Latitude 5420

Service Manual

Regulatory Model: P137G
Regulatory Type: P137G001,P137G002
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Rev. A04

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.

Contents

1

Working inside your computer

Topics:

Before working inside your computer

About this task

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

Steps

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

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

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

Safety precautions

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

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

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

Standby power

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

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

Bonding

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

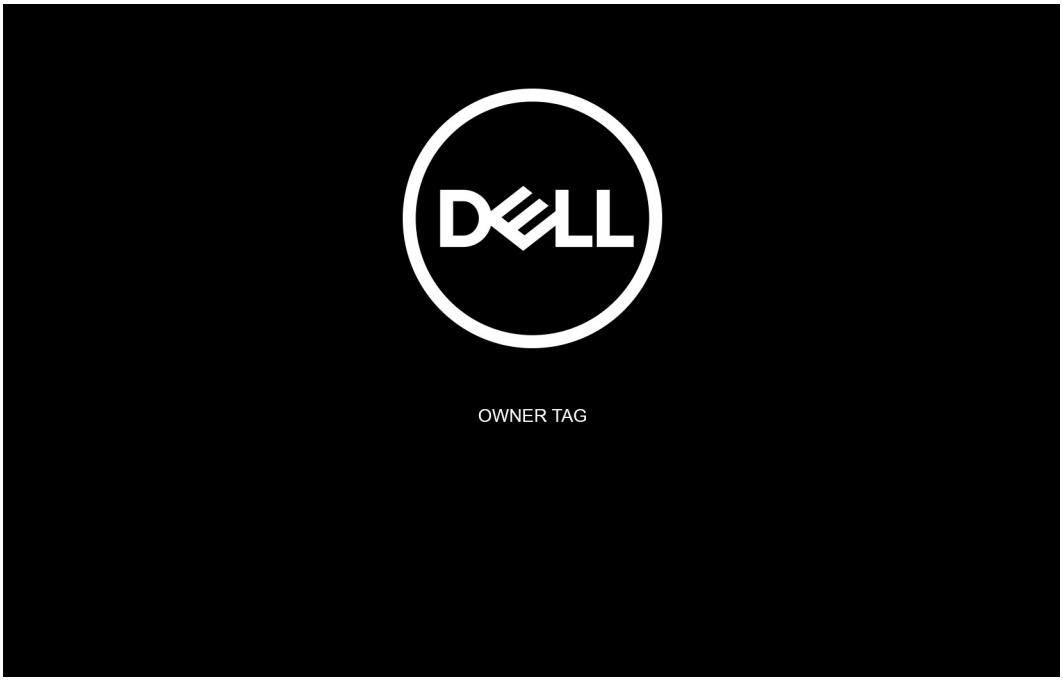
Enter service mode

Service Mode allows you to immediately cut the power from the computer without disconnecting the battery cable or removing the battery from the computer.

Steps

1. Shut down the computer and disconnect the AC adapter from the computer.
2. Press and hold the **<B>** key on the keyboard, and then press the power button for 3 seconds until the Dell logo appears on the screen.

The computer restarts and the following screed in displayed.



3. Press any key to continue.

   NOTE: The **Service Mode** procedure automatically skips this step if the Owner Tag of the system is not set up in advance by the manufacturer.

4. When the ready-to-proceed message appears on the screen, press any key to proceed. The system emits three short beeps and shuts down immediately.

NOTE: If the AC adapter has not been disconnected, a message prompting you to remove the AC adapter appears on the screen. Remove the AC adapter and then press any key to continue the **Service Mode** procedure.

Once the system shuts down, you can perform the replacement procedures without disconnecting the battery cable from the system board.

5. To exit **Service Mode** after finishing replacement procedures, connect AC adapter and press the power button to power on the system. The system automatically returns to normal functioning mode.

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. 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 deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or 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** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the anti-static mat is not required, or connect to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the 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 kit, it is a best practice to regularly test the strap prior to each service, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. To perform the test, plug the bonding-wire of the wrist-strap into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.

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.

After working inside your computer

About this task

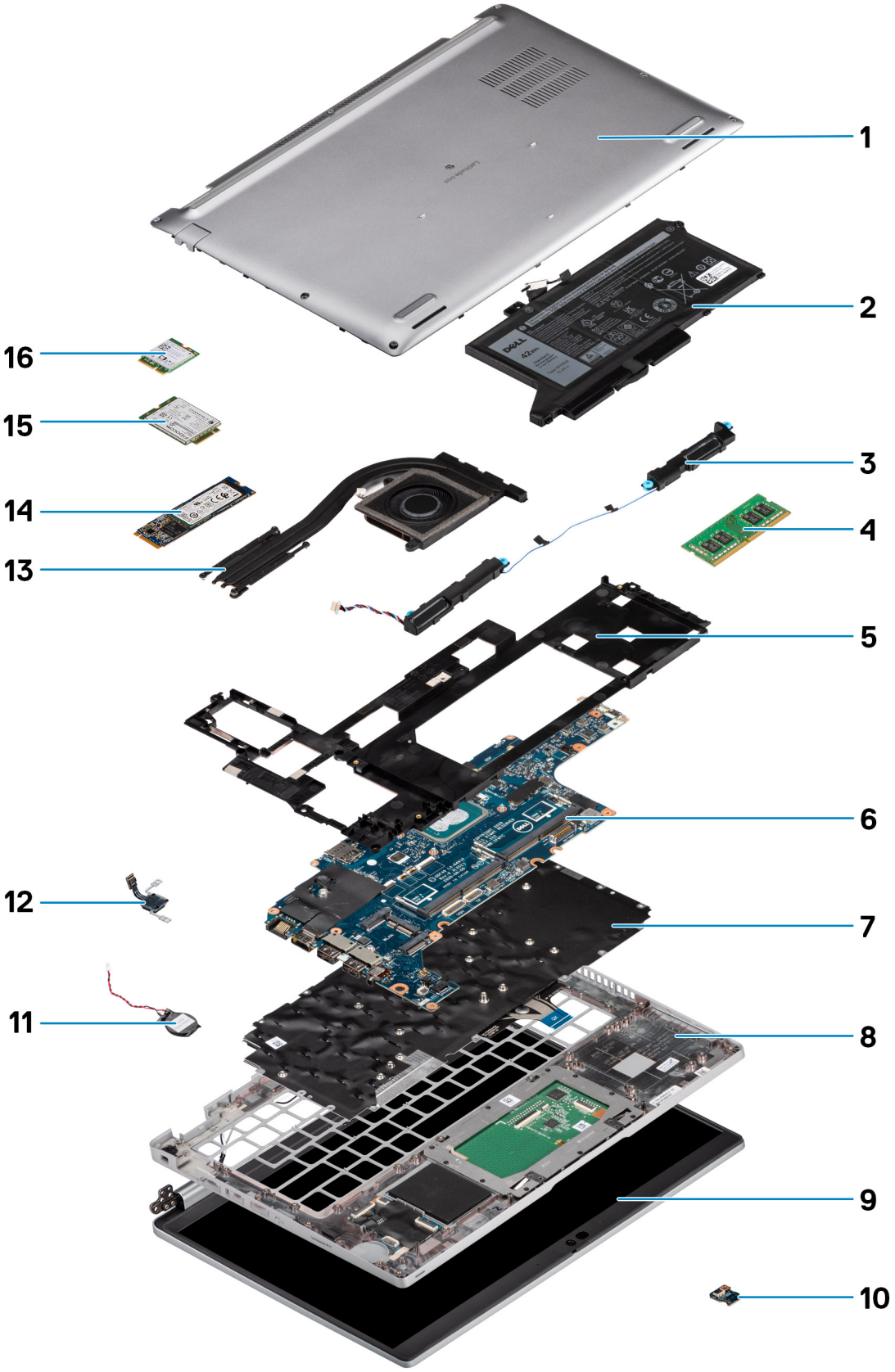
CAUTION: Leaving stray or loose screws inside your computer may severely damage your computer.

Steps

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

2

Major components of your computer



1. Base cover
2. Battery
3. Speakers
4. Memory module
5. Assembly inner frame
6. System board
7. Keyboard assembly
8. Palm-rest assembly
9. Display assembly
10. Battery LED board
11. Coin-cell battery
12. Power button/fingerprint board
13. Heat sink
14. Solid-state drive
15. WWAN card
16. WLAN card

3

Removing and installing components

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

Topics:

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Plastic scribe

Screw list

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

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

NOTE: Screw color may vary with the configuration ordered.

Table 1. Latitude 5420 screw list

Component	Screw type	Quantity	Screw image
Base cover	Captive screws	8	N/A
WLAN card	Captive screws	1	N/A
WWAN card	M2x2.5	1	
M.2 2230 solid-state drive	M2x3	4	
M.2 2280 solid-state drive	M2x3	2	
Assembly inner frame	M2x3 M2x5	7 3	 
3-cell battery	M2x5	2	

Table 1. Latitude 5420 screw list (continued)

Component	Screw type	Quantity	Screw image
4-cell battery	M2x5	3	
Heat sink—integrated	Captive screws	4	N/A
System Fan	M2x5	2	
eDP cable/bracket	M2x3	2	
USB Tyoe-C support bracket	M2x5	3	
System board	M2x3	4	
Power button	M2x2.5	2	
Smart card reader	M2x2.5	3	
Battery LED board	M2x3	1	
Keyboard assembly	M2x2	6	
Keyboard bracket	M2x2	17	
Display assembly	M2.5x5 (display hinge to palm-rest assembly)	4	
Display hinge	M2.5x3 (display hinge to display back cover)	4	
Display panel	M2.5x3	2	

Disassembly and reassembly

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

Subscriber Identity Module (SIM) card

Removing the SIM card

Prerequisites

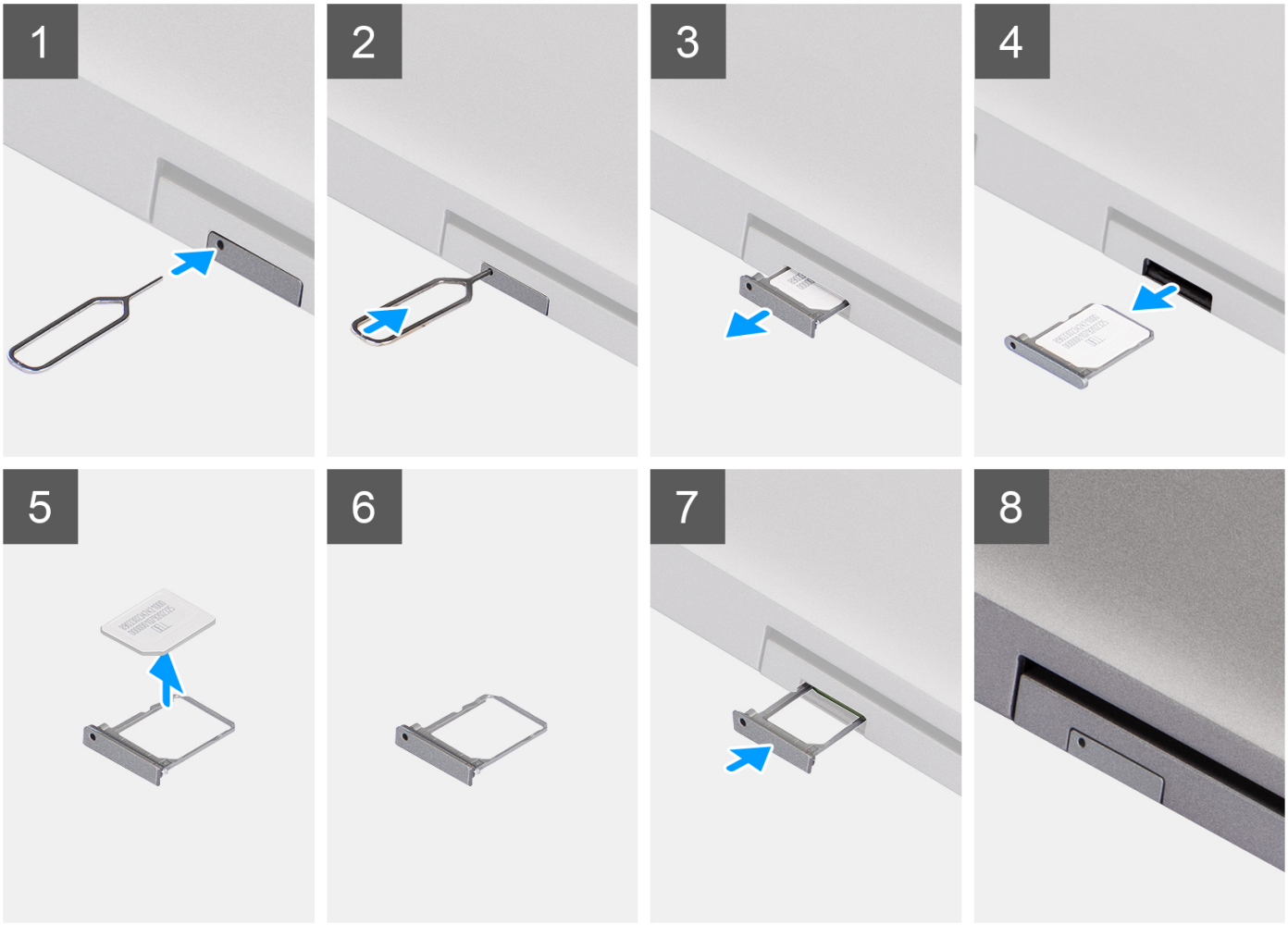
1. Follow the procedure in Before working inside your computer.
2. Enter service mode.

NOTE: SIM card or SIM card tray removal is only available on systems that are shipped with WWAN module. The procedure for removal is only applicable for systems that are shipped with a WWAN module.

CAUTION: Removing the SIM card with the computer turned on, may cause data loss or damage to the card. Ensure that your computer is turned off or the network connections are disabled.

About this task

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



Steps

1. Insert a pin into the hole of the SIM card tray and push inward until the tray is released.
2. Slide the SIM card tray out of the slot on the computer.
3. Remove the SIM card from the SIM card tray.
4. Slide the SIM card tray into the slot, until it clicks into place.

Installing the SIM card

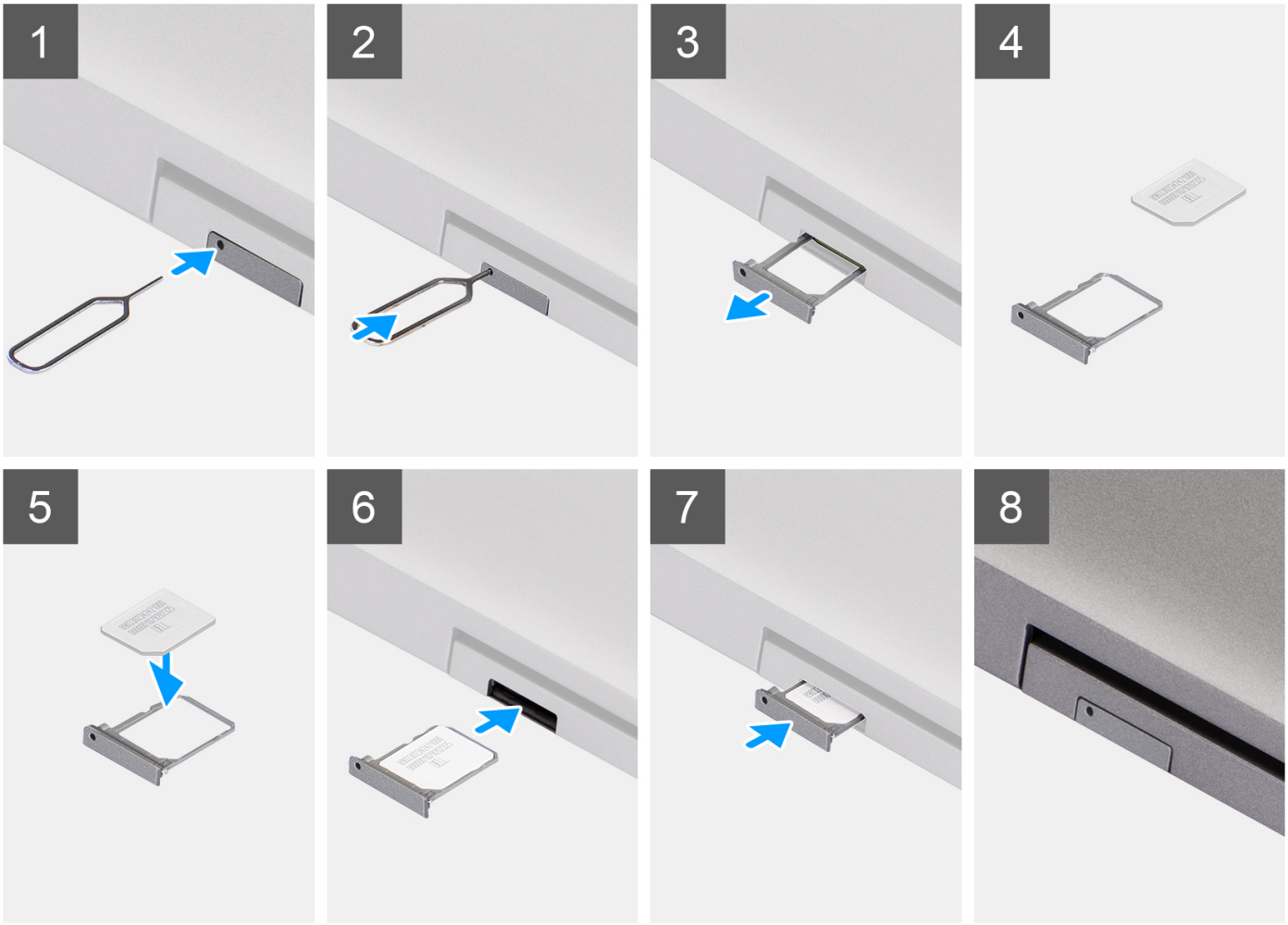
Prerequisites

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

NOTE: SIM card or SIM card tray removal is only available on systems that are shipped with WWAN module. Hence, removing procedure is only applicable for systems that are shipped with WWAN module.

About this task

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



Steps

1. Insert a pin into the hole of the SIM card tray and push inward until the tray is released.

2. Slide the SIM card tray out of the slot on the computer.
3. Place the SIM card into the SIM card tray with the metallic contact facing up.
4. Align the SIM card tray with the slot on the computer and carefully slide it in.
5. Slide the SIM card tray into the slot, until it clicks into place.

Next steps

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

Micro Secure Digital (SD) Card

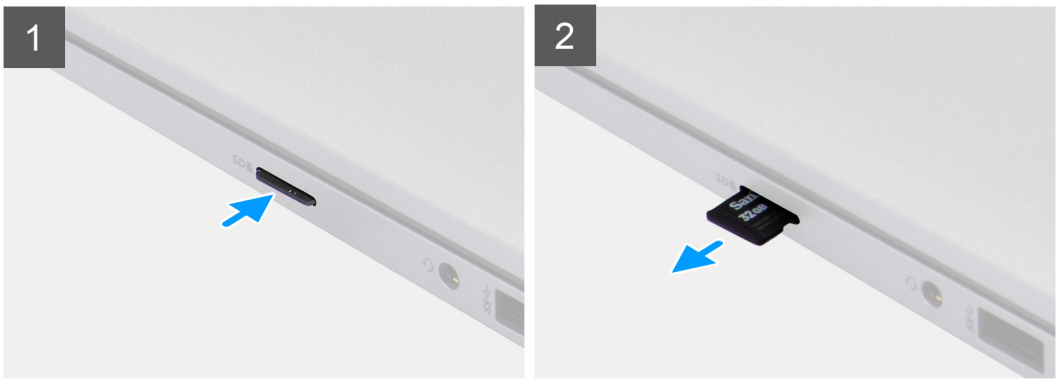
Removing the microSD card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.

About this task

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



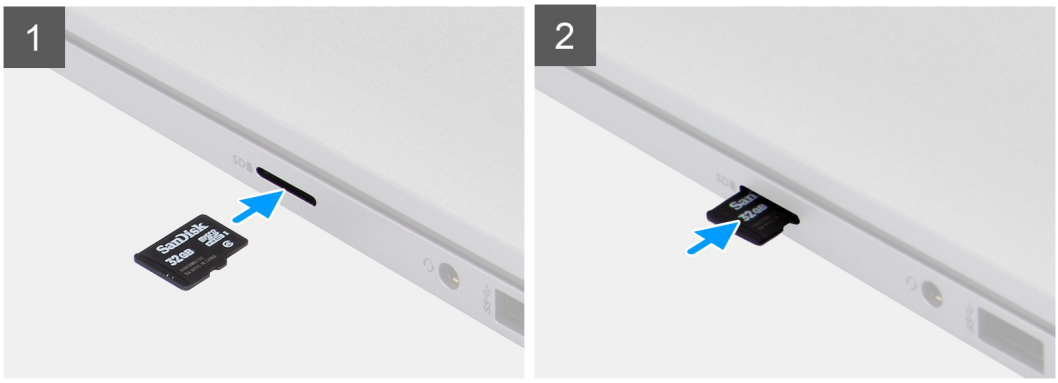
Steps

1. Push the microSD card to release it from the computer.
2. Slide the microSD card out of the computer.

Installing the microSD card

About this task

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



Steps

1. Align the microSD card to its slot on the computer.
2. Slide the microSD card into the slot until it clicks into place.

Next steps

Follow the procedures in After working inside your computer.

Base cover

Removing the base cover

Prerequisites

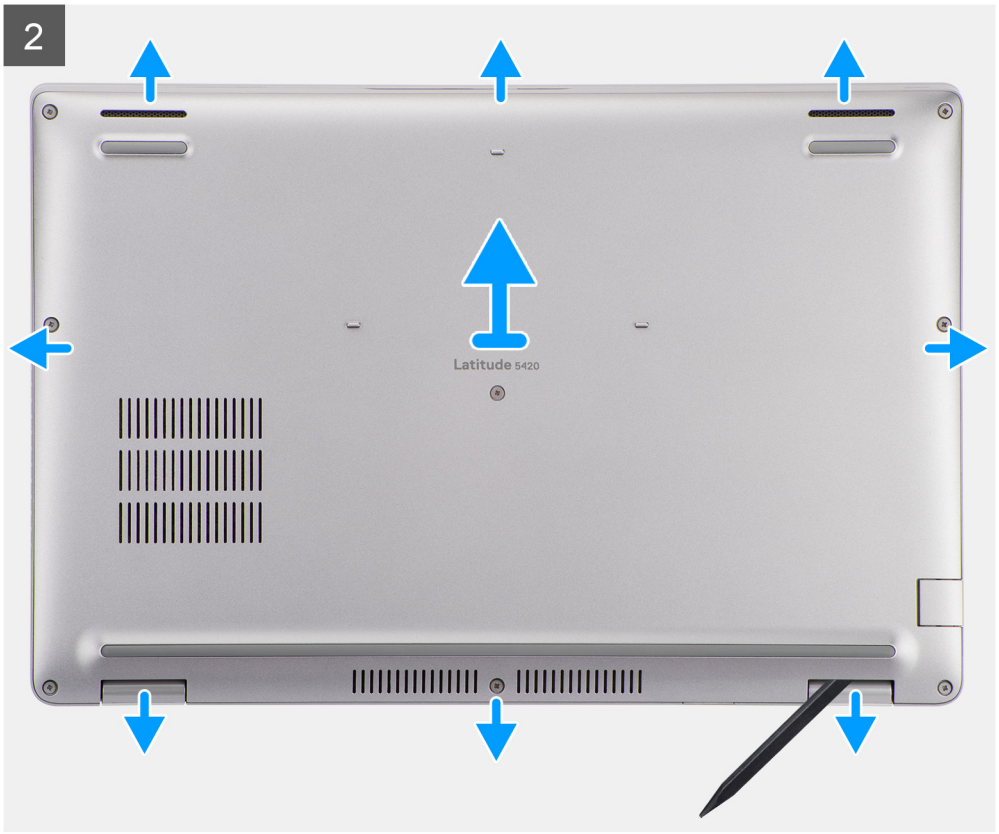
1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.

About this task

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

1

2



Steps

1. Loosen the eight captive screws that secure the base cover to the palm-rest assembly and keyboard assembly.
2. Using a plastic scribe, pry the base cover from the U-shaped indents at the top edge of the base cover to remove the base cover from the palm-rest assembly and keyboard assembly.
3. Grasp the left side and the right side of the base cover and remove the base cover from the palm-rest assembly and keyboard assembly.

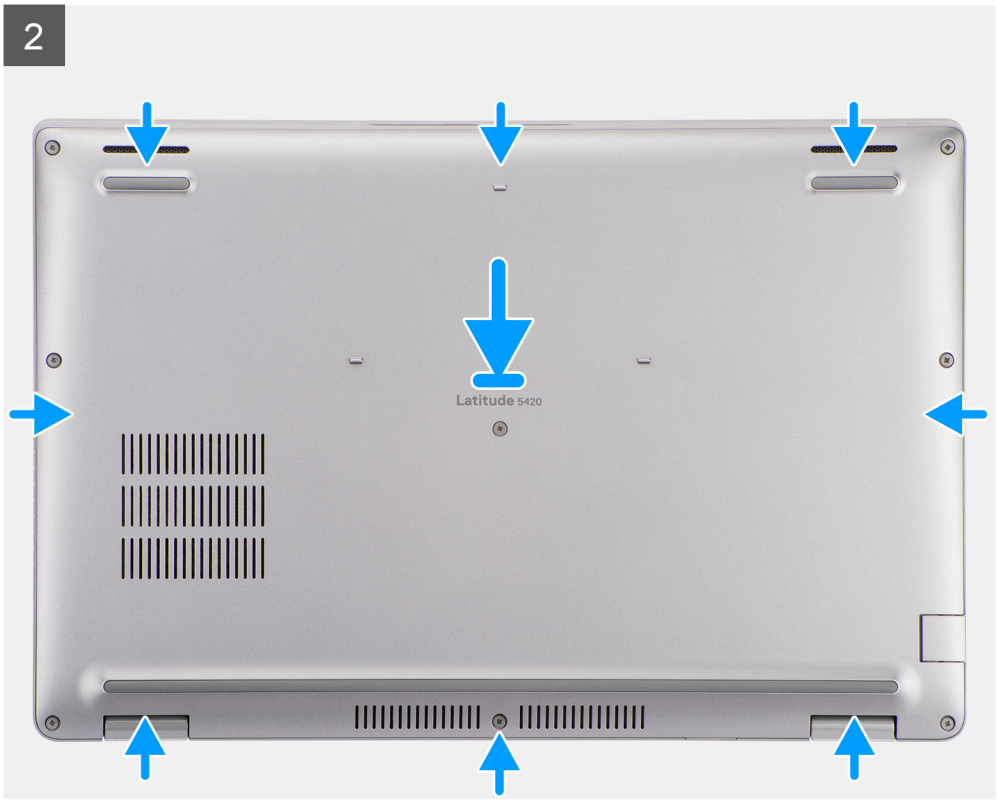
Installing the base cover

Prerequisites

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

About this task

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



Steps

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

Next steps

1. Install the microSD card.
2. Install the SIM card.
3. Follow the procedure in After working inside your computer.

WLAN card

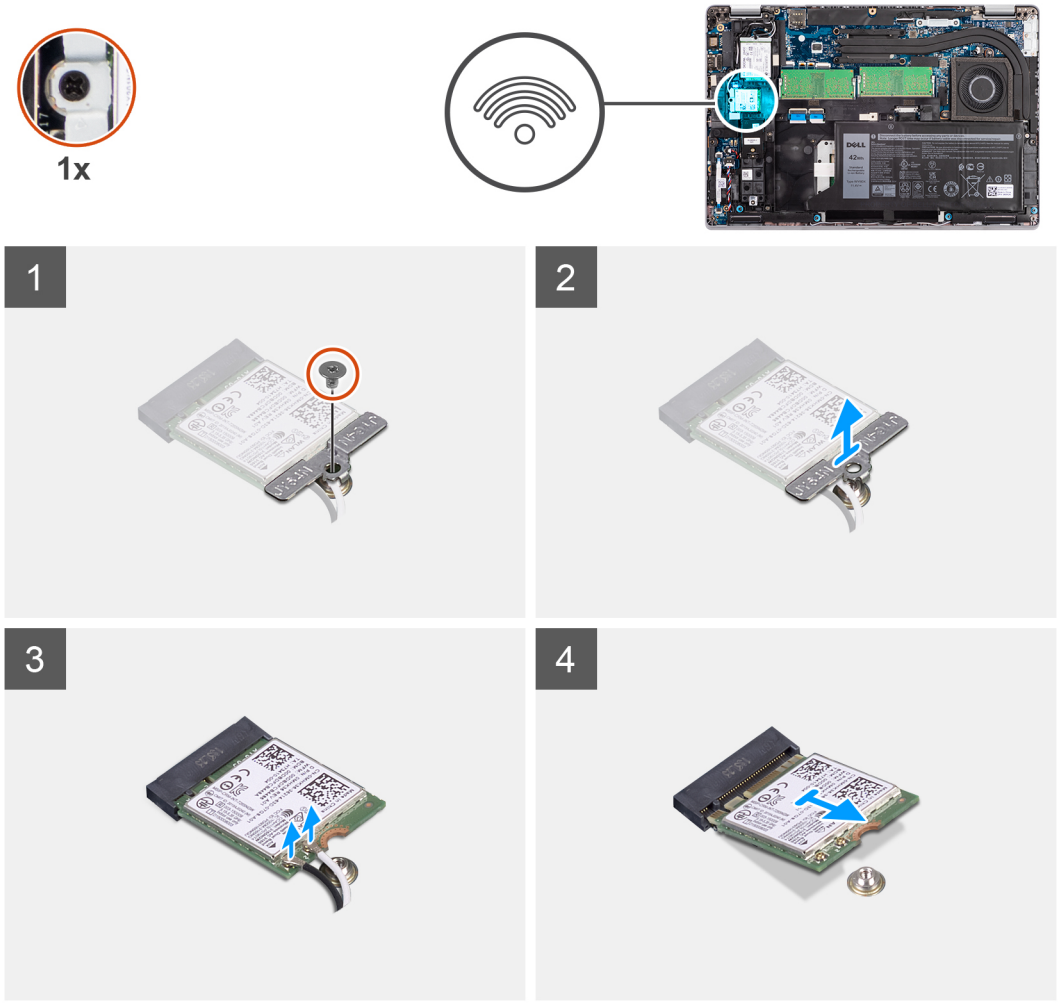
Removing the WLAN card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

About this task

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



Steps

NOTE: When removing the WLAN card from the system, if the adhesive pad which helps secure the WLAN card in place is removed from the system along with the WLAN card, adhere it back to the system.

