

Dell Pro Precision 5 16

PW516261

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 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 [Dell Regulatory Compliance Home Page](#).

 **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.

 **WARNING:** For laptops, discharge the battery completely before removing it. Disconnect the AC power adapter from the computer and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button

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

 **CAUTION:** You should only perform troubleshooting and repairs as authorized or directed by the Dell technical support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

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

 **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 connector on the cable is correctly oriented and aligned with the port.

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

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

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 instructions.

3. Turn off all the attached peripherals.
4. Disconnect your computer from the electrical outlet.
5. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
6. Remove any media card and optical drive from your computer, if applicable.
7. To clean the air vents, use a soft brush and move vertically.

 **NOTE:** Do not remove the base cover or use any blower to clean the vents.

8. Enter the Service Mode.

Service Mode

Service Mode is used to cut off power without disconnecting the battery cable from the system board before conducting repairs in the computer.

 **CAUTION:** If you are unable to turn on the computer to put it into Service Mode, disconnect the battery cable. To disconnect the battery cable, follow the steps in [Removing the battery](#).

 **NOTE:** Ensure that your computer is shut down and the power adapter is disconnected.

- a. Press and hold the B key and the power button for three seconds, or until the Dell logo appears on the screen.
- b. If the **Owner Tag** is set, it is displayed on the screen. Press any key to continue.

 **NOTE:** If the **Owner Tag** information is not already set, the computer automatically skips this step and proceeds to enter Service Mode.

- c. If the power adapter is still connected, a message appears on the screen prompting you to disconnect it. Disconnect the power adapter, then press any key to continue.
- d. When the **System Ready For Service** message appears on the screen, press any key to proceed. The computer emits three short beeps and shuts down immediately.
The computer shuts down and enters the Service Mode.

Safety precautions

This section details the primary steps to be followed before disassembling any device or component.

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

- Turn off the computer and all attached peripherals.
- Disconnect the computer from AC power.
- Disconnect all network cables and peripherals from the computer.
- Use an ESD field service kit when working inside your computer to avoid electrostatic discharge (ESD) damage.
- Place the removed component on an anti-static mat after removing it from the computer.
- Press and hold the power button for 15 seconds to discharge the 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 by using 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 nonmetal surface. Ensure that the wrist strap is secure and in full contact with your skin. Remove all jewelry, watches, bracelets, or rings before grounding 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 modules, and system boards. A slight charge 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.

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 module that has

received a static shock and immediately generates a "No POST/No Video" symptom with a beep code that is 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 memory module receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms that are 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, and so on.

Intermittent failures that are also called latent or "walking wounded" are difficult to detect and troubleshoot.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. Wireless anti-static straps 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, use the anti-static wrist strap to discharge the static electricity from your body.

NOTE: You can protect against ESD and discharge static electricity from your body by touching a metal-grounded object before you interact with anything electronic, for example, an unpainted metal surface on your computer's I/O panel. When connecting a peripheral (including handheld digital assistants) to your computer, you should always ground both yourself and the peripheral before connecting it to the computer. In addition, as you work inside the computer, periodically touch a metal-grounded object to remove any static charge that your body may have accumulated.

For more information about the wrist strap and ESD wrist strap tester, see [Components of an ESD Field Service Kit](#).

- 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.

CAUTION: It is critical to keep ESD-sensitive devices away from internal parts that are insulated and often highly charged, such as plastic heat sink casings.

Working environment

Before the ESD Field Service kit is deployed, conduct an evaluation of the site to ensure proper setup and readiness. For example, deploying the kit for a server environment is different than for a desktop or laptop environment. Servers are typically installed in a rack within a data center; desktops or laptops 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 computer 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 component 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 anti-static mat, in the computer, or inside an ESD bag.

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 anti-static mat and to any bare metal on the computer being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the anti-static mat. ESD-sensitive items are safe in your hand, on the anti-static mat, in the computer, or inside an ESD bag.
- **Wrist Strap and Bonding Wire** – If an anti-static mat is not being used, the wrist strap and bonding wire should be connected directly between your wrist and an exposed metal part of the hardware. If you are using an anti-static mat, connect the wrist strap and bonding wire to the anti-static mat to ensure protection for any hardware placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the anti-static mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, anti-static mat, and bonding wire. Never use wireless wrist straps. Always be cautious 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 an ESD strap are prone to damage over time. When using an unmonitored ESD kit, it is recommended to test the wrist strap regularly—ideally before each service session, and at a minimum, once per week. The most reliable method for testing is with a wrist strap tester. To perform the test, connect the bonding wire of the wrist strap to the tester while wearing the strap. Press the test button to initiate the check. A green LED indicates a successful test, while a red LED and audible alarm signal a failure.

 **NOTE:** It is recommended to always use the traditional wired ESD grounding wrist strap and protective anti-static mat when servicing Dell products. In addition, it is critical to keep sensitive parts separate from all insulator parts while servicing the computer.

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.

After working inside your computer

About this task

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

Steps

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

 **NOTE:** To exit service mode, ensure to connect the AC adapter to the power-adapter port on your computer.

5. Press the power button to turn on the computer.

Information on repairability for Québec - From Dell Canada Inc. - to Quebec consumers

Dell does not guarantee the availability of replacement parts, repair services, or information necessary for maintenance or repair.

BitLocker

When updating the BIOS on a computer with BitLocker enabled, consider the following precautions.

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the BitLocker key is not recognized the next time you reboot the computer. You will then be prompted to enter the recovery key to proceed, and the

computer displays a prompt for the recovery key on each reboot. Failure to provide the recovery key can result in data loss or an operating system reinstall. For more information, refer [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

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Phillips screwdriver #1
- Torx #5 (T5) screwdriver
- Plastic scribe

Screw list

- NOTE:** When removing screws from a component, it is recommended to note the screw type and 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 depending on the configuration ordered.

Table 1. Screw list

Component	Screw type	Quantity	Screw image
Base cover	Captive screw NOTE: Screws are part of the base cover.	9	
Battery	M2x4	8	
Solid state drive	M2x4	1	
Wireless-card bracket	M2x3	1	
Darwin-cable bracket	M2x3	1	
Speakers	M1.6x3	4	
Right/Processor fan	M2x4	2	
Left/Video fan	M2x4	2	
Heat sink	Captive screw NOTE: Screws are part of the heat sink.	4	

Table 1. Screw list (continued)

Component	Screw type	Quantity	Screw image
GPU filler	M2x3	2	
Battery frame	M2x3	10	
USH board	M2x2	2	
Smart-card reader	M2x2	3	
Display-cable bracket	M2x3	3	
Display assembly	M2.5x5	6	
Display panel	M2x3	4	
Display hinges	M2.5x2.5	6	
Fingerprint-reader bracket	M2x3	1	
System board	M2x4	2	
	M2x3	3 or 4	
USB Type-C module	M2x5	3	
Power button	M2x2	2	
Keyboard	M2x2.2	9	
Keyboard bracket	M2x2.2	20	
FX Beam	M2x4L	2	

Major components of Dell Pro Precision 5 16 PW516261

The following image shows the major components of Dell Pro Precision 5 16 PW516261.

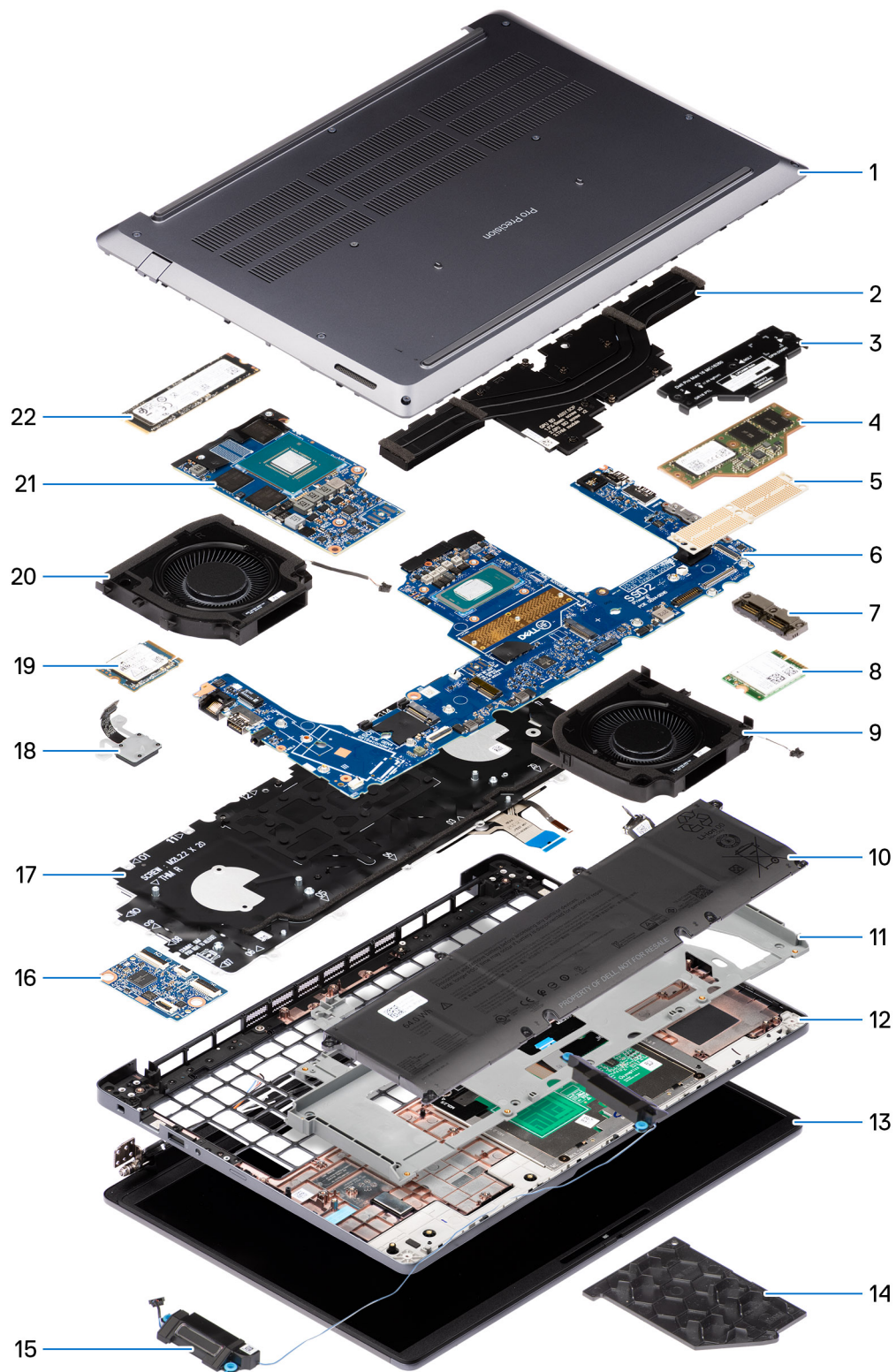


Figure 1. Major components of Dell Pro Precision 5 16 PW516261

1. Base cover
2. Heat sink
3. Memory-module bracket
4. Memory module
5. CAMM memory interposer

6. System board
7. USB Type-C module
8. Wireless card
9. Left/Video fan
10. Battery
11. Battery frame
12. Palm-rest assembly
13. Display assembly
14. GPU filler
15. Speakers
16. USH board
17. Keyboard assembly
18. Power button with optional fingerprint reader
19. WWAN card
20. Right/Processor fan
21. DGFF board
22. Solid state drive

NOTE: Dell provides a list of components and their part numbers for the original computer configuration purchased. These parts are available depending on the warranty coverage that is selected at the time of purchase. Components from upsell or upgraded variants may not be covered under the standard system warranty. For more details or to explore purchase options, contact your Dell sales representative.

Customer Replaceable Units (CRUs) and Field Replaceable Units (FRUs) list

The replaceable components in Dell Pro Precision 5 16 PW516261 are either Customer Replaceable Units (CRUs) or Field Replaceable Units (FRUs).

CAUTION: CRUs may be replaced by the customer, following the safety precautions and replacement procedures.

CAUTION: FRUs should be replaced by an authorized service technician, who is a trained technical repair specialist.

CAUTION: Replacement of FRUs by persons other than authorized service technicians may result in damage to the computer or data loss.

NOTE: Damages resulting from improper replacement or from failure to follow instructions are not covered by your warranty. Consider having a trained technical repair specialist perform replacements of FRU components.

Table 2. CRU and FRU list

Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
Base cover	Heat sink
Battery	Right/Processor fan
Battery cable	Left/Video fan
Solid-state drive	Graphics card filler
Memory module	Graphics card
Wireless card	Battery frame
Speakers	Smart-card reader
	I/O board cable
	I/O board
	Power button

Table 2. CRU and FRU list (continued)

Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
	Display assembly
	Display bezel
	Display panel
	Display hinges
	Display cable
	Camera
	Display back-cover and antenna assembly
	System board
	Keyboard
	Palmrest assembly

Removing and installing Customer Replaceable Units (CRUs)

The replaceable components in this chapter are Customer Replaceable Units (CRUs).

 **CAUTION:** CRUs may be replaced by the customer, following the safety precautions and replacement procedures.

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

Base cover

Removing the base cover

Prerequisites

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

 **NOTE:** Ensure that your computer is in Service Mode. For more information, see [Before working inside your computer](#).

 **CAUTION:** If the computer does not turn on, does not enter Service Mode, or does not support Service mode, proceed to disconnect the battery cable.

About this task

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



9x



Figure 2. Loosen the captive screws

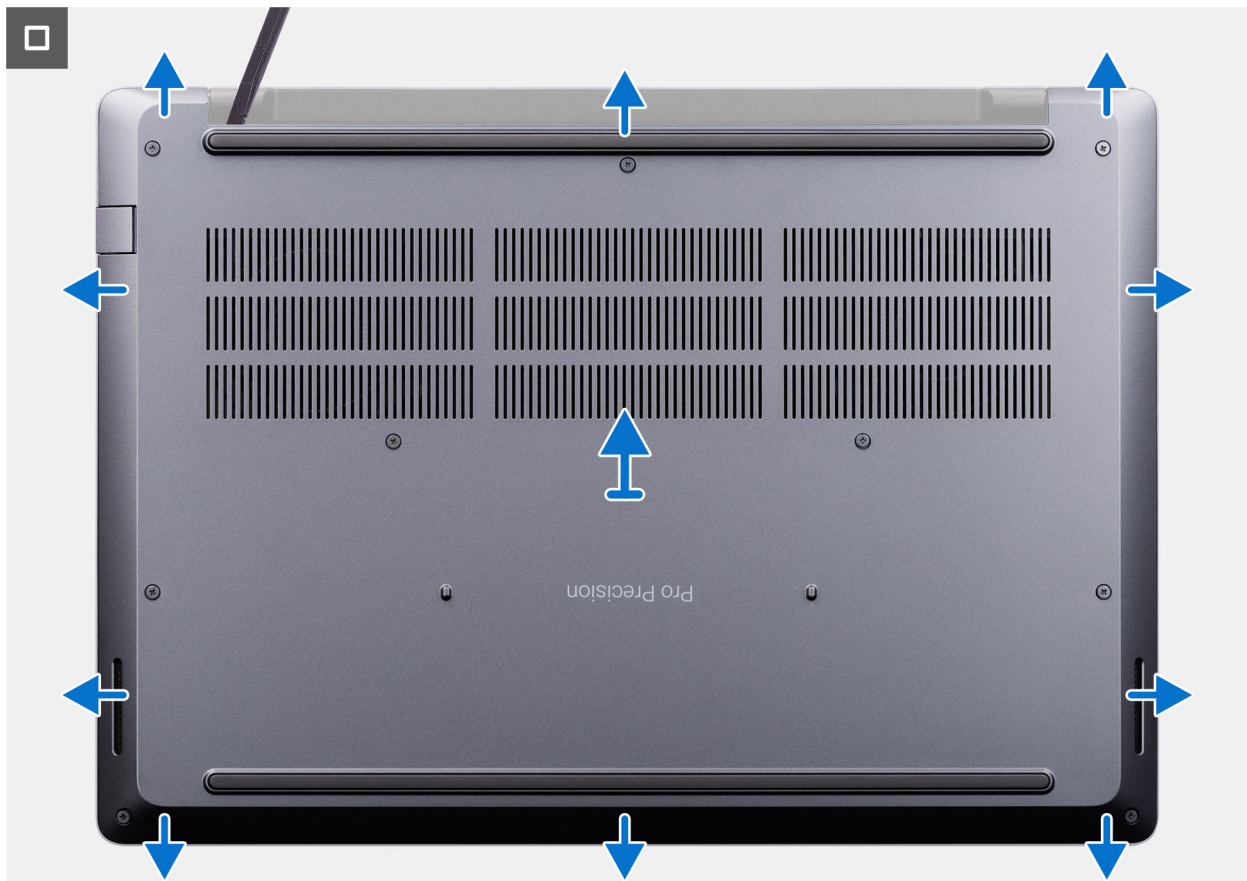


Figure 3. Remove the base cover

Steps

1. Loosen the nine captive screws that secure the base cover to the palm-rest assembly.
2. Using a plastic scribe, pry open the base cover starting from the recesses, which are located at the top edge of the base cover, near the hinges.

CAUTION: Do not slide the scribe along the edges of the base cover as it may damage the latches inside the base cover. Instead, insert the scribe at regular intervals and pry open the base cover.

3. Pry open the top of the base cover followed by the left, right, and bottom to release the base cover.
4. Lift the base cover off the palm-rest assembly.

NOTE: Ensure that your computer is in Service Mode. If your computer is unable to enter Service Mode, then disconnect the battery cable from the system board.

Installing the base 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 base cover and provide a visual representation of the installation procedure.



9x

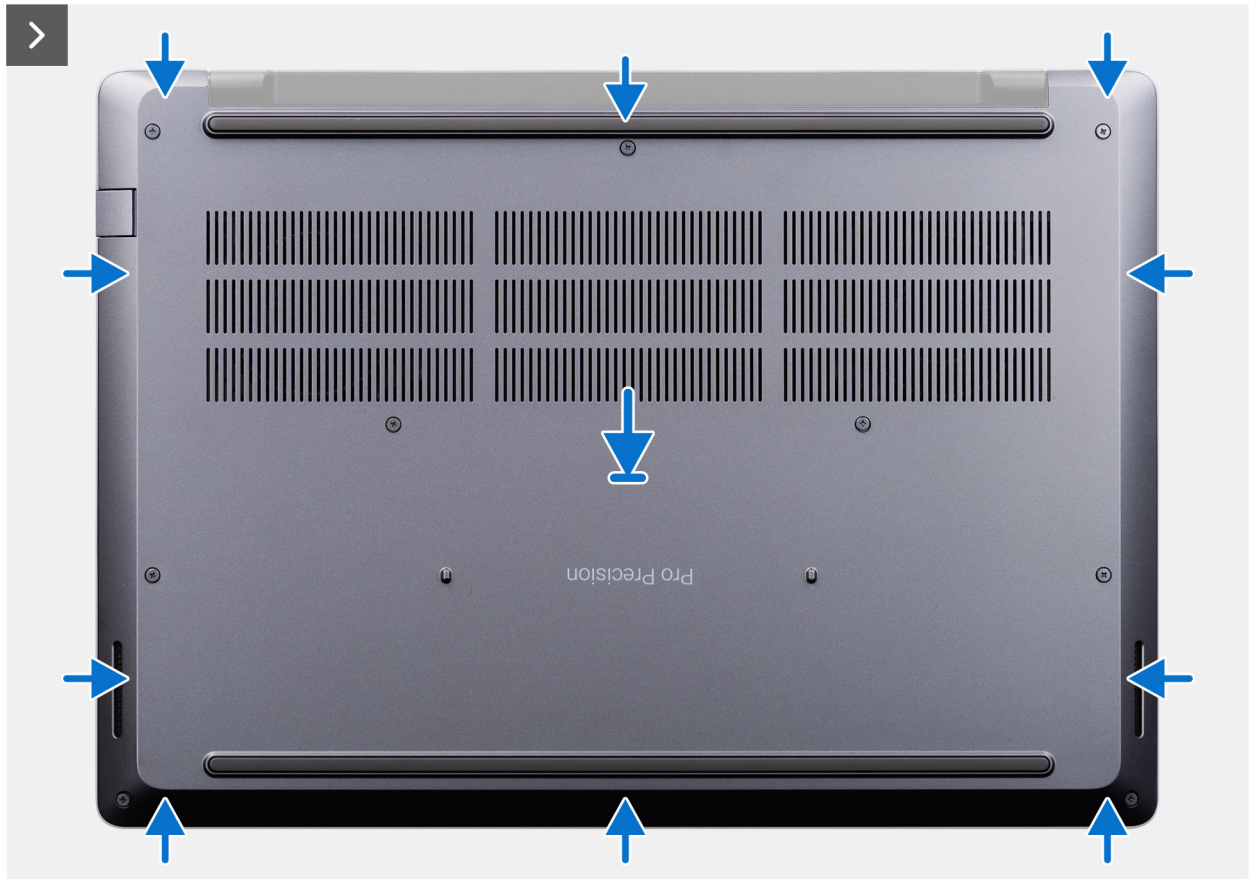


Figure 4. Installing the base cover



Figure 5. Installing the base cover

Steps

1. Place the base cover on the palm-rest assembly.
2. Align the screw holes on the base cover with the screw holes on the palm-rest assembly, and then snap the base cover into place.
3. Tighten the nine captive screws that secure the base cover to the palm-rest assembly.

Next steps

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

 **NOTE:** Ensure that your computer is in Service Mode. For more information, see [After working inside your computer](#).

Battery

Rechargeable Li-ion battery precautions

CAUTION:

- Exercise caution when handling rechargeable Li-ion batteries.
- Discharge the battery completely before removing it. Disconnect the AC power adapter from the computer and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.

- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any kind to pry on or against the battery.
- To prevent accidental puncture or damage to the battery and other components, ensure that no screws are lost or misplaced during the servicing of the computer.
- Always purchase genuine batteries from [Dell Support Site](#) or authorized Dell partners and resellers.
- Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how to handle and replace swollen rechargeable Li-ion batteries, see [Handling swollen rechargeable Li-ion batteries](#).

Removing the battery

CAUTION: The information in this removal section is intended for authorized service technicians only.

Prerequisites

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

About this task

CAUTION: Removing the battery resets the BIOS setup settings to default. It is recommended that you note the BIOS setup settings before removing the battery.

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

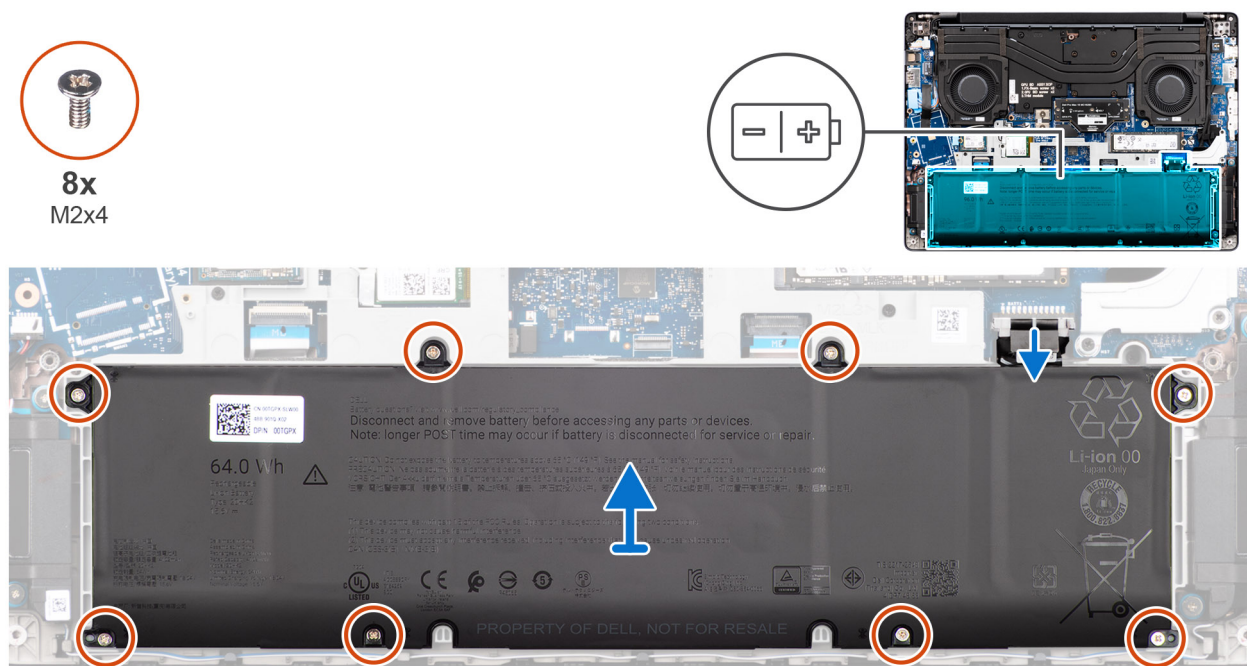


Figure 6. Removing the battery

Steps

1. Disconnect the battery cable from the battery cable connector (BATT1) on the system board (if not disconnected earlier).
2. Loosen the eight screws (M2x4) that secure the battery to the palm-rest assembly.
3. Lift the battery off the palm-rest assembly.
4. Flip the battery and peel the tape that adheres the battery cable to the battery.
5. Remove the battery cable from the routing guides on the battery.

6. Disconnect the battery cable from the connector on the battery.
7. Remove the battery cable away from the battery.

Installing the battery

CAUTION: The information in this installation section is intended for authorized service technicians only.

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 battery and provide a visual representation of the installation procedure.

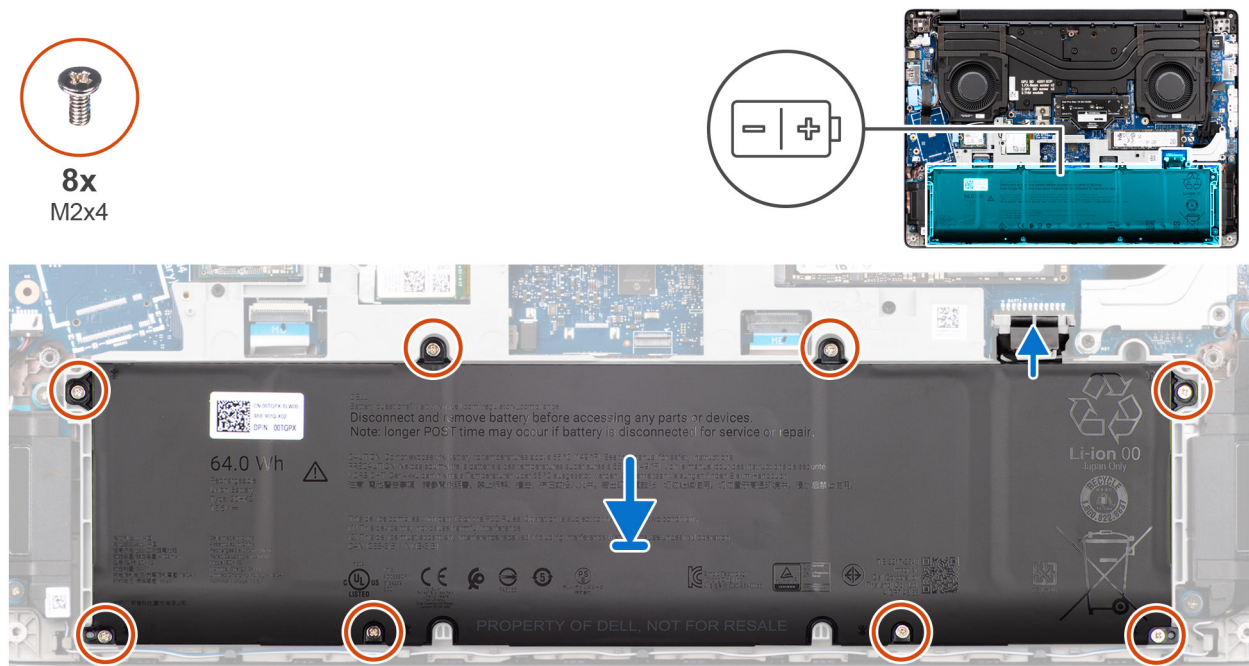


Figure 7. Installing the battery

Steps

1. Align and route the battery cable through the routing guides on the battery.
2. Adhere the tape that secures the battery cable to the battery.
3. Connect the battery cable to the connector on the battery.
4. Flip the battery.
5. Using the alignment posts, place the battery on the palm-rest assembly.
6. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
7. Tighten the eight screws (M2x4) that secure the battery to the palm-rest assembly.
8. Connect the battery cable to the battery cable connector (BATT1) on the system board.

Next steps

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

Battery cable

Removing the battery cable

Prerequisites

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

About this task

The following image indicates the location of the battery cable and provides a visual representation of the removal procedure.

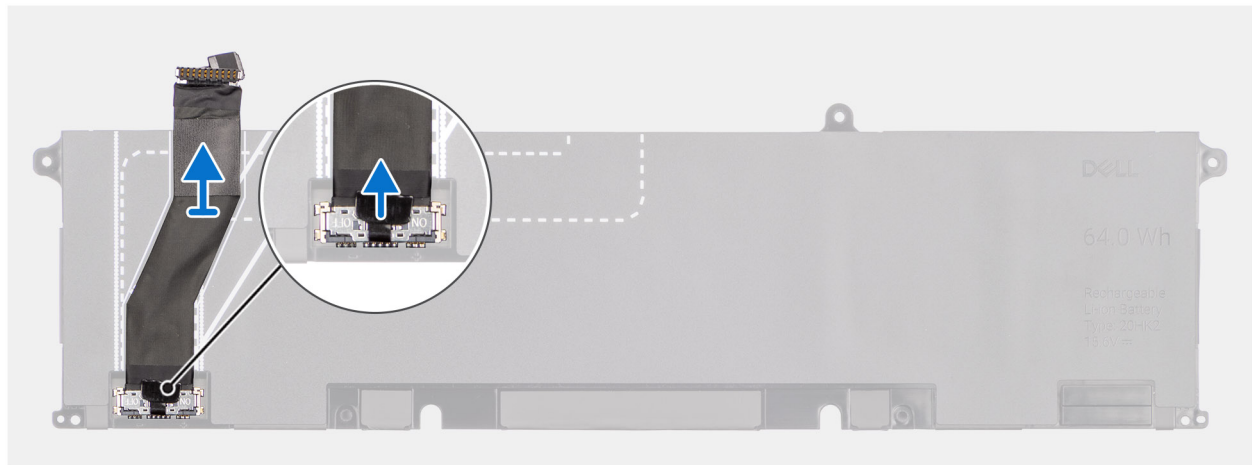


Figure 8. Removing the battery cable

Steps

1. Unroute the battery cable from the battery.
2. Disconnect the battery cable from the connector on the battery.

Installing the battery cable

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 battery cable and provides a visual representation of the installation procedure.

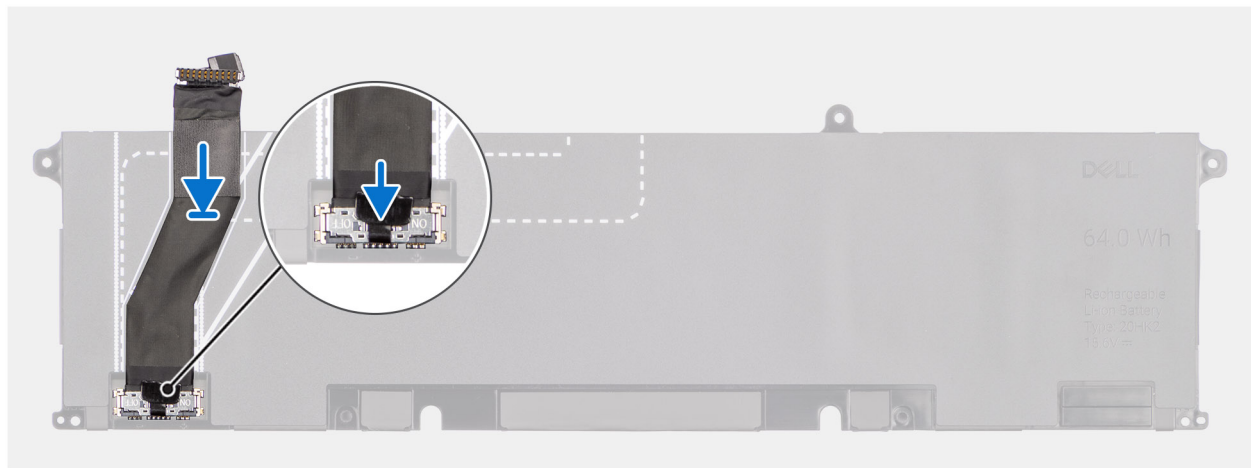


Figure 9. Installing the battery cable

Steps

1. Connect the battery cable to the connector on the battery.
2. Route the battery cable through the routing channels on the battery.

Next steps

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

Solid-state drive

Removing the M.2 2230 solid state drive

Prerequisites

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

About this task

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

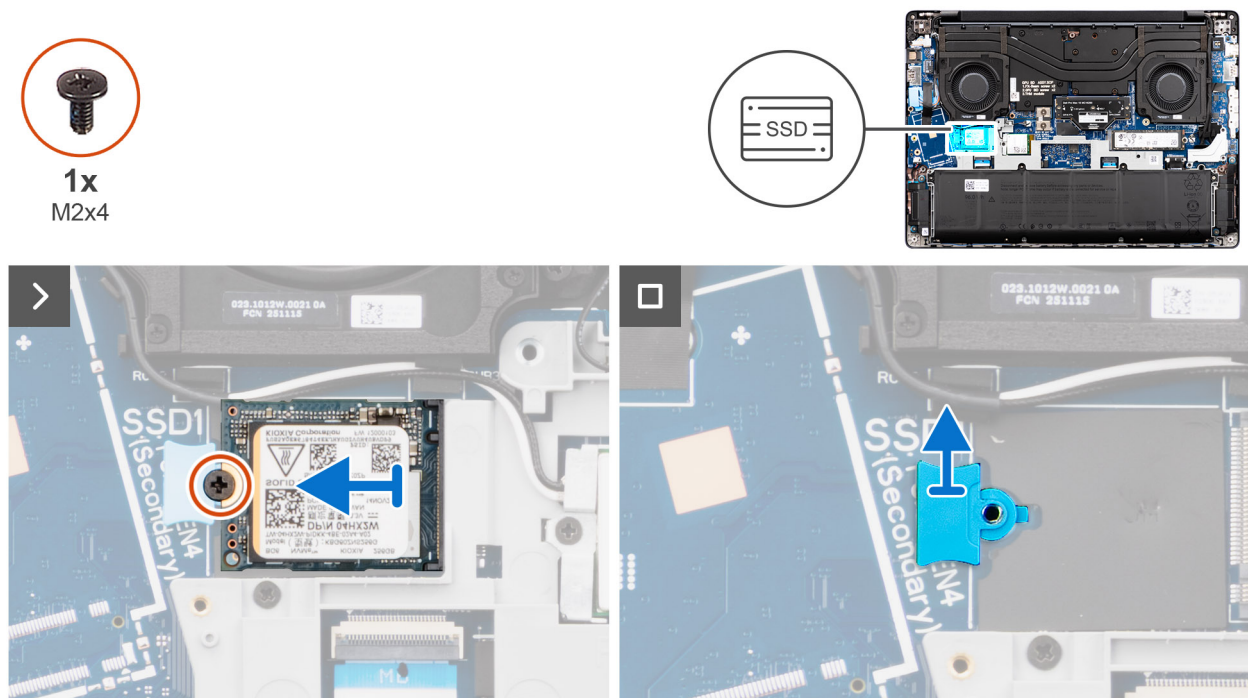


Figure 10. Removing the M.2 2230 solid state drive 1

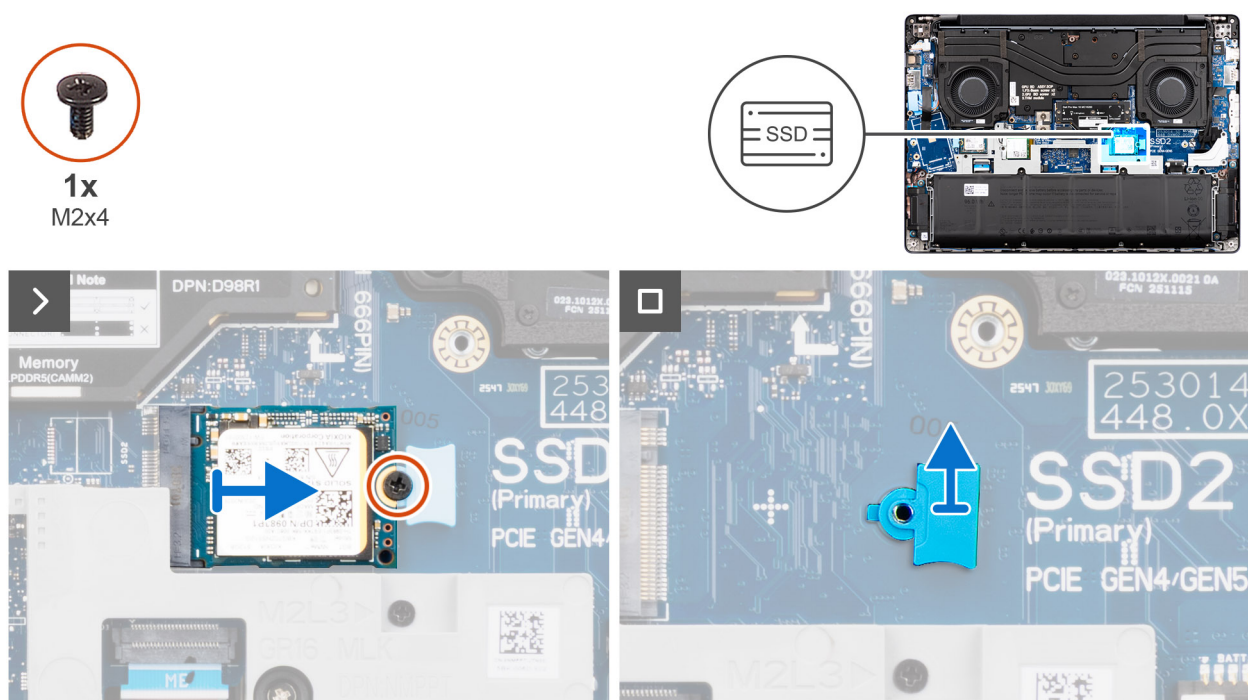


Figure 11. Removing the M.2 2230 solid state drive 2

Steps

1. Remove the screw (M2x4) that secures the M.2 2230 solid state drive to the palm-rest assembly.
2. Remove the M.2 2230 solid state drive from the M.2 card slot (SSD1 or SSD2, whichever is applicable) on the system board.
3. Remove the M.2230 SSD holder from the system board.

