the graphics card and provides a visual representation of the installation procedure.







Steps

1. Align the graphics card with the PCIe x16 slot on the system board.

2. Using the alignment post on the PCIe slot, insert the card into the slot on the system board, and press down firmly. Ensure that the card is firmly seated.
3. Close the PCIe door.
4. Insert the graphics-card support bracket onto the retaining rails.

   NOTE: The size and location of the graphic-card middle holder may vary depending on the graphics card configuration on your computer.

5. Push the graphics-card supporting bracket down until it locks into position.
6. Connect the graphics-card power cable to the graphics card.
7. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Memory modules

Removing the memory modules

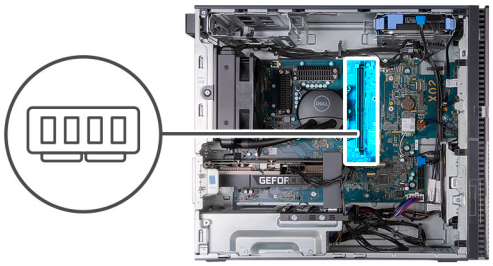
Prerequisites

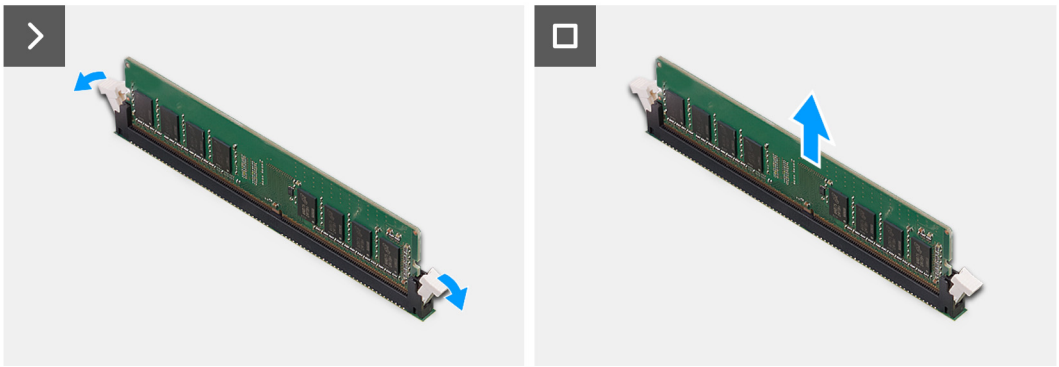
1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

NOTE: This computer may have up to two memory modules installed.

The following image(s) indicate the location of the memory and provides a visual representation of the removal procedure.





Steps

1. Place the computer on its side with the left side facing up.
2. Carefully spread apart the securing-clips on each end of the memory-module slot.
3. Grasp the memory module near the securing clip, and then gently ease the memory module out of the memory-module slot.

CAUTION: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components on the memory module.

NOTE: Repeat step 2 to step 3 to remove any other memory modules installed in your computer.

NOTE: Note the slot and the orientation of the memory module in order to replace it in the correct slot.

NOTE: If the memory module is difficult to remove, gently ease the memory module back and forth to remove it from the slot.

Installing the memory modules

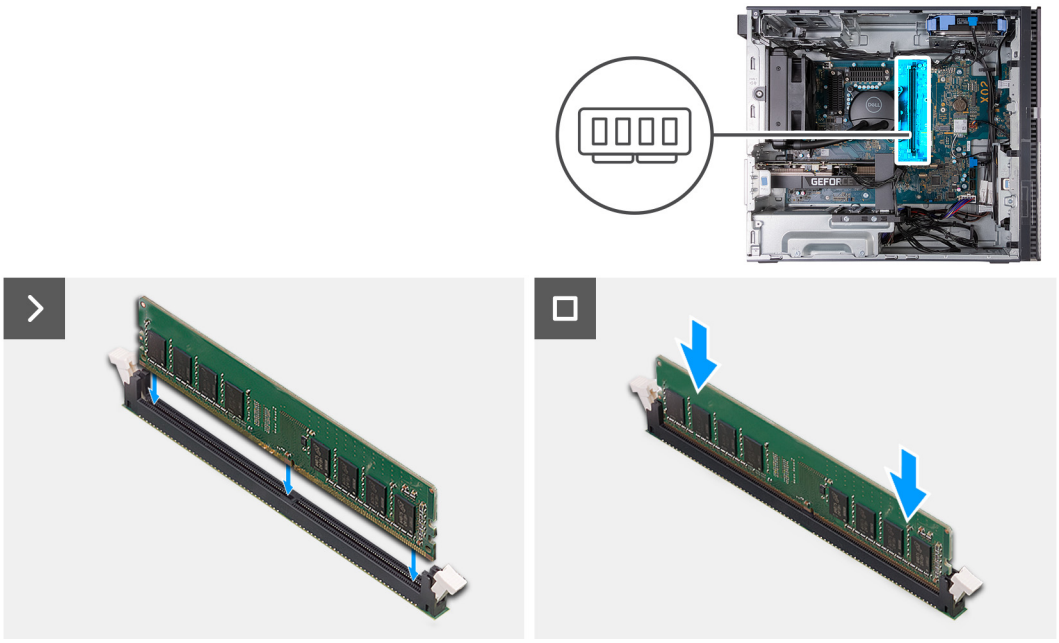
Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

NOTE: Up to two memory modules may be installed into this computer.

The following image(s) indicate the location of the memory and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the memory module with the tab on the memory-module slot.
2. Insert the memory module into the memory-module connector.
3. Press down on the memory module until the memory module snaps into position and the securing clip locks in place.

CAUTION: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components on the memory module.

NOTE: The securing clips return to the locked position. If you do not hear the click, remove the memory module and reinstall it.

NOTE: If the memory module is difficult to remove, gently ease the memory module back and forth to remove it from the slot.

NOTE: Repeat steps 1 to 3 for each memory module being installed into your computer.

NOTE: To achieve dual-channel support when installing two memory modules of the same capacity, install the memory modules in DIMM 1 and 2 or DIMM 3 and 4.

4. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Solid-state drive

Removing the 2230 solid-state drive

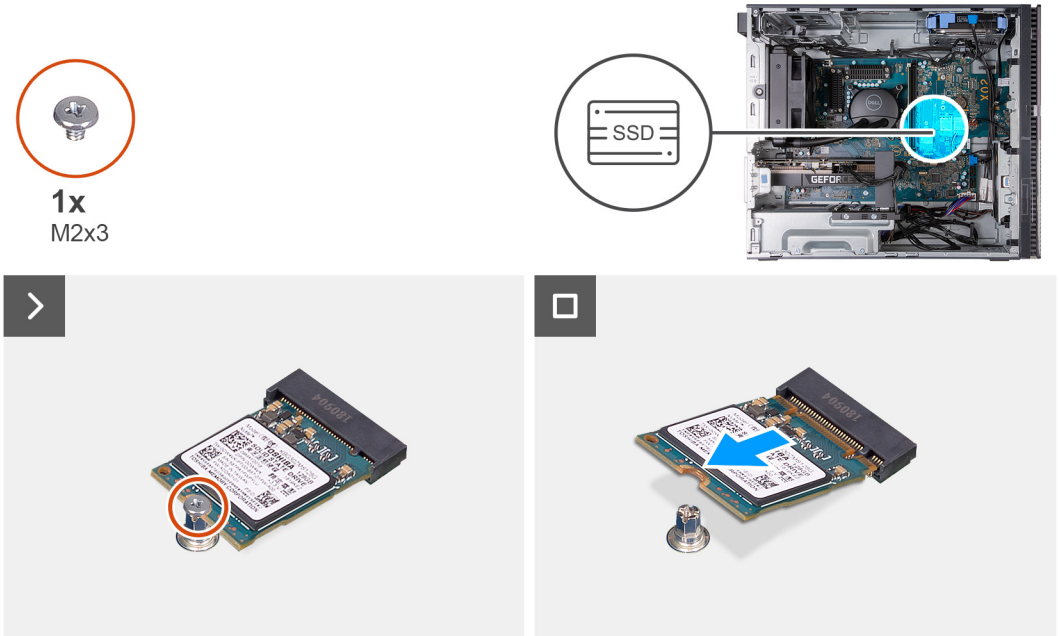
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

NOTE: Depending on the configuration ordered, your computer may have up to two M.2 2230/2280 solid-state drives installed in the two M.2 solid-state drive slots on the system board.

The following image(s) indicate the location of the 2230 solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Remove the screw (M2x3) that secures the 2230 solid-state drive to the system board.
3. Slide and lift the 2230 solid-state drive from the M.2 card slot on the system board.

Installing the 2230 solid-state drive

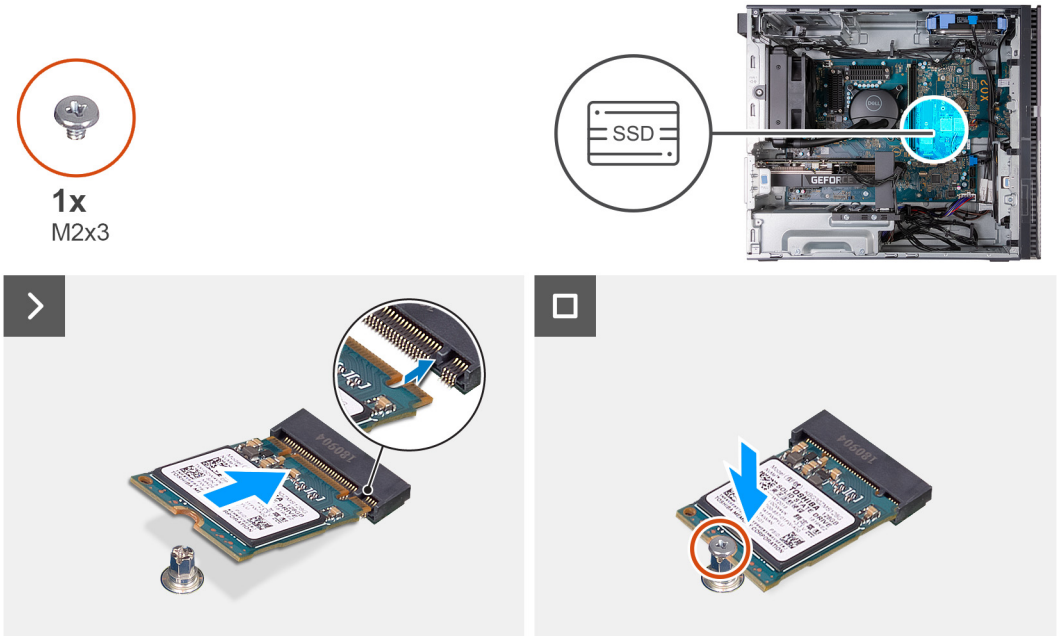
Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

NOTE: You may install up to two M.2 2230/2280 solid-state drives into the two M.2 solid-state drive slots on the system board.

The following image(s) indicate the location of the 2230 solid-state drive and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the 2230 solid-state drive with the tab on the M.2 card slot on the system board.
2. Slide the 2230 solid-state drive into the M.2 card slot on the system board.
3. Replace the screw (M2x3) that secures the 2230 solid-state drive to the system board.
4. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Removing the 2280 solid-state drive

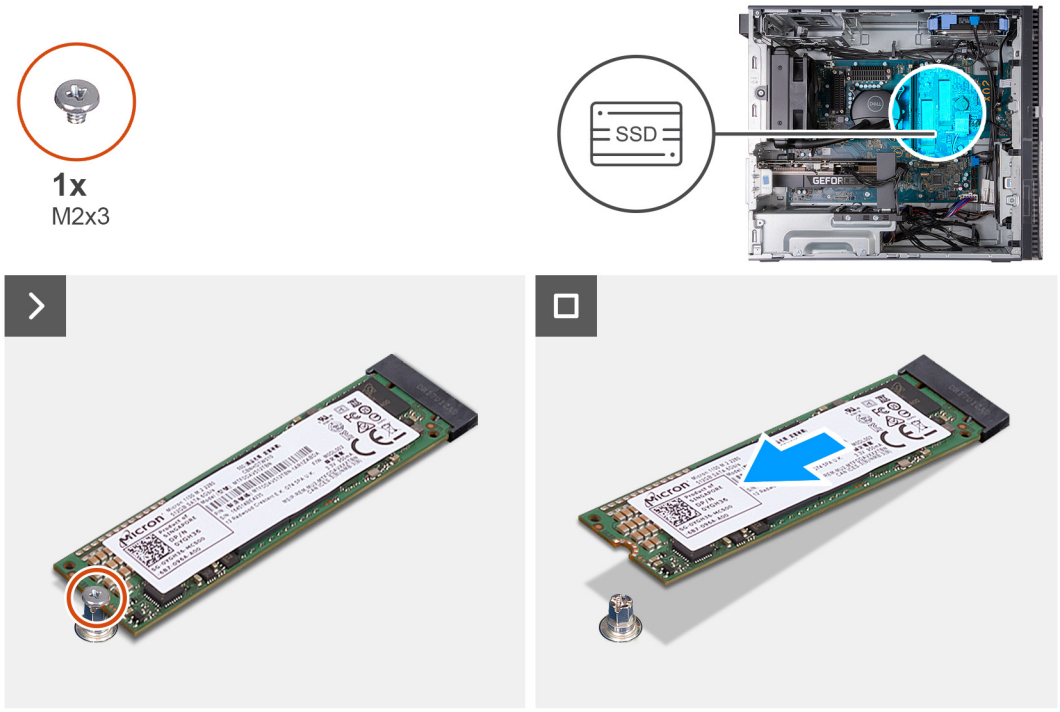
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

NOTE: Depending on the configuration ordered, your computer may have up to two M.2 2230/2280 solid-state drives installed in the two M.2 solid-state drive slots on the system board.

The following image(s) indicate the location of the 2280 solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Remove the screw (M2x3) that secures the 2280 solid-state drive to the system board.
3. Slide and lift the 2280 solid-state drive from the M.2 card slot on the system board.

Installing the 2280 solid-state drive

Prerequisites

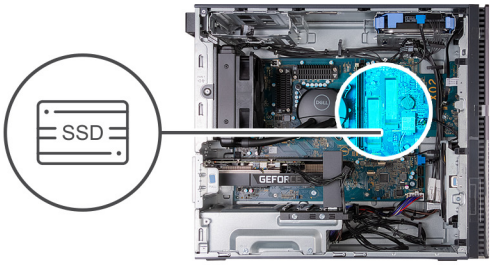
If you are replacing a component, remove the existing component before performing the installation process.

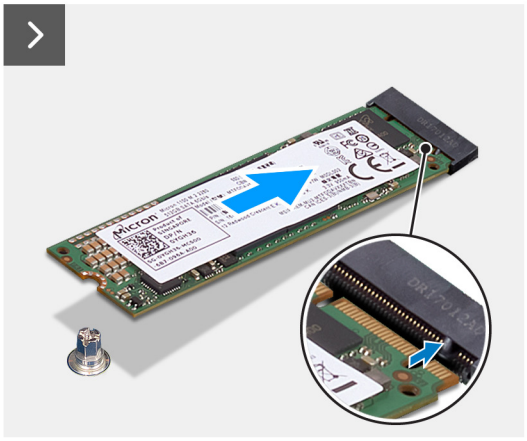
About this task

NOTE: You may install up to two M.2 2230/2280 solid-state drives into the two M.2 solid-state drive slots on the system board.

The following image(s) indicate the location of the 2280 solid-state drive and provides a visual representation of the installation procedure.

1x
M2x3





Steps

1. Align the notch on the 2280 solid-state drive with the tab on the M.2 card slot on the system board.
2. Slide the 2280 solid-state drive into the M.2 card slot on the system board.
3. Replace the screw (M2x3) that secures the 2280 solid-state drive to the system board.
4. Place the computer in an upright position.