1. Remove the screw (M2x2.5) that secures the WLAN card bracket to the WLAN card.
2. Slide and remove the WLAN card bracket off the WLAN card.
3. Disconnect the antenna cables from the WLAN card.
4. Slide and remove the WLAN card from the WLAN card slot.

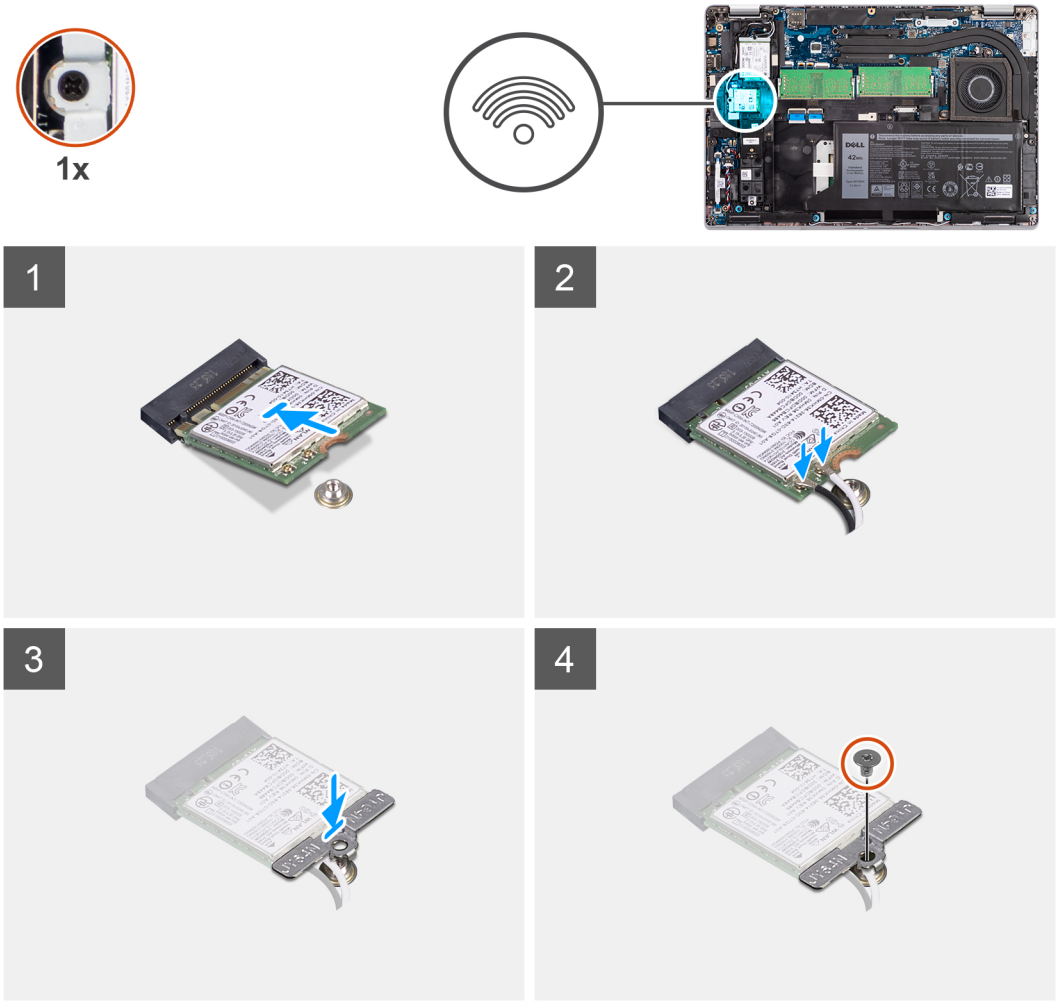
Installing the WLAN card

Prerequisites

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

About this task

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



Steps

1. Connect the antenna cables to the wireless card.
   The following table provides the antenna-cable color scheme:

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color
Main (white triangle)	White
Auxiliary (black triangle)	Black

2. Place the WLAN-card bracket on the WLAN card.
3. Align the notch on the wireless card with the tab on the WLAN card slot.

   NOTE: When removing the WLAN card from the computer, if the adhesive pad which helps secure the WLAN card in place is removed from the computer along with the WLAN card, adhere it back to the computer.

4. Slide the wireless card at an angle into the WLAN card slot.
5. Replace the screw (M2x2.5) to secure the WLAN-card bracket to the WLAN card.

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. Follow the procedure in After working inside your computer.

Wireless Wide Area Network (WWAN) card

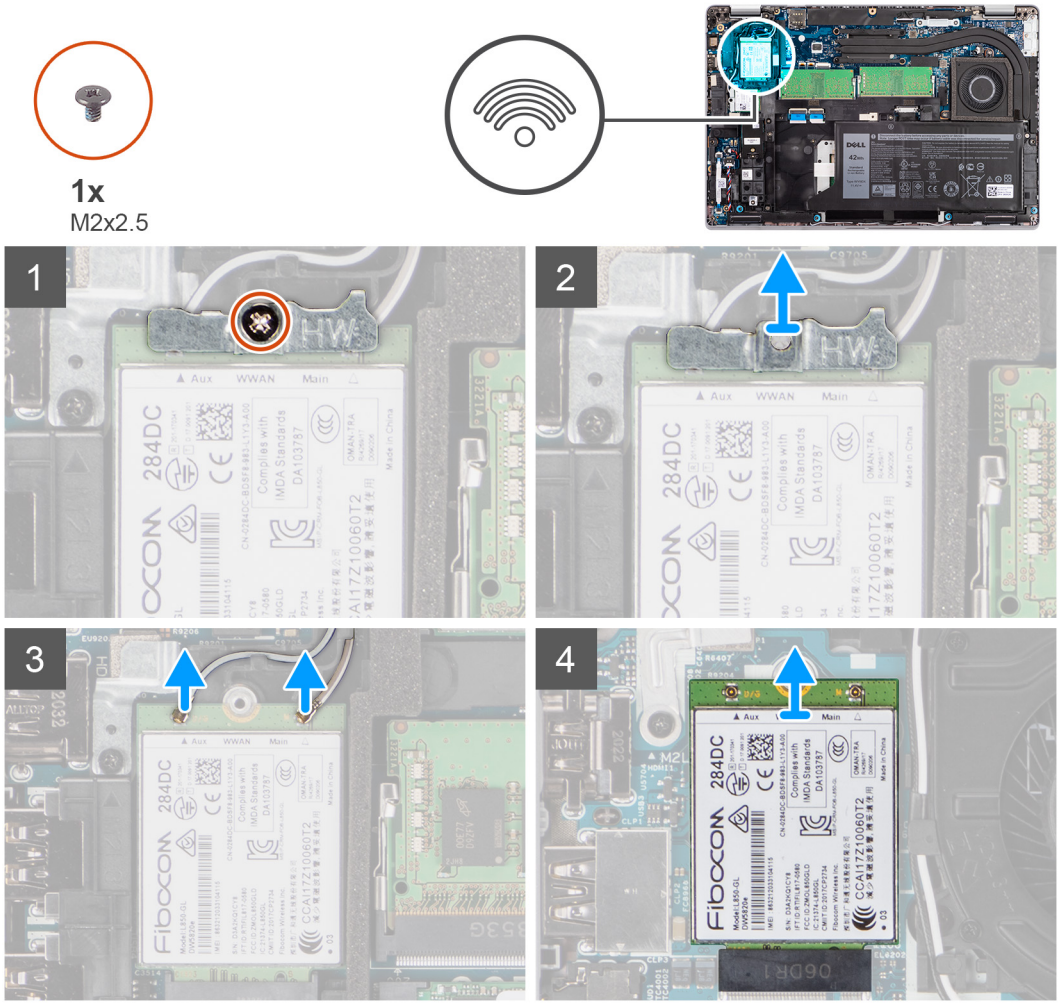
Removing the WWAN card

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

About this task

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



Steps

1. Remove the screw (M2x2.5) that secures the WWAN card bracket to the WWAN card.
2. Slide and remove the WWAN card bracket off the WWAN card.
3. Disconnect the antenna cables from the WWAN card.
4. Slide and remove the WWAN card from the WWAN card slot.

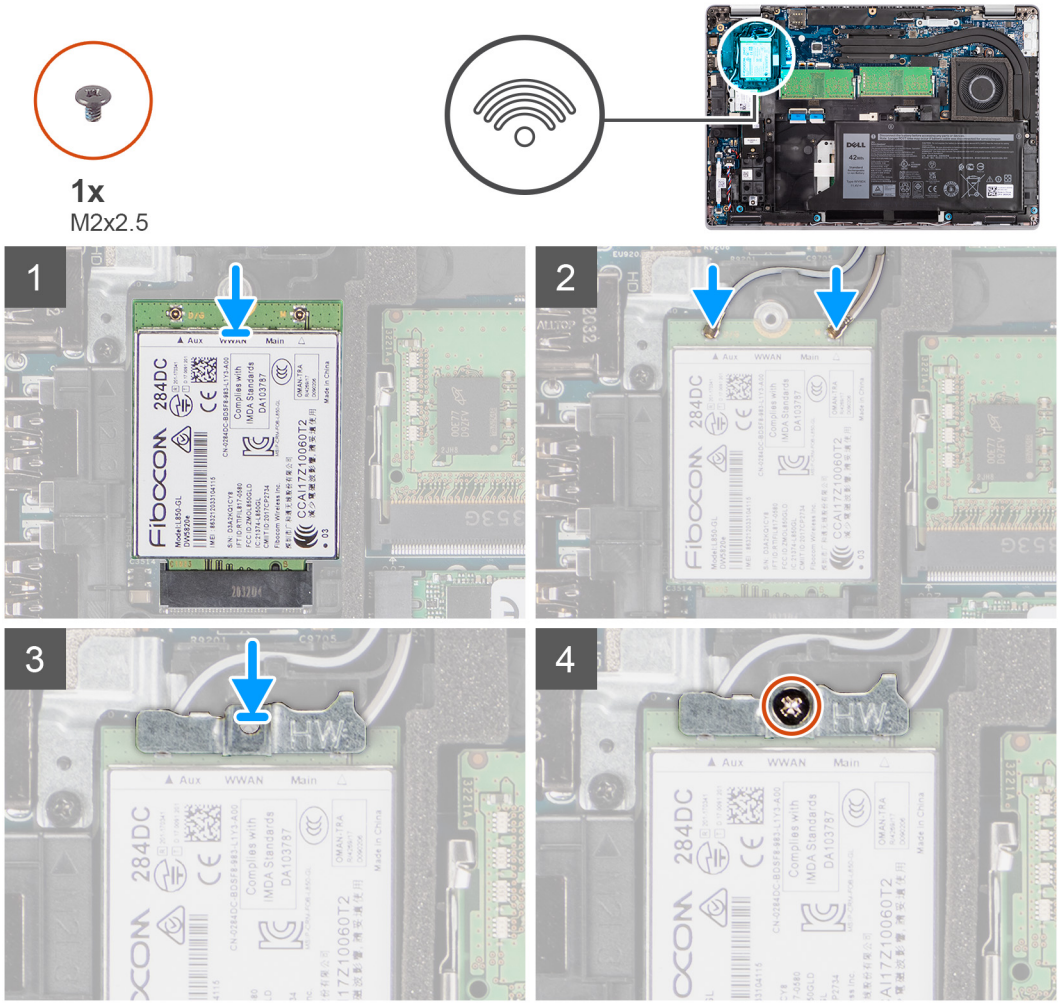
Installing the WWAN card

Prerequisites

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

About this task

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



Steps

1. Connect the antenna cables to the WWAN card.
   The following table provides the antenna-cable color scheme:

Table 3. Antenna-cable color scheme

Connectors on the WWAN card	Antenna-cable color
Main (white triangle)	White
Auxiliary (black triangle)	Black

2. Place the WWAN card bracket on the WWAN card.
3. Align the notch on the WWAN card with the tab on the WWAN slot.
4. Slide the WWAN card at an angle into the WWAN slot.
5. Replace the screw (M2x2.5) to secure the WWAN bracket to the WWAN card.

NOTE: For instructions on how to find your computer's IMEI (International Mobile Station Equipment Identity) number, see the knowledge base article 000143678 at www.dell.com/support.

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. Follow the procedure in After working inside your computer.

Solid State Drive (SSD)

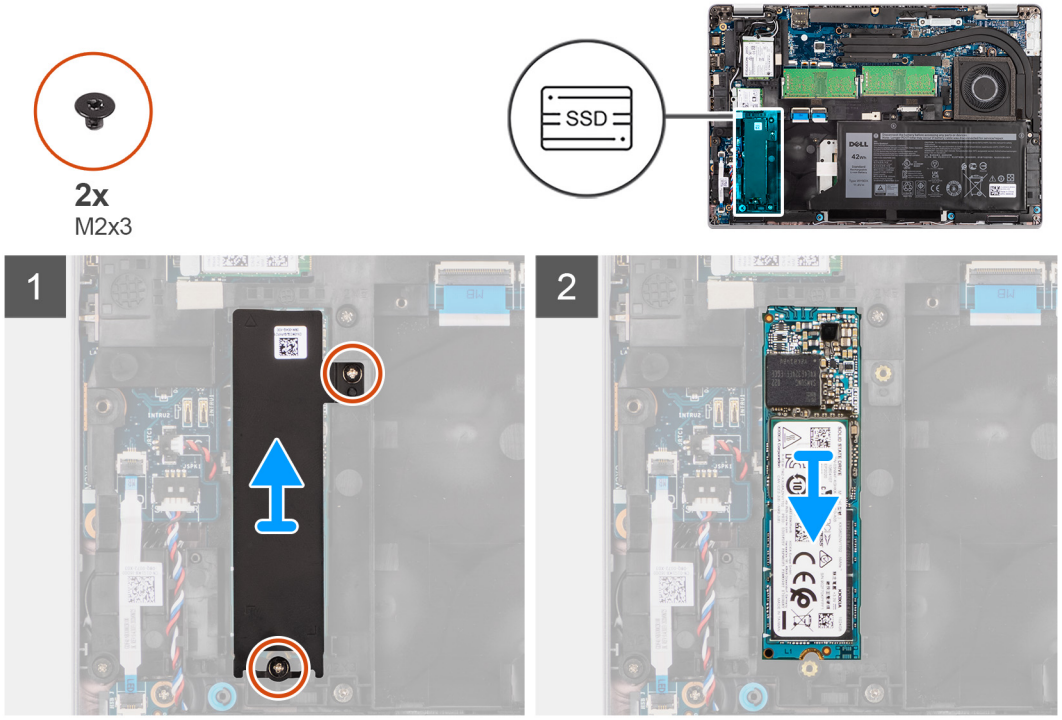
Removing the M.2 2280 solid-state drive

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

About this task

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



Steps

1. Remove the two screws (M2x3) that secures the M.2 2280 solid-state drive thermal plate to the system board.
2. Lift the M.2 2280 solid-state drive thermal plate off the system board.
3. Slide and remove the M.2 2280 solid-state drive from the solid-state drive slot on the system board.

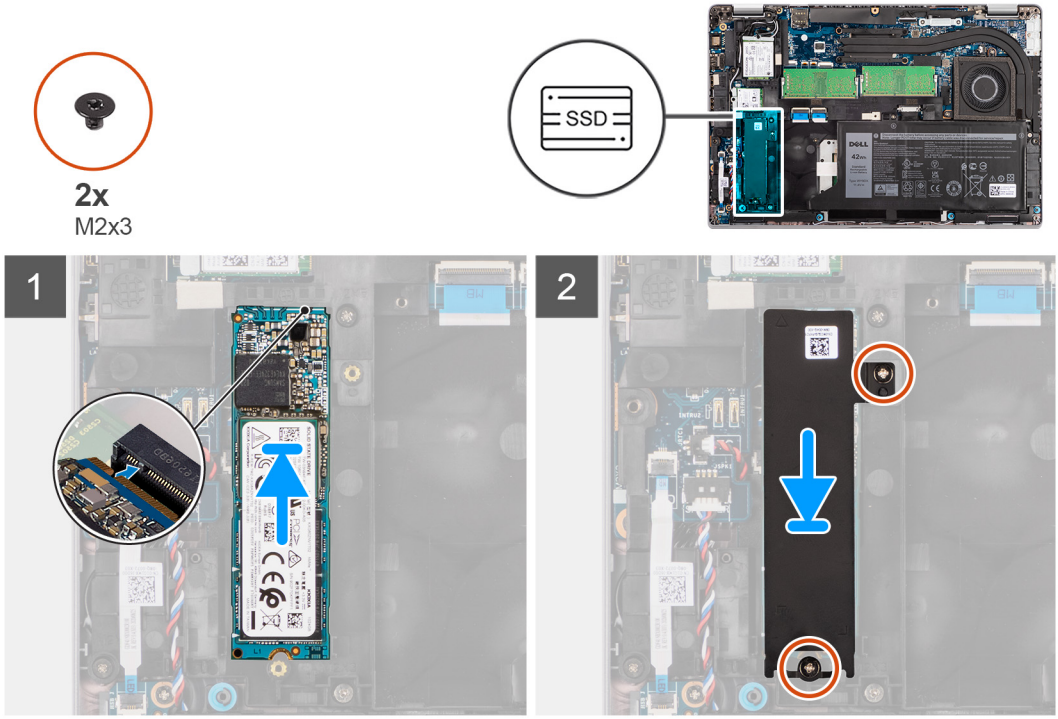
Installing the M.2 2280 solid-state drive

Prerequisites

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

About this task

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



Steps

1. Align the notch on the M.2 2280 solid-state drive with the tab on the solid-state drive slot.
2. Slide the M.2 2280 solid-state drive into the solid-state drive slot on the system board.
3. Align the screw holes on the M.2 2280 solid-state drive thermal plate with the screw holes on the system board.
4. Replace the two screws (M2x3) that secures the M.2 2280 solid-state drive thermal plate to the system board.

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. Follow the procedure in After working inside your computer.

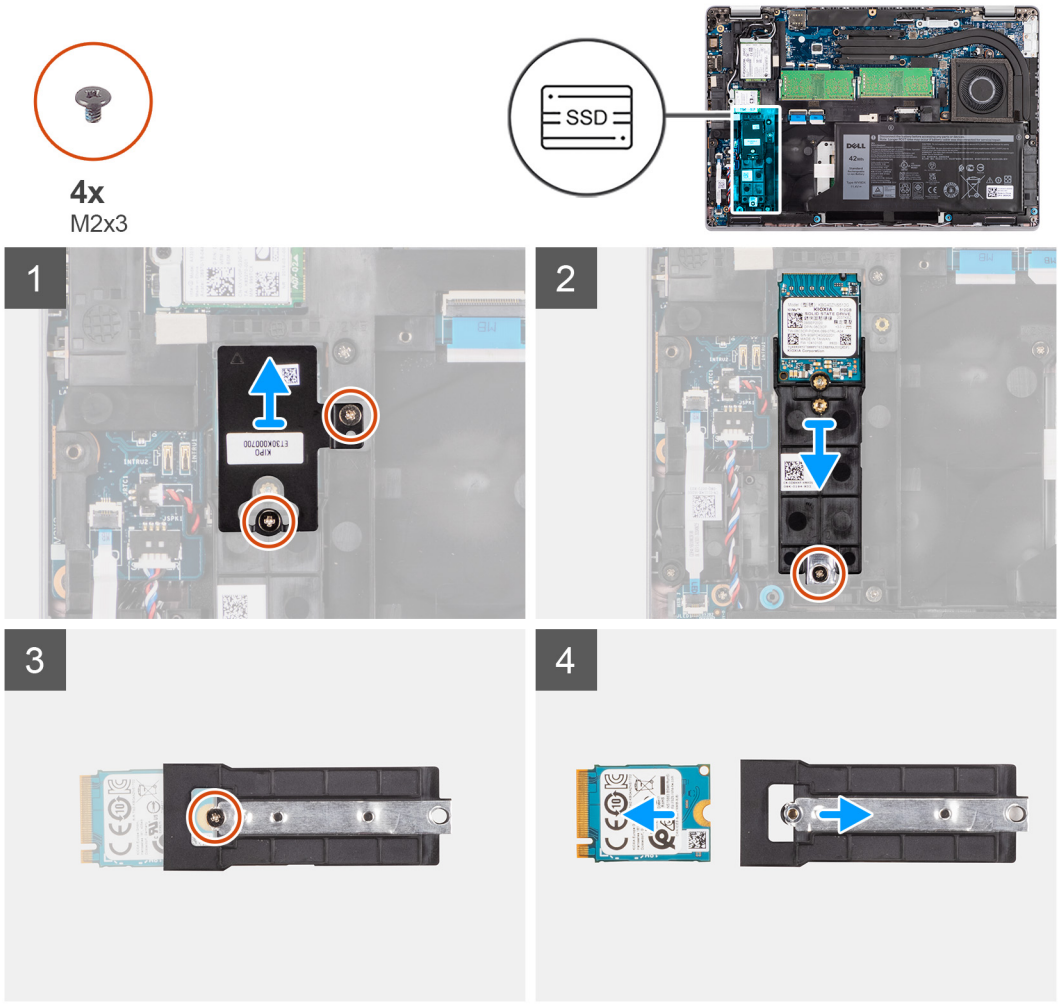
Removing the M.2 2230 solid-state drive

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

About this task

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



Steps

1. Remove the two screws (M2x3) that secures the M.2 2230 solid-state drive thermal plate to the M.2 2230 solid-state drive holder.
2. Remove the single screw (M2x3) that secure the M.2 2230 solid-state drive holder to the system board.
3. Lift the M.2 2230 solid-state drive holder off the system board.
4. Flip the M.2 2230 solid-state drive holder and remove the single screw (M2x3) that secure the M.2 2230 solid-state drive to the M.2 2230 solid-state drive holder.
5. Slide and remove the M.2 2230 solid-state drive from the M.2 2230 solid-state drive holder.

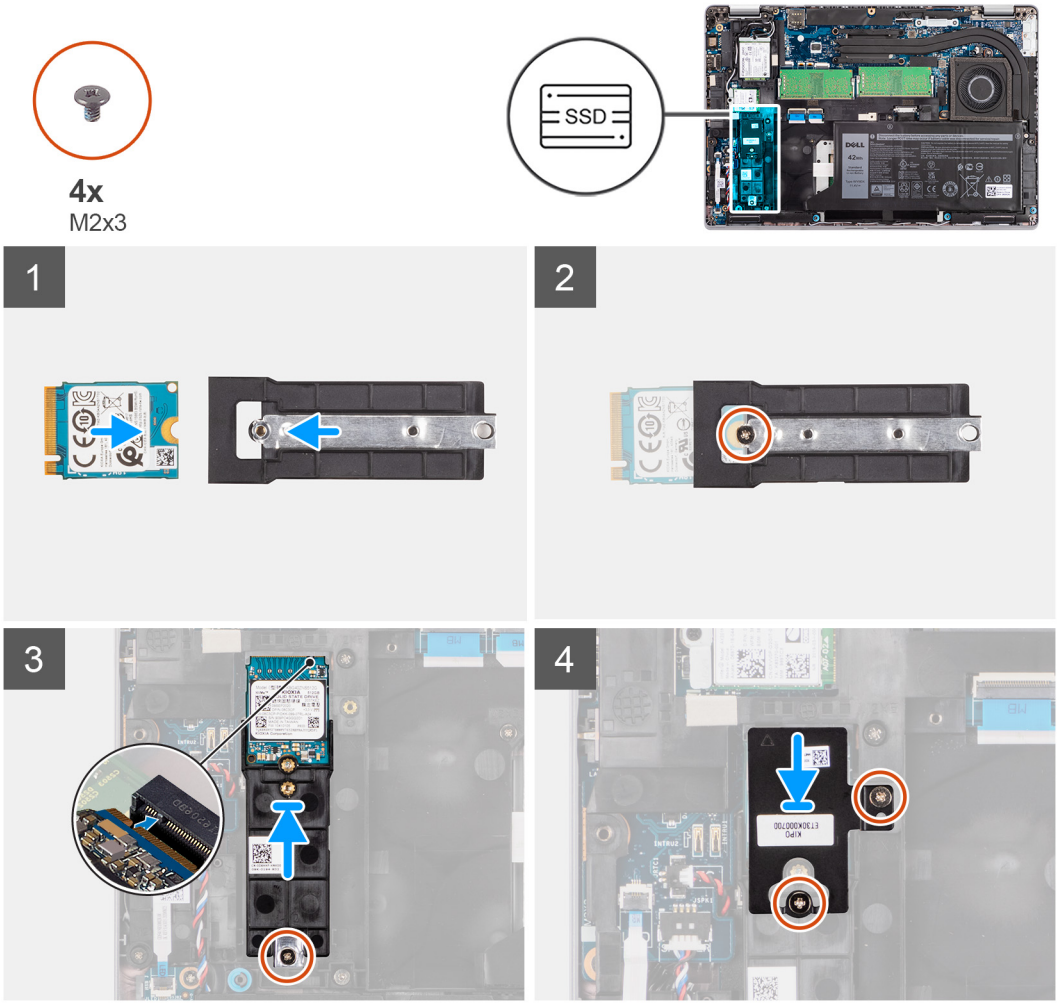
Installing the M.2 2230 solid-state drive

Prerequisites

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

About this task

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



Steps

1. Flip the M.2 2230 solid-state drive holder and align the notch on the M.2 2230 solid-state drive with the tab on the M.2 2230 solid-state drive holder.
2. Replace the single screw (M2x3) that secure the M.2 2230 solid-state drive to the M.2 2230 solid-state drive holder.
3. Align and insert the M.2 2230 solid-state drive holder on the system board to accommodate the M.2 2230 solid-state drive.
4. Replace the single screw (M2x3) that secure the M.2 2230 solid-state drive holder to the system board.
5. Align the screw holes on the M.2 2230 solid-state drive thermal pad with the screw holes on the M.2 2230 solid-state drive holder.
6. Replace the two screws (M2x2.5) that secures the M.2 2230 solid-state drive thermal pad to the M.2 2230 solid-state drive holder.

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. Follow the procedure in After working inside your computer.

Memory module

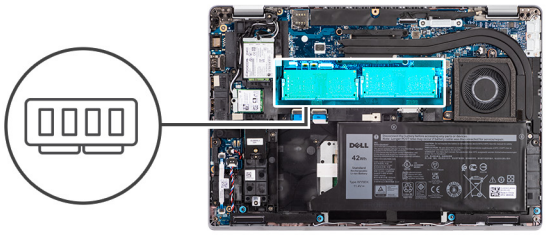
Removing the memory modules

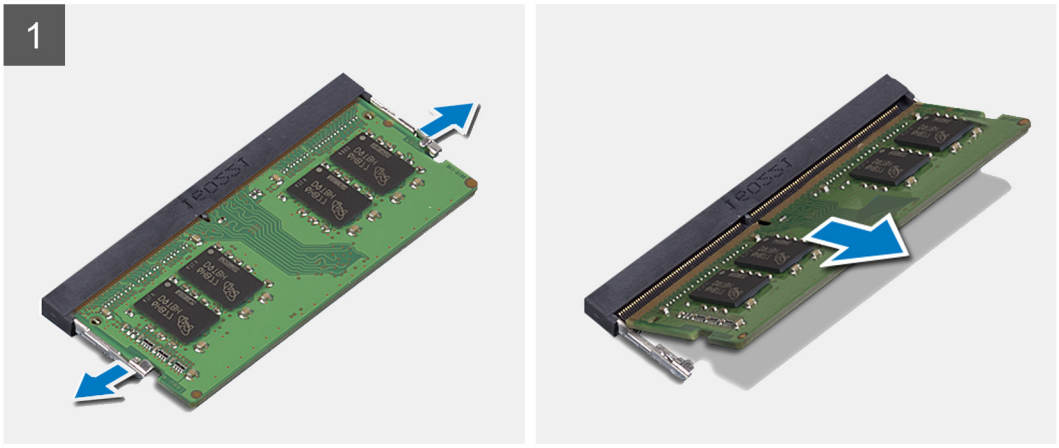
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

About this task

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





Steps

1. Using your fingertips, spread apart the securing clips on the memory-module slot until the memory module pops up.
2. Slide and remove the memory module from the memory-module slot.