NOTE: This step applies only if you are replacing a M.2 2230 solid state drive with a M.2 2280 solid state drive.

Installing the 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 M.2 2230 solid state drive (SSD) and provide a visual representation of the installation procedure.

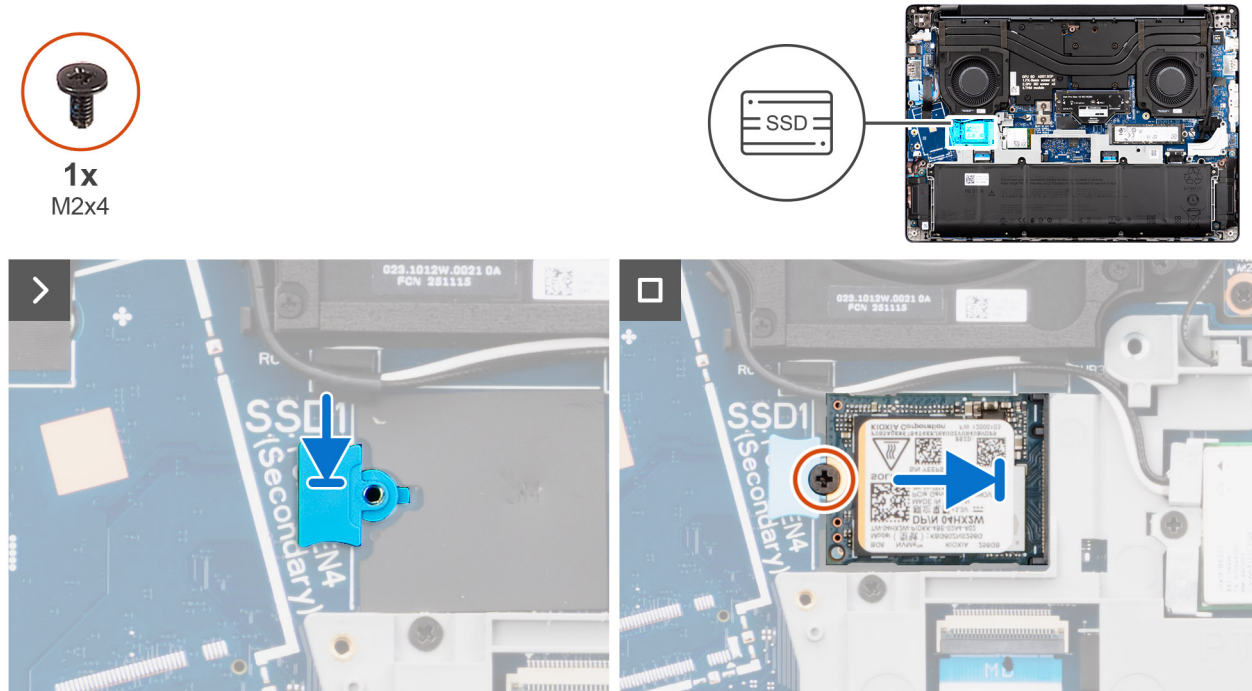


Figure 12. Installing the M.2 2230 solid state drive 1

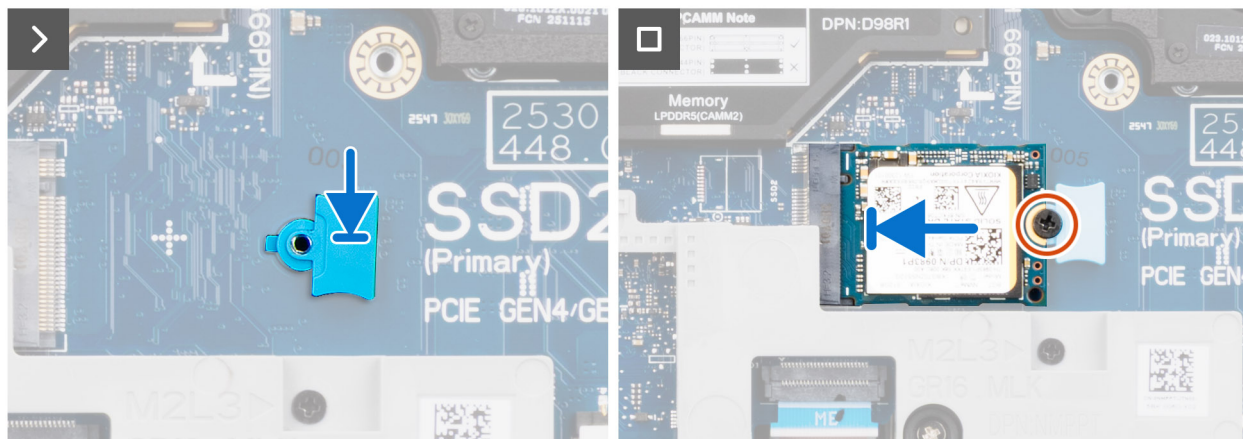
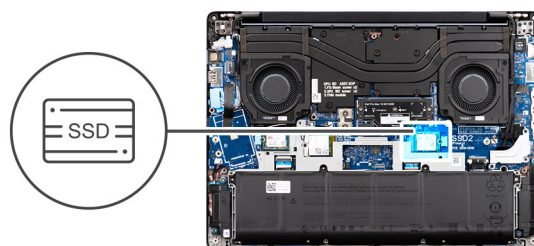


Figure 13. Installing the M.2 2230 solid state drive 2

Steps

1. Align and place the M.2230 SSD holder in its slot on the system board.

NOTE: This step applies only if you are replacing a M.2 2280 solid state drive with a M.2 2230 solid state drive.

2. Align the notch on the M.2 2230 solid state drive to the tab on the M.2 card slot (SSD1 or SSD2, whichever is applicable) on the system board.
3. Slide the M.2 2230 solid state drive at an angle into the M.2 card slot on the system board.
4. Replace the screw (M2x4) to secure the M.2 2230 solid state drive to the palm-rest assembly.

Next steps

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

Removing the M.2 2280 solid state drive

Prerequisites

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

About this task

The following image indicates the location of the M.2 2280 solid state drive (SSD) and provides a visual representation of the removal procedure.

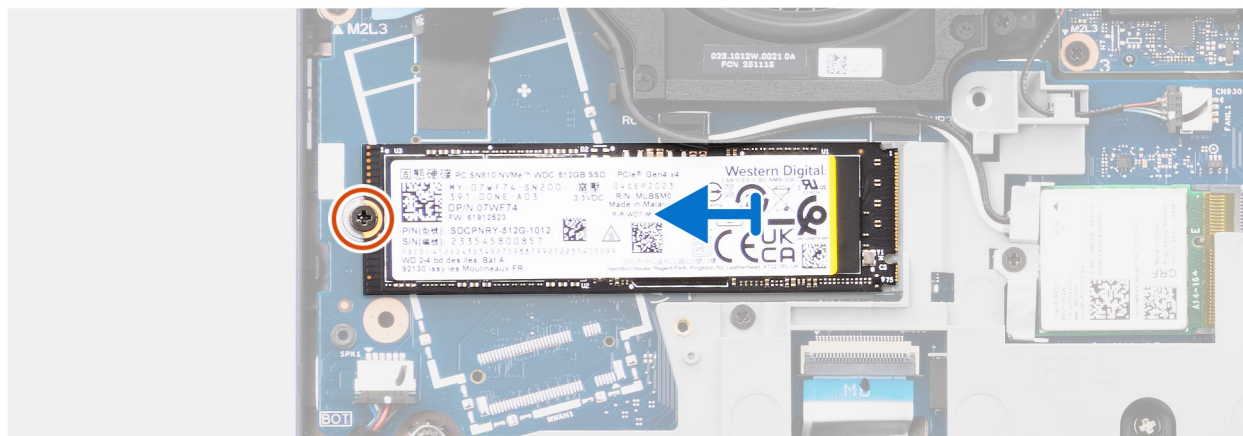


Figure 14. Removing the M.2 2280 solid state drive 1

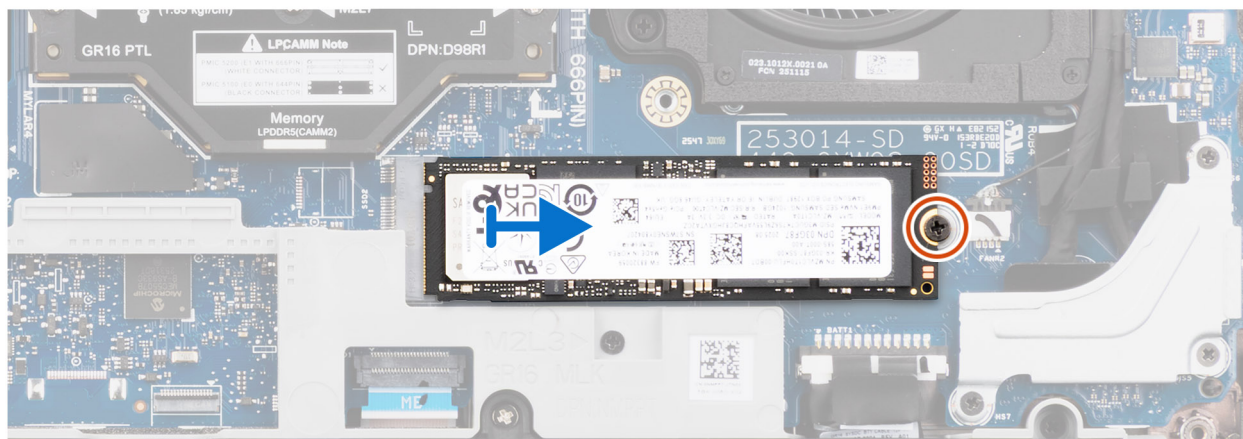


Figure 15. Removing the M.2 2280 solid state drive 2

Steps

1. Remove the screw (M2x4) that secures the M.2 2280 solid state drive to the system board.
2. Remove the M.2 2280 solid state drive from the M.2 card slot (SSD1 or SSD2, whichever is applicable) on the system board.



1x
M2x4

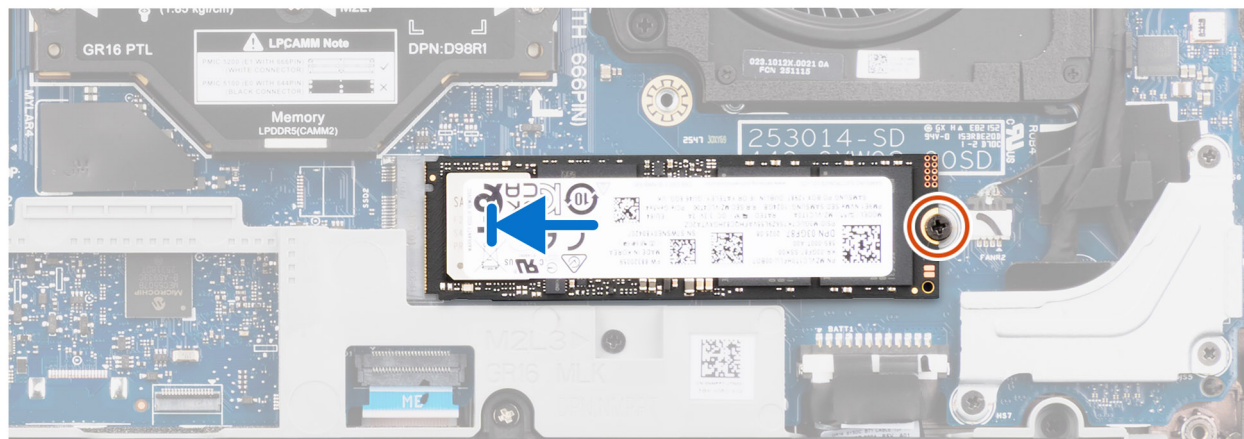
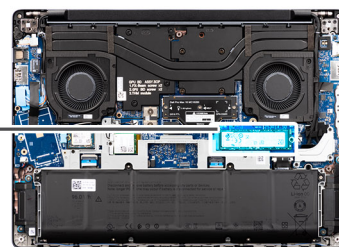


Figure 17. Installing the M.2 2280 solid state drive 2

Steps

1. Align the notch on the M.2 2280 solid state drive to the tab on the M.2 card slot (SSD1 or SSD2, whichever is applicable) on the system board.
2. Slide the M.2 2280 solid state drive at an angle into the M.2 card slot on the system board.
3. Replace the screw (M2x4) to secure the M.2 2280 solid state drive to the system board.

Next steps

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

Memory module

Removing the memory module

Prerequisites

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

About this task

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



3x
M2x7

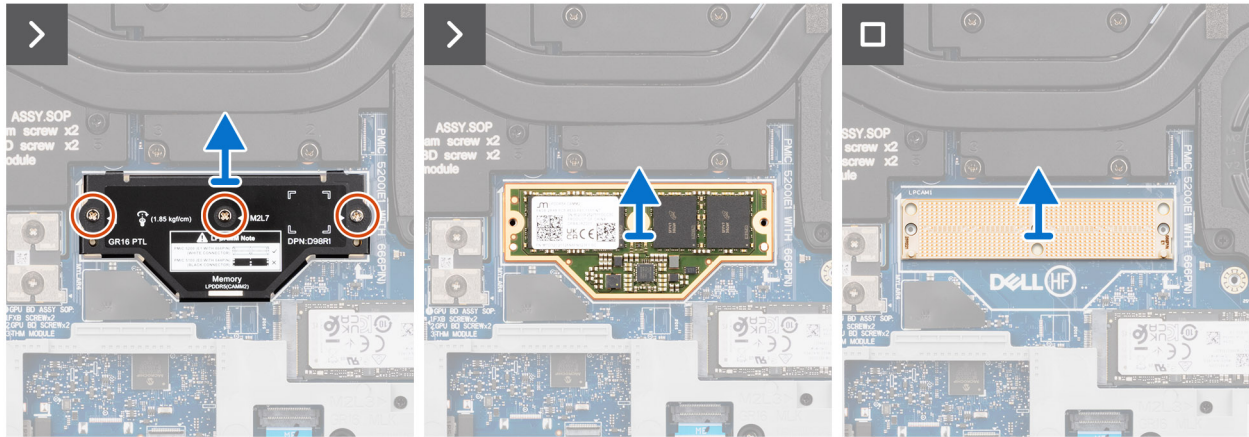
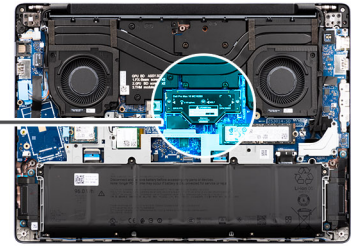
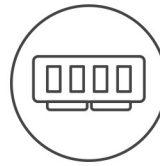


Figure 18. Removing the memory module

Steps

1. Remove the three screws (M2x7) that secure the memory-module bracket to the system board.
2. Lift the memory-module bracket away from the system board.
3. Carefully lift the memory module away from the memory-module connector.

CAUTION: To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components or metallic contacts on the memory module as electrostatic discharge (ESD) can inflict severe damage on the components. To read more about ESD protection, see [ESD protection](#).

CAUTION: When removing the memory module from the system board, ensure that the memory-module connector is not lifted or moved. The connector pins are fragile and any direct contact with the pins may damage them.

NOTE: The memory-module bracket and memory-module connector are non-serviceable parts. When replacing the memory module, they must be used with the new replacement memory module.

Installing the memory module

Prerequisites

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

About this task

The following images indicate the location of the memory module and provide a visual representation of the installation procedure.

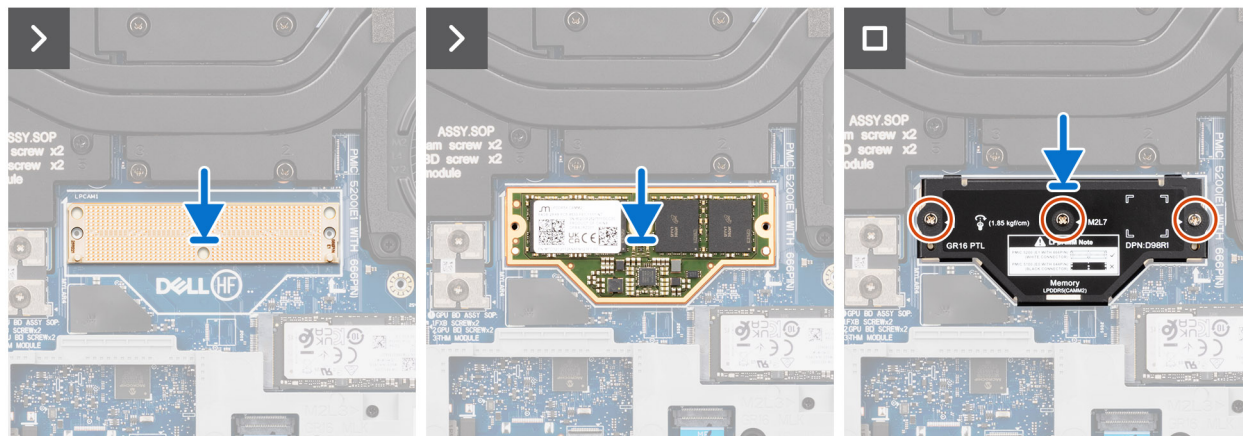
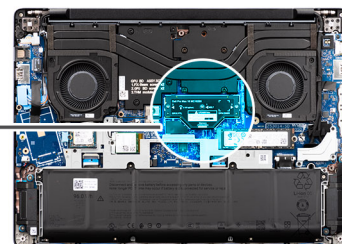
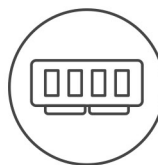


Figure 19. Installing the memory module

Steps

- Align and place the memory module on the memory-module connector plate.
 - CAUTION:** To prevent damage to the memory module, hold the memory module by the edges. Do not touch the components or metallic contacts on the memory module as electrostatic discharge (ESD) can inflict severe damage on the components. To read more about ESD protection, see [ESD protection](#).
 - CAUTION:** When replacing the memory module to the system board, ensure that the memory-module connector is not pressed or moved. The connector pins are fragile and any direct contact with the pins may damage them.
 - NOTE:** The memory-module bracket and memory-module connector are non-serviceable parts. When replacing the memory module, they must be used with the new replacement memory module.
- Align and place the memory-module bracket on the memory module.
- Replace the three screws (M2x7) to secure the memory-module bracket to the system board.

Next steps

- Install the [base cover](#).
- Follow the procedure in [After working inside your computer](#).

Wireless card

Removing the wireless card

Prerequisites

- Follow the procedure in [Before working inside your computer](#).
- Remove the [base cover](#).

About this task

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

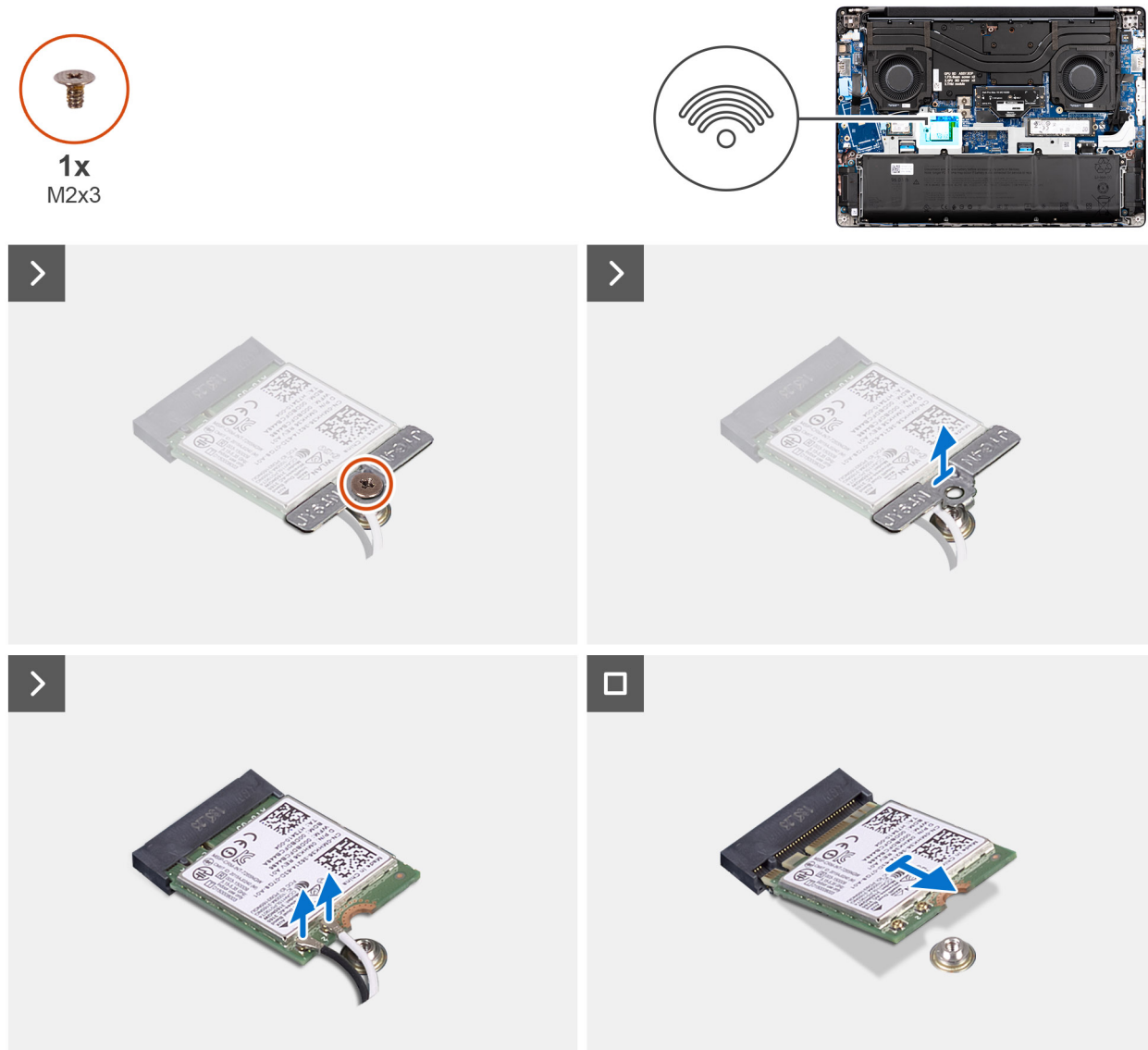


Figure 20. Removing the wireless card

Steps

1. Remove the screw (M2x3) that secures the wireless-card bracket to the system board.
2. Lift the wireless-card bracket off the wireless card.
3. Disconnect the wireless-antenna cables from the connectors on the wireless card.
4. Slide and remove the wireless card from the wireless-card slot (WLAN) on the system board.

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.



1x
M2x3

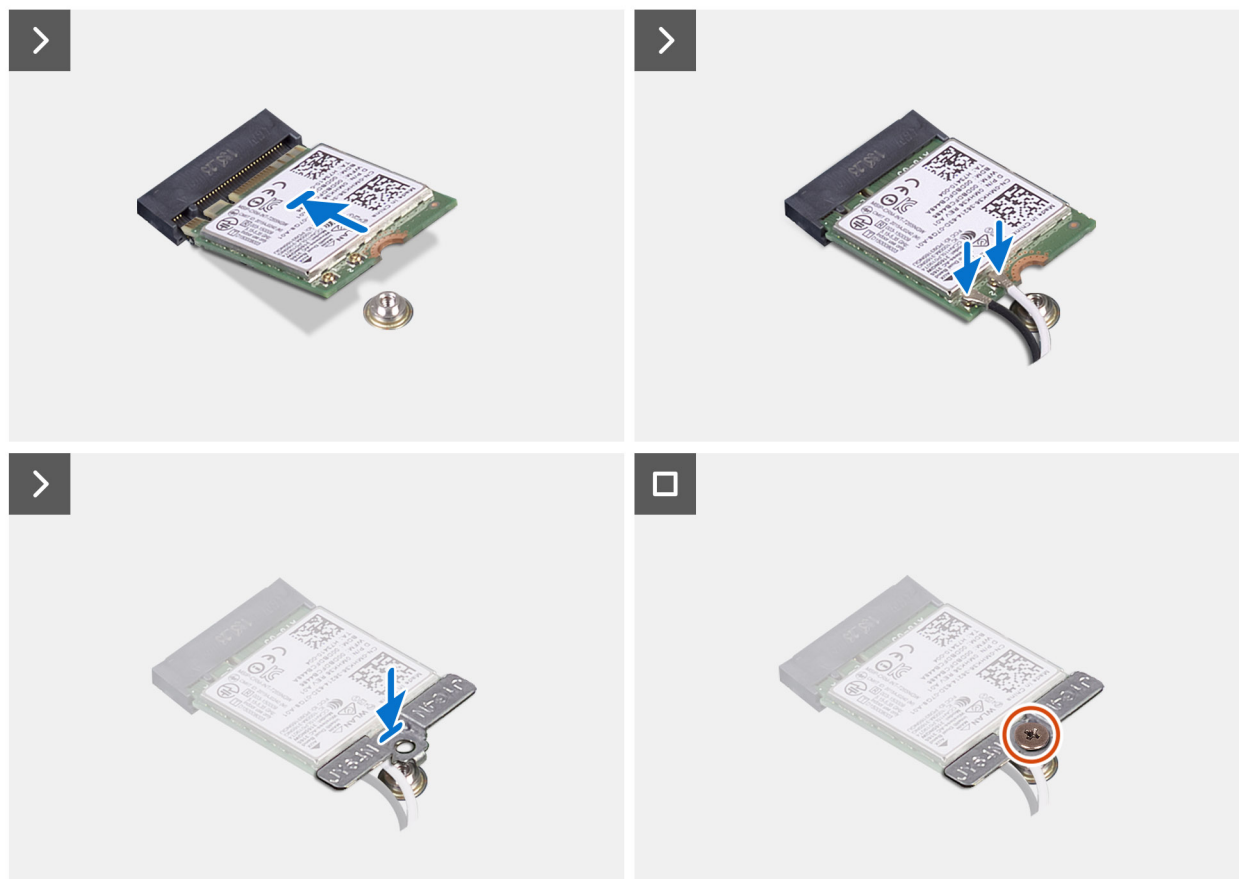


Figure 21. Installing the wireless card

Steps

1. Align the notch on the wireless card to the tab on the wireless-card slot (WLAN) on the system board.
2. Slide the wireless card at an angle into the wireless-card slot on the system board.
3. Connect the wireless-antenna cables to the connectors on the wireless card.

The following table provides the antenna-cable color scheme for the wireless card supported by your computer.

Table 3. Antenna-cable color scheme

Connector on the wireless card	Antenna-cable color	Silkscreen marking	
Main	White	MAIN	△ (white triangle)
Auxiliary	Black	AUX	▲ (black triangle)

4. Place the wireless-card bracket on the wireless card.
5. Align the screw hole on the wireless-card bracket with the screw hole on the system board.
6. Replace the screw (M2x3) to secure the wireless-card bracket and the wireless card to the system board.

Next steps

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

Speakers

Removing the speakers

Prerequisites

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

About this task

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

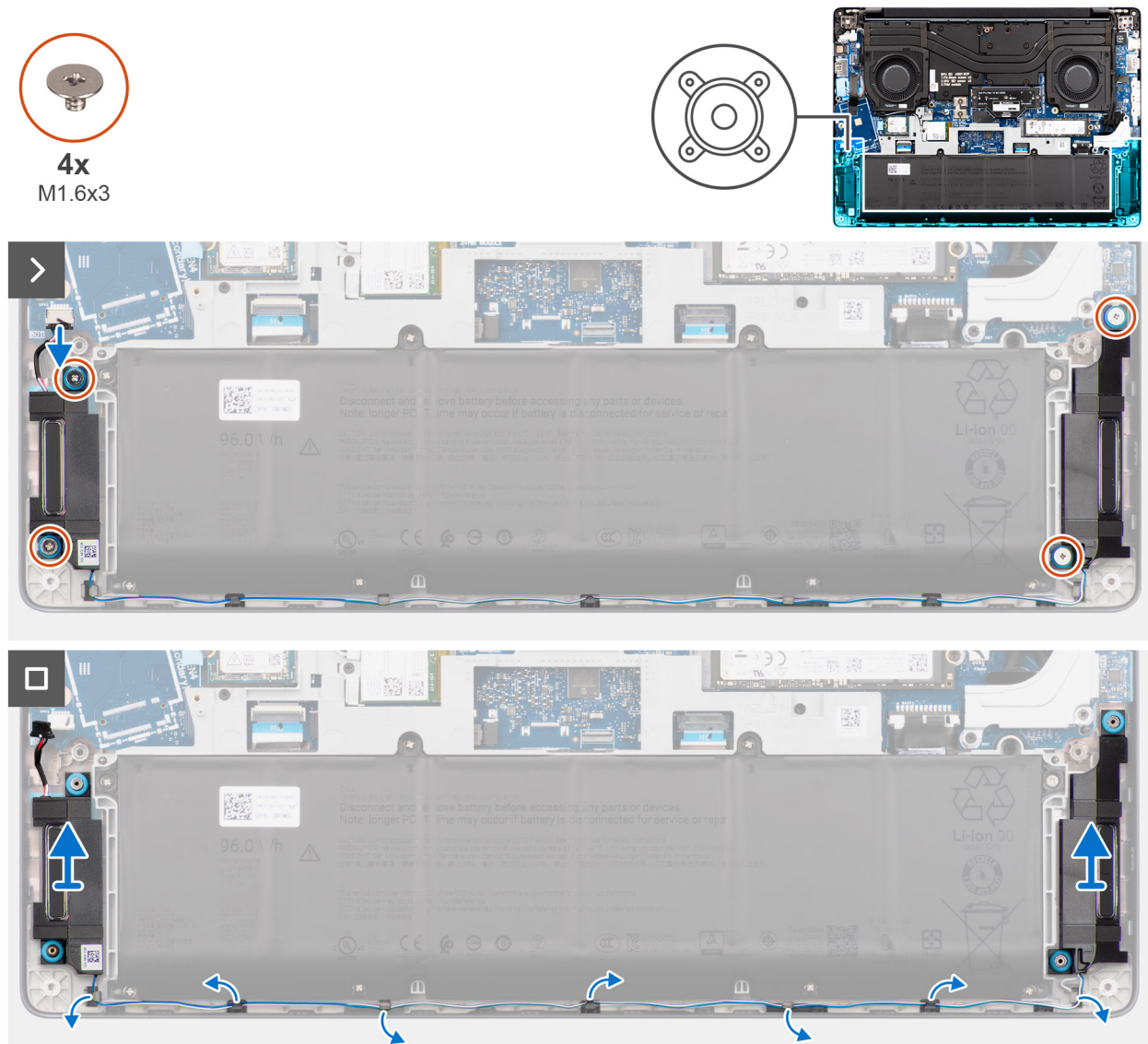


Figure 22. Removing the speakers

Steps

1. Disconnect the speaker cable from the connector (SPK) on the system board.
2. Remove the four screws (M1.6x3) that secure the speakers to the palm-rest assembly.
3. Carefully remove the speaker cable from the routing guides on the palm-rest assembly.
4. Lift the speakers, along with the cable, off the palm-rest assembly.

Installing the speakers

Prerequisites

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

About this task

NOTE: If the rubber grommets are pushed out when removing the speakers, push them back in before replacing the speakers.

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

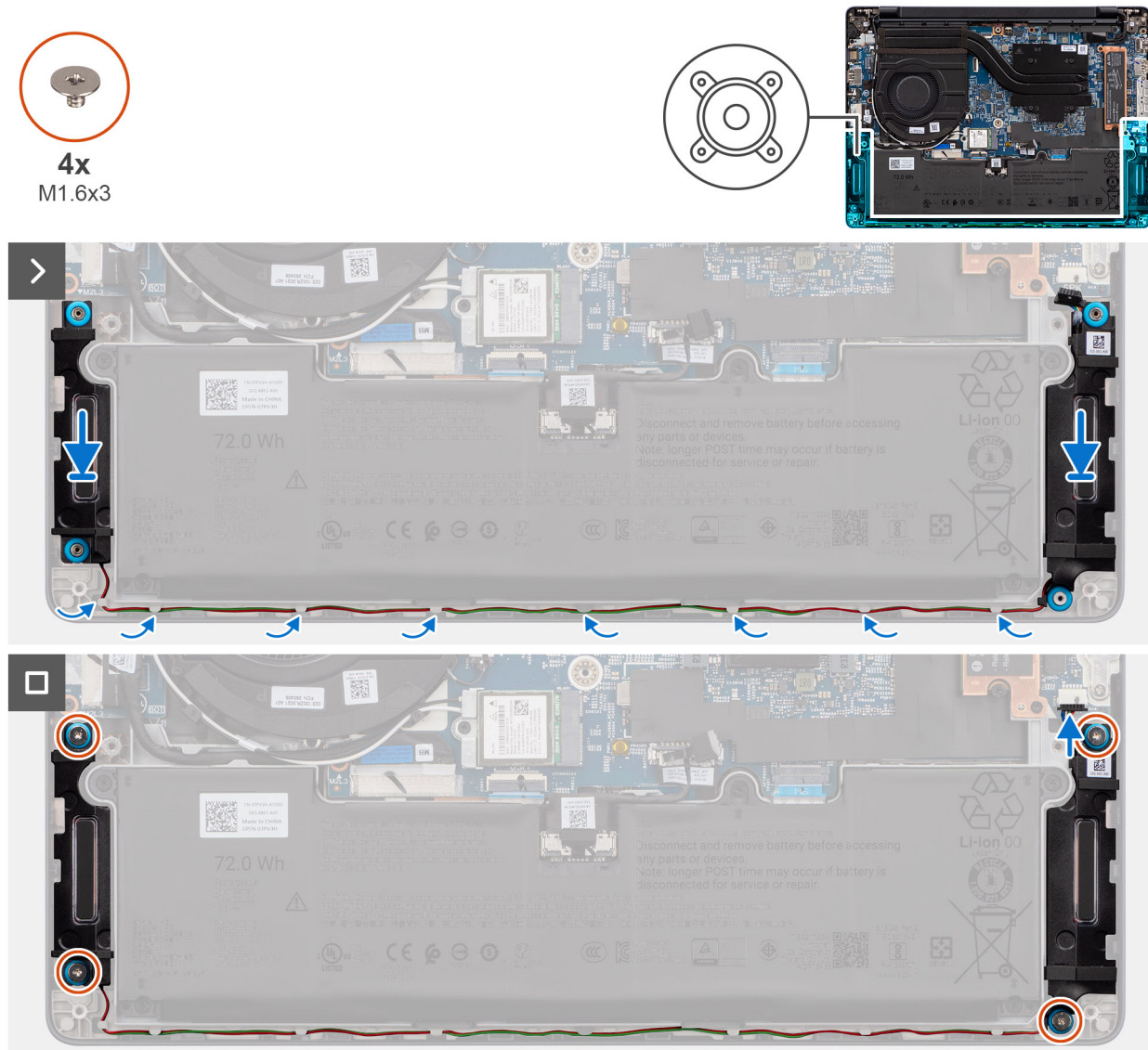


Figure 23. Installing the speakers

Steps

1. Using the alignment posts and rubber grommets, place the speakers in the slots on the palm-rest assembly.

NOTE: Ensure that the rubber grommets on the speakers are threaded through the alignment posts. Ensure that the four rubber grommets are seated into the slot and installed on the speakers properly.

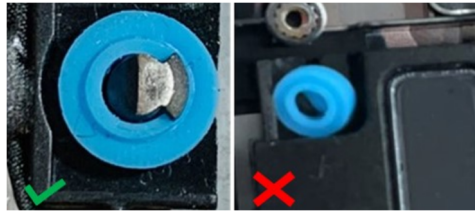


Figure 24. Installing the speakers

2. Route the speaker cable through the routing guides on the palm-rest assembly.
3. Replace the four screws (M1.6x3) to secure the speakers to the palm-rest assembly.
4. Connect the speaker cable to the connector (SPK) on the system board.

Next steps

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

Removing and installing Field Replaceable Units (FRUs)

The replaceable components in this chapter are Field Replaceable Units (FRUs).