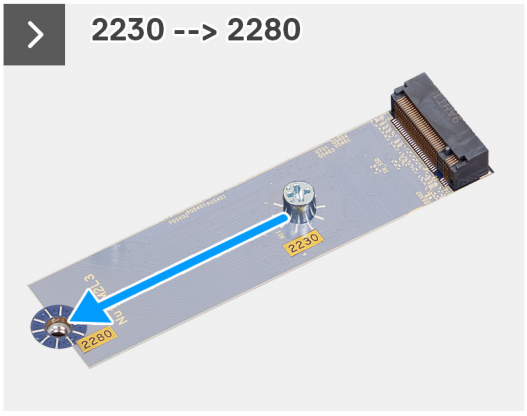
Next steps

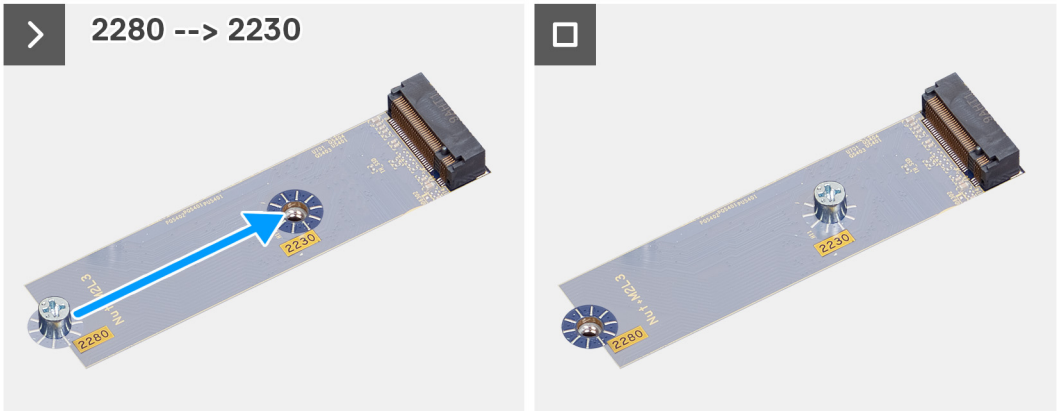
1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Removing and installing the M.2 screw mount

About this task

The following image provides a visual representation of the procedure to remove and install the M.2 screw mount on the system board. This procedure allows the conversion of the slot for M.2 2230 and 2280 solid-state drives.





Wireless card

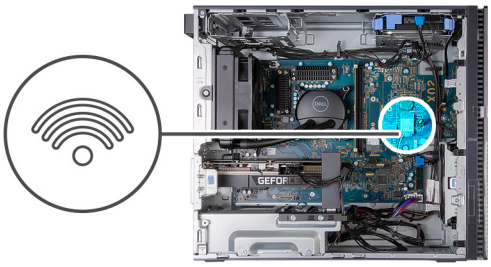
Removing the wireless card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

The following image(s) indicate the location of the wireless card and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Remove the screw (M2x3) that secures the wireless card to the system board.
3. Slide and lift the wireless-card bracket off the wireless card.
4. Disconnect the antenna cables from the wireless card.
5. Slide and remove the wireless card at an angle from the wireless-card slot.

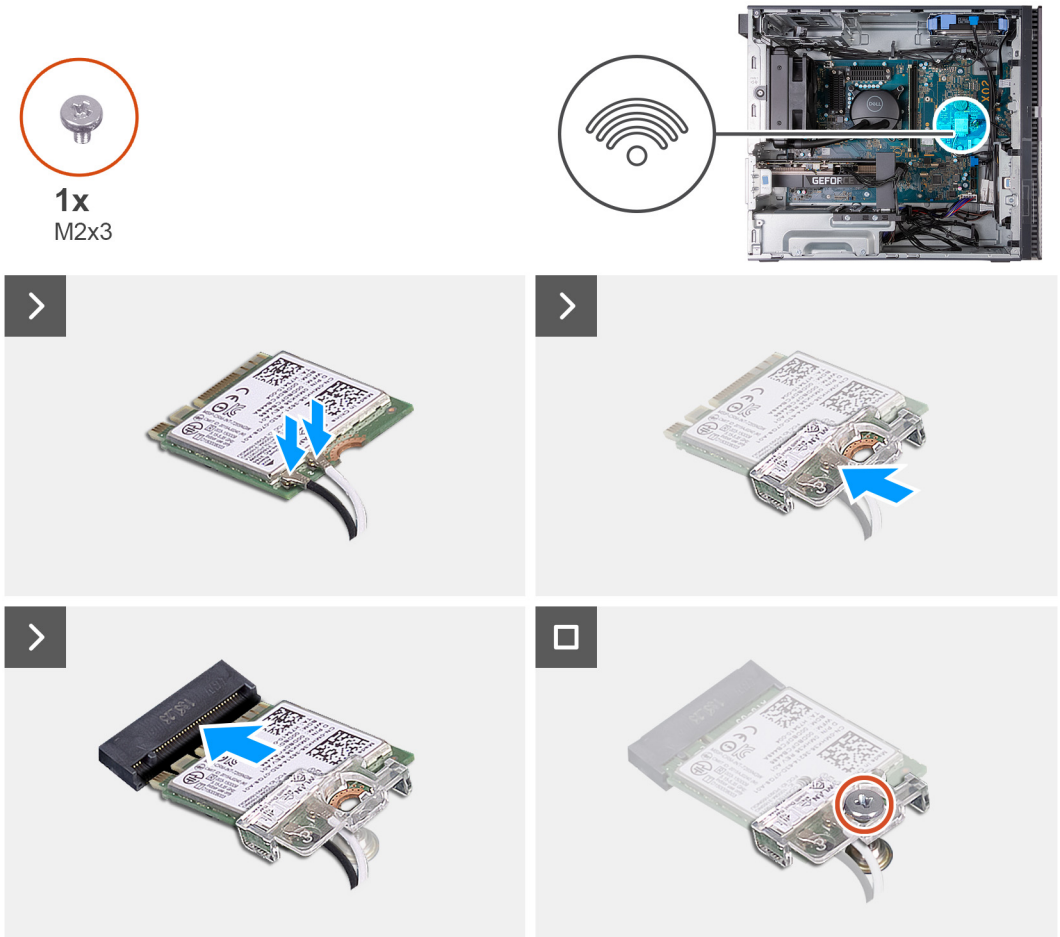
Installing the wireless card

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the wireless card and provides a visual representation of the installation procedure.



Steps

1. Connect the antenna cables to the wireless card.

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color	Silkscreen marking	
Main	White	MAIN	△ (white triangle)

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color	Silkscreen marking	
Auxiliary	Black	AUX	▲ (black triangle)

2. Slide and place the wireless-card bracket on the wireless card.
3. Align the notch on the wireless card with the tab on the wireless-card slot.
4. Slide the wireless card at an angle into the wireless-card slot.
5. Replace the screw (M2x3) that secures the wireless card to the system board.
6. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Coin-cell battery

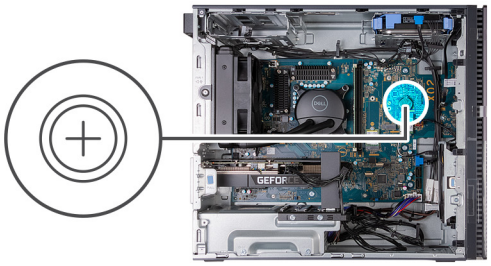
Removing the coin-cell battery

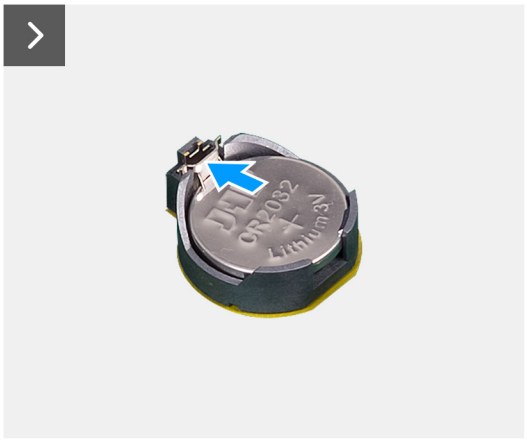
Prerequisites

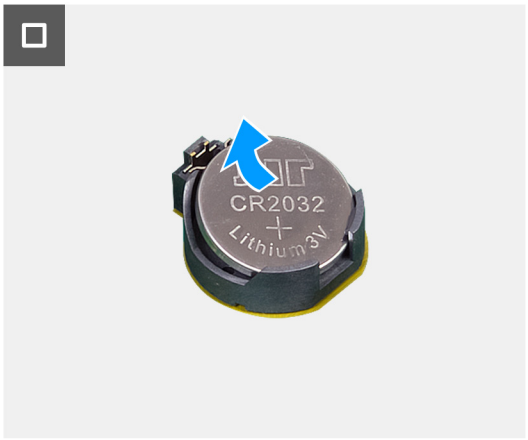
1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

The following image(s) indicate the location of the coin-cell battery and provides a visual representation of the removal procedure.







Steps

1. Place the computer on its side with the left side facing up.

2. Push the coin-cell battery-release lever on the coin-cell battery socket to release the coin-cell battery out of the socket.
3. Remove the coin-cell battery.

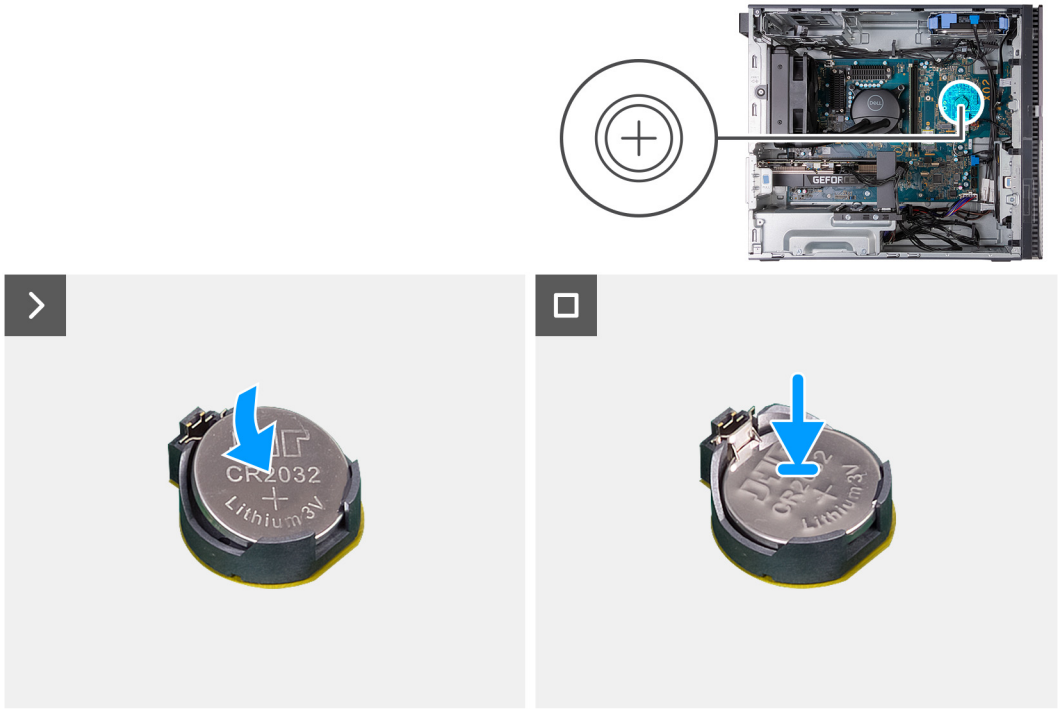
Installing the coin-cell battery

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the coin-cell battery and provides a visual representation of the installation procedure.



Steps

1. Insert the coin-cell battery into the socket with the positive side (+) label facing up and snap the battery in the socket.
2. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Front-chassis fan

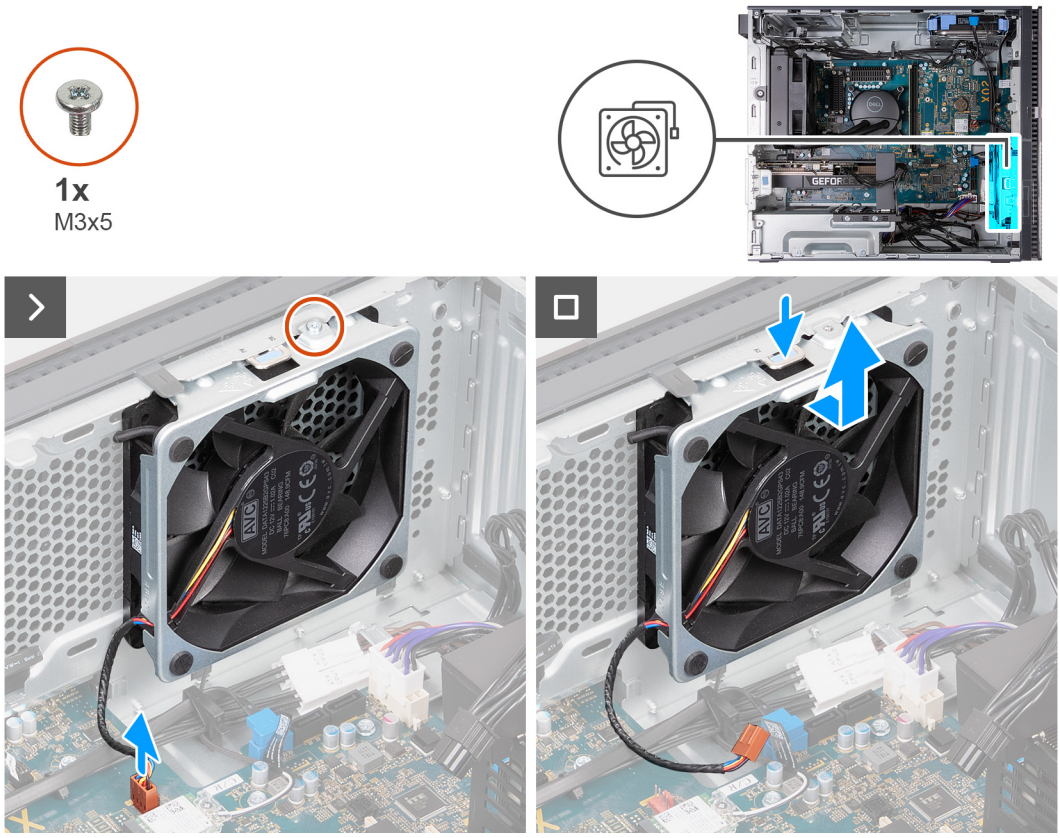
Removing the front-chassis fan

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

The following image(s) indicate the location of the front-chassis fan and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Remove the screw (M3x5) that secures the front-chassis fan to the chassis.
3. Disconnect the front-chassis fan cable from the system board.
4. Press down on the securing tab to release the front-chassis fan from the chassis.
5. Lift the front-chassis fan off the chassis.

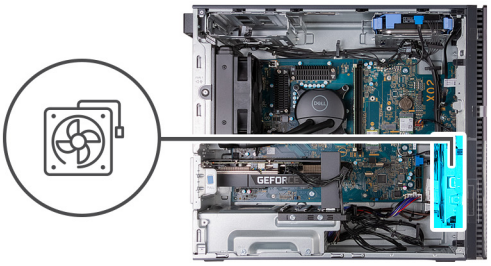
Installing the front-chassis fan

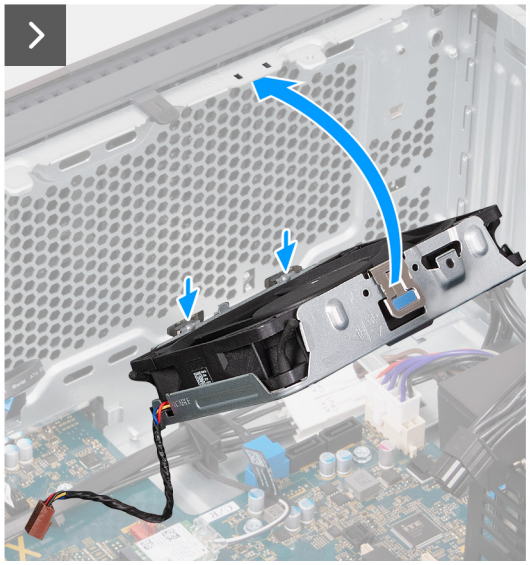
Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the front-chassis fan and provides a visual representation of the installation procedure.