NOTE: Repeat step 1 and 2 if there are two memory modules.

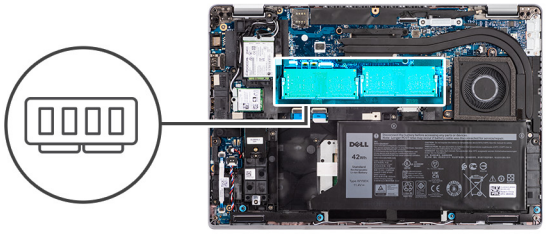
Installing the memory modules

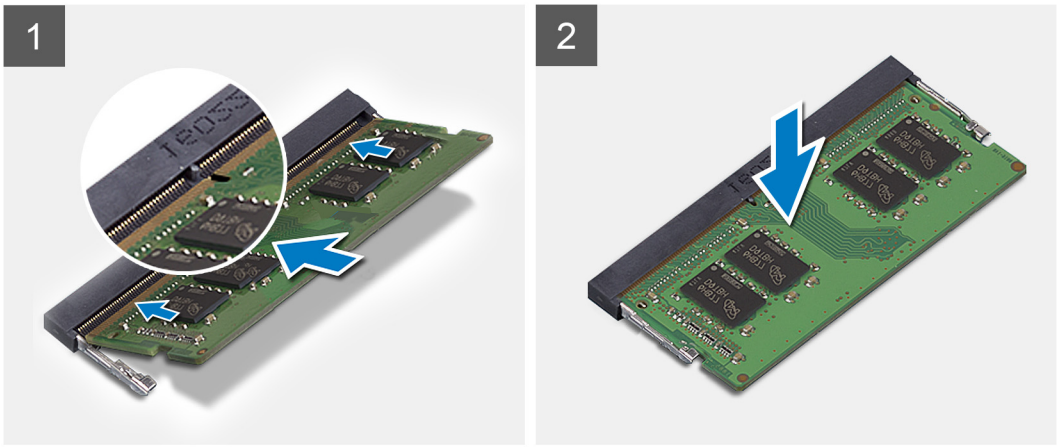
Prerequisites

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

About this task

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





Steps

1. Align the notch on the memory module with the tab on the memory-module slot.
2. Slide the memory module firmly into the slot at an angle and press the memory module down until it clicks into place.

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

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. 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 this product.**

- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a rechargeable Li-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See Contact Support at Dell Support Site.**
- **Always purchase genuine batteries from Dell 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 3-cell battery

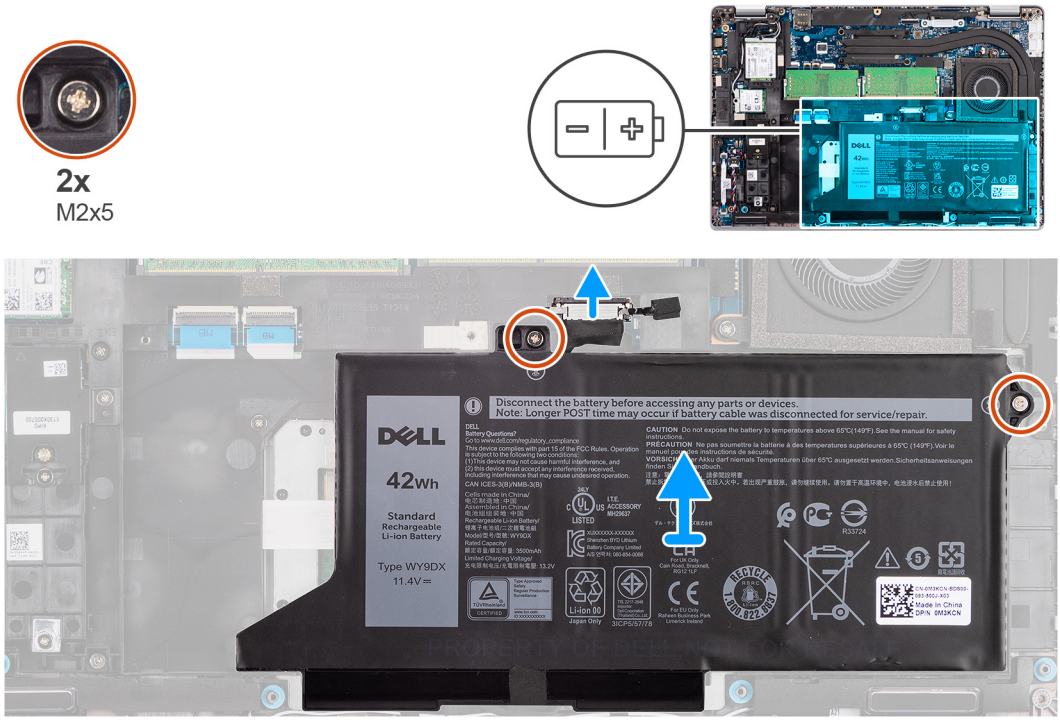
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

NOTE: If battery is disconnected from system board for service, then there is a delay during system boot-up as the system undergoes RTC battery reset.

About this task

The following images indicate the location of the 3-cell battery and provide a visual representation of the removal procedure.



Steps

1. Disconnect the battery cable from the system board, if it was not disconnected earlier.
2. Remove the two screws (M2x5) that secure the battery to the palm-rest assembly and keyboard assembly.
3. Lift the battery off the palm-rest assembly and keyboard assembly.

Installing the 3-cell battery

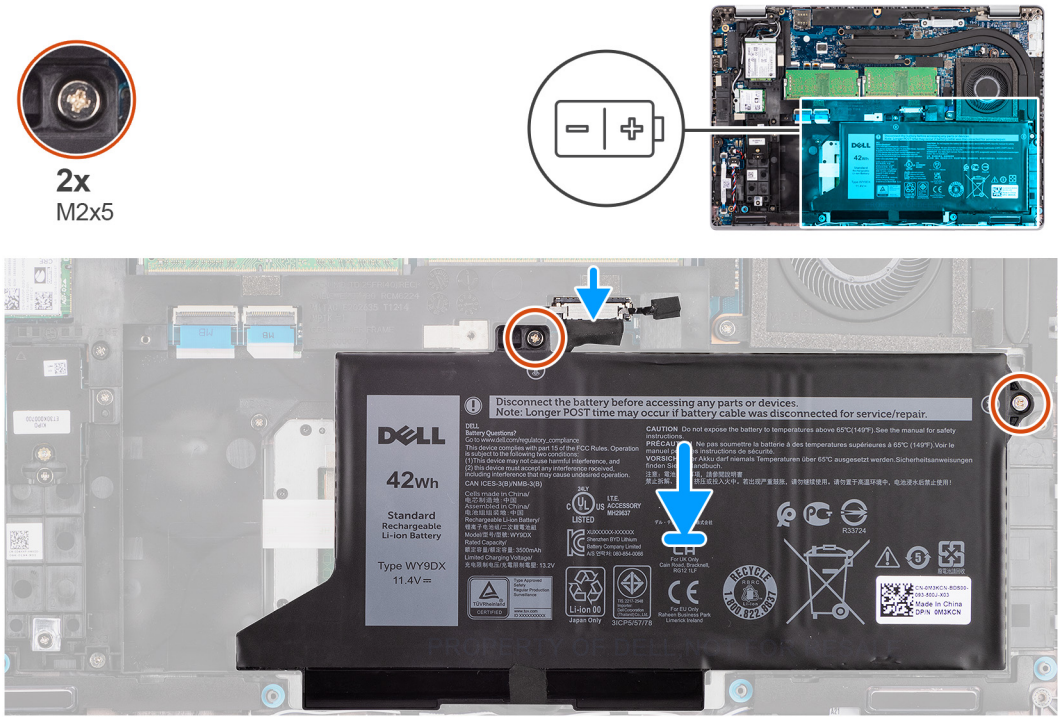
Prerequisites

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

About this task

The following image indicates the location of the 3-cell battery and provides a visual representation of the installation procedure.

NOTE: If battery is disconnected from system board for service, then there is a delay during system boot-up as the system undergoes RTC battery reset.



Steps

1. Align and place the battery from the left side on the computer.
2. Replace the two screws (M2x5) that secure the battery to the palm-rest assembly and keyboard assembly.
3. Connect the battery cable to the system board.

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. Follow the procedure in After working inside your computer.

Removing the 4-cell battery

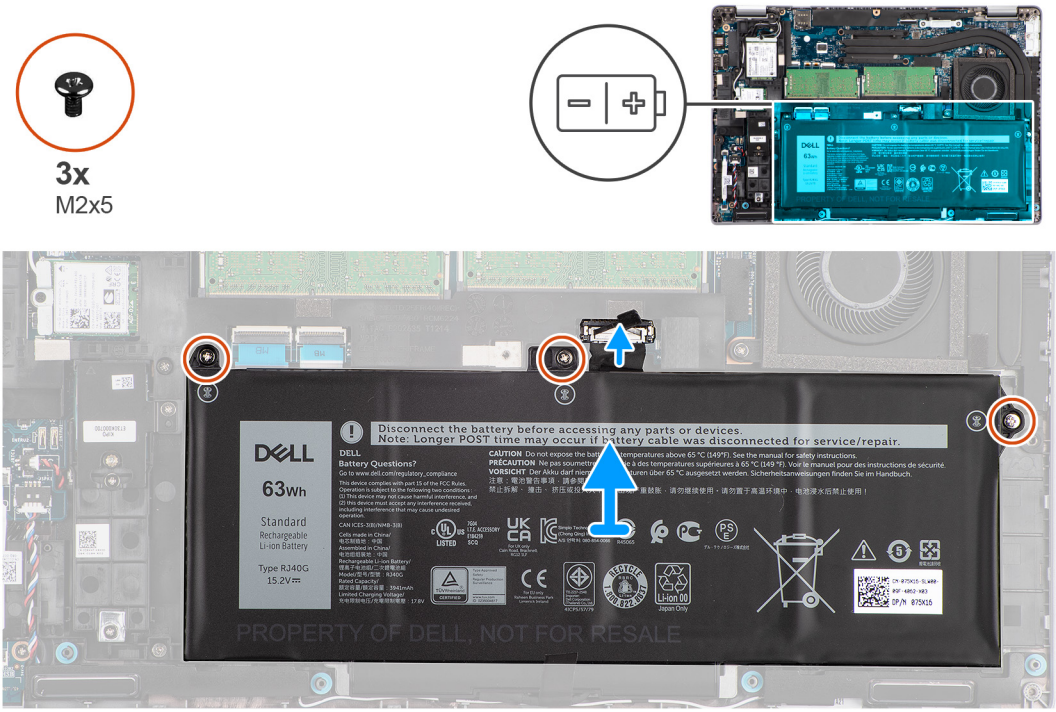
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.

NOTE: If battery is disconnected from system board for service, then there is a delay during system boot-up as the system undergoes RTC battery reset.

About this task

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



Steps

1. Disconnect the battery cable from the system board, if it was not disconnected earlier.
2. Remove the three screws (M2x5) that secure the battery to the palm-rest assembly and keyboard assembly.
3. Lift the battery off the palm-rest assembly and keyboard assembly.

Installing the 4-cell battery

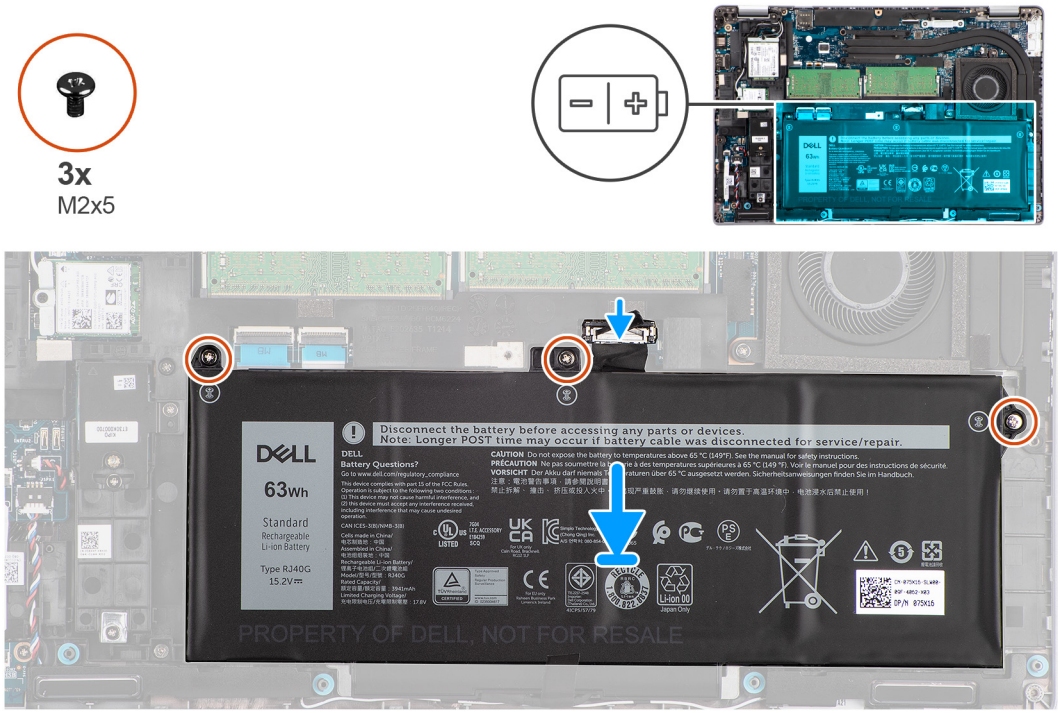
Prerequisites

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

About this task

The following image indicates the location of the 4-cell battery and provides a visual representation of the installation procedure.

NOTE: If battery is disconnected from system board for service, then there is a delay during system boot-up as the system undergoes RTC battery reset.



Steps

1. Align and place the battery from the left side on the computer.
2. Replace the three screws (M2x5) that secure the battery to the palm-rest assembly and keyboard assembly.
3. Connect the battery cable to the system board.

Next steps

1. Install the base cover.
2. Install the microSD card.
3. Install the SIM card.
4. Follow the procedure in After working inside your computer.

Battery cable

Removing the battery cable

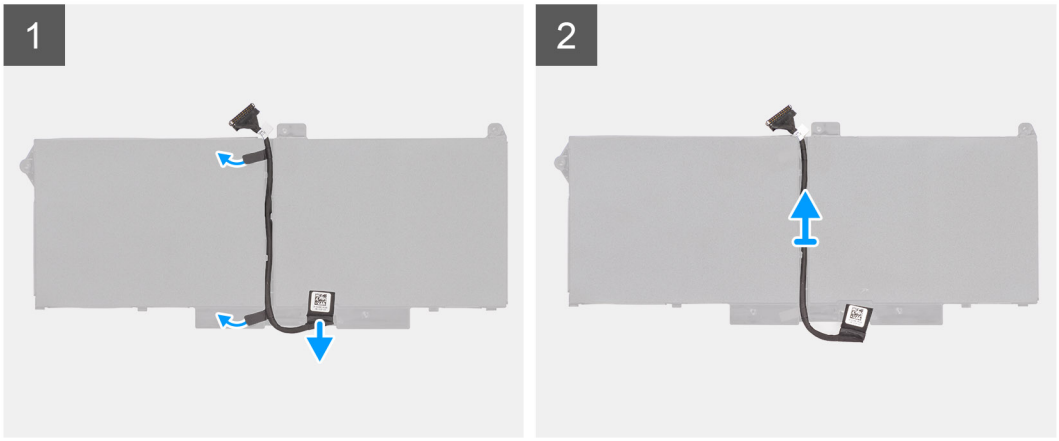
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.
6. Remove the battery.

NOTE: If battery is disconnected from system board for service, then there is a delay during system boot-up as the system undergoes RTC battery reset.

About this task

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



Steps

1. Flip the battery and unroute the battery cable from the routing guides on the battery.
2. Disconnect the battery cable from the connector on the battery.
3. Lift the battery cable away from the battery.

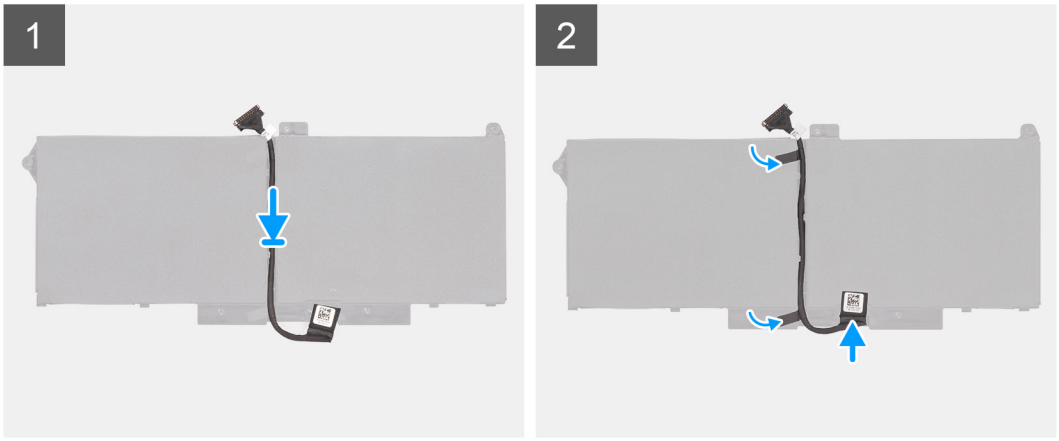
Installing the battery cable

Prerequisites

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

About this task

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



Steps

1. Align and place the battery cable on the battery.
2. Route the battery cable through the routing guides on the battery.
3. Connect the battery cable to the connector on the battery.

Next steps

1. Install the battery.
2. Install the base cover.
3. Install the microSD card.
4. Install the SIM card.
5. Follow the procedure in After working inside your computer.

Assembly-inner frame

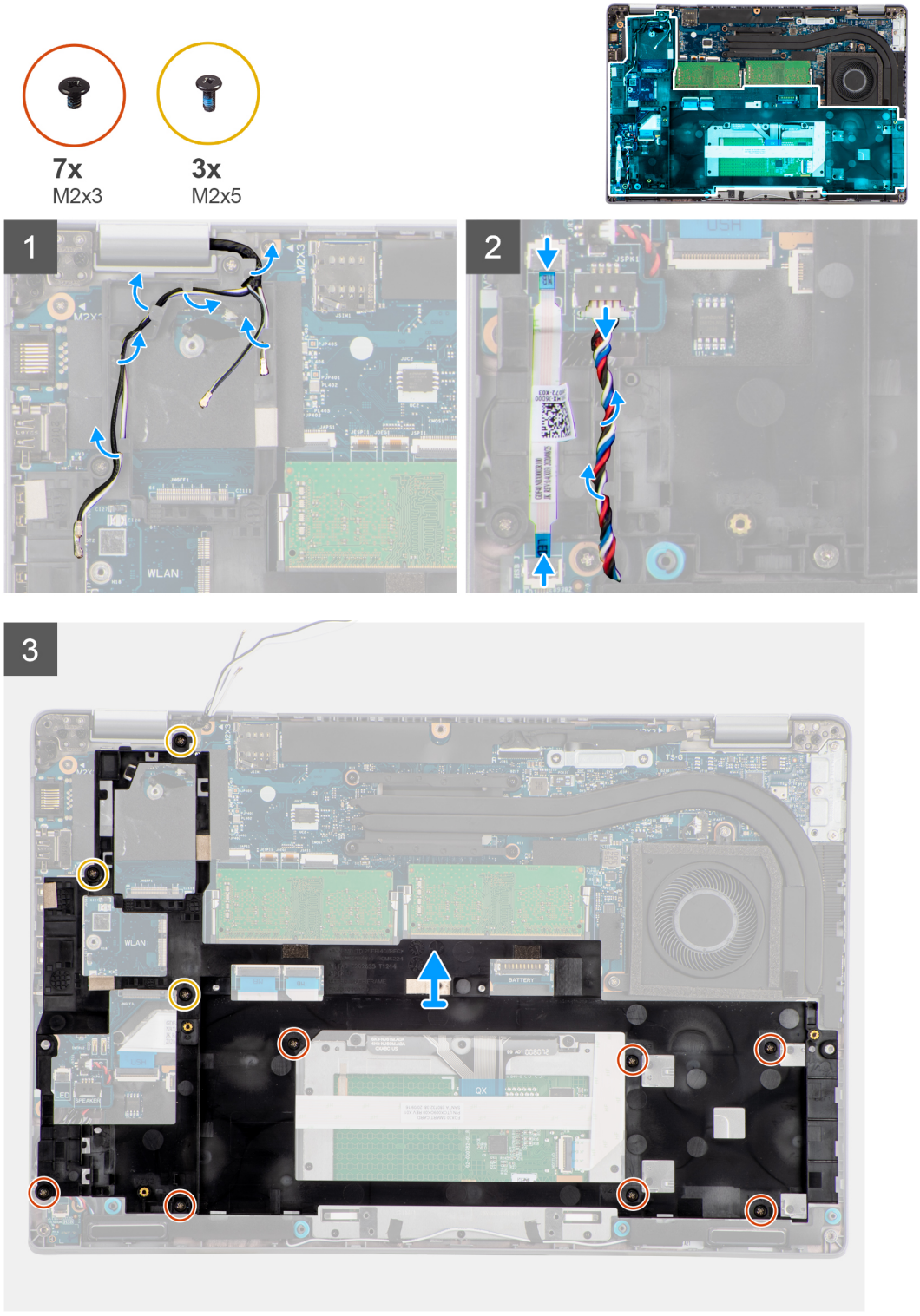
Removing the assembly inner frame

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the solid-state drive.
6. Remove the base cover.
7. Remove the battery.
8. Remove the WLAN card.
9. Remove the WWAN card.

About this task

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



Steps

1. Unroute the antenna cables from the routing guides on the assembly inner frame.
2. Disconnect the LED-board cable from the connector on the system board.
3. Disconnect the speaker cable from the connector on the system board and unroute the cable from the routing guides on the assembly inner frame.
4. Remove the three screws (M2x5) that secures the assembly inner frame to the system board and the palm-rest assembly.
5. Remove the seven screws (M2x3) that secure the assembly inner frame to the system board and the palm-rest assembly .
6. Lift the assembly inner frame off the system board and the palm-rest assembly.

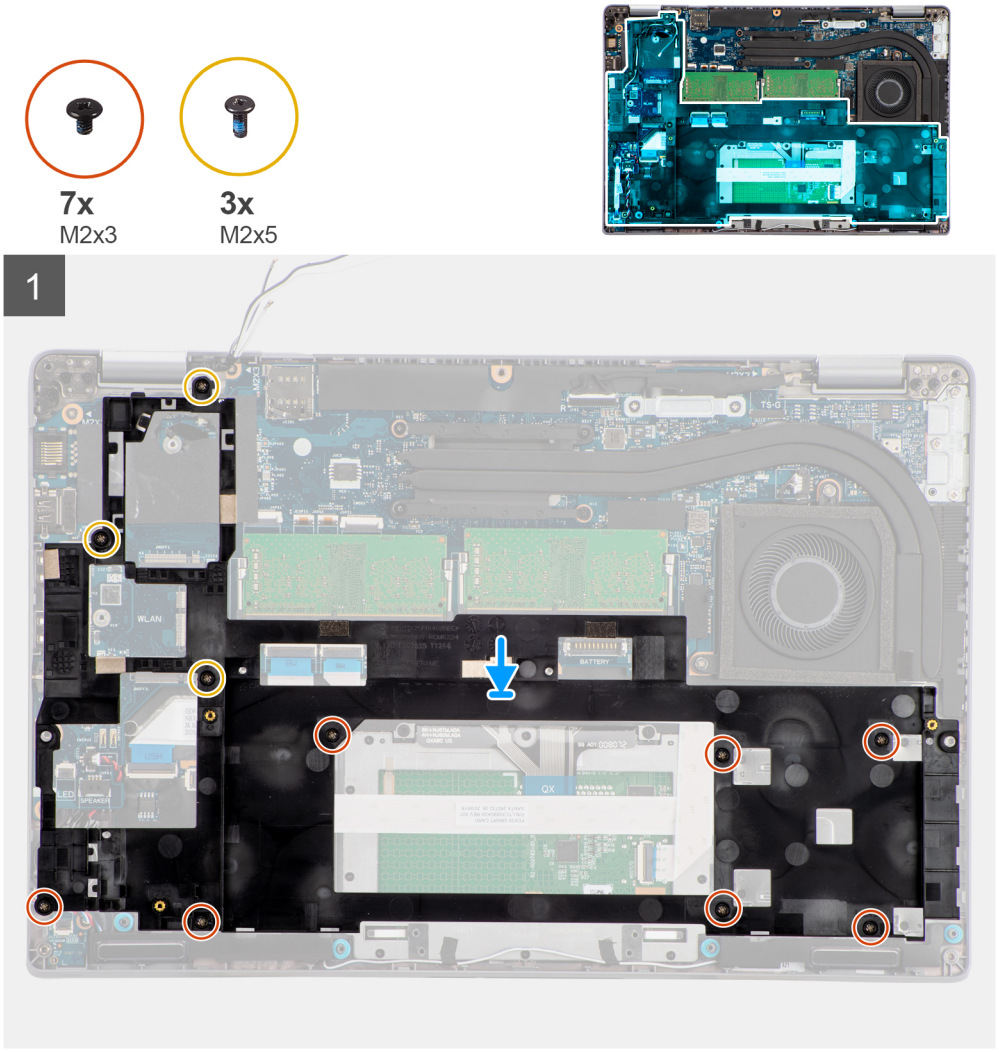
Installing the assembly inner frame

Prerequisites

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

About this task

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



Steps

1. Align the screw holes on the assembly inner frame with the screw holes on the system board and the palm-rest assembly.

   NOTE: Ensure that the tab on the top-left corner of the assembly inner frame is installed underneath the tab on the palm-rest assembly.

2. Replace the seven screws (M2x3) that secure the assembly inner frame to the system board and the palm-rest assembly.
3. Replace the three screws (M2x5) that secure the assembly inner frame to the system board and the palm-rest assembly.
4. Connect the LED-board cable to the connector on the system board.
5. Route the speaker cable firmly through the routing guide on the assembly inner frame and connect the speaker cable to the connector on the system board.
6. Route the antennas cable through the routing guides on the assembly inner frame.

Next steps

1. Install the WWAN card.
2. Install the WLAN card.
3. Install the battery.
4. Install the solid-state drive.
5. Install the base cover.
6. Install the microSD card.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

LED board

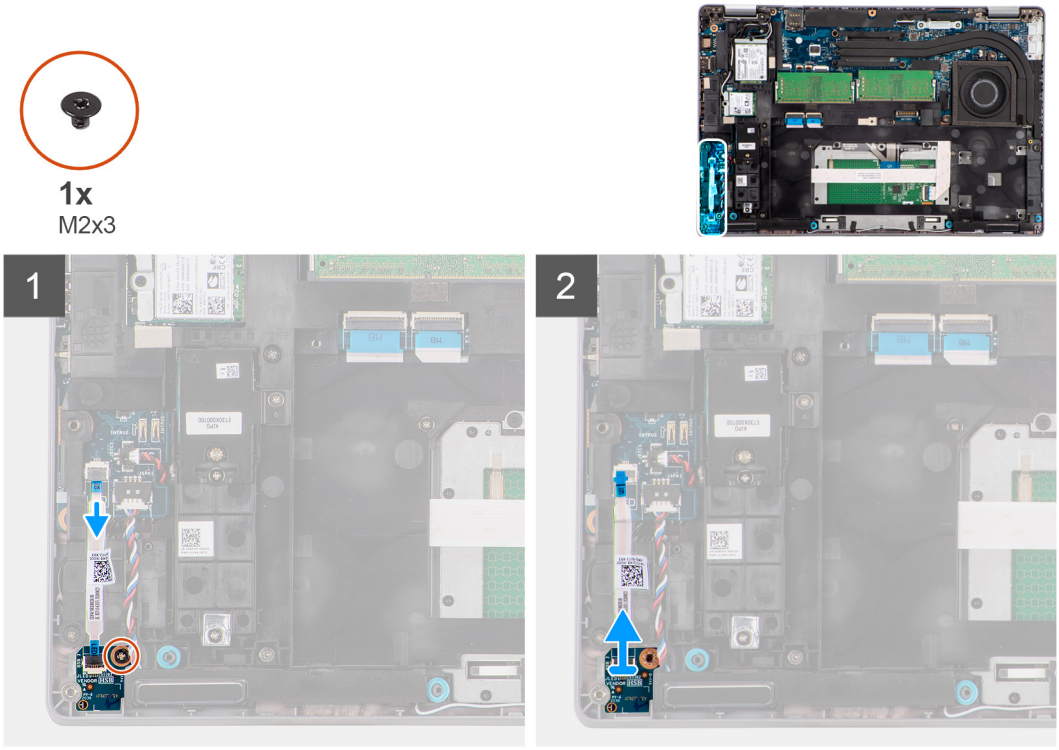
Removing the LED board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the battery.

About this task

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



Steps

1. Disconnect the LED-board cable from the connector on the system board.
2. Remove the single screw (M2x3) that secures the LED board to the palm-rest assembly.
3. Lift the LED board and cable away from the palm-rest assembly.

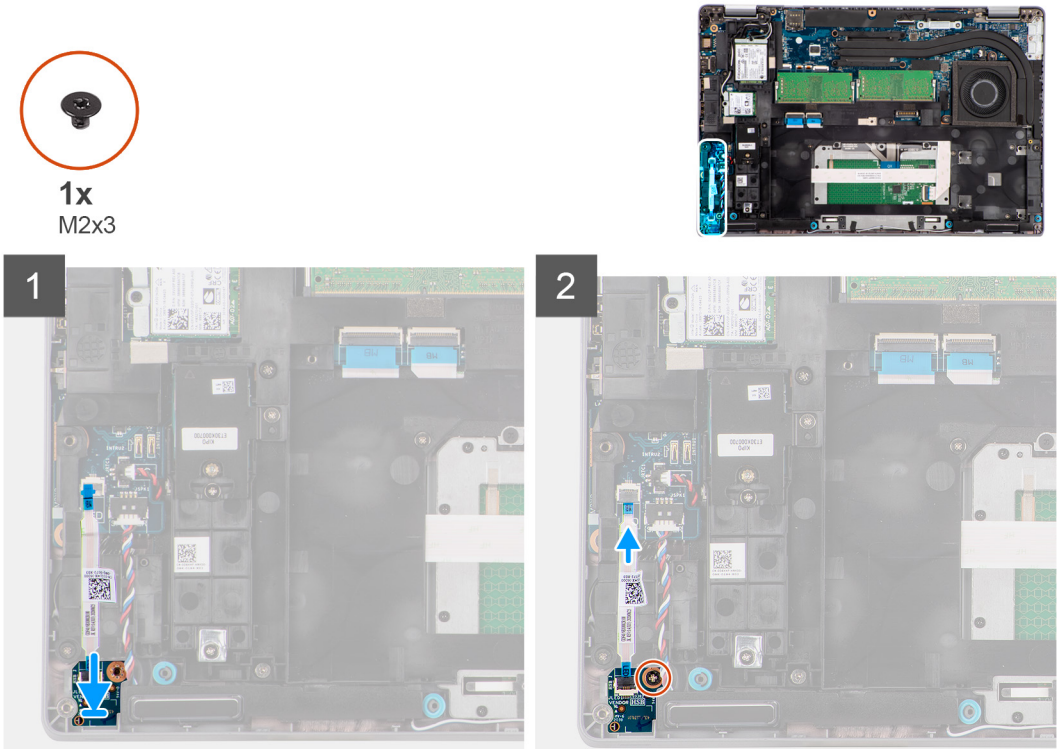
Installing the LED board

Prerequisites

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

About this task

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



Steps

1. Align the screw hole on the LED board with the screw hole on the palm-rest assembly.
2. Replace the single screw (M2x3) to secure the LED board to the palm-rest assembly.
3. Route the LED-board cable and connect the cable to the connector on the system board.

Next steps

1. Install the battery.
2. Install the base cover.
3. Install the microSD card.
4. Install the SIM card.
5. Follow the procedure in After working inside your computer.

Heat sink

Removing the heat sink

Prerequisites

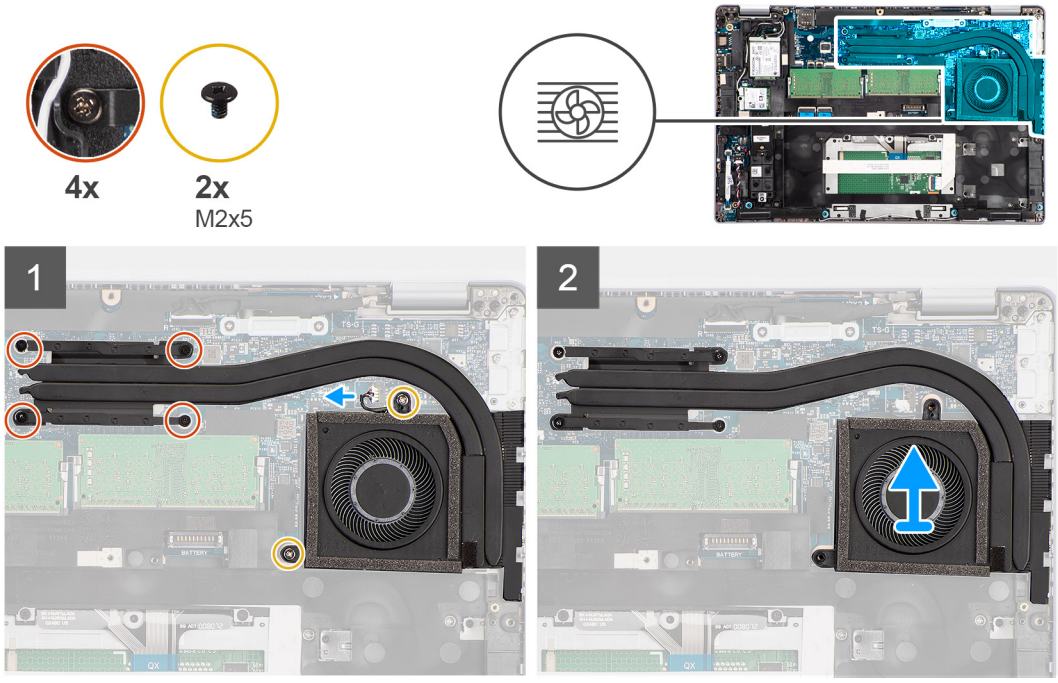
1. Follow the procedure in before working inside your computer.

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

2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the battery.

About this task

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



Steps

1. Disconnect the system fan cable from the connector on the system board.
2. Remove the two screws (M2x5) that secures the heat sink to the system board.
3. Loosen the four captive screws that secure the heat sink to the system board.
4. Lift the heat sink off the system board.

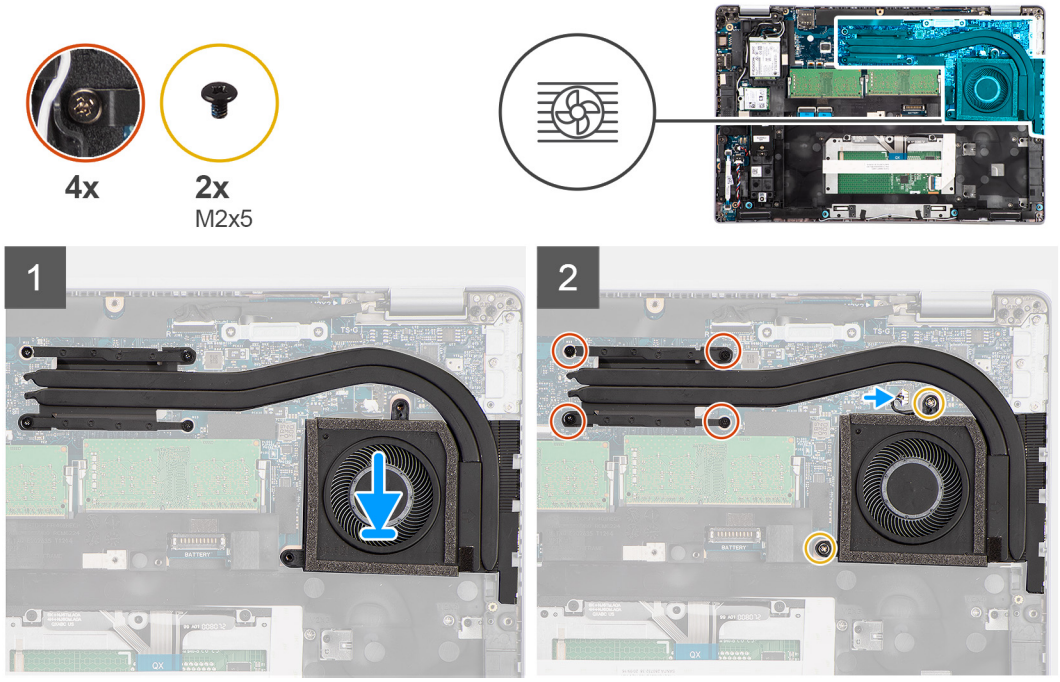
Installing the heat sink

Prerequisites

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

About this task

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



Steps

1. Align the screw holes on the heat sink with the screw holes on the system board.
2. Connect the system fan cable to the connector on the system board.
3. Tighten the four captive screws that secure the heat sink to the system board.
4. Replace the two screws (M2x5) that secures the heat sink to the system board.

Next steps

1. Install the battery.
2. Install the base cover.
3. Install the microSD card.
4. Install the SIM card.
5. Follow the procedure in After working inside your computer.

Speakers

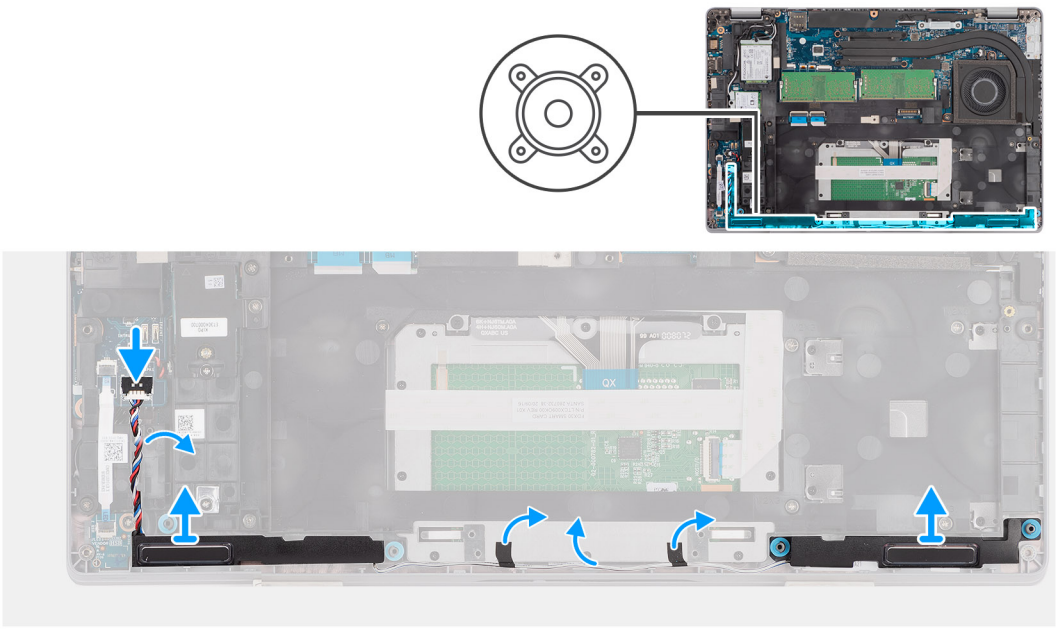
Removing the speaker

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the battery.

About this task

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



Steps

1. Disconnect the speaker cable from the connector on the system board.
2. Unroute the speaker cable from the routing guides on the assembly inner frame and palm-rest assembly.
3. Lift the speakers along with the cable off the palm-rest assembly.

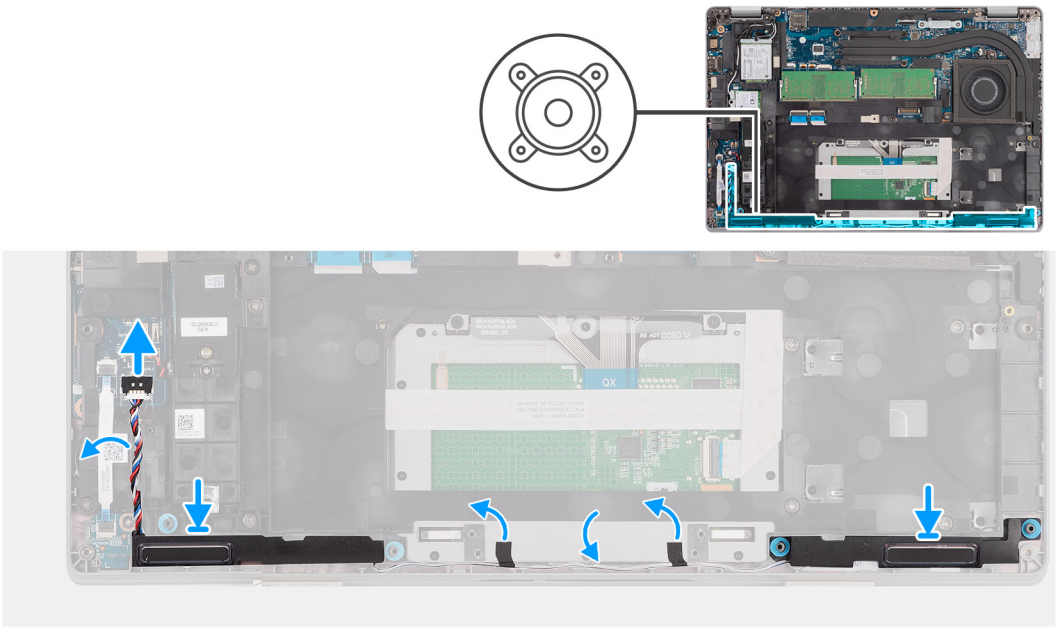
Installing the speaker

Prerequisites

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

About this task

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



Steps

1. Using the alignment posts and rubber grommets, place the speakers in the slots on the palm-rest assembly.
2. Route the speaker cable through the routing guide on the assembly inner frame and palm-rest assembly.
3. Connect the speaker cable to the connector on the system board.

Next steps

1. Install the battery.
2. Install the base cover.
3. Install the microSD card.
4. Install the SIM card.
5. Follow the procedure in After working inside your computer.

System board

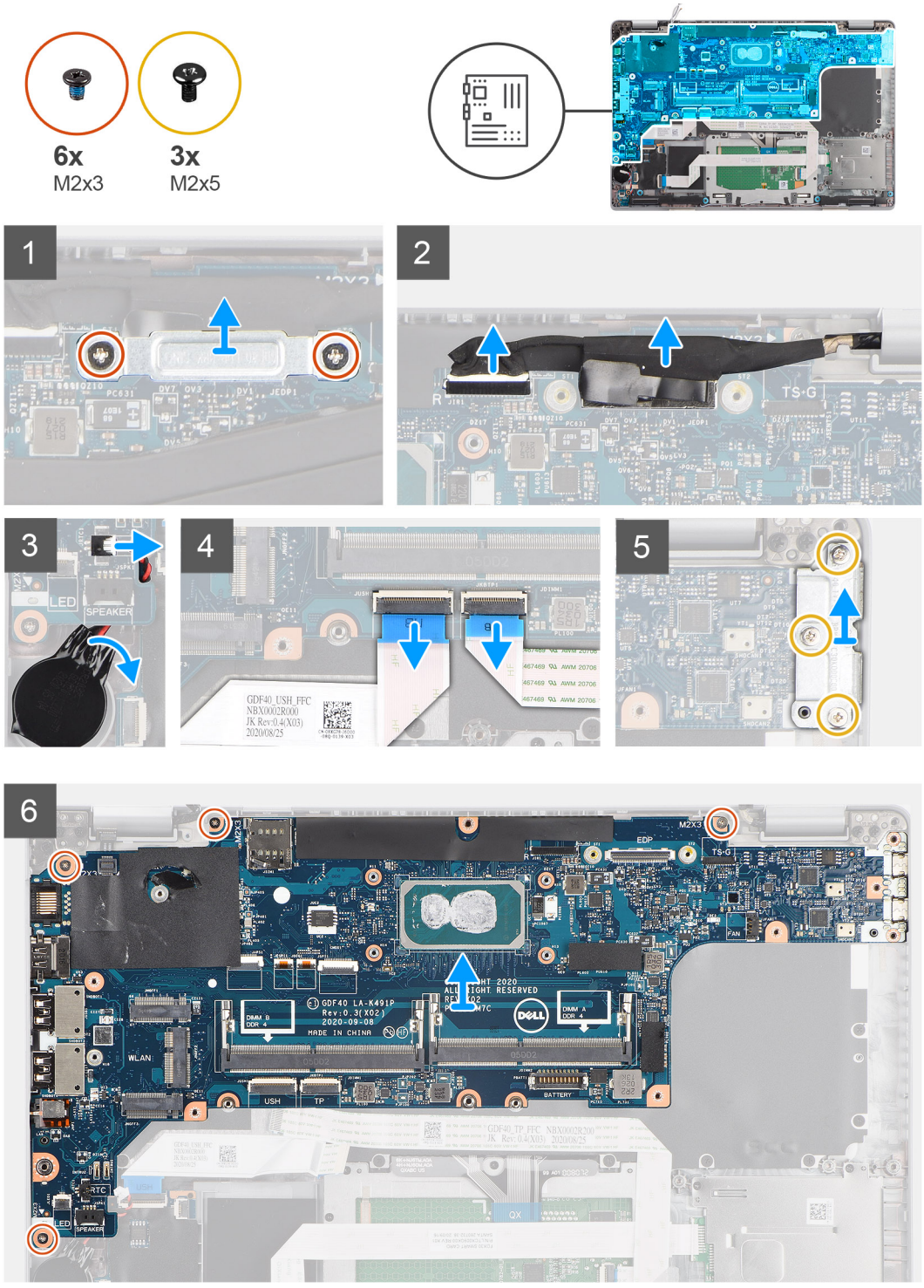
Removing the system board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.
6. Remove the WLAN card.
7. Remove the WWAN card.
8. Remove the memory module.
9. Remove the heat sink.
10. Remove the solid-state drive.
11. Remove the battery.
12. Remove the assembly inner frame.

About this task

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



Steps

NOTE: The system board can be removed and installed with the heat sink attached in order to simplify the procedure and preserve the heat sink between the system board and heat-sink. In order to do so, technicians must also remove the two (M2x5) screws the secure the system fan to the system board.

NOTE: For the models shipped with a fingerprint reader, disconnect the fingerprint reader cable from the connector on the system board before removing the system board from the palm-rest assembly and keyboard assembly.

1. Remove the two screws (M2x3) that secure the eDP/display cable bracket to the system board.
2. Lift the eDP/display cable bracket away from the system.

3. Peel the tape that secures the display cable to the system board.
4. Using the pull tab, disconnect the display cable from the connector on the system board.
5. Disconnect the coin-cell battery cable from the connecter on the system board.

   NOTE: When you disconnect the coin-cell battery cable from the connecter on the system board, the CMOS setting is cleared.

6. Open the latch and disconnect the USH board cable from the connector on the system board.
7. Open the latch and disconnect the touch-pad cable from the connector on the system board.
8. Remove the three screws (M2x5) that secure the USB Type-C bracket to the system board.
9. Lift off the USB Type-C bracket off the system board.
10. Remove the four screws (M2x5) that secure the system board to the palm-rest assembly and keyboard assembly.
11. Lift the system board off the palm-rest assembly and keyboard assembly.

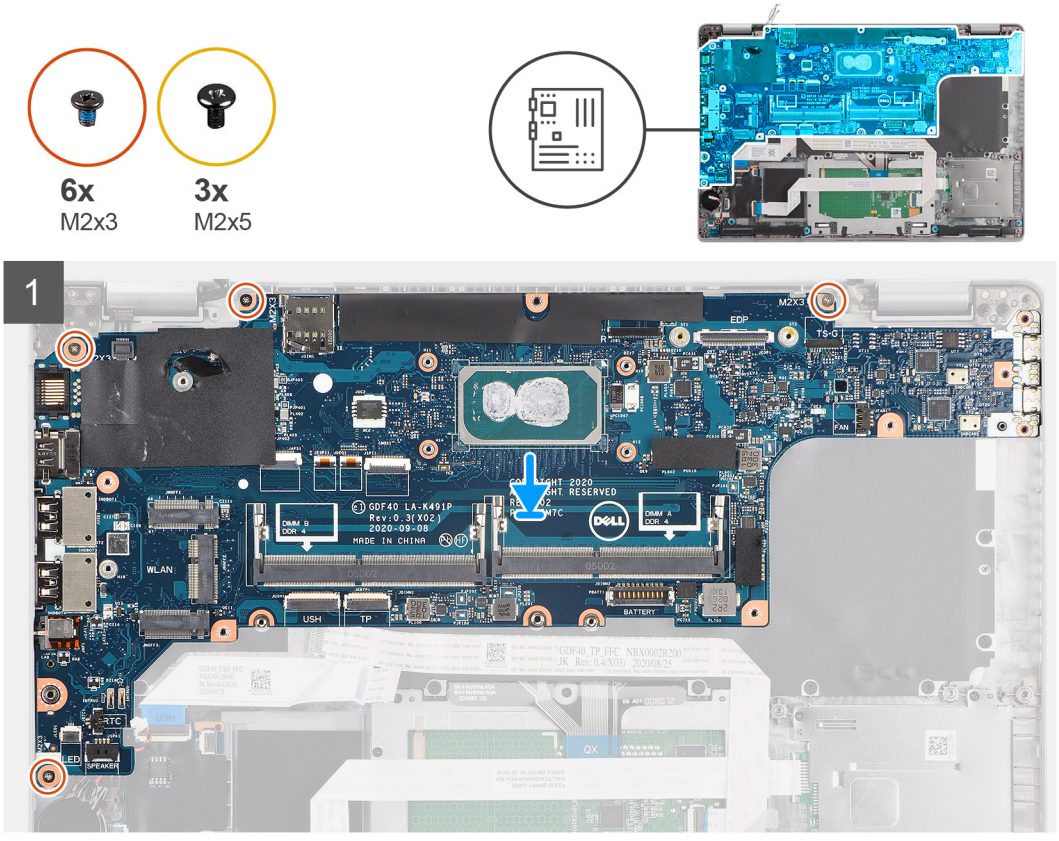
Installing the system board

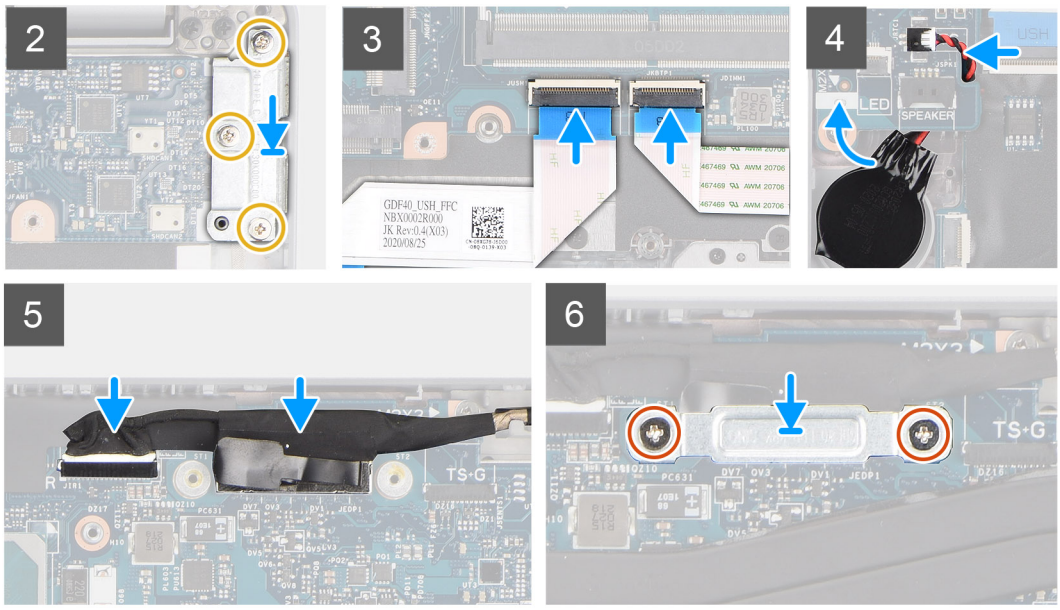
Prerequisites

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

About this task

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





Steps

NOTE: The system board can be removed and installed with the thermal module attached in order to simplify the procedure and preserve the thermal bond between the system board and heat-sink. In order to do so, technicians must also remove the two (M2x5) screws the secure the system fan to the system board.

1. Slide the system board to make the USB Type-C connector to toe-in to the hinge saddle and align the screw holes on the system board with the screw holes on the palm-rest assembly and keyboard assembly.
2. Replace the four screws (M2x3) to secure the system board to the palm-rest assembly and keyboard assembly.
3. Align and place the USB Type-C bracket on the system board.
4. Replace the three screws (M2x5) that secure the USB Type-C bracket to the system board.
5. Connect the USH board cable to the system board and close the latch to secure the cable to the system board.
6. Connect the touch pad cable to the system board and close the latch to secure the cable to the system board.
7. Route the coin-cell battery cable under the system board and connect the coin-cell battery cable to the connector on the system board.
8. Route the display and eDP/display cable through the routing guide on the system board.
9. Connect the eDP/display cable to the connector on the system board.
10. Connect the display cable to the connector on the system board.
11. Adhere the tape that secures the display cable to the system board.
12. Align the screw holes on the eDP/display cable bracket with the screw holes on the system board.
13. Replace the two screws (M2x3) that secure the eDP/display cable bracket to the system board.

Next steps

1. Install the assembly inner frame.
2. Install the battery.
3. Install the solid-state drive.
4. Install the heat sink.
5. Install the memory module.
6. Install the WWAN card.
7. Install the WLAN card.
8. Install the base cover.
9. Install the microSD card.
10. Install the SIM card.
11. Follow the procedure in After working inside your computer.

Power-button board

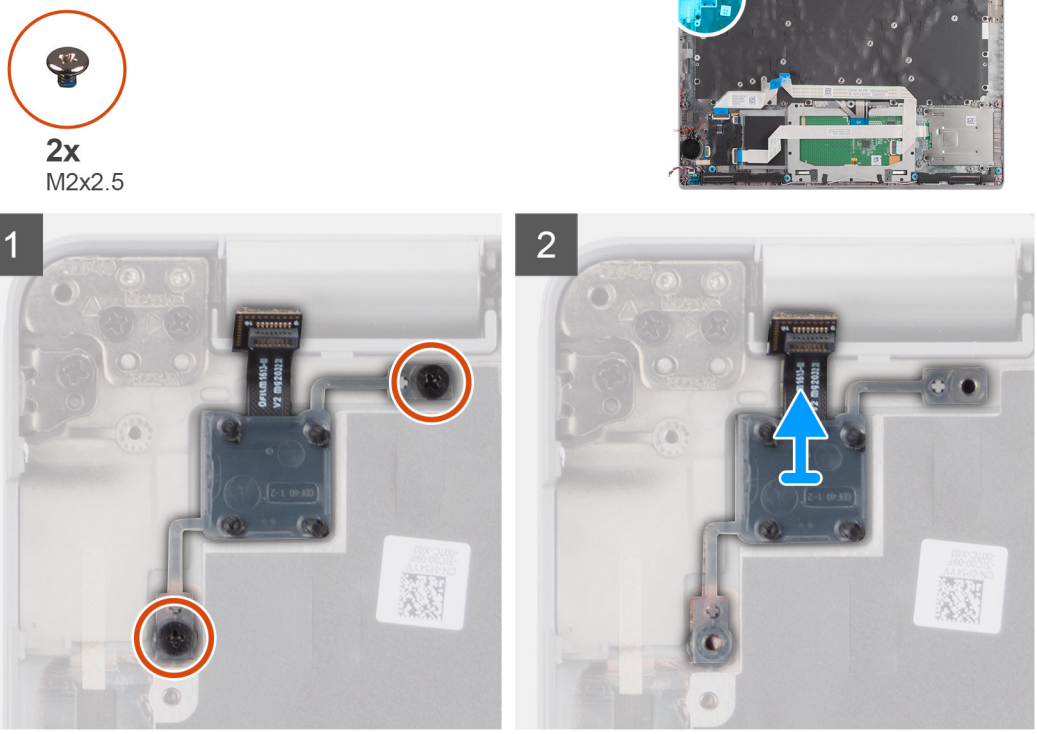
Removing the power-button board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the memory module.
8. Remove the solid-state drive.
9. Remove the battery.
10. Remove the assembly inner frame.
11. Remove the system board.

About this task

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



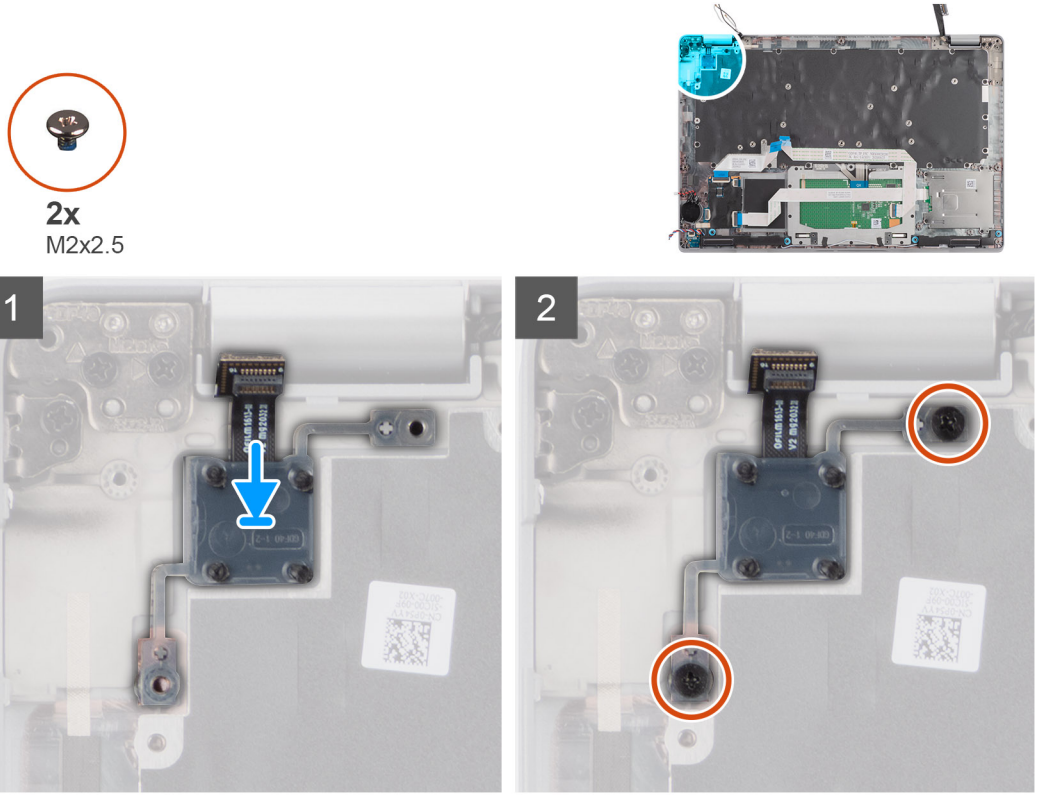
Steps

1. Remove the two screws (M2x2.5) that secure the power-button board to the palm-rest assembly.
2. Lift the power-button board off the palm-rest assembly.

Installing the power-button board

About this task

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



Steps

1. Align and place the power-button board on the palm-rest assembly.
2. Replace the two screws (M2x2.5) that secure the power-button board to the palm-rest assembly.

Next steps

1. Install the system board.
2. Install the assembly inner frame.
3. Install the battery.
4. Install the solid-state drive.
5. Install the memory module.
6. Install the WWAN card.
7. Install the WLAN card.
8. Install the base cover.
9. Install the microSD card.
10. Install the SIM card.
11. Follow the procedure in After working inside your computer.

Smart card reader

Removing the smart card reader

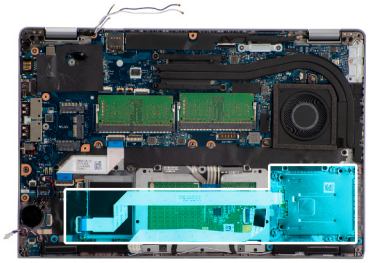
Prerequisites

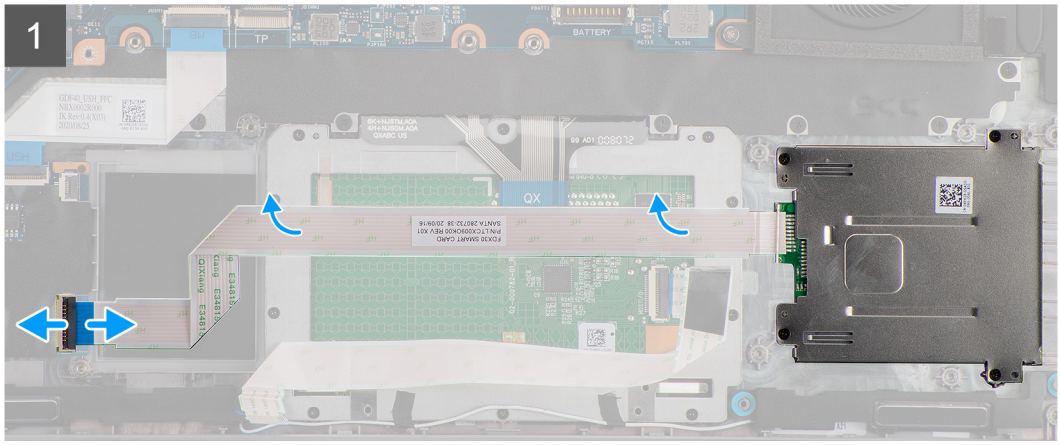
1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the solid-state drive.
8. Remove the battery.
9. Remove the assembly inner frame.

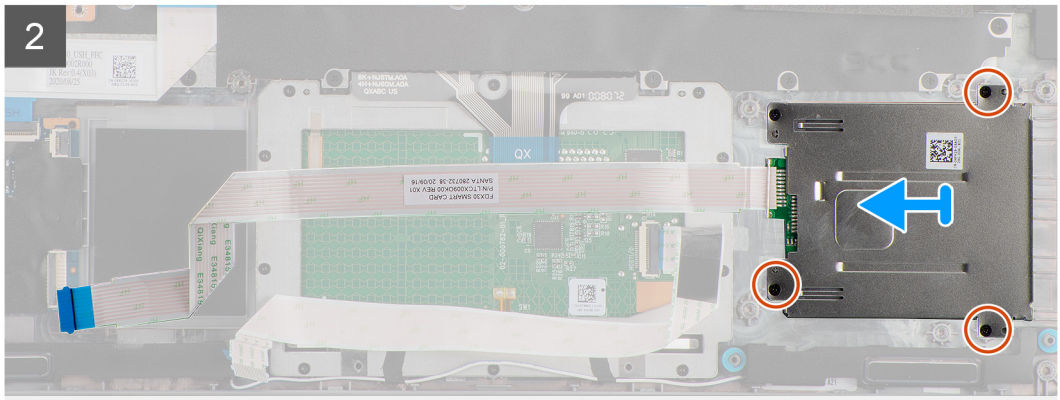
About this task

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

3x
M2x2.5







Steps

1. Open the latch and disconnect the smart card reader cable from the connector on the USH board.
2. Remove the four screws (M2x2.5) that secure the smart card reader to the palm-rest assembly.
3. Lift the smart card reader off the palm-rest assembly.

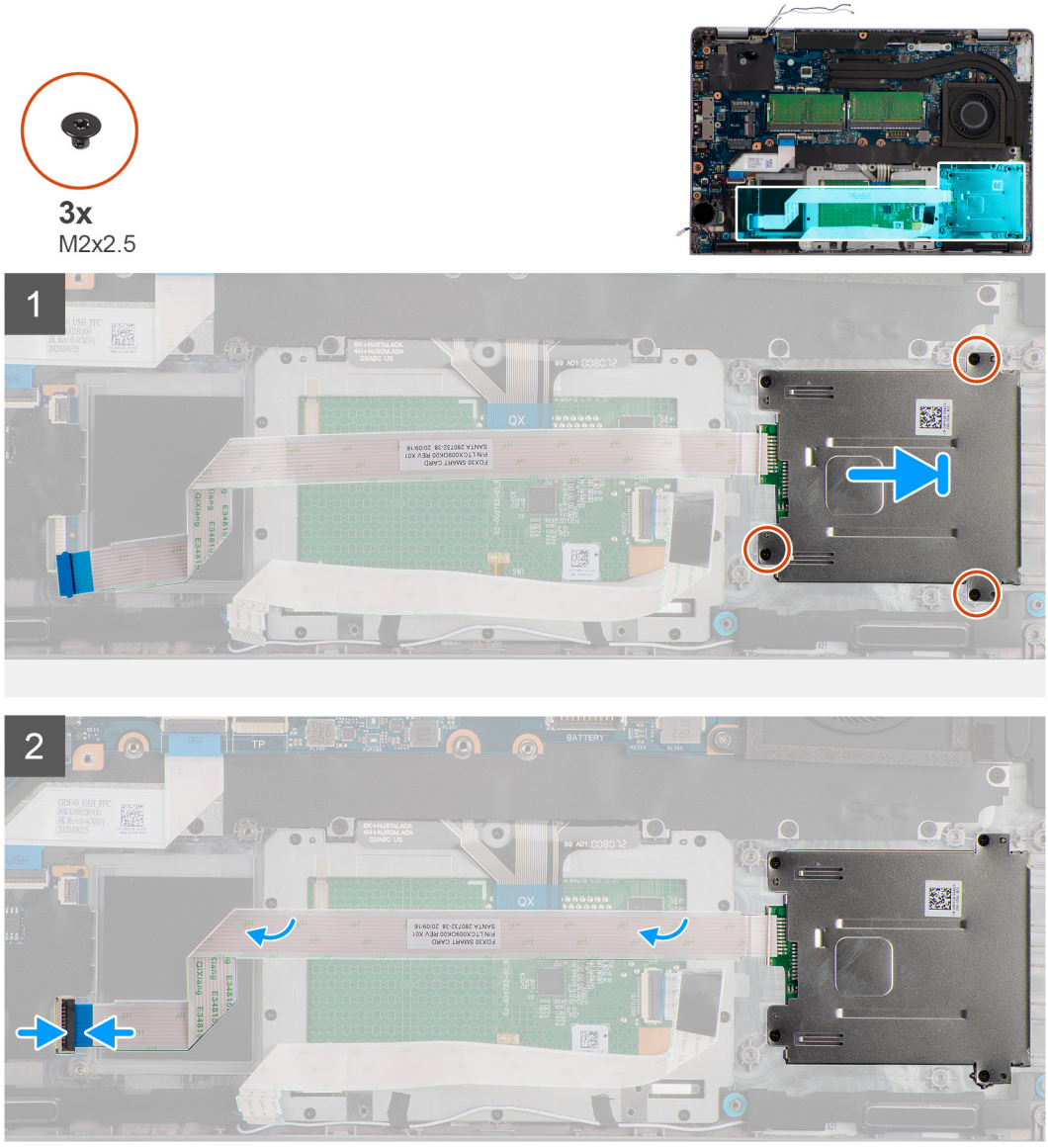
Installing the smart card reader

Prerequisites

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

About this task

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



Steps

1. Align and place the smart card reader on the palm-rest assembly.
2. Replace the four screws (M2x2.5) that secure the smart card reader to the palm-rest assembly.
3. Connect the smart card reader cable to the connector on the USH board.

Next steps

1. Install the assembly inner frame.
2. Install the battery.
3. Install the solid-state drive.
4. Install the WWAN card.
5. Install the WLAN card.
6. Install the base cover.
7. Install the microSD card.
8. Install the SIM card.
9. Follow the procedure in After working inside your computer.

Keyboard assembly

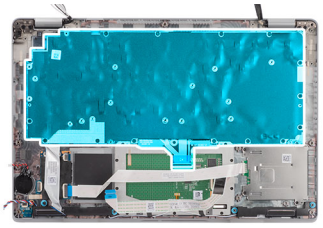
Removing the keyboard assembly

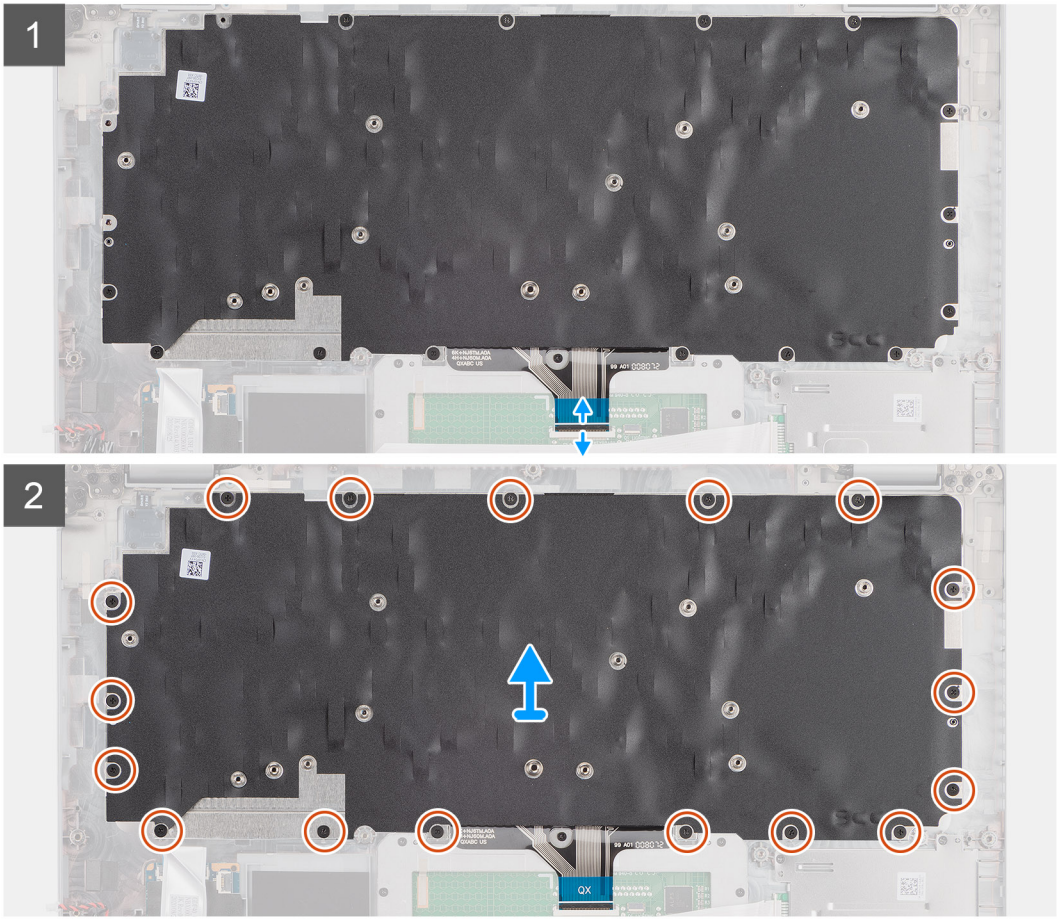
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the memory module.
8. Remove the solid-state drive.
9. Remove the battery.
10. Remove the assembly inner frame.
11. Remove the system board.

About this task

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





Steps

1. Open the latch and disconnect the keyboard cable from the connector on the touch pad.
2. Remove the 17 screws (M2x2) that secure the keyboard assembly to the palm-rest assembly.
3. Remove the keyboard assembly off the palm-rest assembly.

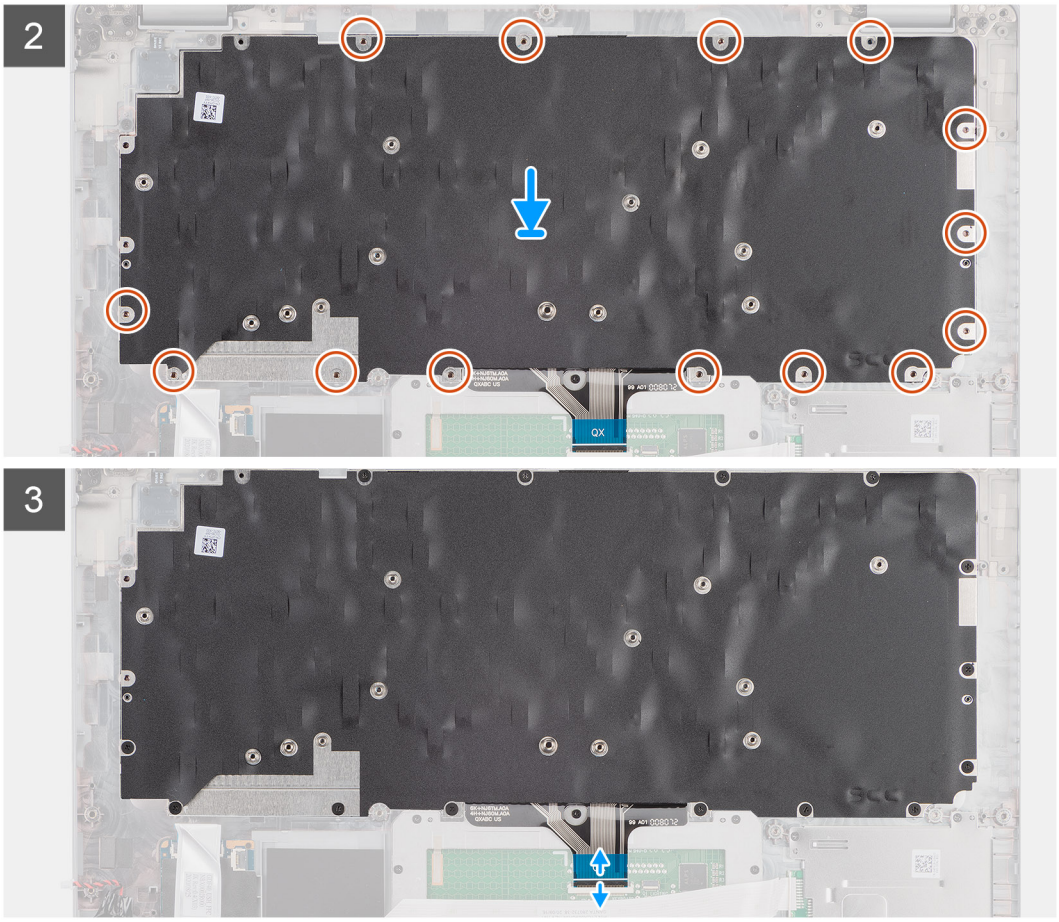
Installing the keyboard assembly

Prerequisites

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

About this task

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



Steps

1. Align and place the keyboard assembly on the palm-rest assembly.
2. Replace the 17 screws (M2x2) that secure the keyboard assembly to the palm-rest assembly.
3. Connect the keyboard cable to the connector on the touch-pad.

Next steps

1. Install the system board.
2. Install the assembly inner frame.
3. Install the battery.
4. Install the solid-state drive.
5. Install the memory module.
6. Install the WWAN card.
7. Install the WLAN card.
8. Install the base cover.
9. Install the microSD card.
10. Install the SIM card.
11. Follow the procedure in After working inside your computer.

Keyboard bracket

Removing the keyboard bracket

Prerequisites

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

2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the memory module.
8. Remove the solid-state drive.
9. Remove the battery.
10. Remove the assembly inner frame.
11. Remove the system board.
12. Remove the keyboard assembly.

About this task

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

Steps

1. Remove the six screws (M2x2) that secure the keyboard to the keyboard bracket.
2. Remove the keyboard from the keyboard bracket.

Installing the keyboard bracket

Prerequisites

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

About this task

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

6x
M2x2

Steps

1. Align and place the keyboard on the keyboard bracket.
2. Replace the six screws (M2x2) to secure the keyboard to the keyboard bracket.

Next steps

1. Install the keyboard assembly.
2. Install the system board.
3. Install the assembly inner frame.
4. Install the battery.
5. Install the solid-state drive.
6. Install the memory module.
7. Install the WWAN card.
8. Install the WLAN card.
9. Install the base cover.
10. Install the microSD card.
11. Install the SIM card.
12. Follow the procedure in After working inside your computer.

Display assembly

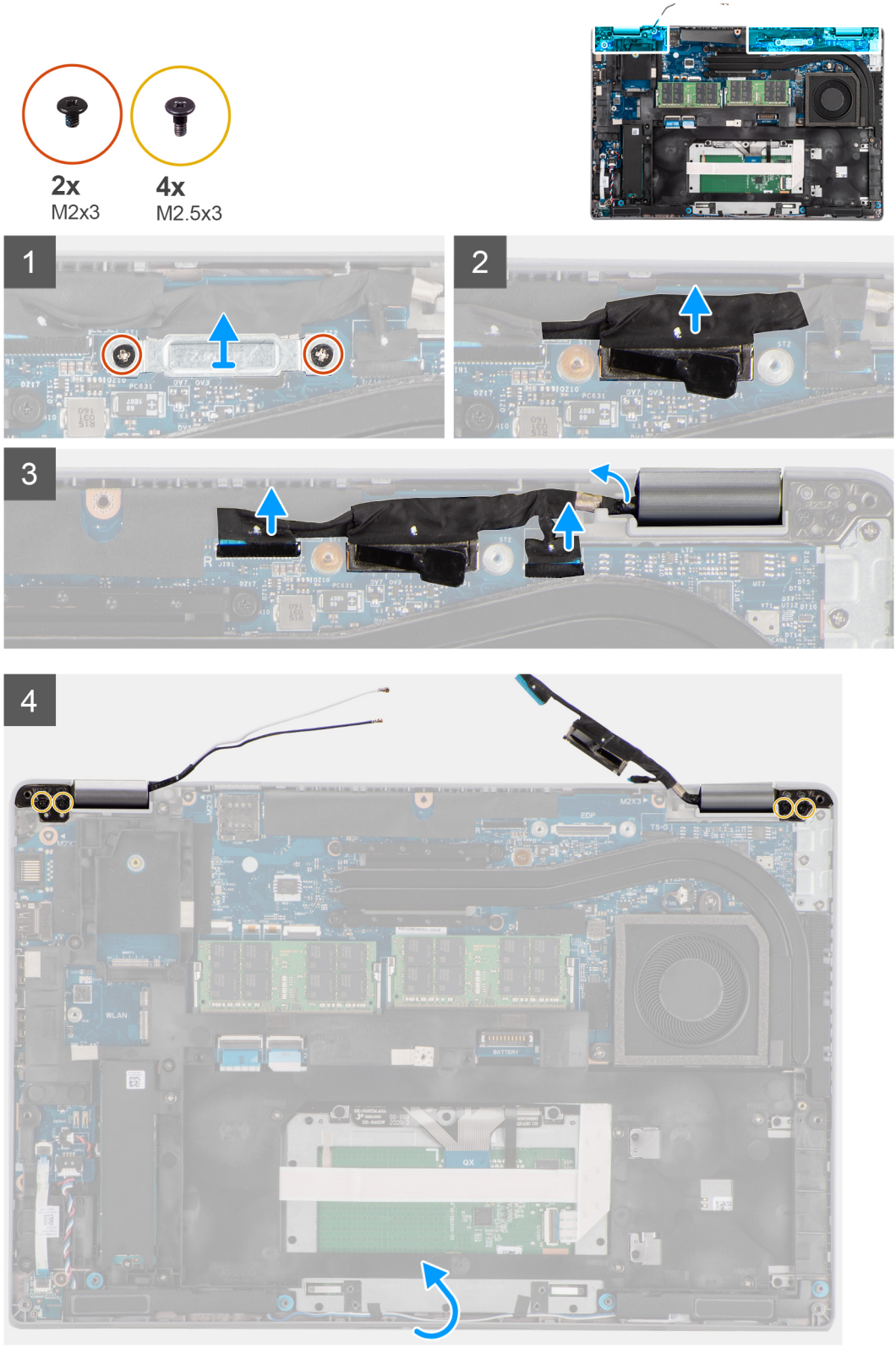
Removing the display assembly

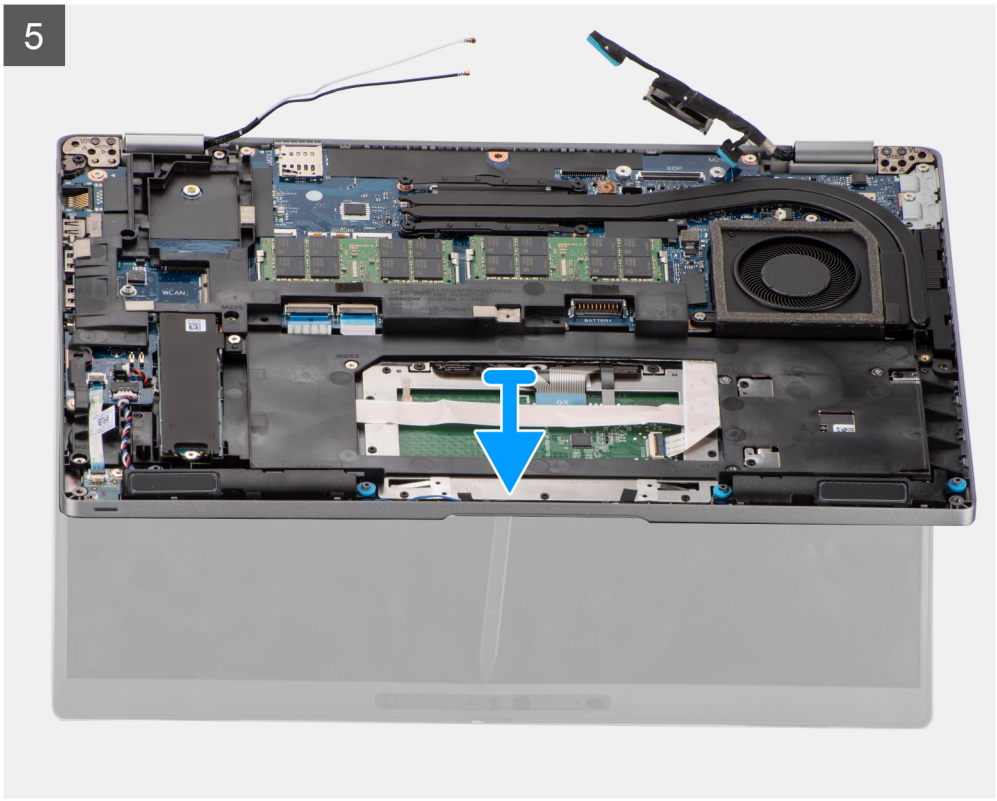
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.
6. Remove the WLAN card.
7. Remove the WWAN card.

About this task

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





Steps

1. Remove the two screws (M2x3) that secure the display cable bracket to the system board.
2. Lift the display cable bracket away from the system board.
3. Using the pull tab, gently disconnect the display cable from the connector on the system board.

   CAUTION: The display cable, sensor board cable and IR camera cable are part of the same composite cable structure. To avoid damaging the cables, and the cable connectors on the system board, do not apply tension on any of these cables until all cables in the series have been disconnected.

4. Disconnect the IR camera cable from the connector on the system board.
5. Disconnect the sensor board cable from the connector on the system board.
6. Remove the display cable, sensor board cable and IR camera cable from the routing guide on the palm-rest and keyboard assembly.
7. Remove the four screws (M2.5x3) that secure the display hinges to the system board.
8. Lift the palm-rest and keyboard assembly to pry open the display hinges.
9. Remove the palm-rest and keyboard assembly off the display assembly.

Installing the display assembly

Prerequisites

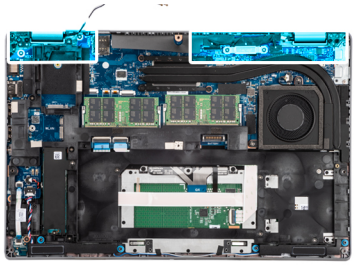
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

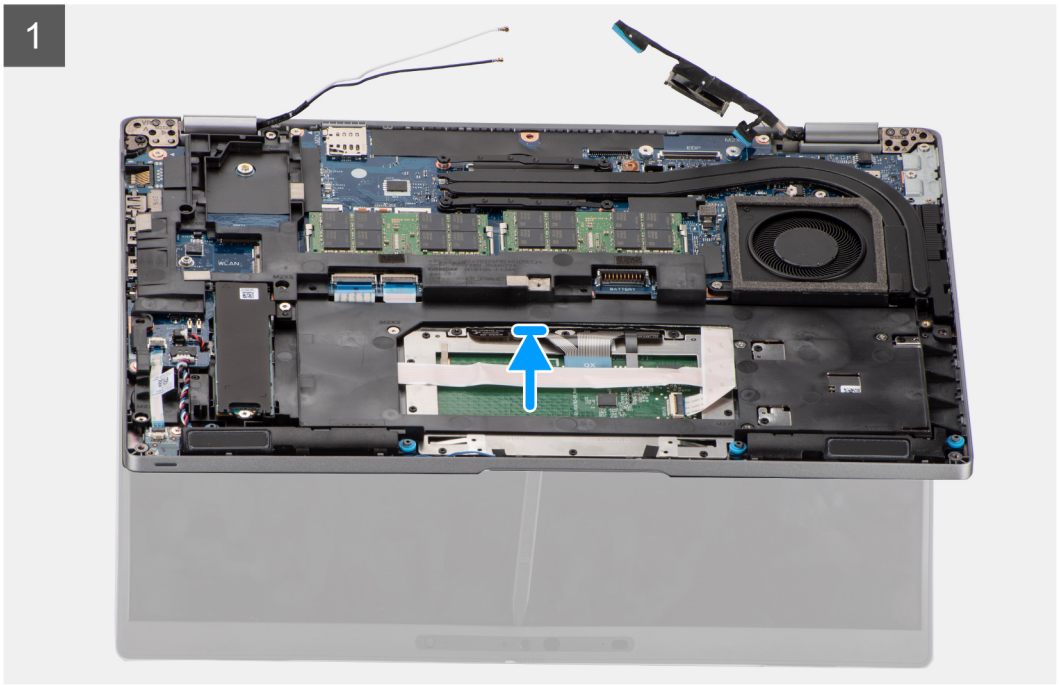
The following image indicates the location of the display assembly and provides a visual representation of the installation procedure.

2x
M2x3

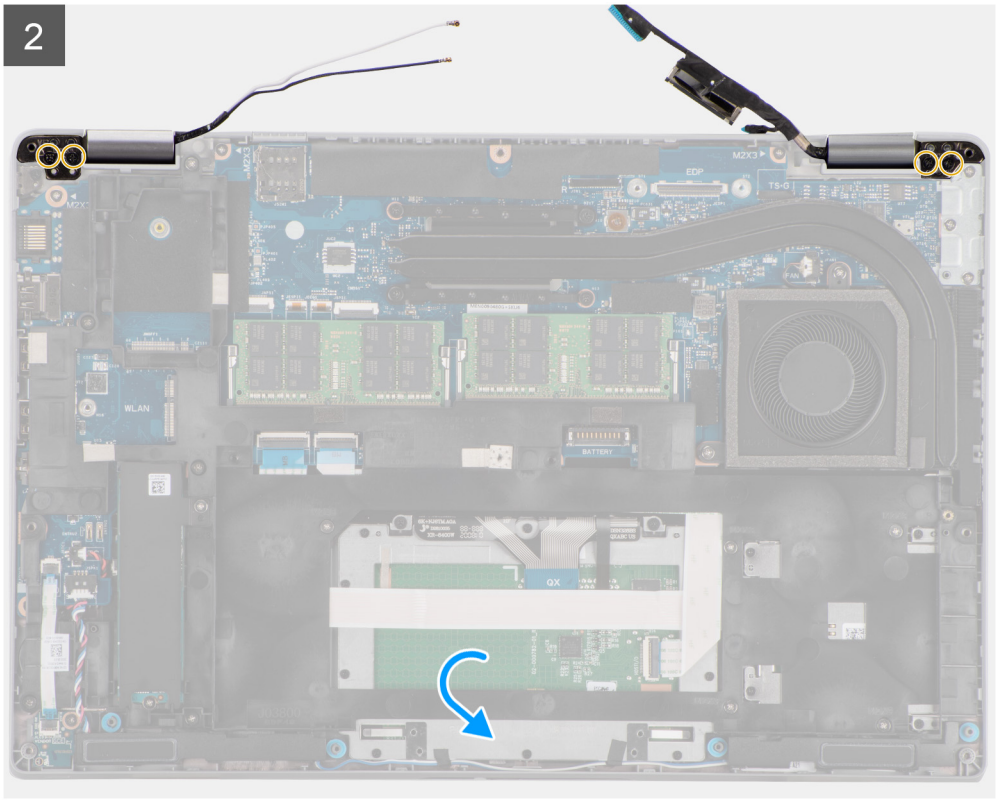
4x
M2.5x3

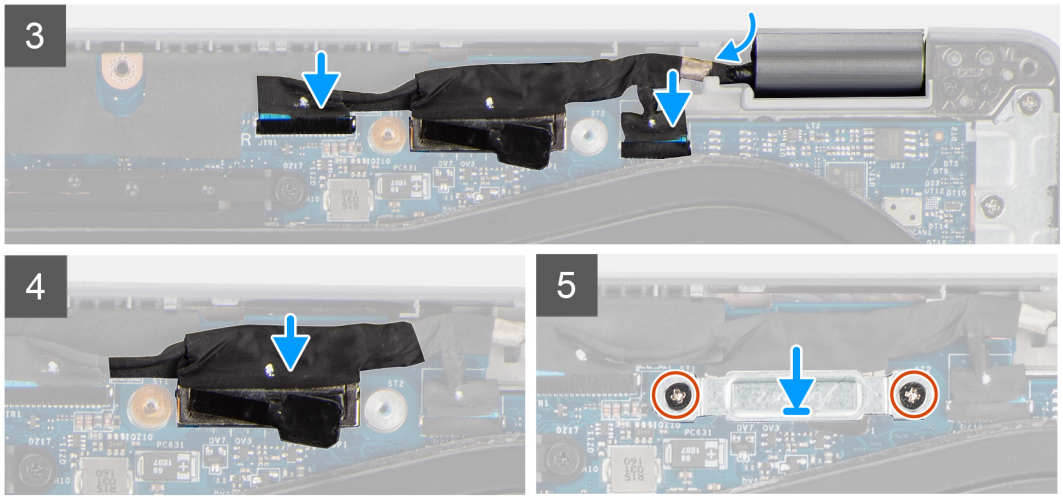


1



2





Steps

1. Place the palm-rest assembly on the display. Close the display hinges and align the screw holes on the display hinges with screw holes on the palm-rest assembly.
2. Replace the four screws (M2.5x3) that secure the display hinges to the palm-rest assembly.
3. Route the display cable, sensor board cable and IR camera cable through the routing guide on the system board.
4. Connect the IR camera cable to the connector on the system board.
5. Connect the sensor board cable to the connector on the system board.
6. Connect the display cable to the connector on the system board.
7. Place the display cable bracket on the system board and align the screw holes on the display cable bracket with the screw holes on the system board.
8. Replace the two screws (M2x3) that secure the display cable bracket to the system board.

Next steps

1. Install the WWAN card.
2. Install the WLAN card.
3. Install the base cover.
4. Install the microSD card.
5. Install the SIM card.
6. Follow the procedure in After working inside your computer.

Display bezel

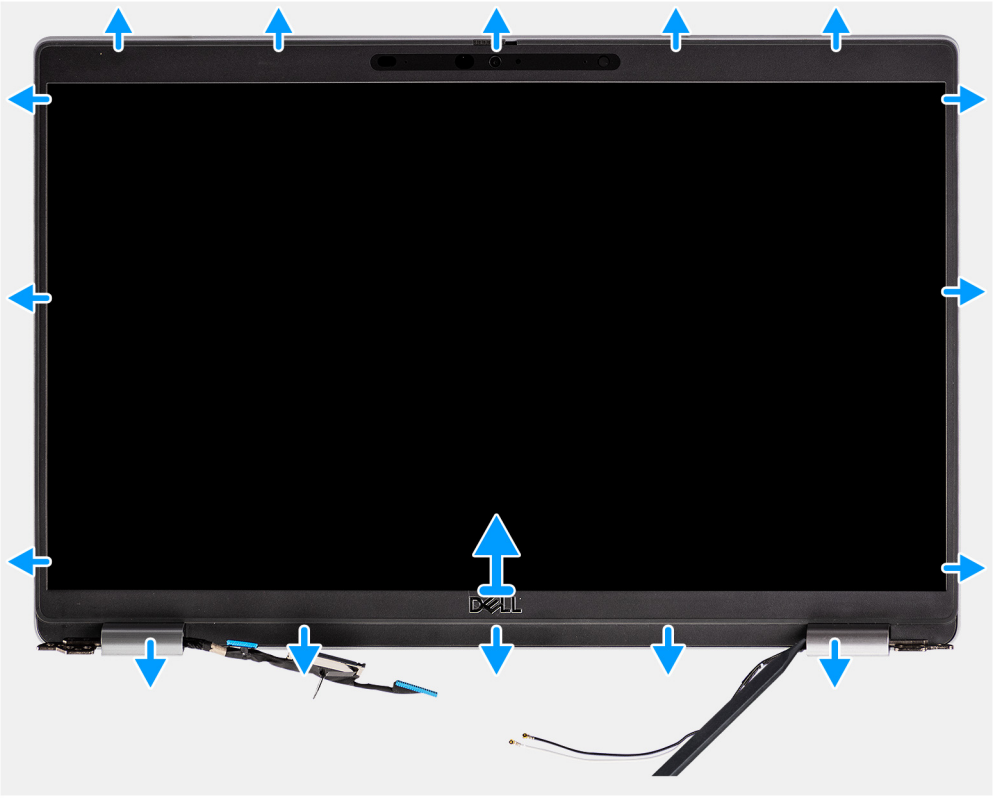
Removing the display bezel

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.
6. Remove the WLAN card.
7. Remove the WWAN card.
8. 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.



Steps

NOTE: The display bezel is adhered to the display panel with adhesive. Insert a plastic scribe into the recesses near both hinge caps to start the prying process to release the display bezel. Pry along the outside edge of the display bezel and work your way around the entire display bezel until the display bezel is separated from the display cover.

CAUTION: Carefully pry and remove the display bezel to minimize the risk of display panel damages.

1. Insert a plastic scribe into the recesses near both hinge caps to start the prying process to release the display bezel.
2. Pry along the outside edge of the display bezel and work your way around the entire display bezel until the display bezel is separated from the display cover.
3. Lift the display bezel from the display assembly.

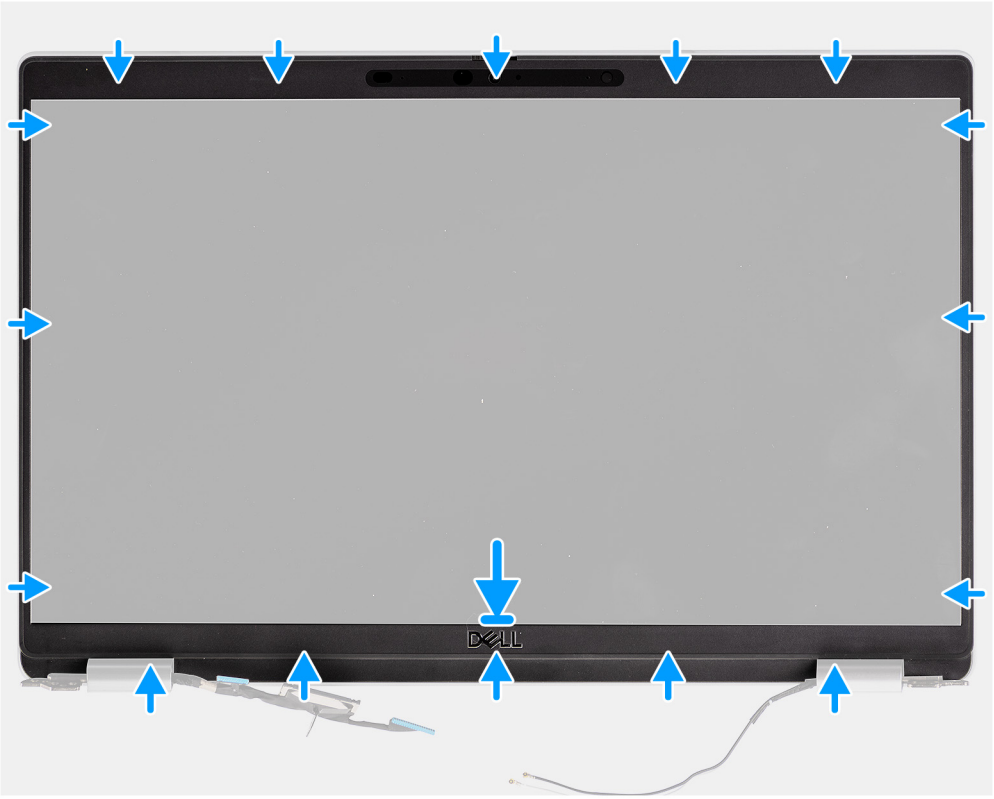
Installing the display bezel

Prerequisites

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

About this task

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



Steps

1. Align and place the display bezel on the display assembly.
2. Gently snap the display bezel into place.

Next steps

1. Install the display assembly.
2. Install the WWAN card.
3. Install the WLAN card.
4. Install the base cover.
5. Install the microSD card.
6. Install the SIM card.
7. 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. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the base cover.
8. Remove the display assembly.
9. Remove the display bezel.

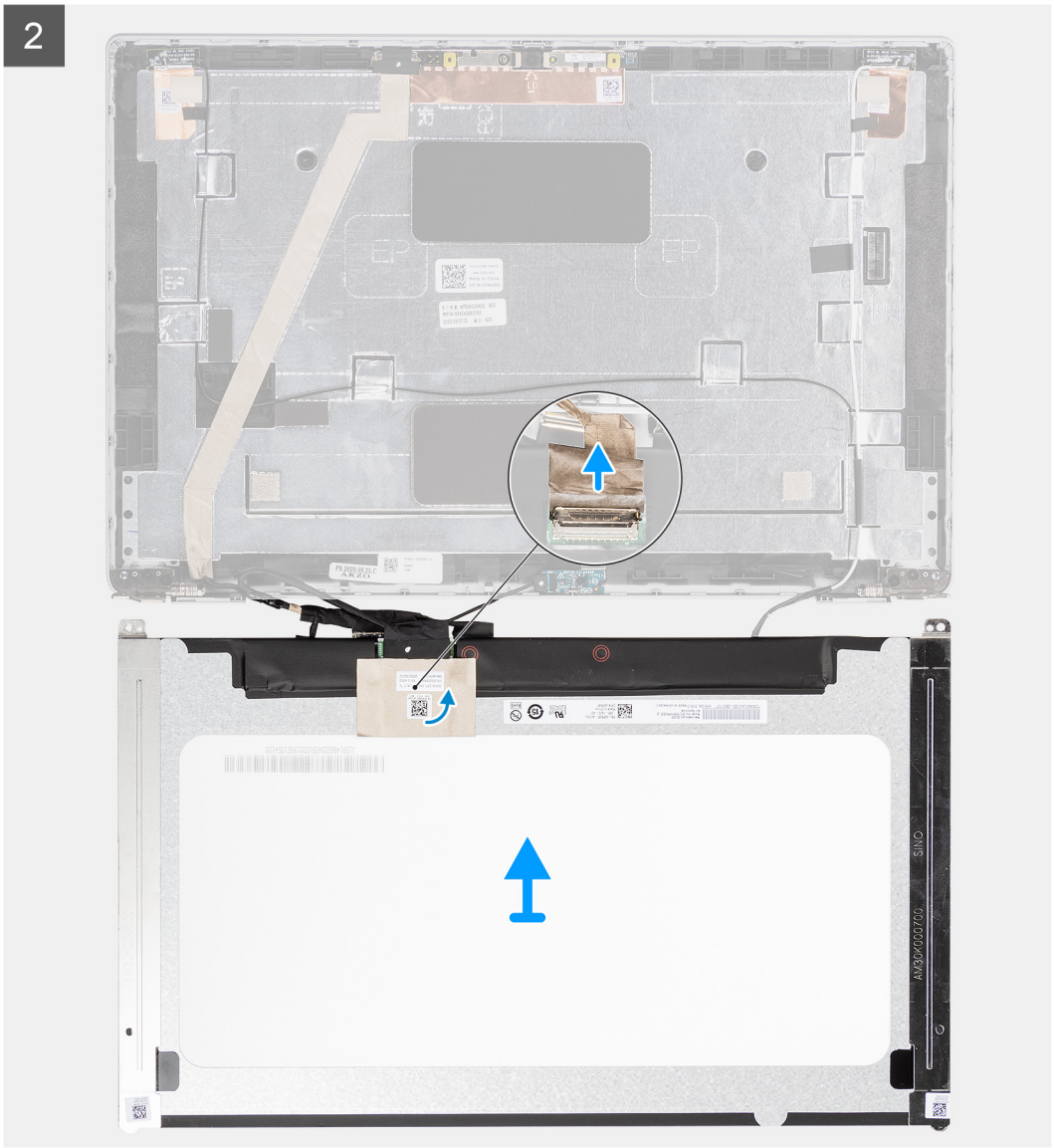
About this task

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

2x
M2.5x3

1

2



Steps

NOTE: The display panel is preassembled with the display brackets as a single service part. Do not pull the Stretch Release (SR) tapes and separate the brackets from the display panel.

1. Remove the two screws (M2.5x3) that secure the display panel to the display back cover.

   NOTE: While removing the display panel, disengage the display panel tabs from the display cover before flipping it over

2. Lift and open the display panel to access the display cable.
3. Peel the conductive tape on the display cable connector.
4. Open the latch and disconnect the cable from the connector on the display panel.
5. Lift the display panel away from the display back cover.

Installing the display panel

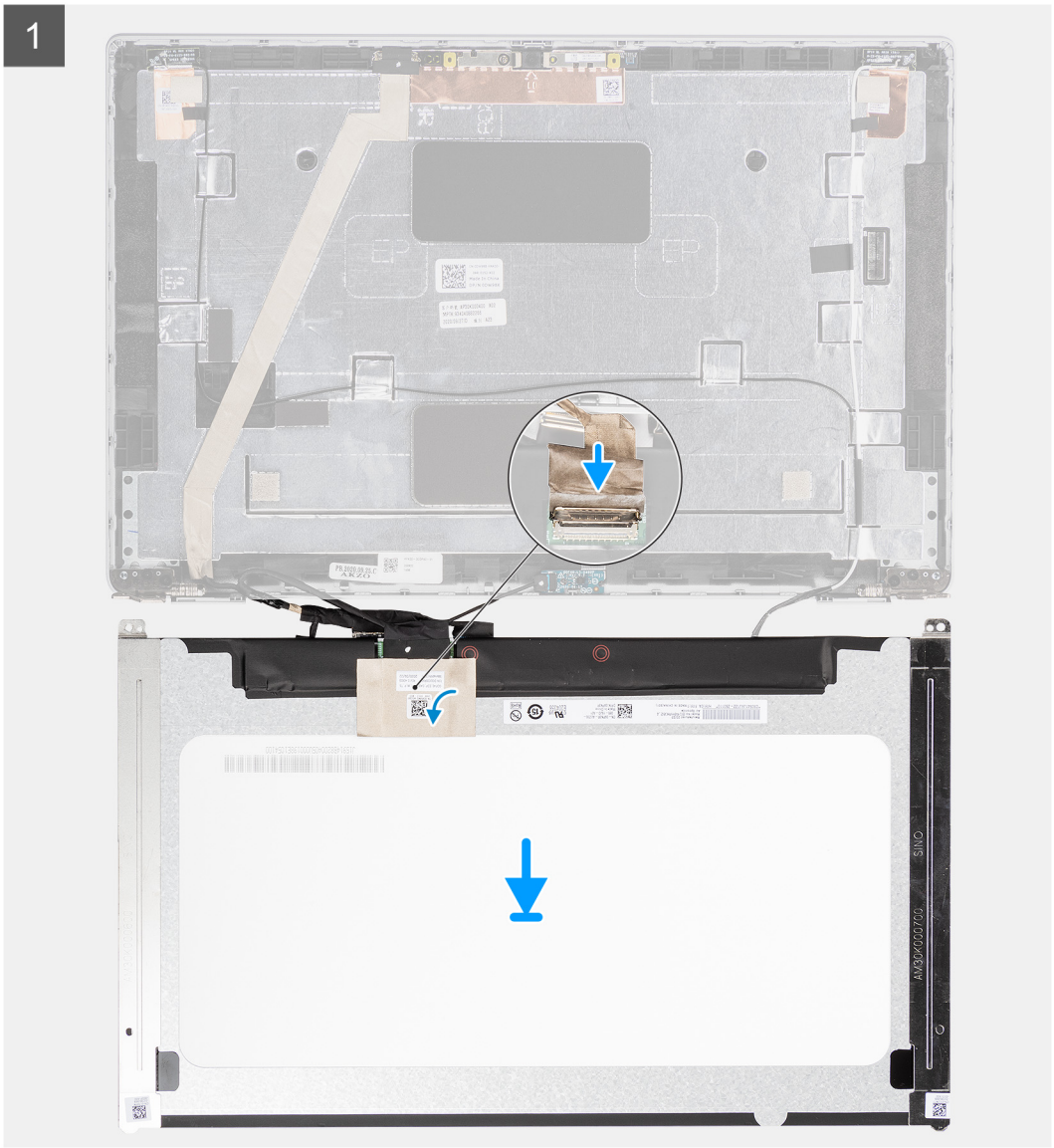
Prerequisites

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

About this task

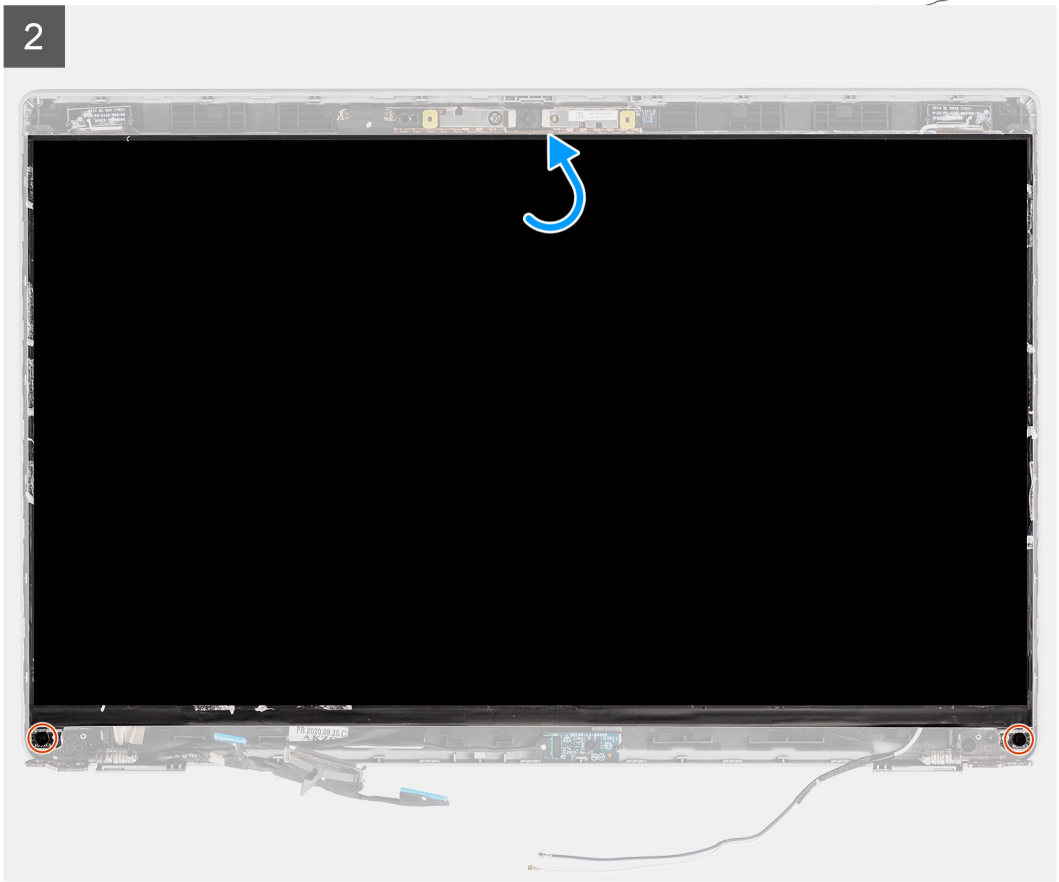
The following images indicate the location of the display panel and provides a visual representation of the installation procedure.

1



2x
M2.5x3

2



Steps

1. Connect the display cable to the connector on the display panel and close the latch.
2. Adhere the conductive tape to secure the display cable to the display panel.
3. Close the display panel and the display back cover to assemble.

   NOTE: Ensure that the display panel tabs are inserted into the slots on the display cover.

4. Replace the two screws (M2.5x3) to secure the display panel to the display back cover.

Next steps

1. Install the display bezel.
2. Install the display assembly.
3. Install the WWAN card.
4. Install the WLAN card.
5. Install the base cover.
6. Install the microSD card.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

Camera/microphone module

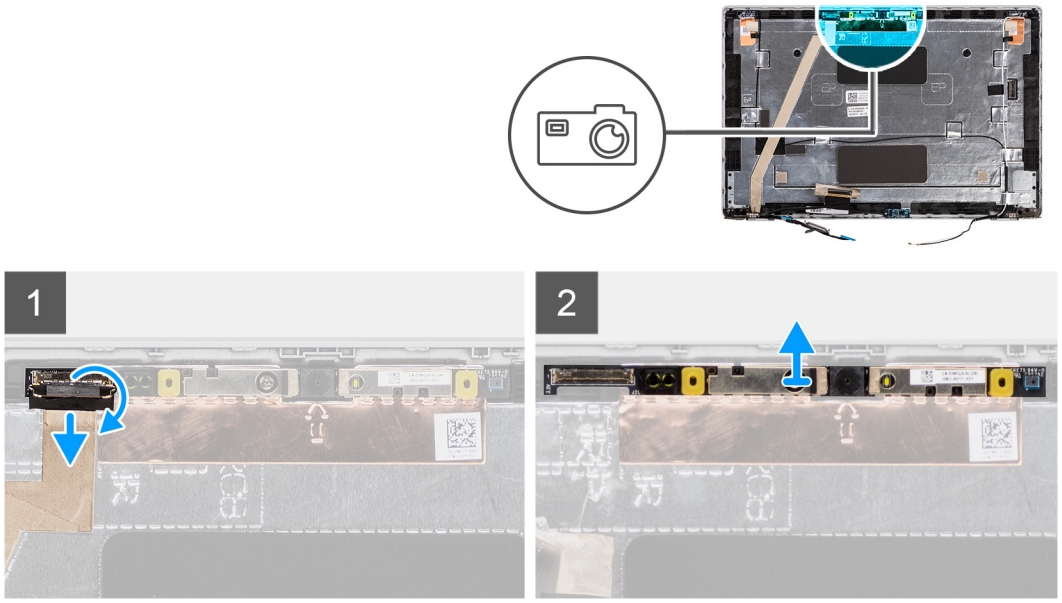
Removing the camera/microphone module

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the base cover.
8. Remove the display assembly.
9. Remove the display bezel.
10. Remove the display panel.

About this task

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



Steps

NOTE: For models shipped with a camera/microphone, there is a recess near the camera/microphone module, indicated by an arrow etched on the grounding foil, that should be used to begin the prying process. Starting from the recess at the bottom edge of the camera/microphone module, pry up the camera/microphone module ensuring that the two tiny pegs used to secure the camera/microphone module in place is not damaged throughout the prying process.

1. Peel the two conductive tapes that secure the camera/microphone module in place.
2. Disconnect the camera/microphone cable from the connector on the camera/microphone module.
3. Carefully lift the camera/microphone module from the display back cover.

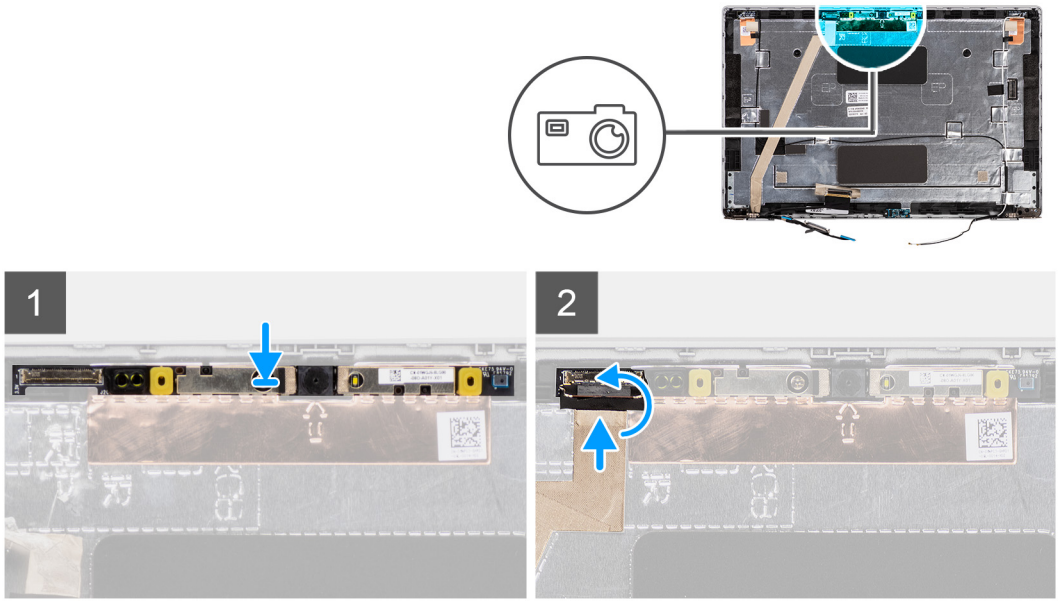
Installing the camera/microphone module

Prerequisites

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

About this task

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



Steps

1. Align and place the camera/microphone module into the slot on the display back cover.
2. Connect the camera/microphone cable to the connector on the camera/microphone module.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WWAN card.
5. Install the WLAN card.
6. Install the base cover.
7. Install the microSD card.
8. Install the SIM card.
9. Follow the procedure in After working inside your computer.

eDP/display cable

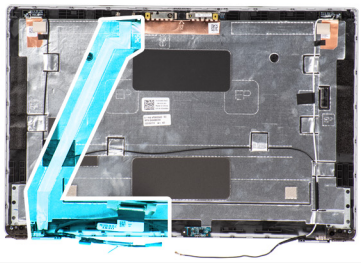
Removing the eDP cable

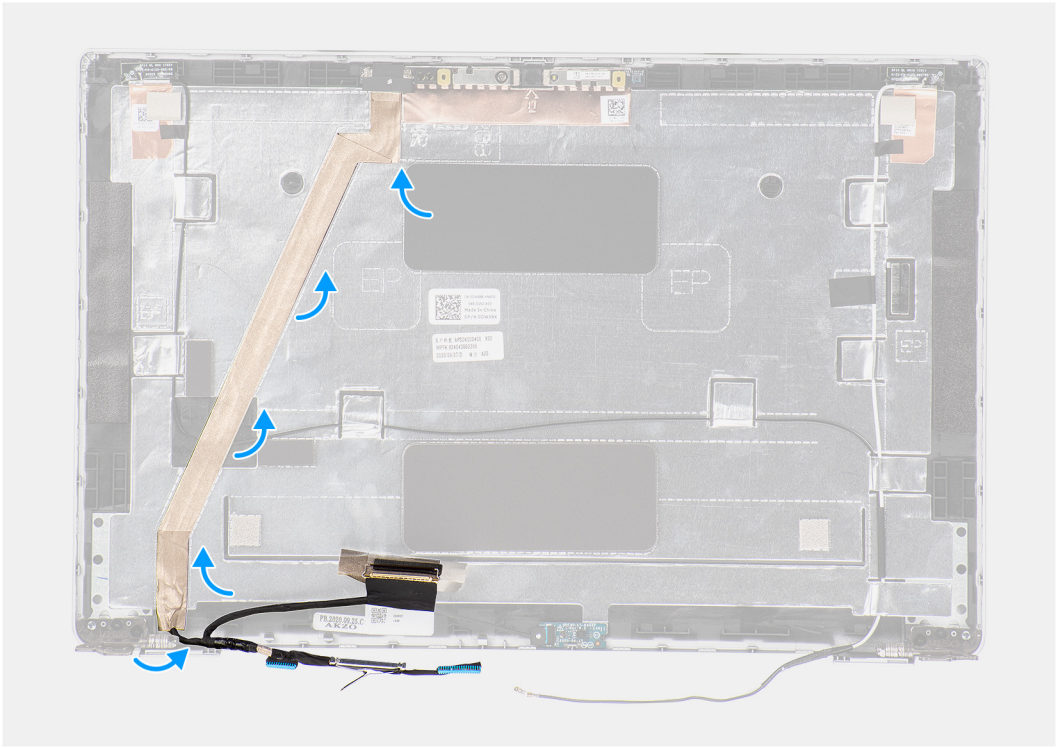
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the base cover.
8. Remove the display assembly.
9. Remove the display bezel.
10. Remove the display panel.

About this task

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





Steps

1. Disconnect the eDP/display cable from the connector on the camera/microphone module.
2. Peel the conductive tape and unroute the eDP/display cable to release it from adhesive and lift the eDP/display cable from the display back cover.

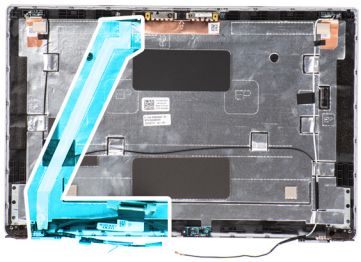
Installing the eDP cable

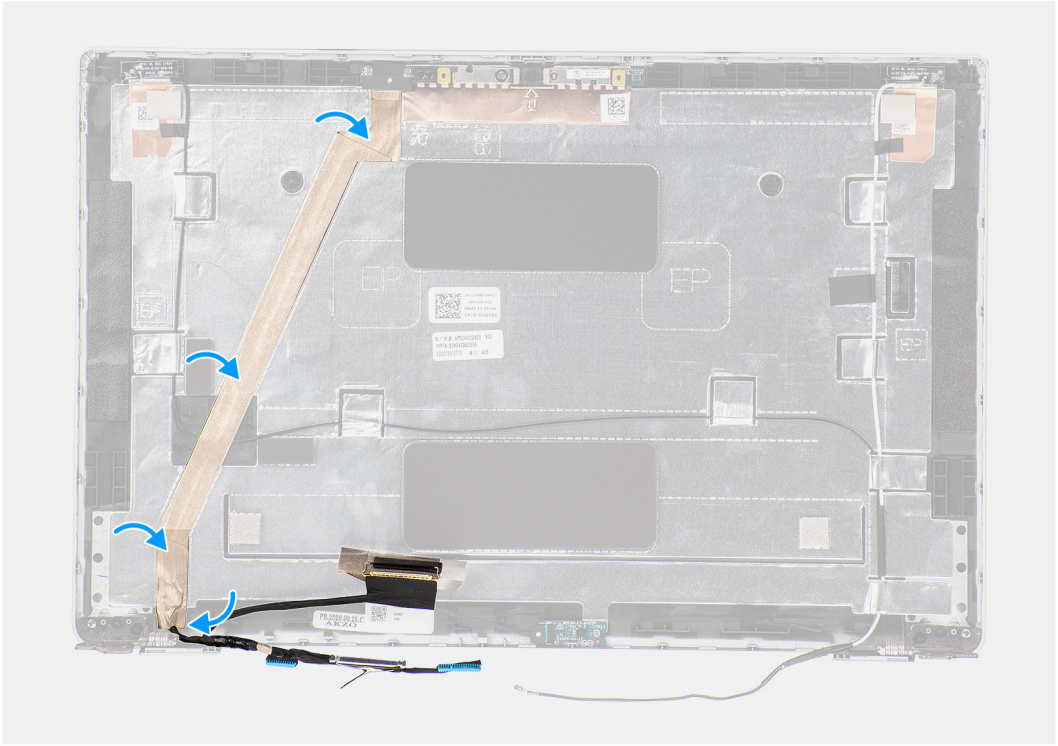
Prerequisites

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

About this task

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





Steps

1. Connect the eDP/display cable to the connector on the camera.
2. Adhere the eDP/display cable to the display back cover.
3. Adhere the conductive tape and route the eDP/display cable to the display back cover.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WWAN card.
5. Install the WLAN card.
6. Install the base cover.
7. Install the microSD card.
8. Install the SIM card.
9. Follow the procedure in After working inside your computer.

Sensor board

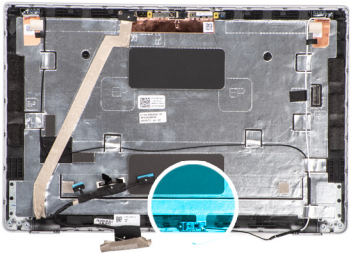
Removing the sensor board

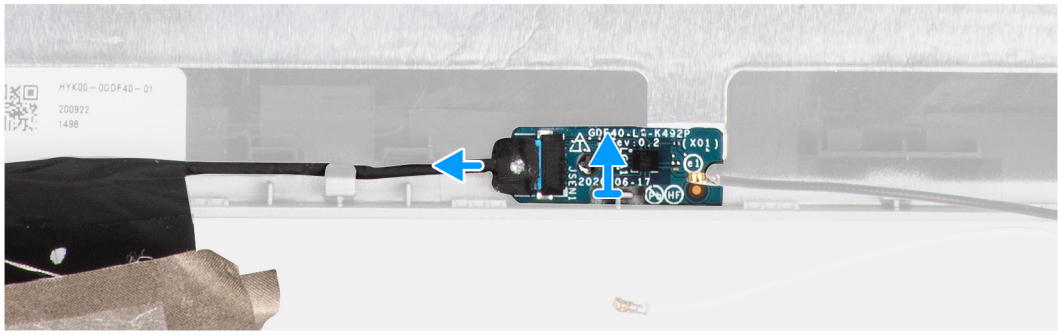
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.
6. Remove the WLAN card.
7. Remove the WWAN card.
8. Remove the display assembly.
9. Remove the display bezel.

About this task

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





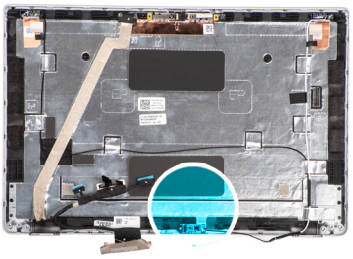
Steps

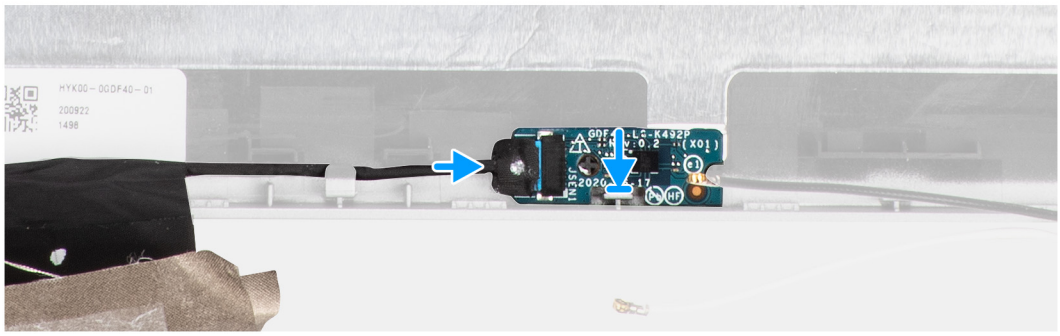
1. Open the latch and disconnect the display cable from connector on the sensor board.
2. Gently lift the sensor board away from the display back cover.

Installing the sensor board

About this task

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





Steps

1. Align and place the sensor board on the display back cover.
2. Connect the display cable to the connector on the sensor board and close the latch.

Next steps

1. Install the display bezel.
2. Install the display assembly.
3. Install the WWAN card.
4. Install the WLAN card.
5. Install the base cover.
6. Install the microSD card.
7. Install the SIM card.
8. Follow the procedure in After working inside your computer.

Display hinges

Removing the display hinges

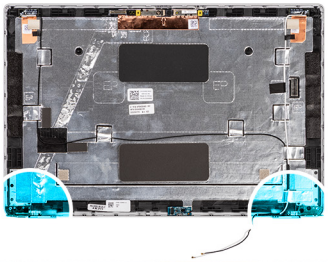
Prerequisites

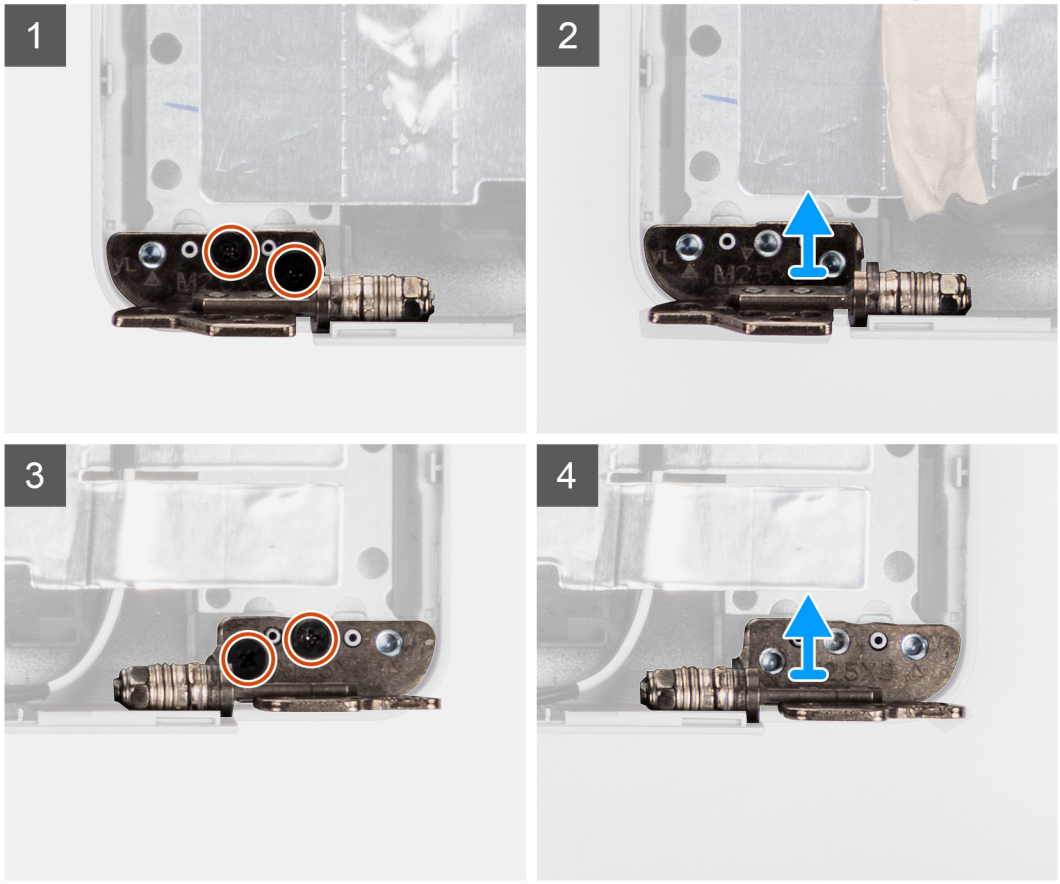
1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the base cover.
8. Remove the display assembly.
9. Remove the display bezel.
10. Remove the display panel.

About this task

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

4x
M2.5x3





Steps

1. Remove the two screws (M2.5x3) that secures the right hinge to the display back cover.
2. Lift and remove the right hinge from the display back cover.
3. Remove the two screws (M2.5x3) that secures the left hinge to the display back cover.
4. Lift and remove the left hinge from the display back cover.

Installing the display hinges

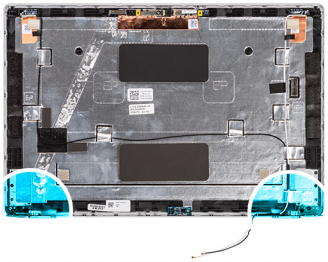
Prerequisites

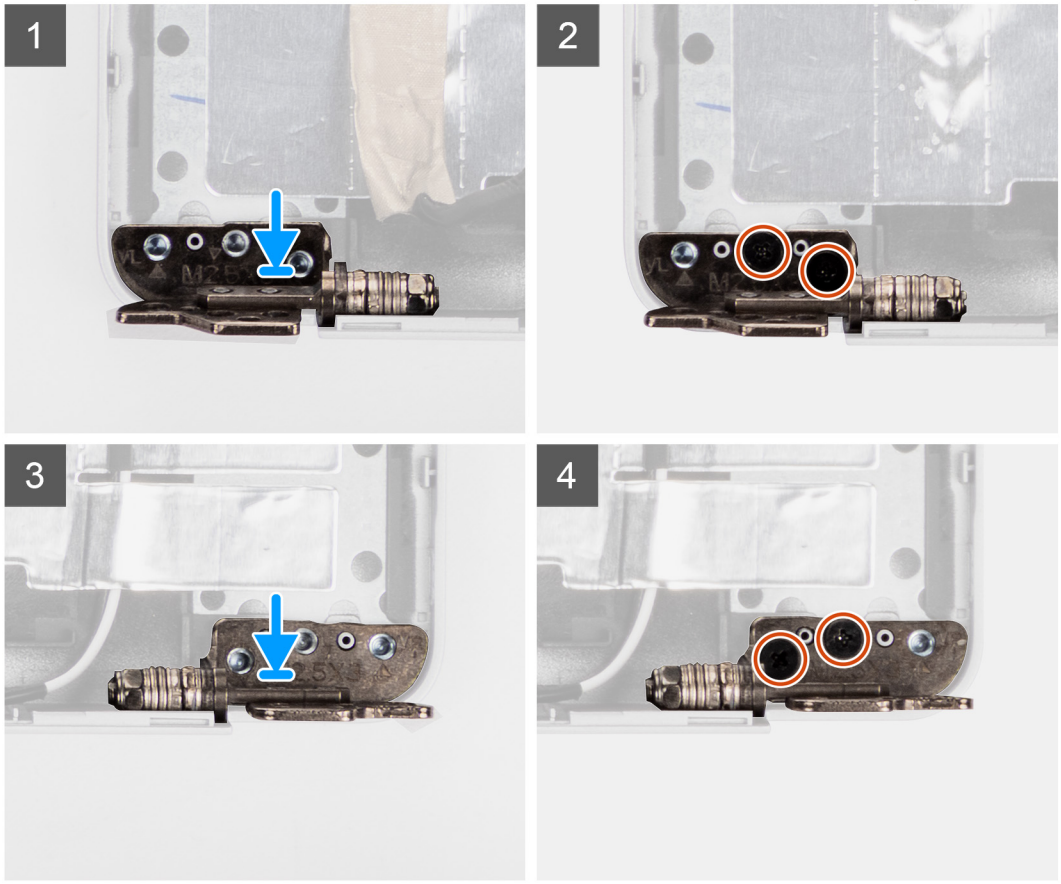
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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

4x
M2.5x3





Steps

1. Align the screw hole on the left hinge with the screw hole on the display back cover.
2. Replace the two screws (M2.5x3) to secure the left hinge to the display back cover.
3. Align the screw hole on the right hinge with the screw hole on the display back cover.
4. Replace the two screws (M2.5x3) to secure the right hinge to the display back cover.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WWAN card.
5. Install the WLAN card.
6. Install the base cover.
7. Install the microSD card.
8. Install the SIM card.
9. Follow the procedure in After working inside your computer.

Display back cover

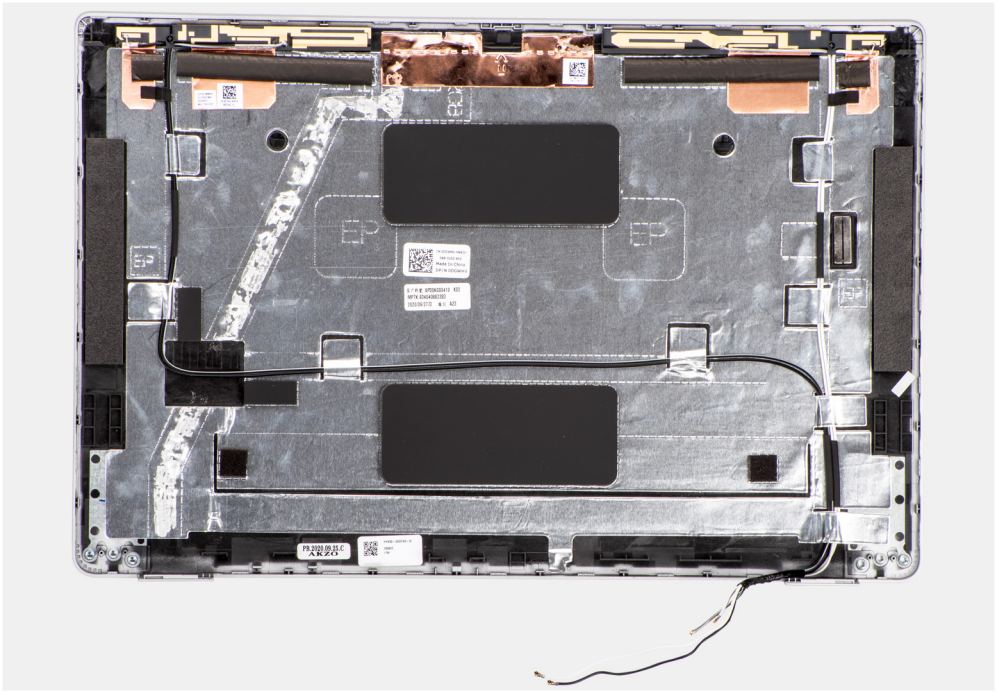
Removing the display back cover

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Enter service mode.
3. Remove the SIM card.
4. Remove the microSD card.
5. Remove the base cover.
6. Remove the WLAN card.
7. Remove the WWAN card.
8. Remove the display assembly.
9. Remove the display bezel.
10. Remove the display panel.
11. Remove the camera/microphone module.
12. Remove the eDP/display cable.
13. Remove the sensor board.
14. Remove the display hinges.

About this task

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



Steps

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

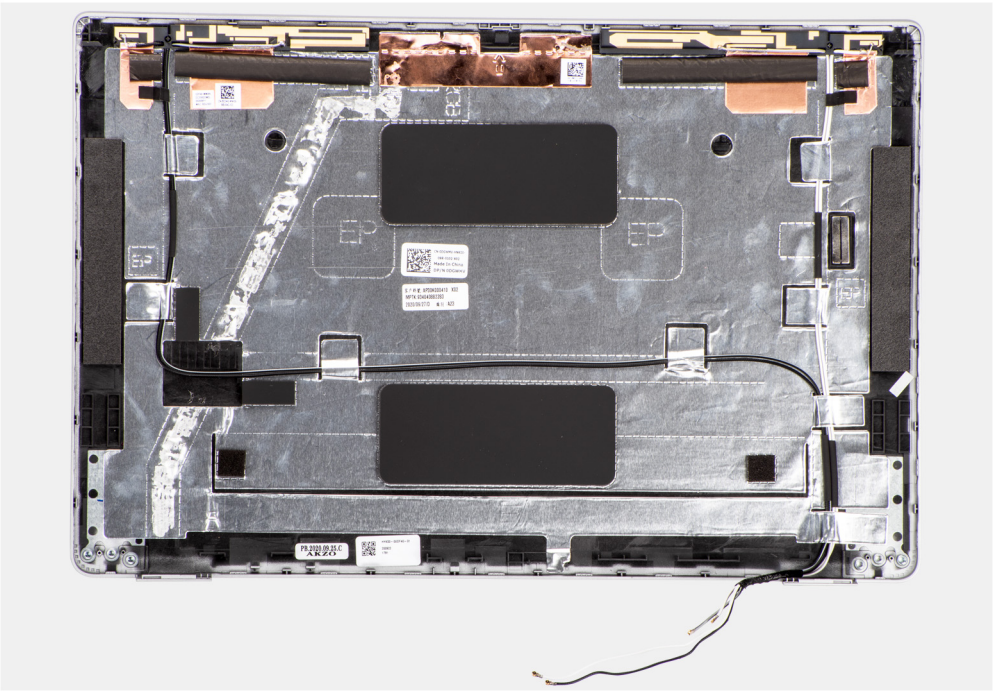
Installing the display back cover

Prerequisites

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

About this task

The following images indicate the location of the display back cover and provides a visual representation of the installation procedure.



Steps

Place the display back cover on a flat surface.

Next steps

1. Install the display hinges.
2. Install the sensor board.
3. Install the eDP/display cable.
4. Install the camera/microphone module.
5. Install the display panel.
6. Install the display bezel.
7. Install the display assembly.
8. Install the WWAN card.
9. Install the WLAN card.
10. Install the base cover.
11. Install the microSD card.
12. Install the SIM card.
13. Follow the procedure in After working inside your computer.

Dummy SIM-card slot filler

Removing the dummy SIM-card slot filler

Prerequisites

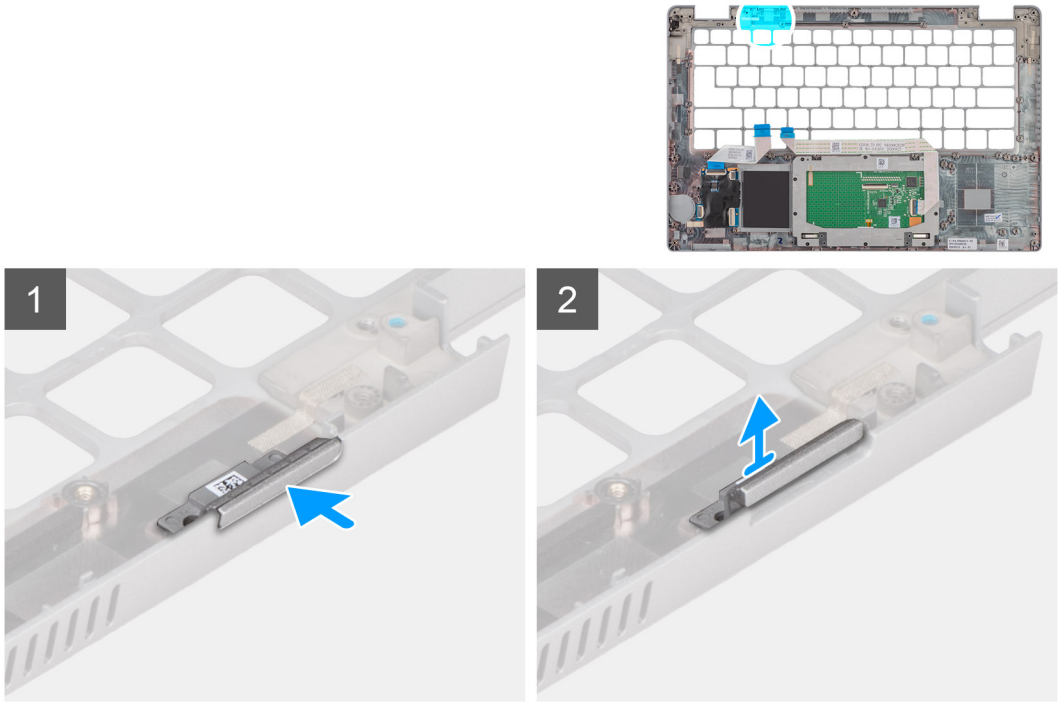
1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the WLAN card.

6. Remove the WWAN card.
7. Remove the memory module.
8. Remove the solid-state drive.
9. Remove the battery.
10. Remove the assembly inner frame.
11. Remove the system board.
12. Remove the smart card reader.
13. Remove the LED board.
14. Remove the power-button board.
15. Remove the keyboard assembly.
16. Remove the display assembly.
17. Remove the palm-rest assembly.

About this task

NOTE: For models shipped with WLAN antennas only, the dummy SIM-card slot filler is a separate service part and is not included with replacement palm rest. As a result, the dummy SIM-card slot filler must be removed and then reinstalled when replacing the palm-rest assembly.

The following image indicates the dummy SIM-card slot filler and provides a visual representation of the dummy SIM-card slot filler removal procedure.



Steps

1. Push the dummy SIM-card slot filler from the top side of the palm-rest assembly.
2. Gently lift the dummy SIM-card slot filler out of the palm-rest assembly.

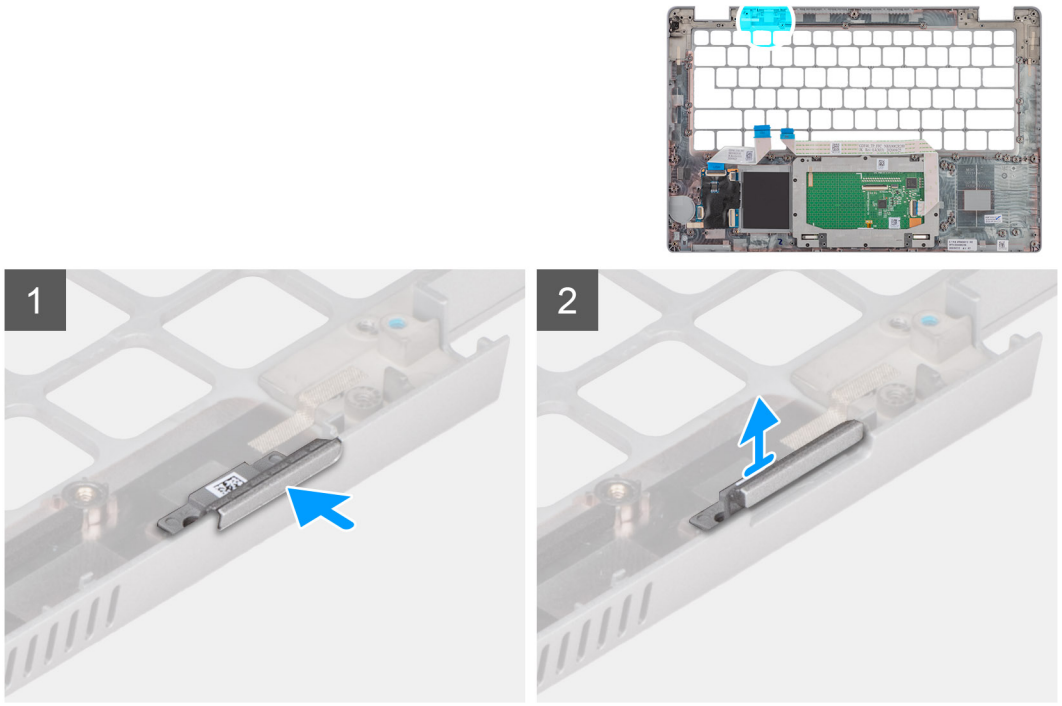
Installing the dummy SIM-card slot filler

Prerequisites

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

About this task

The following image indicates the location of the dummy SIM-card slot filler and provides a visual representation of the dummy SIM-card slot filler installation procedure.



Steps

1. Place the dummy SIM-card slot filler into its compartment on the palm rest.

   NOTE: Ensure that the dummy SIM-card slot filler is aligned with the ribs on the palm-rest assembly.

2. Press the dummy SIM-card slot filler until it clicks into place and ensure it fits securely into the SIM card slot.

Next steps

1. Install the palm-rest assembly.
2. Install the display assembly.
3. Install the keyboard assembly.
4. Install the power-button board.
5. Install the smart card reader.
6. Install the LED board.
7. Install the system board.
8. Install the assembly inner frame.
9. Install the battery.
10. Install the solid-state drive.
11. Install the memory module.
12. Install the WWAN card.
13. Install the WLAN card.
14. Install the base cover.
15. Install the microSD card.
16. Install the SIM card.
17. Follow the procedure in After working inside your computer.

Palm-rest assembly

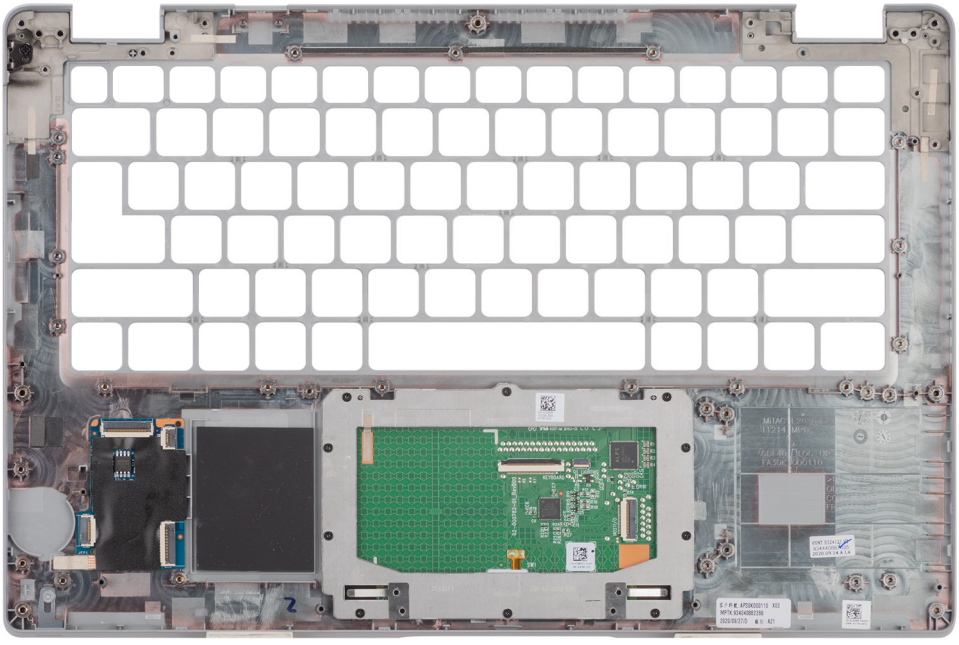
Removing the palm-rest assembly

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the SIM card.
3. Remove the microSD card.
4. Remove the base cover.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the memory module.
8. Remove the solid-state drive.
9. Remove the battery.
10. Remove the assembly inner frame.
11. Remove the system board.
12. Remove the smart card reader.
13. Remove the LED board.
14. Remove the power-button board.
15. Remove the keyboard assembly.
16. Remove the display assembly.

About this task

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



Steps

After performing the steps in the pre-requisites, we are left with the palm-rest assembly.

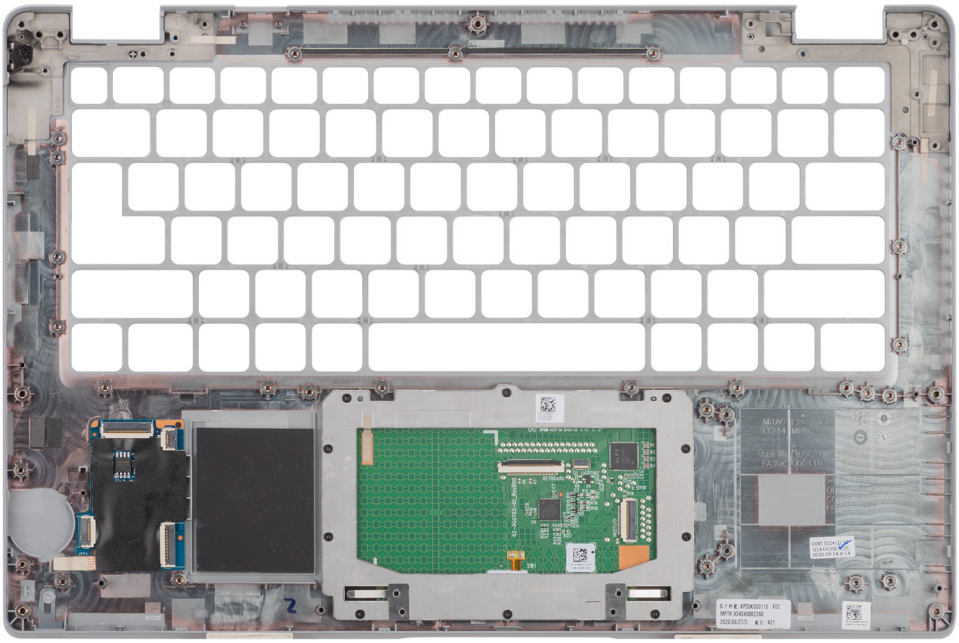
Installing the palm-rest assembly

Prerequisites

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

About this task

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



Steps

NOTE: For non-WWAN LTE configuration, you must remove and transfer the dummy SIM card filler when replacing the palm-rest assembly.

1. Place the palm-rest assembly on a flat surface.
2. Remove the dummy SIM card filler for the non-WWAN LTE configuration.

Next steps

1. Install the display assembly.
2. Install the keyboard assembly.
3. Install the power-button board.
4. Install the smart card reader.
5. Install the LED board.
6. Install the system board.
7. Install the assembly inner frame.
8. Install the battery.
9. Install the solid-state drive.
10. Install the memory module.
11. Install the WWAN card.
12. Install the WLAN card.
13. Install the base cover.
14. Install the microSD card.
15. Install the SIM card.
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.

Topics:

Operating system

Your Latitude 5420 supports the following operating systems:

- Windows 10 Pro, 64-bit
- Windows 10 Home, 64-bit
- Windows 10 Pro Education, 64-bit
- Windows 10 Enterprise N, 64-bit
- Ubuntu Linux 20.04 LTS, 64-bit

Downloading the drivers

Steps

1. Turn on your computer.
2. Go to Dell Support Site.
3. Enter the Service Tag of your computer, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.

4. Click **Drivers & downloads**.
5. Click the **Detect Drivers** button.
6. Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
7. If necessary, your computer starts to download and install **SupportAssist**.

   NOTE: Review on-screen instructions for browser-specific instructions.

8. Click **View Drivers for My System**.
9. Click **Download and Install** to download and install all driver updates detected for your computer.
10. Select a location to save the files.
11. If prompted, approve requests from **User Account Control** to make changes on the system.
12. The application installs all drivers and updates identified.

    NOTE: Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.

13. For manual download and installation, click **Category**.
14. From the drop-down list, select the preferred driver.
15. Click **Download** to download the driver for your computer.
16. After the download is complete, navigate to the folder where you saved the driver file.
17. Double-click the driver file icon and follow the instructions on the screen to install the driver.

5

BIOS Setup

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

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.

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 a user-selectable option, such as the user password, type of storage device installed, and enable or disable base devices.

Topics:

BIOS overview

The BIOS manages data flow between the computer's operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

Entering BIOS Setup

Steps

1. Turn on your computer.
2. Press F2 immediately to enter the BIOS Setup.

   NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Then, turn off your computer and try again.

Navigation keys

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

Table 4. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.

Table 4. Navigation keys (continued)

Keys	Navigation
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.

System setup options

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

Table 5. System setup options—System information menu

Overview	
Latitude 5420	
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.
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.
Battery Information	
Primary	Displays that battery is primary.
Battery Level	Displays the battery level of the computer.

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

Overview	
Battery State	Displays the battery state of the computer.
Health	Displays the battery health of the computer.
AC Adapter	Displays whether the AC adapter is connected or not.
Processor Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Current Clock Speed	Displays the current processor clock speed.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Processor L2 Cache	Displays the processor L2 Cache size.
Processor L3 Cache	Displays the processor L3 Cache size.
Microcode Version	Displays the microcode version.
Intel Hyper-Threading Capable	Displays whether the processor is Hyper-Threading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Memory Information	
Memory Installed	Displays the total computer memory installed.
Memory Available	Displays the total computer memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology used for the memory.
DIMM_SLOT B	Displays the DIMM B memory size.
DIMM_SLOT A	Displays the DIMM A memory size.
Devices Information	
Panel Type	Displays the Panel Type of the computer.
Video Controller	Displays the video controller type of 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 (LOM) MAC address of the computer.
Pass Through MAC Address	Displays the pass through MAC address of the computer.
Cellular Device	Displays the M.2 PCIe SSD information of the computer.

Table 6. System setup options—Boot Configuration menu

Boot Configuration	
Boot Sequence	
Boot mode	Displays the boot mode.

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

Boot Configuration	
Boot Sequence	Displays the boot sequence.
Secure Digital (SD) Card Boot	Enable or disable the SD card read-only boot. By default, the **Secure Digital (SD) Card Boot** option is not enabled.
Secure Boot	
Enable Secure Boot	Enable or disable the secure boot feature. By default, the option is enabled.
Secure Boot Mode	Enable or disable to change the secure boot mode options. By default, the **Deployed Mode** is enabled.
Expert Key Management	
Enable Custom Mode	Enable or disable custom mode. By default, the **custom mode** option is not enabled.
Custom Mode Key Management	Select the custom values for expert key management.

Table 7. System setup options—Integrated Devices menu

Integrated Devices	
Date/Time	Displays the current date in MM/DD/YYYY format and current time in HH:MM:SS AM/PM format.
Camera	Enables or disable the camera. By default, the **Enable Camera** option is selected
Audio	
Enable Audio	Enable or disable the integrated audio controller. By default, all the options are enabled.
USB/Thunderbolt Configuration	• Enable or disable booting from USB mass storage devices connected to external USB ports. By default, the **Enable External USB Ports** option is enabled. • Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive. By default, the **Enable USB Boot Support** option is enabled.
Enable Thunderbolt Technology Support	Enable or disable the associated ports and adapters. By default, the **Enable Thunderbolt Technology Support** option is selected.
Enable Thunderbolt Boot Support	Enable or disable the Thunderbolt adapter peripheral device and USB devices connected to the Thunderbolt adapter to be used during BIOS Pre-boot. By default, the **Enable Thunderbolt Boot Support** option is disabled.
Enable Thunderbolt (and PCIe behind TBT) pre-boot modules	Enable or disable the PCIe devices that are connected through a Thunderbolt adapter to execute the PCIe devices UEFI Option ROM (if present) during pre-boot. By default, the **Enable Thunderbolt (and PCIe behind TBT) pre-boot modules** option is disabled.
Disable USB4 PCIE Tunneling	Disable the USB4 PCIE Tunneling option. By default, the option is disabled.
Video/Power only on Type-C Ports	Enable or disable the Type-C port functionality to video or only power.

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

Integrated Devices	
	By default, the **Video/Power only on Type-C Ports** option is disabled.
Type-C Dock Override	Enables 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.
Video	Enable or disable the usage of video on Dell Dock external ports. By default, the **Video** option is disabled.
Audio	Enable or disable the usage of audio on Dell Dock external ports. By default, the **Audio** option is enabled.
Lan	Enable or disable the usage of LAN on Dell Dock external ports. By default, the **Lan** option is enabled.
Miscellaneous Devices	Enable or disable Fingerprint Reader device. By default, the **Enable Fingerprint Reader Device** option is enabled.
Unobtrusive Mode	
Enable Unobtrusive Mode	Enable or disable all the computer light and sound. By default, the **Enable Unobtrusive Mode** option is disabled.

Table 8. System setup options—Storage menu

Storage	
SATA/NVMe Operation	
SATA/NVMe Operation	Set the operating mode of the integrated storage device controller. By default, the RAID On option is enabled.
SMART Reporting	
Enable SMART Reporting	Enable or disable Self-Monitoring, Analysis, and Reporting Technology (SMART) during computer startup. By default, the **Enable SMART Reporting** option is not enabled.
Drive Information	
SATA-1	
Type	Displays the SATA-1 type information of the computer.
Device	Displays the SATA-1 device information of the computer.
M.2 PCIe SSD-1	
Type	Displays the M.2 PCIe SSD-1 type information of the computer.
Device	Displays the M.2 PCIe SSD-1 device information of the computer.
M.2 PCIe SSD-2	
Type	Displays the M.2 PCIe SSD-2 type information of the computer.
Device	Displays the M.2 PCIe SSD-2 device information of the computer.
Enable MediaCard	
Secure Digital (SD) Card	Enable or disable the SD card. By default, the **Secure Digital (SD) Card** option is enabled.
Secure Digital (SD) Card Read-Only Mode	Enable or disable the SD card read-only mode.

Table 8. System setup options—Storage menu (continued)

Storage	
	By default, the **Secure Digital (SD) Card Read-Only Mode** option is not enabled.

Table 9. System setup options—Display menu

Display	
Display Brightness	
Brightness on battery power	Enable to set screen brightness when the computer is running on battery power.
Brightness on AC power	Enable to set screen brightness when the computer is running on AC power.
Full Screen Logo	Enable or disable full screen logo. By default, the option is not enabled.

Table 10. System setup options—Connection menu

Connection	
Network Controller Configuration	
Integrated NIC	Controls the on-board LAN controller. By default, the **Enabled with PXE** option is enabled.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack. By default, the **Enable UEFI Network Stack** and **Enabled w/PXE** option are enabled.
Wireless Device Enable	
WWAN/GPS	Enable or disable the internal WWAN/GPS device By default, the option enabled.
WWAN Bus Mode	Set the interface type of the Wireless Wan (WWAN) card. By default, the **Bus Mode PCIe** option is enabled.
WLAN	Enable or disable the internal WLAN device By default, the option enabled.
Bluetooth	Enable or disable the internal Bluetooth device By default, the option enabled.
Contactless smartcard/NFC	Enable or disable the internal Contactless smartcard/NFC device By default, the option enabled.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack and controls the on-board LAN Controller. By default, the **Enable UEFI Network Stack** option are enabled.
Wireless Radio Control	
Control WLAN radio	Sense the connection of the computer to a wired network and subsequently disable the selected wireless radios (WLAN). By default, the option is disabled.
Control WWAN radio	Sense the connection of the computer to a wired network and subsequently disable the selected wireless radios (WWAN). By default, the option is disabled.

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

Connection	
HTTPs Boot Feature	
HTTPs Boot	Enable or disable the HTTPs Boot feature. By default, the **HTTPs Boot** option is enabled.
HTTPs Boot Mode	With Auto Mode, the HTTPs Boot extracts Boot URL from the DHCP. With Manual Mode, the HTTPs Boot reads Boot URL from the user-provided data. By default, the **Auto Mode** option is enabled.

Table 11. System setup options—Power menu

Power	
Battery configuration	Enables 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 enabled.
Advanced Configuration	
Enable Advanced Battery Charge Configuration	Enable or disable the advanced battery charge configuration. By default, the **Enable Advanced Battery Charge Configuration** option is disabled.
Peak Shift	Enables the computer to run on battery during peak power usage hours. By default, the **Enable Peak Shift** option is enabled.
Enable Peak Shift	
USB PowerShare	
Enable USB PowerShare	Enable or disable the USB PowerShare. By default, the **Enable USB PowerShare** option is disabled
Thermal Management	Enables to cool the fan and processor heat management to adjust the computer performance, noise, and temperature. By default, the **Optimized** option is enabled.
USB Wake Support	
Wake on Dell USB-C Dock	When enabled, connecting a Dell USB-C Dock will wake the computer from standby. By default, the **Wake on Dell USB-C Dock** option is enabled.
Block Sleep	Enables to block entering sleep (S3) mode in the operating system. By default, the **Block Sleep** option is disabled.
Lid Switch	Enable or disable the lid switch. By default, the **Lid Switch** option is enabled.
Intel Speed Shift Technology	Enable or disable the Intel speed shift technology support. By default, the **Intel Speed Shift Technology** option is enabled.
Long Life Cycle Primary Battery	By default, the **Normal Battery** option is enabled.

Table 12. System setup options—Security menu

Security	
TPM 2.0 Security	

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

Security	
TPM 2.0 Security On	Enable or disable TPM 2.0 security options. By default, the **TPM 2.0 Security On** option is enabled.
Attestation Enable	Enables to control whether the Trusted Platform Module (TPM) Endorsement Hierarchy is available to the operating system. By default, the **Attestation Enable** option is enabled.
Key Storage Enable	Enables to control whether the Trusted Platform Module (TPM) Storage Hierarchy is available to the operating system. By default, the **Key Storage Enable** option is enabled.
SHA-256	BIOS and the TPM will use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot. By default, the **SHA-256** option is enabled.
Clear	Enables to clear the TPM owner information and returns the TPM to the default state. By default, the **Clear** option is disabled.
PPI ByPass for Clear Commands	Controls the TPM Physical Presence Interface (PPI). By default, the **PPI ByPass for clear Commands** option is disabled.
Intel Total Memory Encryption	
Total Memory Encryption	Enable or disable you to protect memory from physical attacks including freeze spray, probing DDR to read the cycles, and others. By default, the **Total Memory Encryption** option is disabled.
Chassis intrusion	Controls the chassis intrusion feature. By default, the **On-Silent** option is enabled.
SMM Security Mitigation	Enable or disable SMM Security Mitigation. By default, the option is enabled.
Data Wipe on Next Boot	
Start Data Wipe	Enable or disable the data wipe on next boot. By default, the option is enabled.
Absolute	Enable or disable or permanently disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute software. By default, the option is enabled.
UEFI Boot Path Security	Controls whether or not the computer will prompt the user to enter the admin password (if set) when booting to a UEFI boot device from the F12 boot menu. By default, the **Always Except Internal HDD** option is enabled.

Table 13. System setup options—Passwords menu

Passwords	
Admin Password	Set, change, or delete the administrator password.
System Password	Set, change, or delete the computer password.
NVMe SSD0	Set, change, or delete the NVMe SSD0 password.
Password Configuration	
Upper Case Letter	Reinforces password must have at least one upper case letter.

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

Passwords	
	By default, the option is disabled.
Lower Case Letter	Reinforces password must have at least one lower case letter. By default, the option is disabled.
Digit	Reinforces password must have at least one digit. By default, the option is disabled.
Special Character	Reinforces password must have at least one special character. By default, the option is disabled.
Minimum Characters	Set the minimum characters allowed for password.
Password Bypass	When enabled, this always prompts for computer and internal hard drive passwords when powered on from the off state. By default, the **Disabled** option is enabled.
Password Changes	
Enable Non-Admin Password Changes	Enable or disable to change computer and hard drive password without the need for admin password. By default, the option is enabled.
Admin Setup Lockout	
Enable Admin Setup Lockout	Enables administrators control over how their users can or cannot access BIOS setup. By default, the option is disabled.
Master Password Lockout	
Enable Master Password Lockout	When enabled, this will disable the master password support. By default, the option is disabled.
Allow Non-Admin PSID Revert	
Enable Allow Non-Admin PSID Revert	Controls access to the Physical Security ID (PSID) revert of NVMe hard-drives from the Dell Security Manager prompt. By default, the option is disabled.

Table 14. System setup options—Update, Recovery menu

Update, Recovery	
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update packages. By default, the option is enabled.
BIOS Recovery from Hard Drive	Enables the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. By default, the option is enabled.
BIOS Downgrade	
Allow BIOS Downgrade	Enable or disable the flashing of the computer firmware to previous revision is blocked. By default, the option is enabled.
SupportAssist OS Recovery	Enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain computer errors.

Table 14. System setup options—Update, Recovery menu (continued)

Update, Recovery	
	By default, the option is enabled.
BIOSConnect	Enable or disable cloud Service OS 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 OS does not boot or is not installed. By default, the option is enabled.
Dell Auto OS Recovery Threshold	Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool. By default, the threshold value is set to 2.

Table 15. System setup options—System Management menu

System Management	
Service Tag	Display the Service Tag of the computer.
Asset Tag	Create a computer Asset Tag.
AC Behavior	
Wake on AC	Enable or disable the wake on AC option. By default, the option is disabled.
Wake on LAN	
Wake on LAN	Enable or disable the computer to power on by special LAN signals when it receives a wakeup signal from the WLAN. By default, the **Disabled** option is selected.
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 option is disabled.

Table 16. System setup options—Keyboard menu

Keyboard	
Numlock Enable	Enable or disable the Numlock function when the computer boots. By default, the option is enabled.
Fn Lock Options	By default, the Fn lock option is enabled.
Keyboard Illumination	Enables to change the keyboard illumination settings. By default, the **Bright** option is enabled.
Keyboard Backlight Timeout on AC	Set the timeout value for the keyboard backlight when an AC adapter is connected to the computer. By default, the **10 seconds** option is enabled.
Keyboard Backlight Timeout on Battery	Set the timeout value for the keyboard backlight when the is running only on battery power. By default, the **10 seconds** option is enabled.
Device Configuration Hotkey Access	Manages whether you can access device configuration screens through hotkeys during computer startup. By default, the option is enabled.

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

Pre-boot Behavior	
Adapter Warnings	
Enable Adapter Warnings	Enable or disable the warning messages during boot when the adapters with less power capacity are detected. By default, the option is enabled.
Warning and Errors	Enable or disable the action to be done when a warning or error is encountered. By default, the **Prompt on Warnings and Errors** option is enabled.
USB-C Warnings	
Enable Dock Warning Messages	Enable or disable Dock Warning Messages. By default, the option is enabled.
Fastboot	Enable to set the speed of the boot process. By default, the **Minimal** option is enabled.
Extend BIOS POST Time	Set the BIOS POST time. By default, the **0 seconds** option is enabled.
MAC Address Pass-Through	Replaces the external NIC MAC address with the selected MAC address from the computer. By default, the **System Unique MAC Address** option is enabled.

Table 18. System setup options—Performance menu

Performance	
Multi Core Support	
Active Cores	Enables to change the number of CPU cores available to the operating system. By default, the **All Cores** options is enabled.
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 option is enabled.
C-States Control	
Enable C-State Control	Enable or disable additional processor sleep states. By default, the option is enabled.
Intel TurbocBoost Technology	
Enable Intel Turbo Boost Technology	Enable or disable Intel TurboBoost mode of the processor. By default, the option is enabled.
Intel Hyper-Threading Technology	
Enable Intel Hyper-Threading Technology	Enable or disable Hyper-Threading in the processor. By default, the option is enabled.
Dynamic Tuning:Machine Learning	
Enable Dynamic Tuning:Machine Learning	Enables the operating system capability to enhance dynamic power tuning capabilities based on detected workloads. By default, the option is disabled.

Table 19. System setup options—System Logs menu

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

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, see the Knowledge Base Resource updating the BIOS on Dell systems with BitLocker enabled.

Steps

1. Go to Dell Support Site.
2. Go to **Identify your product or search 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, use the SupportAssist to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, search in the Knowledge Base Resource at 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 the knowledge base article 000131486 at 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, see the Knowledge Base Resource updating the BIOS on Dell systems with BitLocker enabled.

Steps

1. Go to Dell Support Site.
2. Go to **Identify your product or search 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, use the SupportAssist to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. Create a bootable USB drive. For more information, search in the Knowledge Base Resource at 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

You can run the BIOS flash update file from Windows using a bootable USB drive or you can also update the BIOS from the One-Time boot menu on the computer. To update your computers BIOS, copy the BIOS XXXX.exe file onto a USB drive formatted with the FAT32 file system. Then, restart your computer and boot from the USB drive using the One-Time Boot Menu.

About this task

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the computer it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress, and the computer will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system reinstall. For more information about this subject, search in the Knowledge Base Resource at Dell Support Site.

BIOS Update

To confirm if the BIOS Flash Update is listed as a boot option you can boot your computer to the **One Time Boot** Menu. If the option is listed, then the BIOS can be updated using this method.

To update your BIOS from the One-Time boot menu, you need the following:

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

Perform the following steps to update the BIOS from the One-Time boot menu:

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

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 20. 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. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to create the system password:
   - A password can have up to 32 characters.
   - A password can at least have one special character: "(! " # $ % & ' * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | })"
   - A password can have numbers 0 to 9.
   - A password can have an upper case letters from A to Z.
   - A password can have a lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press 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. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that the **Password Status** is Unlocked.
3. Select **System Password**. Update or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**. Update or delete the existing setup password, and press Enter or Tab.

   NOTE: If you change the system 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.

5. Press Esc. A message prompts you to save the changes.
6. 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.

6

Troubleshooting

Topics:

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 in the Knowledge Base Resource at Dell Support Site.

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The Dell SupportAssist Pre-boot System Performance Check diagnostics is embedded within the BIOS and launched by the BIOS internally. The embedded system diagnostics provides options for particular devices or device groups allowing you to:

- Run tests automatically or in an interactive mode.
- Repeat the tests.
- Display or save test results.
- Run thorough tests to add more options and obtain details about any failed devices.
- View status messages that inform you when the tests are completed successfully.
- View error messages that inform you of problems encountered during testing.

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

For more information, see the knowledge base article 000181163.

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 diagnostic quick 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 built-in 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 indicator LED 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 LED flashes one of the following error codes for 30 seconds:

Table 21. LED error codes

Blinking Pattern		Possible Problem
Amber	**White**	
2	1	CPU 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.

Logical 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 normally, 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.

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

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

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

How to invoke the LCD-BIST

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

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

System diagnostic lights

Battery-status light

Indicates the power and battery-charge status.

Solid white — Power adapter is connected and the battery has more than 5 percent charge.

Amber — Computer is running on battery and the battery has less than 5 percent charge.

Off

- Power adapter is connected, and the battery is fully charged.
- Computer is running on battery, and the battery has more than 5 percent charge.
- Computer is in a sleep state, hibernation, or turned off.

The power and battery-status light blinks amber along with beep codes indicating failures.

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

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

Table 22. System diagnostic lights

Blinking Pattern		Problem description	Suggested resolution
Amber	**White**		
1	1	TPM detection failure	Replace the system board.
1	2	Unrecoverable SPI flash failure	Replace the system board.
1	5	EC unable to program i-Fuse	Replace the system board.
1	6	Generic catch-all for ungraceful EC code flow errors	Disconnect all power source (AC, battery, coin cell) and drain flea power by pressing and holding down power button.
2	1	CPU failure	Run the Intel CPU diagnostics tools. If problem persists, replace the system board.
2	2	System Board failure (included BIOS corruption or ROM error)	Flash latest BIOS version. If problem persists, replace the system board.
2	3	No Memory / RAM detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2	4	Memory / RAM failure	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2	5	Invalid memory installed	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2	6	System board / Chipset Error	Replace the system board.
2	7	Potential LCD Panel damage and/ or LCD cable failure (SBIOS message)	Run LCD BIST to check for physical LCD damage. If no sign of life on display (no backlight), reseat display cable (EDP) at the

Table 22. System diagnostic lights (continued)

Blinking Pattern		Problem description	Suggested resolution
Amber	White		
			Motherboard. If the colors are displayed without distortion (screen showing a solid color) or the 2,7 code persists, replace the LCD assembly and display cable (EDP).
2	8	Power rail failure at the system board side	If the display is black or dim (no backlight), replace the Motherboard and display cable (EDP). If no display issues (LCD panel functional), only replace the Motherboard.
3	1	CMOS battery failure	Reset the CMOS battery connection. If problem persists, replace the RTC battery.
3	2	PCI or Video card/chip failure	Replace the system board.
3	3	BIOS recovery image not found	Flash latest BIOS version. If problem persists, replace the system board.
3	4	BIOS recovery image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.
3	5	Power rail failure	Replace the system board.
3	6	Flash corruption detected by SBIOS.	Replace the system board.
3	7	Timeout waiting on ME to reply to HECI message.	Replace the system board.
4	3	LCD Panel Failure	Replace the LCD Assembly
4	4	Power rail failure at system board side	If the display is dim (no backlight), replace the Motherboard and display cable (EDP). If the display is black/no image on panel, replace the Motherboard and LCD Assembly.
4	5	LCD Panel Failure and Power rail failure at system board side.	Replace the Motherboard, LCD Assembly and Display Cable (EDP).
4	6	Display Cable (EDP) Failure	Reseat the display cable (EDP) at the Motherboard. If the 4,6 code persists, replace the display cable (EDP).

Camera status light: Indicates whether the camera is in use.

- Solid white — Camera is in use.
- Off — Camera is not in use.

Caps Lock status light: Indicates whether Caps Lock is enabled or disabled.

- Solid white — Caps Lock enabled.
- Off — Caps Lock disabled.

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 stand-alone tool that is preinstalled in 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**.

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: The battery is a Field Replaceable Unit (FRU) and 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 23. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	Dell Support
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	Dell Support for Windows Dell Support for Linux
Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.	Dell Support Site
Dell knowledge base articles for a variety of computer concerns.	1. Go to Dell Support Site. 2. Type the subject or keyword in the **Search** box. 3. Click **Search** to retrieve the related articles.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see Contact Dell.

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

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