 **CAUTION:** FRUs should be replaced by an authorized service technician, who is a trained technical repair specialist.

 **NOTE:** Damages resulting from improper replacement or from failure to follow instructions are not covered by your warranty. Consider having a trained technical repair specialist perform replacements of FRU components.

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

Heat sink

Removing the heat sink - for computers shipped with integrated graphics card

Prerequisites

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

About this task

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

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

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

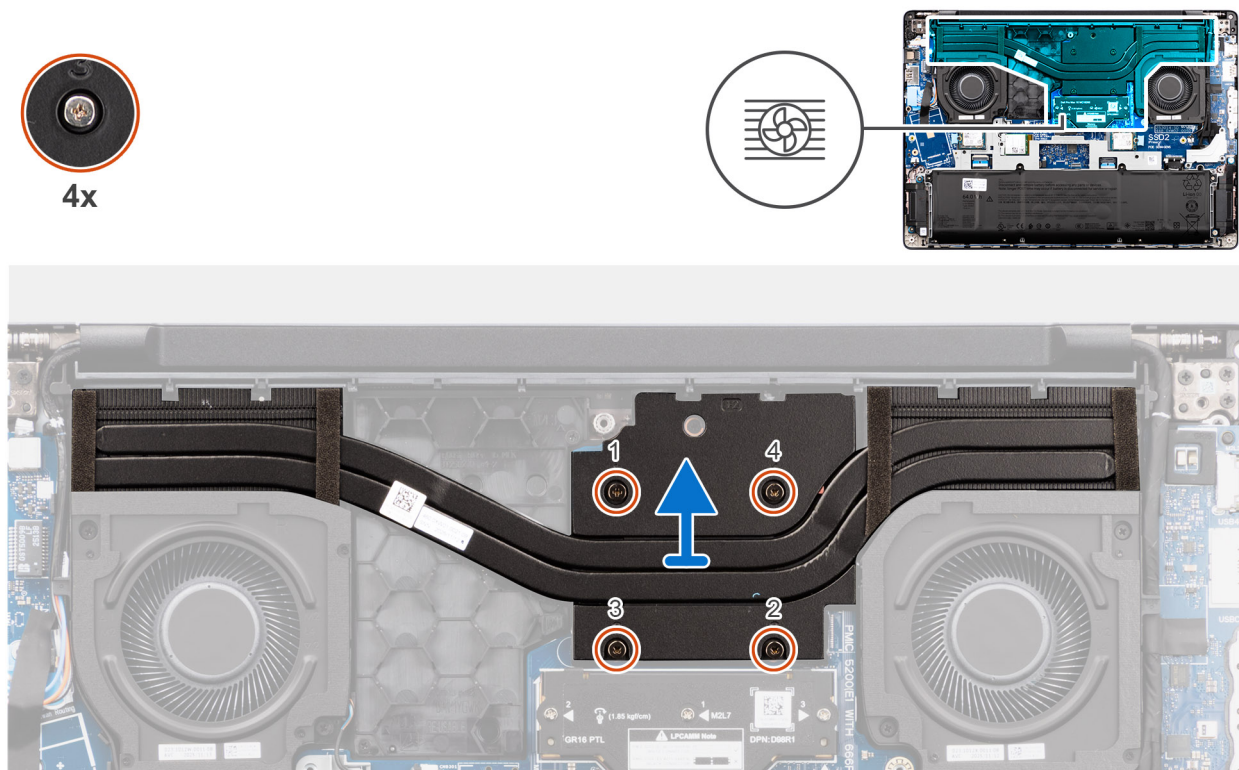


Figure 25. Removing the heat sink

Steps

1. In reverse sequential order (4 > 3 > 2 > 1), loosen the four captive screws that secure the heat sink to the system board. The screw numbers are etched on the heat sink.
2. Lift the heat sink off the system board.

Installing the heat sink - for computers shipped with integrated graphics card

Prerequisites

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

About this task

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

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

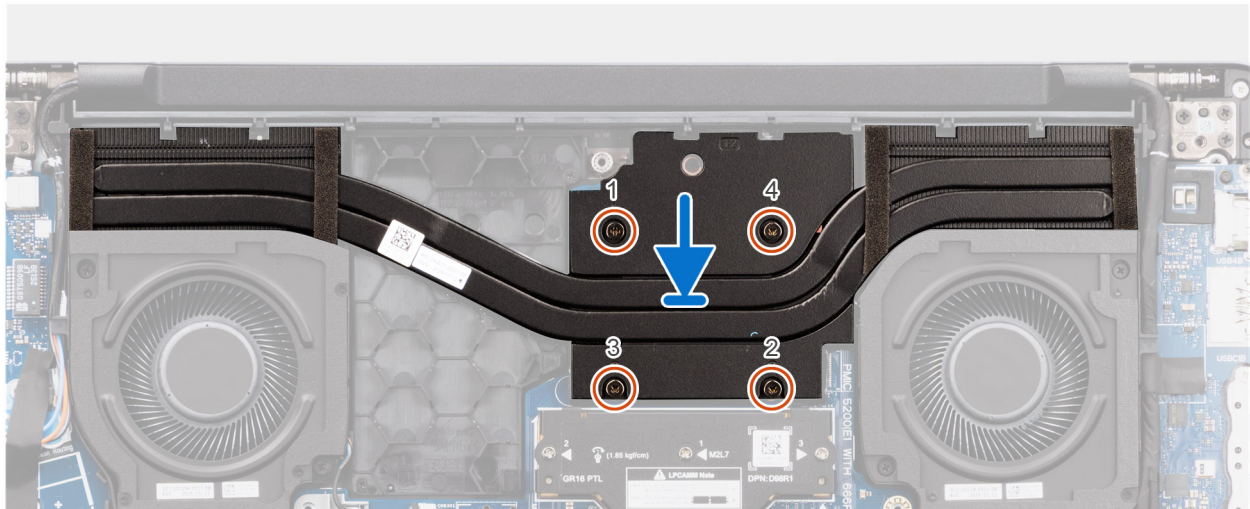
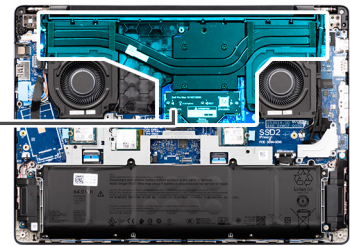


Figure 26. Installing the heat sink

Steps

1. Place the heat sink in the slot on the system board.
2. Align the screw holes on the heat sink with the screw holes on the system board.
3. In sequential order (1 > 2 > 3 > 4), tighten the four captive screws to secure the heat sink to the system board. The screw numbers are etched on the heat sink.

Next steps

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

Removing the heat sink - for computers shipped with discrete graphics card

Prerequisites

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

About this task

-  **NOTE:** The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.
-  **NOTE:** For optimal cooling of the processor, do not touch the heat-transfer areas on the heat sink. The oils in your skin can reduce the heat-transfer capability of the thermal grease.

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

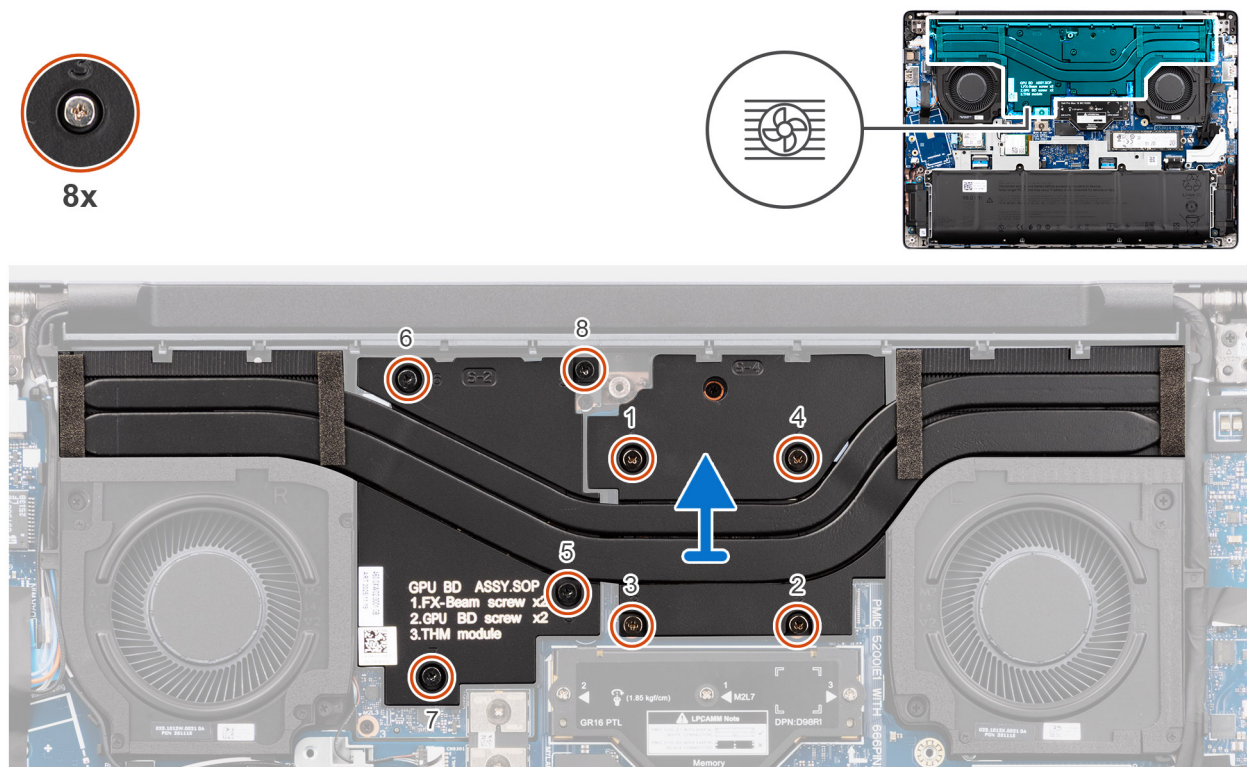


Figure 27. Removing the heat sink

Steps

1. In reverse sequential order (8 > 7 > 6 > 5 > 4 > 3 > 2 > 1), loosen the eight captive screws that secure the heat sink to the system board. The screw numbers are etched on the heat sink.
2. Lift the heat sink off the system board.

Installing the heat sink - for computers shipped with discrete graphics card

Prerequisites

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

About this task

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

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

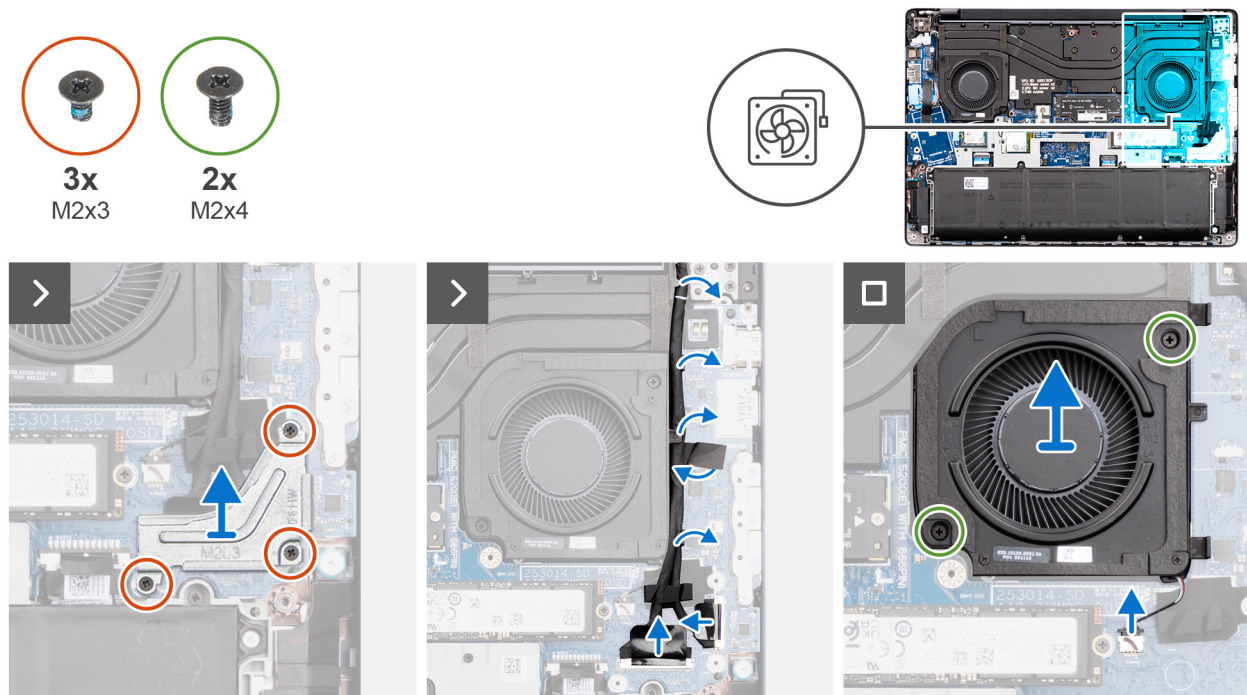


Figure 29. Removing the right/processor fan

Steps

1. **NOTE:** Steps 1 to 3 apply only to computers shipped with a WWAN module installed.

Remove the three screws (M2x3) that secure the Darwin-cable bracket to the system board.

2. Lift the Darwin-cable bracket off the system board.
3. Disconnect the Darwin-antenna cable from the connector (DARWIN) on the system board.
4. Remove the wireless-antenna cables and WWAN-antenna cables, if available, from the routing guides on the fan.
5. Disconnect the fan cable from the connector (FANL1) on the system board.
6. Remove the two screws (M2x4) that secure the fan to the palm-rest assembly.
7. Lift the right/processor fan off the palm-rest assembly.

Installing the right/processor 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 right/processor fan and provide a visual representation of the installation procedure.

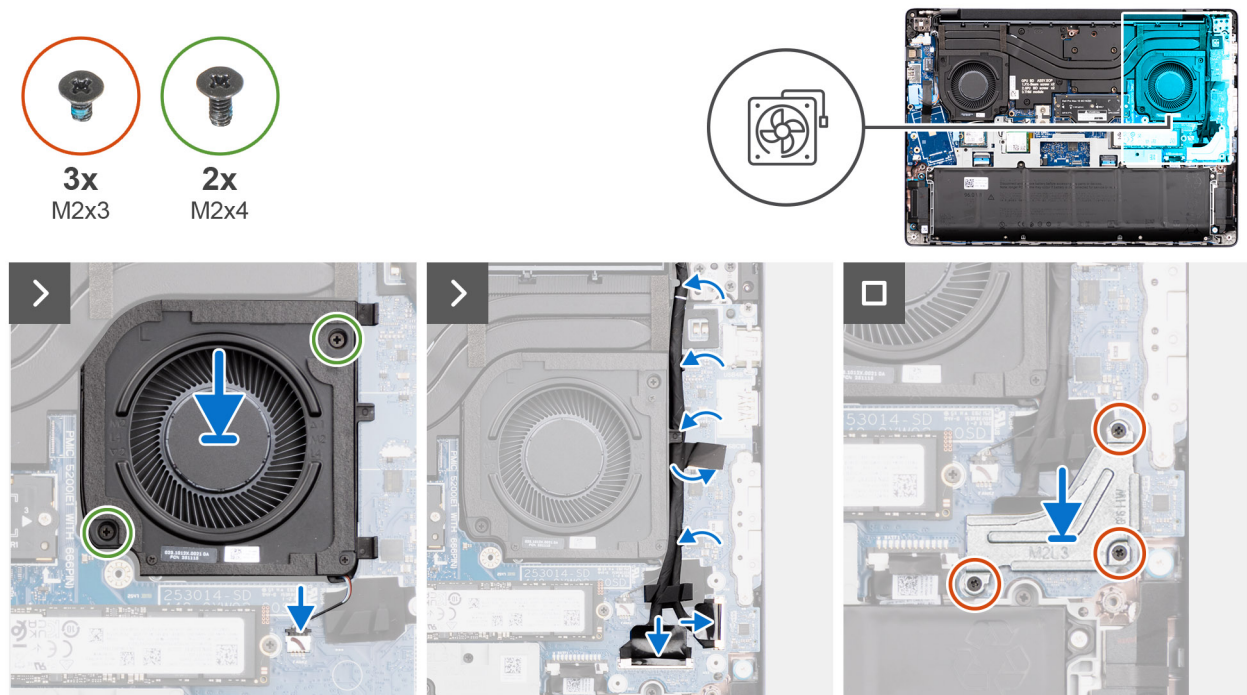


Figure 30. Installing the right/processor fan

Steps

1. Place the right/processor fan in the slot on the palm-rest assembly.
2. Align the screw holes on the fan with the screw holes on the palm-rest assembly.
3. Replace the two screws (M2x4) to secure the fan to the palm-rest assembly.
4. Connect the fan cable to the connector (FANL1) on the system board.
5. Route the wireless-antenna cables and WWAN-antenna cables, if available, through the routing guides on the fan.
6.  **NOTE:** Steps 6 to 8 apply only to computers shipped with a WWAN module installed.

Connect the Darwin-antenna cable to the connector (DARWIN) on the system board.

7. Align and place the Darwin-cable bracket over the Darwin-antenna cable on the system board.
8. Replace the three screws (M2x3) to secure the Darwin-cable bracket to the system board.

Next steps

1. Install the [wireless card](#).
2. Install the [base cover](#).
3. Follow the procedure in [After working inside your computer](#).

Left/Video fan

Removing the left/video fan

Prerequisites

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

About this task

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

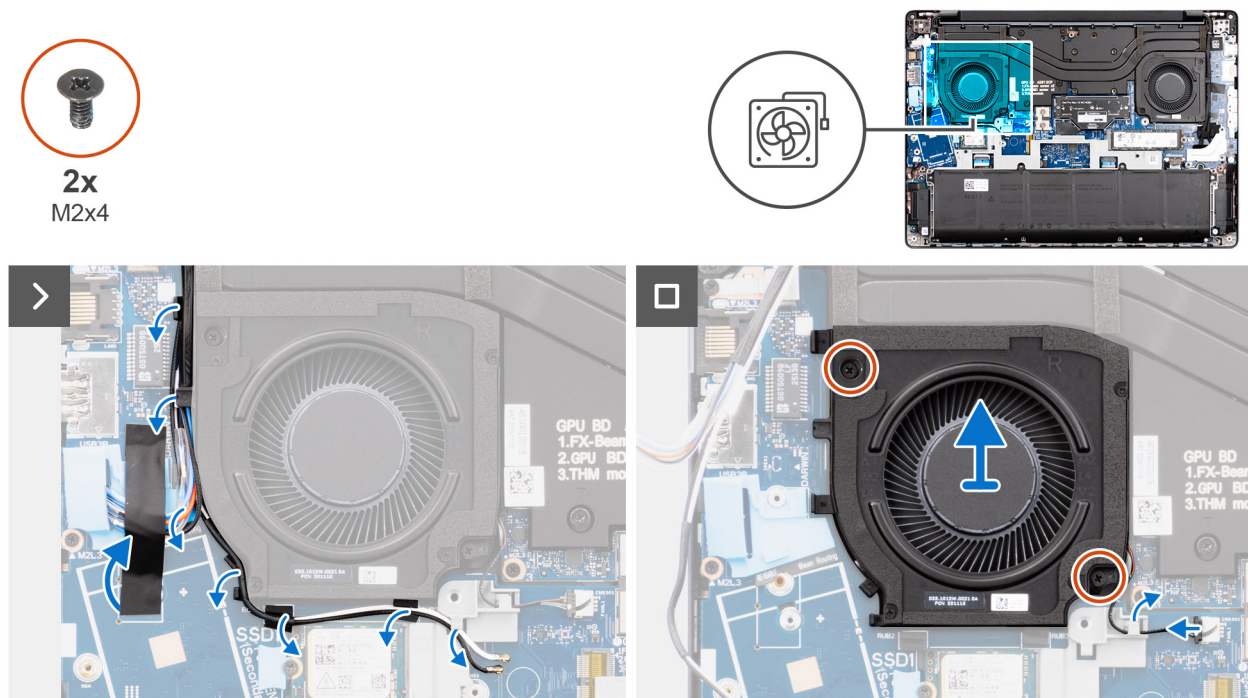


Figure 31. Removing the left/video fan

Steps

1. Disconnect the display cable from the connector (LCD1) on the system board.
2. Disconnect the IR-camera cable from the connector (CAM1) on the system board.
i **NOTE:** This step applies only to computers shipped with an IR camera installed.
3. Remove the display cable and the IR-camera cable, if available, from the routing guides on the fan.
4. Disconnect the fan cable from the connector (FANR2) on the system board.
5. Remove the two screws (M2x4) that secure the fan to the palm-rest assembly.
6. Lift the left/video fan off the palm-rest assembly.

Installing the left/video 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 left/video fan and provide a visual representation of the installation procedure.

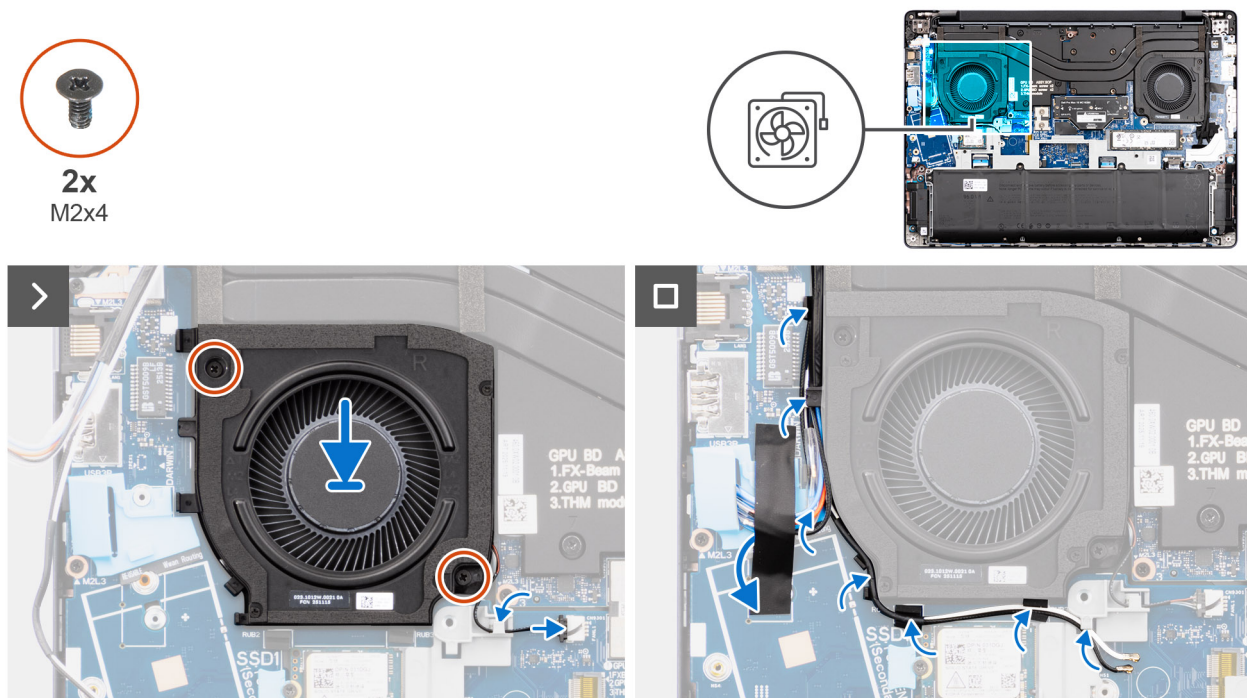


Figure 32. Installing the left/video fan

Steps

1. Place the left/video fan in the slot on the palm-rest assembly.
2. Align the screw holes on the fan with the screw holes on the palm-rest assembly.
3. Replace the two screws (M2x4) to secure the fan to the palm-rest assembly.
4. Connect the fan cable to the connector (FANR2) on the system board.
5. Route the display cable and the IR-camera cable, if available, through the routing guides on the fan.
6. Connect the display cable to the connector (LCD1) on the system board.
7. Connect the IR-camera cable to the connector (CAM1) on the system board.

NOTE: This step applies only to computers shipped with an IR camera installed.

Next steps

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

Graphics card filler (for computers shipped with integrated graphics card)

Removing the graphics card filler (for computers shipped with integrated graphics card)

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [heat sink](#).

NOTE: If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

About this task

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

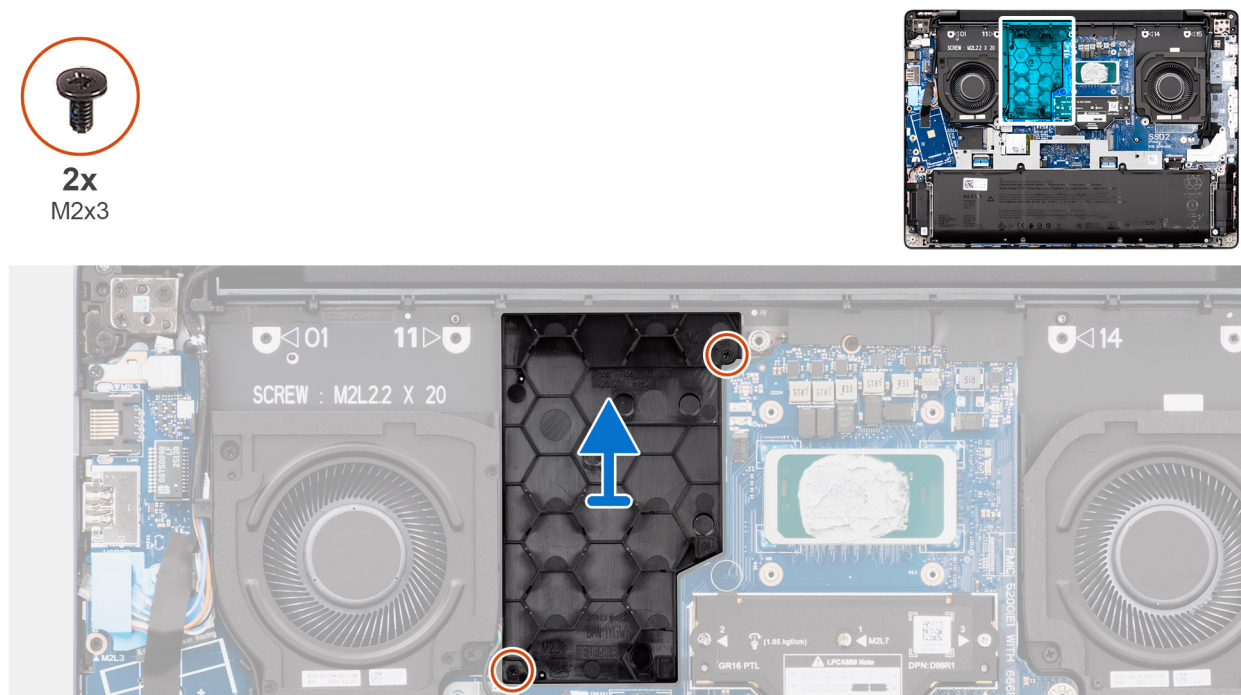


Figure 33. Removing the GPU filler

Steps

1. Remove the two screws (M2x3) that secure the GPU filler to the palm-rest assembly.
2. Lift the GPU filler off the palm-rest assembly.

Installing the graphics card filler (for computers shipped with integrated 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 GPU filler and provide a visual representation of the installation procedure.

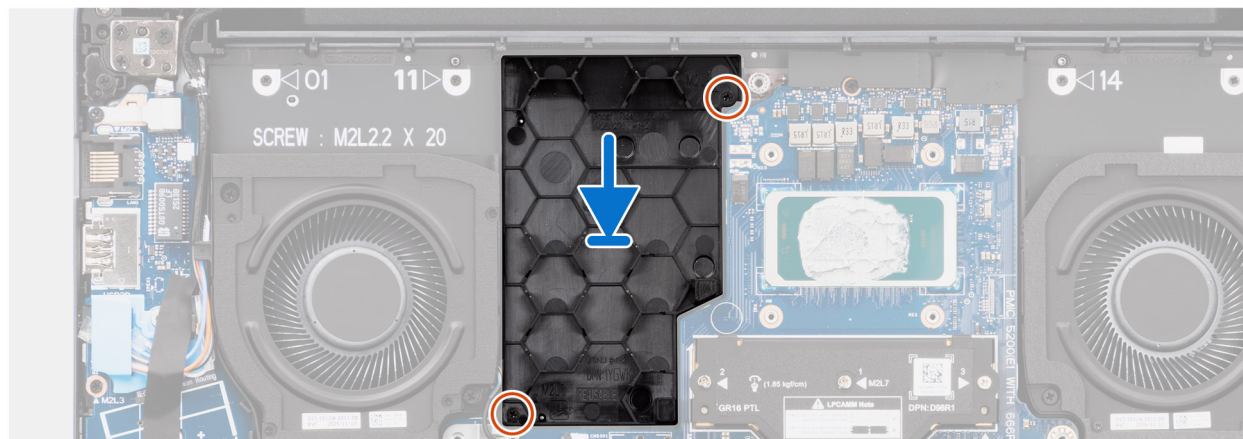


Figure 34. Installing the GPU filler

Steps

1. Align and place the GPU filler in the slot on the palm-rest assembly.
2. Replace the two screws (M2x3) to secure the GPU filler to the palm-rest assembly.

Next steps

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

Graphics card

Removing the GPU

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [heat sink](#).

About this task

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

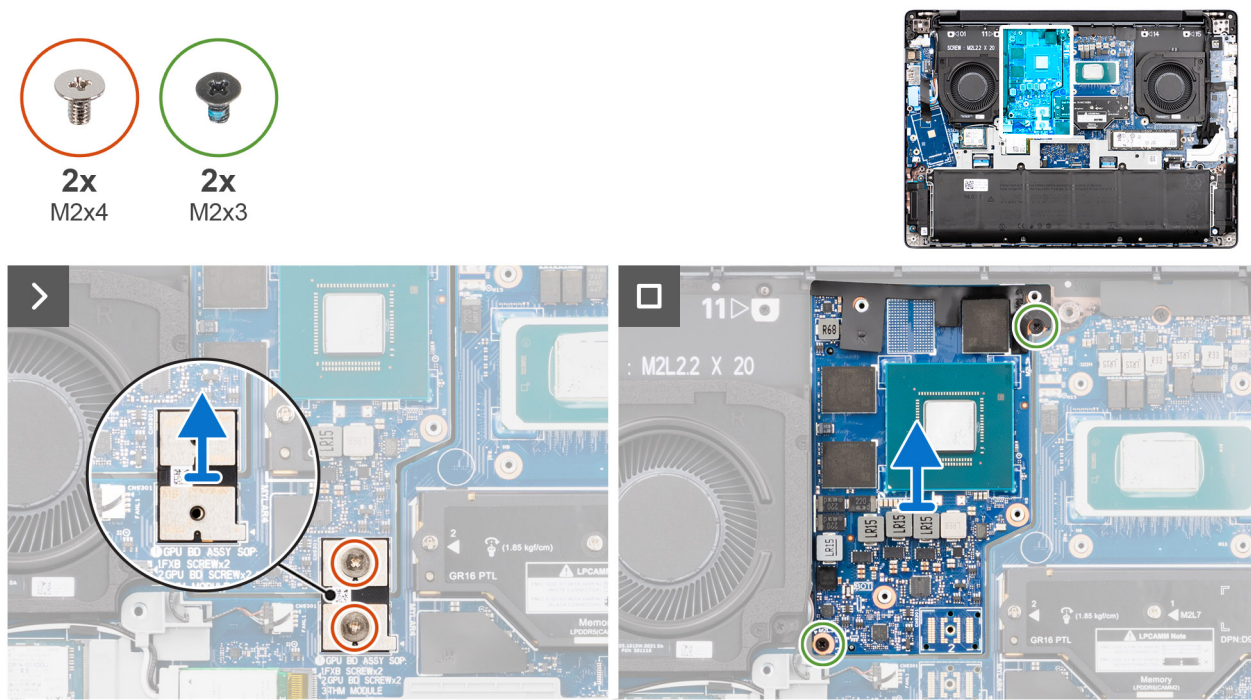


Figure 35. Removing the GPU

Steps

1. Remove the two screws (M2x4) and two screws (M2x3) that secure the GPU to the palm-rest assembly.
2. Disconnect and remove the F-beam connector.
3. Lift the GPU off the palm-rest assembly.

Installing the GPU

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 GPU and provide a visual representation of the installation procedure.

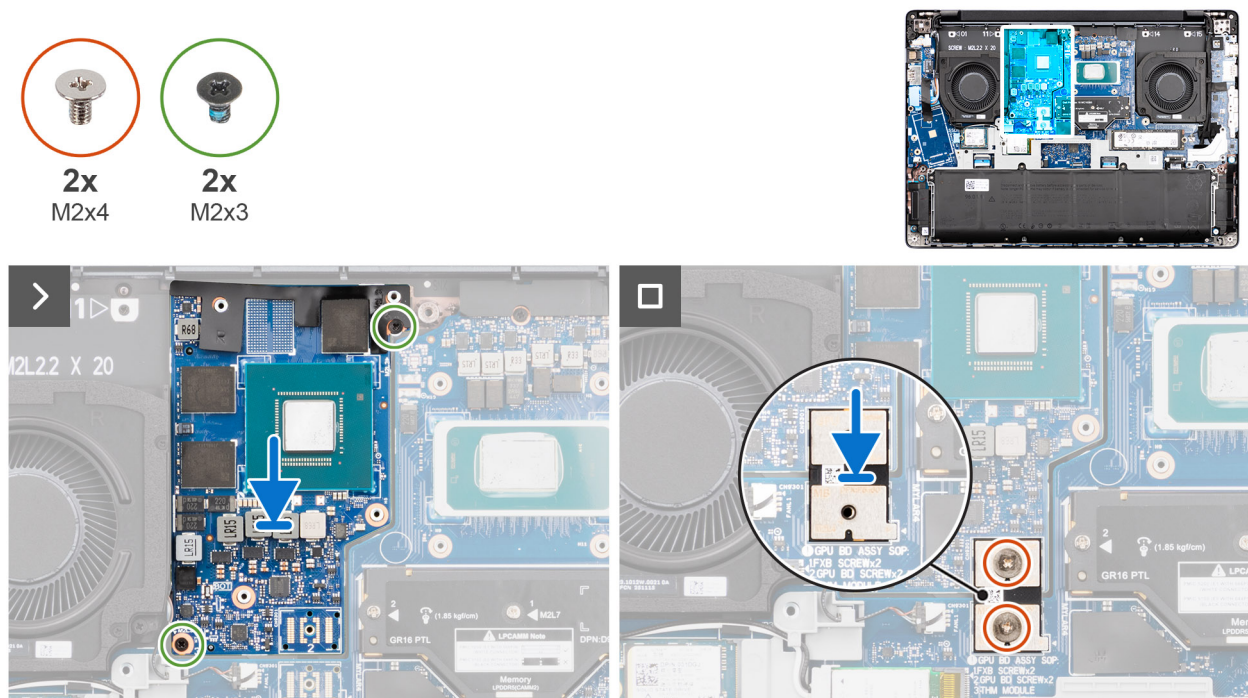


Figure 36. Installing the GPU

Steps

1. Align and place the GPU in the slot on the palm-rest assembly.
2. Replace the F-beam connector.
3. Replace the two screws (M2x4) and two screws (M2x3) to secure the GPU to the palm-rest assembly.

Next steps

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

Battery frame

Removing the battery frame

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [wireless card](#).

About this task

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



10x
M2x3

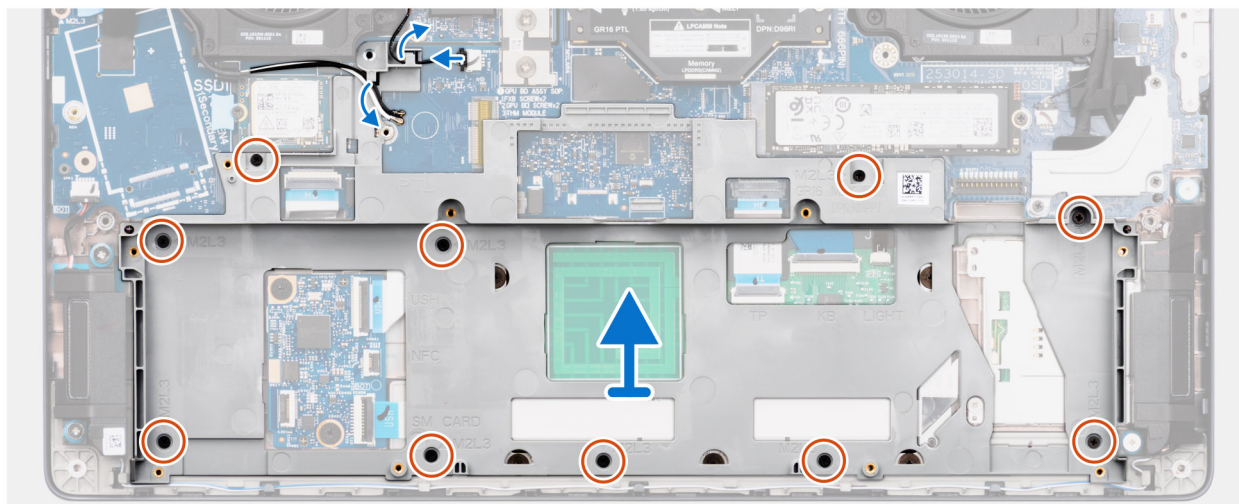
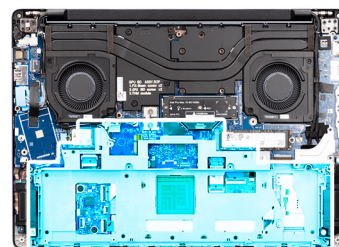


Figure 37. Removing the battery frame

Steps

1. Remove the ten screws (M2x3) that secure the battery frame to the palm-rest assembly.
2. Lift the battery frame off the palm-rest assembly.

