

Dell Pro Precision 5 16S

PW516265

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.

Chapter 1: Working inside your computer.....	6
Safety instructions.....	6
Before working inside your computer.....	6
Before working inside your computer.....	7
Safety precautions.....	7
Electrostatic discharge—ESD protection.....	8
ESD Field Service kit	8
Transporting sensitive components.....	9
After working inside your computer.....	9
After working inside your computer.....	10
Information on repairability for Québec - From Dell Canada Inc. - to Quebec consumers.....	10
BitLocker.....	10
Recommended tools.....	10
Screw list.....	11
Major components of Dell Pro Precision 5 16S PW516265.....	12
Customer Replaceable Units (CRUs) and Field Replaceable Units (FRUs) list.....	14
Chapter 2: Removing and installing Customer Replaceable Units (CRUs).....	16
Nano-SIM card tray.....	16
Removing the nano-SIM card tray.....	16
Installing the nano-SIM card tray.....	17
Base cover.....	18
Removing the base cover.....	18
Installing the base cover.....	21
Solid-state drive.....	23
Removing the 2230 solid state drive.....	23
Installing the 2230 solid state drive.....	24
WLAN card.....	26
Removing the WLAN card.....	26
Installing the WLAN card.....	27
WWAN card.....	28
Removing the 5G WWAN card.....	28
Installing the 5G WWAN card.....	29
Battery.....	31
Rechargeable Li-ion battery precautions.....	31
Removing the battery.....	31
Installing the battery.....	33
Speakers.....	34
Removing the speakers.....	34
Installing the speakers.....	35
Fan.....	36
Removing the fan.....	36
Installing the fan.....	36

Chapter 3: Removing and installing Field Replaceable Units (FRUs)	38
I/O-bridge board	38
Removing the I/O-bridge board	38
Installing the I/O-bridge board	40
Heat sink	44
Removing the heat sink	44
Installing the heat sink	44
I/O board	45
Removing the I/O board	45
Installing the I/O board	46
Power button	50
Removing the power button	50
Installing the power button	50
Display assembly	52
Removing the display assembly	52
Installing the display assembly	54
Display bezel	57
Removing the display bezel	57
Installing the display bezel	60
Display hinges	62
Removing the display hinges	62
Installing the display hinges	63
Display panel	64
Removing the display panel	64
Installing the display panel	66
Camera	68
Removing the camera	68
Installing the camera	69
Display cable	70
Removing the display cable	70
Installing the display cable	71
Display back-cover	73
Removing the display-back cover	73
Installing the display-back cover	74
System board	75
Removing the system board	75
Installing the system board	78
USB Type-C module	82
Removing the USB Type-C module	82
Installing the USB Type-C module	83
Wireless-antenna modules	85
Removing the wireless-antenna modules	85
Installing the wireless-antenna modules	86
Keyboard	87
Removing the keyboard	87
Installing the keyboard	89
Palm-rest assembly	92
Removing the palm-rest assembly	92
Installing the palm-rest assembly	93

Chapter 4: Software.....	95
Operating system.....	95
Drivers and downloads.....	95
Chapter 5: BIOS Setup.....	96
Entering BIOS Setup program.....	96
Navigation keys.....	96
F12 One Time Boot menu.....	96
View Advanced Setup options.....	97
BIOS Setup options.....	97
Updating the BIOS.....	104
Updating the BIOS in Windows.....	104
Updating the BIOS using the USB drive in Windows.....	104
Updating the BIOS from the One-Time boot menu.....	105
Updating the BIOS in Linux and Ubuntu.....	105
System and setup password.....	105
Assigning a System Setup password.....	106
Deleting or changing an existing system password or setup password.....	106
Clearing system and setup passwords.....	106
Clearing CMOS settings.....	107
Chapter 6: Troubleshooting.....	108
Handling swollen rechargeable Li-ion batteries.....	108
Dell SupportAssist Pre-boot System Performance Check diagnostics.....	108
Running the SupportAssist Pre-Boot System Performance Check.....	109
Built-in self-test (BIST).....	109
Motherboard Built-In Self-Test (M-BIST).....	109
LCD Built-in Self-Test (LCD-BIST).....	110
Logic Built-in Self-test (L-BIST).....	110
System-diagnostic lights.....	110
Recovering the operating system.....	111
Chromebook storage.....	112
Overview.....	112
Battery management.....	112
Preparing the Chromebook for long-term storage.....	113
Getting your Chromebook ready.....	113
Recovering the operating system.....	113
Real-Time Clock (RTC Reset).....	114
Backup media and recovery options.....	114
Network power cycle.....	114
Drain flea power (perform hard reset).....	114
Chapter 7: Getting help and contacting Dell.....	116
Chapter 8: Revision history.....	117

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 shut-down 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.

 **CAUTION:** To disconnect a network cable, unplug the cable from your computer.

6. Remove any media card and optical disc from your computer, if applicable.

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, discs, or any other components that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

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	7	
2230 solid-state drive	M2x2.5	2	
WLAN card	M2x2.5	1	
WWAN card	M2x3.5	1	
Battery	Captive	5	
Speakers	M1.6x1.5	4	
Fingerprint-reader bracket	M2x2.5	1	
Fan	M2x4	2	
I/O-bridge board	M2x4	2	
Heatsink	Captive	4	
I/O board	M2x2.5	4	
Power button	M1.6x2.5	2	
Display assembly	M2.5x4.5	5	
Display hinges	M2.5x2.5	6	
System board	M2x3	5	

Table 1. Screw list (continued)

Component	Screw type	Quantity	Screw image
USB Type-C module	M2x5	3	
Wireless-antenna modules	M1.6x2.5	4	
Keyboard	M2x2.2	21	

Major components of Dell Pro Precision 5 16S PW516265

The following image shows the major components of Dell Pro Precision 5 16S PW516265.

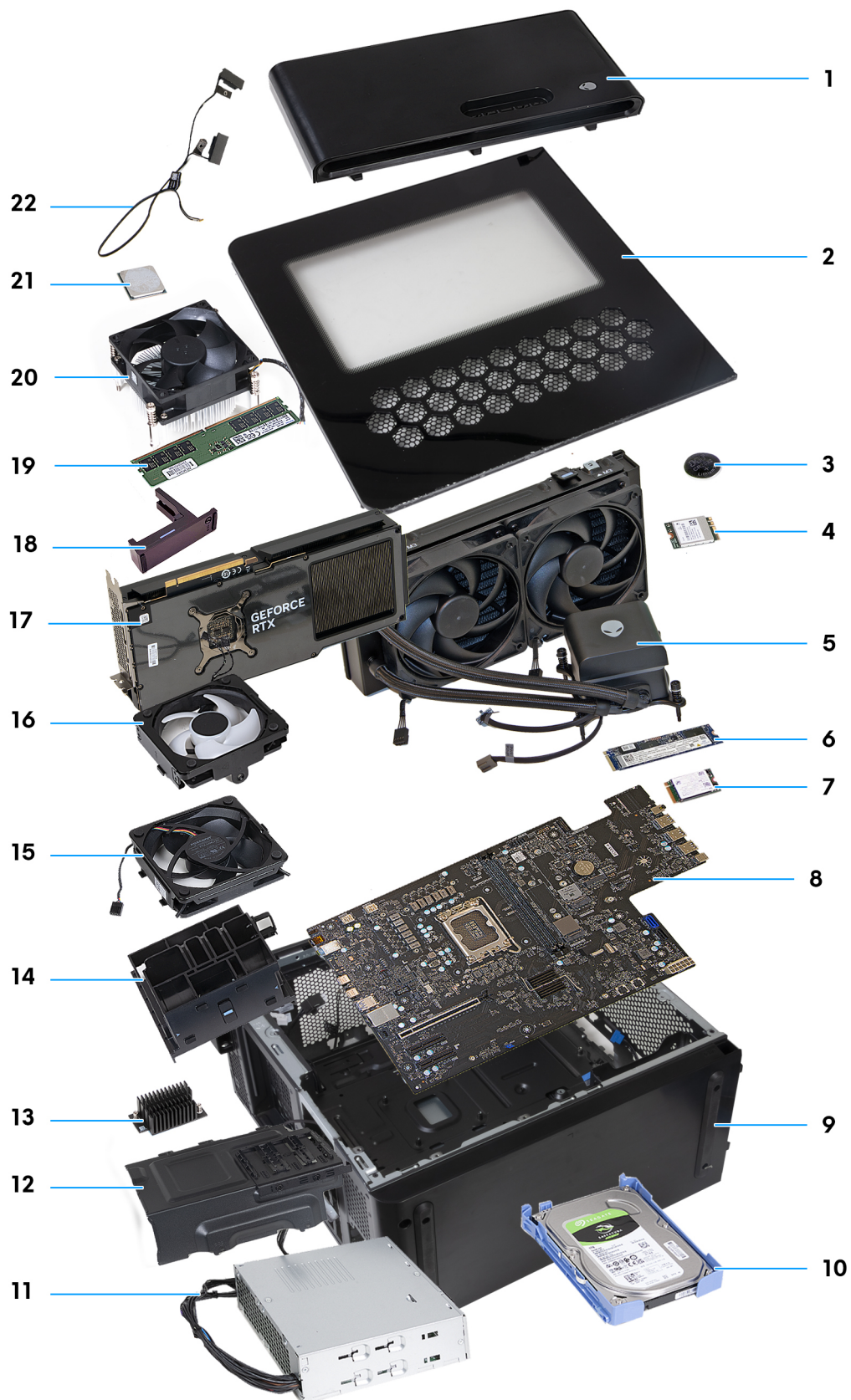


Figure 1. Major components of Alienware Aurora ACT1250

1. Front bezel
2. Left-side cover

3. Coin-cell battery
4. Wireless card
5. Liquid-cooling assembly
6. M.2 2280 solid state drive
7. M.2 2230 solid state drive
8. System board
9. Chassis
10. 3.5-inch hard drive
11. Power-supply unit
12. Power-supply unit bracket
13. VR heat sink
14. Graphics-card end holder
15. Lower front-chassis fan
16. Rear-chassis fan
17. Graphics card
18. Graphics-card bracket
19. Memory module
20. Processor fan and heat-sink assembly
21. Processor
22. Antenna

 **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 16S PW516265 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)
SIM-card tray	Heat sink
Base cover	I/O board
Solid-state drive	Power button
Wireless card	Display assembly
Battery	Display hinges
Battery cable	System board
Speakers	USB Type-C module
Fan	wireless-antenna modules

Table 2. CRU and FRU list (continued)

Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
WWAN card	keyboard
	palm-rest 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.

Nano-SIM card tray

Removing the nano-SIM card tray

Prerequisites

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

About this task

 **NOTE:** The nano-SIM card tray is only available on computers that are shipped with a WWAN card.

The following image indicates the location of the nano-SIM card tray and provides a visual representation of the removal procedure.

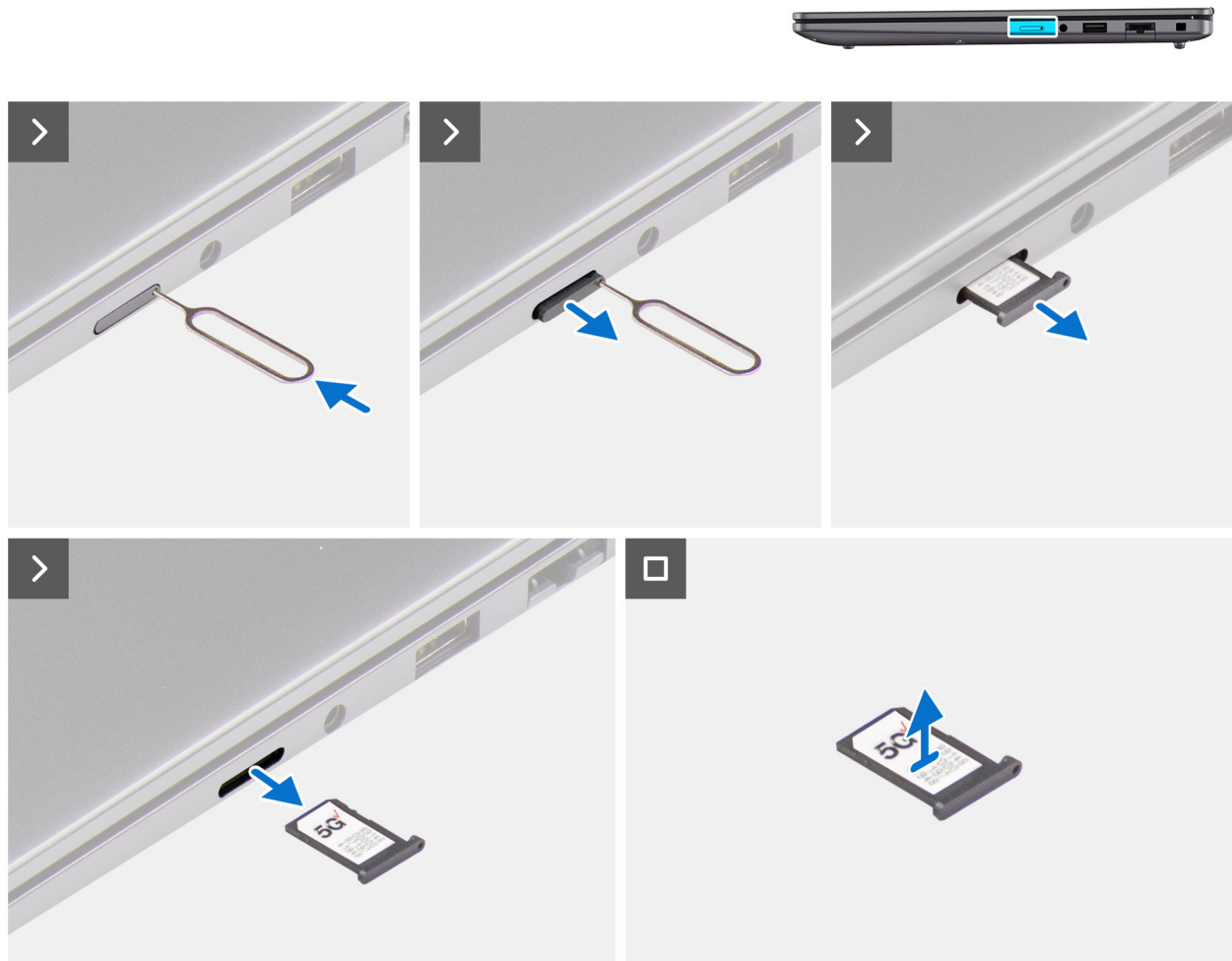


Figure 2. Removing the nano-SIM card tray

Steps

1. Insert a SIM-ejector pin into the release hole to release the nano-SIM card tray.
2. Push the pin to disengage the lock, and eject the nano-SIM card tray.
3. Slide the nano-SIM card tray out of the slot on the computer.
4. Remove the nano-SIM card from the nano-SIM card tray.

NOTE: This step is applicable only if a nano-SIM card has been previously installed on your computer.

Installing the nano-SIM card tray

Prerequisites

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

About this task

NOTE: This procedure is applicable only for computers that are shipped with a WWAN card.

The following image indicates the location of the nano-SIM card tray and provides a visual representation of the installation procedure.



Figure 3. Installing the nano-SIM card tray

Steps

1. Align and place the nano-SIM card on the nano-SIM card tray.
i **NOTE:** This step is applicable only if you are installing a nano-SIM card into your computer.
2. Align the nano-SIM card tray with the slot on the computer and carefully slide it in.
3. Gently push the nano-SIM card tray until it is fully seated in the slot.

Next steps

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

Base cover

Removing the base cover

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.

About this task

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



Figure 4. Removing the base cover

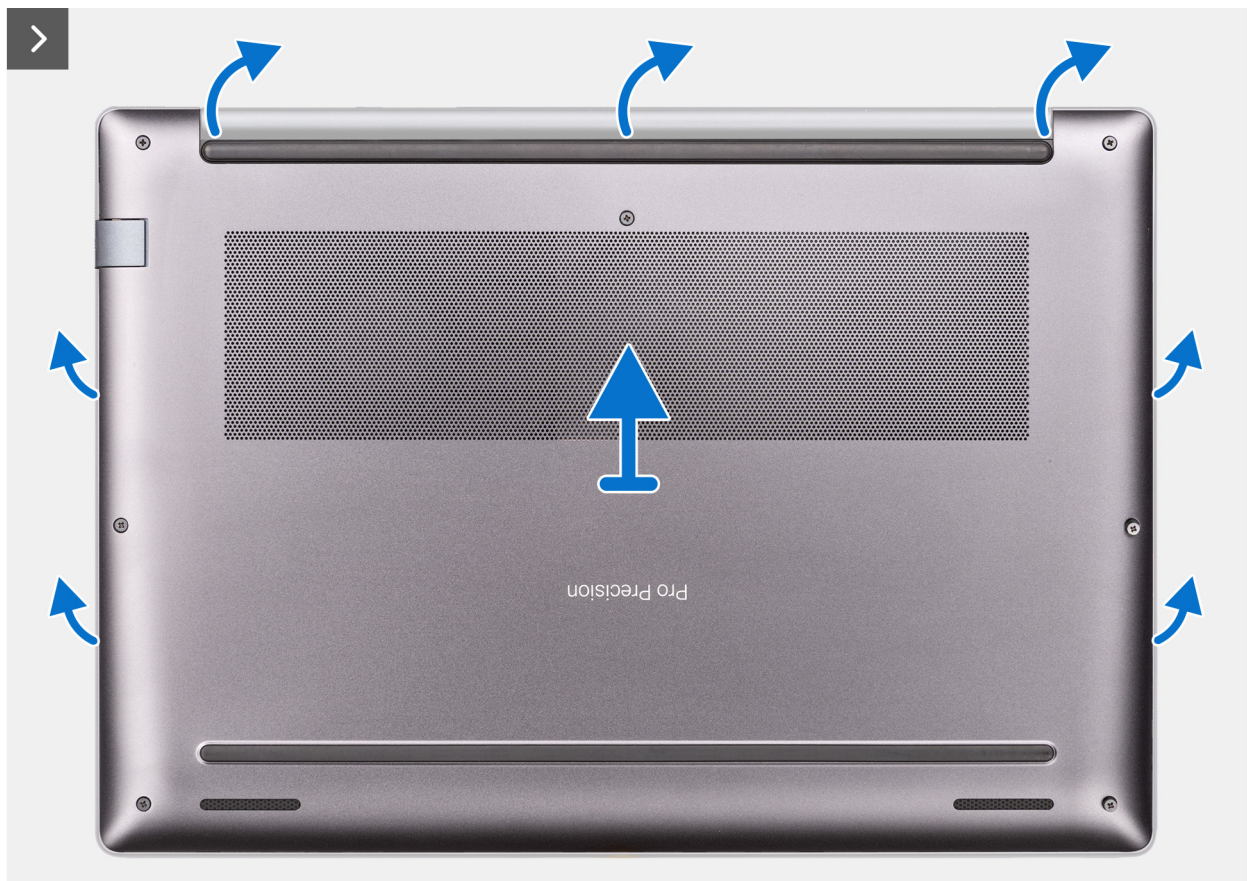


Figure 5. Removing the base cover

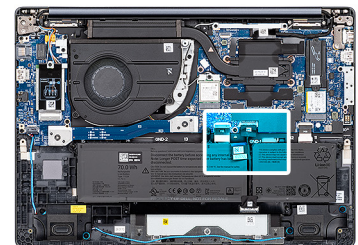


Figure 6. Disconnecting the battery cable

Steps

1. Loosen the seven captive screws that secure the base cover to the palm-rest assembly.
2. Using a plastic scribe, pry open the base cover from the recesses that are at the top edge of the base cover.
3. Using the plastic scribe, pry around the edges of the base cover to release it from the palm-rest assembly.
4. Lift the base cover off the palm-rest assembly.
5. Disconnect the battery cable from its connector (BATT1) on the system board, then flip the computer over and press and hold the power button for five seconds to drain the flea power.

 **NOTE:** This step is applicable only if your computer is unable to enter Service Mode.

Installing the base cover

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



Figure 7. Connecting the battery cable

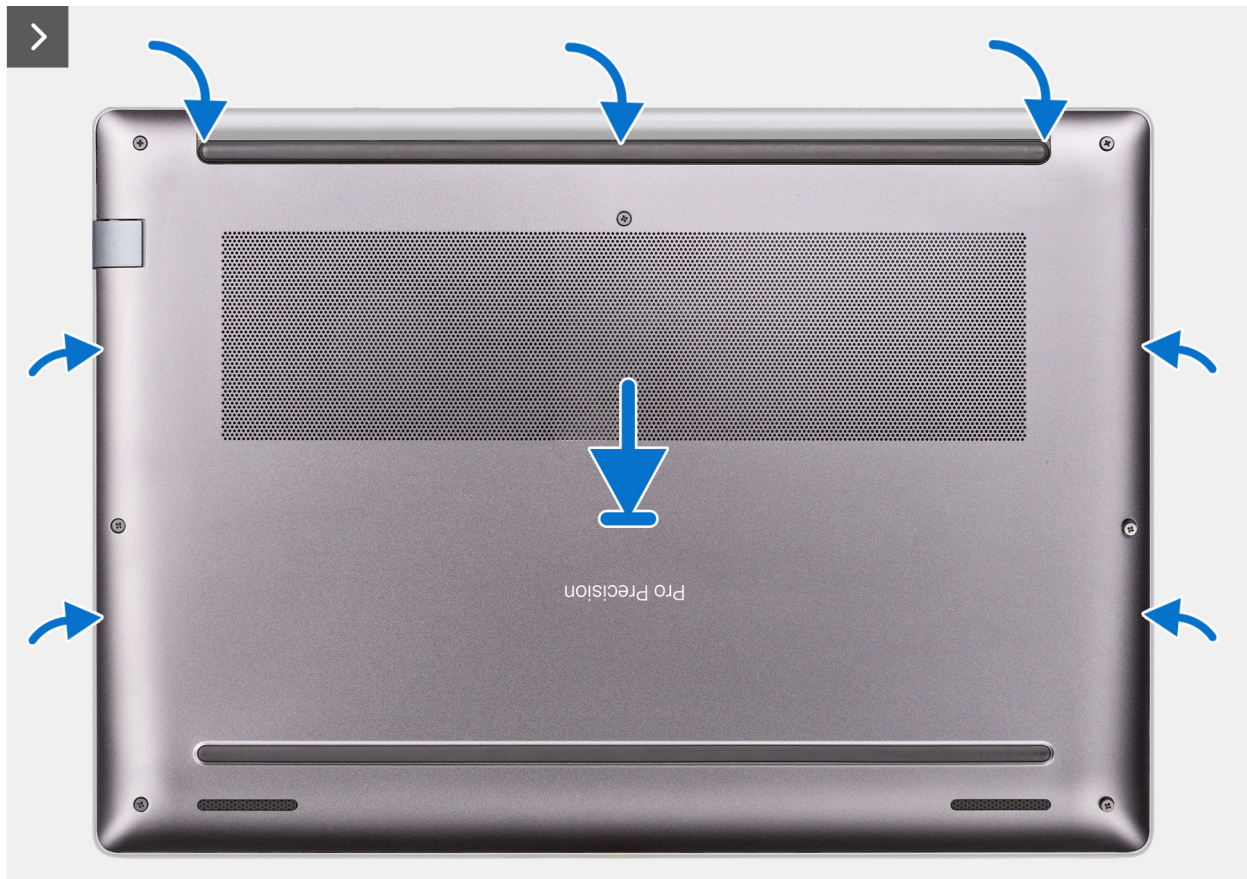


Figure 8. Installing the base cover



Figure 9. Installing the base cover

Steps

1. Connect the battery cable to the battery-cable connector (BATT1) on the system board.
NOTE: This step is applicable only if the battery cable had been disconnected previously.
2. Place the base cover on the palm-rest assembly.
3. 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.
4. Tighten the seven captive screws that secure the base cover to the palm-rest assembly.

Next steps

1. Install the [nano-SIM card tray](#), if applicable.
2. Follow the procedure in [After working inside your computer](#).

Solid-state drive

Removing the 2230 solid state drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

The following image indicates the location of the 2230 solid state drive and provides a visual representation of the removal procedure.

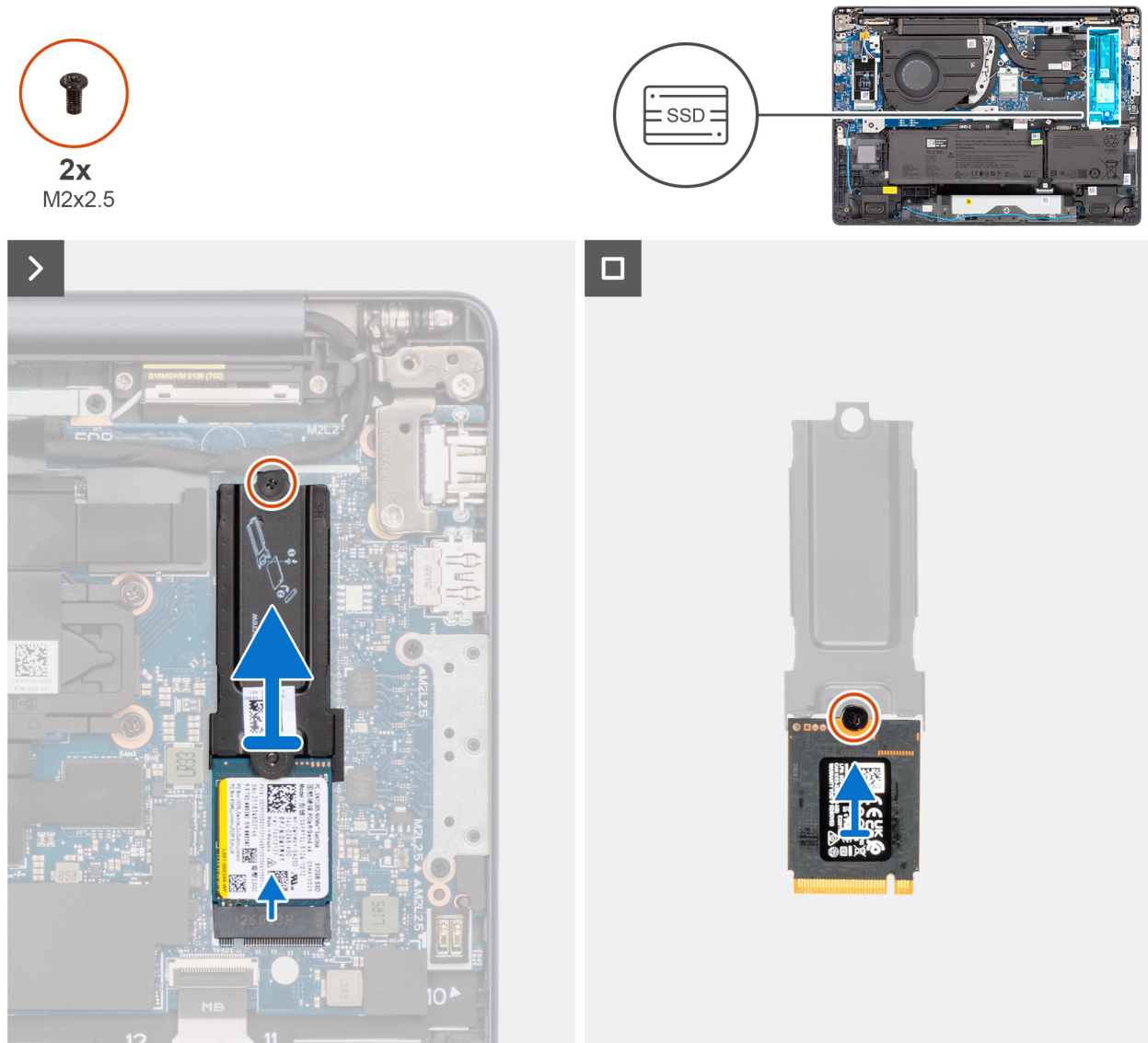


Figure 10. Removing the 2230 solid state drive

Steps

1. Remove the screw (M2x2.5) that secures the 2230 solid state drive module to the system board.
2. Slide and lift the 2230 solid state drive module off the system board.
3. Flip the solid state drive module.
4. Remove the screw (M2x2.5) that secures the solid state drive to extender.
5. Remove the solid state drive away from the extender.

Installing the 2230 solid state drive

Prerequisites

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

About this task

The following image indicates the location of the 2230 solid state drive and provides a visual representation of the installation procedure.

