Dell Pro 5 14

P514260

Service Manual

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DELL Technologies

Notes, cautions, and warnings

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

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

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

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1

Working inside your computer

Safety instructions

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

WARNING: Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see Dell Regulatory Compliance Home Page.

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

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

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

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

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

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

CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the connector on the cable is correctly oriented and aligned with the port.

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

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

Before working inside your computer

About this task

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

Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. For Windows operating system, click **Start** > **Power** > **Shut down**.

   NOTE: If you are using a different operating system, see the documentation of your operating system for instructions.

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

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

8. Enter the Service Mode.

   Service Mode

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

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

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

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

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

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

Safety precautions

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

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

- Turn off the computer and all attached peripherals.
- Disconnect the computer from AC power.
- Disconnect all network cables and peripherals from the computer.
- Use an ESD field service kit when working inside your computer to avoid electrostatic discharge (ESD) damage.
- Place the removed component on an anti-static mat after removing it from the computer.
- Press and hold the power button for 15 seconds to discharge the residual power in the system board.

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done by using a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or nonmetal surface. Ensure that the wrist strap is secure and in full contact with your skin. Remove all jewelry, watches, bracelets, or rings before grounding yourself and the equipment.

Electrostatic discharge—ESD protection

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

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

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory module that has

received a static shock and immediately generates a "No POST/No Video" symptom with a beep code that is emitted for missing or nonfunctional memory.

- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The memory module receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms that are related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, and so on.

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

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. Wireless anti-static straps do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, use the anti-static wrist strap to discharge the static electricity from your body.

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

  For more information about the wrist strap and ESD wrist strap tester, see Components of an ESD Field Service Kit.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD Field Service kit

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

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

Working environment

Before the ESD Field Service kit is deployed, conduct an evaluation of the site to ensure proper setup and readiness. For example, deploying the kit for a server environment is different than for a desktop or laptop environment. Servers are typically installed in a rack within a data center; desktops or laptops are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of computer that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components.

ESD packaging

All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged component using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the anti-static mat, in the computer, or inside an ESD bag.

Components of an ESD Field Service kit

The components of an ESD Field Service kit are:

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

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

Transporting sensitive components

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

After working inside your computer

About this task

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

Steps

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

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

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

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

BitLocker

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

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

computer displays a prompt for the recovery key on each reboot. Failure to provide the recovery key can result in data loss or an operating system reinstall. For more information, refer Updating the BIOS on Dell systems with BitLocker enabled.

The installation of the following components triggers BitLocker:

- Hard disk drive or solid state drive
- System board

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Flat head slotted screwdriver (<4mm)
- 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	6	
LPCAMM2 memory	M2x4	3	
2230 solid-state drive (SODIMM memory)	M2x2.5	1	
2230 solid-state drive (LPCAMM2 memory)	M2x2.5	2	
2280 solid-state drive (LPCAMM2 memory)	M2x2.5	1	
WLAN card	M2x2.5	1	
WWAN card	M2x3.5	1	
Battery	Captive	5	
Speakers	M1.6x1.5	4	

Table 1. Screw list (continued)

Component	Screw type	Quantity	Screw image
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	M1.6x1.7	2	
Display-cable bracket	M2x3.5	2	
Display assembly	M2.5x5	4	
Display hinges	M2.5x2.5	6	
Display panel	M2x2	4	
System board	M2x2.5	2	
	M2x3.5	2	
USB Type-C module	M2x3.5	3	
Wireless-antenna modules	M1.6x2.5	4	
Keyboard	M1.6x1.4	2	
	M1.6x1.7	17	

Major components of Dell Pro 5 14 P514260

The following image shows the major components of Dell Pro 5 14 P514260.

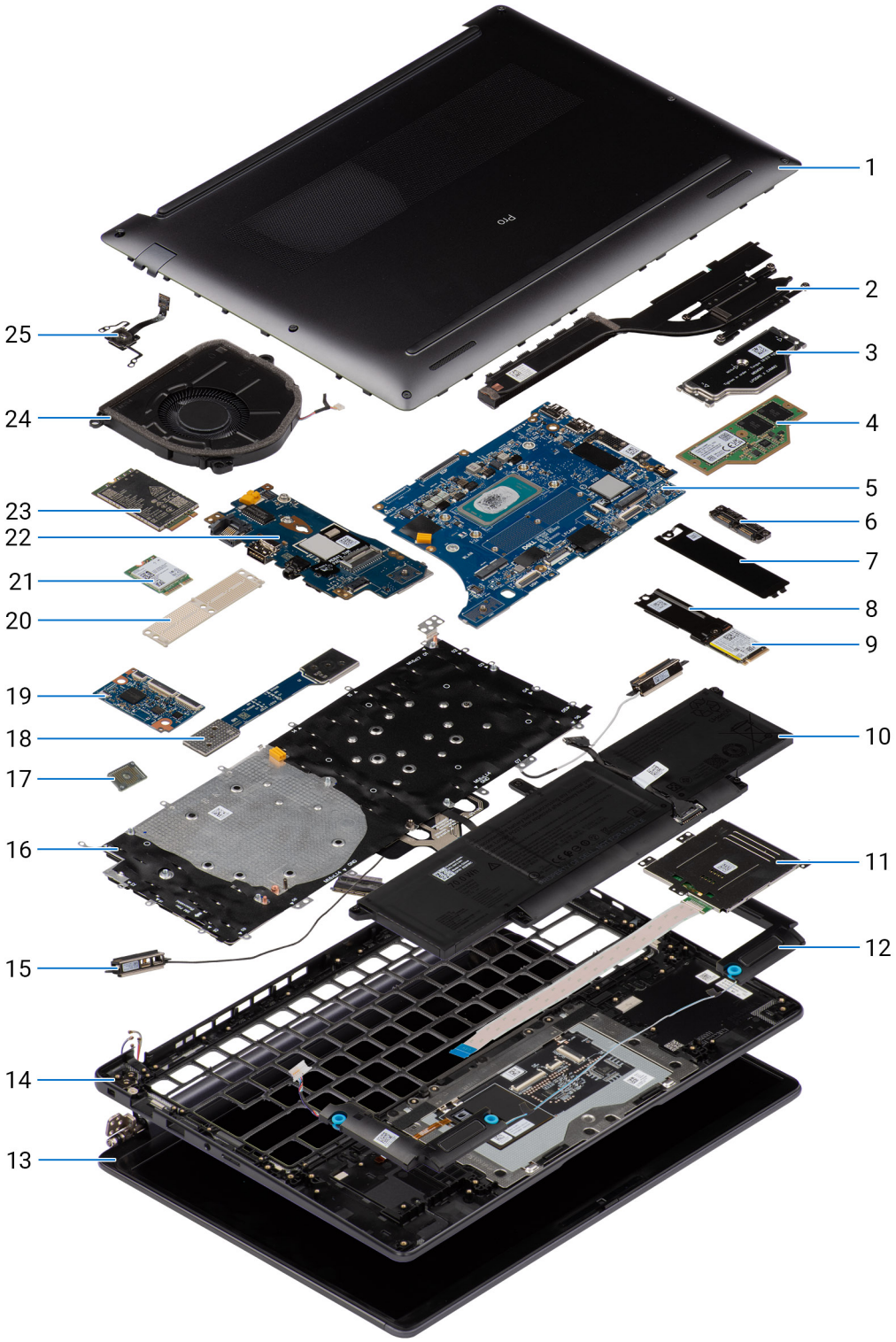


Figure 1. Major components of your computer

1. Base cover
2. Heatsink
3. LPCAMM2 memory heat sink
4. LPCAMM2 memory module
5. System board
6. USB Type-C module
7. Solid-state drive thermal shield

8. 2230 solid-state drive bracket
9. 2230 solid-state drive
10. Battery
11. Smart-card reader
12. Speakers
13. Display assembly
14. Palm-rest assembly
15. WLAN antenna module
16. Keyboard
17. I/O-bridge board interposer
18. I/O-bridge board
19. USH board
20. LPCAMM2 memory interposer
21. WLAN card
22. I/O board
23. WWAN card
24. Fan
25. Power button

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

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

The replaceable components in your Dell Pro 5 14 P514260 are either Customer Replaceable Units (CRUs) or Field Replaceable Units (FRUs).

CAUTION: To avoid any potential damage to the component or loss of data, ensure that an authorized service technician replaces the Field Replaceable Units (FRUs). Customers can replace only the Customer Replaceable Units (CRUs) following the safety precautions and replacement procedures.

Table 2. CRU and FRU list

Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
nano-SIM card tray	I/O-bridge board
Base cover	Heat sink
Memory	I/O board
Solid-state drive	Power button
WLAN card	Display assembly
WWAN card	Display bezel
Battery	Display hinges
Battery cable	Display panel
Speakers	Camera
Fan	Display cable
	Display-back cover
	System board
	USB Type-C module
	Wireless-antenna modules

Table 2. CRU and FRU list (continued)

Customer Replaceable Unit (CRU)	Field Replaceable Unit (FRU)
	Keyboard
	Palm-rest assembly

2

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 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.

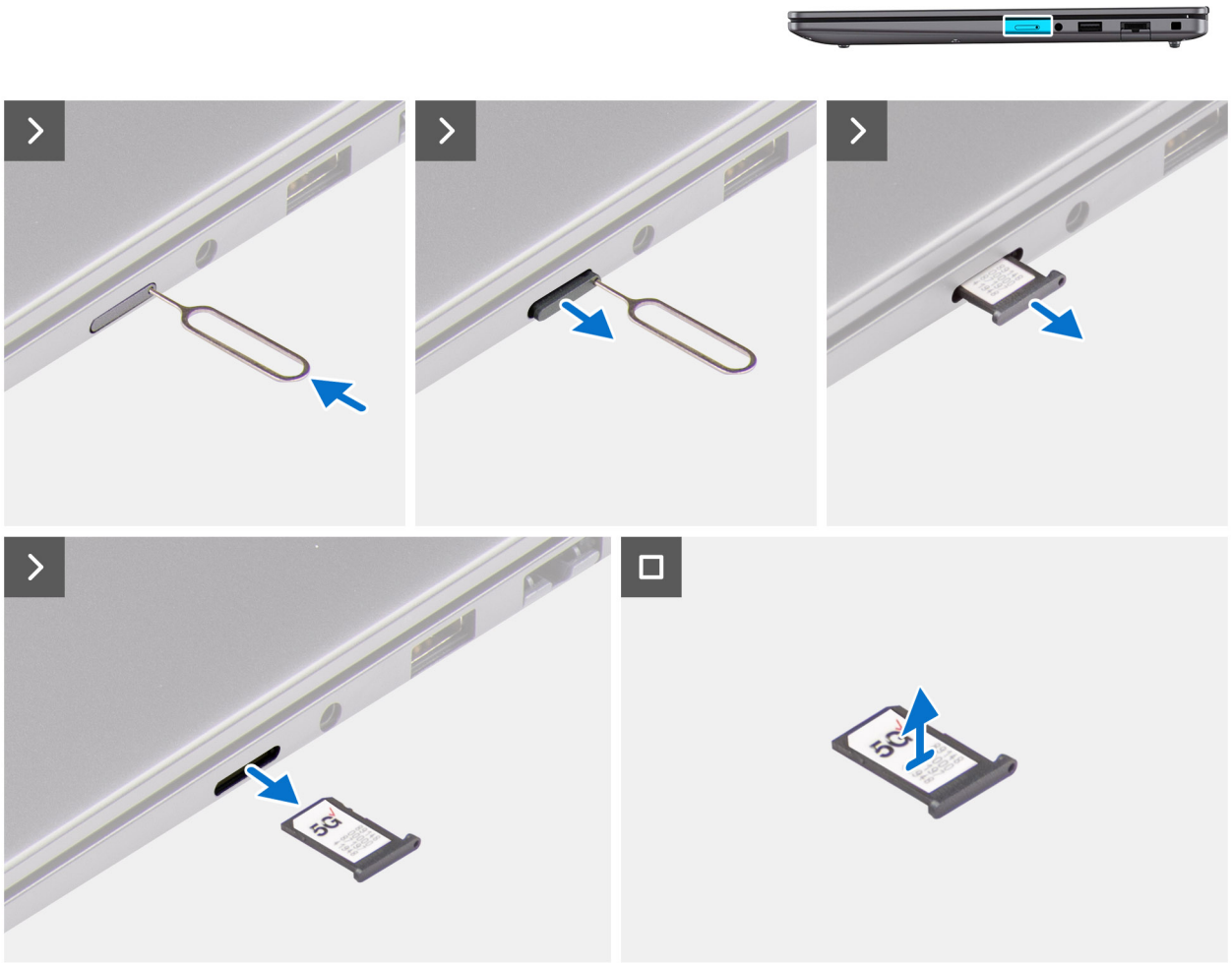


Figure 2. Removing the nano-SIM card tray

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.

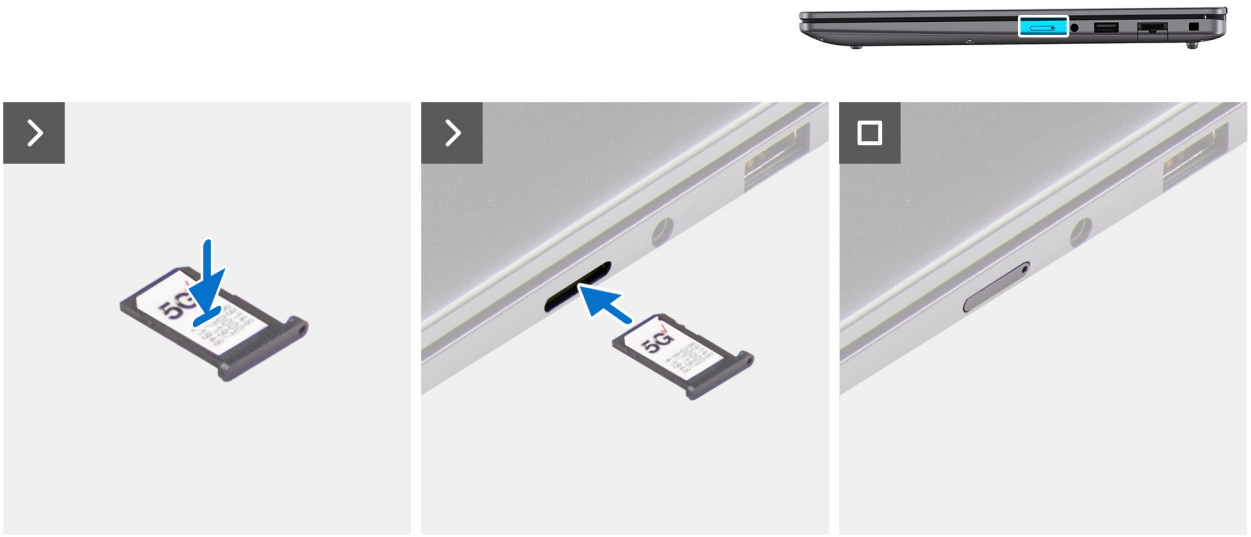


Figure 3. Installing the nano-SIM card tray

Steps

1. Align and place the nano-SIM card on the nano-SIM card tray.

   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 (Full Aluminium)

Prerequisites

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

About this task

NOTE: This procedure is applicable only to computers shipped with a Full Aluminium chassis configuration.

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



Figure 4. Removing the base cover (Full Aluminium)



Figure 5. Removing the base cover (Full Aluminium)

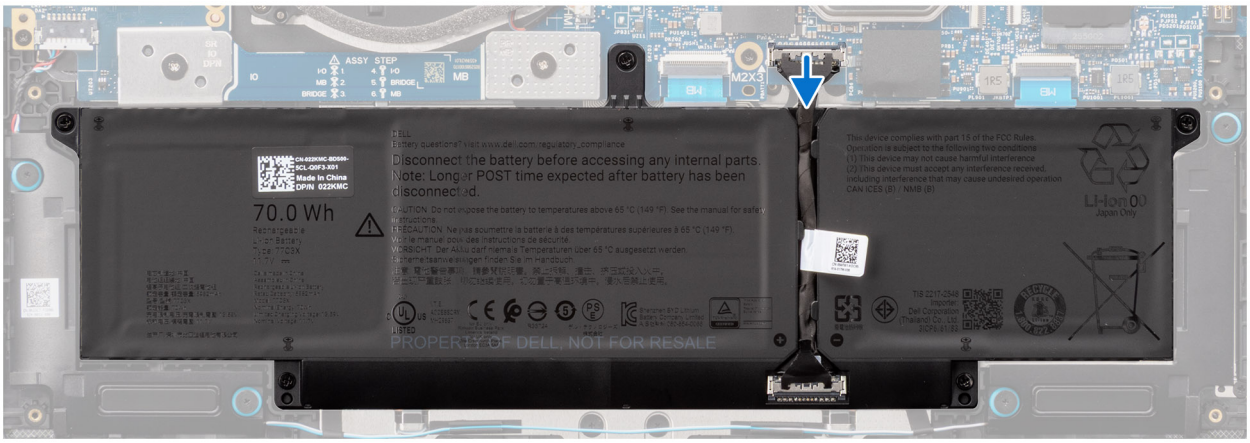


Figure 6. Disconnecting the battery cable

Steps

1. Loosen the six 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 located 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 (Full Aluminium)

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 to computers shipped with a Full Aluminium chassis configuration.

The following images indicate the location of the base cover (Full Aluminium) and provide a visual representation of the installation procedure.

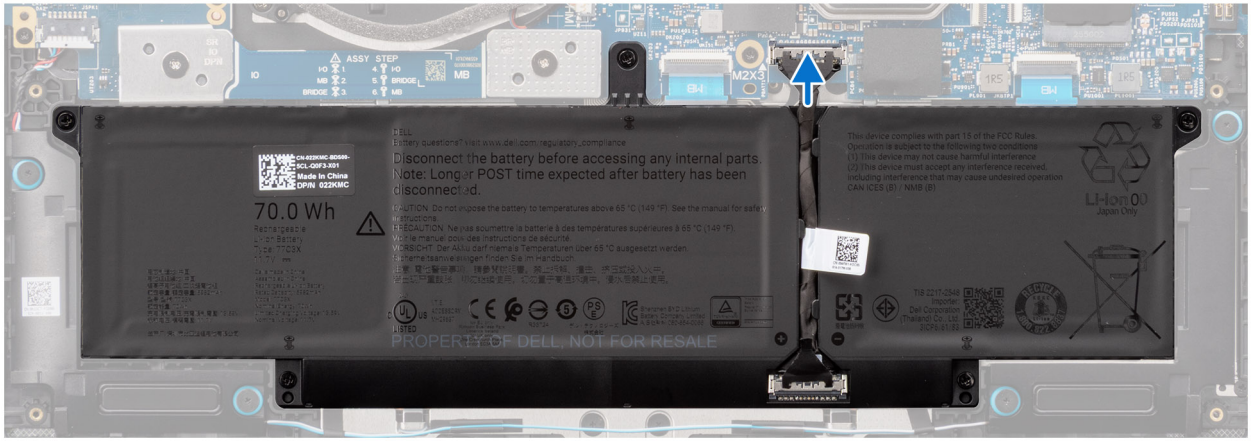


Figure 7. Connecting the battery cable



Figure 8. Installing the base cover (Full Aluminium)



Figure 9. Installing the base cover (Full Aluminium)

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 six 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.

Installing the base cover (Aluminium and Glass Fiber Composite)

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 to computers shipped with an Aluminium and Glass Fiber Composite chassis configuration.

The following images indicate the location of the base cover (Aluminium and Glass Fiber Composite) and provide a visual representation of the installation procedure.

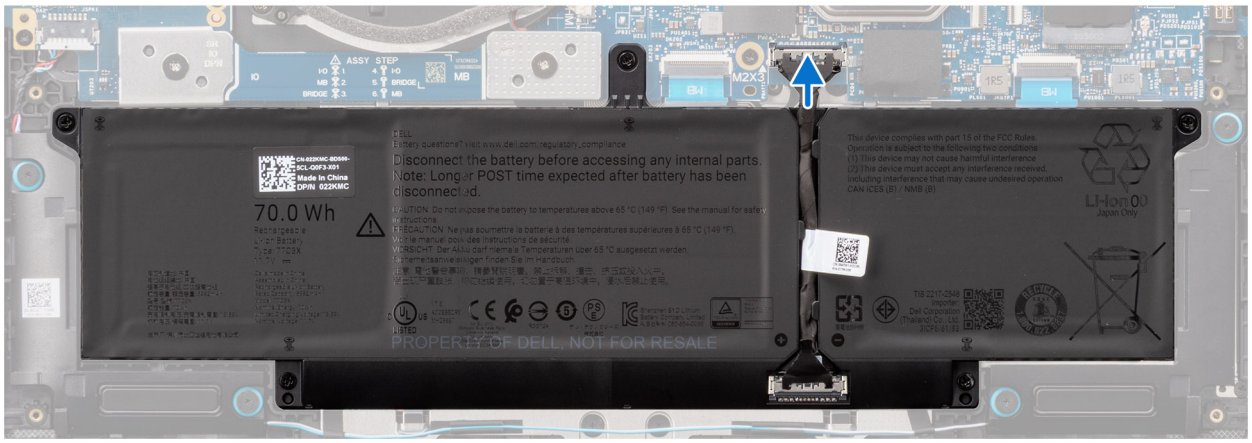


Figure 10. Connecting the battery cable



Figure 11. Installing the base cover (Aluminium and Glass Fiber Composite)



Figure 12. Installing the base cover (Aluminium and Glass Fiber Composite)

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 six 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.

Removing the base cover (Aluminium and Glass Fiber Composite)

Prerequisites

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

About this task

NOTE: This procedure is applicable only to computers shipped with an Aluminium and Glass Fiber Composite chassis configuration.

The following images indicate the location of the base cover (Aluminium and Glass Fiber Composite) and provide a visual representation of the removal procedure.



Figure 13. Removing the base cover (Aluminium and Glass Fiber Composite)



Figure 14. Removing the base cover (Aluminium and Glass Fiber Composite)

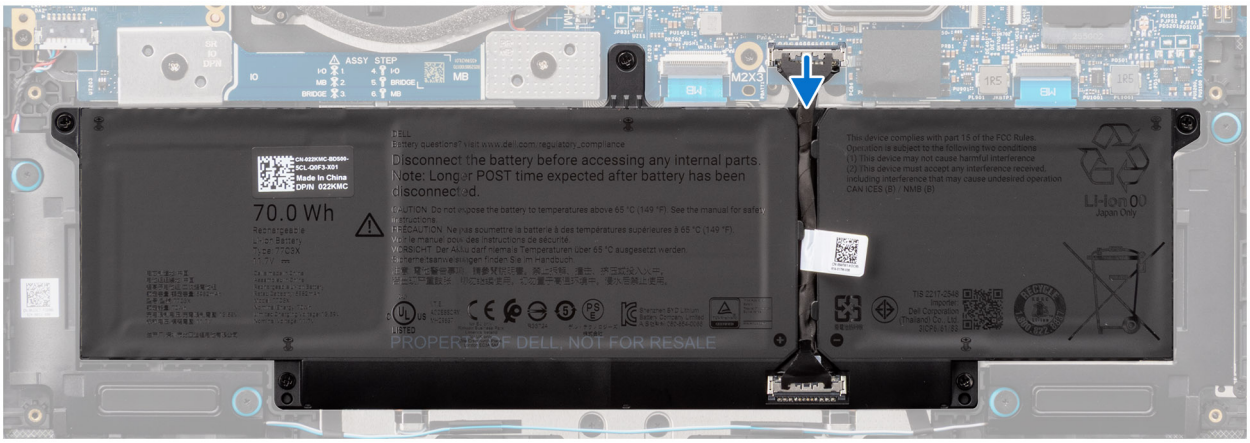


Figure 15. Disconnecting the battery cable

Steps

1. Loosen the six 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 located 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.

Memory

Removing the SODIMM memory

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure is applicable only for computers that are shipped with SODIMM (Small Outline Dual In-line Memory Module) memory.

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

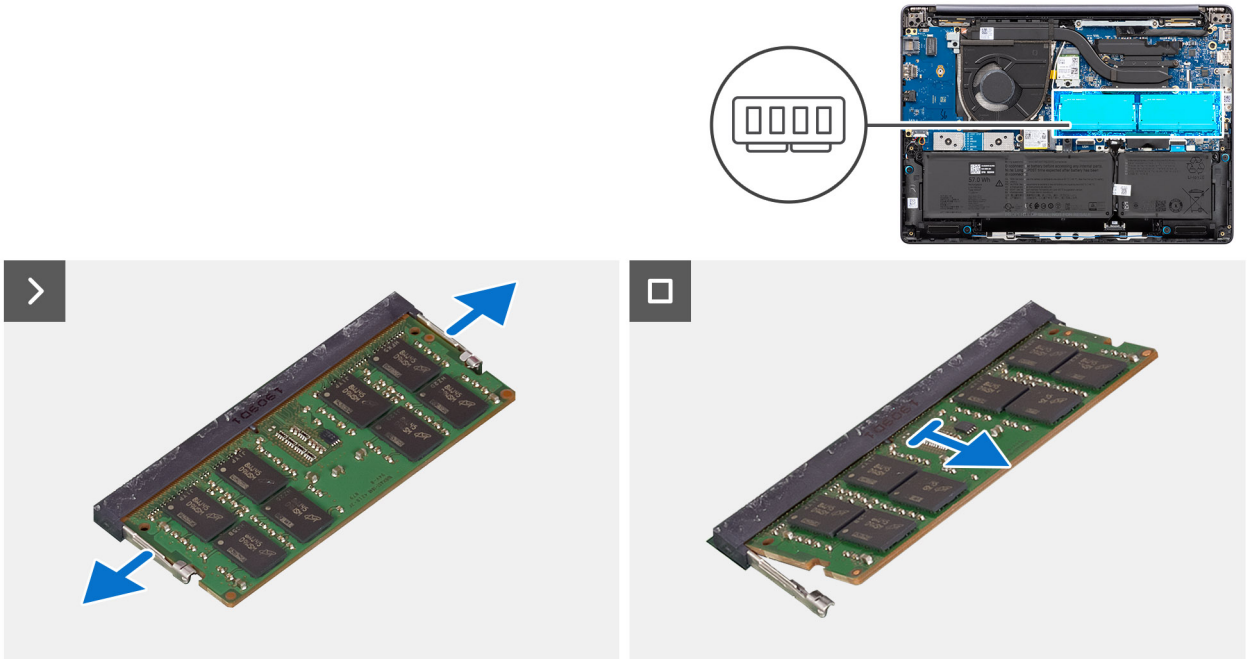


Figure 16. Removing the SODIMM memory

Steps

1. Carefully spread apart the securing-clips on each end of the SODIMM-memory slot (DIMMA/DIMMB).
2. Grasp the SODIMM memory module at each end near the securing clips, and then gently lift the SODIMM-memory module out of the SODIMM-memory slot.

   NOTE: Repeat steps 1 and 2 for each SODIMM memory installed on your computer.

Installing the SODIMM memory

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 SODIMM (Small Outline Dual In-line Memory Module) memory on your computer.

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

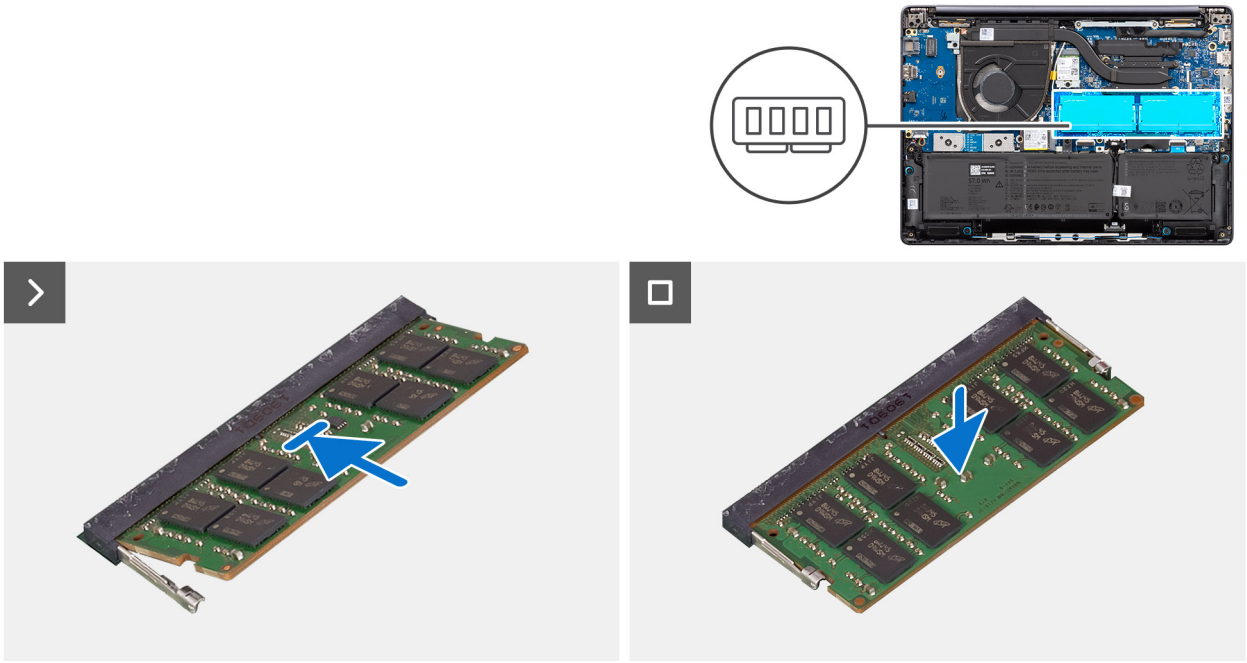


Figure 17. Installing the SODIMM memory

Steps

1. Grasp each corner of the SODIMM-memory module and align the notch on the module with the tab on the SODIMM-memory slot (DIMMA/DIMMB).
2. Insert the SODIMM-memory module into the SODIMM-memory slot.
3. Press down on the SODIMM-memory module until the securing clips lock in place.

   NOTE: Repeat steps 1 to 3 for each SODIMM-memory module to be installed on your computer.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Removing the LPCAMM2 memory

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure is applicable only for computers that are shipped with LPCAMM2 (Low-Power Compression Attached Memory Module) memory.

The following image indicates the location of the LPCAMM2 memory and provides a visual representation of the removal procedure.

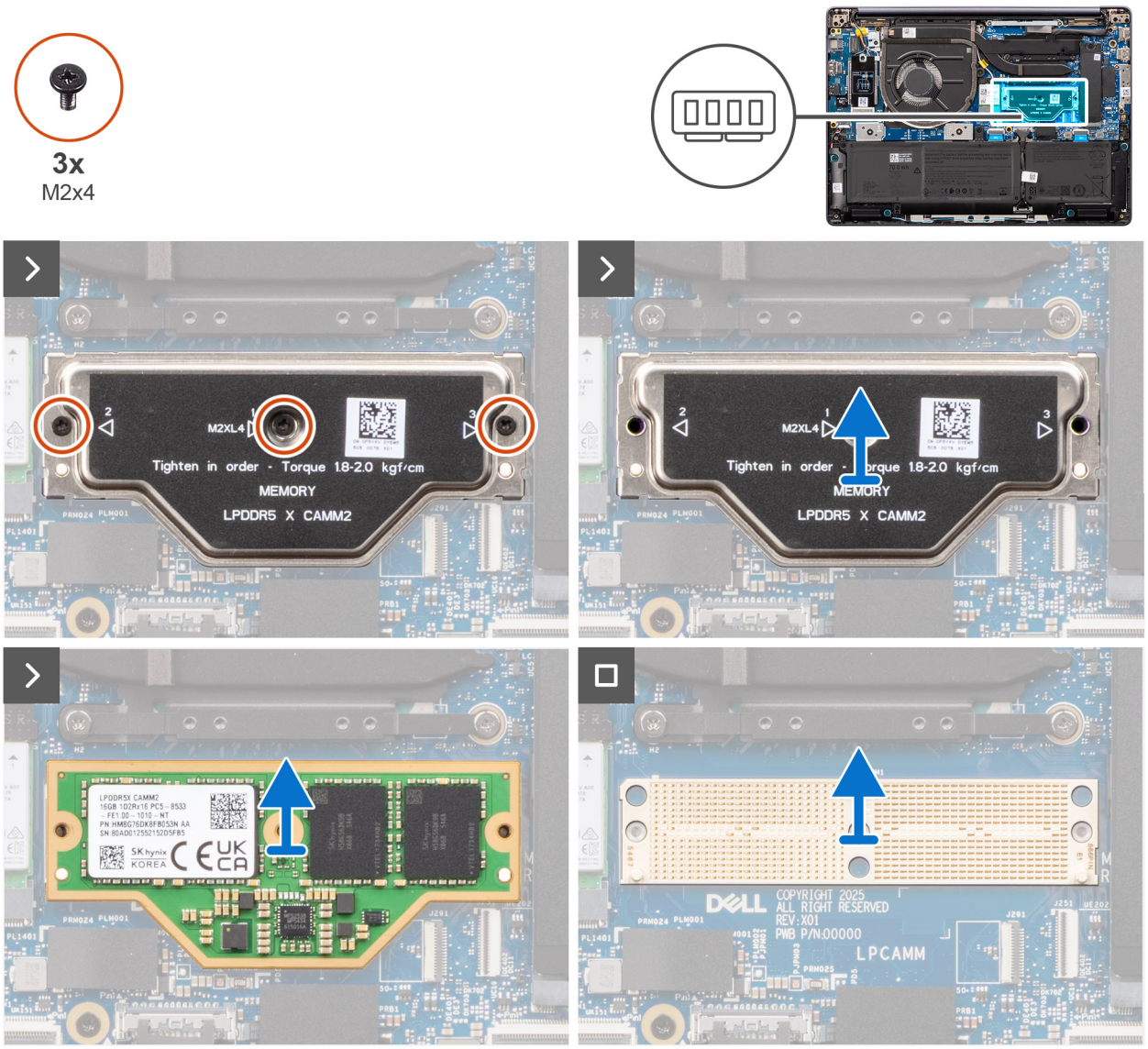


Figure 18. Removing the LPCAMM2 memory

Steps

1. In reverse sequential order (3 > 2 > 1), remove the three screws (M2x4) that secure the LPCAMM2 memory heat sink to the system board.
2. Remove the LPCAMM2 memory heat sink from the system board.
3. Lift the LPCAMM2 memory module off the system board.
4. Lift the LPCAMM2 memory interposer off the system board.

CAUTION: To avoid bending the pins and damaging the LPCAMM2 memory interposer, hold the interposer by the edges while handling it.

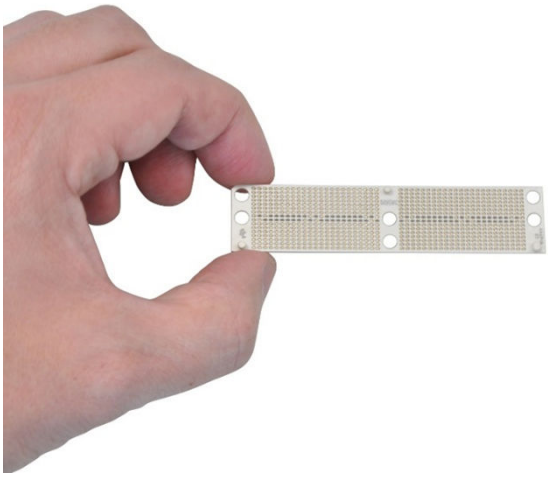


Figure 19. Proper handling of the LPCAMM2 memory interposer

Installing the LPCAMM2 memory

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 LPCAMM2 (Low-Power Compression Attached Memory Module) memory on your computer.

The following image indicates the location of the LPCAMM2 memory and provides a visual representation of the installation procedure.

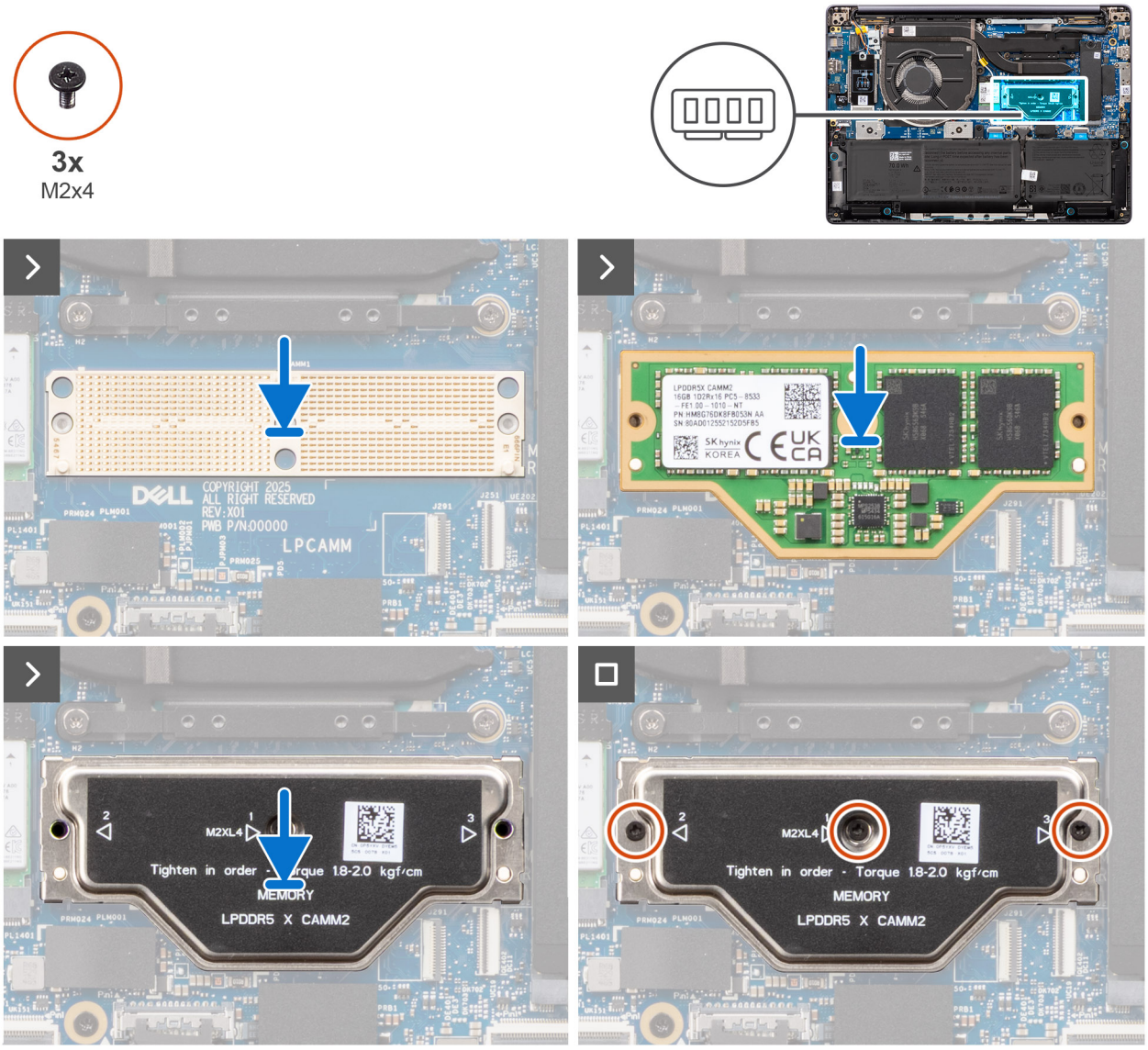


Figure 20. Installing the LPCAMM2 memory

Steps

1. Gently lift the LPCAMM2 memory interposer by pinching the edges of the interposer with your fingertips.

   CAUTION: To avoid bending the pins and damaging the LPCAMM2 memory interposer, hold the interposer by the edges while handling it.

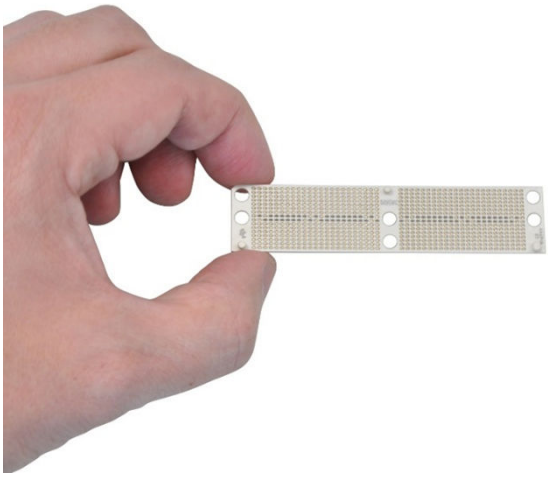


Figure 21. Proper handling of the LPCAMM2 memory interposer

2. Orient the LPCAMM2 memory interposer so that the beveled corner is in the top-left position, and then place the LPCAMM2 memory interposer on its connector (LPCAMM) on the system board.

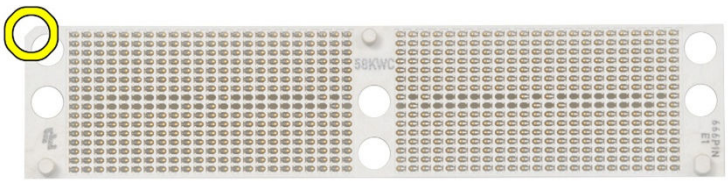


Figure 22. Proper orientation of the LPCAMM2 memory interposer

3. Using the alignment posts, place the LPCAMM2 memory on the system board, aligning the screw holes on the LPCAMM2 memory with the screw holes on the system board.
4. Using the alignment posts, place the LPCAMM2 memory heat sink on the system board.
5. In sequential order (1 > 2 > 3), replace the three screws (M2x4) that secure the LPCAMM2 memory heat sink to the system board.

CAUTION: To prevent improper seating of the LPCAMM2 memory module, ensure that the screws are replaced in the sequence provided.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Solid-state drive

Removing the 2230 solid-state drive (SODIMM memory)

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure applies to computers shipped with a 2230 solid-state drive and SODIMM (Small Outline Dual In-line Memory Module) memory.

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

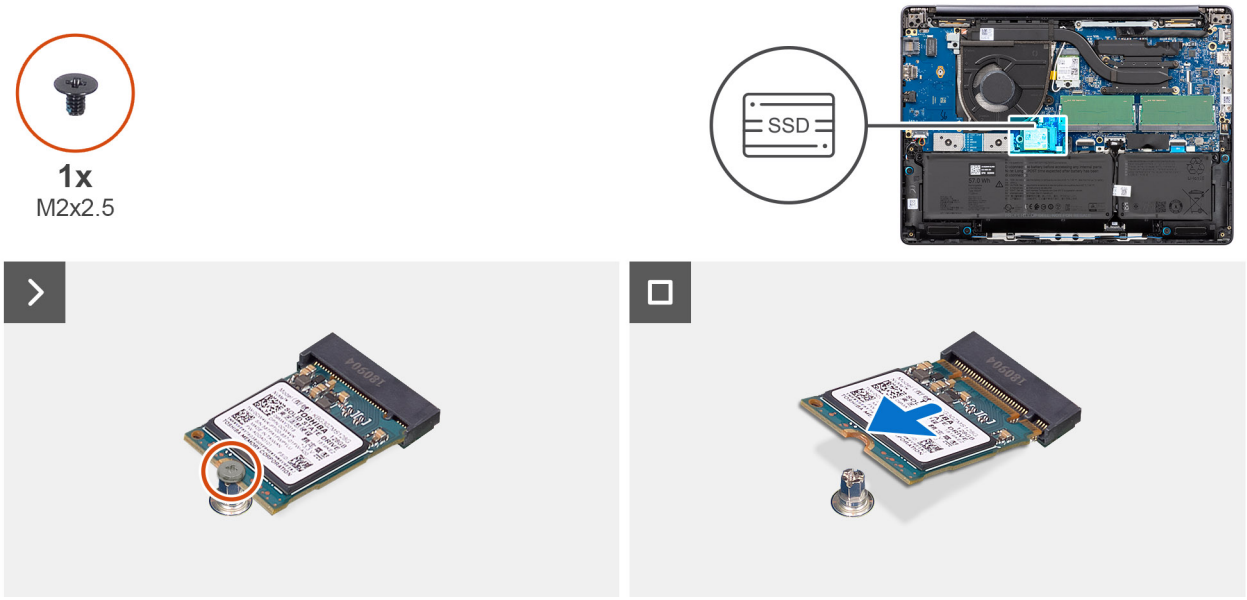


Figure 23. Removing the 2230 solid-state drive (SODIMM memory)

Steps

1. Remove the screw (M2x2.5) that secures the 2230 solid-state drive to the system board.
2. Slide and lift the 2230 solid-state drive off the system board.