Steps

1. Slide the tabs on the front-chassis fan into the slots on the chassis and rotate the rear-chassis fan inwards.
2. Press the front-chassis fan against the chassis to snap the chassis fan in place.
3. Connect the front-chassis fan cable to the system board.
4. Replace the screw (M3x5) that secures the front-chassis fan to the chassis.
5. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Power-supply unit

Removing the power-supply unit

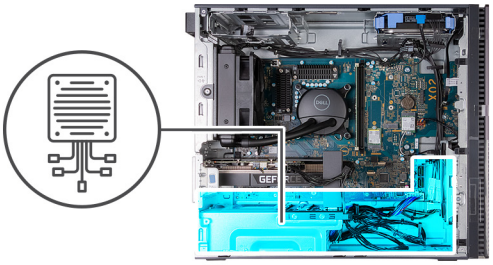
Prerequisites

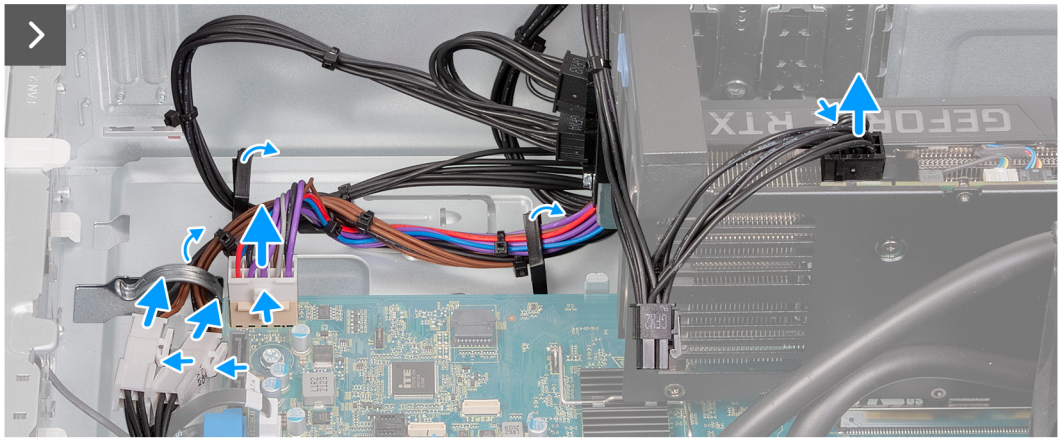
1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

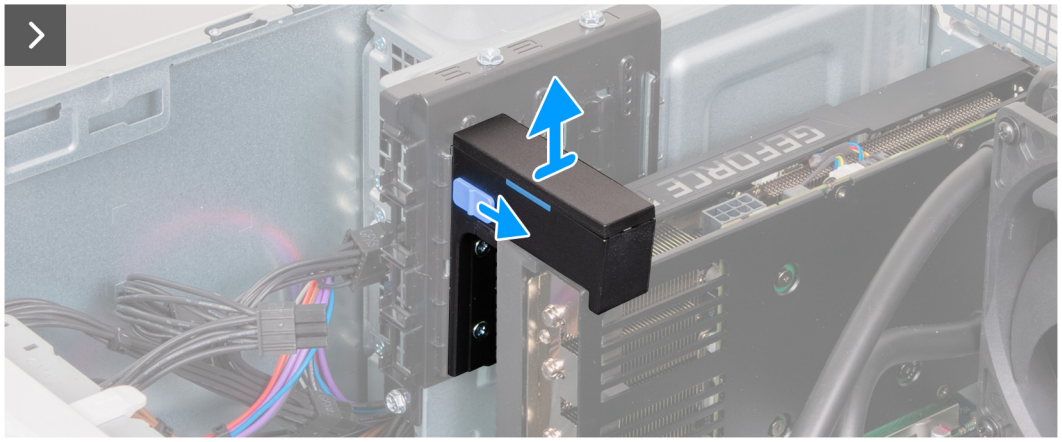
About this task

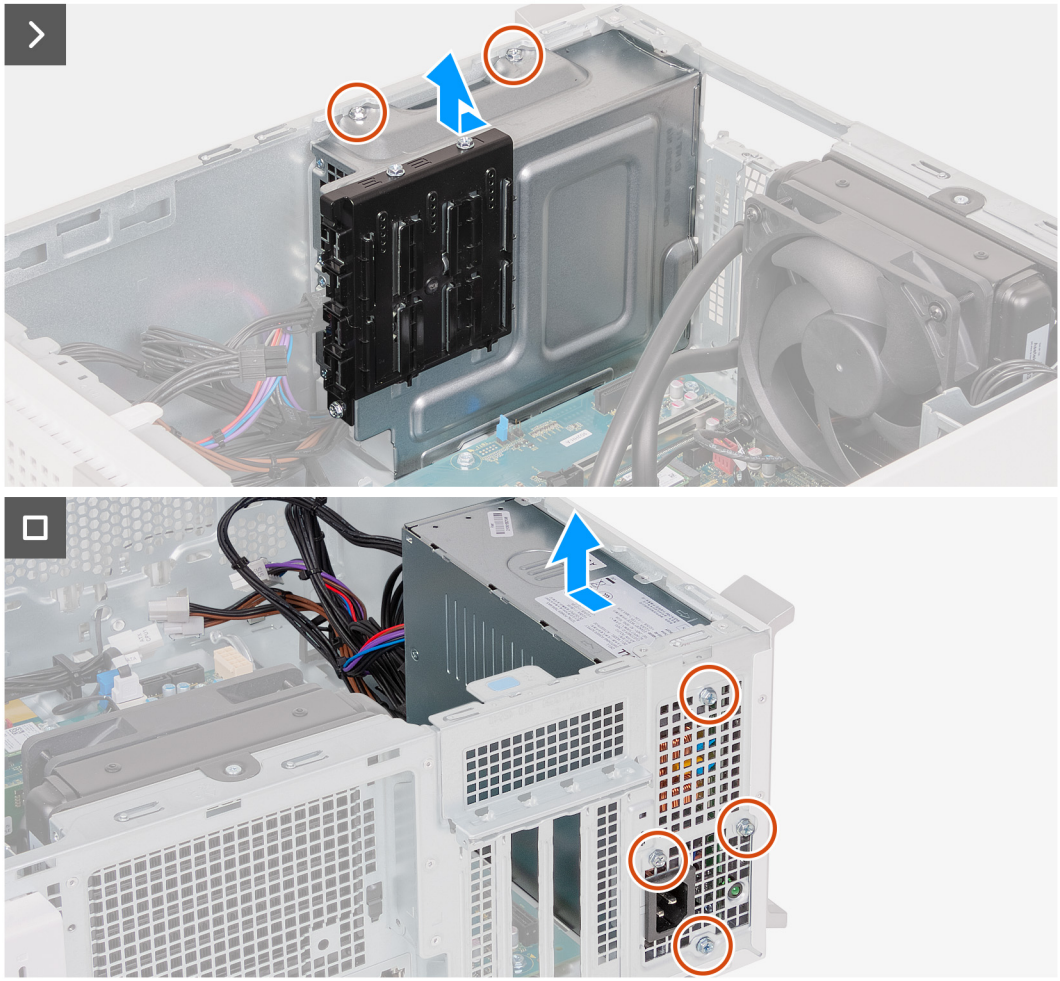
The following image(s) indicate the location of the power-supply unit and provides a visual representation of the removal procedure.

6x
#6-32









Steps

1. Place the computer on its side with the left side facing up.
2. Press down on the securing clip to disconnect the graphics-card power cables from the graphics card.
3. Disconnect the graphics-card power cables from the power-supply unit.
4. Press down on the securing clips to disconnect the power-supply cables from the processor-power cables.
5. While pressing down on the tab at the end of the graphics card slot, lift the graphics card off the system board.
6. Remove the power-supply cables from the routing guides on the chassis.
7. Slide and hold the locking mechanism on the graphics card support bracket, then pull it off the retaining rails on the chassis.

   NOTE: The size and location of the graphic-card middle holder may vary depending on the graphics card configuration on your computer.

8. Remove the two screws (#6-32) that secure the power-supply cage to the chassis.
9. Slide and lift the power-supply cage off the chassis.
10. Remove the four screws (#6-32) that secure the power-supply unit to the chassis.
11. Slide and lift the power-supply unit off the chassis.

Installing the power-supply unit

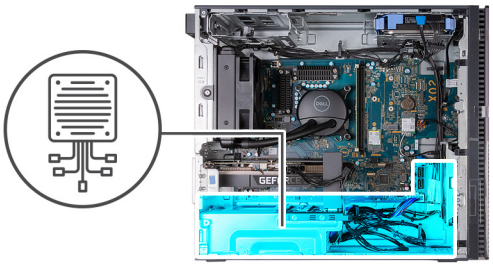
Prerequisites

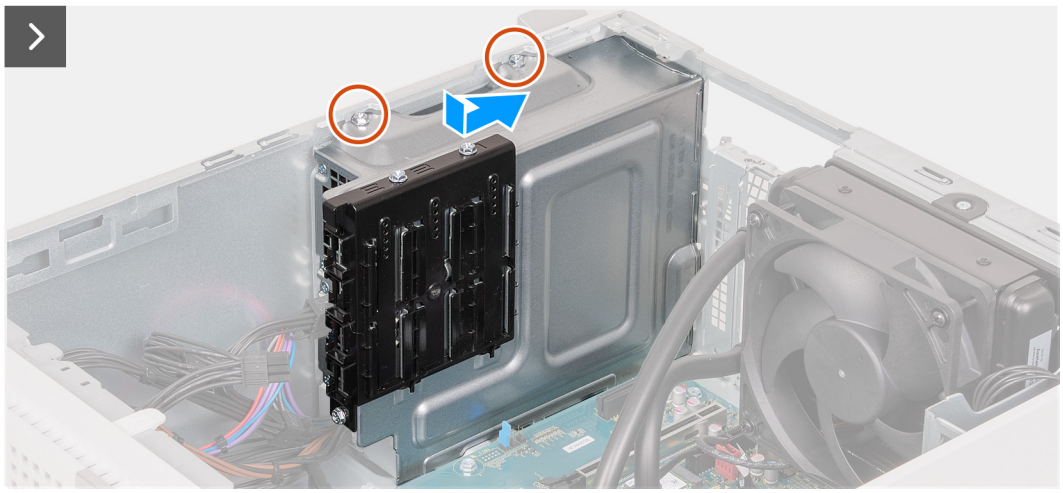
If you are replacing a component, remove the existing component before performing the installation process.

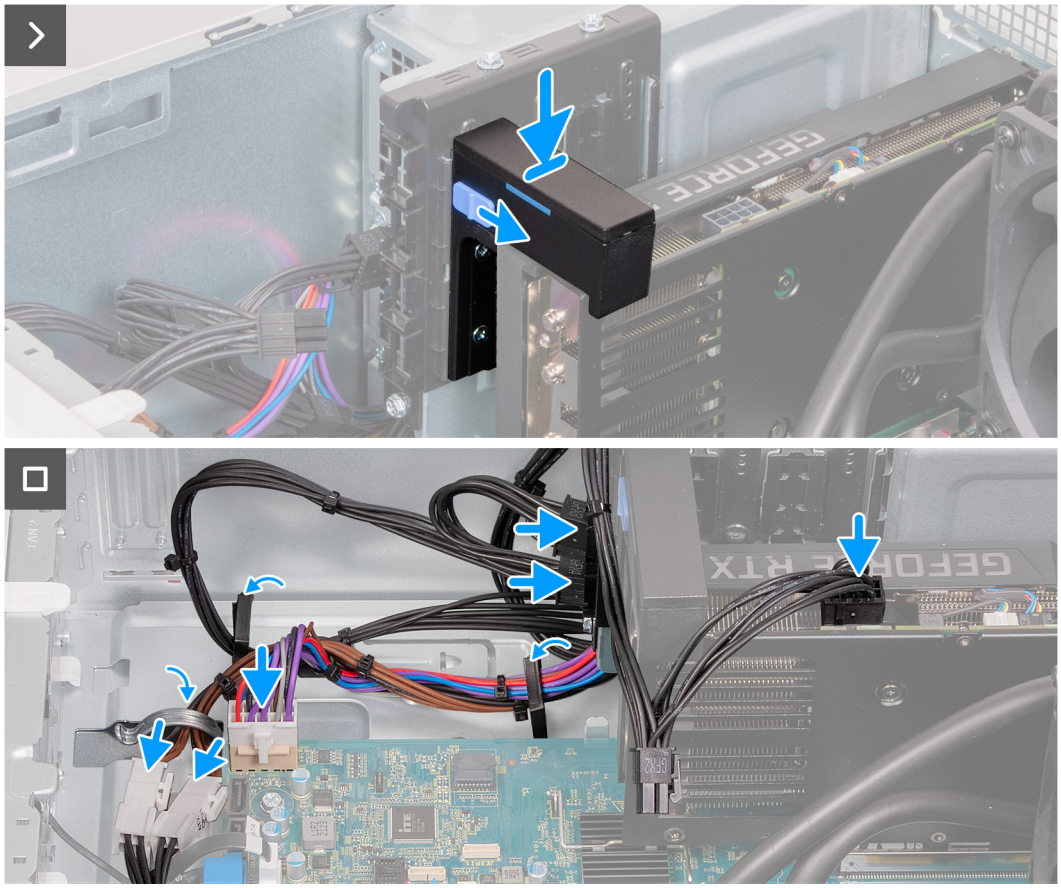
About this task

The following image(s) indicate the location of the power-supply unit and provides a visual representation of the installation procedure.

6x
#6-32







Steps

1. Place and align the screw holes on the power-supply unit to the screw holes on the chassis.
2. Replace the four screws (#6-32) that secure the power-supply unit to the chassis.
3. Place and align the screw holes on the power-supply cage to the screw holes on the chassis.
4. Replace the two screws (#6-32) that secure the power-supply cage to the chassis.
5. Insert the graphics-card support bracket onto the retaining rails.

   NOTE: The size and location of the graphic-card middle holder may vary depending on the graphics card configuration on your computer.