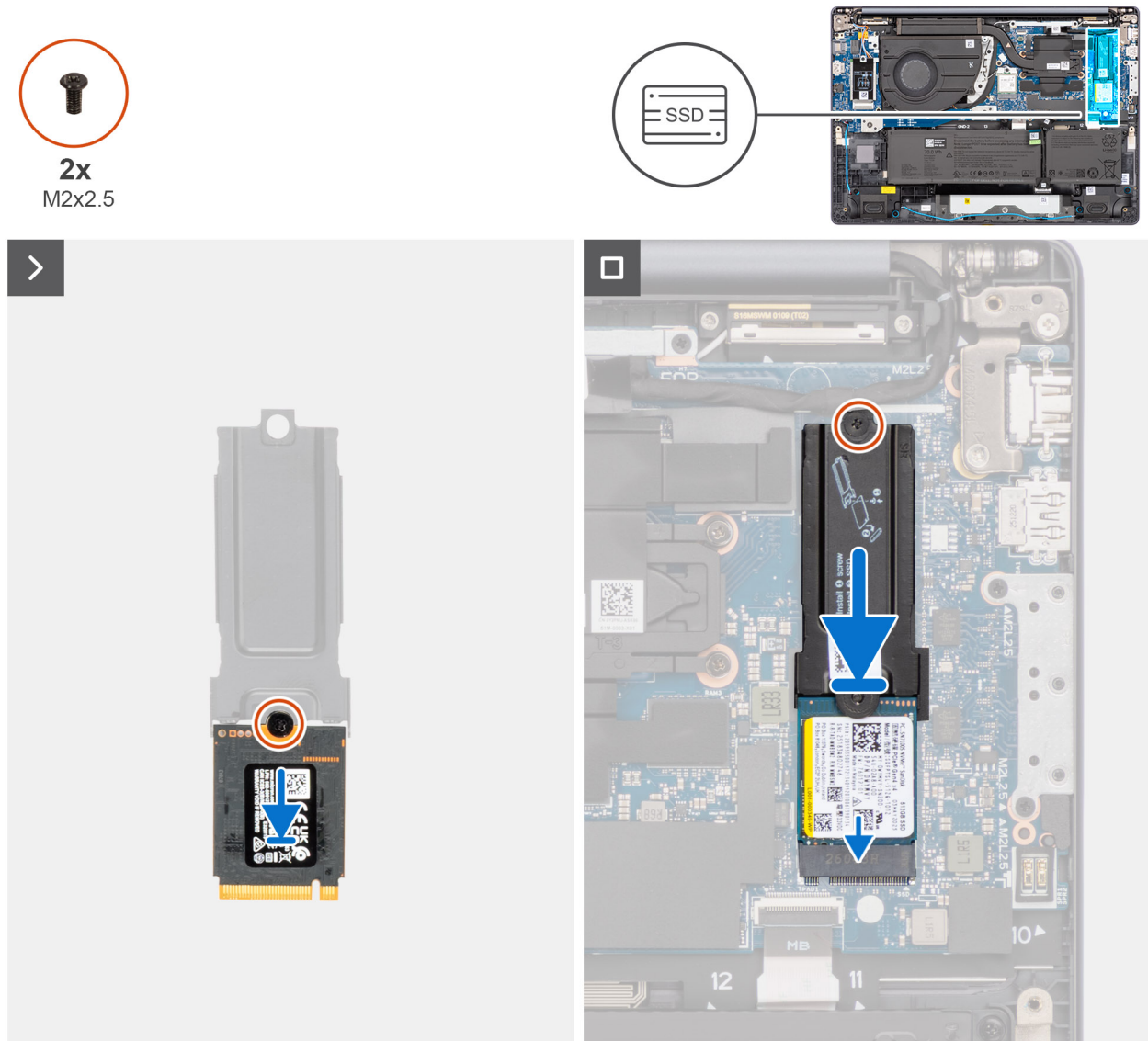


Figure 11. Installing the 2230 solid state drive

Steps

1. Align the indent on the 2230 solid state drive with the extender.
2. Replace the screw (M2x2.5) to secure the 2230 solid state drive to the extender.
3. Flip the 2230 solid state drive module.
4. Align the notch on the 2230 solid state drive with the tab on the M.2 solid state drive slot.
5. Slide the 2230 solid state drive into the M.2 solid state drive slot on the system board.
6. Replace the screw (M2x2.5) that secures the 2230 solid state drive to the system board.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. Follow the procedure in [After working inside your computer](#).

WLAN card

Removing the WLAN card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

The following image indicates the location of the WLAN card and provides a visual representation of the removal procedure.

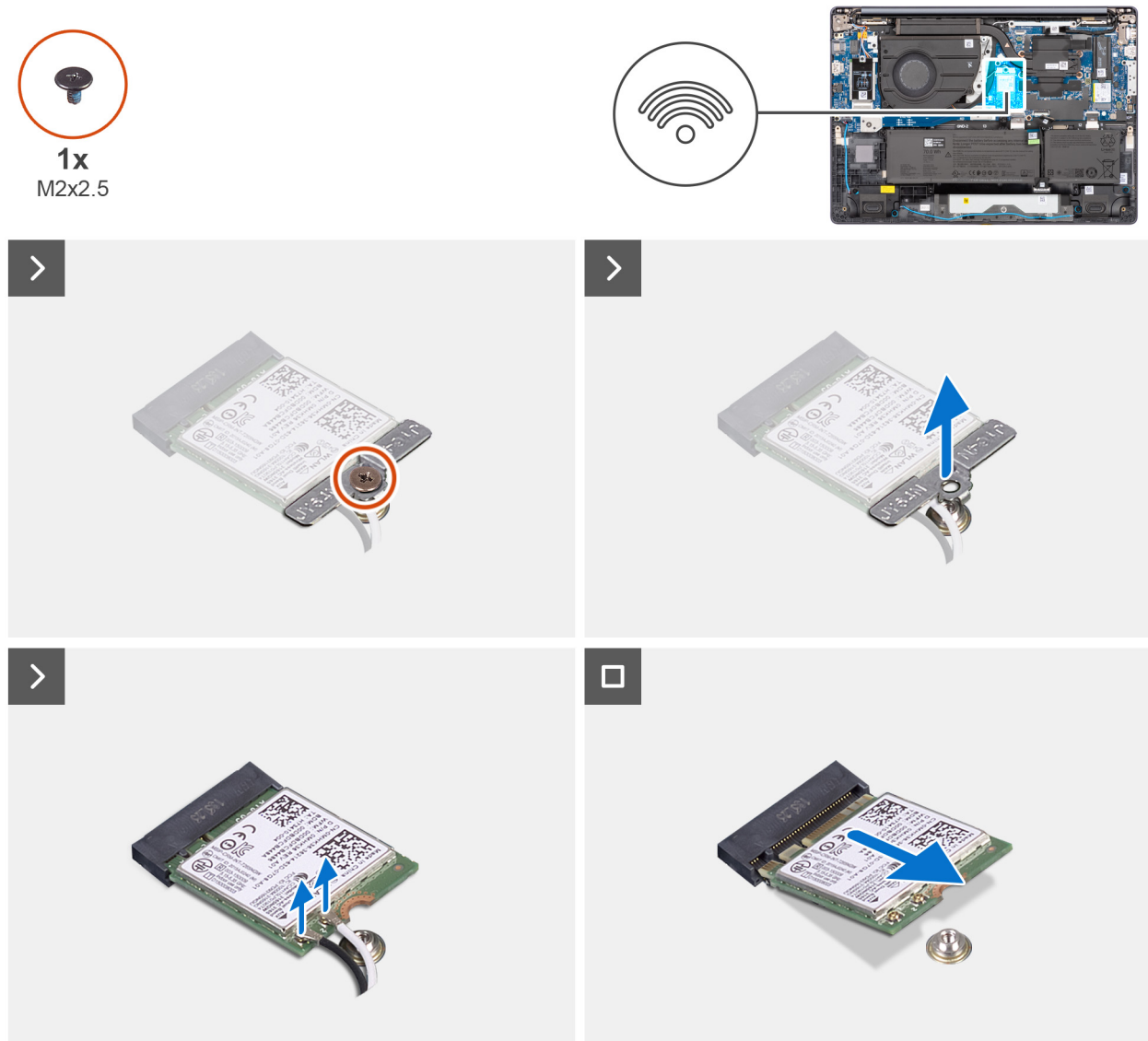


Figure 12. Removing the WLAN card

Steps

1. Remove the screw (M2x2.5) that secures the wireless card to the system board.
2. Slide and lift the wireless-card bracket off the wireless card.
3. Disconnect the antenna cables from the wireless card.

- Slide and remove the wireless card at an angle from the wireless-card slot (JWLAN1).

Installing the WLAN card

Prerequisites

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

About this task

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

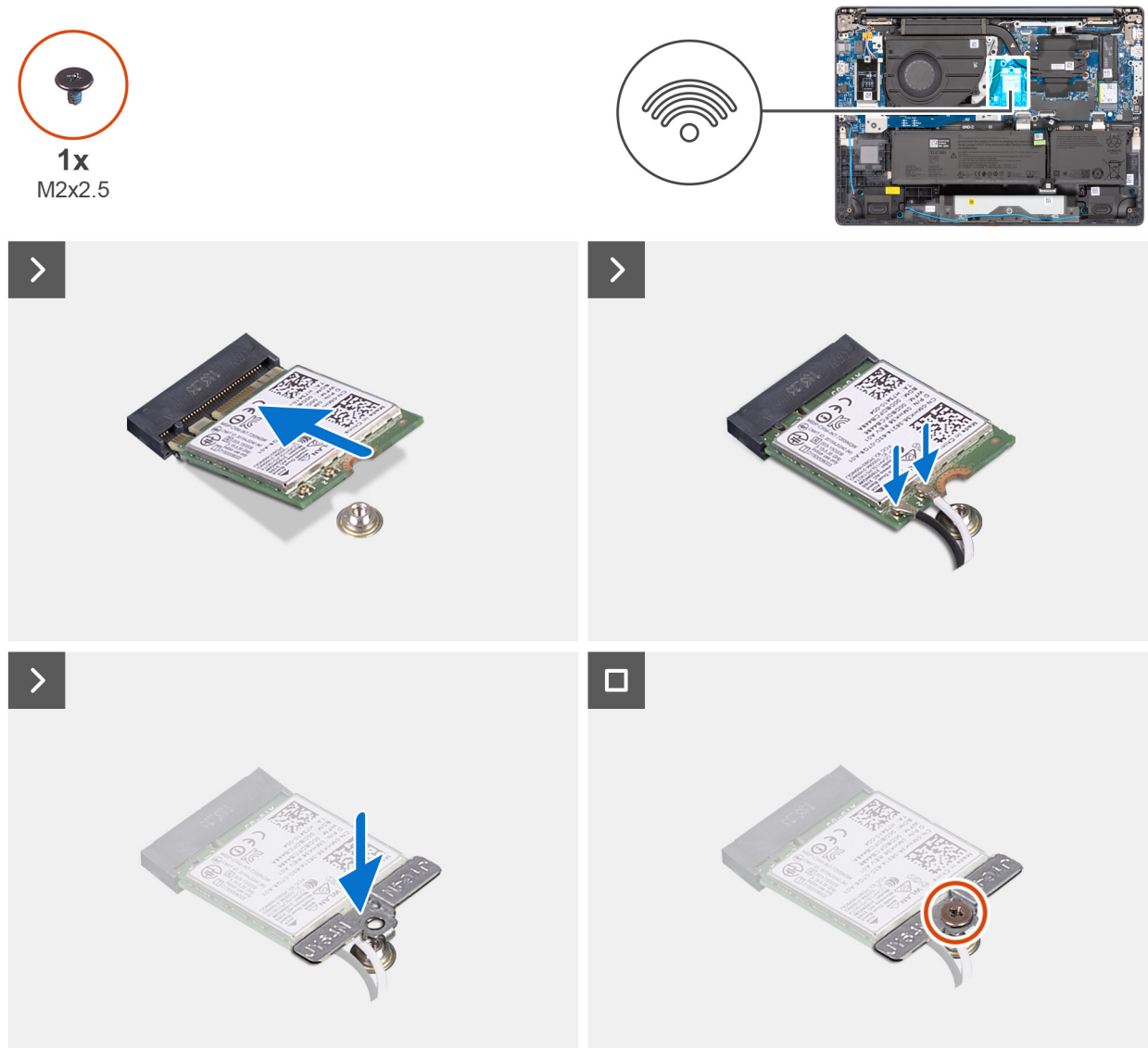


Figure 13. Installing the WLAN card

Steps

- Align the notch on the wireless card with the tab on the wireless-card slot (JWLAN1).
- Slide the wireless card at an angle into the wireless-card slot.
- Connect the antenna cables to the wireless card.

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)

- Slide and place the wireless-card bracket on the wireless card.
- Replace the screw (M2x2.5) that secures the wireless card to the system board.

Next steps

- Install the [base cover](#).
- Install the [nano-SIM card tray](#), if applicable.
- Follow the procedure in [After working inside your computer](#).

WWAN card

Removing the 5G WWAN card

Prerequisites

- Follow the procedure in [Before working inside your computer](#).
- Remove the [nano-SIM card tray](#), if applicable.
- Remove the [base cover](#).

About this task

 **NOTE:** This procedure is applicable only for computers that are shipped with a 5G WWAN (Wireless Wide Area Network) card.

The following image indicates the location of the 5G WWAN card and provides a visual representation of the removal procedure.

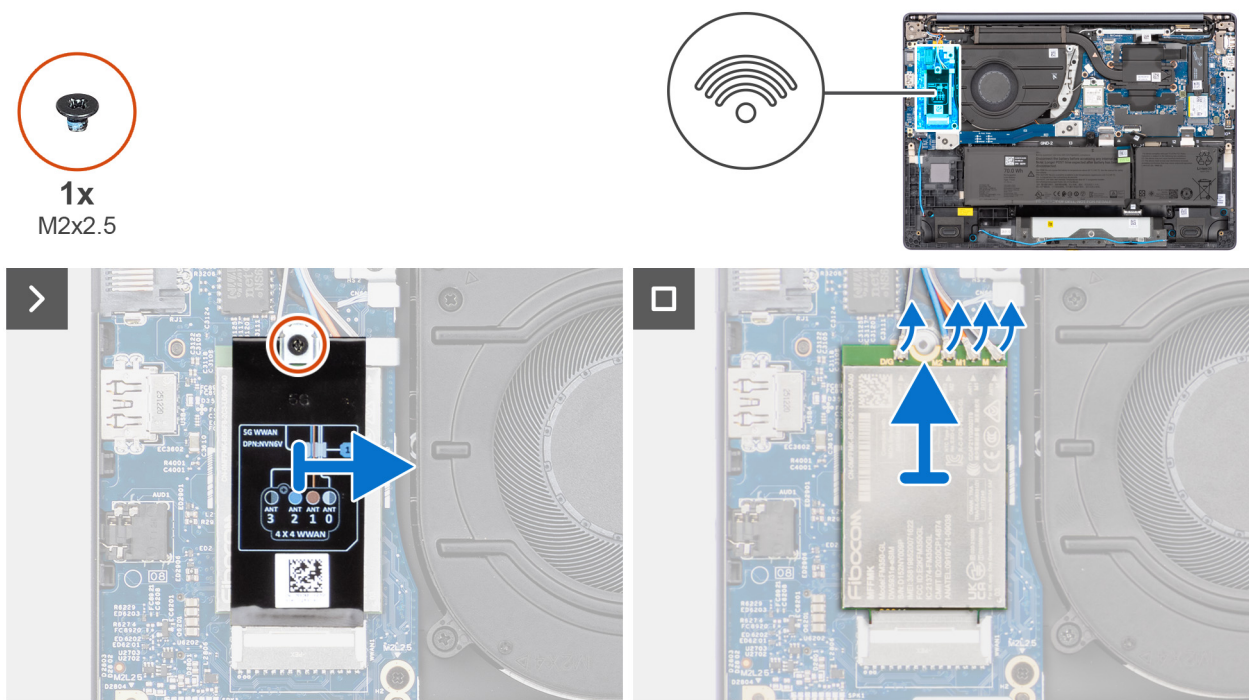


Figure 14. Removing the 5G WWAN card

Steps

1. Remove the screw (M2x3.5) that secures the 5G WWAN-card thermal shield to the I/O board.
2. Lift the 5G WWAN-card thermal shield off the 5G WWAN card.
3. Disconnect the antenna cables from the 5G WWAN card.

 **NOTE:** The cable color and the number of antenna cables vary depending on the type of WWAN card that is installed on your computer.

your computer.

4. Lift and slide the 5G WWAN card out of the WWAN-card slot on the I/O board.

 **CAUTION:** To avoid damaging the WWAN connector on the I/O board, ensure that the angle of removal is not greater than 5 degrees.

Installing the 5G WWAN card

Prerequisites

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

About this task

 **NOTE:** This procedure is applicable only if you are installing a 5G WWAN (Wireless Wide Area Network) card on your computer.

 **NOTE:** The type of WWAN card that is supported by your computer depends on the availability of the following antenna connections.

Table 4. Determining the WWAN card support of your computer

WWAN card support	Antenna cables
5G	• One black cable with a thin gray stripe • One blue cable • One orange cable • One white cable with a thin gray stripe
4G	• One black cable with a thin gray stripe • One white cable with a thin gray stripe

The following image indicates the location of the 5G WWAN card and provides a visual representation of the installation procedure.

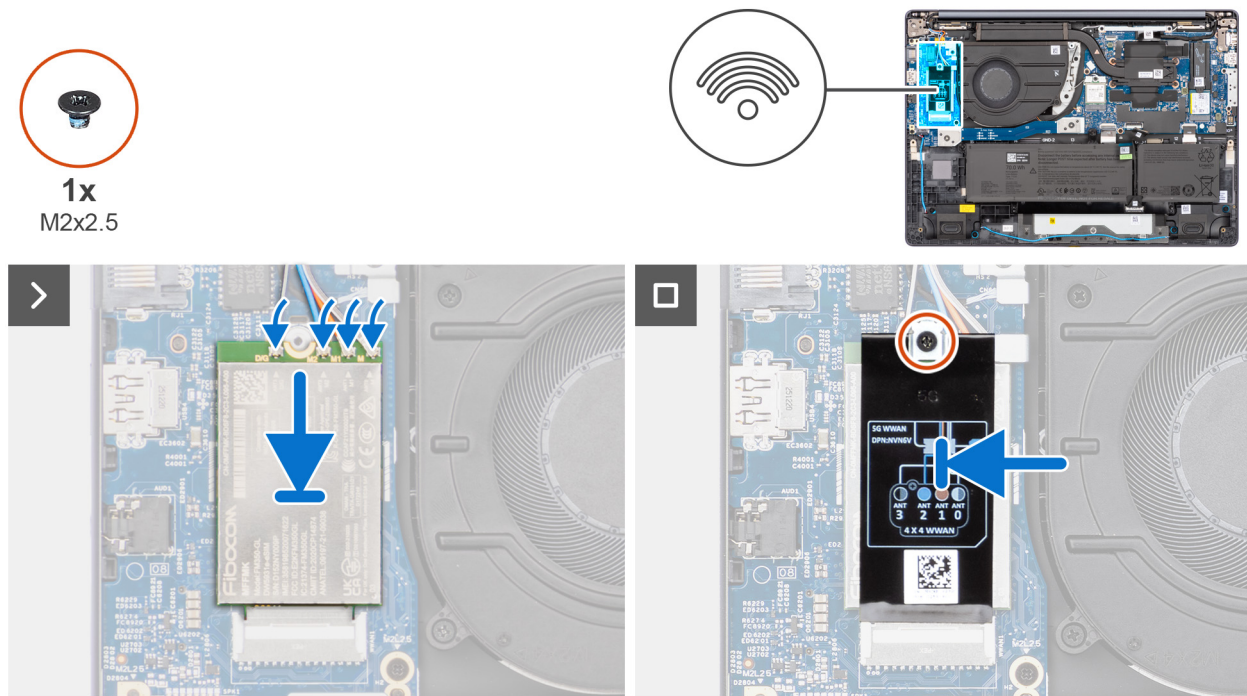


Figure 15. Installing the 5G WWAN card

Steps

1. Insert the 5G WWAN card at an angle into the WWAN-card slot on the I/O board.
NOTE: Ensure that the thermal pad is in place before installing the WWAN card.
2. Connect the antenna cables to their respective connectors on the 5G WWAN card.
NOTE: The cable color and the number of antenna cables to connect vary depending on the type of WWAN card that is being installed on your computer.

Table 5. Antenna-cable color scheme for the WWAN card

5G WWAN Connector	4G WWAN Connector	Antenna-cable color
D/G	6 Aux1	Black with a thin gray stripe
M2	Not applicable	Blue
M1	Not applicable	Orange
M	5 Main	White with a thin gray stripe

3. Align the screw hole on the 5G WWAN-card thermal shield with the screw hole on the I/O board.
4. Replace the screw (M2x2.5) that secures the 5G WWAN-card thermal shield to the I/O board.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. Follow the procedure in [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

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

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

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

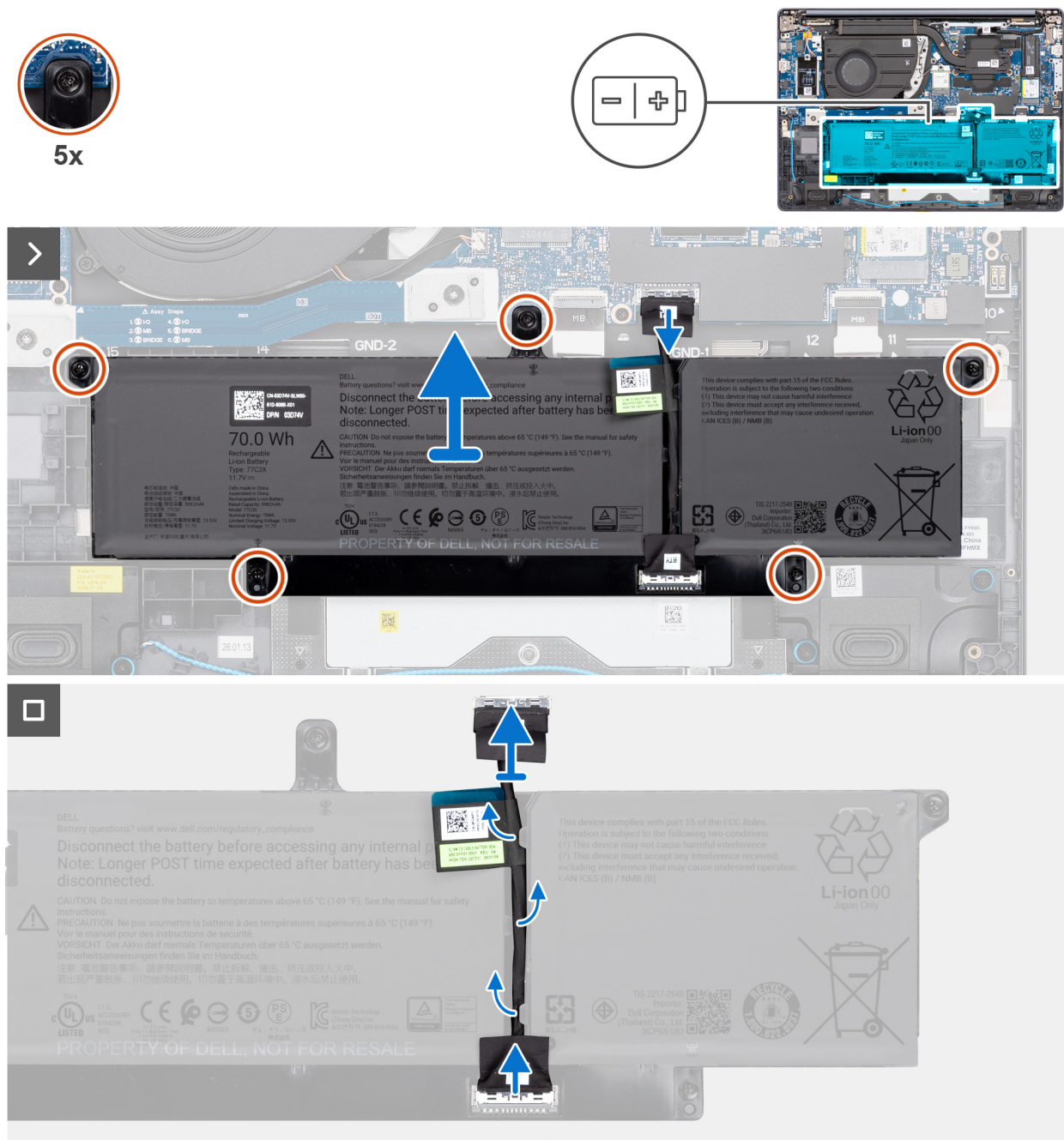


Figure 16. Removing the battery

Steps

1. Disconnect the battery cable from the battery-cable connector (BATT) on the system board.
2. Loosen the five captive screws that secure the battery to the palm-rest assembly.
3. Lift the battery off the palm-rest assembly.
4. Remove the battery cable from the routing guides on the battery.
5. Peel the tape that secures the battery cable to the battery.
6. Disconnect the battery cable from its connector on the battery and lift the battery cable off the battery.

Installing the battery

Prerequisites

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

About this task

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

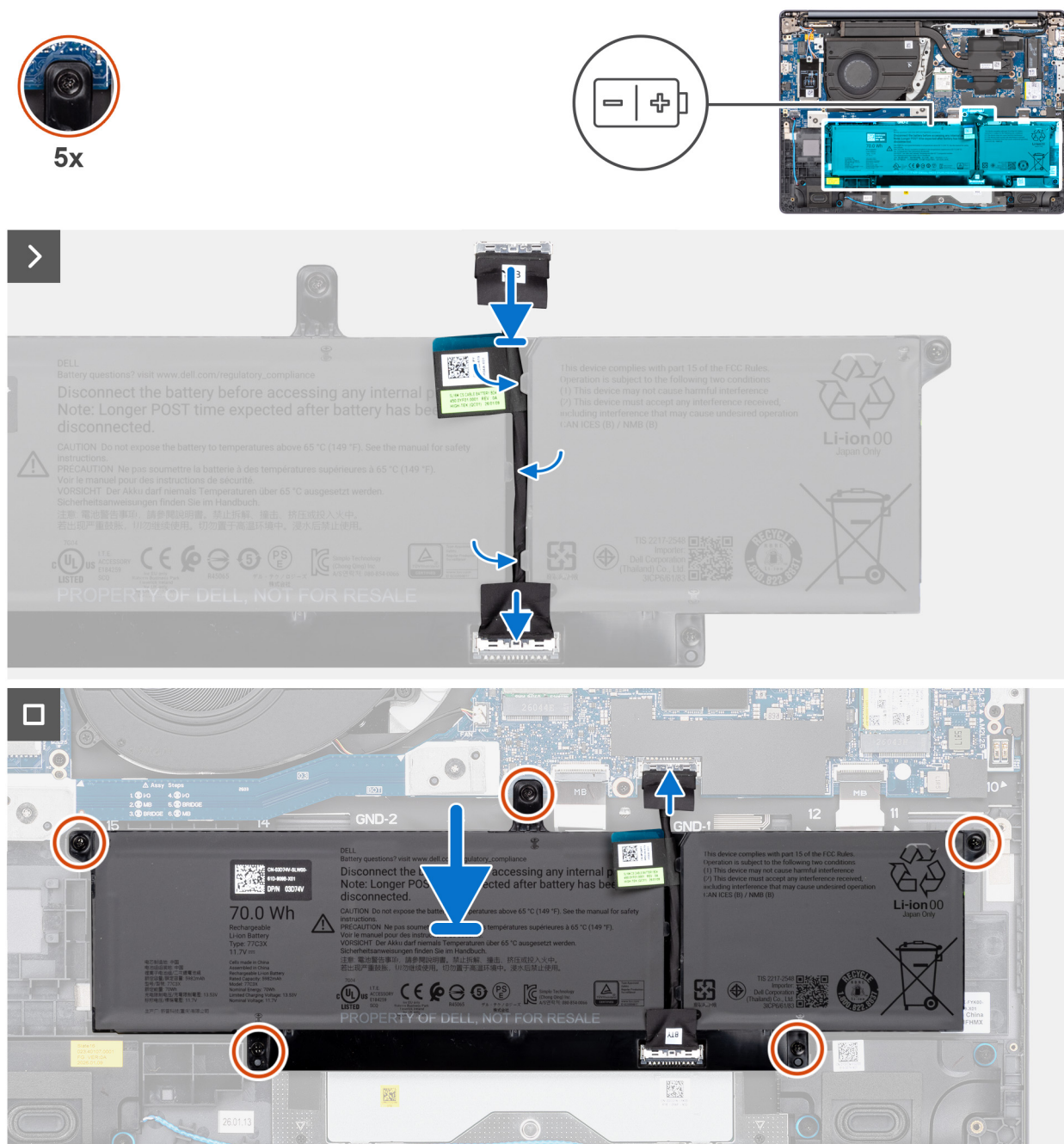


Figure 17. Installing the battery

Steps

1. Route the battery cable through the tabs on the battery.
2. Adhere the Mylar on the battery cable to the battery.
3. Connect the battery end of the cable to the connector on the battery.

4. Using the alignment posts, place the battery on the palm-rest assembly aligning the screw holes on the battery with the screw holes on the palm-rest assembly.
5. Tighten the five captive screws that secure the battery to the palm-rest assembly.
6. Connect the battery cable to the battery-cable connector (BATT1) on the system board.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

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

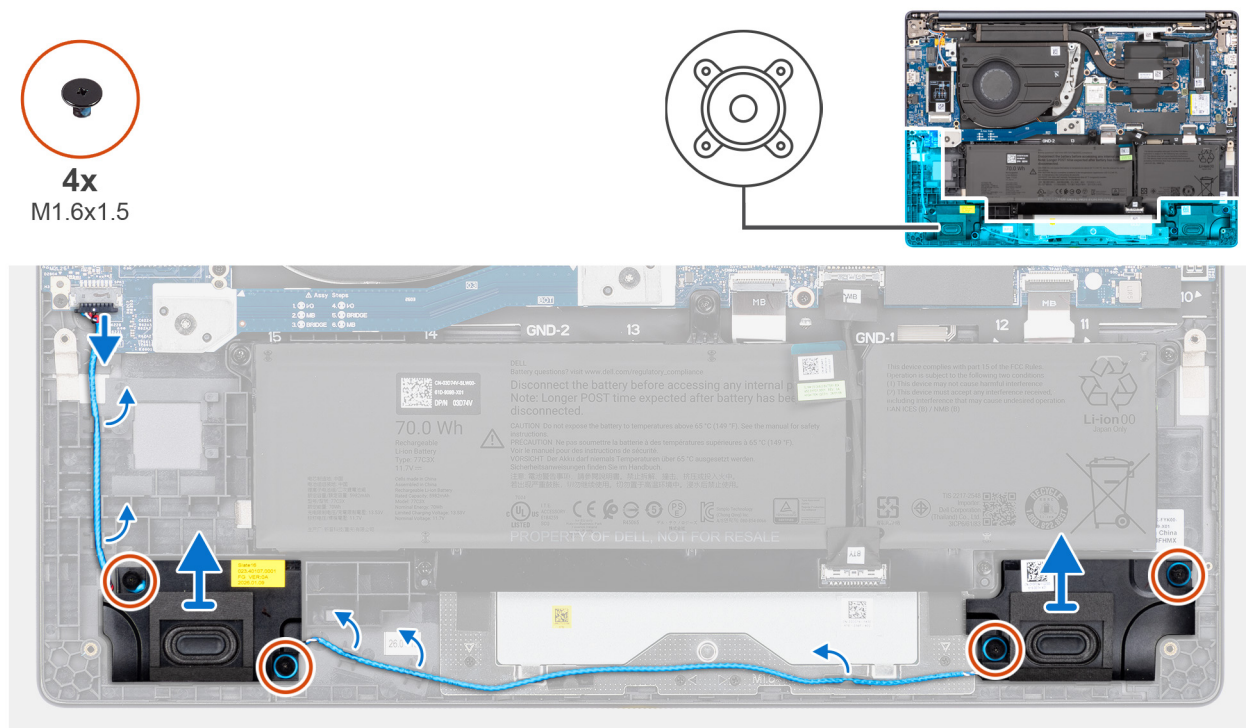


Figure 18. Removing the speakers

Steps

1. Disconnect the speaker cable from its connector (JSPK1) on the I/O board.
2. Remove the four screws (M1.6x1.5) that secure the speakers to the palm-rest assembly.
3. Remove the speaker cable from the routing guides on the palm-rest assembly.
4. Lift the speakers off the palm-rest assembly.