Installing the 2230 solid-state drive (SODIMM memory)

Prerequisites

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

About this task

NOTE: This procedure applies if you are installing a 2230 solid-state drive on a computer with SODIMM (Small Outline Dual In-line Memory Module) memory.

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

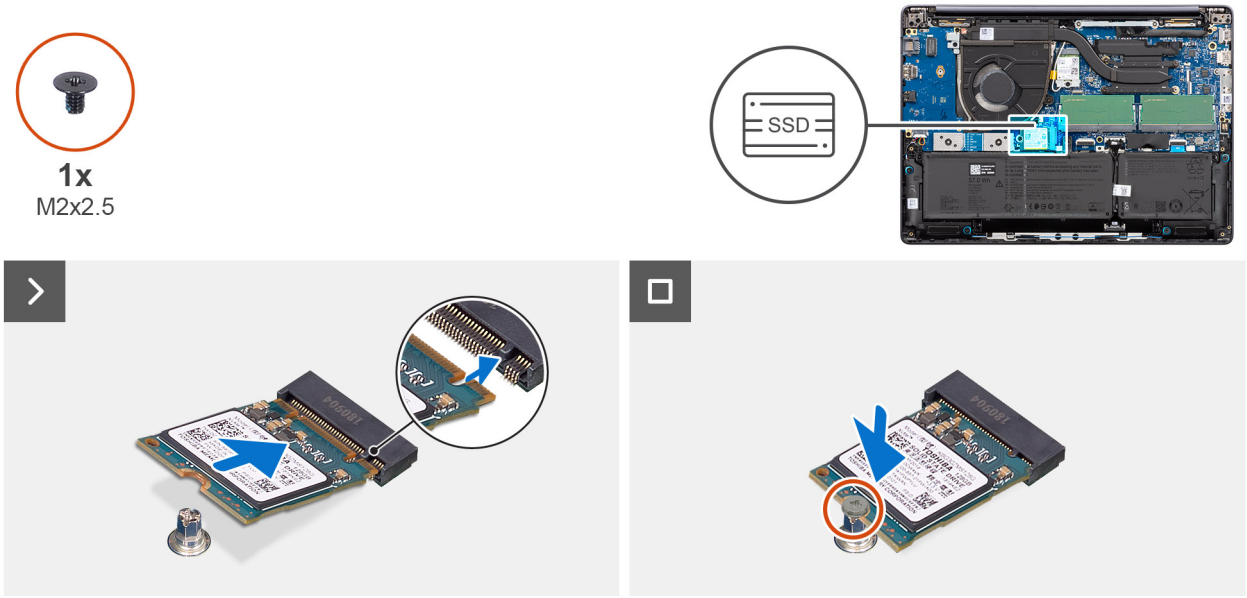


Figure 24. Installing the 2230 solid-state drive (SODIMM memory)

Steps

1. Align the notch on the 2230 solid-state drive with the tab on the M.2 solid-state drive slot.
2. Slide the 2230 solid-state drive into the M.2 solid-state drive slot on the system board.
3. Replace the screw (M2x2.5) that secures the 2230 solid-state drive to the system board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Removing the 2230 solid-state drive (LPCAMM2 memory)

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure applies to computers shipped with a 2230 solid-state drive and LPCAMM2 (Low-Power Compression-Attached Memory Module) memory.

The following image indicates the location of the 2230 solid-state drive (LPCAMM2 memory) and provides a visual representation of the removal procedure.

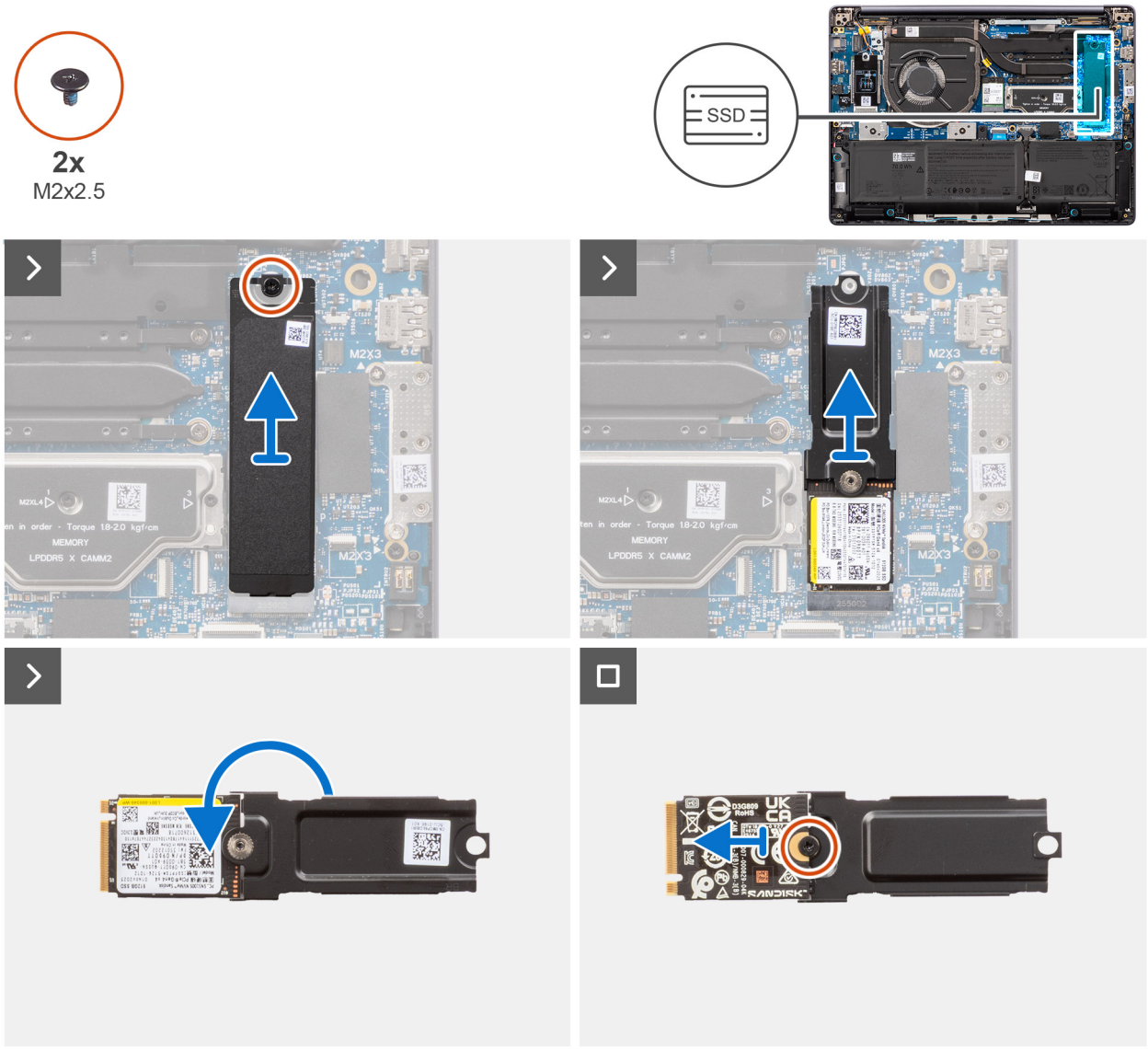


Figure 25. Removing the 2230 solid-state drive (LPCAMM2 memory)

Steps

1. Remove the screw (M2x2.5) that secures the solid-state drive thermal shield to the system board.
2. Lift the solid-state drive thermal shield off the 2230 solid-state drive.
3. Slide and lift the 2230 solid-state drive and its bracket off the system board.
4. Flip over the 2230 solid-state drive and its bracket.
5. Remove the screw (M2x2.5) that secures the 2230 solid-state drive to its bracket.
6. Lift the 2230 solid-state drive off its bracket.

Installing the 2230 solid-state drive (LPCAMM2 memory)

Prerequisites

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

About this task

NOTE: This procedure applies if you are installing a 2230 solid-state drive on a computer with LPCAMM2 (Low-Power Compression-Attached Memory Module) memory.

The following image indicates the location of the 2230 solid-state drive (LPCAMM2 memory) and provides a visual representation of the installation procedure.

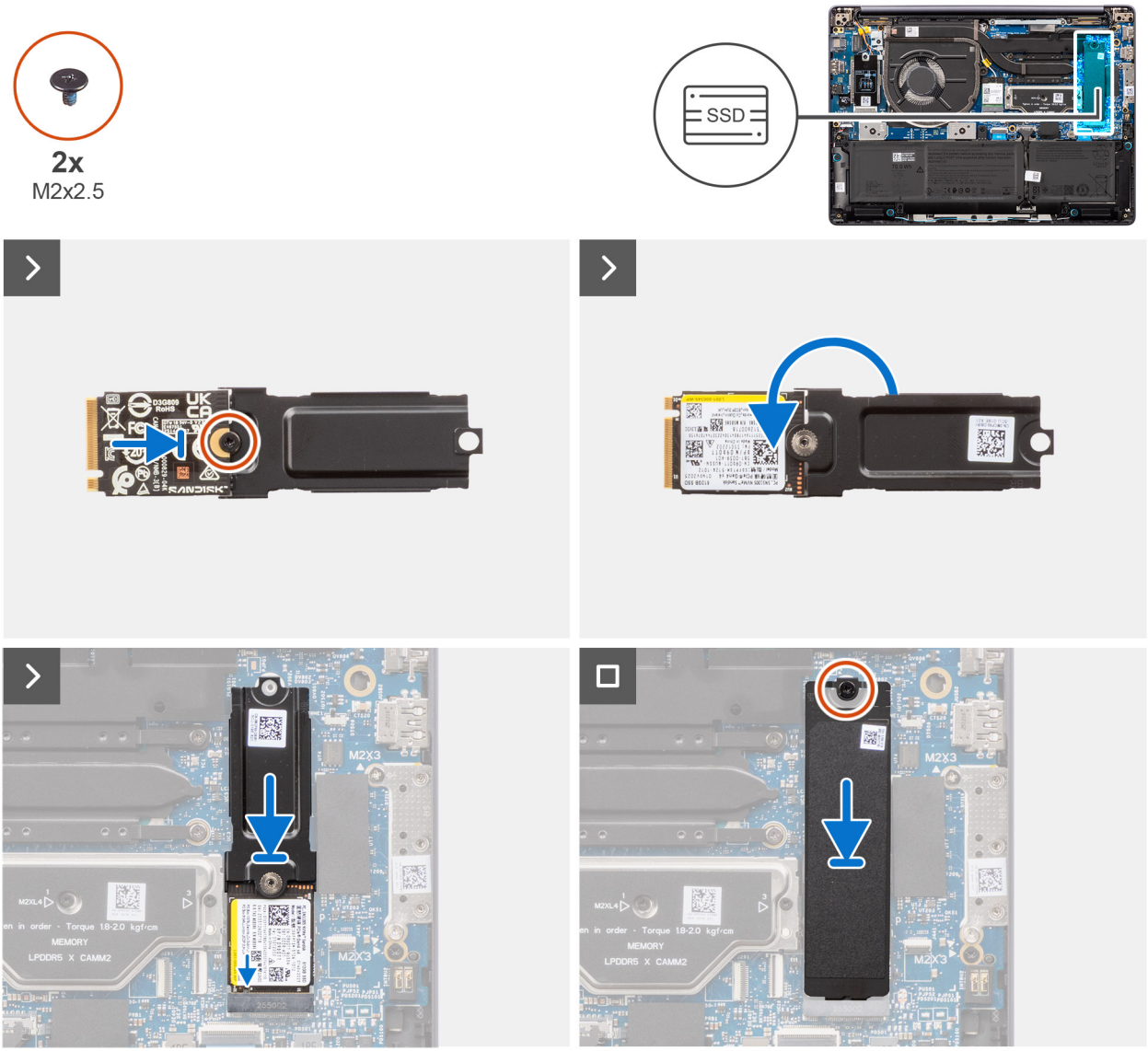


Figure 26. Installing the 2230 solid-state drive (LPCAMM2 memory)

Steps

1. Place the 2230 solid-state drive on the 2230 solid-state drive bracket.
2. Replace the screw (M2x2.5) that secures the 2230 solid-state drive to its bracket.
3. Flip over the 2230 solid-state drive and its bracket.
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 and its bracket into the M.2 solid-state drive slot on the system board.
6. Align the screw hole on the solid-state drive thermal shield with the screw hole on the system board.
7. Replace the screw (M2x2.5) that secures the solid-state drive thermal shield to the system board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Removing the 2280 solid-state drive (LPCAMM2 memory)

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure applies to computers shipped with a 2280 solid-state drive and LPCAMM2 (Low-Power Compression-Attached Memory Module) memory.

The following image indicates the location of the 2280 solid-state drive (LPCAMM2 memory) and provides a visual representation of the removal procedure.

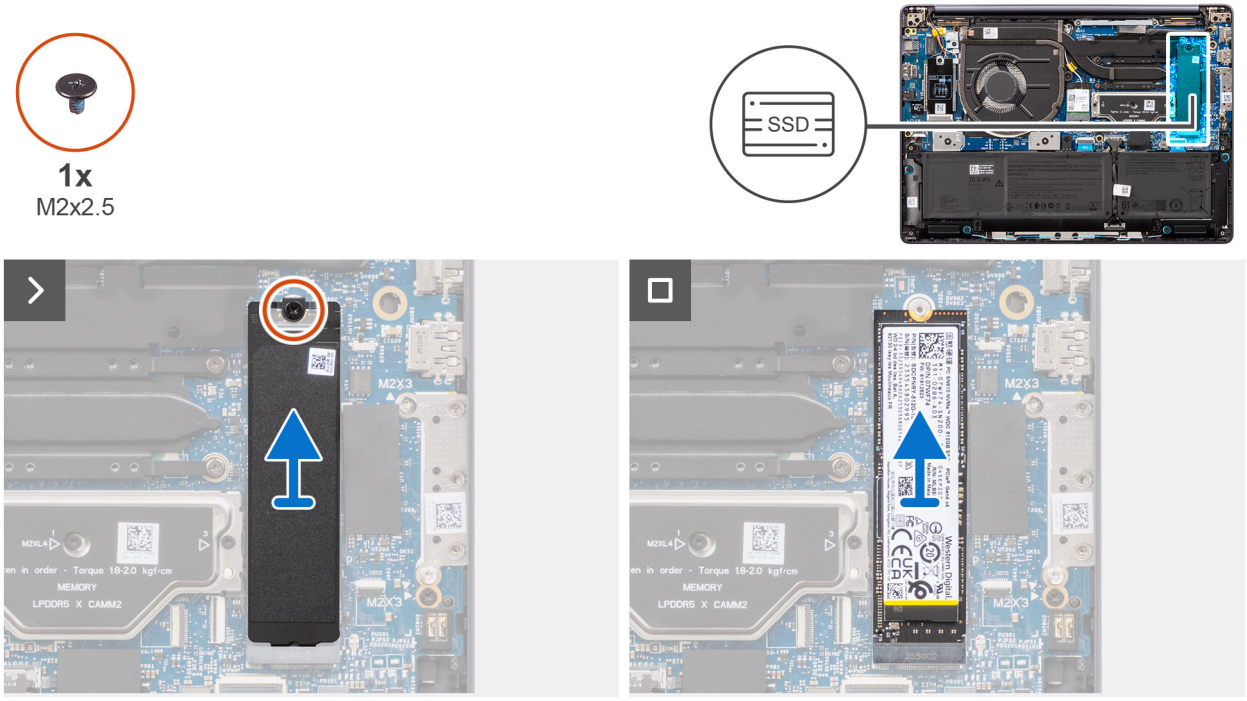


Figure 27. Removing the 2280 solid-state drive (LPCAMM2 memory)

Steps

1. Remove the screw (M2x2.5) that secures the solid-state drive thermal shield to the system board.
2. Lift the solid-state drive thermal shield off the 2280 solid-state drive.
3. Slide and lift the 2280 solid-state drive off the system board.

Installing the 2280 solid-state drive (LPCAMM2 memory)

Prerequisites

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

About this task

NOTE: This procedure applies if you are installing a 2280 solid-state drive on a computer with LPCAMM2 (Low-Power Compression-Attached Memory Module) memory.

The following image indicates the location of the 2280 solid-state drive (LPCAMM2 memory) and provides a visual representation of the installation procedure.

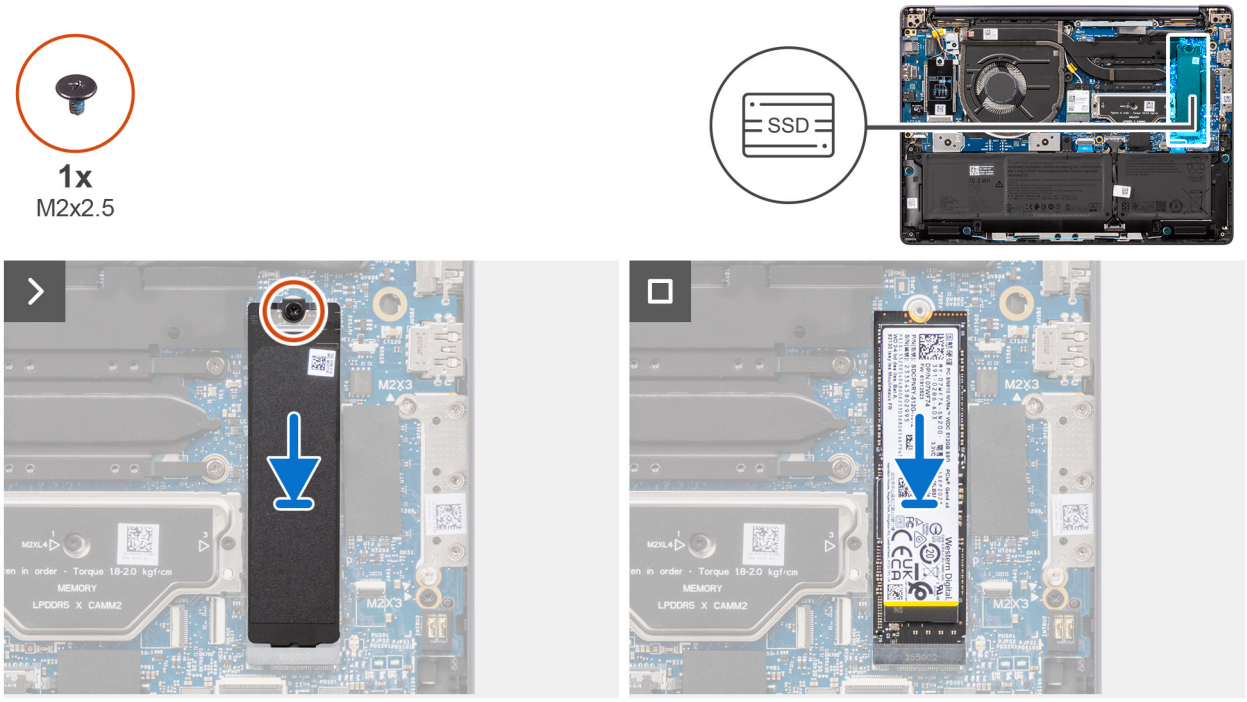


Figure 28. Installing the 2280 solid-state drive (LPCAMM2 memory)

Steps

1. Align the notch on the 2280 solid-state drive with the tab on the M.2 solid-state drive slot.
2. Slide the 2280 solid-state drive into the M.2 solid-state drive slot on the system board.
3. Align the screw hole on the solid-state drive thermal shield with the screw hole on the system board.
4. Replace the screw (M2x2.5) that secures the solid-state drive thermal shield to the system board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

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

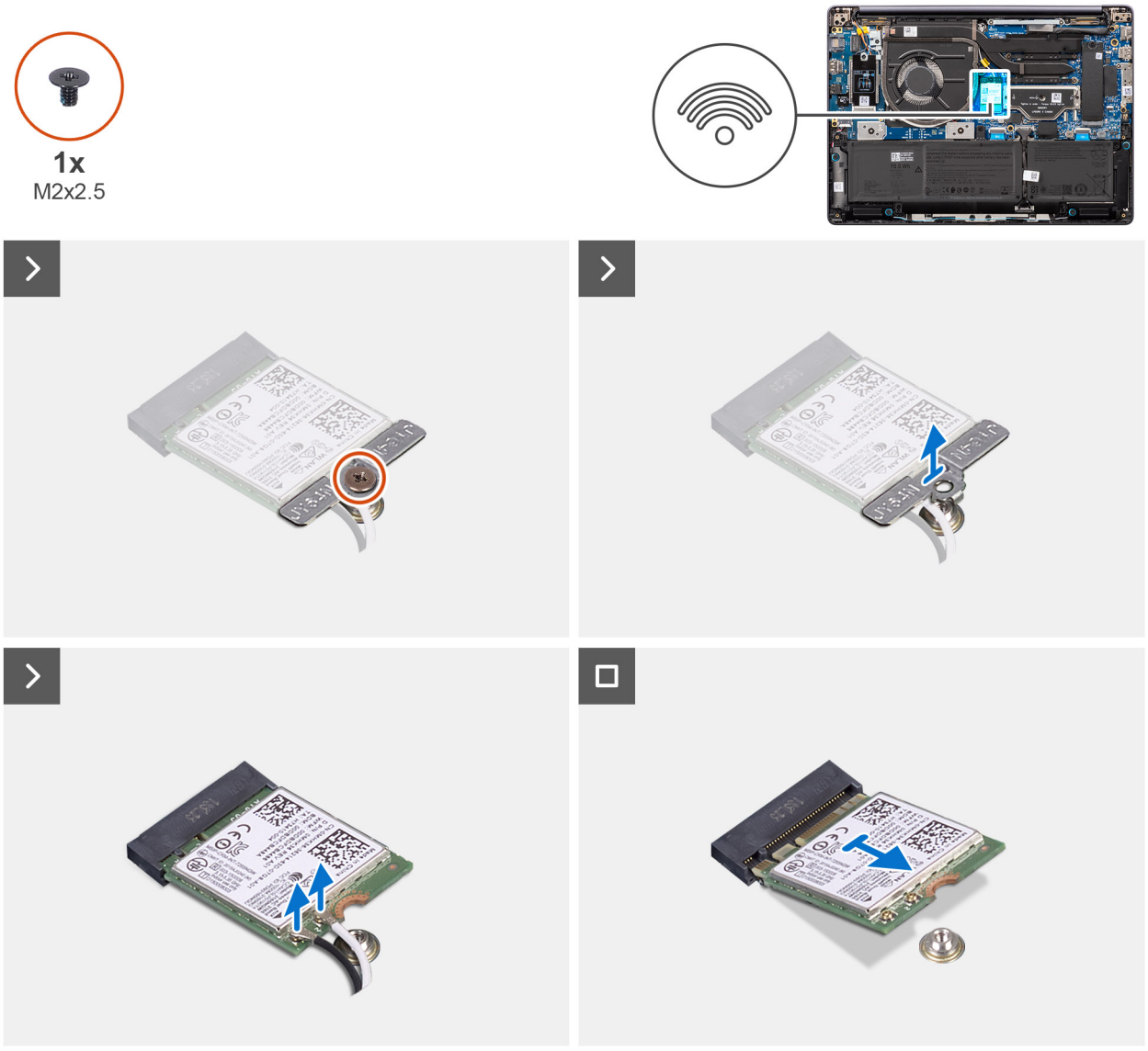


Figure 29. Removing the WLAN card

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.
4. 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.

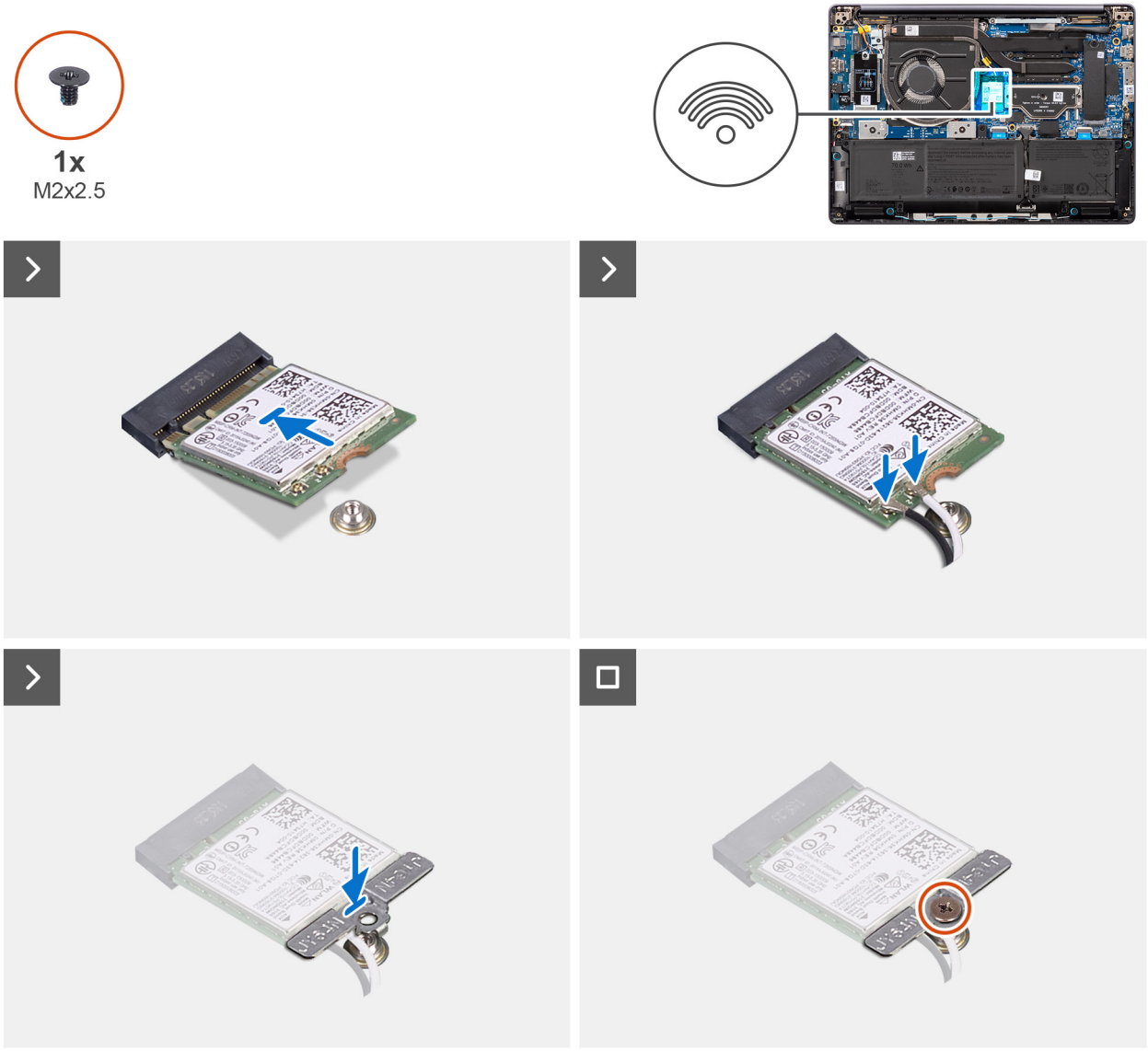


Figure 30. Installing the WLAN card

Steps

1. Align the notch on the wireless card with the tab on the wireless-card slot (JWLAN1).
2. Slide the wireless card at an angle into the wireless-card slot.
3. 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)

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

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.

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

WWAN card

Removing the 4G WWAN card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the nano-SIM card tray.
3. Remove the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure is applicable only for computers that are shipped with a 4G WWAN (Wireless Wide Area Network) card.

The following image indicates the location of the 4G WWAN card and provides a visual representation of the removal procedure.

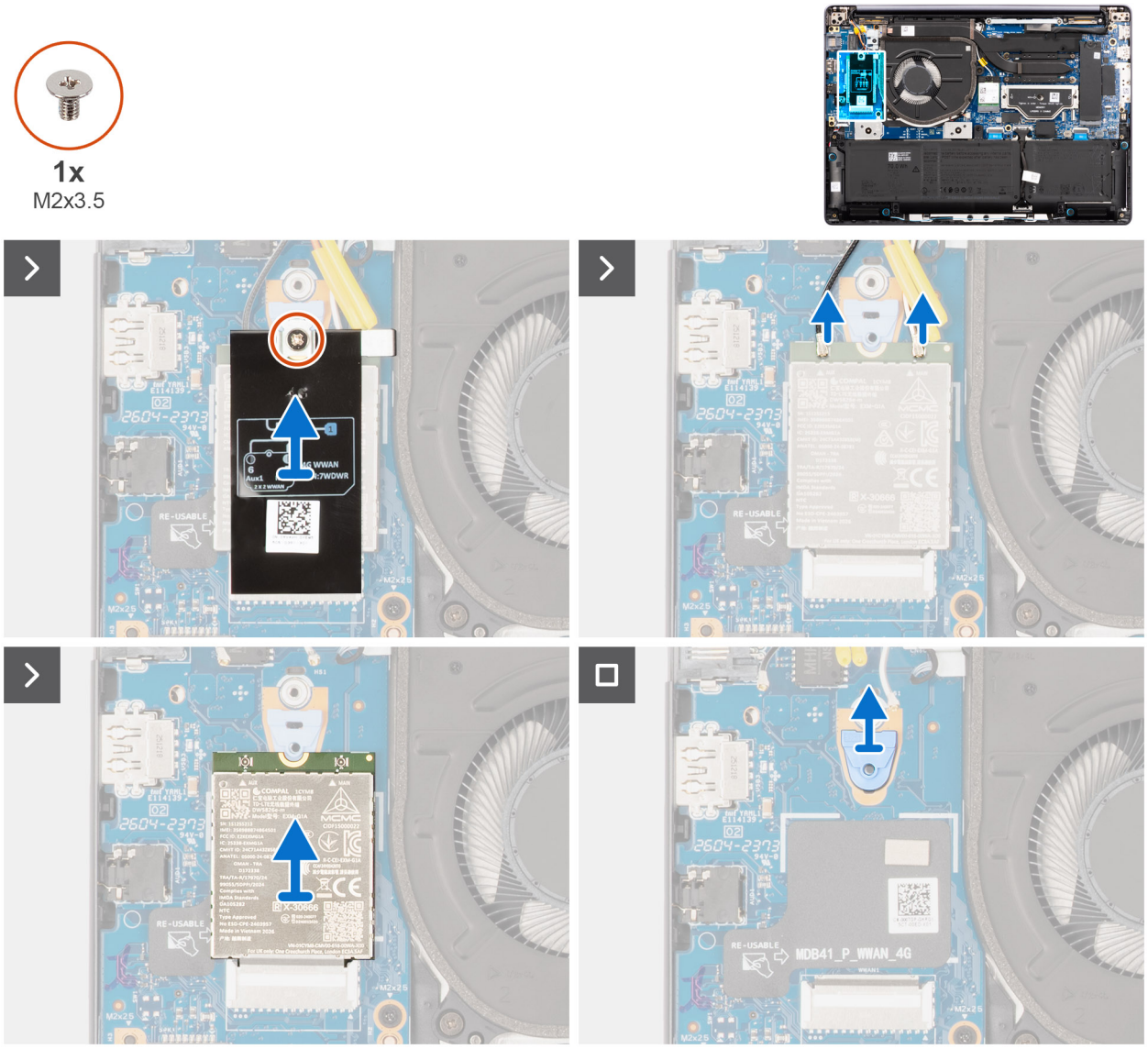


Figure 31. Removing the 4G WWAN card

Steps

1. Remove the screw (M2x3.5) that secures the 4G WWAN-card thermal shield to the I/O board.
2. Lift the 4G WWAN-card thermal shield off the 4G WWAN card.
3. Disconnect the antenna cables from the 4G 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.

4. Lift and slide the 4G 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.

5. Remove the 4G WWAN-card holder from the I/O board.

Installing the 4G 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 4G WWAN (Wireless Wide Area Network) card on your computer.

NOTE: The type of WWAN card 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 4G WWAN card and provides a visual representation of the installation procedure.

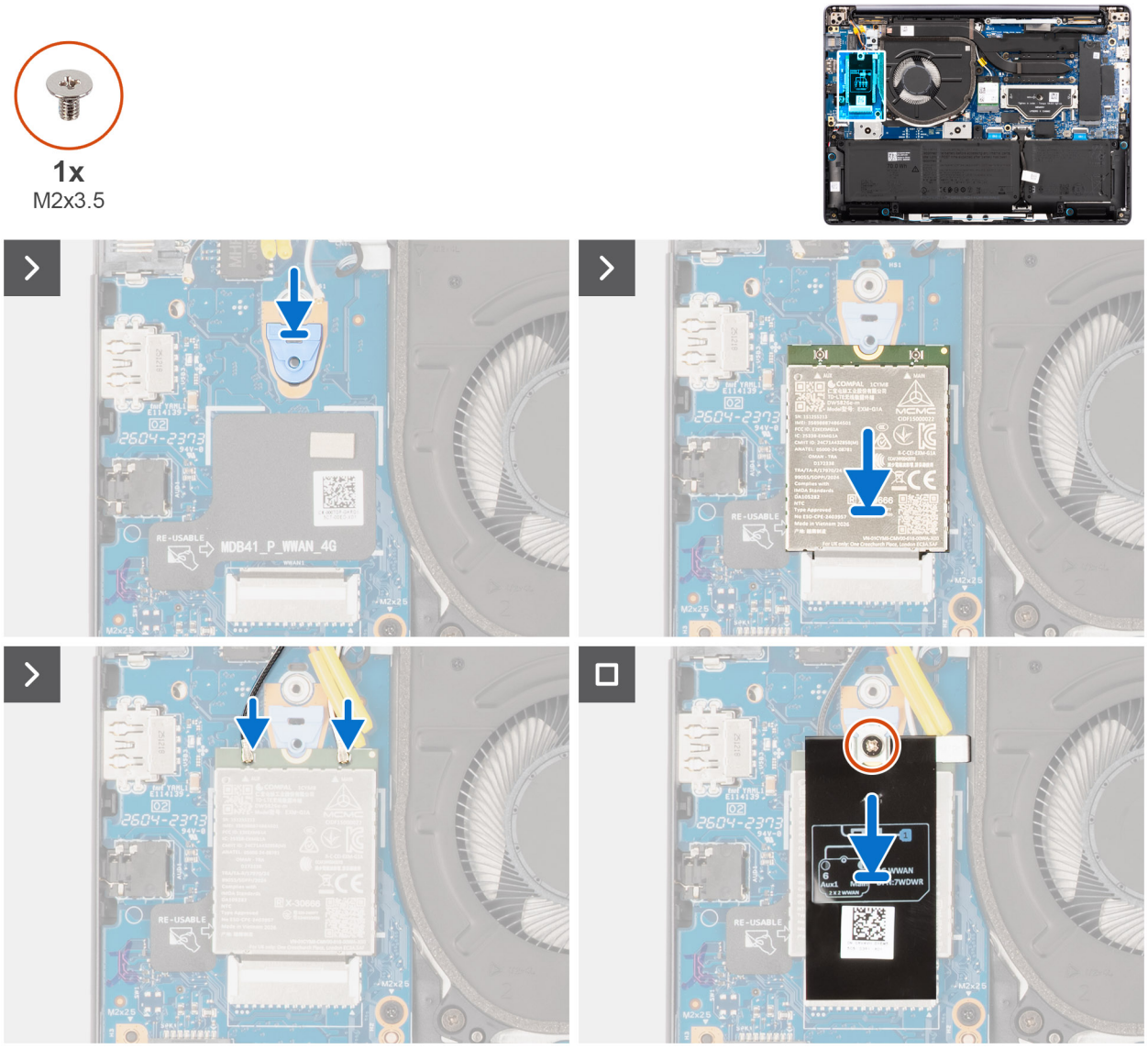


Figure 32. Installing the 4G WWAN card

Steps

1. Place the 4G WWAN-card holder into its slot on the I/O board.
2. Insert the 4G 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.

3. Connect the antenna cables to their respective connectors on the 4G 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

4. Place the 4G WWAN-card thermal shield and align the screw hole on the thermal shield with the screw hole on the card holder.
5. Replace the screw (M2x3.5) that secures the 4G WWAN-card thermal shield to the I/O board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray.
3. Follow the procedure in After working inside your computer.

Removing the 5G WWAN card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the nano-SIM card tray.
3. Remove the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

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 33. 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.

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 supported by your computer depends on the availability of the following antenna connections.

Table 6. 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.

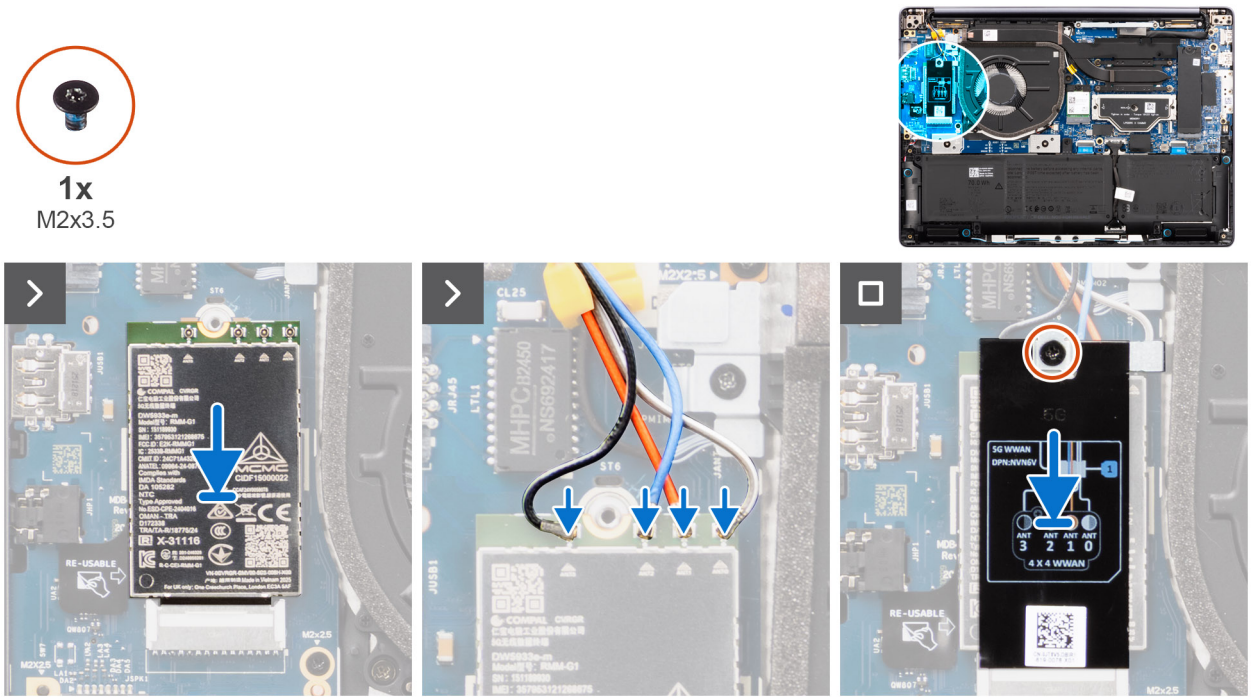


Figure 34. Installing the 5G WWAN card

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 7. 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. Place the 5G WWAN-card thermal shield and align the screw hole on the thermal shield with the screw hole on the I/O board.
4. Replace the screw (M2x3.5) that secures the 5G WWAN-card thermal shield to the I/O board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

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.

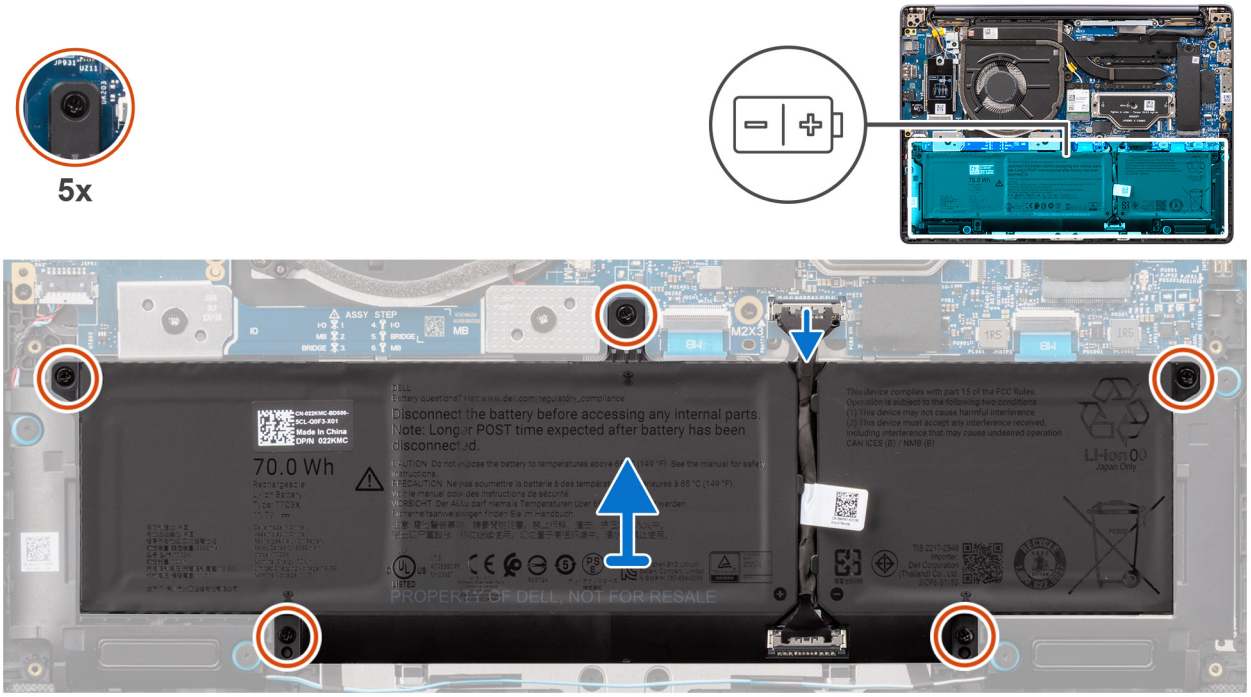


Figure 35. Removing the battery

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.

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.