6. Push the graphics-card supporting bracket down until it locks into position.
7. Connect the system-board power cable to the system board.
8. Connect the power-supply cables to the processor-power cables.
9. Route the power-supply cables through the routing guides on the chassis.
10. Connect the graphics-card power cables to the power-supply unit.
11. Connect the graphics-card power cables to the graphics card.
12. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Processor fan and heat-sink assembly

Removing the processor fan and heat-sink assembly (65 W, air cooling)

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

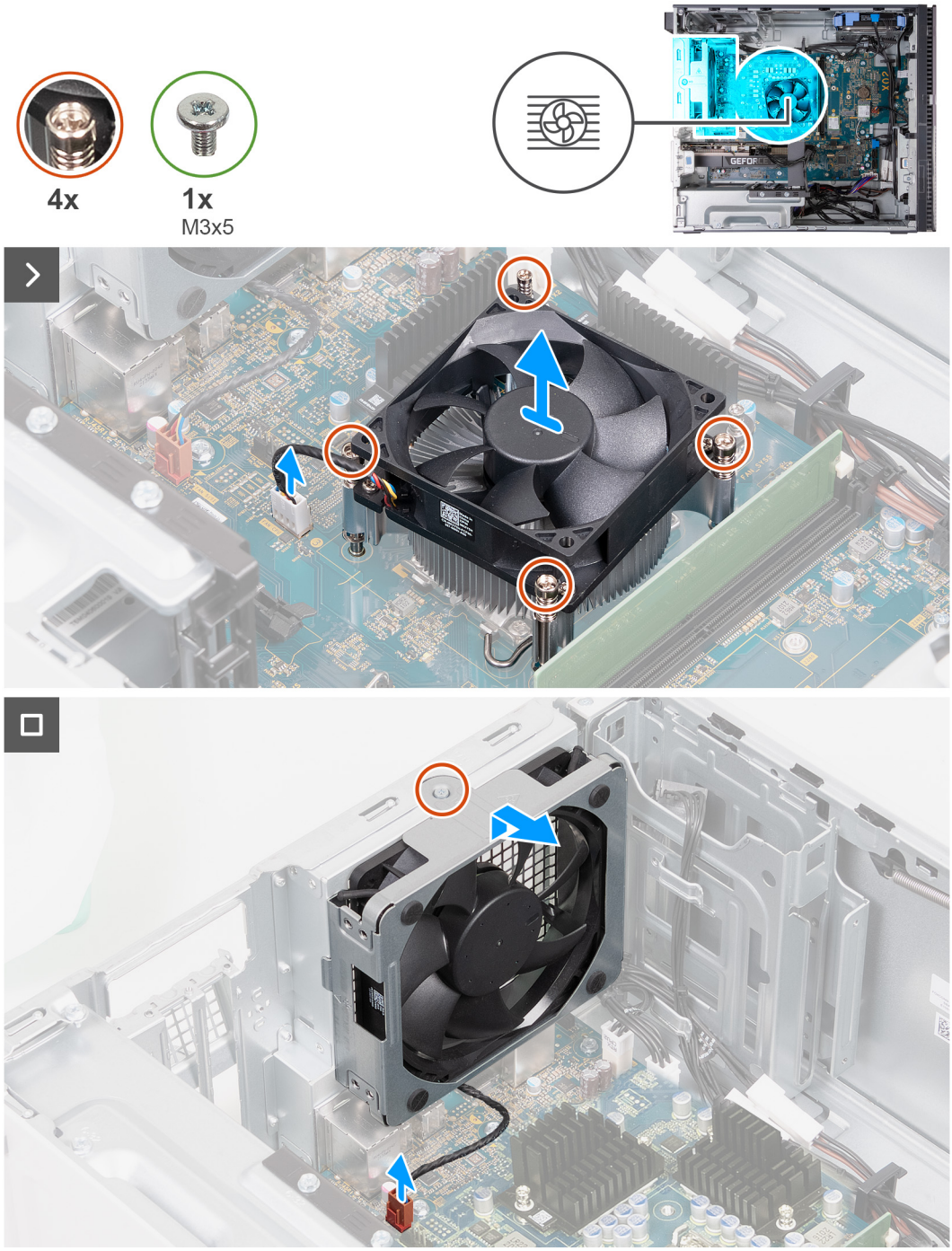
NOTE: The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

NOTE: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

NOTE: This procedure only applies for computers shipped with a 65 W processor.

NOTE: This procedure also includes the specific back-chassis fan that is installed on your computer with the use of the processor fan and heat-sink assembly (65 W, air cooling).

The following image(s) indicate the location of the processor fan and heat-sink assembly (65 W, air cooling) and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. In sequential order (1>2>3>4), loosen the four captive screws that secure the processor fan and heat sink assembly to the system board.
3. Disconnect the processor-fan cable from the system board.
4. Lift the processor fan and heat-sink assembly from the system board.
5. Disconnect the back-chassis fan cable from the system board.
6. Slide the back-chassis fan off the alignment posts and lift the back-chassis fan off the chassis.

Installing the processor fan and heat-sink assembly (65 W, air cooling)

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

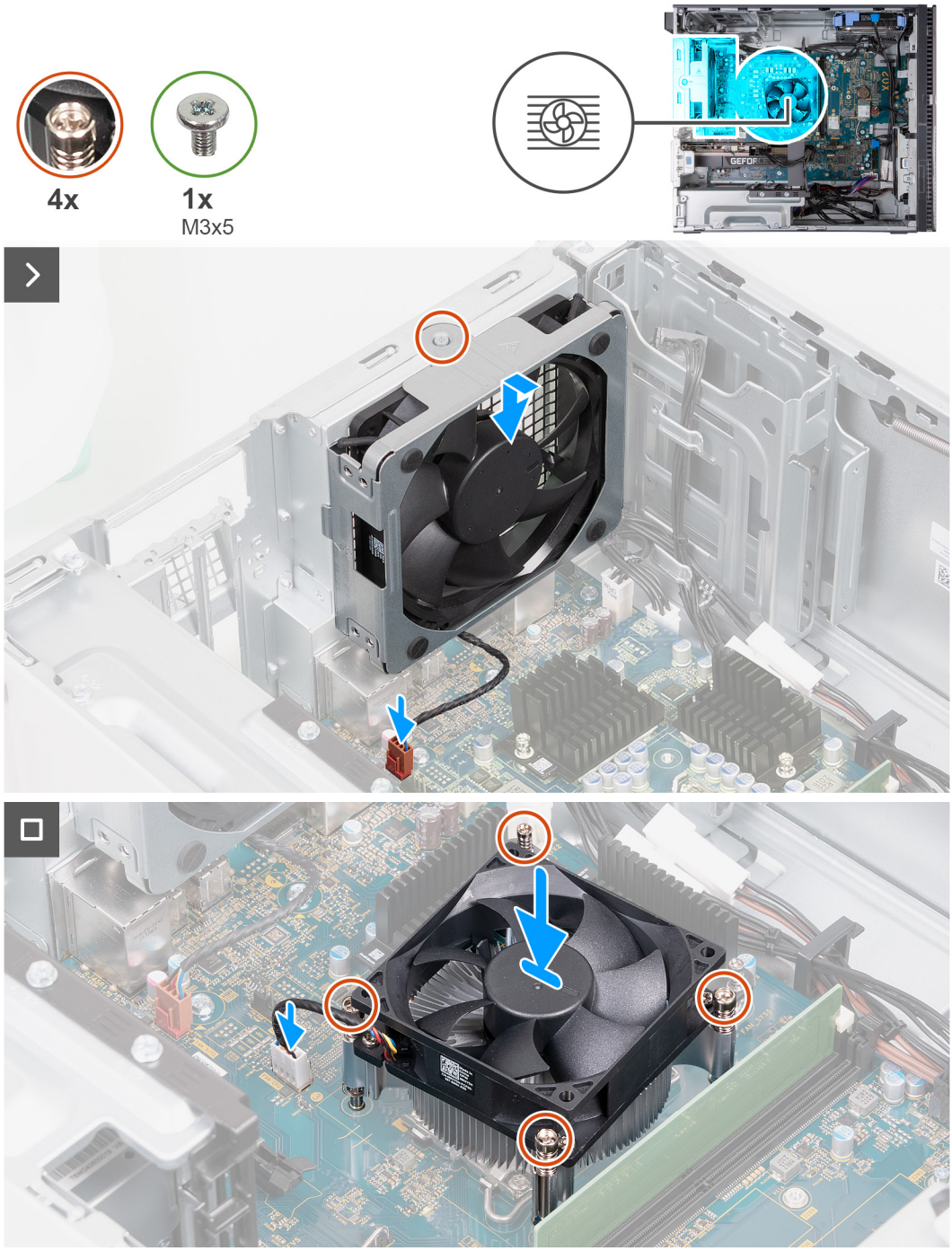
About this task

NOTE: If either the processor or the fan and heat-sink assembly is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.

NOTE: This procedure only applies for computers shipped with a 65 W processor.

NOTE: This procedure also includes the specific back-chassis fan that is installed on your computer with the use of the processor fan and heat-sink assembly (65 W, air cooling)

The following image(s) indicate the location of the processor fan and heat-sink assembly (65 W, air cooling) and provides a visual representation of the installation procedure.



Steps

1. Thread the alignment posts on the chassis through the rubber grommets on the back-chassis fan.
2. Connect the back-chassis fan cable to the system board.
3. Place the processor fan and heat-sink assembly on the system board and align the captive screws to the screw holes on the system board.
4. In reverse sequential order (4>3>2>1), tighten the four captive screws that secure the heat stink to the system board.
5. Connect the processor-fan cable to the system board.
6. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Removing the processor fan and heat-sink assembly (125 W, air cooling)

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

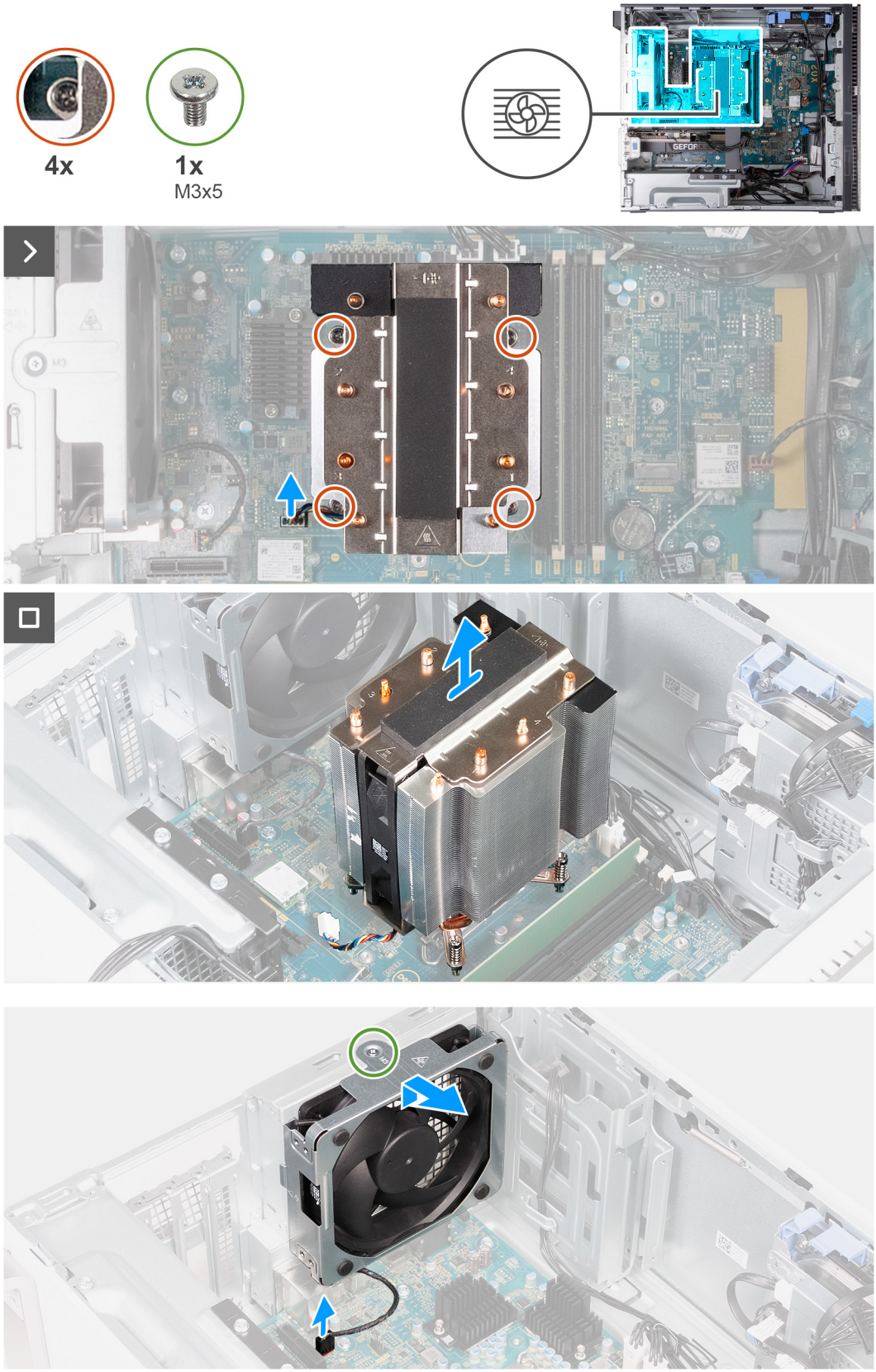
NOTE: The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

NOTE: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

NOTE: This procedure only applies for computers shipped with a 125 W processor.

NOTE: This procedure also includes the specific back-chassis fan that is installed on your computer with the use of the processor fan and heat-sink assembly (125 W, air cooling).

The following image(s) indicate the location of the processor fan and heat-sink assembly (125 W, air-cooling) and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Disconnect the processor fan and heat-sink assembly fan cable from the system board.
3. In sequential order(1>2>3>4), loosen the four captive screws that secure the heat sink to the system board.

4. Lift the processor fan and heat-sink assembly from the system board.
5. Disconnect the back-chassis fan cable from the system board.
6. Remove the screw (M3x5) that secures the back-chassis fan to the chassis.
7. Slide and lift the back-chassis fan off the chassis.

Installing the processor fan and heat-sink assembly (125 W, air cooling)

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

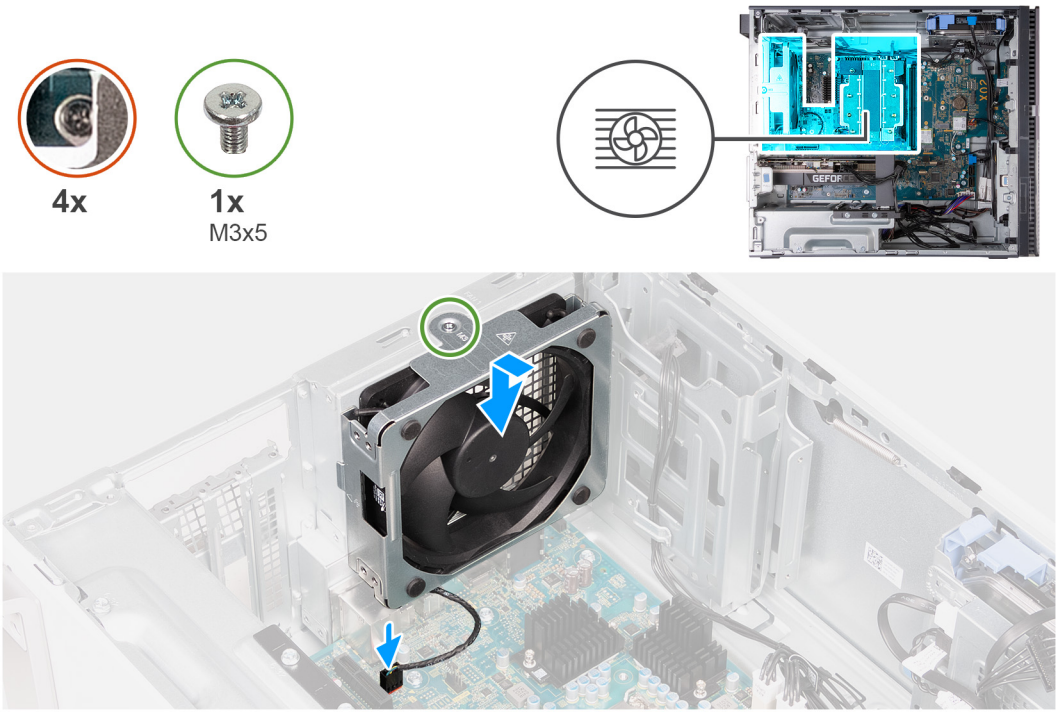
About this task

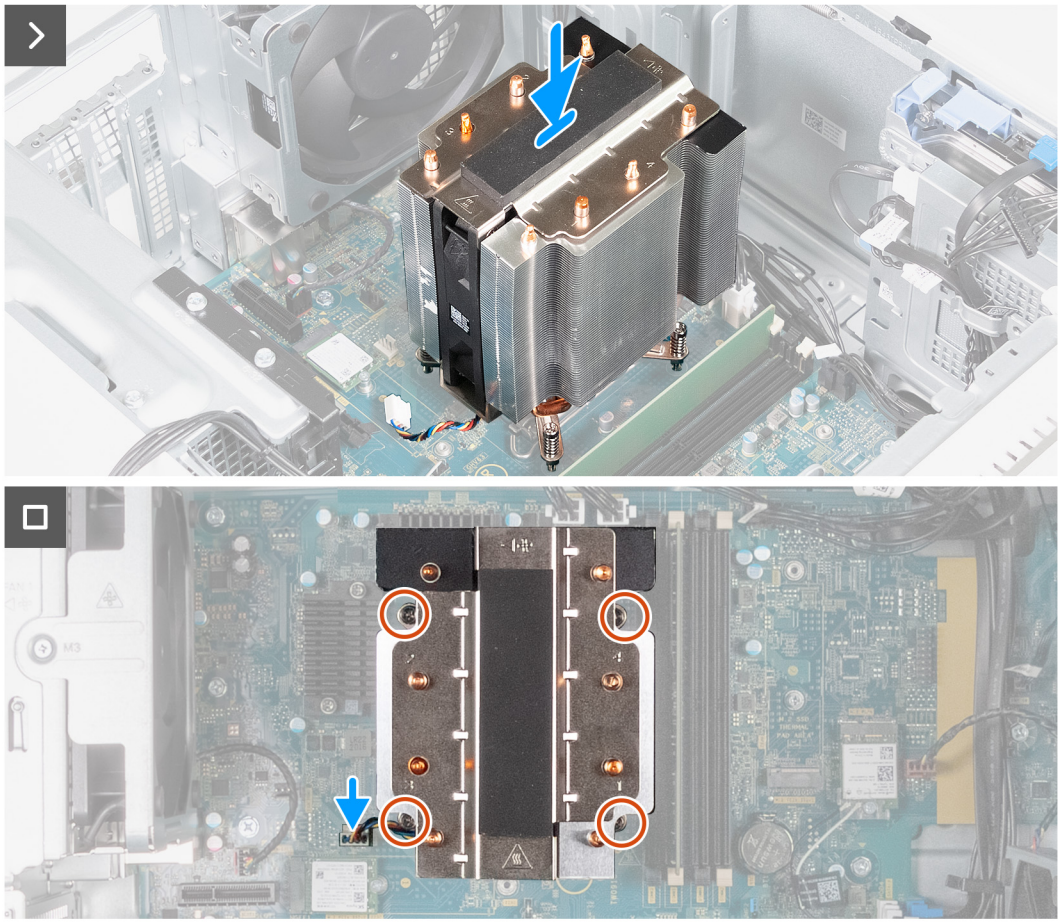
NOTE: If either the processor or the fan and heat-sink assembly is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.