Installing the battery frame

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 battery frame and provide a visual representation of the installation procedure.



10x
M2x3

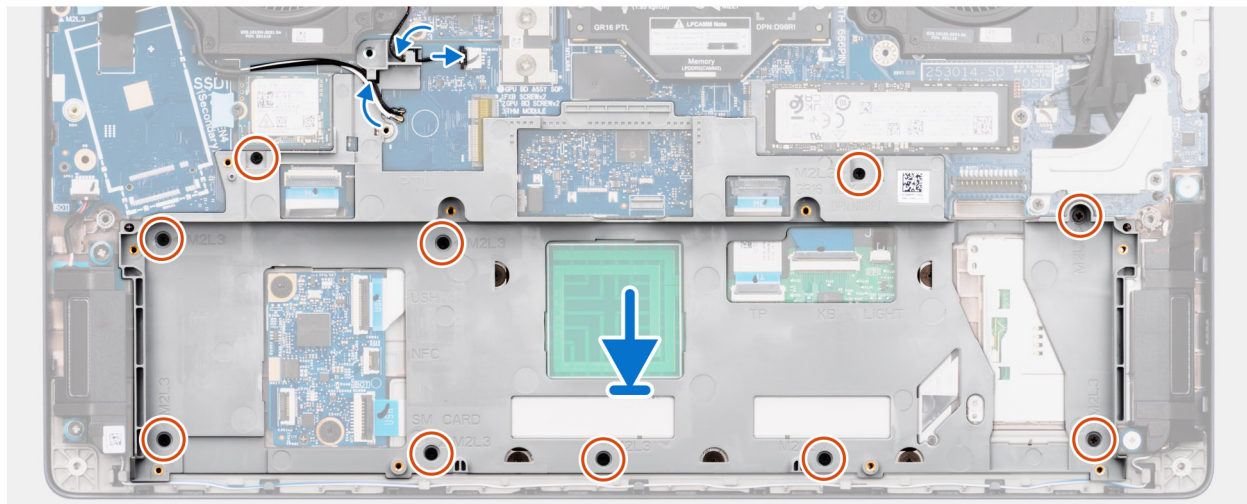
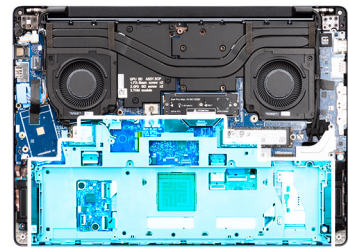


Figure 38. Installing the battery frame

Steps

1. Align and place the battery frame in the slot on the palm-rest assembly.
2. Replace the ten screws (M2x3) to secure the battery frame to the palm-rest assembly.

Next steps

1. Install the [wireless card](#).
2. Install the [battery](#).
3. Install the [base cover](#).
4. Follow the procedure in [After working inside your computer](#).

USH board

Removing the USH board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [battery frame](#).

About this task

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



2x
M2x2

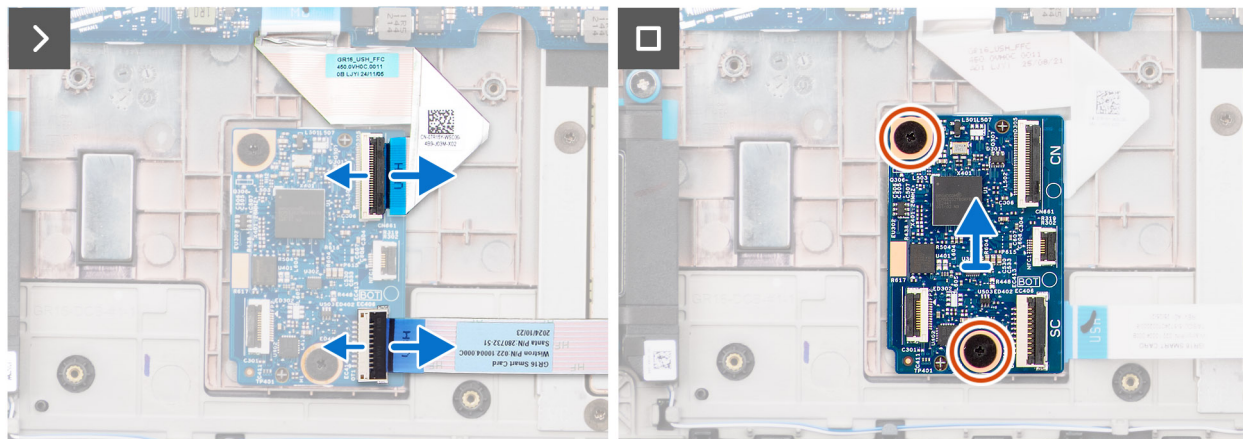
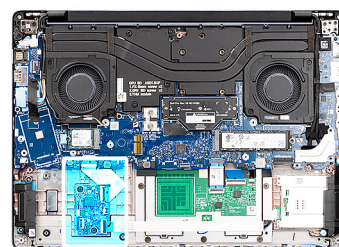


Figure 39. Removing the USH board

Steps

1. Disconnect the USH-board cable from the connector (CN) on the USH board.
2. Disconnect the smart-card reader cable from the connector (SC) on the USH board.
i **NOTE:** This step applies only to computers shipped with a smart-card reader installed.
3. Disconnect the NFC-sensor cable from the connector (NFC1) on the USH board.
i **NOTE:** This step applies only to computers shipped with an NFC sensor installed.
4. Remove the two screws (M2x2) that secure the USH board to the palm-rest assembly.
5. Lift the USH board off the palm-rest assembly.

Installing the USH 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 USH board and provide a visual representation of the installation procedure.

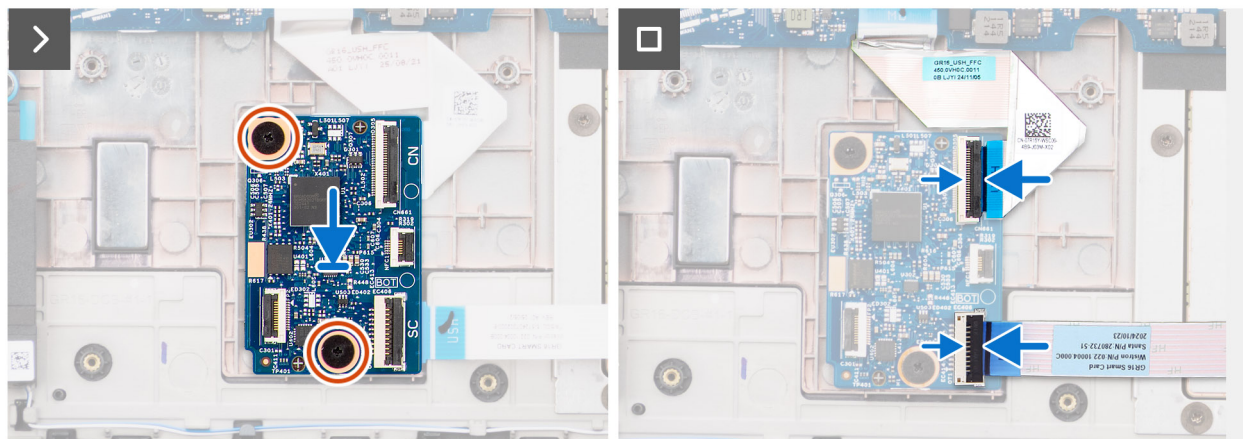
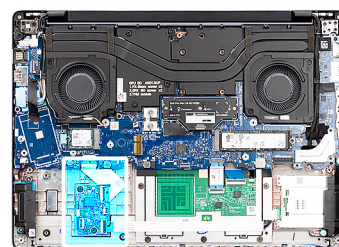


Figure 40. Installing the USH board

Steps

1. Align and place the USH board in the slot on the palm-rest assembly.
 2. Replace the two screws (M2x2) to secure the USH board to the palm-rest assembly.
 3. Connect the USH-board cable to the connector (CN) on the USH board.
 4. Connect the smart-card reader cable to the connector (SC) on the USH board.
- NOTE:** This step applies only to computers shipped with a smart-card reader installed.
5. Connect the NFC-sensor cable to the connector (NFC1) on the USH board.
- NOTE:** This step applies only to computers shipped with an NFC sensor installed.

Next steps

1. Install the [battery frame](#).
2. Install the [battery](#).
3. Install the [base cover](#).
4. Follow the procedure in [After working inside your computer](#).

Smart-card reader

Removing the smart-card reader

NOTE: This procedure applies only to computers shipped with an NFC sensor or smart-card reader installed.

Prerequisites

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

4. Remove the [wireless card](#).
5. Remove the [speakers](#).
6. Remove the [battery frame](#).

About this task

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

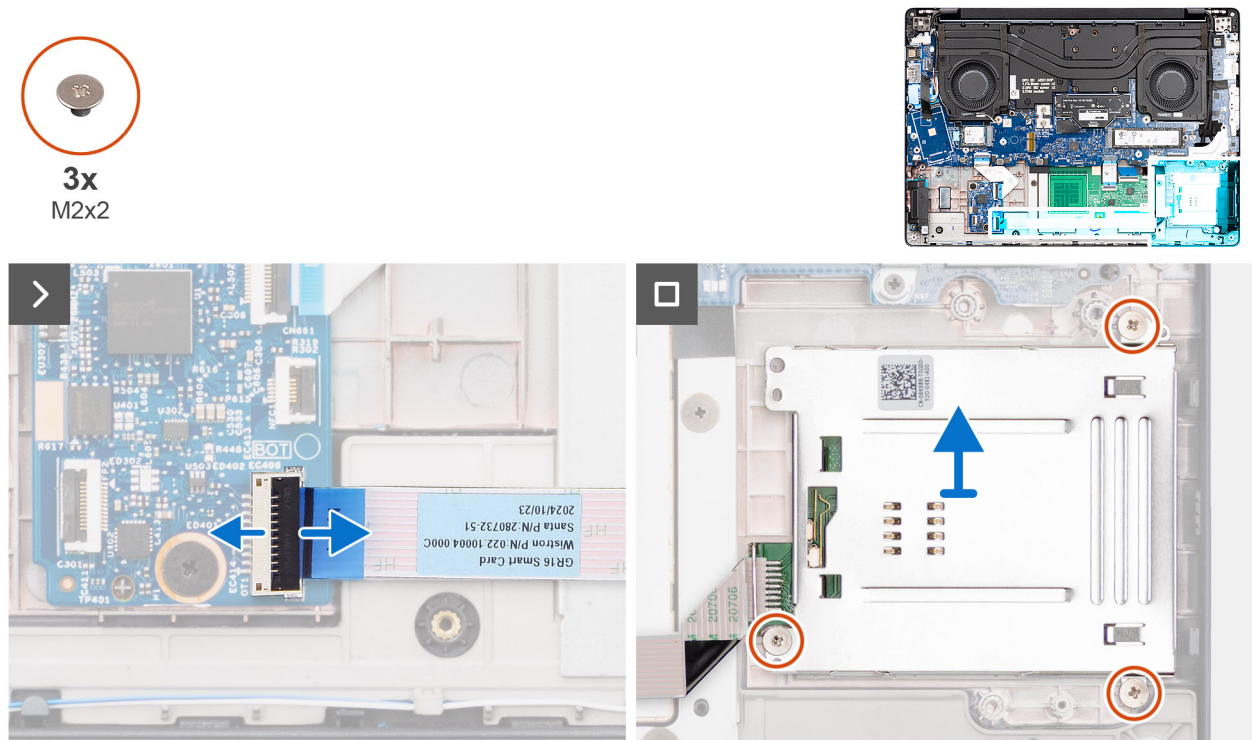


Figure 41. Removing the smart-card reader

Steps

1. Disconnect the NFC sensor or smart-card reader cable, whichever is applicable, from the connector (SC) on the USH board.
2. Remove the three screws (M2x2) that secure the smart-card reader to the palm-rest assembly.
3. Lift the smart-card reader off the palm-rest assembly.

Installing the smart-card reader

NOTE: This procedure applies only to computers shipped with an NFC sensor or smart-card reader installed.

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 smart-card reader and provide a visual representation of the installation procedure.

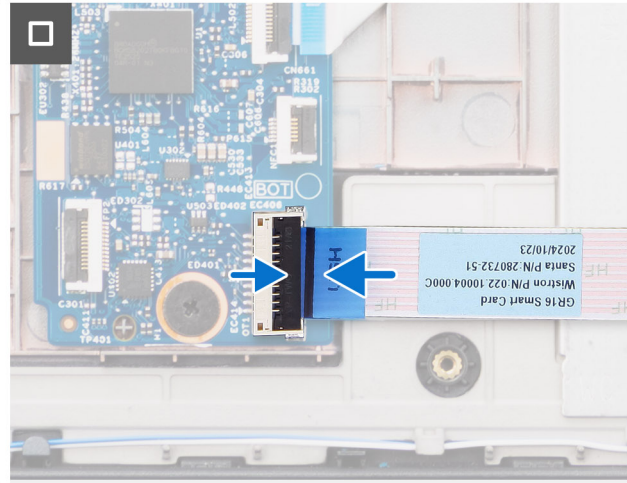
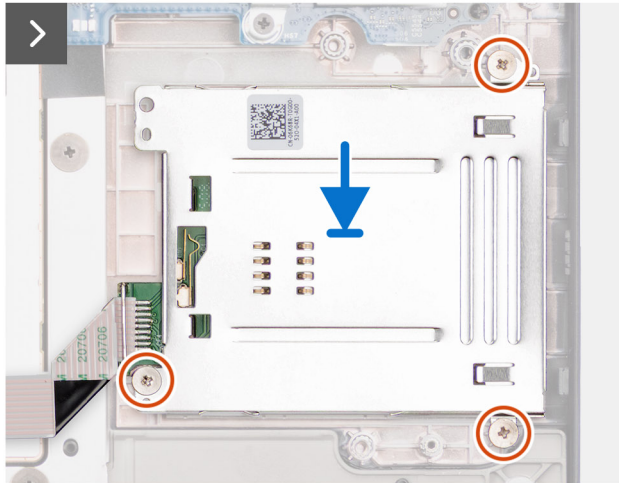
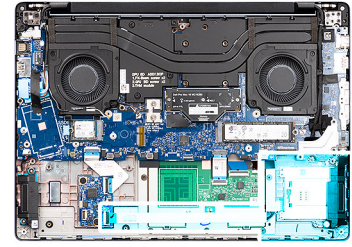


Figure 42. Installing the smart-card reader

Steps

1. Align and place the smart-card reader in the slot on the palm-rest assembly.
2. Replace the three screws (M2x2) to secure the smart-card reader to the palm-rest assembly.
3. Connect the NFC sensor or smart-card reader cable, whichever is applicable, to the connector (SC) on the USH board.

Next steps

1. Install the [battery frame](#).
2. Install the [speakers](#).
3. Install the [wireless card](#).
4. Install the [battery](#).
5. Install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).

Display assembly

Removing the display assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).

About this task

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

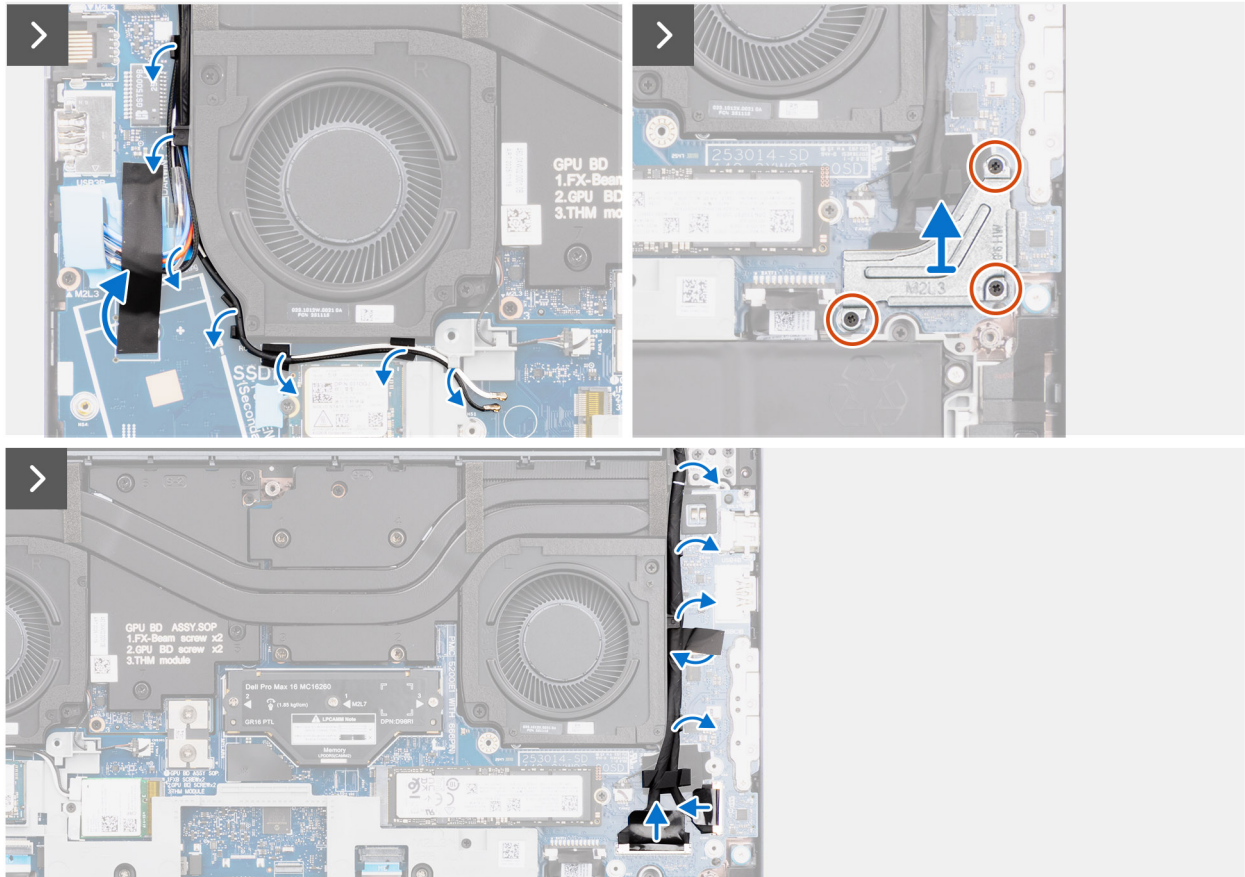
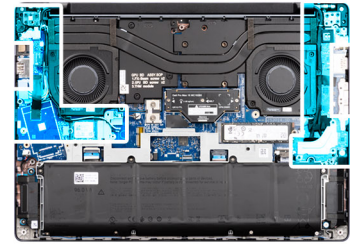
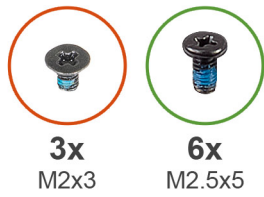


Figure 43. Removing the display assembly

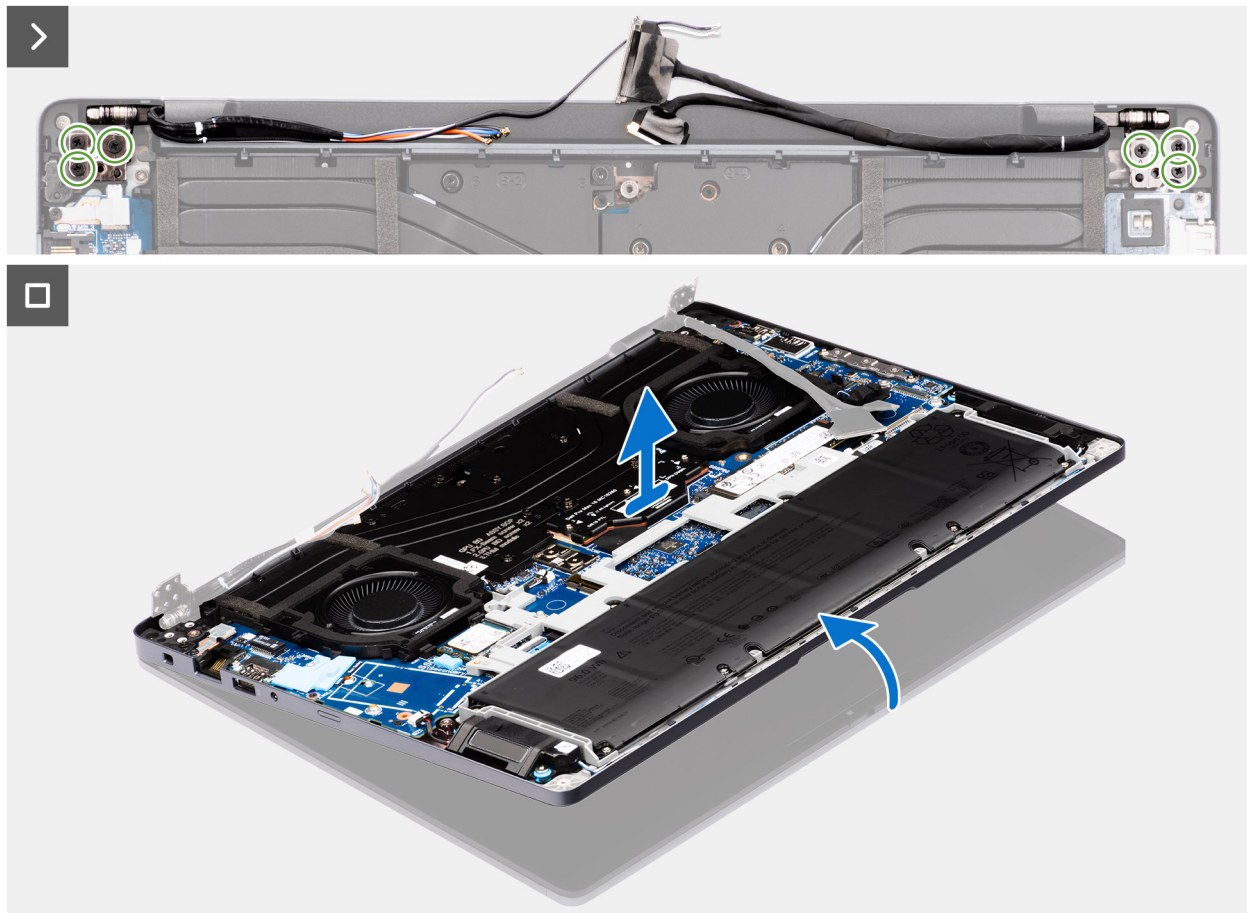


Figure 44. Removing the display assembly



Figure 45. Display assembly

Steps

1. Remove the wireless-antenna cables from the routing guides on the fan.
2. Remove the three screws (M2x3) that secure the display-cable bracket to the system board.
3. Lift the display-cable bracket off the system board.
4. Disconnect the display cable from the connector (LCD) on the system board.
5. Disconnect the IR-camera cable from the connector (CAM) on the system board.

i **NOTE:** This step applies only to computers shipped with an IR camera installed.

6. Remove the six screws (M2.5x5) that secure the display hinges to the palm-rest assembly.
7. Using a plastic scribe, lift the left and right hinges to an angle of 90 degrees from the palm-rest assembly.
8. Lift the palm-rest assembly at an angle to free it from the hinges and remove it from the display assembly.

⚠ CAUTION: To avoid damaging the display, do not slide the palm-rest assembly over the display assembly.

Installing the display assembly

Prerequisites

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

About this task

i **NOTE:** Ensure that the display hinges are opened to the maximum before replacing the display assembly on the palm-rest assembly.

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



Figure 46. Installing the display assembly

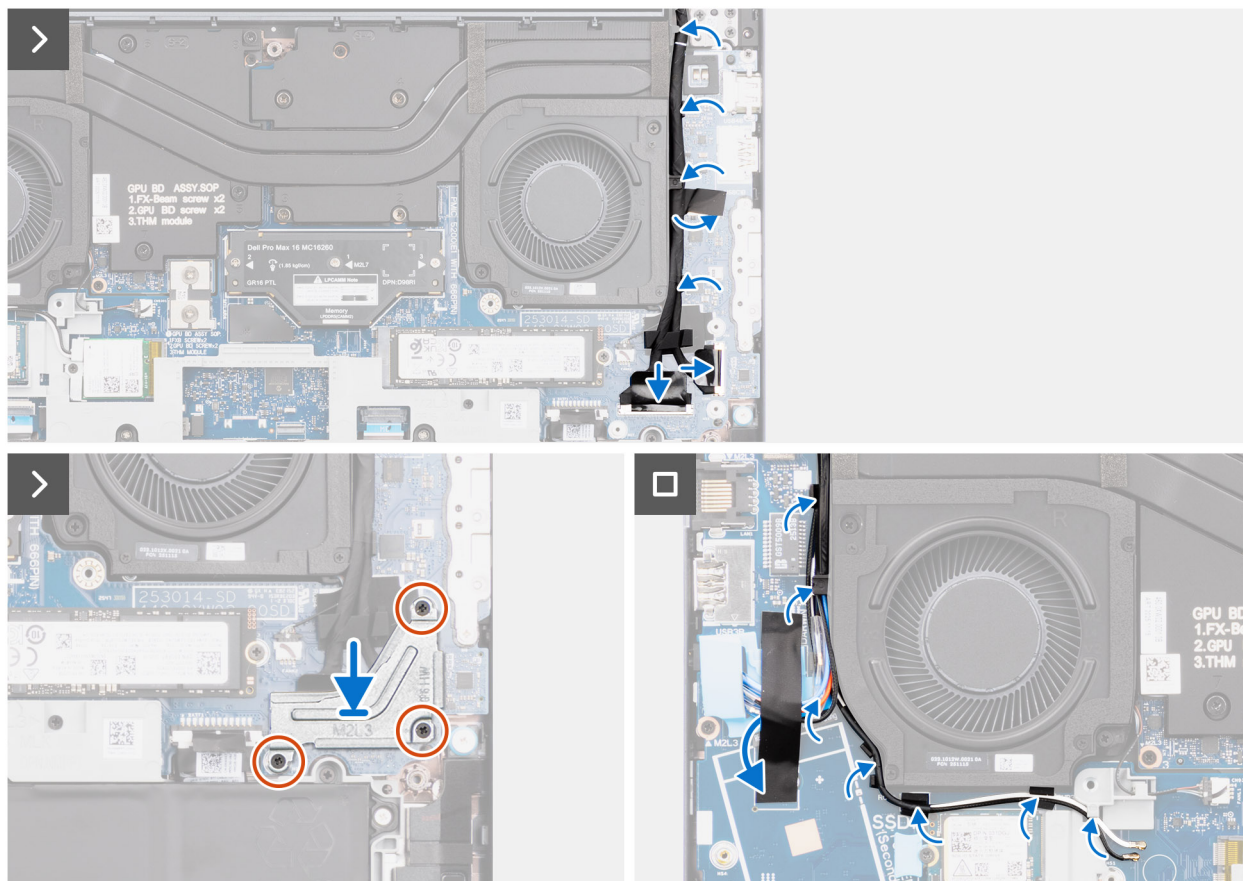


Figure 47. Installing the display assembly

Steps

1. Place the display assembly on a clean and flat surface.
2. Hold the palm-rest assembly at an angle and slide the palm-rest assembly under the display hinges.

CAUTION: To avoid damaging the display, do not slide the palm-rest assembly over the display assembly.

3. Close the display hinges to align the screw holes on the display hinges with the screw holes on the palm-rest assembly.
4. Replace the six screws (M2.5x5) to secure the display hinges to the palm-rest assembly.
5. Connect the display cable to the connector (LCD) on the system board.
6. Connect the IR-camera cable to the connector (CAM) on the system board.

NOTE: This step applies only to computers shipped with an IR camera installed.

7. Align and place the display-cable bracket over the display cable and the IR-camera cable, if available, on the system board.
8. Replace the three screws (M2x3) to secure the display-cable bracket to the system board.
9. Route the wireless-antenna cables through the routing guides on the fan.

Next steps

1. Install the [wireless card](#).
2. Install the [base cover](#).
3. Follow the procedure in [After working inside your computer](#).

Display bezel

Removing the display bezel

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).

About this task

 **NOTE:** The display-hinge caps are a part of the display bezel.

The following image indicates the location of the display bezel and provides a visual representation of the removal procedure.



Figure 48. Removing the display bezel



Figure 49. Removing the display bezel

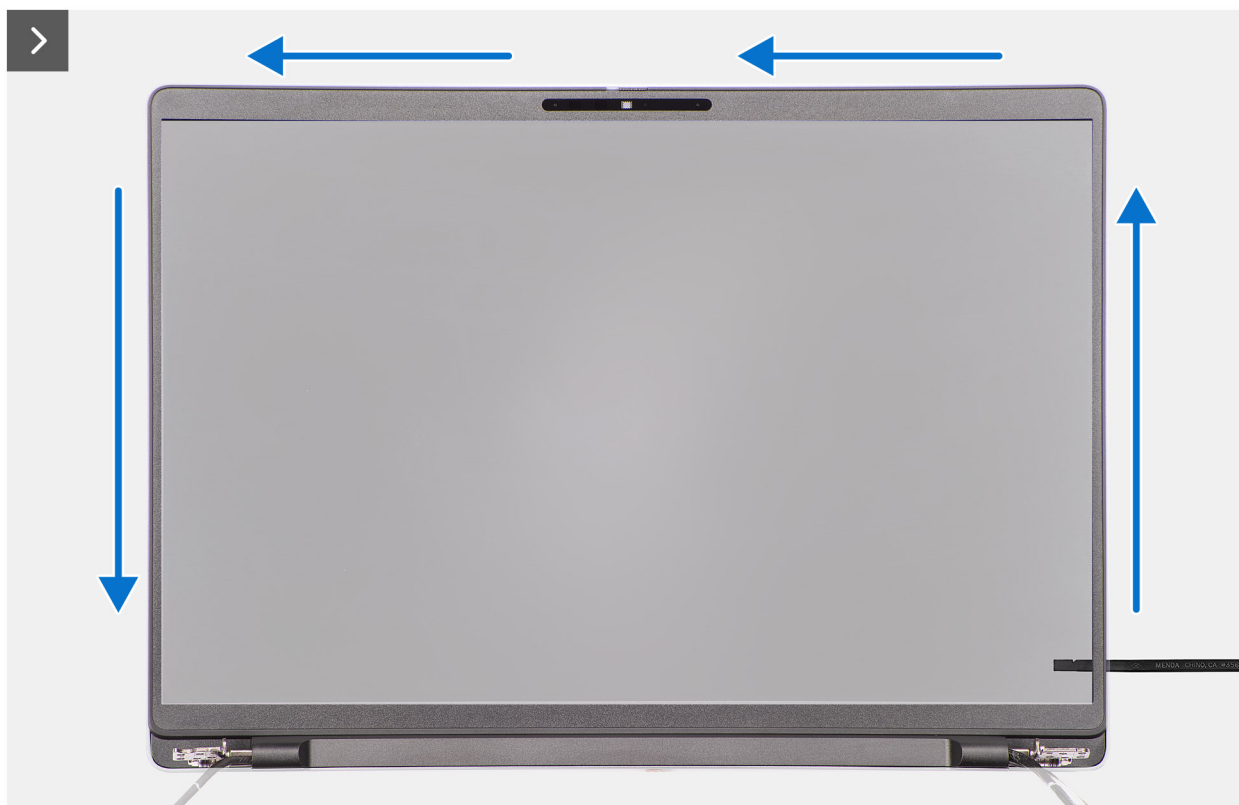


Figure 50. Removing the display bezel

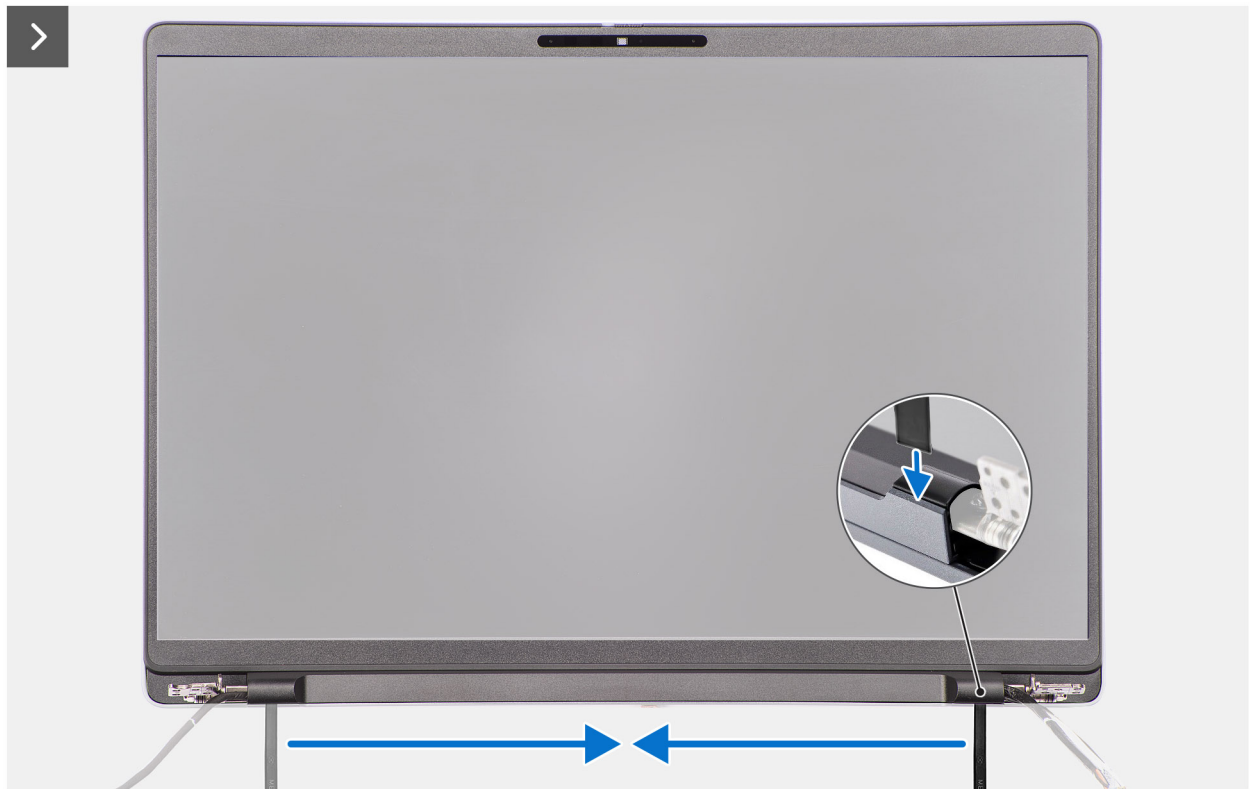


Figure 51. Removing the display bezel



Figure 52. Removing the display bezel

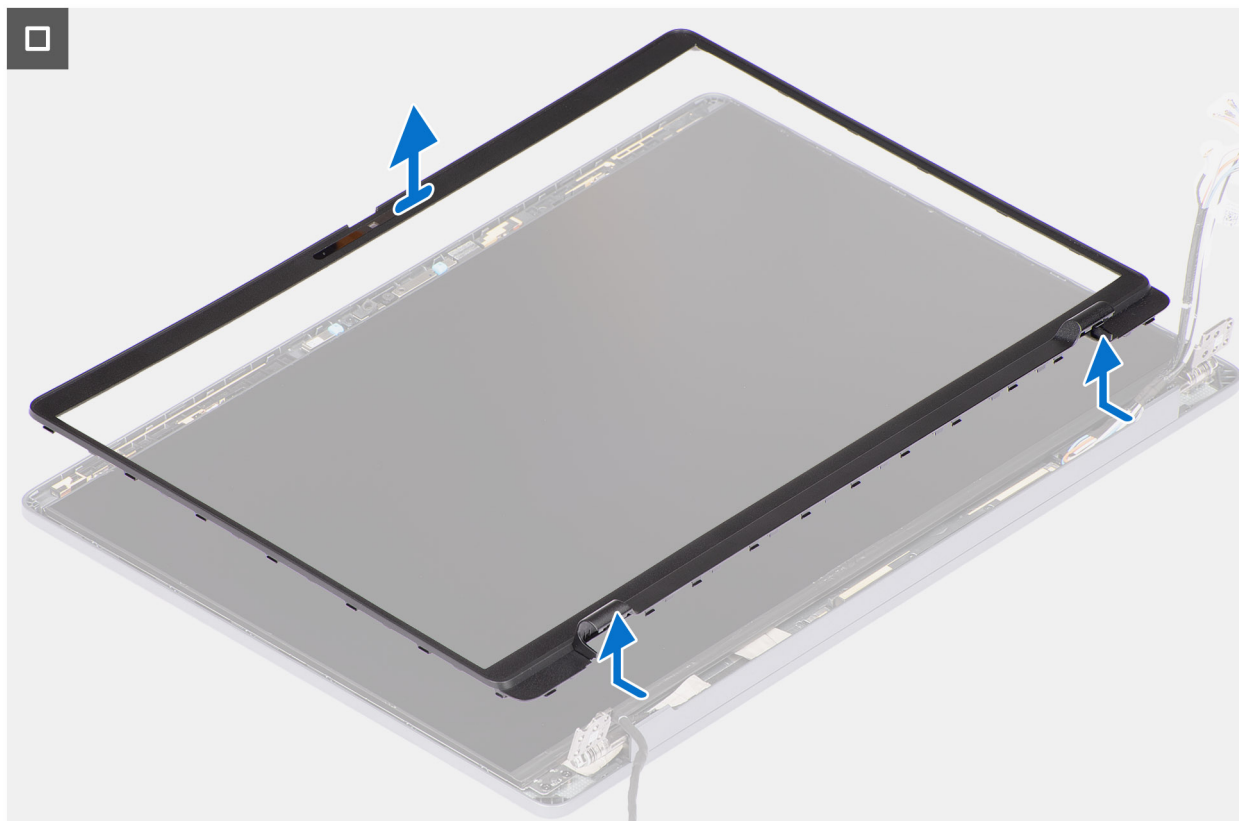


Figure 53. Removing the display bezel

Steps

1. Place the display assembly on a clean, flat surface and gently open the display hinges to at least 90 degrees.
2. At an angle, insert a flat-head slotted screwdriver (maximum width: 4 mm) into the slots on the bottom edge of the display bezel, near the display hinges. Then gently pry open the display bezel at both ends, near the hinges.