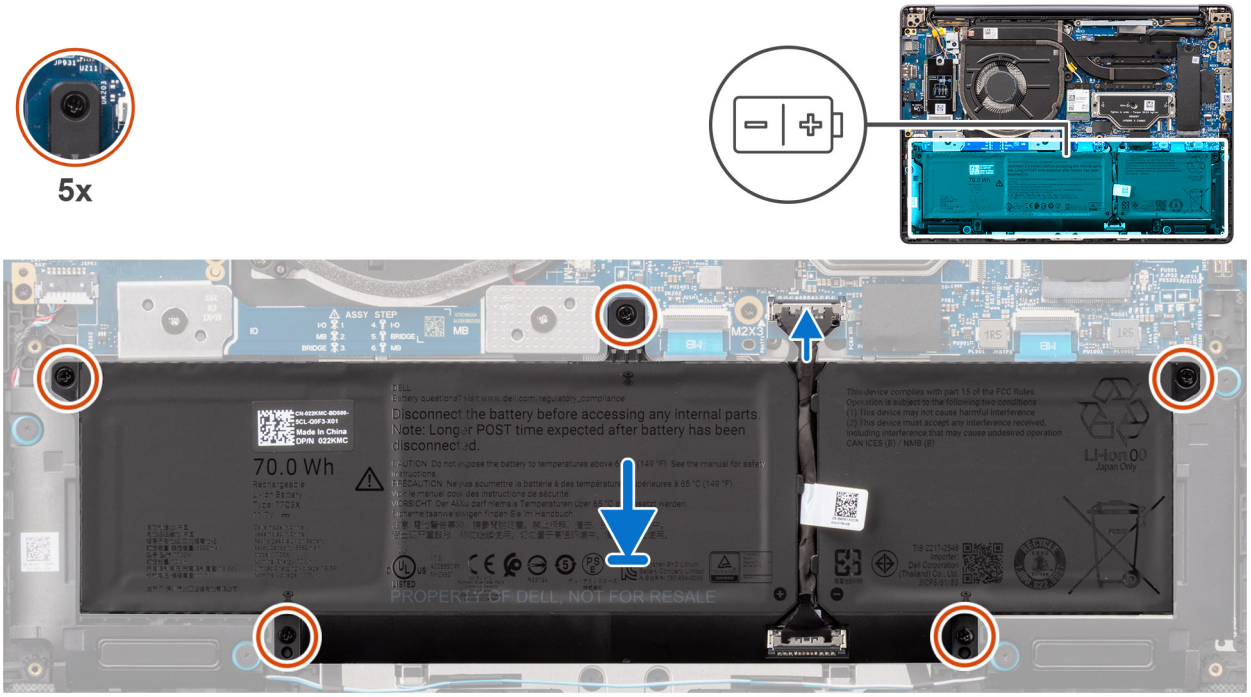


Figure 36. Installing the battery

Steps

1. 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.
2. Tighten the five captive screws that secure the battery to the palm-rest assembly.
3. Connect the battery cable to the battery-cable connector (BATT1) on the system board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Battery cable

Removing the battery cable

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the nano-SIM card tray, if applicable.
3. Remove the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the battery.

About this task

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

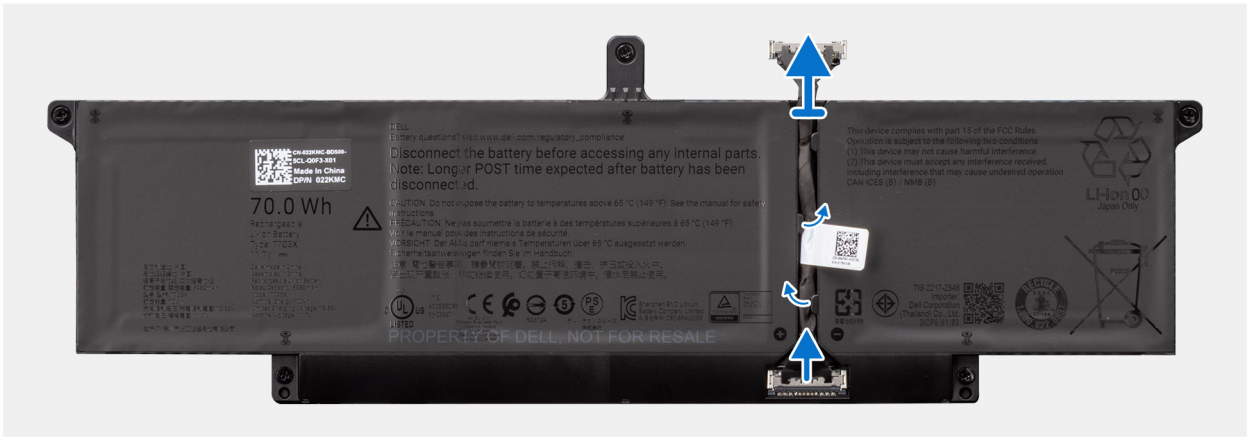


Figure 37. Removing the battery cable

Steps

1. Remove the battery cable from the routing guides on the battery.
2. Disconnect the battery cable from its connector on the battery and lift the battery cable off the battery.

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

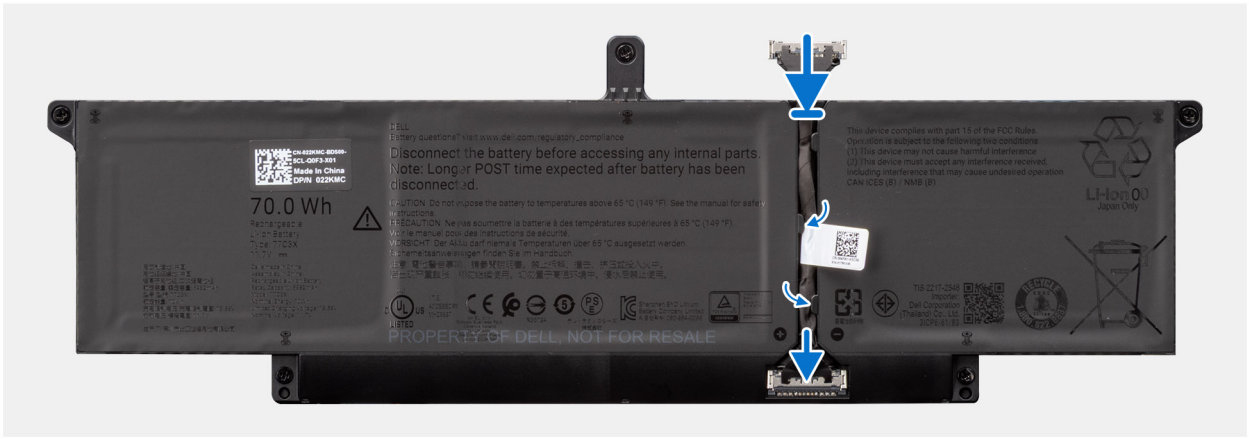


Figure 38. Installing the battery cable

Steps

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

Next steps

1. Install the battery.
2. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
3. Install the nano-SIM card tray, if applicable.
4. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

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

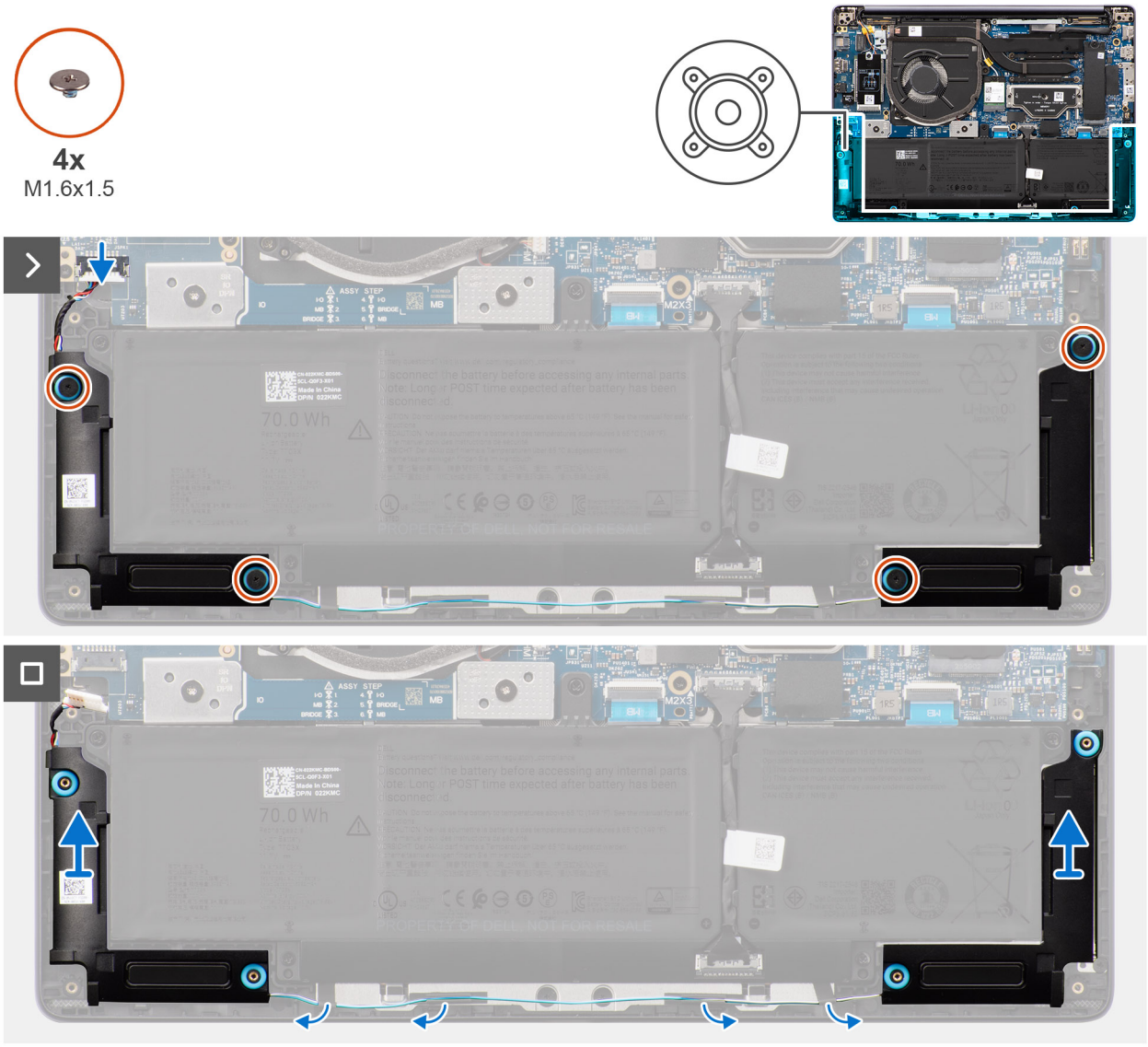


Figure 39. Removing the speakers

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.

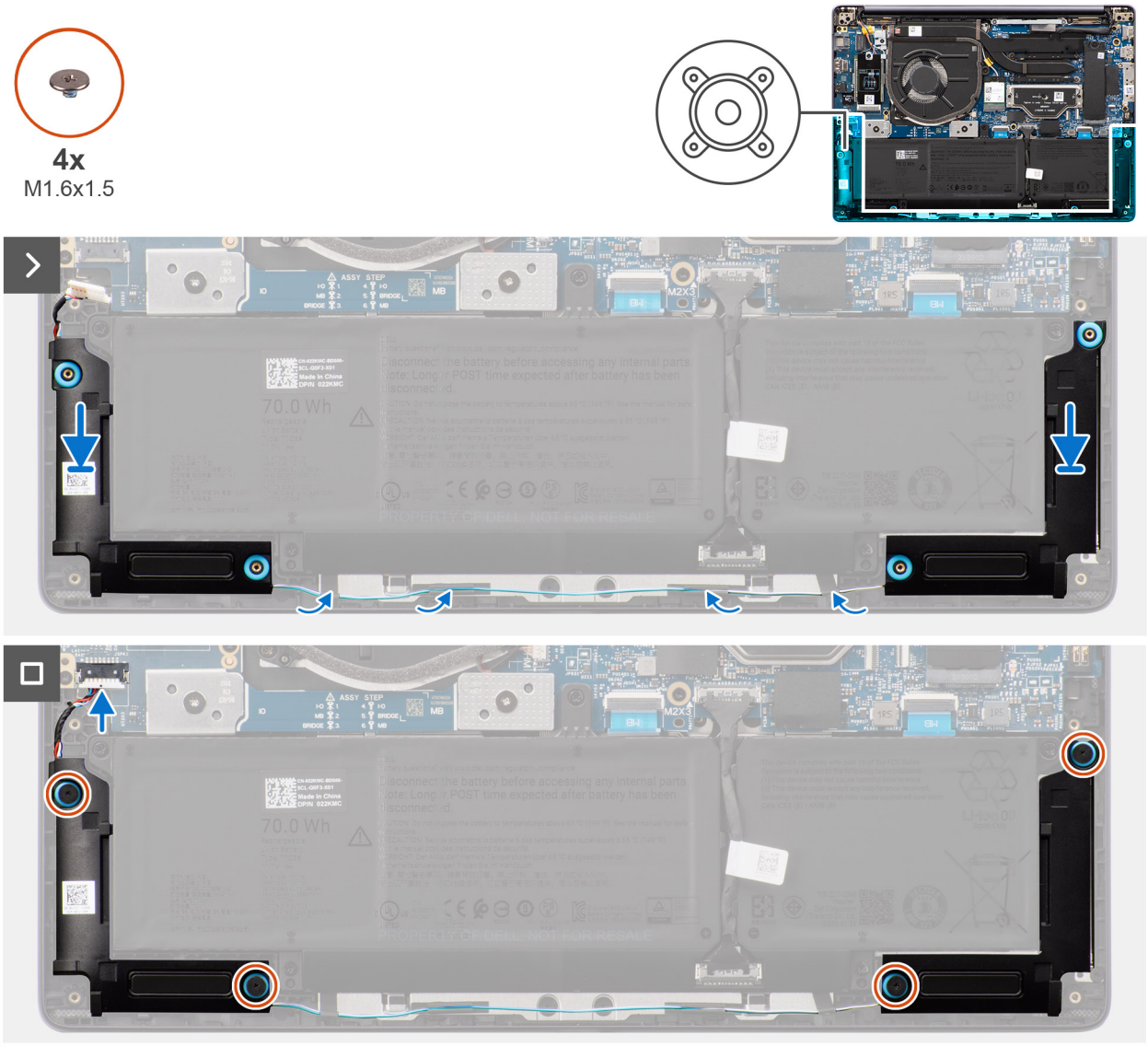


Figure 40. Installing the speakers

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Removing the speaker 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

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

- speakers
- wireless-antenna modules

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

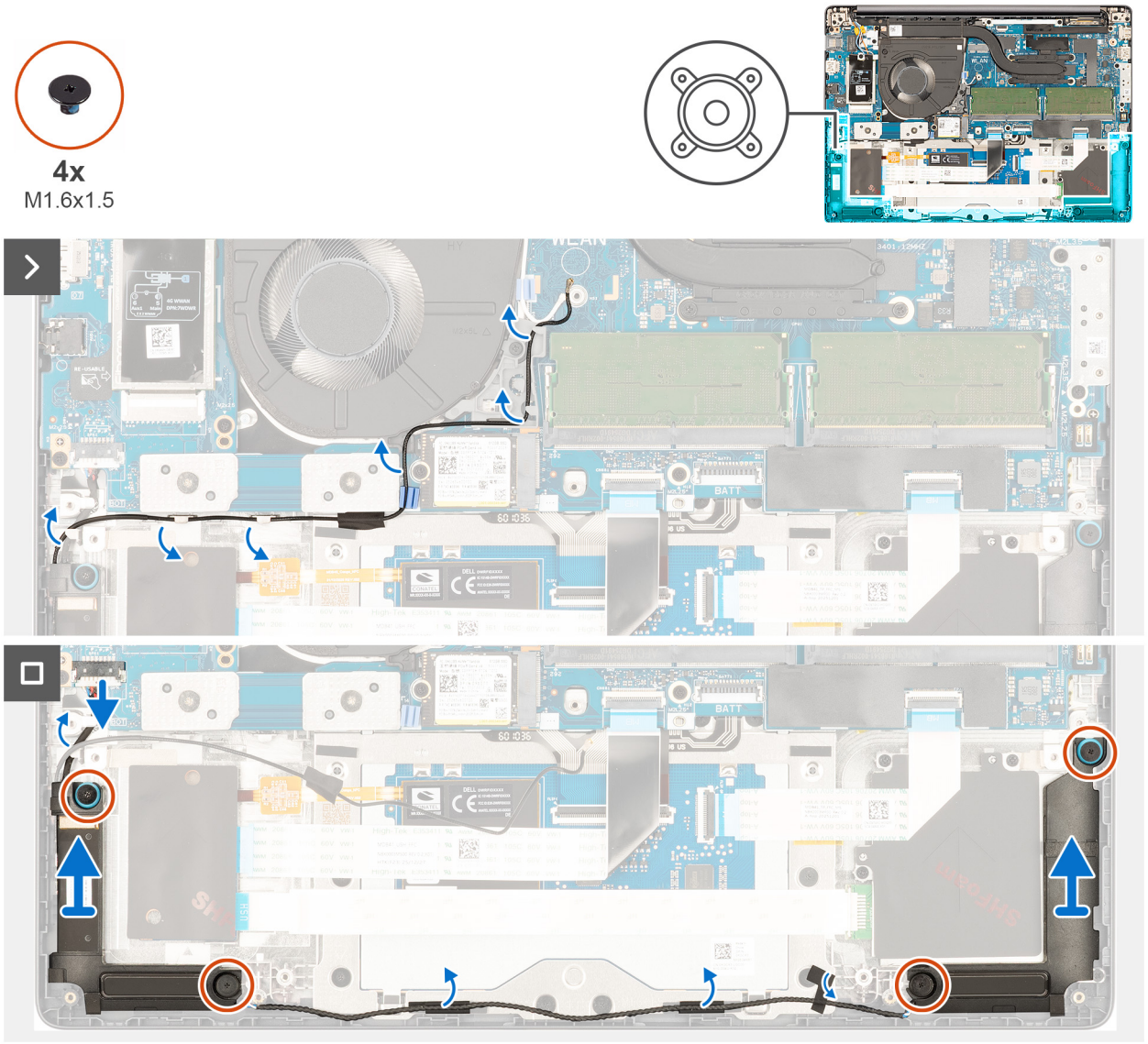


Figure 41. Removing the speaker assembly

Steps

1. Remove the wireless-antenna cables from the routing guides on the palm-rest assembly.

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

Installing the speaker assembly

Prerequisites

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

About this task

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

- speakers
- wireless-antenna modules

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

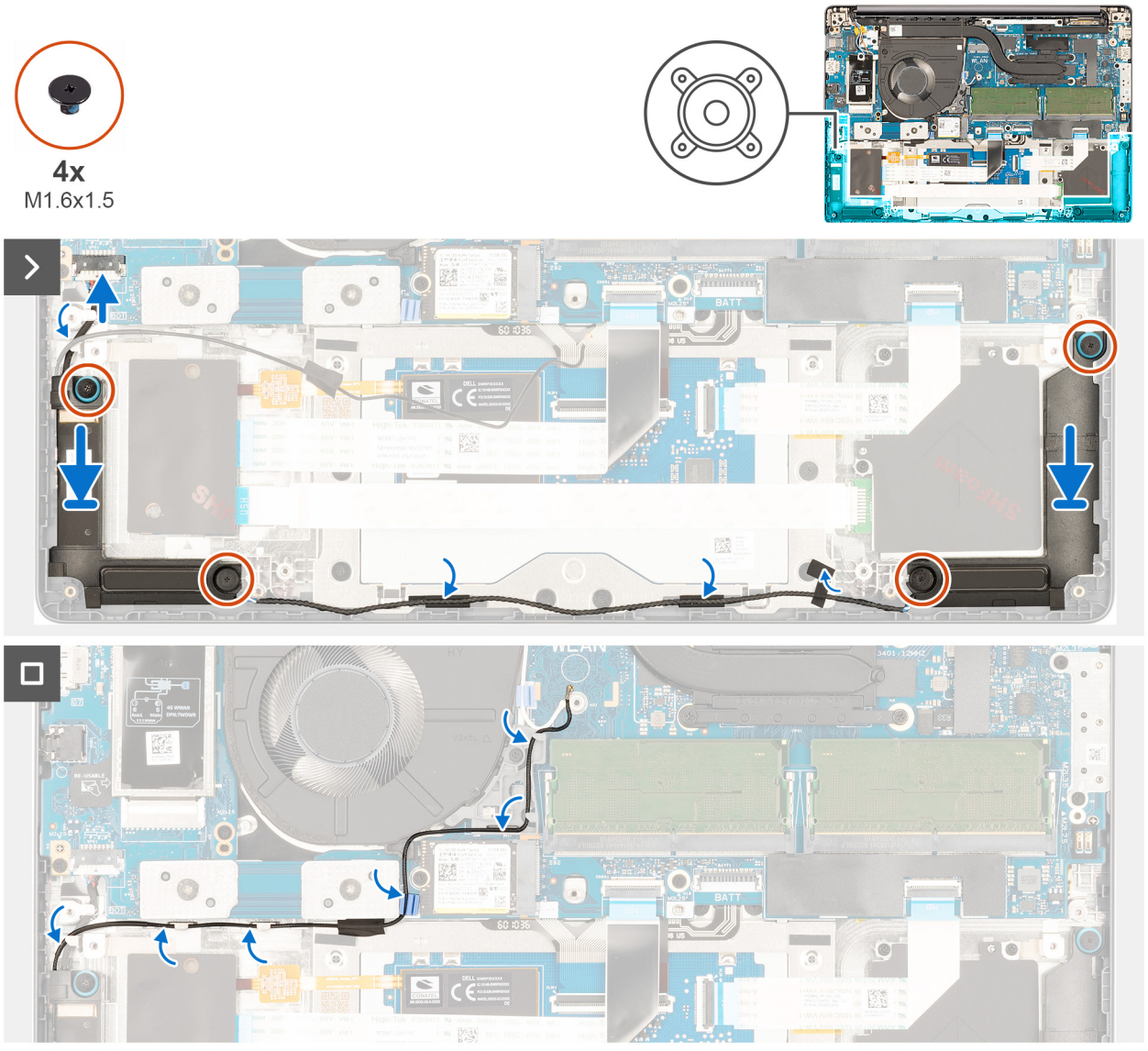


Figure 42. Installing the speaker assembly

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 speaker assembly to the palm-rest assembly.
4. Connect the speaker cable to its connector (JSPK1) on the I/O board.
5. Route the wireless-antenna cables through the routing guides on the palm-rest assembly.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Fan

Removing the fan (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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure is applicable only to computers shipped with speakers.

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

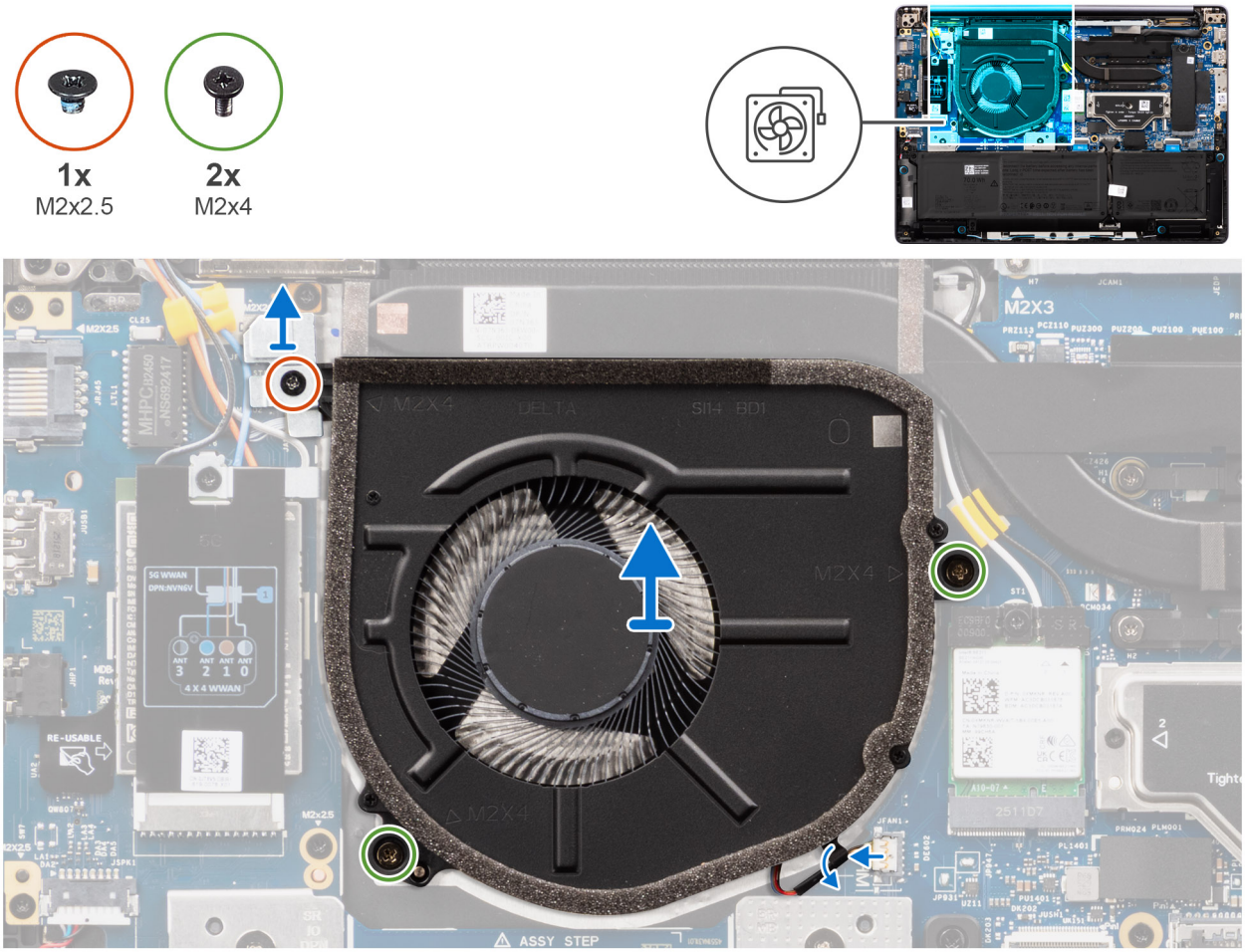


Figure 43. Removing the fan (speakers)

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 fan cable from its connector (JFAN1) on the system board.
4. Remove the two screws (M2x4) that secure the fan to the palm-rest assembly.
5. Lift the fan off the palm-rest assembly.

Installing the fan (speakers)

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 to computers shipped with speakers.

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

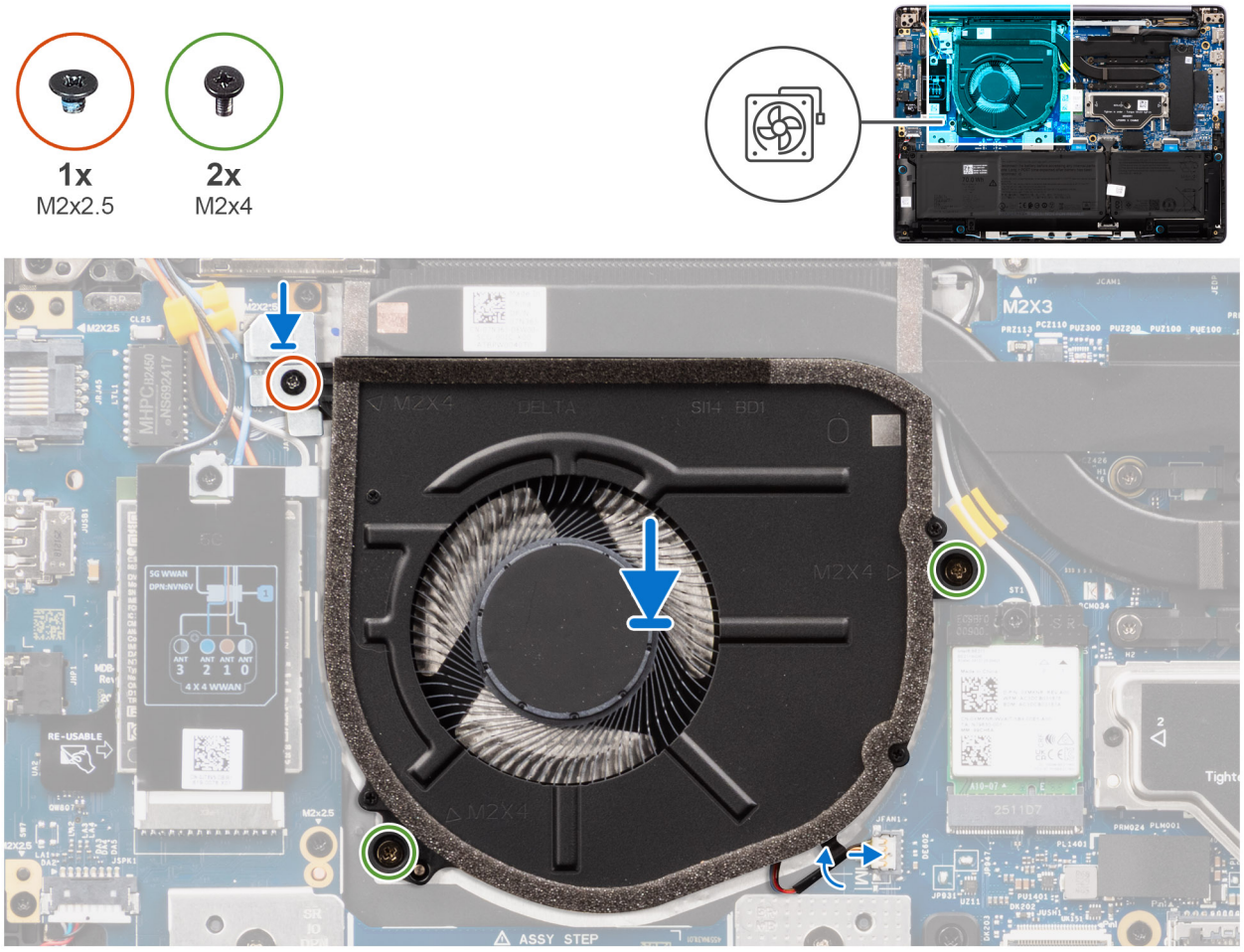


Figure 44. Installing the fan (speakers)

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 two screws (M2x4) that secure the fan to the palm-rest assembly.
4. Connect the fan cable to its connector (JFAN1) on the system board.
5. Place and align the fingerprint-reader bracket on the palm-rest assembly.
6. Replace the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

Removing the fan (speaker 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

NOTE: This procedure is applicable only to computers shipped with a speaker assembly.

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

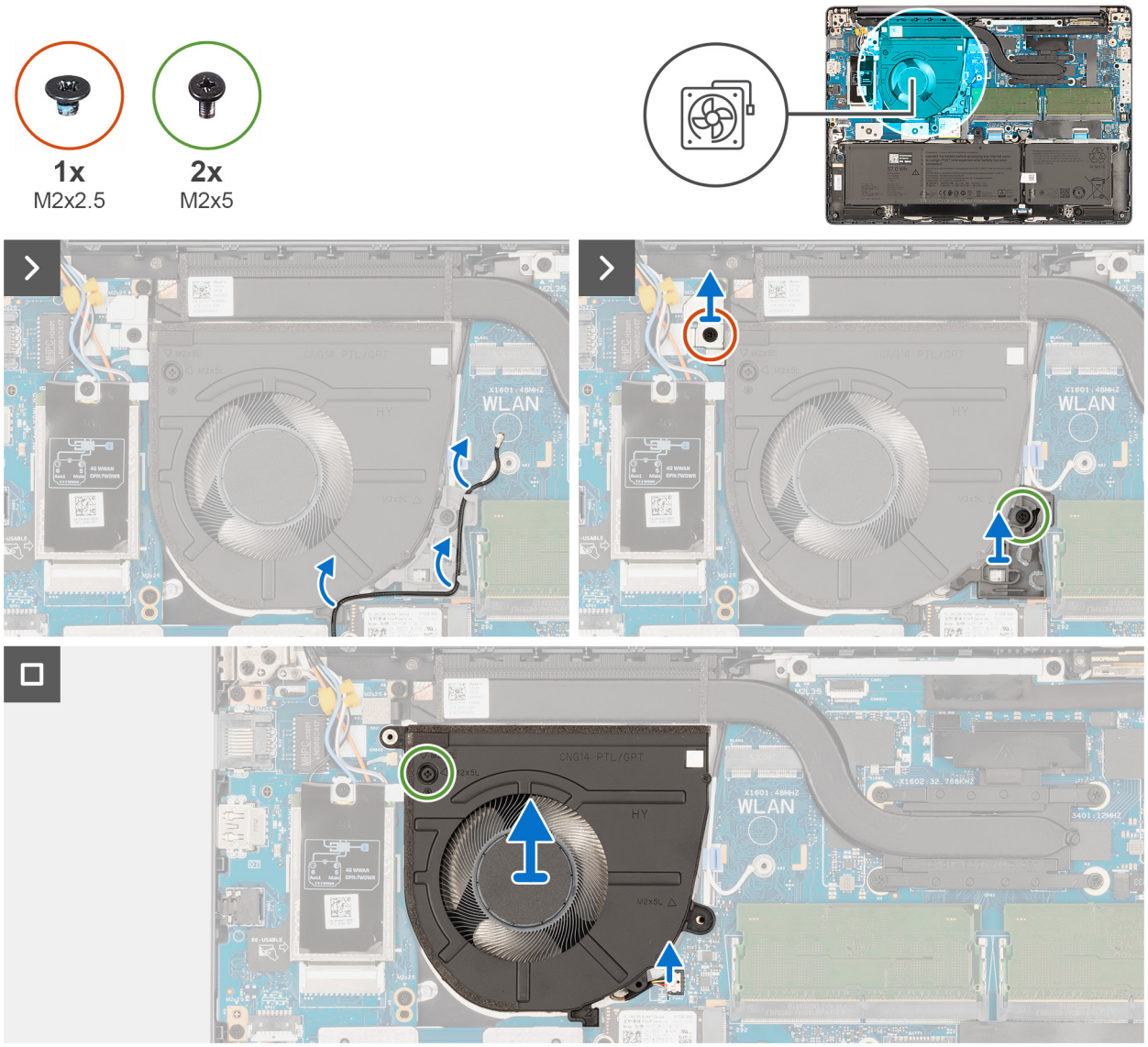


Figure 45. Removing the fan (speaker assembly)

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. Remove the screw (M2x5) that secures the wireless-antenna routing bracket to the palm-rest assembly.
4. Lift the wireless-antenna routing bracket off the palm-rest assembly.
5. Disconnect the fan cable from its connector (JFAN1) on the system board.
6. Remove the screw (M2x5) that secures the fan to the palm-rest assembly.
7. Lift the fan off the palm-rest assembly.

Installing the fan (speaker assembly)

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 to computers shipped with a speaker assembly.

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

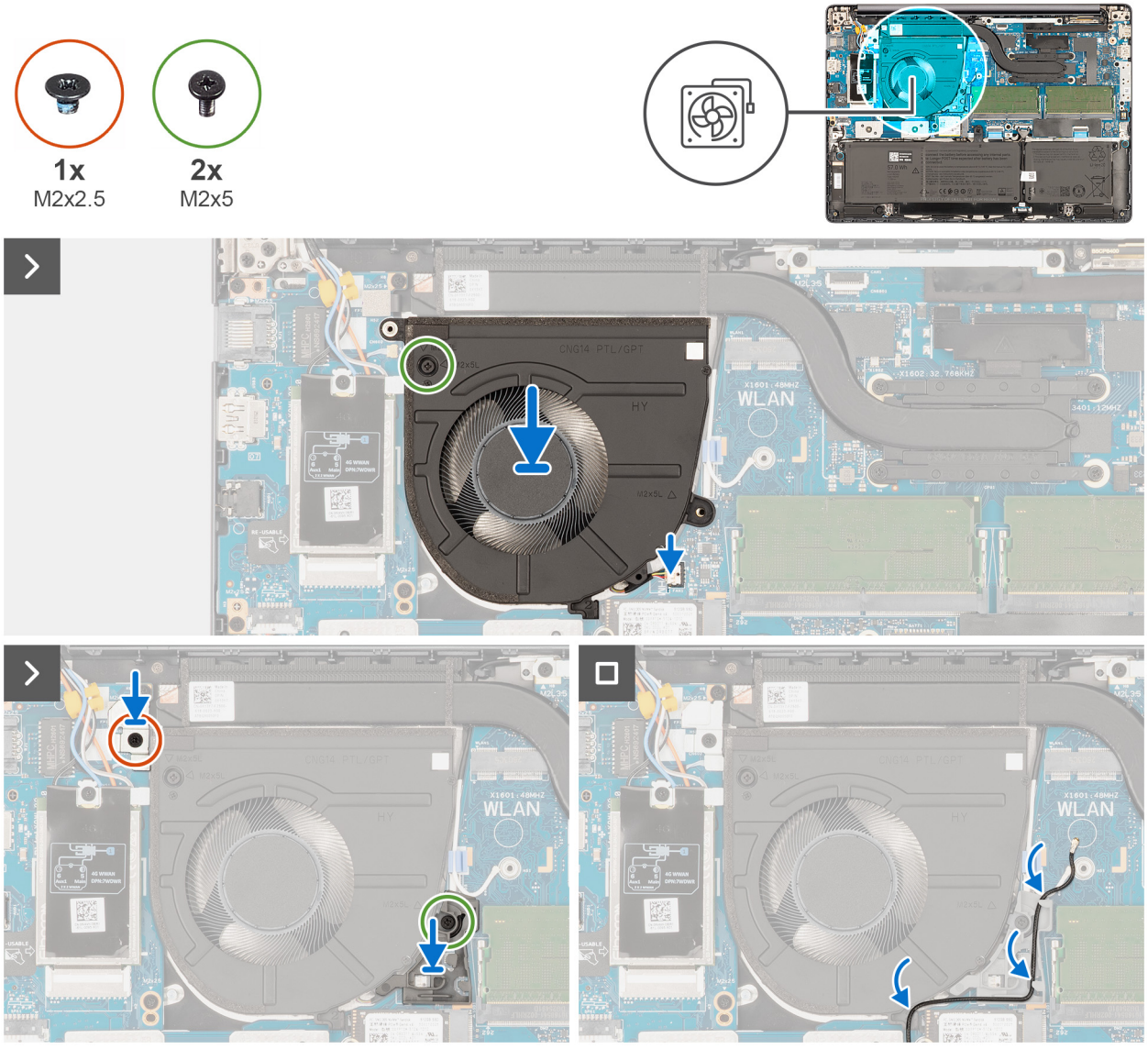


Figure 46. Installing the fan (speaker assembly)

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 screw (M2x5) that secures the fan to the palm-rest assembly.
4. Connect the fan cable to its connector (JFAN1) on the system board.
5. Place the wireless-antenna routing bracket on the palm-rest assembly.

6. Align the screw hole on the wireless-antenna routing bracket with the screw hole on the palm-rest assembly.
7. Replace the screw (M2x5) that secures the wireless-antenna routing bracket to the palm-rest assembly.
8. Place and align the fingerprint-reader bracket on the palm-rest assembly.
9. Replace the screw (M2x2.5) that secures the fingerprint-reader bracket to the palm-rest assembly.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
2. Install the nano-SIM card tray, if applicable.
3. Follow the procedure in After working inside your computer.

3

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

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.

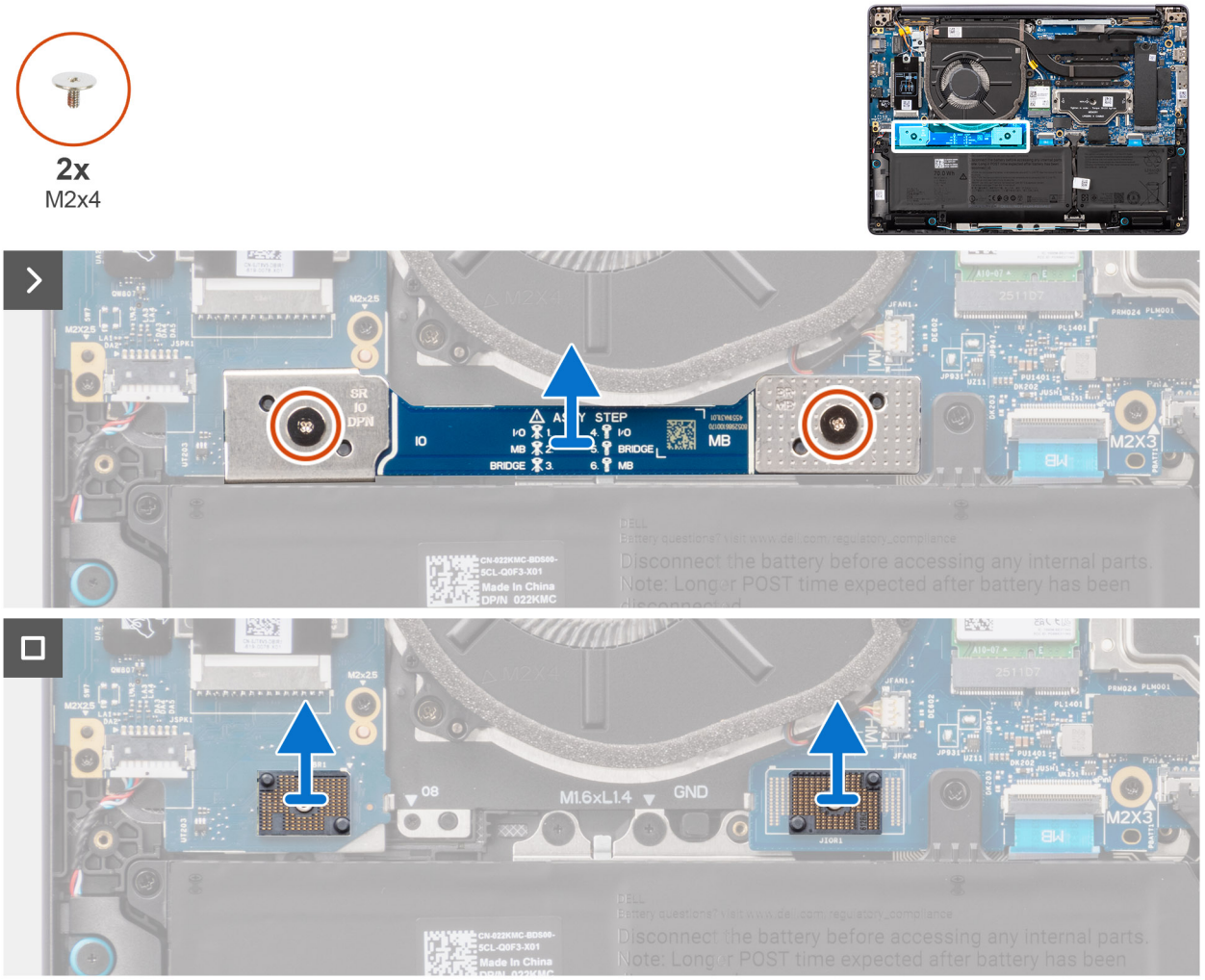


Figure 47. Removing the I/O-bridge board

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.

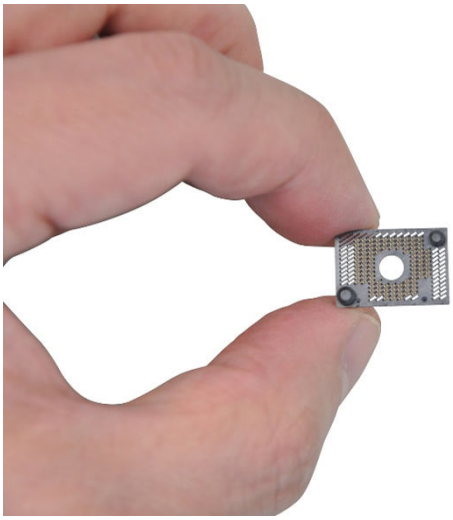


Figure 48. Proper handling of the I/O-bridge board interposer

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.