NOTE: This procedure only applies for computers shipped with a 125 W processor.

NOTE: This procedure also includes the specific back-chassis fan that is installed on your computer with the use of the processor fan and heat-sink assembly (125 W, air cooling)

The following image(s) indicate the location of the processor fan and heat-sink assembly (125 W, air cooling) and provides a visual representation of the installation procedure.





Steps

1. Thread the alignment posts on the chassis through the rubber grommets on the back-chassis fan.
2. Align the screw hole on the back-chassis fan to the screw hole on the chassis.
3. Replace the screw (M3x5) that secures the back-chassis fan to the chassis.
4. Connect the back-chassis fan cable to the system board.
5. Place the heat sink on the system board and align the captive screws to the screw holes on the system board.
6. In reverse sequential order (4>3>2>1), tighten the four captive screws that secure the heat stink to the system board.
7. Connect the processor fan and heat-sink assembly fan cable to the system board.
8. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Removing the processor fan and heat-sink assembly (125 W, liquid cooler)

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.

About this task

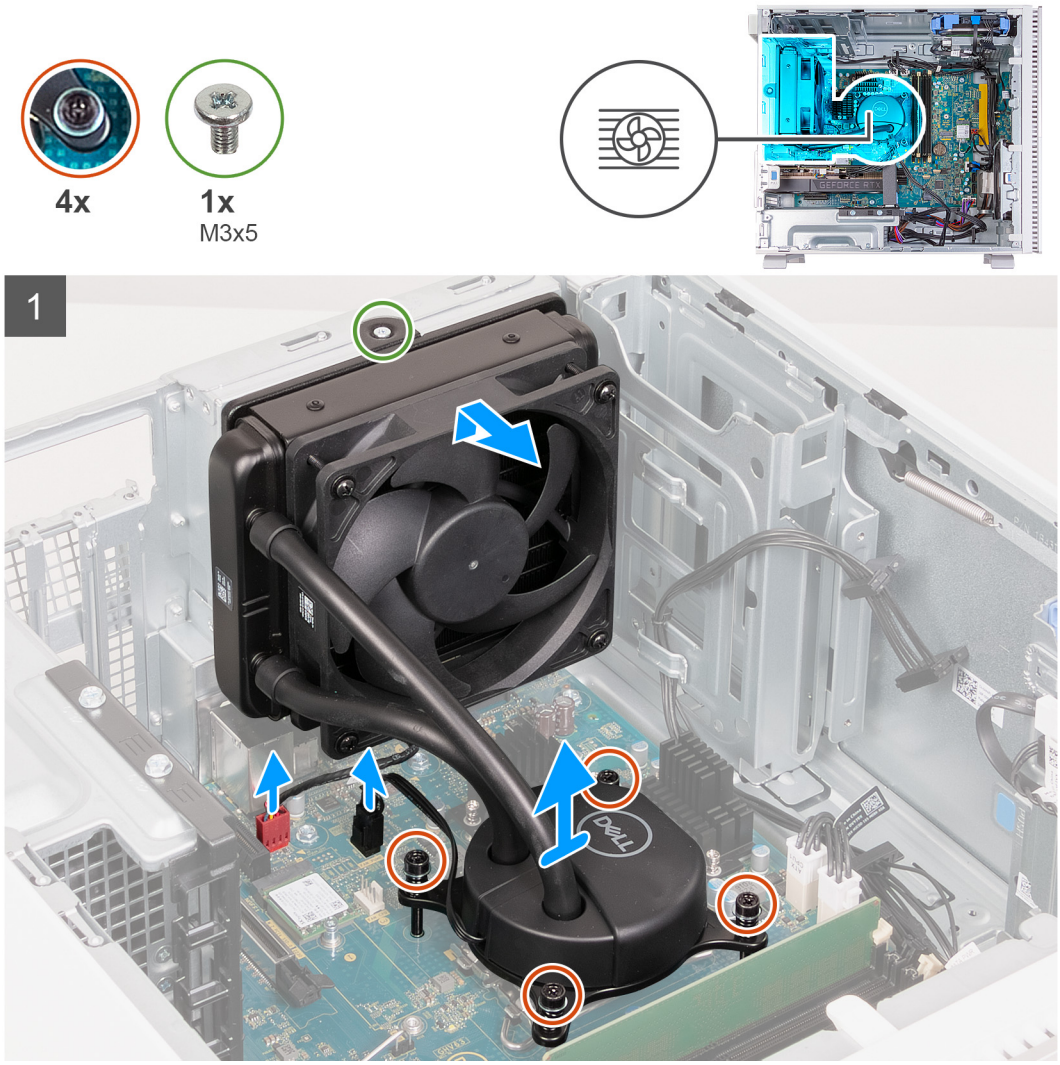
NOTE: The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

NOTE: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

NOTE: The processor fan and heat-sink assembly (125 W, liquid cooler) consists of one radiator fan and one heat sink that is linked by tubing containing water. Ensure that you do not damage the tubing when removing the processor fan and heat-sink assembly. If there is a leak, replace the processor fan and heat-sink assembly.

NOTE: This procedure only applies for computers shipped with a 125 W processor.

The following image(s) indicate the location of the processor fan and heat-sink assembly (125 W, liquid cooler) and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Disconnect the radiator-fan cable from the system board.
3. Disconnect the processor-fan pump cable from the system board.
4. In sequential order (1>2>3>4), loosen the four captive screws that secure the heat sink to the system board.
5. Remove the screw (M3x5) that secures the radiator fan to the chassis.
6. Slide the radiator fan off the alignment posts and lift the radiator fan from the chassis.
7. Lift the processor fan and heat-sink assembly from the system board.

Installing the processor fan and heat-sink assembly (125 W, liquid cooler)

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

NOTE: If either the processor or the fan and heat-sink assembly is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.

NOTE: The processor fan and heat-sink assembly (125 W, liquid cooler) consists of one radiator fan and one heat sink that is linked by tubing containing water. Ensure that there is no damage to the tubing and there is no leaks before replacing the processor fan and heat-sink assembly

NOTE: This procedure only applies for computers shipped with a 125 W processor.

The following image(s) indicate the location of the processor fan and heat-sink assembly (125 W, liquid cooler) and provides a visual representation of the installation procedure.

Steps

1. Place the heat sink on the system board and align the captive screws to the screw holes on the system board.
2. In reverse sequential order (4>3>2>1), tighten the four captive screws that secure the heat stink to the system board.

3. Thread the alignment posts on the chassis through the rubber grommets on the radiator fan.
4. Align the screw hole on the radiator fan to the screw hole on the chassis.
5. Replace the screw (M3x5) that secures the radiator fan to the chassis.
6. Connect the radiator-fan cable to the system board.
7. Connect the processor-fan pump cable to the system board.
8. Place the computer in an upright position.

Next steps

1. Install the left-side cover.
2. Follow the procedure in After working inside your computer.

Voltage-regulator heat sink

Removing the voltage-regulator heat sink

Prerequisites

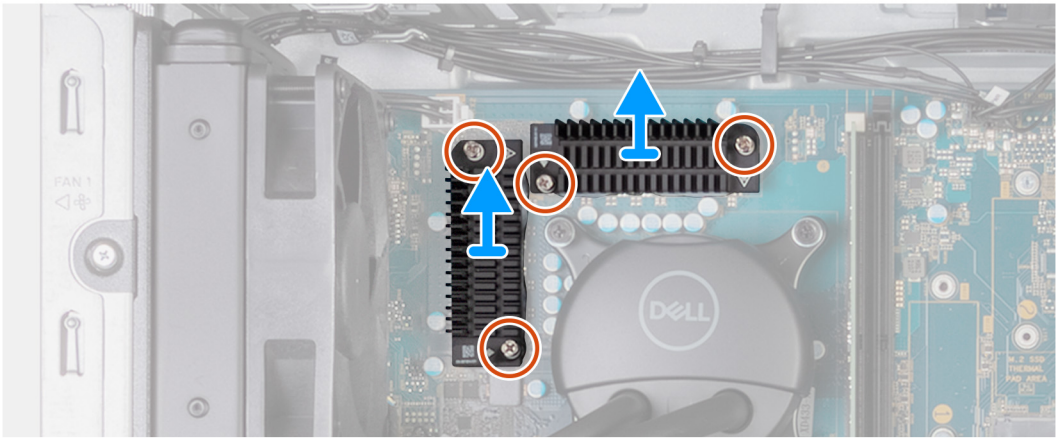
1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the processor fan and heat-sink assembly (125 W, air cooling), if applicable.

About this task

NOTE: The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

NOTE: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

The following image(s) indicate the location of the voltage-regulator heat sink and provides a visual representation of the removal procedure.



Steps

1. Place the computer on its side with the left side facing up.
2. Remove the four captive screws that secure the voltage-regulator heat sink to the system board.
3. Lift the voltage-regulator heat sink off the system board.

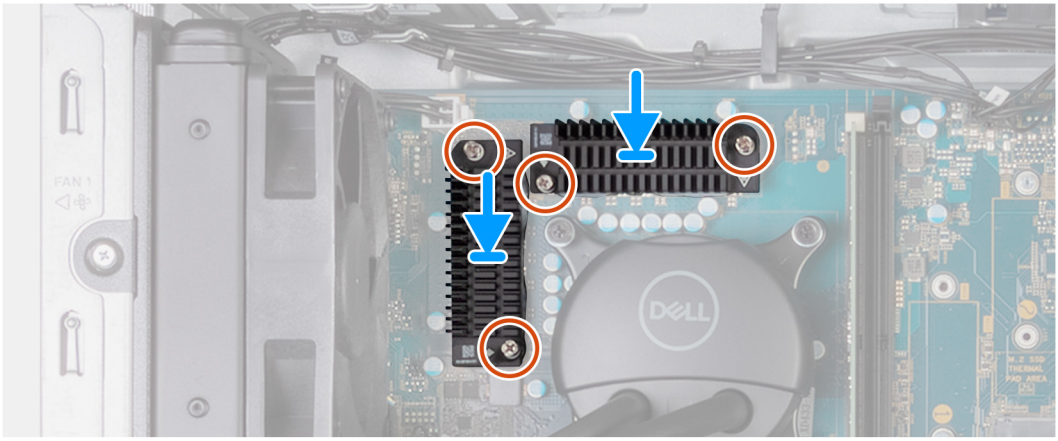
Installing the voltage-regulator heat sink

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the voltage-regulator heat sink and provides a visual representation of the installation procedure.



Steps

1. Place the voltage-regulator heat sink on the system board.
2. Align the captive screws on the voltage-regulator heat sink to the screw holes on the system board.
3. Tighten the four captive screws that secure the voltage-regulator heat stink to the system board.
4. Place the computer in an upright position.

Next steps

1. Install the processor fan and heat-sink assembly (125 W, air cooling), if applicable.
2. Install the left-side cover.
3. Follow the procedure in After working inside your computer.

Processor

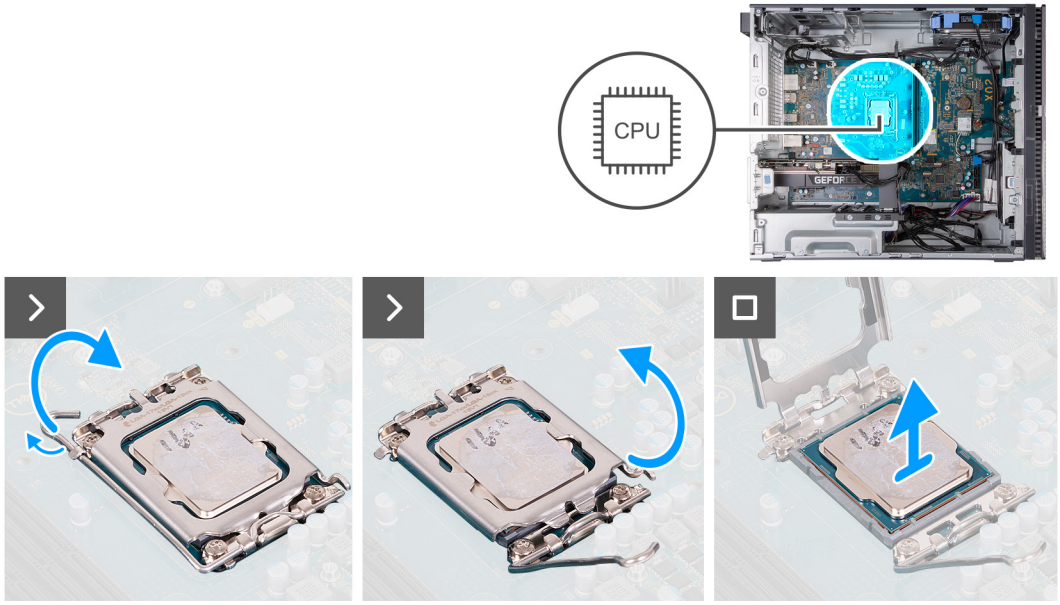
Removing the processor

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the fan and heat-sink assembly (65 W) or the fan and heat-sink assembly (125 W), whichever applicable.

About this task

The following image(s) indicate the location of the processor and provides a visual representation of the removal procedure.



Steps

1. Press the release lever down and then push it away from the processor to release it from the securing tab.
2. Extend the release lever completely and open the processor cover.

   CAUTION: When removing the processor, do not touch any of the pins inside the socket or allow any objects to fall on the pins in the socket.

