

Precision 7865 Tower

Service Manual

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.

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Working inside your computer


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 Lithium-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.


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. For Windows operating system, 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 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 tablet/notebook/desktop 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 15 seconds should discharge residual power in the system board.

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

 **NOTE:** 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.

BitLocker

 **CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress, and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system reinstall. For more information about this subject, see Knowledge Article: [updating the BIOS on Dell systems with BitLocker enabled.](#)**

The installation of the following components triggers BitLocker:

- Hard disk drive or solid state drive
- System board

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 #0
- Phillips screwdriver #1
- Torx T20 screwdriver
- 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

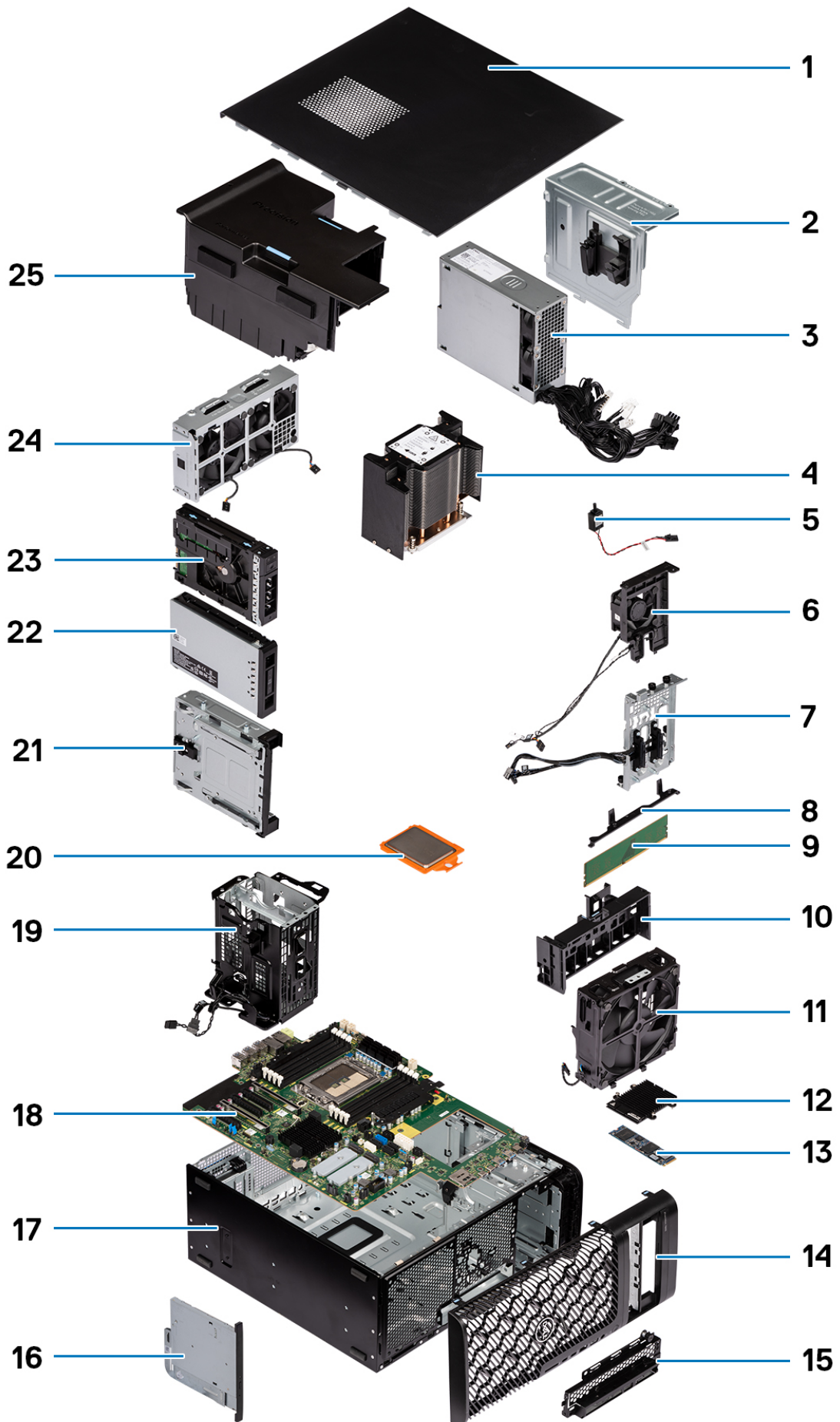
Component	Screw type	Quantity	Screw image
Front I/O bracket	Captive	1	
Front fan	M3x5	1	
Rear fan	#6-32	2	
Solid-state drive1	M2x3.5	1	
solid-state drive2	M2x3.5	1	
Heat sink	Captive: Torx T20	4	
Hard-drive fan assembly	M3x5	2	

Table 1. Screw list (continued)

Component	Screw type	Quantity	Screw image
Processor	Captive: Torx T20	3	
Internal hard-drive cage	#6-32	5	
Solid-state drive heatsink	Captive	4	
Power-supply unit	#6-32	6	
Voltage-Regulator heatsink - Location 1	M3x5	2	
Voltage-Regulator heatsink - Location 2	Captive	2	
Voltage-Regulator heatsink - Location 3	M3x5	3	
System board	#6-32	11	

Major components of Precision 7865 Tower

The following image shows the major components of Precision 7865 Tower.



- | | |
|----------------------------------|---|
| 1. Side cover | 2. Power-supply cover |
| 3. Power-supply unit | 4. Heat sink |
| 5. Intrusion switch | 6. Hard-drive fan assembly |
| 7. Storage bay connectors | 8. System-board supporting bracket |
| 9. Memory module | 10. PCIe holder |
| 11. Front-fan assembly | 12. Solid-state drive heat-sink |
| 13. M.2 Solid-state drive | 14. Front bezel |
| 15. Front I/O bracket | 16. Slim optical-drive |
| 17. Chassis | 18. System board |
| 19. Internal hard-drive cage | 20. Processor |
| 21. Optical-drive bay | 22. M.2 external solid-state drive assembly |
| 23. External hard-drive assembly | 24. Rear-fan assembly |
| 25. Air shroud | |

NOTE: Dell provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representative for purchase options.

Side cover

Removing the side cover

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

NOTE: Ensure that you remove the security cable from the security-cable slot (if applicable).

About this task

The following images indicate the location of the side cover and provide a visual representation of the removal procedure.



2



Steps

1. Insert the side-cover key and turn the key clockwise to unlock the side cover.
2. Pull the release latch to release the side cover from the computer.
3. Open the side cover at an angle and lift the cover away from the chassis.

Installing the side cover

Prerequisites

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

About this task

The following images indicate the location of the side cover and provide a visual representation of the installation procedure.



Steps

1. Align the tabs on the side cover with the slots on the chassis.
2. Press the side cover back towards the side of the computer to secure it.
i **NOTE:** The release latch automatically locks the side cover to the computer.
3. Insert the side-cover key into the key slot and turn it counter-clockwise to lock the computer.

Next steps

1. Follow the procedure in [After working inside your computer](#).

Front bezel

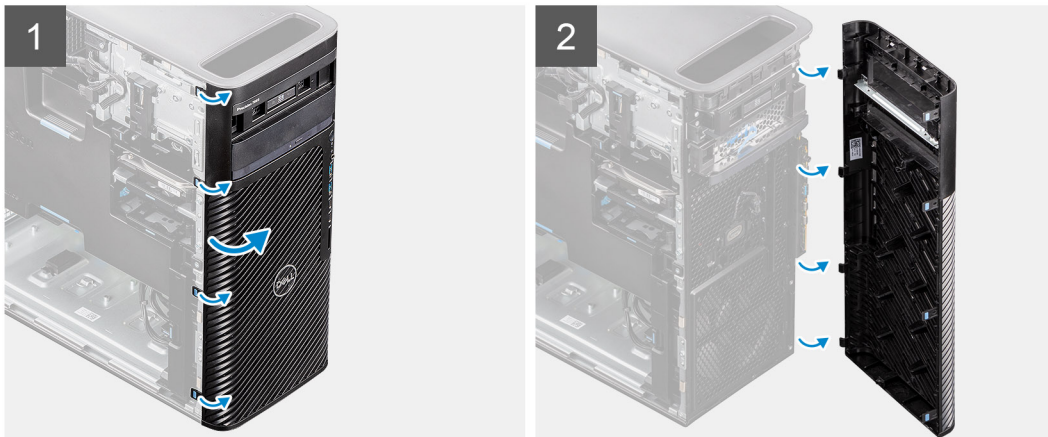
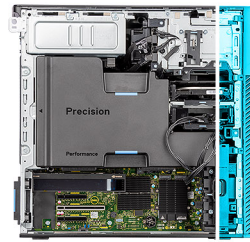
Removing the front bezel

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

The following images indicate the location of the front bezel and provide a visual representation of the removal procedure.



Steps

1. Pry the retention tabs to release the front bezel from the computer.
2. Slightly pull the front bezel and gently rotate to release the other tabs on the bezel from the slots in the chassis.
3. Remove the front bezel from the computer.

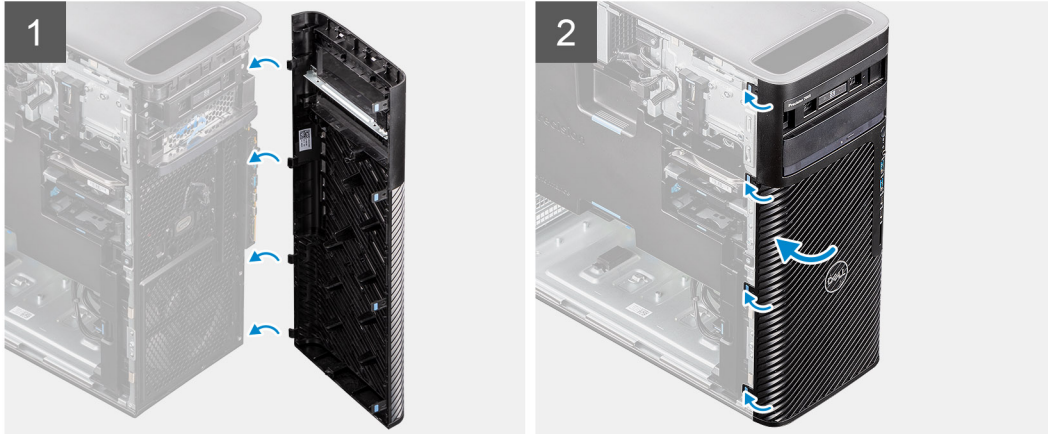
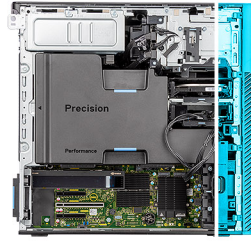
Installing the front bezel

Prerequisites

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

About this task

The following images indicate the location of the front bezel and provide a visual representation of the installation procedure.



Steps

1. Position the front bezel to align the tabs on the bezel with the slots on the chassis.
2. Press the bezel until the tabs clicks into place.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

I/O board

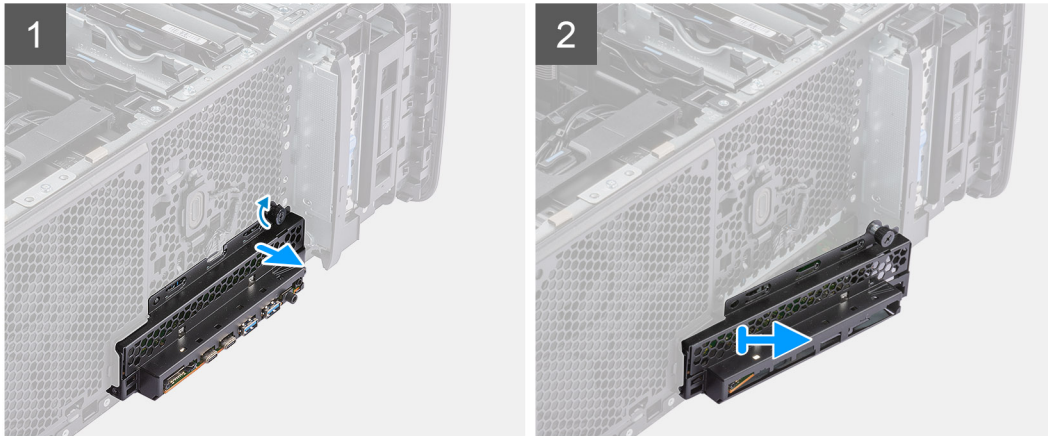
Removing the front I/O bracket

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [front bezel](#).

About this task

The following images indicate the location of the front I/O bracket and provide a visual representation of the removal procedure.



Steps

1. Loosen the thumb screw on the front I/O bracket.
2. Move the top end of the front I/O bracket at an angle to free it from its slot on the chassis.
3. Remove the front I/O bracket from the computer.

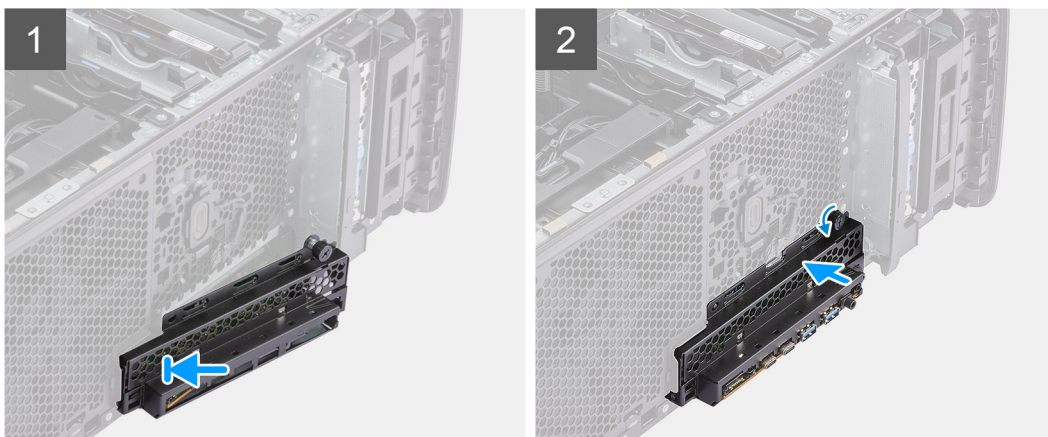
Installing the front I/O bracket

Prerequisites

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

About this task

The following images indicate the location of the front I/O bracket and provide a visual representation of the installation procedure.



Steps

1. Position the front I/O bracket to align the tabs on the bracket with the slots on the chassis.
2. Tighten the thumb screw to secure the front I/O bracket to the chassis.

Next steps

1. Install the [front bezel](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

External storage flexbay (Hard drive)

Removing the external hard-drive assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the external hard-drive assembly and provide a visual representation of the removal procedure.



Steps

1. Push the release button on the external-flexbay bracket to open the release latch.
2. Hold the release latch and slide the hard-drive assembly out of the external flexbay slot.

Installing the external hard-drive assembly

Prerequisites

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

About this task

The following images indicate the location of the external hard-drive assembly and provide a visual representation of the installation procedure.



Steps

1. Slide and insert the hard-drive assembly into the external flexbay slot.
2. Close the release latch to secure the hard-drive assembly in place.

Next steps

1. Follow the procedure in [After working inside your computer](#).

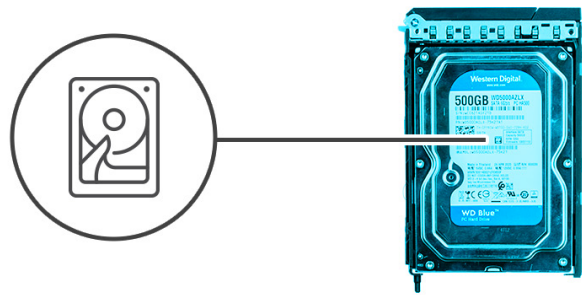
Removing the external 3.5-inch hard-drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the external 3.5-inch hard-drive and provide a visual representation of the removal procedure.



Steps

1. Pry the sides of the external hard-drive bracket to release the tabs on the bracket from the slots on the hard drive.
2. Lift and remove the hard drive off the external hard-drive bracket.

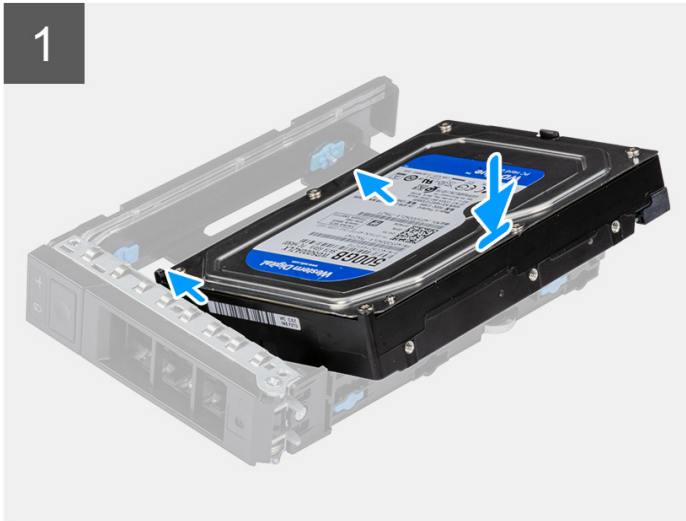
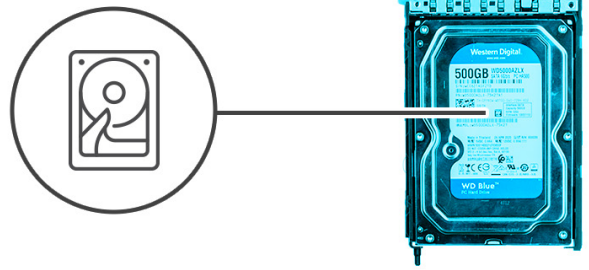
Installing the external 3.5-inch hard-drive

Prerequisites

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

About this task

The following images indicate the location of the external 3.5-inch hard-drive and provide a visual representation of the installation procedure.



Steps

1. Place the hard drive into the external hard-drive bracket and align the tabs on the bracket with the slots on the hard drive.
2. Snap the hard-drive into the external hard-drive bracket.

Next steps

1. Follow the procedure in [After working inside your computer](#).

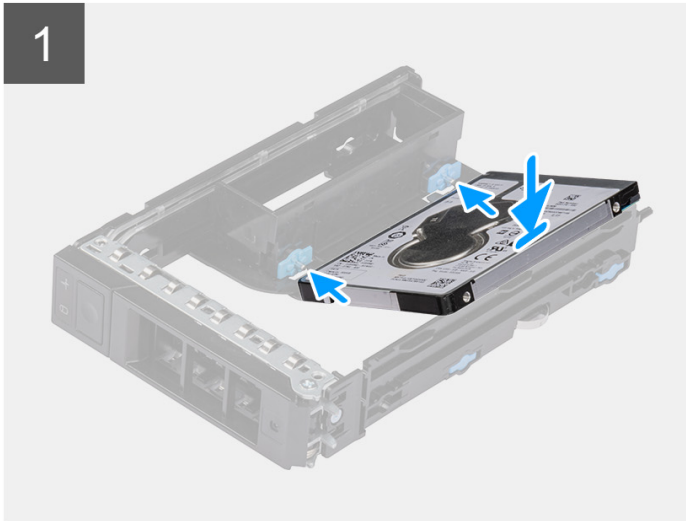
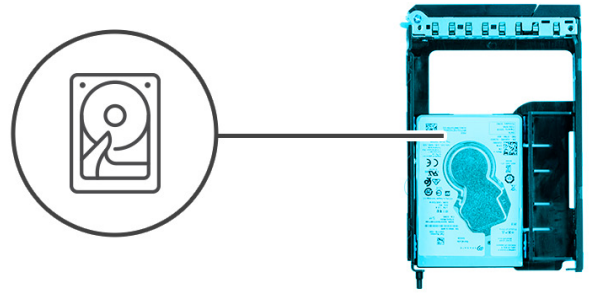
Removing the external 2.5-inch hard-disk drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the external 2.5-inch hard-drive and provide a visual representation of the removal procedure.



Steps

1. Pry the sides of the external hard-drive bracket to release the tabs on the bracket from the slots on the hard drive.
2. Lift and remove the hard drive off the external hard-drive bracket.

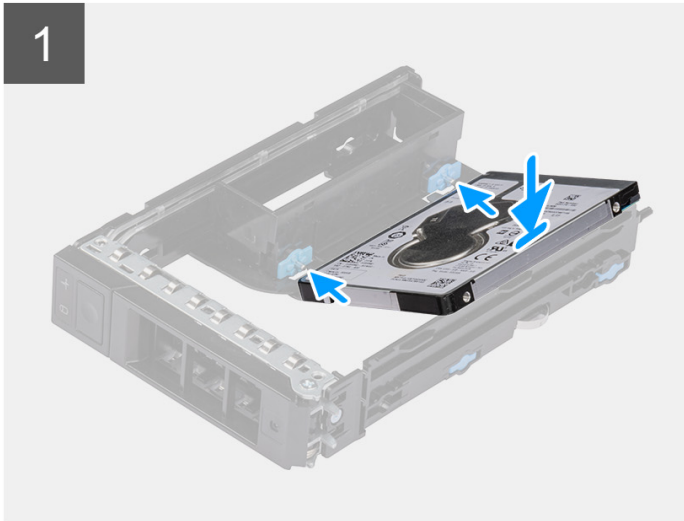
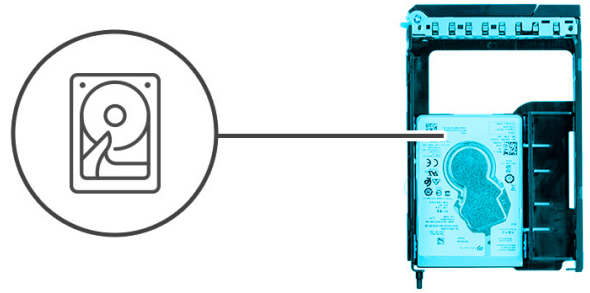
Installing the external 2.5-inch hard-drive

Prerequisites

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

About this task

The following images indicate the location of the external 2.5-inch hard-drive and provide a visual representation of the installation procedure.



Steps

1. Place the hard drive into the external hard-drive bracket and align the tabs on the bracket with the slots on the hard drive.
2. Snap the hard-drive into the external hard-drive bracket.

Next steps

1. Follow the procedure in [After working inside your computer](#).

External storage flexbay (Solid-state drive)

Removing the external solid-state drive assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the external solid-state drive assembly and provide a visual representation of the removal procedure.



Steps

1. Push the release button on the external-flexbay bracket to open the release latch.
2. Hold the release latch and slide the solid-state drive assembly out of the external flexbay slot.

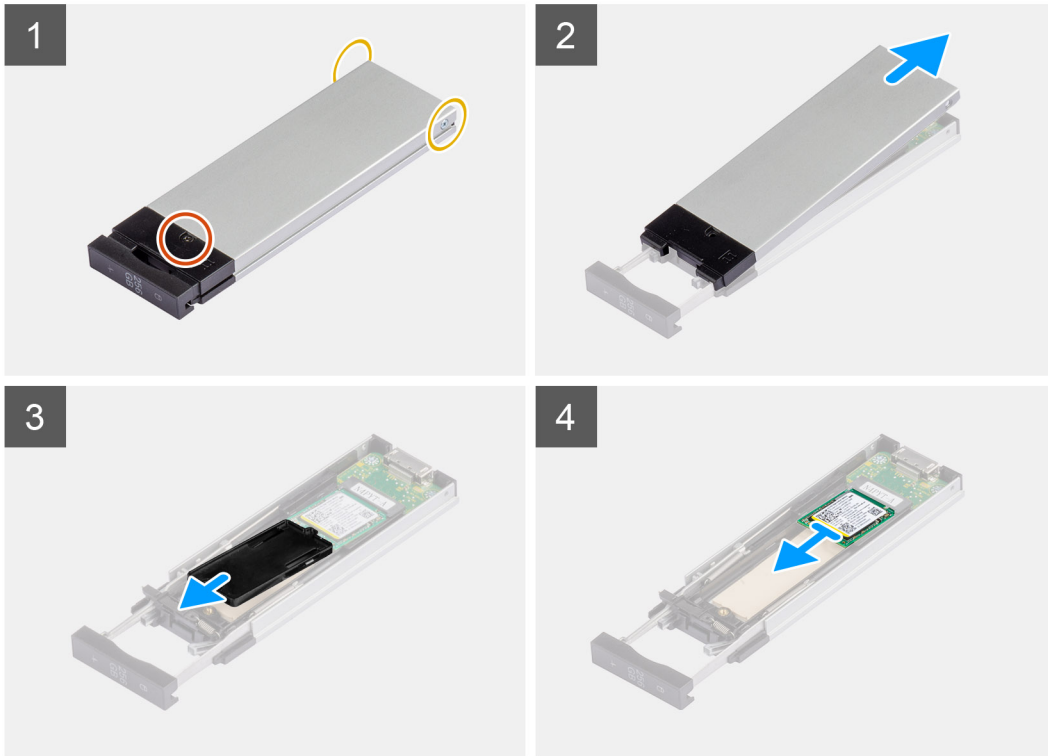
Removing the external M.2 2230 solid-state drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the external M.2 2230 solid-state drive and provide a visual representation of the removal procedure.



Steps

1. Remove the single (M3x6) screw and the two (M3x3) screws from the solid-state drive assembly.
2. Lift and remove the cover from the solid-state drive assembly.
3. Slide and remove the solid-state drive holder from the solid-state drive assembly.
4. Slide and remove the solid-state drive from the solid-state drive assembly.

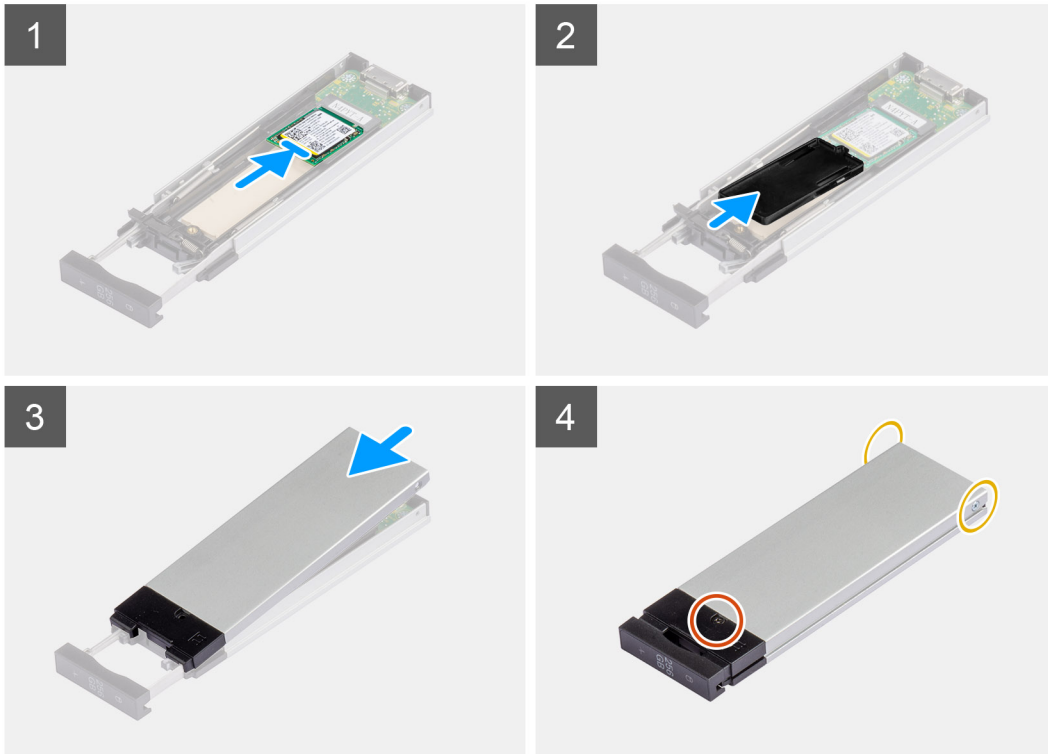
Installing the external M.2 2230 solid-state drive

Prerequisites

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

About this task

The following images indicate the location of the external M.2 2230 solid-state drive and provide a visual representation of the installation procedure.



Steps

1. Align the notch on the solid-state drive with the tab on the solid-state drive connector.
2. Insert the solid-state drive at a 45-degree angle into the slot on the solid-state drive assembly.
3. Align and place the solid-state drive bracket onto the solid-state drive assembly.
4. Place the cover over the solid-state drive assembly.
5. Install the single (M3x6) screw and the two (M3x3) screws to secure the cover to the solid-state drive assembly.

Next steps

1. Follow the procedure in [After working inside your computer](#).

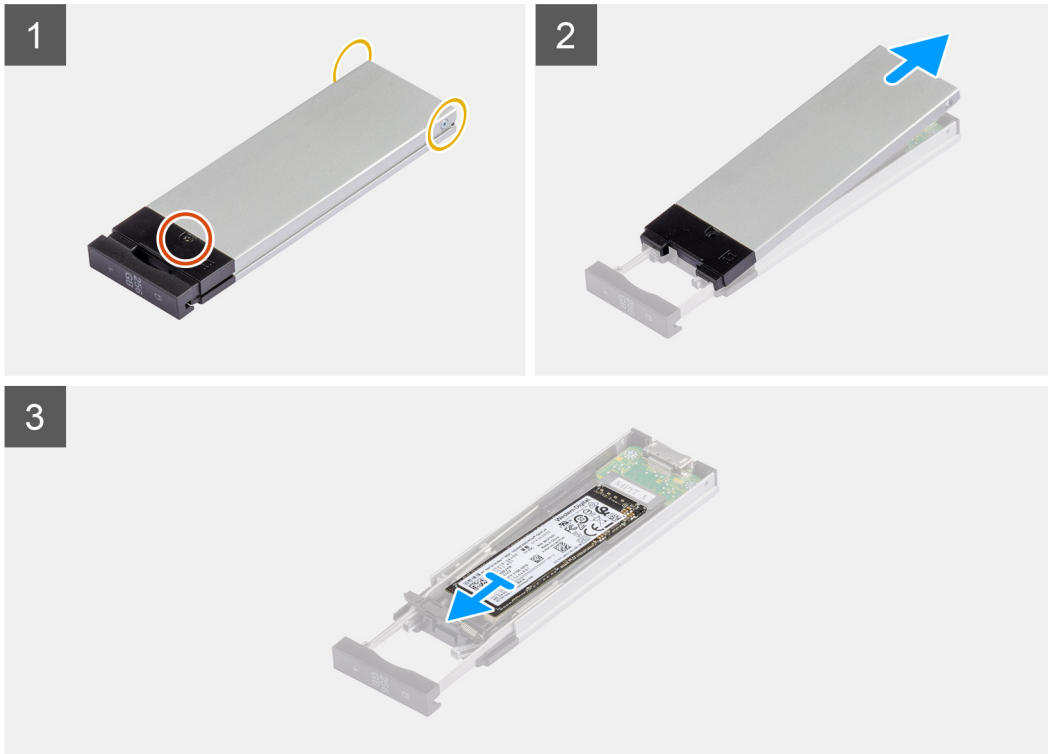
Removing the external M.2 2280 solid-state drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

About this task

The following images indicate the location of the external M.2 2280 solid-state drive and provide a visual representation of the removal procedure.



Steps

1. Remove the single (M3x6) screw and the two (M3x3) screws from the solid-state drive assembly.
2. Lift and remove the cover from the solid-state drive assembly.
3. Slide and remove the solid-state drive from the solid-state drive assembly.

Installing the external M.2 2280 solid-state drive

Prerequisites

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

About this task

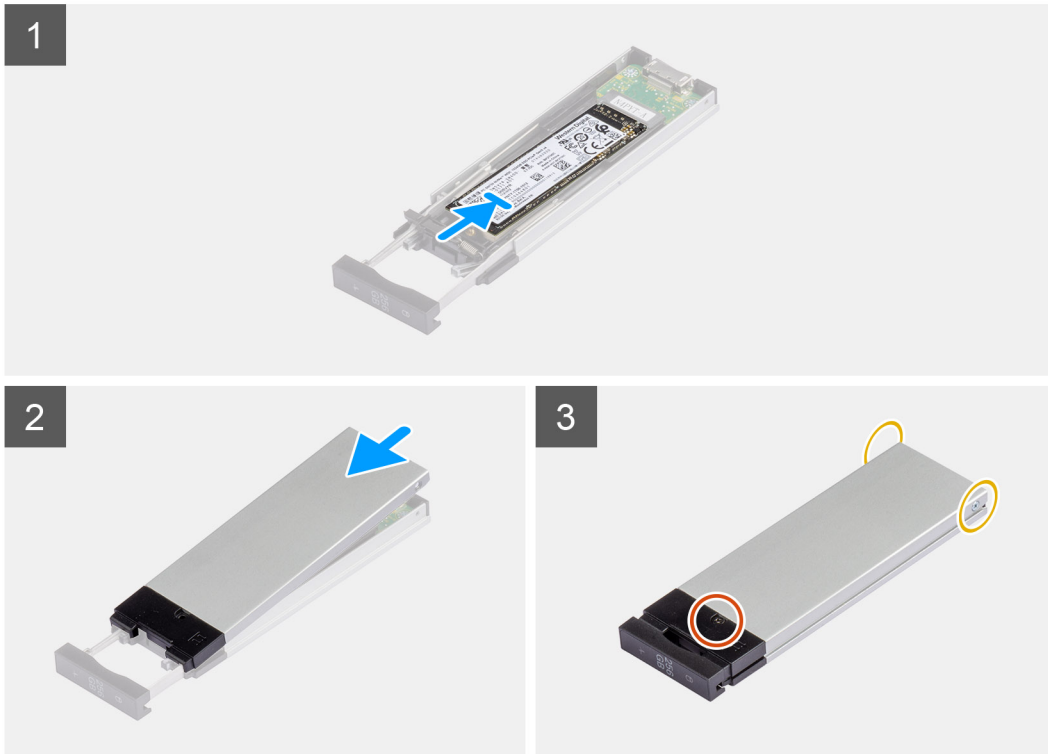
The following images indicate the location of the external M.2 2280 solid-state drive and provide a visual representation of the installation procedure.



1x
M3x6



2x
M3x3



Steps

1. Align the notch on the solid-state drive with the tab on the solid-state drive connector.
2. Insert the solid-state drive at a 45-degree angle into the slot on the solid-state drive assembly.
3. Place the cover over the solid-state drive assembly.
4. Install the single (M3x6) screw and the two (M3x3) screws to secure the cover to the solid-state drive assembly.