NOTE: The display bezel may get damaged during this step. If this happens, replace the display bezel with a new one.

3. **CAUTION:** Do not use the flat-head slotted screwdriver to pry open the rest of the display bezel. Instead, use a plastic scribe to continue prying along the display bezel.

CAUTION: When inserting the plastic scribe under the display bezel, ensure that it is parallel to the display panel. Pressing it down can damage the display panel.

Carefully insert a plastic scribe into the openings near the right display hinge, parallel to the display panel, to release the display bezel from the display.

4. Repeat step 3 near the left display hinge to release the display bezel from the display.
5. Keeping the plastic scribe parallel to the display panel, pry open the left, right, and top edges of the display bezel and carefully release it from the latches and adhesive on the display assembly.
6. Carefully insert the plastic scribe into the display-hinge cap at an angle of 90 degrees and pry open the display-hinge cap.
7. Keeping the plastic scribe at an angle of 90 degrees to the display panel, continue prying the bottom edge of the display bezel by sliding the scribe across the bottom edge and release it from the latches and adhesive on the display assembly.
8. Keeping the plastic scribe parallel to the right display hinge, insert the plastic scribe into the display bezel from the right edge. Then, carefully release the bezel, above the right display hinge, from the latches and adhesive on the display panel.
9. Repeat step 8 to release the display bezel above the left display hinge.
10. Lift the bezel to an angle of 15 degrees and gently pry along the middle part of the bottom edge and release the bezel from the latches and adhesive on the display panel.
11. Once all edges are released, carefully lift the display bezel off the display assembly.

Installing the display bezel

Prerequisites

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

About this task

 **NOTE:** The display-hinge caps are a part of the display bezel.

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

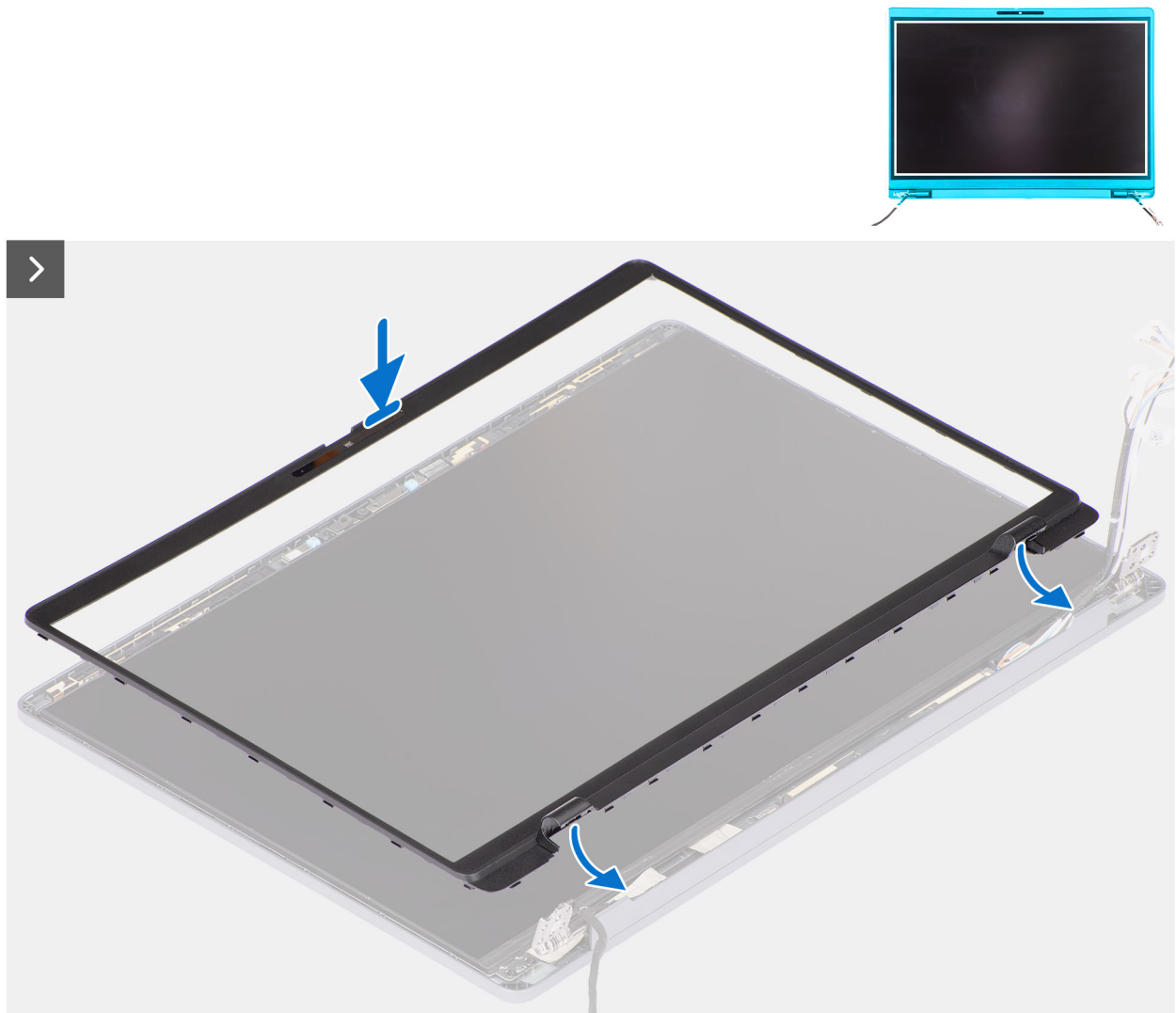


Figure 54. Installing the display bezel

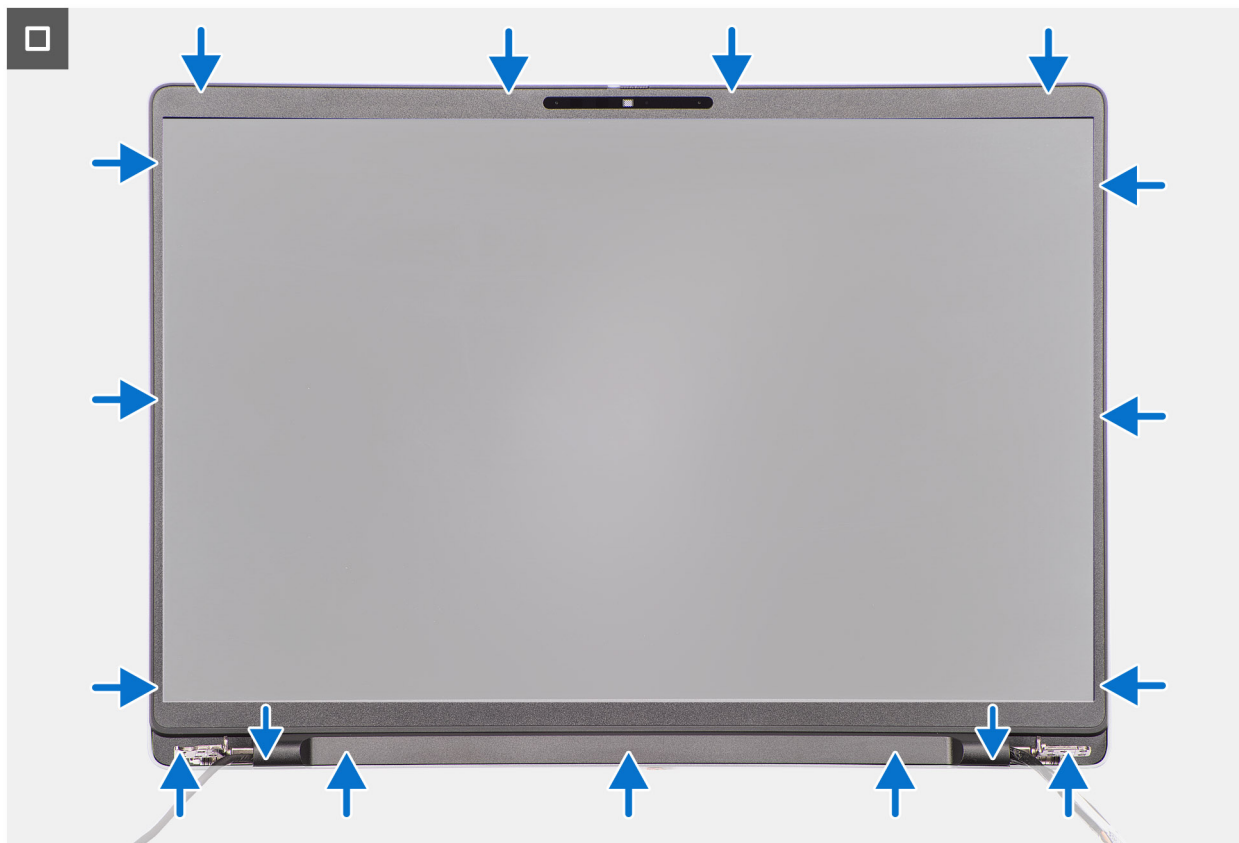


Figure 55. Installing the display bezel

Steps

1. Place the display assembly on a clean and flat surface.
2. Align and place the display bezel on the display assembly.
3. Route the display cable and wireless-antenna cables through the respective display-hinge caps.
4. Press the display-hinge caps down on the display hinges, until they click in place.
5. Starting from the bottom corner, press the display bezel and work around the entire bezel until it snaps onto the display assembly.

Next steps

1. Install the [display assembly](#).
2. Install the [wireless card](#).
3. Install the [base cover](#).
4. Follow the procedure in [After working inside your computer](#).

Display panel

Removing the display panel

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).
5. Remove the [display bezel](#).

About this task

NOTE: The display panel is assembled with the display-panel brackets as a single service part.

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

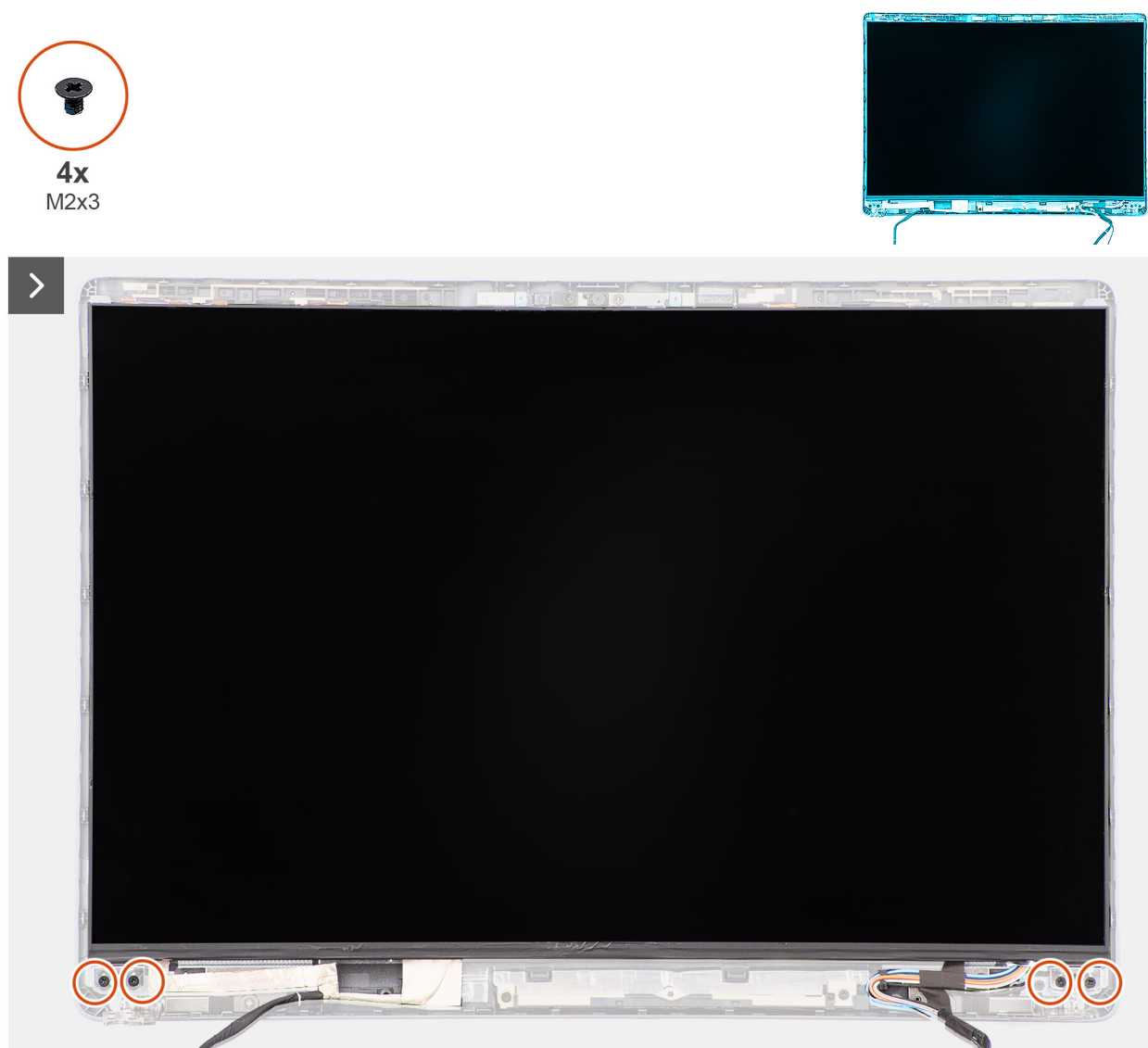


Figure 56. Removing the display panel

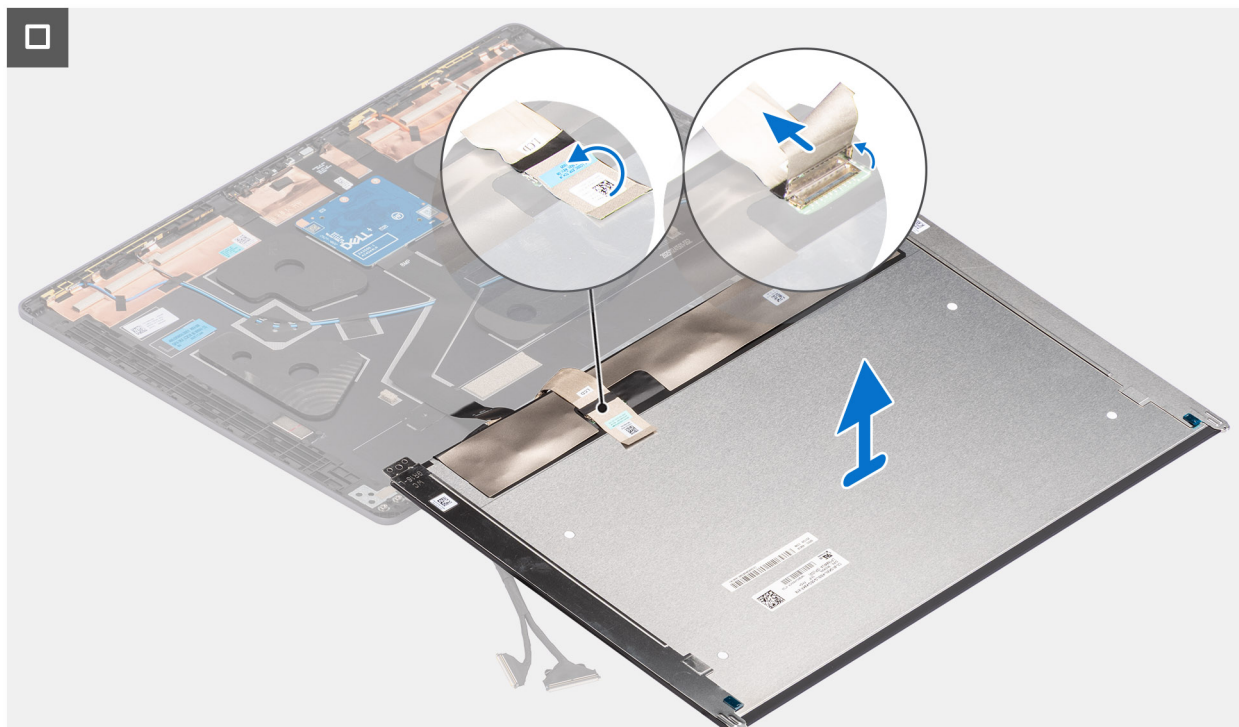


Figure 57. Removing the display panel

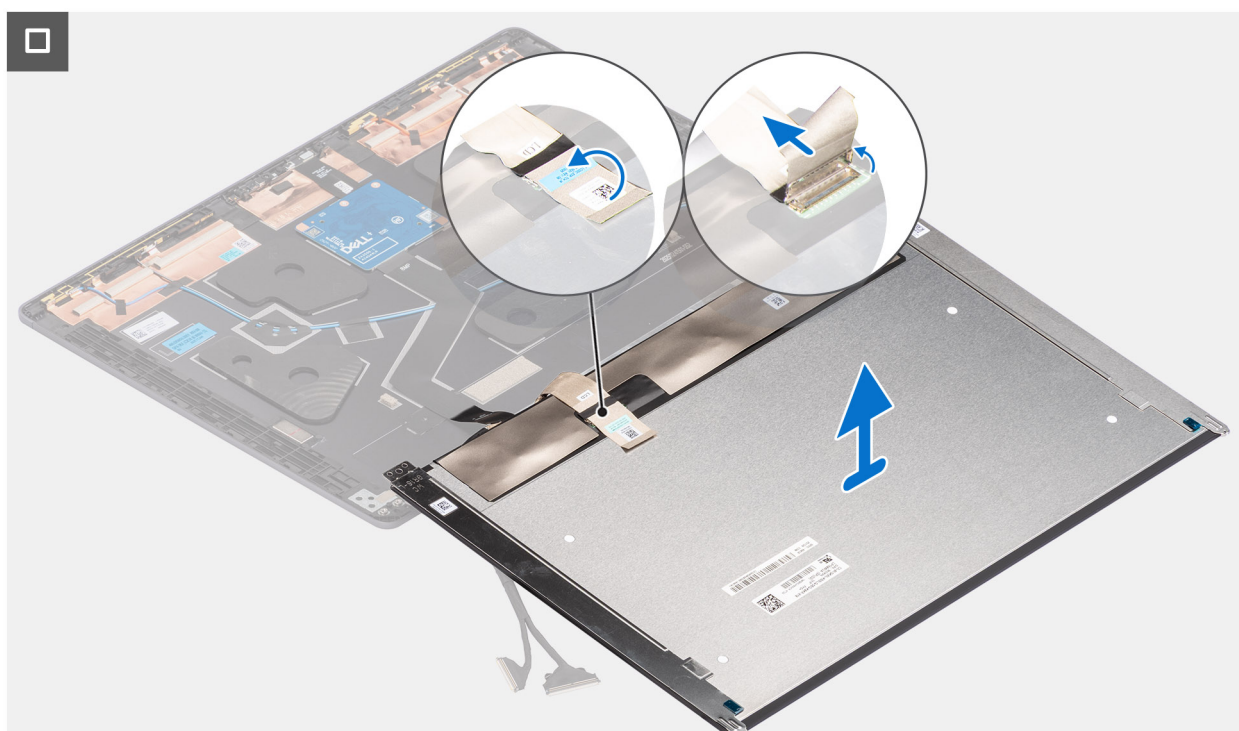


Figure 58. Removing the display panel

Steps

1. Remove the four screws (M2x3) that secure the display-panel brackets to the display back-cover and antenna assembly.
2. Holding the display-panel brackets at the top, gently flip the display panel assembly forward. Then, peel back the tape that secures the display cable to the connector on the rear of the display panel.

NOTE: To prevent damage, ensure that the display panel has a clean and smooth surface to rest on.

3. Disconnect the display cable from the connector on the display panel and remove the display panel.

CAUTION: The display panel is assembled with the display-panel brackets as a single service part. Do not pull the two pieces of elastic tape and separate the brackets from the panel.



Figure 59. Display panel

Installing the display panel

Prerequisites

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

About this task

NOTE: The display panel is assembled with the display-panel brackets as a single service part.

The following images indicate the location of the display panel and provide a visual representation of the installation procedure.



4x
M2x3

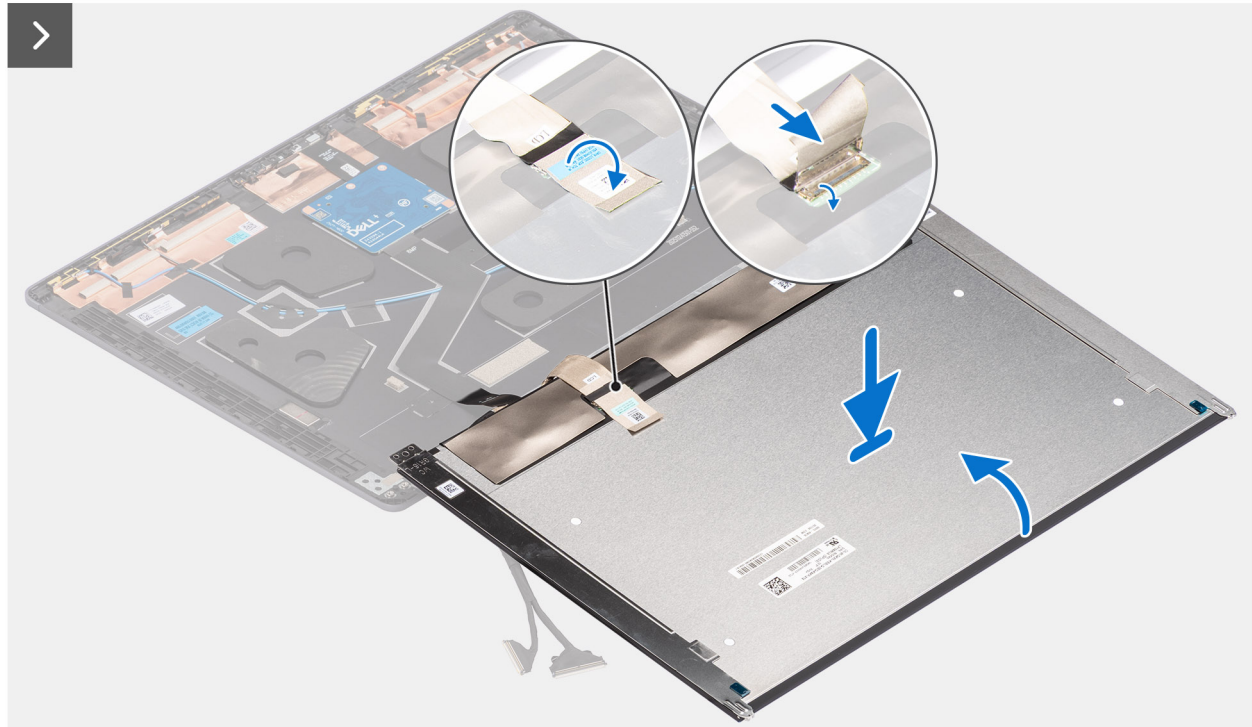
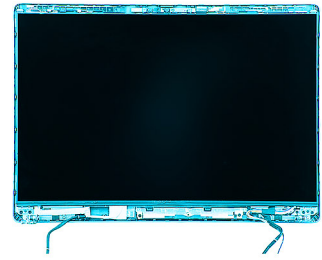


Figure 60. Installing the display panel



Figure 61. Installing the display panel

Steps

1. Place the display panel and display assembly on a clean and flat surface.
2. Connect the display cable to the connector on the display panel.
3. Adhere the tape to secure the display cable to the connector on the display panel.
4. Gently turn the display panel over and place the display panel in the slot on the display back cover.
5. Replace the four screws (M2x3) to secure the display-panel brackets to the display back-cover and antenna assembly.

Next steps

1. Install the [display bezel](#).
2. Install the [display assembly](#).
3. Install the [wireless card](#).
4. Install the [base cover](#).
5. Follow the procedure in [After working inside your computer](#).

Display hinges

Removing the display hinges

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).

5. Remove the [display bezel](#).
6. Remove the [display panel](#).

About this task

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

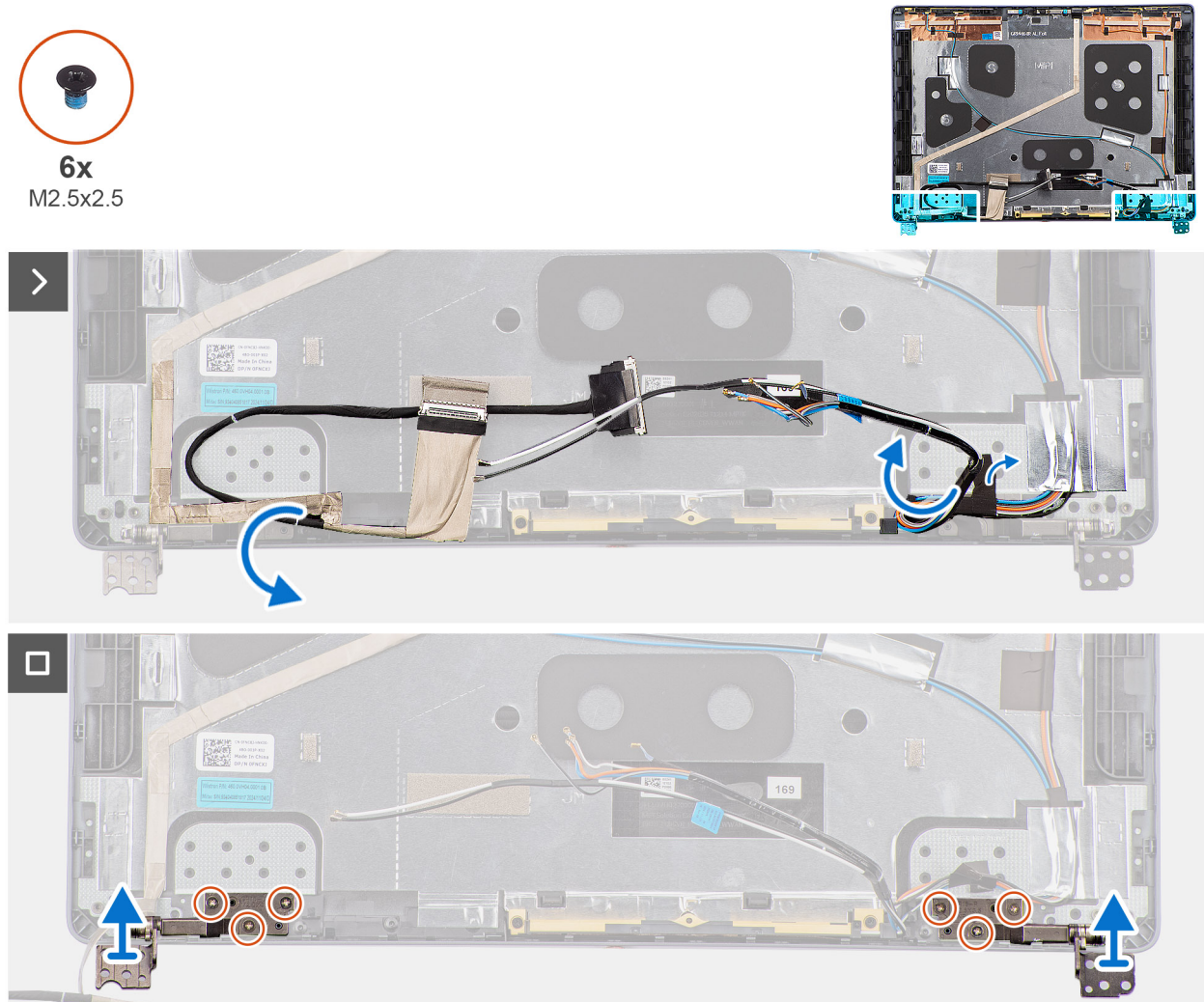


Figure 62. Removing the display hinges

Steps

1. Gently peel back the display cable to access the left display hinge on the display back cover.
2. Gently peel back the tapes that secure the wireless-antenna cables to the display back cover.
3. Remove the three screws (M2.5x3.5) that secure the right display hinge to the display back cover.
4. Lift and remove the right display hinge from the display back-cover and antenna assembly.
5. Repeat steps 3 and 4 to remove the left display hinge from the display back-cover and antenna assembly.

Installing the display hinges

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 display hinges and provide a visual representation of the installation procedure.

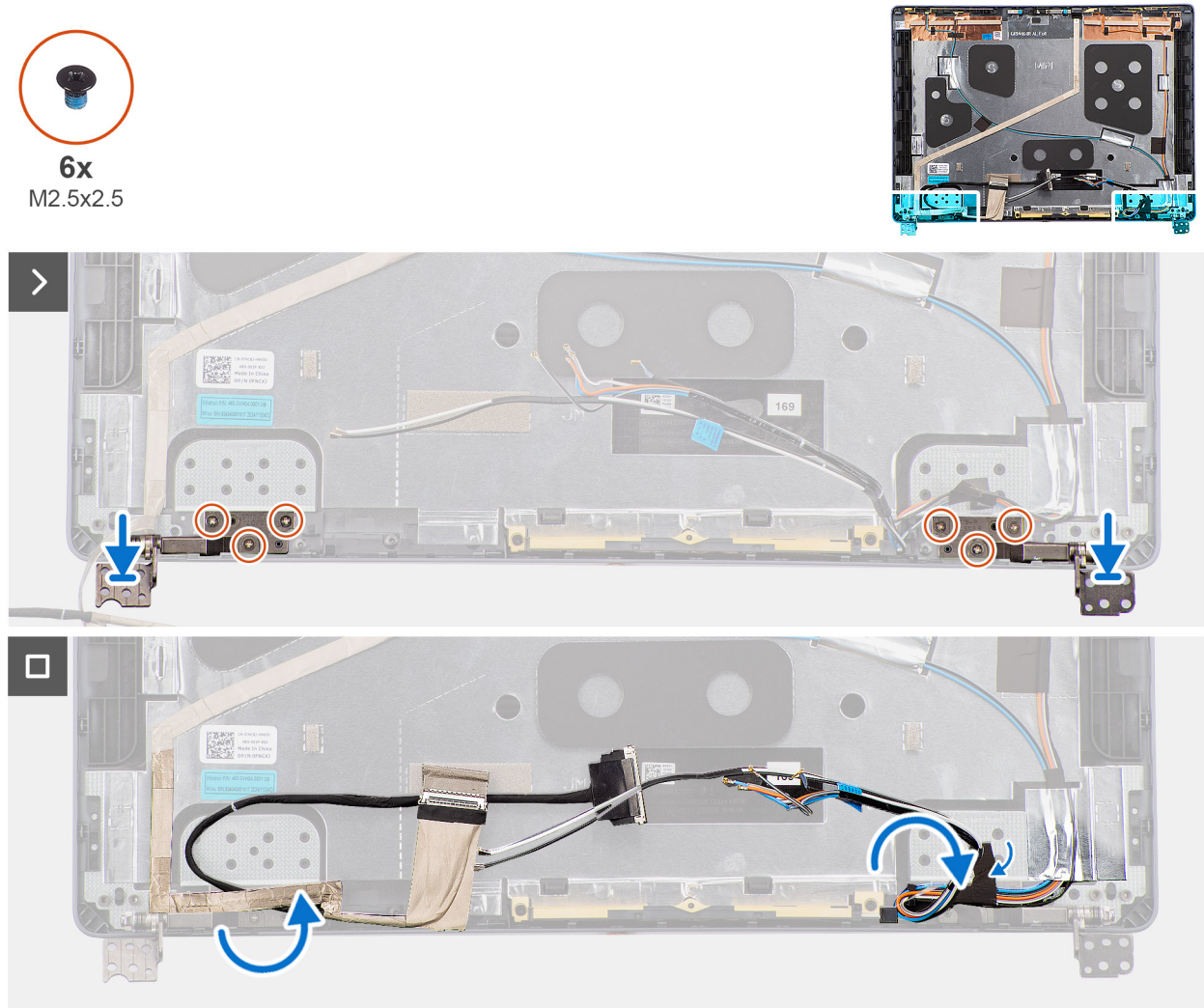


Figure 63. Installing the display hinges

Steps

1. Align and place the right display hinge on the display back-cover and antenna assembly.
2. Replace the three screws (M2.5x3.5) to secure the right display hinge to the display back cover.
3. Repeat steps 1 and 2 to secure the left display hinge to the display back cover.
4. Adhere the tapes to secure the wireless-antenna cables to the display back-cover and antenna assembly.
5. Adhere the display cable and secure it to the display back-cover and antenna assembly.

Next steps

1. Install the [display panel](#).
2. Install the [display bezel](#).
3. Install the [display assembly](#).
4. Install the [wireless card](#).
5. Install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).

Display cable

Removing the display cable

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).
5. Remove the [display bezel](#).
6. Remove the [display panel](#).

About this task

The following image indicates the location of the display cable and provides a visual representation of the removal procedure.

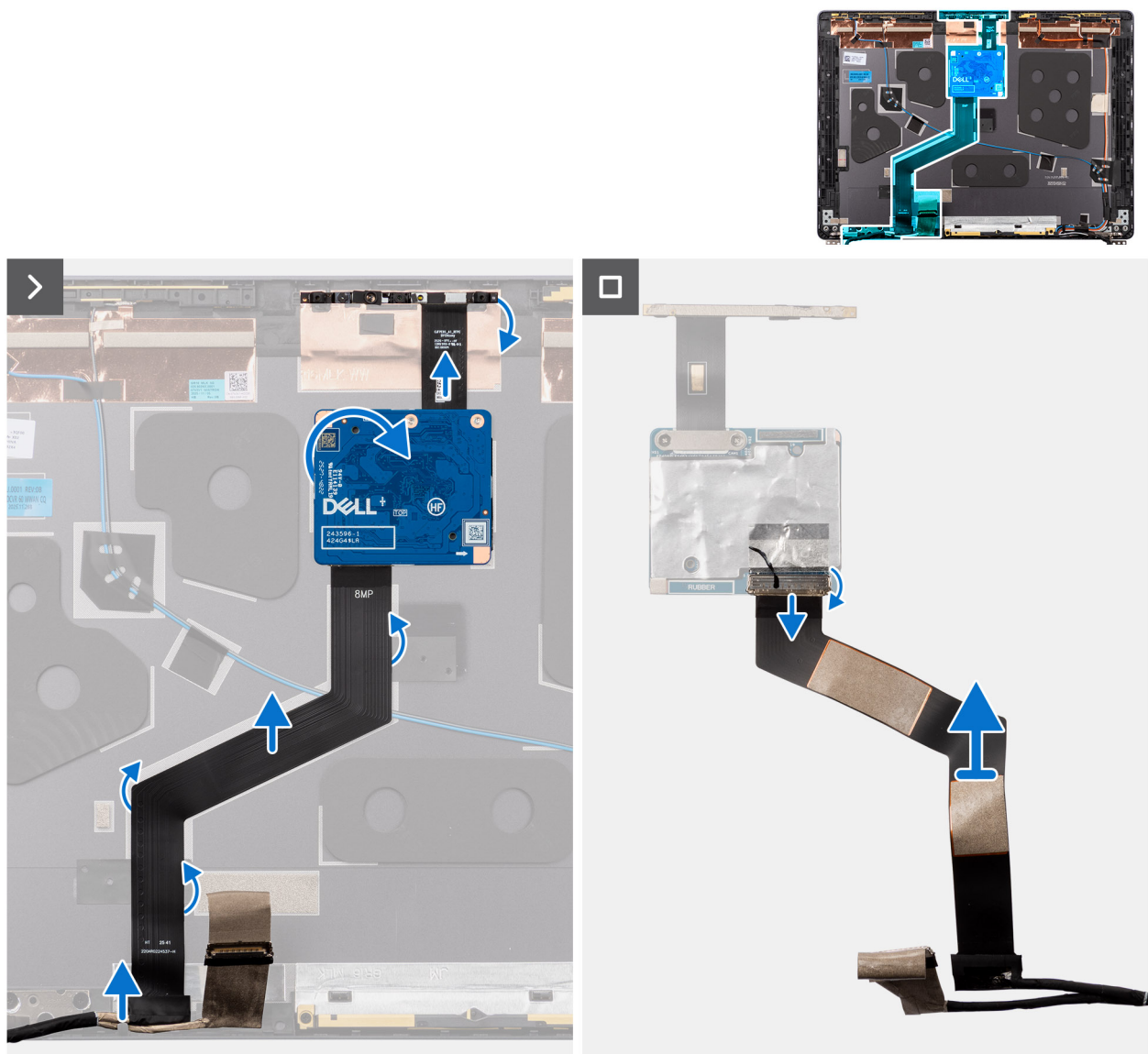


Figure 64. Removing the display cable

Steps

1. Disconnect the display cable from the connector on the camera module.
2. Carefully peel back and remove the display cable from the display back-cover and antenna assembly.