3. Gently lift the processor from the processor socket.

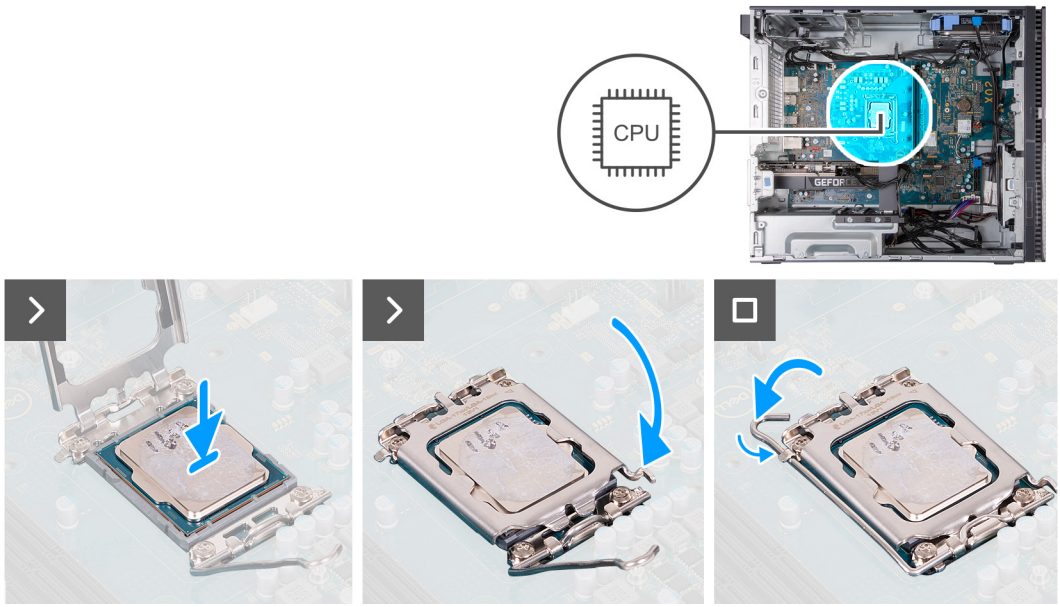
Installing the processor

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the processor and provides a visual representation of the installation procedure.



Steps

1. Ensure that the release lever on the processor socket is fully extended in the open position.

   NOTE: The pin-1 corner of the processor has a triangle that aligns with the triangle on the pin-1 corner on the processor socket. When the processor is properly seated, all four corners are aligned at the same height. If one or more corners of the processor are higher than the others, the processor is not seated properly.

2. Align the notches on the processor with the tabs on the processor socket and place the processor in the processor socket.

   CAUTION: Ensure that the processor-cover notch is positioned underneath the alignment post.

3. When the processor is fully seated in the socket, pivot the release-lever down and place it under the tab on the processor cover.

Next steps

1. Install the fan and heat-sink assembly (65 W) or the fan and heat-sink assembly (125 W), whichever applicable.
2. Install the left-side cover.
3. Follow the procedure in After working inside your computer.

System board

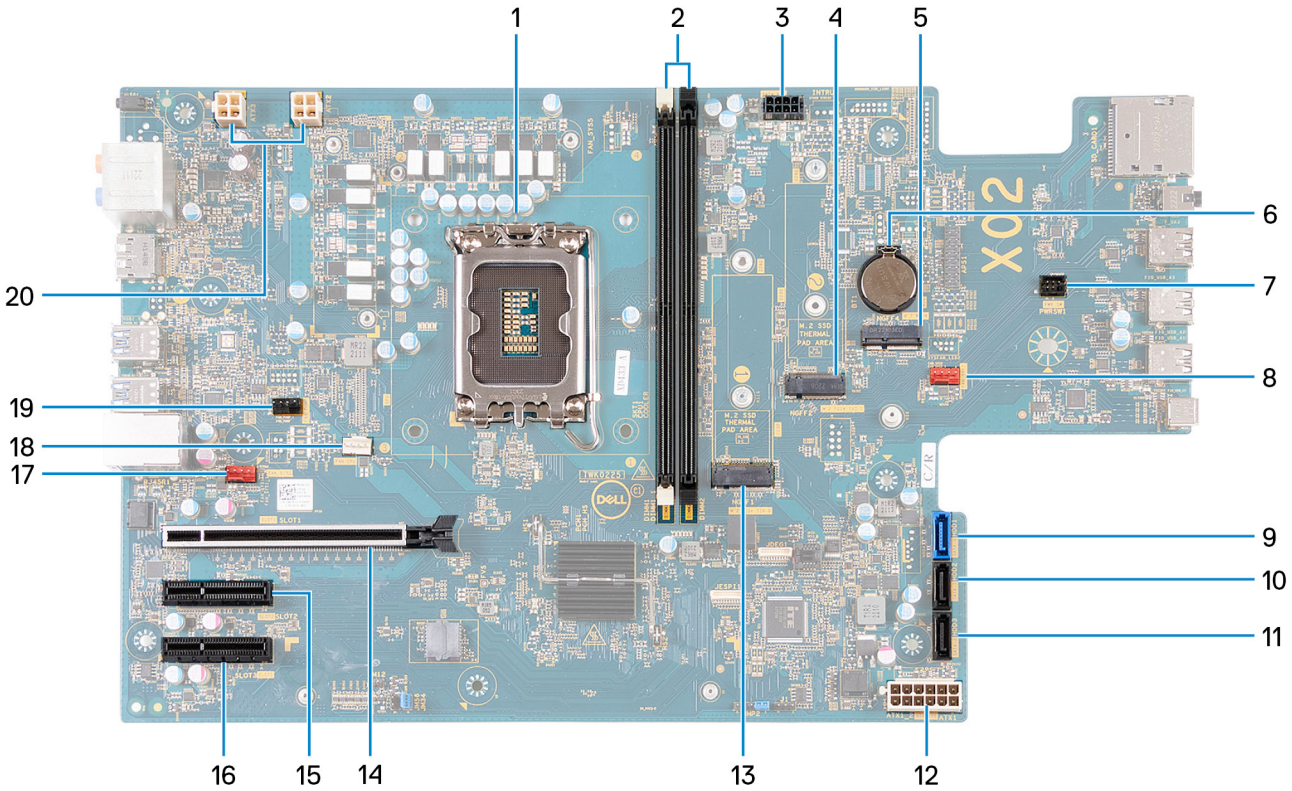
Removing the system board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the left-side cover.
3. Remove the front cover.
4. Remove the memory modules.
5. Remove the 2230 solid-state drive or the 2280 solid-state drive, whichever applicable.
6. Remove the graphics card, if applicable.
7. Remove the wireless card.
8. Remove the coin-cell battery.
9. Remove the voltage-regulator heat sink, if applicable.
10. Remove the fan and heat-sink assembly (65 W) or the fan and heat-sink assembly (125 W), whichever applicable.
11. Remove the processor.

About this task

The following image indicates the slots and connectors on your system board.

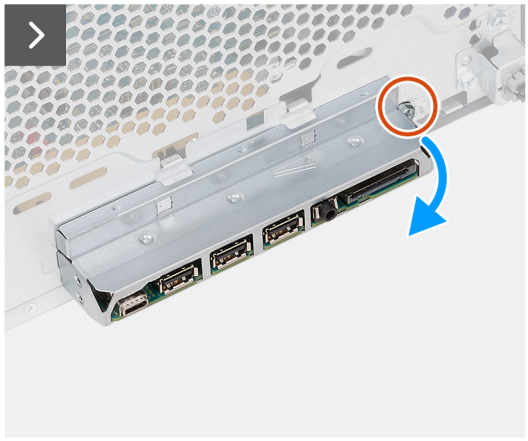


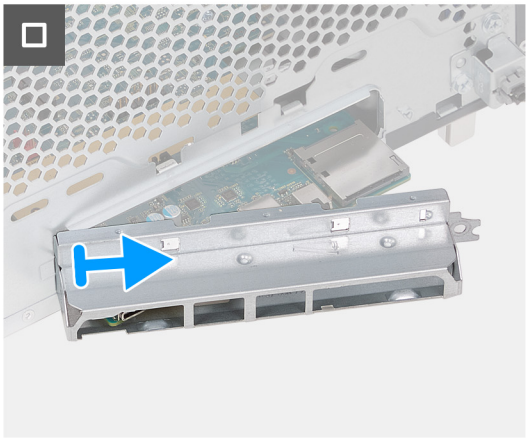
1. Processor socket
2. U-DIMM slots

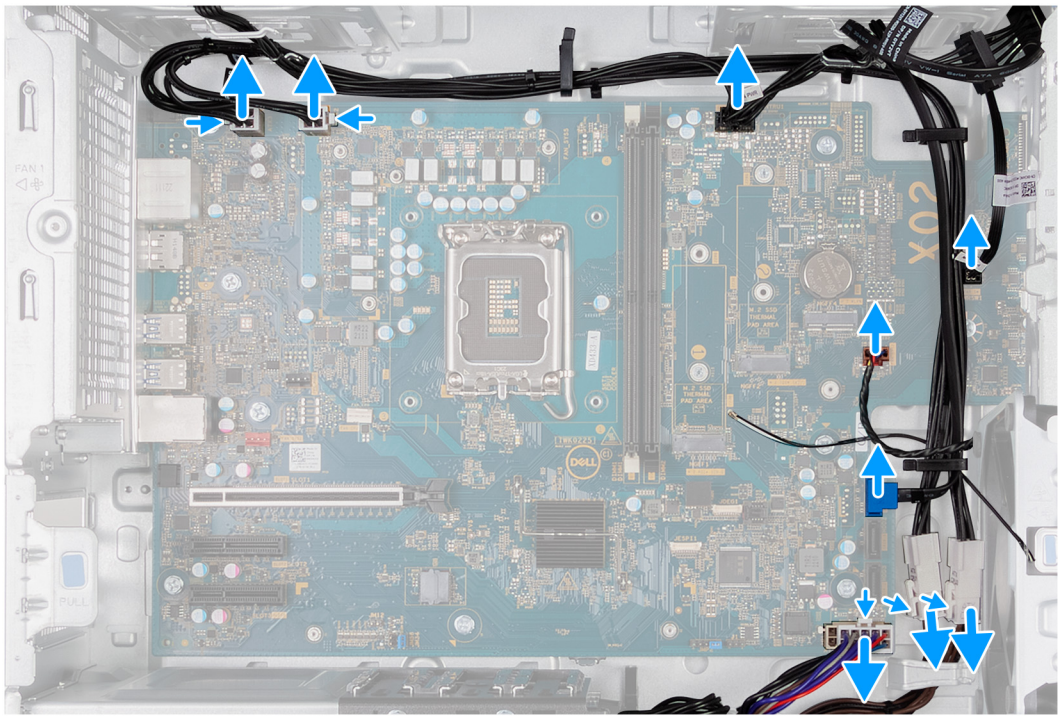
   From the left (a>b>c>d):
   a. DIMM 1
   b. DIMM 2
3. SATA power cable
4. M.2 2230/2280 solid-state drive slot
5. M.2 2230 wireless-card slot
6. Coin-cell battery socket
7. Power-button cable
8. Front chassis-fan cable
9. Hard-drive data cable (SATA 0)
10. Hard-drive data cable (SATA 1)
11. Hard-drive data cable (SATA 2)
12. System-board power cable
13. M.2 2230/2280 solid-state drive slot
14. PCIe x16 slot (SLOT 1)
15. PCIe x4 slot (SLOT 2)
16. PCIe x4 slot (SLOT 3)
17. Back chassis-fan cable
18. Processor fan and heat-sink fan cable
19. Processor liquid cooler pump cable
20. Processor-power cables

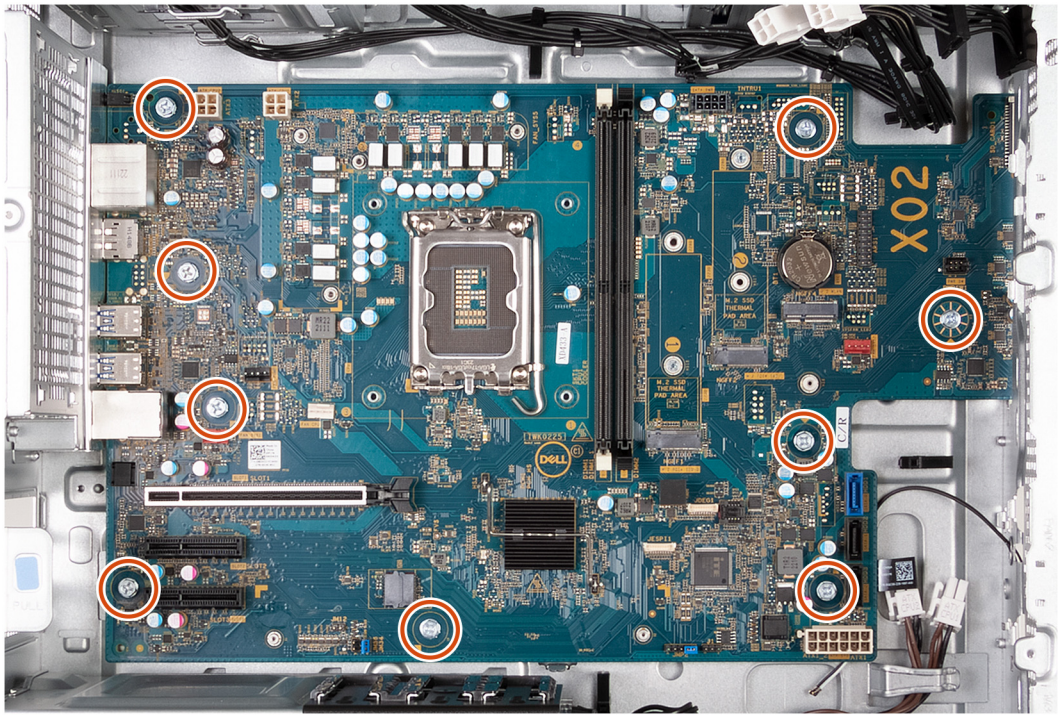
The following image(s) indicate the location of the system board and provides a visual representation of the removal procedure.

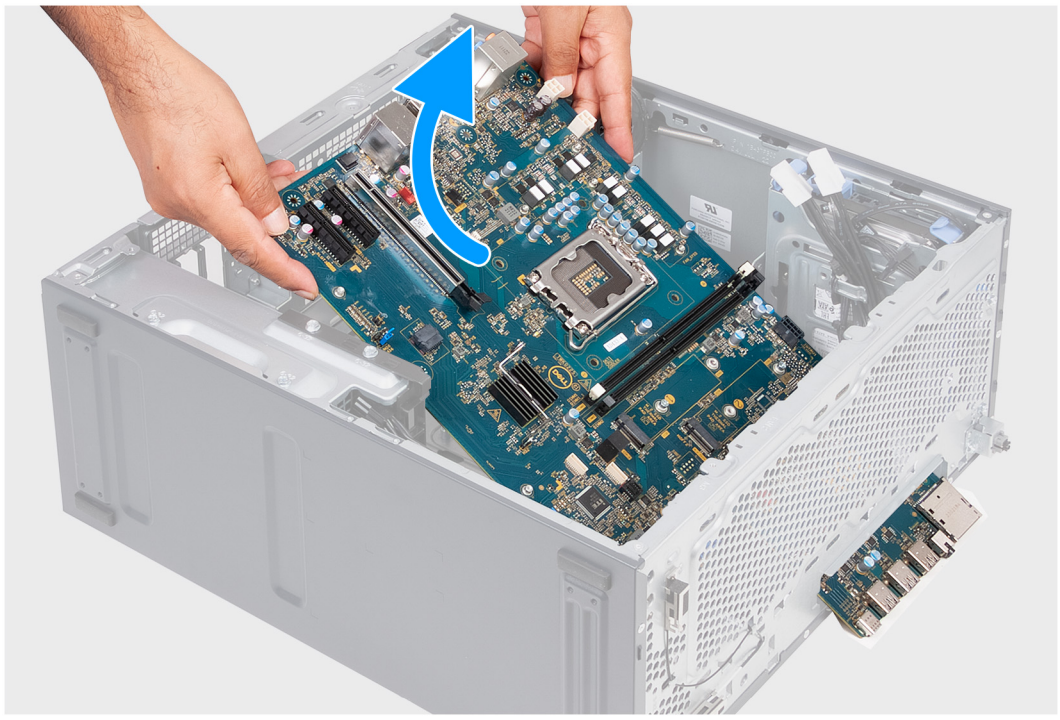
10x
#6-32











Steps

1. Remove the screw (#6-32) that secures the front I/O-bracket to the chassis.
2. Rotate and remove the front I/O-bracket from the chassis.
3. Disconnect all the cables that are connected to the system board.
4. Remove the nine screws (#6-32) that secure the system board to the chassis.
5. Lift the system board at an angle and remove it from the chassis.