Next steps

1. Follow the procedure in [After working inside your computer](#).

Installing the external solid-state drive assembly

Prerequisites

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

About this task

The following images indicate the location of the external solid-state drive assembly and provide a visual representation of the installation procedure.



Steps

1. Slide and insert the solid-state drive assembly into the external flexbay slot.
2. Push and close the release latch to secure the solid-state drive assembly in place.

Next steps

1. Follow the procedure in [After working inside your computer](#).

Slim optical-drive

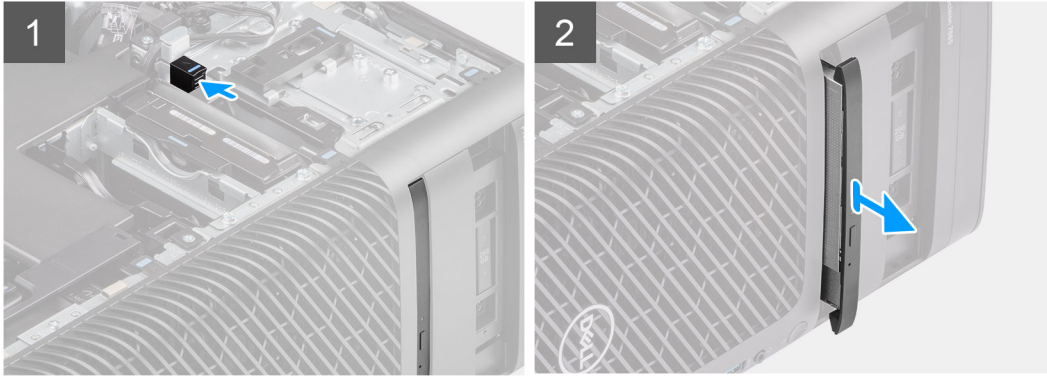
Removing the slim optical-drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

The following images indicate the location of the slim optical-drive and provide a visual representation of the removal procedure.



Steps

1. Move the slim optical-drive latch to release it from the slot on the hard drive and optical-drive cage.
2. Slide and remove the slim optical-drive from the slot on the hard drive and optical-drive cage.

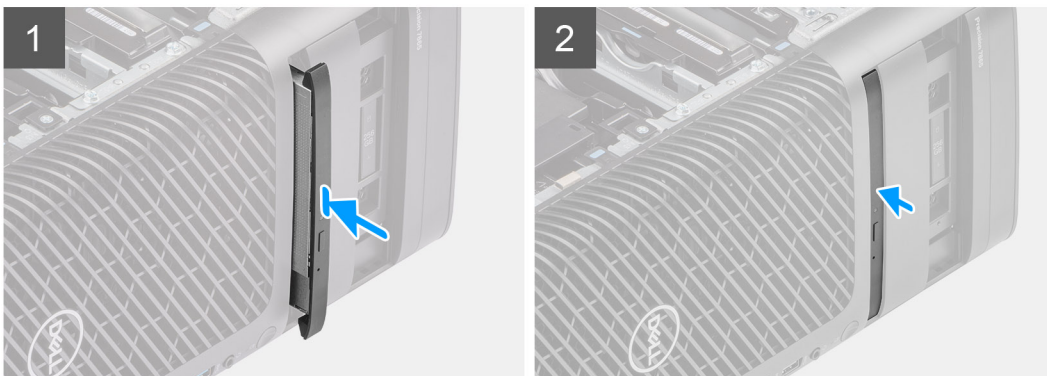
Installing the slim optical-drive

Prerequisites

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

About this task

The following images indicate the location of the slim optical-drive and provide a visual representation of the installation procedure.



Steps

1. Insert the slim optical-drive assembly into the slim optical-drive.
2. Slide the slim optical-drive assembly until it snaps into place.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Air shroud

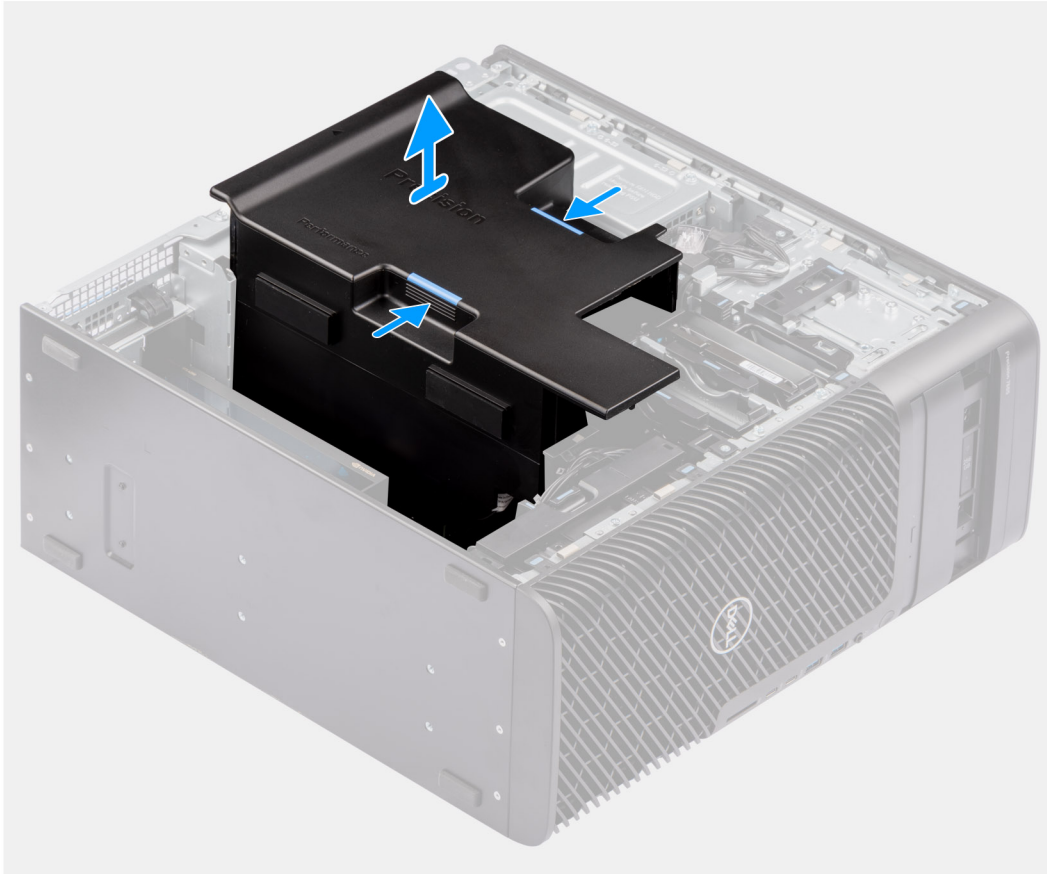
Removing the air shroud

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

The following image indicates the location of the air shroud and provides a visual representation of the removal procedure.



Steps

1. Hold the air shroud at the gripping points.
2. Pull the air shroud upwards and out of the computer.

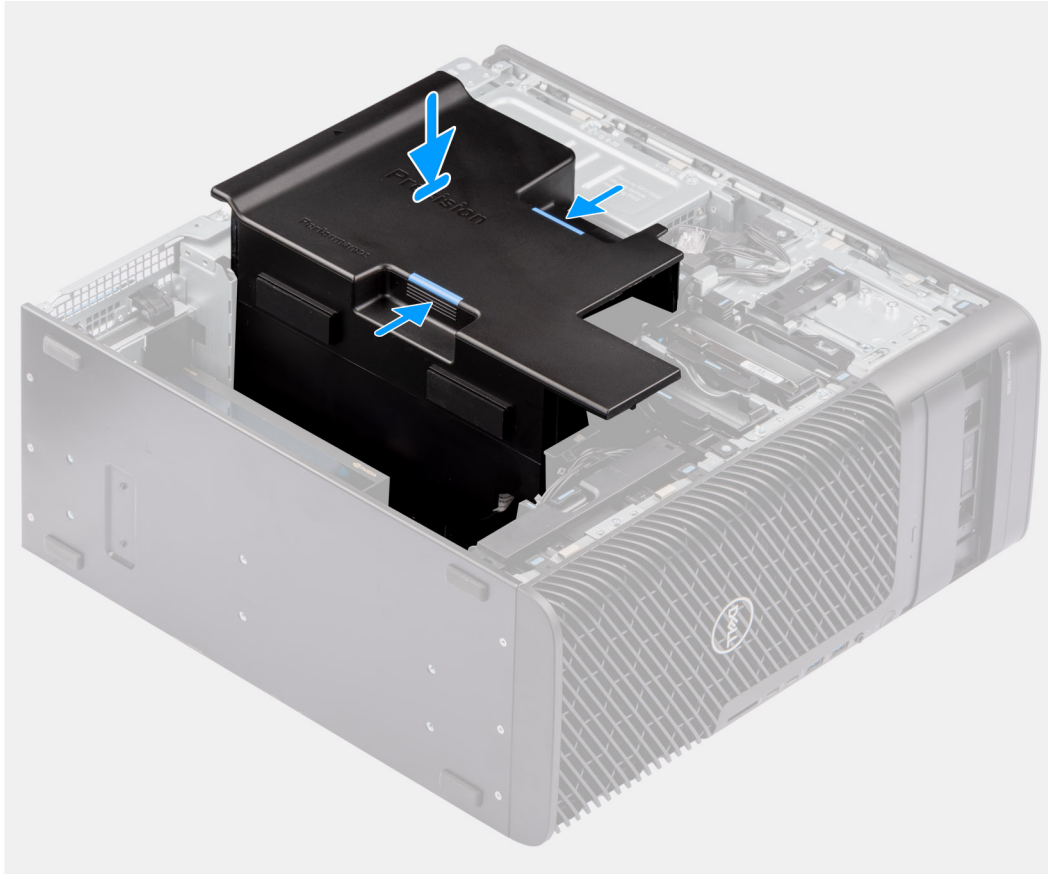
Installing the air shroud

Prerequisites

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

About this task

The following image indicates the location of the air shroud and provides a visual representation of the installation procedure.



Steps

1. Align the air shroud over the heat-sink and system board holding and seat it in the slot.
2. Press the air shroud down until the tabs clicks into place.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

PCIe holder

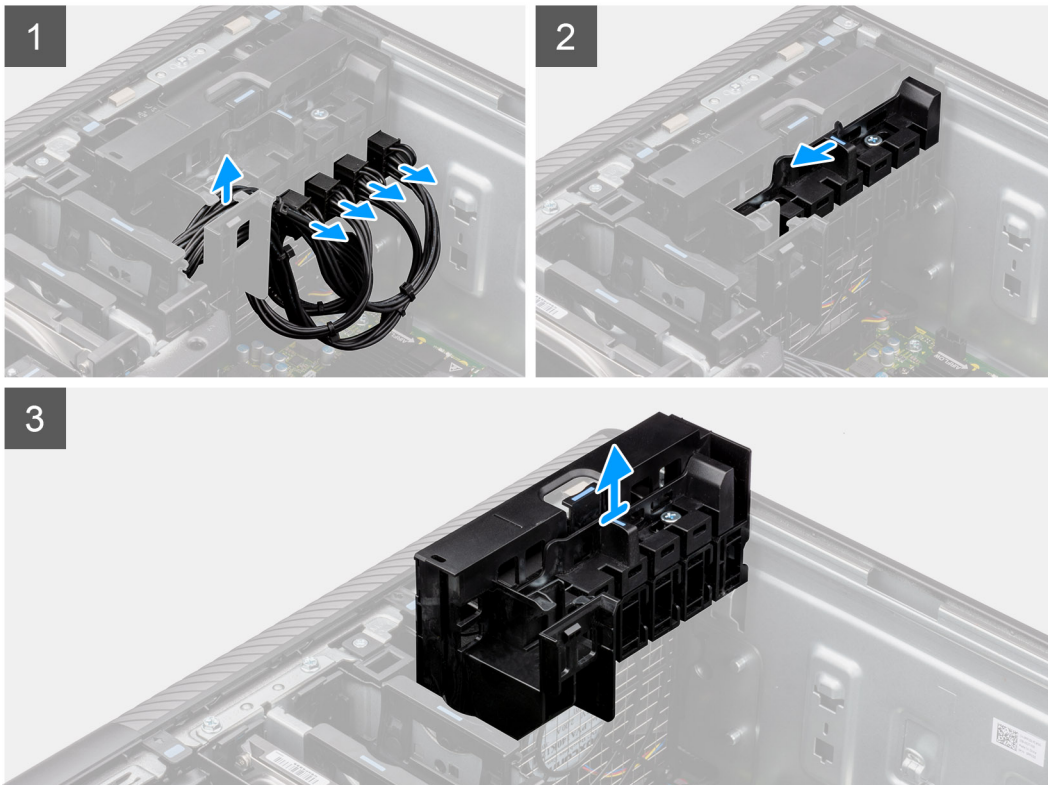
Removing the PCIe holder

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the PCIe holder and provide a visual representation of the removal procedure.



Steps

1. Remove the PCIe-power cables from the slots on the PCIe holder.
2. Push and hold the PCIe-holder latch upwards to release the PCIe holder.
3. Lift and remove the PCIe holder out of the computer.

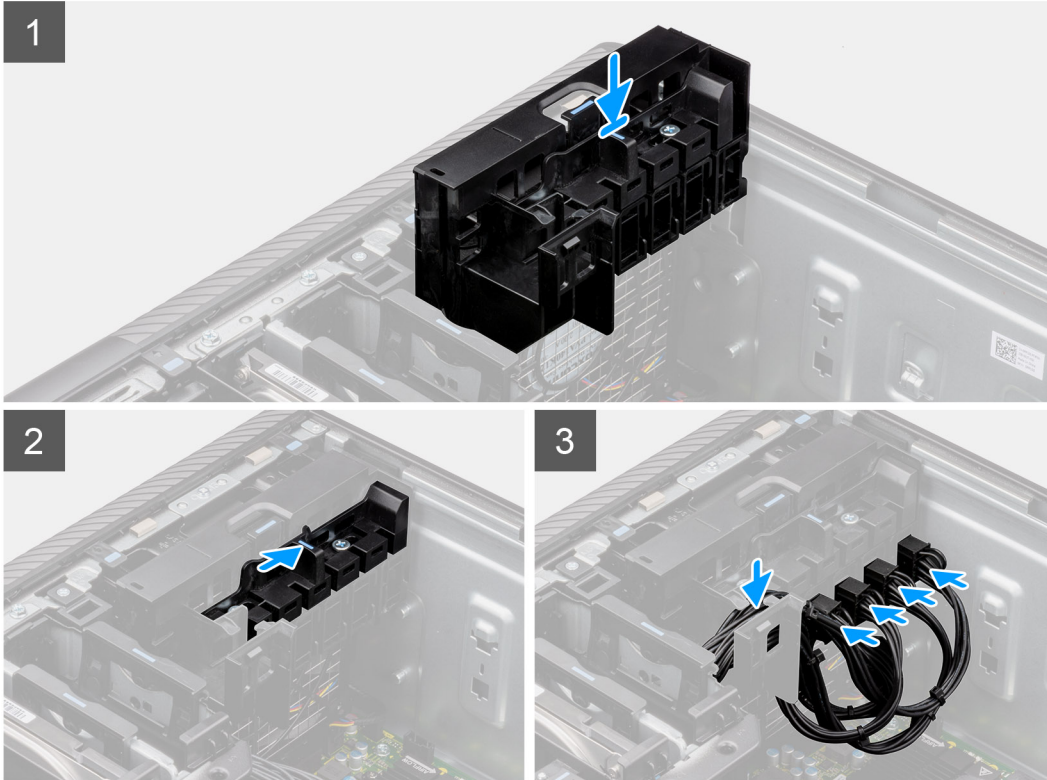
Installing the PCIe holder

Prerequisites

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

About this task

The following images indicate the location of the PCIe holder and provide a visual representation of the installation procedure.



Steps

1. Align and place the PCIe holder on the slot over the front fan.
2. Push the latch down to secure the PCIe holder to the chassis.
3. Reconnect the PCIe-power cables to the slots on the PCIe holder.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Front fan

Removing the front-fan assembly

Prerequisites

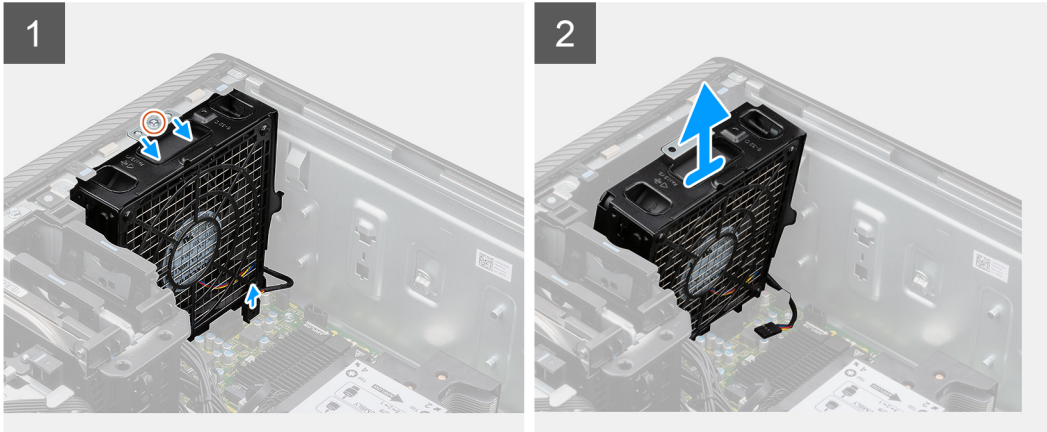
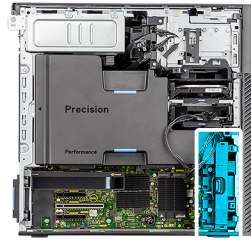
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

The following images indicate the location of the front-fan assembly and provide a visual representation of the removal procedure.



1x
M3x5



Steps

1. Remove the single (M3x5) screw from the fan assembly.
2. Disconnect the fan cable from the connector on the system board.
3. Move the fan assembly at an angle from the chassis.
4. Lift and remove the fan assembly from the computer.

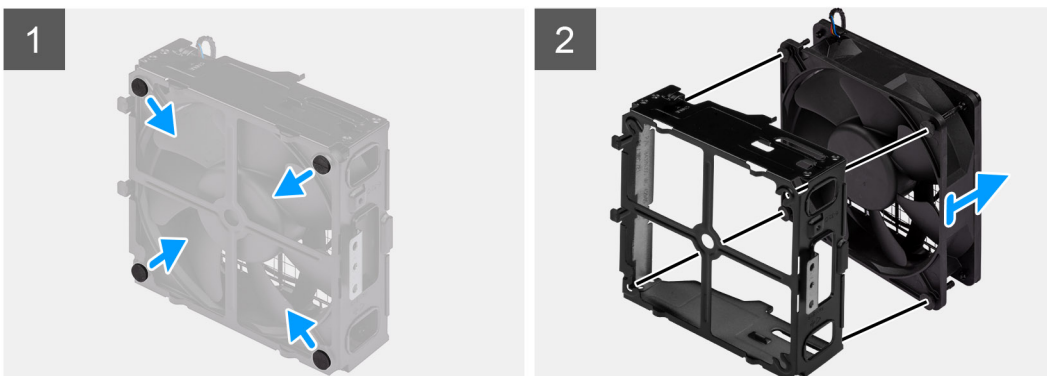
Removing front fan

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [front-fan assembly](#).

About this task

The following images indicate the location of the front fan and provide a visual representation of the removal procedure.



Steps

1. Locate the position of rubber grommets.
2. Gently pull the rubber grommets to release the fan from the fan cage.
3. Remove the fan from the fan cage.

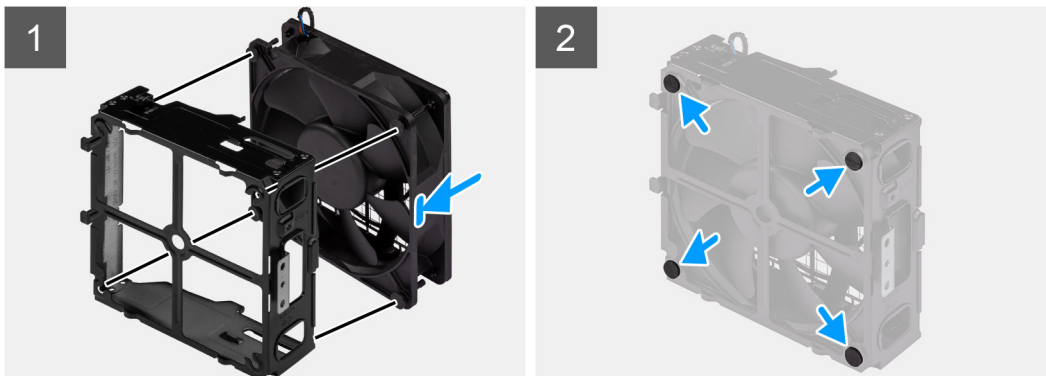
Installing the front fan

Prerequisites

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

About this task

The following images indicate the location of the front fan and provide a visual representation of the installation procedure.



Steps

1. Insert the rubber grommets on the fan cage.
2. Align the slots on the fan with the rubber grommets on the fan cage.
3. Route the rubber grommets through the slots on the fan and pull the rubber grommets until the fan snaps into position.

Next steps

1. Install the [front-fan assembly](#).
2. Follow the procedure in [After working inside your computer](#).

Installing the front-fan assembly

Prerequisites

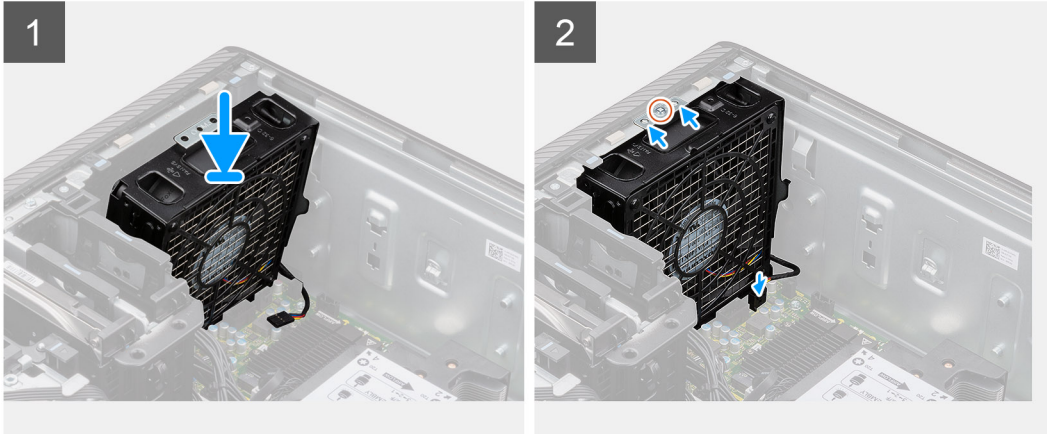
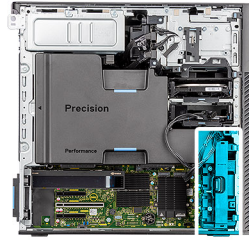
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the front-fan assembly and provide a visual representation of the installation procedure.



1x
M3x5



Steps

1. Align the tabs on the fan assembly with the slots on the chassis.
2. Insert the fan assembly at an angle into the slot in the chassis.
3. Install the single (M3x5) screw to secure the fan assembly to the chassis.
4. Connect the fan cable to the connector on the system board.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

3.5-inch hard-drive assembly

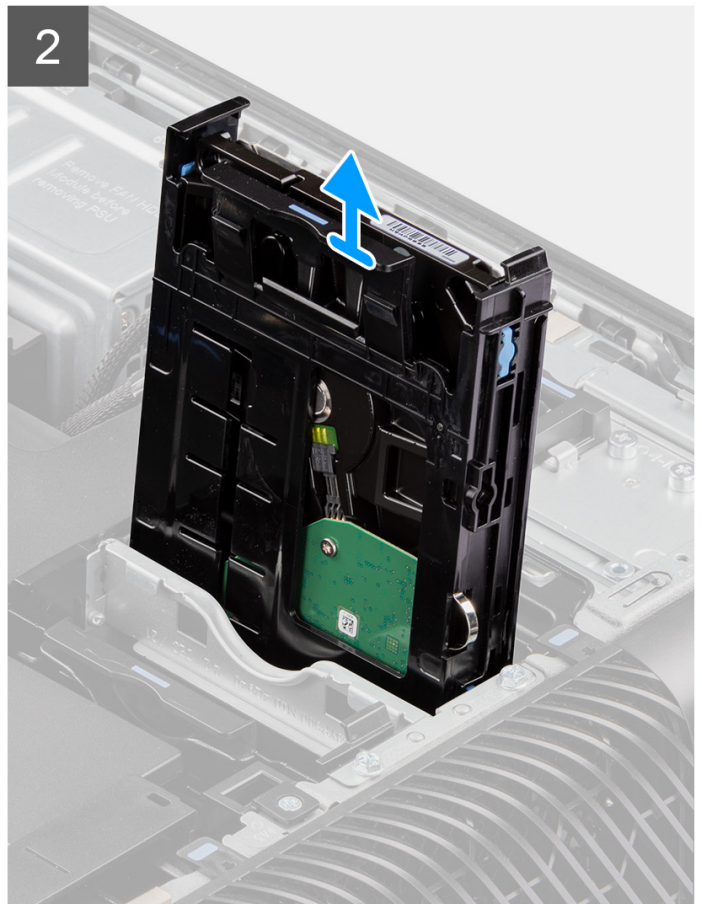
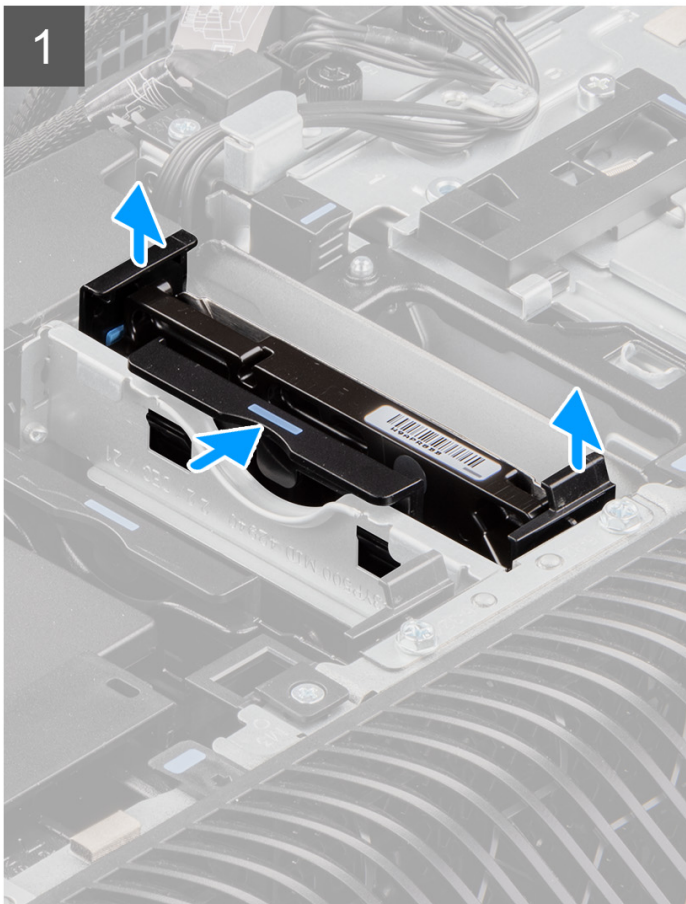
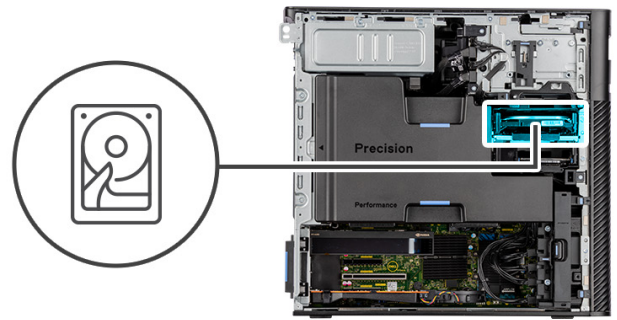
Removing the 3.5-inch hard-drive assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

The following images indicate the location of the 3.5-inch hard-drive assembly and provide a visual representation of the removal procedure.



Steps

1. Press the securing tabs to release the hard-drive assembly from the chassis.
2. Slide the hard-disk drive assembly out of the hard-drive bracket.

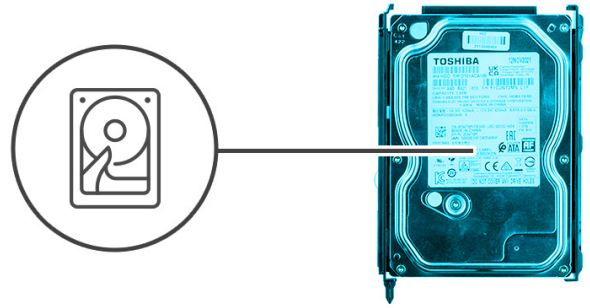
Removing the 3.5-inch hard-drive bracket

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [3.5-inch hard-drive assembly](#).

About this task

The following images indicate the location of the 3.5-inch hard-drive bracket and provide a visual representation of the removal procedure.



Steps

1. Pry the sides of the hard-drive bracket to release the tabs on the bracket from the slots on the hard drive.
2. Lift and remove the hard drive off the hard-drive bracket.

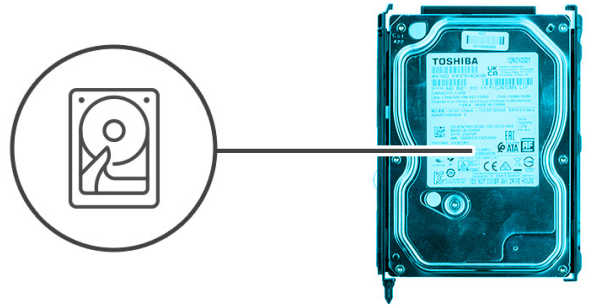
Installing the 3.5-inch hard-drive bracket

Prerequisites

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

About this task

The following images indicate the location of the 3.5-inch hard-drive bracket and provide a visual representation of the installation procedure.



Steps

1. Place the hard drive into the hard-drive bracket and align the tabs on the bracket with the slots on the hard drive.
2. Snap the hard-drive into the hard-drive bracket.

Next steps

1. Install the [3.5-inch hard-drive assembly](#).
2. Install the [side cover](#).
3. Follow the procedure in [after working inside your computer](#).

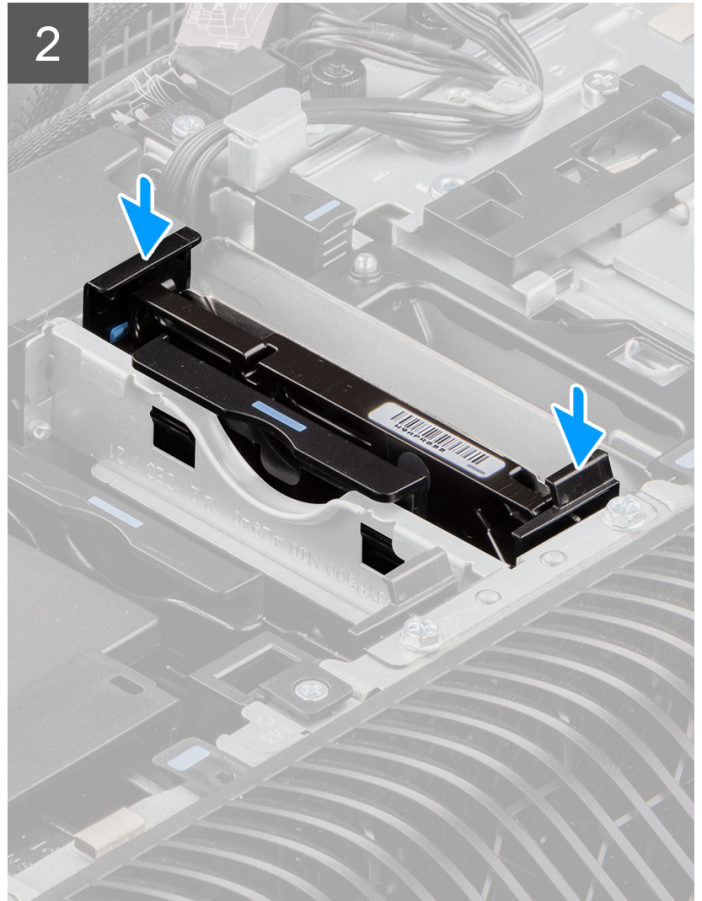
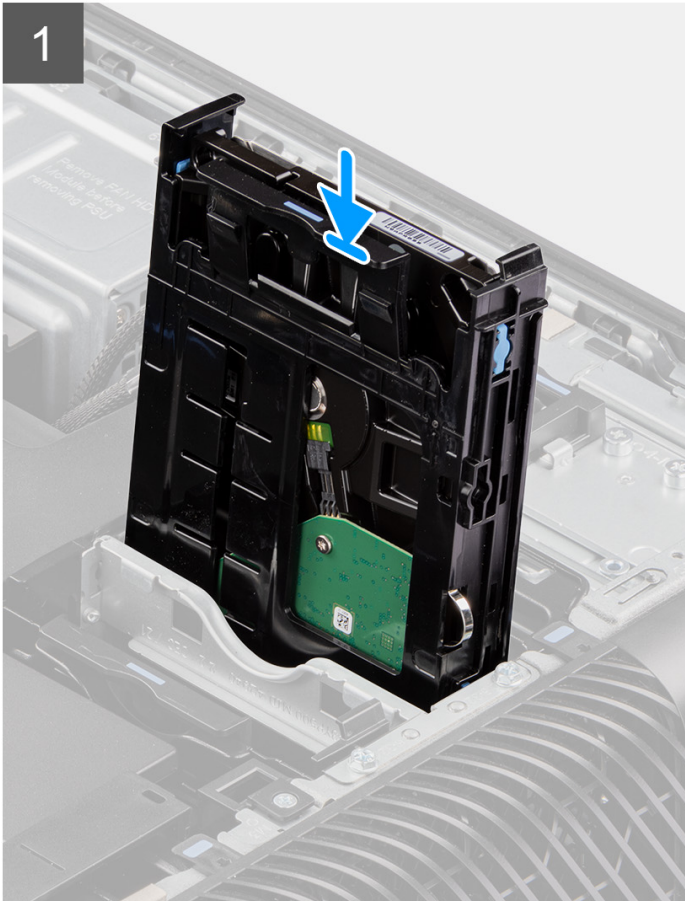
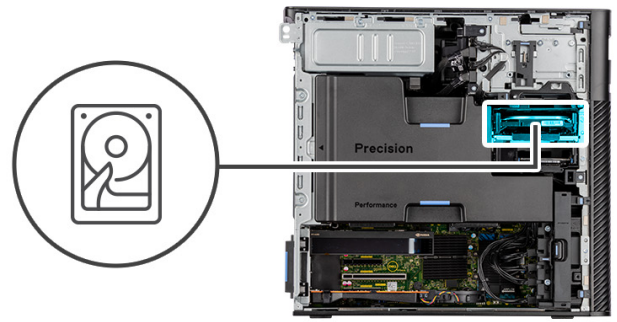
Installing the 3.5-inch hard-drive assembly

Prerequisites

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

About this task

The following images indicate the location of the 3.5-inch hard-drive assembly and provide a visual representation of the installation procedure.



Steps

Slide and insert the 3.5-inch hard-drive assembly into the slot on the hard-drive bracket.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

2.5-inch hard-drive assembly

Removing the 2.5-inch hard-drive assembly

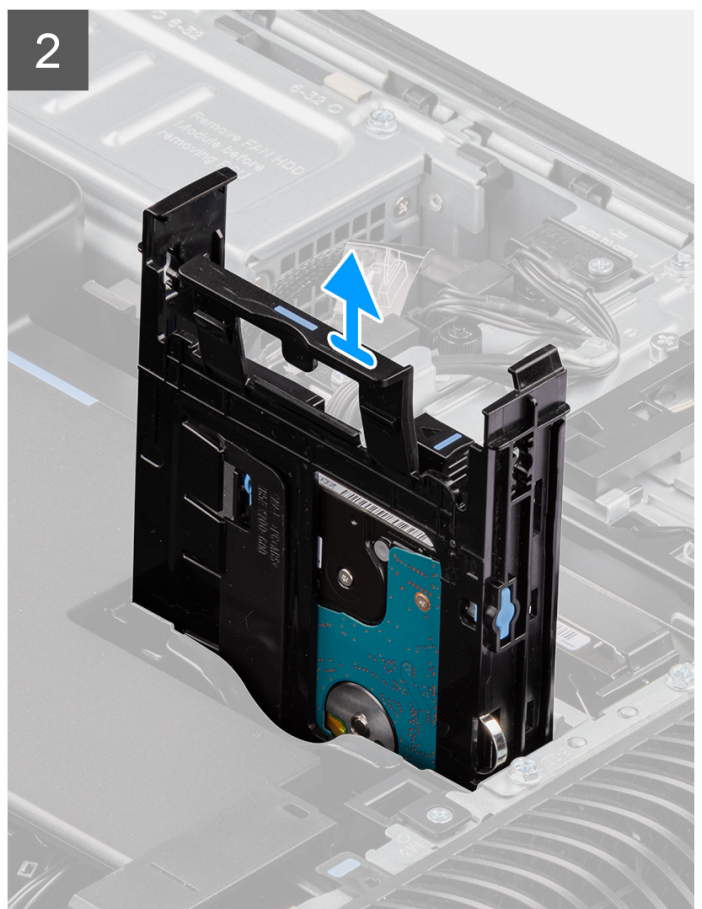
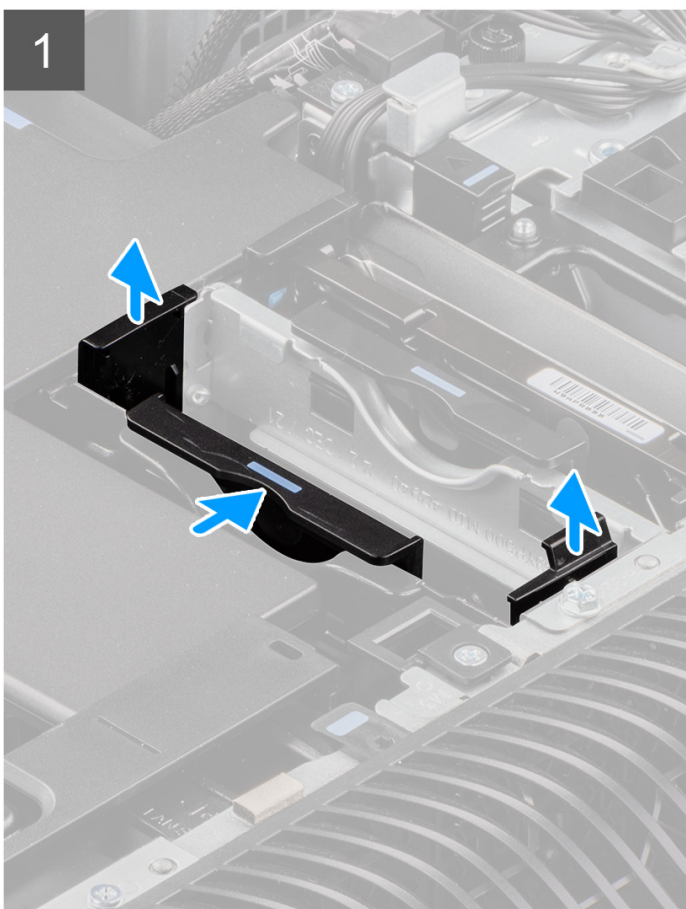
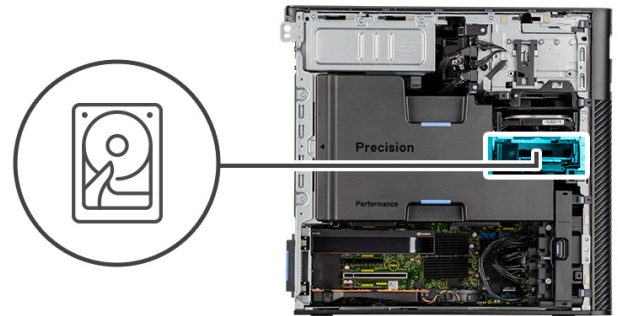
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

2. Remove the [side cover](#).

About this task

The following images indicate the location of the 2.5-inch hard-drive assembly and provide a visual representation of the removal procedure.



Steps

1. Press the securing tabs to release the hard-drive assembly from the chassis.
2. Slide the hard-disk drive assembly out of the hard-drive bracket.

Removing the 2.5-inch hard-disk drive bracket

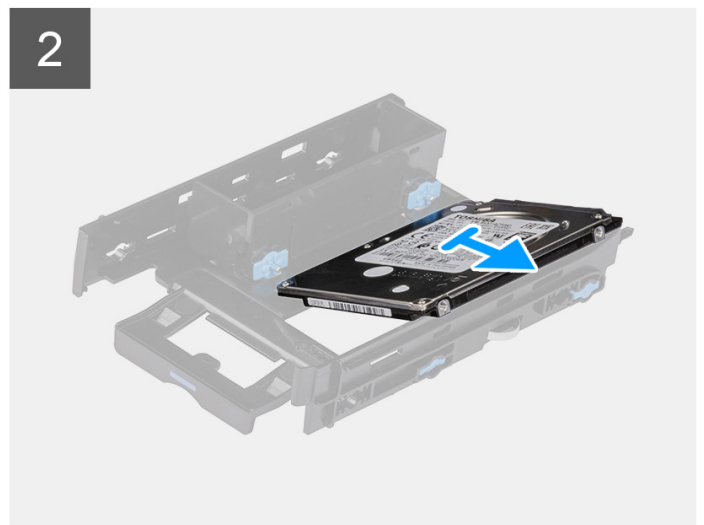
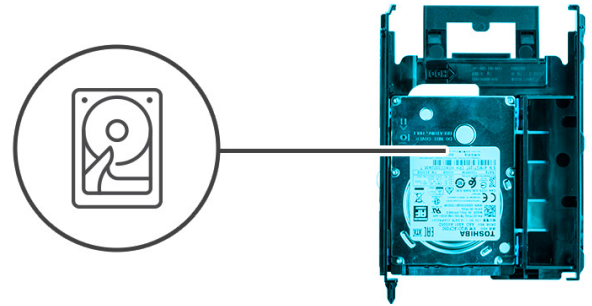
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

3. Remove the [2.5-inch hard-drive assembly](#).

About this task

The following images indicate the location of the 2.5-inch hard-drive bracket and provide a visual representation of the removal procedure.



Steps

1. Pry the sides of the hard-drive bracket to release the tabs on the bracket from the slots on the hard drive.
2. Lift and remove the hard drive off the hard-drive bracket.

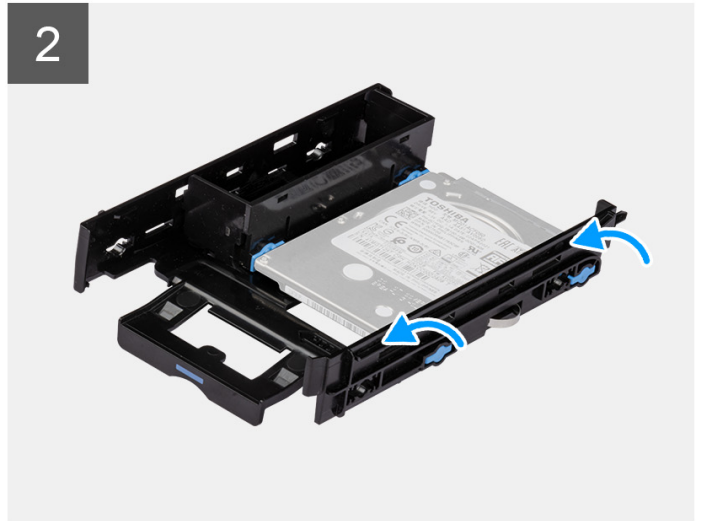
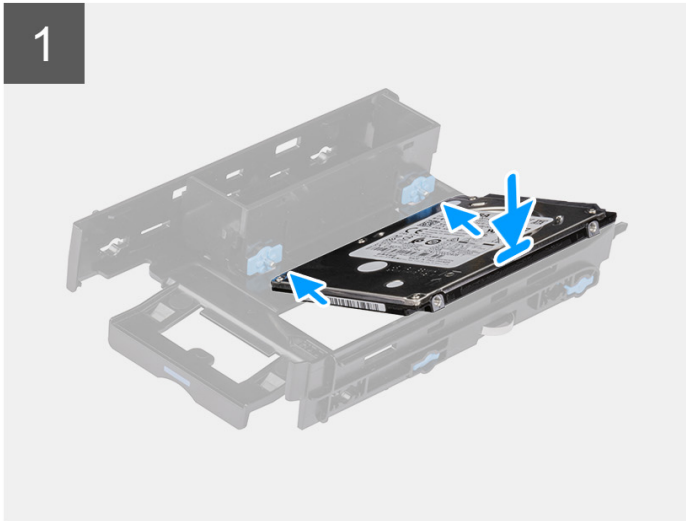
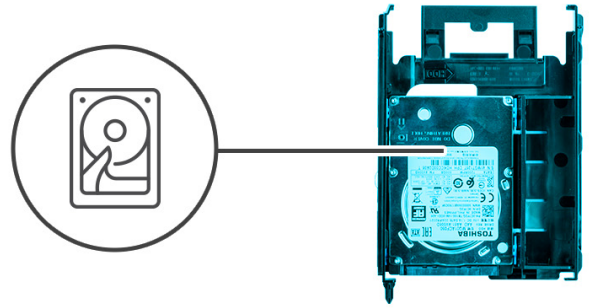
Installing the 2.5-inch hard-drive bracket

Prerequisites

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

About this task

The following images indicate the location of the 2.5-inch hard-drive bracket and provide a visual representation of the installation procedure.



Steps

1. Place the hard drive into the hard-drive bracket and align the tabs on the bracket with the slots on the hard drive.
2. Snap the hard-drive into the hard-drive bracket.

Next steps

1. Install the [2.5-inch hard-drive assembly](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

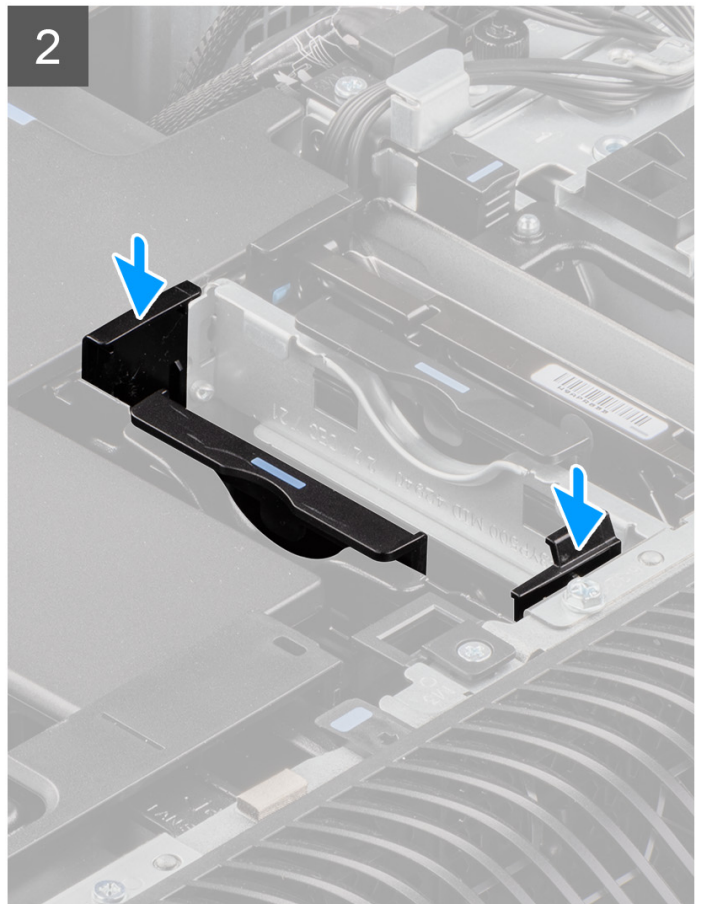
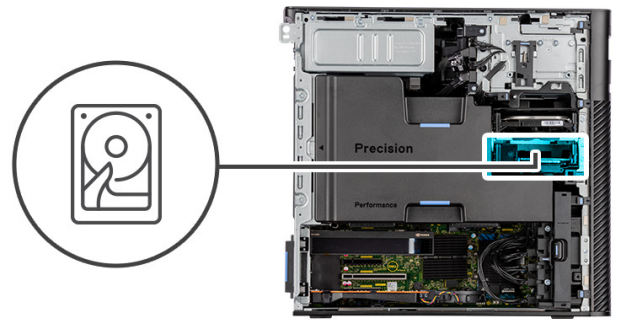
Installing the 2.5-inch hard-drive assembly

Prerequisites

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

About this task

The following images indicate the location of the 2.5-inch hard-drive assembly and provide a visual representation of the installation procedure.



Steps

Slide and insert the hard-drive assembly into the slot on the hard-drive bracket.

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Rear fans

Removing the rear-fan assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

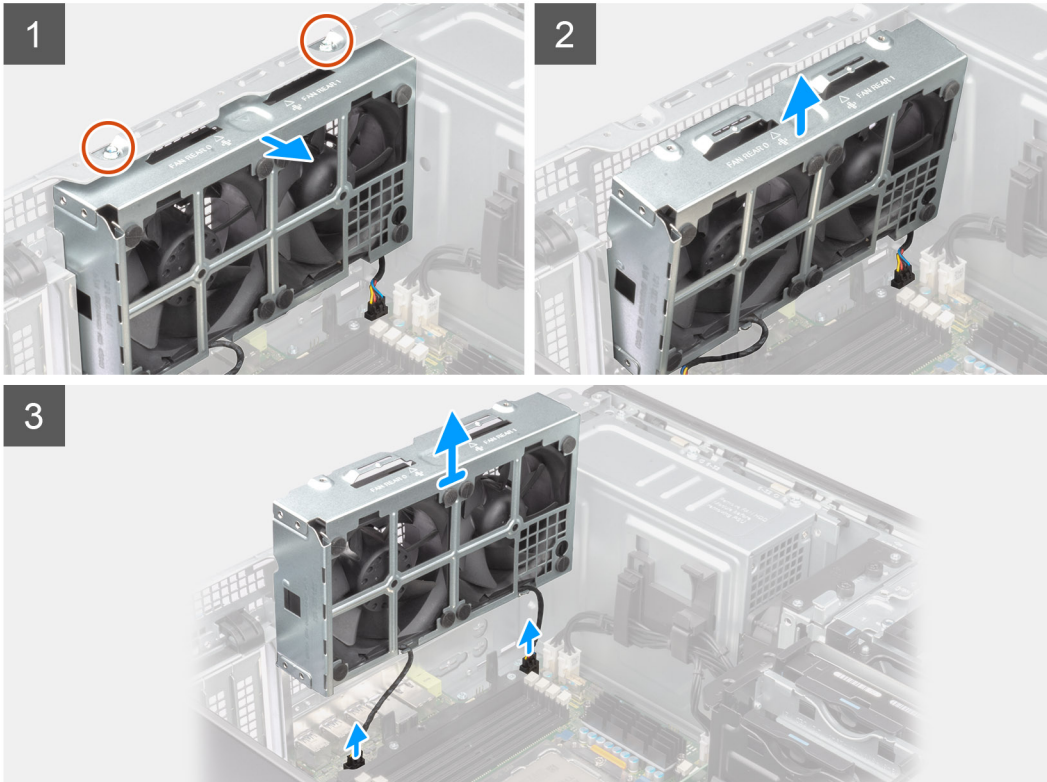
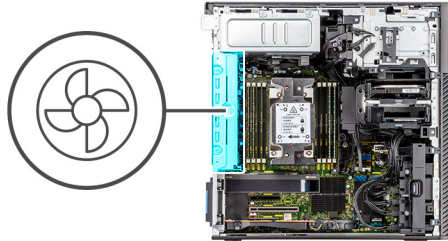
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the rear-fan assembly and provide a visual representation of the removal procedure.



2x
#6-32



Steps

1. Remove the two (#6-32) screws from the fan assembly.
2. Move the fan assembly at an angle from the chassis.
3. Disconnect the two fan cables from the connectors on the system board.
4. Lift and remove the fan assembly from the computer.

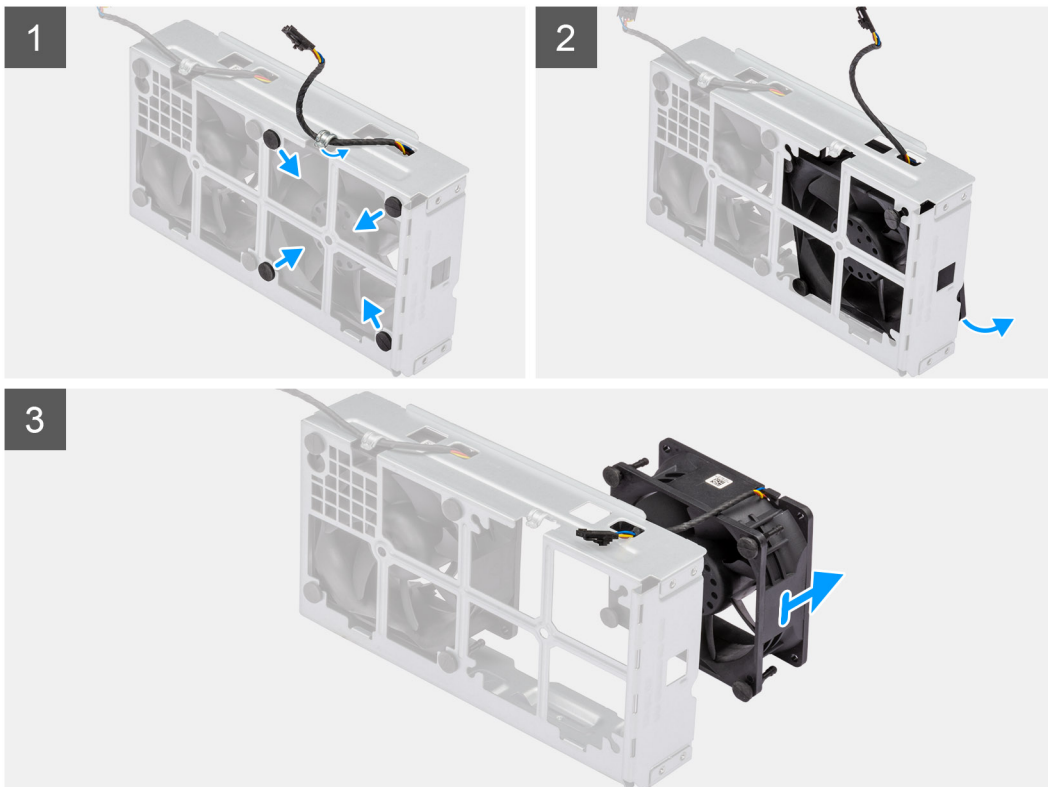
Removing rear fan

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [rear-fan assembly](#).

About this task

The following images indicate the location of the front-fan cage and provide a visual representation of the removal procedure.



Steps

1. Remove the fan cable from the routing guide on the fan assembly.
2. Locate the position of rubber grommets.
3. Gently pull the rubber grommets inwards to release the fan from the fan cage.
4. Remove the fan from the fan cage.

i **NOTE:** Follow the same steps for the second fan.

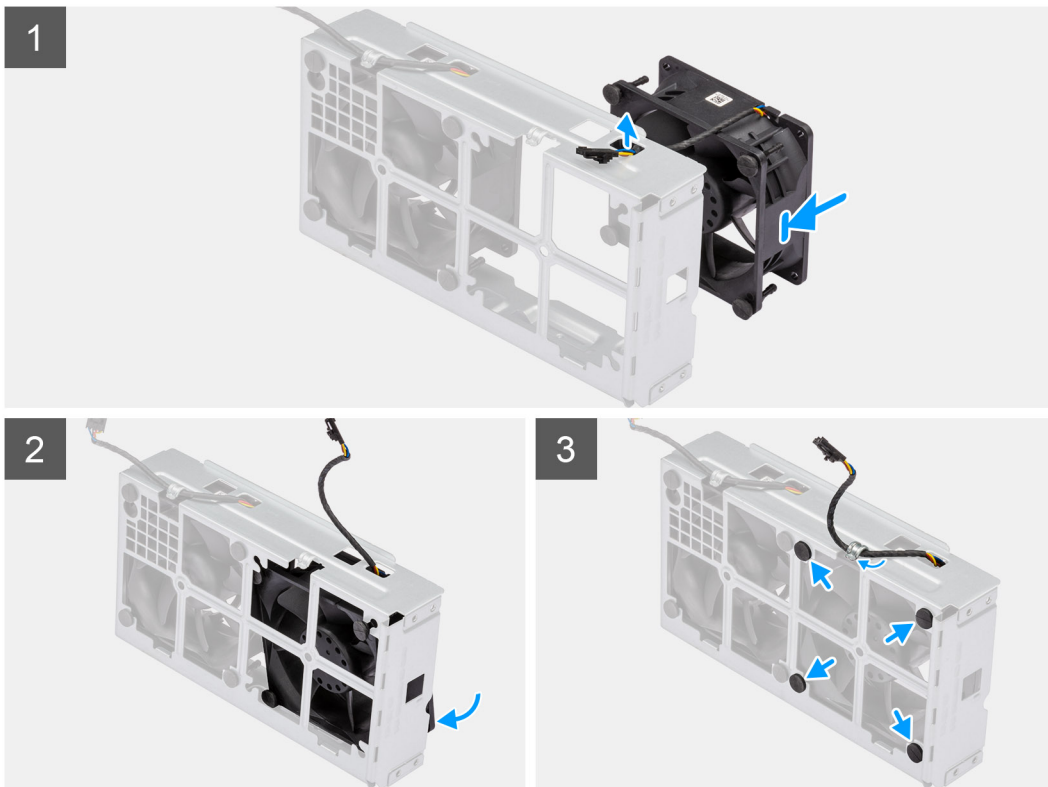
Installing the rear fan

Prerequisites

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

About this task

The following images indicate the location of the rear fan and provide a visual representation of the installation procedure.



Steps

1. Route the fan cable through the slot on the fan cage.
2. Place the fan inside the fan cage.
3. Insert the rubber grommets on the fan cage.
4. Align the slots on the fan with the rubber grommets on the fan cage.
5. Route the rubber grommets through the slots on the fan and pull the rubber grommets until the fan snaps into position.

Next steps

1. Install the [rear-fan assembly](#).
2. Follow the procedure in [After working inside your computer](#).

Installing the rear-fan assembly

Prerequisites

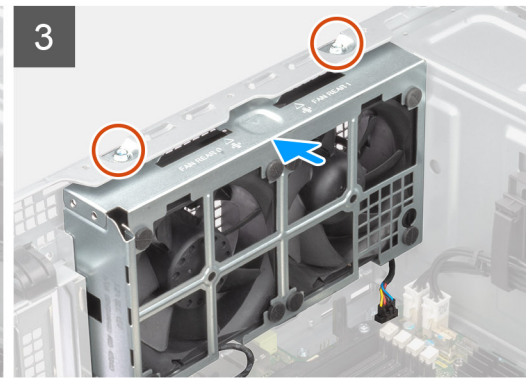
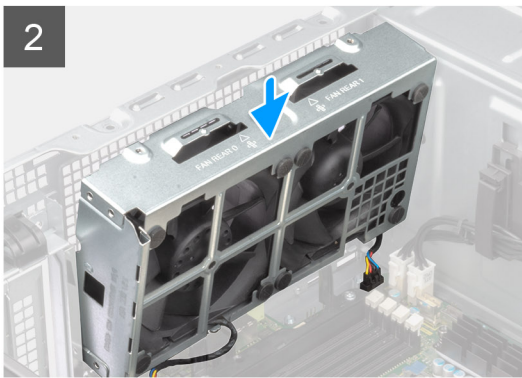
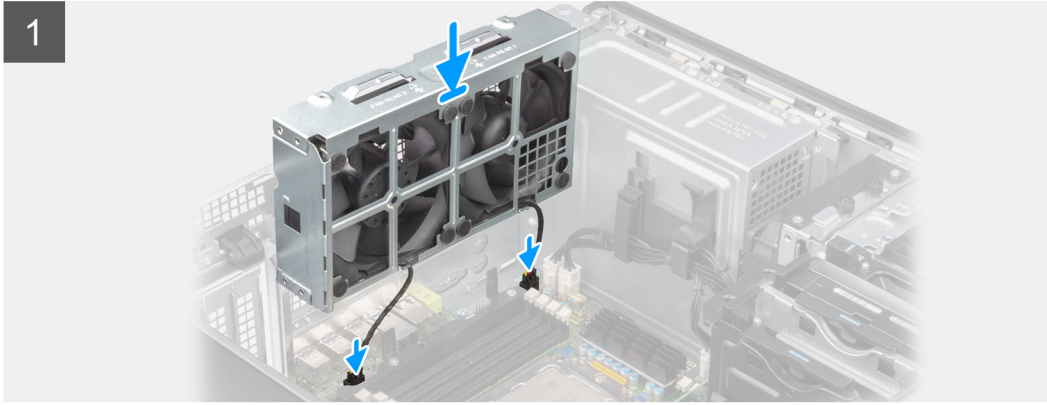
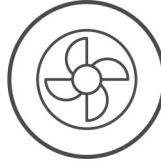
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the rear-fan assembly and provide a visual representation of the installation procedure.



2x
#6-32



Steps

1. Align the tabs on the fan assembly with the slots on the chassis.
2. Insert the fan assembly at an angle into the slot in the chassis.
3. Install the two (#6-32) screws to secure the fan assembly to the chassis.
4. Connect the fan cable to the connector on the system board.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Memory modules

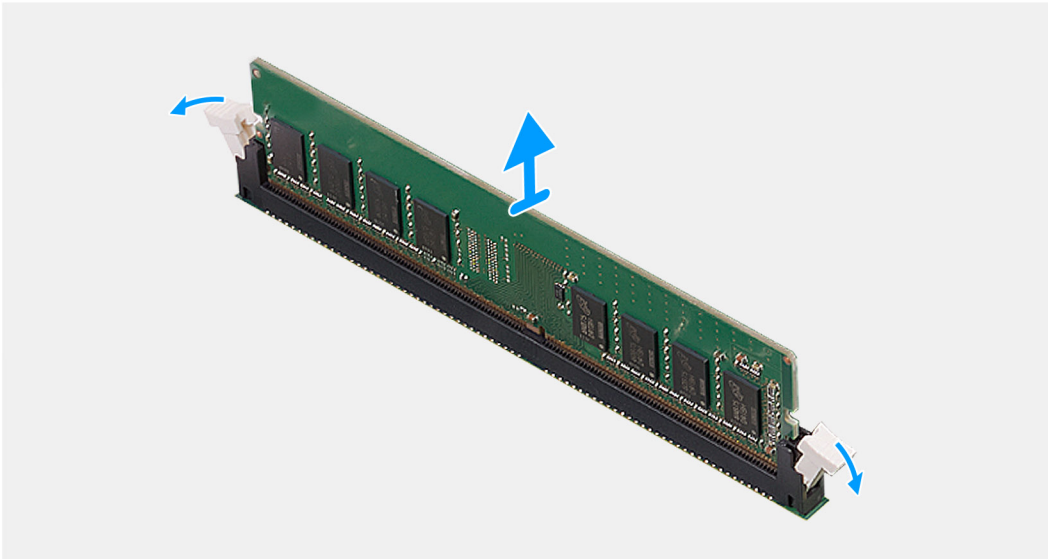
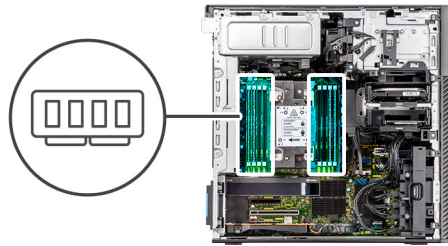
Removing the memory module

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following image indicates the location of the memory module and provide a visual representation of the removal procedure.



Steps

1. Pull the securing clips from both side of the memory module until the memory module pops up.
2. Slide and remove the memory module from the memory-module slot.

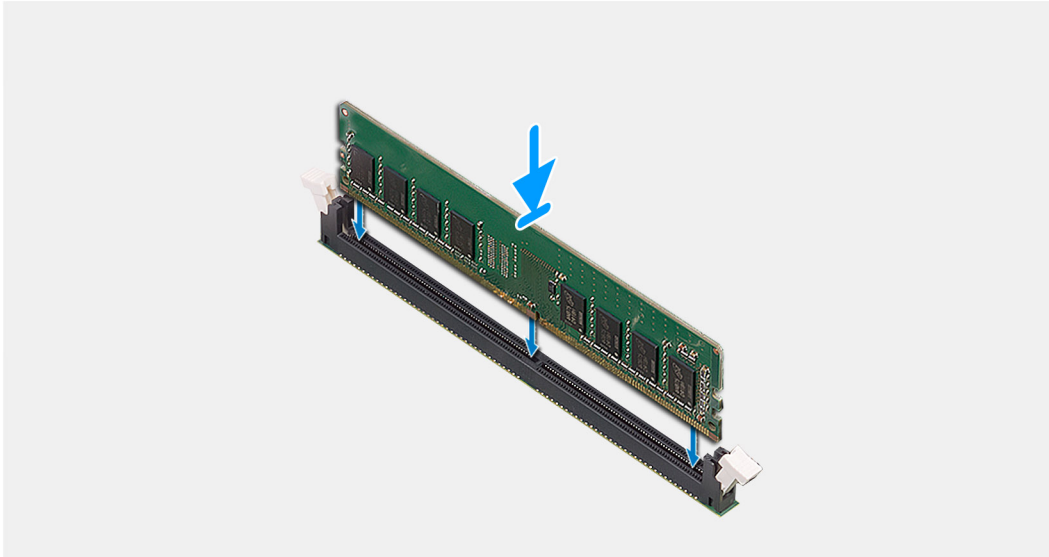
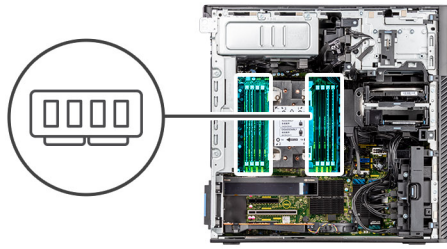
Installing the memory module

Prerequisites

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

About this task

The following image indicates the location of the memory module 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. Slide the memory module firmly into the slot at an angle and press the memory module down until it clicks into place.

NOTE: If you do not hear the click, remove the memory module and reinstall it.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [after working inside your computer](#).

M.2 solid-state drive

Removing the M.2 2230 PCIe solid-state drive

Prerequisites

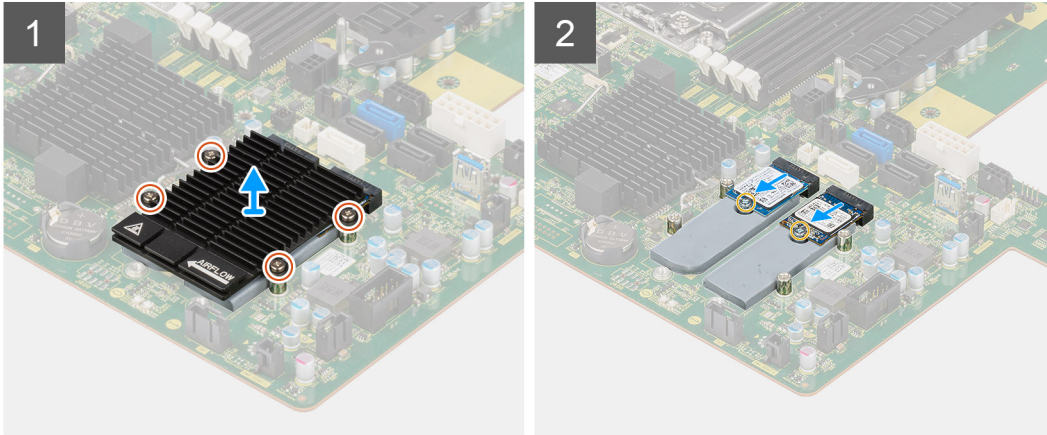
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [PCIe holder](#).

About this task

The following images indicate the location of the M.2 2230 solid-state drive and provide a visual representation of the removal procedure.



2x
M2 x 3.5



Steps

1. Loosen the four captive screws that secures the M.2 heat-sink to the system board.
2. Lift and remove the M.2 heat-sink from the computer.
3. Remove the single (M2x3.5) screws that secures the solid-state drive to the system board.

 **NOTE:** If the computer has two solid-state drives installed, repeat the same steps for the second solid-state drive.

4. Slide and lift the solid-state drive off the system board.

Installing the M.2 2230 PCIe solid-state drive

Prerequisites

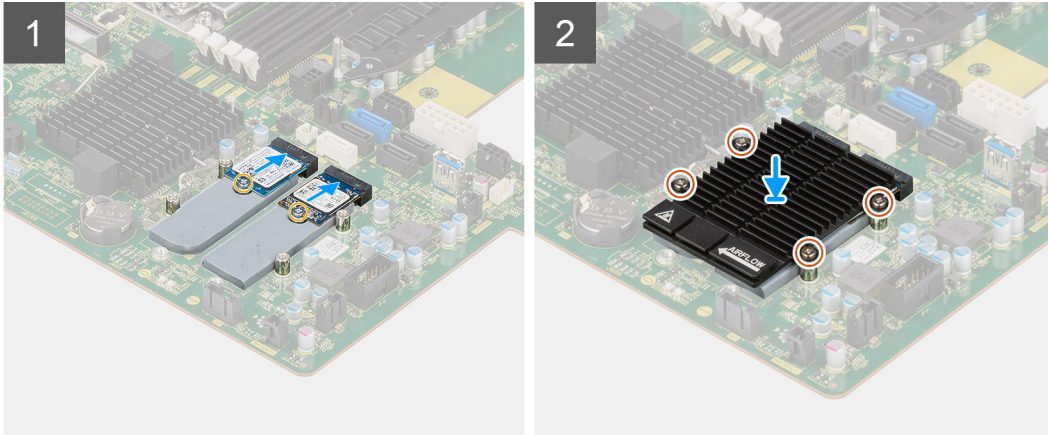
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the M.2 2230 solid-state drive and provides a visual representation of the installation procedure.



2x
M2 x 3.5



Steps

1. Align the notch on the solid-state drive with the tab on the solid-state drive connector.
2. Insert the solid-state drive at a 45-degree angle into the slot on the system board.

NOTE: When replacing a M.2 2280 solid-state drive from a M.2 2230 solid-state drive, ensure to move the standoff nut to the M.2 2230 solid-state drive slot position.

3. Replace the single (M2x3.5) screw to secure the solid-state drive to the system board.
4. Align and place the M.2 heat-sink over the solid-state drive.
5. Tighten the four captive screws to secure the M.2 heat-sink to the system board.

Next steps

1. Install the [PCIe holder](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Removing the M.2 2280 PCIe solid-state drive

Prerequisites

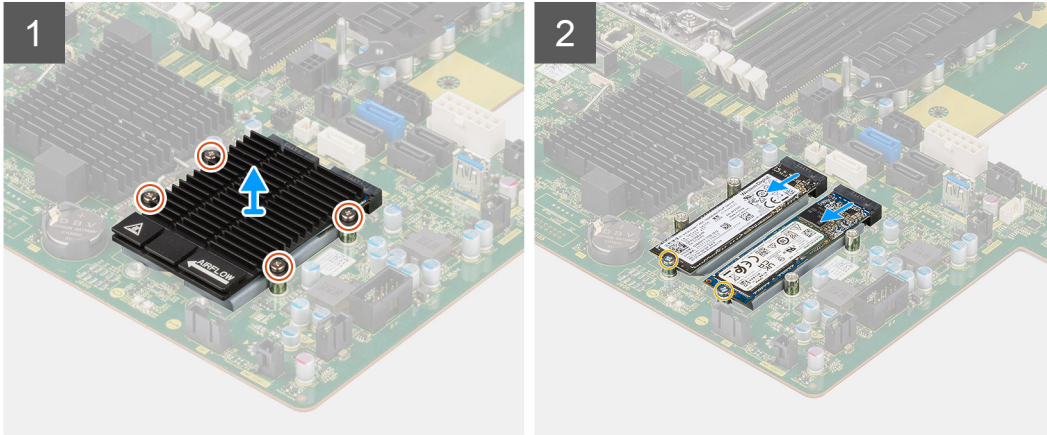
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [PCIe holder](#).

About this task

The following images indicate the location of the M.2 2280 solid-state drive and provide a visual representation of the removal procedure.



2x
M2 x 3.5



Steps

1. Loosen the four captive screws that secures the M.2 heat-sink to the system board.
2. Lift and remove the M.2 heat-sink from the computer.
3. Remove the single (M2x3.5) screws that secures the solid-state drive to the system board.

i **NOTE:** If the computer has two solid-state drives installed, repeat the same steps for the second solid-state drive.

4. Slide and lift the solid-state drive off the system board.

Installing the M.2 2280 PCIe solid-state drive

Prerequisites

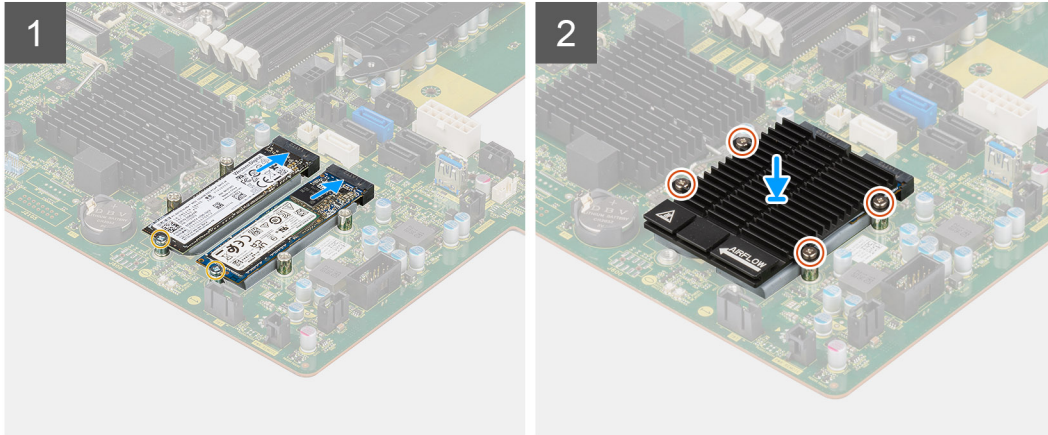
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the M.2 2280 solid-state drive and provides a visual representation of the installation procedure.



2x
M2 x 3.5



Steps

1. Align the notch on the solid-state drive with the tab on the solid-state drive connector.
2. Insert the solid-state drive at a 45-degree angle into the slot on the system board.

NOTE: When replacing a M.2 2280 solid-state drive to a M.2 2230 solid-state drive, ensure to move the standoff nut to the M.2 2230 solid-state drive slot position.

3. Replace the single (M2x3.5) screw to secure the solid-state drive to the system board.
4. Align and place the M.2 heat-sink over the solid-state drive.
5. Tighten the four captive screws to secure the M.2 heat-sink to the system board.

Next steps

1. Install the [PCIe holder](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Heat sink

Removing the heat-sink assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

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

CAUTION: 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.

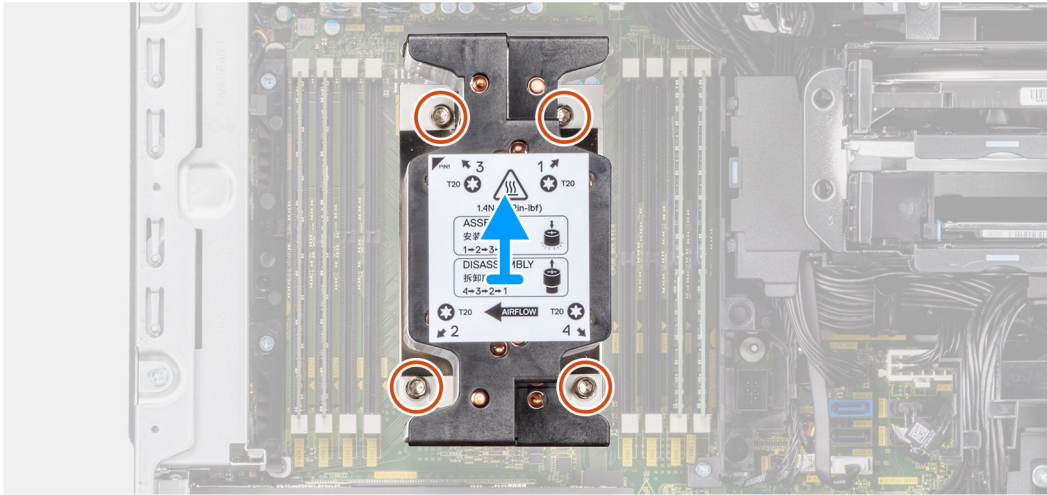
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the heat-sink assembly and provide a visual representation of the removal procedure.



4x



Steps

1. Using a Torx T20 screwdriver, in reverse sequential order (4->3->2->1), loosen the four captive screws that secure the heat-sink assembly to the system board.
2. Lift the heat-sink assembly from the system board.

Installing the heat-sink assembly

Prerequisites

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

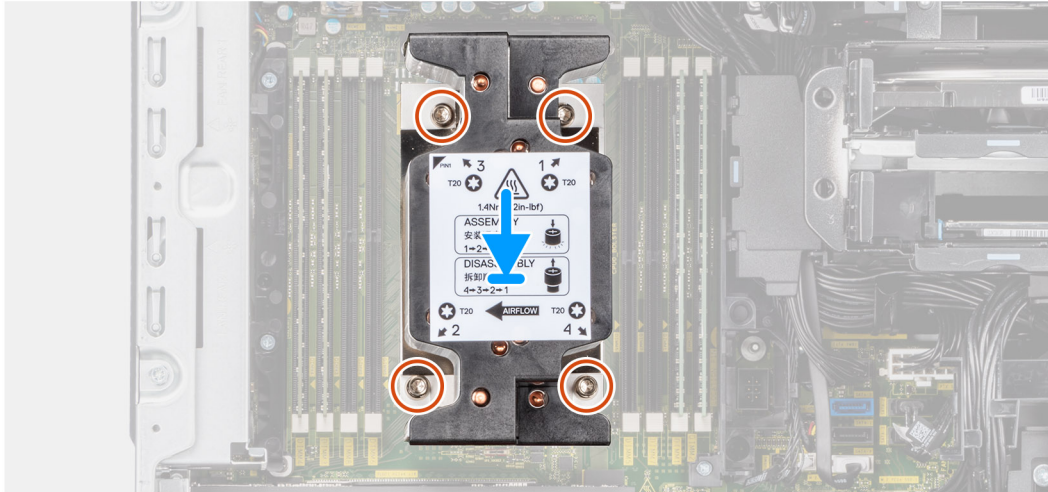
NOTE: If either the processor or the heat sink is replaced, use the thermal grease that is provided in the kit to ensure that thermal conductivity is achieved.

About this task

The following images indicate the location of the heat-sink assembly and provides a visual representation of the installation procedure.



4x



Steps

1. Align the screws on the processor fan and heat-sink assembly with the screw holders on the system board and place the processor fan and heat-sink assembly on the processor.

NOTE: Ensure that the triangle mark is directed towards the rear side of the computer.

2. In the sequential order (1->2->3->4), tighten the captive screws to secure the processor fan and heat-sink assembly to the system board.

NOTE: Tighten the screws in a sequential order (1,2,3,4) as printed on the system board.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Hard-drive fan assembly

Removing the hard-drive fan assembly

Prerequisites

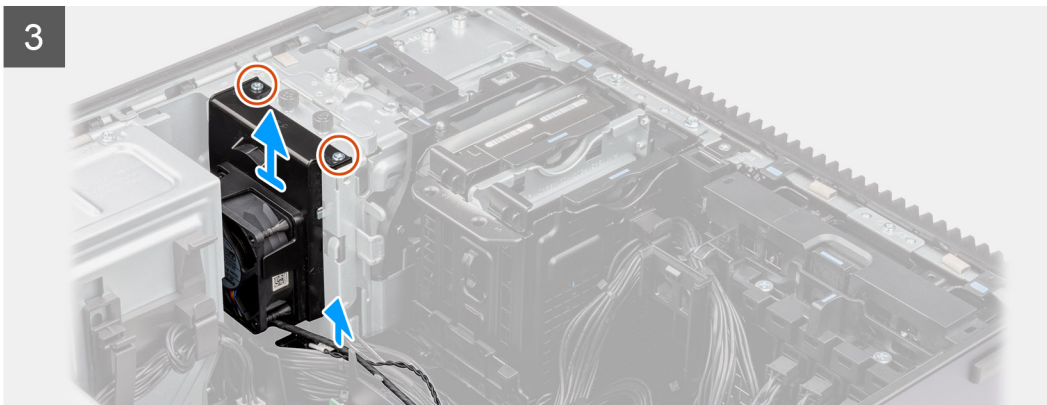
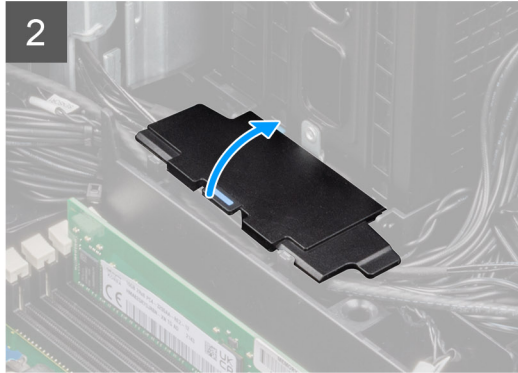
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the hard-drive fan assembly and provide a visual representation of the removal procedure.



2x
M3



Steps

1. Disconnect the SATA power-cable, thermal-sensor cable, PCIe cable and the fan-controller cable from the connectors on the system board.
2. Open the bottom-air shroud cover and remove the cables that are routed inside.
3. Remove the two (M3) screws from the hard-drive fan assembly.
4. Lift and remove the hard-drive fan assembly from the computer.

Installing the hard-drive fan assembly

Prerequisites

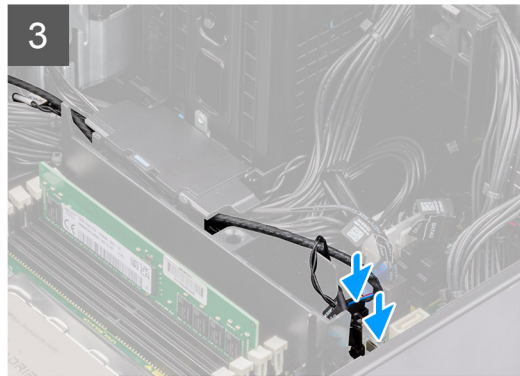
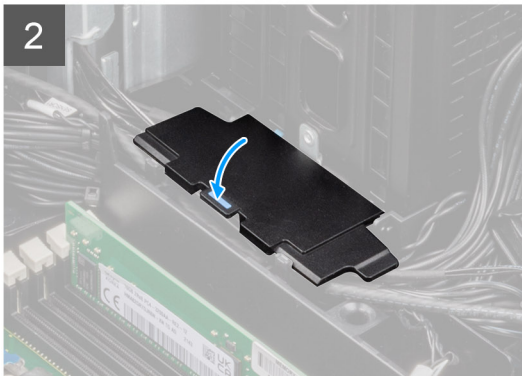
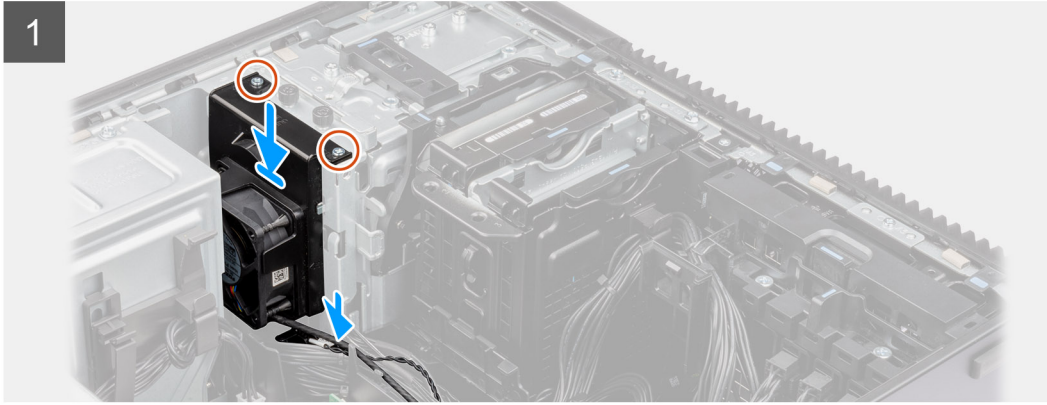
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the hard-drive fan assembly and provide a visual representation of the installation procedure.



2x
M3



Steps

1. Align the tabs on the hard-drive fan assembly with the slots on the chassis.
2. Place the hard-drive fan assembly into the slot in the chassis.
3. Install the two (M3) screws to secure the fan assembly to the chassis.
4. Route the SATA power-cable, thermal-sensor cable, PCIe cable and fan-controller cable through the bottom air-shroud cover.
5. Close the lid of the bottom air-shroud cover.
6. Connect the SATA power-cable, thermal-sensor cable, PCIe cable and fan-controller cable to the connectors on the system board.

Next steps


1. Install the [air shroud](#).
2. Install the [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 [side cover](#).
3. Remove the [heat-sink assembly](#).

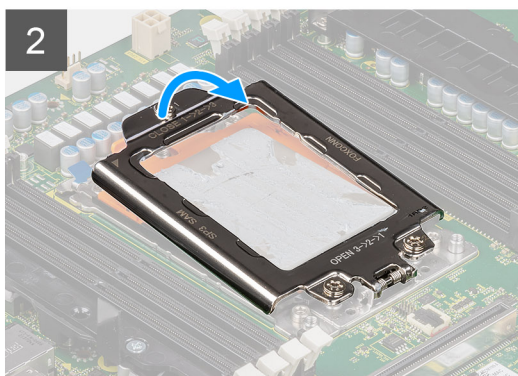
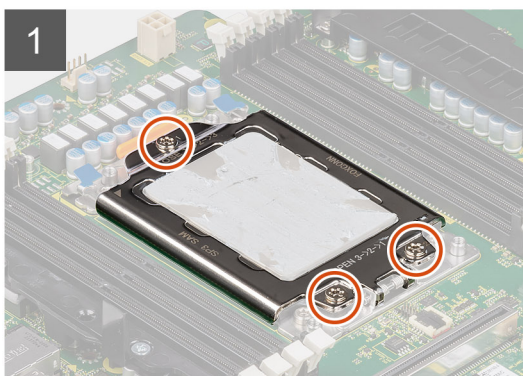
 **NOTE:** The processor might still be hot after the computer is shut down. Allow the processor to cool down before removing it.

About this task

The following images indicate the location of the processor and provide a visual representation of the removal procedure.



3x



Steps

1. Loosen the three captive screws that secure the force frame to the system board.
2. Lift and open the force frame.
3. Lift the CPU carrier by holding the two blue latch points on the rail frame and rotating it to the vertical position.

 **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.

4. Gently slide the processor out of the guide rails on the CPU carrier.

Installing the processor

Prerequisites

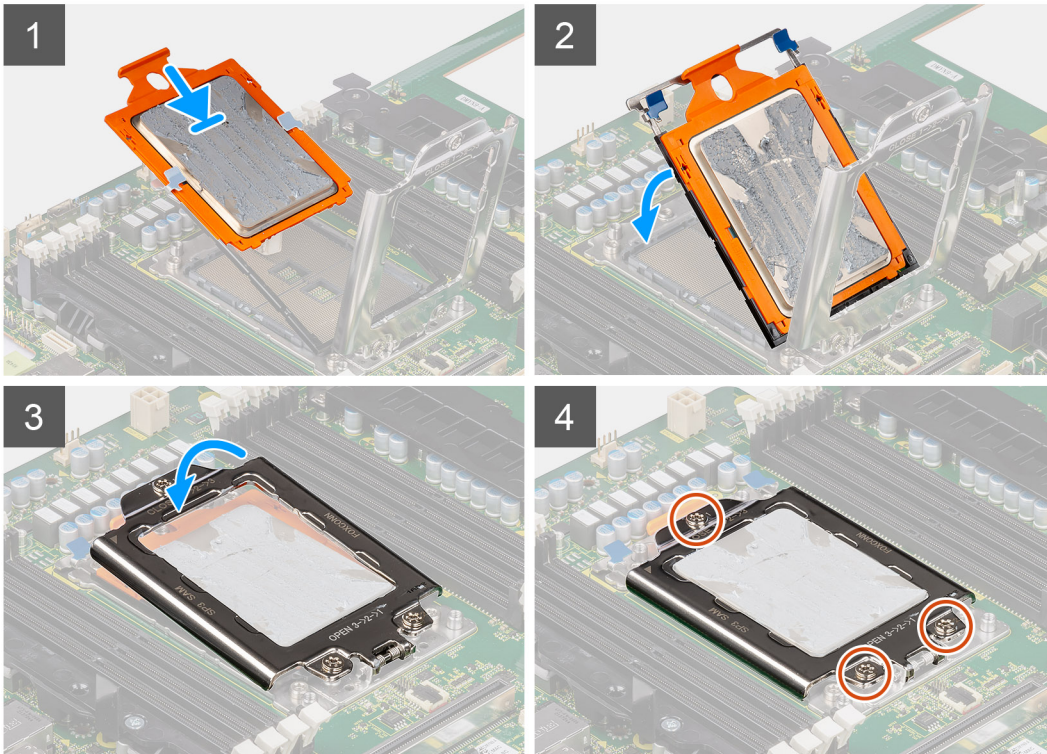
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the processor and provides a visual representation of the installation procedure.



3x



Steps

1. Slide the CPU carrier-frame along the guide rails on the CPU carrier.
2. Close the CPU carrier and latch it to the socket housing.
3. Close the force frame and tighten the three captive screws in a sequential order (1 > 2 > 3) to secure the force frame to the system board.
4. Align the notches on the processor with the tabs on the processor socket and place the processor in the processor socket.

Next steps

1. Install the [heat-sink assembly](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Expansion card

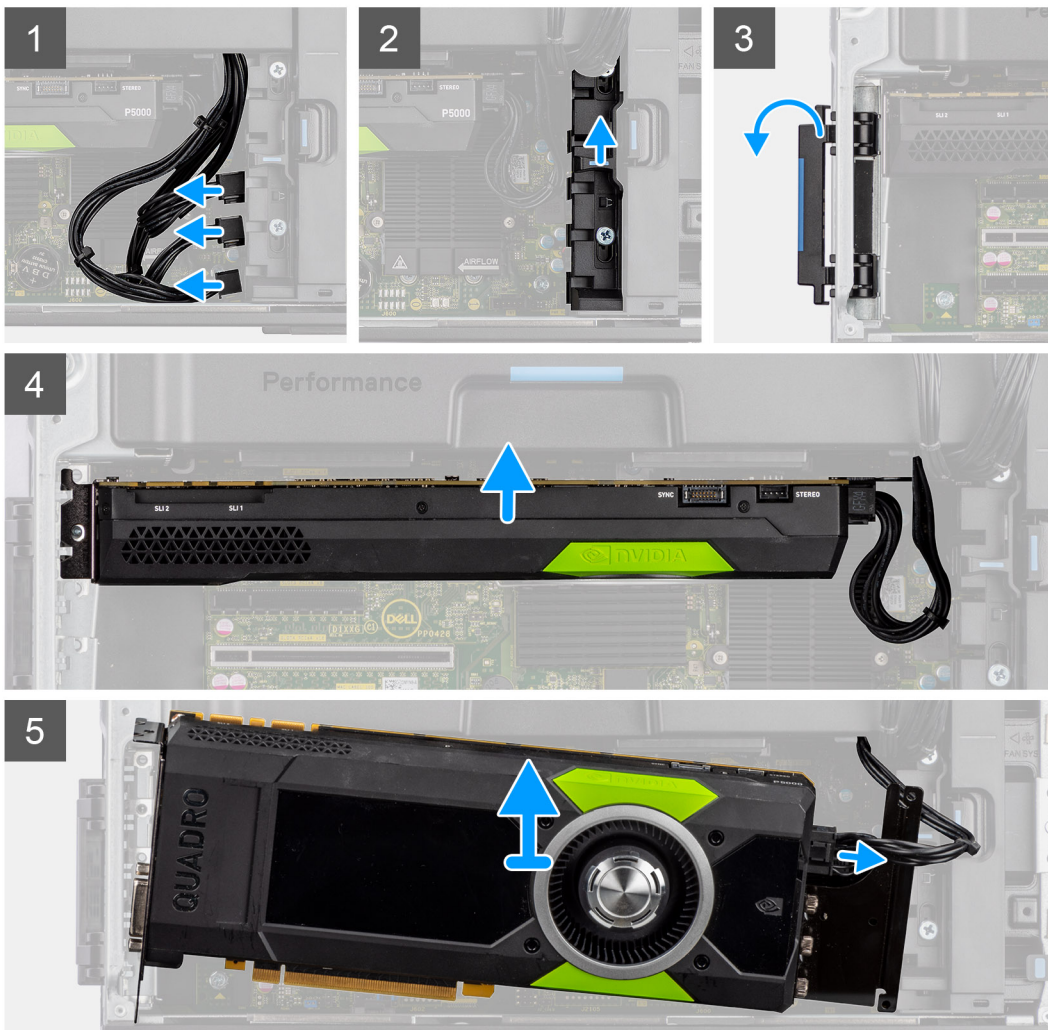
Removing the powered graphics-card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the powered graphics-card and provide a visual representation of the removal procedure.



Steps

1. Disconnect the PCIe-power cable from the connector on the graphics card.
2. Remove the PCIe-power cables from the PCIe holder.
3. Push the PCIe latch to open the PCIe door.
4. Push the PCIe-holder latch upwards to release the PCIe-card bracket.
5. Lift the graphics card away from the graphics-card slot.

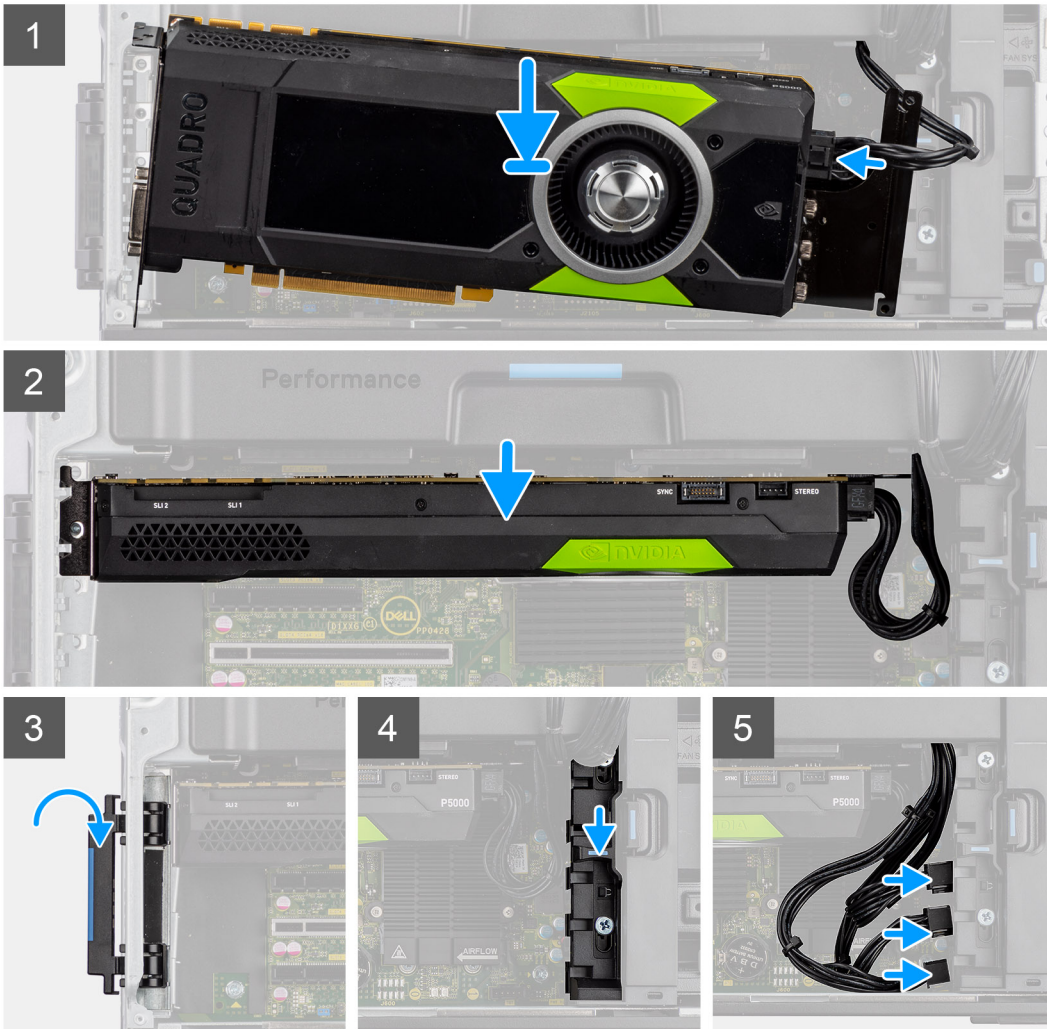
Installing the powered graphics-card

Prerequisites

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

About this task

The following images indicate the location of the powered graphics-card and provide a visual representation of the installation procedure.



Steps

1. Align the powered GPU with the PCI-Express card connector on the system board.
2. Using the alignment post, connect the graphics card to the connector and press down firmly. Ensure that the graphics card is firmly seated.
3. Slide the release latch down on the PCIe-holder to secure the PCIe-card bracket.
4. Connect the PCIe-power cable to the connectors on the graphics card.
5. Connect the PCIe-power cables to the slots on the PCIe holder.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

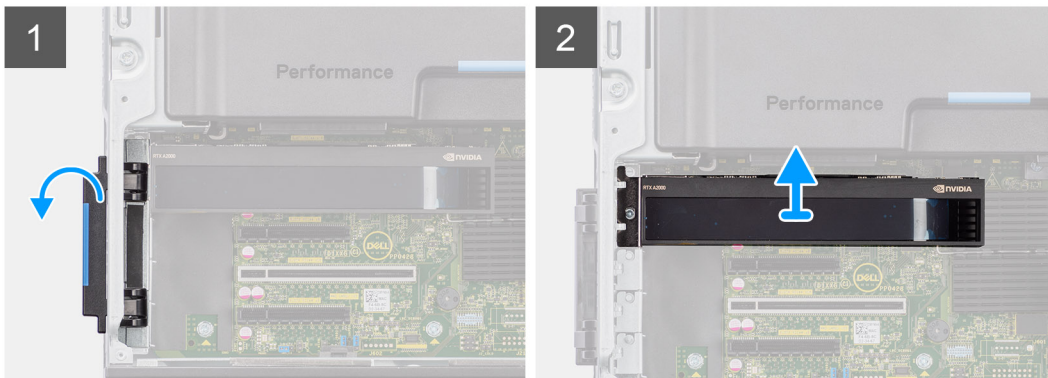
Removing the non-powered graphics card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the non-powered graphics card and provide a visual representation of the removal procedure.



Steps

1. Push the PCIe latch to open the PCIe door.
2. Lift the graphics card away from the graphics-card slot.

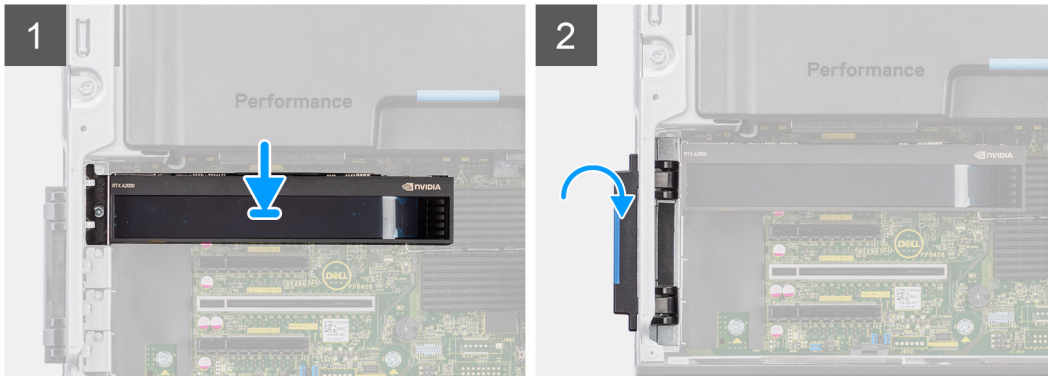
Installing the non-powered graphics card

Prerequisites

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

About this task

The following images indicate the location of the non-powered graphics card and provide a visual representation of the installation procedure.



Steps

1. Align the powered GPU with the PCI-Express card connector on the system board.
2. Using the alignment post, connect the graphics card to the connector and press down firmly. Ensure that the graphics card is firmly seated.
3. Close the PCIe door.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

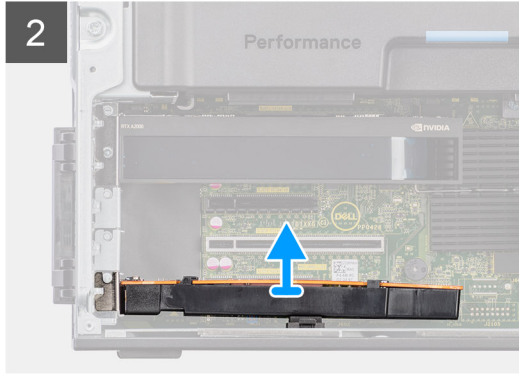
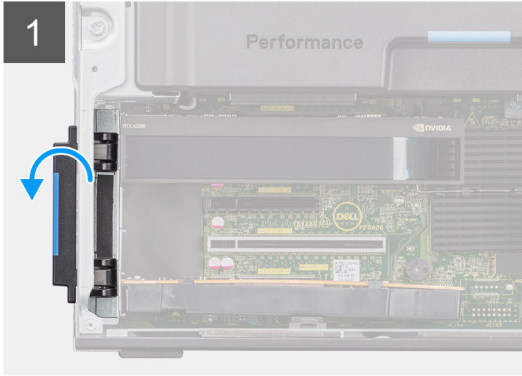
Removing the UltraSpeed Duo card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the UltraSpeed Duo card and provide a visual representation of the removal procedure.



Steps

1. Push the PCIe latch to open the PCIe door.
2. Lift and remove the UltraSpeed Duo card away from the expansion-card slot.

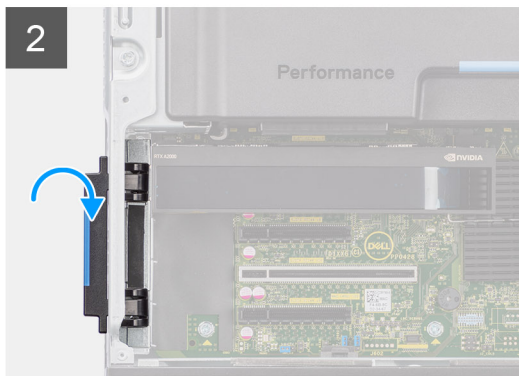
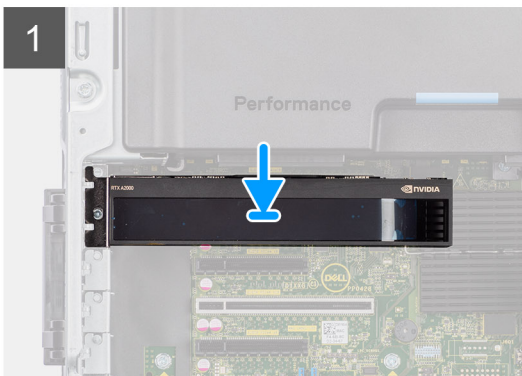
Installing the UltraSpeed Duo card

Prerequisites

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

About this task

The following images indicate the location of the UltraSpeed Duo card and provide a visual representation of the installation procedure.



Steps

1. Align the UltraSpeed Duo card with the expansion-card slot on the system board.
2. Using the alignment post, connect the UltraSpeed Duo card to the connector and press down firmly. Ensure that the UltraSpeed Duo card is firmly seated.
3. Close the PCIe door.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

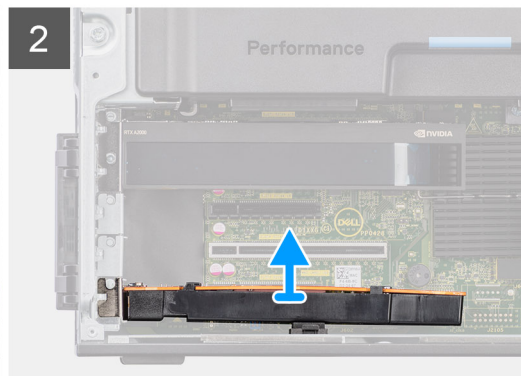
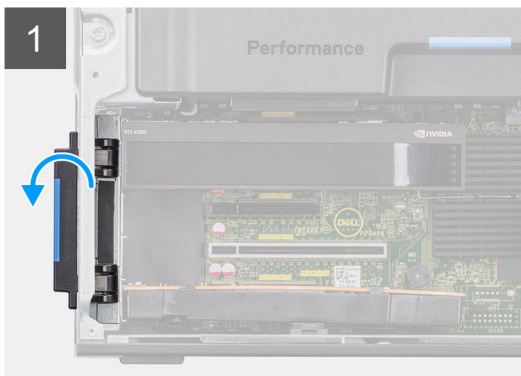
Removing the UltraSpeed Quad card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the UltraSpeed Quad card and provide a visual representation of the removal procedure.



Steps

1. Push the PCIe latch to open the PCIe door.
2. Lift and remove the UltraSpeed Quad card away from the expansion-card slot.

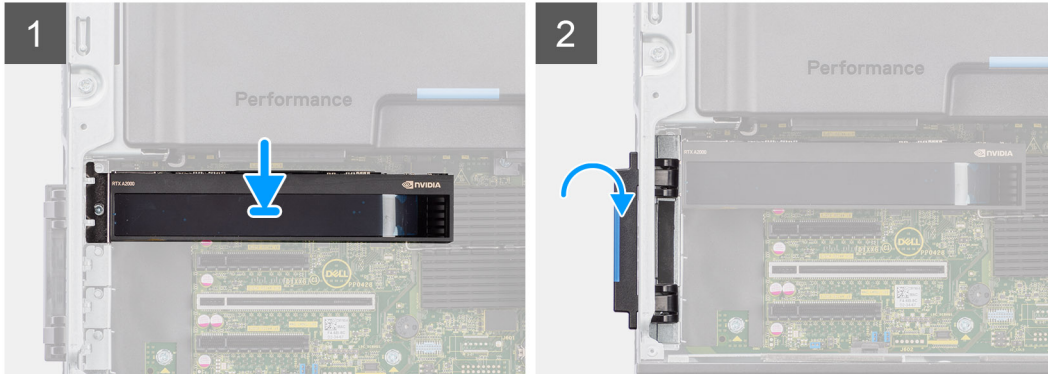
Installing the UltraSpeed Quad card

Prerequisites

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

About this task

The following images indicate the location of the UltraSpeed Quad card and provide a visual representation of the installation procedure.



Steps

1. Align the UltraSpeed Quad card with the expansion-card slot on the system board.
2. Using the alignment post, connect the UltraSpeed Quad card to the connector and press down firmly. Ensure that the UltraSpeed Quad card is firmly seated.
3. Close the PCIe door.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

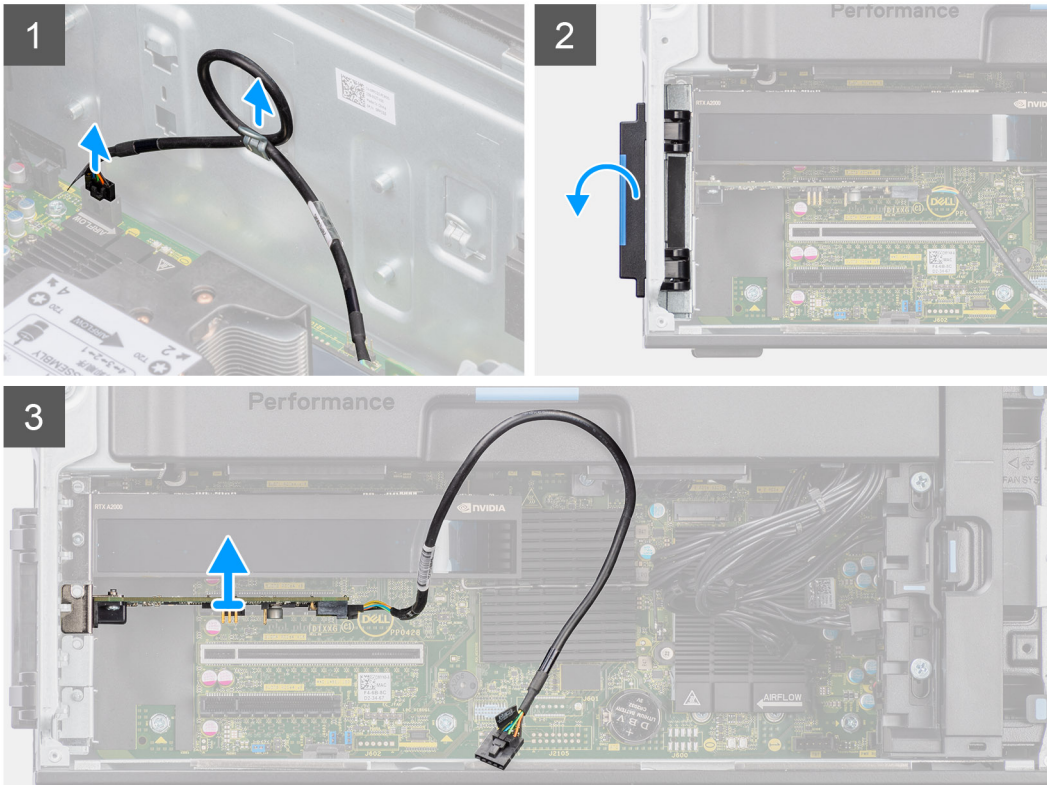
Removing the Thunderbolt 3 PCIe card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the Thunderbolt 3 PCIe card and provide a visual representation of the removal procedure.



Steps

1. Disconnect the Thunderbolt 3 PCIe cable from the connector on the system.
2. Remove the Thunderbolt 3 PCIe cable from the routing guide on the chassis.
3. Push the PCIe latch to open the PCIe door.
4. Lift and remove the Thunderbolt 3 PCIe card away from the expansion-card slot.

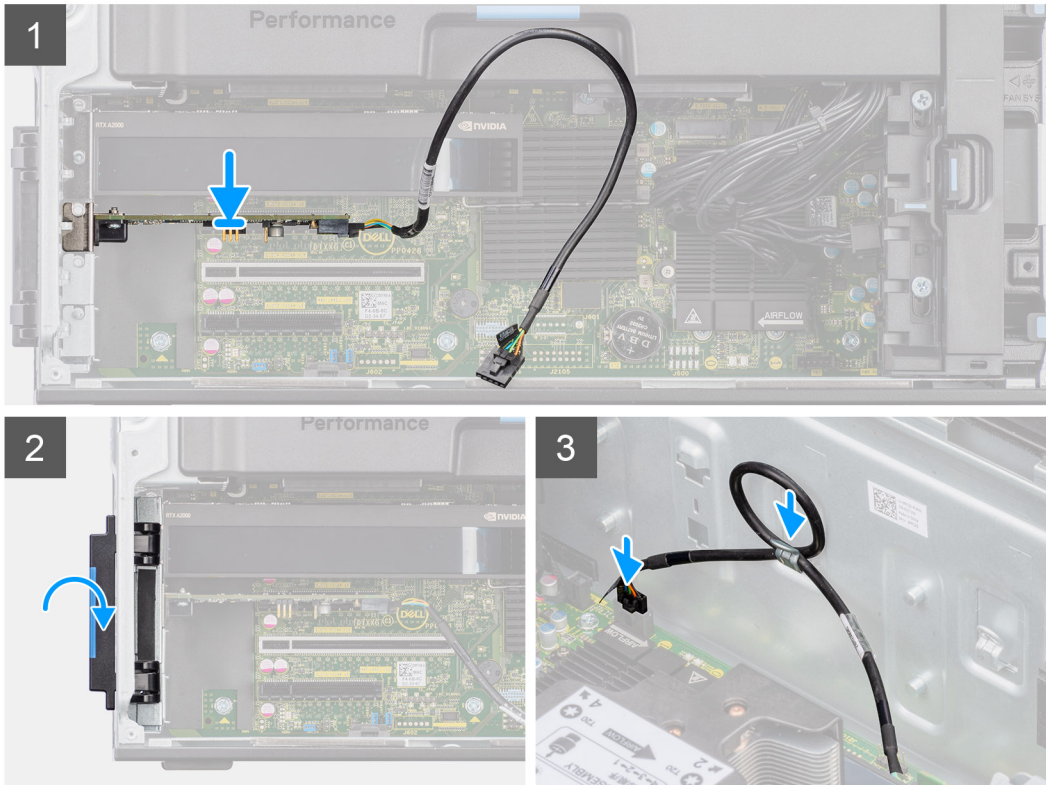
Installing the Thunderbolt 3 PCIe card

Prerequisites

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

About this task

The following images indicate the location of the Thunderbolt 3 PCIe card and provide a visual representation of the installation procedure.



Steps

1. Align the Thunderbolt 3 PCIe card with the expansion-card slot on the system board.
2. Using the alignment post, connect the Thunderbolt 3 PCIe card to the connector and press down firmly. Ensure that the Thunderbolt 3 PCIe card is firmly seated.
3. Route the Thunderbolt 3 PCIe through the routing guide on the chassis.
4. Connect the Thunderbolt 3 PCIe cable to the connector on the system board.
5. Close the PCIe door.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Removing the wireless card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the wireless card and provide a visual representation of the removal procedure.

Steps

1. Loosen the captive screw on the external-antenna cover.
2. Remove the external-antenna cover from over the antenna connectors on the PCIe-riser card.
3. Loosen the bolts on the external-antenna cable connector.
4. Disconnect the PCIe-riser card cable from the connector on the system board.
5. Remove the PCIe-riser card cable from the routing guide on the chassis.
6. Push the PCIe latch to open the PCIe door.
7. Remove the PCIe-riser card from the expansion-card slot.
8. Remove the single (M2x3) screw from the WLAN card.
9. Disconnect the WLAN antenna cables from the connectors on the WLAN card.
10. Slide and remove the WLAN card from the WLAN slot on the PCIe-riser card.

Installing the wireless card

Prerequisites

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

About this task

The following images indicate the location of the wireless card and provide a visual representation of the installation procedure.

Steps

1. Align the notch on the WLAN card with the tab on the PCIe riser-card.
2. Slide the WLAN card at an angle into the PCIe riser-card.
3. Install the single (M2x3) screw to secure the WLAN card to the PCIe-riser card.
4. Align and slide the PCIe riser card into the expansion-card slot on the system board.
5. Connect the PCIe riser-card cable to the connector on system board.
6. Route the PCIe riser-card cable through the hook on the chassis.
7. Tighten the bolts to secure the external-antenna cable to the connector on the PCIe riser-card.
8. Push the external-antenna cover towards the chassis to secure the external-antenna cable.
9. Replace the single screw that secures the external-antenna cover to the PCIe riser-card and chassis.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Speaker

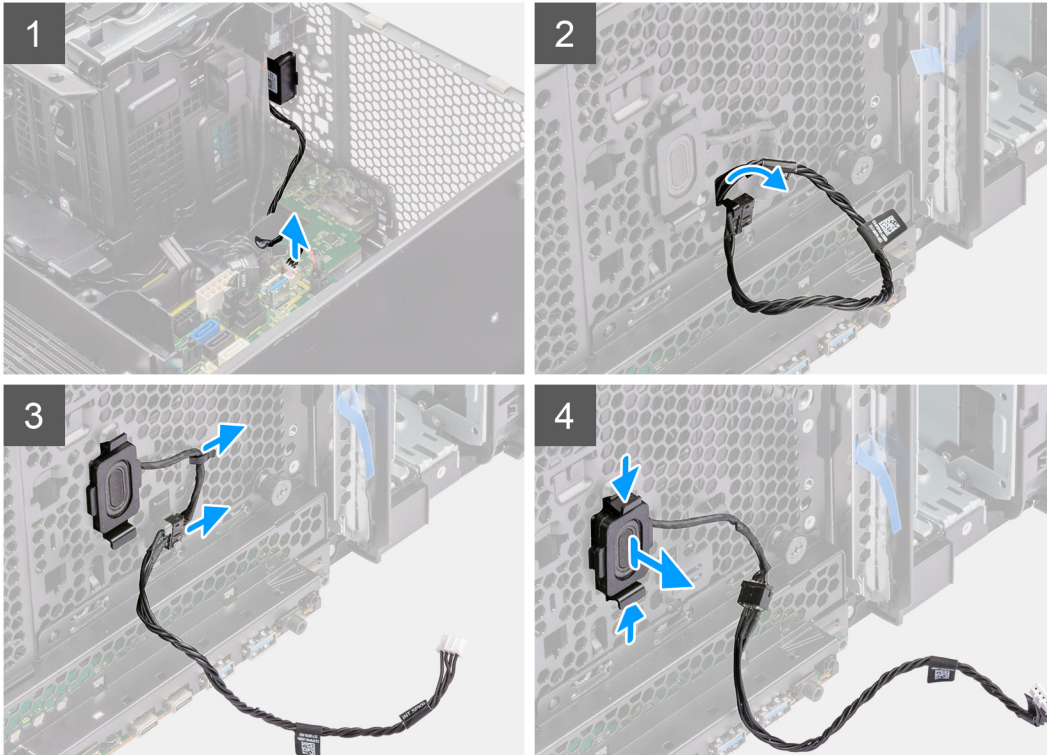
Removing the speaker

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [front bezel](#).
4. Remove the [air shroud](#).

About this task

The following images indicate the location of the speaker and provide a visual representation of the removal procedure.



Steps

1. Disconnect the speaker cable from the connector on the system board.
2. Remove the speaker cable from the front chassis.
3. Remove the speaker cable from the routing guides on the chassis.
4. Press the two tabs and slide the speaker along with the cable from the slot on the chassis.

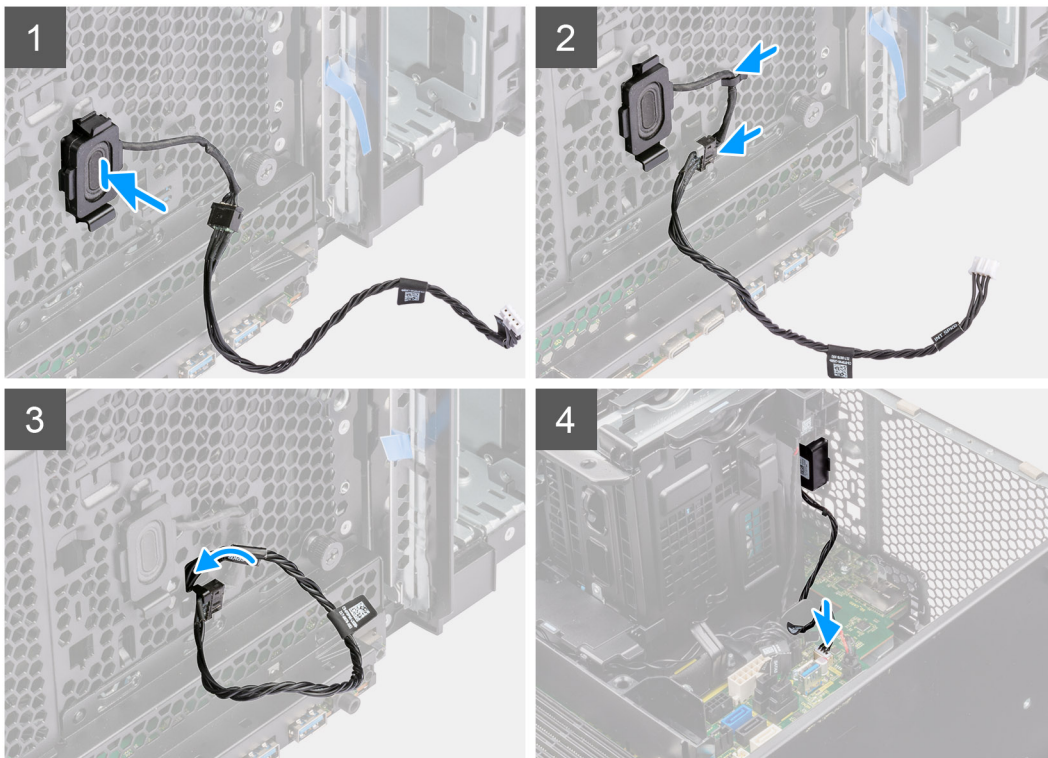
Installing the speaker

Prerequisites

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

About this task

The following image indicates the location of the speaker and provides a visual representation of the installation procedure.



Steps

1. Press the tabs on the speaker and slide the speaker in the slot on the chassis until it snaps into place.
2. Route the speaker cable through the routing guide on the chassis.
3. Route the speaker cable through the slot on the chassis.
4. Connect the speaker cable to the connector on the system board.

Next steps

1. Install the [air shroud](#).
2. Install the [front bezel](#).
3. Install the [side cover](#).
4. Follow the procedure in [After working inside your computer](#).

Intrusion switch

Removing the intrusion switch

Prerequisites

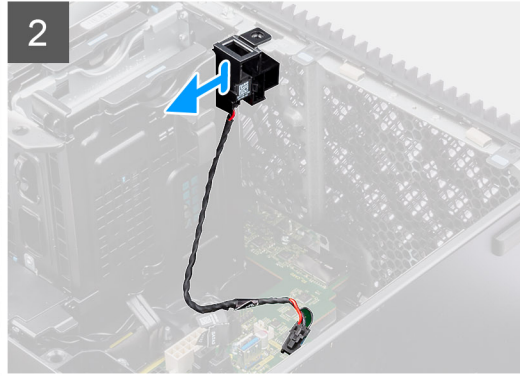
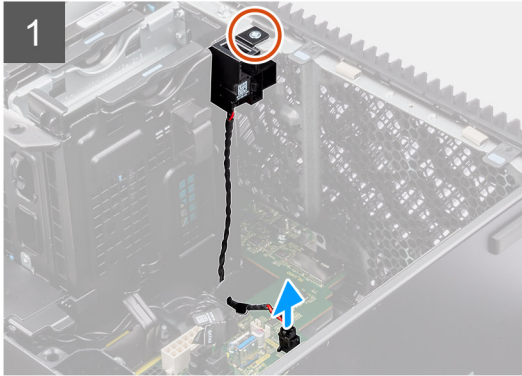
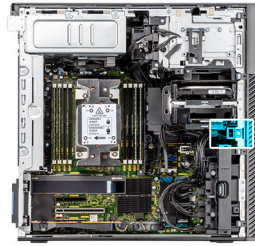
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).

About this task

The following images indicate the location of the intrusion switch and provide a visual representation of the removal procedure.



1x
M3



Steps

1. Disconnect the intrusion-switch cable from the connector on the system board.
2. Remove the cable from the routing point on the system board.
3. Slide and remove the intrusion switch from the computer.

Installing the intrusion switch

Prerequisites

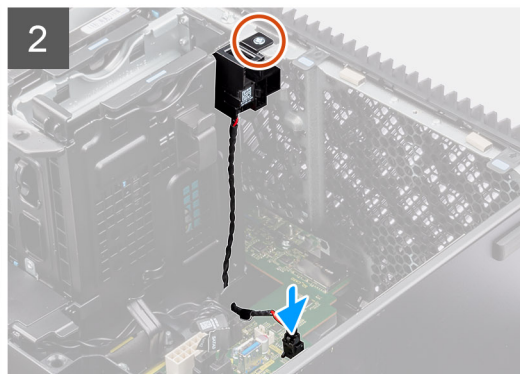
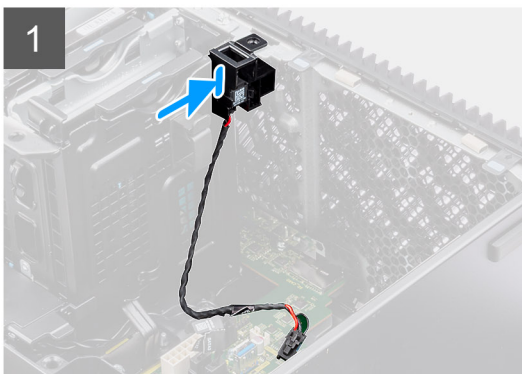
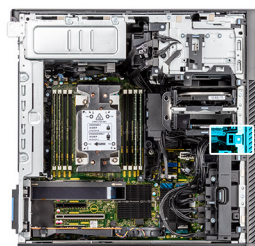
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the intrusion switch and provide a visual representation of the installation procedure.



1x
M3



Steps

1. Insert the intrusion switch into its slot in the chassis.
2. Route the intruder cable through the routing guides on the system board.
3. Connect the intrusion-switch cable to the connector on the system board.

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Internal hard-drive cage

Removing the internal hard-drive cage

Prerequisites

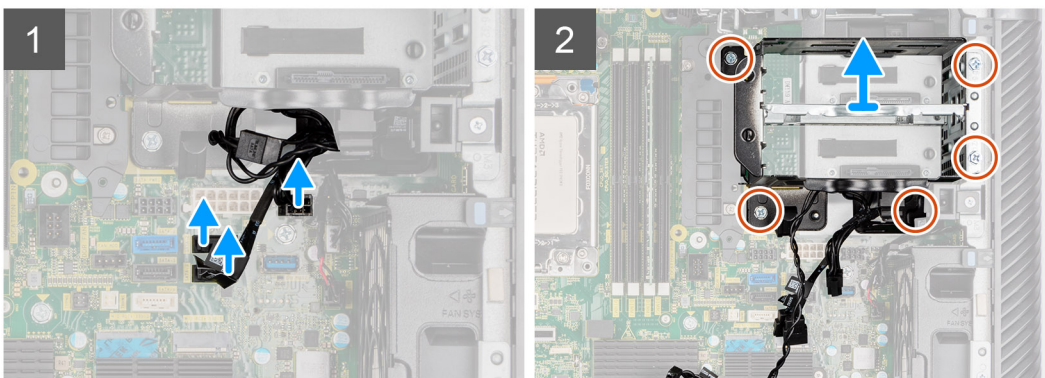
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).
3. Remove the [air shroud](#).
4. Remove the [2.5-inch hard-drive assembly](#).
5. Remove the [3.5-inch hard-drive assembly](#).

About this task

The following images indicate the location of the internal hard-drive cage and provide a visual representation of the removal procedure.



5x
#6-32



Steps

1. Disconnect the SATA power-cables and SATA data-cables from the connectors on the system board.
2. Remove the five (#6-32) screws from the hard-drive cage.
3. Slide and remove the hard-drive cage out of the computer.

Installing the internal hard-drive cage

Prerequisites

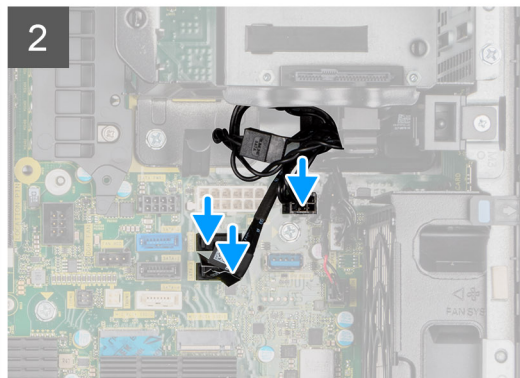
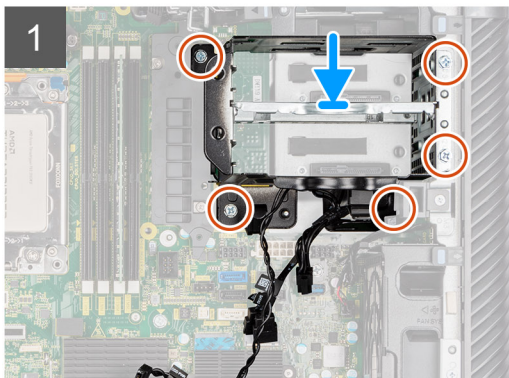
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the internal hard-drive cage and provide a visual representation of the installation procedure.



5x
#6-32



Steps

1. Slide and insert the hard-drive cage into the slot on the chassis.
2. Install the four (#6-32) screws to secure the hard-drive cage to the chassis.
3. Connect the SATA power-cables and SATA data-cables to the connectors on the system board.

Next steps

1. Install the [3.5-inch hard-drive assembly](#).
2. Install the [2.5-inch hard-drive assembly](#).
3. Install the [air shroud](#).
4. Install the [side cover](#).
5. Follow the procedure in [After working inside your computer](#).


Voltage-regulator heat sink

Removing the voltage-regulator heat sink - Location 1

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

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

 **CAUTION:** 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.

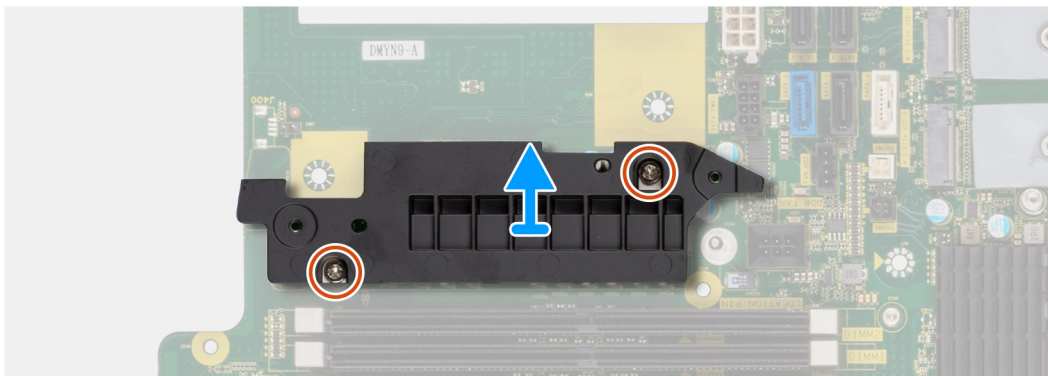
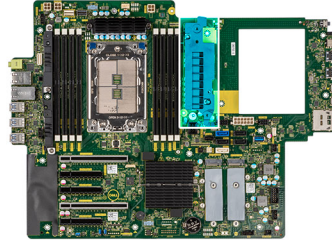
2. Remove the [side cover](#).
3. remove the [air shroud](#).

About this task

The following image indicates the location of the voltage-regulator heat sink and provides a visual representation of the removal procedure.



2x
M3x5



Steps

1. Remove the two (M3x5) screws that secure the voltage-regulator heat sink to the system board.
2. Lift the heat sink off the system board.

Installing the voltage-regulator heat sink - Location 1

Prerequisites

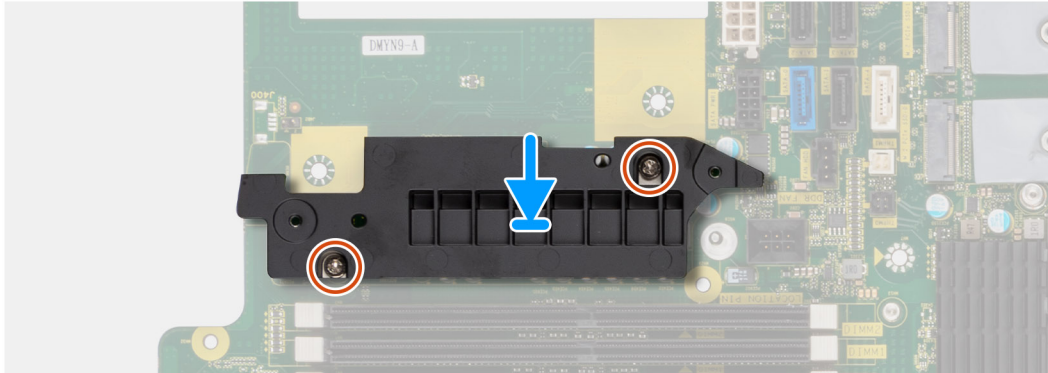
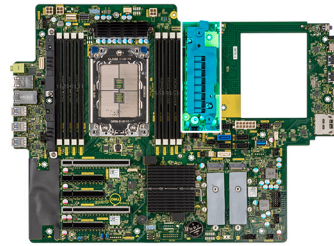
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the voltage-regulator heat sink and provides a visual representation of the installation procedure.



2x
M3x5



Steps

1. Align the screw holes on the voltage-regulator heat sink to the screw holes on the system board and adhere the voltage-regulator heat sink to the system board.
2. Install the two (M3x5) screws that secure the voltage-regulator heat sink to the system board.

Next steps


1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Removing the voltage-regulator heat sink - Location 2

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

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

 **CAUTION:** 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.

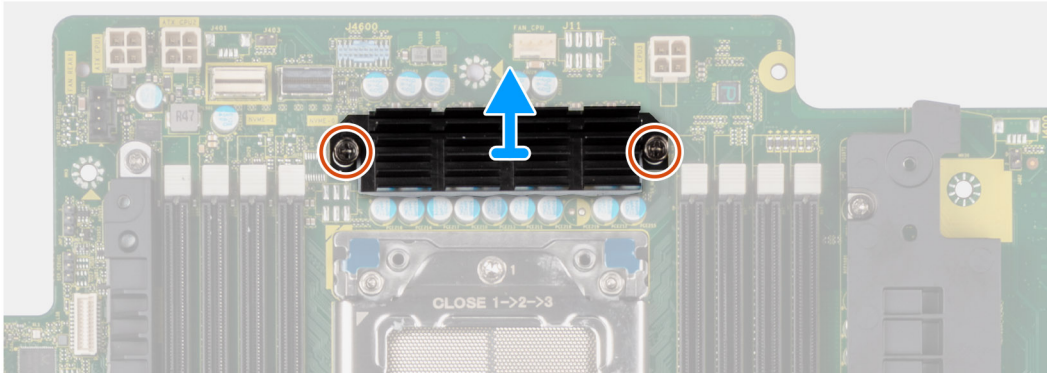
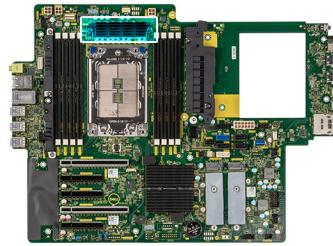
2. Remove the [side cover](#).
3. remove the [air shroud](#).

About this task

The following image indicates the location of the voltage-regulator heat sink and provides a visual representation of the removal procedure.



2x



Steps

1. Loosen the two captive screws that secure the voltage-regulator heat sink to the system board.
2. Lift the heat sink off the system board.

Installing the voltage-regulator heat sink - Location 2

Prerequisites

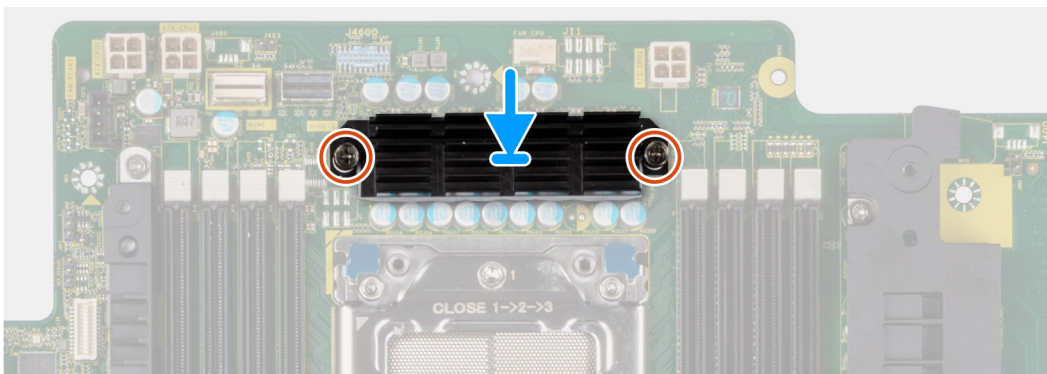
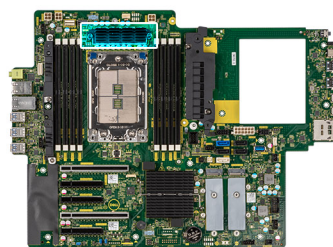
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the voltage-regulator heat sink and provides a visual representation of the installation procedure.



2x



Steps

1. Align the screw holes on the voltage-regulator heat sink to the screw holes on the system board and adhere the voltage-regulator heat sink to the system board.
2. Tighten the two captive screws that secure the voltage-regulator heat sink to the system board.

Next steps


1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

Removing the voltage-regulator heat sink - Location 3

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

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

 **CAUTION:** 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.

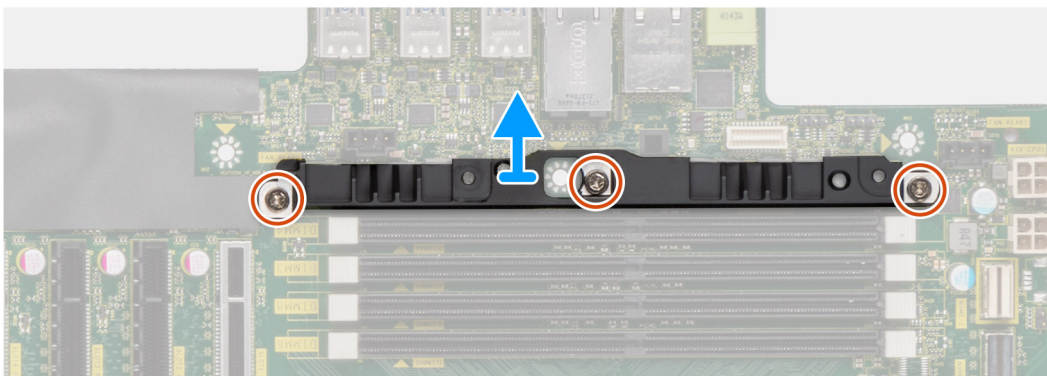
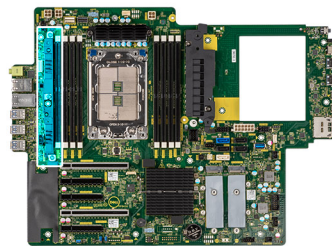
2. Remove the [side cover](#).
3. remove the [air shroud](#).

About this task

The following image indicates the location of the voltage-regulator heat sink and provides a visual representation of the removal procedure.



3x
M3x5



Steps

1. Remove the three (M3x5) screws that secure the voltage-regulator heat sink to the system board.
2. Lift the heat sink off the system board.

Installing the voltage-regulator heat sink - Location 3

Prerequisites

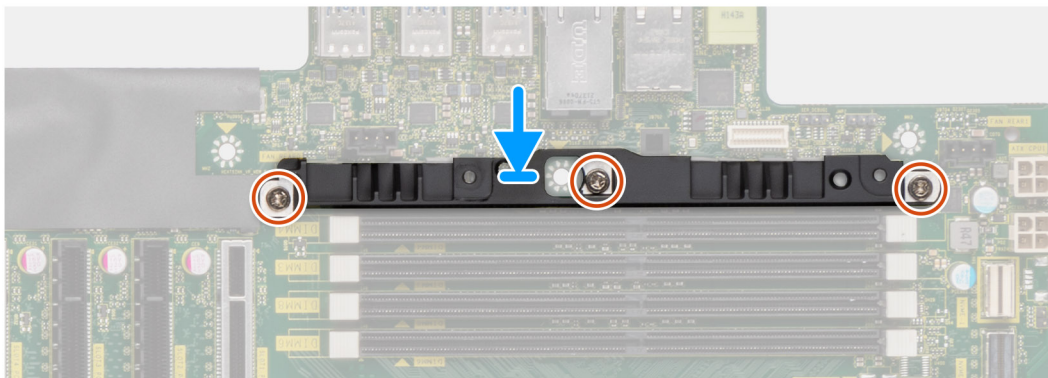
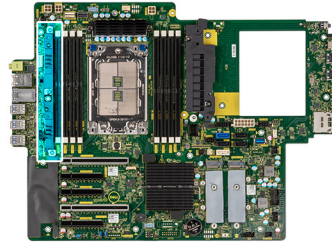
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the voltage-regulator heat sink and provides a visual representation of the installation procedure.



3x
M3x5



Steps

1. Align the screw holes on the voltage-regulator heat sink to the screw holes on the system board and adhere the voltage-regulator heat sink to the system board.
2. Replace the three (M3x5) screws to secure the voltage-regulator heat sink to the system board.

Next steps


1. Install the [air shroud](#).
2. Install the [side cover](#).
3. 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 [side cover](#).
3. Remove the [air shroud](#).

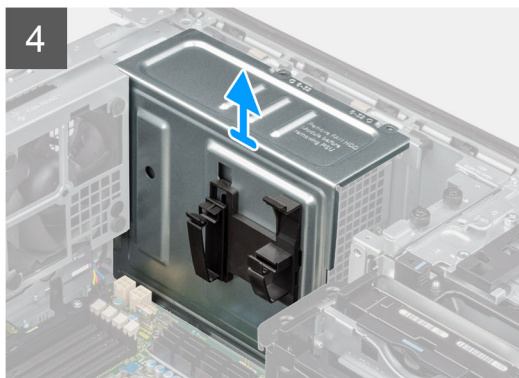
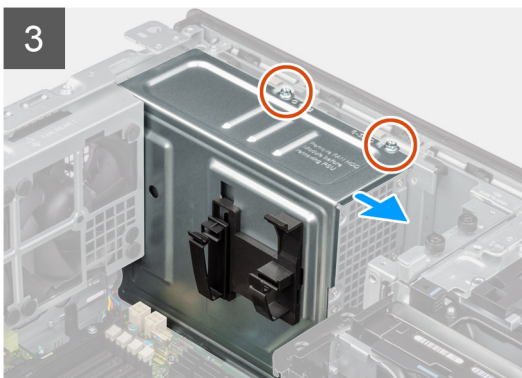
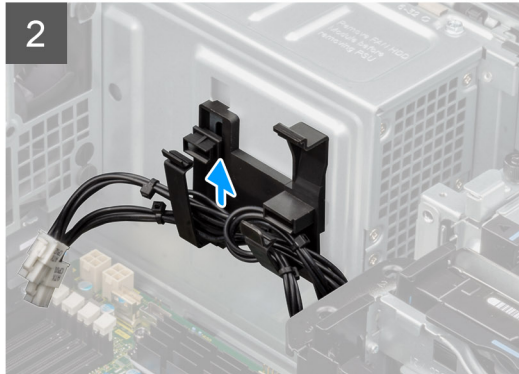
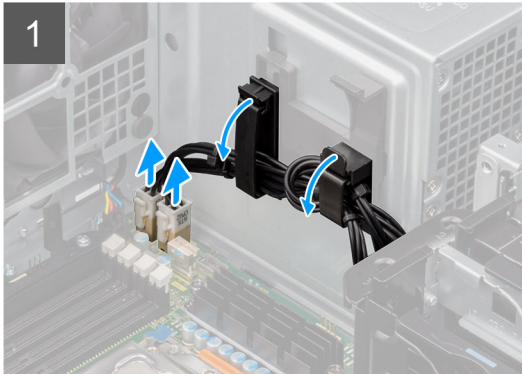
 **NOTE:** Note the routing of all cables as you remove them so that you can route them correctly while you are replacing the power-supply unit.

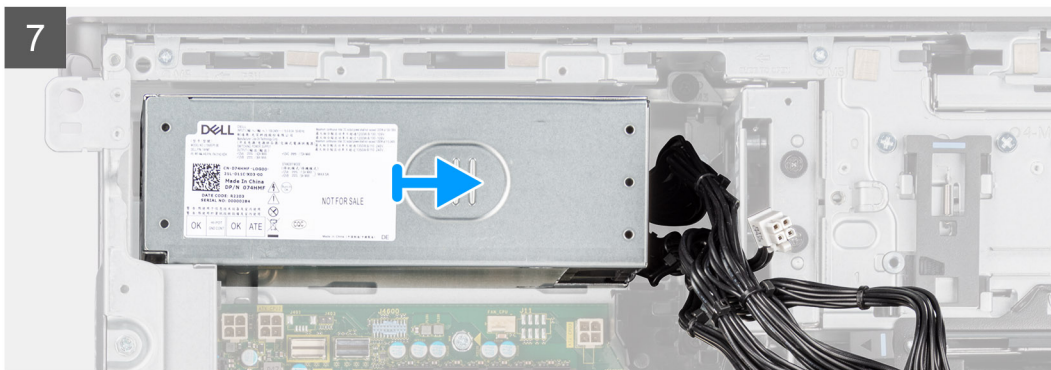
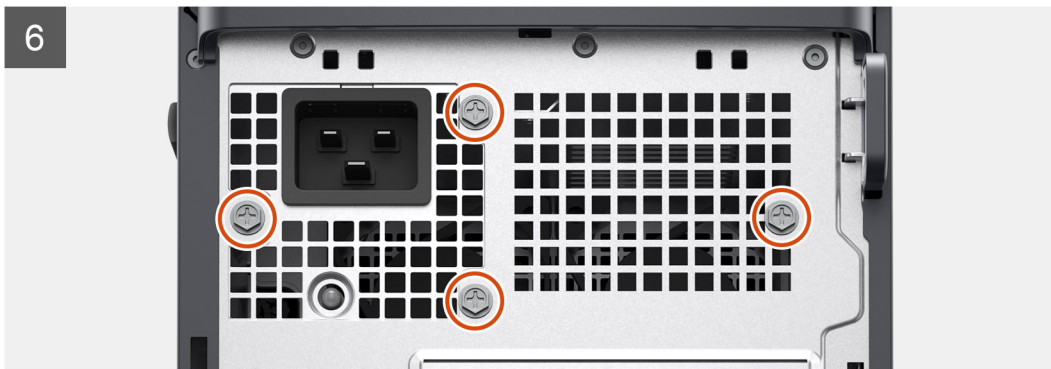
About this task

The following images indicate the location of the power-supply unit and provide a visual representation of the removal procedure.



6x
#6-32






Steps

1. Lay the computer on the right side.
2. Disconnect the ATX CPU power-cables from the connectors on the system board.
3. Open the clips on the routing guides on the power-supply cover and remove the CPU ATX power-cables from the clips.
4. Remove the four (#6-32) screws from the power-supply cover.
5. Remove the power-supply cover from the computer.
6. Disconnect the SATA power-cables from the connectors on the system board.
7. Disconnect the PCIe power-cables from the PCIe holder.
8. Open the bottom-air shroud cover and remove the cables from inside it.
9. Remove the four (#6x32) screws that secure the power-supply unit to the chassis.
10. Slide the power-supply unit away from the back of the chassis.
11. 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 procedure.

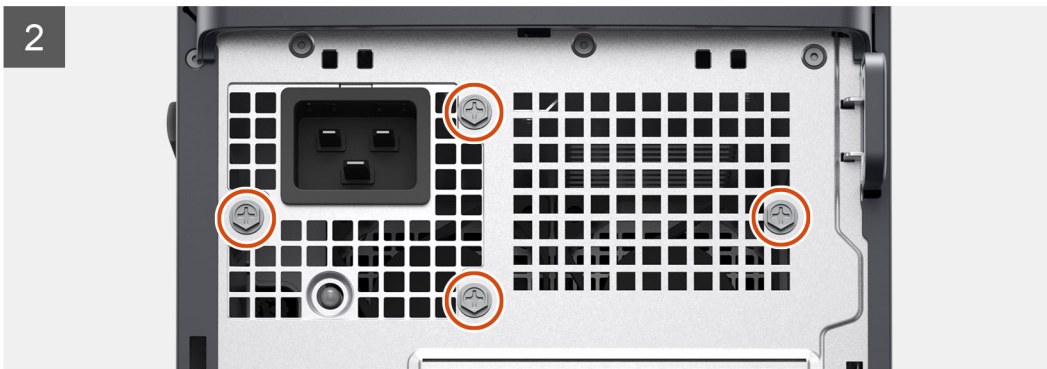
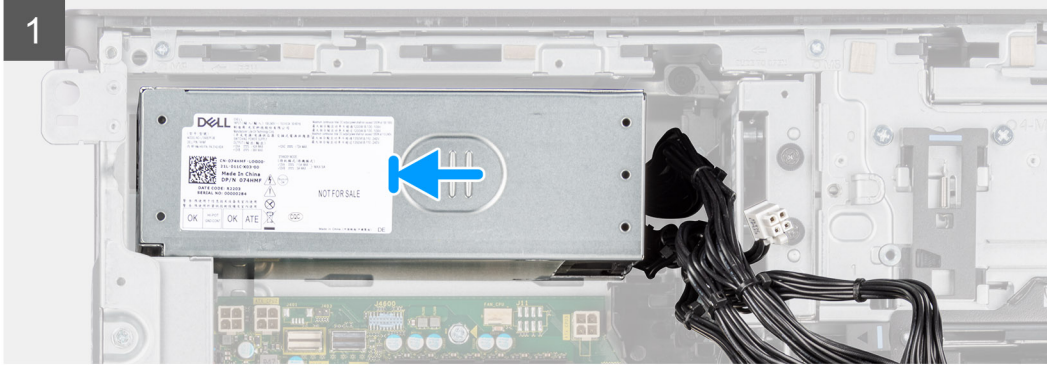
 **WARNING: The cables and ports on the back of the power-supply unit are color-coded to indicate the different power wattage. Ensure that you plug in the cable to the correct port. Failure to do so may result in damaging the power-supply unit and/or system components.**

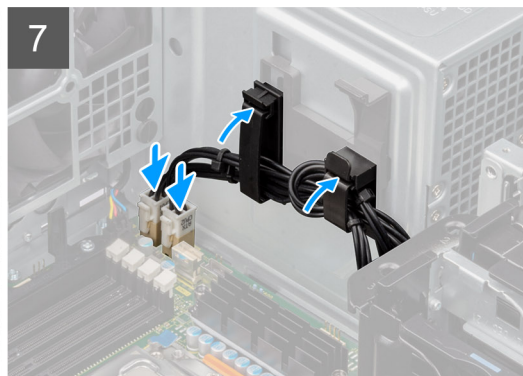
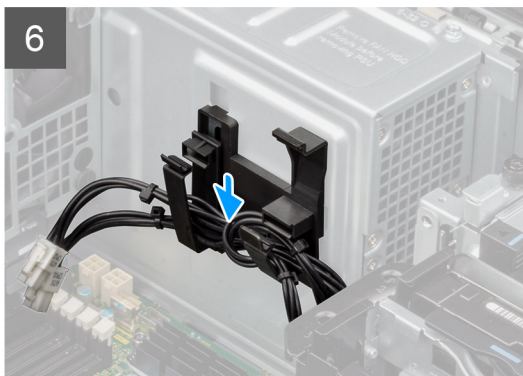
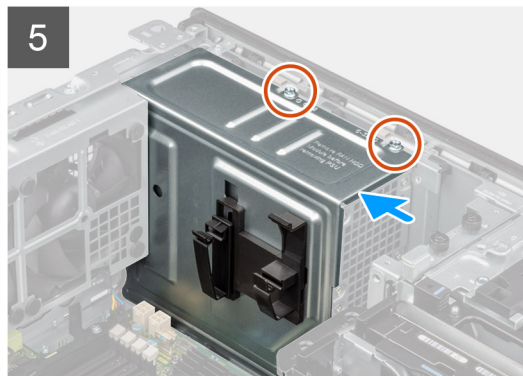
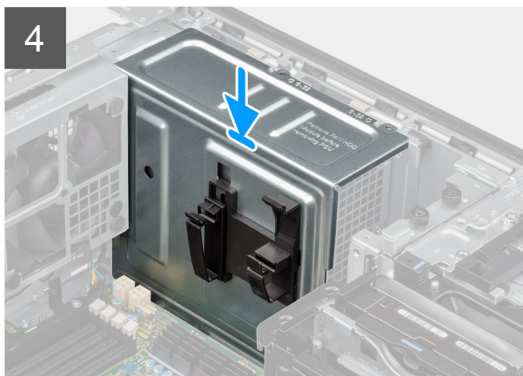
About this task

The following images indicate the location of the power-supply unit and provide a visual representation of the installation procedure.



6x
#6-32





Steps

1. Slide the power-supply unit into the chassis until the securing tab snaps into position.
2. Replace the four (#6x32) screws to secure the power-supply unit to the chassis.
3. Route the PCIe power-cables and SATA power-cables through the bottom-air shroud.
4. Close the bottom-air shroud cover.
5. Connect the PCIe power-cables to the slots on the PCIe holder.
6. Connect the SATA power-cables to the connectors on the system board.
7. Align and place the power-supply cover over the power-supply unit.
8. Install the two (#6-32) screws to secure the power-supply cover to the chassis.
9. Open the clips on the routing guides on the power-supply cover and route the CPU ATX power-cables through the clips.
10. Close the clips on the routing guides on the power-supply cover.
11. Connect the ATX CPU power-cables to the connectors on the system board..

Next steps

1. Install the [air shroud](#).
2. Install the [side cover](#).
3. Follow the procedure in [After working inside your computer](#).

System board

System-board callouts

This topics provides detailed callouts for the connectors on the system board:

System-board callouts

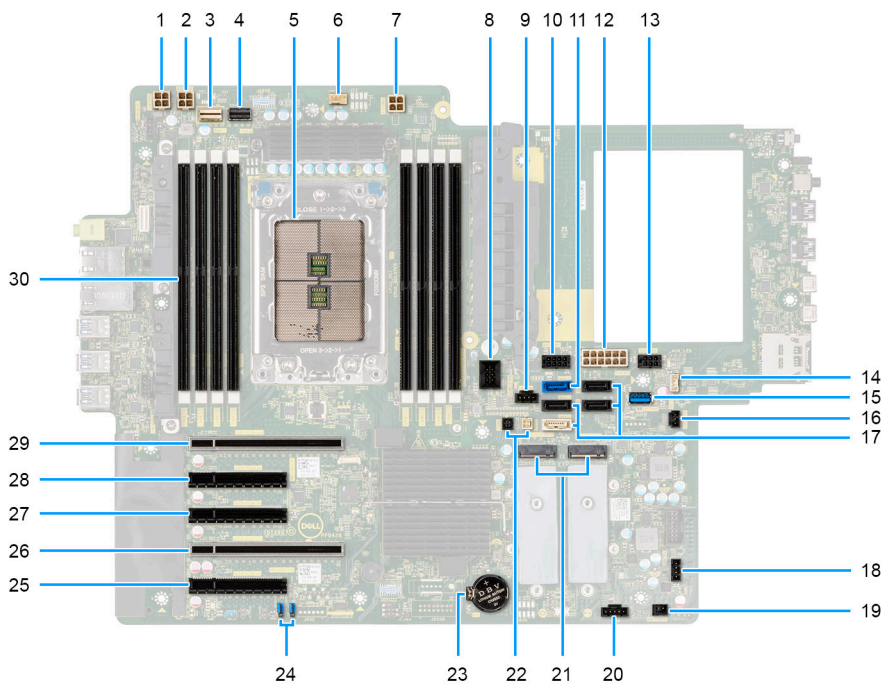


Table 2. Precision 7865 tower system board callouts

No	Connector	Description
1	ATX CPU1	4-pin processor power connector
2	ATX CPU2	4-pin processor power connector
3	NVME1	NVMe connector for externally facing M.2 flexbay drive
4	NVME0	NVMe connector for externally facing M.2 flexbay drive
5	CPU0_SKT	Processor socket
6	FAN_CPU	Processor fan connector
7	ATX CPU3	4-pin processor power connector
8	DDR FAN	Memory-module fan connector
9	FAN HDD	Hard-drive fan connector
10	SATA PWR1	SATA power connector
11	SATA-0	Primary SATA Hard drive data cable connector
12	ATX SYS	System-board power connector
13	SATA PWR2	SATA power connector
14	INT SPKR	Internal-speaker connector
15	INT USB2	USB 3.2 Gen1 port to accommodate standard USB storage key
16	INTRUSION	Intrusion switch connector
17	<ul style="list-style-type: none"> ● SATA-1 ● SATA-2 ● SATA-3 ● SATA-4 	<ul style="list-style-type: none"> ● SATA device data cable connector ● SATA device data cable connector ● SATA device data cable connector ● SATA device data cable connector
18	FAN SYS	System fan connector
19	PWR REMOTE	Remote power-switch connector
20	TBT	Thunderbolt add-in card connector
21	<ul style="list-style-type: none"> ● M.2 PCIe SSD-0 ● M.2 PCIe SSD-1 	<ul style="list-style-type: none"> ● M.2280/M.2230 Solid-state drive socket ● M.2280/M.2230 Solid-state drive socket
22	<ul style="list-style-type: none"> ● THRM0 ● THRM1 	<ul style="list-style-type: none"> ● Thermal sensor 0 connector ● Thermal sensor 1 connector
23	RTC	Coin cell battery
24	JUMPER	TPM jumper
25	SLOT5 PCIe4 x8	PCI Express Gen 4 x8 slot
26	SLOT4 PCIe4 x16	PCI Express Gen 4 x16 slot
27	SLOT3 PCIe4 x8	PCI Express Gen 4 x8 slot
28	SLOT2 PCIe4 x8	PCI Express Gen 4 x8 slot
29	SLOT1 PCIe4 x16	PCI Express Gen 4 x16 slot
30	DIMM1 - DIMM8	Memory module connectors

Removing the system board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).

i **NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

i **NOTE:** Replacing the system board removes any changes that you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

i **NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.

2. Remove the [side cover](#).
3. Remove the [front bezel](#).
4. Remove the [front I/O bracket](#).
5. Remove the [air shroud](#).
6. Remove the [PCIe holder](#).
7. Remove the [3.5-inch hard drive/2.5-inch hard drive](#).
8. Remove the [memory module](#).
9. Remove the [M.2 2230 SSD/M.2 2280 SSD](#).
10. Remove the [hard-drive fan assembly](#).
11. Remove the [internal hard-drive cage](#).
12. Remove the [powered GPU](#).

i **NOTE:** Remove the graphics-card rubber protector from the chassis before removing the system board.

13. Remove the [intrusion switch](#).
14. Remove the [heat-sink assembly](#).
15. Remove the [front-fan assembly](#) and [rear-fan assembly](#).
16. Remove the [power-supply unit](#).

i **NOTE:** Remove the power-supply cable clips from the power-supply cover before removing the system board.

17. Remove the [processor](#).

About this task

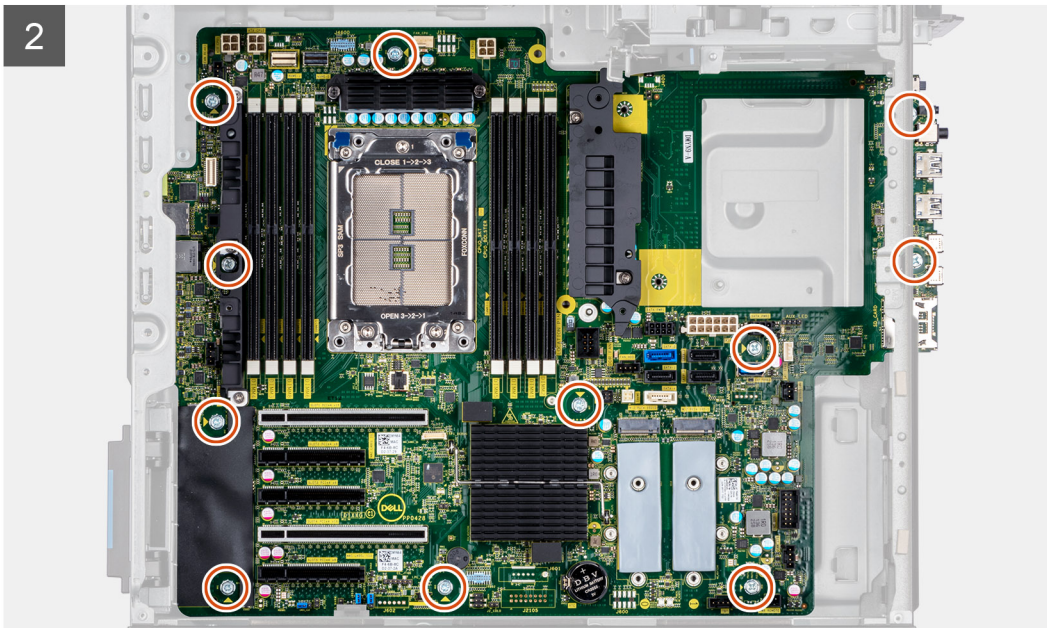
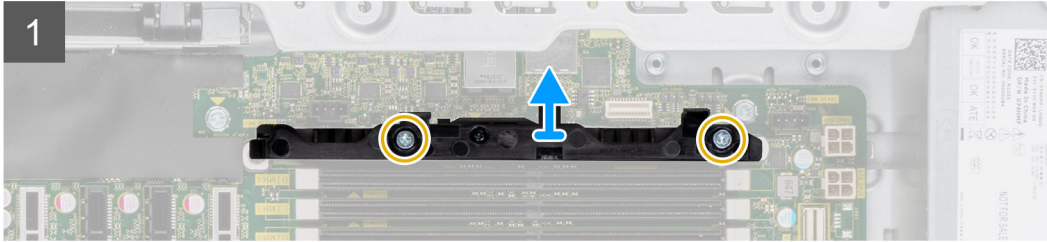
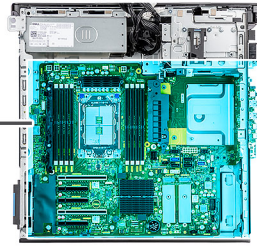
The following images indicate the location of the system board and provide a visual representation of the removal procedure.

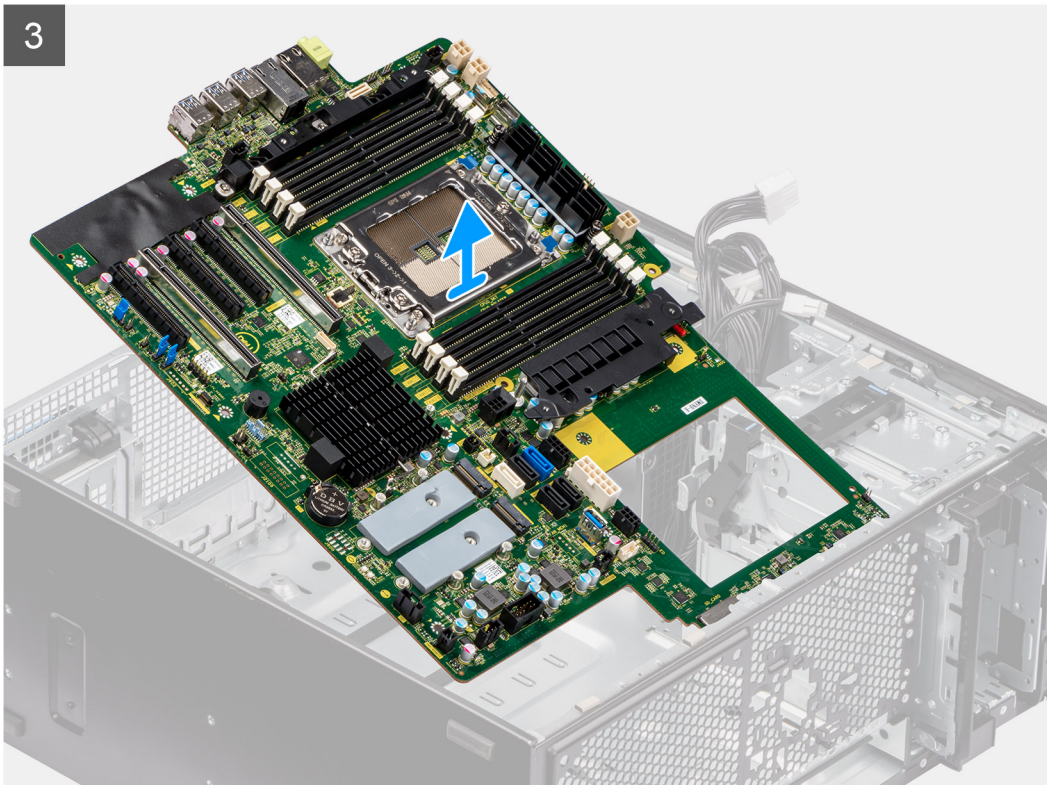


11x
#6-32



2x
M3





Steps

1. Remove the (M3) screws that secure the supporting bracket to the system board.
i **NOTE:** One of the screws that secures the system board to the chassis is located under the VR heatsink. Remove the air shroud protector followed by the VR heatsink to access the screw.
2. Remove the eleven (#6-32) screws that secure the system board to the chassis.
3. Lift the system board at an angle and remove the system board off the chassis.

Installing the system board

Prerequisites

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

About this task

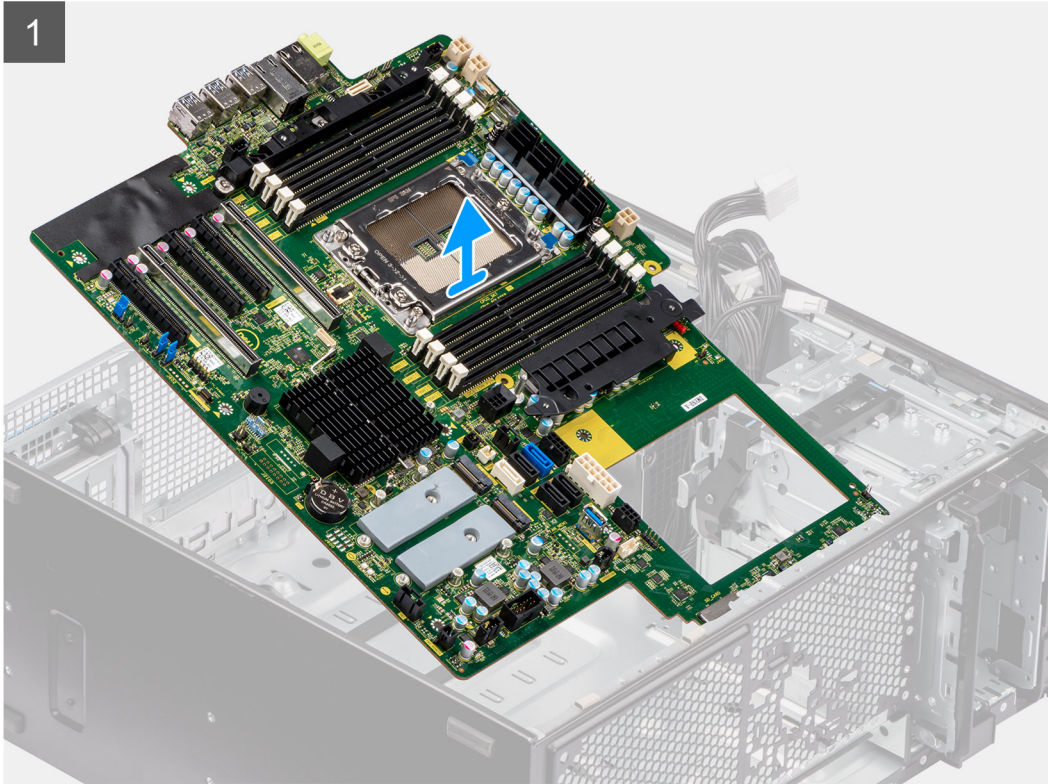
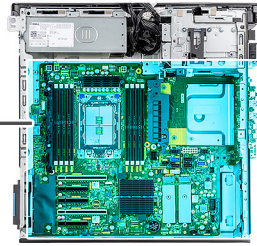
The following images indicate the location of the system board and provide a visual representation of the installation procedure.

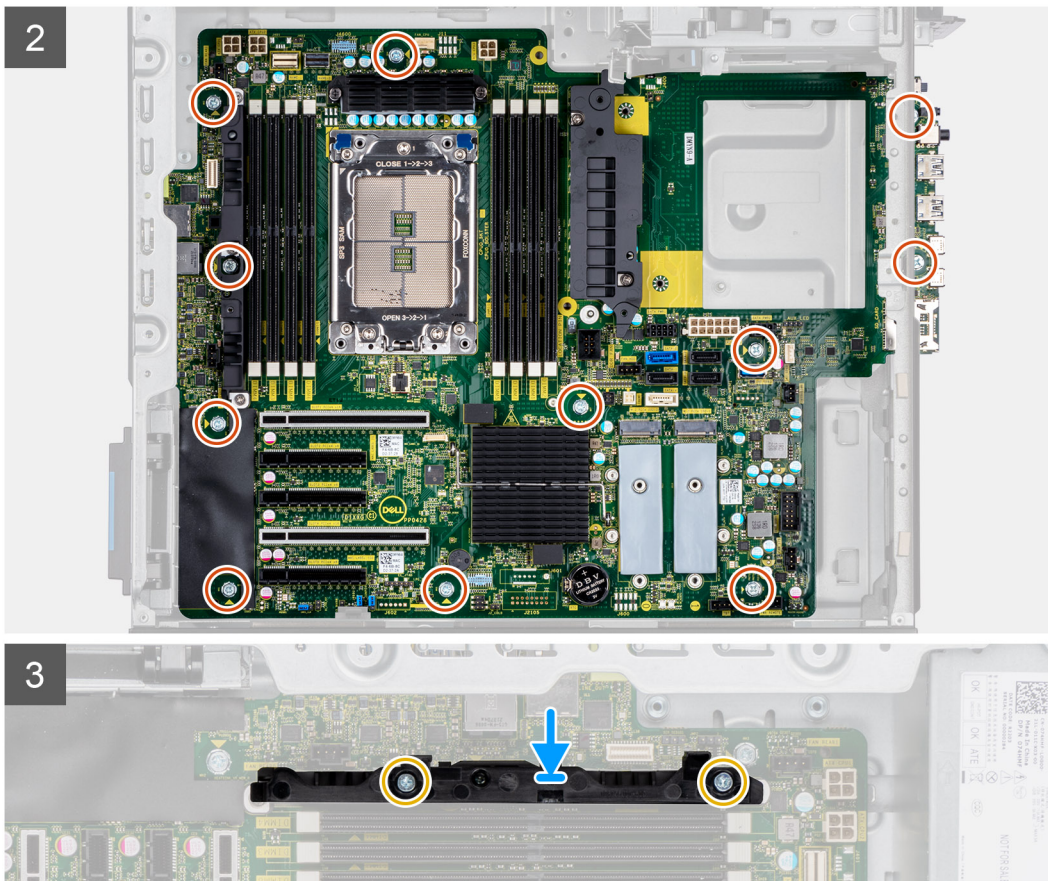


11x
#6-32



2x
M3





Steps

1. Slide the front 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 eleven (#6-32) screws that secure the system board to the chassis.
3. Align and place the supporting bracket on the system board.
4. Install the two (M3) screws to secure the supporting bracket to the system board

Next steps

1. Install the [processor](#).
2. Install the [power-supply unit](#).
 - i** **NOTE:** Install the power-supply cable clips to the power-supply cover replacing the system board.
3. Install the [front-fan assembly](#) and [rear-fan assembly](#).
4. Install the [heat-sink assembly](#).
5. Install the [intrusion switch](#).
6. Install the [powered GPU](#).
 - i** **NOTE:** Install the graphics-card rubber protector to the chassis after replacing the system board.
7. Install the [internal hard-drive cage](#).
8. Install the [hard-drive fan assembly](#).
9. Install the [M.2 2230 SSD/M.2 2280 SSD](#).
10. Install the [memory module](#).
11. Install the [3.5-inch hard drive/2.5-inch hard drive](#).
12. Install the [PCIe holder](#).
13. Install the [air shroud](#).
14. Install the [front I/O bracket](#).
15. Install the [front bezel](#).
16. Install the [side cover](#).
17. Follow the procedure in [After working inside your computer](#).

NOTE: Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

NOTE: Replacing the system board removes any changes that you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Rail kit

Removing the right rail-kit

Prerequisites

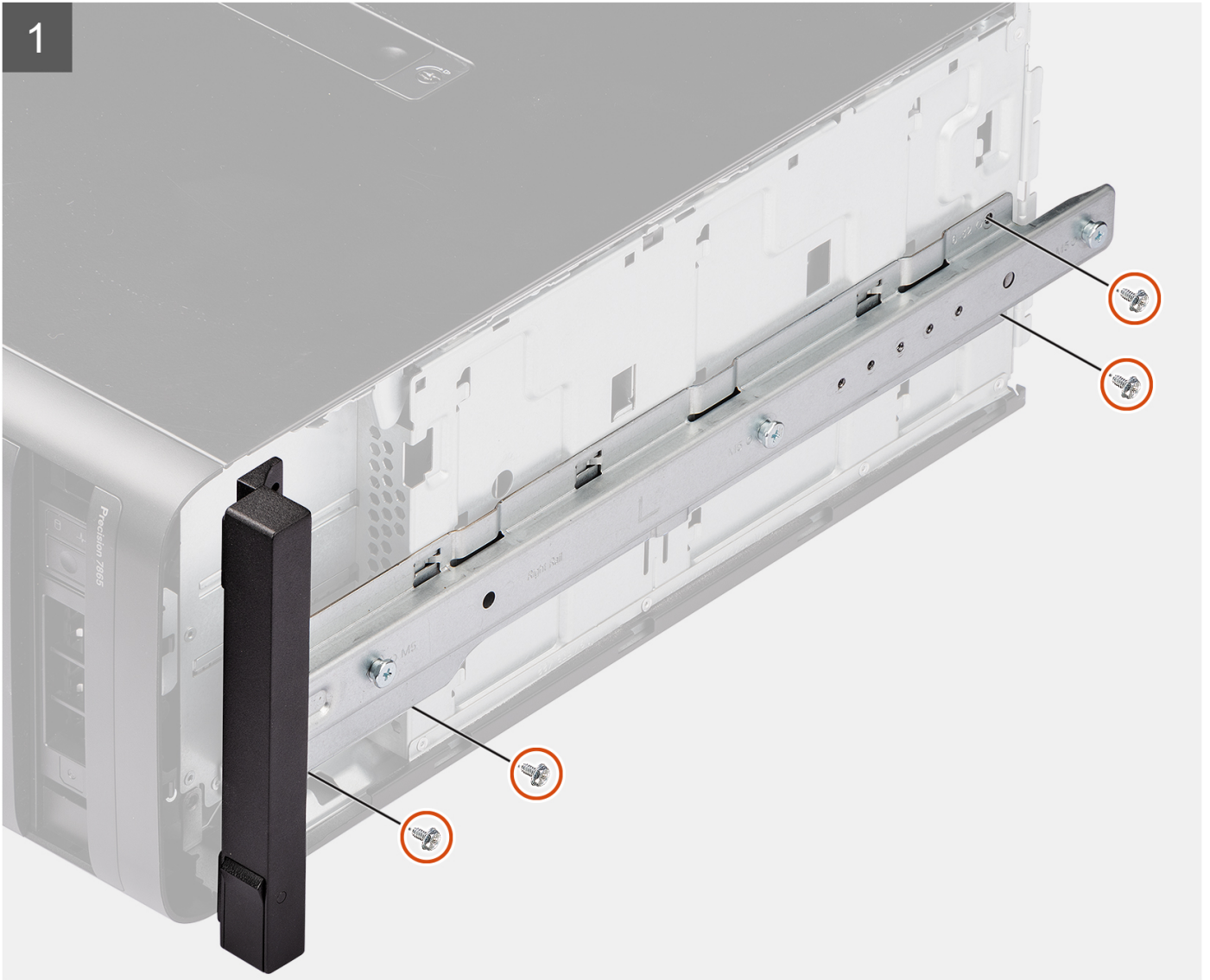
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

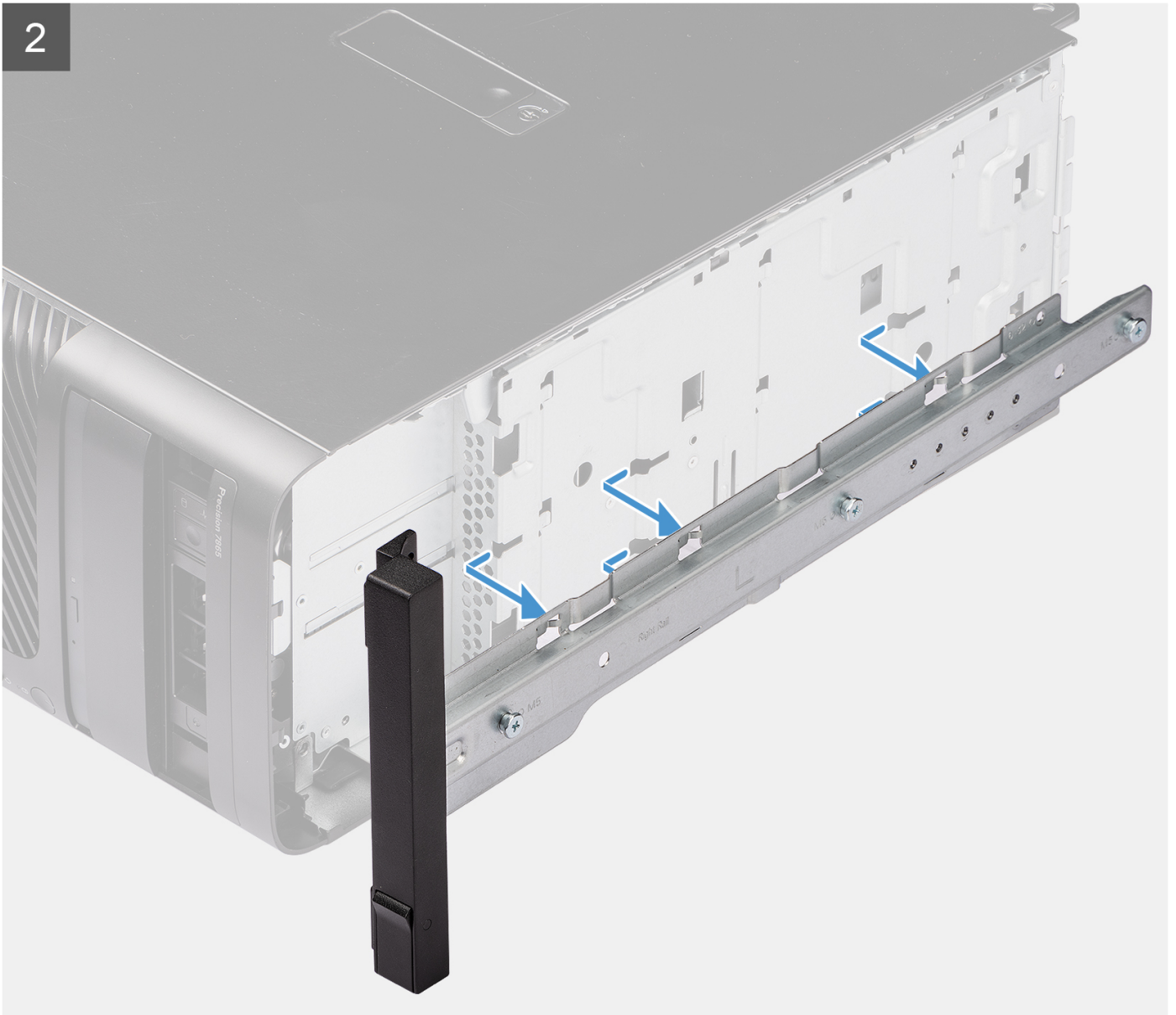
The following images indicate the location of the right rail-kit and provide a visual representation of the removal procedure.



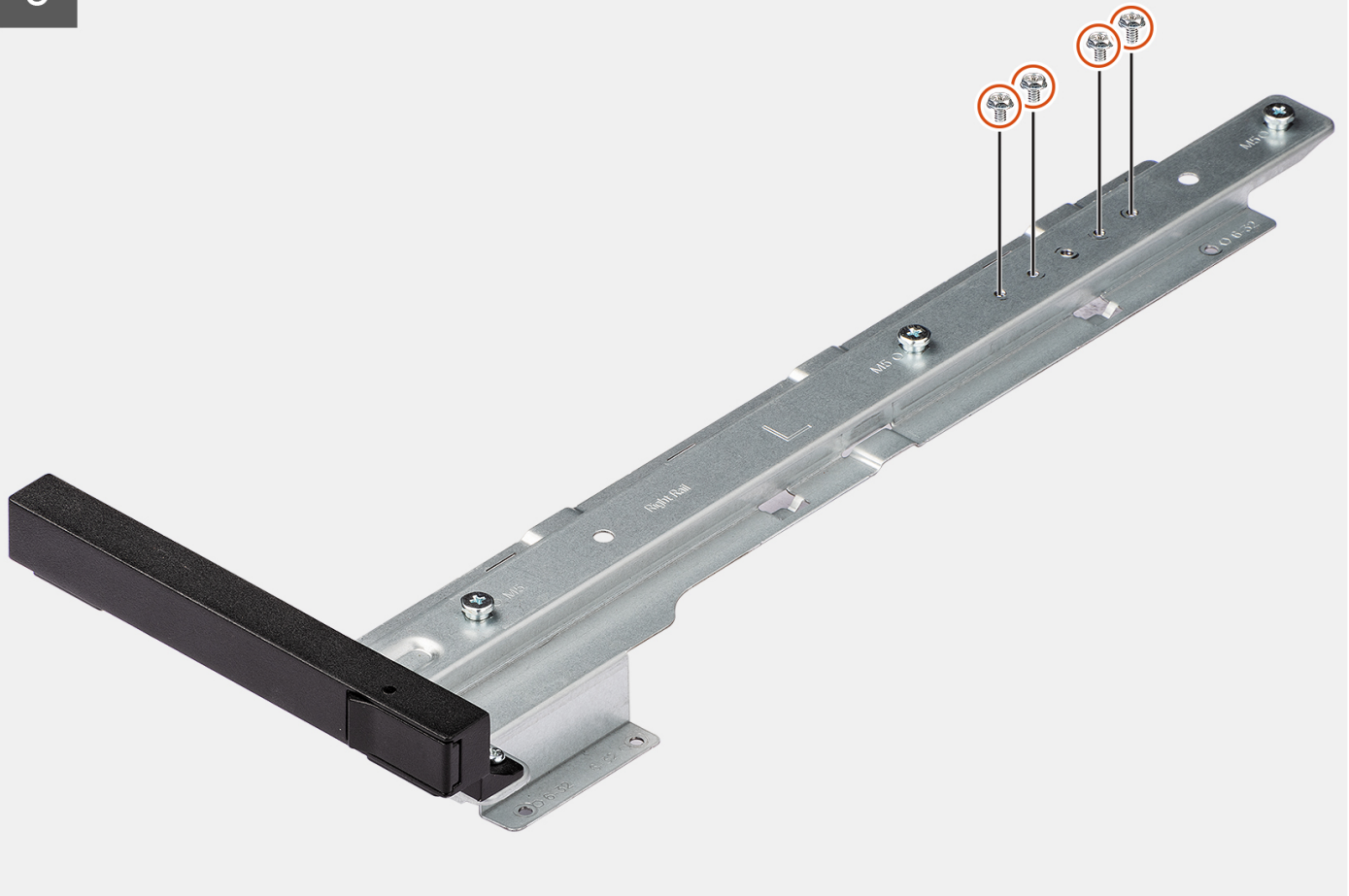
4x
M6x32



2



3



Steps

1. Remove the four screws (M6x32) that secure the right rail-kit to the chassis.
2. Slide and remove the rail-kit from the slots on the chassis.
3. Replace the four screws (M6x32) to the rail-kit.

Installing the right rail-kit

Prerequisites

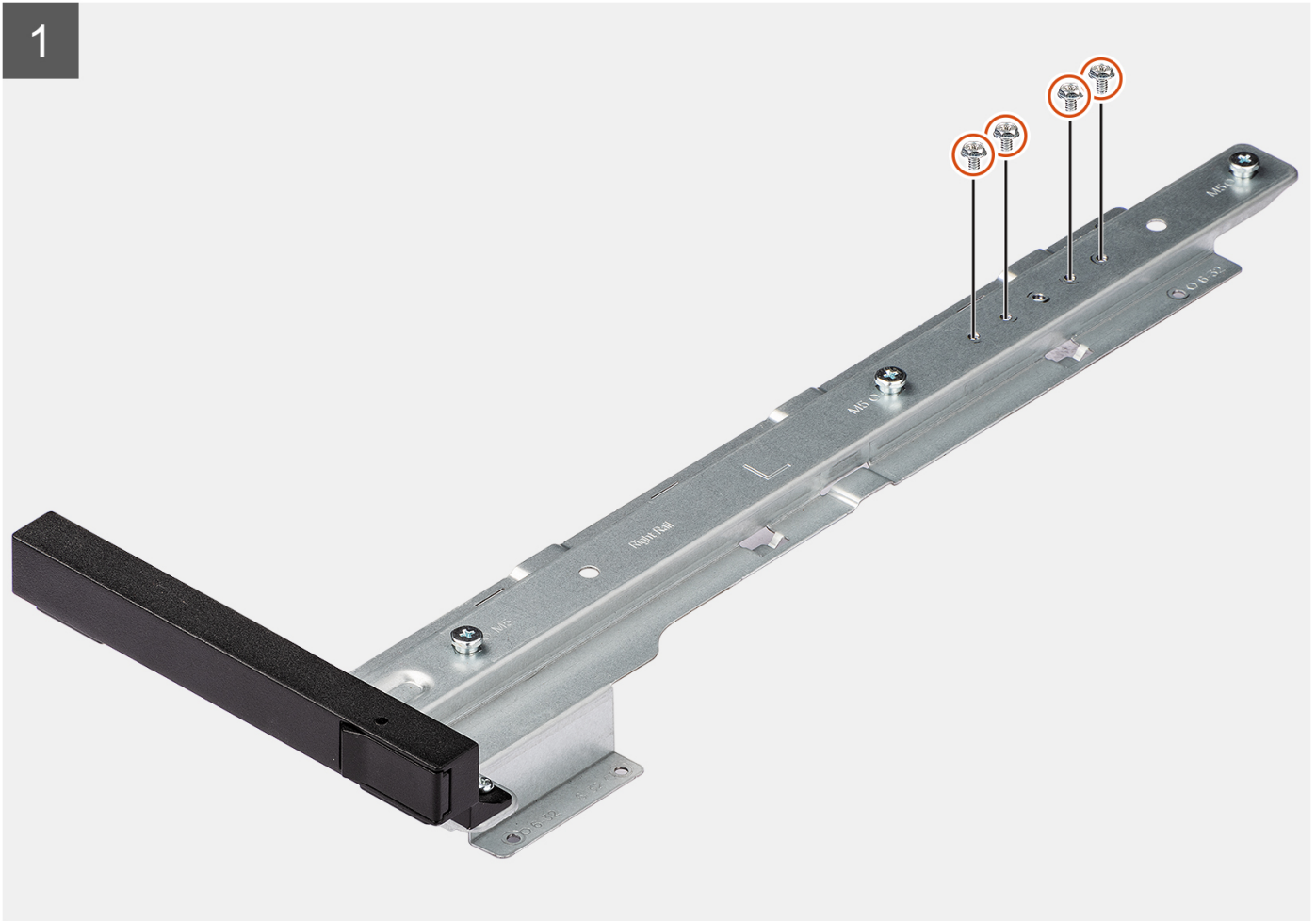
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

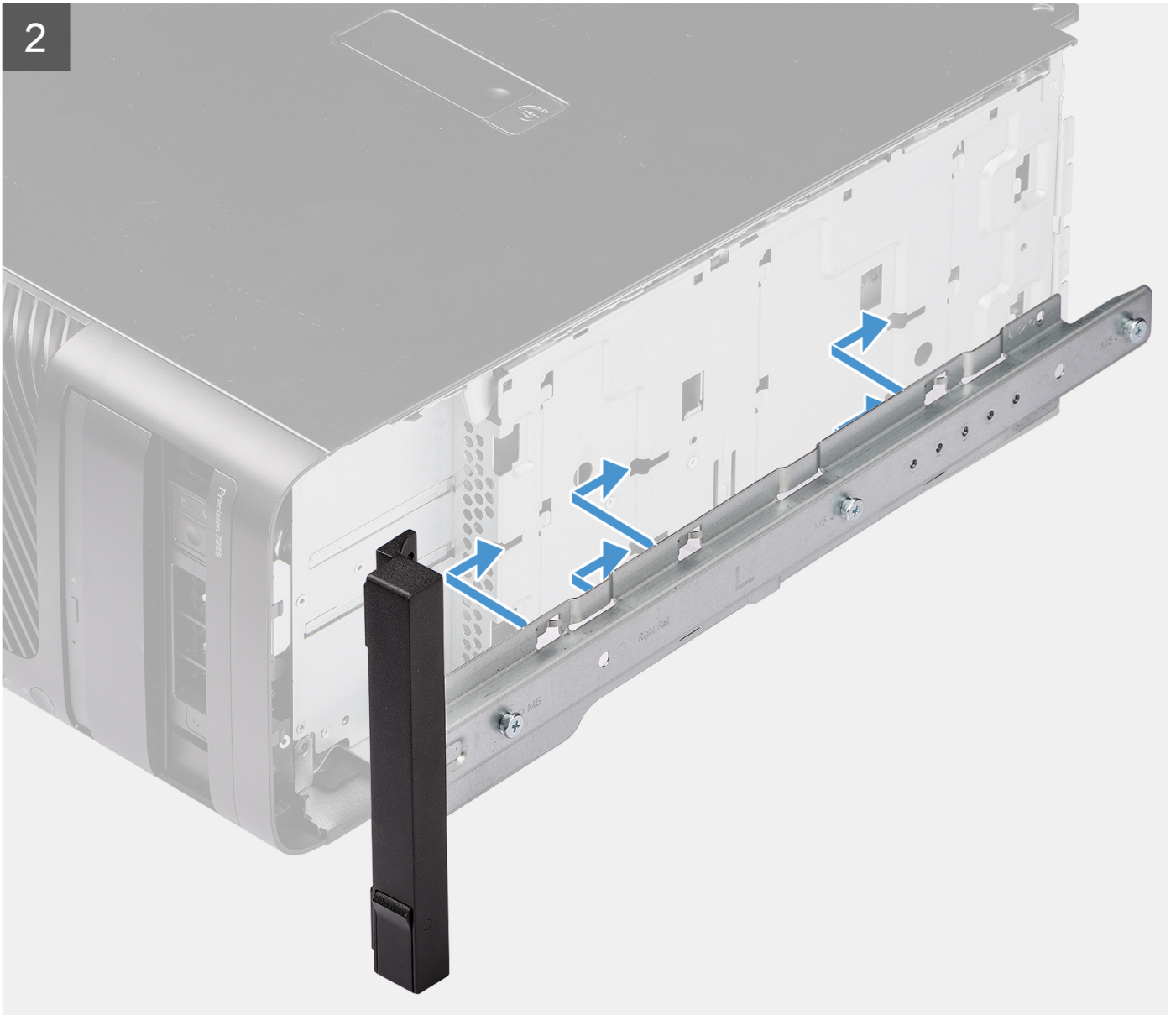
The following images indicate the location of the right rail-kit and provide a visual representation of the installation procedure.

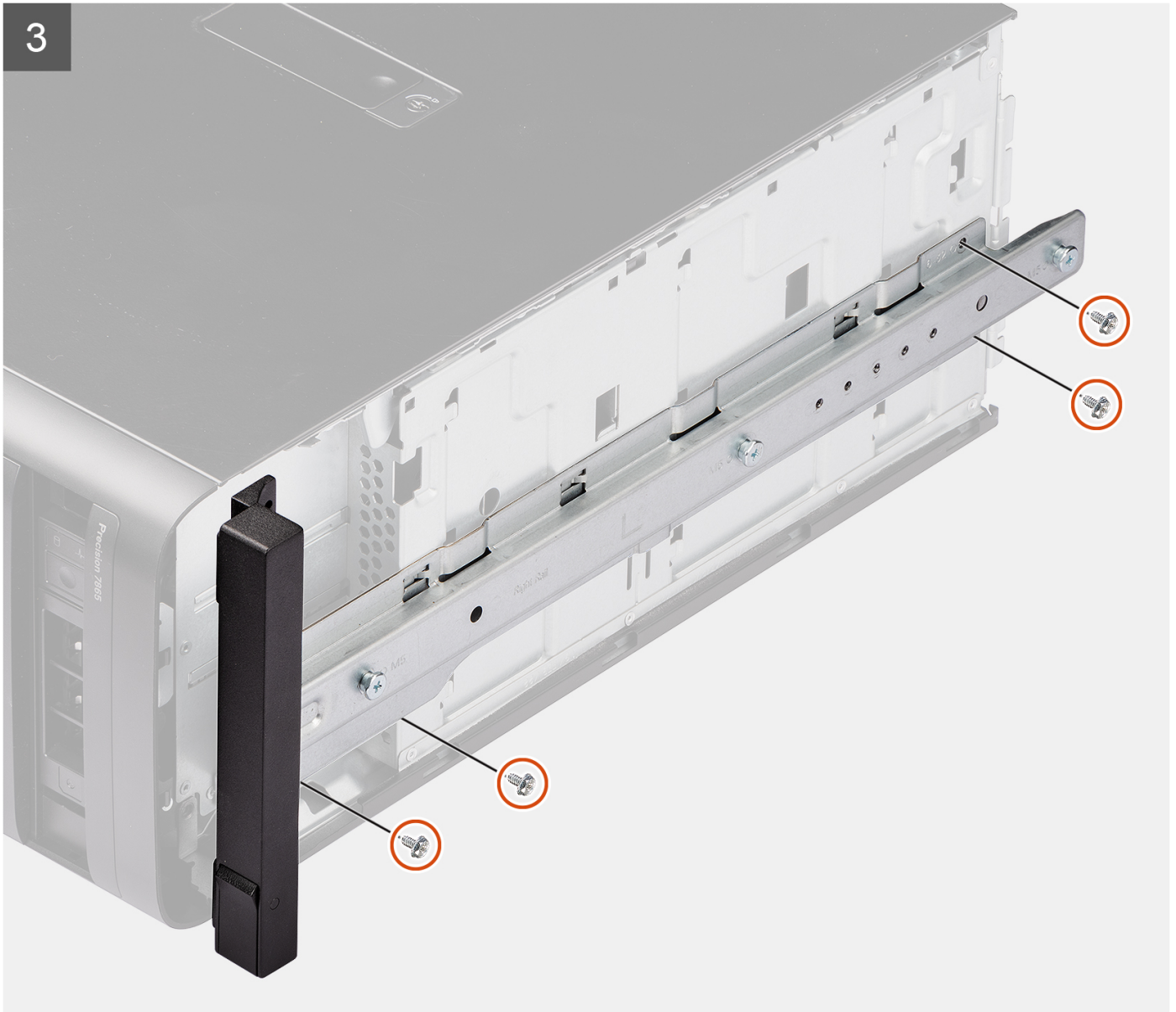


4x
M6x32



2





Steps

1. Remove the four screws (M6x32) from the rail-kit.
2. Align the right rail-kit with the slots on the chassis and slide to secure it in place.
3. Replace the four screws (M6x32) to secure the right rail-kit to the chassis

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Removing the left rail-kit

Prerequisites

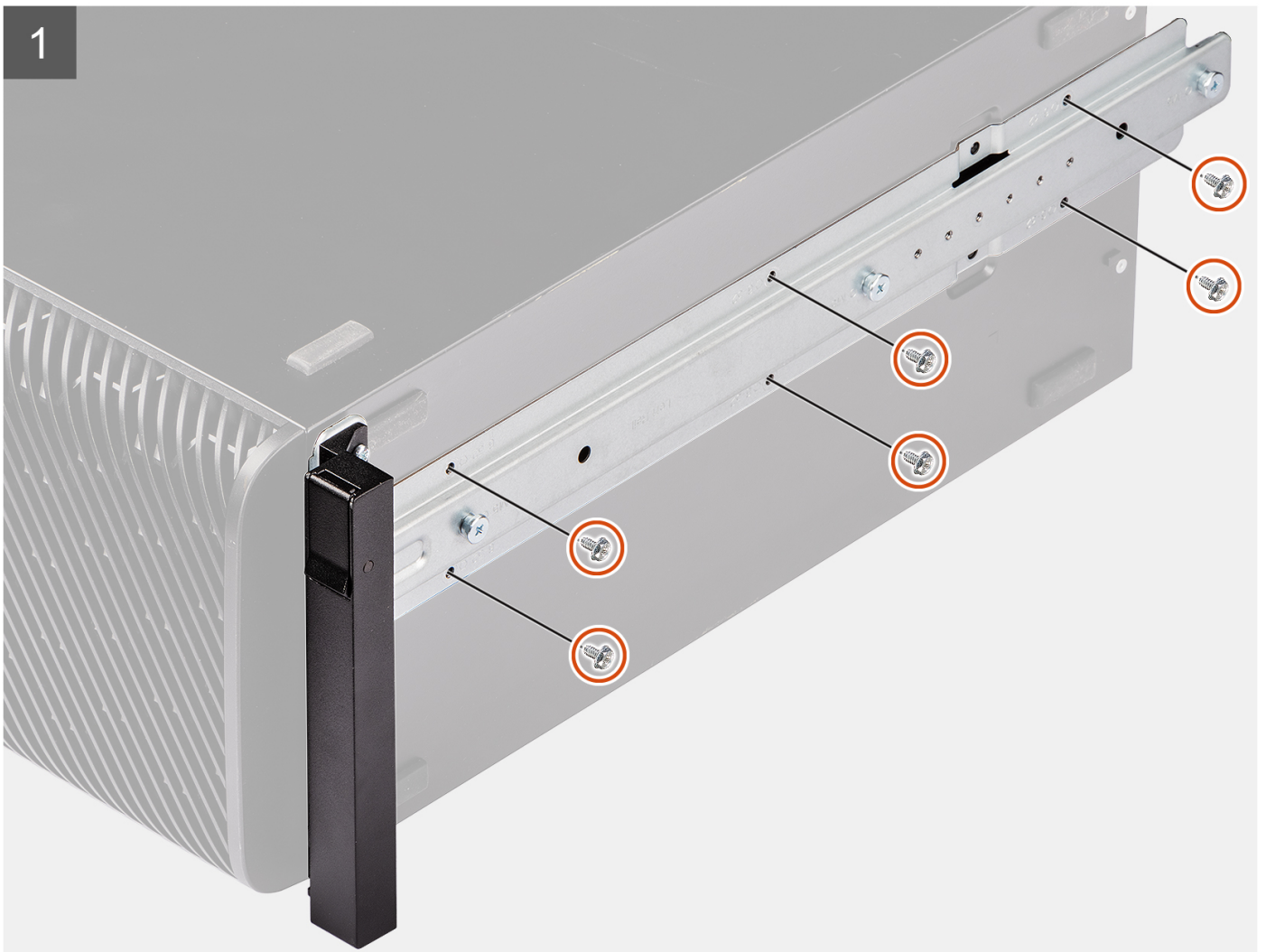
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [side cover](#).

About this task

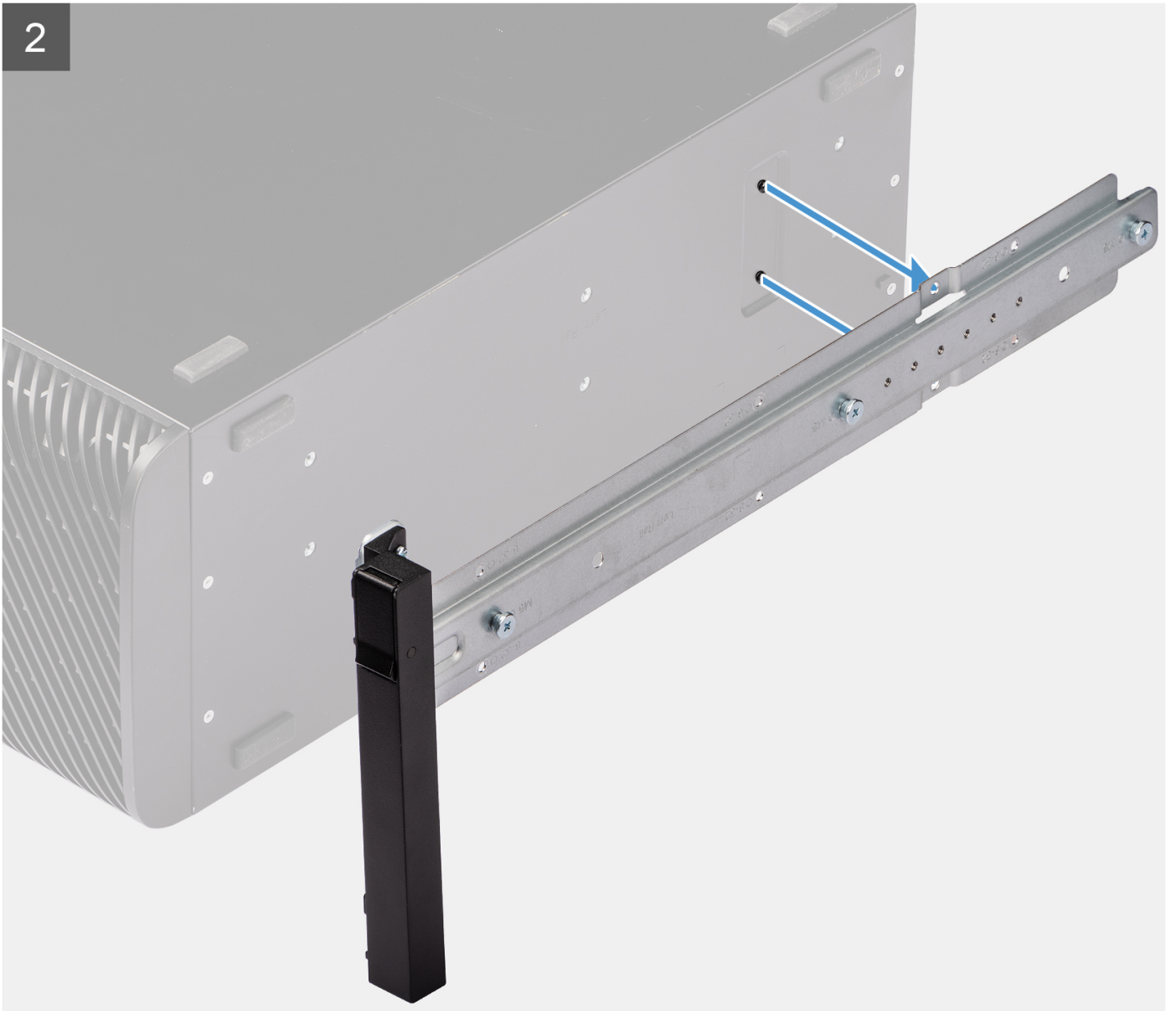
The following images indicate the location of the left rail-kit and provide a visual representation of the removal procedure.



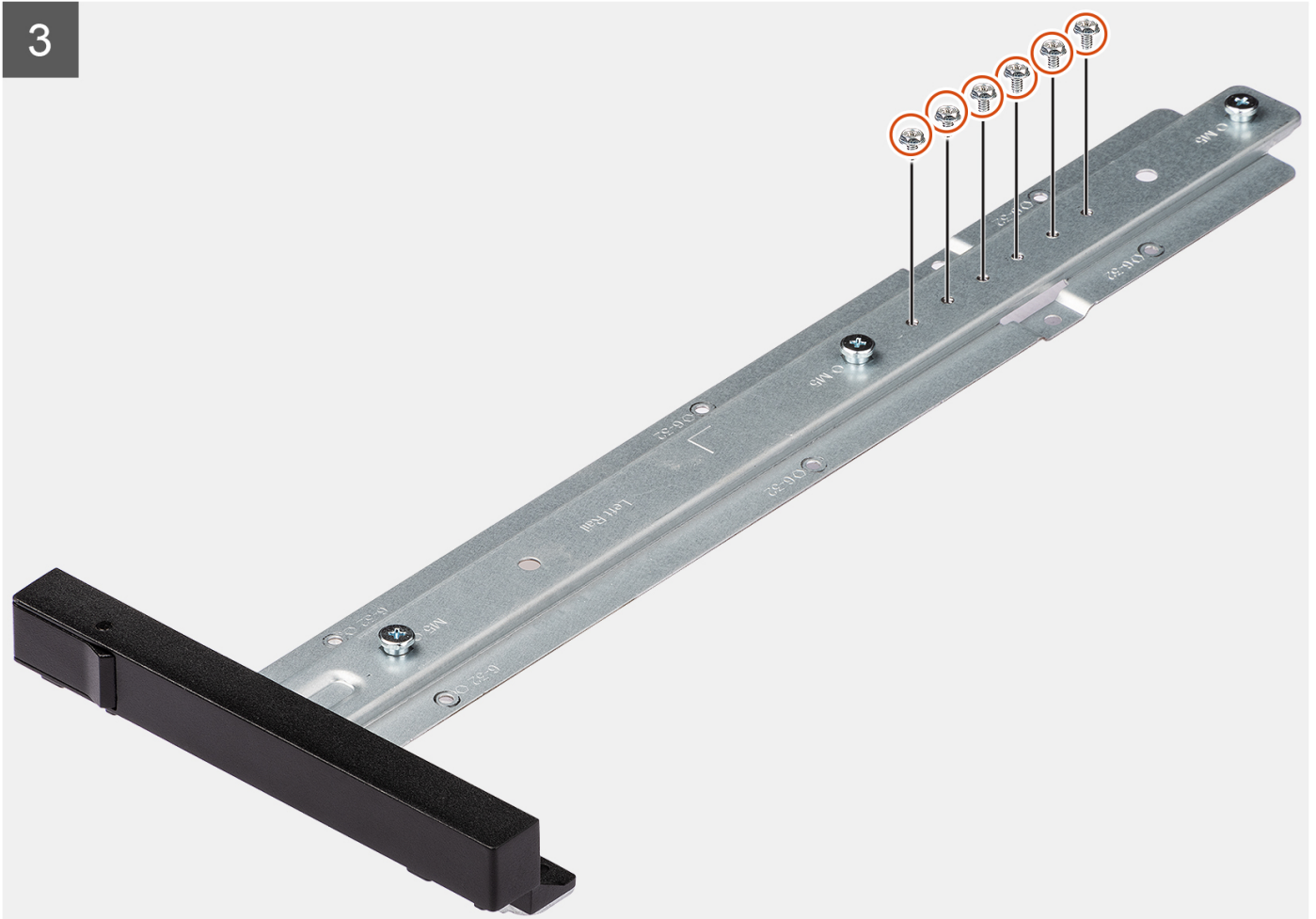
6x
M6x32



2



3



Steps

1. Remove the six screws (M6x32) that secure the left rail-kit to the chassis.
2. Remove the rail-kit from the chassis.
3. Replace the four screws (M6x32) to the rail-kit.

Installing the left rail-kit

Prerequisites

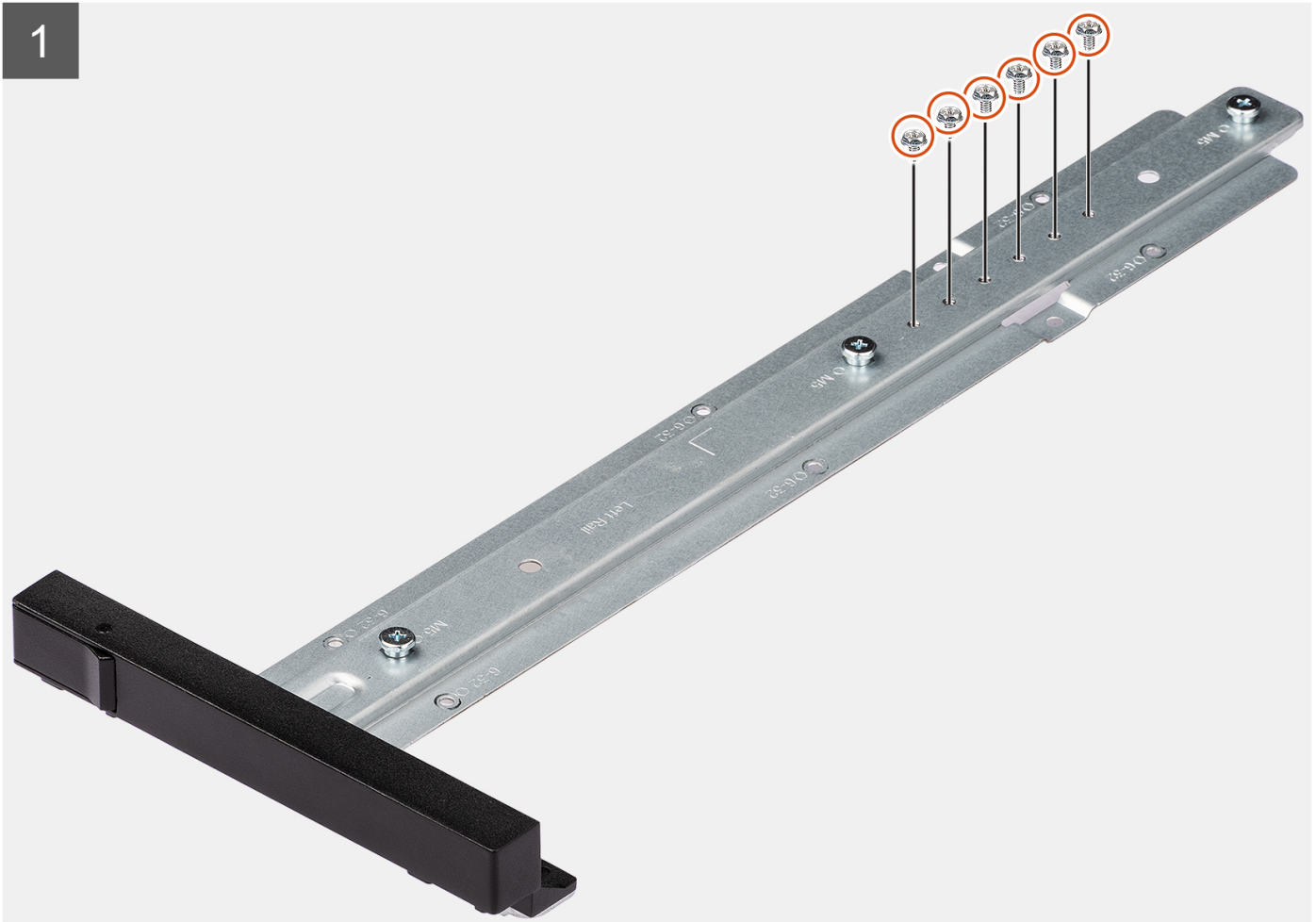
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

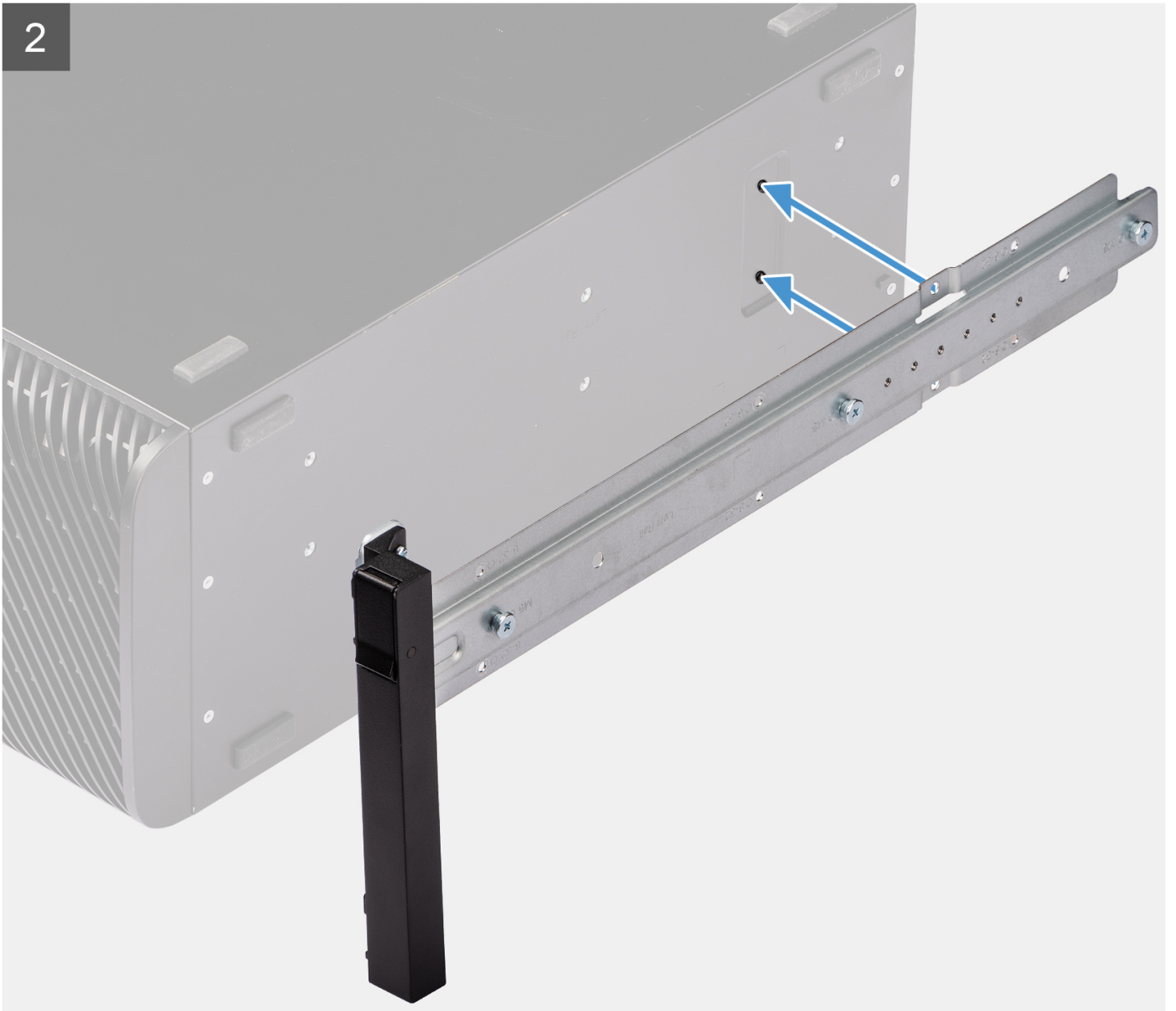
The following images indicate the location of the left rail-kit and provide a visual representation of the installation procedure.

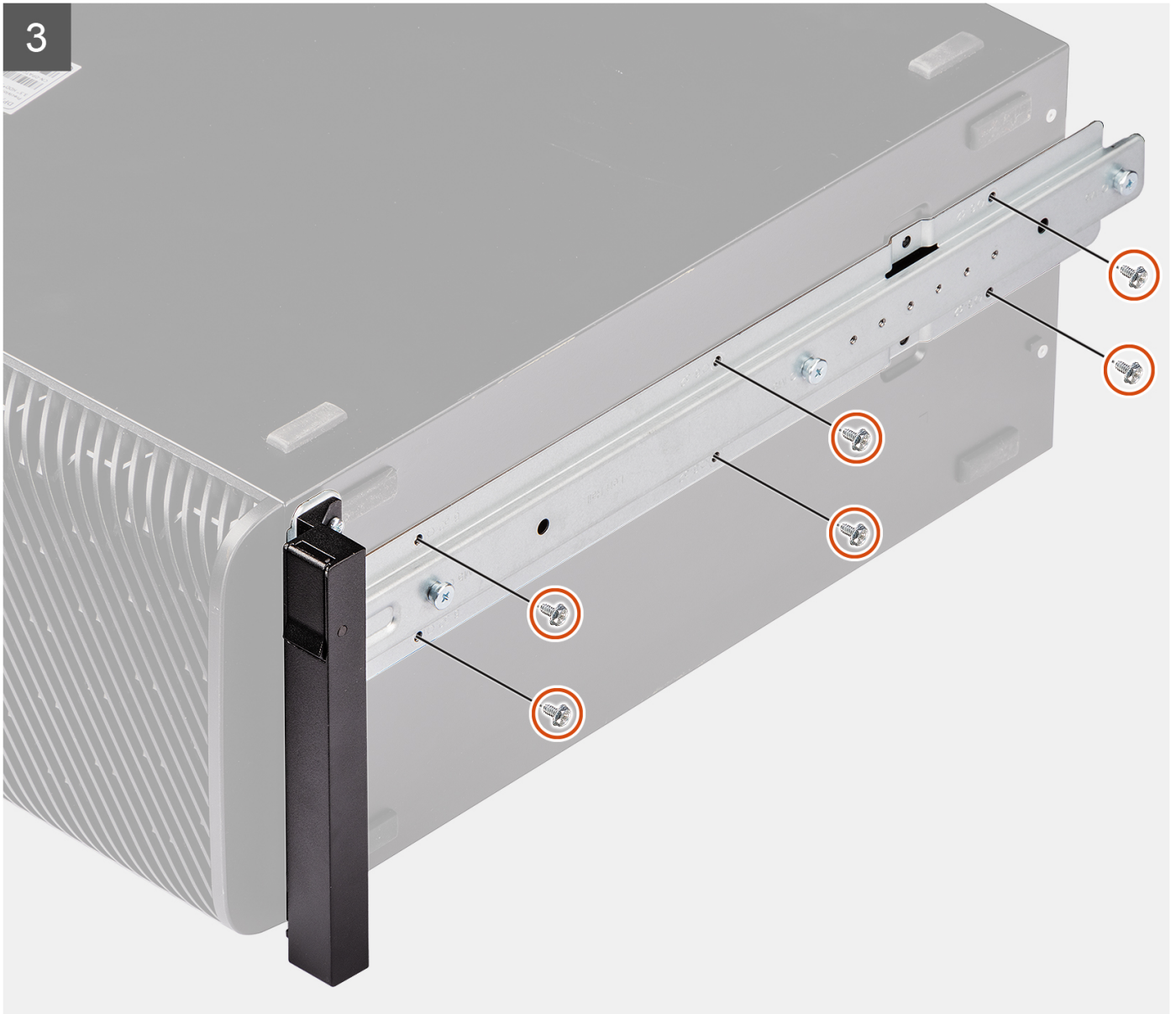


6x
M6x32



2





Steps

1. Remove the six screws (M6x32) from the rail-kit.
2. Align the screw holes on the left rail-kit with the screw holes on the chassis.
3. Replace the six screws (M6x32) to secure the left rail-kit to the chassis

Next steps

1. Install the [side cover](#).
2. Follow the procedure in [After working inside your computer](#).

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ [000123347](#).

BIOS 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.

One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F2 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)
- **i** **NOTE:** XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics
- **i** **NOTE:** Choosing **Diagnostics**, will display the **ePSA diagnostics** screen.

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.

i **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)
- **i** **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

i **NOTE:** Depending on your system and its installed devices, the items that are listed in this section may or may not appear.

Table 4. System setup options—System information menu

Overview	
Lattitude 3320	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the system.
Asset Tag	Displays the Asset Tag of the system.
Manufacture Date	Displays the manufacture date of the system.
Ownership Date	Displays the ownership date of the system.
Express Service Code	Displays the express service code of the system.
Ownership Tag	Displays the Ownership Tag of the system.
Signed Firmware Update	Displays whether the Signed Firmware Update is enabled on your system.
Battery Information	
Primary	Displays that battery is primary.
Battery Level	Displays the battery level of the system.
Battery State	Displays the battery state of the system.
Health	Displays the battery health of the system.

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

Overview	
AC Adapter	Displays whether the AC adapter is connected or not.
Processor Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Current Clock Speed	Displays the current processor clock speed.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Processor L2 Cache	Displays the processor L2 Cache size.
Processor L3 Cache	Displays the processor L3 Cache size.
Microcode Version	Displays the microcode version.
Intel Hyper-Threading Capable	Displays whether the processor is Hyper-Threading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Memory Information	
Memory Installed	Displays the total system memory installed.
Memory Available	Displays the total system memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology that is used for the memory.
Devices Information	
Panel Type	Displays the Panel Type of the system.
Video Controller	Displays the video controller type of the system.
Video Memory	Displays the video memory information of the system.
Wi-Fi Device	Displays the wireless device information of the system.
Native Resolution	Displays the native resolution of the system.
Video BIOS Version	Displays the video BIOS version of the system.
Audio Controller	Displays the audio controller information of the system.
Bluetooth Device	Displays the Bluetooth device information of the system.

Table 5. System setup options—Boot Configuration menu

Boot Configuration	
Boot Sequence	
Boot mode	Displays the boot mode.
Boot Sequence	Displays the boot sequence.
Secure Digital (SD) Card Boot	Enable or disable the SD card read-only boot. By default, the Secure Digital (SD) Card Boot option is not enabled.
Secure Boot	
Enable Secure Boot	Enable or disable the secure boot feature. By default, the option is not enabled.
Secure Boot Mode	Enable or disable to change the secure boot mode options.

Table 5. System setup options—Boot Configuration menu (continued)

Boot Configuration	
	By default, the Deployed Mode is enabled.
Expert Key Management	
Enable Custom Mode	Enable or disable custom mode.
	By default, the custom mode option is not enabled.
Custom Mode Key Management	Select the custom values for expert key management.

Table 6. System setup options—Integrated Devices menu

Integrated Devices	
Date/Time	Displays the current date in MM/DD/YYYY format and current time in HH:MM:SS AM/PM format.
Camera	Enables or disable the camera. By default, the Enable Camera option is selected
Audio	
Enable Audio	Enable or disable the integrated audio controller. By default, all the options are enabled.
USB Configuration	<ul style="list-style-type: none"> • Enable or disable booting from USB mass storage devices that are connected to external USB ports. By default, the Enable External USB Ports option is enabled. • Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive. By default, the Enable USB Boot Support option is enabled.
Disable USB4 PCIE Tunneling	Disable the USB4 PCIE Tunneling option. By default, the option is disabled.
Video/Power only on Type-C Ports	Enable or disable the Type-C port functionality to video or power only. By default, the Video/Power only on Type-C Ports option is disabled.

Table 7. System setup options—Storage menu

Storage	
SATA/NVMe Operation	
SATA/NVMe Operation	Set the operating mode of the integrated storage device controller. By default, the RAID On option is enabled.
Storage interface	
Port Enablement	This page allows you to enable the onboard drives. By default, the M.2 PCIe SSD option is enabled.
SMART Reporting	
Enable SMART Reporting	Enable or disable Self-Monitoring, Analysis, and Reporting Technology (SMART) during system startup. By default, the Enable SMART Reporting option is not enabled.
Drive Information	
M.2 PCIe SSD	

Table 7. System setup options—Storage menu (continued)

Storage	
Type	Displays the M.2 PCIe SSD type information of the system.
Device	Displays the M.2 PCIe SSD device information of the system.
Enable MediaCard	
Secure Digital (SD) Card	Enable or disable the SD card. By default, the Secure Digital (SD) Card option is enabled.
Secure Digital (SD) Card Read-Only Mode	Enable or disable the SD card read-only mode. By default, the Secure Digital (SD) Card Read-Only Mode option is not enabled.

Table 8. System setup options—Display menu

Display	
Display Brightness	
Brightness on battery power	Enable to set screen brightness when the system is running on battery power.
Brightness on AC power	Enable to set screen brightness when the system is running on AC power.
EcoPower	
	Enable or disable EcoPower Feature in your panel. EcoPower can increase the battery life of your system by reducing the display brightness when appropriate. By default, Enable EcoPower option is enabled.
Full Screen Logo	
	Enable or disable full screen logo. By default, the option is not enabled.

Table 9. System setup options—Connection menu

Connection	
Wireless Device Enable	
WLAN	Enable or disable the internal WLAN device. By default, the option enabled.
Bluetooth	Enable or disable the internal Bluetooth device By default, the option enabled.
Enable UEFI Network Stack	
	Enable or disable UEFI Network Stack and controls the on-board LAN Controller. By default, the Enable UEFI Network Stack option is enabled.
HTTPs Boot Feature	
HTTPs Boot	Enable or disable the HTTPs Boot feature. By default, the HTTPs Boot option is disabled.

Table 10. System setup options—Power menu

Power	
Battery configuration	
	Enables the system to run on battery during peak power usage hours. Use the table Custom Charge Start and Custom Charge Stop , to prevent AC power usage between certain times of each day. By default, the Adaptive option is enabled.
Advanced Configuration	

Table 10. System setup options—Power menu (continued)

Power	
Enable Advanced Battery Charge Configuration	<p>Enable or disable the advanced battery charge configuration.</p> <p>By default, the Enable Advanced Battery Charge Configuration option is disabled.</p>
<p>Peak Shift</p> <p>Enable Peak Shift</p>	<p>Enables the system to run on battery during peak power usage hours.</p> <p>By default, the Enable Peak Shift option is disabled.</p>
<p>Thermal Management</p>	<p>Enables to cool the fan and processor heat management to adjust the system performance, noise, and temperature.</p> <p>By default, the Optimized option is enabled.</p>
<p>USB Wake Support</p> <p>Enable USB Wake Support</p>	<p>When enabled, the USB devices like a mouse or keyboard can be used to wake the system from Standby, Hibernate, and Power Off.</p> <p>NOTE: This feature requires Deep Sleep Control to be disabled.</p> <p>NOTE: This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed before Standby, the BIOS will remove power from all of the USB ports to conserve battery power.</p> <p>By default, the Enable USB Wake Support option is disabled.</p>
Wake on Dell USB-C Dock	<p>When enabled, connecting a Dell USB-C Dock will wake the system from Standby, Hibernate, and Power Off.</p> <p>By default, the Wake on Dell USB-C Dock option is enabled.</p>
<p>Block Sleep</p>	<p>Enables to block entering sleep (S3) mode in the operating system.</p> <p>By default, the Block Sleep option is disabled.</p>
<p>Lid Switch</p> <p>Enabled Lid Switch</p>	<p>Enable or disable the lid switch.</p> <p>By default, the Enable Lid Switch option is enabled.</p>
Power On Lid Open	<p>When enabled, allows the system to power up from the off state whenever the lid is opened.</p> <p>By default, the Power On Lid Open option is enabled.</p>
<p>Intel Speed Shift Technology</p>	<p>Enable or disable the Intel speed shift technology support.</p> <p>By default, the Intel Speed Shift Technology option is enabled.</p>

Table 11. System setup options—Security menu

Security	
<p>TPM 2.0 Security</p> <p>TPM 2.0 Security On</p>	<p>Allows you to enable or disable TPM visibility to operating system.</p> <p>By default, the TPM 2.0 Security On option is enabled.</p>
Attestation Enable	<p>Enables to control whether the Trusted Platform Module (TPM) Endorsement Hierarchy is available to the operating system.</p> <p>By default, the Attestation Enable option is enabled.</p>
Key Storage Enable	<p>Enables to control whether the Trusted Platform Module (TPM) Storage Hierarchy is available to the operating system.</p> <p>By default, the Key Storage Enable option is enabled.</p>

Table 11. System setup options—Security menu (continued)

Security	
SHA-256	<p>When enabled, the BIOS and TPM will use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot.</p> <p>By default, the SHA-256 option is enabled.</p>
Clear	<p>Enables to clear the TPM owner information and returns the TPM to the default state.</p> <p>By default, the Clear option is disabled.</p>
PPI Bypass for Clear Commands	<p>Controls the TPM Physical Presence Interface (PPI).</p> <p>By default, the PPI ByPass for clear Commands option is disabled.</p>
SMM Security Mitigation	<p>Enable or disable additional UEFI SMM Security Mitigation protections.</p> <p>By default, the option is enabled.</p>
Data Wipe on Next Boot	
Start Data Wipe	<p>Enable or disable the data wipe on next boot.</p> <p>By default, the Start Data Wipe option is disabled.</p>
Absolute	<p>Enable or disable or permanently disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute software.</p> <p>By default, the option is enabled.</p> <p>⚠ WARNING: The 'Permanently Disabled' option can only be selected once. When 'Permanently Disabled' is selected, Absolute Persistence cannot be re-enabled. No further changes to the Enable/Disable states are allowed.</p> <p>i NOTE: The Enable/Disable options will be unavailable while Computrace is in the activated state.</p>
UEFI Boot Path Security	<p>Controls whether the system will prompt the user to enter the admin password (if set) when booting to a UEFI boot path device from the F12 boot menu.</p> <p>By default, the Always Except Internal HDD option is enabled.</p>

Table 12. System setup options—Passwords menu

Passwords	
Admin Password	Set, change, or delete the administrator password.
System Password	Set, change, or delete the system password.
NVMe SSD0	Set, change, or delete the NVMe SSD0 password.
Password Configuration	
Upper Case Letter	<p>Reinforces password must have at least one upper case letter.</p> <p>By default, the option is disabled.</p>
Lower Case Letter	<p>Reinforces password must have at least one lower case letter.</p> <p>By default, the option is disabled.</p>
Digit	<p>Reinforces password must have at least one digit number.</p> <p>By default, the option is disabled.</p>
Special Character	<p>Reinforces password must have at least one special character.</p> <p>By default, the option is disabled.</p>
Minimum Characters	Set the minimum characters allowed for password.

Table 12. System setup options—Passwords menu (continued)

Passwords	
<p>Password Bypass</p> <p>Password Changes</p> <p>Enable Non-Admin Password Changes</p>	<p>When enabled, this always prompts for system and internal hard drive passwords when powered on from the off state.</p> <p>By default, the Disabled option is selected.</p> <p>Enable or disable to change system and hard drive password without the need for admin password.</p> <p>By default, the option is enabled.</p>
Admin Setup Lockout	
<p>Enable Admin Setup Lockout</p>	<p>Enables administrators control over how their users can or cannot access BIOS setup.</p> <p>By default, the option is disabled.</p>
Master Password Lockout	
<p>Enable Master Password Lockout</p>	<p>When enabled, this disables the master password support.</p> <p>By default, the option is disabled.</p>
Allow Non-Admin PSID Revert	
<p>Enable Allow Non-Admin PSID Revert</p>	<p>Controls access to the Physical Security ID (PSID) revert of NVMe hard-drives from the Dell Security Manager prompt.</p> <p>By default, the option is disabled.</p>

Table 13. System setup options—Update, Recovery menu

Update, Recovery	
<p>UEFI Capsule Firmware Updates</p>	<p>Enable or disable BIOS updates through UEFI capsule update packages.</p> <p>i NOTE: Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS).</p> <p>By default, the option is enabled.</p>
<p>BIOS Recovery from Hard Drive</p>	<p>Enables the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key.</p> <p>By default, the option is enabled.</p> <p>i NOTE: BIOS Recovery from Hard Drive is not available for self-encrypting drives (SED).</p>
<p>BIOS Downgrade</p> <p>Allow BIOS Downgrade</p>	<p>This field controls the flashing of the system firmware to previous revisions.</p> <p>By default, the option is enabled.</p>
<p>SupportAssist OS Recovery</p>	<p>Enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors.</p> <p>By default, the option is enabled.</p>
<p>BIOSConnect</p>	<p>Enable or disable cloud Service operating system recovery if the main operating system fails to boot with the number of failures equal to or greater than the value specified by the Auto operating system Recovery Threshold setup option and local Service operating system does not boot or is not installed.</p> <p>By default, the option is enabled.</p>
<p>Dell Auto operating system Recovery Threshold</p>	<p>Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery Tool.</p>

Table 13. System setup options—Update, Recovery menu (continued)

Update, Recovery	
	By default, the threshold value is set to 2.

Table 14. System setup options—System Management menu

System Management	
Service Tag	Displays the Service Tag of the system.
Asset Tag	Create a system Asset Tag.
AC Behavior	
Wake on AC	Enable or disable the wake on AC option. By default, the option is disabled.
Auto on Time	Enable to set the system to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. By default, the option is disabled.

Table 15. System setup options—Keyboard menu

Keyboard	
Numlock Enable	Allows you to enable or disable the Numlock function when the system boots. By default, the option Fn Lock Options is enabled.
Fn Lock Options	By default, the Fn lock option is enabled.
Lock Mode	By default, the Lock Mode Secondary option is enabled. With this option, the F1-F2 keys scan the code for their secondary functions.

Table 16. System setup options—Pre-boot Behavior menu

Pre-boot Behavior	
Adapter Warnings	
Enable Adapter Warnings	Enable or disable the warning messages during boot when the adapters with less power capacity are detected. By default, the option is enabled.
Warning and Errors	Enable or disable the action to be done when a warning or error is encountered. By default, the Prompt on Warnings and Errors option is enabled.
USB-C Warnings	
Enable Dock Warning Messages	By default, the option is enabled.
Fastboot	Allows you to configure the speed of the UEFI boot process. By default, the Minimal option is enabled.
Extend BIOS POST Time	Set the BIOS POST load time. By default, the 0 seconds option is enabled.

Table 17. System setup options—Virtualization menu

Virtualization	
Intel Virtualization Technology	
Enable Intel Virtualization Technology (VT)	When enabled, the system will be able to run a Virtual Machine Monitor (VMM).

Table 17. System setup options—Virtualization menu (continued)

Virtualization	
VT for Direct I/O	<p>By default, the option is enabled.</p> <p>When enabled, the system will be able to perform Virtualization Technology for Direct I/O (VT-d).</p> <p>By default, the option is enabled.</p>
Intel Trusted Execution Technology (TXT)	
Enable Intel Trusted Execution Technology (TXT)	<p>Specifies whether a measured Virtual Machine Monitor (MVMM) can use the additional hardware capabilities that are provided by Intel Trusted Execution Technology. The following must be enabled in order to enable Intel TXT.</p> <ul style="list-style-type: none"> • Trusted Platform Module (TPM) • Intel Hyper-Threading • All CPU cores (Multi-Core Support) • Intel Virtualization Technology • Intel VT for Direct I/O <p>By default, the option is disabled.</p>

Table 18. System setup options—Performance menu

Performance	
Multi Core Support	
Active Cores	<p>Enables to change the number of CPU cores available to the operating system.</p> <p>By default, the All Cores option is enabled.</p>
Intel SpeedStep	
Enable Intel SpeedStep Technology	<p>Enables the system to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production.</p> <p>By default, the option is enabled.</p>
C-States Control	
Enable C-State Control	<p>Enable the ability of the CPU to enter and exit low power state. When disabled, it disabled all C-states. When enabled, it enabled all C-states that the chipset or platform allows.</p> <p>By default, the option is enabled.</p>
Intel Turbo Boost Technology	
Enable Intel Turbo Boost Technology	<p>Enable or disable the Intel TurboBoost mode of the processor.</p> <p>By default, the option is enabled.</p>
Intel Hyper-Threading Technology	
Enable Intel Hyper-Threading Technology	<p>Enable or disable Hyper-Threading in the processor.</p> <p>By default, the option is enabled.</p>
Dynamic Tuning:Machine Learning	
Enable Dynamic Tuning:Machine Learning	<p>Enables the operating system capability to enhance dynamic power tuning capabilities based on detected workloads.</p> <p>By default, the option is disabled.</p>


Table 19. System setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear Bios Event Log	Displays BIOS events. By default, the Keep Log option is enabled.
Thermal Event Log	
Clear Thermal Event Log	Displays Thermal events. By default, the Keep Log option is enabled.
Power Event Log	
Clear Power Event Log	Displays power events. By default, the Keep Log option is enabled.
License Information	Displays the license information of the system.


Updating the BIOS

Updating the BIOS in Windows

About this task

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.

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, search in the Knowledge Base Resource at www.dell.com/support.

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](https://www.dell.com/support) at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

About this task

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.


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 in 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 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

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, search in the Knowledge Base Resource at www.dell.com/support.

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.

System and setup password


Table 20. 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.

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.

Troubleshooting

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The Dell SupportAssist Pre-boot System Performance Check diagnostics is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing 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 to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

NOTE: Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

For more information, see <https://www.dell.com/support/kbdoc/000180971>.

Running the SupportAssist Pre-Boot System Performance Check

Steps

1. Turn on your computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.
4. Click the arrow at the bottom left corner.
Diagnostics front page is displayed.
5. Click the arrow in the lower-right corner to go to the page listing.
The items detected are listed.
6. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
7. Select the device from the left pane and click **Run Tests**.
8. If there are any issues, error codes are displayed.
Note the error code and validation number and contact Dell.

Power-Supply Unit Built-in Self-Test

Built-in Self-Test (BIST) helps determine if the power-supply unit is working. To run self-test diagnostics on the power-supply unit of a desktop or all-in-one computer, search in the Knowledge Base Resource at www.dell.com/support.

System-diagnostic lights

This section lists the system-diagnostic lights of your Precision 7865 Tower.

Power-supply diagnostics light

Indicates the status of the power-supply in either of the two sates:

- Off: No Power
- On: Power is supplied.

Power button light

Table 21. Power button LED status

Power button LED state	System state	Description
Off	<ul style="list-style-type: none"> • S4 • S5 	There is in Hibernate or Off state.
Solid White	S0	Working state
Solid Amber		Various sleep states or No POST
Blinking Amber/White		Failure to POST

This platform relies on the Power button LED light blinking in an amber/white pattern to determine a failure as listed in the following table:

NOTE:

The blinking patterns consists of two numbers (representing First Group: Amber blinks, Second Group: White blinks).

- **First Group:** The Power button LED light blinks Amber, 1 to 9 times followed by a short pause with LED off for a couple of seconds.
- **Second Group:** The Power button LED light then blinks White, 1 to 9 times, followed by a longer pause before the next cycle starts again after a short interval.

Example: No Memory detected (2,3). Power button LED blinks 2-times in Amber followed by a pause, and then blinks 3-times in White. The Power button LED will pause for few seconds before the next cycle repeats itself again.

Table 22. System-diagnostic lights

Blinking pattern		Problem description	Suggested resolution
Amber	White		
1	1	TPM detection failure	Replace the system board.
1	2	Unrecoverable SPI Flash Failure	Replace the system board.
1	5	EC unable to program i-Fuse	Replace the system board.
1	6	Generic catch-all for ungraceful EC code flow errors	Disconnect all power source (AC, battery, coin cell) and drain flea power by pressing and holding down power button for 3~5 seconds.
2	1	CPU failure	<ul style="list-style-type: none"> • Run the Dell Support Assist/Dell Diagnostics tool. • If problem persists, replace the system board.
2	2	System board failure (included BIOS corruption or ROM error)	<ul style="list-style-type: none"> • Flash latest BIOS version • If problem persists, replace the system board.
2	3	No memory/RAM detected	<ul style="list-style-type: none"> • Confirm that the memory module is installed properly. • If problem persists, replace the memory module.

Table 22. System-diagnostic lights (continued)

Blinking pattern		Problem description	Suggested resolution
Amber	White		
2	4	Memory/RAM failure	<ul style="list-style-type: none"> Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2	5	Invalid memory installed	<ul style="list-style-type: none"> Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2	6	System board/Chipset Error	Replace the system board.
2	7	LCD failure (SBIOS message)	Replace the LCD module.
2	8	LCD failure (EC detection of power rail failure)	Replace the system board.
3	1	CMOS battery failure	<ul style="list-style-type: none"> Reset the main battery connection. If problem persists, replace the main battery.
3	2	PCI or Video card/chip failure	Replace the system board.
3	3	BIOS Recovery image not found	<ul style="list-style-type: none"> Flash latest BIOS version If problem persists, replace the system board.
3	4	BIOS Recovery image found but invalid	<ul style="list-style-type: none"> Flash latest BIOS version If problem persists, replace the system board.
3	5	Power rail failure	Replace the system board.
3	6	Flash corruption detected by SBIOS.	<ul style="list-style-type: none"> Press power button for over 25 seconds to do RTC reset. If problem persists, replace the system board. Disconnect all power source (AC, battery, coin cell) and drain flea power by pressing and holding down power button 3~5 seconds to ensure all power are drained. Run "BIOS recovery from USB", and the instructions are in the website Dell support. If problem persists, replace the system board.
3	7	Timeout waiting on ME to reply to HECI message.	Replace the system board.

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**.

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 Latitude and Precision systems from **No POST/No Boot/No Power** situations. You can initiate the RTC reset on the system from a power-off state only if it is connected to AC power. Press and hold the power button for 25 seconds. The system RTC reset occurs after you release the power button.

NOTE: If AC power is disconnected from the system during the process or the power button is held longer than 40 seconds, the RTC reset process gets aborted.

The RTC reset will reset the BIOS to Defaults, un-provision Intel vPro and reset the system date and time. The following items are unaffected by the RTC reset:

- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password
- System Password
- HDD Password
- Key Databases
- System Logs

NOTE: The IT administrator's vPro account and password on the system will be un-provisioned. The system needs to go through the setup and configuration process again to reconnect it to the vPro server.

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

- Boot List
- Enable Legacy Option ROMs
- Secure Boot Enable
- Allow BIOS Downgrade


Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell proposes multiple options for recovering Windows operating system on your Dell PC. For more information, see [Dell Windows Backup Media and Recovery Options](#).

WiFi power cycle

About this task

If your computer is unable to access the internet due to WiFi connectivity issues a WiFi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a WiFi 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.

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 23. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
Tips	
Contact Support	In Windows search, type <code>Contact Support</code> , and press Enter.
Online help for operating system	www.dell.com/support/windows www.dell.com/support/linux
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	<ol style="list-style-type: none"> 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.