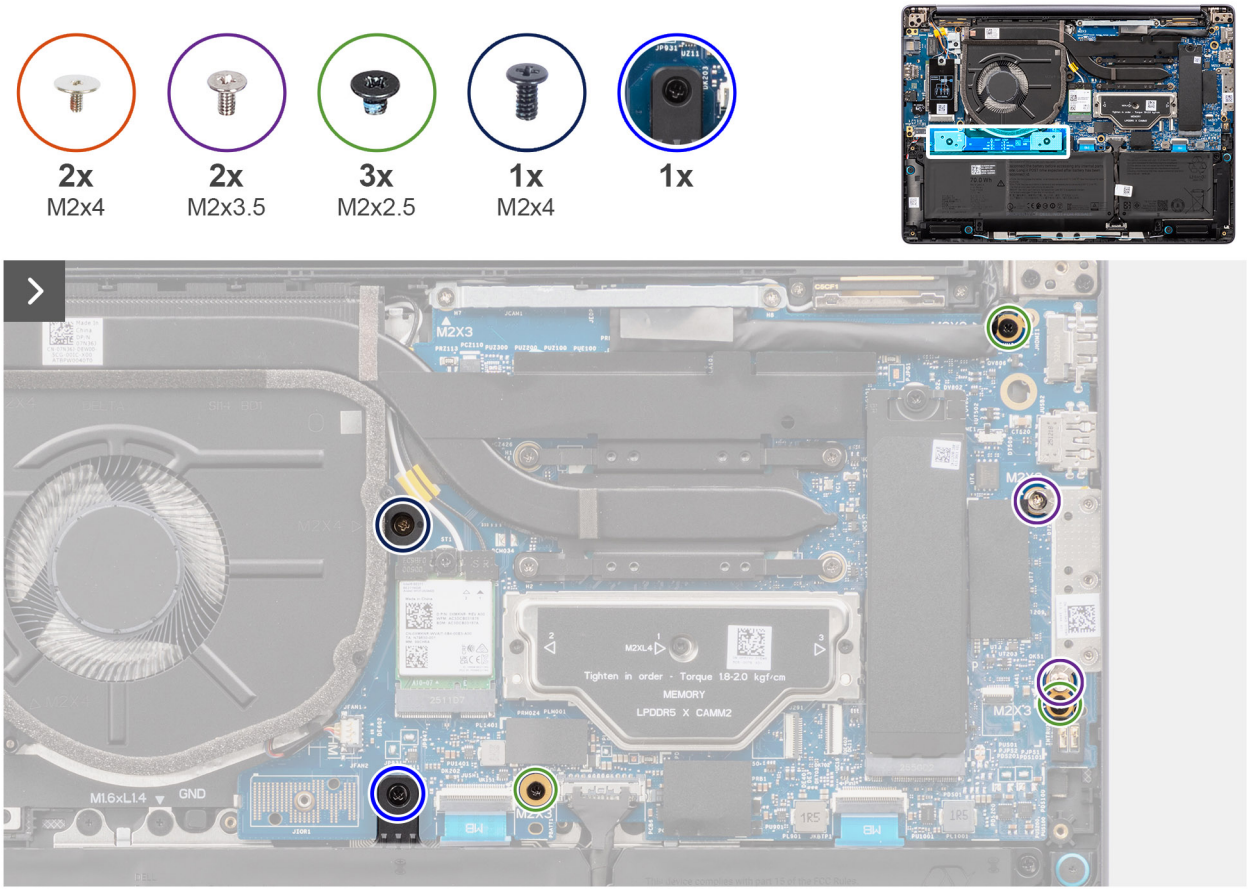


Figure 49. Installing the I/O-bridge board

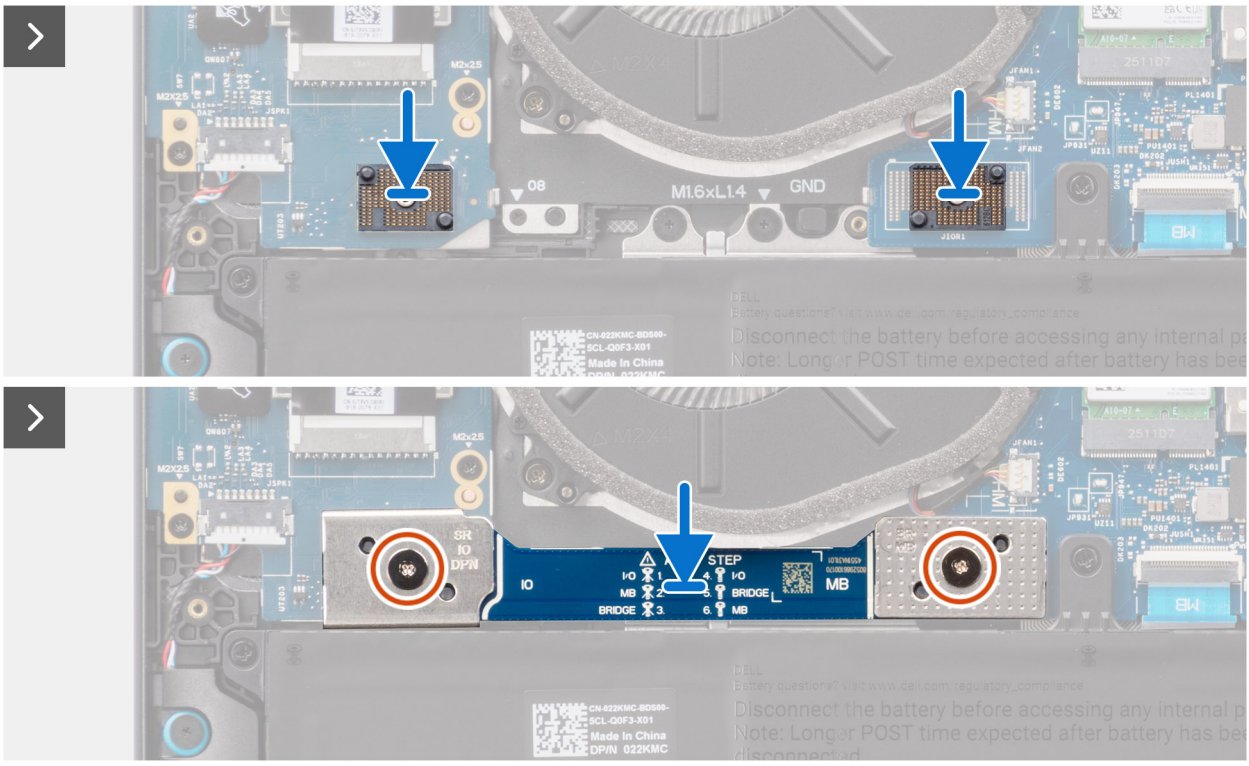


Figure 50. Installing the I/O-bridge board

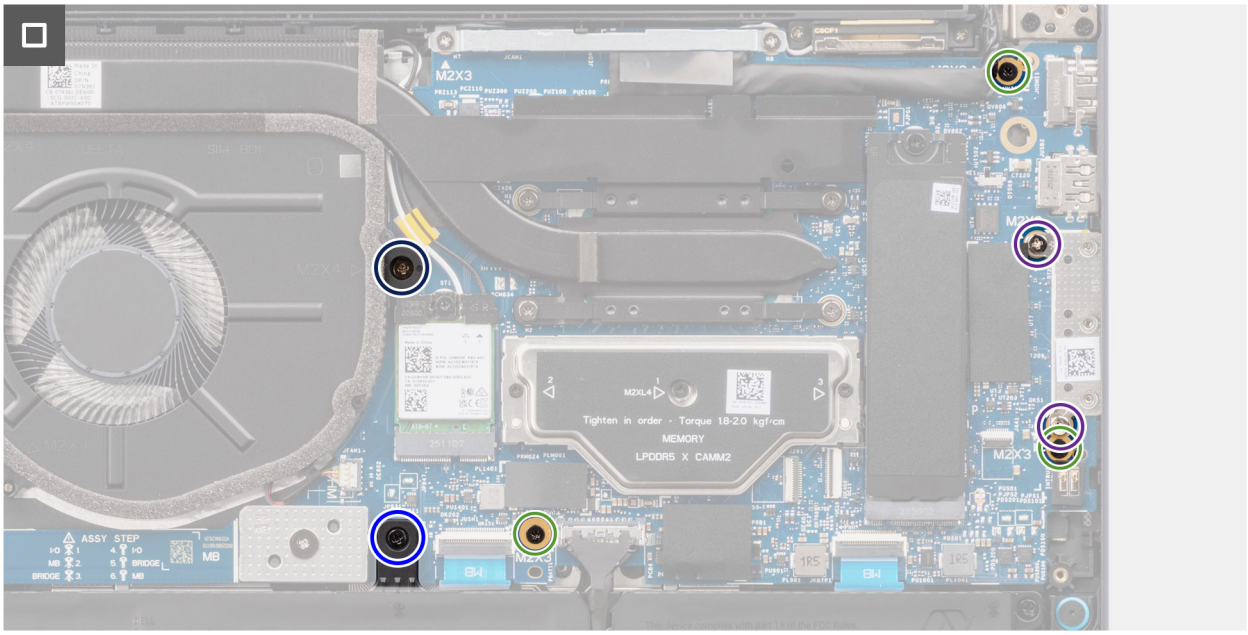


Figure 51. Installing the I/O-bridge board

Steps

1. Loosen the captive screw that secures the battery to the palm-rest assembly.
2. Remove the screw (M2x4) that secures the fan to the palm-rest assembly.
3. Remove the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
4. Remove 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. 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.

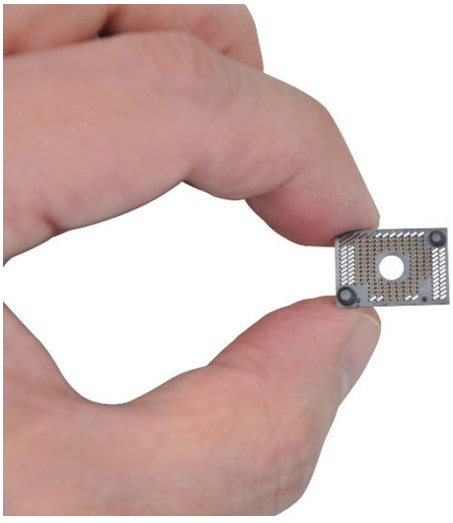


Figure 52. Proper handling of the I/O-bridge board interposer

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 two screws (M2x2.5) that secure the system board to the palm-rest assembly.
11. Replace the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
12. Replace the screw (M2x4) that secures the fan to the palm-rest assembly.
13. Tighten the captive screw that secures the battery to the palm-rest assembly.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

About this task

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

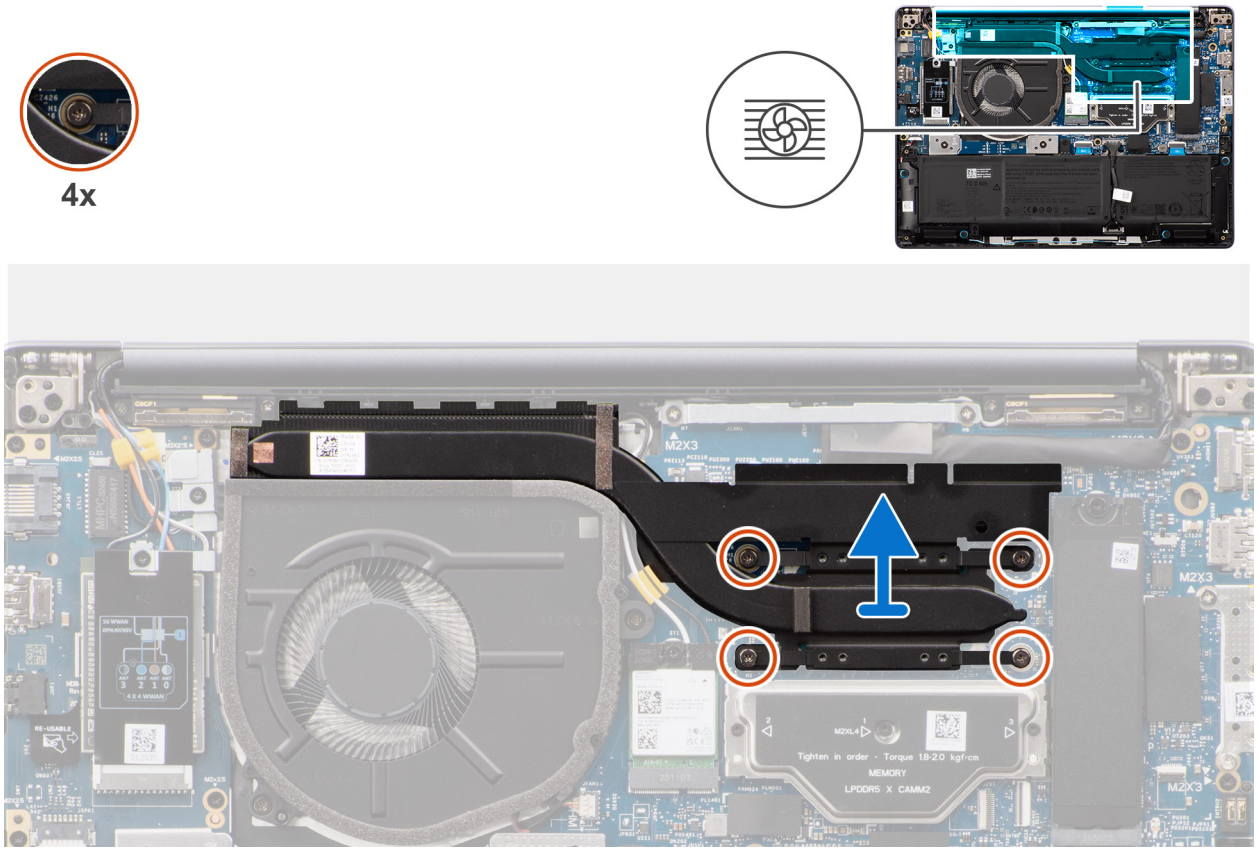


Figure 53. Removing the heat sink

Steps

1. In the reverse sequential order (4 > 3 > 2 > 1), loosen the four captive screws that secure the heat sink to the system board.
2. 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.

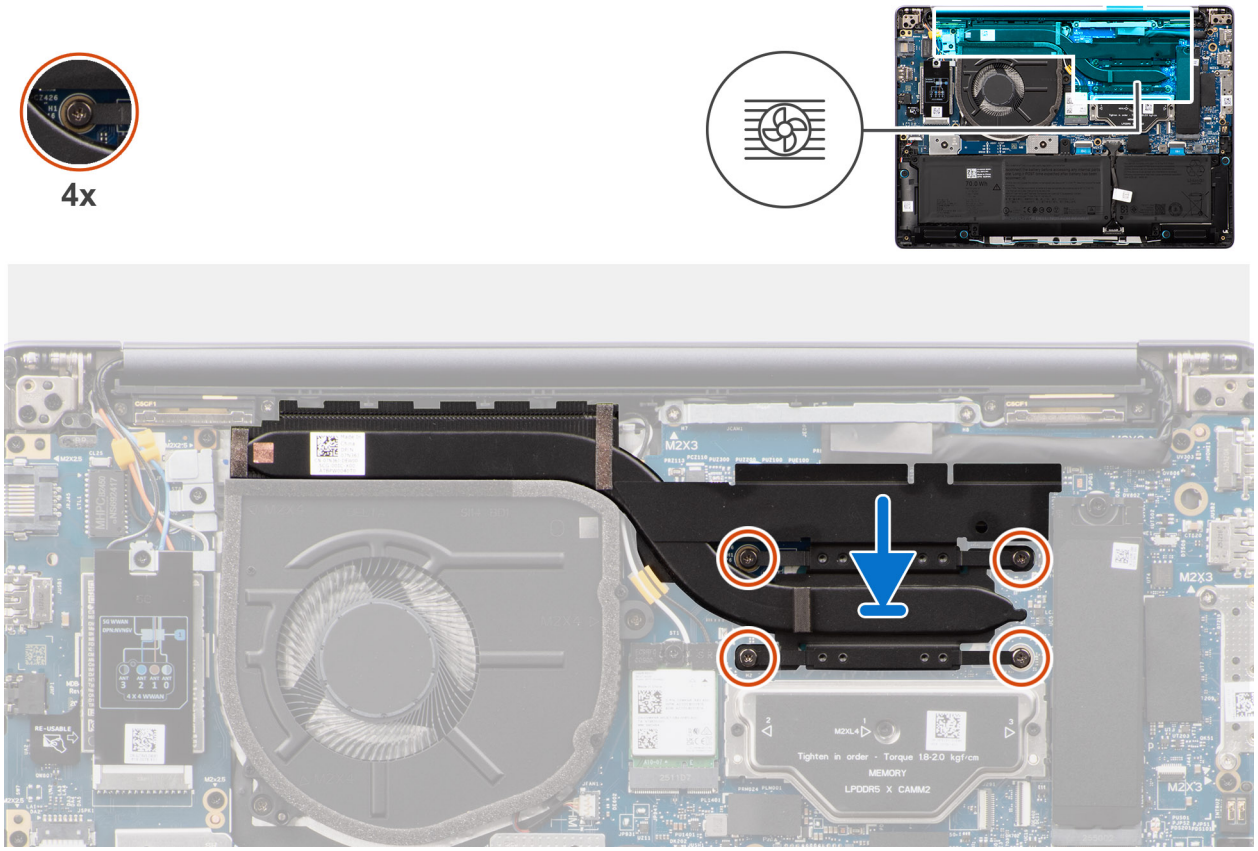


Figure 54. Installing the heat sink

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.

   NOTE: If you are replacing the heat sink, the replacement heat sink from Dell will come with the thermal gel and grease pre-applied.

2. In sequential order (1 > 2 > 3 > 4), tighten the four captive screws (M2x3) that secure the heat sink to the system board.

Next steps

1. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
6. 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.

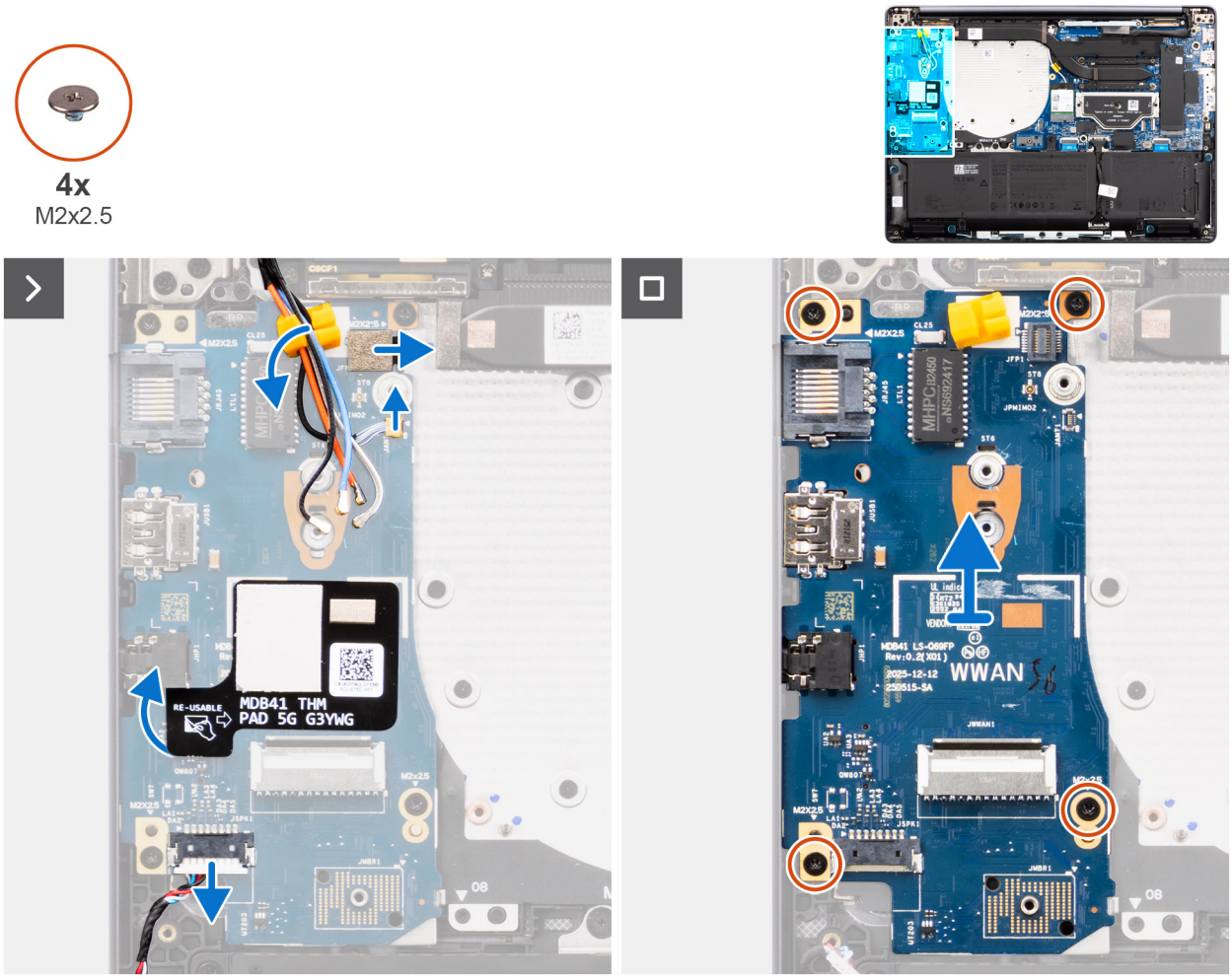


Figure 55. Removing the I/O board

Steps

1. 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.
2. Disconnect the fingerprint-reader cable from its connector (JFP1) on the I/O board.

   NOTE: This step is applicable only for computers shipped with the optional fingerprint reader.

3. Disconnect the Darwin cable from its connector (JANT1) on the I/O board.

   NOTE: This step is applicable only for computers shipped with a WWAN card.

4. Disconnect the speaker cable from its connector (JSPK1) on the I/O board.
5. 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 installed and you are replacing the I/O board on your computer with another one.

6. Remove the four screws (M2x2.5) that secure the I/O board to the palm-rest assembly.
7. 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.

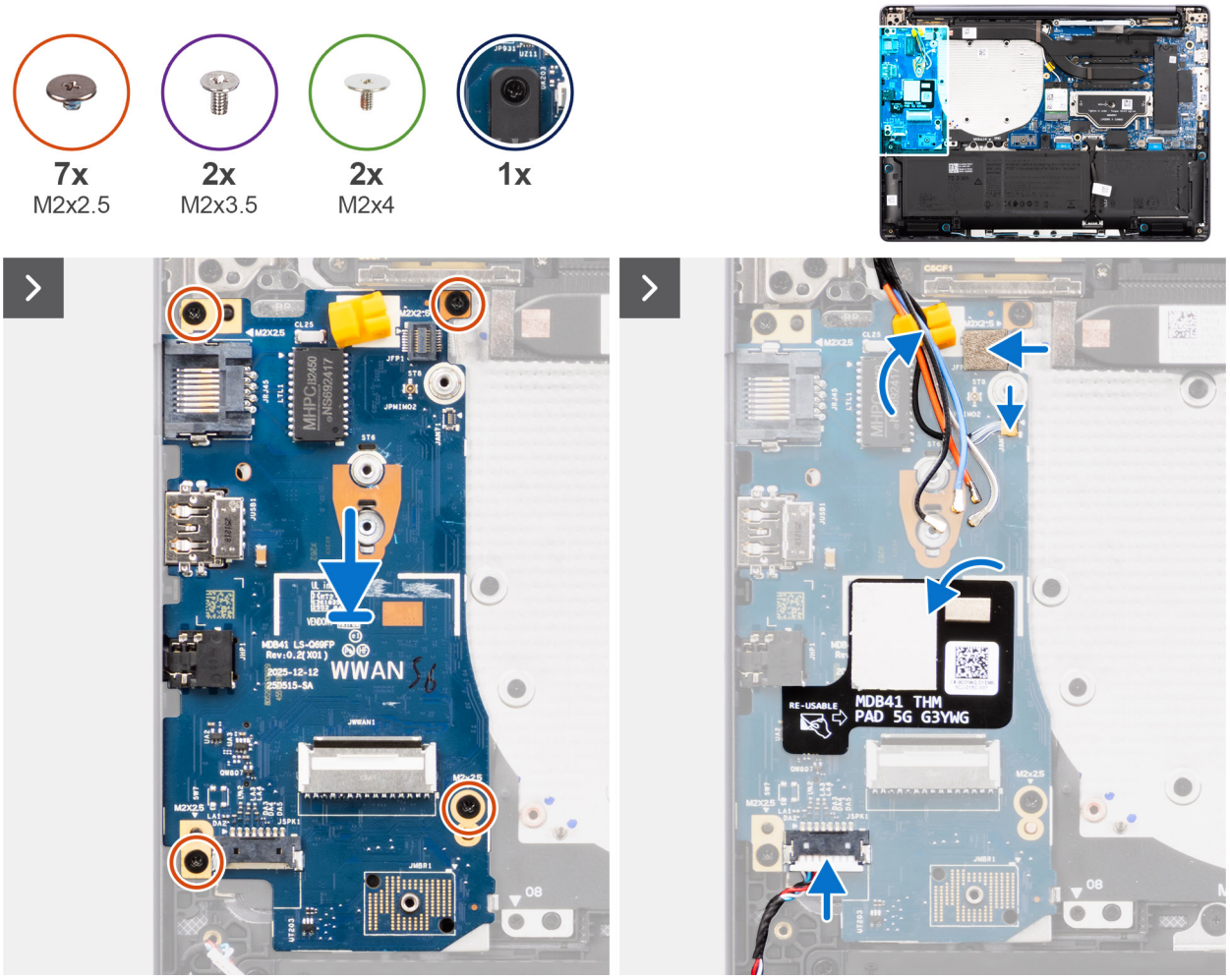


Figure 56. Installing the I/O board

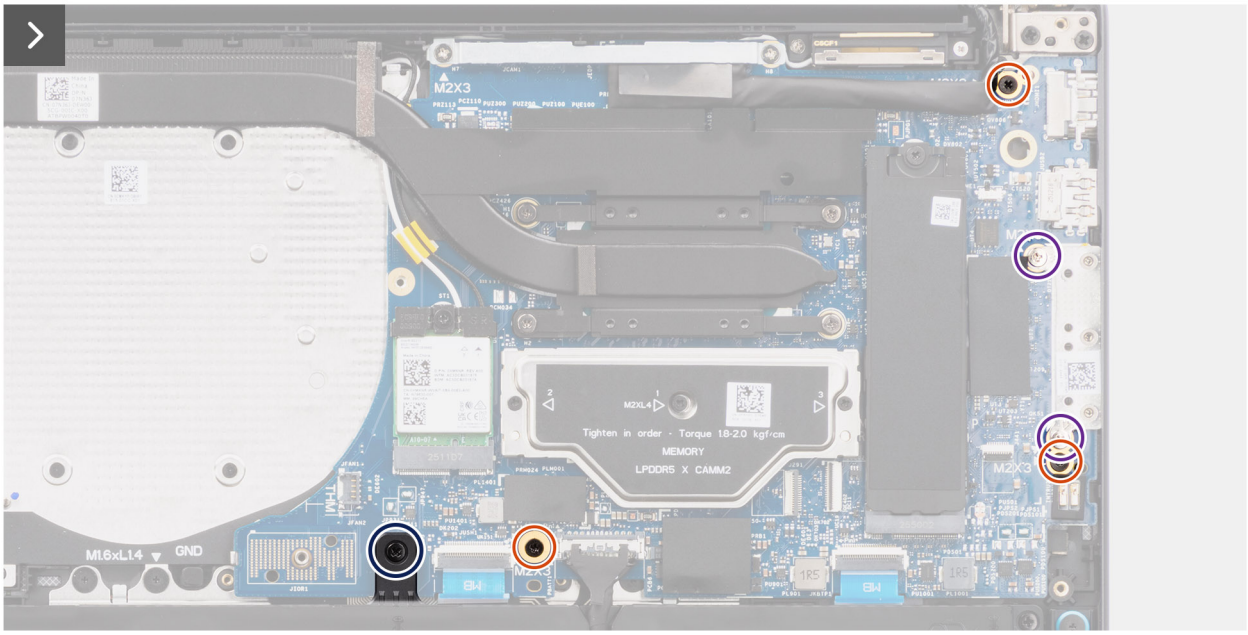


Figure 57. Installing the I/O board

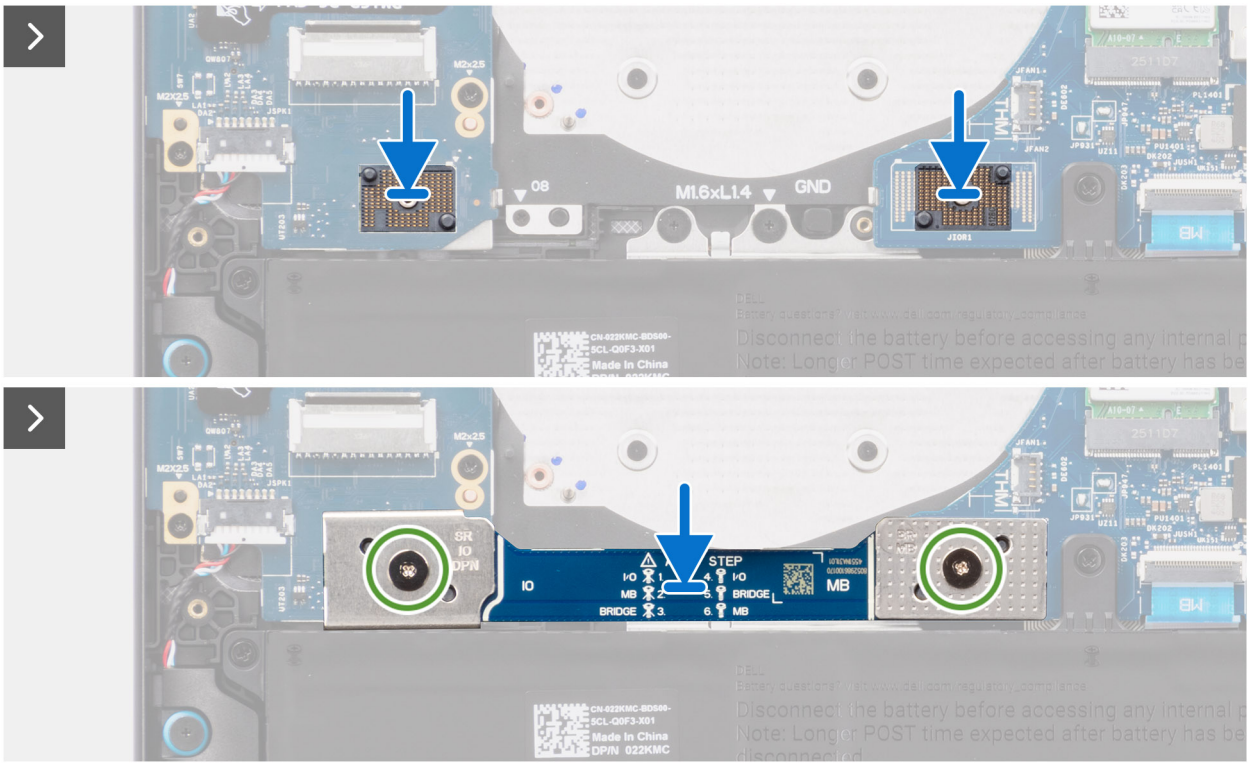


Figure 58. Installing the I/O board



Figure 59. 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. Replace the four screws (M2x2.5) that secure the I/O board to the palm-rest assembly.
4. Adhere the WWAN-card thermal pad and Mylar tape on the I/O board.

   NOTE: This step is applicable only if your computer has a WWAN card installed and you are replacing the I/O board on your computer with another one.

5. Connect the fingerprint-reader cable to its connector (JFP1) on the I/O board.

   NOTE: This step is applicable only for computers shipped with the optional fingerprint reader.

6. Connect the Darwin cable to its connector (JANT1) on the I/O board.

   NOTE: This step is applicable only for computers shipped with a WWAN card.

7. Connect the speaker cable to its connector (JSPK1) on the I/O board.
8. Route the WWAN antenna cables and Darwin cable through its routing guides on the I/O board.
9. Loosen the captive screw that secures the battery to the palm-rest assembly.
10. Remove the screw (M2x4) that secures the fan to the palm-rest assembly.
11. Remove the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
12. Remove the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
13. 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.
14. 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.

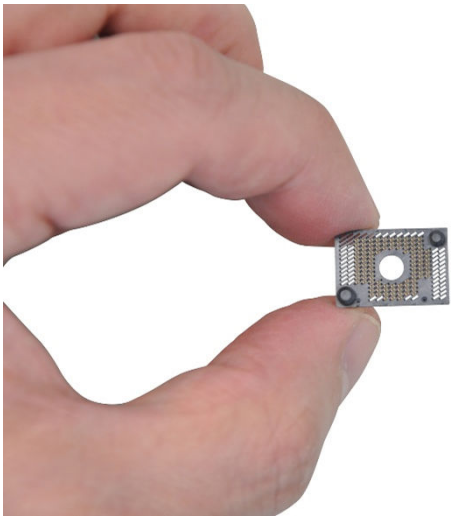


Figure 60. Proper handling of the I/O-bridge board interposer

15. 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.
16. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
17. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
18. Replace the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
19. Replace the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
20. Replace the screw (M2x4) that secures the fan to the palm-rest assembly.
21. Tighten the captive screw that secures the battery to the palm-rest assembly.

Next steps

1. Install the fan (speakers) or the fan (speaker assembly), whichever is applicable.
2. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
3. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Install the nano-SIM card tray, if applicable.
5. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
6. Remove the I/O-bridge board.
7. 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 exactly the same.

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

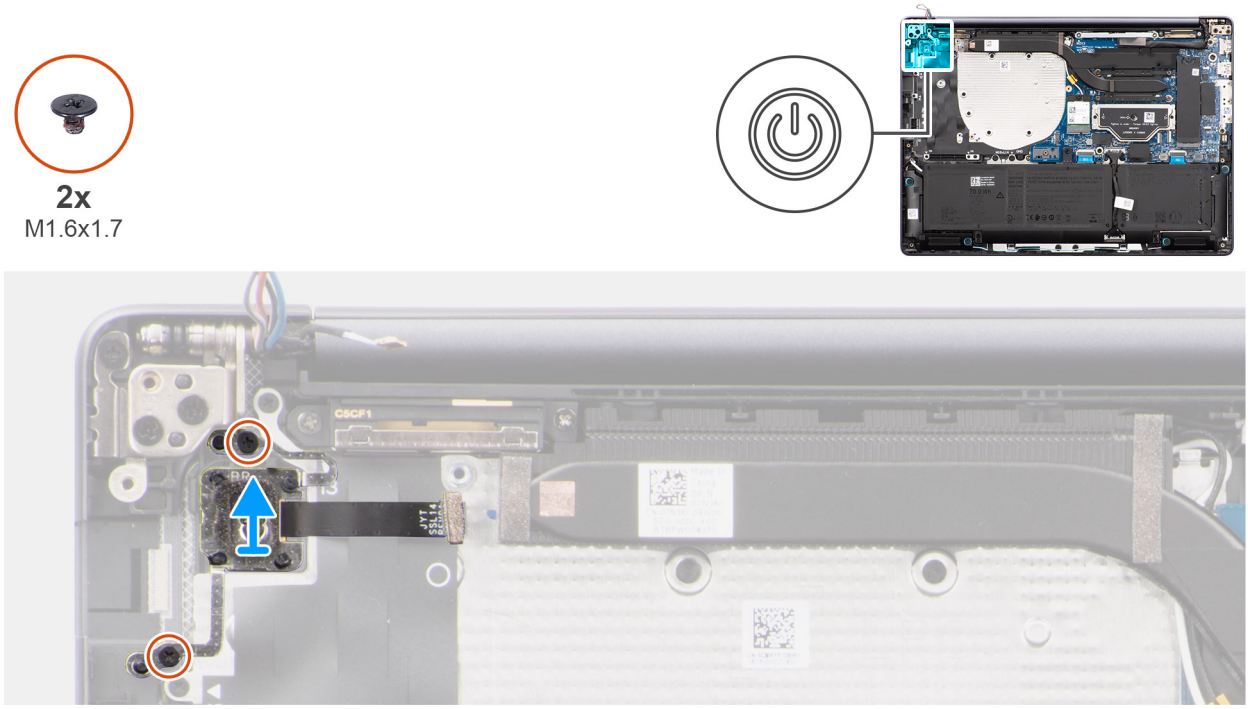


Figure 61. Removing the power button

Steps

1. Remove the two screws (M1.6x1.7) that secure the power button to the palm-rest assembly.
2. 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 exactly the same.

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

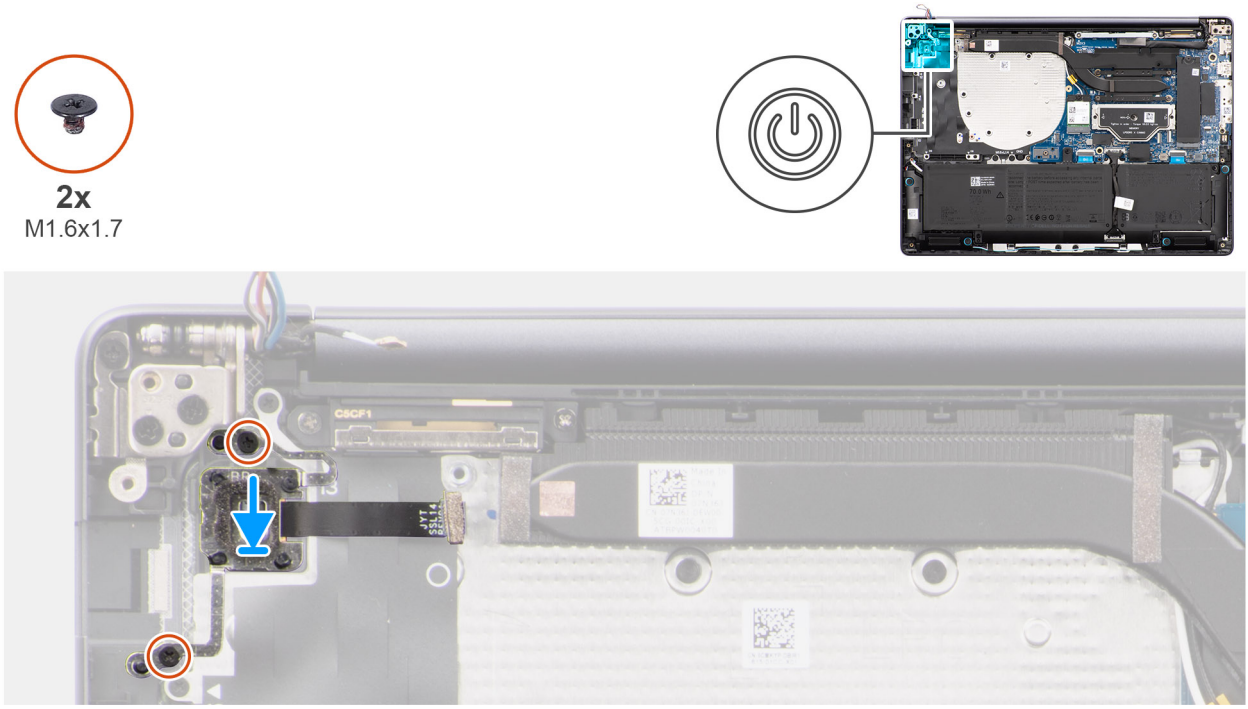


Figure 62. Installing the power button

Steps

1. Place the power button into its slot on the palm-rest assembly.
2. Replace the two screws (M1.6x1.7) that secure the power button to the palm-rest assembly.

Next steps

1. Install the I/O board.
2. Install the I/O-bridge board.
3. Install the fan (speakers) or the fan (speaker assembly), whichever is applicable.
4. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
6. Install the nano-SIM card tray, if applicable.
7. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.

About this task

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

- display bezel
- display hinges
- display panel

- camera
- display cable
- display-back cover
- WWAN-antenna module, if applicable

NOTE: For computers shipped with OLED displays, the display assembly is a HUD (Hinge-Up Display) and cannot be further disassembled. If any of the components of the display assembly need to replaced, replace the entire display assembly.

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

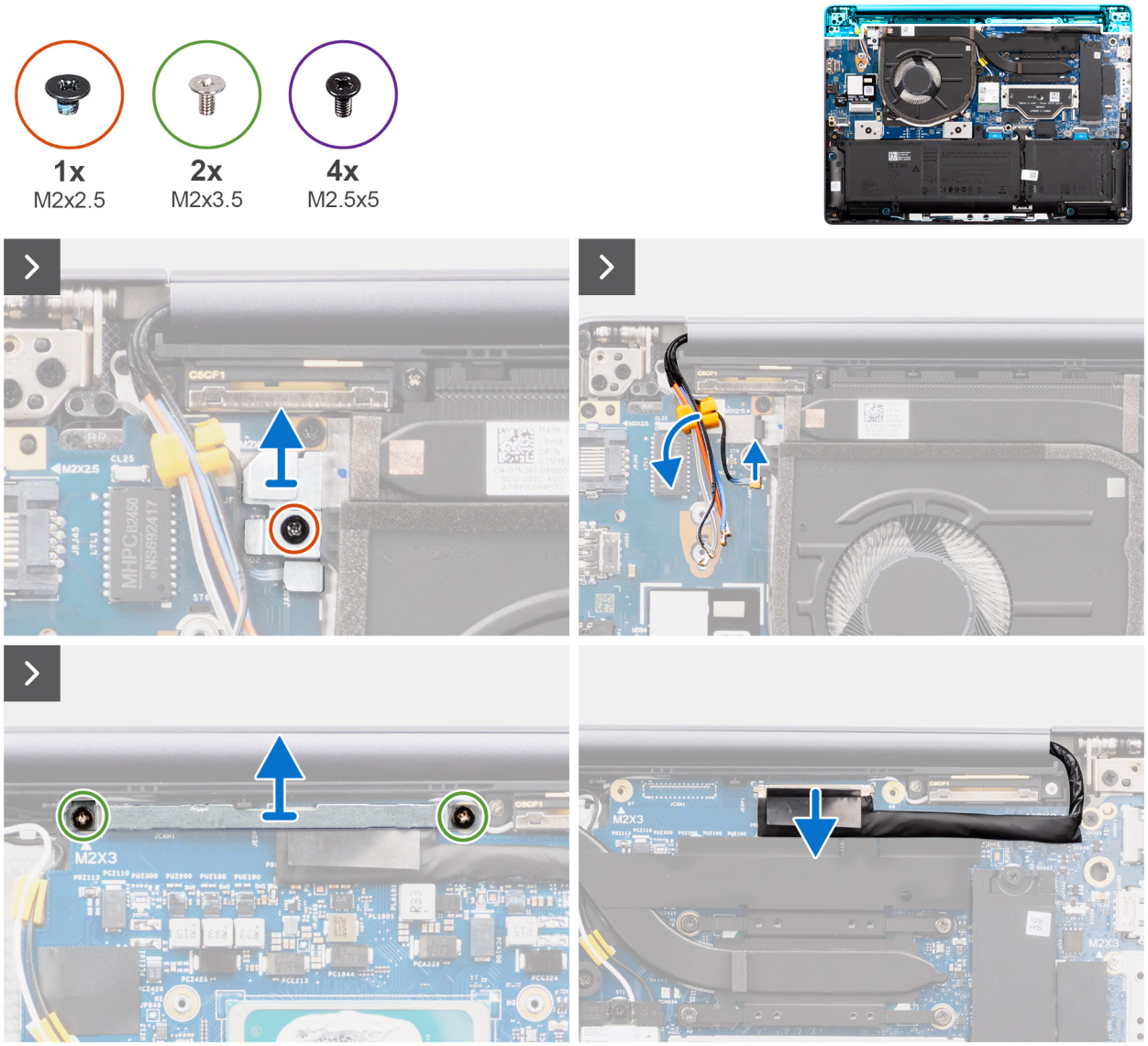


Figure 63. Removing the display assembly



Figure 64. 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.

   NOTE: Steps 1 to 3 are applicable only for computers shipped with a WWAN card.

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 (M2.5x5) 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
- display-back cover
- WWAN-antenna module, if applicable

NOTE: For computers shipped with OLED configurations, the display assembly is a HUD (Hinge-Up Display) and cannot be further disassembled. If any of the components of the display assembly need to replaced, replace the entire display assembly.

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



Figure 65. Installing the display assembly

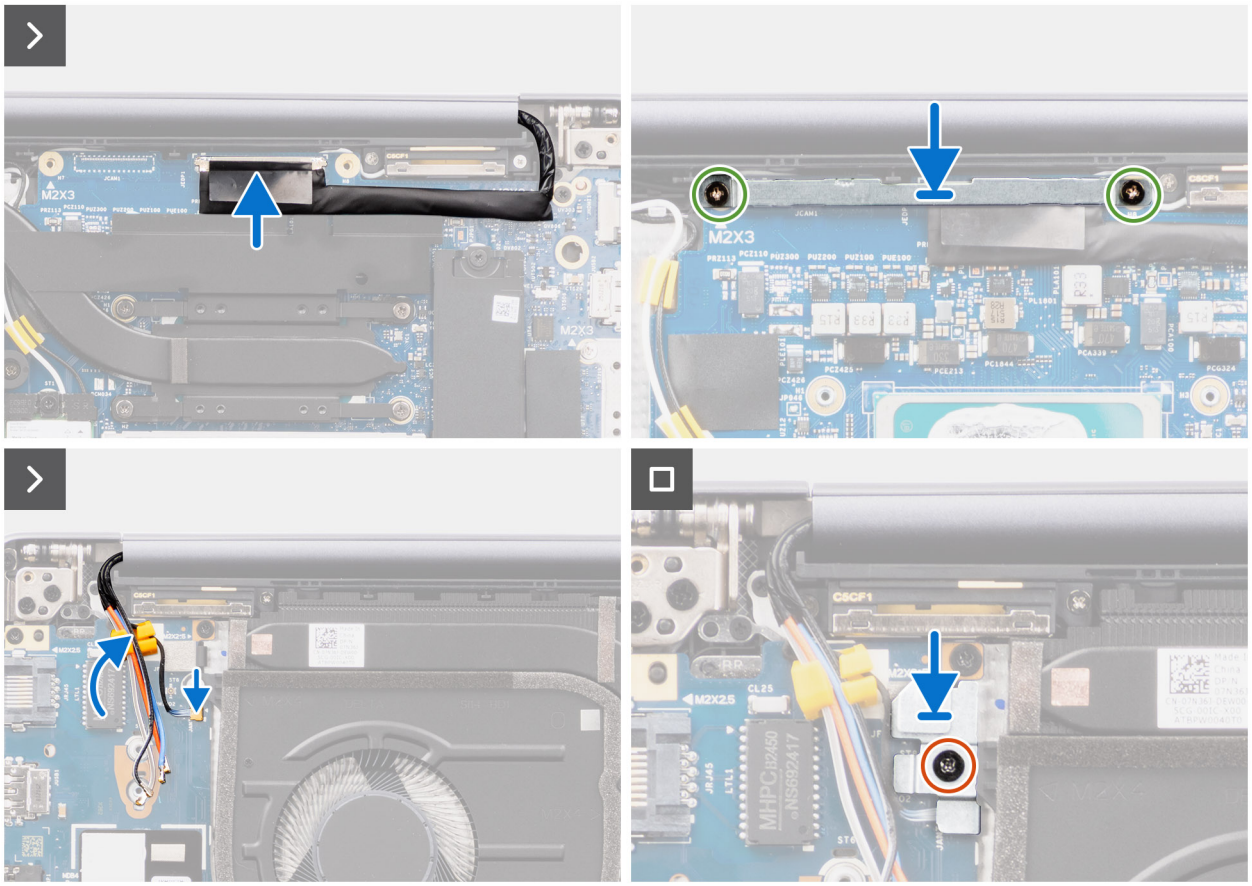


Figure 66. Installing the display assembly

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 four screws (M2.5x5) 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.

NOTE: Steps 10 to 12 are applicable only for computers shipped with a WWAN card.

Next steps

1. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
2. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
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 67. Removing the display bezel



Figure 68. Removing the display bezel



Figure 69. Removing the display bezel

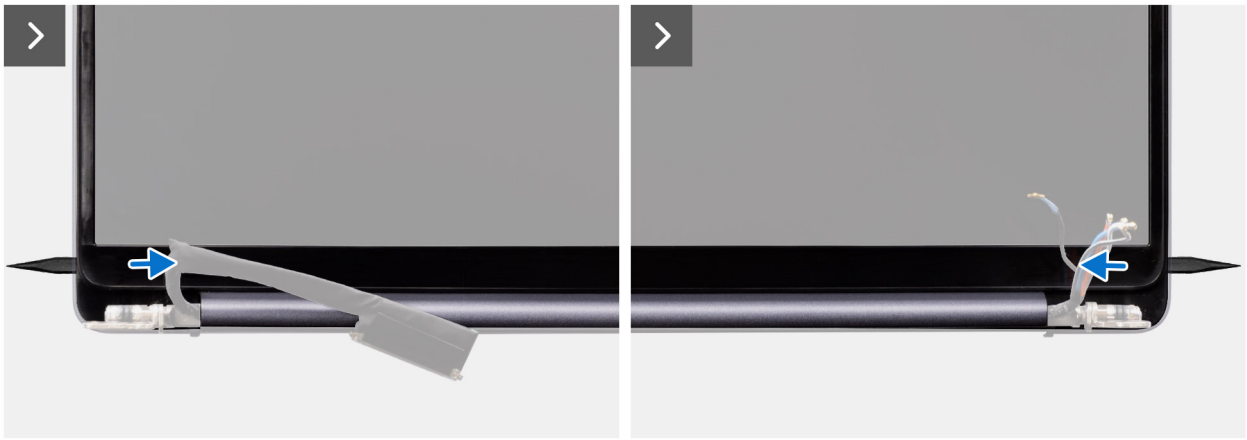


Figure 70. Removing the display bezel

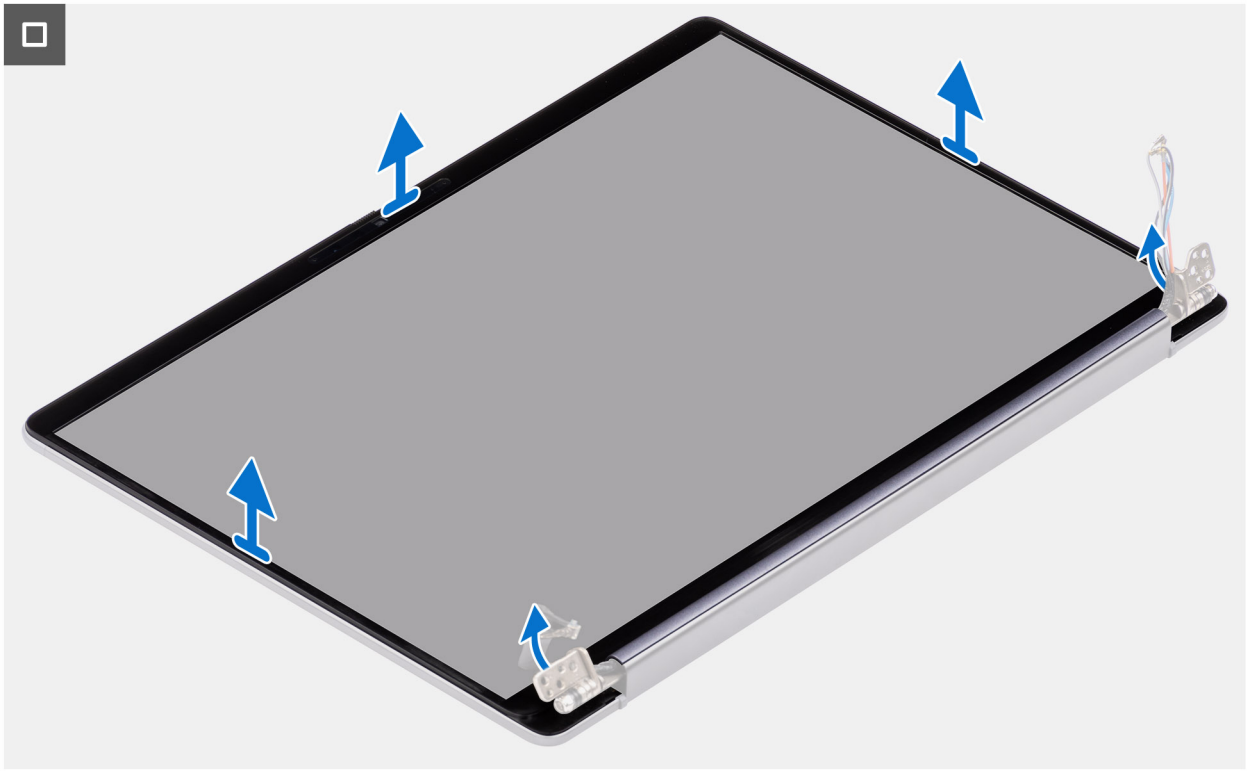


Figure 71. Removing the display bezel

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 will ship 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.

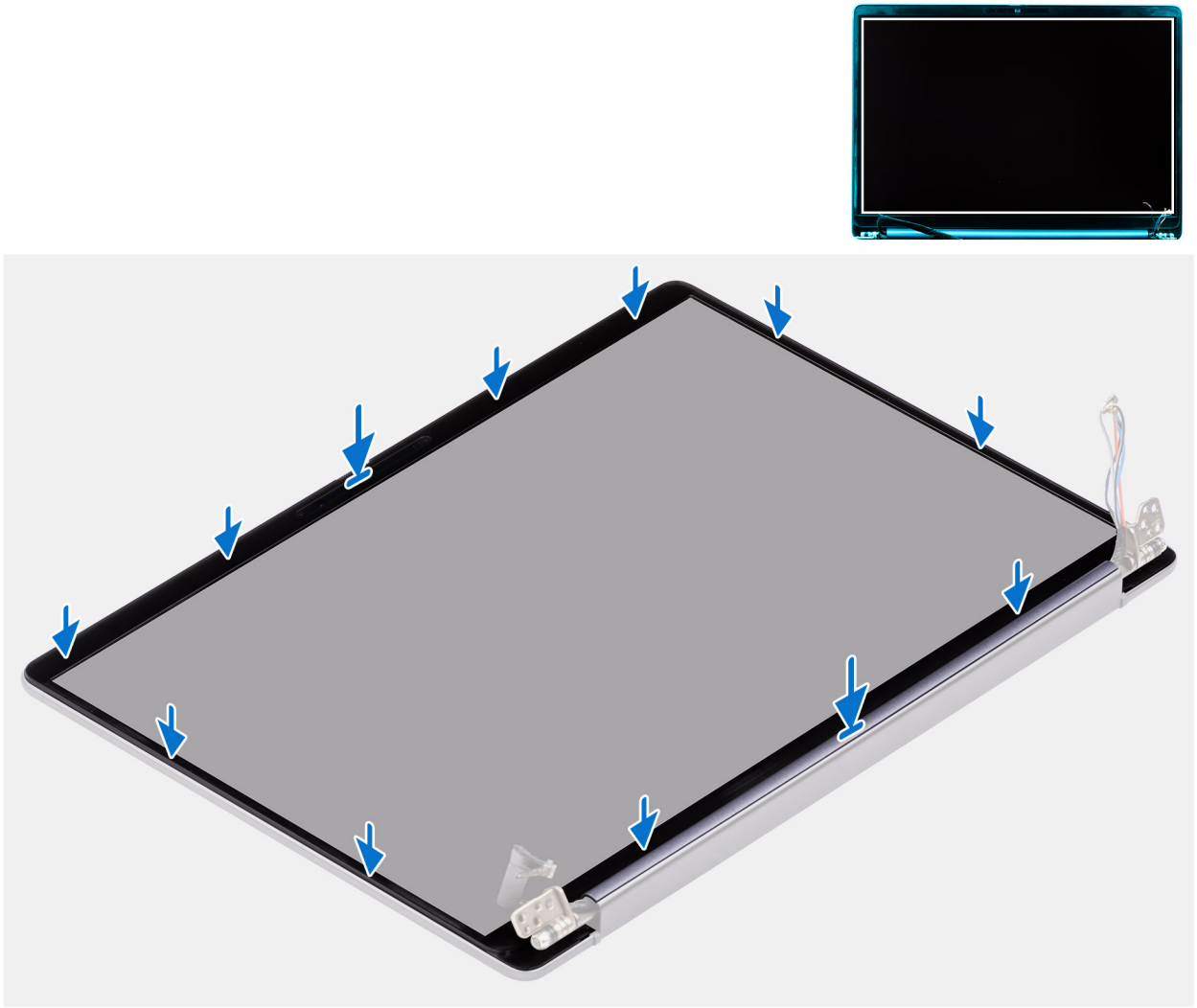


Figure 72. Installing the display bezel

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 4G WWAN card or the 5G WWAN card, whichever is applicable.
3. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
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.

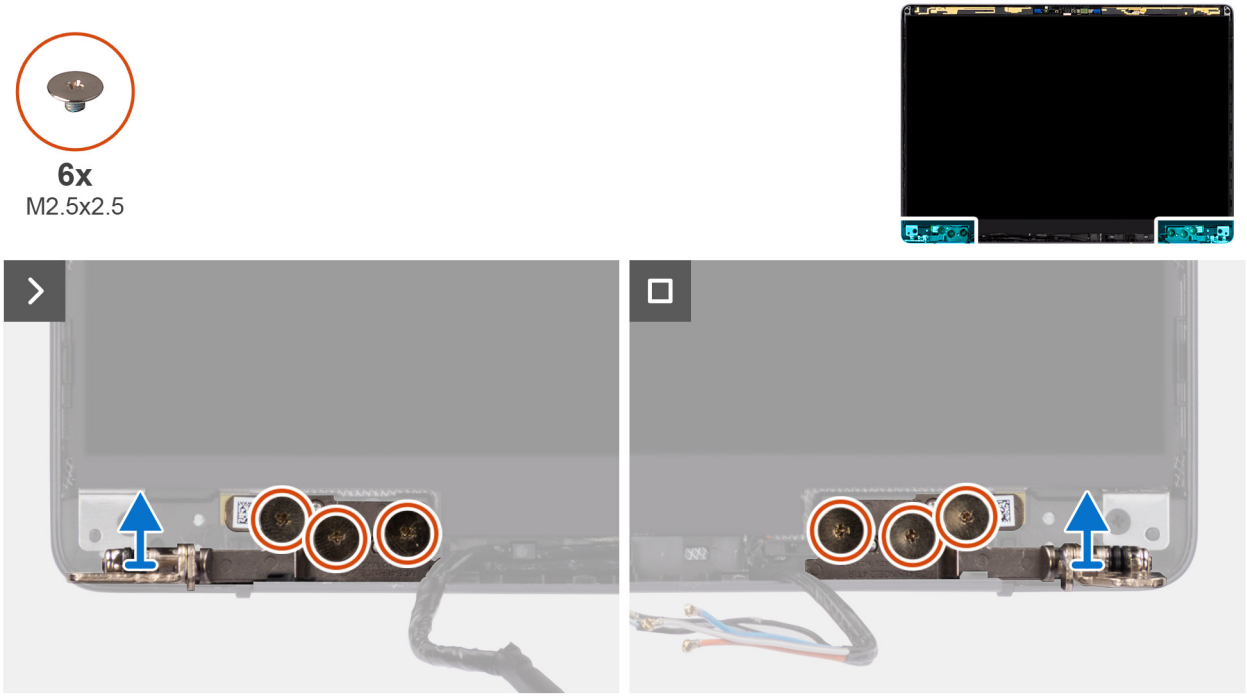


Figure 73. Removing the display hinges

Steps

1. Remove the three screws (M2.5x2.5) that secure the left display hinge to the display-back cover.
2. Lift the left display hinge off the display-back cover.
3. Remove the three screws (M2.5x2.5) that secure the right display hinge to the display-back cover.

4. 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.

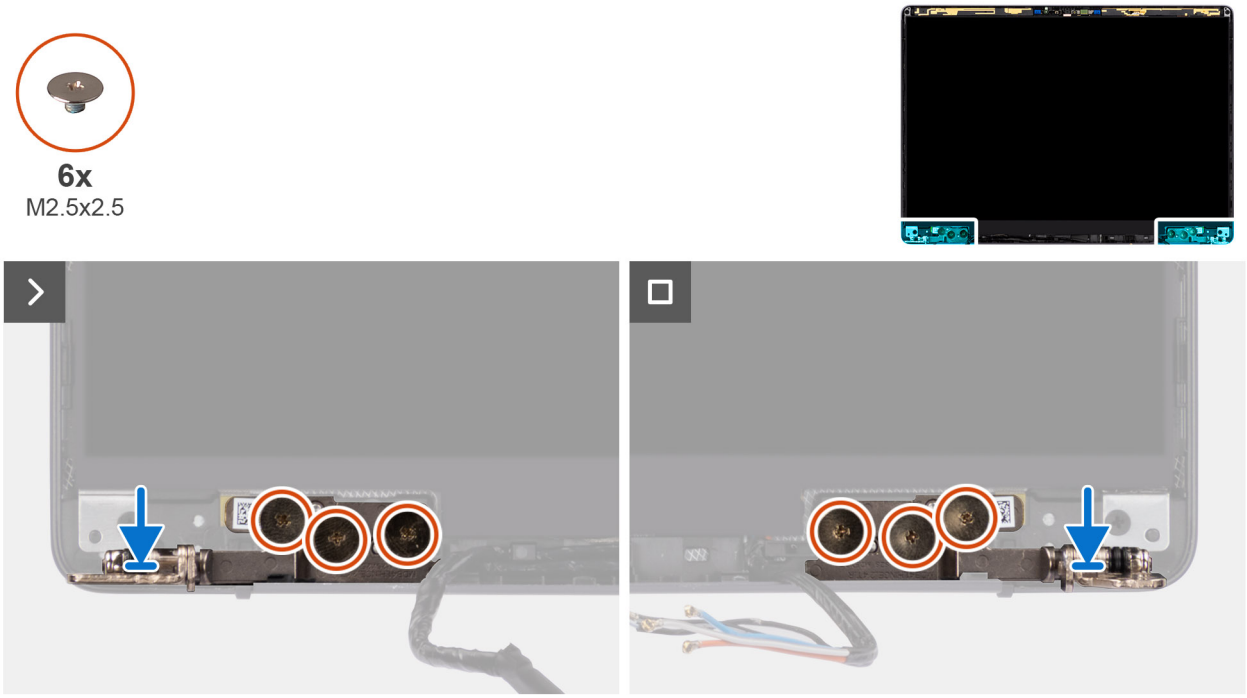


Figure 74. Installing the display hinges

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 diplay 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 diplay hinge to the display-back cover.

Next steps

1. Install the display assembly.
2. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
3. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Install the nano-SIM card tray, if applicable.
5. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display hinges.

About this task

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



Figure 75. Removing the display panel

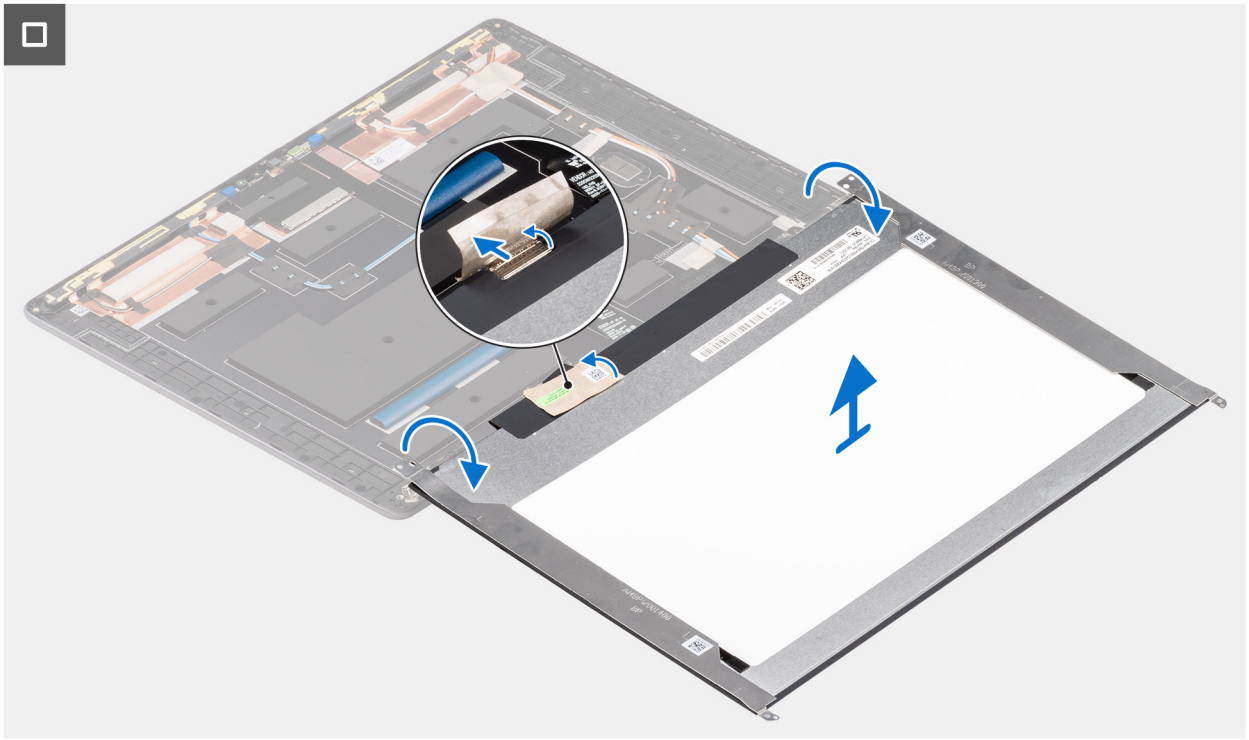


Figure 76. Removing the display panel

Steps

1. Remove the four screws (M2x2) 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. Lift 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 images indicate the location of the display panel and provide a visual representation of the installation procedure.

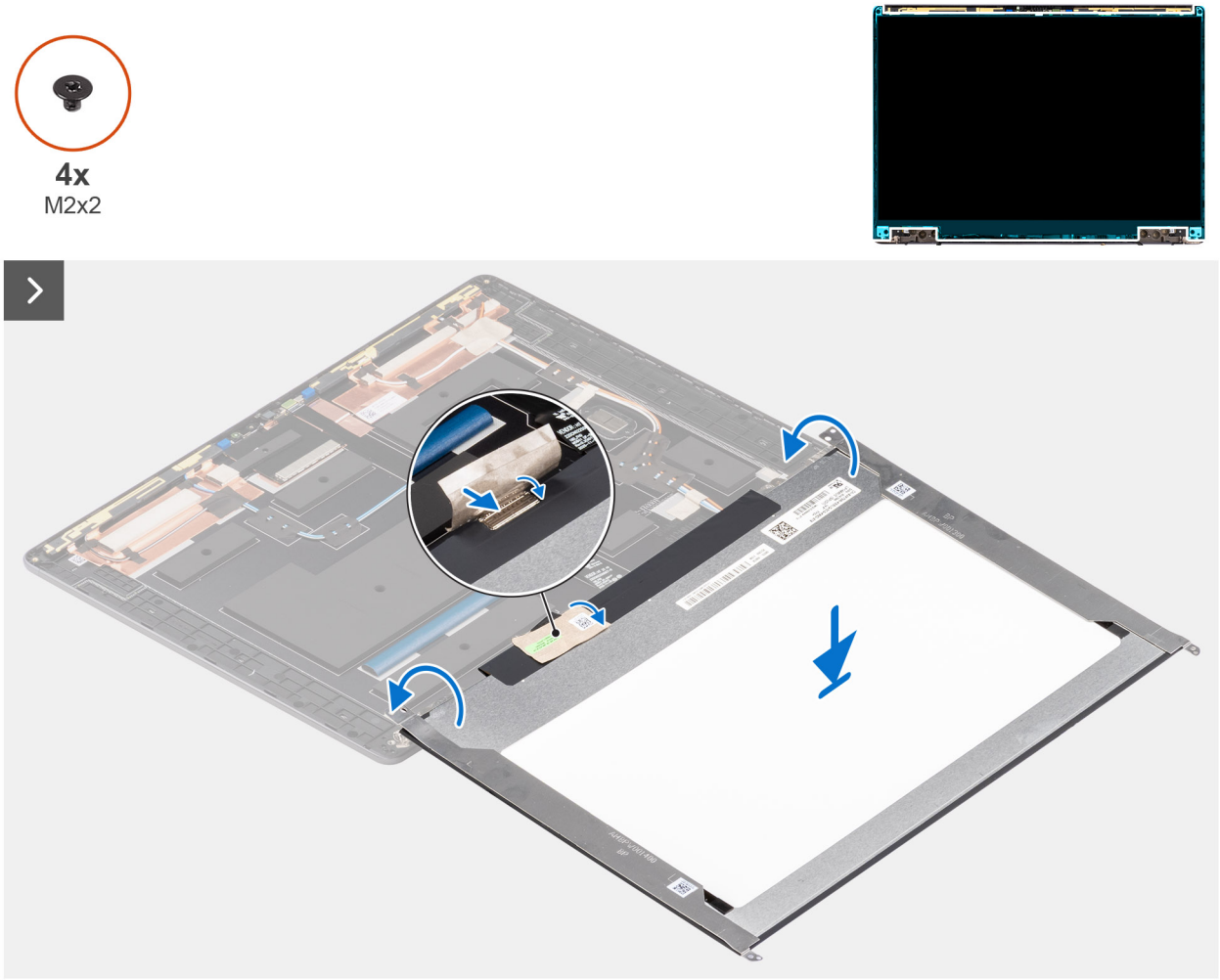


Figure 77. Installing the display panel

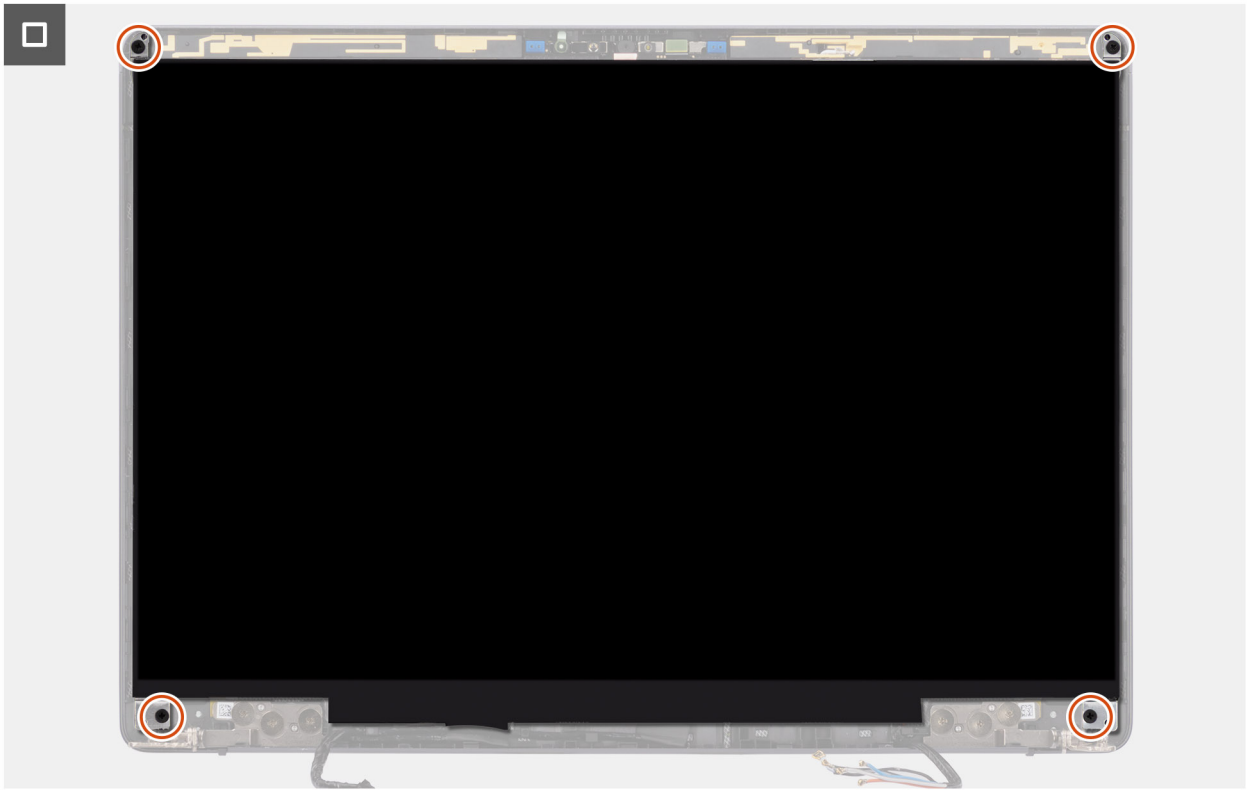


Figure 78. Installing the display panel

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 four screws (M2x2) 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 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
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 camera and provides a visual representation of the removal procedure.

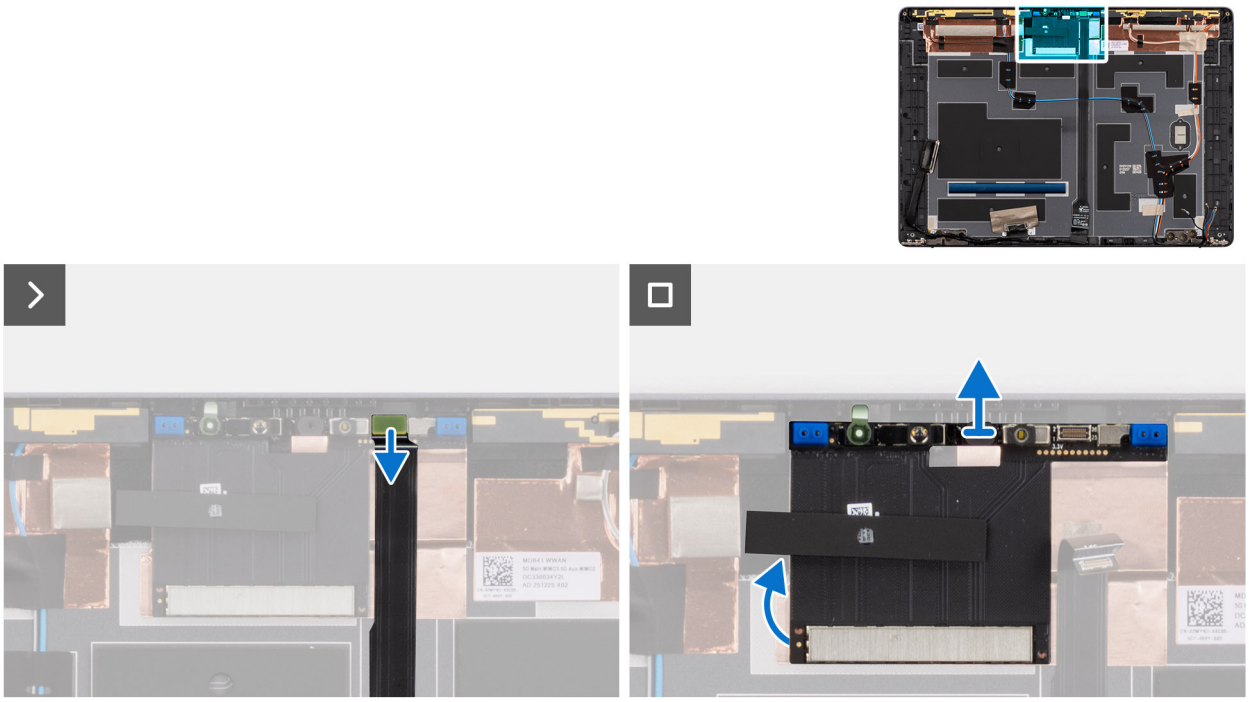


Figure 79. Removing the camera

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.

   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

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

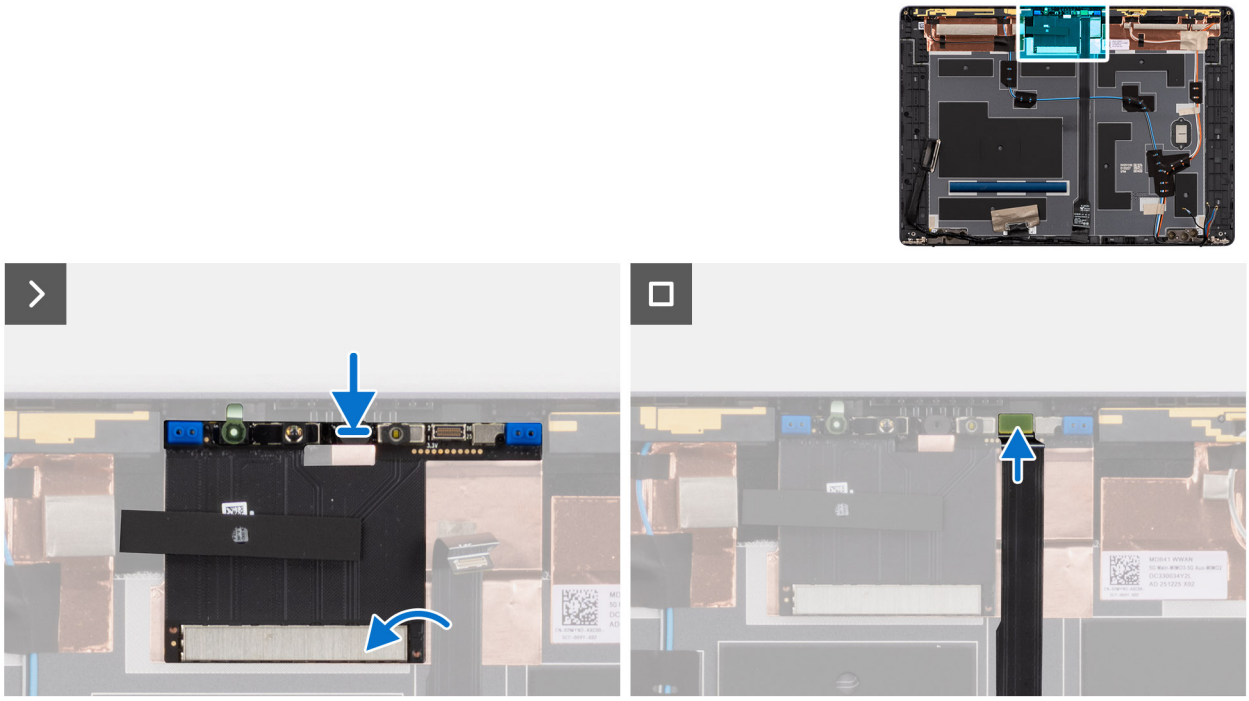


Figure 80. Installing the camera

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.

   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 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 4G WWAN card or the 5G WWAN card, whichever is applicable.
6. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.

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.

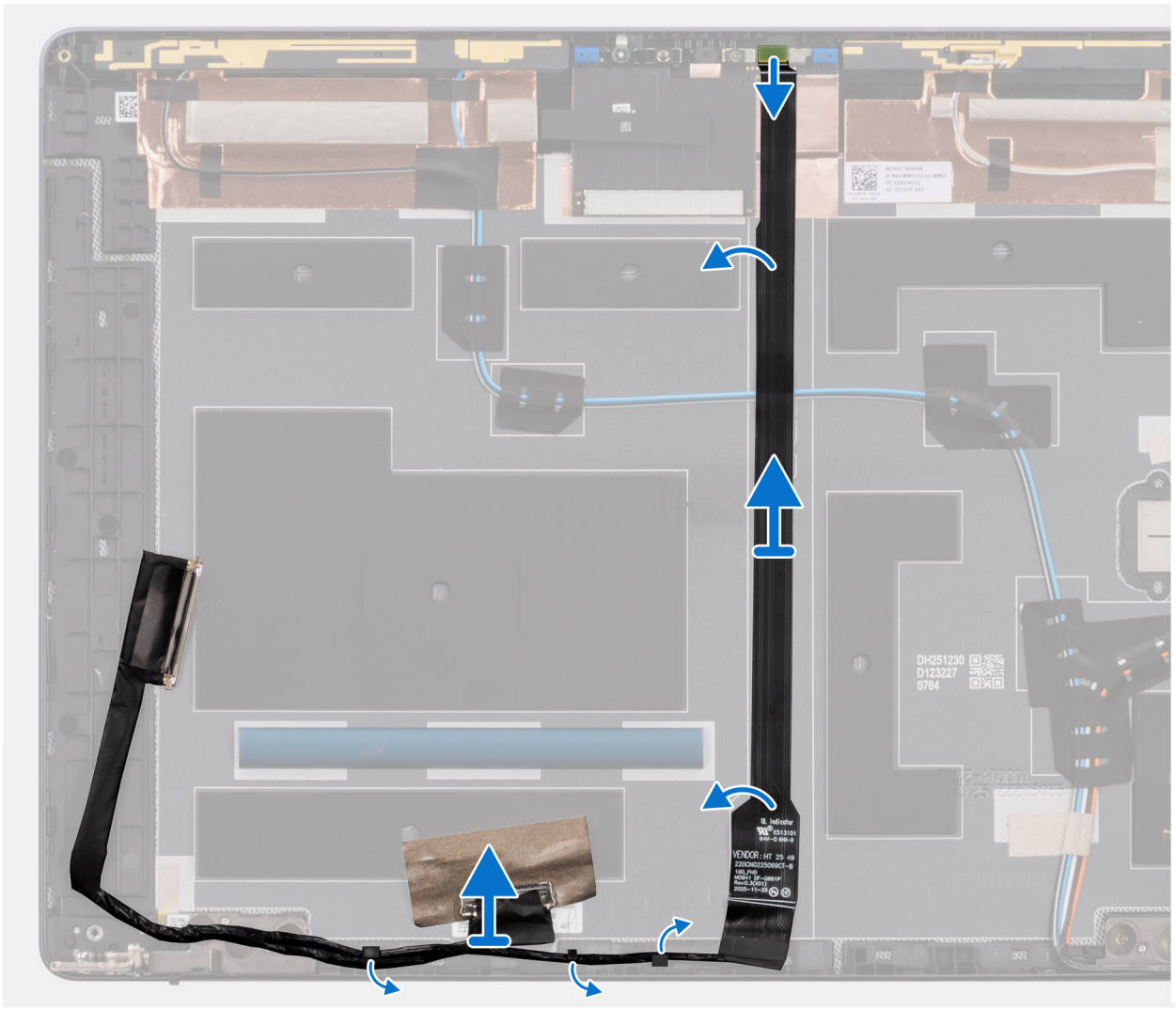


Figure 81. Removing the display cable

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.

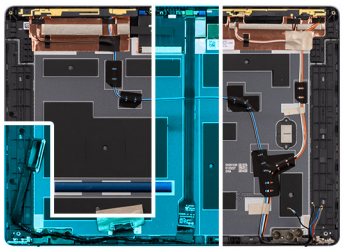
Installing the display cable

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.



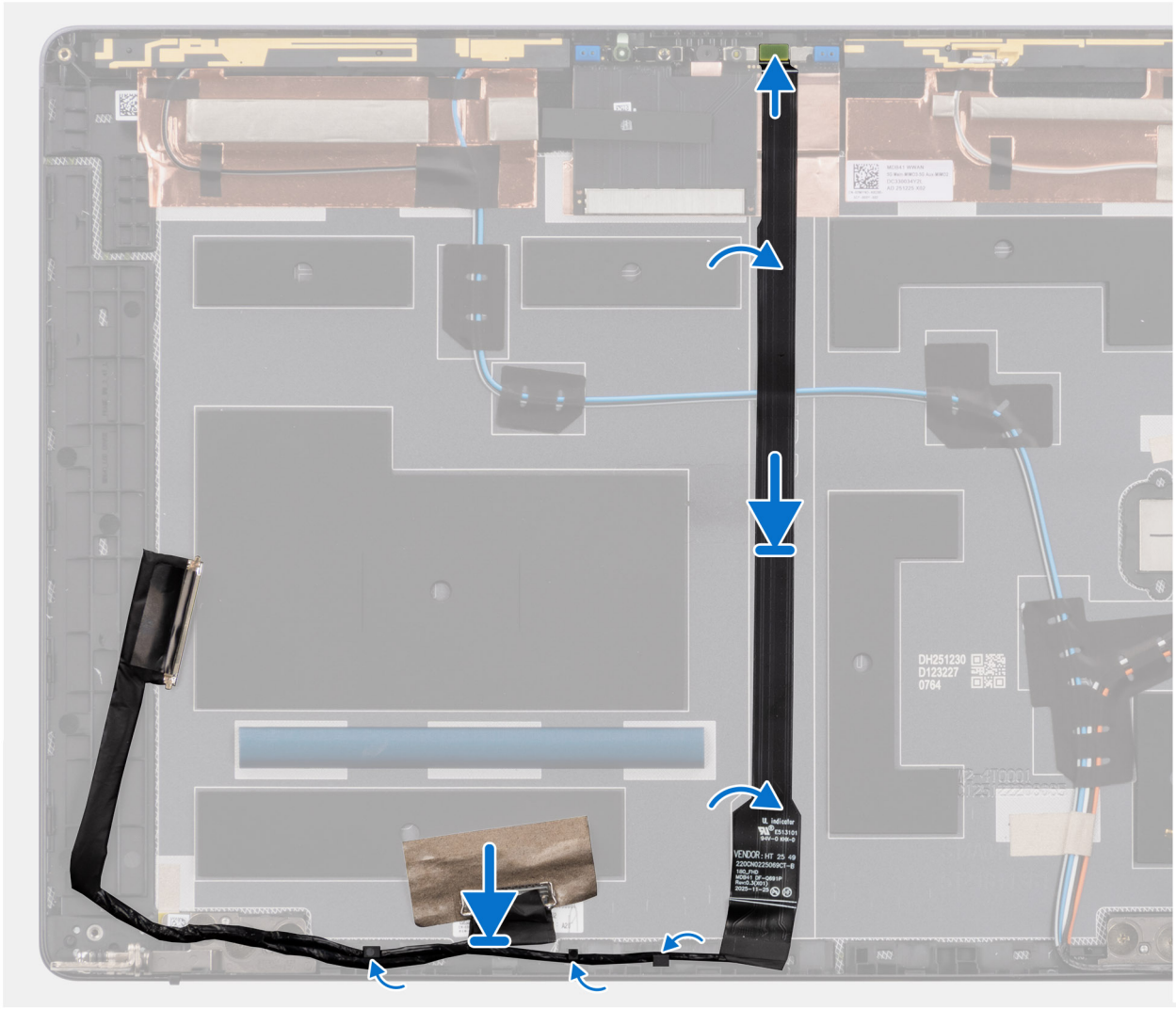


Figure 82. Installing the display cable

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 4G WWAN card or the 5G WWAN card, whichever is applicable.
6. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
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, if applicable.

About this task

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

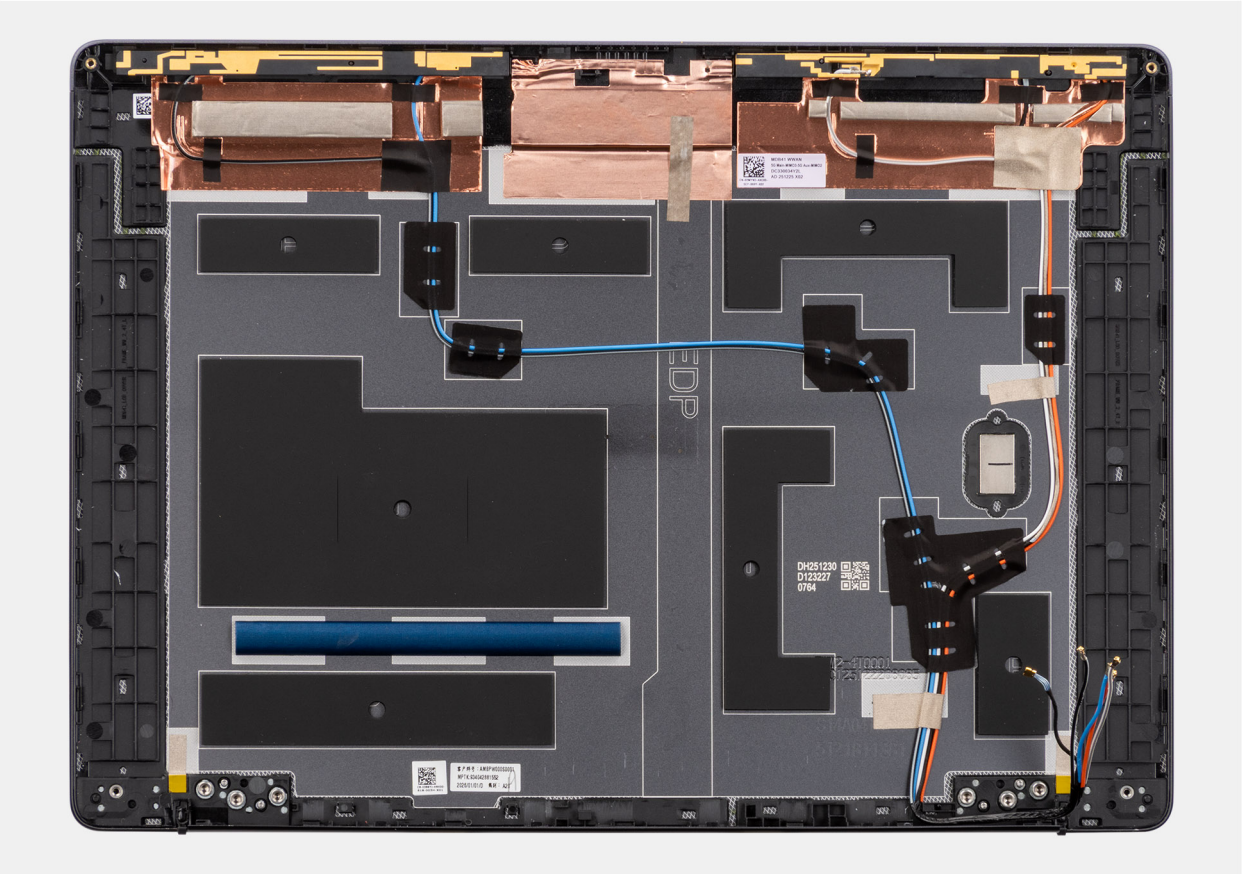


Figure 83. Removing the display-back cover

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.

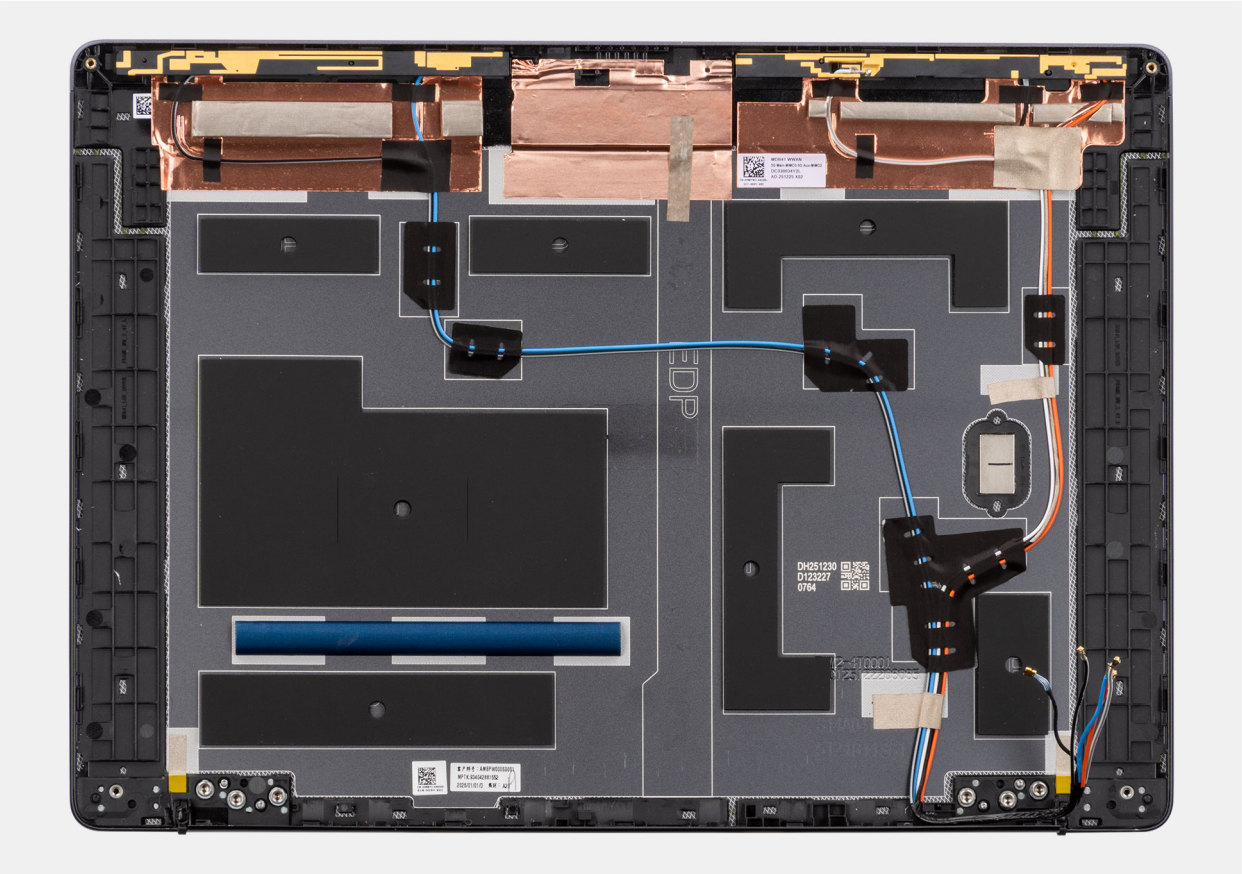


Figure 84. Installing the display-back cover

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, if applicable.
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 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (SODIMM memory)

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.

4. Remove the SODIMM memory.
5. Remove the 2230 solid-state drive (SODIMM memory).
6. Remove the WLAN card.
7. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Remove the battery.
9. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
10. Remove the I/O-bridge board.
11. Remove the heat sink.

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.

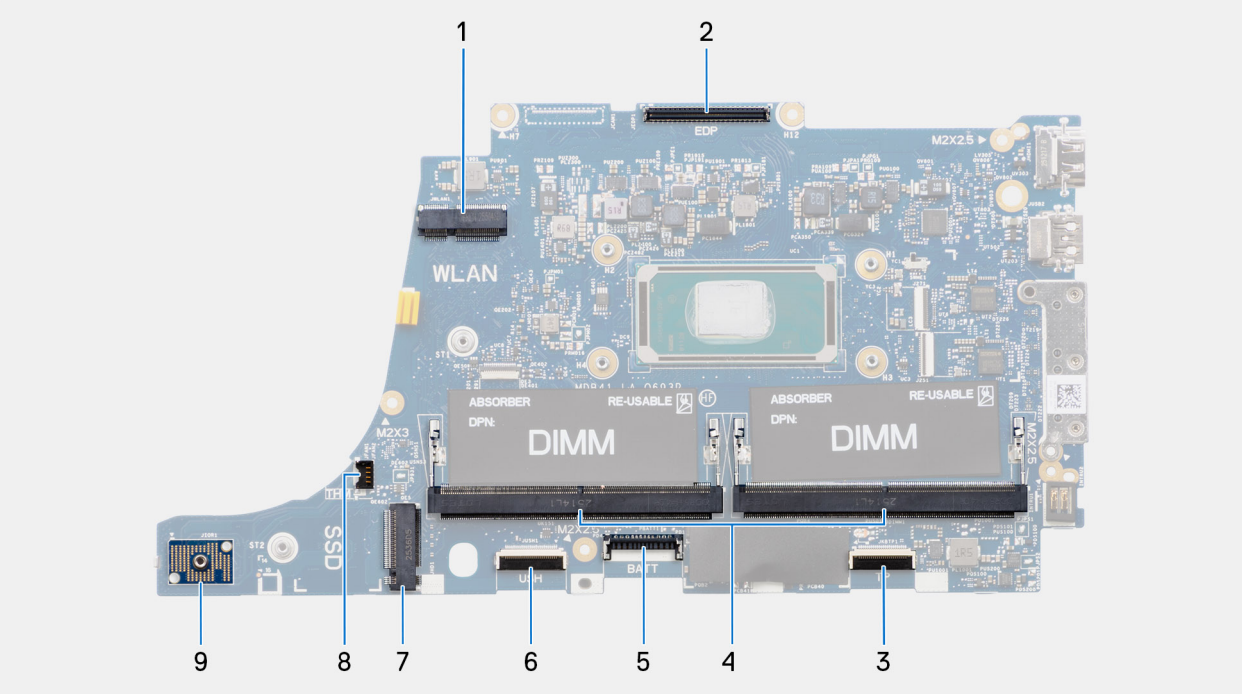


Figure 85. System board (SODIMM memory) callouts

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

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

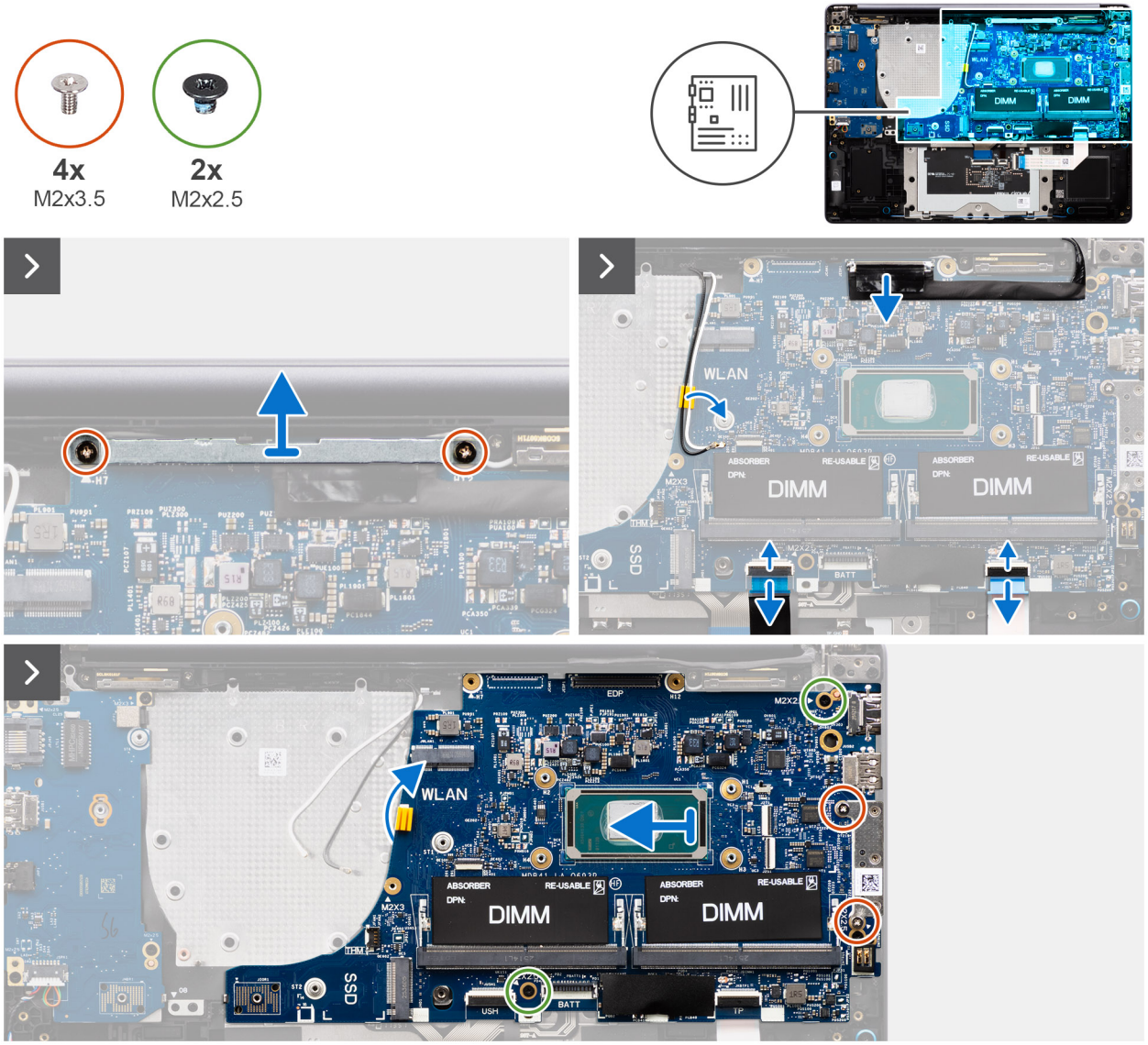


Figure 86. Removing the system board (SODIMM memory)

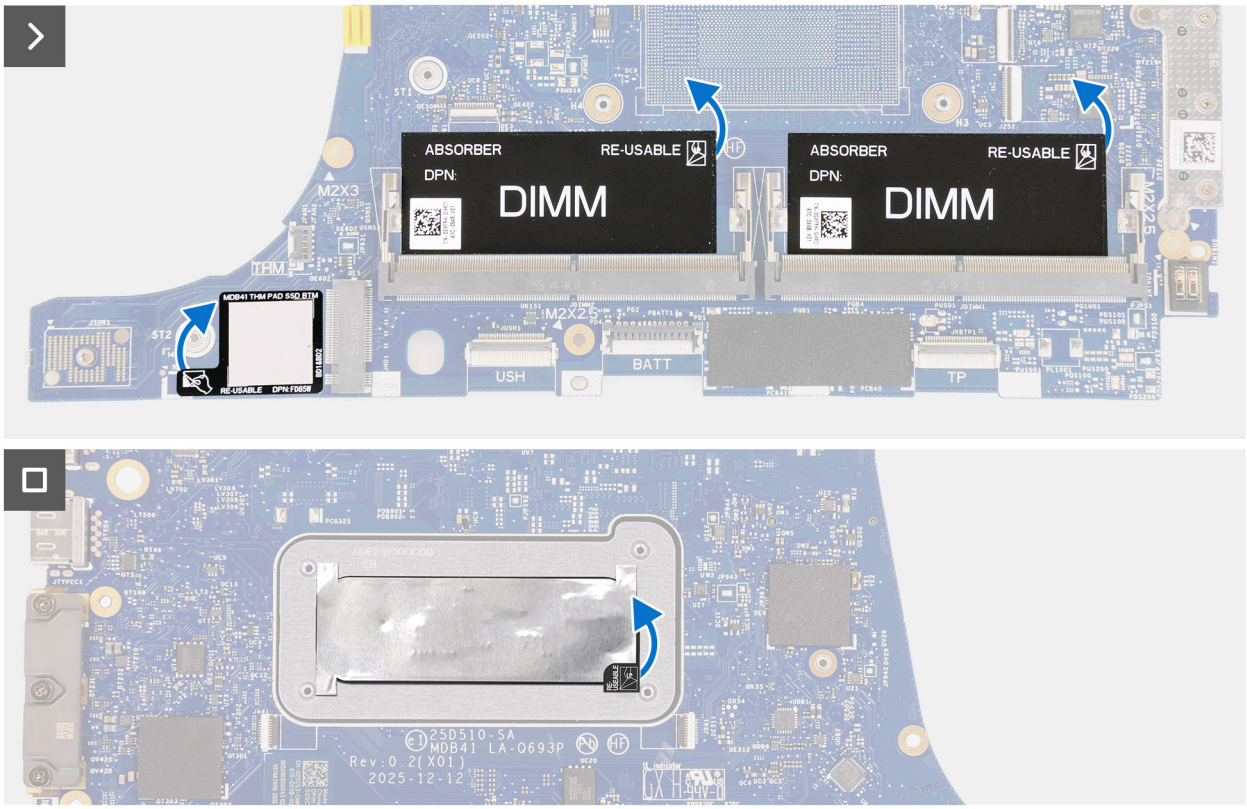


Figure 87. Removing the system board (SODIMM memory)

Steps

1. Remove the two screws (M2x3.5) that secure the display-cable bracket to the system board.
2. Lift the display-cable bracket off the system board.
3. Remove the WLAN-antenna cables from the routing guide on the system board.
4. Disconnect the display and camera cable from its connector (EDP) on the system board.
5. Lift the latch and disconnect the touchpad cable from its connector (TP) on the system board.
6. Lift the latch and disconnect the USH-board cable from its connector (USH) on the system board.
7. Remove the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
8. Remove the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
9. Lift the system board at an angle and slide the ports on the system board out of the slots on the palm-rest assembly.
10. Lift the system board off the palm-rest assembly.
11. Peel the M.2 SSD thermal pad off the system board.
12. Peel the SODIMM Mylars off the system board.
13. Flip the system board over.
14. Peel the CPU-thermal Mylar off the system board.

NOTE: Steps 11 to 14 are only applicable if you are replacing the system board with another one.

Installing the system board (SODIMM memory)

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.

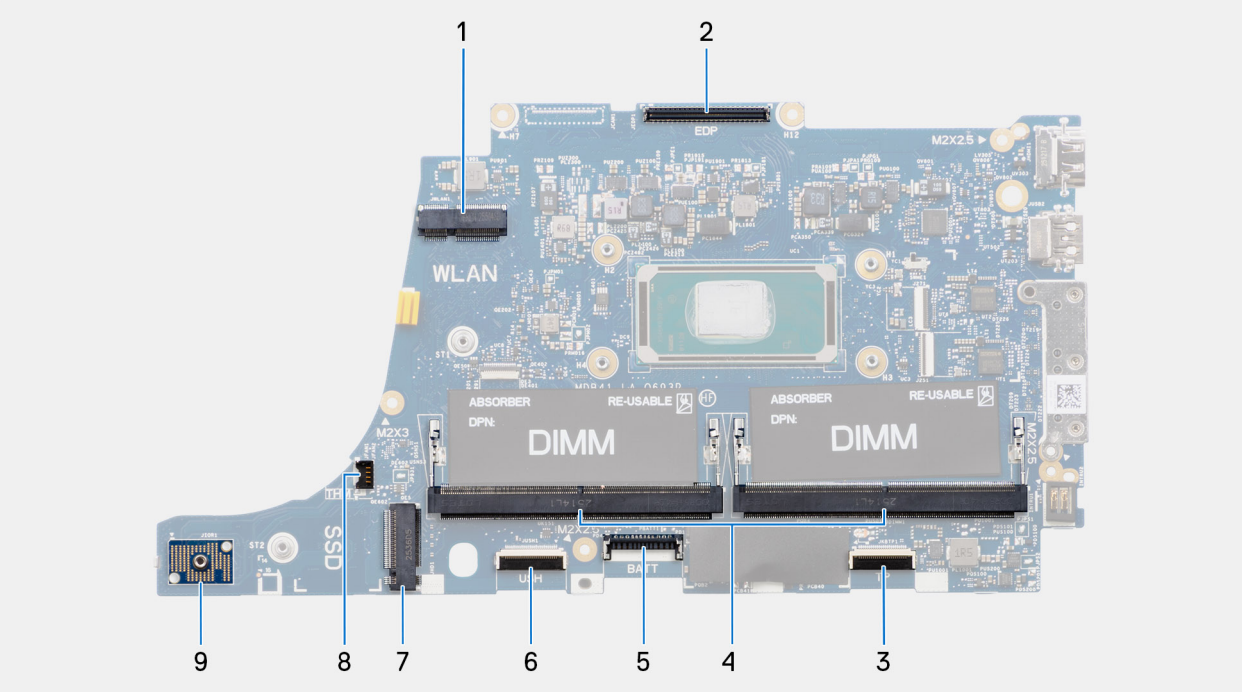


Figure 88. System board (SODIMM memory) callouts

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

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

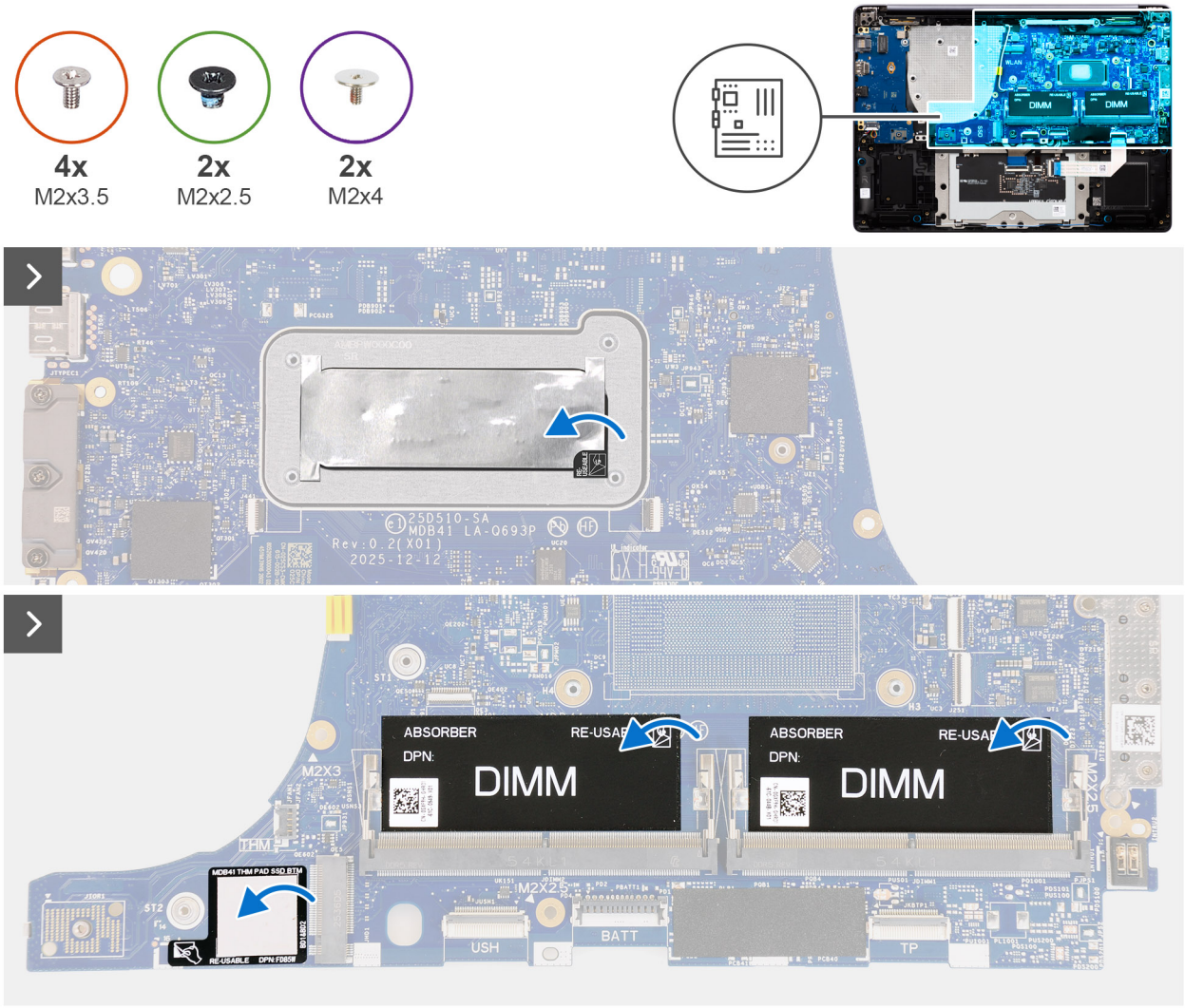


Figure 89. Installing the system board (SODIMM memory)

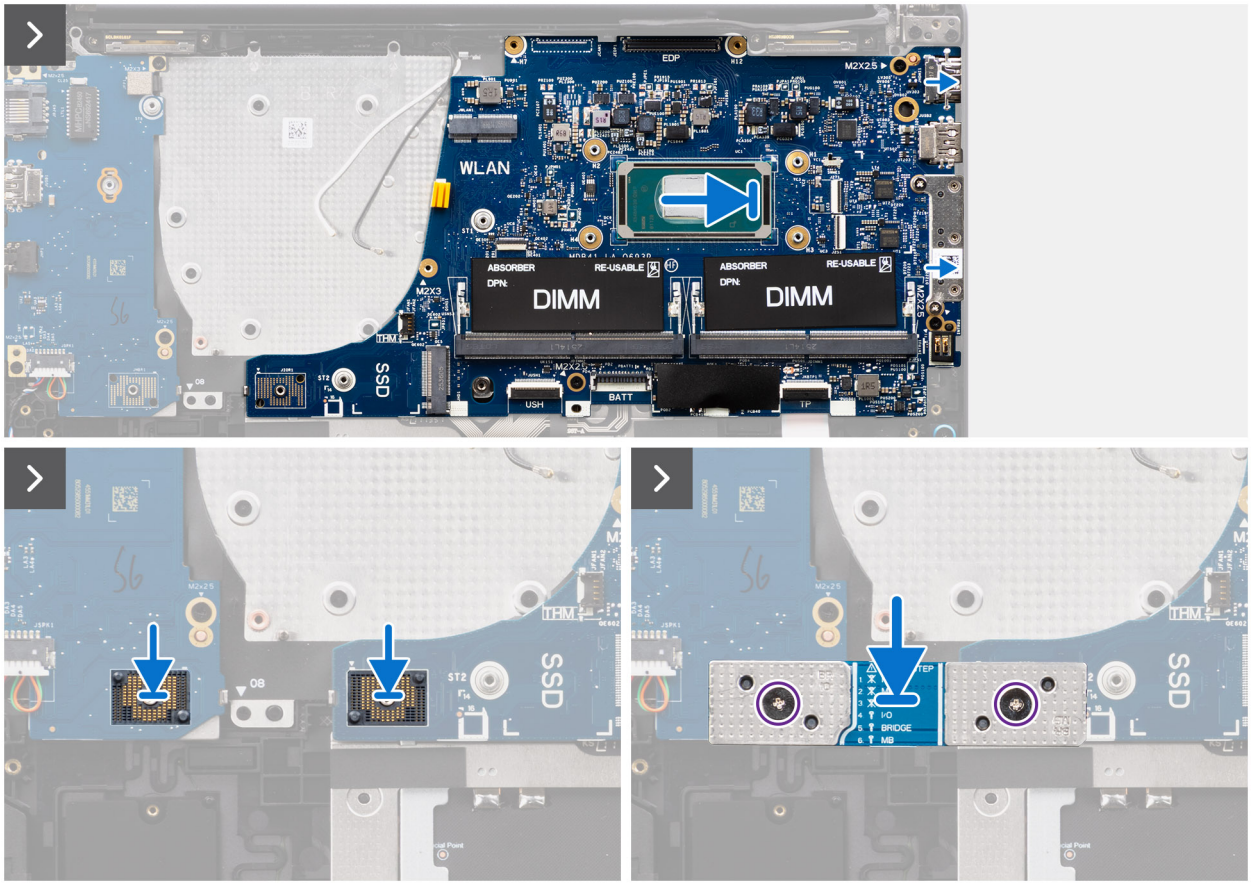


Figure 90. Installing the system board (SODIMM memory)

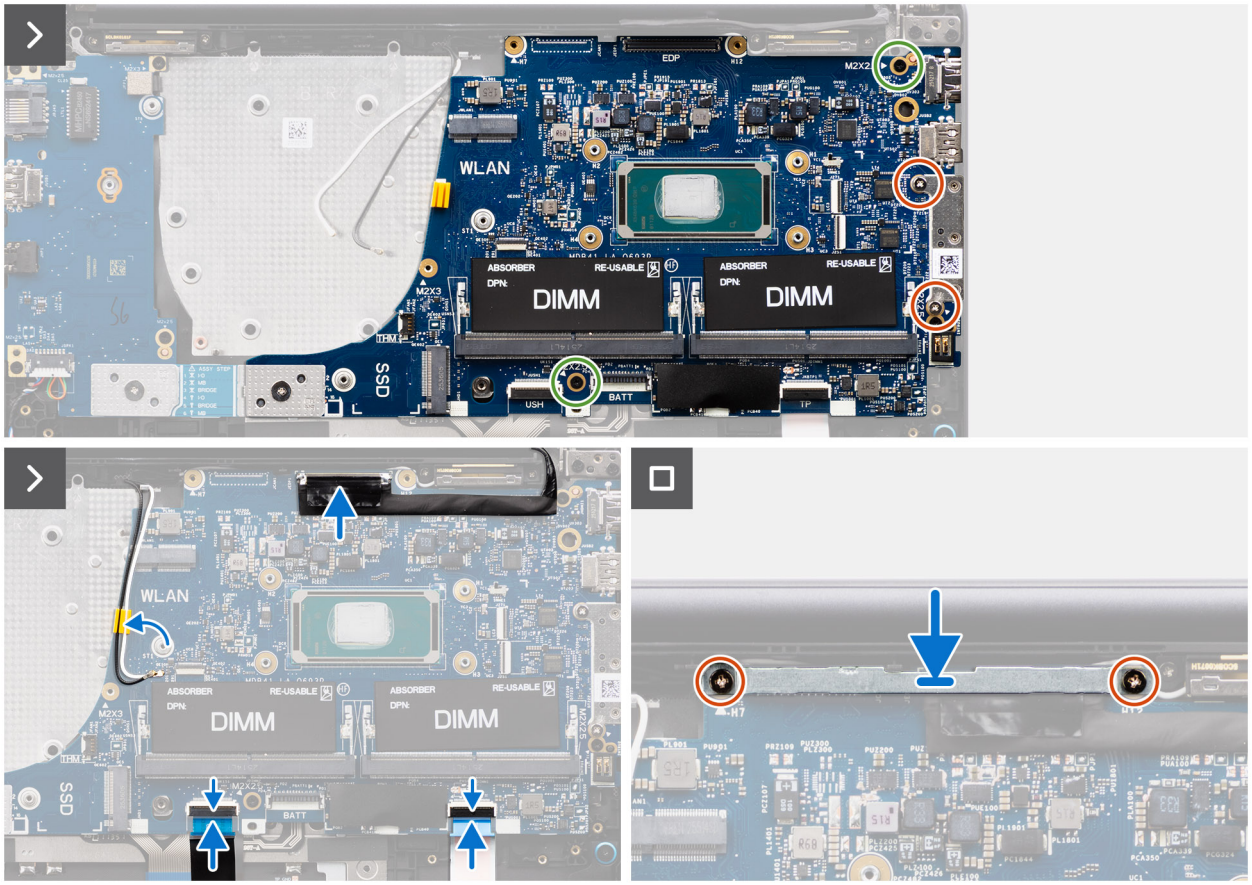


Figure 91. Installing the system board (SODIMM memory)

Steps

1. Flip the system board over.
2. Adhere the CPU-thermal Mylar to the system board.
3. Flip the system board over.
4. Adhere the memory-module Mylars to the system board.
5. Adhere the M.2 SSD thermal pad to the system board.

   NOTE: Steps 1 to 5 are only applicable if you are replacing the system board with another one.

6. Align the ports on the system board with the slots on the palm-rest assembly and slide them into place.
7. Place the system board on the palm-rest assembly
8. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
9. 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.
10. 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.

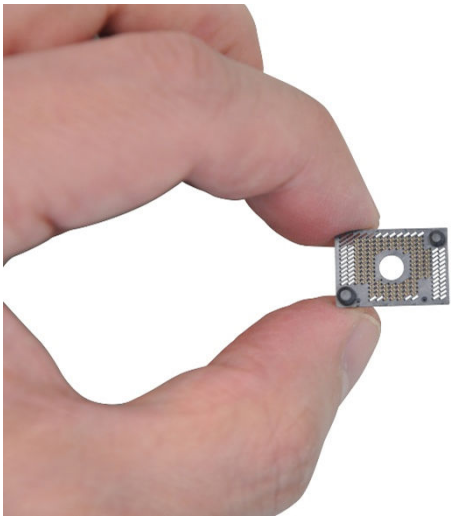


Figure 92. Proper handling of the I/O-bridge board interposer

11. 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.
12. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
13. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
14. Replace the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
15. Replace the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
16. Connect the USH-board cable to its connector (MB) on the system board and close the latch to secure the cable.
17. Connect the touchpad cable to its connector (TP) on the system board and close the latch to secure the cable.
18. Route the WLAN-antenna cables through the routing guide on the system board.
19. Disconnect the display and camera cable from its connector (EDP) on the system board.
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 heat sink.
2. Install the fan (speakers) or the fan (speaker assembly), whichever is applicable.
3. Install the battery.
4. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Install the WLAN card.
6. Install the 2230 solid-state drive (SODIMM memory).
7. Install the SODIMM memory.
8. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
9. Install the nano-SIM card tray, if applicable.
10. Follow the procedure in After working inside your computer.

Removing the system board (LPCAMM2 memory)

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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the LPCAMM2 memory.
5. Remove the 2230 solid-state drive (LPCAMM2 memory) or the 2280 solid-state drive (LPCAMM2 memory) , whichever is applicable.

6. Remove the WLAN card.
7. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Remove the battery.
9. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
10. Remove the I/O-bridge board.
11. Remove the heat sink.

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.

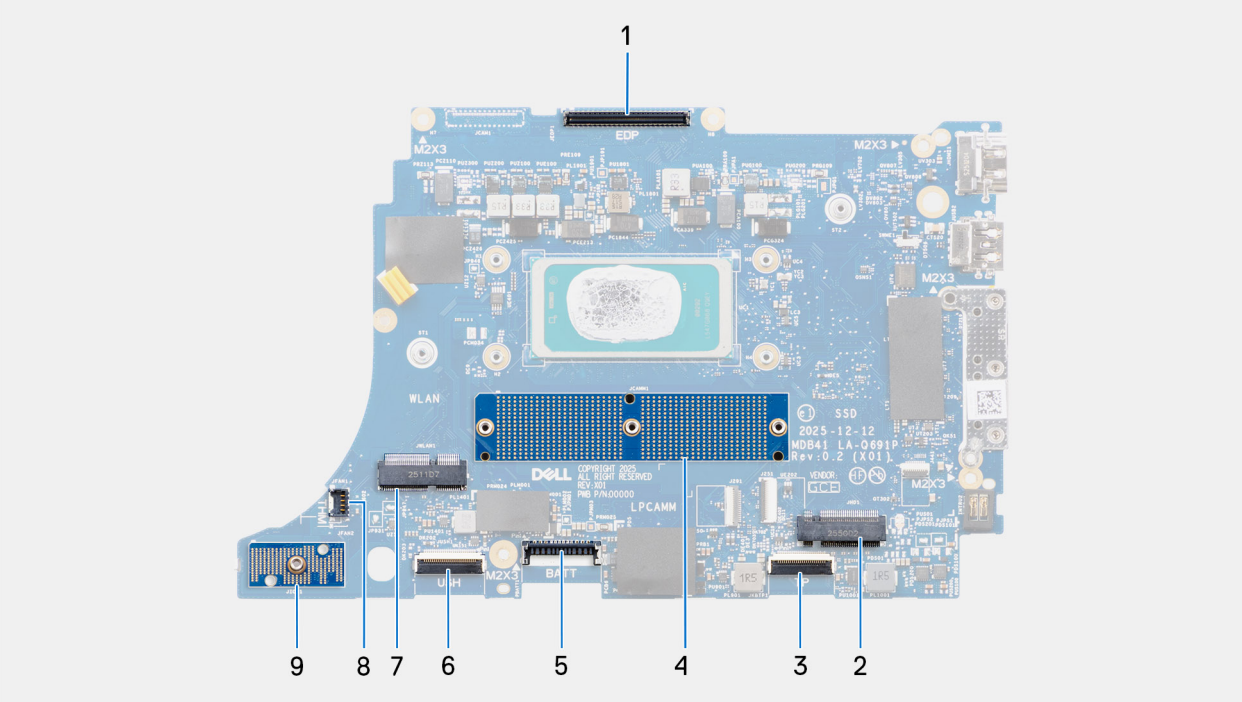


Figure 93. System board (LPCAMM2 memory) callouts

1. Display and camera cable (EDP)
2. M.2 2230/2280 solid-state drive slot (SSD)
3. Touchpad cable (TP)
4. LPCAMM2 slot (LPCAMM)
5. Battery cable (BATT)
6. USH-board cable (USH)
7. Wireless card slot (WLAN)
8. Fan cable (JFAN1)
9. I/O-bridge board (JIOR1)

The following image indicates the location of the system board (LPCAMM2 memory) and provides a visual representation of the removal procedure.

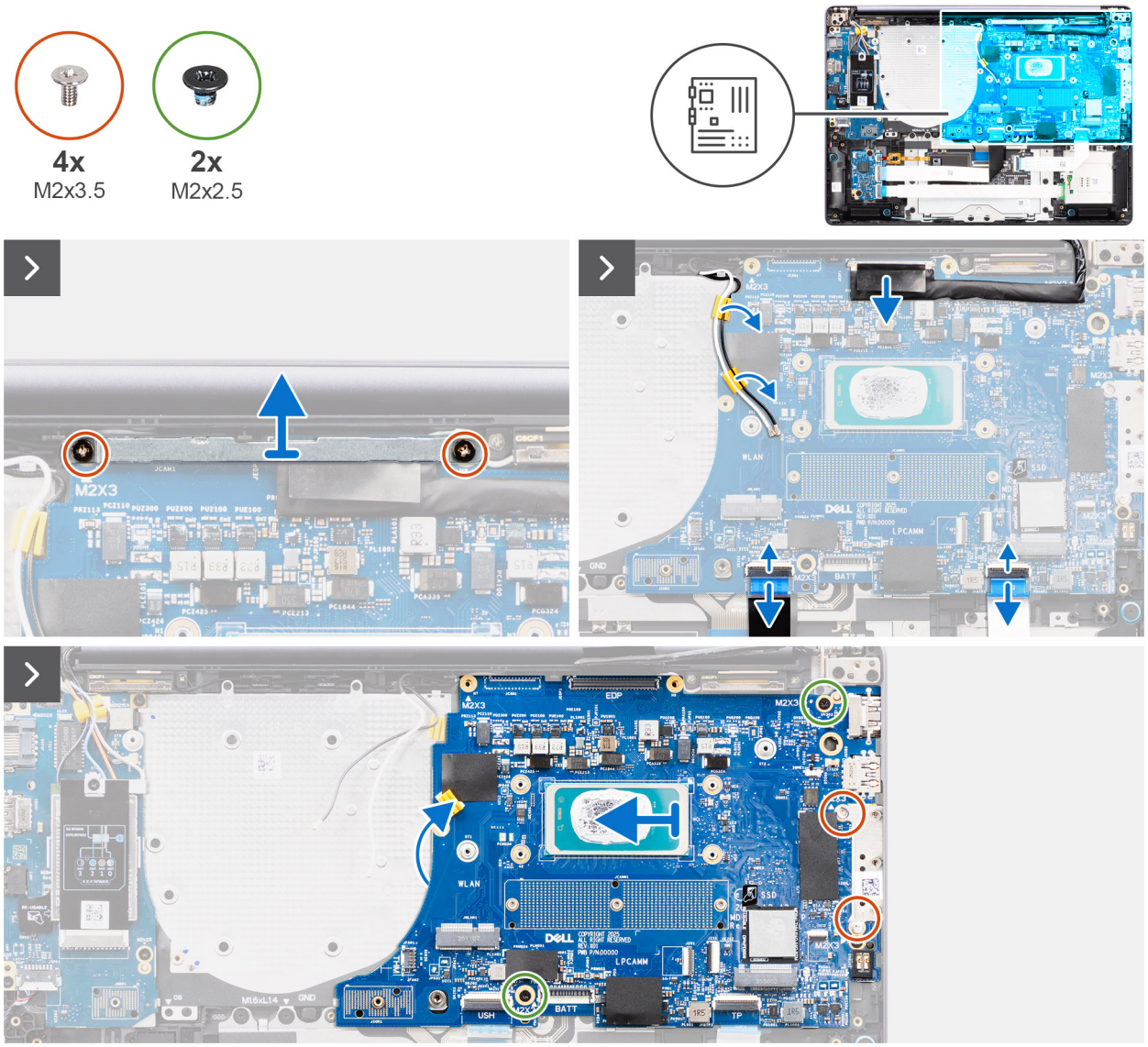


Figure 94. Removing the system board (LPCAMM2 memory)

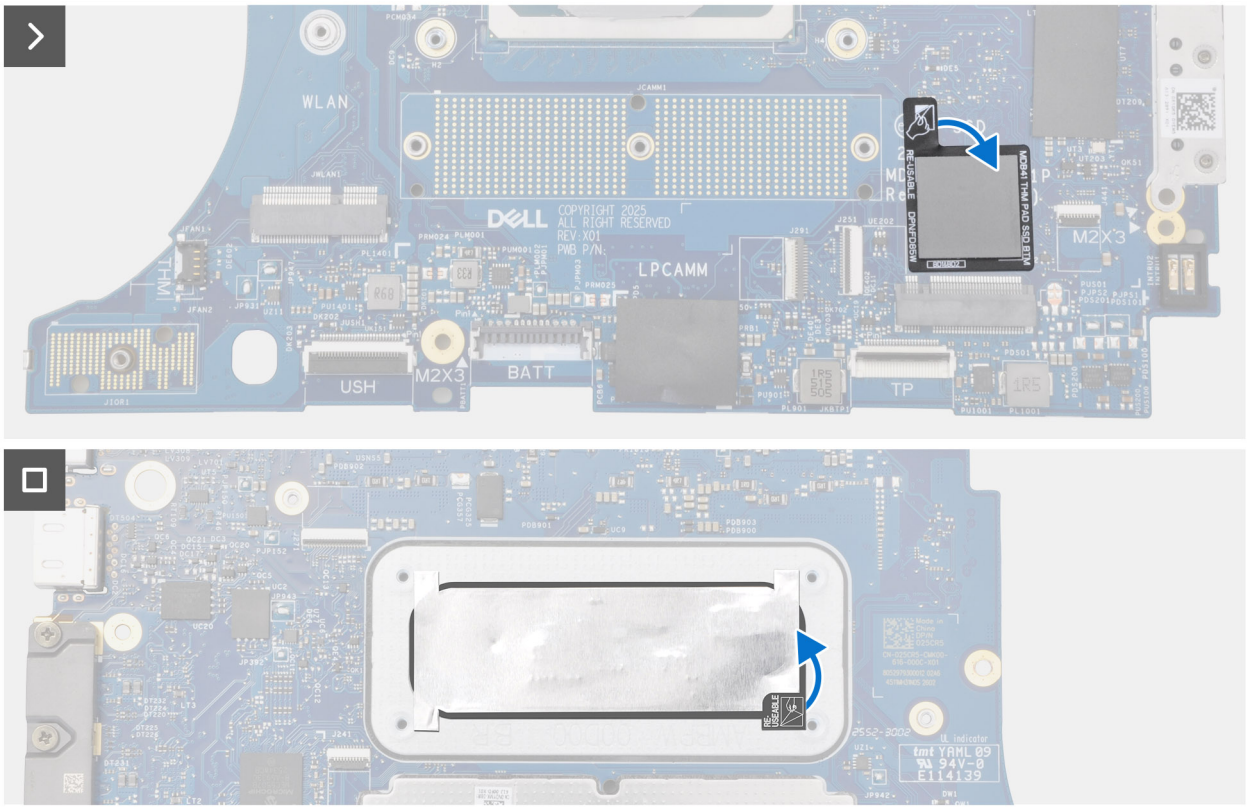


Figure 95. Removing the system board (LPCAMM2 memory)

Steps

1. Remove the two screws (M2x3.5) that secure the display-cable bracket to the system board.
2. Lift the display-cable bracket off the system board.
3. Remove the WLAN-antenna cables from the routing guides on the system board.
4. Disconnect the display and camera cable from its connector (EDP) on the system board.
5. Lift the latch and disconnect the touchpad cable from its connector (TP) on the system board.
6. Lift the latch and disconnect the USH-board cable from its connector (USH) on the system board.
7. Remove the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
8. Remove the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
9. Lift the system board at an angle and slide the ports on the system board out of the slots on the palm-rest assembly.
10. Lift the system board off the palm-rest assembly.
11. Peel the M.2 SSD thermal pad off the system board.
12. Flip the system board over.
13. Peel the CPU-thermal Mylar off the system board.

NOTE: Steps 11 to 13 are only applicable if you are replacing the system board with another one.

Installing the system board (LPCAMM2 memory)

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.

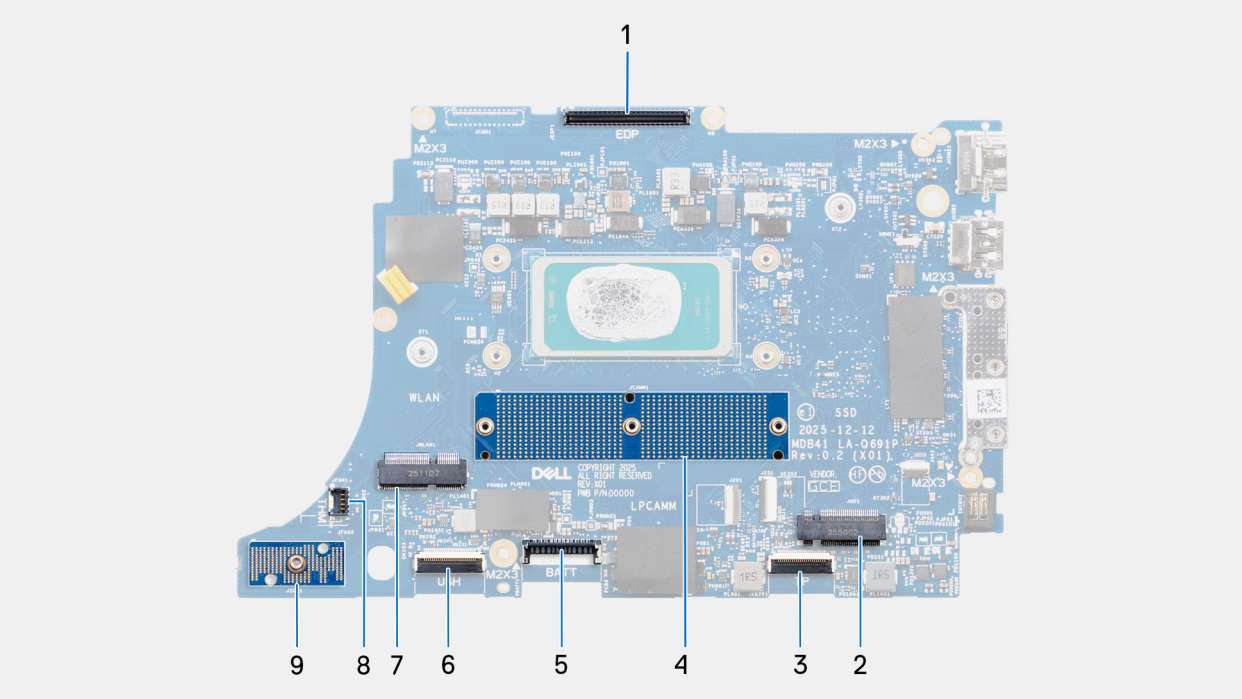


Figure 96. System board (LPCAMM2 memory) callouts

1. Display and camera cable (EDP)
2. M.2 2230/2280 solid-state drive slot (SSD)
3. Touchpad cable (TP)
4. LPCAMM2 slot (LPCAMM)
5. Battery cable (BATT)
6. USH-board cable (USH)
7. Wireless card slot (WLAN)
8. Fan cable (JFAN1)
9. I/O-bridge board (JIOR1)

The following image indicates the location of the system board (LPCAMM2 memory) and provides a visual representation of the installation procedure.

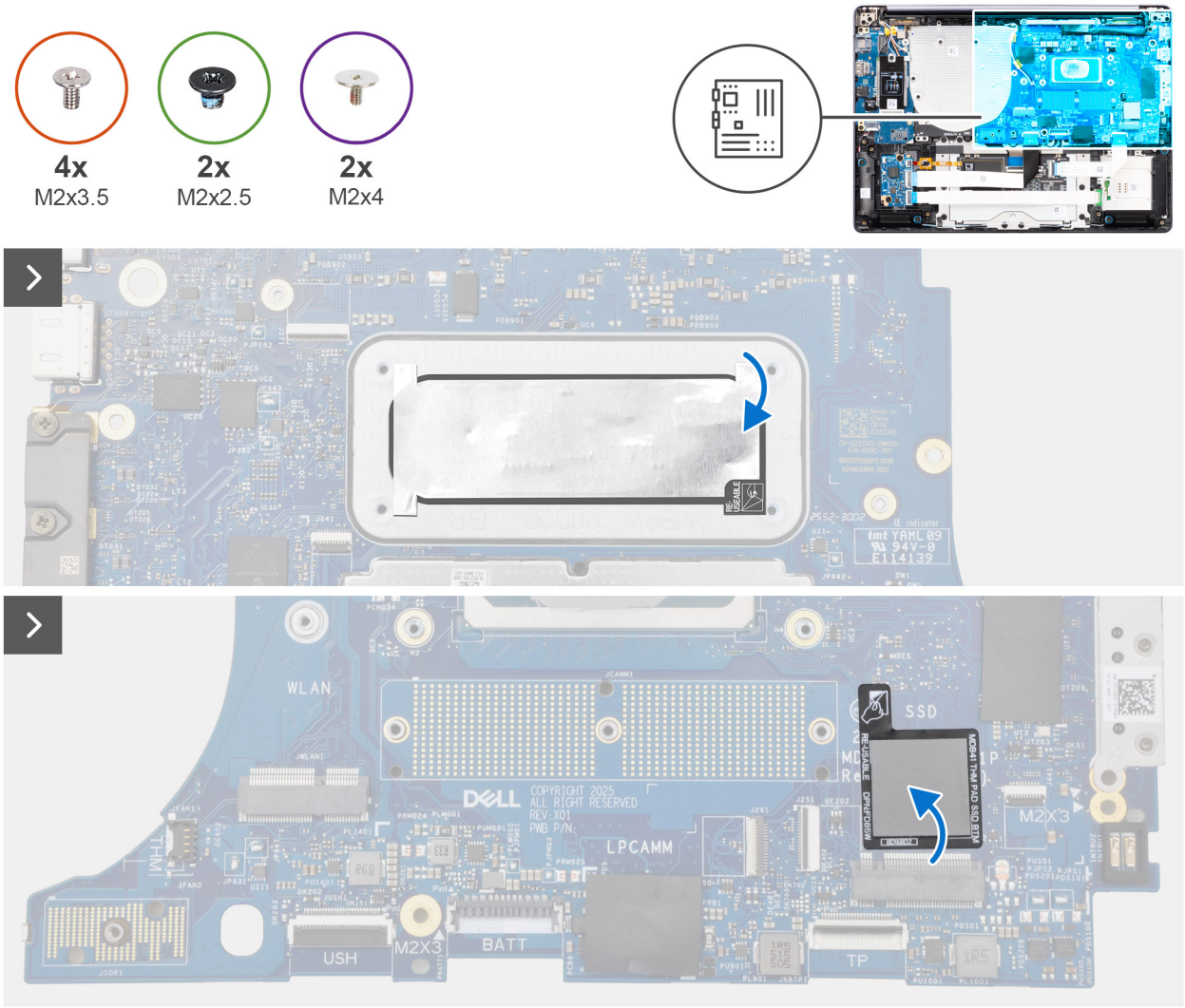


Figure 97. Installing the system board (LPCAMM2 memory)

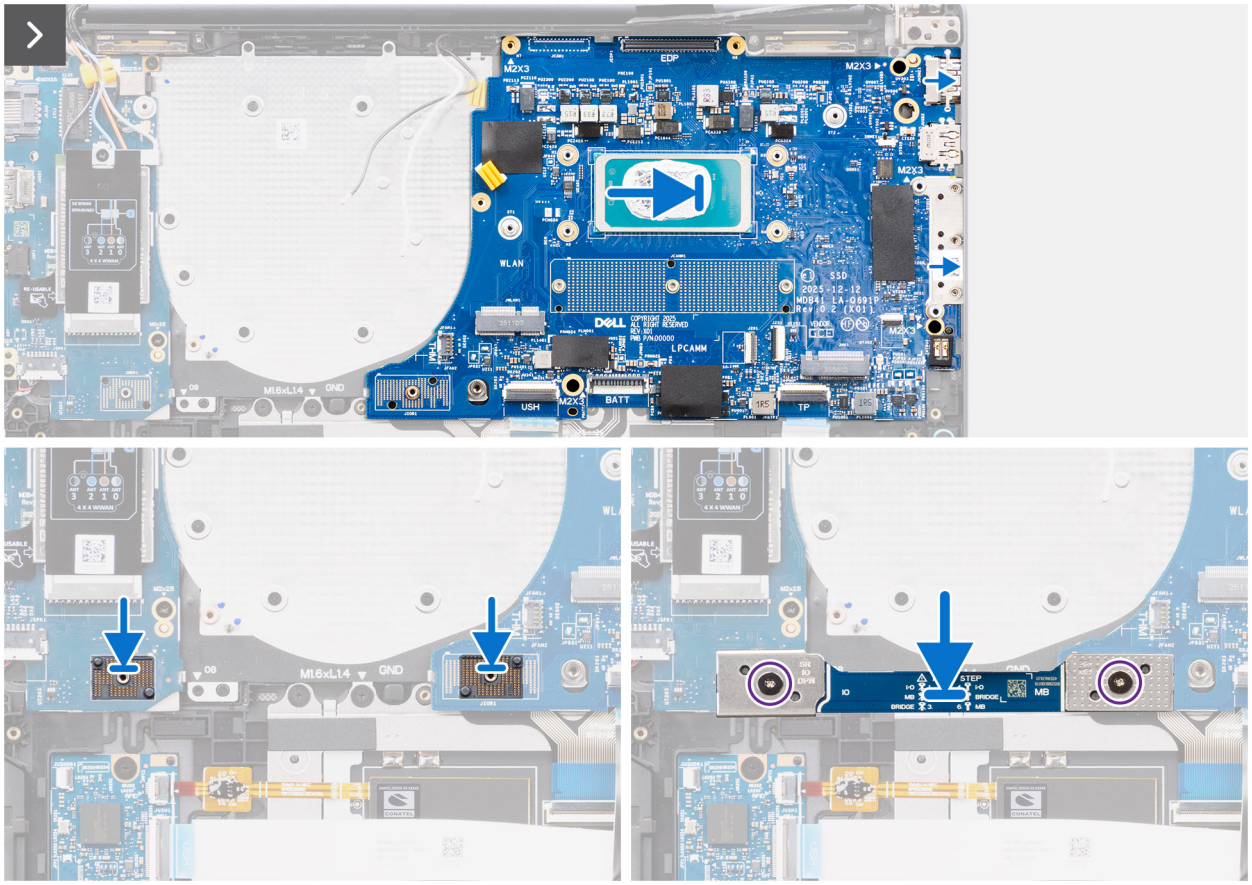


Figure 98. Installing the system board (LPCAMM2 memory)

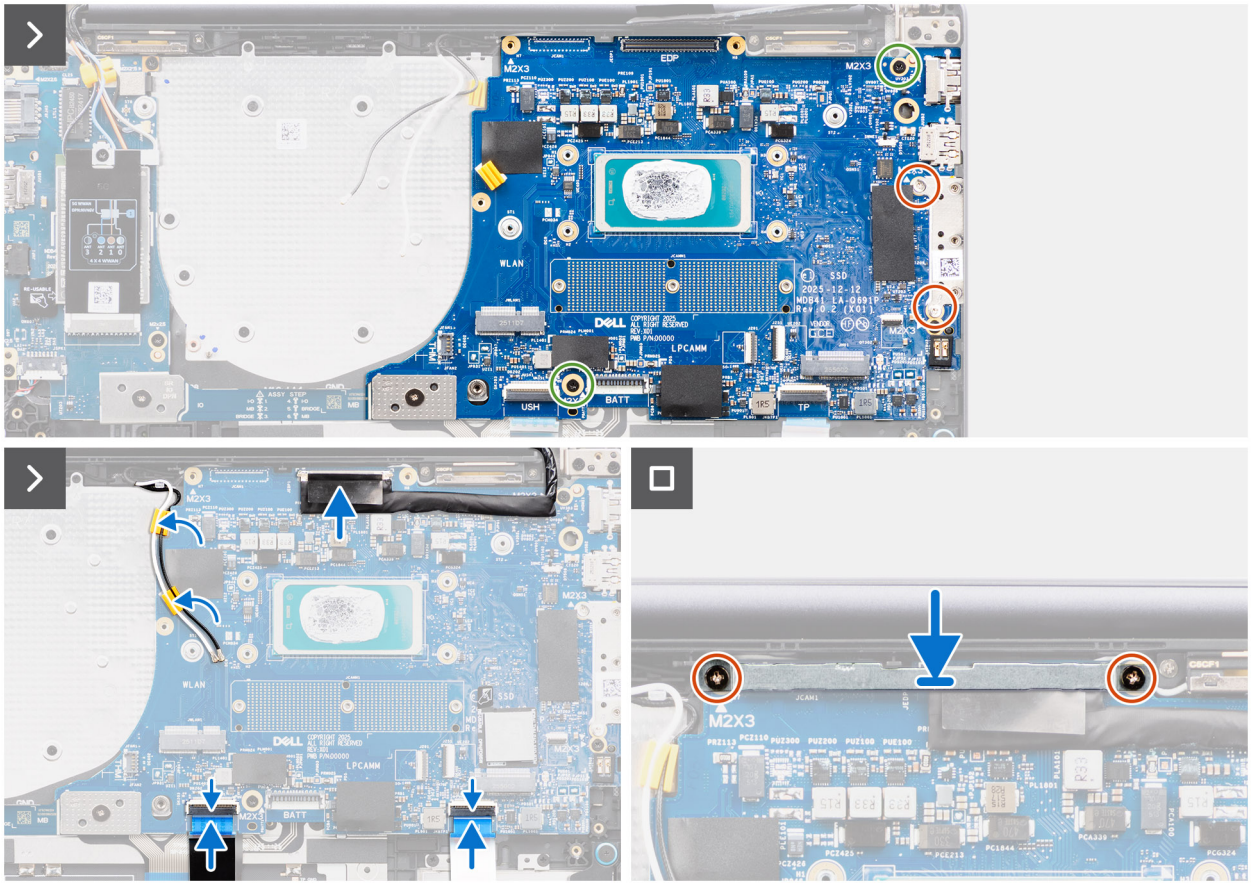


Figure 99. Installing the system board (LPCAMM2 memory)

Steps

1. Flip the system board over.
2. Adhere the CPU-thermal Mylar to the system board.
3. Flip the system board over.
4. Adhere the M.2 SSD thermal pad to the system board.

   NOTE: Steps 1 to 4 are only applicable if you are replacing the system board with another one.

5. Align the ports on the system board with the slots on the palm-rest assembly and slide them into place.
6. Place the system board on the palm-rest assembly
7. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
8. 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.
9. 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.

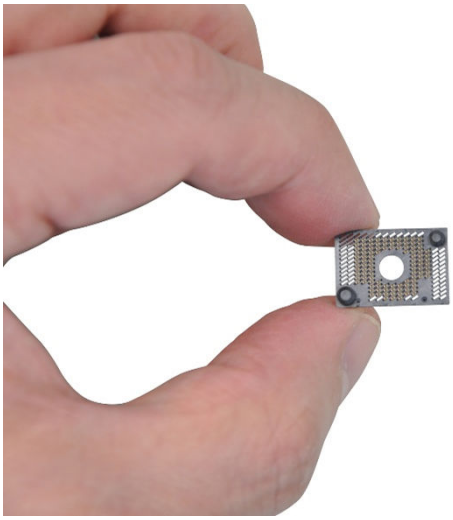


Figure 100. Proper handling of the I/O-bridge board interposer

10. 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.
11. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the I/O board.
12. Replace the screw (M2x4) that secures the I/O-bridge board to its connector on the system board.
13. Replace the two screws (M2x2.5) that secure the system board to the palm-rest assembly.
14. Replace the two screws (M2x3.5) that secure the system board to the palm-rest assembly.
15. Connect the USH-board cable to its connector (MB) on the system board and close the latch to secure the cable.
16. Connect the touchpad cable to its connector (TP) on the system board and close the latch to secure the cable.
17. Route the WLAN-antenna cables through the routing guides on the system board.
18. Connect the display and camera cable to its connector (EDP) on the system board.
19. Place the display-cable bracket over the display connectors on the system board.
20. Align the screw holes on the display-cable bracket to the screw holes on the system board.
21. Replace the two screws (M2x3.5) that secure the display-cable bracket to the system board.

Next steps

1. Install the heat sink.
2. Install the fan (speakers) or the fan (speaker assembly), whichever is applicable.
3. Install the battery.
4. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Install the WLAN card.
6. Install the 2230 solid-state drive (LPCAMM2 memory) or the 2280 solid-state drive (LPCAMM2 memory), whichever is applicable.
7. Install theLPCAMM2 memory.
8. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
9. Install the nano-SIM card tray, if applicable.
10. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the SODIMM memory or LPCAMM2 memory, whichever is applicable.
5. Remove one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
6. Remove the WLAN card.
7. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Remove the battery.
9. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
10. Remove the I/O-bridge board.
11. Remove the system board (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

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.

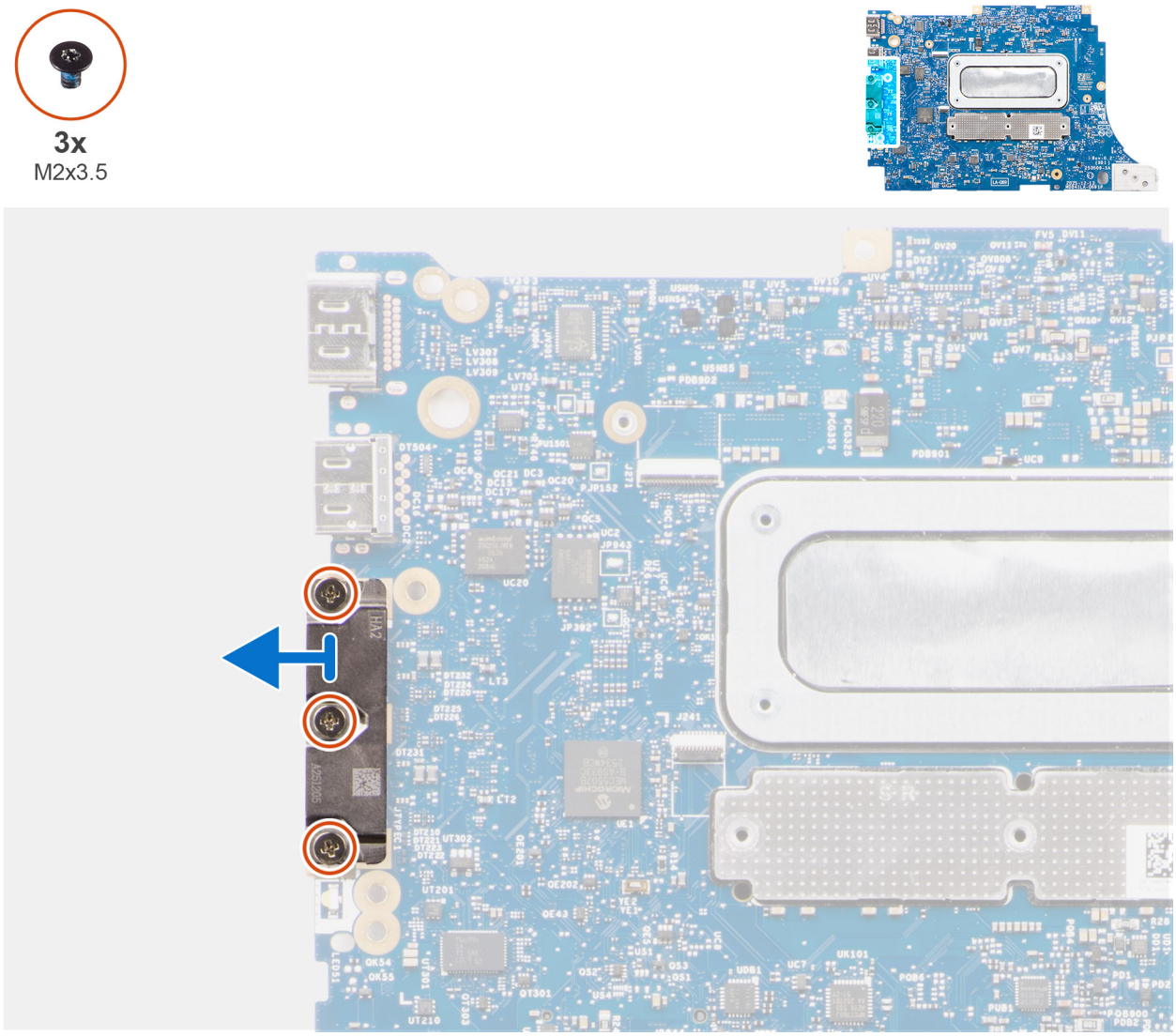


Figure 101. Removing the USB Type-C module

Steps

1. Flip the system board over.
2. Remove the three screws (M2x3.5) 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.

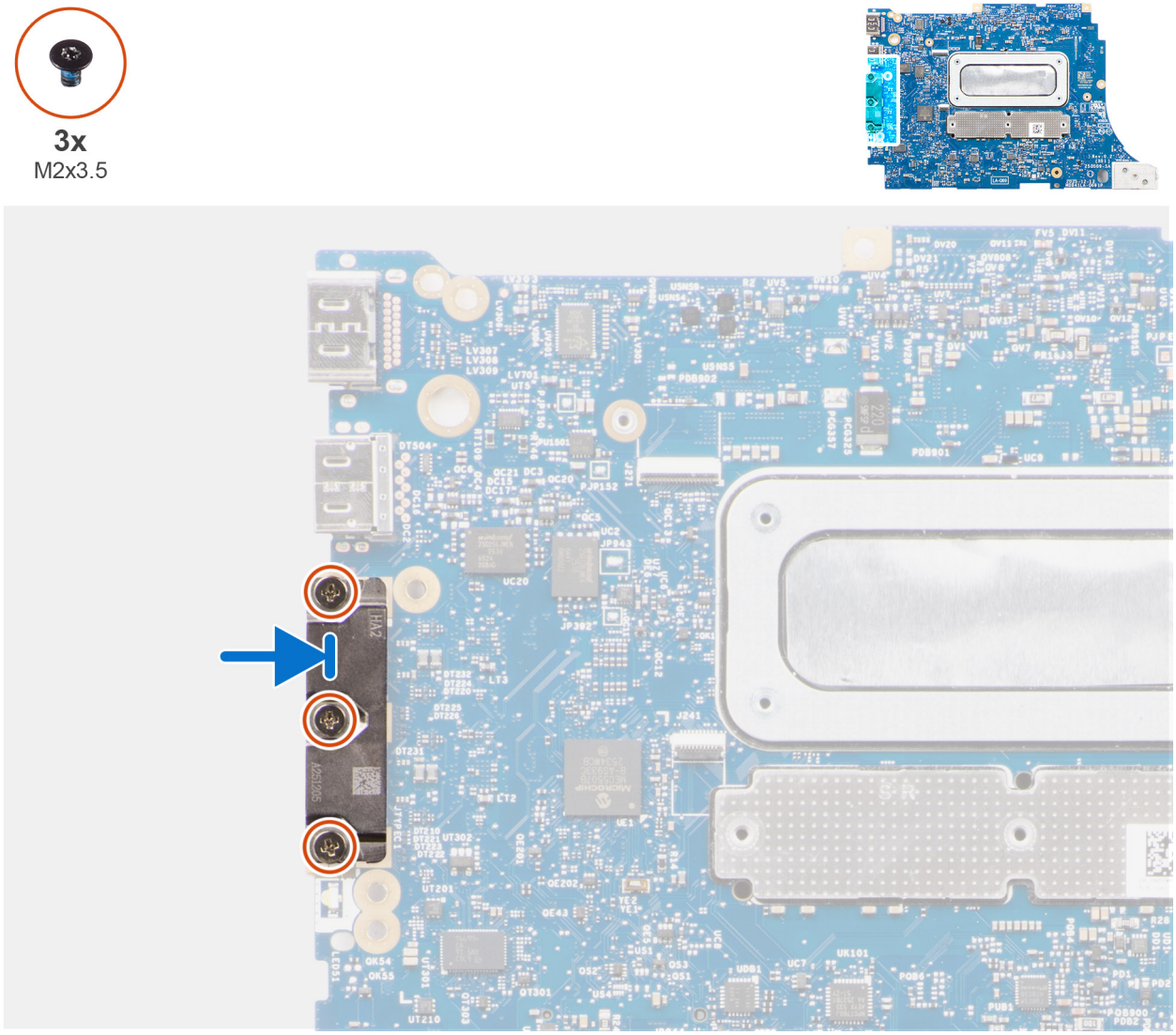


Figure 102. Installing the USB Type-C module

Steps

1. Place the USB Type-C module onto the slot on the bottom side of the system board.
2. Replace the three screws (M2x3.5) 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 (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

   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 fan (speakers) or the fan (speaker assembly), whichever is applicable.
3. Install the battery.
4. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Install the WLAN card.
6. Install one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
7. Install the SODIMM memory or LPCAMM2 memory, whichever is applicable.
8. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
9. Install the nano-SIM card tray, if applicable.
10. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the SODIMM memory or LPCAMM2 memory, whichever is applicable.
5. Remove one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
6. Remove the WLAN card.
7. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Remove the battery.
9. Remove the fan (speakers).
10. Remove the I/O-bridge board.
11. Remove the system board (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

    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 103. Removing the wireless-antenna modules

Steps

1. Remove the four screws (M1.6x2.5) that secure the wireless-antenna modules to the palm-rest assembly.
2. Remove the antenna cables from the routing guides on 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 104. 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 (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

   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 fan (speakers).
3. Install the battery.
4. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
5. Install the WLAN card.
6. Install one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
7. Install the SODIMM memory or LPCAMM2 memory, whichever is applicable.
8. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the SODIMM memory or LPCAMM2 memory, whichever is applicable.
5. Remove one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
6. Remove the WLAN card.
7. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Remove the battery.
9. Remove the speakers or the speaker assembly, whichever is applicable.
10. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
11. Remove the I/O-bridge board.
12. Remove the I/O board.
13. Remove the power button.
14. Remove the system board (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

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.

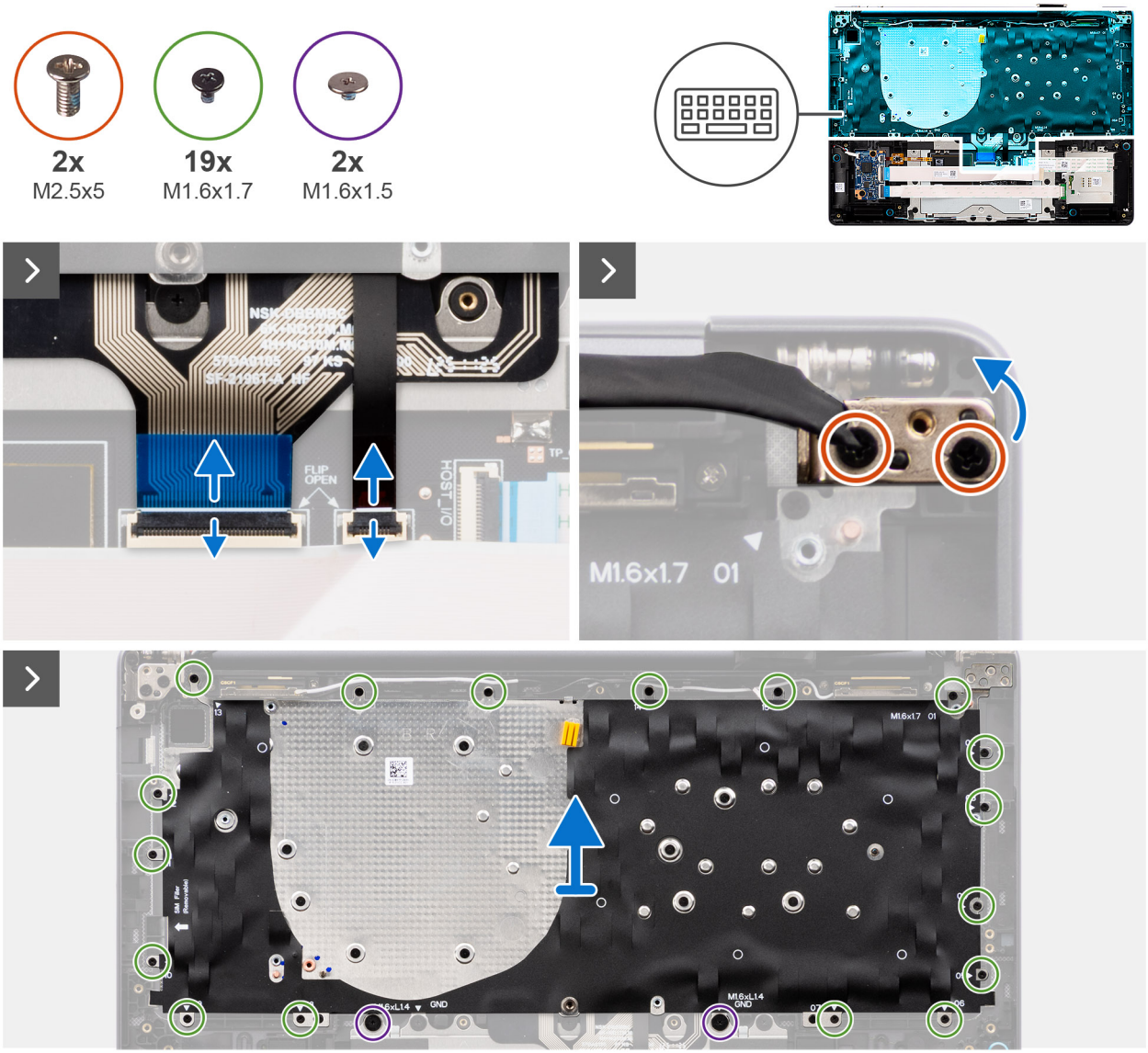


Figure 105. Removing the keyboard



Figure 106. Removing the keyboard

Steps

1. Remove the two screws (M2.5x5) that secure the right display hinge to the palm-rest assembly.
2. Pry open the right display hinge at a 90 degree angle.
3. Lift the latch and disconnect the keyboard cable from the touchpad.
4. Lift the latch and disconnect the keyboard-backlight cable from the touchpad.
5. Remove the 17 screws (M1.6x1.7) that secure the keyboard assembly to the palm-rest assembly
6. Remove the two screws (M1.6x1.4) that secure the keyboard assembly to the palm-rest assembly
7. Lift the keyboard assembly off the palm-rest assembly.
8. Flip over the keyboard assembly.
9. Remove the two screws (M1.6x1.7) that secure the keyboard to the keyboard bracket.
10. 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 107. Installing the keyboard

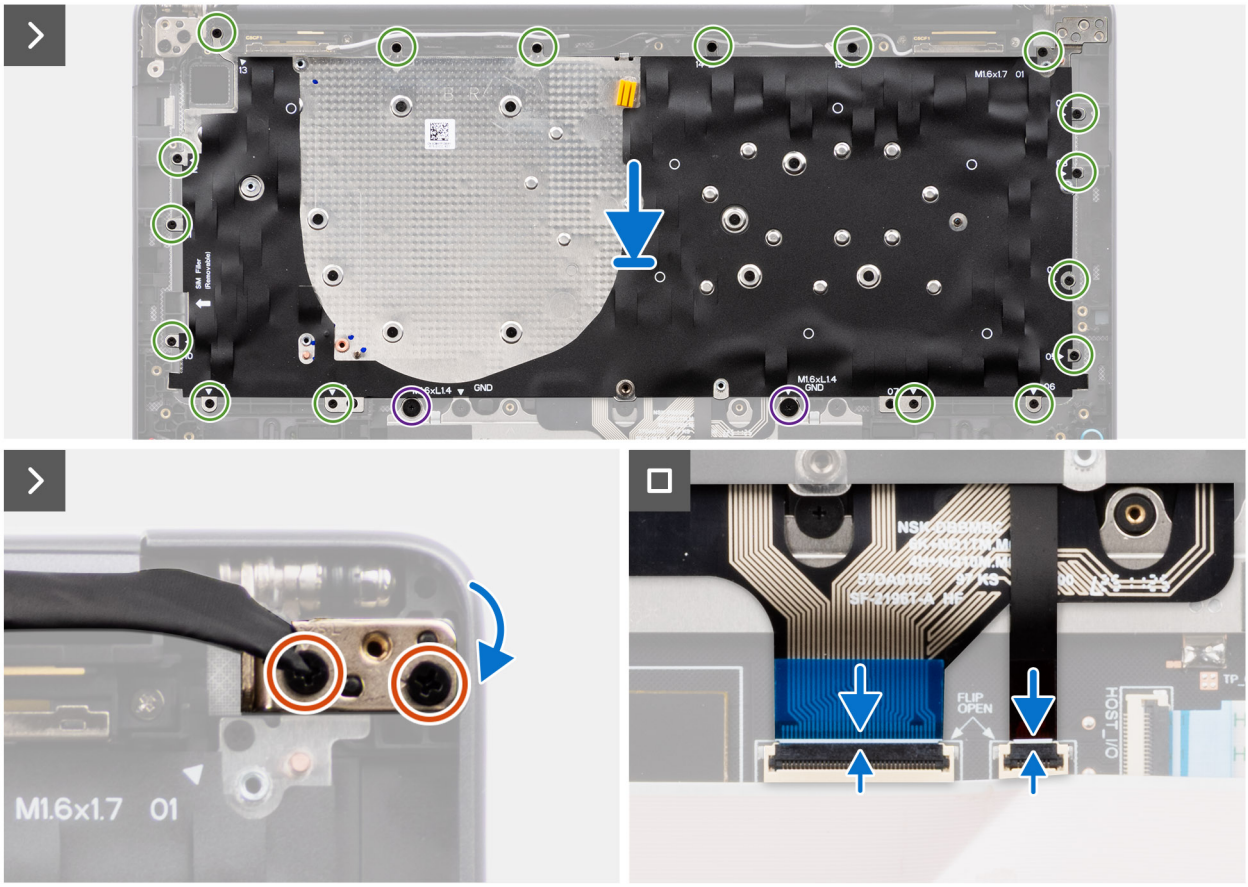


Figure 108. Installing the keyboard

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 two screws (M1.6x1.7) 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 17 screws (M1.6x1.7) that secure the keyboard assembly to the palm-rest assembly
8. Replace the two screws (M1.6x1.4) that secure the keyboard assembly to the palm-rest assembly
9. Close the right display hinge.
10. 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.
11. Replace the two screws (M2.5x5) that secure the right display hinge to the palm-rest assembly.
12. Connect the keyboard-backlight cable from the touchpad and close the latch to secure the cable.
13. Connect the keyboard cable from the touchpad and close the latch to secure the cable.

Next steps

1. Perform steps 1 to 8 of Installing the I/O board.
2. Install the system board (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

   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.

3. Install the power button.
4. Install the fan (speakers) or the fan (speaker assembly), whichever is applicable.
5. Install the speakers or the speaker assembly, whichever is applicable.
6. Install the battery.
7. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Install the WLAN card.
9. Install one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
10. Install the SODIMM memory or LPCAMM2 memory, whichever is applicable.
11. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
12. Install the nano-SIM card tray, if applicable.
13. 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 (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
4. Remove the SODIMM memory or LPCAMM2 memory, whichever is applicable.
5. Remove one of the following solid-state drives, whichever is applicable for your computer:
   - 2230 solid-state drive (SODIMM memory)
   - 2230 solid-state drive (LPCAMM2 memory)
   - 2280 solid-state drive (LPCAMM2 memory)
6. Remove the WLAN card.
7. Remove the 4G WWAN card or the 5G WWAN card, whichever is applicable.
8. Remove the battery.
9. Remove the speakers or the speaker assembly, whichever is applicable.
10. Remove the fan (speakers) or the fan (speaker assembly), whichever is applicable.
11. Remove the I/O-bridge board.
12. Remove the I/O board.
13. Remove the power button.
14. Remove the display assembly.
15. Remove the system board (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

    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.

16. Remove the wireless-antenna modules, if applicable.
17. 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
- palm rest
- smart-card reader
- USH board

- USH-board cable

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

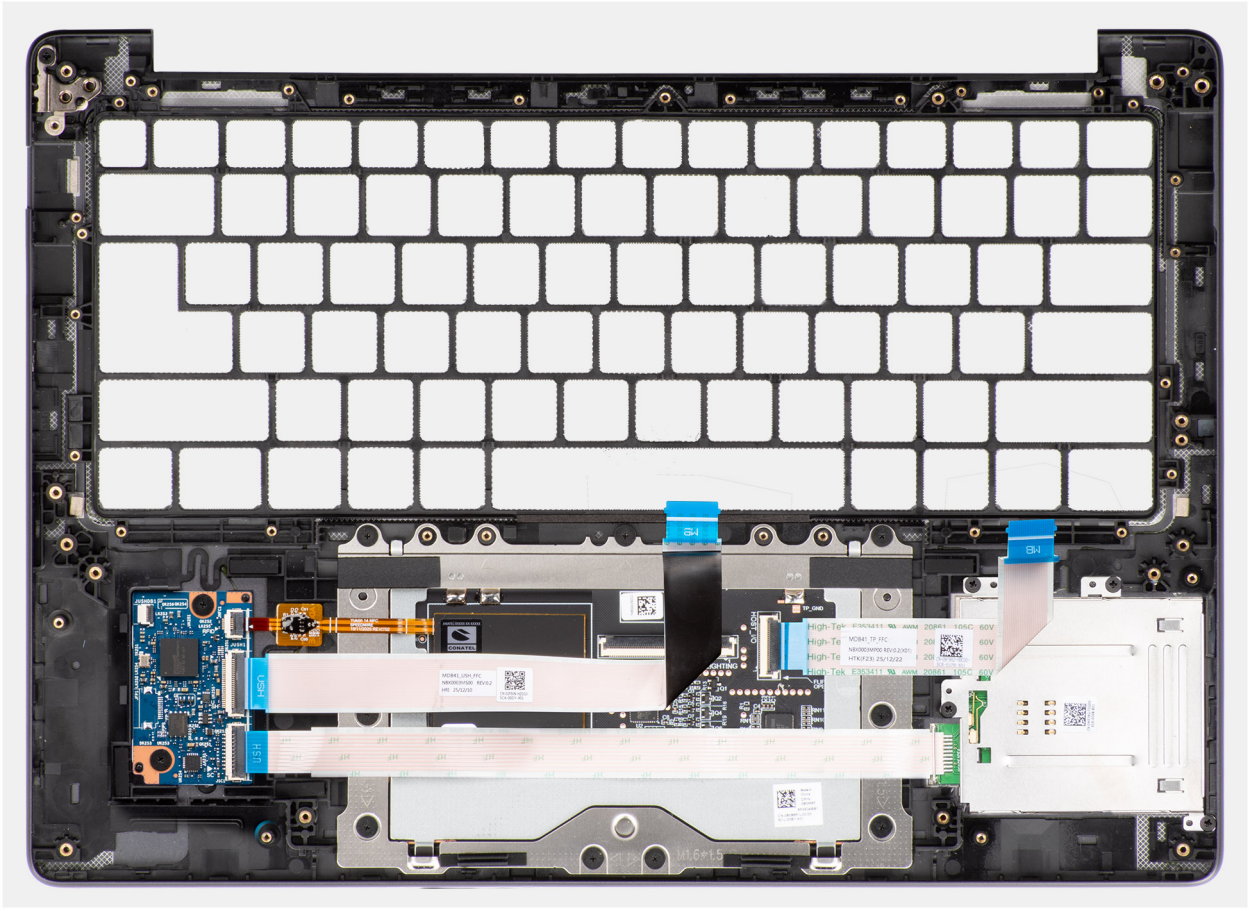


Figure 109. Removing the palm-rest assembly

Steps

1. Using a plastic scribe, pry off the nano-SIM card slot filler from the palm-rest assembly.

   NOTE: This step is applicable only for computer shipped without a WWAN module.

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
- palm rest
- smart-card reader
- USH board

- USH-board cable

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

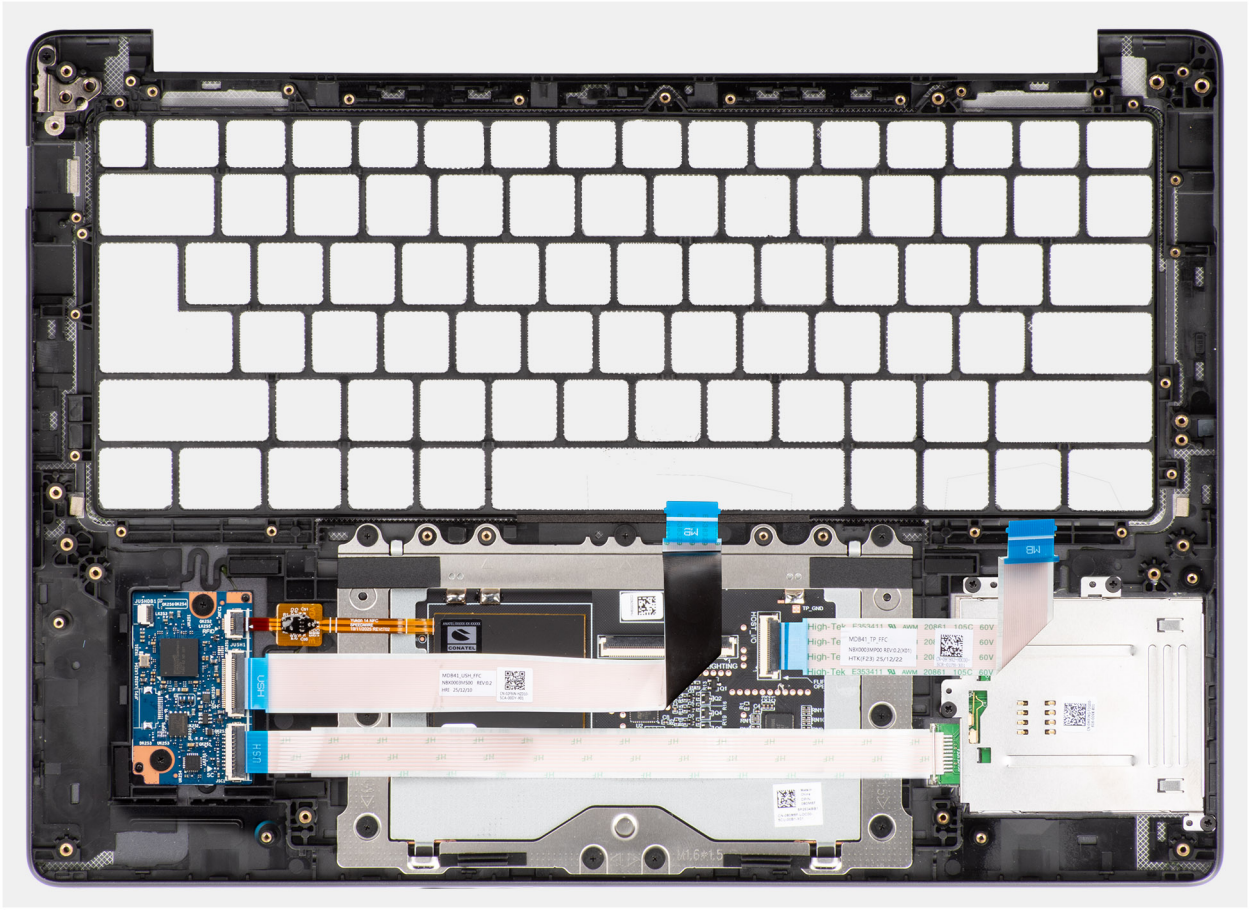


Figure 110. Installing the palm-rest assembly

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.

NOTE: This step is applicable only for computer shipped without a WWAN module.

Next steps

1. Install the keyboard.
2. Perform steps 1 to 8 of Installing the I/O board.
3. Install the wireless-antenna modules, if applicable.
4. Install the system board (SODIMM memory) or the system board (LPCAMM2 memory), whichever is applicable.

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.

5. Install the display assembly.
6. Install the power button.
7. Install the fan (speakers) or the fan (speaker assembly), whichever is applicable.
8. Install the speakers or the speaker assembly, whichever is applicable.
9. Install the battery.
10. Install the 4G WWAN card or the 5G WWAN card, whichever is applicable.
11. Install the WLAN card.

12. Install one of the following solid-state drives, whichever is applicable for your computer:
    - 2230 solid-state drive (SODIMM memory)
    - 2230 solid-state drive (LPCAMM2 memory)
    - 2280 solid-state drive (LPCAMM2 memory)
13. Install the SODIMM memory or LPCAMM2 memory, whichever is applicable.
14. Install the base cover (Full Aluminium) or the base cover (Aluminium and Glass Fiber Composite), whichever is applicable.
15. Install the nano-SIM card tray, if applicable.
16. Follow the procedure in After working inside your computer.

4

Software

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

Operating system

Your Dell Pro 5 14 P514260 supports the following operating systems:

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

Drivers and downloads

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

5

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 8. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follows the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restart the computer.

F12 One Time Boot menu

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

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

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

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

NOTE: XXX denotes the SATA drive number.

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

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

View Advanced Setup options

About this task

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

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

To enable Advanced Setup:

Steps

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

View Service options

About this task

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

NOTE: Service options are described in BIOS Setup options.

To view Service options:

Steps

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

BIOS Setup options

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

Table 9. BIOS Setup options—Overview menu

Overview	Description
Dell Pro 5 14 P514260	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.
Manufacture Date	Displays the manufacture date of the computer.

Table 9. BIOS Setup options—Overview menu (continued)

Overview	Description
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the Express Service Code of the computer.
Ownership Tag	Displays the Ownership Tag of the computer.
Signed Firmware Update	Displays whether the Signed Firmware Update is enabled on your computer. By default, the **Signed Firmware Update** option is enabled.
System UUID	Displays the Universally Unique Identifier of the computer.
Battery Information	
Primary	Displays the primary battery of the computer.
Battery Level	Displays the battery level of the computer.
Battery State	Displays the battery state of the computer.
Health	Displays the battery health of the computer.
AC Adapter	Displays whether an AC adapter is connected. If connected, displays the type of AC adapter that is connected.
Battery Life Type	Displays the battery life type of the computer.
Processor Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Current Clock Speed	Displays the current processor clock speed.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Processor L2 Cache	Displays the processor L2 cache size.
Processor L3 Cache	Displays the processor L3 cache size.
Microcode Version	Displays the microcode version.
Intel Hyper-Threading Capable	Displays whether the processor is Hyper-Threading (HT) capable.
Intel vPro Technology	Displays whether Intel vPro Technology used.
Memory Information	
Memory Installed	Displays the total memory that is installed on the computer.
Memory Available	Displays the total memory available on the computer.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology that is used for the memory.
DIMMA	Displays the memory of the module installed in DIMM A.
DIMMB	Displays the memory of the module installed in DIMM B.
Devices Information	
Panel Type	Displays the type of display panel available on the computer.
Panel Revision	Displays the panel revision number.
Privacy Screen	Displays if there is a privacy screen on the display panel.

Table 9. BIOS Setup options—Overview menu (continued)

Overview	Description
Video Controller	Displays the type of video controller available on the computer.
Video Memory	Displays the video memory information of the computer.
Wi-Fi Device	Displays the wireless device information of the computer.
Native Resolution	Displays the native resolution of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.
Audio Controller	Displays the audio controller information of the computer.
Bluetooth Device	Displays the Bluetooth device information of the computer.
LOM MAC Address	Displays the LAN On Motherboard MAC Address
Pass Through MAC Address	Displays the MAC address of the video pass-through.
Cellular Device	Displays if a cellular device is installed.

Table 10. BIOS Setup options—Boot Configuration menu

Boot Configuration	Description
Boot Sequence	
Boot Sequence	Displays the boot sequence.
Enable PXE Boot Priority	When enabled, allows a computer to boot an operating system or installation image from a remote network server.
UEFI Network Boot Order	Allows administrators to choose the priority between **IPv4** and **IPv6** network protocols when performing a network boot.
Secure Digital (SD) Card Boot	Enables or disables read-only boot from Secure Digital (SD) card. By default, the **Secure Digital (SD) Card Boot** option is enabled.
Secure Boot	Secure Boot is a method of guaranteeing the integrity of the boot path by performing additional validation of the operating system and PCI add-in cards. The computer stops booting to the operating system when a component is not authenticated during the boot process. Secure Boot can be enabled in BIOS setup or using management interfaces like Dell Command|Configure, but can only be disabled from BIOS setup.
Enable Secure Boot	Enables the computer to boot using only validated boot software. By default, 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 must be in UEFI boot mode and the Enable Legacy Option ROMs option must be turned off.
Secure Boot Mode	Enables or disables the Secure Boot operation mode. By default, the **Deployed Mode** is selected. **NOTE:** **Deployed Mode** should be selected for normal operation of Secure Boot.
Expert Key Management	
Enable Custom Mode	Enables or disables the ability to modify the keys in the PK, KEK, db, and dbx security key databases to be modified. By default, the **Enable Custom Mode** option is disabled.

Table 10. BIOS Setup options—Boot Configuration menu (continued)

Boot Configuration	Description
Custom Mode Key Management	Selects the custom values for expert key management. By default, the **PK** option is selected.

Table 11. BIOS Setup options—Integrated Devices menu

Integrated Devices	Description
Date/Time	
Date	Sets the computer date in MM/DD/YYYY format. Changes to the date format take effect immediately.
Time	Sets the computer time in HH/MM/SS 24-hour format. You can select between a 12-hour and 24-hour clock. Changes to the time format take effect immediately.
Camera	
Enable Camera	Enables the camera. By default, the **Enable Camera** option is enabled. **NOTE:** Depending on the configuration ordered, the camera setup option may not be available.
Audio	
Enable Audio	Enables all integrated audio controller. By default, all the options are enabled.
Enable Microphone	Enables the microphone. By default, the **Enable Microphone** option is enabled. **NOTE:** Depending on the configuration ordered, the microphone setup option may not be available.
Enable Internal Speaker	Enables the internal speaker. By default, the **Enable Intenal Speaker** option is enabled.
USB/Thunderbolt Configuration	
Enable USB Boot Support	Enables booting from USB mass storage devices that are connected to external USB ports. By default, the **Enable USB Boot Support** option is enabled.
Enable External USB Ports	Enables the external USB ports. By default, the **Enable External USB Ports** option is enabled.
Enable Thunderbolt Technology Support	
Enable Thunderbolt Technology Support	Enables the associated ports and adapters for Thunderbolt Technology support. By default, the **Enable Thunderbolt Technology Support** option is enabled.
Enable Thunderbolt Boot Support	
Enable Thunderbolt Boot Support	Enables the Thunderbolt adapter-peripheral device and USB devices that are connected to the Thunderbolt adapter to be used during BIOS Preboot. By default, the **Enable Thunderbolt Boot Support** option is disabled.
Enable Thunderbolt (and PCIe behind TBT) pre-boot modules	Enables the PCIe devices that are connected through a Thunderbolt adapter to run the PCIe devices UEFI Option ROM (if present) during preboot.

Table 11. BIOS Setup options—Integrated Devices menu (continued)

Integrated Devices	Description
	By default, the **Enable Thunderbolt (and PCIe behind TBT) pre-boot modules** option is disabled.
Disable USB4 PCIE Tunneling	Disables the USB4 PCIE Tunneling option. By default, the **Disable USB4 PCIE Tunneling** option is disabled.
Video/Power only on Type-C Ports	Enables or disables the Type-C port functionality to video or only power. By default, the **Video/Power only on Type-C Ports** option is disabled.
Type-C Dock	
Type-C Dock Override	Enables or disables to use connected Type-C Dell Dock to provide data stream with external USB ports disabled. When Type-C Dock override is enabled, the Video/Audio/LAN submenu is activated. By default, the **Type-C Dock Override** option is enabled.
Type-C Dock Audio	Enables or disables the usage of audio inputs and outputs from the connected Type-C Dell docking station. By default, the **Type-C Dock Audio** option is enabled.
Type-C Dock LAN	Enables or disables the usage of LAN on the external ports of the connected Type-C Dell docking station. By default, the **Type-C Dock LAN** option is enabled.
Miscellaneous Devices	
Enable Fingerprint Reader Device	Enables the Fingerprint Reader Device option. By default, the **Enable Fingerprint Reader Device** option is enabled.
Unobtrusive mode	When enabled, turns off all system light and sound.
Dust Filter Maintenance	Sets the frequency in which Dust Filter Maintenance notifications are displayed pre-boot.

Table 12. BIOS Setup options—Storage menu

Storage	Description
SATA/NVMe Operation	
SATA/NVMe Operation	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.
Storage Interface	Displays the information of various onboard drives.
Port Enablement	Enables or disables the M.2 PCIe SSD option. By default, the **M.2 PCIe SSD** option is enabled.
SMART Reporting	When enabled, the BIOS can receive analytical information from integrated drives and notifications during startup about possible future failure of the drive.
Drive Information	Displays the information of onboard drives.

Table 13. BIOS Setup options—Display menu

Display	Description
Display Brightness	

Table 13. BIOS Setup options—Display menu (continued)

Display	Description
Brightness on battery power	By default, the screen brightness is set to 50 when the computer is running on battery power. Set the screen brightness when the computer is running on battery power.
Brightness on AC power	By default, the screen brightness is set to 100 when the computer is running on AC power. Set the screen brightness when the computer is running on AC power.
Touchscreen	Enables or disables the touch screen option. By default, the **Touchscreen** option is enabled.
Full Screen Logo	Enables or disables the computer to display a full-screen logo, if the image matches screen resolution. By default, the **Full Screen Logo** option is disabled.

Table 14. BIOS Setup options—Connection menu

Connection	Description
Network Controller Configuration	
Integrated NIC	Controls the on-board LAN controller.
Wireless Device Enable	
WWAN	Enables or disables the internal WWAN device. By default, the **WWAN** option enabled.
WLAN	Enables or disables the internal WLAN device. By default, the **WLAN** option enabled.
Bluetooth	Enables or disables the internal Bluetooth device. By default, the **Bluetooth** option enabled.
Enable UEFI Network Stack	Enables or disables the UEFI Network Stack and controls the onboard LAN Controller. By default, the **Enable UEFI Network Stack** option is enabled.
IPv4 PXE Boot	Enables the IPv4 PXE Boo toption.
IPv6 PXE Boot	Enables the IPv6 PXE Boo toption.
Wireless Radio Control	
Control WLAN Radio	Allows the computer to detect a wired network connection and then disable the selected wireless radios (WLAN). Upon disconnection from the wired network, the selected wireless radios are re-enabled. By default, the **Control WLAN Radio** option is disabled.
Control WWAN Radio	Allows the computer to detect a wired network connection and then disable the selected wireless radios (WWAN). Upon disconnection from the wired network, the selected wireless radios are re-enabled. By default, the **Control WWAN Radio** option is disabled.
HTTP(s) Boot Feature	
HTTP(s) Boot	Enables HTTP(s) Boot features.
HTTP(s) Boot Modes	Select the HTTP(s) Boot Mode.
CA Certificate	Upload a CA certificate to connect to a HTTPs Boot server or delete an existing CA certificate.

Table 15. BIOS Setup options—Power menu

Power	Description
Battery Configuration	Enables or disables the computer to run on battery during peak power usage hours. Use the table **Custom Charge Start** and **Custom Charge Stop**, to prevent AC power usage between certain times of each day. By default, the **Adaptive** option is selected. Battery settings are adaptively optimized based on your typical battery usage pattern.
Advanced Configuration	
Enable Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. When enabled, Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day. By default, the **Enable Advanced Battery Charge Configuration** option is disabled.
Peak Shift	
Enable Peak Shift	Enables the computer to switch to battery power automatically during peak energy usage hours. By default, the **Enable Peak Shift** option is disabled.
Thermal Management	Allows you to manage the fan settings to regulate processor temperature and control computer performance, noise, and thermal levels. By default, the **Optimized** option is selected.
Type-C Connector Power	
Type-C Connector Power	Set the maximum power that can be drawn from the Type-C connector.
USB PowerShare	
Enable USB PowerShare	Enables PowerShare feature via a supported USB connection when the computer is in a sleep state.
Thermal Management	
Thermal Management	Set the thermal profile of your computer. This setting may be overriden by the Power Mode configuration.
USB Wake Support	
Wake on Dell USB-C Dock	When enabled, connecting a Dell USB-C Dock wakes the computer from Standby, Hibernate, and Power Off. By default, the **Wake on Dell USB-C Dock** option is enabled.
Block Sleep	Enables or disables the computer from entering Sleep (S3) mode in the operating system. By default, the **Block Sleep** option is disabled. **NOTE:** When enabled, the computer does not go to Sleep, Intel Rapid Start is disabled automatically, and the operating system power option is blank if it was set to Sleep.
Lid Switch	
Enable Lid Switch	Enables or disables the Lid Switch. By default, the **Enable Lid Switch** option is enabled.
Power On Lid Open	When enabled, it allows the computer to turn on from the off state whenever the lid is opened. By default, the **Power On Lid Open** option is enabled.

Table 15. BIOS Setup options—Power menu (continued)

Power	Description
Intel Speed Shift Technology	Enables or disables the Intel Speed Shift Technology support. When enabled, the operating system selects the appropriate processor performance automatically. By default, the **Intel Speed Shift Technology** option is enabled.

Table 16. BIOS Setup options—Security menu

Security	Description
Trusted Platform Module (TPM)	The Trusted Platform Module (TPM) provides various cryptographic services which serve as the cornerstone for many platform security technologies. Trusted Platform Module (TPM) is a security device that stores computer-generated keys for encryption and features such as BitLocker, Virtual Secure Mode, remote Attestation. By default, the **Trusted Platform Module (TPM)** option is enabled. For additional security, Dell Technologies recommends keeping **Trusted Platform Module (TPM)** enabled to allow these security technologies to fully function. **NOTE:** The options that are listed apply to computers with a discrete **Trusted Platform Module (TPM)** chip.
TPM On	Allows you to enable or disable TPM. By default, the **TPM On** option is enabled. For additional security, Dell Technologies recommends keeping **TPM On** enabled to allow these security technologies to fully function.
Physical Presence Interface (PPI) Bypass	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. For additional security, Dell Technologies recommends keeping the **PPI Bypass for Enable Commands** option enabled. For additional security, Dell Technologies recommends keeping the **PPI Bypass for Disable Commands** option disabled. For additional security, Dell Technologies recommends keeping the **PPI Bypass for Clear Commands** option disabled.
Attestation Enable	The **Attestation Enable** option controls the endorsement hierarchy of the 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.
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.

Table 16. BIOS Setup options—Security menu (continued)

Security	Description
SHA-256	Enables selection of 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 BIOS setup of your computer. 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.
Intel Platform Trust Technology (PTT)	Intel PTT is a firmware-based Trusted Platform Module (fTPM) device that is part of Intel chipsets. It provides credential storage and key management that can replace the equivalent functionality of a discrete TPM chip. **NOTE:** The options that are listed apply to computers without a discrete **Trusted Platform Module (TPM)**.
PTT On	Enables or disables the Intel PTT option. By default, the **PTT On** option is enabled. For additional security, Dell Technologies recommends keeping the **PTT On** option enabled.
Physical Presence Interface (PPI) Bypass for Clear Commands	The PPI Bypass for Clear Commands option allows the operating system to manage certain aspects of PTT. When enabled, you are not prompted to confirm changes to the PTT configuration. By default, the **PPI Bypass for Clear Commands** option is disabled. For additional security, Dell Technologies recommends keeping the **PPI Bypass for Clear Commands** option disabled.
Clear	When enabled, the **Clear** option clears the information that is stored in the PTT fTPM after exiting the BIOS setup of your computer. 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 PTT fTPM data needs to be cleared.
Chassis intrusion	
Chassis Intrusion Detection	The chassis intrusion detection enables a physical switch that triggers an event when the computer cover is opened. When set to **Enabled**, a notification is displayed on the next boot and the event is logged in the BIOS Events log. When set to **On-Silent**, the event is logged in the BIOS Events log, but no notification is displayed. When set to **Disabled**, no notification is displayed and no event is logged in the BIOS Events log.

Table 16. BIOS Setup options—Security menu (continued)

Security	Description
	By default, the **Chassis Intrusion Detection** option is enabled. For additional security, Dell Technologies recommends keeping the **Chassis Intrusion Detection** option enabled.
Block Boot Until Cleared	Enables or disables the Block Boot Until Cleared option. By default, the **Block Boot Until Cleared** option is disabled. **NOTE:** The Block Boot Until Cleared option prevents the system from booting after a chassis intrusion event is detected. The warning must be cleared from BIOS Setup, by clearing the Chassis Intrusion Warning option. If a BIOS Admin Password is set, the password must be entered prior to clearing the Chassis Intrusion Warning. Dell Technologies recommends keeping the **Block Boot Until Cleared** option disabled.
Chassis Intrusion Power Off	Enables or disables the Chassis Intrusion Power Off option. By default, the **Chassis Intrusion Power Off** option is disabled. **NOTE:** When enabled, the computer immediately shuts down when a chassis intrusion is detected. This setting could cause data loss or corruption. Dell Technologies recommends keeping the **Chassis Intrusion Power Off** option disabled.
Chassis Intrusion TPM Clear	Enables or disables the Chassis Intrusion TPM Clear option. By default, the **Chassis Intrusion TPM Clear** option is disabled. **NOTE:** When enabled, the computer clears the TPM when a chassis intrusion is detected. This setting could cause data loss or corruption. Dell Technologies recommends keeping the **Chassis Intrusion TPM Clear** option disabled.
Chassis Intrusion Data Wipe	Enables or disables the Chassis Intrusion Data Wipe option. By default, the **Chassis Intrusion Data Wipe** option is disabled. **NOTE:** When enabled, the computer will wipe data from all the internal drives when a chassis intrusion is detected. This setting could cause data loss or corruption. Dell Technologies recommends keeping the **Chassis Intrusion Data Wipe** option disabled.
Device Configuration Hotkey Access	The OROM Keyboard Access feature allows you to enter the Option ROM configuration screens, using hotkeys during the boot process. This setting controls only the Intel RAID (CTRL+I), MEBX (CTRL+P), and LSI RAID (CTRL+C) Option ROMs. Other preboot Option ROMs which support entry via a key sequence are not affected by this setting. For additional security, Dell Technologies recommends keeping the **OROM Keyboard Access** option enabled.
Legacy Manageability Interface Access	Allows the administrator to control the access to BIOS configuration through the Legacy Manageability Interface option. When enabled, this prevents the BIOS Administrator password-based manageability tools from running, prevents some Dell software applications from reading configuration settings, and/or prevents changes to the BIOS configuration settings. When enabled, this option only supports the Authenticated BIOS Manageability Interface (ABI) for managing the BIOS configuration changes. To support this feature, ABI must be enabled and provisioned.

Table 16. BIOS Setup options—Security menu (continued)

Security	Description
	When set to **Enabled**, the Legacy Manageability Interface can be used to read and change BIOS configuration settings. When set to **Read-Only**, BIOS configuration settings can be read, but cannot be changed through the Legacy Manageability Interface. When set to **Disabled**, the Legacy Manageability Interface is disabled. BIOS configuration reads and writes are blocked.
SMM Security Mitigation	Enables or disables additional UEFI SMM Security Mitigation protections. This option uses the Windows SMM Security Mitigations Table (WSMT) to confirm to the operating system that security best practices have been implemented by the UEFI firmware. By default, the **SMM Security Mitigation** option is enabled. For additional security, Dell Technologies recommends keeping the **SMM Security Mitigation** option enabled unless you have a specific application which is not compatible. **NOTE:** This feature may cause compatibility issues or loss of functionality with some legacy tools and applications.
Thunderbolt Security Level	Thunderbolt Security Level gives you control to authenticate Thunderbolt devices, when connected to the computer. When set to **User Authorization** the computer will prompt you to allow each Thunderbolt device that you connect to the computer. **NOTE:** Thunderbolt devices may have access to read and write the computer memory. You should only allow devices which you trust. Dell Technologies recommends keeping the **Thunderbolt Security Level** option to **User Authorization**.
Disable USB4 PCIe Tunneling	The Disable USB4 PCIe Tunneling option allows a system administrator to disable the PCIe functionality of Thunderbolt ports. When enabled, the Disable USB4 PCIe Tunneling option will prevent Thunderbolt ports from operating in native TBT mode, and any attached PCIe devices will not function (e.g. PCIe NIC). Dell Technologies recommends keeping the **Disable USB4 PCIe Tunneling** option to disabled for full functionality. For enhanced security, Dell Technologies recommends keeping the **Disable USB4 PCIe Tunneling** option enabled.
Data Wipe on Next Boot	
Start Data Wipe	Data Wipe is a secure wipe operation that deletes information from a storage device. **CAUTION: The secure Data Wipe operation deletes information in a way that it cannot be reconstructed.** Commands such as delete and format in the operating system may remove files from showing up in the file system. However, they can be reconstructed through forensic means as they are still represented on the physical media. Data Wipe prevents this reconstruction and the data can no longer be recovered. When enabled, the data wipe option provides prompts to wipe any storage devices that are connected to the computer on the next boot. By default, the **Start Data Wipe** option is disabled.
Absolute	Absolute Software provides various cyber security solutions, some requiring software preloaded on Dell computers and integrated into the BIOS. To use these

Table 16. BIOS Setup options—Security menu (continued)

Security	Description
	features, you must enable the Absolute BIOS setting and contact Absolute for configuration and activation. By default, the **Absolute** option is enabled. For additional security, Dell Technologies recommends keeping the **Absolute** option enabled. **NOTE:** When the Absolute features are activated, the Absolute integration cannot be disabled from the BIOS setup screen.
UEFI Boot Path Security	Enables or disables the computer to prompt the user to enter the Administrator password (if set) when booting to a UEFI boot path device from the F12 boot menu. By default, the **Always Except Internal HDD** option is enabled.
Firmware Device Tamper Detection	Allows you to control the firmware device tamper detection feature. This feature notifies the user when the firmware device is tampered. When enabled, a screen warning messages are displayed on the computer and a tamper detection event is logged in the BIOS Events log. The computer fails to reboot until the event is cleared. By default, the **Firmware Device Tamper Detection** option is enabled. For additional security, Dell Technologies recommends keeping the **Firmware Device Tamper Detection** option enabled.

Table 17. BIOS Setup options—Passwords menu

Passwords	
Administrator Password	The Administrator Password prevents unauthorized access to the BIOS Setup options. Once the administrator password is set, the BIOS setup options can only be modified after providing the correct password. The following rules and dependencies apply to the Administrator Password - ● The administrator password cannot be set if computer and/or internal storage device passwords are already set. ● The administrator password can be used in place of the computer and/or internal storage 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	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.

Table 17. BIOS Setup options—Passwords menu (continued)

Passwords	
Hard Drive Password	The Hard Drive Password can be set to prevent unauthorized access of the data stored on the hard drive. The computer prompts for the hard drive password during boot in order to unlock the drive. A password-secured hard drive stays locked even when removed from the computer or placed into another computer. It prevents an attacker from accessing data on the drive without authorization. The following rules and dependencies apply when the Hard Drive Password is used - ● The hard drive password option cannot be accessed when a hard drive is disabled in the BIOS setup. ● The computer shuts down when idle for approximately 10 minutes at the hard drive password prompt. ● The computer shuts down after three incorrect attempts to enter the hard drive password and treats the hard drive as not available. ● The hard drive does not accept password unlock attempts after five incorrect attempts to enter the hard drive password from the BIOS Setup. The hard drive password must be reset for the new password unlock attempts. ● The computer treats the hard drive as not available when the **Esc** key is pressed at the hard drive password prompt. ● The hard drive password is not prompted when the computer resumes from standby mode. When the hard drive is unlocked by the user before the computer goes into standby mode, it remains unlocked after the computer resumes from standby mode. ● If the computer and hard drive passwords are set to the same value, the hard drive unlocks after the correct computer password is entered. Dell Technologies recommends using a hard drive password to protect unauthorized data access.
Owner Password	The Owner Password is typically used when a computer is loaned or leased, and the end user sets their own computer or hard drive password. The Owner Password can provide override access to unlock the computer when it is returned. The Owner Password cannot be set using BIOS Setup. System lessors are given a tool which enables them to configure the Owner Password. The following rules and dependencies apply when the Owner Password is used - ● The owner password cannot be set when the administrator password is already set. ● The owner password can be used in place of the administrator, computer, or storage passwords. **NOTE:** The hard drive password must be set on the computer with the owner password. Dell Technologies recommends that only computer lessors use the owner password.
Strong Password	The Strong Password feature enforces stricter rules for administrator, owner, and computer passwords. When enabled, the following rules are enforced - ● The minimum length of the password is set to eight characters. ● The password is required to include at least one upper case and one lower case character. **NOTE:** These requirements do not affect the hard drive password. By default, the **Strong Password** option is enabled. For additional security, Dell Technologies recommends keeping the **Strong Password** option enabled as it requires passwords to be more complex.

Table 17. BIOS Setup options—Passwords menu (continued)

Passwords	
Password Configuration	The Password configuration page includes several options for changing the requirements of BIOS passwords. You can modify the minimum and maximum length of the passwords and require passwords to contain certain character classes (upper case, lower case, digit, special character). Dell Technologies recommends setting the minimum password length to at least eight characters.
Password Bypass	The **Password Bypass** option allows the computer to reboot from the operating system without entering the computer or hard drive password. If the computer has already booted to the operating system, it is presumed that the user has already entered the correct computer or hard drive password. **NOTE:** This option does not remove the requirement to enter the password after shutting down. By default, the **Password Bypass** option is enabled. For additional security, Dell Technologies recommends keeping the **Password Bypass** option enabled.
Password Changes	
Allow Non-Admin Password Changes	The **Allow Non-Admin Password Changes** option in BIOS setup allows an end user to set or change the computer or hard drive passwords without entering the administrator password. This gives an administrator control over the BIOS settings but enables an end user to provide their own password. By default, the **Allow Non-Admin Password Changes** option is disabled. For additional security, Dell Technologies recommends keeping the **Allow Non-Admin Password Changes** option disabled.
Non-Admin Setup Changes	The **Non-Admin Setup Changes** option allows an end user to configure the wireless devices without requiring the administrator password. By default, the **Non-Admin Setup Changes** option is disabled. For additional security, Dell Technologies recommends keeping the **Non-Admin Setup Changes** option disabled.
Admin Setup Lockout	The **Admin Setup Lockout** option prevents an end user from even viewing the BIOS setup configuration without first entering the administrator password (if set). By default, the **Admin Setup Lockout** option is disabled. For additional security, Dell Technologies recommends keeping the **Admin Setup Lockout** option disabled.
Recovery Password	The Recovery Password can be used when a system owner forgets the administrator, system, or hard drive password. You can get an unlock code from Dell Support over the phone after verifying ownership details. The unlock code overrides and removes the existing password. **NOTE:** When a hard drive password is overridden using this method, the data on the hard drive is erased if secure erase was enabled when setting the password.
Master Password Lockout	
Enable Master Password Lockout	The Master Password Lockout setting allows you to disable the Recovery Password feature. If the computer, administrator, or hard drive password is forgotten, the computer becomes unusable. **NOTE:** When the owner password is set, the Master Password Lockout option is not available.

Table 17. BIOS Setup options—Passwords menu (continued)

Passwords	
	NOTE: When an internal hard drive password is set, it must first be cleared before Master Password Lockout can be changed. By default, the **Enable Master Password Lockout** option is disabled. Dell does not recommend enabling the **Master Password Lockout** unless you have implemented your own password recovery computer.
Allow Non-Admin PSID Revert	
Enable Allow Non-Admin PSID revert	This option controls access to the Physical Security ID revert of NVMe hard-drives.

Table 18. BIOS Setup options—Update, Recovery menu

Update, Recovery	
UEFI Capsule Firmware Updates	
Enable UEFI Capsule Firmware Updates	Enables or disables BIOS updates through UEFI capsule update packages. **NOTE:** Disabling this option blocks the BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS). By default, the **Enable UEFI Capsule Firmware Updates** option is enabled.
BIOS Recovery from Hard Drive	Enables or disables the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. By default, the **BIOS Recovery from Hard Drive** option is enabled. **NOTE:** BIOS Recovery from Hard Drive is not available for self-encrypting drives (SED). **NOTE:** BIOS recovery is designed to fix the main BIOS block and cannot work if the Boot Block is damaged. In addition, this feature cannot work in the event of EC corruption, ME corruption, or a hardware issue. The recovery image must exist on an unencrypted partition on the drive.
BIOS Downgrade	
Allow BIOS Downgrade	Controls flashing of the computer firmware to previous revisions. By default, the **Allow BIOS Downgrade** option is enabled.
SupportAssist OS Recovery	Enables or disables the boot flow for SupportAssist OS Recovery tool in the event of certain computer errors. By default, the **SupportAssist OS Recovery** option is enabled.
BIOSConnect	Enables or disables cloud Service operating system recovery if the main operating system fails to boot with the number of failures equal to or greater than the value specified by the Auto OS Recovery Threshold setup option and local Service operating system does not boot or is not installed. By default, the **BIOSConnect** option is enabled.
Dell Auto OS Recovery Threshold	Allows you to control the automatic boot flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool. By default, the **Dell Auto OS Recovery Threshold** value is set to 2.

Table 19. BIOS Setup options—System Management menu

System Management	
Service Tag	Displays the Service Tag of the computer.

Table 19. BIOS Setup options—System Management menu (continued)

System Management	
Asset Tag	Creates a computer Asset Tag that can be used by an IT administrator to uniquely identify a particular computer. **NOTE:** Once set in BIOS, the Asset Tag cannot be changed.
AC Behavior	
Wake on AC	Enables or disables the computer to turn on and go to boot when AC power is supplied to the computer. By default, the **Wake on AC** option is disabled.
Wake on LAN	Enables or disables the computer to turn on by a special LAN signal. By default, the **Wake on LAN** option is disabled.
Auto On Time	Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. By default, the **Auto On Time** option is disabled.
Intel AMT capability	
Enable Intel AMT capability	Enable Intel AMT capability.
First Power On Date	
Set Ownership Date	Set the Owership Date.
Diagnostics	
OS Agent Requests	Enables OS Agent scheduling of onboard diagnostics on a subsequent boot.
Power-on-Self-Test Automatic Recovery	Enables the BIOS attempt to recover the computer after the computer becomes unresponsive during the BIOS Power-on-Self-Test.

Table 20. BIOS Setup options—Keyboard menu

Keyboard	
Fn Lock Options	Enables or disables the Fn Lock option. By default, the **Fn Lock** option is enabled.
Lock Mode	By default, the **Lock Mode Secondary** option is enabled. With this option, the F1-F12 keys scan the code for their secondary functions.
Keyboard 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 Timeout on AC	Sets the timeout value for the keyboard backlight when an AC adapter is connected to the computer. By default, the **10 seconds** option is selected.
Keyboard Backlight Timeout on Battery	Sets the timeout value for the keyboard backlight when the computer is running only on the battery power. The keyboard backlight timeout value is only effective when the backlight is enabled. By default, the **10 seconds** option is selected.
Device Configuration HotKey Access	Allows you to control whether you can access device configuration screens through hotkeys during computer startup. By default, the **Device Configuration HotKey Access** option is enabled.

Table 20. BIOS Setup options—Keyboard menu (continued)

Keyboard	
	NOTE: This setting controls only the Intel RAID (CTRL+I), MEBX (CTRL+P), and LSI RAID (CTRL+C) Option ROMs. Other preboot Option ROMs, which support entry using a key sequence, are not affected by this setting.

Table 21. BIOS Setup options—Pre-boot Behavior menu

Preboot Behavior	
Adapter Warnings	
Enable Adapter Warnings	Enables the warning messages during boot when the adapters with less power capacity are detected. By default, the **Enable Dock Warning Messages** option is enabled.
Warnings and Errors	Enables or disables the action to be taken when a warning or error is encountered. By default, the **Prompt on Warnings and Errors** option is selected. **NOTE:** Errors deemed critical to the operation of the computer hardware stop the functioning of the computer.
USB-C Warnings	
Enable Dock Warning Messages	Enables the warning messages during boot when the USB-C adapters with less power capacity are detected. By default, the **Enable Dock Warning Messages** option is enabled.
Fastboot	Allows you to configure the speed of the UEFI boot process. By default, the **Thorough** option is selected. Performs complete hardware and configuration initialization during boot.
Extend BIOS POST Time	Sets the BIOS POST (Power-On Self-Test) load time. By default, the **0 seconds** option is selected.
MAC Address Pass-Through	Replaces the external NIC MAC address (in a supported dock or dongle) with the selected MAC address from the computer. By default, the **System Unique MAC Address** option is selected.
Mouse/Touchpad	Defines how the computer handles mouse and touchpad input. By default, the **Touchpad and PS/2 Mouse** option is selected. Leaves the integrated touchpad enabled when an external PS/2 mouse is present.
Sign of Life	
Early Logo Display	Display Logo Sign of Life. By default, the **Early Logo Display** option is enabled.
Early Keyboard Backlight	Keyboard Backlight Sign of Life. By default, the **Early Keyboard Backlight** option is enabled.
Show ownership with Logo	Enables the feature to show system Ownership Tag in addition to the BIOS boot logo when an Ownership Tag has been set.
Unsupported Hardware Warning	Enables the warning notification at startup when unsupported hardware is detected.

Table 22. BIOS Setup options—Virtualization menu

Virtualization Support	
Intel Virtualization Technology	
Enable Intel Virtualization Technology (VT)	When enabled, the computer can run a Virtual Machine Monitor (VMM). By default, the **Enable Intel Virtualization Technology (VT)** option is enabled.
VT for Direct I/O	
Enable Intel VT for Direct I/O	When enabled, the computer can perform Virtualization Technology for Direct I/O (VT-d). VT-d is an Intel method that provides virtualization for memory map I/O. By default, the **Enable Intel VT for Direct I/O** option is enabled.
Intel Trusted Execution Technology (TXT)	Intel Trusted Execution Technology (TXT) is a set of hardware extensions to Intel processors and chipsets. It provides a hardware-based root of trust to ensure that a platform boots with a known good configuration of firmware, BIOS, virtual machine monitor, and operating system. The following must be enabled in order to enable Intel TXT - ● Intel Virtualization Technology - X ● Intel Virtualization Technology - Direct By default, the **Intel Trusted Execution Technology (TXT)** option is enabled. For additional security, Dell Technologies recommends keeping the **Intel Trusted Execution Technology (TXT)** option enabled.
DMA Protection	
Enable Pre-Boot DMA Support	Allows you to control the Pre-Boot DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Enable Pre-Boot DMA Support** option is enabled. For additional security, Dell Technologies recommends keeping the **Enable Pre-Boot DMA Support** option enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable.
Enable OS Kernel DMA Support	Allows you to control the Kernel DMA protection for both internal and external ports. This option does not directly enable DMA protection in the operating system. For operating systems that support DMA protection, this setting indicates to the operating system that the BIOS supports the feature. **NOTE:** This option is not available when the virtualization setting for IOMMU is disabled (VT-d/AMD Vi). By default, the **Enable OS Kernel DMA Support** option is enabled. **NOTE:** This option is provided only for compatibility purposes, since some older hardware is not DMA capable.
Internal Port DMA Compatibility Mode	Enables BIOS notifications when internal ports are not DMA capable.

Table 23. BIOS Setup options—Performance menu

Performance	
Multi-Core Support	
Active Multiple Performance Cores (P-Cores) select	Allows to change the number of P-Cores available to the operating system. The default value is set to the maximum number of cores. By default, the **All Active** option is selected.

Table 23. BIOS Setup options—Performance menu (continued)

Performance	
Intel SpeedStep	
Enable Intel SpeedStep Technology	Enables the computer to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production. By default, the **Enable Intel SpeedStep Technology** option is enabled.
C-State Control	
Enable C-State Control	Enables or disables the ability of the CPU to enter and exit low-power state. When disabled, it disables all C-states. When enabled, it enables all C-states that the chipset or platform allows. By default, the **Enable C-State Control** option is enabled.
Intel Turbo Boost Technology	
Enable Intel Turbo Boost Technology	Enables or disables the Intel TurboBoost mode of the processor. When enabled, the Intel TurboBoost driver increases the performance of the CPU or graphics processor. By default, the **Enable Intel Turbo Boost Technology** option is enabled.
PCIe Resizable Base Address Register (BAR)	
PCIe Resizable Base Address Register (BAR)	Enable PCIe Resizable Base Address Register (BAR) support.
Intel Hyper-Threading Technology	
Enable Intel Hyper-Threading Technology	Enables or disables the Intel Hyper-Threading mode of the processor. When enabled, the Intel Hyper-Threading increases the efficiency of the processor resources when multiple threads run on each core. By default, the **Intel Hyper-Threading Technology** option is enabled.
Dynamic Tuning: Machine Learning	
Enable Dynamic Tuning: Machine Learning	Enables or disables operating system capability to enhance power tuning capabilities depending on the detected workloads. **NOTE:** This option is available for development only. By default, the **Enable Dynamic Tuning: Machine Learning** option is enabled.

Table 24. BIOS Setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear BIOS Event Log	Allows you to select option to keep or clear BIOS events logs. By default, the **Keep Log** option is selected.
Thermal Event Log	
Clear Thermal Event Log	Allows you to select option to keep or clear thermal events logs. By default, the **Keep Log** option is selected.
Power Event Log	
Clear Power Event Log	Allows you to select option to keep or clear power events logs. By default, the **Keep Log** option is selected.

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 25. 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. Flip over the computer.
4. Press and hold the power button for 20 seconds.
5. Wait for one minute.
6. Flip over the computer.

7. Connect the battery cable to the system board.
8. Replace the base cover.

6

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.

Quick charge support on power adapters with detachable Type-C cables

For some Dell power adapters, there is a detachable Type-C cable that connects the power adapter to your computer. To ensure that Quick Charge is supported, the Type-C cable must be able to support a current higher than 3 A.

When the computer is connected to an adapter and turned on, it takes up to three seconds to detect the adapter. When the Type-C cable does not support Quick Charge, the power-adapter LED light flashes for about five seconds before resuming operation.

NOTE: Dell Power adapters are always shipped with a Type-C cable that supports Quick Charge. When using third-party cables, check and ensure that Quick Charge is supported by observing the LED light behavior of the power adapter.

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 26. 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.

Enhanced 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 (display panel) of the Dell laptop or with the video card (GPU) and computer settings.

When you notice screen abnormalities like cracks, 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.
3. Connect the AC adapter (charger) to the computer.
4. Ensure that the LCD screen is clean (no dust particles on the surface of the screen).
5. Press and hold the **D** key and press the power button to enter LCD Built-In Self-Test (BIST) mode. Continue to hold the **D** key until the computer boots up.
6. The screen displays solid colors and changes colors on the entire screen to white, black, red, green, and blue twice.

   NOTE: Refer to table below for diagnosis.

7. The screen will then display the colours in the following order of white, black and red. 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.

Table 27. Enhanced LCD BIST behavior table

Diagnostic Event	Problem description
Enhanced LCD BIST displays white and black. The system's Power/Battery LED alternates between White and Off for approximately 25 seconds **NOTE:** The LCD Screen will attempt to alternate between Black (OFF) and White. However, when panels are damaged, they may show various colors, lines, or distortions. On systems with updated BIOS that supports **Enhanced LCD BIST Crack Glass diagnostics**, the Power/Battery LED can be used to determine if damage has occurred. The screen can be used to visually check for damage.	Potential cracked LCD panel / glass. **NOTE:** In some cases, the screen can be damaged or cracked underneath the LCD Bezel. In this scenario the crack may not be visible in the viewable area
LCD BIST displays white, black, red, green and blue but with display anomalies and visible crack present.	Potential cracked LCD panel / glass.
LCD BIST displays white, black, red, green and blue	LCD panel passed

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 5 14 P514260.

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 28. 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

Table 28. Diagnostic light codes (continued)

Diagnostic light codes (Amber, White)	Problem description
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

NOTE: Blinking 3-3-3 LEDS on Lock LED (Caps-lock or Num-lock), Power button LED (without Fingerprint Reader) and Diagnostic LED indicates a failure to provide input during LCD panel test on Dell SupportAssist Pre-boot System Performance Check Diagnostics.

Recovering the operating system

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

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

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

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at Serviceability Tools at the Dell Support Site. Click **SupportAssist** and then click **SupportAssist OS Recovery**.

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

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 a 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.

7

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 29. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	Dell Site
Contact Support	In Windows search, type `Contact Support`, 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.

8

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 30. Revision history

Revision	Date	Description
A00	May 2026	Original publish date.