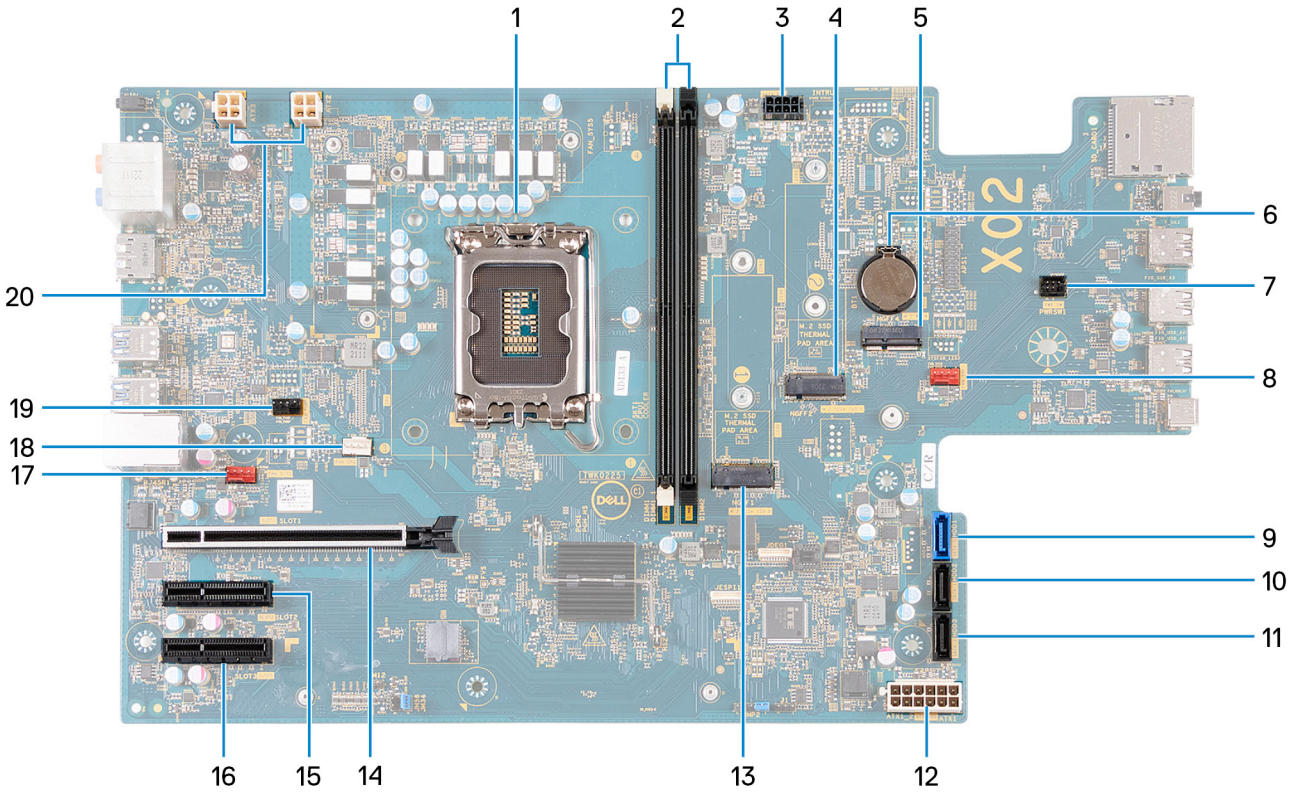
Installing the system board

Prerequisites

If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image indicates the slots and connectors on your system board.



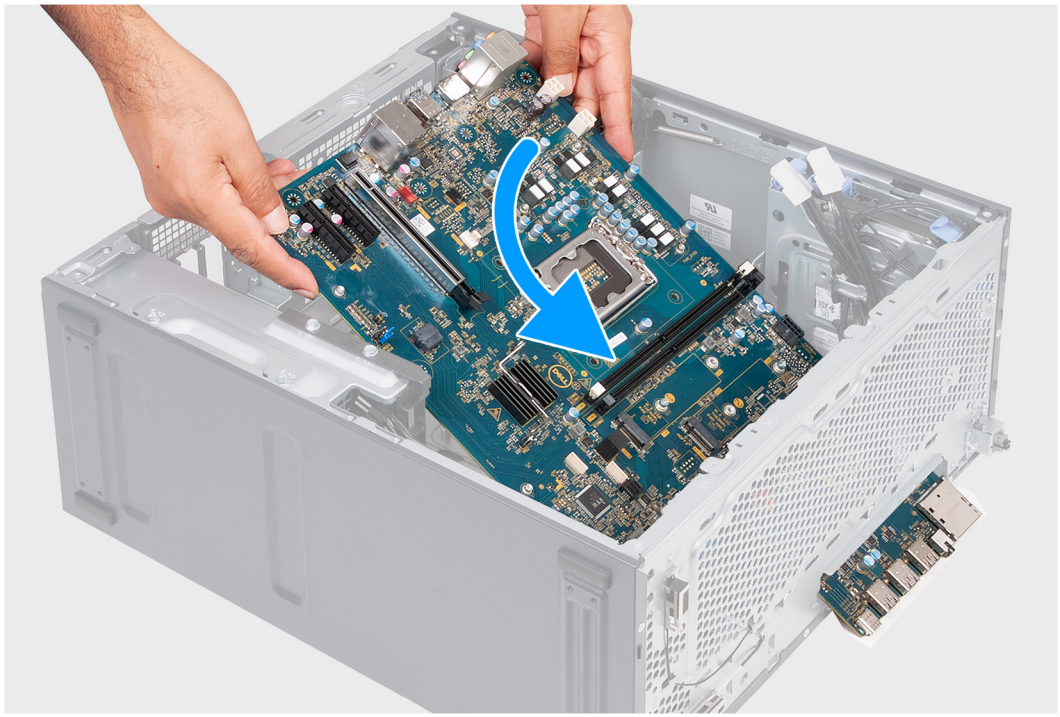
1. Processor socket
2. U-DIMM slots

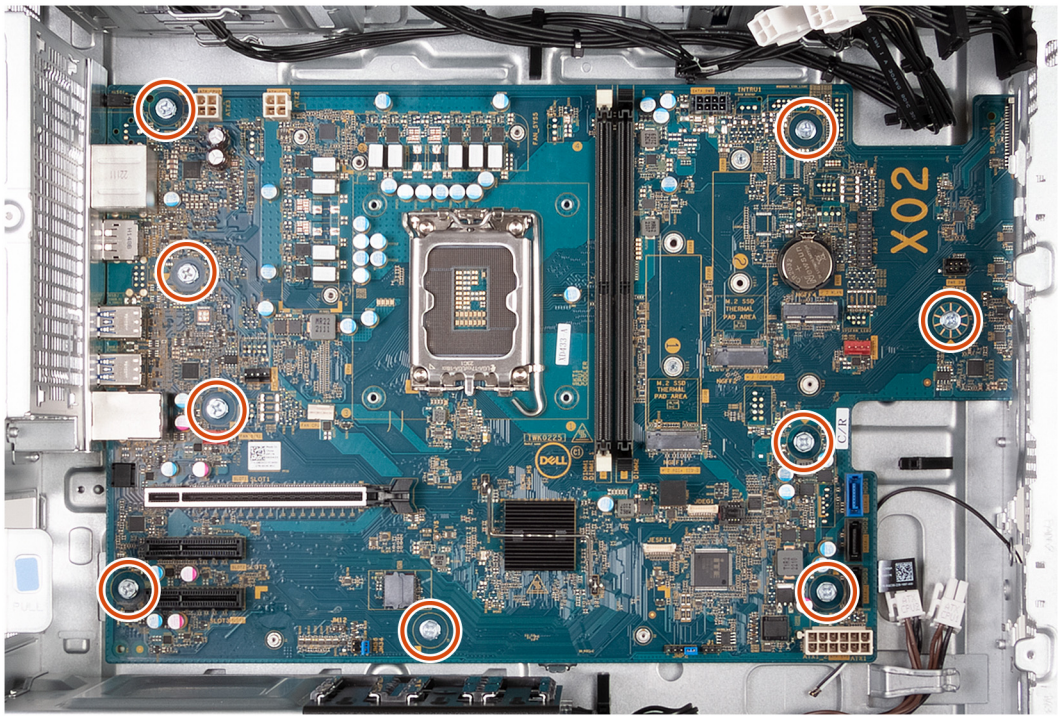
   From the left (a>b>c>d):
   a. DIMM 1
   b. DIMM 2

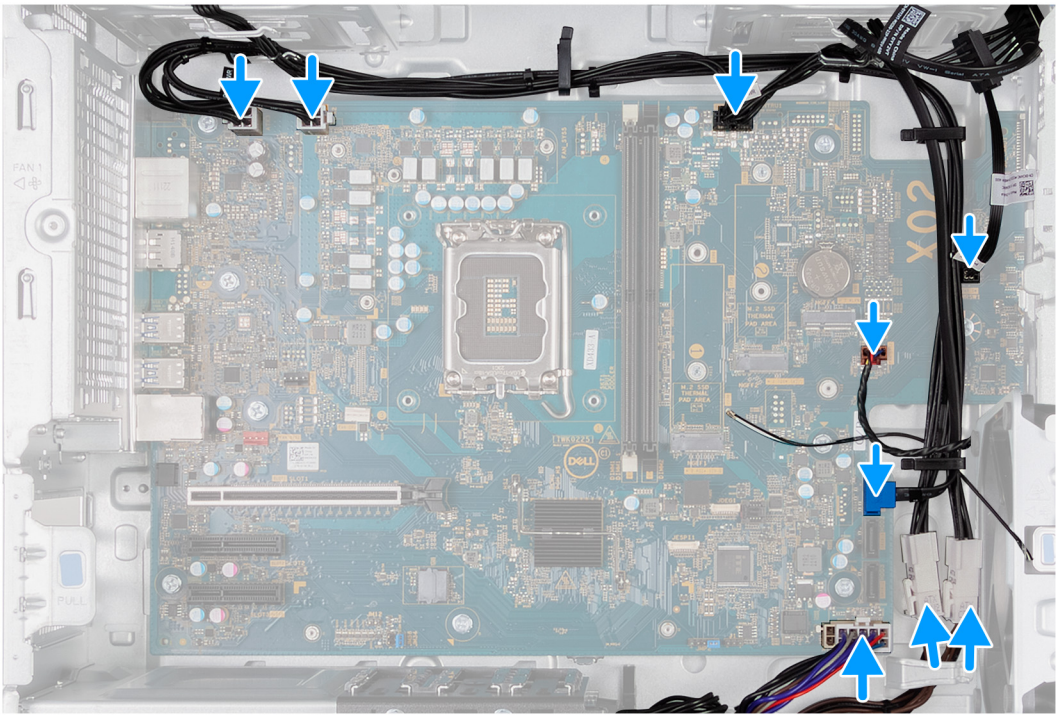
3. SATA power cable
4. M.2 2230/2280 solid-state drive slot
5. M.2 2230 wireless-card slot
6. Coin-cell battery socket
7. Power-button cable
8. Front chassis-fan cable
9. Hard-drive data cable (SATA 0)
10. Hard-drive data cable (SATA 1)
11. Hard-drive data cable (SATA 2)
12. System-board power cable
13. M.2 2230/2280 solid-state drive slot
14. PCIe x16 slot (SLOT 1)
15. PCIe x4 slot (SLOT 2)
16. PCIe x4 slot (SLOT 3)
17. Back chassis-fan cable
18. Processor fan and heat-sink fan cable
19. Processor liquid cooler pump cable

20. Processor-power cables

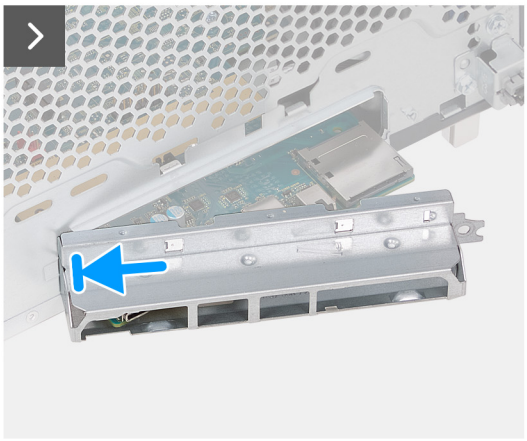
The following image(s) indicate the location of the system board and provides a visual representation of the installation procedure.

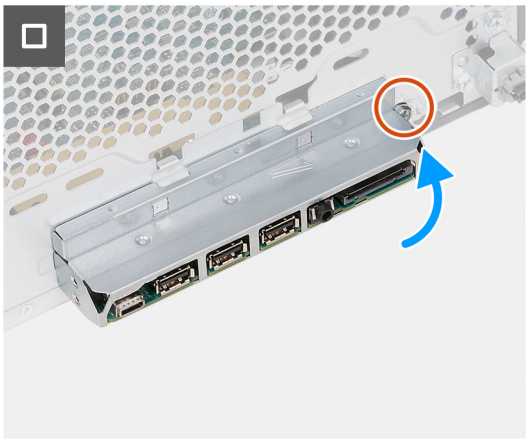






10x
#6-32





Steps

1. Slide the back I/O-ports on the system board into the front I/O-slots on the chassis and align the screw holes on the system board with the screw holes on the chassis.
2. Replace the nine screws (#6-32) that secure the system board to the chassis.
3. Route and connect all the cables that you disconnected from the system board.
4. Place and align the front I/O-bracket with I/O slot on the chassis.
5. Replace the screw (#6-32) that secures the front I/O-bracket to the chassis.

Next steps

1. Install the processor.

2. Install the fan and heat-sink assembly (65 W) or the fan and heat-sink assembly (125 W), whichever applicable.
3. Install the voltage-regulator heat sink, if applicable.
4. Install the coin-cell battery.
5. Install the wireless card.
6. Install the graphics card, if applicable.
7. Install the 2230 solid-state drive or the 2280 solid-state drive, whichever applicable.
8. Install the memory modules.
9. Install the front cover.
10. Install the left-side cover.
11. Follow the procedure in After working inside your computer.

3

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Base article, Drivers and Downloads FAQs 000123347.

4

System setup

CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not be displayed.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Entering BIOS setup program

About this task

Turn on (or restart) your computer and press F2 immediately.

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Table 3. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. **NOTE:** For the standard graphics browser only.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

Boot sequence

Boot sequence allows you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key

- Bring up the one-time boot menu by pressing F12 key

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive (if available)

  NOTE: XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

The boot sequence screen also displays the option to access the System Setup screen.

One Time Boot menu

To enter **One Time Boot menu**, turn on your computer, and then press F12 immediately.

NOTE: It is recommended to shutdown the computer if it is on.

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

- Removable Drive (if available)
- STXXXX Drive (if available)

  NOTE: XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

The boot sequence screen also displays the option to access the System Setup screen.

System setup options

NOTE: Depending on your computer and its installed devices, the items listed in this section may or may not appear.

Table 4. System setup options—Main menu

Main		
	System Time	Displays the current time in hh:mm:ss format.
	System Date	Displays the current date in mm/dd/yy format.
	BIOS Version	Displays the BIOS version number.
	Product Name	Displays the product name. Default: XPS 8960
	Service Tag	Displays the service tag of your computer.
	Asset Tag	Displays the asset tag of your computer.
	CPU Type	Displays the processor type.
	CPU Speed	Displays the speed of the processor.
	CPU ID	Displays the processor identification code.
CPU Cache		
	L1 Cache	Displays the processor L1 cache size.
	L2 Cache	Displays the processor L2 cache size.
	L3 Cache	Displays the processor L3 cache size.
	Discrete Graphics 1	Displays the primary discrete graphics of your computer.