Installing the display cable

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 display cable and provides a visual representation of the installation procedure.

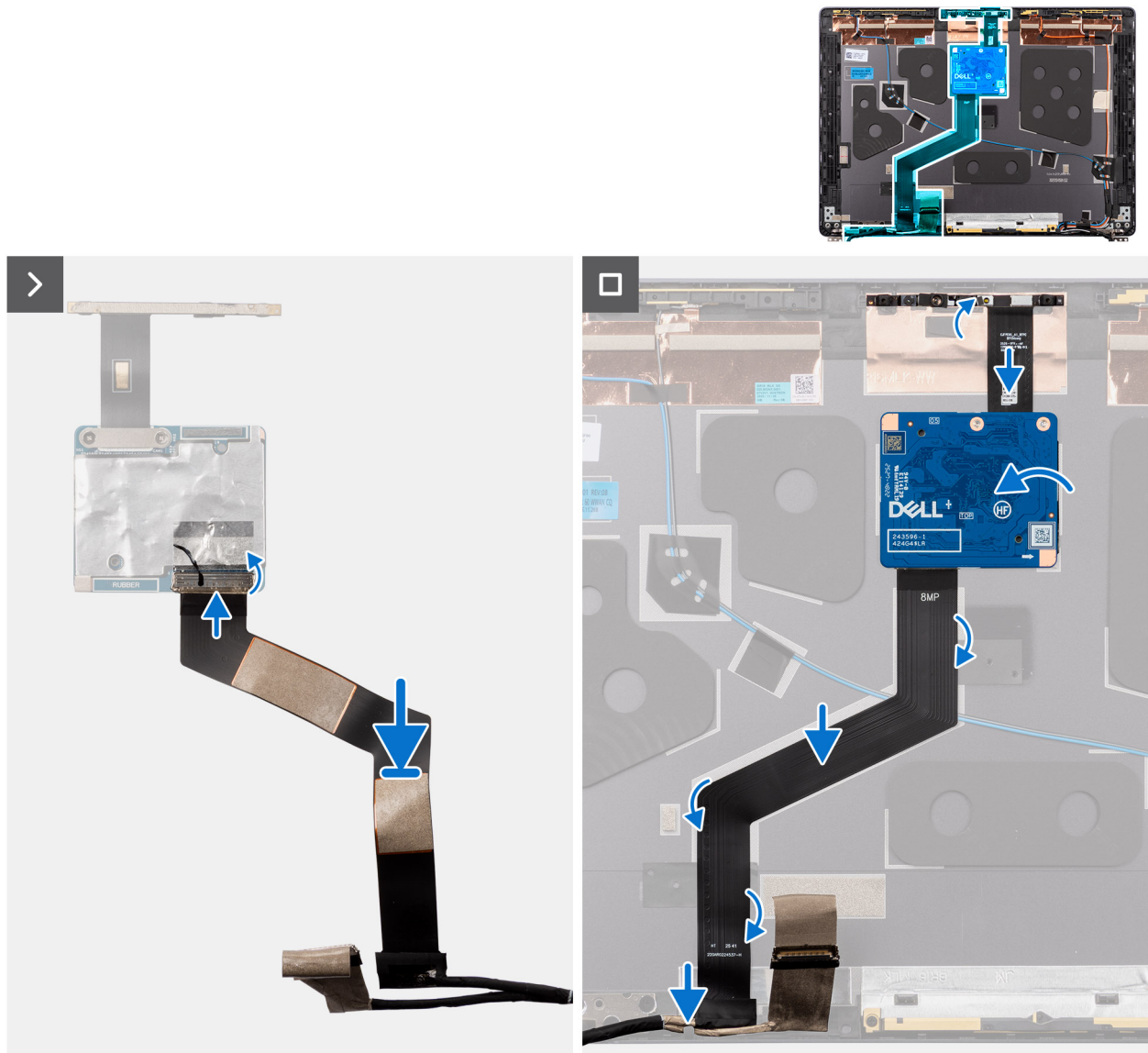


Figure 65. Installing the display cable

Steps

1. Adhere the display cable to the display back-cover and antenna assembly.
2. Connect the display cable to the connector on the camera module.

Next steps

1. Install the [display panel](#).
2. Install the [display bezel](#).
3. Install the [display assembly](#).
4. Install the [wireless card](#).
5. Install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).

Camera

Removing the camera

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).
5. Remove the [display bezel](#).
6. Remove the [display panel](#).
7. Remove the [display cable](#).

About this task

 **NOTE:** The camera module is removed with the foil as a single service part.

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



2x
M1.6x1.4

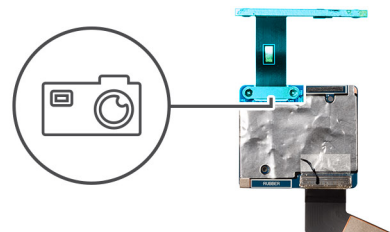


Figure 66. Removing the camera

Steps

1. Disconnect the display cable from the connector on the camera module.

2. Gently peel back the copper or aluminum foil, whichever is applicable, from the display back-cover and antenna assembly.
3. Remove the camera module, along with the foil, from the display assembly.

Installing the camera

Prerequisites

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

About this task

 **NOTE:** The camera module is installed with the foil as a single service part.

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

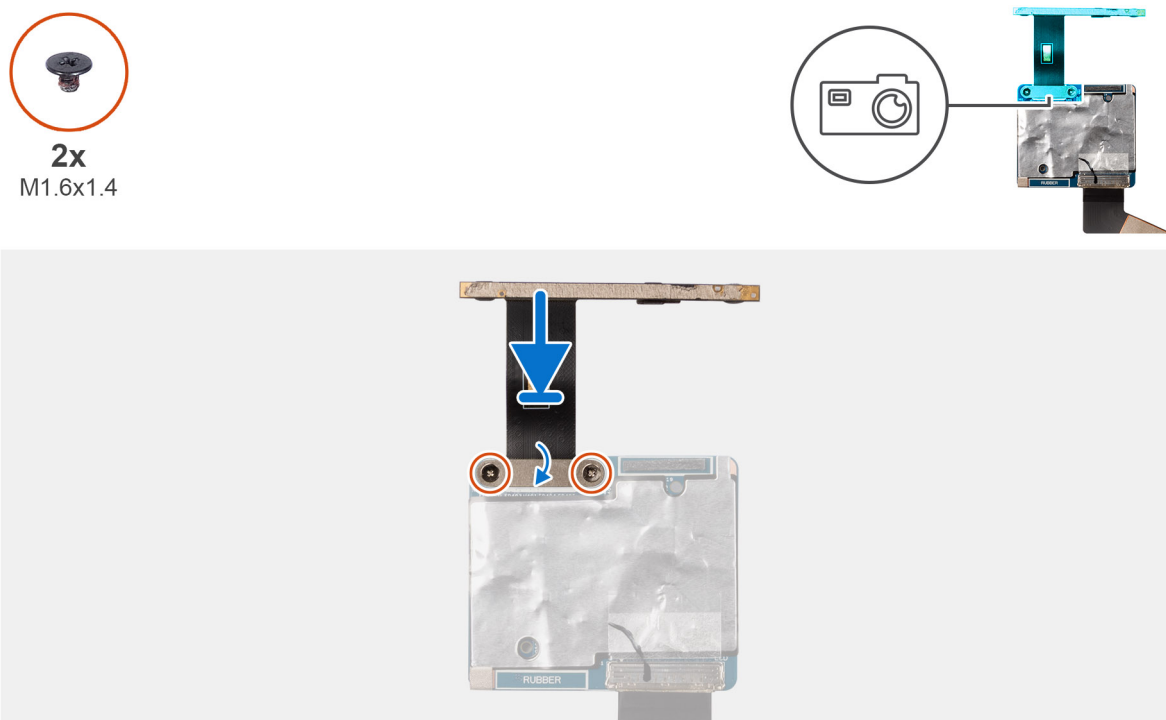


Figure 67. Installing the camera

Steps

1. Align and place the camera module in the alignment post on the display back-cover and antenna assembly.
2. Adhere the copper or aluminum foil, whichever is applicable, to the display back-cover and antenna assembly.
3. Connect the display cable to the connector on the camera module.

Next steps

1. Install the [display cable](#).
2. Install the [display panel](#).
3. Install the [display bezel](#).
4. Install the [display assembly](#).
5. Install the [wireless card](#).
6. Install the [base cover](#).
7. Follow the procedure in [After working inside your computer](#).

Display back-cover and antenna assembly

Removing the display back-cover and antenna assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).
5. Remove the [display bezel](#).
6. Remove the [display panel](#).
7. Remove the [display hinges](#).
8. Remove the [display cable](#).
9. Remove the [camera](#).

About this task

NOTE: The display back-cover and antenna assembly cannot be further disassembled once all the **Prerequisites** are completed. If the wireless antennas are malfunctioning and are required to be replaced, replace the entire display back-cover and antenna assembly.

The image below shows the display back-cover and antenna assembly after the **Prerequisites** have been performed.

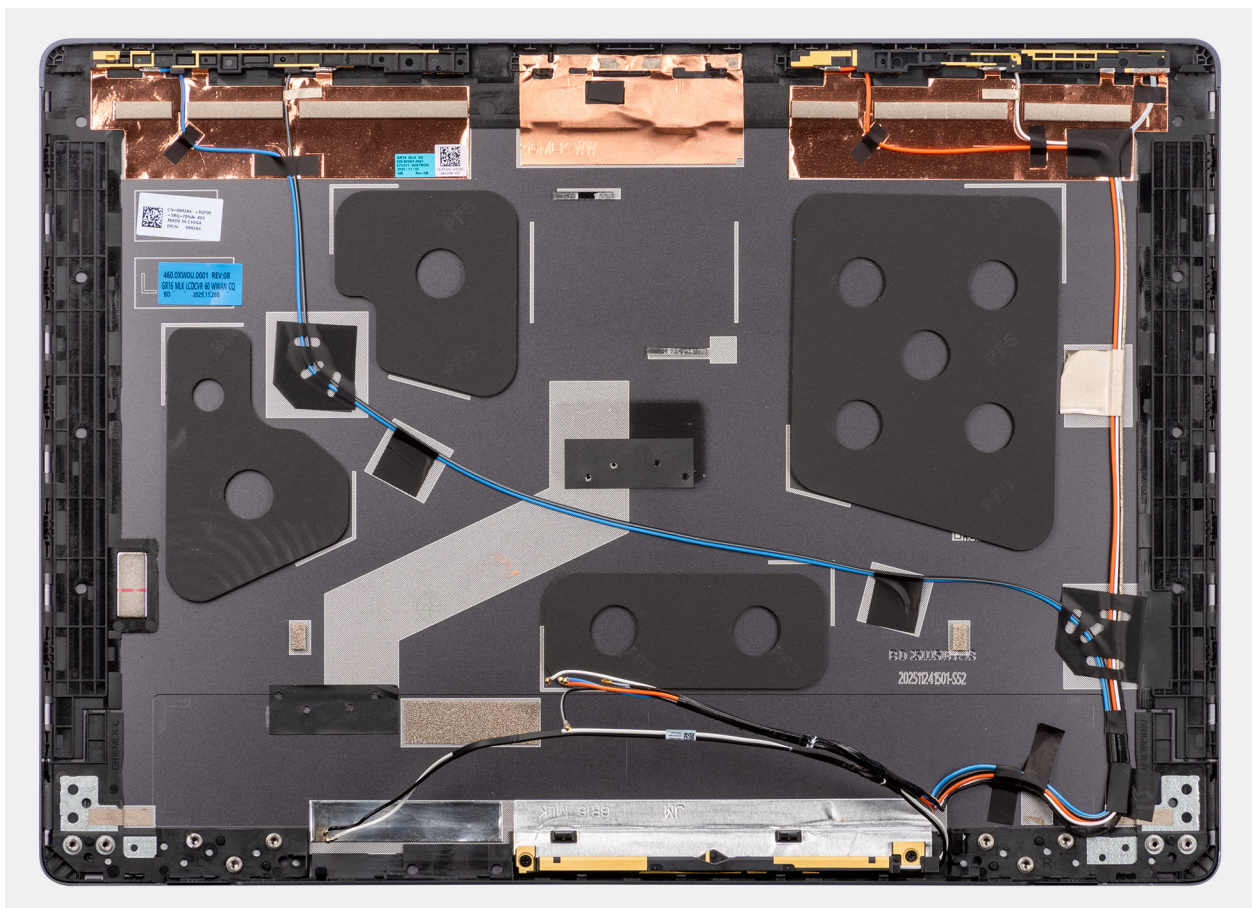


Figure 68. Display back-cover and antenna assembly

Steps

After performing the **Prerequisites**, you are left with the display back-cover and antenna assembly.

Installing the display back-cover and antenna assembly

Prerequisites

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

About this task

The image below shows the display back-cover and antenna assembly.

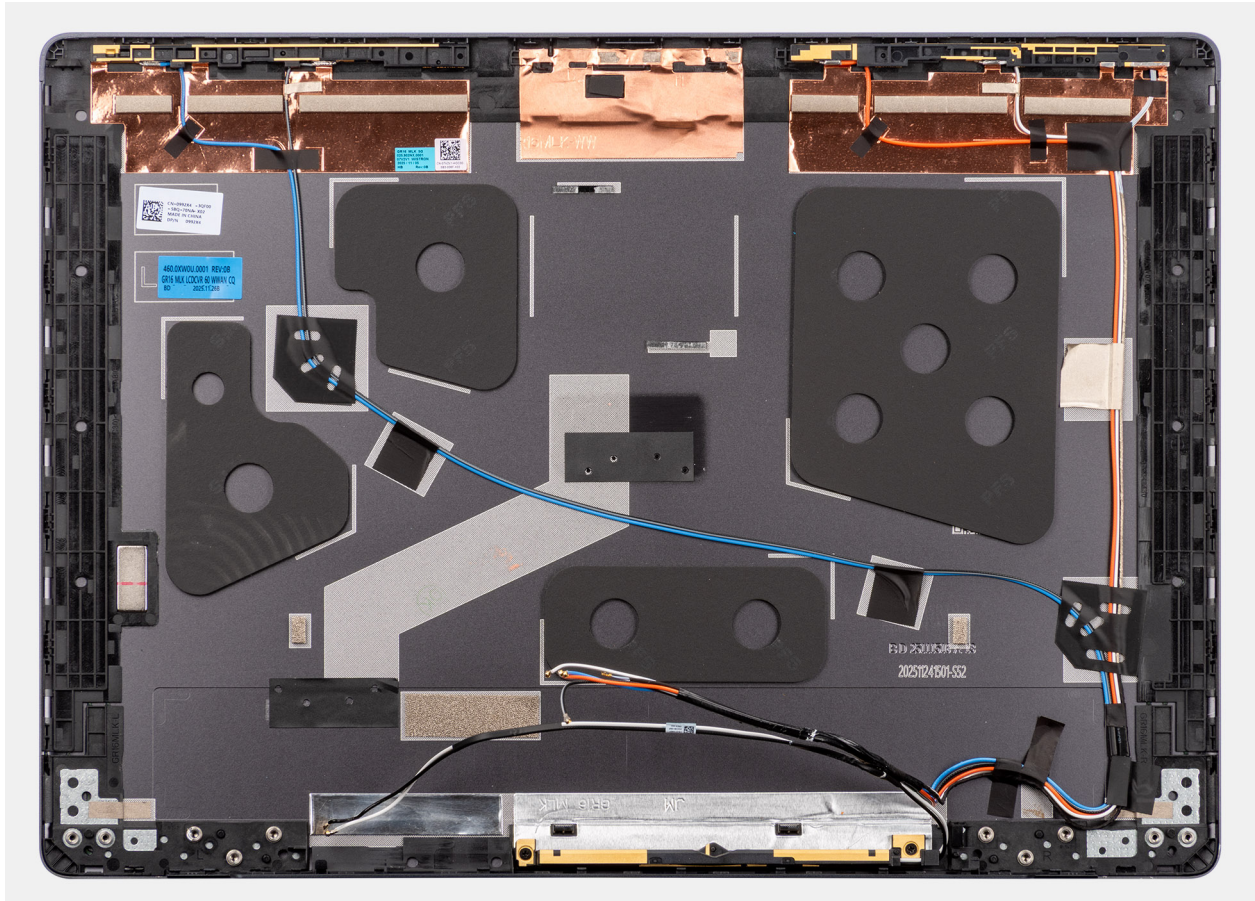


Figure 69. Display back-cover and antenna assembly

Steps

Place the display back-cover and antenna assembly on a flat surface and perform the **Next steps** to install the display back-cover and antenna assembly.

Next steps

1. Install the [camera](#).
2. Install the [display cable](#).
3. Install the [display hinges](#).
4. Install the [display panel](#).
5. Install the [display bezel](#).
6. Install the [display assembly](#).
7. Install the [wireless card](#).
8. Install the [base cover](#).
9. Follow the procedure in [After working inside your computer](#).

System board

Removing the system board - for computers shipped with integrated graphics card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory module](#).
5. Remove the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
6. Remove the [wireless card](#).
7. Remove the [right/processor fan](#).
8. Remove the [left/video fan](#).
9. Remove the [heat sink](#).

NOTE: If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

10. Remove the [battery frame](#).

About this task

The following image indicates the connectors on your system board.

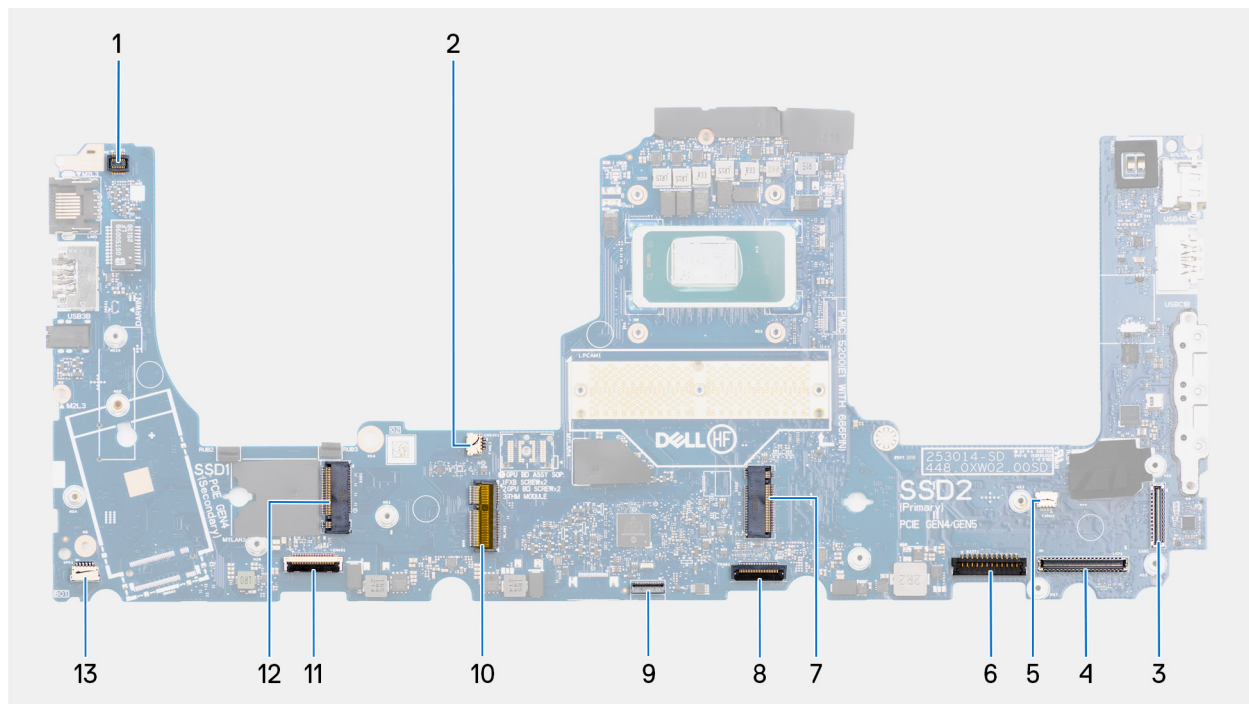


Figure 70. System board connectors

1. Fingerprint-reader cable connector (FP1)
2. Right/Processor-fan cable connector (FANL1)
3. 8MP camera cable connector (CAM1)
4. Display-cable connector (LCD1)
5. Left/Video-fan cable connector (FANR2)

6. Battery-cable connector (BATT1)
7. Primary M.2 solid state drive connector (SSD2)
8. Touchpad-cable connector (TPAD1)
9. Memory-module connectors (DIMM1 and DIMM2)
10. Wireless-card connector (WLAN1)
11. USH-board cable connector (CN661)
12. Secondary M.2 solid state drive connector (SSD1)
13. WWAN-module connector (WWAN1)
14. Speaker-cable connector (SPK1)

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

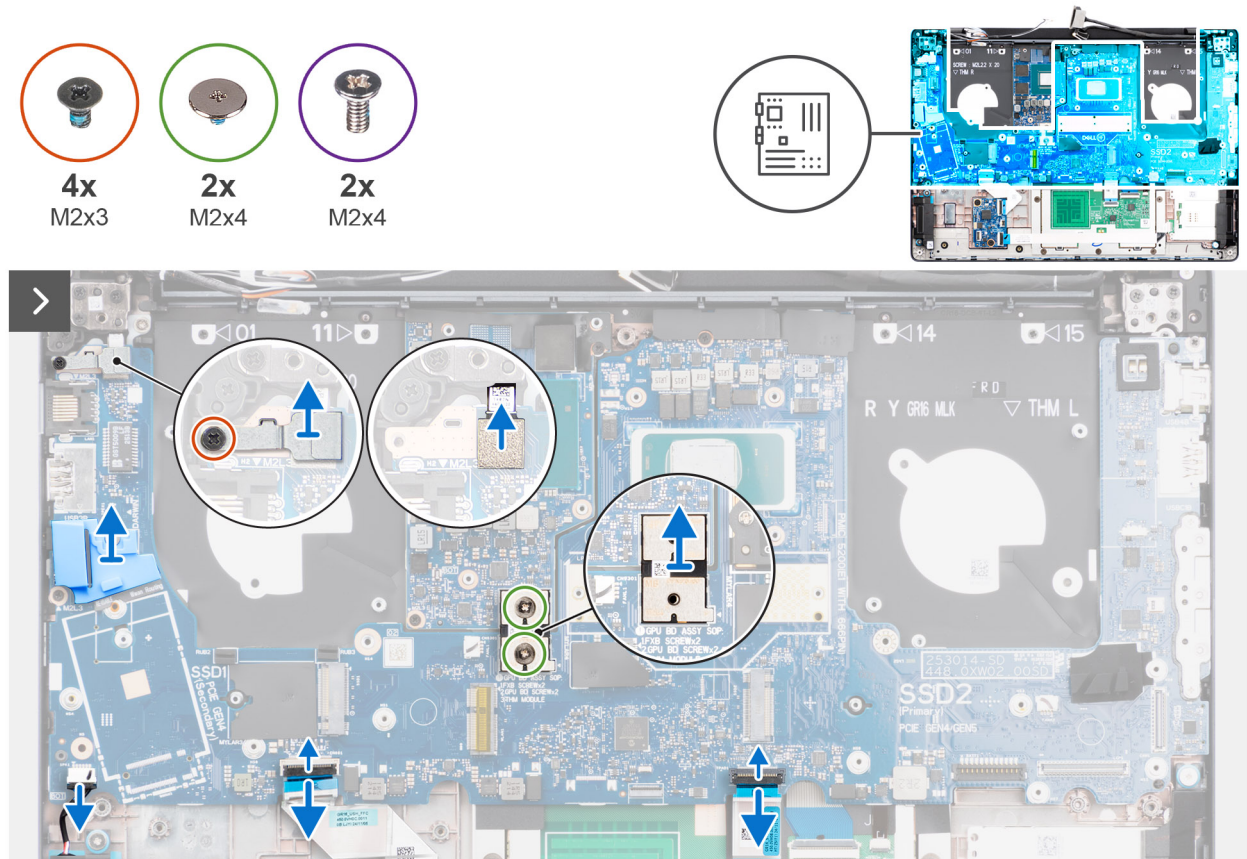


Figure 71. Removing the system board

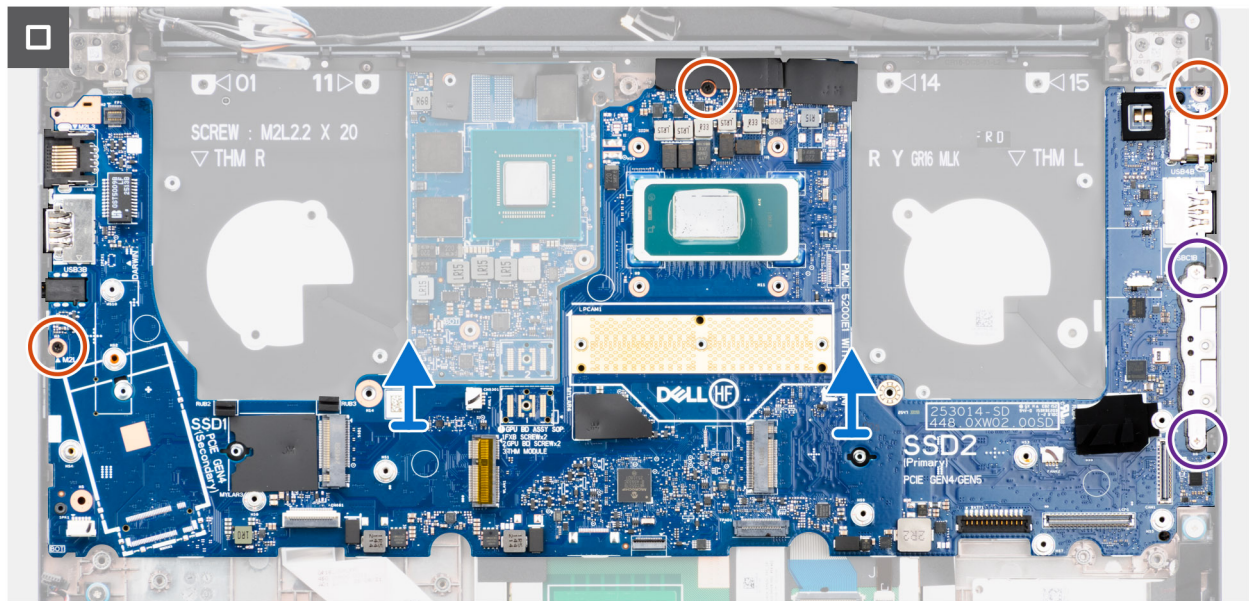


Figure 72. Removing the system board

Steps

1. Remove the reusable Mylar sheet with thermal pads from the system board and transfer it to the new replacement system board.
2. Remove the screw (M2x3) that secures the fingerprint-reader bracket to the palm-rest assembly.
i **NOTE:** Steps 1 to 3 apply only to computers shipped with a fingerprint reader installed.
3. Lift the fingerprint-reader bracket off the system board.
4. Disconnect the fingerprint-reader cable from the connector (FP1) on the system board.
5. Disconnect the following cables from the system board:
 - a. Speaker cable (SPK1)
 - b. Touchpad cable (TPAD1)
 - c. USH-board cable (CN661)
6. For computers shipped without a fingerprint reader, remove the four screws (M2x3) and the two screws (M2x4) that secure the system board to the palm-rest assembly.
 For computers shipped with a fingerprint reader, remove the three screws (M2x3) and the two screws (M2x4) that secure the system board to the palm-rest assembly.
7. Carefully lift and remove the system board at angle, from the palm-rest assembly, to clear the ports from the port slots.

Installing the system board - for computers shipped with integrated graphics card

Prerequisites

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

About this task

The following image indicates the connectors on your system board.

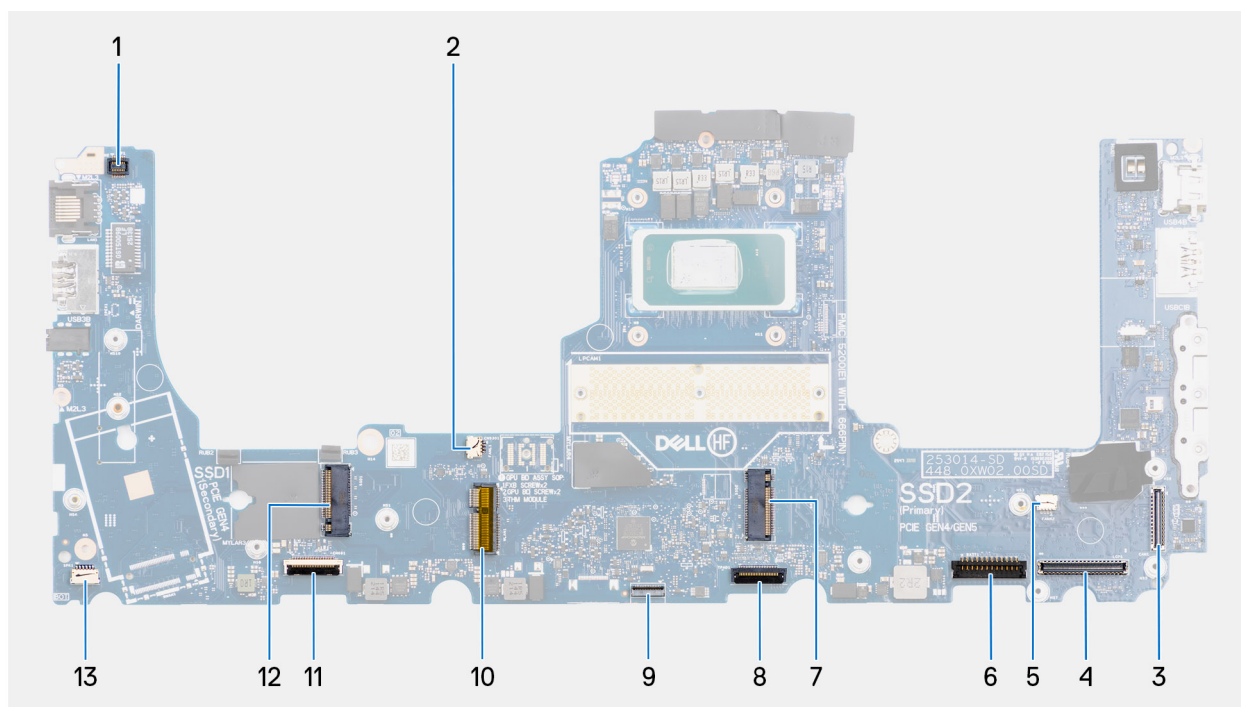


Figure 73. System board connectors

1. Fingerprint-reader cable connector (FP1)
2. Right/Processor-fan cable connector (FANL1)
3. IR-camera cable connector (CAM1)
4. Display-cable connector (LCD1)
5. Left/Video-fan cable connector (FANR2)
6. Battery-cable connector (BATT1)
7. Primary M.2 solid state drive connector (SSD2)
8. Touchpad-cable connector (TPAD1)
9. Memory-module connectors (DIMM1 and DIMM2)
10. Wireless-card connector (WLAN1)
11. USH-board cable connector (CN661)
12. Secondary M.2 solid state drive connector (SSD1)
13. WWAN-module connector (WWAN1)
14. Speaker-cable connector (SPK1)

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

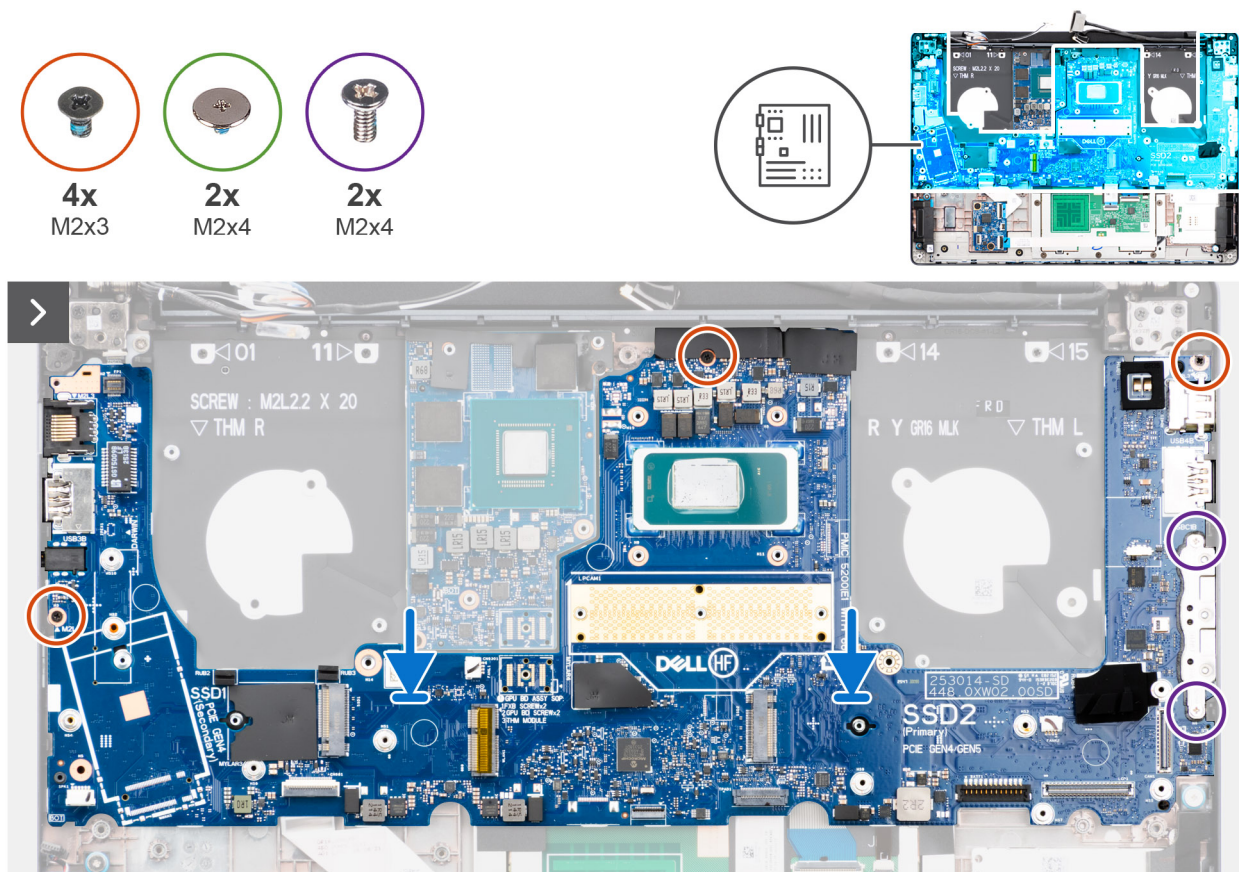


Figure 74. Installing the system board

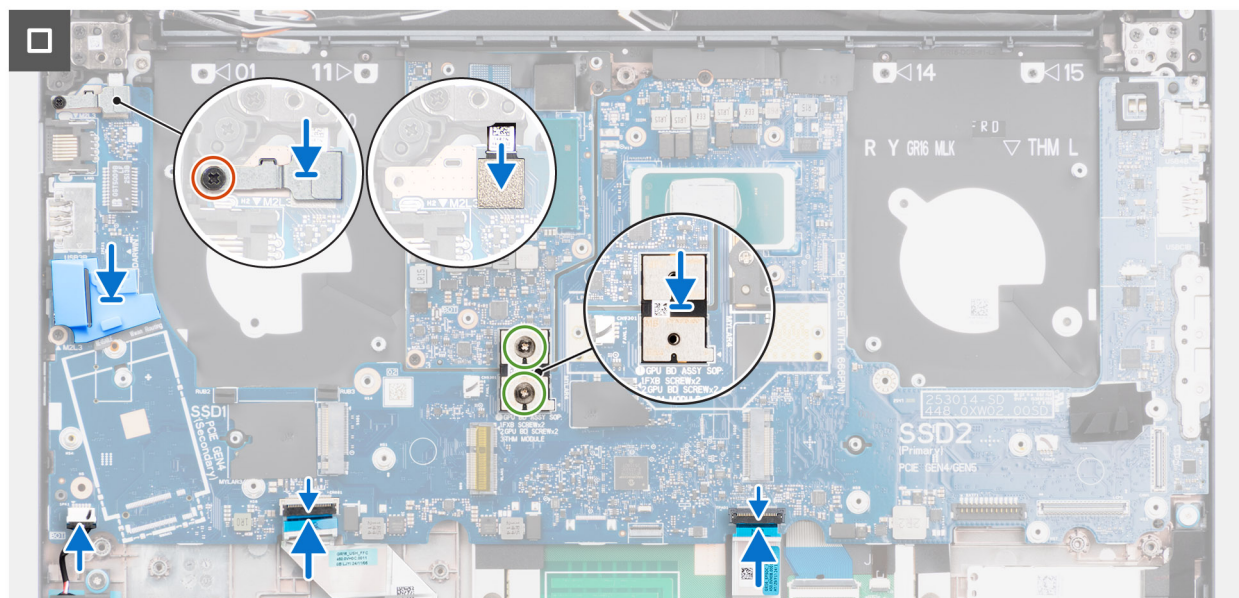


Figure 75. Installing the system board

Steps

1. Align the ports on the system board to the port slots and place the system board on the palm-rest assembly.
2. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
3. For computers shipped with a fingerprint reader, replace the three screws (M2x3) and the two screws (M2x4) to secure the system board to the palm-rest assembly.

For computers shipped without a fingerprint reader, replace the four screws (M2x3) and the two screws (M2x4) to secure the system board to the palm-rest assembly.

4. Connect the following cables to the system board:
 - a. Speaker cable (SPK1)
 - b. Touchpad cable (TPAD1)
 - c. USH-board cable (CN661)
5. Connect the fingerprint-reader cable to the connector (FP1) on the system board.

i **NOTE:** Steps 6 to 8 apply only to computers shipped with a fingerprint reader installed.

6. Align and place the fingerprint-reader bracket over the fingerprint-reader connector on the system board.
7. Replace the screw (M2x3) to secure the fingerprint-reader bracket to the palm-rest assembly.
8. Ensure that the reusable Mylar sheet with thermal pads is placed on the system board.

i **NOTE:** When replacing the system board, this Mylar sheet should be transferred to the new replacement system board.

Next steps

1. Install the [battery frame](#).
2. Install the [heat sink](#).
3. Install the [left/video fan](#).
4. Install the [right/processor fan](#).
5. Install the [wireless card](#).
6. Install the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
7. Install the [memory module](#).
8. Install the [battery](#).
9. Install the [base cover](#).
10. Follow the procedure in [After working inside your computer](#).

Power button

Removing the power button

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory module](#).
5. Remove the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
6. Remove the [wireless card](#).
7. Remove the [heat sink - integrated](#) or [heat sink - discrete](#), whichever is applicable.

i **NOTE:** If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

8. Remove the [battery frame](#).
9. Remove the [system board](#).

i **NOTE:** If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

About this task

The following image indicates the location of the power button and provides a visual representation of the removal procedure.

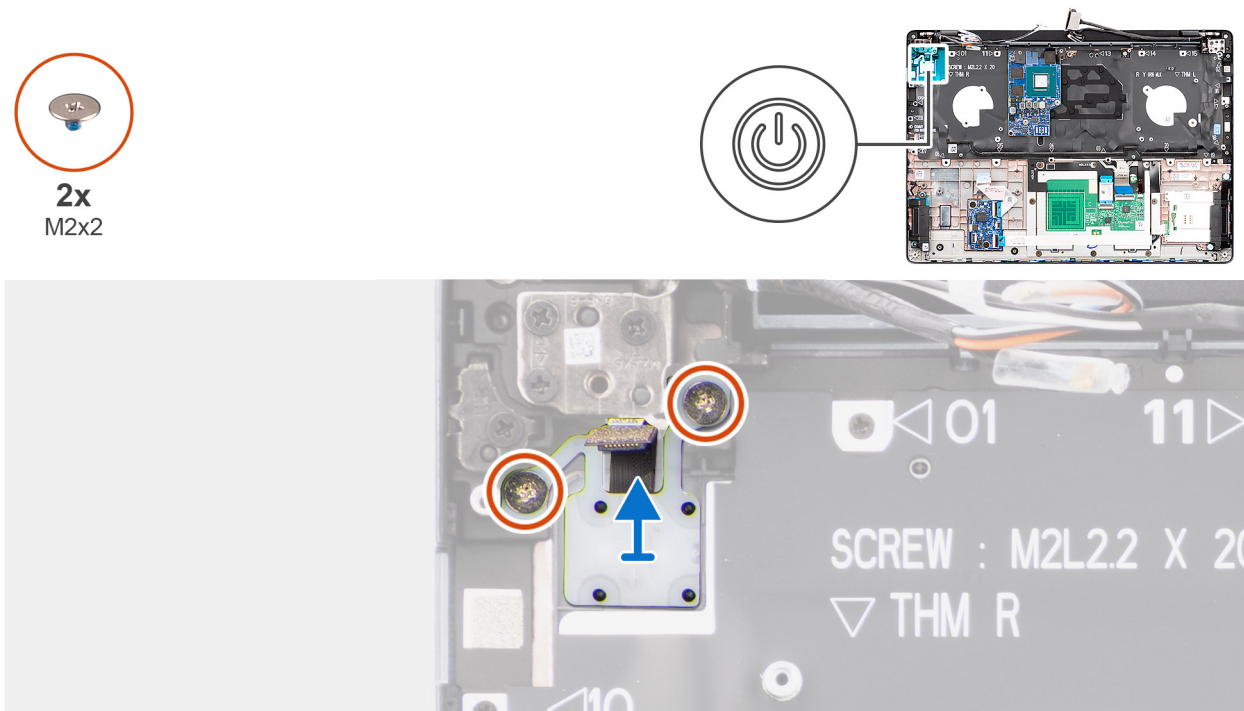


Figure 76. Removing the power button

Steps

1. Remove the two screws (M2x2) that secure the power button to the palm-rest assembly.
2. Lift the power button off the slot on the palm-rest assembly.

Installing the power button

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 power button and provides a visual representation of the installation procedure.

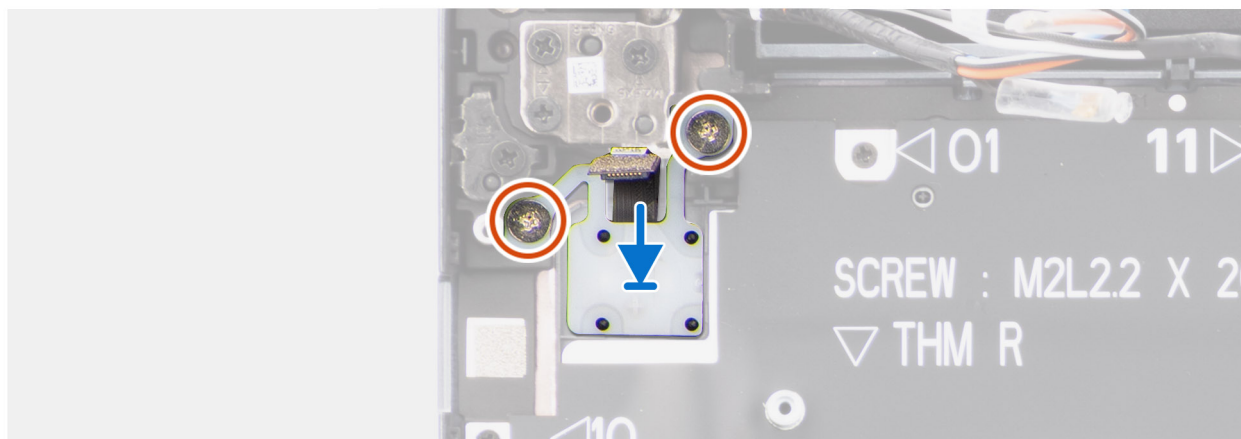
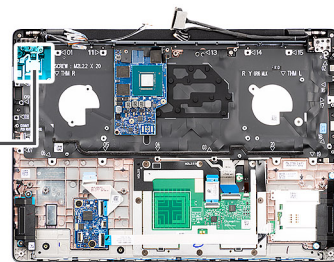


Figure 77. Installing the power button

Steps

1. Place the power button in the slot on the palm-rest assembly.
2. Align the screw holes on the power button with the screw holes on the palm-rest assembly.
3. Replace the two screws (M2x2) to secure the power button to the palm-rest assembly.

Next steps

1. Install the [system board](#).
2. Install the [battery frame](#).
3. Install the [heat sink - integrated](#) or [heat sink - discrete](#), whichever is applicable.
4. Install the [left/video fan](#).
5. Install the [right/processor fan](#).
6. Install the [wireless card](#).
7. Install the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
8. Install the [memory module](#).
9. Install the [battery](#).
10. Install the [base cover](#).
11. Follow the procedure in [After working inside your computer](#).

Keyboard

Removing the keyboard

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory module](#).
5. Remove the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
6. Remove the [wireless card](#).

7. Remove the [battery frame](#).
8. Remove the [heat sink - integrated](#) or [heat sink - discrete](#), whichever is applicable.

i NOTE: If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

9. Remove the [system board](#).

i NOTE: If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

About this task

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

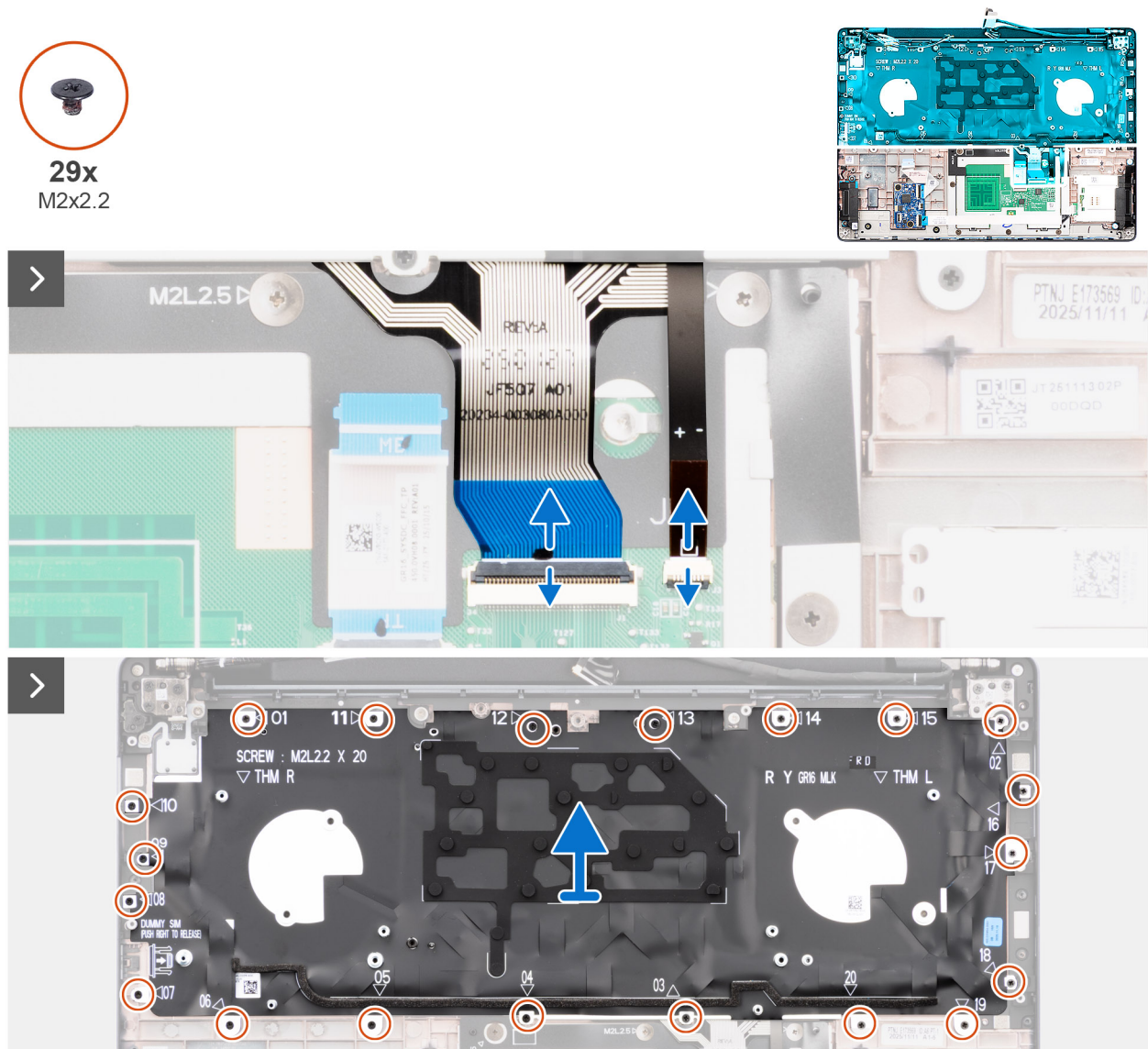


Figure 78. Removing the keyboard

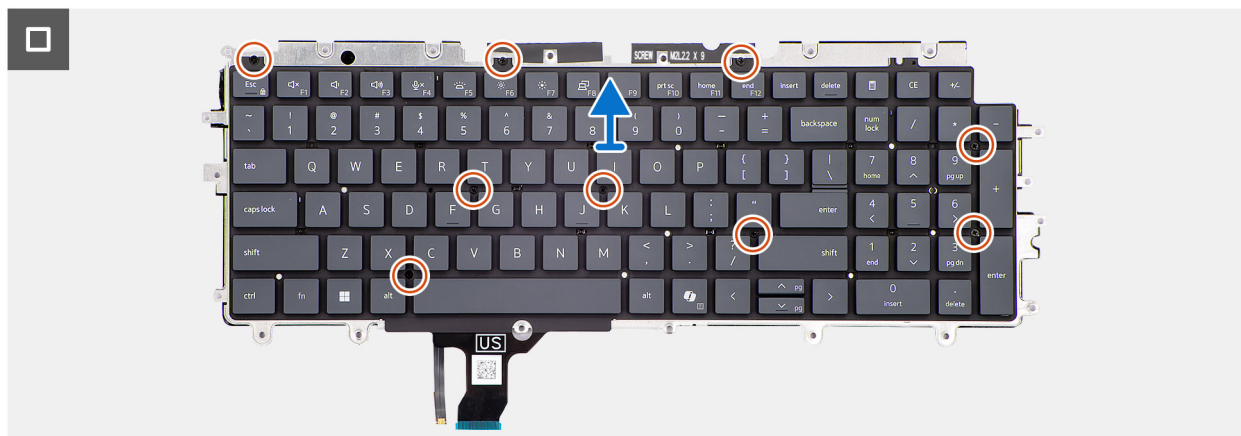


Figure 79. Removing the keyboard

Steps

1. Disconnect the keyboard cable from the connector (KEYBOARD) on the touchpad board.
2. Disconnect the keyboard-backlight cable from the connector (LIGHTING) on the touchpad board.

NOTE: This step applies only to computers shipped with a backlit keyboard installed.

3. Remove the 20 screws (M2x2.2) that secure the keyboard assembly to the palm-rest assembly.
4. Lift the keyboard assembly off the palm-rest assembly.
5. Remove the nine screws (M2x2.2) that secure the keyboard to the keyboard bracket.
6. Lift the keyboard off the keyboard bracket.

Installing the keyboard

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 keyboard and provide a visual representation of the installation procedure.

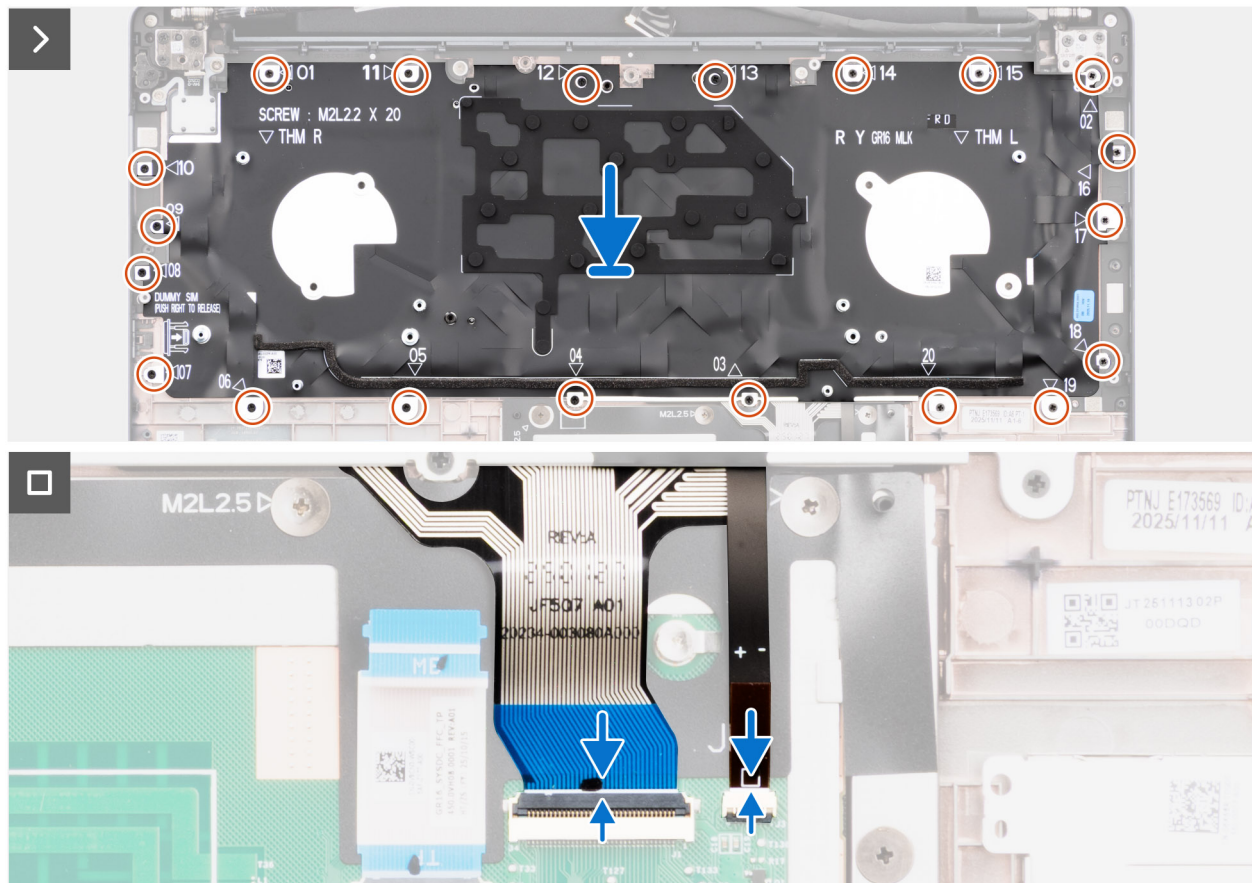


Figure 80. Installing the keyboard

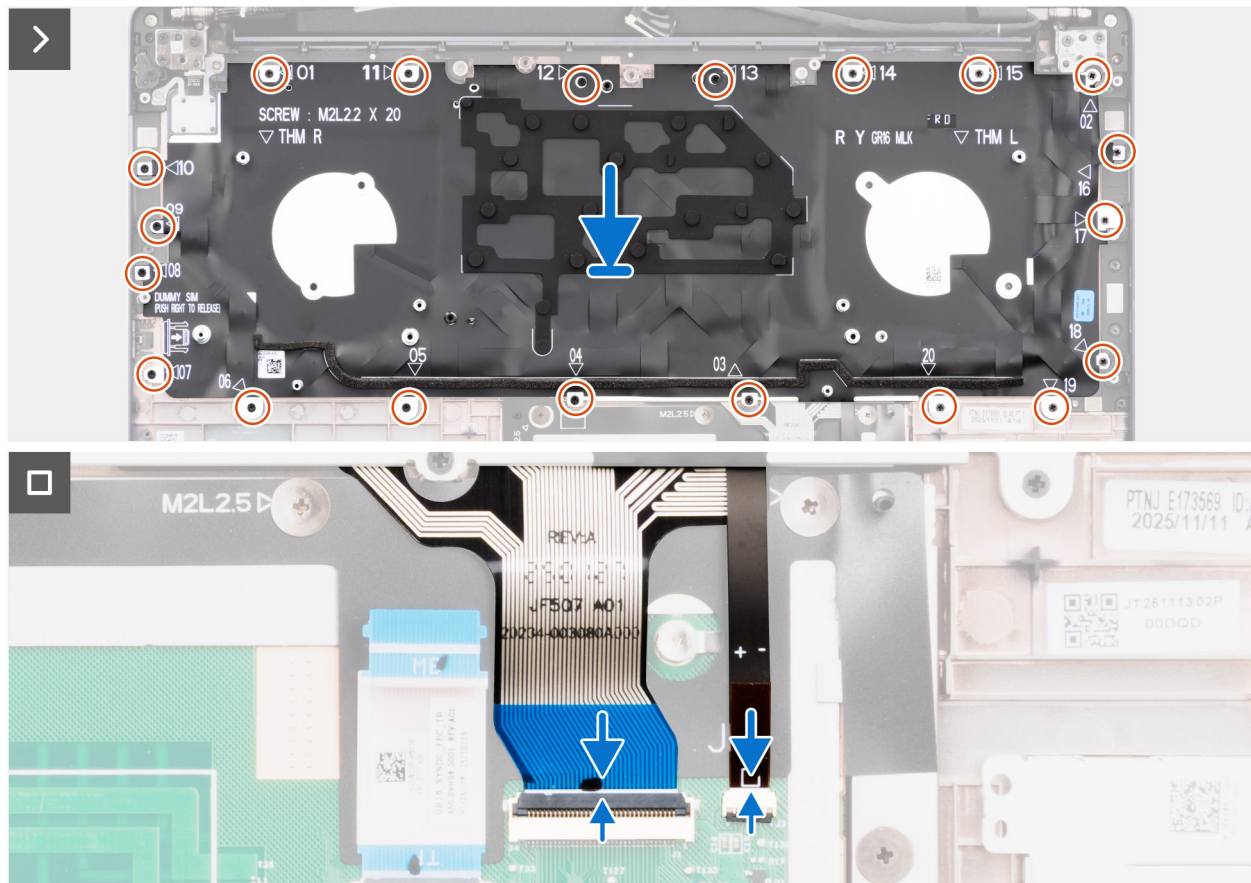


Figure 81. Installing the keyboard

Steps

1. Align and place the keyboard over the keyboard bracket.
2. Replace the nine screws (M2x2.2) to secure the keyboard to the keyboard bracket.
3. Align and place the keyboard assembly in the slot on the palm-rest assembly.
4. Replace the twenty screws (M2x2.2) to secure the keyboard assembly to the palm-rest assembly.
5. Connect the keyboard cable to the connector (KEYBOARD) on the touchpad board.
6. Connect the keyboard-backlight cable to the connector (LIGHTING) on the touchpad board.

NOTE: This step applies only to computers shipped with a backlit keyboard installed.

Next steps

1. Install the [system board](#).
2. Install the [heat sink - integrated](#) or [heat sink - discrete](#), whichever is applicable.
3. Install the [battery frame](#).
4. Install the [wireless card](#).
5. Install the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
6. Install the [memory module](#).
7. Install the [battery](#).
8. Install the [base cover](#).
9. Follow the procedure in [After working inside your computer](#).

Palm-rest assembly

Removing the palm-rest assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory module](#).
5. Remove the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
6. Remove the [wireless card](#).
7. Remove the [speakers](#).
8. Remove the [battery frame](#).
9. Remove the [USH board](#).
10. Remove the [smart-card reader](#), if available.
11. Remove the [heat sink - integrated](#) or [heat sink - discrete](#), whichever is applicable.

NOTE: If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

12. Remove the [display assembly](#).
13. Remove the [system board](#).

NOTE: If you are removing the system board to replace/access other parts, you may remove the system board with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

14. Remove the [keyboard](#).

About this task

NOTE: The palm-rest assembly cannot be further disassembled once all the **Prerequisites** are completed. If the touchpad is malfunctioning and is required to be replaced, replace the entire palm-rest assembly.

The image below shows the palm-rest assembly after the **Prerequisites** have been performed.

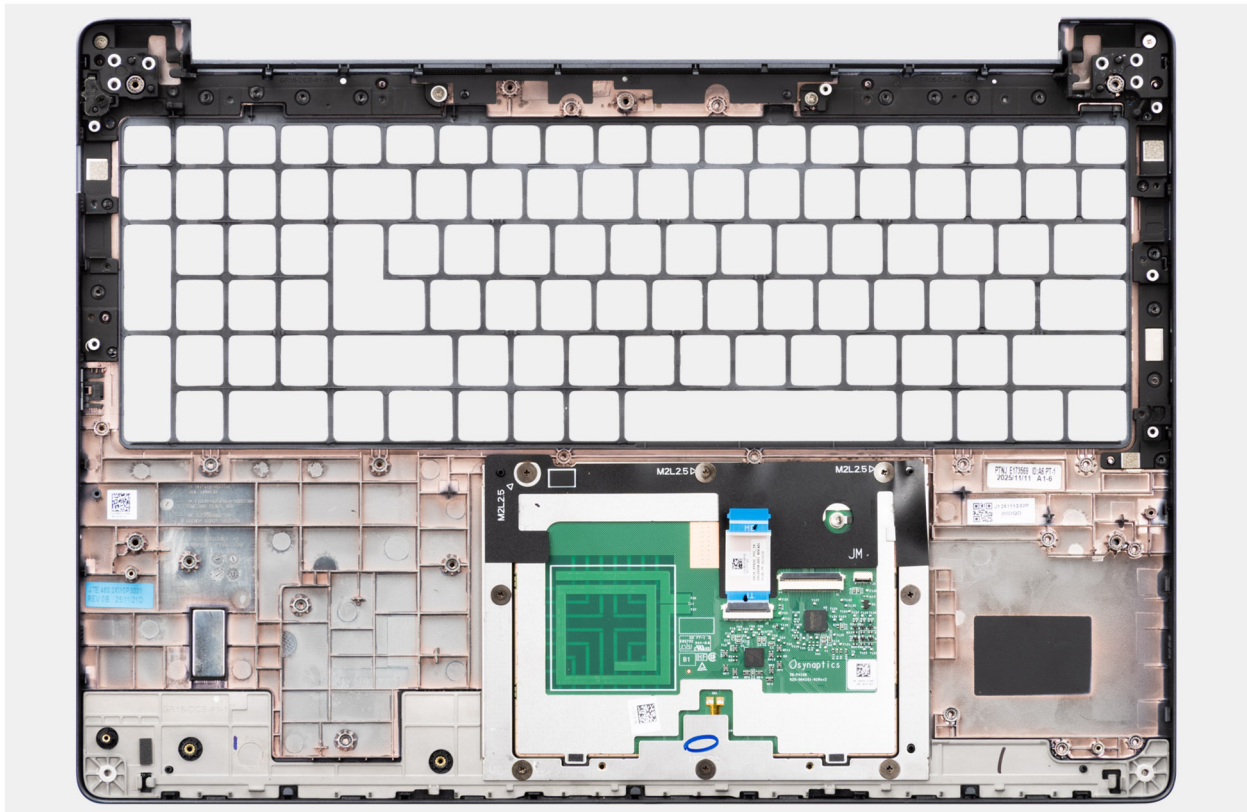


Figure 82. Palm-rest assembly

Steps

After performing the **Prerequisites**, you are left with the palm-rest assembly.

Installing the palm-rest assembly

Prerequisites

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

About this task

NOTE: The system board can be installed with the heat sink attached to it in order to simplify the procedure and preserve the thermal bond between the system board and heat sink.

The image below shows the palm-rest assembly.

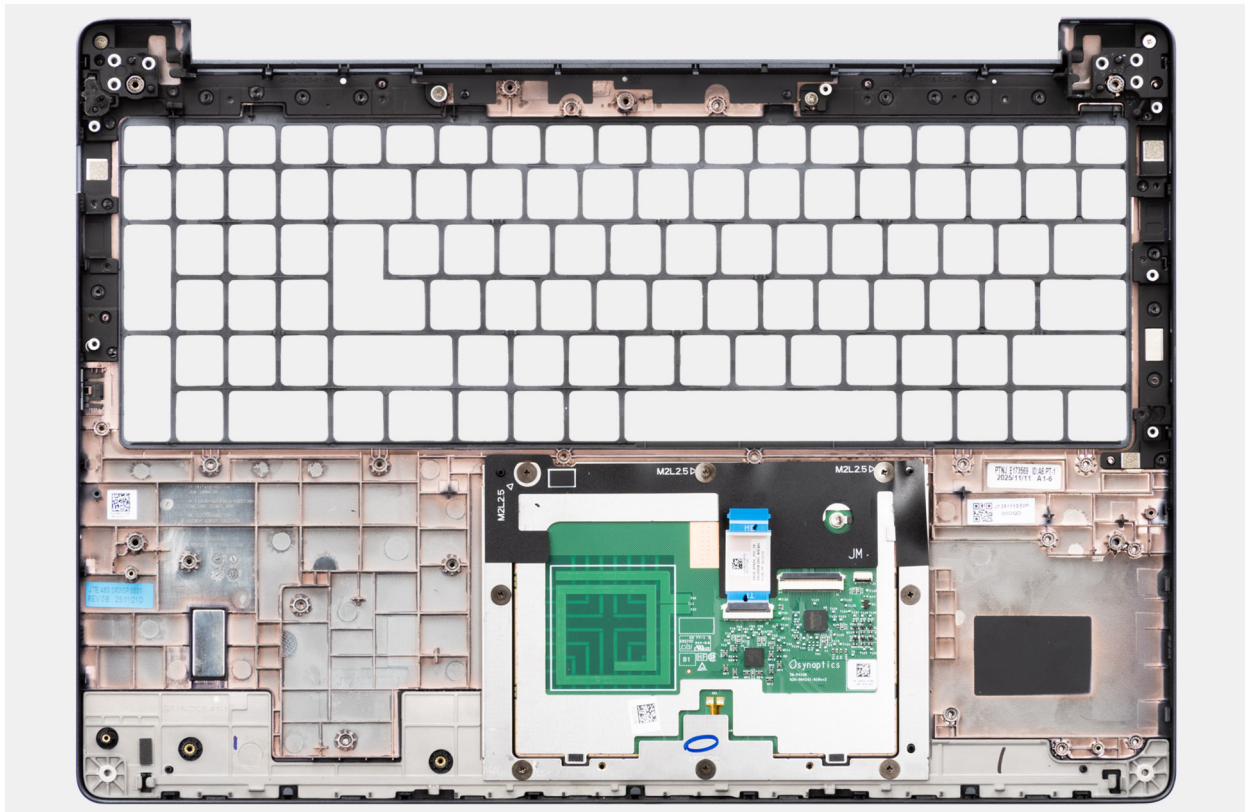


Figure 83. Palm-rest assembly

Steps

Place the palm-rest assembly on a flat surface and perform the **Next steps** to install the palm-rest assembly.

Next steps

1. Install the [keyboard](#).
2. Install the [system board](#).
3. Install the [display assembly](#).
4. Install the [heat sink - integrated](#) or [heat sink - discrete](#), whichever is applicable.
5. Install the [smart-card reader](#), if available.
6. Install the [USH board](#).
7. Install the [battery frame](#).
8. Install the [speakers](#).
9. Install the [wireless card](#).
10. Install the [M.2 2230 solid state drive](#) or [M.2 2280 solid state drive](#), whichever is applicable.
11. Install the [memory module](#).
12. Install the [battery](#).
13. Install the [base cover](#).
14. Follow the procedure in [After working inside your computer](#).

Software

This chapter details the supported operating systems along with instructions on how to install the drivers.

Operating system

Your Dell Pro Precision 5 16 PW516261 supports the following operating systems:

- Windows 11 Home
- Windows 11 Pro
- Ubuntu Linux 24.04 LTS

Drivers and downloads

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

BIOS Setup

 **CAUTION:** Certain changes can make your computer work incorrectly. Before you change the settings in BIOS Setup, it is recommended that you note down the original settings for future reference.

 **NOTE:** Depending on the computer and the installed devices, the options that are listed in below may differ.

Use BIOS Setup for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the capacity of the storage device.
- Change the system configuration information.
- Set or change user-selectable options such as the user password, enabling or disabling base devices, and configuring hard drive settings.

Entering BIOS Setup program

Turn on or restart your computer and press F2 immediately.

Navigation keys

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

Table 4. 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 follows the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.
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 restart the computer.

F12 One Time Boot menu

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

 **NOTE:** If you are unable to enter the One Time Boot menu, repeat the above action.

The One Time Boot menu displays the devices that you can boot from and also display the options to start diagnostics. The boot menu options are:

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

 **NOTE:** XXX denotes the SATA drive number.

- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

The One Time Boot menu screen also displays the option to access BIOS Setup.

View Advanced Setup options

About this task

Some BIOS Setup options are only visible by enabling **Advanced Setup** mode, which is disabled by default.

 **NOTE:** BIOS Setup options, including **Advanced Setup** options, are described in the **System setup options** option.

To enable Advanced Setup:

Steps

1. Enter BIOS Setup.
The Overview menu appears.
2. Click the **Advanced Setup** option to move it to the **ON** mode.
Advanced BIOS Setup options are displayed.

View Service options

About this task

Service options are hidden by default and only visible by entering a hotkey command.

 **NOTE:** Service options are described in [BIOS Setup options](#).

To view Service options:

Steps

1. Enter BIOS Setup.
The **Overview** menu appears.
2. Enter the hotkey combination **Ctrl + Alt + S** to view the **Service** options.
Service options are displayed.

BIOS Setup options

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

 **NOTE:** Depending on your computer and its installed devices, the items that are listed in this section may differ.

Table 5. System Setup options—Overview menu

Overview	
Dell Pro Precision 5 16 PW516261	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.

Table 5. System Setup options—Overview menu (continued)

Overview	
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the Express Service Code of the computer.
Ownership Tag	Displays the Ownership Tag of the computer.
System UUID	Displays the System UUID of the computer.
BATTERY Information	
AC Adapter	Displays whether an AC adapter is connected. If connected, displays the type of AC adapter that is connected.
PROCESSOR Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Processor L2 Cache	Displays the processor Processor L2 Cache.
Processor L3 Cache	Displays the processor Processor L3 Cache.
Microcode Version	Displays the microcode version.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Intel Hyper-Threading Capable	Displays whether the processor is Hyper-Threading (HT) capable.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Intel vPro technology	Displays the processor technology.
MEMORY Information	
Memory Installed	Displays the total memory installed on the computer.
Memory Available	Displays the total memory available on the computer.
Memory Speed	Displays the memory speed.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Memory Technology	Displays the technology that is used for the memory.
DIMM_SLOT A	Displays the memory speed and memory slot type.
DEVICES Information	
Panel Type	Displays the type of display panel available on the computer.
Panel Revision	Displays the type of display revision available on the computer.
Video Controller	Displays the type of video controller available on the computer.
Video Memory	Displays the video memory information of the computer.
Wi-Fi Device	Displays the wireless device information of the computer.
Native Resolution	Displays the native resolution of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.

Table 5. System Setup options—Overview menu (continued)

Overview	
	 NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Audio Controller	Displays the audio controller information of the computer.
Bluetooth Device	Displays the Bluetooth device information of the computer.
LOM MAC Address	Displays the LOM MAC address of the computer.
Pass Through MAC Address	Displays the MAC address of the video pass-through.
dGPU Video Controller	Displays the type of discrete video controller available on the computer.

Table 6. System Setup options—Boot Configuration menu

Boot Configuration	
Boot Sequence	
Boot Mode: UEFI only	Displays the boot mode of the computer.  NOTE: To view this option, enable Service options as described in View Service options .
Boot Sequence	Displays the boot sequence.
Enable PXE Boot Priority	When enabled, any new PXE boot option that is detected by the computer is added to the top of the Boot Sequence. By default, the Enable PXE Boot Priority option is disabled.
Boot Mode: UEFI only	Displays the boot mode of the computer.  NOTE: To view this option, enable Service options as described in View Service options .
Secure Boot	
	Secure Boot is a method of guaranteeing the integrity of the boot path by performing additional validation of the operating system and PCI add-in cards. The computer stops booting to the operating system when a component is not authenticated during the boot process. Secure Boot can be enabled in BIOS setup or using management interfaces like Dell Command Configure, but can only be disabled from BIOS setup.
Enable Secure Boot	Enables the computer to boot using only validated boot software. By default, this Enable Secure Boot option is disabled. For additional security, Dell Technologies recommends keeping the Secure Boot option enabled to ensure that the UEFI firmware validates the operating system during the boot process.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .  NOTE: To enable Secure Boot, the computer must be in UEFI boot mode and the Enable Legacy Option ROMs option must be turned off.
Secure Boot Mode	Enables or disables the Secure Boot operation mode. By default, the Deployed Mode is selected. Deployed Mode should be selected for normal operation of Secure Boot.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Expert Key Management	
Enable Custom Mode	Enables or disables the keys in the PK, KEK, db, and dbx security key databases to be modified.

Table 6. System Setup options—Boot Configuration menu (continued)

Boot Configuration	
	By default, the Enable Custom Mode option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Custom Mode Key Management	Selects the custom values for expert key management. By default, the PK option is selected.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 7. System Setup options—Integrated Devices menu

Integrated Devices	
Date/Time	
Date	Sets the computer date in MM/DD/YYYY format. Changes to the date format take effect immediately.
Time	Sets the computer time in HH/MM/SS 24-hour format. You can select between a 12-hour or 24-hour clock. Changes to the time format take effect immediately.
Camera	
Enable Camera	Enables the camera. By default, the Enable Camera option is enabled.  NOTE: Depending on the configuration ordered, the camera setup option may not be available.
Audio	
Enable Audio	Enables all integrated audio controller. By default, all the options are enabled.
Enable Microphone	Enables the microphone. By default, the Enable Microphone option is enabled.  NOTE: Depending on the configuration ordered, the microphone setup option may not be available.
Enable Internal Speaker	Enables the internal speaker. By default, the Enable Internal Speaker option is enabled.
USB/Thunderbolt Configuration	
Enable USB Boot Support	Enables booting from USB mass storage devices that are connected to external USB ports. By default, the Enable USB Boot Support option is enabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable External USB Ports	Enables the external USB ports. By default, the Enable External USB Ports option is enabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable Thunderbolt Technology Support	
Enable Thunderbolt Technology Support	Enables the associated ports and adapters for Thunderbolt Technology support.

Table 7. System Setup options—Integrated Devices menu (continued)

Integrated Devices	
	By default, the Enable Thunderbolt Technology Support option is enabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable Thunderbolt Boot Support	
Enable Thunderbolt Boot Support	Enables the Thunderbolt adapter-peripheral device and USB devices that are connected to the Thunderbolt adapter to be used during BIOS Preboot. By default, the Enable Thunderbolt Boot Support option is disabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable Thunderbolt (and PCIe behind TBT) pre-boot modules	Enables the PCIe devices that are connected through a Thunderbolt adapter to run the PCIe devices UEFI Option ROM (if present) during preboot. By default, the Enable Thunderbolt (and PCIe behind TBT) pre-boot modules option is disabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Disable USB4 PCIe Tunneling	Disables the USB4 PCIe Tunneling option. By default, the Disable USB4 PCIe Tunneling option is disabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Video/Power only on Type-C Ports	Enables or disables the Type-C port functionality to video or only power. By default, the Video/Power only on Type-C Ports option is disabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Type-C Dock	
Type-C Dock Override	Enables or disables to use connected Type-C Dell Dock to provide data stream with external USB ports disabled. When Type-C Dock override is enabled, the Video/Audio/LAN submenu is activated. By default, the Type-C Dock Override option is enabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Type-C Dock LAN	Enables or disables the usage of LAN on the external ports of the connected Type-C Dell docking station. By default, the Type-C Dock LAN option is enabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Miscellaneous Devices	
Enable Fingerprint Reader Device	Enables or disables the Fingerprint Reader Device option. By default, the Enable Fingerprint Reader Device option is enabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 8. System Setup options—Storage menu

Storage	
SATA/NVMe Operation	
SATA/NVMe Operation	Sets the operating mode of the integrated SATA hard drive controller. By default, the Raid On option is selected.
Storage Interface	
Port Enablement	Enables or disables the M.2 PCIe SSD option. By default, the M.2 PCIe SSD option is enabled.
Drive Information	
	Displays the information of onboard drives.

Table 9. System Setup options—Display menu

Display	
Touchscreen	Enables or disables the touch screen option. By default, the Touchscreen option is enabled.  NOTE: Only available on computers with touch screen displays.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Full Screen Logo	Enables or disables the computer to display full screen logo, if the image matches screen resolution. By default, the Full Screen Logo option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 10. System Setup options—Connection menu

Connection	
Network Controller Configuration	
Integrated NIC	Enables or disables the onboard LAN controller. By default, the Integrated NIC option is set to Enabled with PXE.
Wireless Device Enable	
WLAN	Enables or disables the internal WLAN device. By default, the WLAN option is enabled.
Bluetooth	Enables or disables the internal Bluetooth device. By default, the Bluetooth option is enabled.
Wireless Radio Control	
Control WLAN Radio	Allows the computer to detect a wired network connection and then disable the selected wireless radios (WLAN and/or WWAN). Upon disconnection from the wired network, the selected wireless radios are re-enabled. By default, the Control WLAN Radio option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
HTTP(s) Boot Feature	

Table 10. System Setup options—Connection menu (continued)

Connection	
HTTP(s) Boot	When enabled, supports HTTP(s) boot on the client BIOS, which offers wired or wireless and HTTP/HTTPS connection options. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
HTTP(s) Boot Modes	In Auto Mode, the boot URL is obtained from the DHCP response; the boot URL specifies the HTTP Boot Server and location of the Network Boot Program (NBP) file. In Manual mode, the user enters the URL in the text box, which must start with <code>http://</code> or <code>https://</code> and end with the NBP file name. By default, Auto Mode is selected. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 11. System Setup options—Power menu

Power	
Battery Configuration	Enables or disables the computer 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 selected. Battery settings are adaptively optimized based on your typical battery usage pattern.
Advanced Configuration	
Enable Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. When enabled, Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day. By default, the Enable Advanced Battery Charge Configuration option is disabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Peak Shift	
Enable Peak Shift	Enables the computer to switch to battery power automatically during peak energy usage hours. By default, the Enable Peak Shift option is disabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable USB PowerShare	Enables or disables the USB PowerShare on the computer. By default, the USB Powershare option is disabled.
Thermal Management	Allows you to manage the fan settings to regulate processor temperature and control computer performance, noise, and thermal levels. By default, the Optimized option is selected.
USB Wake Support	
Wake on Dell USB-C Dock	When enabled, connecting a Dell USB-C Dock wakes the computer from Standby, Hibernate, and Power Off. By default, the Wake on Dell USB-C Dock option is enabled. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Lid Switch	

Table 11. System Setup options—Power menu (continued)

Power	
Enable Lid Switch	Enables or disables the Lid Switch. By default, the Enable Lid Switch option is enabled.
Power On Lid Open	When enabled, allows the computer to turn on from the off state whenever the lid is opened. By default, the Power On Lid Open option is enabled.

Table 12. System Setup options—Security menu

Security	
TPM 2.0 Security	Trusted Platform Module (TPM) is a security device that stores computer-generated keys for encryption and features such as BitLocker, Virtual Secure Mode, remote Attestation. By default, the TPM 2.0 Security option is enabled. For additional security, Dell Technologies recommends keeping the Trusted Platform Module (TPM) enabled to allow these security technologies to fully function.
TPM 2.0 Security On	Enables or disables the TPM. By default, the TPM 2.0 Security On option is enabled. For additional security, Dell Technologies recommends keeping TPM enabled to allow these security technologies to fully function.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Physical Presence Interface (PPI) Bypass for Clear Commands	The PPI Bypass for Clear Commands option allows the operating system to manage certain aspects of PTT. When enabled, you are not prompted to confirm changes to the PTT configuration. By default, the PPI Bypass for Clear Commands option is disabled. For additional security, Dell Technologies recommends keeping the PPI Bypass for Clear Commands option disabled.
Intel Total Memory Encryption	Enables or disables the processor's memory encryption feature. By default, the Intel Total Memory Encryption option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Chassis Intrusion	
Chassis Intrusion	Enables or disables the detection of chassis intrusion events. This feature notifies the user when the base cover has been removed from the computer. When set to Enabled, a notification is displayed on the next boot and the event is logged in the BIOS Events log. When set to Disabled, no notification is displayed and no event is logged in the BIOS Events log. When set to On-Silent, the event is logged in the BIOS Events log, but no notification is displayed. By default, the Chassis Intrusion Detection option is disabled. For additional security, Dell Technologies recommends keeping the Chassis Intrusion option enabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 12. System Setup options—Security menu (continued)

Security	
Data Wipe on Next Boot	
Start Data Wipe	Data Wipe is a secure wipe operation that deletes information from a storage device.  CAUTION: The secure Data Wipe operation deletes information in a way that it cannot be reconstructed. Commands such as delete and format in the operating system may remove files from showing up in the file system. However, they can be reconstructed through forensic means as they are still represented on the physical media. Data Wipe prevents this reconstruction and the data can no longer be recovered. When enabled, the data wipe option provides prompts to wipe any storage devices that are connected to the computer on the next boot. By default, the Start Data Wipe option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
HDD Security	
SED Block SID Authentication	Controls whether Block SID protection is applied to Self-Encrypting Drives (SEDs) to prevent unauthorized ownership and password changes. When enabled, the drive remains locked until BIOS-authorized access is granted; when disabled, external software can manage the drive without BIOS intervention.
PPI Bypass for SED Block SID Command	Controls whether user confirmation is required for Block SID PPI requests from external SED management software. When enabled, requests are processed automatically; when disabled, user approval is required before allowing temporary drive unlock or ownership changes.
Absolute	Absolute Software provides various cyber security solutions, some requiring software preloaded on Dell computers and integrated into the BIOS. To use these features, you must enable the Absolute BIOS setting and contact Absolute for configuration and activation. By default, the Absolute option is enabled. For additional security, Dell Technologies recommends keeping the Absolute option enabled.  WARNING: The Permanently Disabled option can only be selected once. When Permanently Disabled is selected, Absolute Persistence cannot be reenabled. No further changes to the Enable/Disable states are allowed.  NOTE: The Enable/Disable options are unavailable while the computer is in the activated state.  NOTE: When the Absolute features are activated, the Absolute integration cannot be disabled from the BIOS Setup screen.
UEFI Boot Path Security	Enables or disables the computer to prompt the user to enter the Administrator password (if set) when booting to a UEFI boot path device from the F12 boot menu. By default, the Always Except Internal HDD option is enabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Authenticated BIOS Interface	
Enable Authenticated BIOS Interface	Enables or disables the authenticated BIOS Interface.

Table 12. System Setup options—Security menu (continued)

Security	
	By default, the Enable Authenticated BIOS Interface option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Legacy Manageability Interface Access	Allows access to the Legacy Manageability Interface.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Firmware Device Tamper Detection	Allows you to control the firmware device tamper detection feature. This feature notifies the user when the firmware device is tampered. When enabled, a screen warning message is displayed on the computer and a tamper detection event is logged in the BIOS Events log. The computer fails to reboot until the event is cleared. By default, the Firmware Device Tamper Detection option is enabled. For additional security, Dell Technologies recommends keeping the Firmware Device Tamper Detection option enabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Clear Firmware Device Tamper Detection	Allows you to clear the events that are logged when tampering of firmware device is detected. By default, the Clear Firmware Device Tamper Detection option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Pluton Security Processor	Enables or disables Pluton Security Processor.

Table 13. System Setup options—Passwords menu

Passwords	
Administrator Password	The Administrator Password prevents unauthorized access to the BIOS Setup options. Once the administrator password is set, the BIOS Setup options can only be modified after providing the correct password. The following rules and dependencies apply to the Administrator Password - • The administrator password cannot be set if computer and/or internal storage device passwords are already set. • The administrator password can be used in place of the system and/or internal storage passwords. • When set, the administrator password must be provided during a firmware update. • Clearing the administrator password also clears the system password (if set). Dell Technologies recommends using an administrator password to prevent unauthorized changes to BIOS Setup options.
System Password	The System Password prevents the computer from booting to an operating system without entering the correct password. The following rules and dependencies apply when the System Password is used - • The computer shuts down when idle for approximately 10 minutes at the system password prompt. • The computer shuts down after three incorrect attempts to enter the system password. • The computer shuts down when the Esc key is pressed at the System Password prompt.

Table 13. System Setup options—Passwords menu (continued)

Passwords	
	The system password is not prompted when the computer resumes from standby mode. Dell Technologies recommends using the system password in situations where it is likely that a computer may be lost or stolen.
M.2 PCIe SSD-1	The M.2 PCIe SSD-1 password prevents the computer from booting to an operating system without entering the correct password. The following rules and dependencies apply when the System Password is used - - The computer shuts down when idle for approximately 10 minutes at the system password prompt. - The computer shuts down after three incorrect attempts to enter the system password. - The computer shuts down when the Esc key is pressed at the System Password prompt. - The system password is not prompted when the computer resumes from standby mode. Dell Technologies recommends using the system password in situations where it is likely that a computer may be lost or stolen.
Password Configuration	The Password configuration page includes several options for changing the requirements of BIOS passwords. You can modify the minimum and maximum length of the passwords as well as require passwords to contain certain character classes (upper case, lower case, digit, special character). When the Lower Case Letter option is enabled, the password requires at least one lower case letter. When the Upper Case Letter option is enabled, the password requires at least one upper case letter. When the Digit option is enabled, the password requires at least one numeric digit. When the Special Character option is enabled, the password requires at least one special character from the set: !"#\$%&'()*+,-./:;<=>?@[\\]^_`{ }~. When setting Minimum Characters for password length, Dell Technologies recommends setting the minimum password length to at least eight characters.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable Master Password Lockout	The Master Password Lockout option allows you to disable the Recovery Password feature. If the system, administrator, or hard drive password is forgotten, the computer becomes unusable.  NOTE: When the owner password is set, the Master Password Lockout option is not available.  NOTE: When an internal hard drive password is set, it must first be cleared before Master Password Lockout can be changed. By default, the Enable Master Password Lockout option is disabled. Dell Technologies does not recommend enabling the Master Password Lockout unless you have implemented your own password recovery system.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 14. System Setup options—Update, Recovery menu

Update, Recovery	
BIOS Downgrade	
Allow BIOS Downgrade	Allows downgrading of the system firmware to previous revisions. By default, the Allow BIOS Downgrade option is enabled.
SupportAssist OS Recovery	Enables or disables the boot flow for SupportAssist OS Recovery tool if certain system errors occur. By default, the SupportAssist OS Recovery option is enabled.
BIOSConnect	Enables or disables 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 OS Recovery Threshold setup option and local service operating system does not boot or is not installed. By default, the BIOSConnect option is enabled.
Dell Auto OS Recovery Threshold	Allows the control of the automatic boot flow for the SupportAssist System Resolution Console and the Dell OS Recovery Tool. By default, the Dell Auto OS Recovery Threshold value is set to 2 .  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .

Table 15. System Setup options—System Management menu

System Management	
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Creates a computer Asset Tag that an IT administrator can use to uniquely identify a particular computer.  NOTE: Once set in the BIOS, the Asset Tag cannot be changed.
Wake on AC	Enables or disables the computer to turn on and go to boot when AC power is supplied to the computer. By default, the Wake on AC option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Wake on LAN	Enables or disables the computer to turn on by a special LAN signal. By default, the Wake on LAN option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .
Auto On Time	Enable to set the computer 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 Auto On Time option is disabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options .

Table 16. System Setup options—Keyboard menu

Keyboard	
Fn Lock Options	Enables or disables the Fn Lock option. By default, the Fn Lock option is enabled.

Table 16. System Setup options—Keyboard menu (continued)

Keyboard	
Lock Mode	By default, the Lock Mode Secondary option is enabled. With this option, the F1-F12 keys scan the code for their secondary functions.
Keyboard Backlight Timeout on Battery	Sets the timeout value for the keyboard backlight when the computer is running only on the battery power. The keyboard backlight timeout value is only effective when the backlight is enabled. By default, the 10 seconds option is selected.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Device Configuration HotKey Access	Allows you to control whether you can access device configuration screens through hotkeys during system startup. By default, the Device Configuration HotKey Access option is enabled.  NOTE: This setting controls only the Intel RAID (CTRL+I), MEBX (CTRL+P), and LSI RAID (CTRL+C) Option ROMs. Other preboot Option ROMs, which support entry using a key sequence, are not affected by this setting.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 17. System Setup options—Pre-boot Behavior menu

Pre-boot Behavior	
Adapter Warnings	
Enable Dock Warning Messages	Enables the warning messages during boot when the adapters with less power capacity are detected. By default, the Enable Dock Warning Messages option is enabled.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Warnings and Errors	Enables or disables the action to be taken when a warning or error is encountered. By default, the Prompt on Warnings and Errors option is selected.  NOTE: Errors deemed critical to the operation of the computer hardware stop the functioning of the computer.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Extend BIOS POST Time	Sets the BIOS POST (Power-On Self-Test) load time. By default, the 0 seconds option is selected.  NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
MAC Address Pass-Through	Replaces the external NIC MAC address (in a supported dock or dongle) with the selected MAC address from the computer. By default, the System Unique MAC Address option is selected.
Show Ownership Tag with Logo	Displays the Ownership Tag with Logo.

Table 18. System Setup options—Virtualization menu

Virtualization Support
DMA Protection

Table 18. System Setup options—Virtualization menu (continued)

Virtualization Support	
Enable Pre-Boot DMA Support	Allows you to control the Pre-Boot DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. NOTE: This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the Enable Pre-Boot DMA Support option is enabled. For additional security, Dell Technologies recommends keeping the Enable Pre-Boot DMA Support option enabled. NOTE: This option is provided only for compatibility purposes, since some older hardware is not DMA capable. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Enable OS Kernel DMA Support	Allows you to control the Kernel DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. For operating systems that support DMA protection, this setting indicates to the operating system that the BIOS supports the feature. NOTE: This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the Enable OS Kernel DMA Support option is enabled. NOTE: This option is provided only for compatibility purposes, since some older hardware is not DMA capable. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Internal Port DMA Compatibility Mode	When enabled, BIOS will notify the operating system if the internal ports are not DMA capable. NOTE: This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the Internal Port DMA Compatibility Mode option is disabled. NOTE: This option is provided only for compatibility purposes, since some older hardware is not DMA capable. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.

Table 19. System Setup options—Performance menu

Performance	
Intel SpeedStep	
Enable Intel SpeedStep Technology	Enables the computer to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production. By default, the Enable Intel SpeedStep Technology option is enabled. NOTE: To view this option, enable Service options as described in View Advanced Setup options.
Enable Adaptive C-States for Discrete Graphics	Enables the ability of the CPU to dynamically detect high usage of a discrete graphic and adjust system parameters for higher performance. By default, the Enable Adaptive C-States for Discrete Graphics option is enabled. NOTE: To view this option, enable Service options as described in View Advanced Setup options.

Table 20. System Setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear BIOS Event Log	Select the option to keep or clear BIOS events logs. By default, the Keep Log option is selected. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Thermal Event Log	
Clear Thermal Event Log	Select the option to keep or clear thermal events logs. By default, the Keep Log option is selected. NOTE: To view this option, enable Advanced Setup mode as described in View Advanced Setup options.
Power Event Log	
Clear Power Event Log	Select the option to keep or clear power events logs. By default, the Keep Log option is selected. NOTE: To view this option, enable View Advanced Setup optionsAdvanced Setup mode as described in View Advanced Setup options.

Updating the BIOS

Updating the BIOS in Windows

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the BitLocker key is not recognized the next time you reboot the computer. You will then be prompted to enter the recovery key to proceed, and the computer displays a prompt for the recovery key on each reboot. Failure to provide the recovery key can result in data loss or an operating system reinstall. For more information, refer [Updating the BIOS on Dell systems with BitLocker enabled](#).

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

Steps

- Go to [Dell Support Site](#).
 - Go to **Identify your product or ask support**. In the box, enter the product identifier, model, service request or describe what you are looking for, and then click **Search**.

NOTE: If you do not have the Service Tag, click **Detect This PC**. The site automatically detects your device, and you can then click **Explore Product Support** to go to the support page for your device. You can also use the product ID or manually browse for your computer model.
 - Click **Drivers & Downloads**.
 - Select the operating system installed on your computer.
 - In the **Category** drop-down list, select **BIOS**.
 - Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
 - After the download is complete, navigate to the folder where the BIOS update file has been saved.
 - Double-click the BIOS update file and follow the on-screen instructions.
- For more information, search [Dell Support Site](#).

Updating the BIOS using the USB drive in Windows

About this task

-  **CAUTION:** If BitLocker is not suspended before updating the BIOS, the BitLocker key is not recognized the next time you reboot the computer. You will then be prompted to enter the recovery key to proceed, and the computer displays a prompt for the recovery key on each reboot. Failure to provide the recovery key can result in data loss or an operating system reinstall. For more information, refer [Updating the BIOS on Dell systems with BitLocker enabled](#).
-  **CAUTION:** Do not turn off the computer during the BIOS flash update process. The computer may not boot if you turn off your computer.

Steps

1. Go to [Dell Support Site](#).
2. Go to **Identify your product or ask support**. In the box, enter the product identifier, model, service request or describe what you are looking for, and then click **Search**.

 **NOTE:** If you do not have the Service Tag, click **Detect This PC**. The site automatically detects your device, and you can then click **Explore Product Support** to go to the support page for your device. You can also use the product ID or manually browse for your computer model.
3. Click **Drivers & Downloads**.
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. Create a bootable USB drive. For more information, search [Dell Support Site](#).
8. Copy the BIOS setup program file to the bootable USB drive.
9. Connect the bootable USB drive to the computer that needs the BIOS update.
10. Restart the computer and press **F12**.
11. Select the USB drive from the **One Time Boot Menu**.
12. Type the BIOS setup program filename and press **Enter**.
The **BIOS Update Utility** appears.
13. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the One-Time boot menu

To update the BIOS from the One-Time boot menu, see [Updating the BIOS from the One Time Boot Menu](#) at [Dell Support Site](#).

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see [How to Update the Dell BIOS in the Ubuntu or Linux Environment](#) at [Dell Support Site](#).

System and setup password

-  **CAUTION:** The password features provide a basic level of security for the data on your computer.
-  **CAUTION:** Ensure that your computer is locked when it is not in use. Anyone can access the data that is stored on your computer, when left unattended.

Table 21. System and setup password

Password type	Description
System password	Password that you must enter to boot to your operating system.
Setup password	Password that you must enter to access and change the BIOS settings of your computer.

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

 **NOTE:** The System and setup password feature is disabled by default.

Assigning a System Setup password

Prerequisites

You can assign a new System or Admin Password only when the status is set to **Not Set**. To enter BIOS System Setup, press F2 immediately after a power-on or reboot.

Steps

1. To enter the **System Setup**, press **F2** immediately after a power-on or reboot.
2. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
The **Security** screen is displayed.
3. Select **System/Admin Password** and create a password in the **Enter the new password** field.
Use the following guidelines to create the system password:
 - Password can be up to 32 characters.
 - Password must contain at least one special character: "(! " # \$ % & ' * + , - . / : ; < = > ? @ [\] ^ _ ` { | })")"
 - The password can contain numbers from 0 to 9.
 - The password can contain alphabets A to Z and a to z.
4. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
5. Press Y to save the changes.
The computer restarts.

Deleting or changing an existing system password or setup password

Prerequisites

Ensure that the **Password Status** is Unlocked in the System Setup before attempting to delete or change the existing system password and/or setup password. You cannot delete or change an existing system password or setup password if the **Password Status** is Locked. To enter the System Setup, press F2 immediately after a power-on or reboot.

Steps

1. To enter the **System Setup**, press **F2** immediately after a power-on or reboot.
2. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
The **System Security** screen is displayed.
3. In the **System Security** screen, verify that the **Password Status** is Unlocked.
4. Select **System Password**. Update or delete the existing system password, and press Enter or Tab.
5. Select **Setup Password**. Update or delete the existing setup password, and press Enter or Tab.

 **NOTE:** If you change the system password and/or setup password, reenter the new password when prompted. If you delete the system password and/or setup password, confirm the deletion when prompted.

6. Press Esc. A message prompts you to save the changes.
7. Press Y to save the changes and exit from **System Setup**.

The computer restarts.

Clearing system and setup passwords

About this task

To clear the system or setup passwords, contact Dell technical support as described at [Contact Support](#).

 **NOTE:** For information about how to reset Windows or application passwords, see the documentation accompanying Windows or your application.

Clearing CMOS settings

About this task

 **CAUTION:** Clearing CMOS settings resets the BIOS settings on your computer.

Steps

1. Remove the base cover.
2. Disconnect the battery cable from the system board.
3. Remove the coin-cell battery.
4. Wait for one minute.
5. Replace the coin-cell battery.
6. Connect the battery cable to the system board.
7. Replace the base cover.

Troubleshooting

Handling swollen rechargeable Li-ion batteries

Like most laptops, Dell laptops use Lithium-ion batteries. One type of Lithium-ion battery is the rechargeable Li-ion battery. Rechargeable Li-ion batteries have increased in popularity in recent years and have become a standard in the electronics industry due to customer preferences for a slim form factor (especially with newer ultra-thin laptops) and long battery life. Inherent to rechargeable Li-ion battery technology is the potential for swelling of the battery cells.

A swollen battery may impact the performance of the laptop. To prevent possible further damage to the device enclosure or internal components leading to malfunction, discontinue the use of the laptop and discharge it by disconnecting the AC adapter and letting the battery drain.

Swollen batteries should not be used and must be replaced and disposed of properly. We recommend contacting Dell Support for options to replace a swollen battery under the terms of the applicable warranty or service contract, including options for replacement by a Dell authorized service technician.

The guidelines for handling and replacing rechargeable Li-ion batteries are as follows:

- Exercise caution when handling rechargeable Li-ion batteries.
- Discharge the battery before removing it from the laptop. To discharge the battery, unplug the AC adapter from the computer and operate the computer only on battery power. The battery is fully discharged when the computer no longer turns on when the power button is pressed.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any type to pry on or against the battery.
- If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a battery can be dangerous.
- Do not attempt to reassemble a damaged or swollen battery into a laptop.
- Swollen batteries that are covered under warranty should be returned to Dell in an approved shipping container (provided by Dell)—this is to comply with transportation regulations. Swollen batteries that are not covered under warranty should be disposed of at an approved recycling center. Contact Dell Support at [Dell Support Site](#) for assistance and further instructions.
- Using a non-Dell or incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell that is designed to work with your Dell computer. Do not use a battery from other computers with your computer. Always purchase genuine batteries from [Dell Site](#) or otherwise directly from Dell.

Rechargeable Li-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high heat. For more information about how to improve the performance and lifespan of the laptop battery and to minimize the possibility of occurrence of the issue, search Dell laptop battery at [Dell Support Site](#).

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 within the BIOS and launched by the BIOS internally. The embedded system diagnostics provides options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode.
- Repeat the tests.
- Display or save test results.
- Run thorough tests to add more options and obtain details about any failed devices.

- View status messages that inform you when the 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 when the diagnostic tests are performed.

For more information, see [How to Run Dell Preboot Diagnostics and Hardware Tests on Your Dell Computer](#).

Running the SupportAssist Pre-Boot System Performance Check

Steps

1. Turn on your computer.
2. As the computer boots, press the F12 key.
3. On the boot menu screen, select **Diagnostics**.
The quick diagnostic test begins.

NOTE: For more information about running the SupportAssist Pre-Boot System Performance Check on a specific device, see [Dell Support Site](#).
4. If there are any issues, error codes are displayed.
Note the error code and validation number and contact Dell.

Built-in self-test (BIST)

Motherboard Built-In Self-Test (M-BIST)

M-BIST is the system board onboard self-test diagnostics tool that improves the diagnostics accuracy of system board Embedded Controller (EC) failures.

- NOTE:** M-BIST can be manually initiated before Power On Self-Test (POST).

How to run M-BIST

- NOTE:** Before initiating M-BIST, ensure that the computer is in a power-off state.
1. Press and hold both the **M** key and the power button to initiate M-BIST.
 2. The battery-status light may exhibit two states:
 - Off: No fault was detected.
 - Amber and White: Indicates a problem with the system board.
 3. If there is a failure with the system board, the battery-status light flashes one of the following error codes for 30 seconds:

Table 22. LED error codes

Blinking Pattern		Possible Problem
Amber	White	
2	1	Processor Failure
2	8	LCD Power rail failure
1	1	TPM detection failure
2	4	Memory/RAM failure

4. If there is no failure with the system board, the LCD cycles through the solid color screens (that are described in the LCD-BIST) for 30 seconds and then turn off.

LCD Built-in Self-Test (LCD-BIST)

Dell laptops have a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with the LCD (screen) of the Dell laptop or with the video card (GPU) and computer settings.

When you notice screen abnormalities like flickering, distortion, clarity issues, fuzzy or blurry image, horizontal or vertical lines, color fade, it is always a good practice to isolate the LCD (screen) by running the LCD-BIST.

How to invoke the LCD-BIST

1. Turn off your computer.
2. Disconnect any peripherals that are connected to the computer. Connect only the AC adapter (charger) to the computer.
3. Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold the **D** key and press the power button to enter LCD-BIST mode. Continue to hold the **D** key until the computer boots up.
5. The screen displays solid colors and changes colors on the entire screen to white, black, red, green, and blue twice.
6. Then it displays the colors white, black, and red.
7. Carefully inspect the screen for abnormalities (any lines, fuzzy color, or distortion on the screen).
8. At the end of the last solid color (red), the computer shuts down.

 **NOTE:** Dell SupportAssist Preboot diagnostics upon launch initiates an LCD-BIST first, expecting a user intervention to confirm functionality of the LCD.

Logic Built-in Self-test (L-BIST)

L-BIST is an enhancement to the single LED error code diagnostics and is automatically initiated during POST. L-BIST will check the LCD power rail. If there is no power being supplied to the LCD (that is if the L-BIST circuit fails), the battery status LED flashes either an error code [2,8] or an error code [2,7].

 **NOTE:** If L-BIST fails, LCD-BIST cannot function as no power will be supplied to the LCD.

How to invoke the L-BIST

1. Turn on your computer.
2. If the computer does not start up look at the battery status LED:
 - If the battery status LED flashes an error code [2,7], the display cable may not be connected properly.
 - If the battery status LED flashes an error code [2,8], there is a failure on the LCD power rail of the system board, hence there is no power that is supplied to the LCD.
3. For cases, when a [2,7] error code is shown, check to see if the display cable is properly connected.
4. For cases when a [2,8] error code is shown, replace the system board.

System-diagnostic lights

This section lists the system-diagnostic lights of your Dell Pro Precision 5 16 PW516261.

The following table shows different Service LED blinking patterns and associated problems. The diagnostic light codes consist of a two-digit number, and the digits are separated by a comma. The number stands for a blinking pattern; the first digit shows the number of blinks in amber color, and the second digit shows the number of blinks in white color. The Service LED blinks in the following manner:

- The Service LED blinks the number of times equal to the value of the first digit and turns off with a short pause.
- After that, the Service LED blinks the number of times equal to the value of the second digit.
- The Service LED turns off again with a longer pause.
- After the second pause, the blinking pattern will be repeated.

Table 23. Diagnostic light codes

Diagnostic light codes (Amber, White)	Problem description
1,1	TPM Detection Failure
1,2	Unrecoverable SPI Flash Failure
1,3	The camera-cable overcurrent protection (OCP1) was triggered. The camera module along with its cable may be damaged.
1,4	The hinge-cable overcurrent protection (OCP) was triggered. The hinge cable may be damaged.
1,5	EC unable to program i-Fuse
1,6	Generic catch-all for ungraceful EC code flow errors
1,7	Non-RPMC Flash on Boot Guard fused system
1,8	Chipset "Catastrophic Error" signal has tripped
2,1	CPU configuration or CPU failure
2,2	System board: BIOS or Read-Only Memory (ROM) failure
2,3	No memory, or Random-Access Memory (RAM) detected
2,4	Memory, or Random-Access Memory (RAM) failure
2,5	Invalid memory module
2,6	System board/Chipset Error
2,7	LCD failure SBIOS message
2,8	Display power-rail failure on the system board
3,1	CMOS battery failure
3,2	PCI of Video card/chip failure
3,3	Recovery image not found
3,4	Recovery image found but invalid
3,5	EC power-rail error
3,6	Flash corruption detected by SBIOS
3,7	Timeout waiting on ME to reply to HECI message
4,1	Memory DIMM power rail failure
4,2	CPU Power cable connection issue
4,3	LCD panel failure
4,4	Cable and power-rail failure
4,5	LCD power rail, cable and LCD panel failure
4,6	LCD cable failure
5,2	EC detects an invalid platform ID

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 on Dell computers running the 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, and 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 the 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 [Serviceability Tools at the Dell Support Site](#). Click **SupportAssist** and then click **SupportAssist OS Recovery**.

NOTE: Windows 11 IoT Enterprise LTSC 2024 and Dell ThinOS 10 do not support Dell SupportAssist. For more information about recovering ThinOS 10, see [Recovery mode using R-Key](#).

Chromebook storage

Overview

Dell Technologies recommends that customers prepare their Chromebooks for long-term storage (or summer break). This best practice eliminates the possibility of battery issues when Chromebooks are put back into service.

The following are a few steps to prepare your Chromebooks for long-term storage:

1. Update to the latest version of the ChromeOS.
2. Charge your Chromebooks so that the battery is at least 80% full. This ensures that even when the battery discharges while unplugged over the summer, power is not fully depleted.
3. DO NOT physically remove the battery from the Chromebook for storage.

NOTE: Failure to follow these steps could cause your batteries to reach a critically low charge when the Chromebook is stored for long periods of time, and can result in permanent failure of the battery. Dell provides a standard 1-year warranty on batteries. Batteries are a consumable item. All batteries degrade with time and use. For more information, see [Dell Support Site](#).

Battery management

Chromebook batteries, after the first power-up will slowly discharge even after the computer is turned off. If the battery is allowed to discharge below 1%, it may enter a permanent failure mode rendering it useless.

Simultaneously, do not keep Chromebooks plugged into a cart or charger if they are in storage for months. This reduces battery life and can lead to other issues. If you are storing Chromebooks for a long time, charge them to at least 80% and unplug them from a battery source.

Dell Technologies recommends that customers properly prepare their Chromebooks for long-term storage. This best practice should eliminate or reduce the possibility of premature battery failure.

Chromebook battery long-term storage - best practices

The following suggestions are provided depending on your long-term storage usage to mitigate the number of Chromebooks that need to be put into storage mode:

Classroom storage:

If the Chromebooks are being stored in the classroom such as on a cart or other storage means, if possible (depending on the age of the student), have the teacher walk through the step with the students on the last day of use. Otherwise depending on the size of the class, have the teacher or maybe a teacher's aid follow the process.

Student takes the the system home for summer break:

Provide the process to the student who will take the Chromebook home. Suggest a letter that can be sent home with the student advising of the process.

1. If the student is going to use the Chromebook over the summer, this would not be a concern.
2. If the student is going to store the Chromebook at home over the summer, it is best to be put in storage mode.

IT department storage (student turns in Chromebook):

If the students turn the Chromebook into the IT dept or lab, you could do the following to avoid additional work load on the IT staff:

1. Have the teacher assist with putting Chromebooks into storage mode before turning them in (similar to Classroom storage), or have the IT team provide steps to put the Chromebook into storage mode.
2. IT team can later press the power button to ensure that it is in storage mode.

Preparing the Chromebook for long-term storage

Prerequisites

Update your Chromebook to the latest version of the ChromeOS and charge so that the battery is at least 80% full. This ensures that even when the battery discharges while unplugged over the summer, power is not fully depleted.

In order to slow the discharge rate during storage, use the same process that the factory uses before they ship devices.

 **NOTE:** DO NOT physically remove the battery from the Chromebook for storage, but instead perform the following steps:

Steps

1. Connect the device to the power adapter and power on.
2. With the power adapter that is connected to the device, put the device in Battery cut-off mode.
3. Press and hold the Refresh + Power keys simultaneously at least for 3 seconds.
4. While holding these keys, remove the power cable from the device, and then release the keys.
The device should shut down and remain off.
5. Attempt to power the unit on using the power button.
6. If the computer does not power on, you have completed the steps and can safely store the computer.
7. If the unit powers on, repeat steps 1 to 5.
8. Store it in a cool, dry place at 25°C (78 °F).

This is the ideal way to store devices, as it reduces battery discharge to a minimal rate. It prevents constant charge or discharge from reducing the battery life and keeps the Chromebook in a stable, powered-off state.

 **NOTE:** If you cannot put your Chromebook into the battery disconnect state as described above, charge the battery to at least 80%, turn off the Chromebook, unplug it from a power source, and store it in a cool, dry place.

 **NOTE:** If combo keys do not work with your model, charging with a higher socket level is the only alternative from Google.

Getting your Chromebook ready

About this task

Perform the following steps to get your Chromebook ready for school:

Steps

1. Connect the Chromebook to a charger and a power source to get the computer out of the battery disconnect state.
2. Turn on your device.
3. Connect your Chromebook to Wi-Fi and update them to the latest ChromeOS release.

 **NOTE:** This step can take time as multiple ChromeOS versions may have been released since the last time the device was updated.

Recovering the operating system

If your Chromebook operating system is malfunctioning, you can recover it by reinstalling the operating system.

To know how to recover your Chromebook operating system, see [Recover your Chromebook](#) at [Chromebook Help](#) page.

Real-Time Clock (RTC Reset)

The Real-Time Clock (RTC) reset function enables you or the service technician to recover Dell computers from No POST/No Power/No Boot situations.

Start the RTC reset with the computer powered off and connected to AC power. Press and hold the power button for twenty-five seconds. The computer RTC Reset occurs after you release the power button.

Backup media and recovery options

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

Network power cycle

About this task

If your computer is unable to access the Internet due to network connectivity issues, reset your network devices by performing the following steps:

Steps

1. Turn off the computer.
2. Turn off the modem.
 **NOTE:** Some Internet service providers (ISPs) provide a modem and router combo device.
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 the computer.

Drain flea power (perform hard reset)

About this task

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

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

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

Perform the following steps to drain the flea power:

Steps

1. Turn off the computer.
2. Disconnect the power adapter from the computer.
3. Remove the base cover.
4. Remove the battery.
 **CAUTION:** If the battery is a Field Replaceable Unit (FRU), the removal and installation procedures are intended for authorized service technicians only.
5. Press and hold the power button for 20 seconds to drain the flea power.

6. Install the battery.
7. Install the base cover.
8. Connect the power adapter to the computer.
9. Turn on the computer.

 **NOTE:** For more information about performing a hard reset, go to [Dell Support Site](#). On the menu bar at the top of the Support page, select Support > Support Library. In the Search field on the Support Library page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

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 24. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	Dell Site
Contact Support	In Windows search, type <code>Contact Support</code> , and press Enter.
Online help for operating system	Windows Support Site Linux Support Site
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals, and documents.	Your Dell computer is uniquely identified using 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 Dell Support Site . For more information about how to find the Service Tag for your computer, see Locate the Service Tag on your computer .
Dell knowledge base articles	1. Go to Dell Support Site. 2. On the menu bar at the top of the Support page, select Support > Support Library. 3. In the Search field on the Support Library 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 [Contact Support at Dell Support Site](#).

 **NOTE:** Availability of the services may vary depending on the country or region, and product.

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

Revision history

Tracks all updates that are made to the document. It typically includes the date of change, version number, and a brief description of the modification. This log helps maintain transparency, accountability, and a clear timeline of progress.

Table 25. Revision history

Revision	Date	Description
A00	May 2026	Original publish date.