Installing the speakers

Prerequisites

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

About this task

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

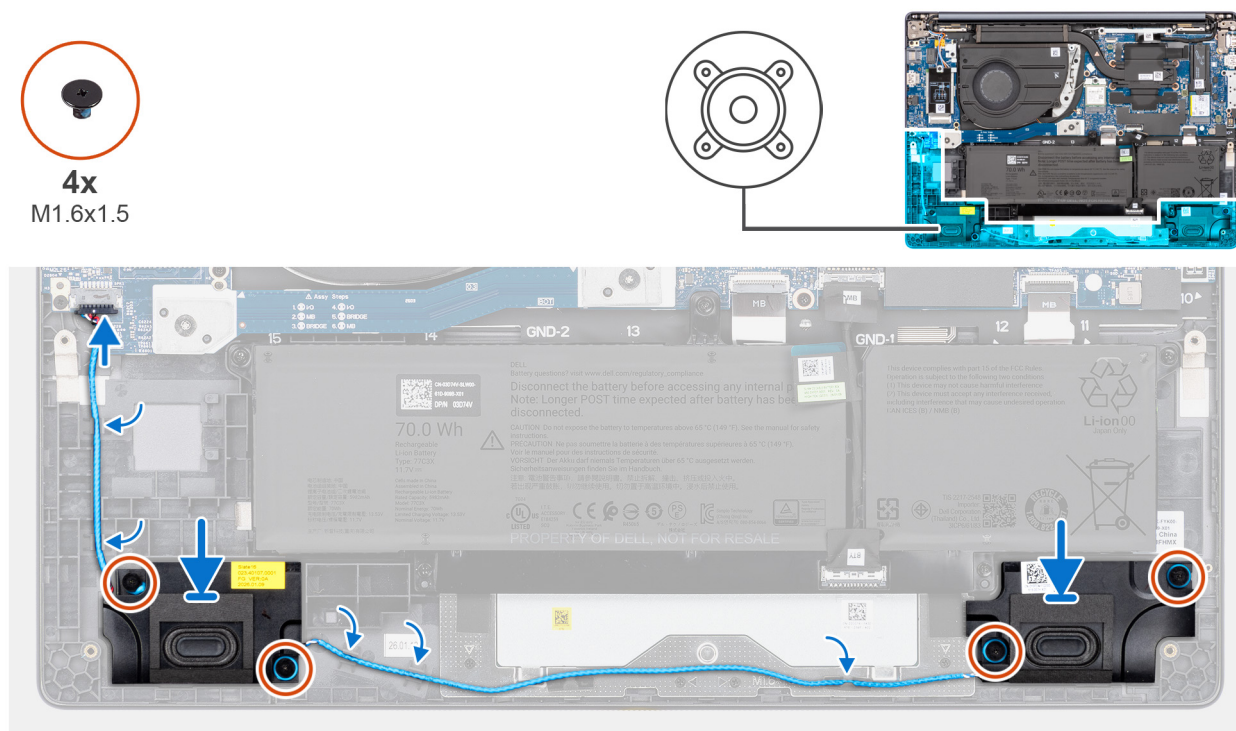


Figure 19. Installing the speakers

Steps

1. Thread the alignment posts through the rubber grommets and place the left and right speakers into their slots on the palm-rest assembly.
NOTE: To ensure that the speakers are properly seated, secure the rubber grommets into the hooks on the alignment posts.
2. Route the speaker cable through the routing guides on the palm-rest assembly.
3. Replace the four screws (M1.6x1.5) that secure the speakers to the palm-rest assembly.
4. Connect the speaker cable to its connector (JSPK1) on the I/O board.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. Follow the procedure in [After working inside your computer](#).

Fan

Removing the fan

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

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

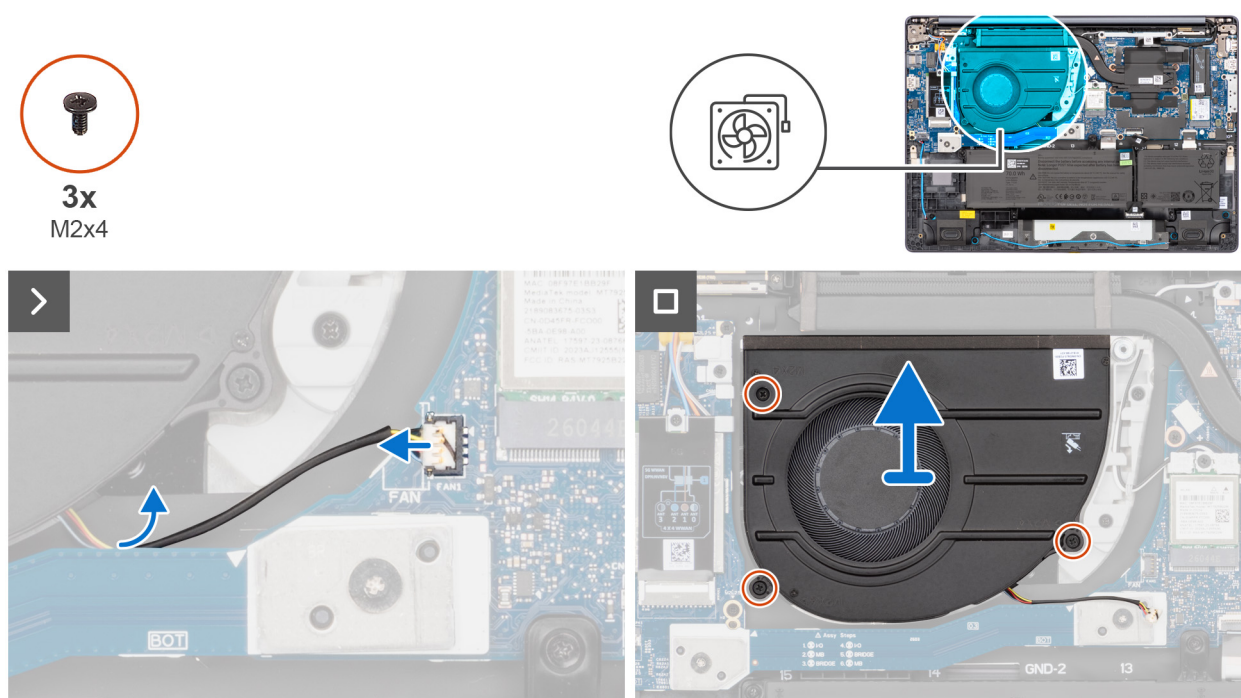


Figure 20. Removing the fan

Steps

1. Disconnect the fan cable from its connector (JFAN1) on the system board.
2. Remove the three screws (M2x4) that secure the fan to the palm-rest assembly.
3. Lift the fan off the palm-rest assembly.

Installing the fan

Prerequisites

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

About this task

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

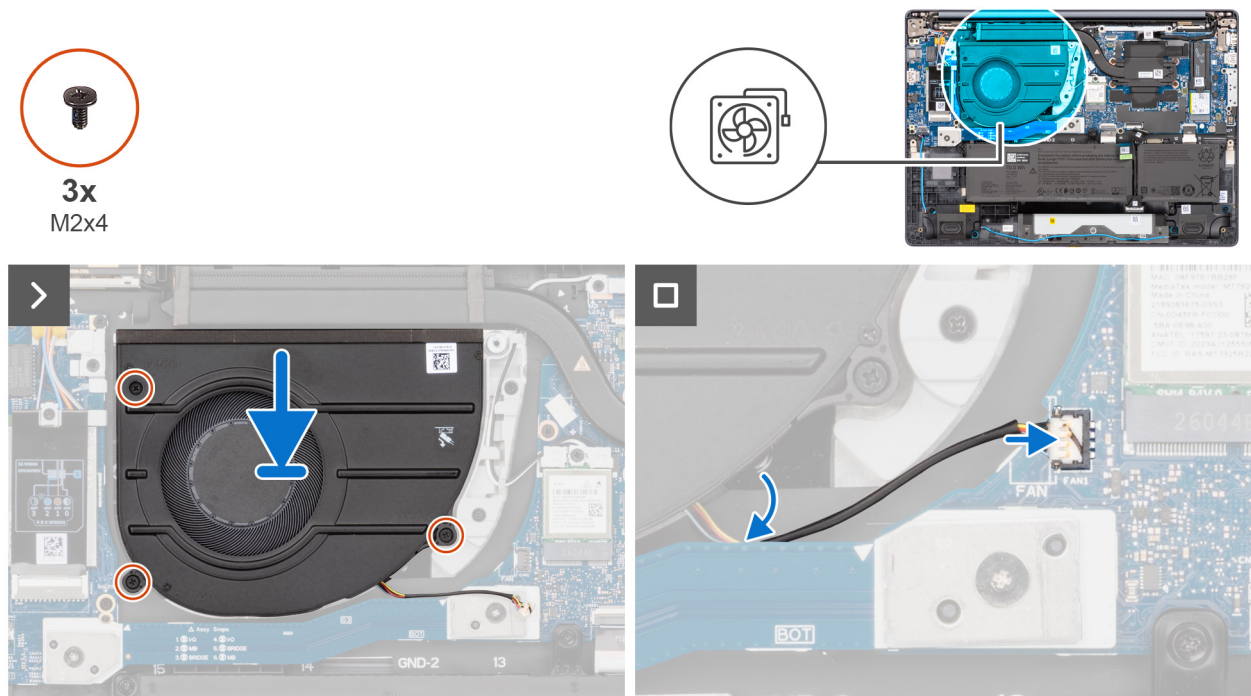


Figure 21. Installing the fan

Steps

1. Place the fan 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 three screws (M2x4) that secure the fan to the palm-rest assembly.
4. Connect the fan cable to its connector (JFAN1) on the system board.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. 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.

I/O-bridge board

Removing the I/O-bridge board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

 **NOTE:** Depending on the type of memory installed on your computer, the I/O-bridge board may vary in appearance.

The following image indicates the location of the I/O-bridge board and provides a visual representation of the removal procedure.



2x
M2x4

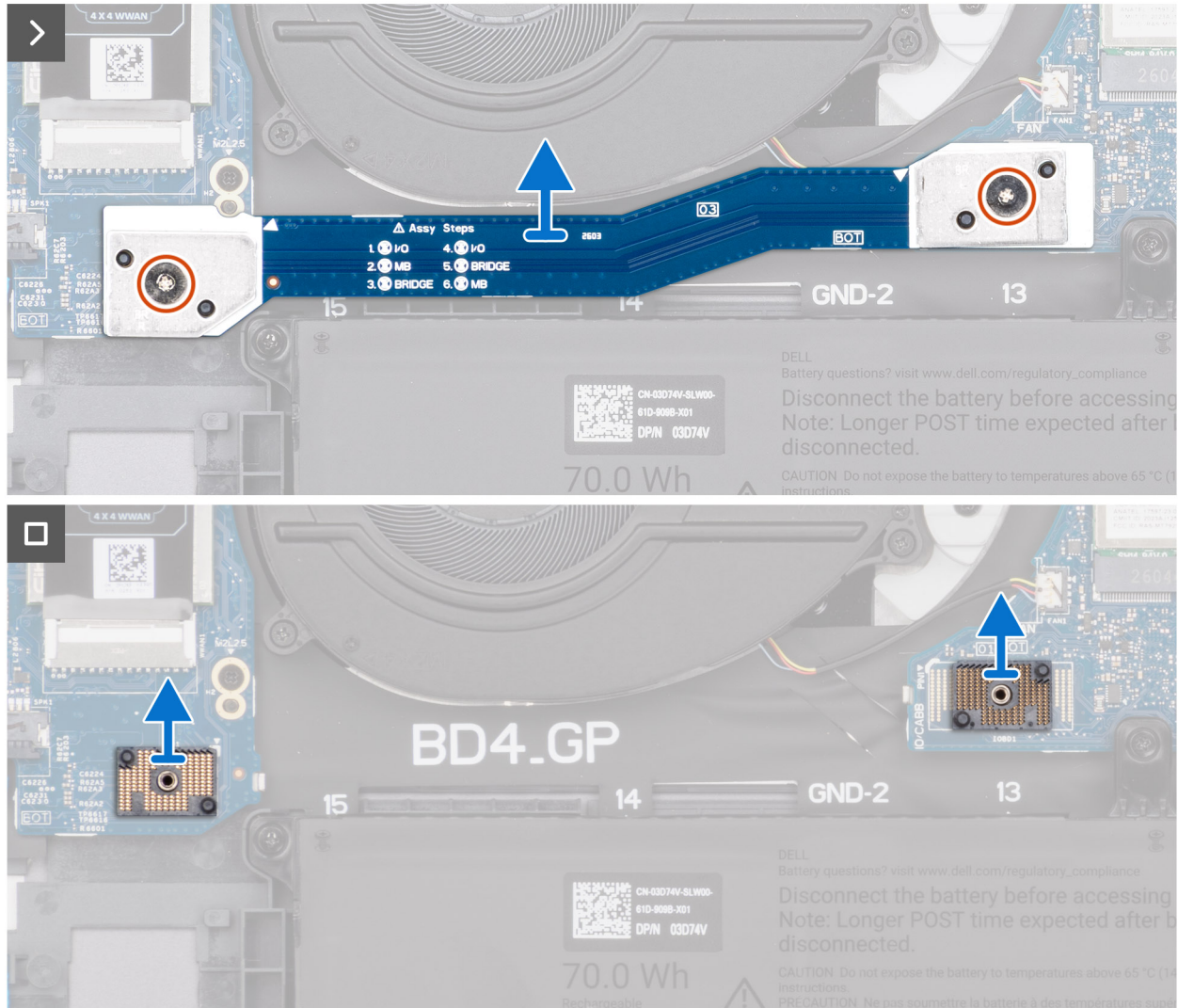
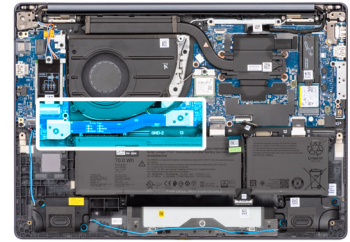


Figure 22. Removing the I/O-bridge board

Steps

1. Remove the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
2. Remove the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
3. Lift the I/O-bridge board off the I/O board and system board.
4. Remove the I/O-bridge board interposer from its connector (JMBR1) on the I/O board.
5. Remove the I/O-bridge board interposer from its connector (JIOR1) on the system board.

CAUTION: To avoid bending the pins and damaging the I/O-bridge board interposer, hold the interposer by the edges while handling it.

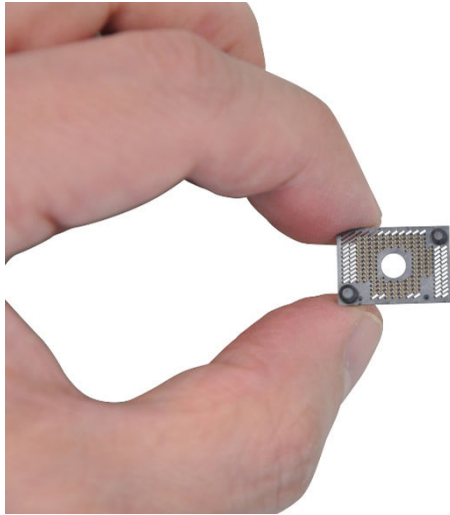


Figure 23. Proper handling of the I/O-bridge board interposer

Installing the I/O-bridge board

Prerequisites

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

About this task

NOTE: Depending on the type of memory installed on your computer, the I/O-bridge board may vary in appearance.

The following images indicate the location of the I/O-bridge board and provide a visual representation of the installation procedure.

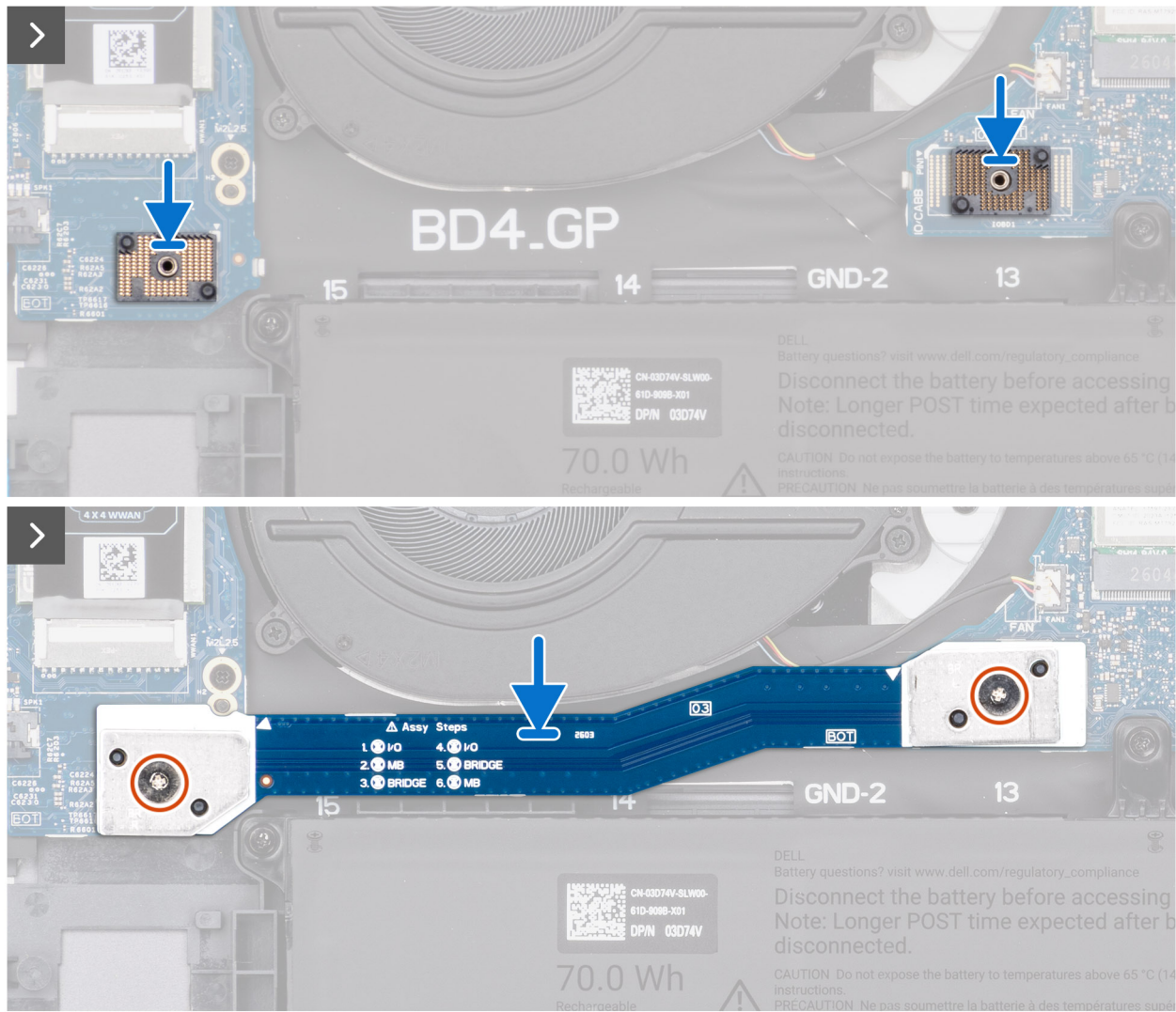


Figure 25. Installing the I/O-bridge board

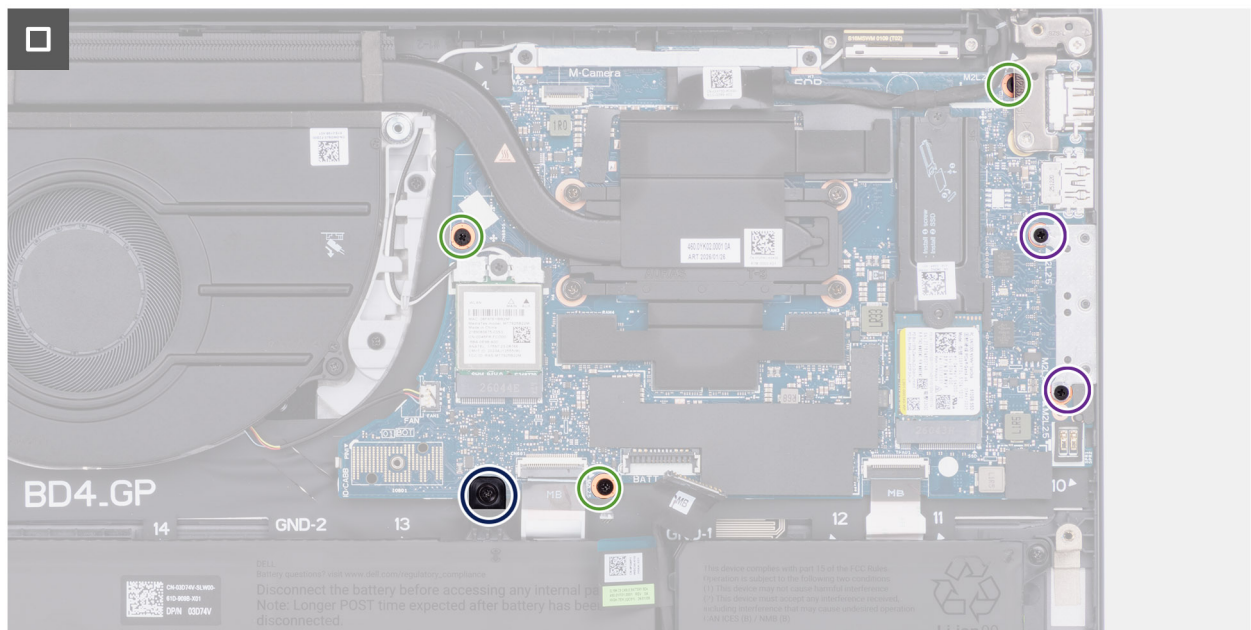


Figure 26. Installing the I/O-bridge board

Steps

1. Remove the two screws (M2x3.5) that secure the right display hinge to the palm-rest assembly.
2. Pry open the right display hinge at a 90-degree angle.
3. Loosen the captive screw that secures the battery to the palm-rest assembly.
4. Loosen the three screws (M2x2.5) and the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
5. Using the alignment posts on the I/O board, place and align the I/O-bridge board interposer onto its connector (JMBR1) on the I/O board.
6. **NOTE:** Follow the sequence (from left to right) to ensure that the bridge connector is properly connected between the system board and the I/O board. The installation sequence that is shown is marked on the bridge connector.

NOTE:



Figure 27. I/O bridge board

Using the alignment posts on the system board, place and align the I/O-bridge board interposer onto its connector (JIOR1) on the system board.

CAUTION: To avoid bending the pins and damaging the I/O-bridge board interposer, hold the interposer by the edges while handling it.

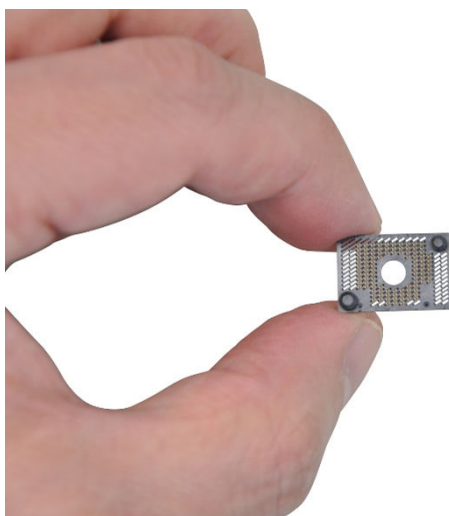


Figure 28. Proper handling of the I/O-bridge board interposer

7. Using the alignment posts on the I/O-bridge board interposers, place and align the I/O-bridge board onto the I/O-bridge board interposers on the system board and I/O board.
8. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
9. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
10. Replace the three screws (M2x2.5) and the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
11. Tighten the captive screw that secures the battery to the palm-rest assembly.
12. Close the right display hinge.
13. Using the alignment posts, align the screw holes on the right display hinge with the screw holes on the palm-rest assembly before fully closing the hinge.
14. Replace the two screws (M2.5x4.5) that secure the right display hinge to the palm-rest assembly.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. Follow the procedure in [After working inside your computer](#).

Heat sink

Removing the heat sink

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

About this task

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

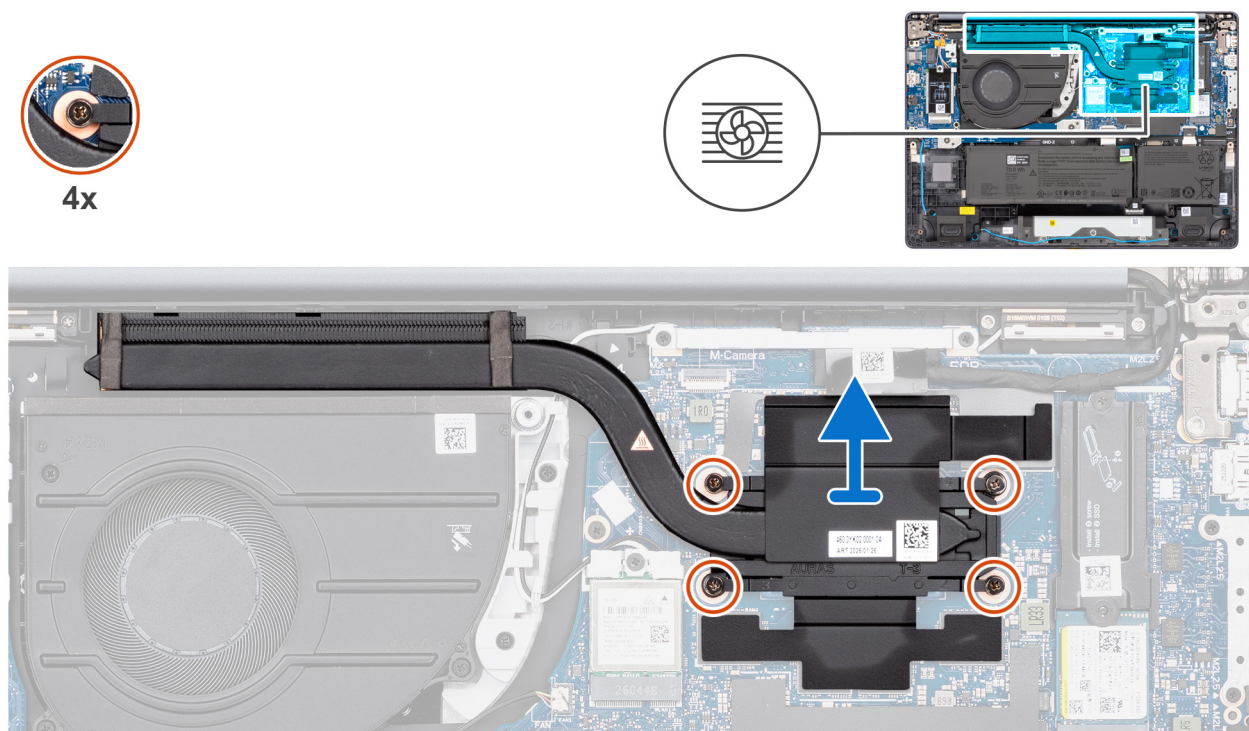


Figure 29. Removing the heat sink

Steps

1. Peel the tape that secures the display and camera cable to the heat sink.
2. In the reverse sequential order (4 > 3 > 2 > 1), loosen the four captive screws that secure the heat sink to the system board.
3. Lift the heat sink off the system board.

Installing the heat sink

Prerequisites

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

About this task

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

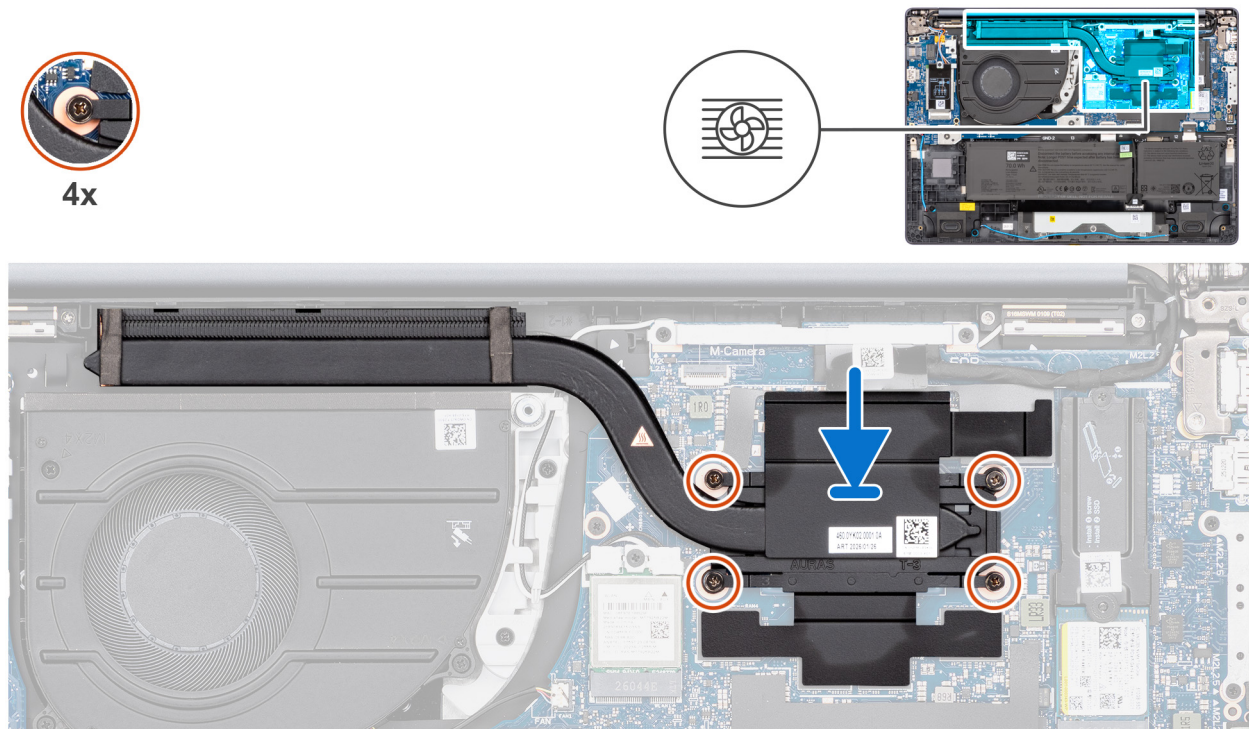


Figure 30. Installing the heat sink

Steps

1. Place the heat sink on the system board and align the captive screws on the heat sink with the screw holes on the system board.
2. In sequential order (1 > 2 > 3 > 4), tighten the four captive screws (M2x3) that secure the heat sink to the system board.
3. Adhere the tape that secures the display and camera cable to the heat sink.

Next steps

1. Install the [base cover](#).
2. Install the [nano-SIM card tray](#), if applicable.
3. Follow the procedure in [After working inside your computer](#).

I/O board

Removing the I/O board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [I/O-bridge board](#).

About this task

The following image indicates the location of the I/O board and provides a visual representation of the removal procedure.

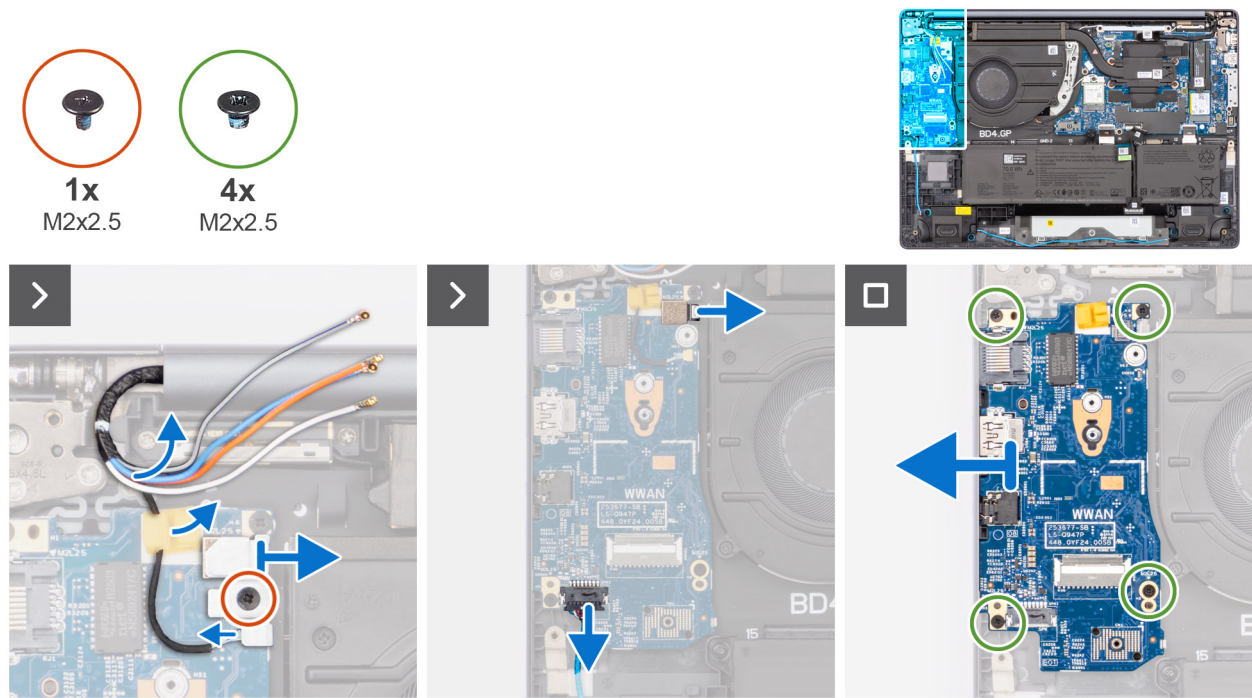


Figure 31. Removing the I/O board

Steps

1. Remove the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.
2. Lift the fingerprint-reader bracket off the palm-rest assembly.
3. Remove the WWAN antenna cables and Darwin cable from the routing guides on the I/O board and move them away from the I/O board.
4. Disconnect the fingerprint-reader cable from its connector (JFP1) on the I/O board.
NOTE: This step is applicable only for computers that are shipped with the optional fingerprint reader.
5. Disconnect the Darwin cable from its connector (JANT1) on the I/O board.
NOTE: This step is applicable only for computers that are shipped with a WWAN card.
6. Disconnect the speaker cable from its connector (JSPK1) on the I/O board.
7. Remove the four screws (M2x2.5) that secure the I/O board to the palm-rest assembly.
8. Peel the WWAN-card thermal pad and Mylar tape off the I/O board.
NOTE: This step is applicable only if your computer has a WWAN card that is installed and you are replacing the I/O board on your computer with another one.
9. Lift the I/O board off the palm-rest assembly.

Installing the I/O board

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 I/O board and provide a visual representation of the installation procedure.

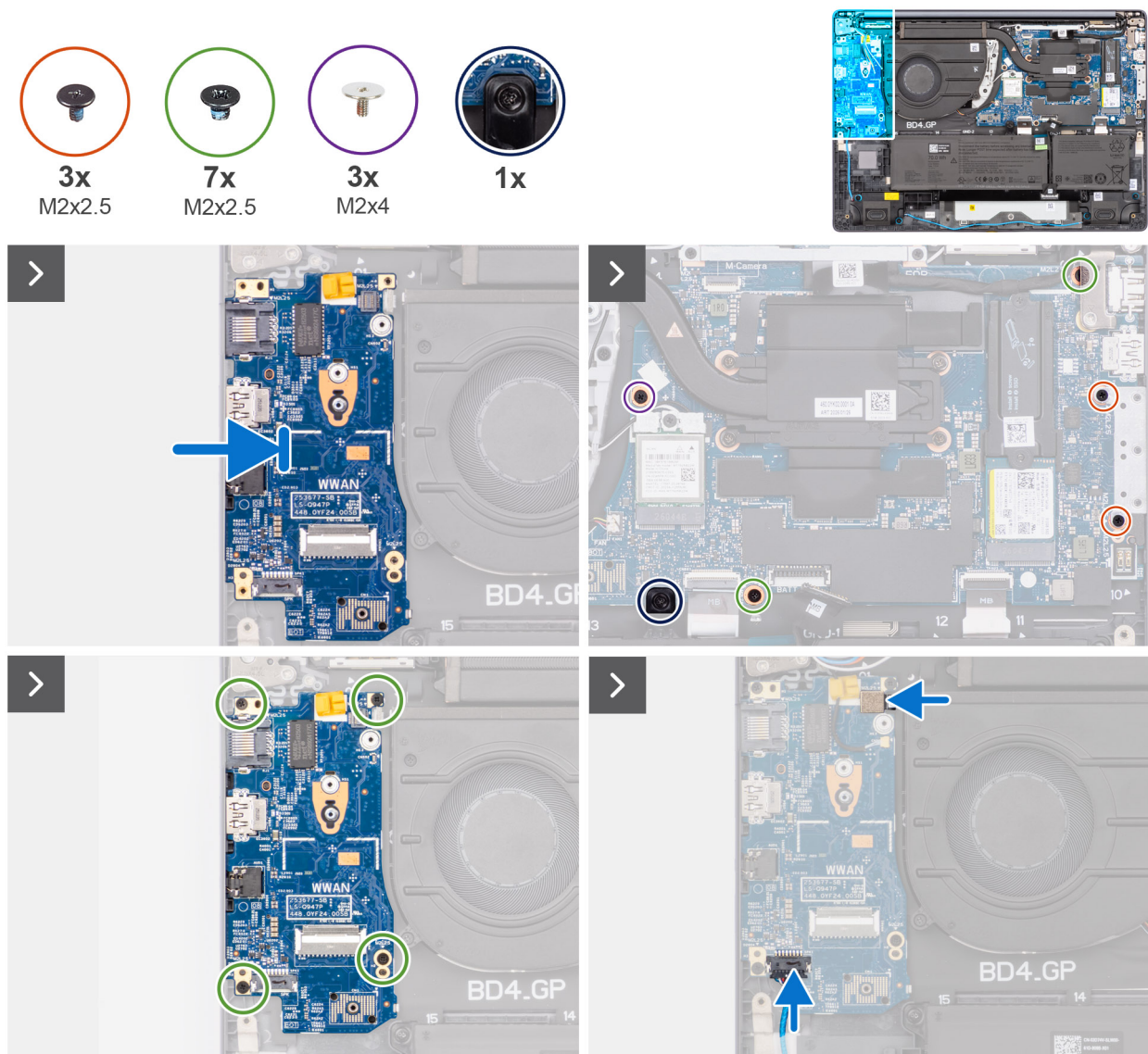


Figure 32. Installing the I/O bridge board

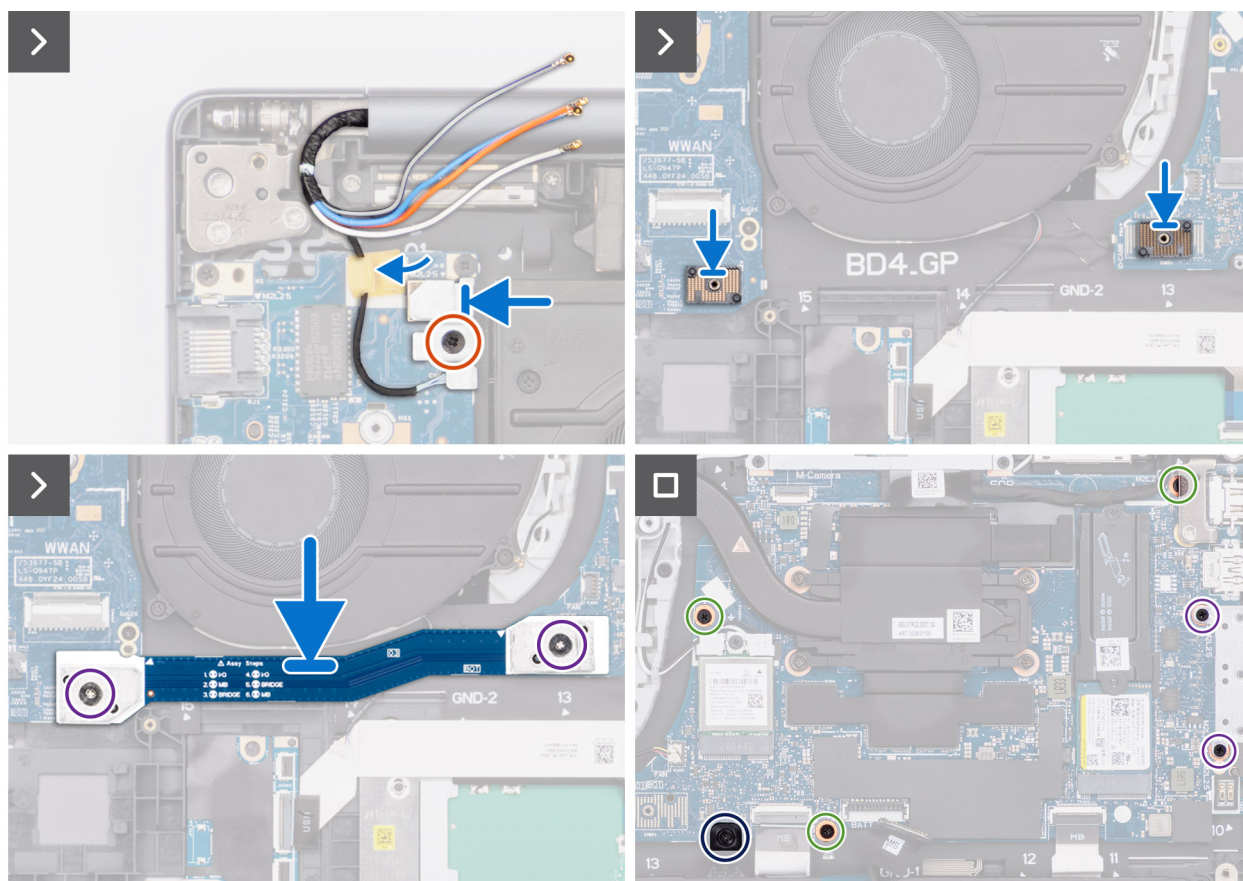


Figure 33. Installing the I/O board

Steps

1. Place the I/O board on the palm-rest assembly.
2. Align the screw holes on the I/O board with the screw holes on the palm-rest assembly.
3. Adhere the WWAN-card thermal pad and Mylar tape on the I/O board.
i NOTE: This step is applicable only if your computer has a WWAN card that is installed and you are replacing the I/O board on your computer with another one.
4. Replace the four screws (M2x2.5) that secure the I/O board to the palm-rest assembly.
5. Connect the speaker cable to its connector (JSPK1) on the I/O board.
6. Connect the fingerprint-reader cable to its connector (JFP1) on the I/O board.
i NOTE: This step is applicable only for computers that are shipped with the optional fingerprint reader.
7. Route the WWAN antenna cables and Darwin cable through its routing guides on the I/O board.
i NOTE: This step is applicable only for computers that are shipped with a WWAN card.
8. Connect the Darwin cable to its connector (JANT1) on the I/O board.
9. Place and align the fingerprint-reader bracket on the palm-rest assembly.
10. Replace the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.
11. Remove the two screws (M2x3.5) that secure the right display hinge to the palm-rest assembly.
12. Pry open the right display hinge at a 90-degree angle.
13. Loosen the captive screw that secures the battery to the palm-rest assembly.
14. Remove the three screws (M2x2.5) and the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
15. **i NOTE:** Follow the sequence (from left to right) to ensure that the bridge connector is properly connected between the system board and the I/O board. The installation sequence that is shown is marked on the bridge connector.

NOTE:



Figure 34. I/O bridge board

Using the alignment posts on the I/O board, place and align the I/O-bridge board interposer onto its connector (JMBR1) on the I/O board.

16. Using the alignment posts on the system board, place and align the I/O-bridge board interposer onto its connector (JIOR1) on the system board.

CAUTION: To avoid bending the pins and damaging the I/O-bridge board interposer, hold the interposer by the edges while handling it.

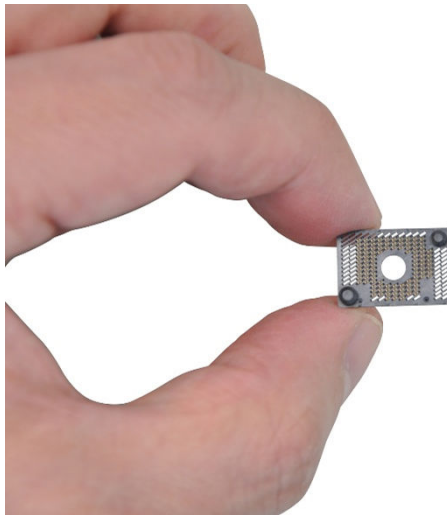


Figure 35. Proper handling of the I/O-bridge board interposer

17. Using the alignment posts on the I/O-bridge board interposers, place and align the I/O-bridge board onto the I/O-bridge board interposers on the system board and I/O board.
18. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
19. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
20. Replace the three screws (M2x2.5) and the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
21. Tighten the captive screw that secures the battery to the palm-rest assembly.
22. Close the right display hinge.
23. Using the alignment posts, align the screw holes on the right display hinge with the screw holes on the palm-rest assembly before fully closing the hinge.
24. Replace the two screws (M2.5x4.5) that secure the right display hinge to the palm-rest assembly.

Next steps

1. Install the [5G WWAN card](#).
2. Install the [base cover](#).
3. Install the [nano-SIM card tray](#), if applicable.
4. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [I/O-bridge board](#).
6. Remove the [I/O board](#).

About this task

 **NOTE:** The procedure to remove the power button or the power button with an optional fingerprint reader is the same.

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

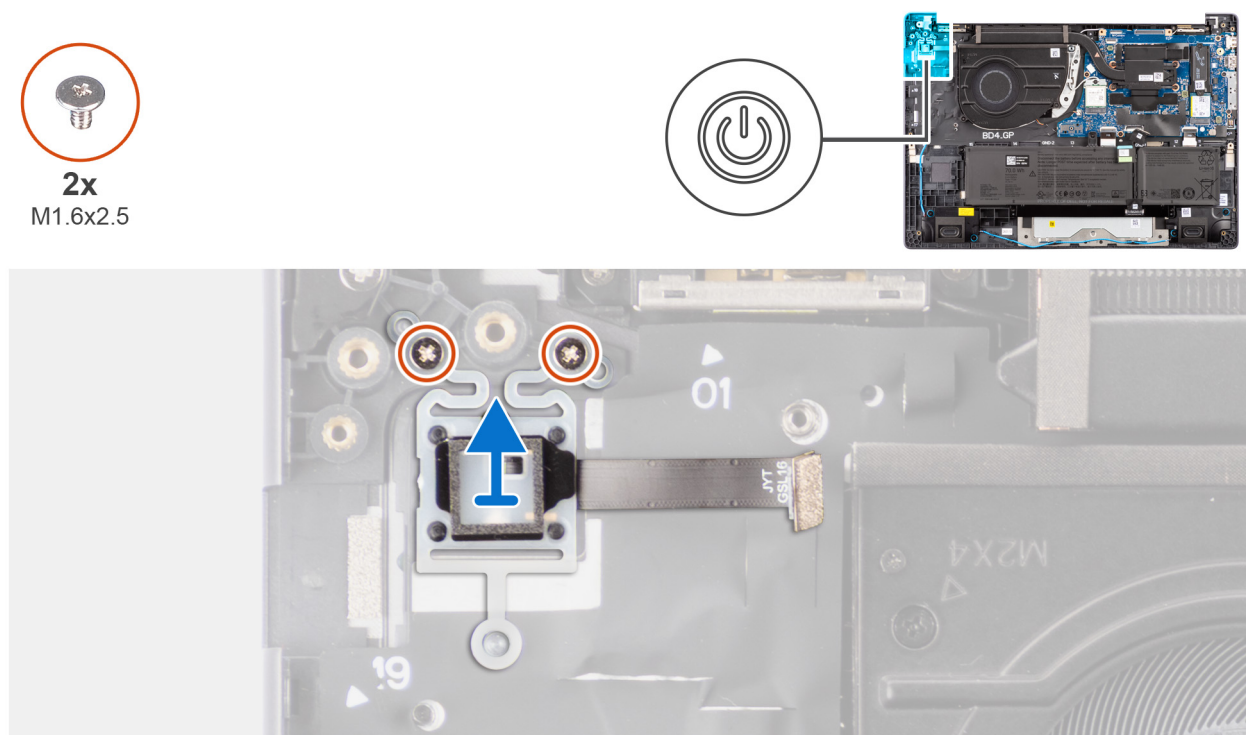


Figure 36. Removing the power button

Steps

1. Remove the three screws (M2.5x4.5) that secure the left display hinge to the palm-rest assembly.
2. Pry open the left display hinge at a 90-degree angle.
3. Remove the two screws (M1.6x2.5) that secure the power button to the palm-rest assembly.
4. Lift the power button off the palm-rest assembly.

Installing the power button

Prerequisites

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

About this task

NOTE: The procedure to install the power button or the power button with an optional fingerprint reader is the same.

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

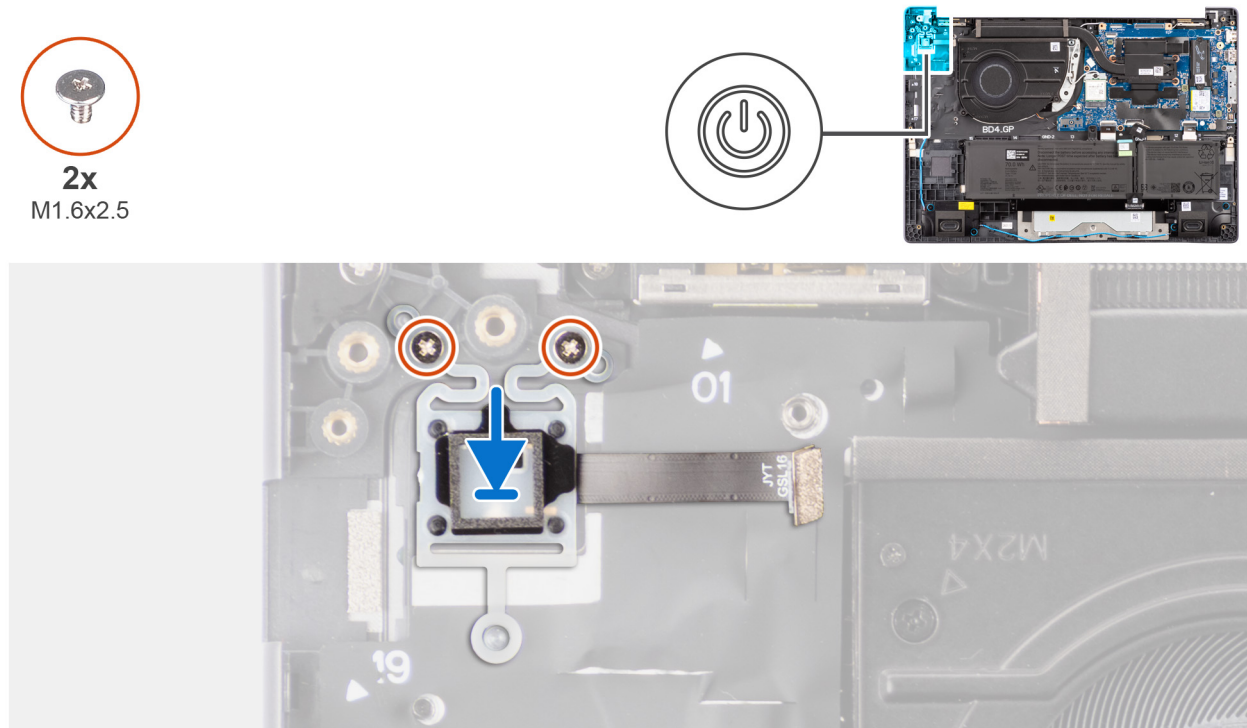


Figure 37. Installing the power button

Steps

1. Place the power button into its slot on the palm-rest assembly.
2. Replace the two screws (M1.6x2.5) that secure the power button to the palm-rest assembly.
3. Close the left display hinge.
4. Using the alignment posts, align the screw holes on the left display hinge with the screw holes on the palm-rest assembly before fully closing the hinge.
5. Replace the three screws (M2.5x4.5) that secure the left display hinge to the palm-rest assembly.

Next steps

1. Install the [I/O board](#).
2. Install the [I/O-bridge board](#).
3. Install the [5G WWAN card](#).
4. Install the [WLAN card](#).
5. Install the [2230 solid-state drive](#).
6. Install the [base cover](#).
7. Install the [nano-SIM card tray](#), if applicable.
8. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).

About this task

NOTE: The display assembly is an assembly consisting of the following components:

- Display bezel
- Display hinges
- Display panel
- Camera
- Display cable
- WWAN-antenna module, if applicable

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

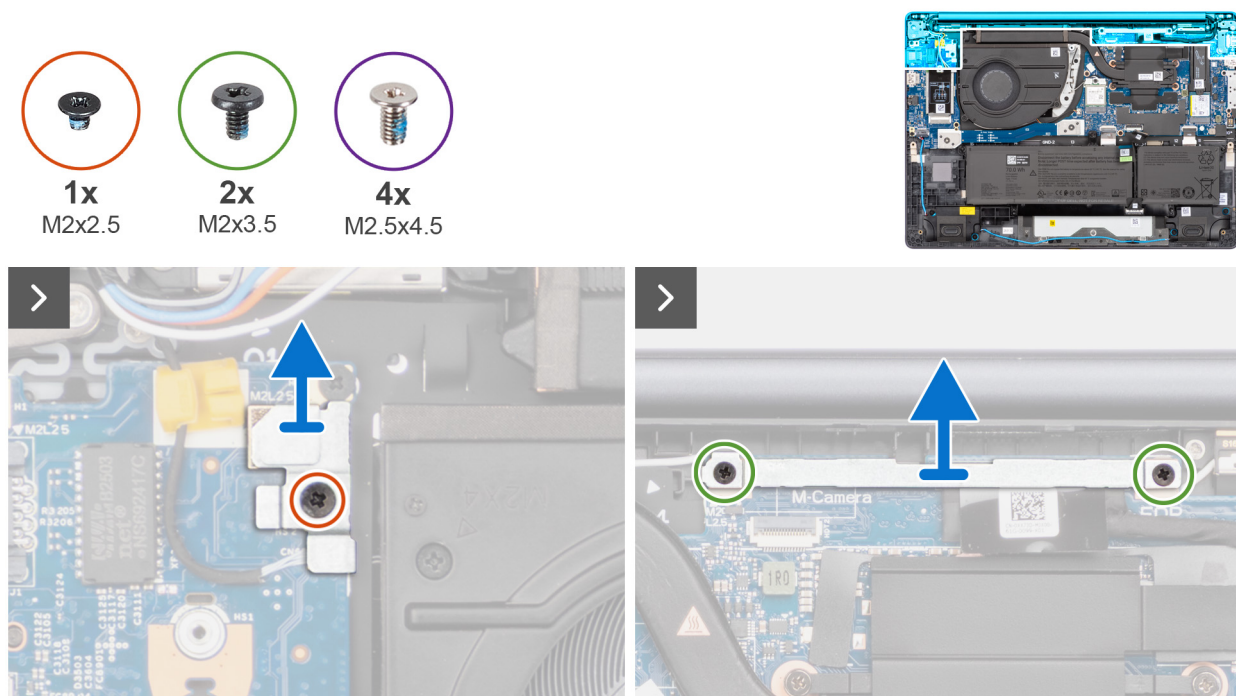


Figure 38. Removing the display assembly

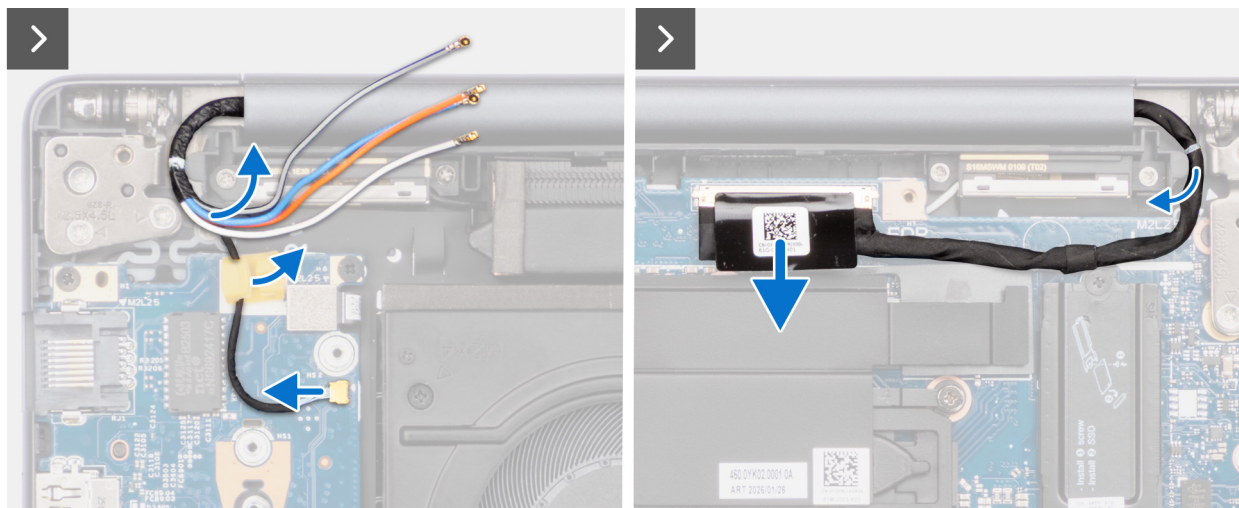


Figure 39. Removing the display assembly

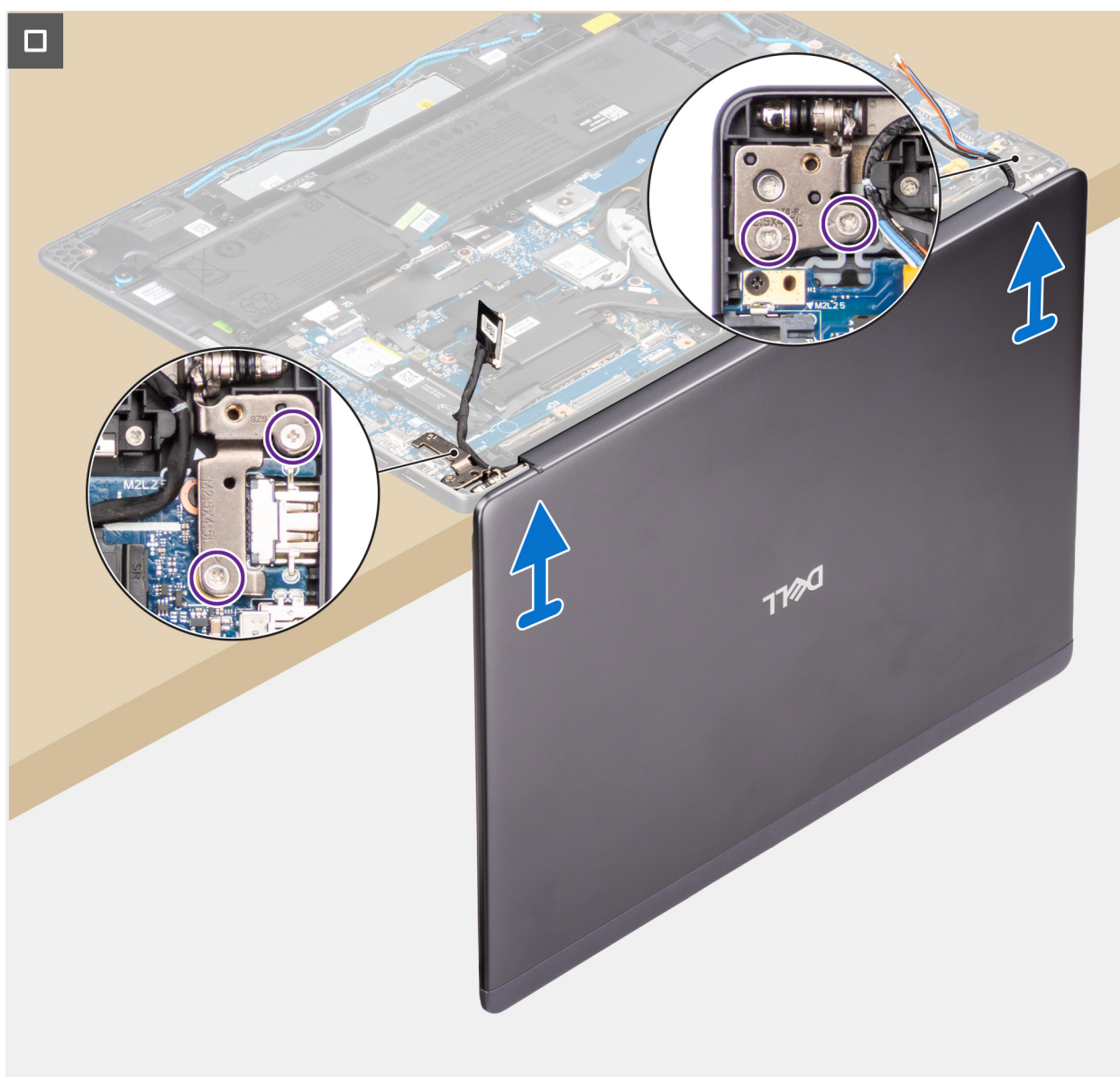


Figure 40. Removing the display assembly

Steps

1. Remove the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.
2. Lift the fingerprint reader bracket off the palm-rest assembly.
3. Disconnect the Darwin cable from its connector (JANT1) on the I/O board.
4. Remove the two screws (M2x3.5) that secure the display-cable bracket to the system board.
5. Lift the display-cable bracket off the system board.
6. Disconnect the display and camera cable from its connector (EDP) on the system board.
7. Open the display assembly at an angle of 90 degrees.
8. Place the computer on the edge of a clean and flat surface so the display assembly extends below the edge of the surface.
9. Remove the four screws (M2.5x4.5) that secure the left and right display hinges to the palm-rest assembly.
10. Lift the display assembly off the palm-rest assembly.

Installing the display assembly

Prerequisites

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

About this task

 **NOTE:** The display assembly is an assembly consisting of the following components:

- Display bezel
- Display hinges
- Display panel
- Camera
- Display cable
- WWAN-antenna module, if applicable

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

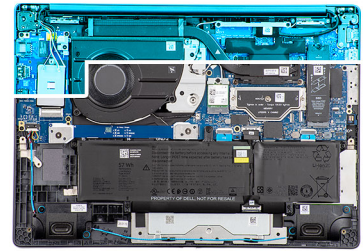


Figure 41. Installing the display assembly

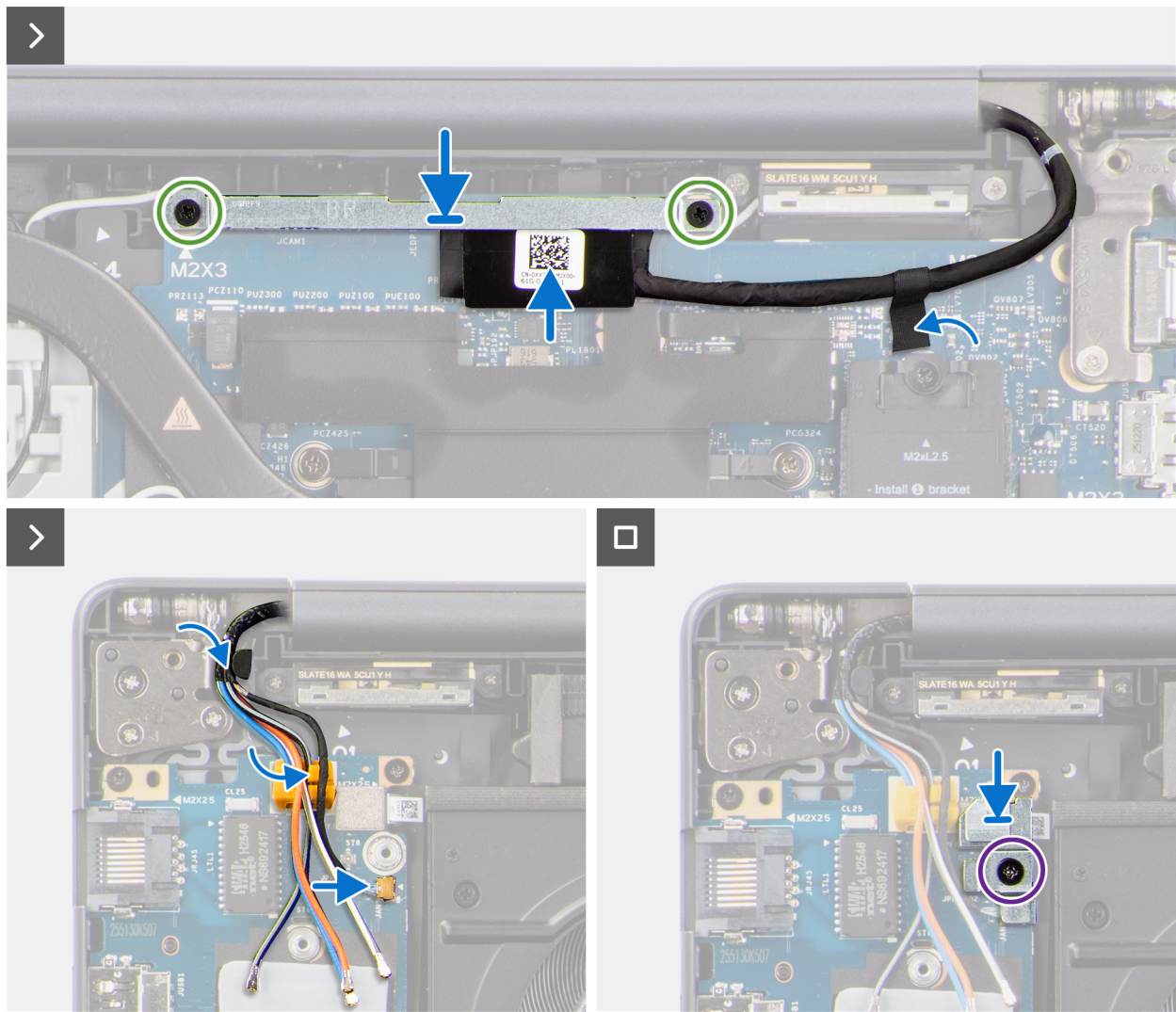


Figure 42. Installing the display assembly

Steps

1. Place the palm-rest assembly on the edge of a clean, flat surface.
2. Open the left and right display hinges at a 90-degree angle.
3. Place the display assembly over the palm-rest assembly, aligning the screw holes on the display assembly with the screw holes on the palm-rest assembly.
4. Replace the five screws (M2.5x4.5) that secure the left and right display hinges to the palm-rest assembly.
5. Connect the display and camera cable to its connector (EDP) on the system board.
6. Place the display-cable bracket over the display connectors on the system board.
7. Align the screw holes on the display-cable bracket to the screw holes on the system board.
8. Replace the two screws (M2x3.5) that secure the display-cable bracket to the system board.
9. Connect the Darwin cable to its connector (JANT1) on the I/O board.
10. Place the fingerprint reader bracket on the palm-rest assembly.
11. Align the screw holes on the fingerprint reader bracket to the screw holes on the I/O board.
12. Replace the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.

Next steps

1. Install the [5G WWAN card](#).
2. Install the [base cover](#).
3. Install the [nano-SIM card tray](#), if applicable.

4. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [display assembly](#).

About this task

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



Figure 43. Removing the display bezel

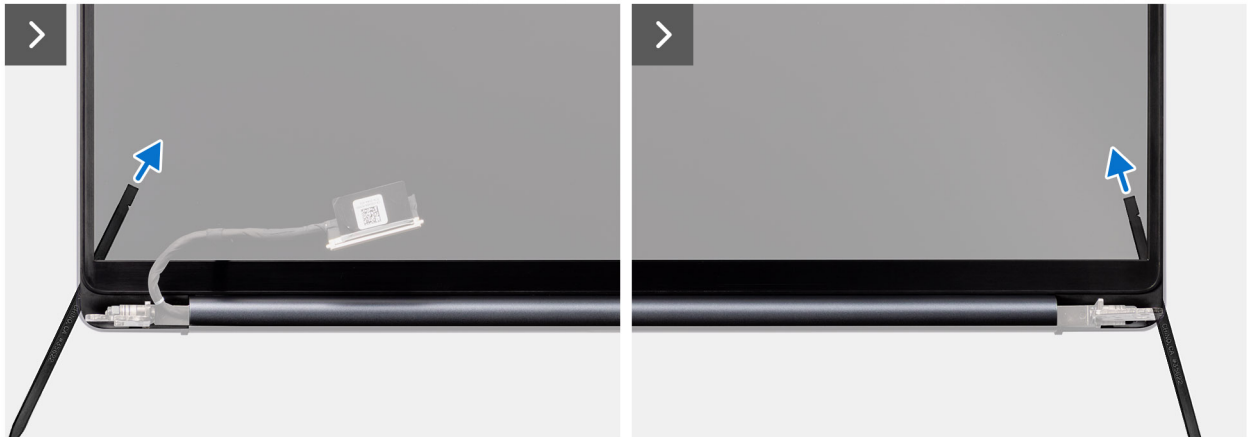


Figure 44. Removing the display bezel



Figure 45. Removing the display bezel



Figure 46. Removing the display bezel

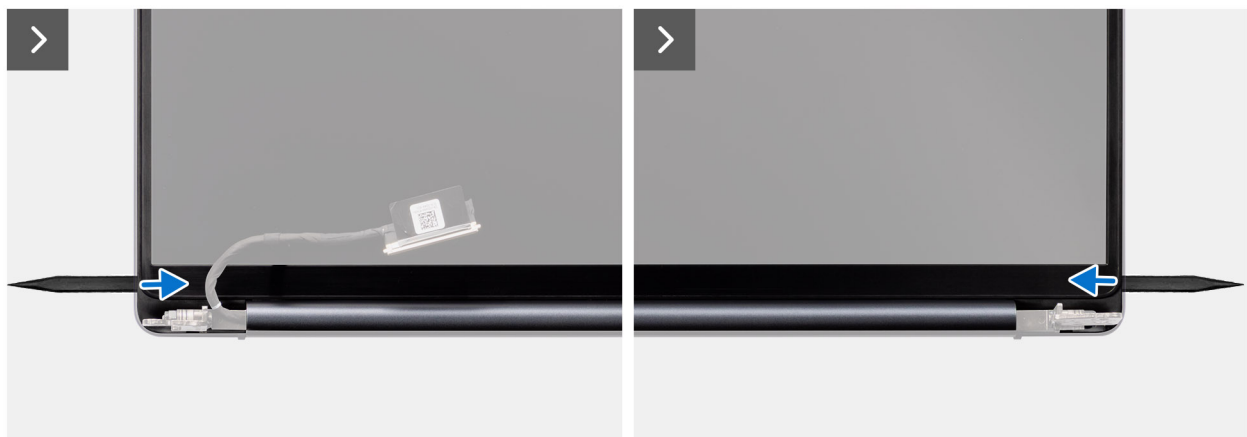


Figure 47. Removing the display bezel

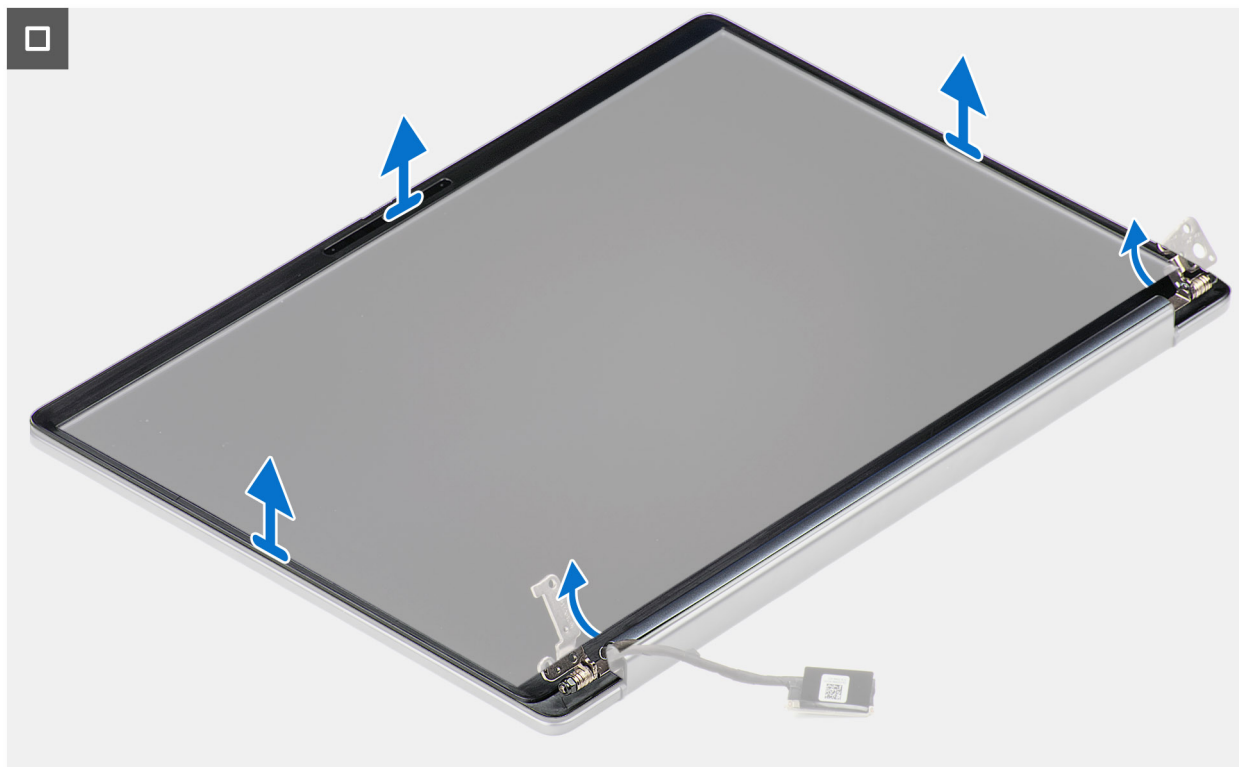


Figure 48. Removing the display bezel

Steps

1. Pry open the display hinges.
2. Insert a flat-head slotted screwdriver (maximum width: 4 mm) into the slots on the display bezel near the hinges, and gently apply pressure to release the bezel at both ends, creating a gap.

NOTE: This action deforms the bezel plastics. Dell ships a new display bezel in the replacement kit when the display bezel is removed as part of the procedure.

3. Insert the flat end of the scribe into the gap created under the display bezel.

CAUTION: When inserting the scribe into the bezel, keep it parallel to the display. Pressing it downward can damage the display. Do not use the flat-head (slotted) screwdriver to release the rest of the bezel. Switch to the plastic scribe to continue prying along the bezel.

4. Keeping the scribe parallel to the display, carefully slide it along the bottom edge of the bezel to release the latches on the lower side.
5. Insert the scribe diagonally into the hinge section to carefully release the portion of the bezel above the hinge.
6. Insert the scribe into the corner of the display bezel near the hinge. Keeping the scribe parallel to the display, carefully slide the scribe along the edges from one corner to the other (right to left or left to right).
7. Lift the display bezel from the display assembly.

Installing the display bezel

Prerequisites

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

About this task

NOTE: Install the new display bezel supplied in your replacement kit instead of the old display bezel that was removed from your computer.

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

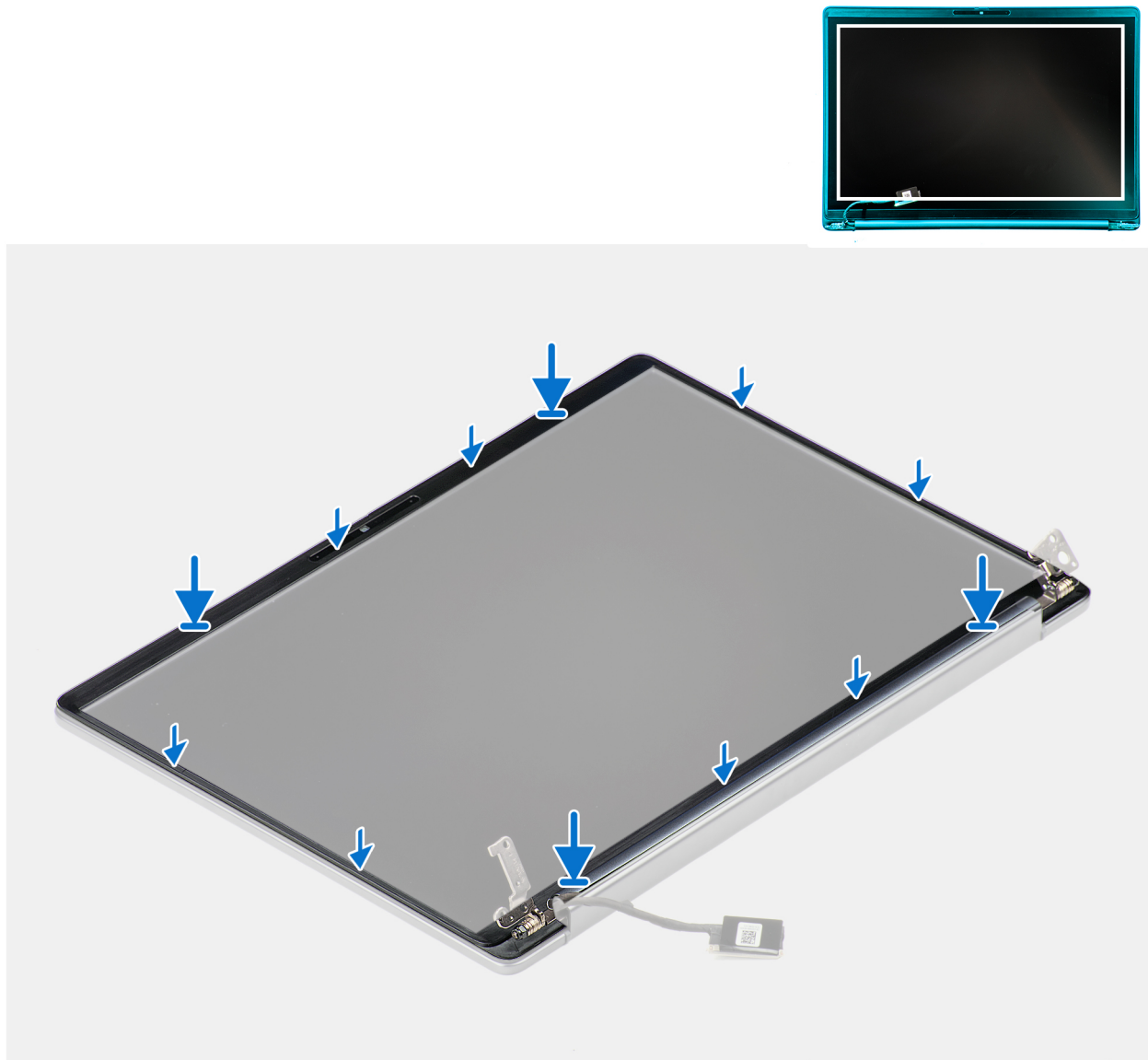


Figure 49. Installing the display bezel

Steps

1. Place the display assembly on a clean and flat surface.
2. Align and place the display bezel on the display assembly.
3. 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 [5G WWAN card](#).
3. Install the [base cover](#).
4. Install the [nano-SIM card tray](#), if applicable.
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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [display assembly](#).
6. Remove the [display bezel](#).

About this task

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

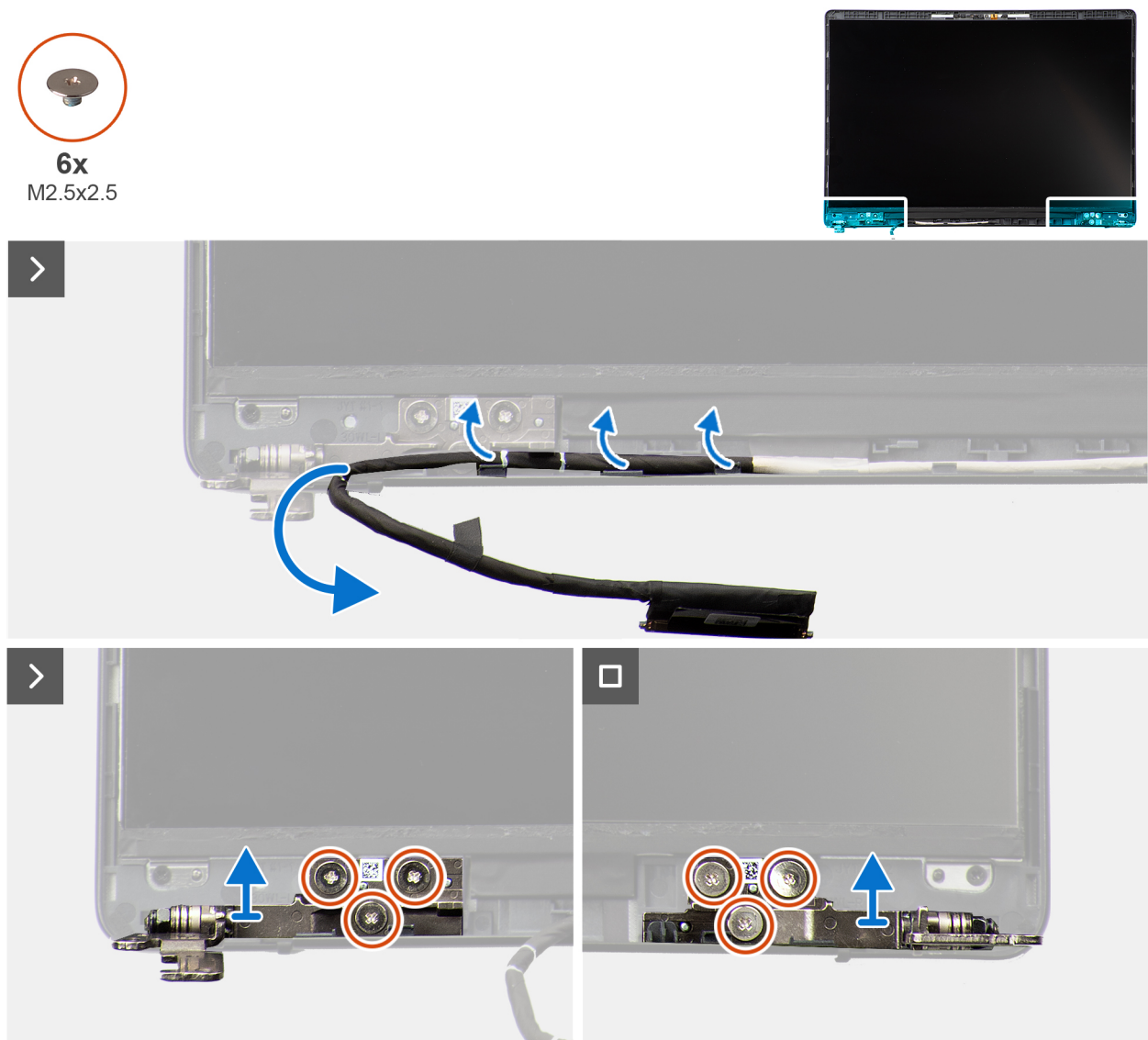


Figure 50. Removing the display hinges

Steps

1. Remove the display and camera cable from the routing guides on the display-back cover.
2. Remove the three screws (M2.5x2.5) that secure the left display hinge to the display-back cover.
3. Lift the left display hinge off the display-back cover.
4. Remove the three screws (M2.5x2.5) that secure the right display hinge to the display-back cover.
5. Lift the right display hinge off the display-back cover.

Installing the display hinges

Prerequisites

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

About this task

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

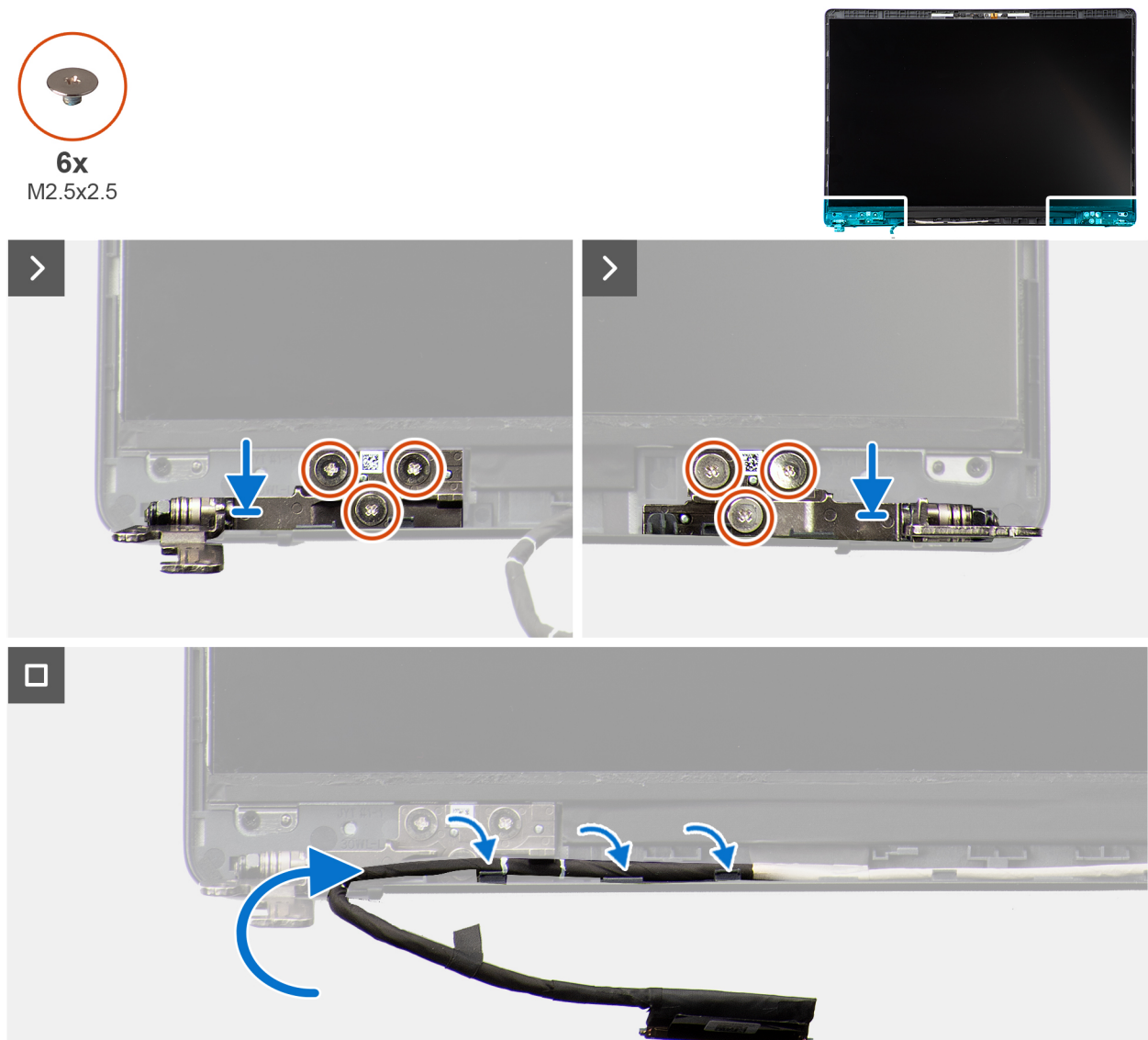


Figure 51. Installing the display hinges

Steps

1. Place the left hinge on the display-back cover.
2. Using the alignment posts, align the screw holes on the left hinge with the screw holes on the back cover.
3. Replace the three screws (M2.5x2.5) that secure the left display hinge to the display-back cover.
4. Place the right hinge on the display-back cover.
5. Using the alignment posts, align the screw holes on the right hinge with the screw holes on the back cover.
6. Replace the three screws (M2.5x2.5) that secure the right display hinge to the display-back cover.
7. Route the display and camera cable through the routing guides on the display-back cover.

Next steps

1. Install the [display bezel](#).
2. Install the [display assembly](#).
3. Install the [5G WWAN card](#).
4. Install the [base cover](#).
5. Install the [nano-SIM card tray](#), if applicable.
6. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [display assembly](#).
6. Remove the [display bezel](#).
7. Remove the [display hinges](#).

About this task

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



2x
M1.6x2.2

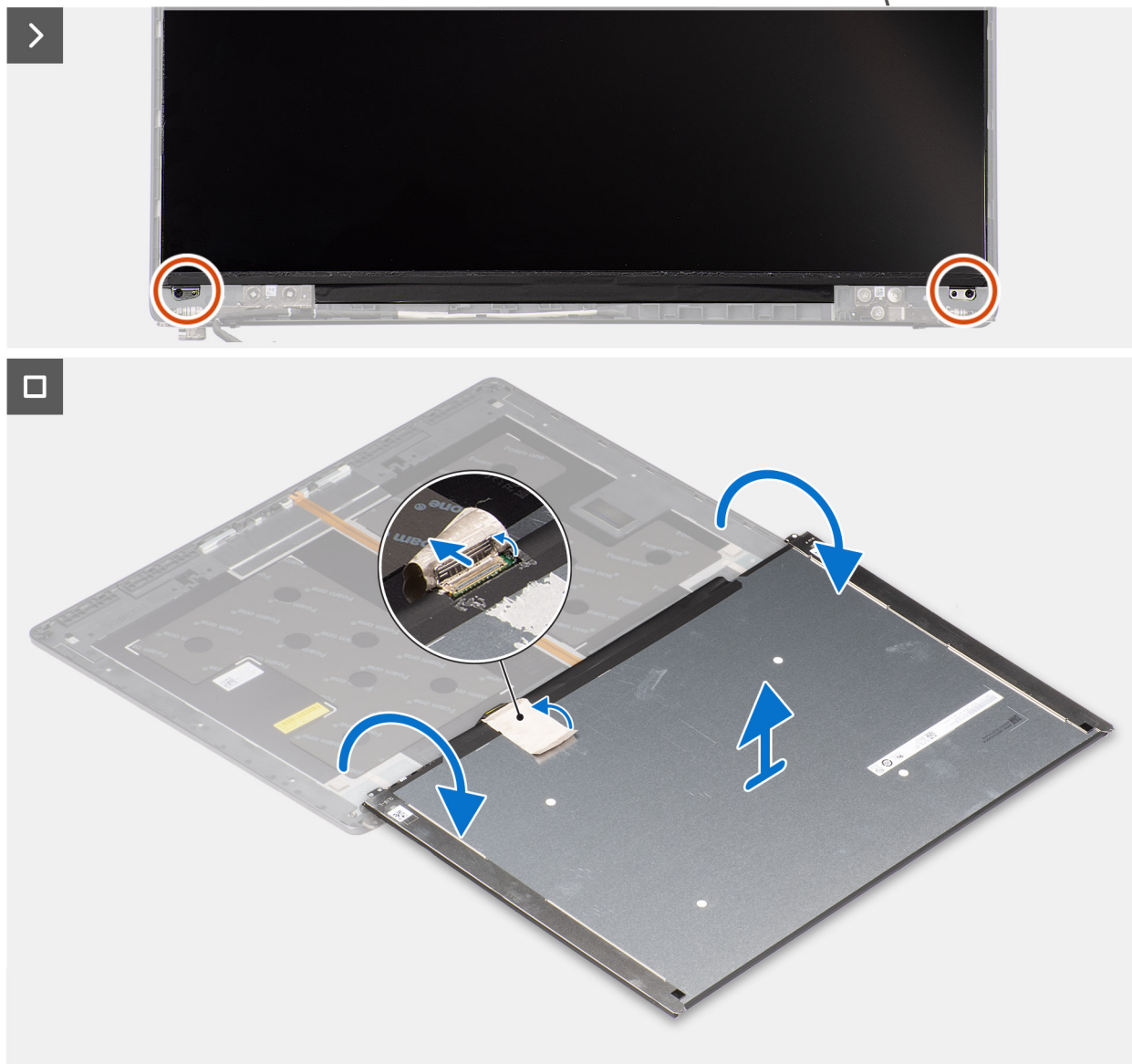


Figure 52. Removing the display panel

Steps

1. Remove the two screws (M1.6x2.2) that secure the display panel to the display-back cover.
2. Gently hold on the top side of the display panel and flip it over.
3. Peel the tape that secures the display cable to the back of the display panel.
4. Open the latch and disconnect the display cable from its connector on the display panel.
5. Lift the display panel off the display-back cover.

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

 **CAUTION:** To avoid damaging your computer, do not pull the two pieces of elastic tape and separate the brackets from the panel.

Installing the display panel

Prerequisites

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

About this task

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



2x
M1.6x2.2

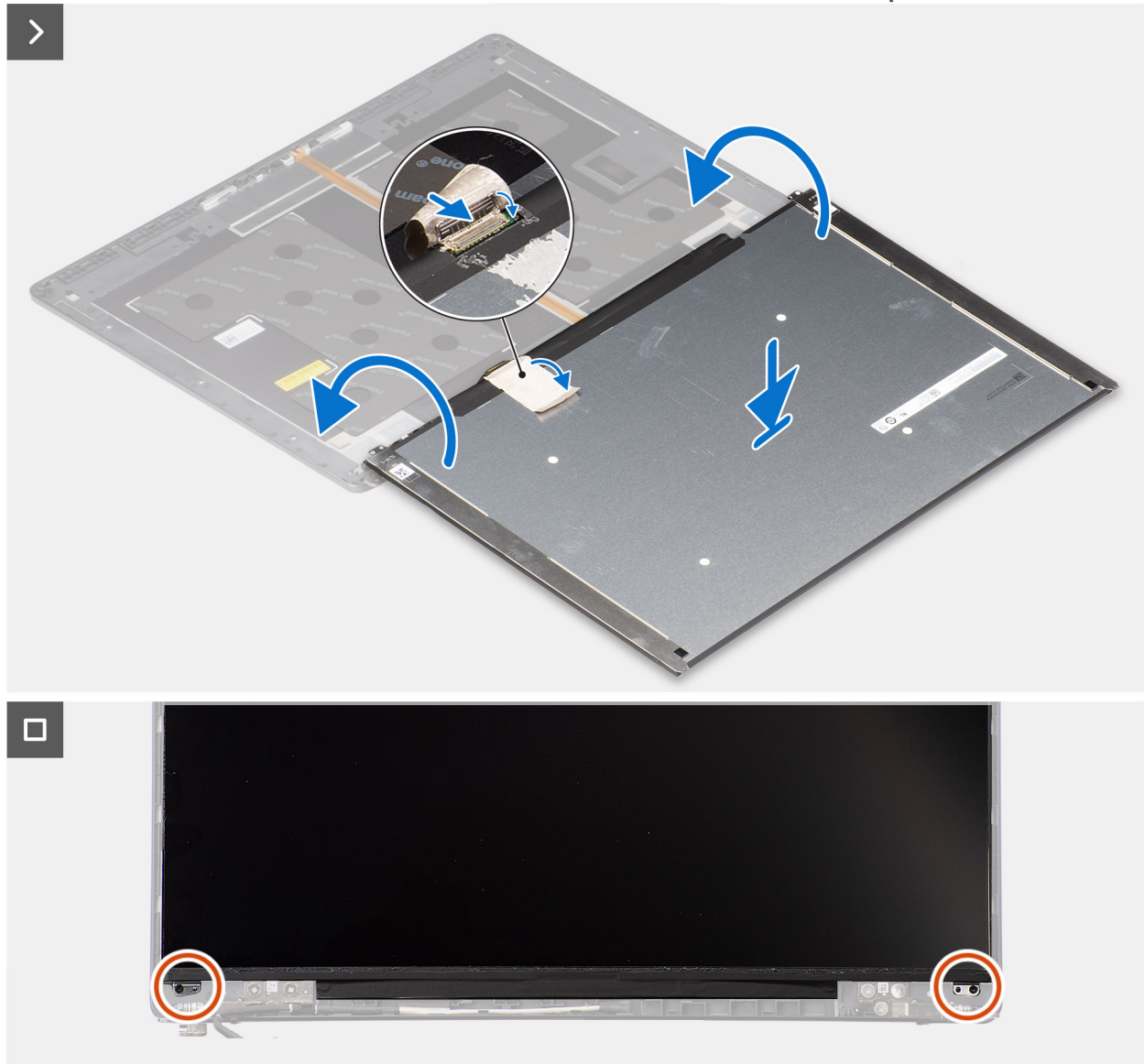


Figure 53. Installing the display panel

Steps

1. Place the display panel face down on a clean and flat surface.
2. Connect the display cable to its connector on the display panel and close the latch to secure the cable.
3. Adhere the tape that secures the display cable to the display panel.
4. Gently lift and flip over the display panel, taking care not to apply tension on the display cable.
5. Place the display panel into its slot on the display-back cover.
6. Align the screw holes on the display panel with the screw holes on the display-back cover.
7. Replace the two screws (M1.6x2.2) that secure the display panel to the display-back cover.

Next steps

1. Install the [display hinges](#).
2. Install the [display bezel](#).
3. Install the [display assembly](#).
4. Install the [5G WWAN card](#).
5. Install the [base cover](#).
6. Install the [nano-SIM card tray](#), if applicable.
7. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [display assembly](#).
6. Remove the [display bezel](#).
7. Remove the [display hinges](#).
8. Remove the [display panel](#).

About this task

 **NOTE:** Depending on the type of camera installed the removal procedure may vary. Refer to the image that best represents your product on hand.

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

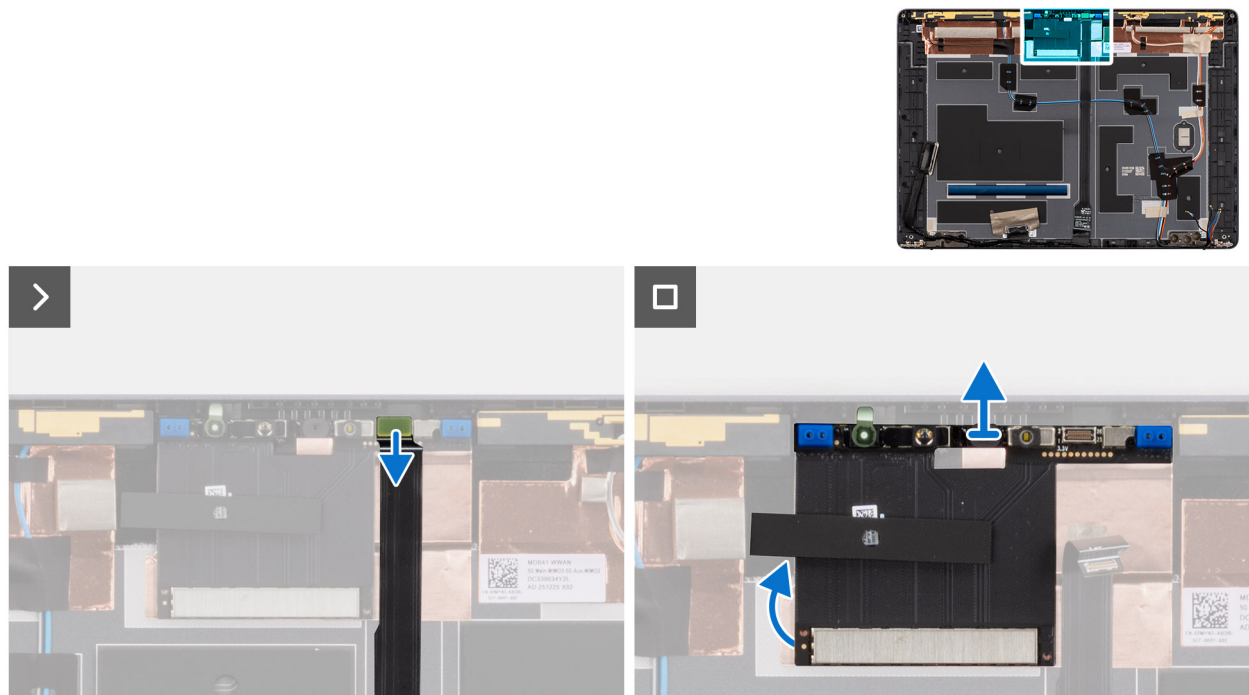


Figure 54. Removing the camera

Steps

1. Lift the tab to disconnect the camera cable from its connector on the camera.
2. Peel the Mylar off the display-back cover.
 - i NOTE:** This step is applicable only to computers shipped with a WWAN card.
3. Peel the camera cable off the display-back cover.
4. Peel the camera off the display back cover.
5. Lift the camera off the display-back cover.

Installing the camera

Prerequisites

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

About this task

- i NOTE:** Depending on the type of camera you are installing the installation procedure may vary. Refer to the image that best represents your product on hand.
- i NOTE:** The type of camera you can install is dependent on the type of camera that was previously installed on your computer. To change to a different camera, replace the entire display assembly.

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

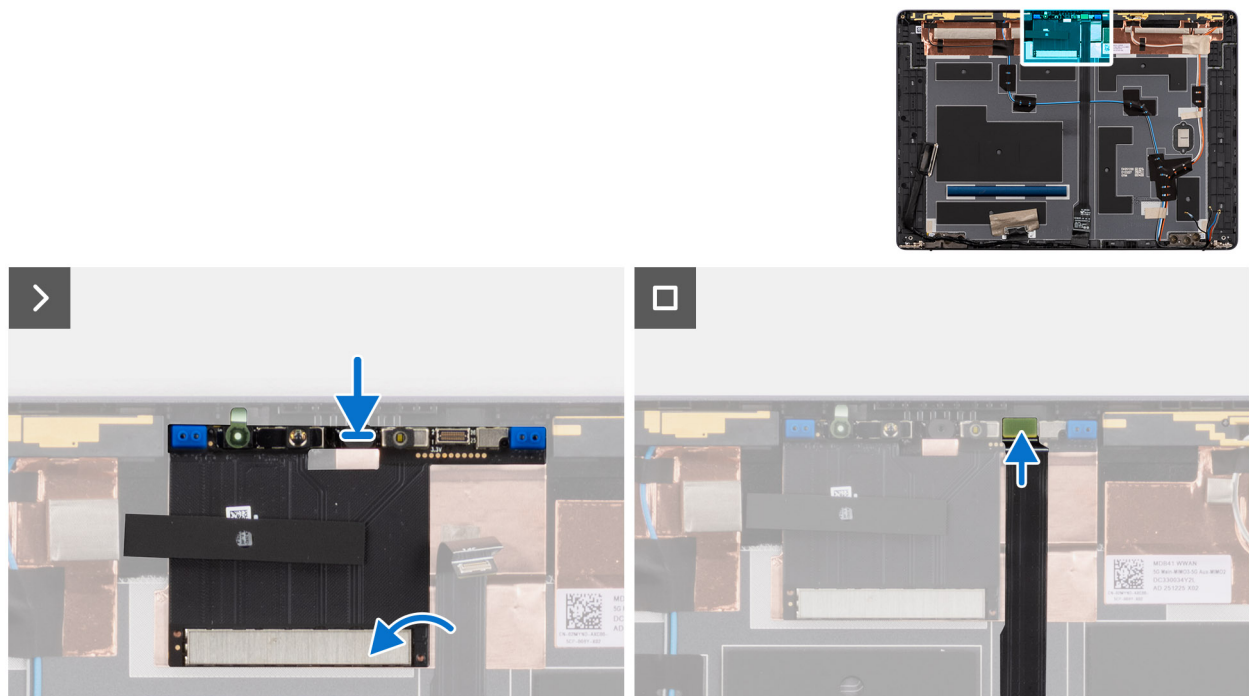


Figure 55. Installing the camera

Steps

1. Place and align the camera on the marked location on the display-back cover.
2. Press gently to adhere the camera to the display-back cover.
3. Adhere the Mylar over the display-back cover.
 - i NOTE:** This step is applicable only to computers shipped with a WWAN card.
4. Connect the camera cable to its connector on the camera and press down on it to secure the cable.

5. Adhere the camera cable to the display-back cover.

Next steps

1. Install the [display panel](#).
2. Install the [display hinges](#).
3. Install the [display bezel](#).
4. Install the [display assembly](#).
5. Install the [5G WWAN card](#).
6. Install the [base cover](#).
7. Install the [nano-SIM card tray](#), if applicable.
8. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [display assembly](#).
6. Remove the [display bezel](#).
7. Remove the [display hinges](#).
8. 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.

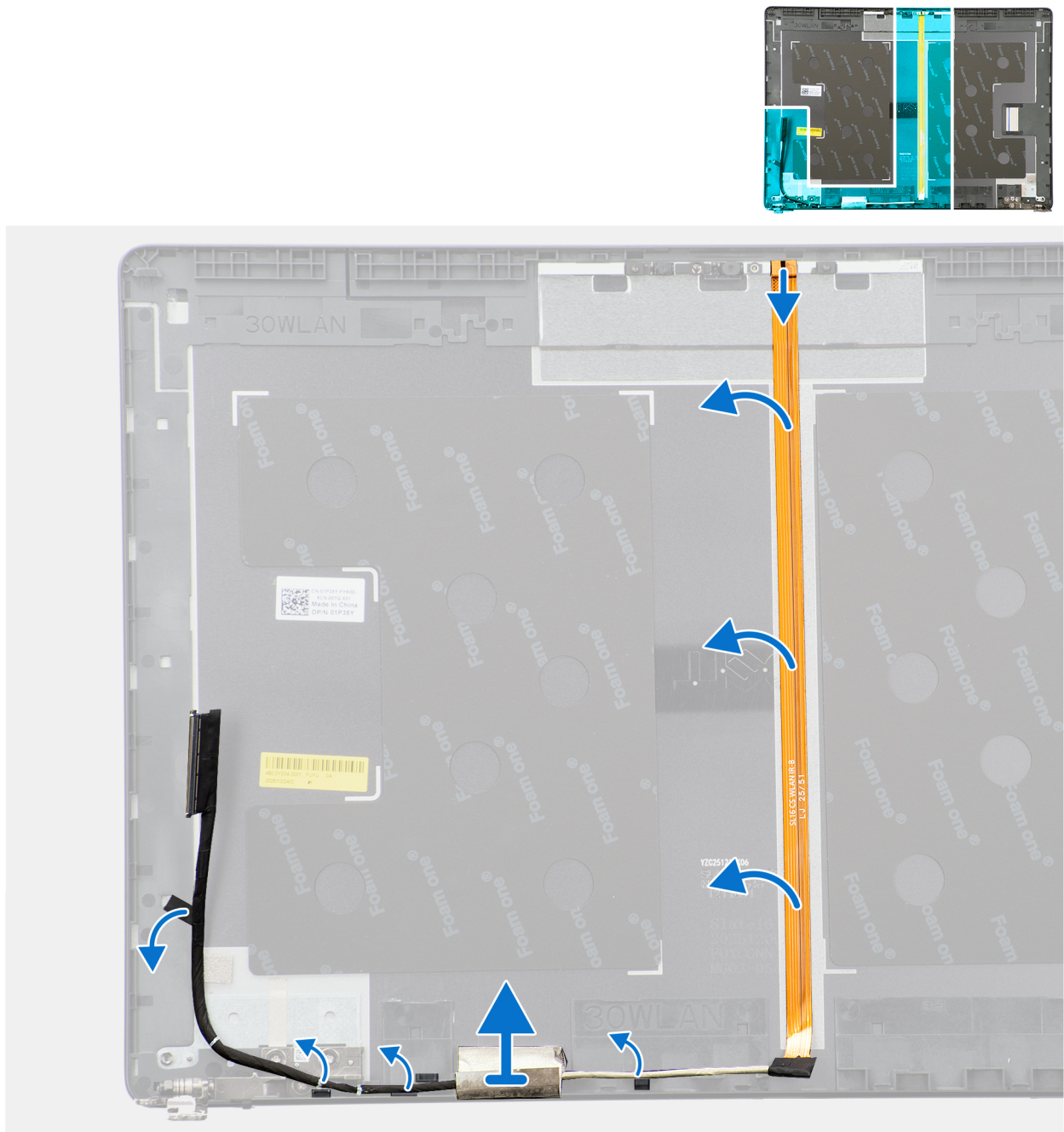


Figure 56. Removing the display cable

Steps

1. Disconnect the camera cable from its connector on the camera.
2. Remove the display and camera cable from the routing guides on the display-back cover.
3. Peel the display and camera cable off the display-back cover.
4. Lift the display and camera cable off the display-back cover.

Installing the display cable

Prerequisites

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

About this task

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

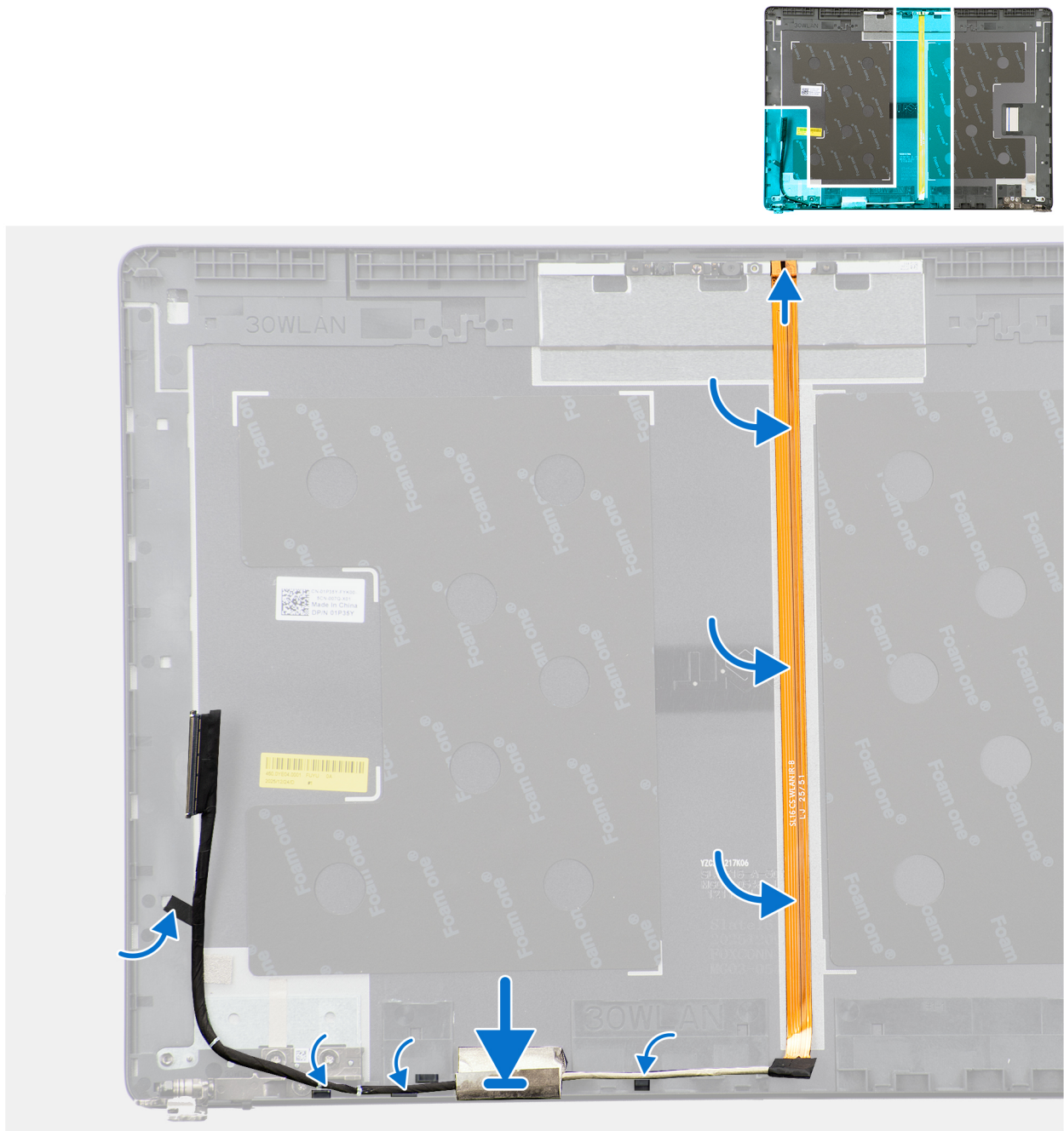


Figure 57. Installing the display cable

Steps

1. Place and align the display and camera cable on the marked locations on the display-back cover.
2. Route the display and camera cable through the routing guides on the display-back cover.
3. Press down and adhere the display and camera cable to the marked locations on the display-back cover.
4. Connect the camera cable to its connector on the camera.

Next steps

1. Install the [display panel](#).
2. Install the [display hinges](#).

3. Install the [display bezel](#).
4. Install the [display assembly](#).
5. Install the [5G WWAN card](#).
6. Install the [base cover](#).
7. Install the [nano-SIM card tray](#), if applicable.
8. Follow the procedure in [After working inside your computer](#).

Display back-cover

Removing the display-back cover

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [5G WWAN card](#).
5. Remove the [display assembly](#).
6. Remove the [display bezel](#).
7. Remove the [display hinges](#).
8. Remove the [display panel](#).
9. Remove the [display cable](#).
10. Remove the [camera](#).

About this task

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



Figure 58. Removing the display-back cover

Steps

After performing the steps in the pre-requisites, you are left with the display-back cover.

Installing the display-back cover

Prerequisites

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

About this task

The following image indicates the location of the display-back cover and provides a visual representation of the installation procedure.

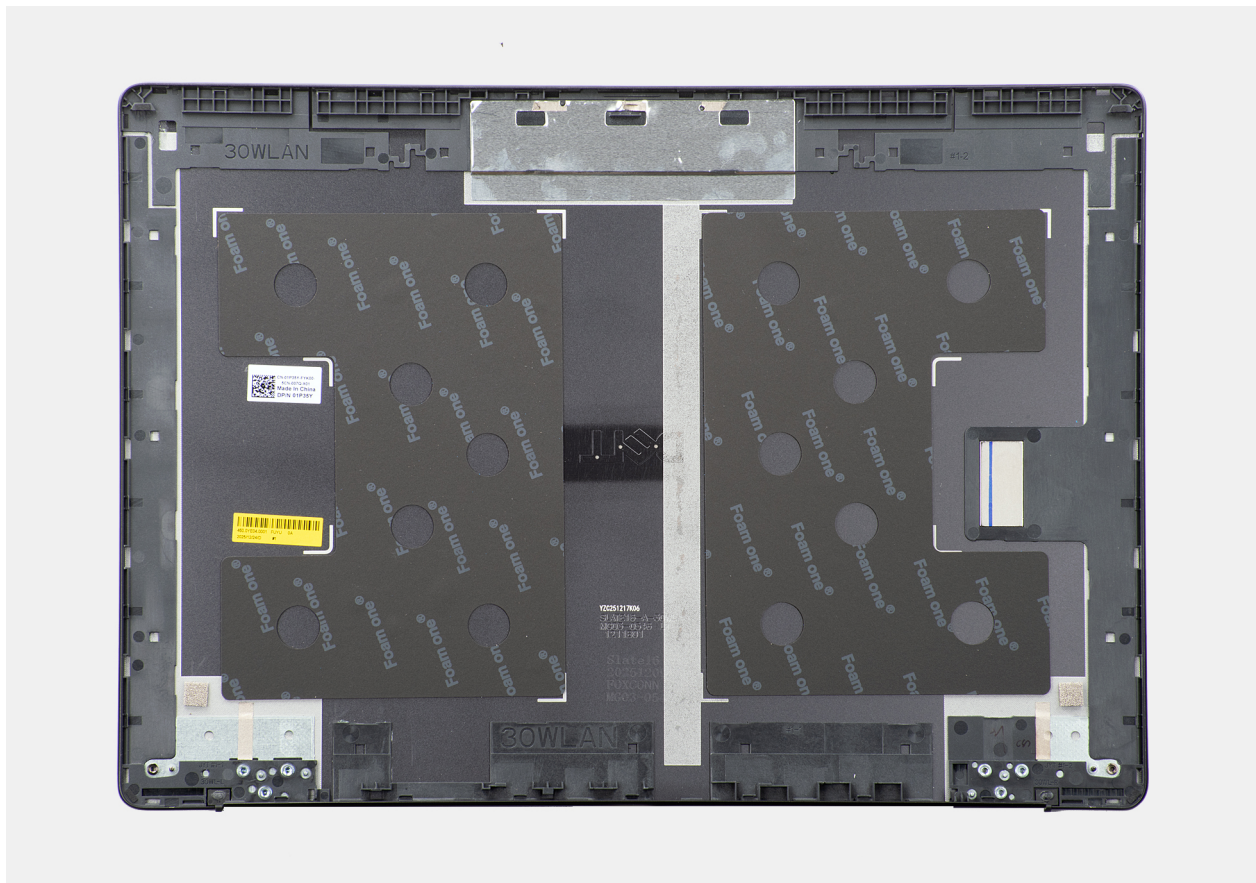


Figure 59. Installing the display-back cover

Steps

1. Place the display-back cover on a clean and flat surface.
2. Follow the steps in the post-requisites to install the display-back cover.

Next steps

1. Install the [camera](#).
2. Install the [display cable](#).
3. Install the [display panel](#).
4. Install the [display hinges](#).
5. Install the [display bezel](#).
6. Install the [display assembly](#).
7. Install the [5G WWAN card](#).
8. Install the [base cover](#).
9. Install the [nano-SIM card tray](#), if applicable.
10. Follow the procedure in [After working inside your computer](#).

System board

Removing the system board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).

4. Remove the 2230 solid-state drive.
5. Remove the WLAN card.
6. Remove the 5G WWAN card.
7. Remove the battery.
8. Remove the speakers.
9. Remove the fan.
10. Remove the power button.
11. Remove the I/O-bridge board.

About this task

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

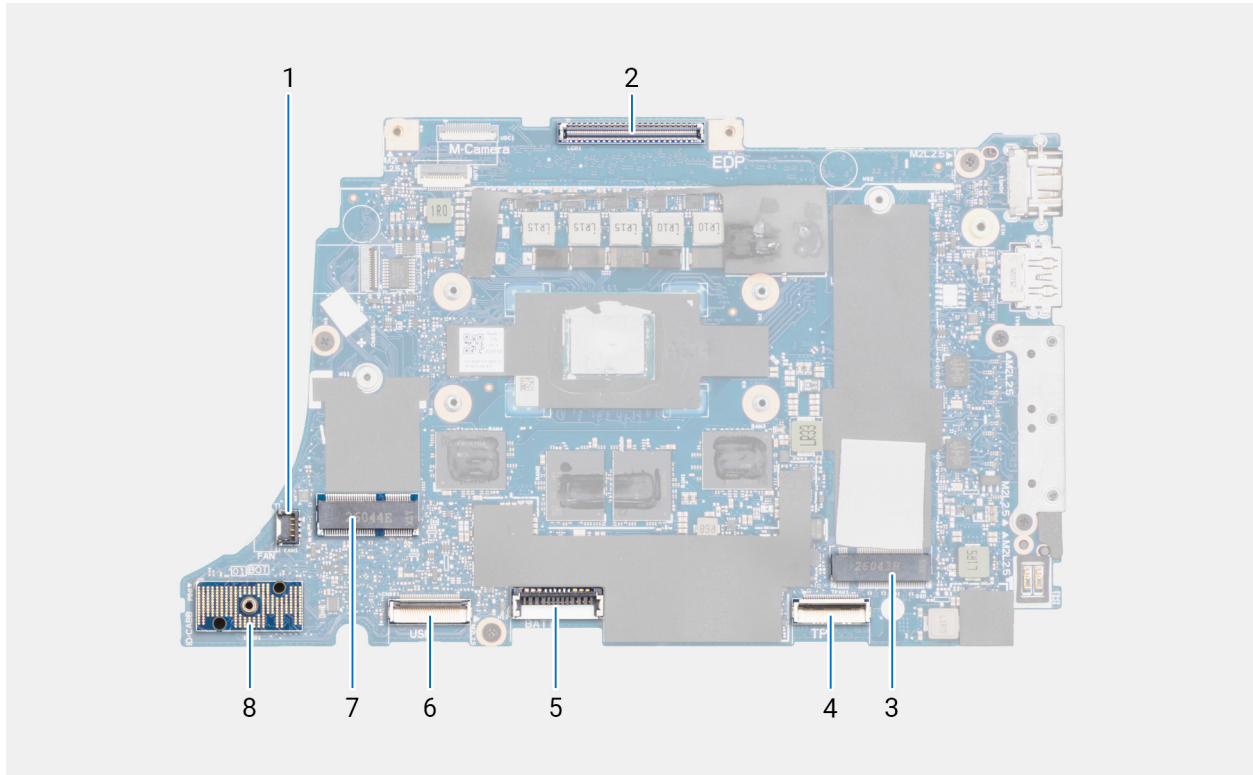


Figure 60. System board callouts

- | | |
|-------------------------------------|------------------------------------|
| 1. Fan cable (JFAN1) | 2. Display and camera cable (EDP) |
| 3. M.2 solid-state drive slot (SSD) | 4. Touchpad cable (TP) |
| 5. Battery cable (BATT) | 6. USH-board cable connector (USH) |
| 7. Wireless card slot (WLAN) | 8. I/O-bridge board (JIOR1) |

The following image indicates the location of the system board and provides a visual representation of the removal procedure.

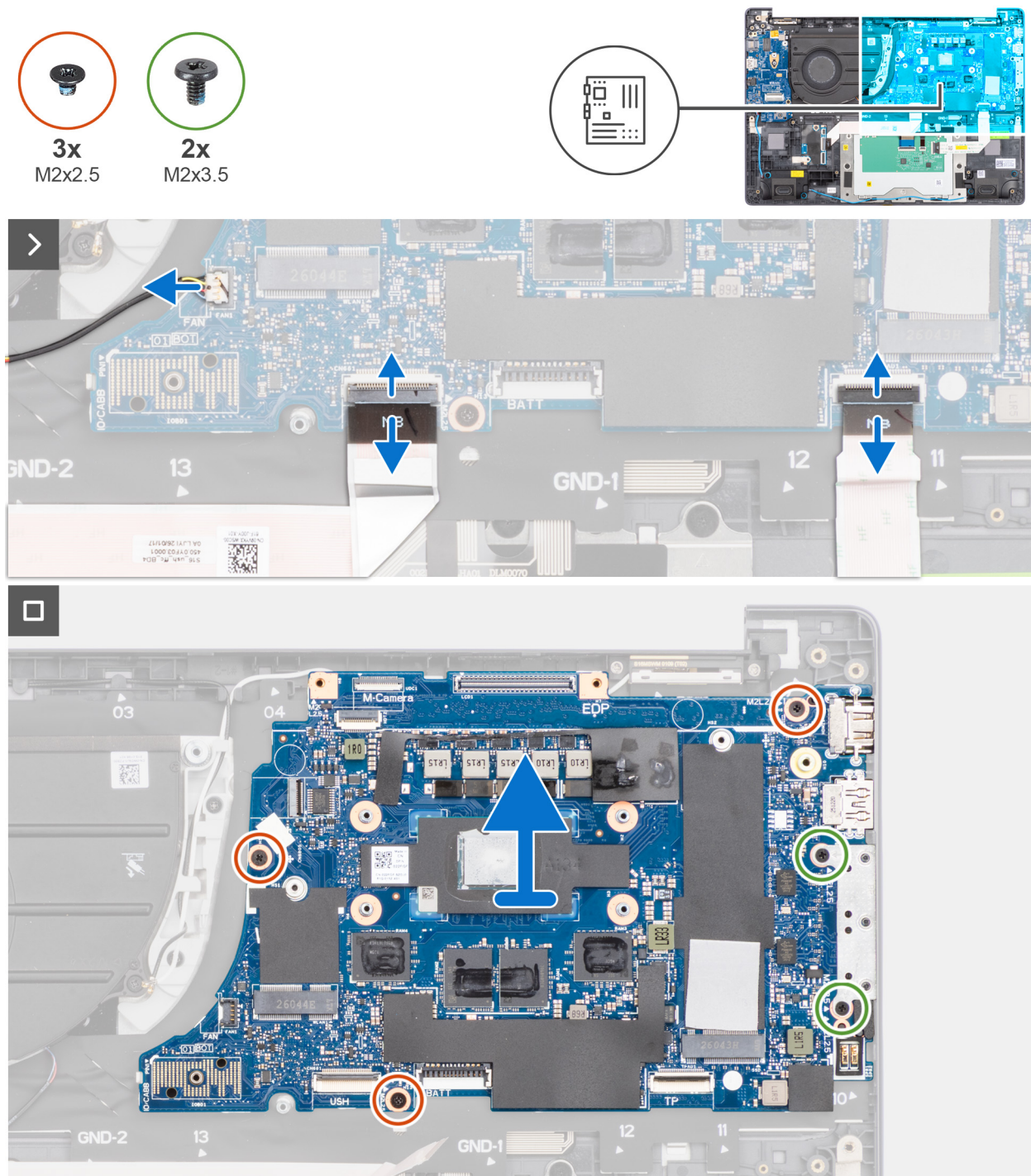


Figure 61. Removing the system board

Steps

1. Disconnect the fan cable from its connector (JFAN1) on the system board.
2. Open the latch and disconnect the touchpad cable from its connector (TP) on the system board.
3. Open the latch and disconnect the USH-board cable from its connector (USH) on the system board.
4. Remove the three screws (M2x2.5) and the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
5. Lift the system board at an angle and slide the ports on the system board out of the slots on the palm-rest assembly.
6. Lift the system board off the palm-rest assembly.

Installing the system board

Prerequisites

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

About this task

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

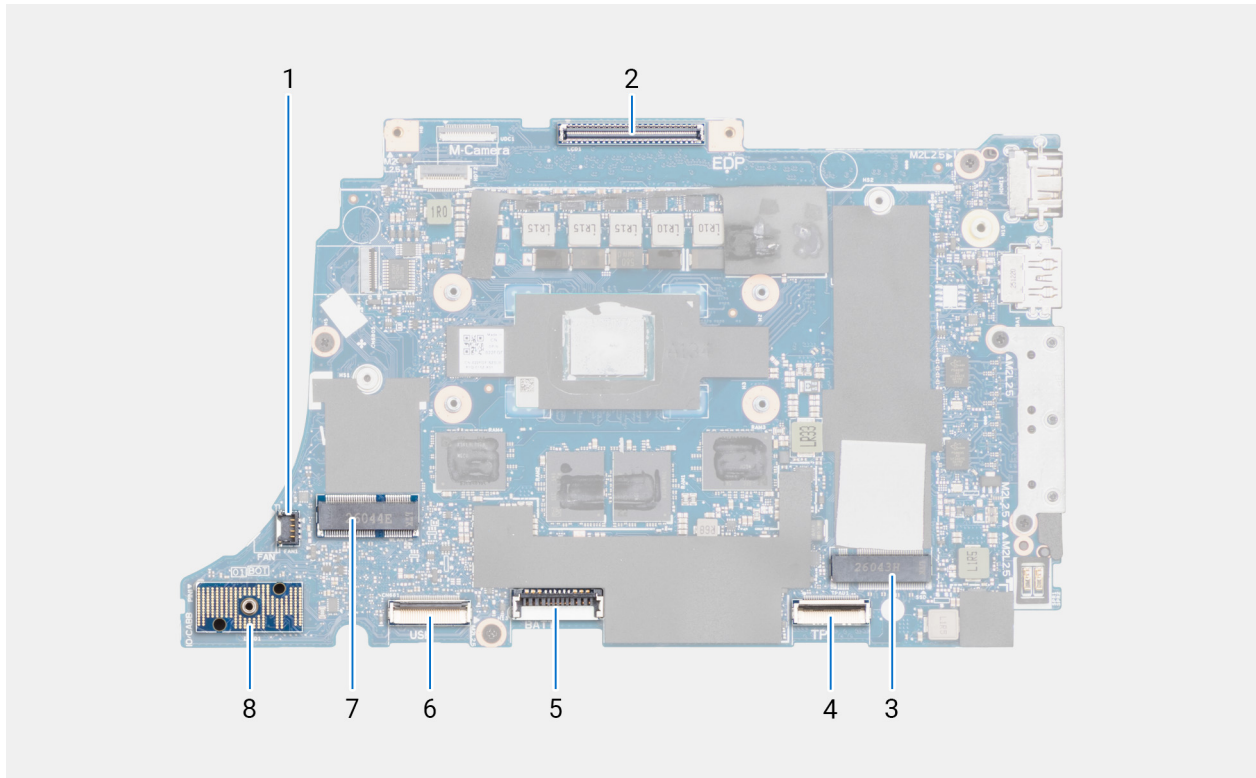


Figure 62. System board callouts

- | | |
|---|-----------------------------------|
| 1. Fan cable (JFAN1) | 2. Display and camera cable (EDP) |
| 3. M.2 2230/2280 solid-state drive slot (SSD) | 4. Touchpad cable (TP) |
| 5. Battery cable (BATT) | 6. USH-board cable (USH) |
| 7. Wireless card slot (WLAN) | 8. I/O-bridge board (JIOR1) |

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

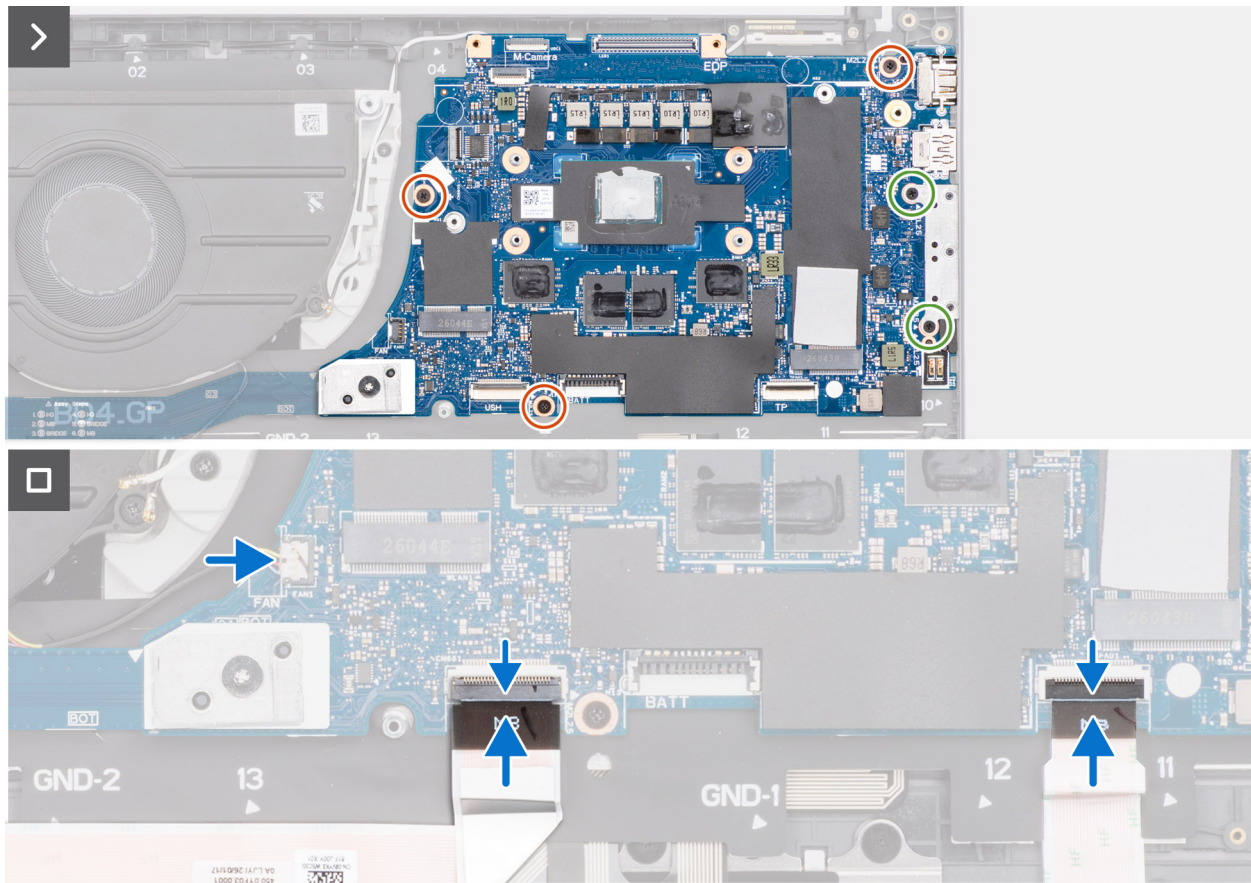


Figure 64. installing the system board

Steps

1. Align the ports on the system board with the slots on the palm-rest assembly and slide them into place.
2. Place the system board on the palm-rest assembly.
3. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
4. Using the alignment posts on the I/O board, place and align the I/O-bridge board interposer onto its connector (JMBR1) on the I/O board.
5. Using the alignment posts on the system board, place and align the I/O-bridge board interposer onto its connector (JIOR1) on the system board.

CAUTION: To avoid bending the pins and damaging the I/O-bridge board interposer, pinch the edges of the interposer while handling it.

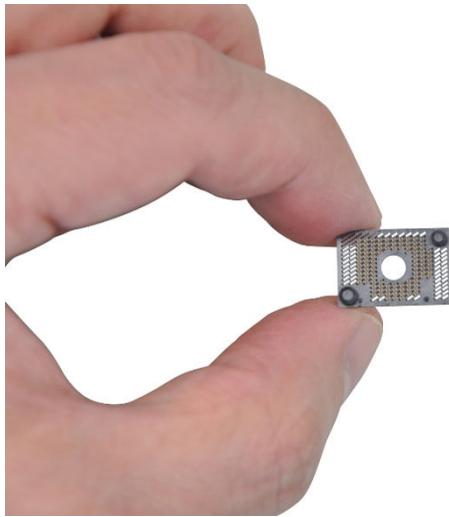


Figure 65. Proper handling of the I/O-bridge board interposer

6. **NOTE:** Follow the sequence (from left to right) to ensure that the bridge connector is properly connected between the system board and the I/O board. The installation sequence that is shown is marked on the bridge connector.

NOTE:



Figure 66. I/O bridge board

Using the alignment posts on the I/O-bridge board interposers, place and align the I/O-bridge board onto the I/O-bridge board interposers on the system board and I/O board.

7. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
8. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
9. Replace the three screws (M2x2.5) that secure the system board to the palm-rest assembly.
10. Connect the USH-board cable to its connector (MB) on the system board and close the latch to secure the cable.
11. Connect the touchpad cable to its connector (TP) on the system board and close the latch to secure the cable.
12. Connect the fan cable to its connector (JFAN1) on the system board.
13. Connect the display and camera cable to its connector (EDP) on the system board.
14. Adhere the tape that secures the display and camera cable to the system board.
15. Close the right display hinge.
16. Using the alignment posts, align the screw holes on the right display hinge with the screw holes on the palm-rest assembly before fully closing the hinge.
17. Replace the two screws (M2.5x4.5) that secure the right display hinge to the palm-rest assembly.
18. Route the WLAN-antenna cables through the routing guides on the palm-rest assembly.
19. Adhere the tape that secures the WLAN-antenna cables to the routing guide on the palm-rest assembly.
20. Place the display-cable bracket over the display connectors on the system board.
21. Align the screw holes on the display-cable bracket to the screw holes on the system board.
22. Replace the two screws (M2x3.5) that secure the display-cable bracket to the system board.

Next steps

1. Install the [power button](#).
2. Install the [fan](#).
3. Install the [speakers](#).
4. Install the [heat sink](#).
5. Install the [battery](#).
6. Install the [5G WWAN card](#).
7. Install the [WLAN card](#).
8. Install the [2230 solid-state drive](#).
9. Install the [base cover](#).
10. Install the [nano-SIM card tray](#), if applicable.
11. Follow the procedure in [After working inside your computer](#).

USB Type-C module

Removing the USB Type-C module

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [2230 solid-state drive](#).
5. Remove the [WLAN card](#).
6. Remove the [5G WWAN card](#).
7. Remove the [battery](#).
8. Remove the [speakers](#).
9. Remove the [fan](#).
10. Remove the [I/O-bridge board](#).
11. Remove the [I/O board](#).
12. Remove the [power button](#).
13. Remove the [display assembly](#).
14. Remove the [system board](#).

 **NOTE:** The system board can be removed with the heat sink attached 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 USB Type-C module and provides a visual representation of the removal procedure.

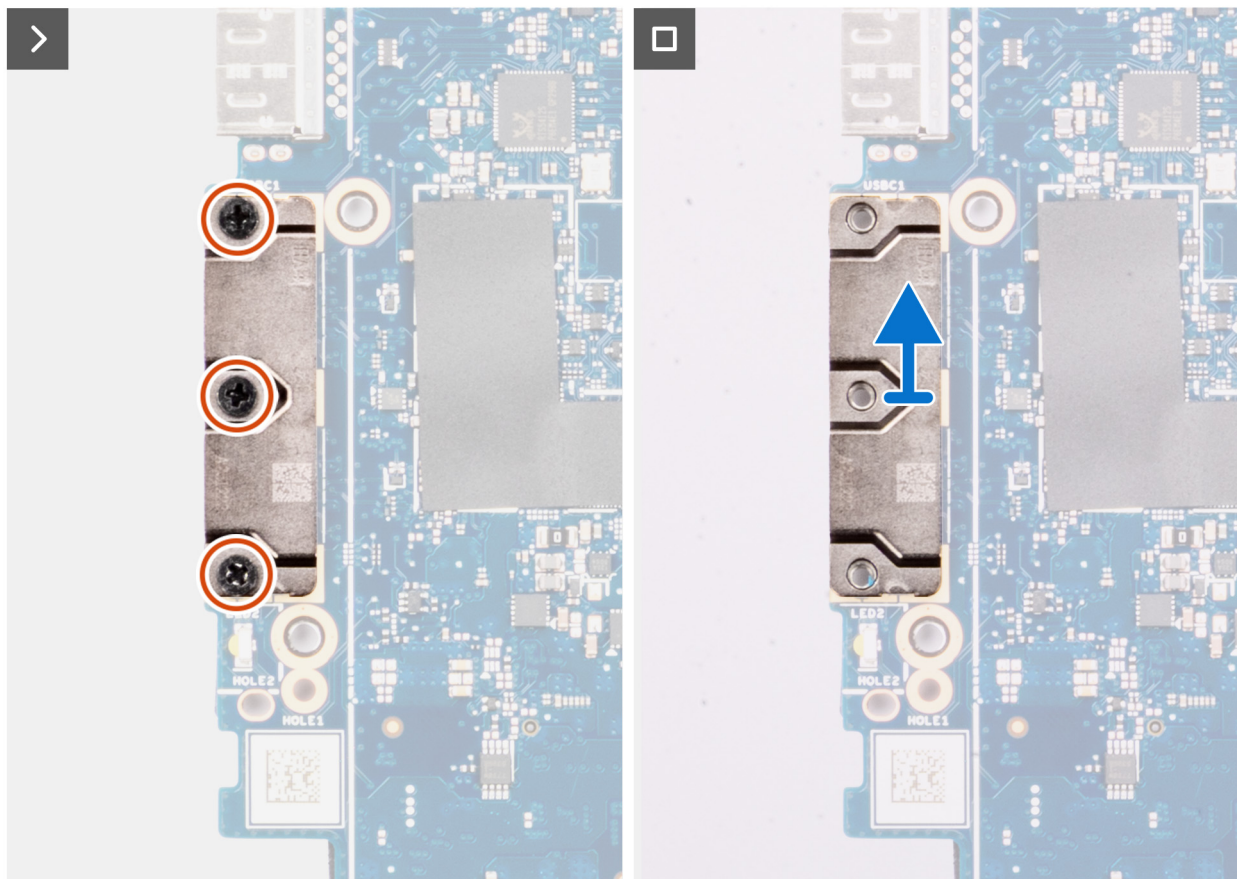
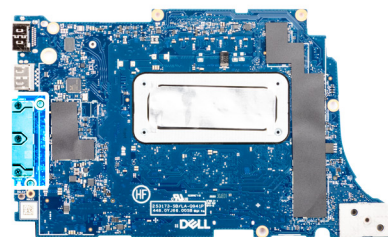


Figure 67. Removing the USB Type-C module

Steps

1. Flip the system board over.
2. Remove the three screws (M2x5) that secure the USB Type-C module to the system board.
3. Lift the USB Type-C module off the system board.

Installing the USB Type-C module

Prerequisites

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

About this task

The following image indicates the location of the USB Type-C module and provides a visual representation of the installation procedure.



3x
M2.5x5

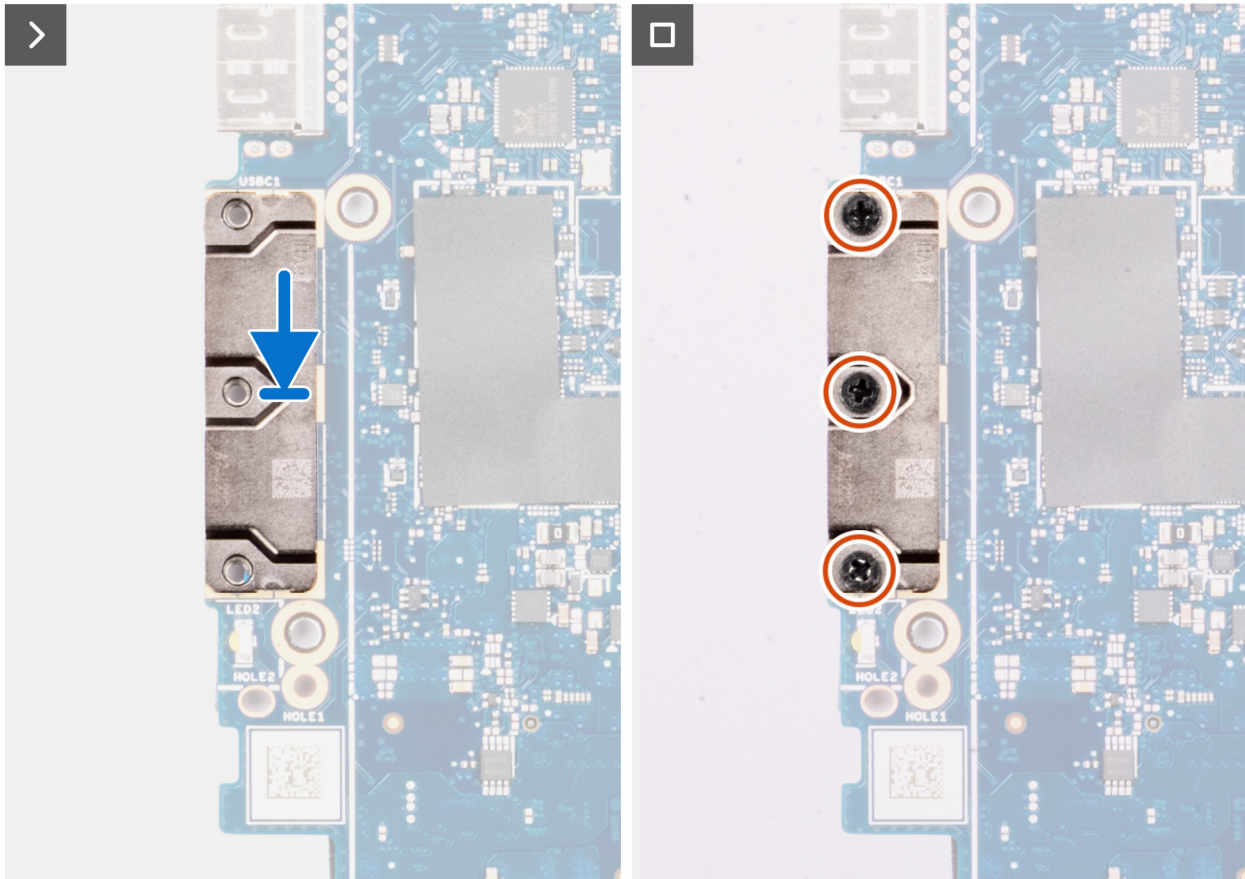
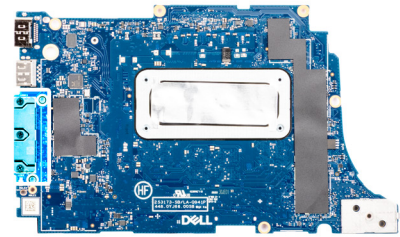


Figure 68. Installing the USB Type-C module

Steps

1. Place the USB Type-C module onto the slot on the bottom side of the system board.
2. Replace the three screws (M2x5) that secure the USB Type-C module to the bottom side of the system board.
3. Flip the system board over.

Next steps

1. Install the [system board](#).

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

2. Install the [display assembly](#).
3. Install the [power button](#).
4. Install the [I/O board](#).
5. Install the [I/O-bridge board](#).
6. Install the [fan](#).
7. Install the [speakers](#).
8. Install the [battery](#).
9. Install the [5G WWAN card](#).

10. Install the [WLAN card](#).
11. Install the [2230 solid-state drive](#).
12. Install the [base cover](#).
13. Install the [nano-SIM card tray](#), if applicable.
14. Follow the procedure in [After working inside your computer](#).

Wireless-antenna modules

Removing the wireless-antenna modules

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [2230 solid-state drive](#).
5. Remove the [WLAN card](#).
6. Remove the [5G WWAN card](#).
7. Remove the [battery](#).
8. Remove the [I/O-bridge board](#).
9. Remove the [display assembly](#).
10. Remove the [system board](#).

NOTE: The system board can be removed with the heat sink attached 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 wireless-antenna modules and provides a visual representation of the removal procedure.



Figure 69. Removing the wireless-antenna modules

Steps

1. Remove the antenna cables from the routing guides on the palm-rest assembly.
2. Remove the four screws (M1.6x2.5) that secure the wireless-antenna modules to the palm-rest assembly.
3. Lift the wireless-antenna modules and its cables off the palm-rest assembly.

Installing the wireless-antenna modules

Prerequisites

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

About this task

The following image indicates the location of the wireless-antenna modules and provides a visual representation of the installation procedure.

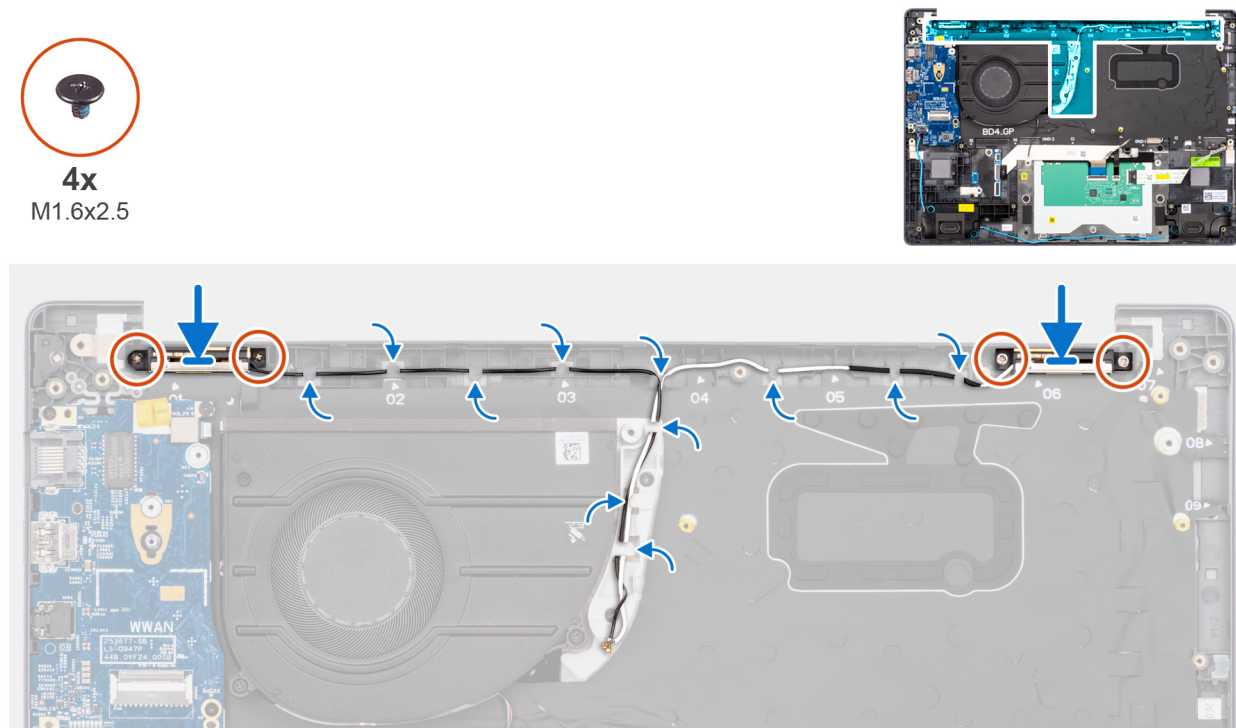


Figure 70. Installing the wireless-antenna modules

Steps

1. Place the wireless-antenna modules and its cables on the palm-rest assembly.
2. Align the screw holes on the wireless-antenna modules to the screw holes on the palm-rest assembly.
3. Replace the four screws (M1.6x2.5) that secure the wireless-antenna modules to the palm-rest assembly.
4. Route the antenna cables through the routing guides on the palm-rest assembly.

Next steps

1. Install the [system board](#).

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

2. Install the [display assembly](#).
3. Install the [I/O-bridge board](#).
4. Install the [battery](#).

5. Install the [5G WWAN card](#).
6. Install the [WLAN card](#).
7. Install the [2230 solid-state drive](#).
8. Install the [base cover](#).
9. Install the [nano-SIM card tray](#), if applicable.
10. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [2230 solid-state drive](#).
5. Remove the [WLAN card](#).
6. Remove the [5G WWAN card](#).
7. Remove the [battery](#).
8. Remove the [speakers](#).
9. Remove the [fan](#).
10. Remove the [I/O-bridge board](#).
11. Remove the [I/O board](#).
12. Remove the [power button](#).
13. Remove the [display assembly](#).
14. Remove the [system board](#).

 **NOTE:** The system board can be removed with the heat sink attached 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.

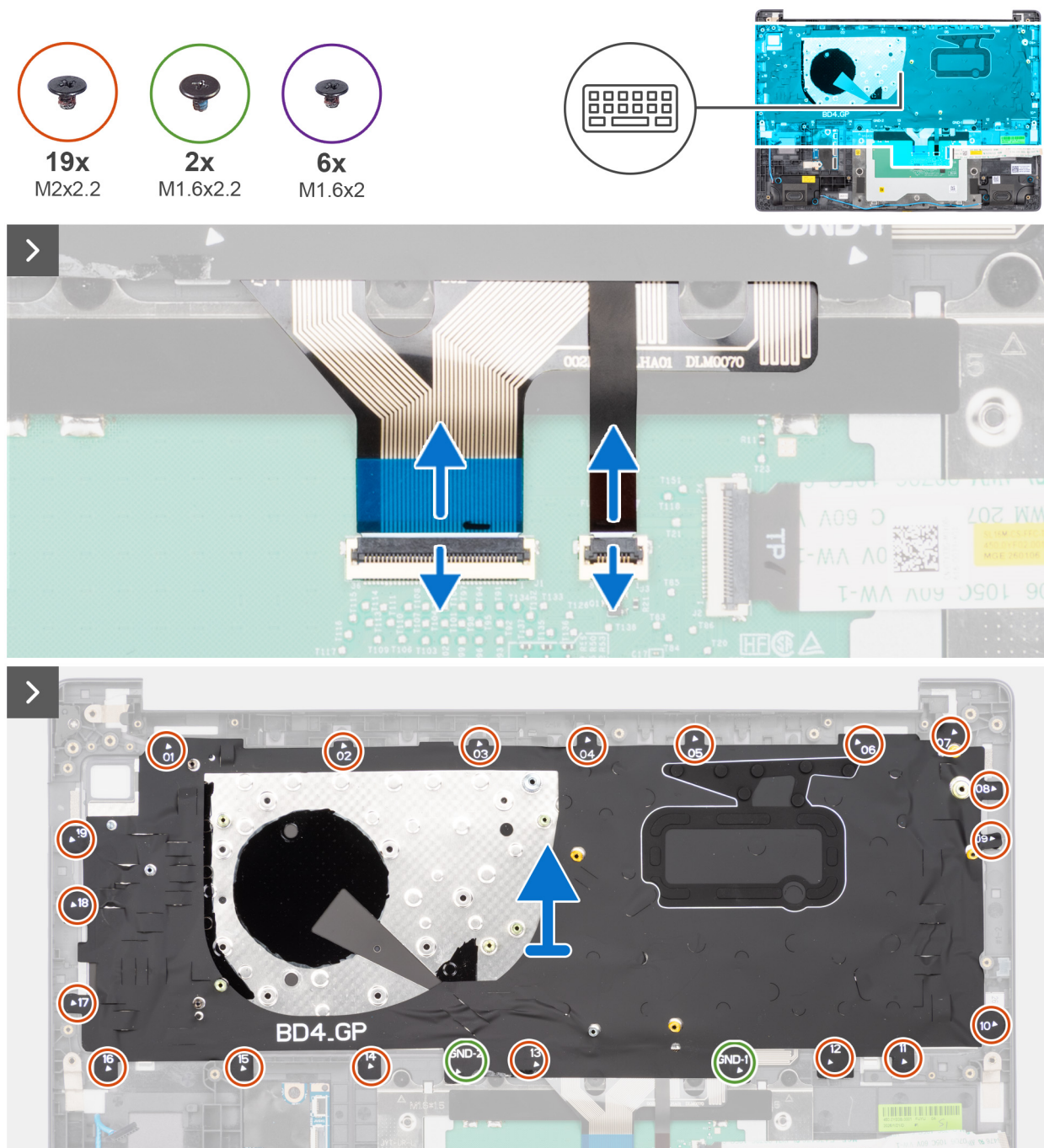


Figure 71. Removing the keyboard



Figure 72. Removing the keyboard

Steps

1. Disconnect the keyboard cable and keyboard backlight cable from the touchpad assembly.
2. Remove the 19 screws (M2x2.2) and the two screws (M1.6x2) that secure the keyboard assembly to the palm-rest assembly.

NOTE: Peel off the USH cable to access the screws.

3. Lift the keyboard assembly off the palm-rest assembly.
4. Flip over the keyboard assembly.
5. Remove the six screws (M1.6x2) 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 process.

About this task

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



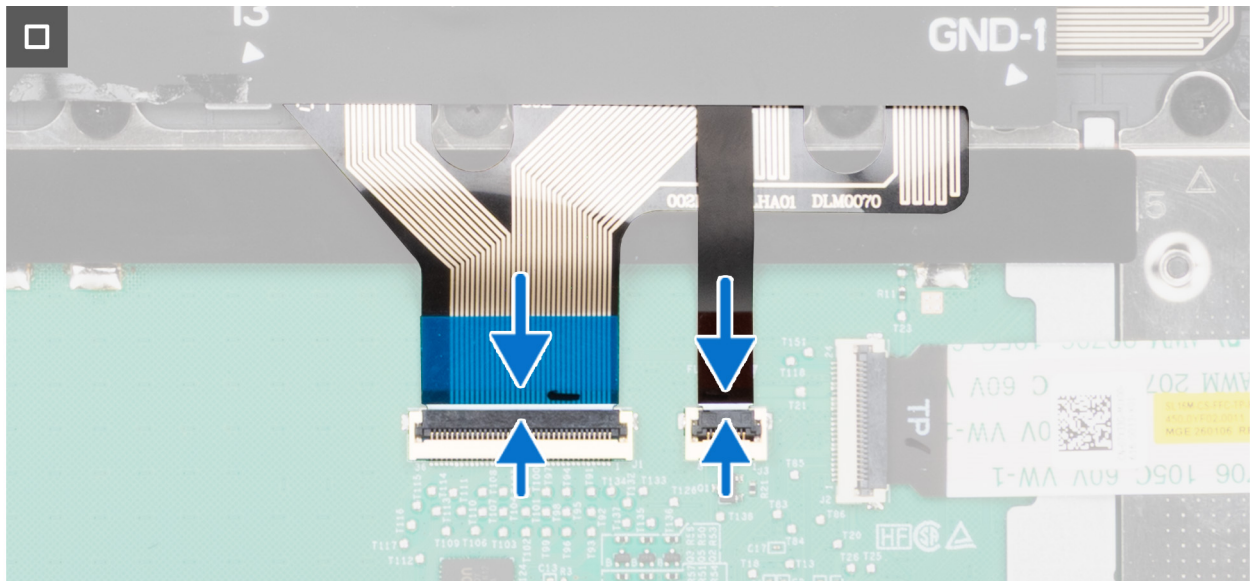


Figure 74. Installing the keyboard

Steps

1. Place the keyboard bracket on a clean and flat surface.
2. Place and align the keyboard on the keyboard bracket.
3. Replace the six screws (M1.6x2) that secure the keyboard to the keyboard bracket.
4. Flip over the keyboard assembly.
5. Place the keyboard assembly on the palm-rest assembly.

CAUTION: To avoid damaging your computer, ensure that the WLAN antenna cables are not pinched under the keyboard.

6. Align the screws on the keyboard assembly to the screws on the palm-rest assembly.
7. Replace the 19 screws (M2x2.2) and the two screws (M1.6x2.2) that secure the keyboard assembly to the palm-rest assembly.
8. Connect the keyboard-backlight cable from the touchpad and close the latch to secure the cable.
9. Connect the keyboard cable from the touchpad and close the latch to secure the cable.

Next steps

1. Perform steps 1 to 10 of Installing the [I/O board](#).
2. Install the [wireless-antenna modules](#).
3. Install the [system board](#).

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

4. Install the [display assembly](#).
5. Install the [power button](#).
6. Install the [fan](#).
7. Install the [speakers](#).
8. Install the [battery](#).
9. Install the [5G WWAN card](#).
10. Install the [WLAN card](#).
11. Install the [2230 solid-state drive](#).
12. Install the [base cover](#).
13. Install the [nano-SIM card tray](#), if applicable.
14. 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 [nano-SIM card tray](#), if applicable.
3. Remove the [base cover](#).
4. Remove the [2230 solid-state drive](#).
5. Remove the [WLAN card](#).
6. Remove the [5G WWAN card](#).
7. Remove the [battery](#).
8. Remove the [speakers](#).
9. Remove the [fan](#).
10. Remove the [I/O-bridge board](#).
11. Remove the [I/O board](#).
12. Remove the [power button](#).
13. Remove the [display assembly](#).
14. Remove the [system board](#).

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

15. Remove the [wireless-antenna modules](#).
16. Remove the [keyboard](#).

About this task

 **NOTE:** The palm-rest assembly is an assembly that contains the following components. To replace any of the components listed below, replace the entire palm-rest assembly.

- Touchpad
- Touchpad cable
- Smart-card reader
- USH-board cable
- USH board
- Palm rest

The following image indicates the location of the palm-rest assembly and provides a visual representation of the removal procedure.

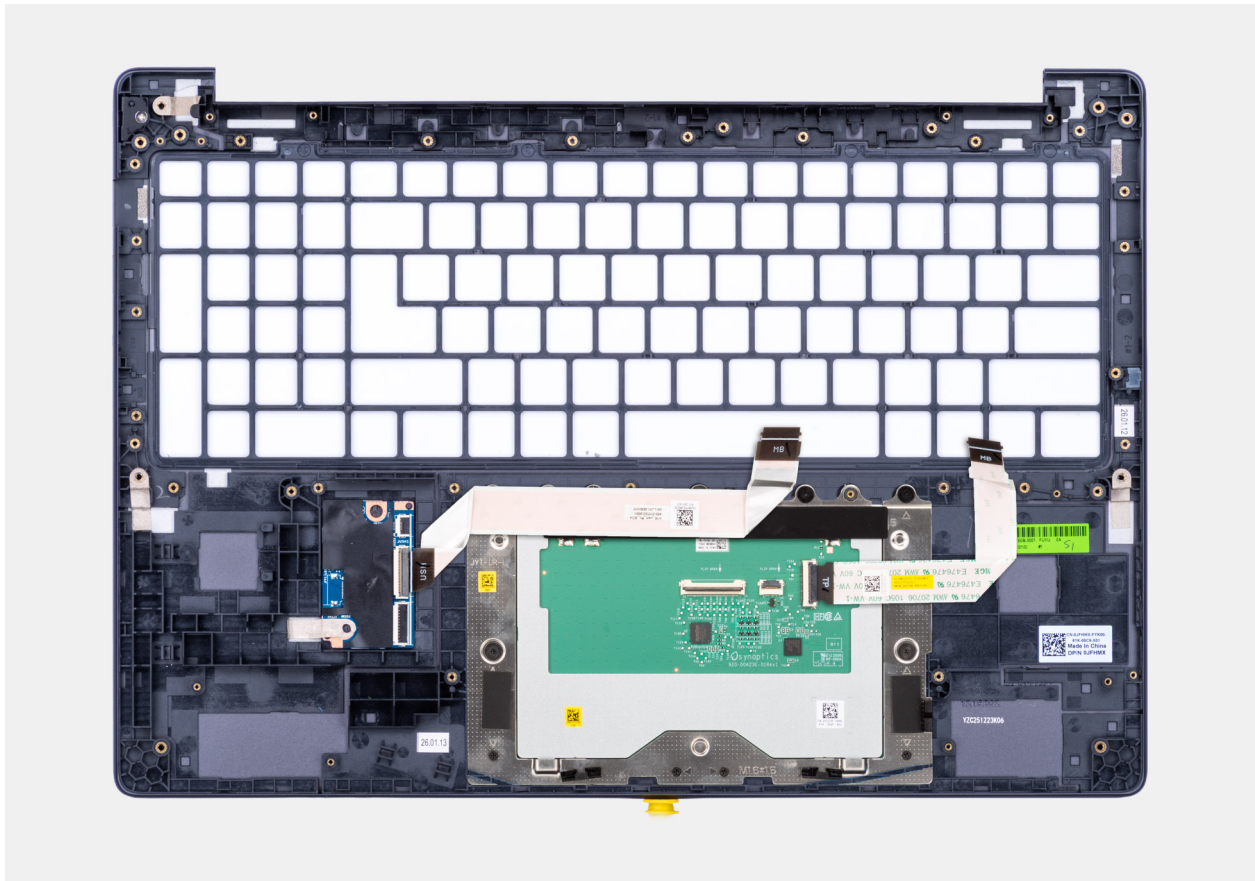


Figure 75. Removing the palm-rest assembly

Steps

1. Using a plastic scribe, pry off the nano-SIM card slot filler from the palm-rest assembly.
2. After performing the steps in the pre-requisites and step 1, 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 process.

About this task

NOTE: The palm-rest assembly is an assembly that contains the following components. To replace any of the components listed below, replace the entire palm-rest assembly.

- Touchpad
- Touchpad cable
- Smart-card reader
- USH-board cable
- USH board
- Palm rest

The following image indicates the location of the palm-rest assembly and provides a visual representation of the installation procedure.

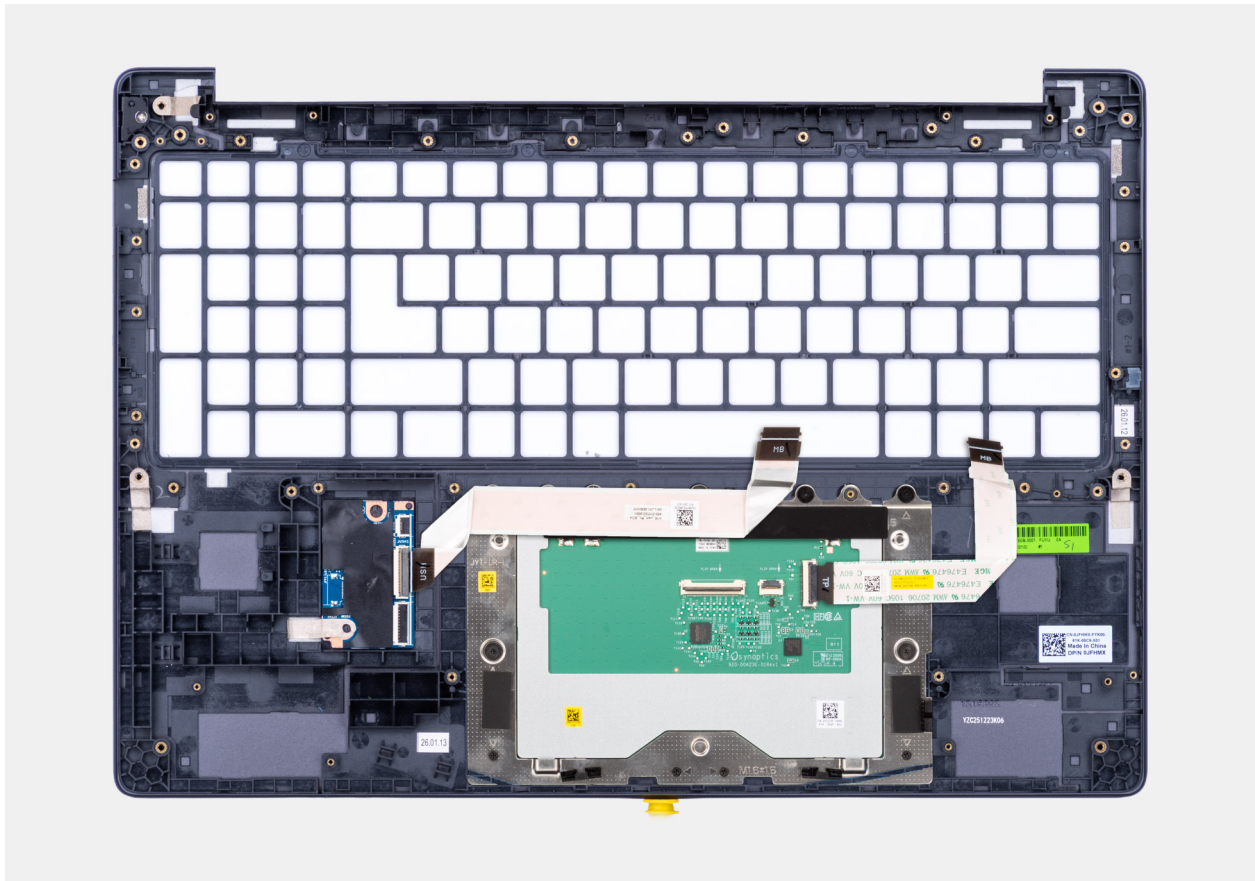


Figure 76. Installing the palm-rest assembly

Steps

1. Place the palm-rest assembly on a clean and flat surface.
2. Place and align the nano-SIM card slot filler into its slot on the palm-rest assembly, then press it into place.

Next steps

1. Install the [keyboard](#).
2. Install the [wireless-antenna modules](#).
3. Install the [system board](#).

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

4. Install the [display assembly](#).
5. Install the [power button](#).
6. Install the [I/O board](#).
7. Install the [I/O-bridge board](#).
8. Install the [fan](#).
9. Install the [speakers](#).
10. Install the [battery](#).
11. Install the [5G WWAN card](#).
12. Install the [WLAN card](#).
13. Install the [2230 solid-state drive](#).
14. Install the [base cover](#).
15. Install the [nano-SIM card tray](#), if applicable.
16. 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 16S PW516265 supports the following operating systems:

- Windows 11 Home
- Windows 11 Pro
- Ubuntu Linux 24.04 LTS
- Red Hat Linux 10.3 Enterprise

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 6. 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.

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 7. BIOS Setup options—Main menu

Main	Description
System Time	Displays the current time in HH:MM:SS format.
System Date	Displays the current date in MM/DD/YYYY format.
BIOS Version	Displays the BIOS version number.
Product Name	Displays the model number of the computer.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.
CPU Type	Displays the processor type.
CPU Speed	Displays the processor speed.
CPU ID	Displays the processor ID.
CPU Cache	
L1 Cache	Displays the processor L1 cache size.
L2 Cache	Displays the processor L2 cache size.
L3 Cache	Displays the processor L3 cache size.
M.2 PCIe SSD	Displays the information of onboard drives.
AC Adapter Type	Displays whether an AC adapter is connected. If connected, displays the type of AC adapter that is connected.

Table 7. BIOS Setup options—Main menu (continued)

Main	Description
System Memory	Displays the total memory that is installed on the computer.
Memory Speed	Displays the memory speed.
Keyboard Type	Displays the type of keyboard that is installed on the computer.

Table 8. BIOS Setup options—Advance menu

Advance	Description
USB Emulation	Enables or disables the USB emulation feature. This feature defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST.  NOTE: You cannot boot to a USB device (floppy, hard drive, or memory key) when this option is disabled. By default, the USB Emulation option is enabled.
SATA/NVMe Operations mode	Sets the operating mode of the integrated SATA hard drive controller By default, the AHCI/NVMe option is selected. The storage device is configured for AHCI/NVMe mode.
Adapter Warnings	Enables the warning messages during boot when the adapters with less power capacity are detected. By default, the Enable Adapter Warning option is enabled.
Function Key Behavior	Allows the user to set the default key behavior of the function key. By default, the Multimedia Key option is selected.
Keyboard Illumination	Configures the operating mode of the keyboard illumination feature. By default, the Bright option is selected. Enables the keyboard illumination feature at 100% brightness level.
Keyboard Backlight with AC	Sets the timeout value for the keyboard backlight when an AC adapter is connected to the computer. By default, the 1 minute option is selected.
Keyboard Backlight with 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 1 minute option is selected.
Battery Health	Displays the battery health of the computer.
External USB Ports	Enables or disables the external USB ports. By default, the External USB Ports option is enabled.
Enable Audio	Enables all integrated audio controller. By default, the Enable Audio option is enabled.
Microphone	Enables or disables the microphone. By default, the Microphone option is enabled.
Camera	Enables or disables the camera. By default, the Camera option is enabled.
Battery Charge Configuration	Allows the user to set the battery charge settings, with a preselected custom charge start and stop time.

Table 8. BIOS Setup options—Advance menu (continued)

Advance	Description
	By default, the Adaptive option is selected.
Advance Battery Charge Configuration	Enables or disables the advanced battery charging feature. By default, the Advance Battery Charge Configuration option is disabled.
IPv4 HTTP Support	Enables or disables the IPv4 HTTP support. By default, the IPv4 HTTP Support option is disabled.
IPv6 HTTP Support	Enables or disables the IPv6 HTTP support. By default, the IPv6 HTTP Support option is disabled.
Maintenance	
Data Wipe on next boot	Enables or disables data wipe on the next boot. 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 is not recoverable. When enabled, the data wipe option will prompt to wipe any storage devices that are connected to the computer on the next boot. By default, the Data Wipe on next boot option is disabled.
BIOS Recovery from Hard drive	Allows the user to recover certain corrupted BIOS conditions from a recovery file on the user's primary hard drive or an external USB drive. By default, the BIOS Recovery from Hard drive option is enabled.
BIOS Auto-Recovery	Allows the user to automatically recover the BIOS without user actions. By default, the BIOS Auto-Recovery option is disabled.
SupportAssist System Resolution	
Auto OS Recovery Threshold	Allows the user to set the automatic OS recovery threshold for the computer. Controls the automatic boot flow for SupportAssist System Resolution Console and for the Dell OS Recovery tool. By default, the Auto OS Recovery Threshold is set to 2.
SupportAssist OS Recovery	Enables or disables the boot flow for SupportAssist OS Recovery tool when certain system errors occur. By default, the SupportAssist OS Recovery option is enabled.

Table 9. System setup options - Security menu

Security	Description
Admin Password	Displays if the administrator password is clear or set. By default, the Admin Password is not set.
System Password	Displays if the system password is clear or set. By default, the System Password is not set.

Table 9. System setup options - Security menu (continued)

Security	Description
Asset Tag	Allows the user to create a computer Asset Tag that can be used by an IT administrator to uniquely identify a particular computer.  NOTE: Once set in the BIOS, the Asset Tag cannot be changed.
Admin Password	Allows the user to set the 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 hard drive passwords are previously set. • The administrator password can be used in place of the computer and/or internal hard drive passwords. • When set, the administrator password must be provided during a firmware update. • Clearing the administrator password also clears the computer password (if set). Dell Technologies recommends using an administrator password to prevent unauthorized changes to BIOS setup options.
System Password	Allows the user to set the 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 computer password prompt. • The computer shuts down after three incorrect attempts to enter the computer password. • The computer shuts down when the Esc key is pressed at the System Password prompt. • The computer password is not prompted when the computer resumes from standby mode. Dell Technologies recommends using the computer password in situations where it is likely that a computer may be lost or stolen.
Password Change	Allows the user to permit or deny system password or hard disk drive password changes. By default, the Permitted option is selected.
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 disabled. For additional security, Dell Technologies recommends keeping the Absolute option disabled.

Table 9. System setup options - Security menu (continued)

Security	Description
	 NOTE: When the Absolute features are activated, the Absolute integration cannot be disabled from the BIOS setup screen.
Absolute Status	Allows the user to activate or deactivate the Absolute Status feature. Displays if the system password is clear or set. By default, the Absolute Status is deactivated.
WINDOWS SMM SECURITY MITIGATIONS TABLE (WSMT)	Enables or disables configuration of platform features on Dell Client Systems with WSMT-enabled BIOS. By default, the WINDOWS SMM SECURITY MITIGATIONS TABLE (WSMT) option is disabled.
Firmware TPM	Enables or disables the firmware TPM. By default, the Firmware TPM option is disabled.
PPI Bypass for Clear Command	Allows the user to control the TPM Physical Presence Interface (PPI). When enabled, this setting allows the operating system to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately. 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.
Enable Master Password Lockout	When enabled, this disables the master password support. By default, the Enable Master Password Lockout option is disabled.
TPM Security	
PPI Bypass for Enable Commands	The Physical Presence Interface (PPI) Bypass options can be used to allow the operating system to manage certain aspects of the TPM. If these options are enabled, you are not prompted to confirm certain changes to the TPM configuration. By default, the PPI Bypass for Enable Commands option is disabled. For additional security, Dell Technologies recommends keeping the PPI Bypass for Enable Commands option enabled.
PPI Bypass for Disable Commands	By default, the PPI Bypass for Disable Commands option is disabled. For additional security, Dell Technologies recommends keeping the PPI Bypass for Disable Commands option disabled.
Attestation Enable	The Attestation Enable option controls the endorsement hierarchy of TPM. Disabling the Attestation Enable option prevents TPM from being used to digitally sign certificates. By default, the Attestation Enable option is enabled. For additional security, Dell Technologies recommends keeping the Attestation Enable option enabled.  NOTE: When disabled, this feature may cause compatibility issues or loss of functionality in some operating systems.

Table 9. System setup options - Security menu (continued)

Security	Description
Key Storage Enable	The Key Storage Enable option controls the storage hierarchy of TPM, which is used to store digital keys. Disabling the Key Storage Enable option restricts the ability of TPM to store owner's data. By default, the Key Storage Enable option is enabled. For additional security, Dell Technologies recommends keeping the Key Storage Enable option enabled. NOTE: When disabled, this feature may cause compatibility issues or loss of functionality in some operating systems.
SHA-256	Allows the user to control the hashing algorithm that is used by the TPM. When enabled, the TPM uses the SHA-256 hashing algorithm. When disabled, the TPM uses the SHA-1 hash algorithm. By default, the SHA-256 option is enabled. For additional security, Dell Technologies recommends keeping the SHA-256 option enabled.
Clear	When enabled, the Clear option clears information that is stored in the TPM after exiting the computer's BIOS. This option returns to the disabled state when the computer restarts. By default, the Clear option is disabled. Dell Technologies recommends enabling the Clear option only when TPM data is required to be cleared.
TPM State	Enables or disables the Trusted Platform Module (TPM). This is the normal operating state for the Trusted Platform Module (TPM) when you want to use its complete array of capabilities. By default, the TPM State option is enabled.
Enable Pre-Boot DMA Support	Allows the user 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 disabled. For additional security, Dell Technologies recommends keeping the Enable Pre-Boot DMA Support option enabled. NOTE: This option is provided only for compatibility purposes, as certain older hardware may not be DMA compliant.
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.

Table 9. System setup options - Security menu (continued)

Security	Description
Internal Port DMA Compatibility Mode	 NOTE: This option is provided only for compatibility purposes, as certain older hardware may not be DMA compliant. Allows you to control the boot compatibility for integrated PCIe peripherals by disabling PCIe DMA protection on internal PCIe ports. When enabled, BIOS will notify the operating system that the internal ports are not DMA capable. This option is to help with devices that have operating system DMA compatibility issues. 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 Internal Port DMA Compatibility Mode option is disabled.  NOTE: This option is provided only for compatibility purposes, as certain older hardware may not be DMA compliant.
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.
Secure Boot	Enables or disables the computer to boot using only validated boot software. By default, the Enable Secure Boot option is enabled. 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: For Secure Boot to be enabled, the computer is required to be in UEFI boot mode and the Enable Legacy Option ROMs option is required to be turned off.
Select Secure Boot	Allows the user to select the Secure Boot operation mode. By default, the Deployed Mode option is selected.  NOTE: Deployed Mode should be selected for normal operation of Secure Boot.

Table 10. System setup options - Boot menu

Exit	Description
File Browser Add Boot Option	Allows the user to add boot options.
File Browser Del Boot Option	Allows the user to delete boot options.
UEFI Boot	Displays the boot sequence.

Table 11. System setup options - Exit menu

Exit	Description
Exit Saving Changes	Allows the user to save the changes and exit the BIOS setup.
Save Change Without Exit	Allows the user to save the changes without exiting the BIOS setup.
Exit Discarding Changes	Allows the user to exit the BIOS setup without saving the changes.
Load Optimal Defaults	Allows the user to restore default values for all BIOS setup options.
Discard Changes	Allows the user to load previous values for all BIOS 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

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. After the download is complete, navigate to the folder where the BIOS update file has been saved.
8. 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 12. 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 13. 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 16S PW516265.

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 14. 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**.

i **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.

i **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 15. 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 16. Revision history

Revision	Date	Description
A01	07-2026	Added M.2 2280 solid state drive.
A00	05-2026	Original publish date.