Table 4. System setup options—Main menu (continued)

Main	
First HDD	Allows you to configure the first HDD.
M.2 PCIe SSD-0	Enables or disables the M.2 PCIe SSD-0.
System Memory	Displays the total computer memory installed.
Memory Speed	Displays the memory speed.

Table 5. System setup options—Advanced menu

Advanced	
Intel(R) SpeedStep	
Intel(R) SpeedStep	Enables or disables Intel(R) SpeedStep. Default: Enabled
Intel Speed Shift Technology	
Intel Speed Shift Technology	Enables or disables Intel Speed Shift Technology. Default: Enabled
HyperThread Control	
HyperThread Control	Enables or disables HyperThread Control. Default: Enabled
Multiple-Cores Support	
Multiple-Cores Support	Allows you to configure Multiple-Core support. Default: All
Multiple Atom cores	
Multiple Atom cores	Allows you to configure Multiple Atom cores. Default: All
Trusted Execution	
Trusted Execution	Allows you to enable or disable Trusted Execution. Default: Disabled
Integrated NIC	
Integrated NIC	Allows you to enable or disable the integrated NIC. Default: Enabled
SATA/NVME Operation mode	
SATA/NVME Operation mode	Sets the operating mode of the integrated storage device controller. Default: RAID on
PCIe Resizable Base Address Register (BAR)	
PCIe Resizable Base Address Register (BAR)	Allows you to enable or disable the Resizable Base Address Register (BAR) feature. Default: Enabled
IPv4 HTTP Support	
IPv4 HTTP Support	Allows you to enable or disable IPv4 HTTP Support. Default: Disabled
IPv6 HTTP Support	

Table 5. System setup options—Advanced menu (continued)

Advanced	
IPv6 HTTP Support	Allows you to enable or disable IPv6 HTTP Support. Default: Disabled
USB Configuration	
Front USB Ports	Allows you to enable or disable the Front USB ports. Default: Enabled
Rear USB Ports	Allows you to enable or disable the Rear USB ports. Default: Enabled
Power Options	
AC Recovery	Sets what action the computer takes when power is restored. Default: Power Off
Deep Sleep Control	Allows you to define the controls when Deep Sleep is enabled. Default: Enabled in S4 and S5
USB Wake Support	Allows you to enable the USB devices to wake the system from Standby. Default: Enabled
USB PowerShare in S4/S5 state	Allows you to charge external devices. Default: Disabled
USB PowerShare in Sleep State	Allows you to enable front the USB devices to wake the system from sleep state. Default: Normal
Auto Power On	Allows you to enable or disable Auto Power On. Default: Disabled
Auto Power On Mode	Allows you to set the computer to turn on automatically every day or on a preselected date. This option can be configured only if the Auto Power On mode is set to Enabled Everyday or Selected Day. Default: Selected Day
Auto Power On Date	Allows you to set the date on which the computer must turn on automatically. This option can be configured only if the Auto Power On mode is set to Enabled 1 to 31. Default: 15
Auto Power On Time	Allows you to set the time at which the computer must turn on automatically. This option can be configured only if the Auto Power On mode is set to Enabled hh:mm:ss. Default: 12:30:30
Numlock Key	Allows you to set the status of the Num Lock key during boot to On or Off. Default: Enabled
Performance Options	
Overclocking Feature	Allows you to enable or disable the Overclocking Feature. Default: Disabled
Overclocking Feature	

Table 5. System setup options—Advanced menu (continued)

Advanced	
Core Over Clocking Level#	Allows you to configure the Core Over Clocking Level. Default: Disabled
Customization	
Core Ratio Limit Override	Allows you to configure the Core Ratio Limit Override.
Core Voltage Override	Allows you to configure the Core Voltage Override.
Long Duration PWR Limit	Allows you to configure the Long Duration PWR Limit.
Short Duration PWR Limit	Allows you to configure the Short Duration PWR Limit.
XMP Memory	Allows you to configure the XMP Memory. Default: Disabled
Maintenance	
Data Wipe on next boot	When enabled, the BIOS will schedule a data wipe cycle for all storage devices that are connected to the system board on the next reboot. Default: Disabled
BIOS Recovery from Hard Drive	Enables the computer to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. **NOTE:** BIOS Recovery from Hard Drive is not available for Self-encrypting drives (SED). Default: Enabled
BIOS Auto-Recovery	When enabled, the autorecovery will be performed if BIOS image integrity check fails and there is a a recovery image on the hard drive. **NOTE:** BIOS Auto-Recovery is not possible from other media. Default: Disabled
SupportAssist System Resolution	Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery tool. Default: 2
Auto OS Recovery Threshold	Allows you to configure the Auto OS Recovery Threshold. Default: 2
SupportAssist OS Recovery	Allows you to enable or disable the SupportAssist OS Recovery. Default: Enabled

Table 6. System setup options—Security menu

Security	
Unlock Setup Status	Displays the unlock setup status. Default: Unlocked
Admin Password Status	Displays whether the admin password is set. Default: Not Set
System Password Status	Displays whether the system password is set.

Table 6. System setup options—Security menu (continued)

Security	
	Default: Not Set
Service Tag	Creates a system Service Tag that can be used by an IT administrator to uniquely identify a particular system. Once set in BIOS, the Service Tag cannot be changed.
Admin Password	Enables the user to set, change, or delete the admin password.
System Password	Enables the user to set, change, or delete the system password.
Password Change	Allows you to enable or disable password change on the computer.
	Default: Permitted
Absolute	Enable or disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software.
	Default: Enabled
Absolute Status	Enables you to activate or deactivate the Absolute Persistence Module service.
	Default: Deactivate
Firmware TPM	Displays the firmware TPM state.
	Default: Enabled
PPI Bypass for Clear Command	Enable or disable the TPM Physical Presence Interface (PPI). When enabled, this setting will allow the OS to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately.
	Default: Disabled
UEFI Firmware Capsule Updates	Enables or disables BIOS updates through UEFI capsule update packages.
	Default: Enabled
Windows SMM Security Mitigations Table (WSMT)	Enables or disables Windows SMM Security Mitigation protections.
	Default: Disabled
Enable Pre-Boot DMA Protection	Enables or disables Pre-Boot DMA Protection.
	Default: Enabled
Enable OS Kernel DMA Support	Enables or disables OS Kernel DMA Support.
	Default: Enabled
Secure Boot	
Secure Boot	Enables secure boot using only validated boot software.
	Default: Disabled
Secure Boot Mode	Modifies the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. Deployed Mode should be selected for normal operation of Secure Boot.
	Default: Deployed Mode
Expert Key Management	

Table 6. System setup options—Security menu (continued)

Security	
Custom Mode	Allows you to enable or disable Custom Mode. When enabled, it allows the PK, KEK, db, and dbx security key databases to be modified. Default: Disabled
Enable Microsoft UEFI CA	Allows you to enable or disable Microsoft UEFI CA. Default: Enabled
PK KEK db dbx Reset all Keys Delete all Keys	Allows for selection of key database. • Delete All Keys will delete the selected key. • Reset All Keys will reset all four keys to their default settings.

Table 7. System setup options—Boot menu

Boot	
Boot List Option	Displays the available boot devices. Default: UEFI
File Browser Add Boot Option	Allows you to set the boot path in the boot option list.
File Browser Del Boot Option	Allows you to delete the boot path in the boot option list.
Boot Option Priorities	Displays the available boot devices.
Boot Option #1	Displays the first boot device. Default: Windows Boot Manager.
Boot Option #2	Displays the second boot device. Default: Onboard NIC (IPV4)
Boot Option #3	Displays the third boot device. Default: Onboard NIC (IPV6)

Table 8. System setup options—Exit menu

Save & Exit	
Save Changes and Reset	Allows you to exit system setup and save your changes.
Discard Changes and Reset	Allows you to exit system setup and load previous values for all system setup options.
Restore Defaults	Allows you to load default values for all system setup options.
Discard Changes	Allows you to exit your changes.
Save Changes	Allows you to save your changes.

System and setup password

Table 9. System and setup password

Password type	Description
System password	Password that you must enter to log in to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

You can create a system password and a setup password to secure your computer.

CAUTION: The password features provide a basic level of security for the data on your computer.

CAUTION: Anyone can access the data that is stored on your computer if it is not locked and left unattended.

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

About this task

To enter the system setup, press F12 immediately after a power-on or reboot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

Prerequisites

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and/or Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

About this task

To enter the System Setup, press F12 immediately after a power-on or reboot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, update, or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

   NOTE: If you change the System and/or Setup password, reenter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

5. Press Esc and a message prompts you to save the changes.
6. Press Y to save the changes and exit from System Setup.
   The computer restarts.

Real Time Clock (RTC) reset

The Real Time Clock (RTC) reset function allows you or the service technician to recover the recently launched model Dell computers from **No POST/No Boot/No Power** situations. You can initiate the RTC reset on the computer from a power-off state only if it is connected to AC power. Press and hold the power button for 30 seconds. The computer RTC reset occurs after you release the power button.

NOTE: The RTC reset is aborted if the power button is held for less than 25 seconds or more than 40 seconds.

The RTC reset restores the BIOS to defaults and resets the computer's date and time. The computer restarts several times during the reset process. Depending on how the computer is configured, you may see LED indications during the period the power button is held and after it is released. Once the reset is complete, the computer restarts and the Dell logo appears indicates reset success.

CAUTION: Once RTC reset is complete, the computer may remain in a no-boot status until the time, date, and other BIOS settings are correctly set to boot in Windows. Failing to boot immediately after a reset does not mean that the reset has failed. You must restore the previous BIOS settings, such as the SATA Operation mode (ex. RAID On AHCI) for the computer to reboot normally.

The following items are unaffected by the RTC reset:

- TPM (remains on and enabled if it was in that state prior to RTC reset)
- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password
- System Password
- Hard drive Password
- Key Databases
- System Logs

The following items may or may not reset based on your custom BIOS setting selections:

- Boot List
- Secure Boot Enable
- Allow BIOS Downgrade
- Password clear

The Master System Password is used to clear the admin and computer password.

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

NOTE: For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

Clearing BIOS (System Setup) and System passwords

About this task

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

NOTE: For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

Updating the BIOS

Updating the BIOS in Windows

Steps

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

   NOTE: If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.

   For more information about how to update the system BIOS, search in the Knowledge Base Resource at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

Steps

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, search the Knowledge Base Resource at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article 000131486 at www.dell.com/support.

Updating the BIOS from the F12 One Time Boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 **One Time Boot** menu.

About this task

BIOS Update

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F12 **One Time Boot** menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 **One Time Boot** Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, then the BIOS supports this BIOS update option.

NOTE: Only computers with BIOS Flash Update option in the F12 **One Time Boot** menu can use this function.

Updating from the One Time Boot menu

To update your BIOS from the F12 **One Time Boot** menu, you need the following:

- USB drive formatted to the FAT32 file system (key does not have to be bootable)
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive
- AC power adapter that is connected to the computer
- Functional computer battery to flash the BIOS

Perform the following steps to perform the BIOS update flash process from the F12 menu:

CAUTION: Do not turn off the computer during the BIOS update process. The computer may not boot if you turn off your computer.

Steps

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the **One Time Boot** Menu, select BIOS Update using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file**.
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS**. The computer restarts to flash the BIOS.
7. The computer will restart after the BIOS update is completed.

5

Troubleshooting

Locate the Service Tag or Express Service Code of your Dell computer

Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, we recommend entering the Service Tag or Express Service Code at www.dell.com/support.

For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer.

SupportAssist diagnostics

About this task

The SupportAssist diagnostics (previously known as ePSA diagnostics) performs a complete check of your hardware. The SupportAssist diagnostics is embedded in the BIOS and is launched by it internally. The SupportAssist diagnostics provides a set of options for particular devices or device groups. It allows you to:

- Run tests automatically or in an interactive mode.
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options and provide extra information about the failed device(s)
- View status messages that indicate if the tests are completed successfully
- View error messages that indicate if problems were encountered during the test

NOTE: Some tests are meant for specific devices and require user interaction. Ensure that you are present in front of the computer when the diagnostic tests are performed.

For more information, see SupportAssist Pre-Boot System Performance Check.

System-diagnostic lights

The power-status light indicates the power status of the computer. These are the power states:

Solid white—Computer is in S0 state. This is the normal power state of the computer.

Blinking white—Computer is in a low-power state, S3. This does not indicate a fault.

Solid amber—Computer is experiencing a boot failure, including the power-supply unit.

Blinking amber—Computer is experiencing a boot failure but the power-supply unit is functioning correctly.

Off—Computer is in sleep state, hibernation mode, or turned off.

The power-status light may also blink amber or white according to predefined "beep codes" indicating various failures.

For example, the power and battery-status light blinks amber two times followed by a pause, and then blinks white three times followed by a pause. This 2,3 pattern continues until the computer is turned off, indicating no memory or RAM is detected.

The following table shows different power and battery-status light patterns and associated problems.

NOTE: The following diagnostic light codes and recommended solutions are intended for Dell service technicians to troubleshoot problems. You should only perform troubleshooting and repairs as authorized or directed by the Dell technical support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

Table 10. Diagnostic light codes

Diagnostic light codes (Amber, White)	Problem description	Recommended solutions
1,2	Unrecoverable SPI Flash Failure	Replace the system board.
2,1	CPU configuration or CPU failure	Run the Intel CPU diagnostics tools. If problem persists, replace the system board.
2,2	System board: BIOS or Read-Only Memory (ROM) failure	Flash latest BIOS version. If problem persists, replace the system board.
2,3	No memory or Random-Access Memory (RAM) detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2,4	Memory or Random-Access Memory (RAM) failure	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2,5	Invalid memory installed	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2,6	System board/Chipset Error/Clock failure/Gate A20 failure/Super I/O failure/ Keyboard controller failure	Flash latest BIOS version. If problem persists, replace the system board.
3,1	CMOS battery failure	Reset the CMOS battery connection. If problem persists, replace the RTC battery.
3,2	PCI of Video card/chip failure	Replace the system board.
3,3	BIOS Recovery 1: BIOS recovery image not found	Flash latest BIOS version. If problem persists, replace the system board.
3,4	BIOS Recovery 2: Recovery image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.
3,5	Power Rail Failure: EC ran into power sequencing failure	EC ran into power sequencing failure. If problem persists, replace the system board.
3,6	Paid SPI Volume Error	Flash corruption detected by SBIOS. If problem persists, replace the system board.
3,7	Management Engine (ME) error. Timeout waiting on ME to reply to HECI message.	Timeout waiting on ME to reply to HECI message. If problem persists, replace the system board.
4,2	CPU Power cable connection issue	• Perform the PSU BIST Test, reseat cable. • If this does not work, replace the system board, power supply or cabling.

Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into their primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

Wi-Fi power cycle

About this task

If your computer is unable to access the Internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi power cycle:

NOTE: Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

Drain residual flea power (perform hard reset)

About this task

Flea power is the residual static electricity that remains in the computer even after it has been powered off and the battery is removed.

For your safety, and to protect the sensitive electronic components in your computer, you are requested to drain residual flea power before removing or replacing any components in your computer.

Draining residual flea power, also known as a performing a "hard reset", is also a common troubleshooting step if your computer does not power on or boot into the operating system.

To drain residual flea power (perform a hard reset)

Steps

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Press and hold the power button for 20 seconds to drain the flea power.
4. Connect the power adapter to your computer.
5. Turn on your computer.

NOTE: For more information about performing a hard reset, see the knowledge base article 000130881 at www.dell.com/support.

6

Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 11. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell app	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents.	Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter the Service Tag or Express Service Code at www.dell.com/support. For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer.
Dell knowledge base articles for a variety of computer concerns	1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**. 3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

NOTE: Availability varies by country/region and product, and some services may not be available in your country/region.

NOTE: If you do not have an active Internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog.