

Latitude 7320 Detachable

Service Manual

Notes, cautions, and warnings

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

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

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

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Working inside your computer

Topics:

- [Before working inside your computer](#)
- [Safety precautions](#)
- [Electrostatic discharge—ESD protection](#)
- [ESD field service kit](#)
- [After working inside your computer](#)

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 tablet/notebook/desktop to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

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

Unplugging, pressing and holding the power button for 15 seconds should discharge residual power in the system board. Remove the battery from tablets.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.

Electrostatic discharge—ESD protection

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

Due to the increased density of semiconductors used in recent Dell products, the sensitivity to static damage is now higher than in previous Dell products. For this reason, some previously approved methods of handling parts are no longer applicable.

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

- **Catastrophic** – Catastrophic failures represent approximately 20 percent of ESD-related failures. The damage causes an immediate and complete loss of device functionality. An example of catastrophic failure is a memory DIMM that has received a static shock and immediately generates a "No POST/No Video" symptom with a beep code emitted for missing or nonfunctional memory.
- **Intermittent** – Intermittent failures represent approximately 80 percent of ESD-related failures. The high rate of intermittent failures means that most of the time when damage occurs, it is not immediately recognizable. The DIMM receives a static shock, but the tracing is merely weakened and does not immediately produce outward symptoms related to the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

The more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure.

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD

mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.

- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components.
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

It is recommended that all field service technicians use the traditional wired ESD grounding wrist strap and protective anti-static mat at all times when servicing Dell products. In addition, it is critical that technicians keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

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.

Removing and installing components

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

Topics:

- [Recommended tools](#)
- [Screw list](#)
- [Subscriber Identity Module \(SIM\) card](#)
- [Display assembly](#)
- [Solid-state drive](#)
- [WWAN card](#)
- [Speakers](#)
- [Rear Camera](#)
- [Microphone module](#)
- [Front Camera](#)
- [Kick stand](#)
- [Kickstand Hinges](#)
- [Docking connector](#)
- [Hall sensor daughter board](#)
- [Heat sink](#)
- [System fan](#)
- [Volume button daughter board](#)
- [Power-button board](#)
- [Fingerprint reader](#)
- [Battery](#)
- [System board](#)
- [Smart card reader](#)

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 5520 Precision 3560 screw list

Component	Screw type	Quantity	Screw image
Base cover	Captive screws	8	
WLAN card bracket	Captive screw	1	
WWAN card bracket	Captive screw	1	
M.2 2230 solid-state drive	M2x4	1	
M.2 2280 solid-state drive	M2x4	1	
Assembly inner frame	M2x3	12	
3-cell battery	M2x4	2	
4-cell battery	M2x4	3	
System Fan	M2x3	2	
Heat sink—integrated	M2x3 Captive screws	1 - M2x3 4 - captive screws	
Heat sink—discrete	M2x3 Captive screws	1 - M2x3 7 - captive screws	
eDP cable/bracket	M2x3	2	
USB Type-C support bracket	M2x4	3	
System board	M2x3	3	
Power button	M2x2	2	
Smart card reader	M2x3	2	
LED board	M2x3	1	
Keyboard assembly	M2x2	26	
Keyboard bracket	M2x2	10	
Display assembly	M2.5x5 (display hinge to palm-rest assembly)	6	
Display hinge	M2.5x3.5 (display hinge to display back cover)	4	

Table 1. Latitude 5520Precision 3560 screw list (continued)

Component	Screw type	Quantity	Screw image
Display panel	M2.5x3.5	4	

Subscriber Identity Module (SIM) card

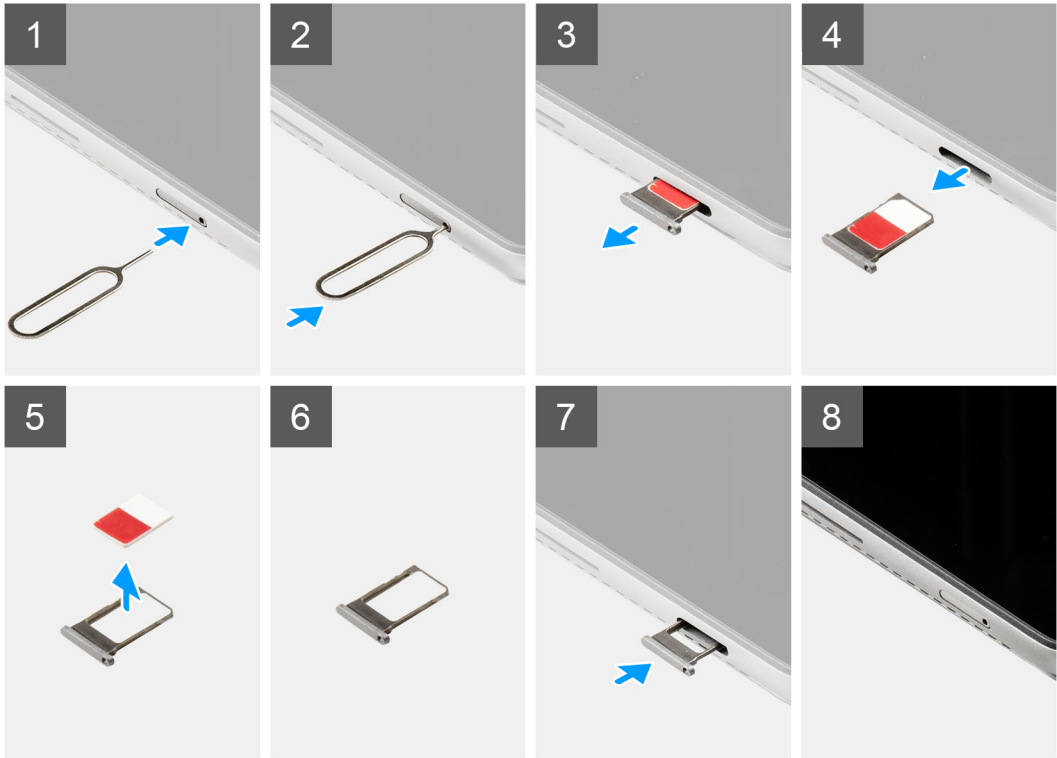
Removing the SIM tray

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
-  **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 slot.
2. Push the pin inward to release the SIM card tray
3. Slide the SIM card tray out of the slot in the computer.
4. Remove the SIM card from the SIM card tray.
5. Slide the SIM card tray into the slot, until it clicks into place.

Installing the SIM tray

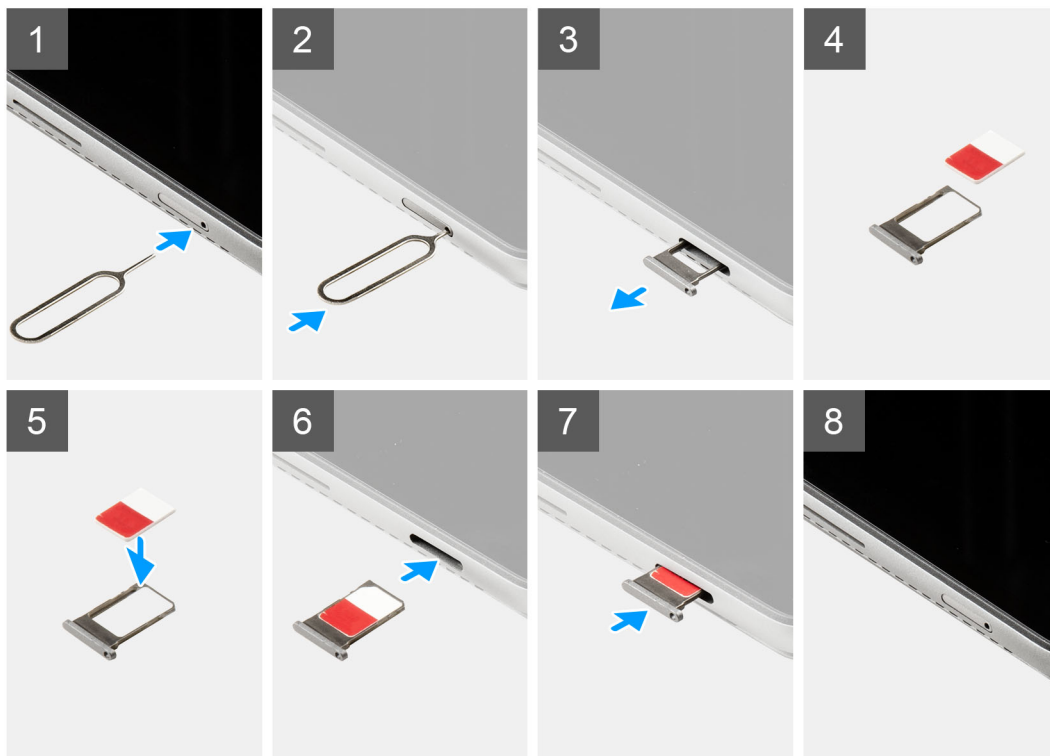
Prerequisites

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

i **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 to release the tray.
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 down.

4. Align the SIM card tray with the slot in 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](#).

Display assembly

Removing the display assembly

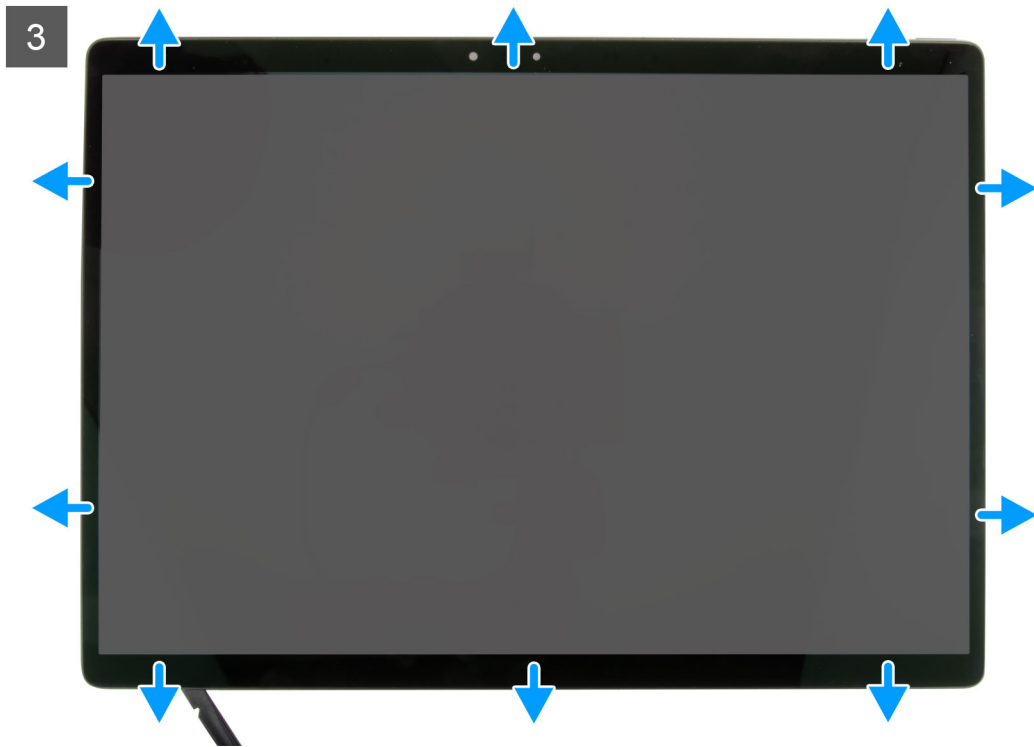
Prerequisites

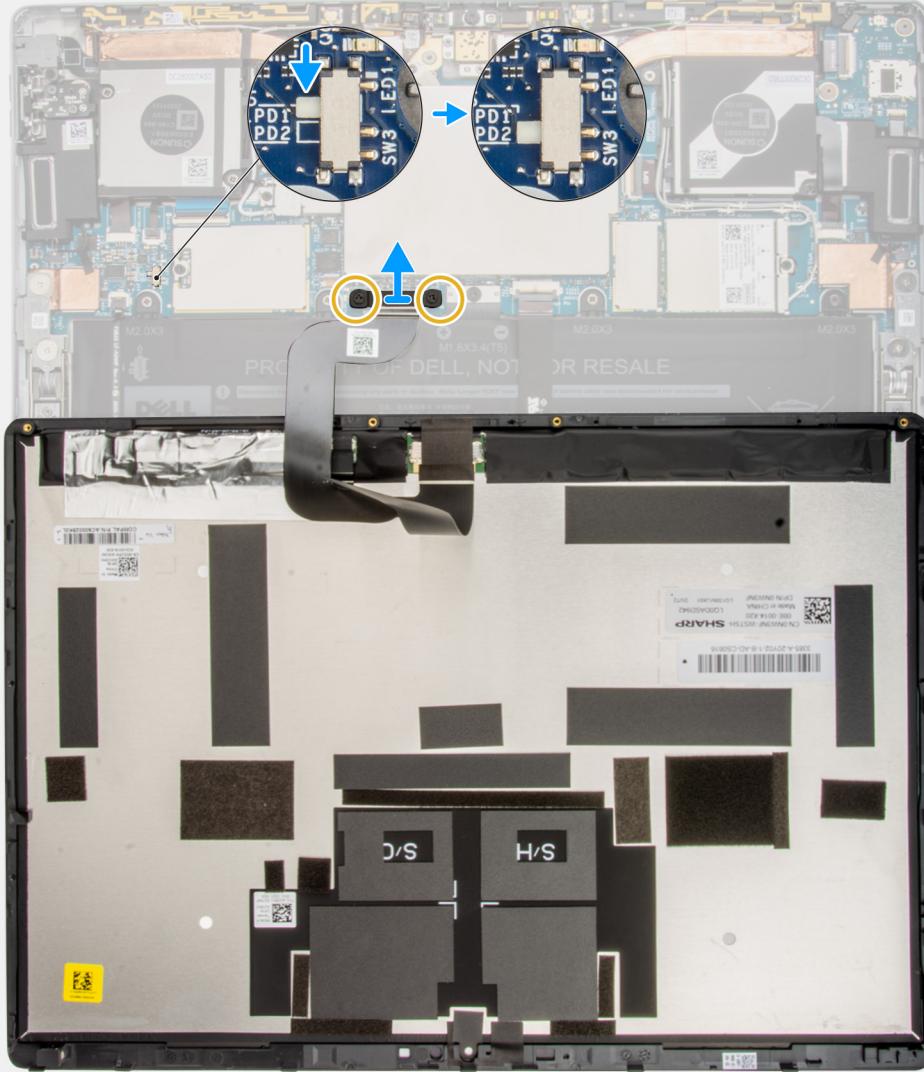
1. Follow the procedure in [Before working inside your system](#).
2. Remove the [SIM tray](#).

About this task

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







5



Steps

1. Open the kick stand to the widest possible angle, the system will power on.
NOTE: The Latitude 7320 Detachable has an automatic power-on feature. The system powers on anytime the kick stand is opened. Follow the below steps to ensure that the system does not power on while the performing replacement procedures.
2. With the kick stand open, shut down the computer using the operating system.
3. Place the system on a padded surface with the display assembly facing down.

4.  **CAUTION:** Make sure that the system has already been powered off before removing the screws.

Remove the four (M1.6x4) screws securing the display panel to the display back cover.

5. Using a plastic scribe, push the two release holes next to the kick stand hinges to loosen the display assembly from the display back cover.
6. Close the kick stand and flip the computer over with the display facing upwards.
7. Using a plastic scribe, pry open the display panel from the bottom-left or bottom-right corner.
8. Work your way around the top and remaining sides of the display panel.
9. Gently flip open the display assembly from the top edge and lay the display panel assembly face down.

 **CAUTION:** Do NOT pull the display panel away from the base while the display panel is still connected to the system board.

10. Slide the power switch on the system board from "PD1" to "PD2".

 **NOTE:** After switching the power switch off, an LED indicator next to the switch will illuminate red, indicating that power has been cut-off from the computer.

11. Remove the two (M2x2.5) screws that secure the display cable bracket to the system board.
12. Remove the display cable bracket from the computer.
13. Disconnect the display cable from the system board and remove the display assembly from the computer.

Installing the display assembly

Prerequisites

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

About this task

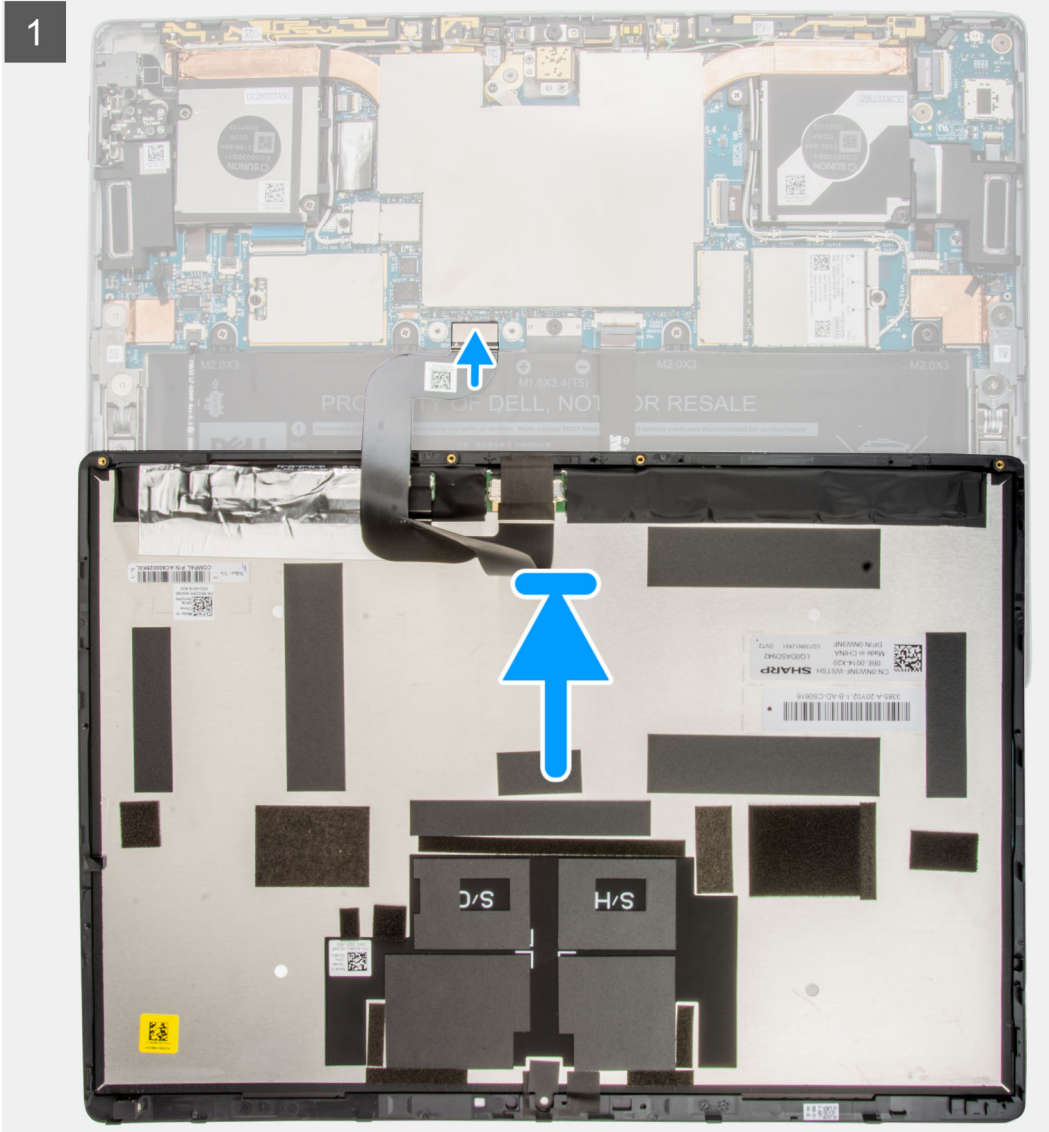
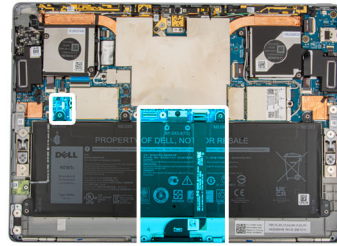
The following image indicates the location of the display assembly and provides a visual representation of the installation procedure.



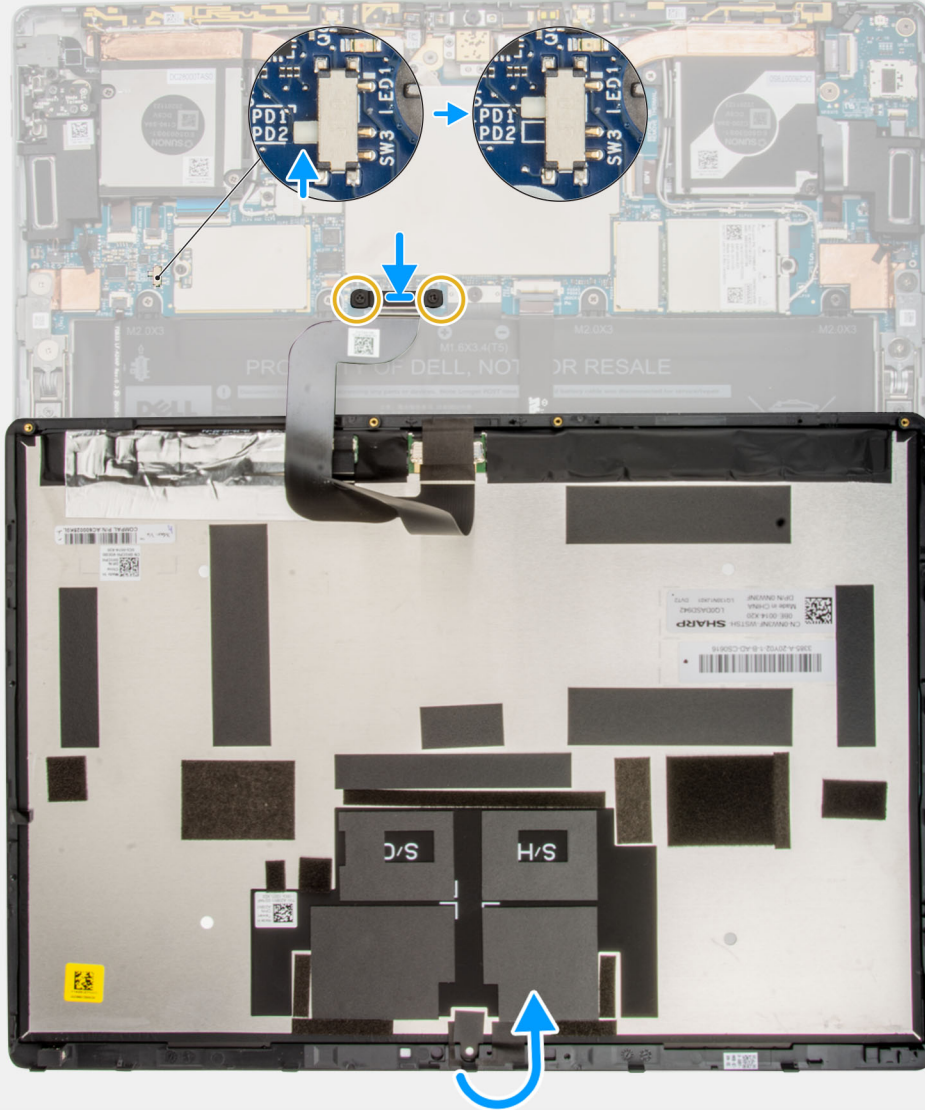
4x
M1.6x4

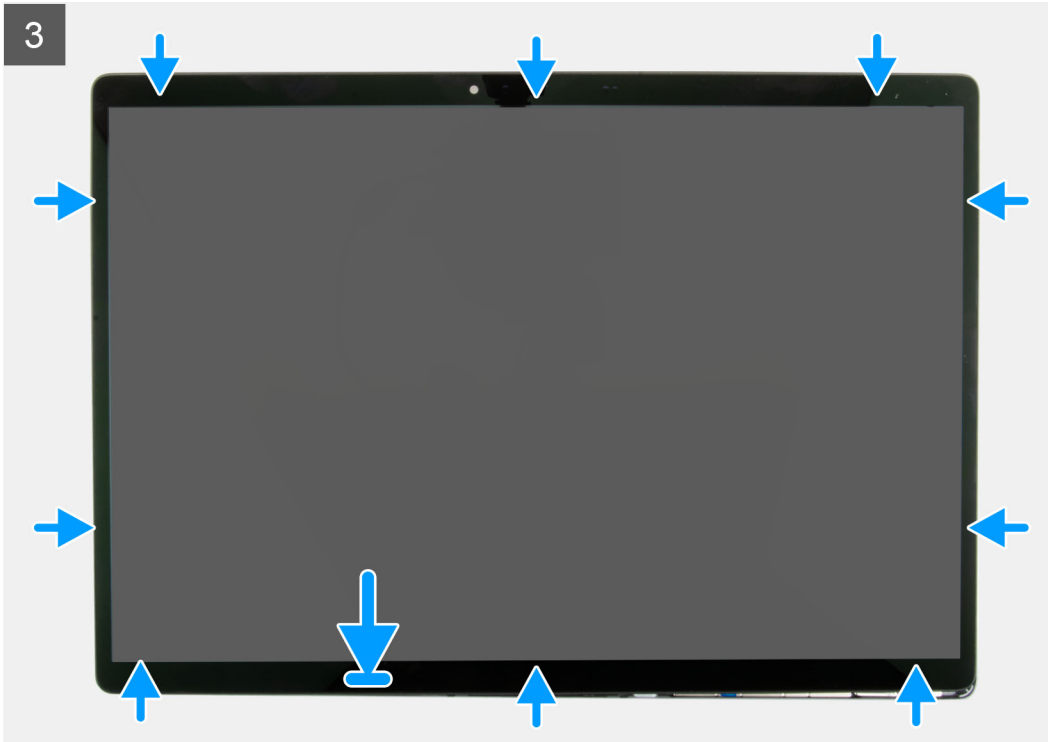


2x
M2x2.5



2







Steps

1. Place the display assembly face down on a padded surface just below the computer.
2. Connect the display cable to the connector on the system board.
3. Align and place the display cable bracket and place it on the display cable connector.
4. Replace the two (M2x2.5) screws that secure the display cable bracket to the system board.
5. Slide the power switch on the system board from "PD2" to "PD1".

NOTE: After switching the power switch to the "ON" position the LED indicator next to the switch will stop illuminating, indicating that power has been restored to the computer.
6. Gently flip the display assembly on to the computer.
7. Align and slide the bottom of the display assembly into the computer.
8. Gently press along the edges of the display assembly until it snaps into place.
9. Replace the four screws (M1.6x4) that secure the display panel to the display back cover.
10. Close the kick stand.

Next steps

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

Solid-state drive

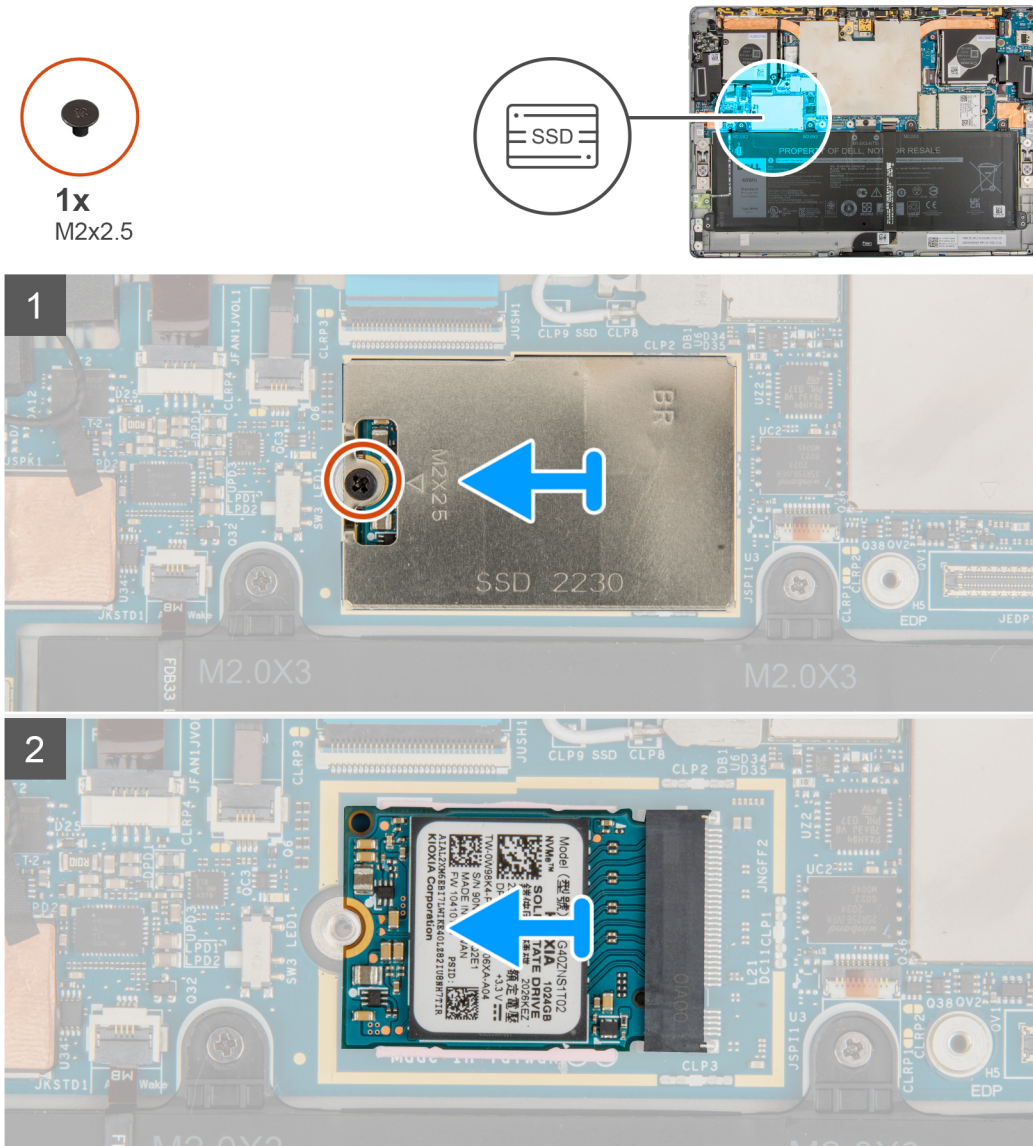
Removing the M.2 solid-state drive

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Remove the single (M2x2.5) screw securing the M.2 solid-state drive shield in place.
2. Remove the M.2 solid-state drive shield from the computer.

 **NOTE:** If the thermal pad located under the M.2 SSD gets detached from the system board, re-adhere it to the system board.

3. Slide the M.2 solid-state drive out the computer.

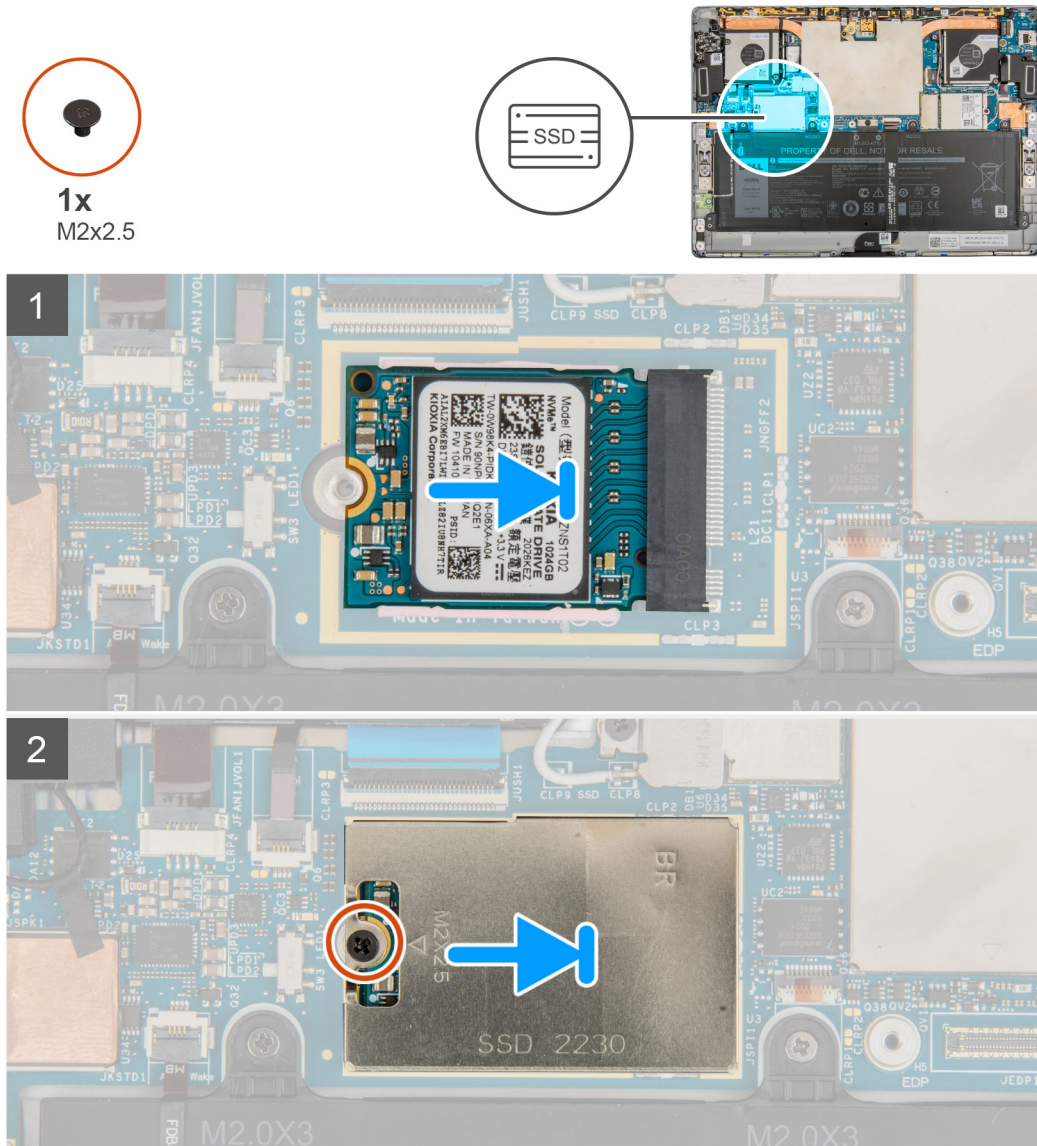
Installing the M.2 solid-state drive

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 solid-state drive and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the M.2 solid-state drive with the tab on the M.2 solid-state drive slot on the system board.
2. Slide the M.2 solid-state drive into the M.2 solid-state drive slot on the system board..
3. Align and place the M.2 solid-state drive shielding cover on the M.2 solid-state drive.

NOTE: Ensure the shielding cover is placed on the guiding clips of the system board.

4. Replace the single (M2x2.5) that secures the M.2 solid-state drive shield to the system board.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

WWAN card

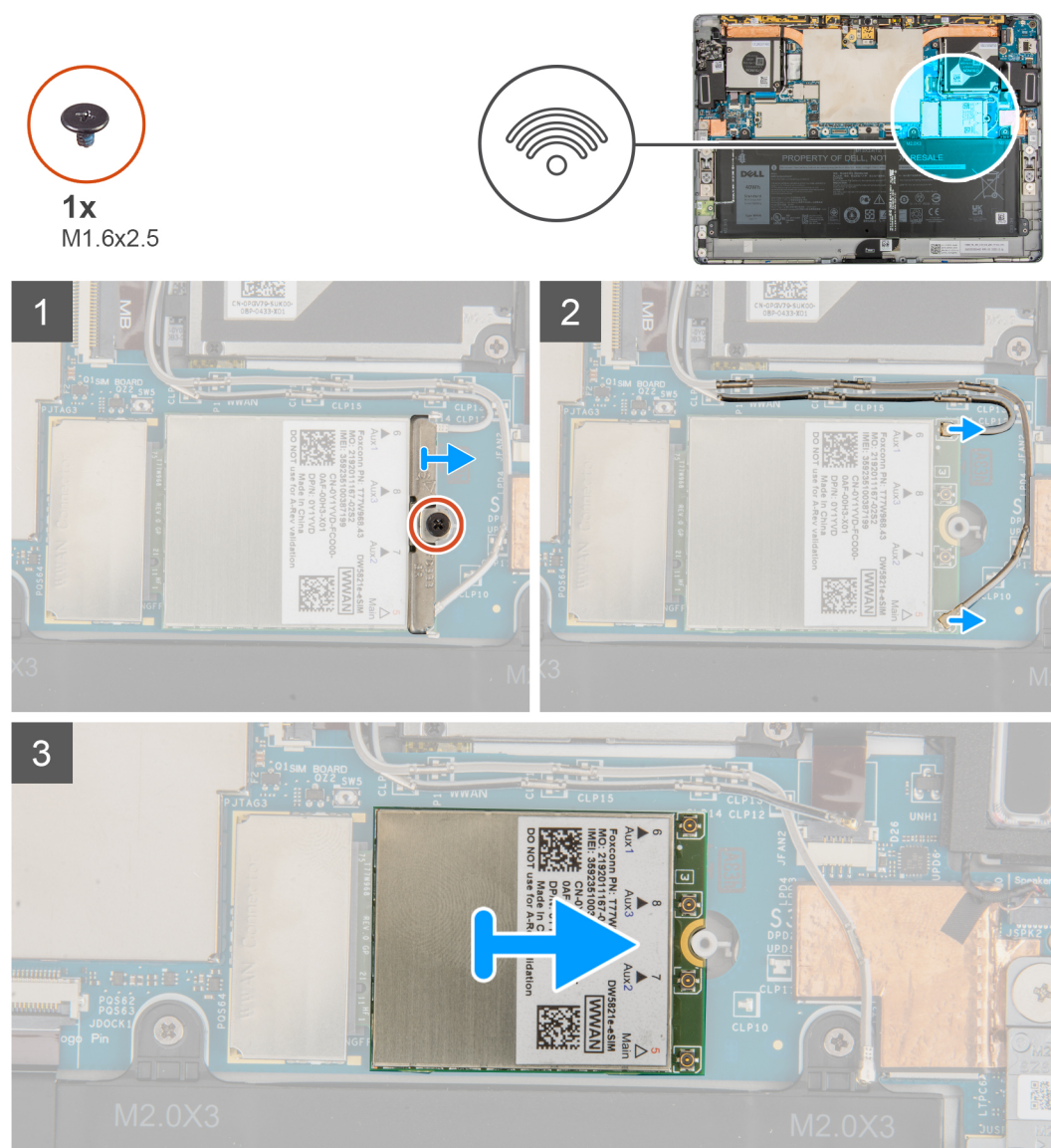
Removing the WWAN card

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Loosen the single captive screw 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.

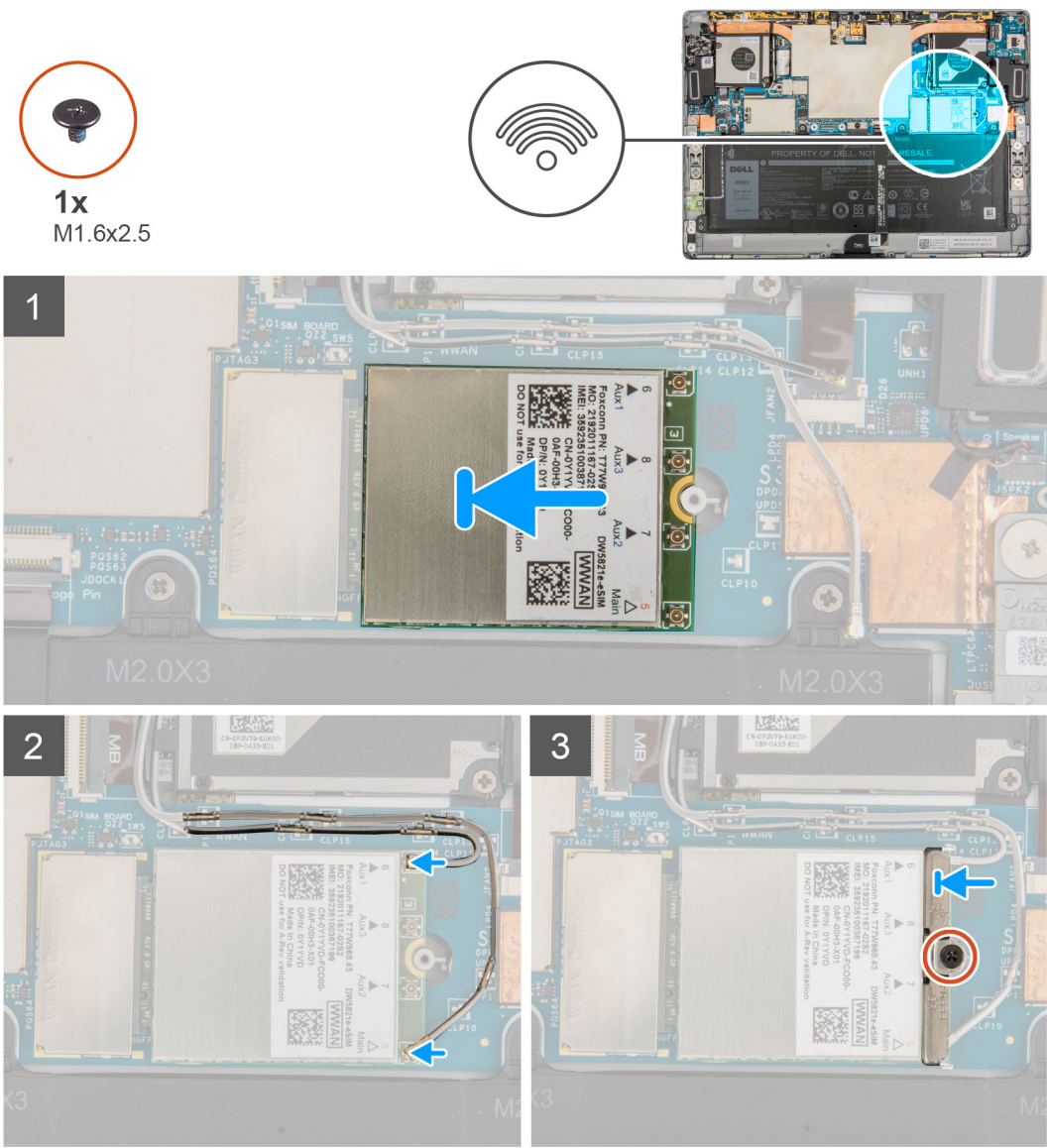
Installing the WWAN card

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. Align the notch on the WWAN card with the tab on the WWAN slot on the system board.
- 2. Slide the WWAN card at an angle into the WWAN slot on the system board.
- 3. Connect the antenna cables to the WWAN card.

The following table provides the antenna-cable color scheme:

Table 2. Antenna-cable color scheme

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

Table 2. Antenna-cable color scheme (continued)

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

4. Place the WWAN card bracket on the antenna connectors of the WWAN card.
5. Tighten the single captive screw to secure the WWAN bracket to the WWAN card.

i **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 [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

Speakers

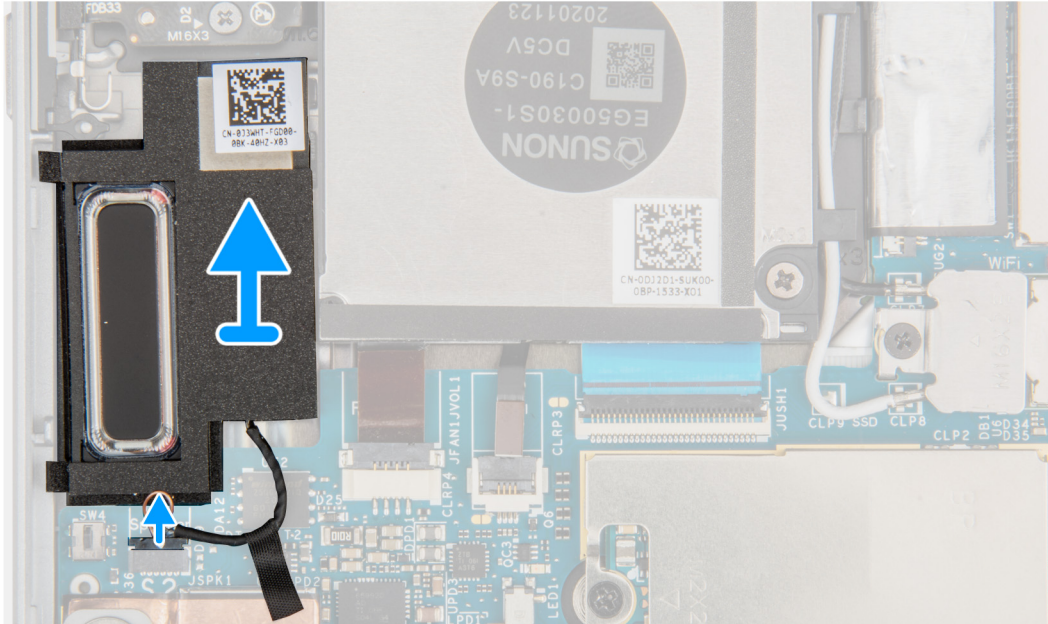
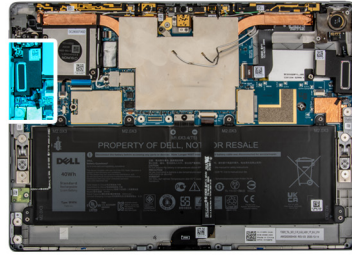
Removing the left speaker

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Disconnect the speaker cable from the connector on system board.
2. Lift the speakers along with the cable off the system board.

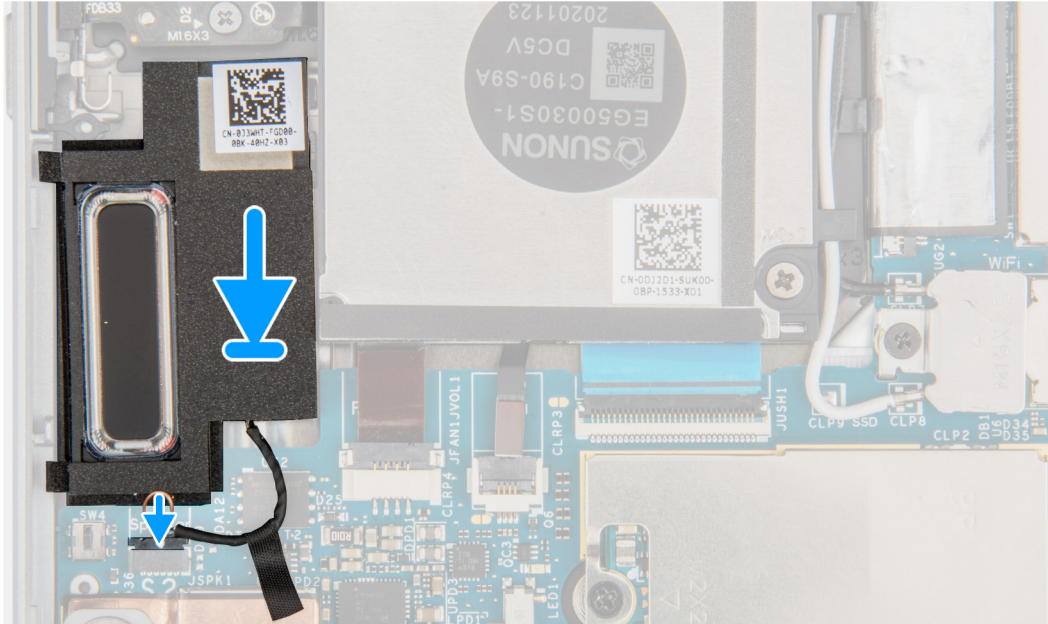
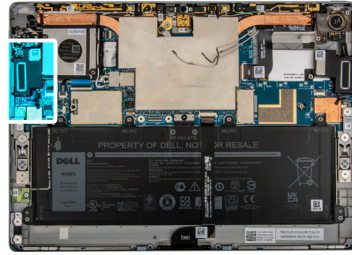
Installing the left speaker

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 left speaker and provides a visual representation of the installation procedure.



]

Steps

1. Align and place the speakers in its slot on the system board.
2. Reconnect the left speaker cable to the connector on the system board.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

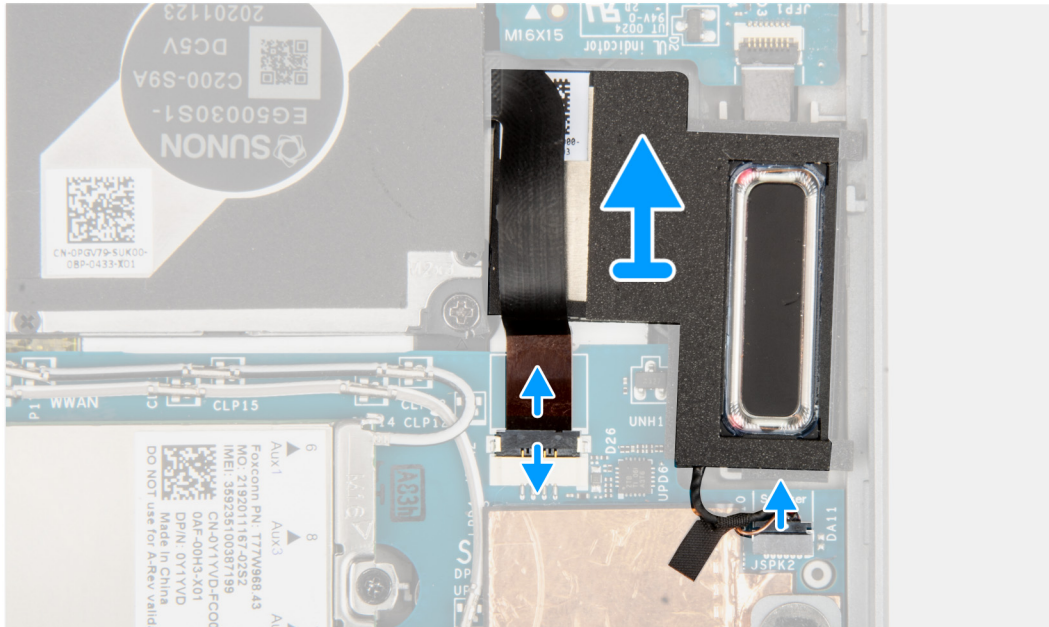
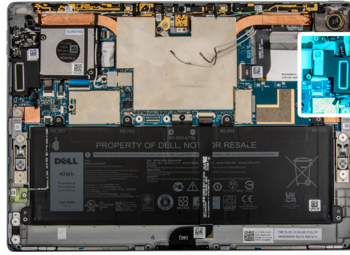
Removing the right speaker

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Disconnect the right fan FPC and speaker cable from the connector on system board.
2. Lift the speakers along with the cable off the system board.

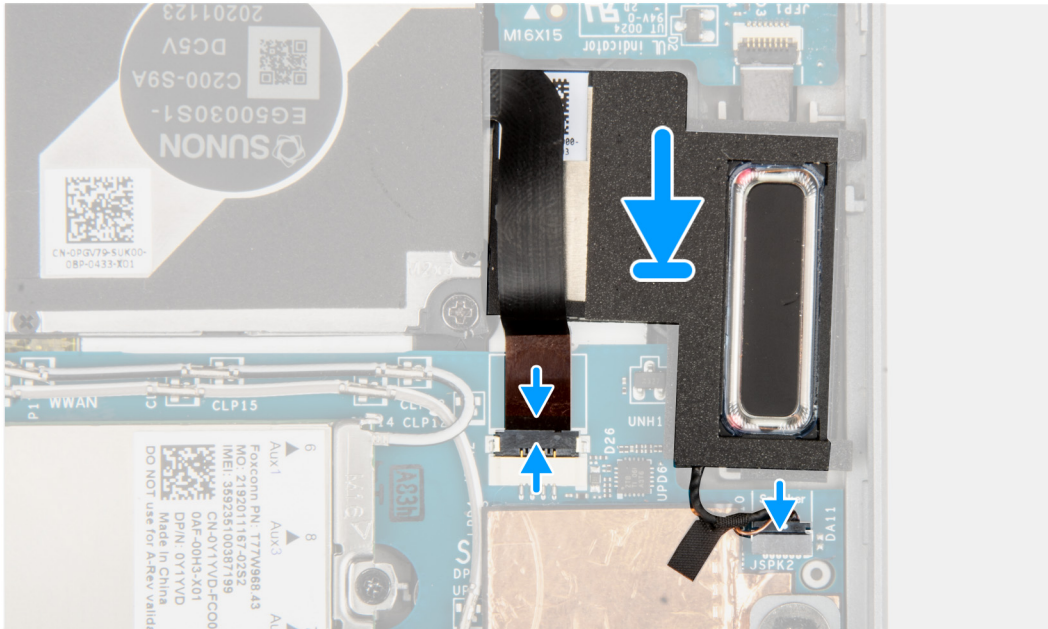
Installing the right speaker

Prerequisites

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

About this task

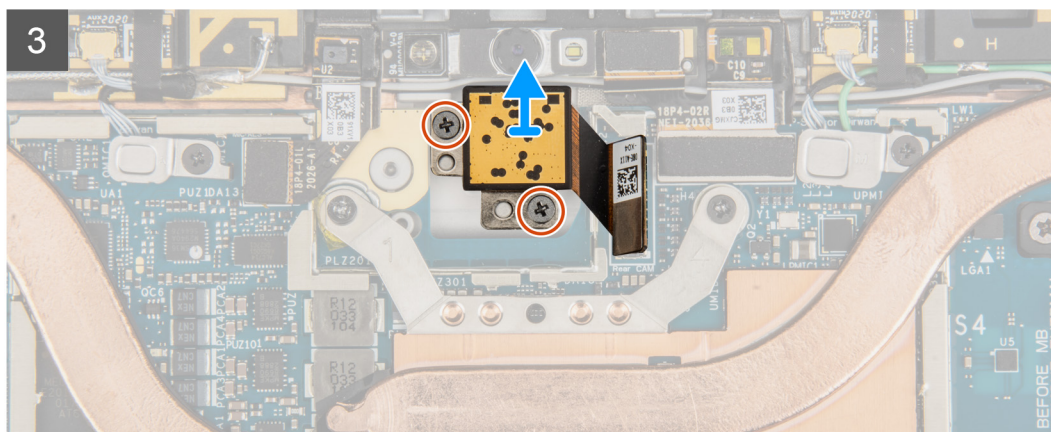
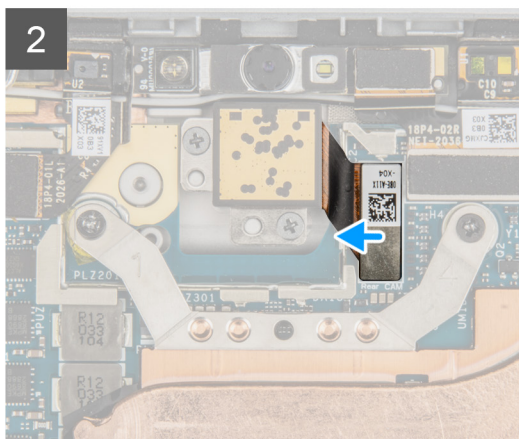
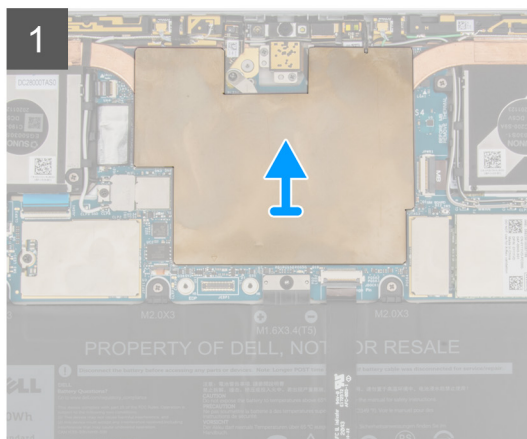
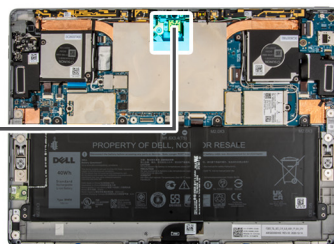
The following image indicates the location of the right speaker and provides a visual representation of the installation procedure.



30 Removing and installing components



2x
M1.6X3



Steps

1. Lift the system board shield off the system board.
2. Disconnect the rear-facing camera FPC from the connector on the system board.
3. Remove the two (M1.6x3) screws that secure the rear-facing camera in place.
4. Lift the rear-facing camera out of the system.

Installing the rear-facing camera

Prerequisites

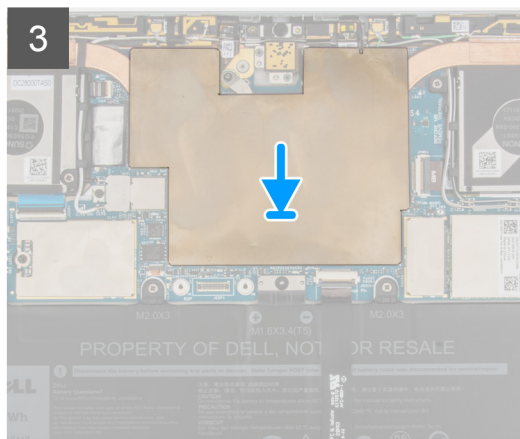
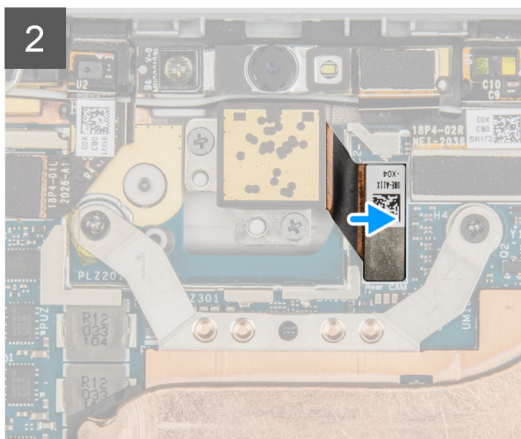
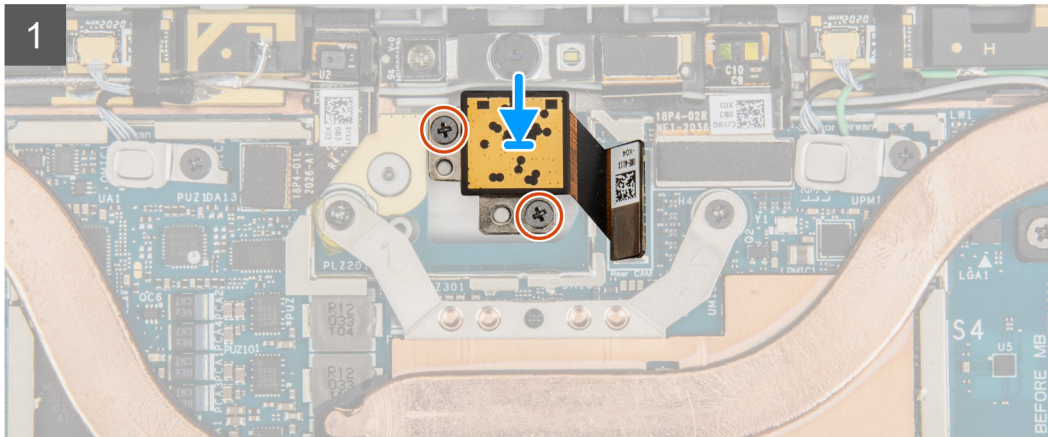
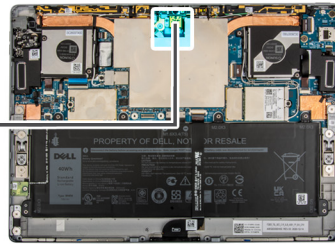
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M1.6X3



Steps

1. Align and place the rear-facing camera into the slot on the display back cover.
2. Replace the two (M1.6x3) that secure the rear-facing camera to the display back cover.
3. Connect the rear-facing camera FPC to the connector on the system board.
4. Place the system board shield on the system board and gently press until it snaps it into place.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

Microphone module

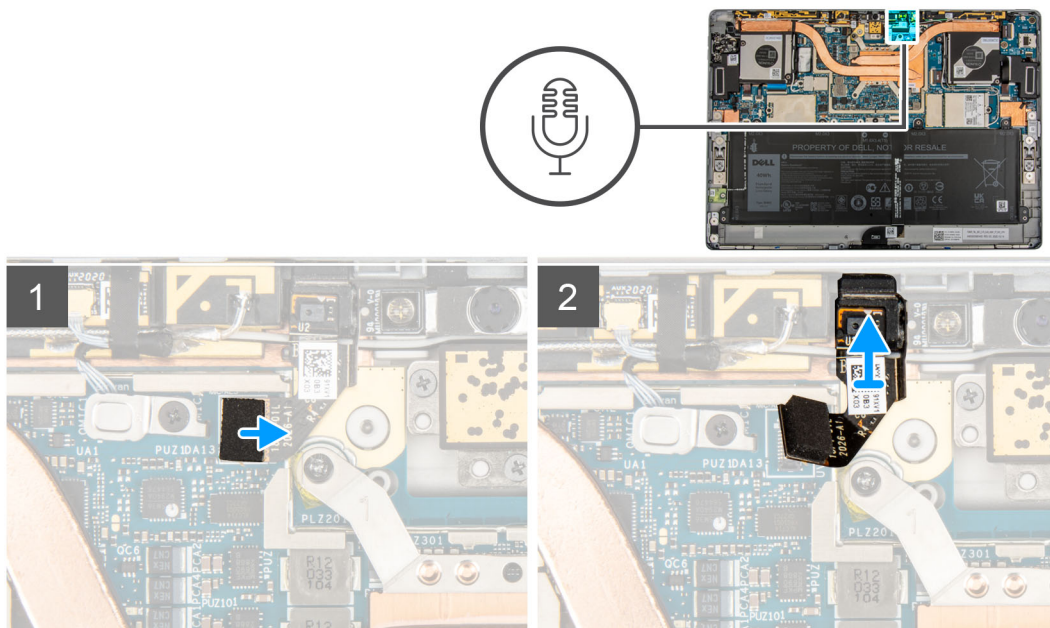
Removing the right microphone modules

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#)
3. Remove the [display assembly](#).

About this task

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



Steps

1. Lift the system board shield off the system board.
2. Disconnect the right microphone module from the front-facing camera module.
3. Disconnect the right microphone module FPC.
4. Lift the right microphone module out of the system.

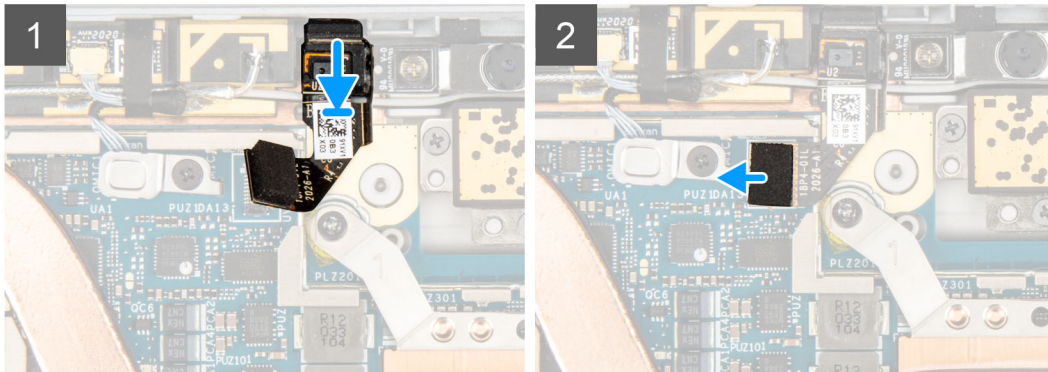
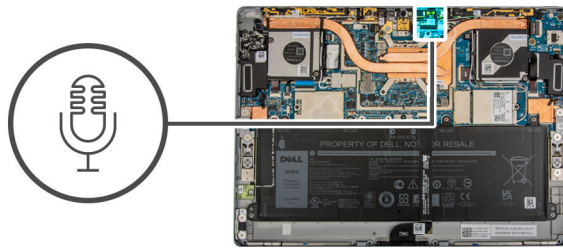
Installing the right microphone modules

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 right microphone module and provides a visual representation of the installation procedure.



Steps

1. Align and place the right microphone into the slot on the display back cover.
2. Connect the right microphone module to the front-facing camera module.
NOTE: The right microphone module must be connected to both the front-facing camera and system board. Failure to make both of these connections will result in the front-facing camera not working..
3. Connect the right microphone module FPC to the connector on the system board.
4. Place the system board shield on the system board and gently press until it snaps it into place.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

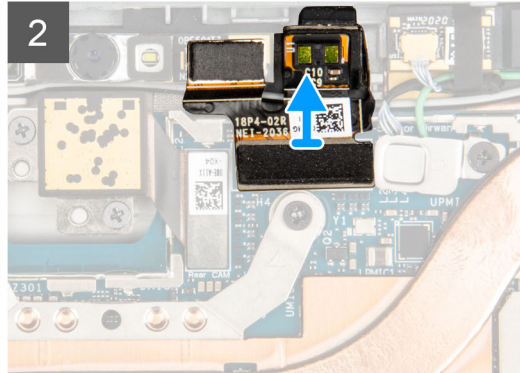
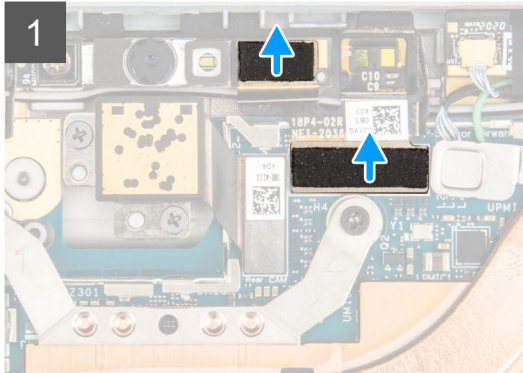
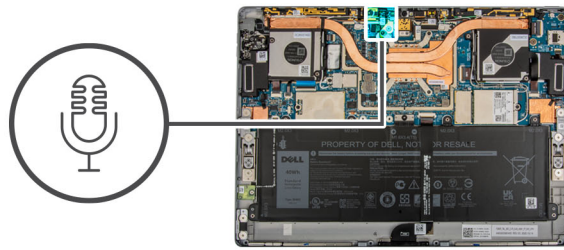
Removing the left microphone module

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#)
3. Remove the [display assembly](#).

About this task

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



Steps

1. Lift the system board shield off the system board.
2. Disconnect the left microphone module FPC.
3. Lift the left microphone module out of the system.

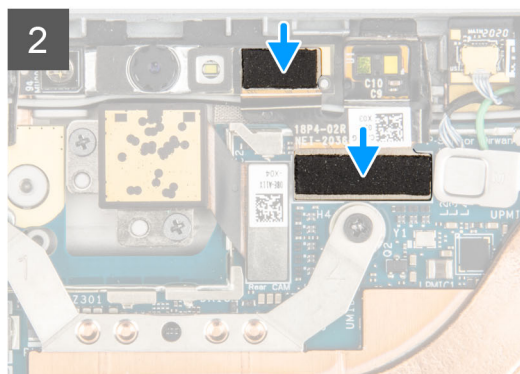
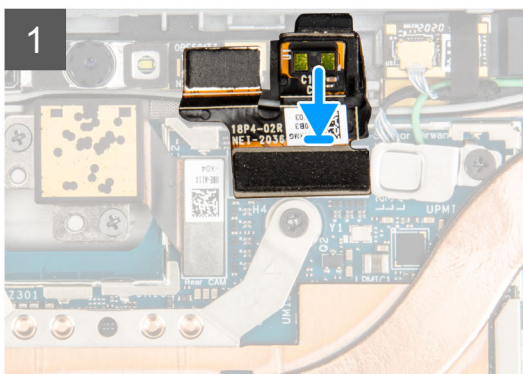
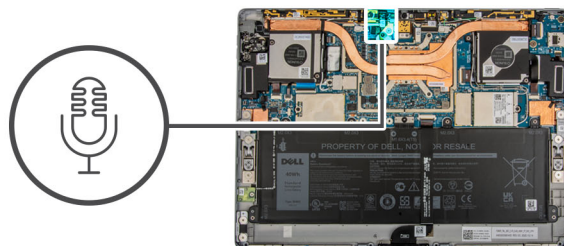
Installing the left microphone modules

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 left microphone module and provides a visual representation of the installation procedure.



Steps

1. Align and place the left microphone into the slot on the display back cover.
2. Connect the left microphone module FPC to the connector on the system board.
3. Place the system board shield on the system board and gently press until it snaps it into place.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

Front Camera

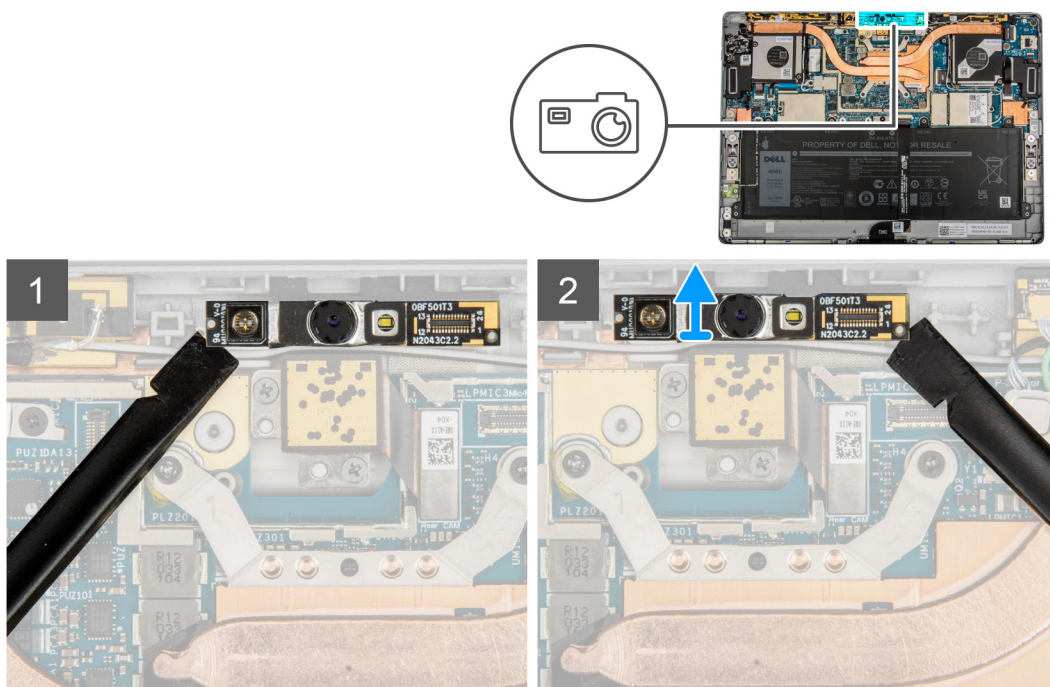
Removing the front-facing camera

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#)
3. Remove the [display assembly](#).
4. Remove the [microphone modules](#).

About this task

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



Steps

1. Using a plastic scribe, gently pry off the left and right side of the front-facing module.
2. Lift the front-facing camera out of the system.

NOTE: If the thermal pad located under the front-facing camera gets detached from the back cover, re-adhere it to the back cover.

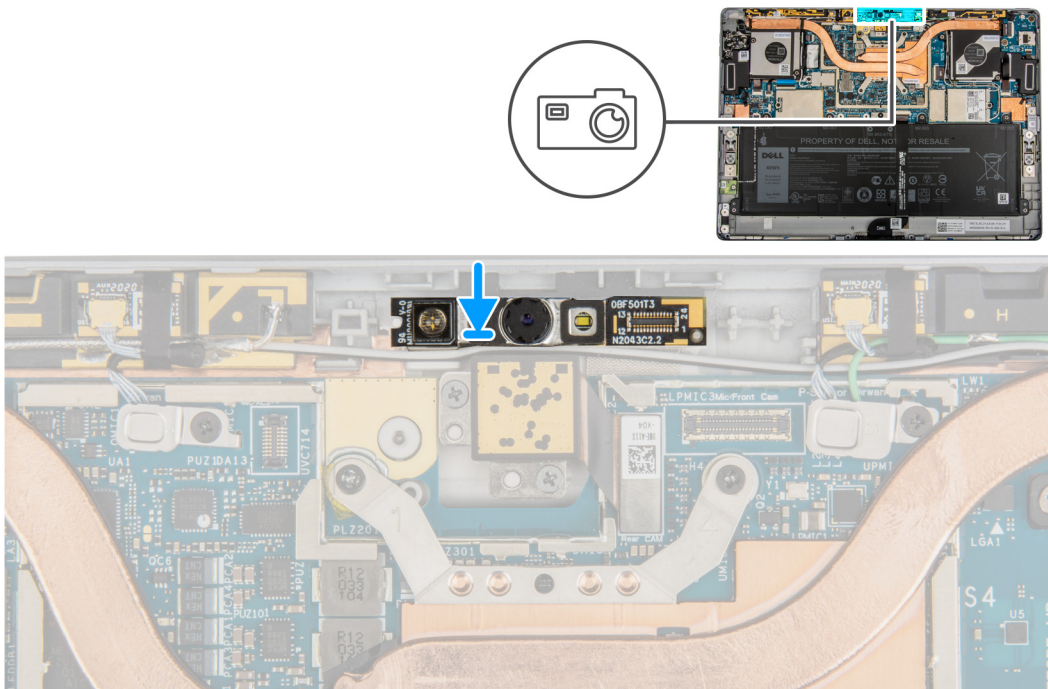
Installing the front-facing camera

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 front-facing camera module and provides a visual representation of the installation procedure.



Steps

1. Align and place the front-facing camera into the slot on the display back cover.
2. Gently press the edges of the front-facing camera and seat it in place

Next steps

1. Install the [microphone modules](#).
2. Install the [display assembly](#).
3. Install the [SIM tray](#).
4. Follow the procedure in [After working inside your computer](#).

Kick stand

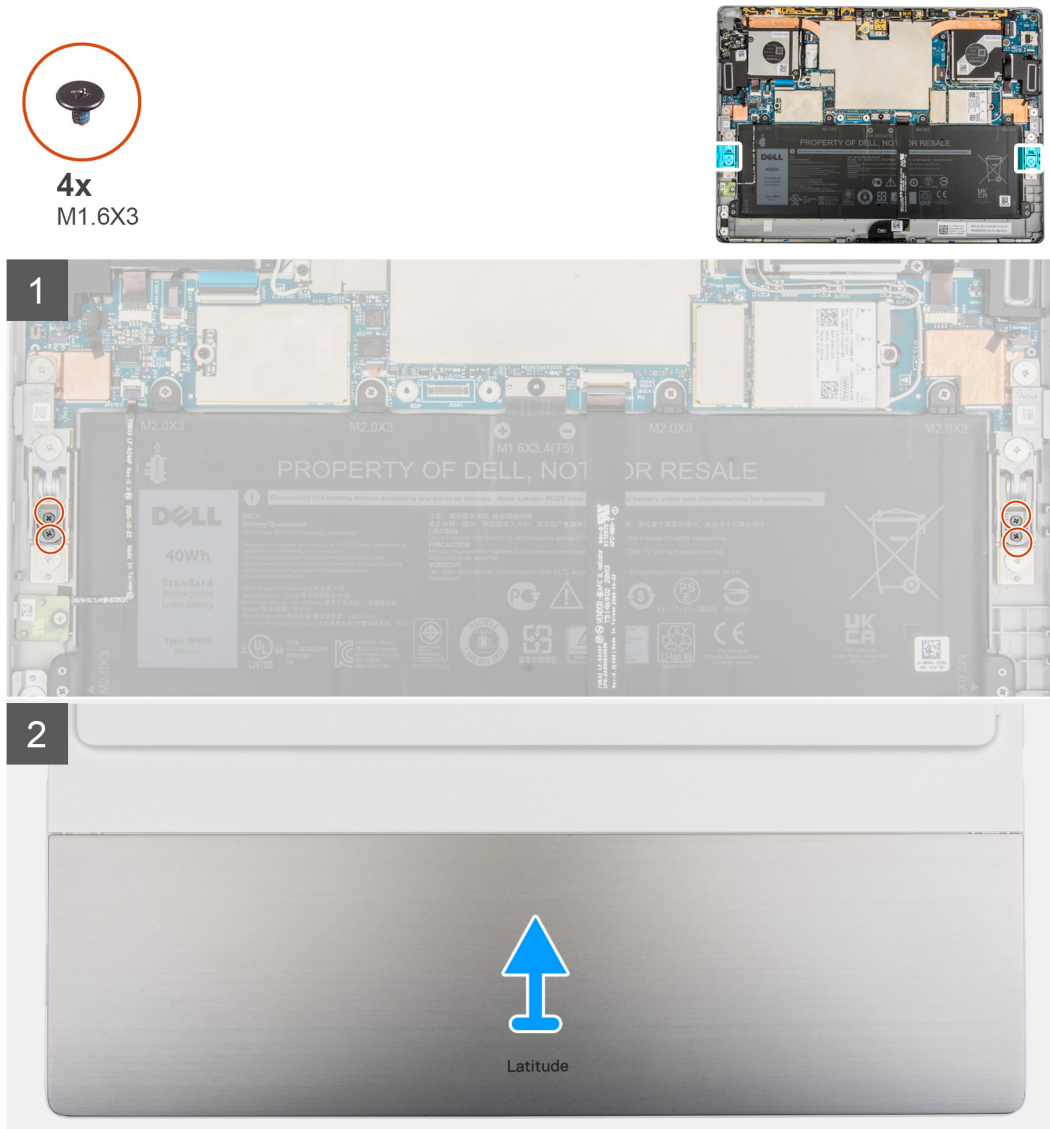
Removing the Kick stand

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Remove the four (M1.6x3) screws that secure the kick stand to the kick stand hinges.
2. Flip the system over and lift the kick stand away from the system.

Installing the kick stand

Prerequisites

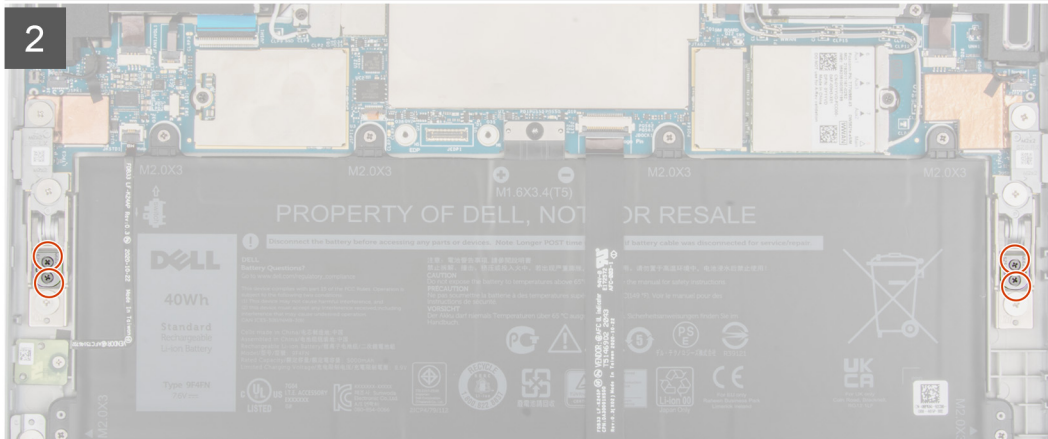
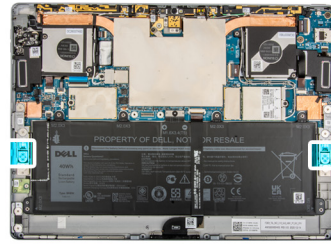
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



4x
M1.6X3



Steps

1. Align the screw holes on the kick stand with the screw holes on the frame, and flip the system.
NOTE: Ensure that the pins on the kick stand are inserted into the alignment holes on the kick stand hinges.
2. Replace the four (M1.6x3) screws that secure the kick stand to the kick stand hinges.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

Kickstand Hinges

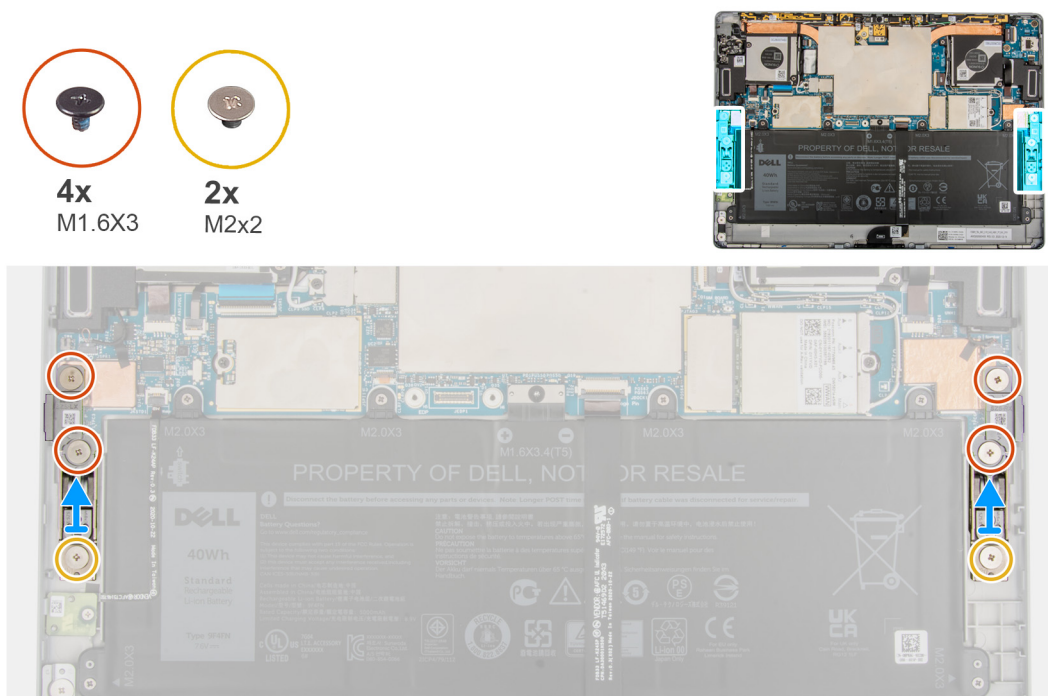
Removing the kick stand hinges

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).
4. Remove the [kick stand](#).

About this task

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



Steps

1. Remove the six (M2x2) screws that secure the kick stand hinges to the frame .
2. Lift the kick stand hinges out of the computer.

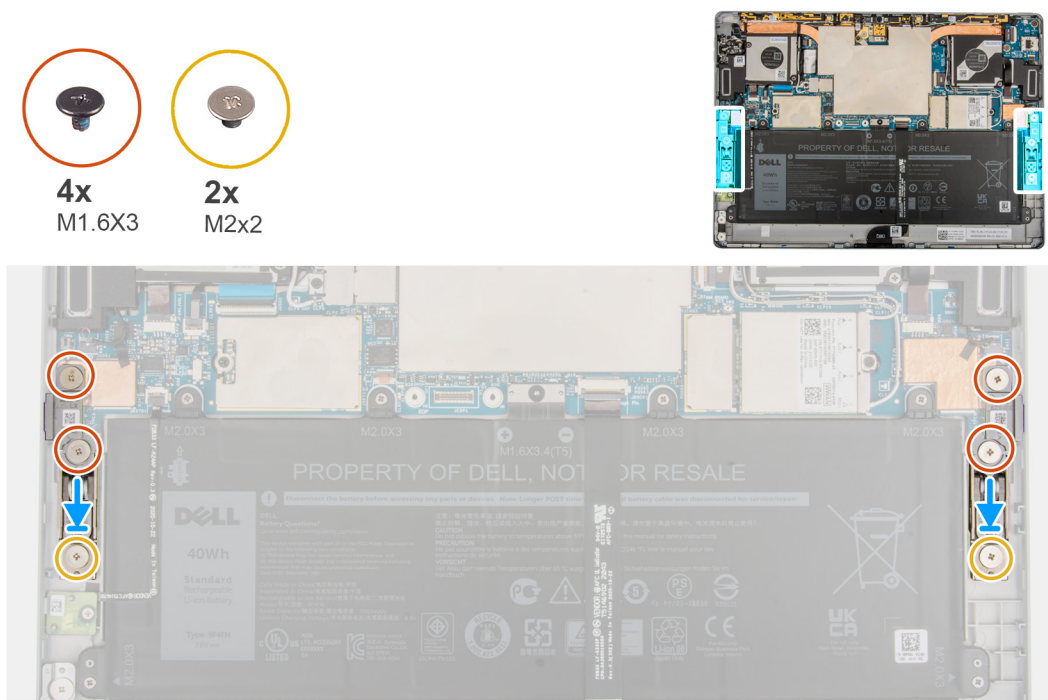
Installing the kick stand hinges

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 kick stand hinges and provide a visual representation of the installation procedure.



Steps

1. Align the screw holes on the kick stand hinges with the screw holes on the frame.
2. Replace the six (M2x2) screws that secure the Kick stand hinges to the frame.

Next steps

1. Install the [kick stand](#).
2. Install the [display assembly](#).
3. Install the [SIM card](#).
4. Follow the procedure in [After working inside your computer](#).

Docking connector

Removing the docking connector

Prerequisites

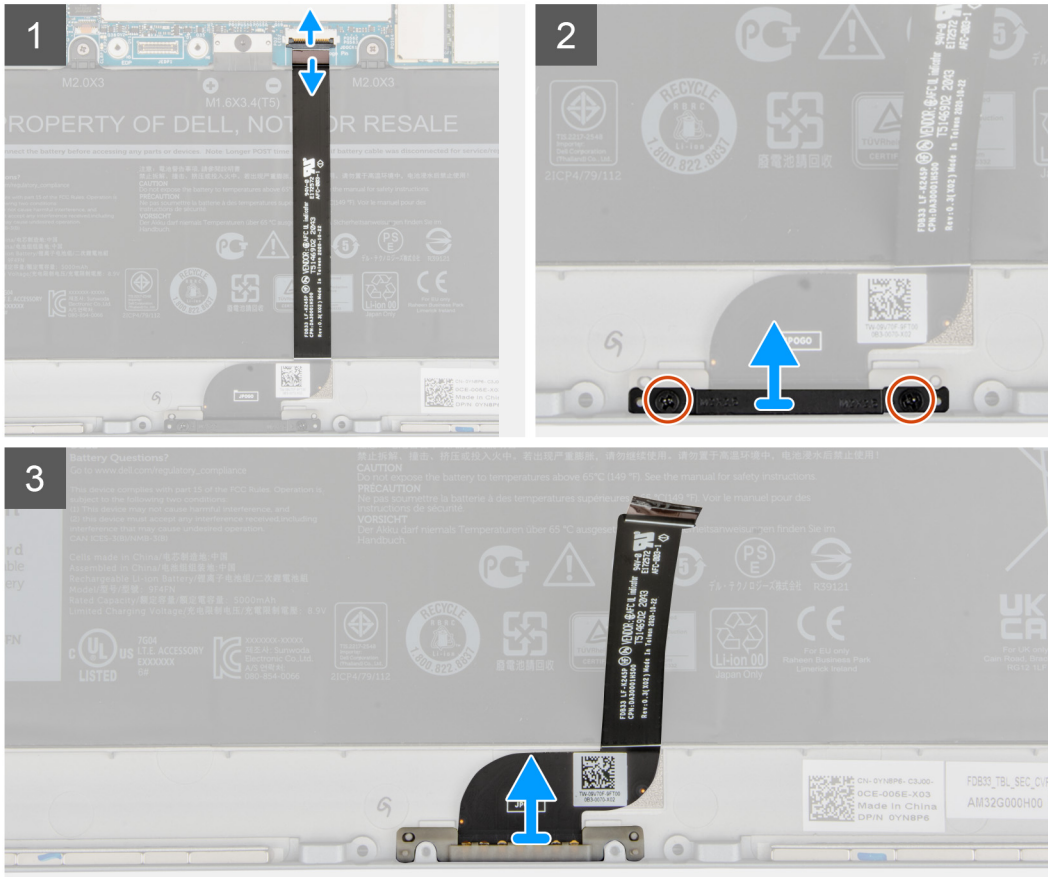
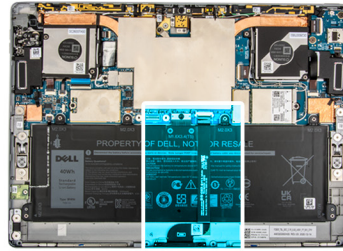
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



2x
M2x2.5



Steps

1. Open the latch and disconnect the docking connector FPC from the connector on the system board.
2. Peel the docking connector from the battery.
3. Remove the two (M2x2) screws that secure the docking connector bracket to the frame.
4. Lift the docking connector bracket and slide the docking connector out of the computer.

Installing the docking connector

Prerequisites

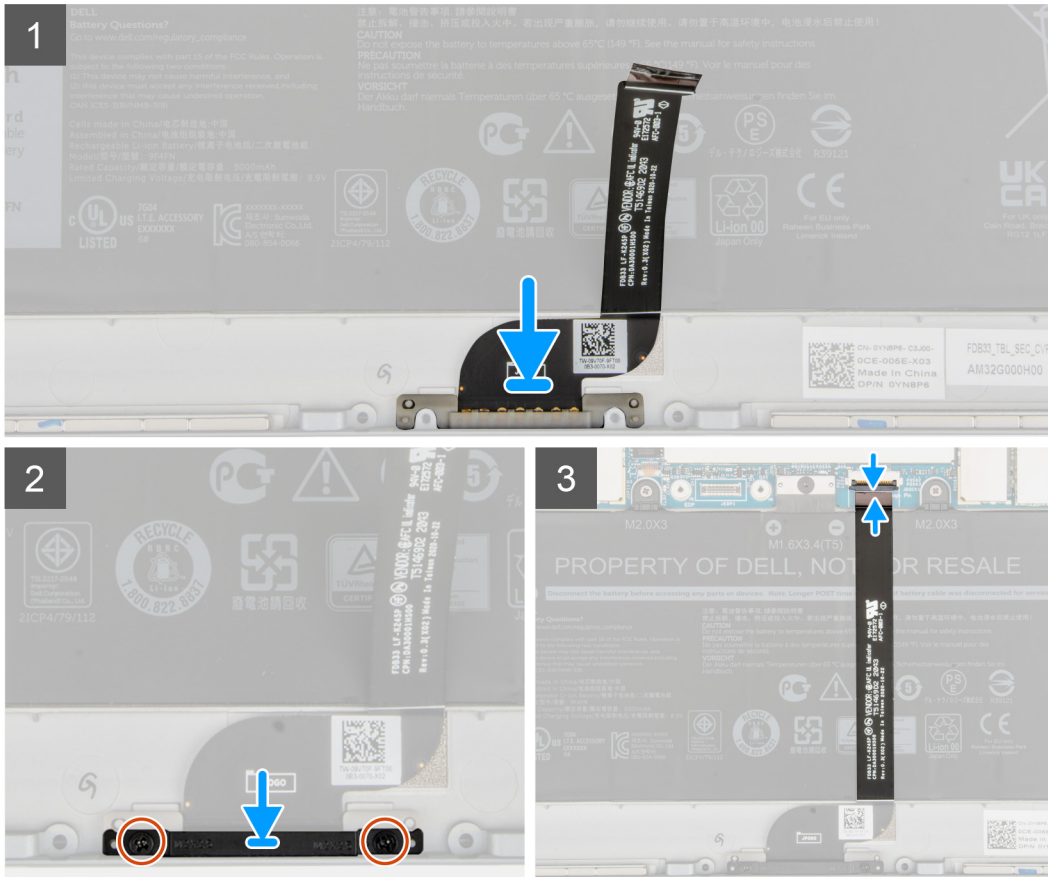
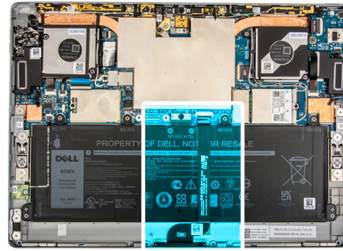
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M2x2.5



Steps

1. Align and place docking connector into slot on the frame.
2. Align and place the docking connector bracket on the docking connector.
3. Replace the two (M2x2) screws to secure the docking connector bracket to the frame.
4. Affix the docking connector FPC to the battery.
5. Connect the docking connector FPC to the connector on the system board and close the latch.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

Hall sensor daughter board

Removing the Hall sensor daughter board

Prerequisites

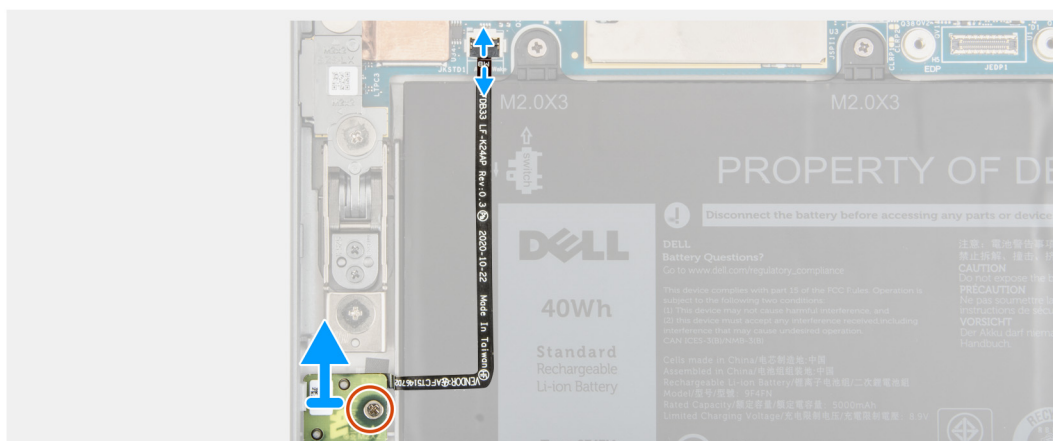
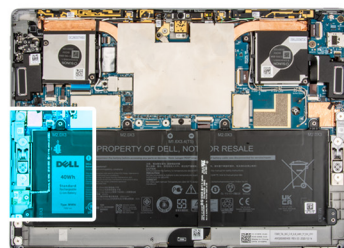
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



1x
M2x2



Steps

1. Disconnect the Hall sensor daughter board FPC from the connector on the system board.
2. Gently peel back the Hall sensor daughter board FPC from the battery .
3. Remove the single (M2x2) screw that secures the Hall sensor daughter board to the frame.
4. Lift the Hall sensor daughter board out of the computer.

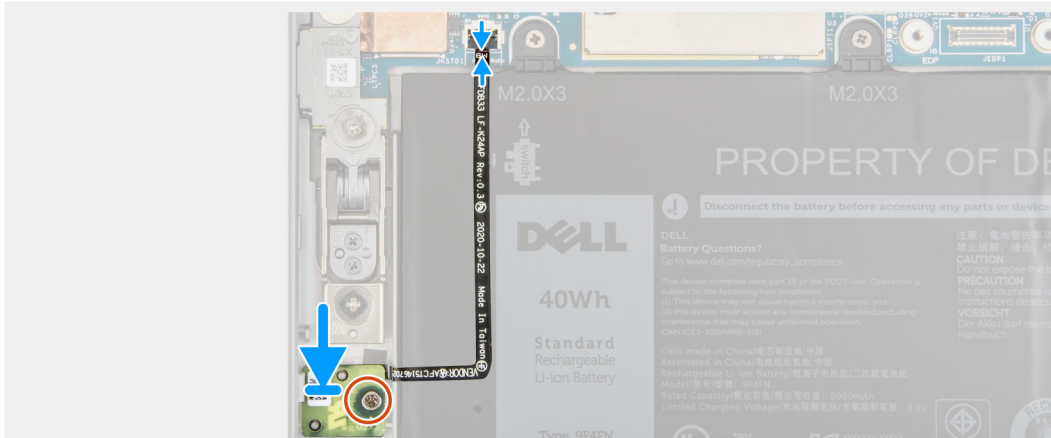
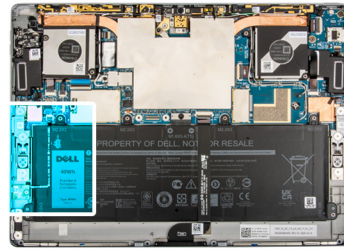
Installing the Hall sensor daughter board

About this task

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



1x
M2x2



Steps

1. Align and place the Hall sensor daughter board into the slot on the frame.
2. Replace the single (M2x2) that secures the Hall sensor daughter board to the frame.
3. Affix the Hall sensor daughter board FPC to the battery.
4. Connect the Hall sensor daughter board FPC to the connector on the system board and close the latch.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

Heat sink

Removing the heat sink

Prerequisites

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

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

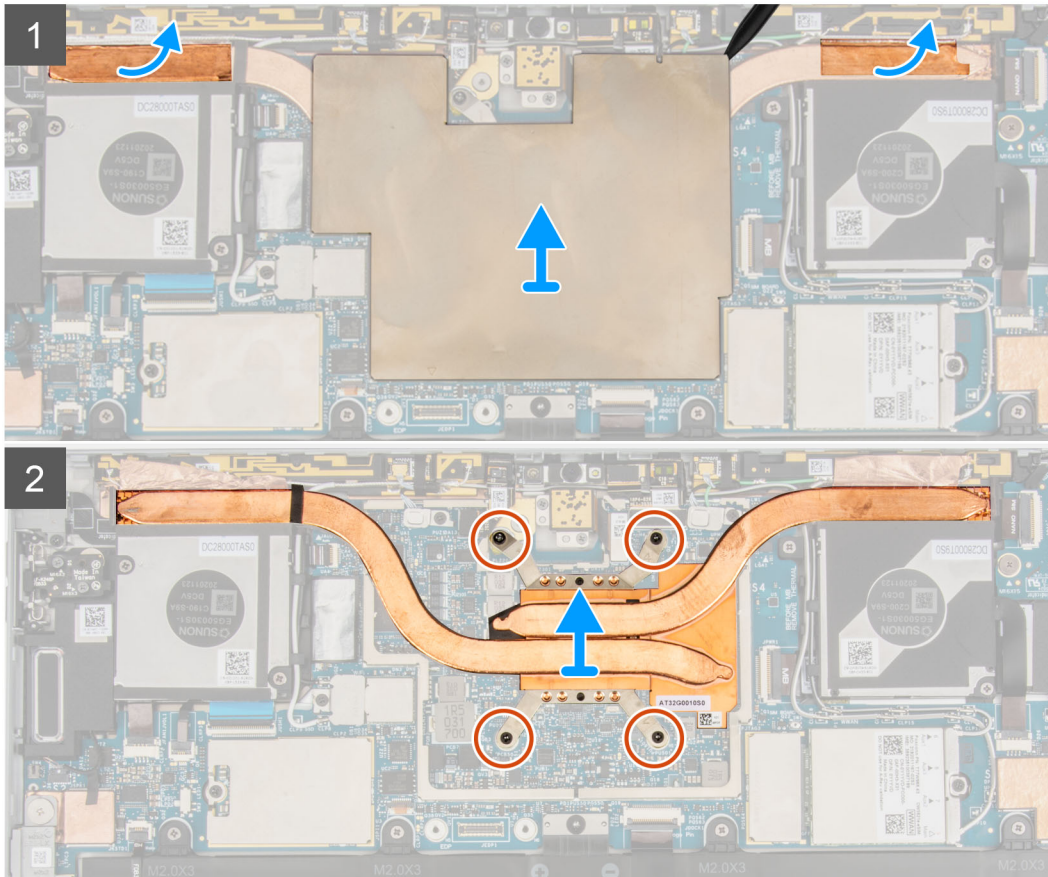
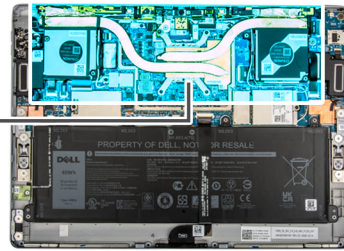
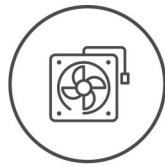
2. Remove the [SIM card](#).
3. Remove the [display assembly](#).

About this task

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



4x
M2x2.5



Steps

1. Lift the system board shielding cover from the system board.
2. Peel back the WLAN antenna grounding foil and WWAN antenna grounding foil from the heat sink..
3. Loosen the four captive screws that secure the heat sink as per their callout .
4. Lift the heat sink out of the system.

Installing the heat sink

Prerequisites

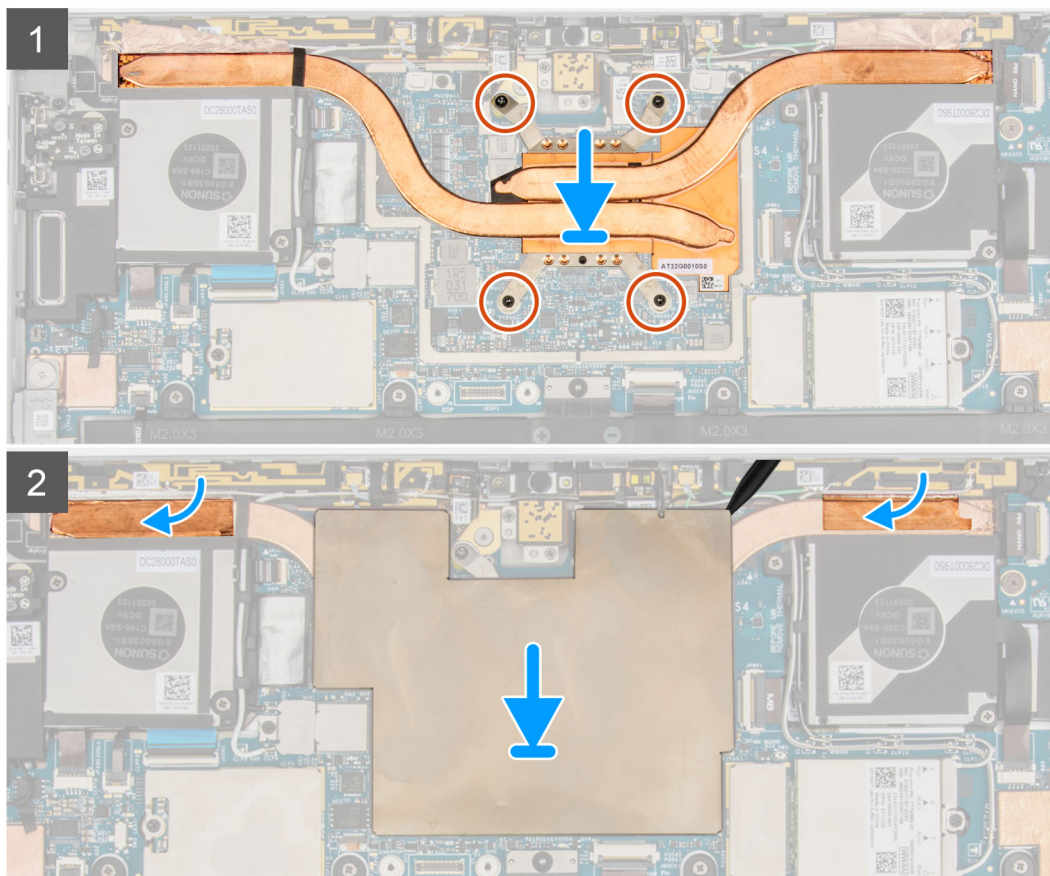
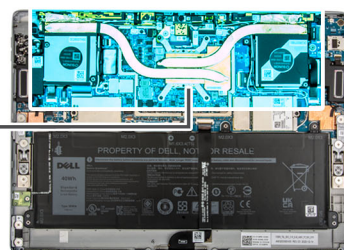
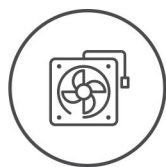
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



4x
M2x2.5



Steps

1. Align the screw holes on the heat sink with the screw holes on the system board.
2. Tighten the four captive screws that secure the heat sink to the system board as per their callout.
3. Affix the WLAN antenna grounding foil and WWAN antenna grounding foil to the heat sink.
4. Place the system board shielding cover on the system board and gently press until it snaps it into place.

Next steps

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

System fan

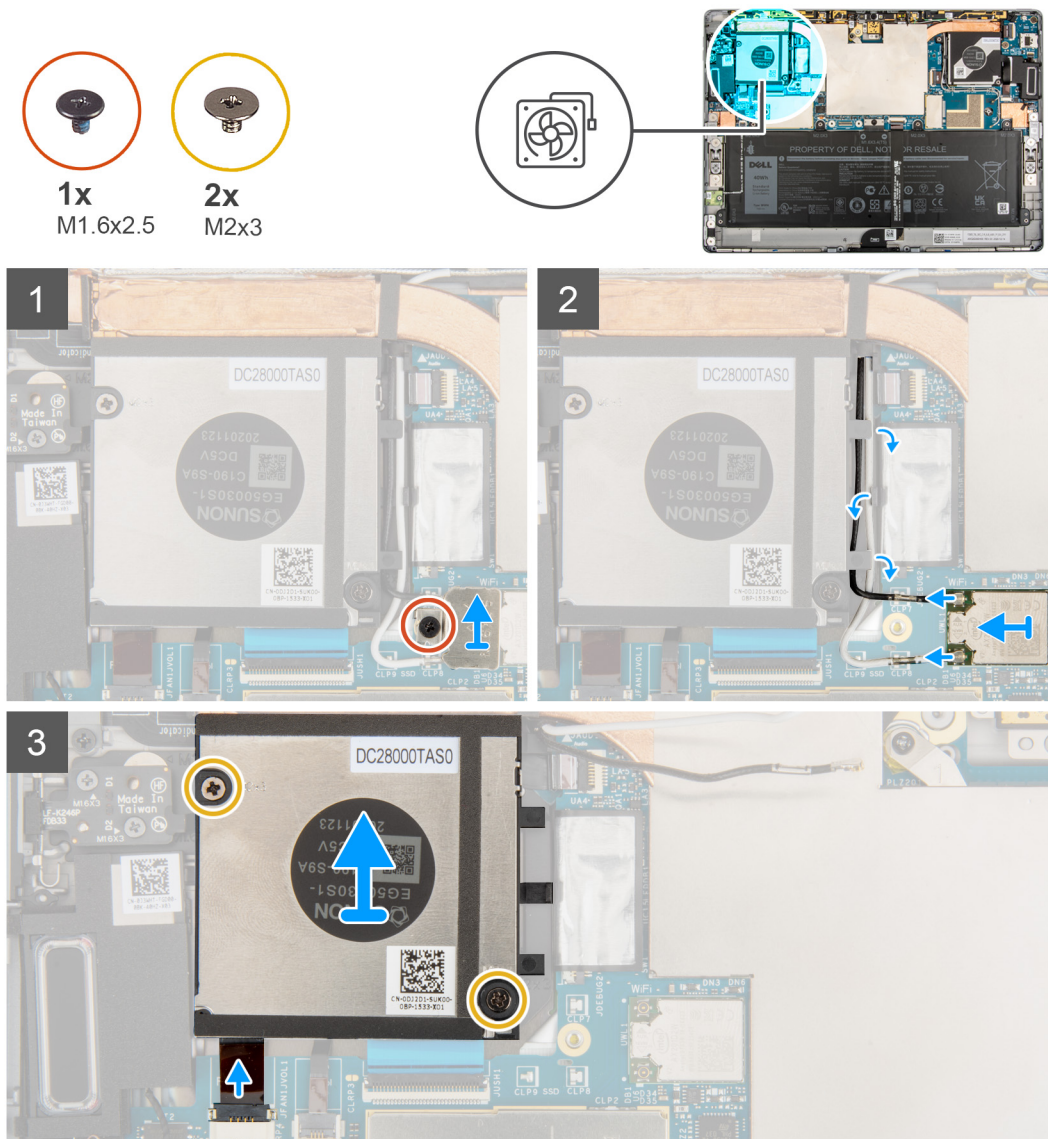
Removing the left fan

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Loosen the single captive screw that secures the WLAN bracket to the system board.
2. Lift the WLAN bracket out of the computer.
3. Disconnect and unroute the WLAN antennas from the routing clips on the fan case.
4. Remove the two (M2x3) screws that secure the left system fan to the frame.

5. Disconnect the left system fan FPC from the connector on the system board.
6. Lift the left fan out of the computer.

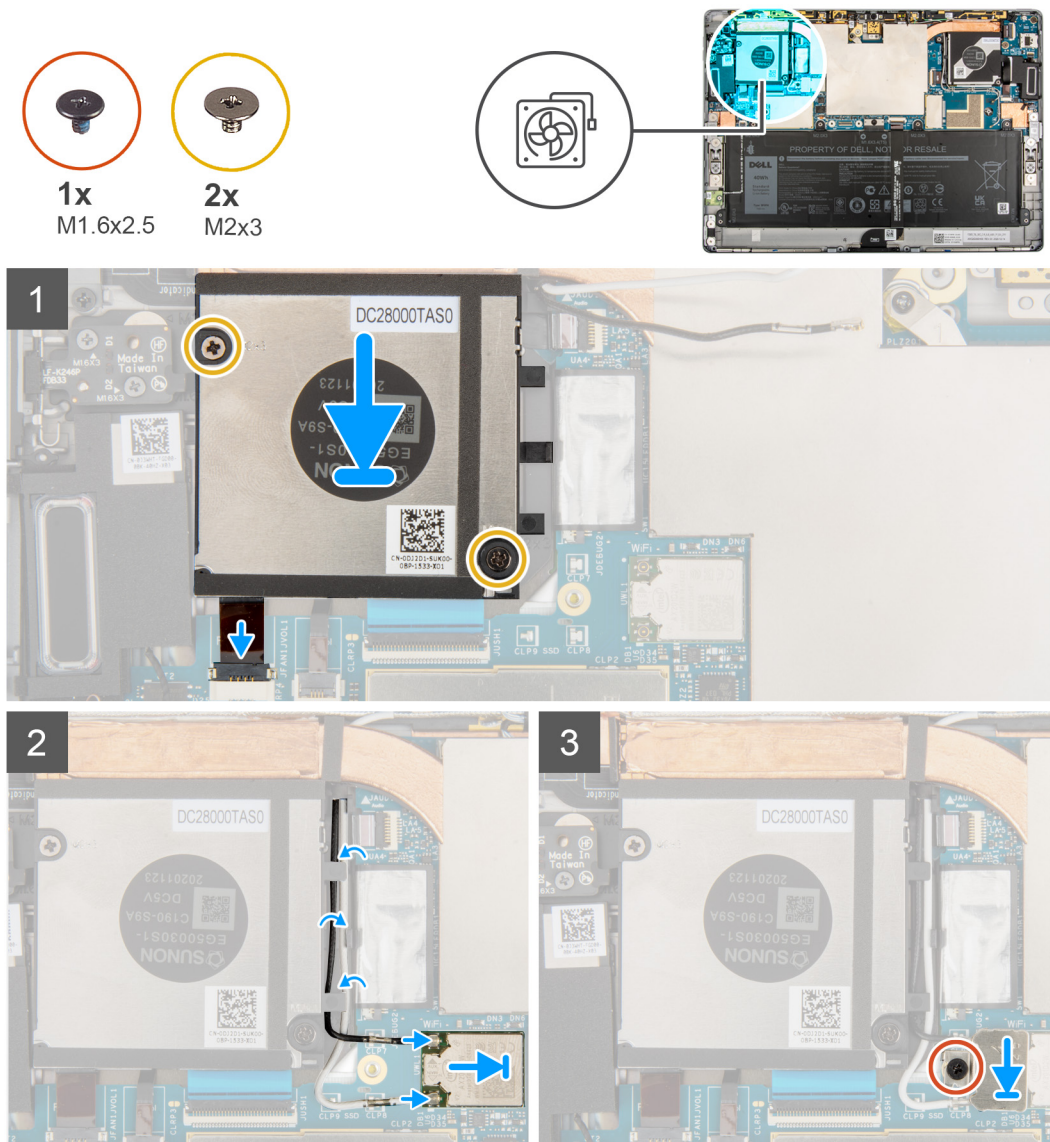
Installing the left fan

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



Steps

1. Align the screw holes on the left system fan with the screw holes on the frame.
2. Replace the two screws (M2x3) to secure the system fan to the frame.
3. Connect the left system fan FPC to the connector on the system board.
4. Route the WLAN antenna cable through the routing pin on the fan case.
5. Connect the WLAN antenna to the connectors on the WLAN card.
6. Place the WLAN card bracket on the WLAN card.

7. Tighten the single captive screw that secures the WLAN card bracket to the system board.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

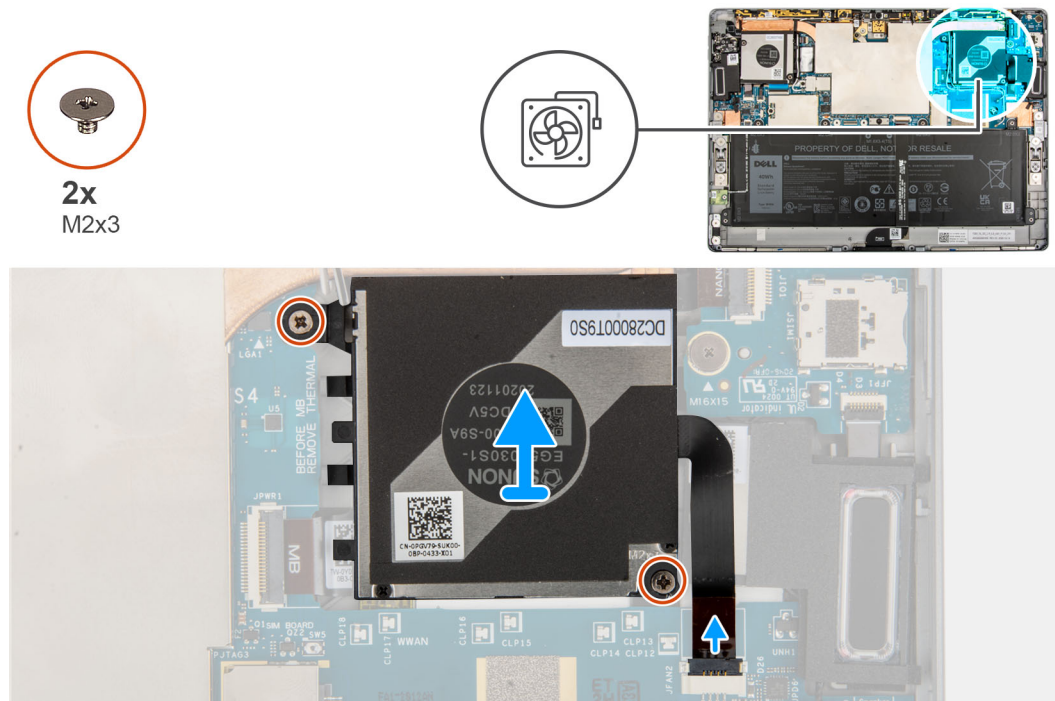
Removing the right system fan

Prerequisites

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

About this task

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



Steps

1. Remove the two (M2x3) screws that secure the right system fan to the frame.
2. Disconnect the right system fan FPC from the connector on the system board.
3. Lift the right system fan out of the system.

Installing the right fan

Prerequisites

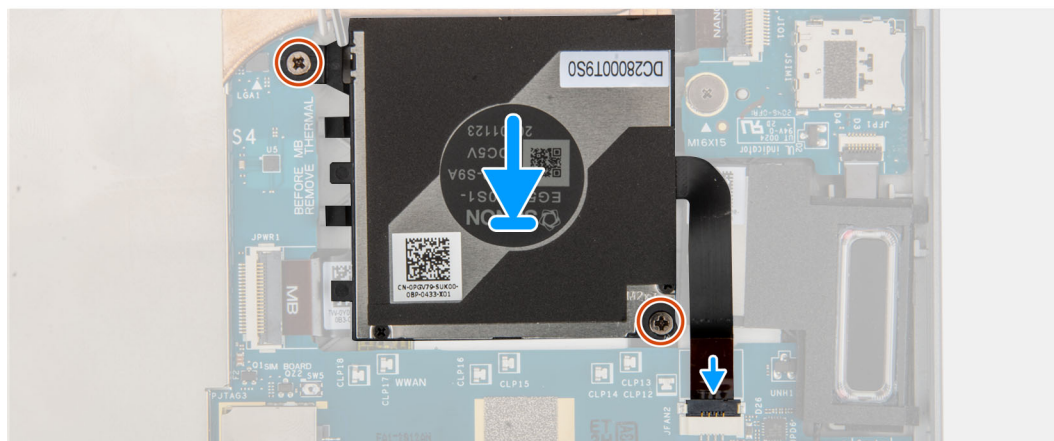
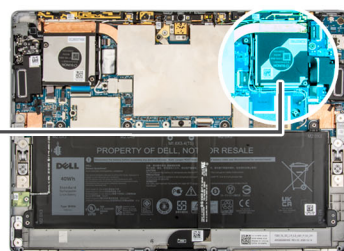
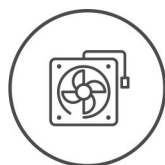
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M2x3



Steps

1. Align the screw holes on the right system fan with the screw holes on the frame.
2. Replace the two screws (M2x3) to secure the right system fan to the frame.
3. Connect the right system fan FPC to the connector on the system board.

Next steps

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

Volume button daughter board

Removing the Volume button daughter board

Prerequisites

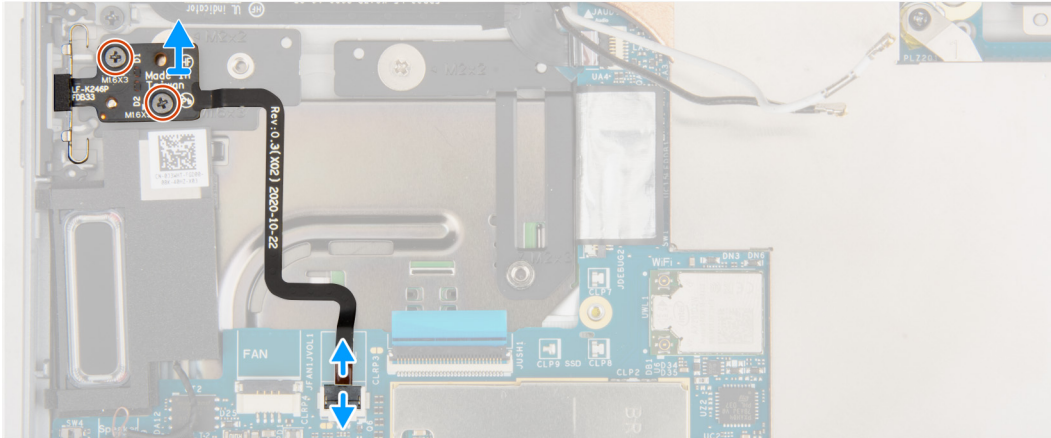
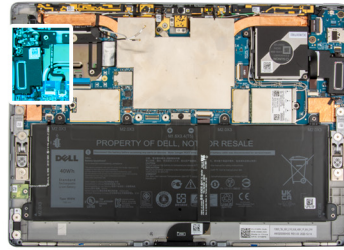
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).
4. Remove the [WWAN card](#).
5. Remove the [left system fan](#).

About this task

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



2x
M1.6x3



Steps

1. Open the latch and disconnect the volume button daughter board FPC from the system board.
2. Remove the two (M1.6x3) screws that secure the volume button daughter board to system board.
3. Lift the volume button daughter board out of the system.

Installing the volume button daughter board

Prerequisites

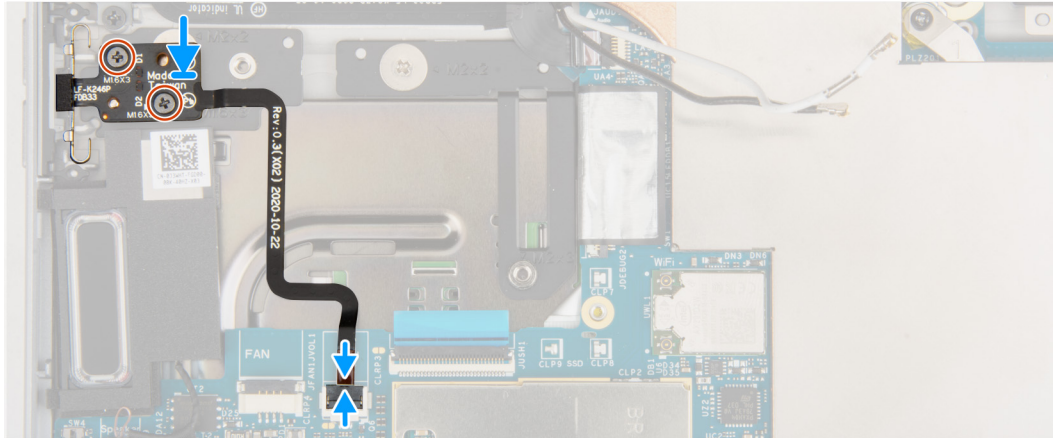
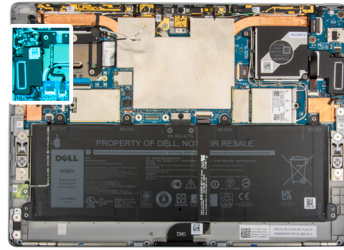
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M1.6x3



Steps

1. Align and place the volume button daughter board on the system board.

NOTE: When installing the volume button daughter board, fully insert the power button module into its compartment, and then press the volume buttons to check whether the daughter board is correctly installed.

2. Replace the two (M1.6x3) screws that secure the volume daughter board to the system board.
3. Connect the volume daughter board FPC to the connector on the system board and close the latch.

Next steps

1. Install the [left system fan](#).
2. Install the [WWAN card](#).
3. Install the [display assembly](#).
4. Install the [SIM tray](#).
5. Follow the procedure in [After working inside your computer](#).

Power-button board

Removing the power-button board

Prerequisites

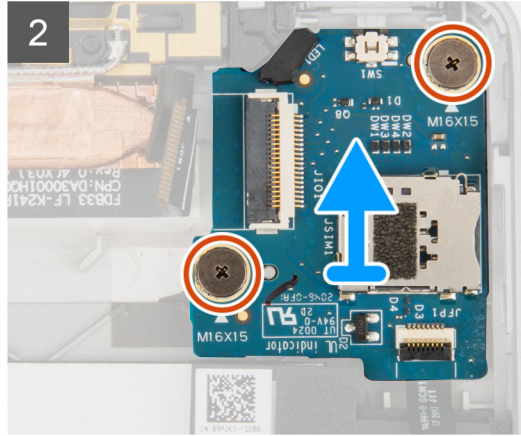
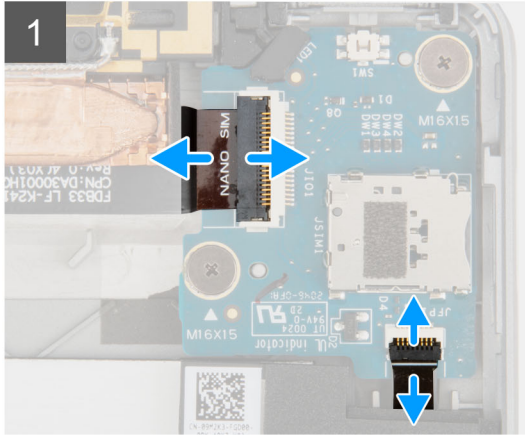
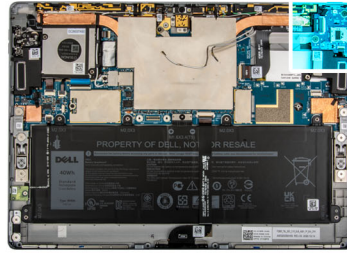
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).
4. Remove the [WWAN card](#).
5. Remove the [right system fan](#).

About this task

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



1x
M1.6x1.5



Steps

1. Open the latch and disconnect the power-button daughter board FPC and the fingerprint reader FFC from the power-button daughter board.
2. Remove the two (M1.6x1.5) screws that secure the power-button daughter board to the frame..
3. Lift the power-button daughter board out of the system.

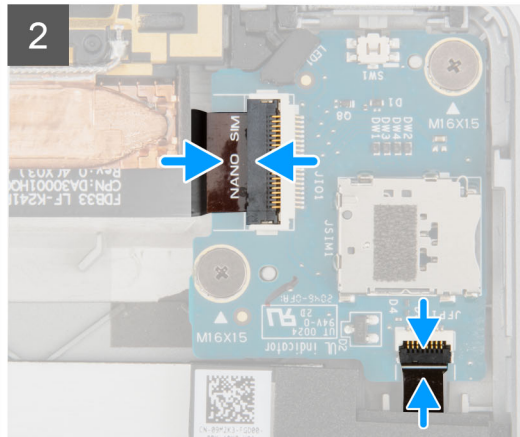
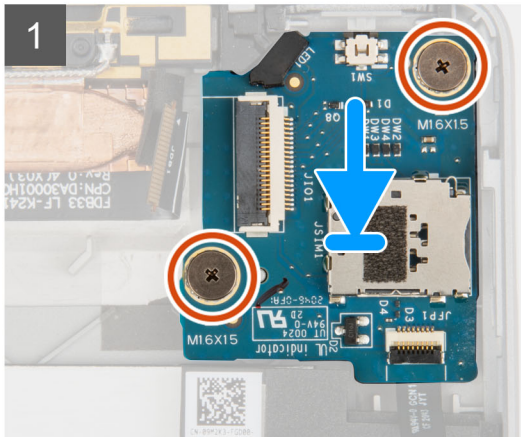
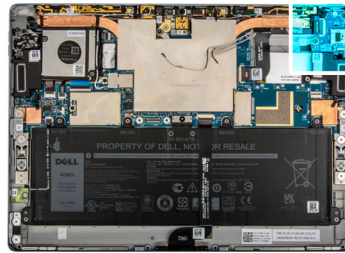
Installing the power-button board

About this task

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



1x
M1.6x1.5



Steps

1. Align and place the power-button board on the frame.
2. Replace the two screws (M1.6x1.5) that secure the power-button board to the frame.
3. Connect the power-button daughter board FPC and the fingerprint reader FFC to the power-button daughter board

Next steps

1. Install the [right system fan](#).
2. Install the [WWAN card](#).
3. Install the [display assembly](#).
4. Install the [SIM tray](#).
5. Follow the procedure in [After working inside your computer](#).

Fingerprint reader

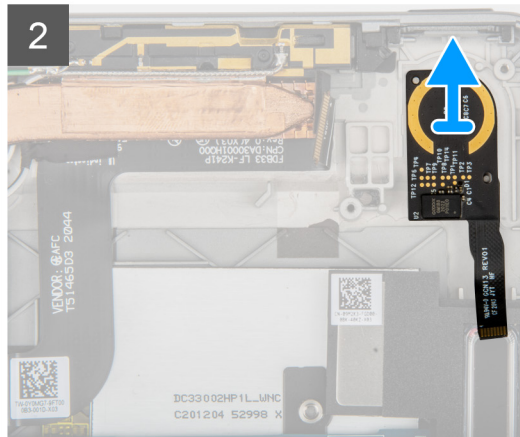
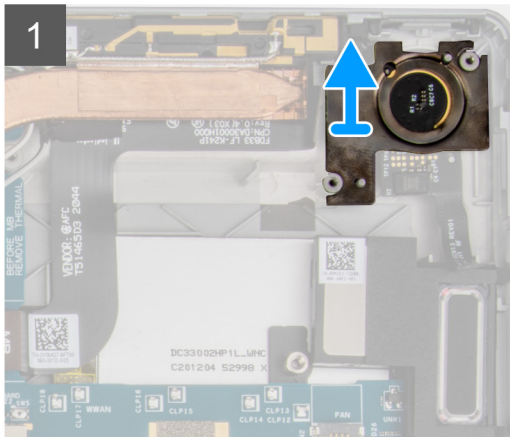
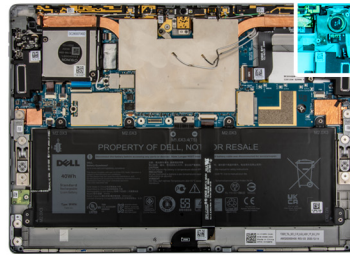
Removing the fingerprint reader

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).
4. Remove the [WWAN card](#).
5. Remove the [right system fan](#).
6. Remove the [power-button board](#)

About this task

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



Steps

1. Peel and remove the fingerprint reader bracket.

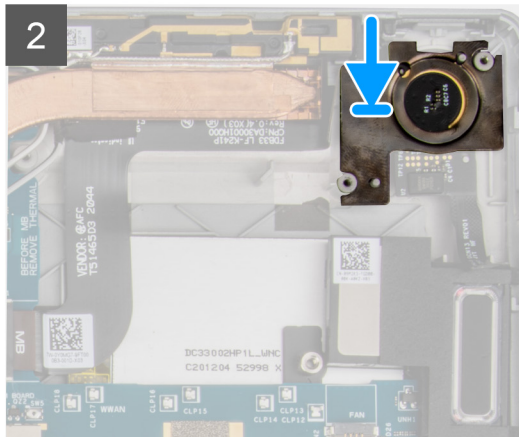
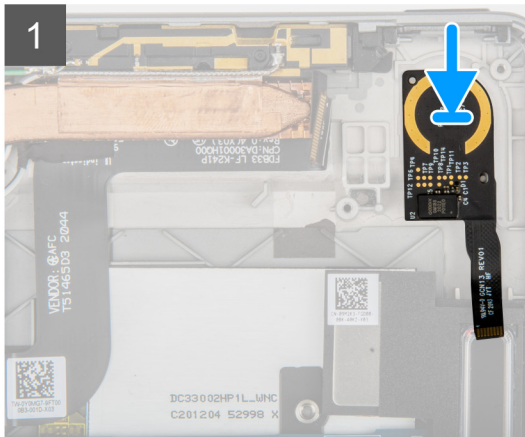
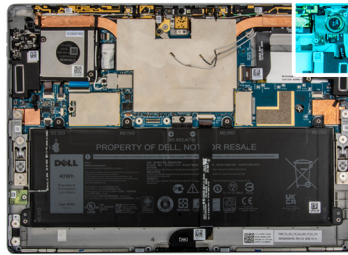
NOTE: If the fingerprint bracket located under the power button daughter board gets detached from the back cover, re-install it onto the back cover.

2. Lift the fingerprint reader out of the system.

Installing the fingerprint reader

About this task

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



Steps

1. Align and place the fingerprint reader on the frame.
2. Replace the fingerprint reader bracket on the finger print reader.

Next steps

1. Install the [power-button daughter board](#).
2. Install the [right system fan](#).
3. Install the [WWAN card](#).
4. Install the [display assembly](#).
5. Install the [SIM tray](#).
6. Follow the procedure in [After working inside your computer](#).

Battery

Lithium-ion battery precautions

⚠ CAUTION:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery completely before removing it. Disconnect the AC power adapter from the system 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.
- Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.

- 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 lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.
- Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.

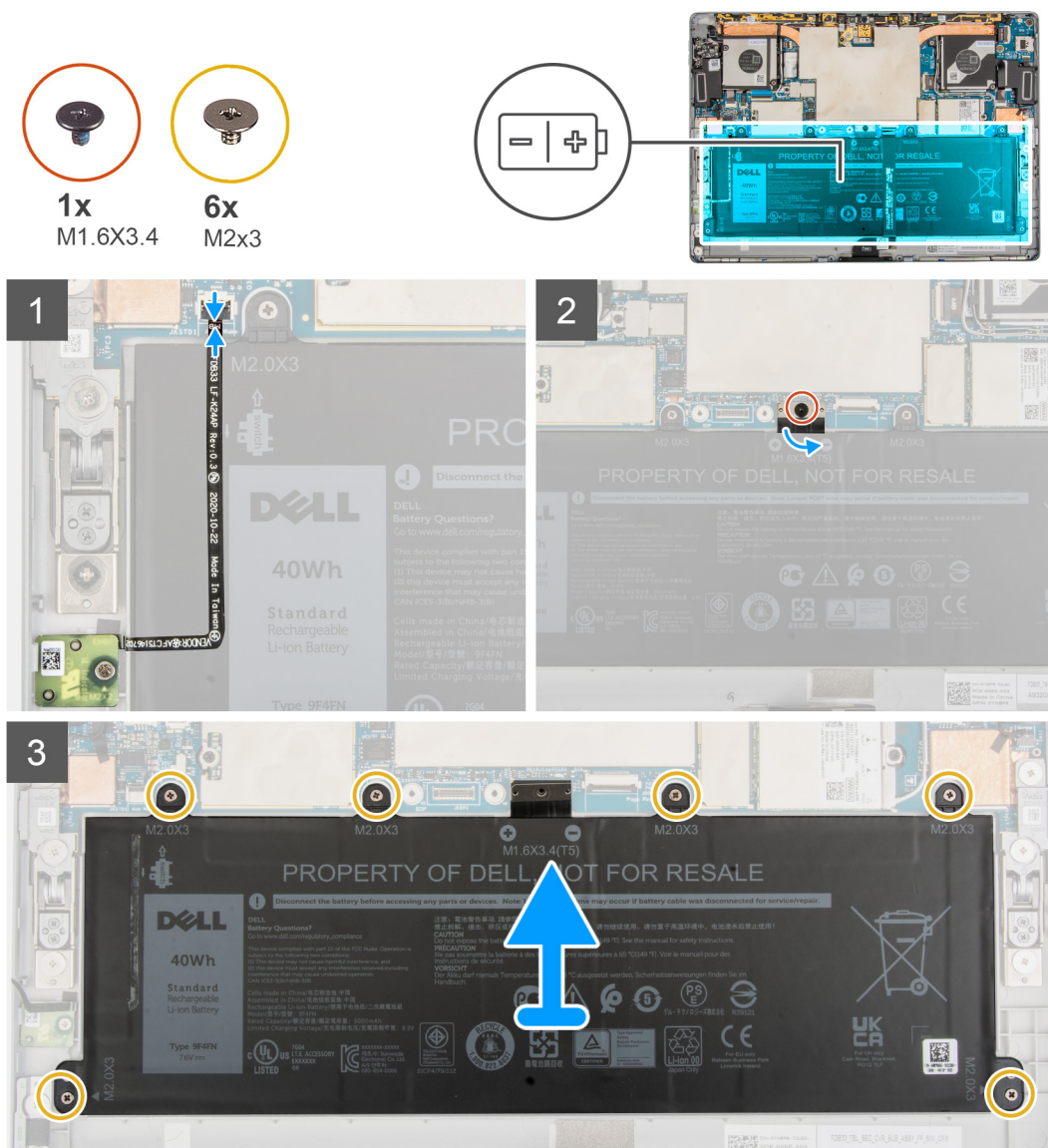
Removing the battery

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).

About this task

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



Steps

1. Disconnect and carefully peel back the HALL sensor daughter board FPC and docking connector FPC from the battery..
2. Remove the single (M1.6x3.4) screw that secures the battery cable connector to the system board.

3. Disconnect the battery cable connector from the system board.
4. Remove the six (M2x3) screws that secure the battery to the frame.
5. Lift the battery out of the system.

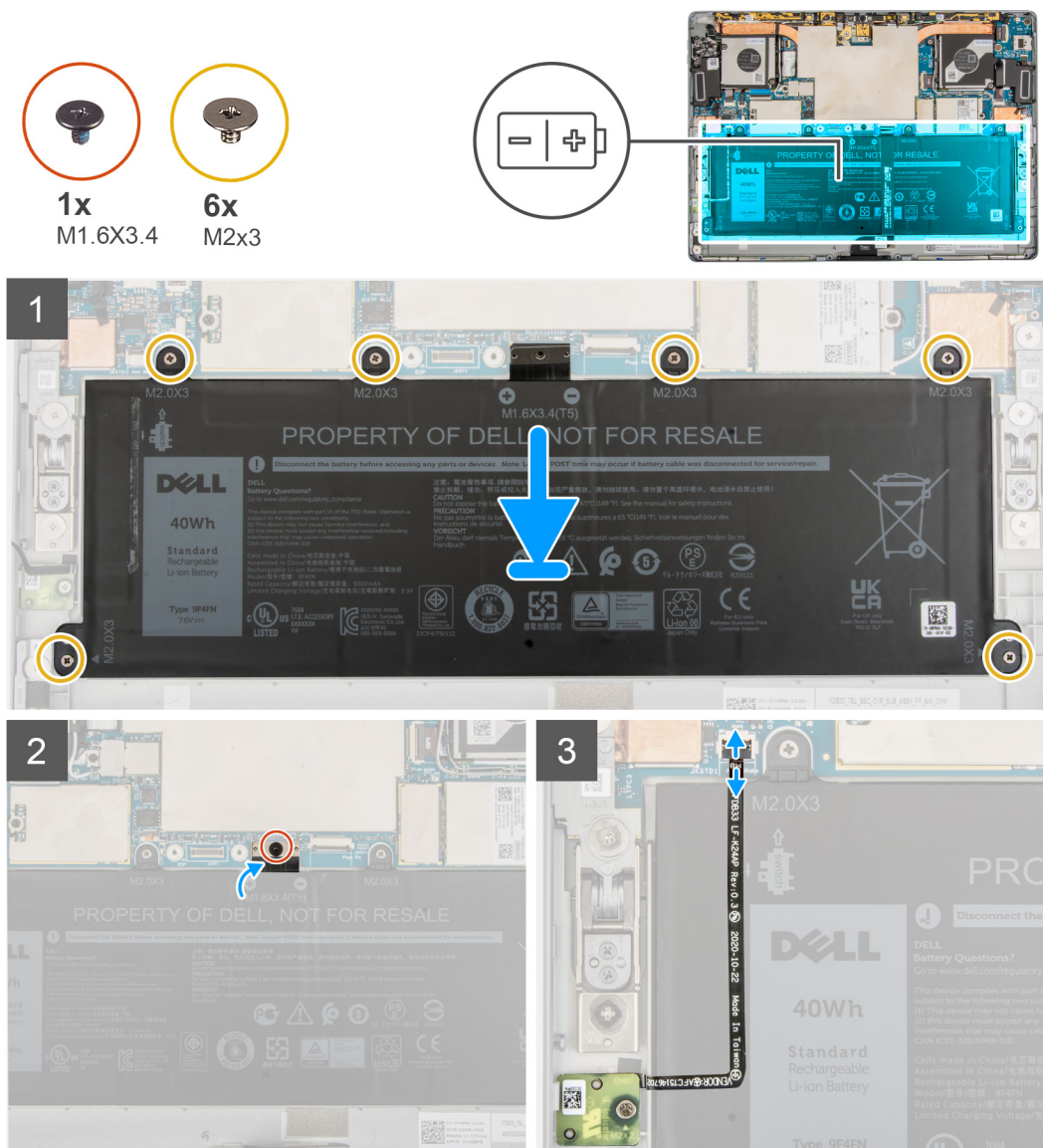
Installing the battery

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 battery and provides a visual representation of the installation procedure.



Steps

1. Align and place the battery into the system.
2. Replace the six (M2x3) screws that secure the battery to the frame.
3. Connect the battery cable to the system board.
4. Replace the single (M1.6x3.4) screw that secures the battery cable connector to the system board.
5. Affix the HALL sensor daughter board FPC and docking connector FPC on the battery.

6. Connect the HALL sensor daughter board FPC and docking connector FPC to the connector on the system board and close the latch.

Next steps

1. Install the [display assembly](#).
2. Install the [SIM tray](#).
3. Follow the procedure in [After working inside your computer](#).

System board

Removing the system board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).
4. Remove the [WWAN card](#).
5. Remove the [left system fan](#).
6. Remove the [right system fan](#).
7. Remove the [solid-state drive](#).
8. Remove the [Microphone](#).
9. Remove the [kickstand](#).
10. Remove the [kickstand hinges](#).
11. Remove the [heat sink](#).

About this task

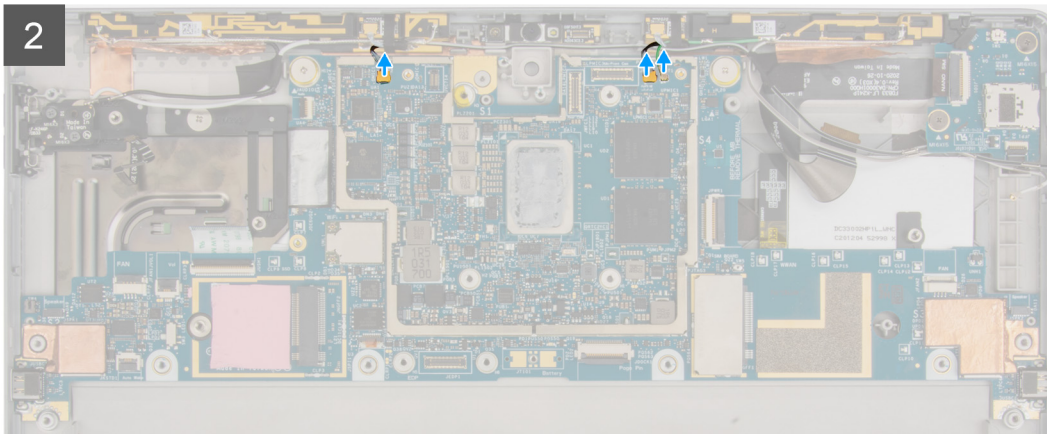
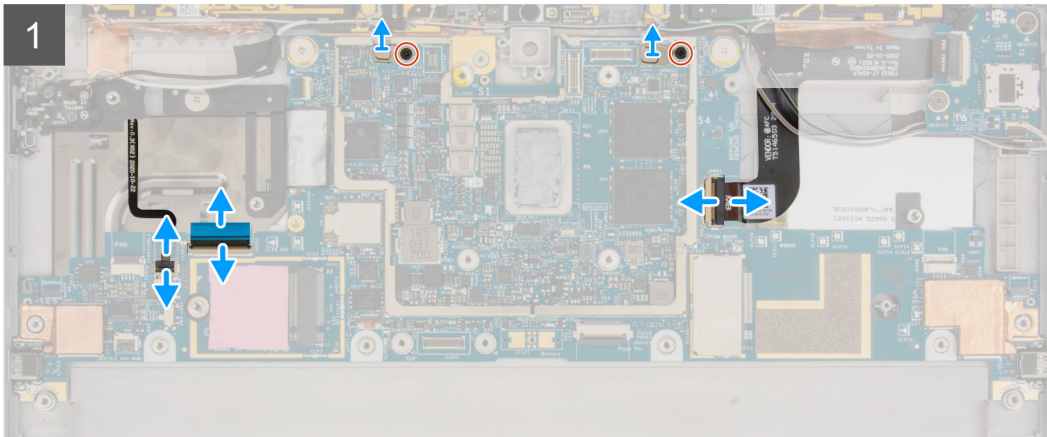
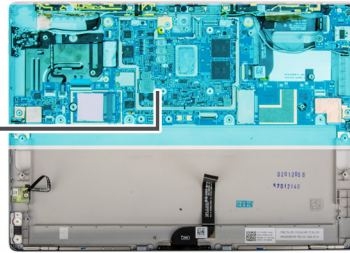
The following images indicate the location of the system board and provide a visual representation of the removal procedure.



2x
M1.6x2.5



2x
M2x2





Steps

1. Remove the two (M1.6x2.5) screws that secure the Darwin cable brackets to the system board.
2. Disconnect the volume button FPC, USH FFC, audio port FPC, rear-facing camera FPC, and the power button daughter board FPC from the system board.
3. Disconnect the Darwin antennas and the P-sensor cable from the system board.
4. Remove the two (M2x2) screws that secure the system board to the frame.
5. Lift the system board out of the system.

Installing the system board

Prerequisites

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

About this task

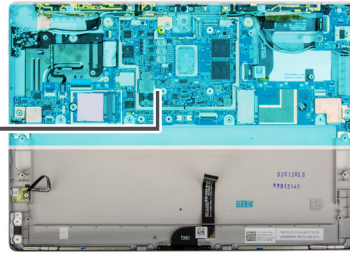
The following image indicates the location of the system board and provides a visual representation of the installation procedure.



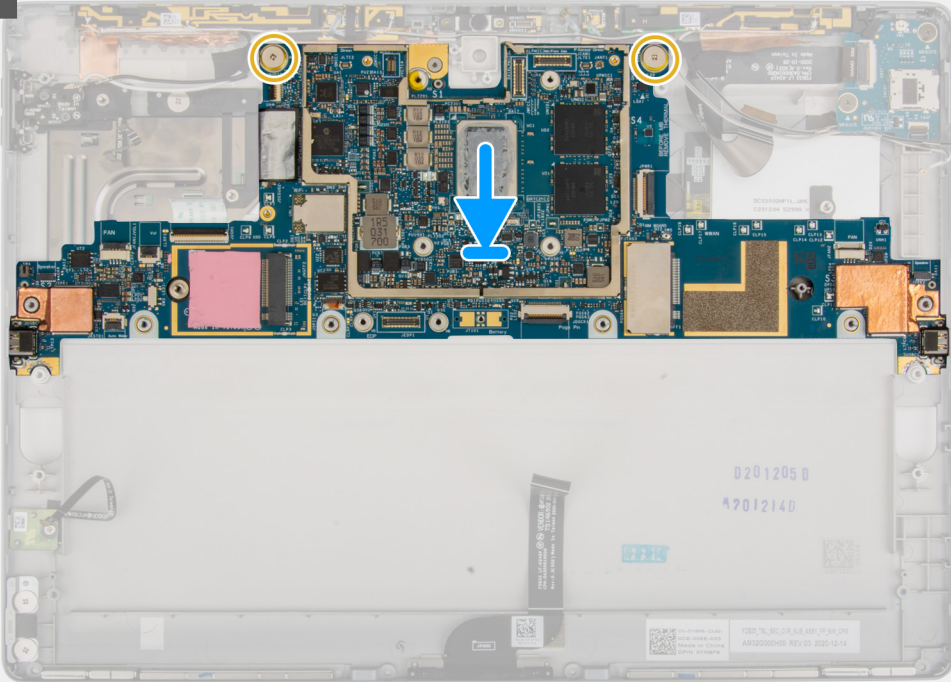
2x
M1.6x2.5

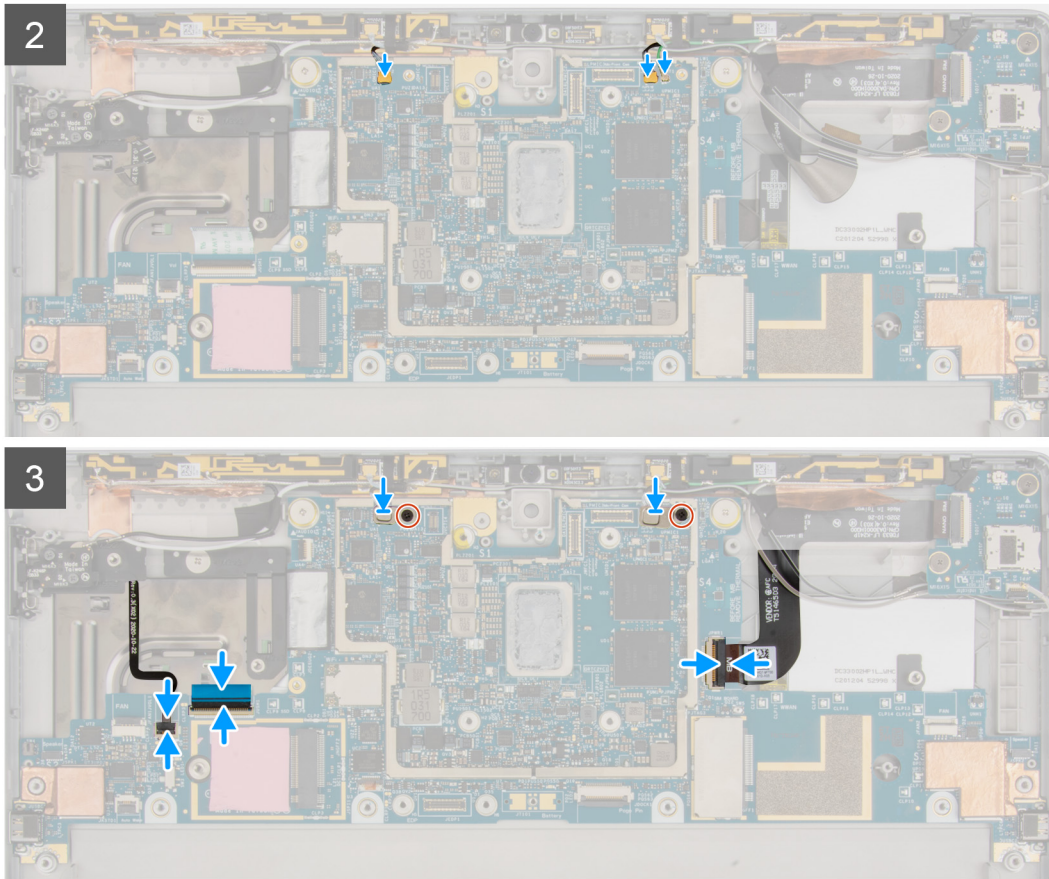


2x
M2x2



1





Steps

1. Align the screw holes on the system board with the screw holes on the frame.
2. Replace the two (M2x2) screws that secure the system board to the frame.
3. Connect the volume button FPC, USH FFC, audio port FPC, rear-facing camera FPC, and the power button daughter board FPC to the system board
4. Connect the Darwin antennas and the P-sensor cable to the system board.
5. Place the Darwin antenna brackets on the Darwin antenna connector.
6. Replace the two (M1.6x2.5) screws that secure the Darwin cable brackets to the system board.

Next steps

1. Install the [heat sink](#).
2. Install the [kickstand hinges](#).
3. Install the [kickstand](#).
4. Install the [Microphone](#).
5. Install the [solid-state drive](#).
6. Install the [right system fan](#).
7. Install the [left system fan](#).
8. Install the [WWAN card](#).
9. Install the [display assembly](#).
10. Install the [SIM tray](#).
11. Follow the procedure in [After working inside your computer](#).

Smart card reader

Removing the smart card reader

Prerequisites

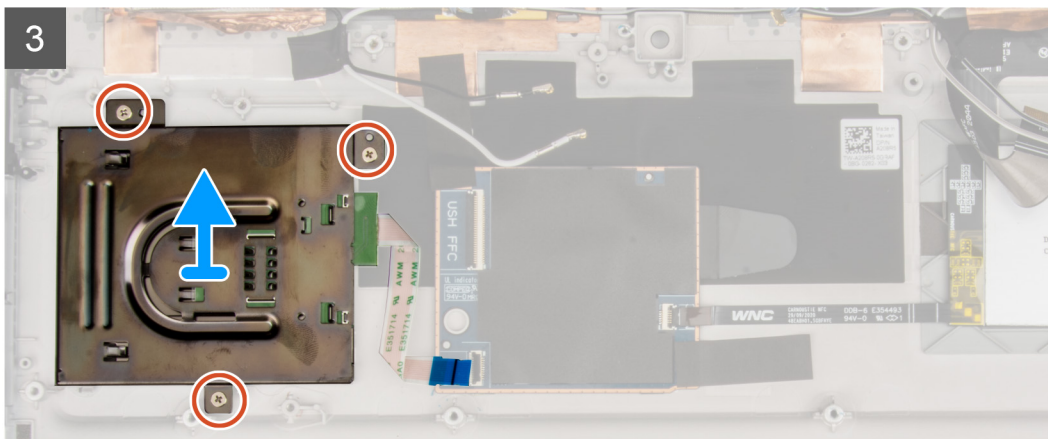
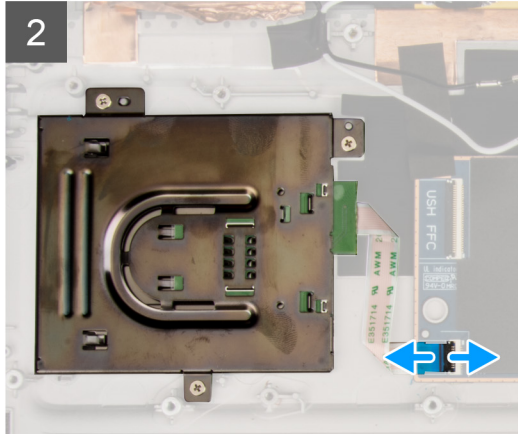
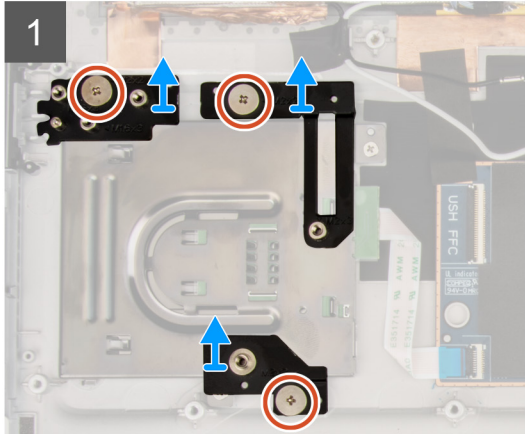
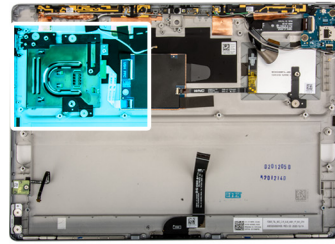
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [SIM tray](#).
3. Remove the [display assembly](#).
4. Remove the [WWAN card](#).
5. Remove the [left system fan](#).
6. Remove the [right system fan](#).
7. Remove the [solid-state drive](#).
8. Remove the [Microphone](#).
9. Remove the [kickstand](#).
10. Remove the [kickstand hinges](#).
11. Remove the [heat sink](#).
12. Remove the [system board](#).
13. Remove the [battery](#).

About this task

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



6x
M2x2



Steps

1. Remove the three (M2x2) screws that secure the smart card reader support brackets to the frame.
2. Remove the smart card reader support brackets.
3. Open the latch and disconnect the smart card reader FPC from the connector on the USH board.
4. Remove the three (M2x2) screws that secure the smart card reader to the frame.
5. Lift the smart card reader off the system.

Installing the smart card reader

Prerequisites

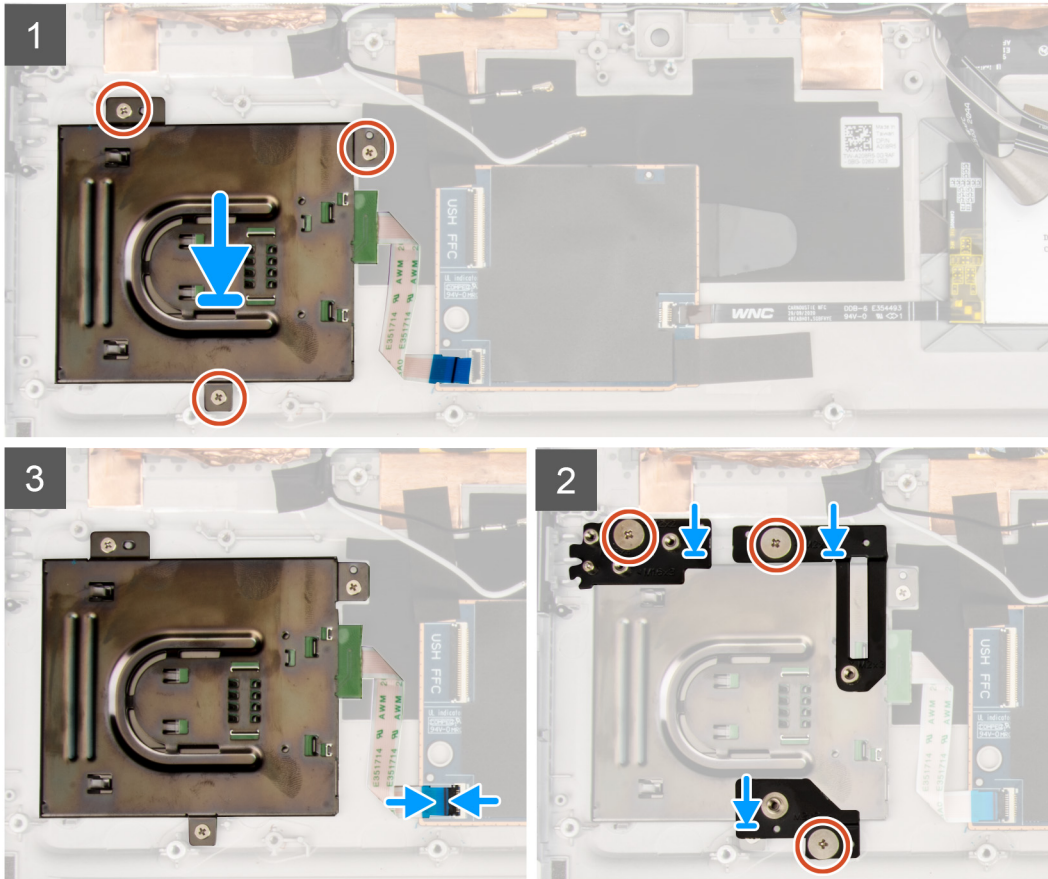
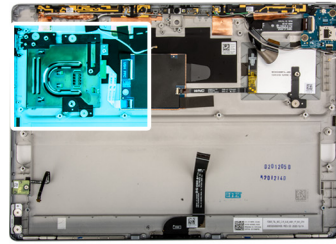
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



6x
M2x2



Steps

1. Align and place the smart card reader on the frame.
2. Replace the three (M2x2) screws that secure the smart card reader to the frame.
3. Connect the smart card reader FPC to the connector on the USH board and close the latch.
4. Place the smart card reader support brackets on the smart card reader.
5. Replace the three (M2x2) screws that secure the smart card reader support bracket to the frame.

Next steps

1. Install the [battery](#).
2. Install the [system board](#).
3. Install the [heat sink](#).
4. Install the [kickstand hinges](#).
5. Install the [kickstand](#).
6. Install the [Microphone](#).
7. Install the [solid-state drive](#).
8. Install the [right system fan](#).
9. Install the [left system fan](#).
10. Install the [WWAN card](#).
11. Install the [display assembly](#).

12. Install the [SIM tray](#).
13. Follow the procedure in [After working inside your computer](#).

Software

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

Topics:

- [Operating system](#)
- [Downloading the drivers](#)

Operating system

- Windows 10 Home (64-bit)
- Windows 10 Professional (64-bit)

Downloading the drivers

Steps

1. Turn on your computer.
2. Go to www.dell.com/support.
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.

System setup

System setup enables you to manage your tablet/desktop/notebook hardware and specify BIOS level options. From the System setup, you can:

- Change the NVRAM settings after you add or remove hardware
- View the system hardware configuration
- Enable or disable integrated devices
- Set performance and power management thresholds
- Manage your computer security

Topics:

- [BIOS overview](#)
- [Entering BIOS setup program](#)
- [System setup options](#)
- [Updating the BIOS](#)
- [System and setup password](#)
- [Clearing BIOS \(System Setup\) and System passwords](#)

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 program

Steps

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

 **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.

System setup options

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

General screen options

This section lists the primary hardware features of your computer.

Option	Description
System Information	• System Information: Displays BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, and the Express Service Code. • Memory Information: Displays Memory Installed, Memory Available, Memory Speed, Memory Channels Mode, Memory Technology

Option	Description
	- Processor Information: Displays Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, HT Capable, and 64-Bit technology. - Device Information: Displays Primary Hard Drive, Video Controller, Video BIOS Version, Video Memory, Panel Type, Native Resolution, Audio Controller, Wi-Fi Device, Cellular Device, Bluetooth Device.
Battery Information	Displays the battery status and the type of AC adapter connected to the computer.
Boot Sequence	Boot Sequence Allows you to change the order in which the computer attempts to find an operating system. The options are: - Windows Boot Manager By default, the options is checked. Boot List Options Allows you to change the boot list option: - UEFI (The option is enabled by default)
Advanced Boot Options	Allows you the legacy option ROMs to load. By default, all the option are disabled.
UEFI Boot Path SecurityOptions	Allows you to control whether or not the system will prompt to the user to enter the Admin password, when a user selects a UEFI boot path from the F12 boot Menu. Always, Except Internal HDD. This option is enabled by default. Always, Except Internal HDD&PXE Never  NOTE: These options have no relevance if the Admin password is not set BIOS settings.
Date/Time	Allows you to change the date and time.

System Configuration screen options

Option	Description
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self-Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. Enable SMART Reporting
USB Configuration	This is an optional feature. This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices—HDD, memory key, floppy. If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. The options are: - Enable USB Boot Support—enabled by default - Enable External USB Port—enabled by default  NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.
USB PowerShare	This field configures the USB PowerShare feature behavior. This option allows you to charge external devices using the stored system battery power through the USB PowerShare port. This option is disabled by default
Audio	This field enables or disables the integrated audio controller. By default, the Enable Audio option is selected. The options are: - Enable Microphone—enabled by default - Enable Internal Speaker—enabled by default

Option	Description
Keyboard Illumination	This field lets you choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 0% to 100%. The options are: • Bright (default) • Dim (50%)
Keyboard Backlight Timeout on Battery	The Keyboard Backlight Timeout dims out with the Battery option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: • 5 sec • 10 sec—enabled by default • 15 sec • 30 sec • 1 min • 5 min • 15 min • Never
Keyboard Backlight Timeout on AC	The Keyboard Backlight Timeout dims out with AC option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: • 5 sec • 10 sec—enabled by default • 15 sec • 30 sec • 1 min • 5 min • 15 min • Never
Unobtrusive Mode	This option, when enabled, pressing Fn+shift+B turns off all light and sound emissions in the system. To resume normal operation, press Fn+shift+B again. This option is disabled by default.
Miscellaneous Devices	Allows you to enable or disable the following devices: • Enable Front Camera—enabled by default • Enable Back Camera—enabled by default • Secure Digital (SD) card—enabled by default • Secure Digital (SD) card boot • Secure Digital (SD) card read-only-mode

System Configuration screen options

Option	Description
Integrated NIC	Does not allow you to control the on-board LAN controller. The options are: • DisabledThe internal LAN is off and not visible to the operating system. • DisabledThe internal LAN is enabled. • Disabled w/PXEThe internal LAN is enabled (with PXE boot). This option is enabled by default.
Drives	Allows you to configure the various drives on board. All drives are enabled by default. The option is: • M.2 2230 PCI-e SSD
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the SMART (Self Monitoring Analysis and Reporting Technology) specification. This option is disabled by default. • Enable SMART Reporting
USB Configuration	This is an optional feature. This field configures the integrated USB controller. If Boot Support is enabled, the system is allowed to boot any type of USB Mass Storage Devices (HDD, memory key, floppy).

Option	Description
	If USB port is enabled, device attached to this port is enabled and available for OS. If USB port is disabled, the OS cannot see any device attached to this port. The options are: • Enable USB Boot Support • Enable External USB Port  NOTE: Both the option is enabled by default.
Dell Type-C dock configuration	Does not support this configuration
Thunderbolt Adapter configuration:	Allows you to configure the Thunderbolt™ adapter security settings within the Operating System.  NOTE: Security Levels are not applicable or enforced in the Pre-boot environment. The options are: • Enable Thunderbolt™ Technology Support This option is enabled by default. • Enable Thunderbolt™ Adapter Boot Support • Enable Thunderbolt™ Adapter Pre-boot Modules • Security level - No Security • Security level - User Authorization This option is enabled by default. • Security level - Secure Correct • Security level - Display Port only
USB PowerShare	Allows you to charge external devices using the stored system battery power through the USB PowerShare port. This field can also configure the USB PowerShare feature behavior. By default, the Enable USB PowerShare is disabled.
Audio	Allows you to enable or disable the integrated audio controller. By default, the Enable Audio option is selected. The options are: • Enable Microphone This option is enabled by default. • Enable Internal Speaker This option is enabled by default.
Keyboard Illumination	Allows you to choose the operating mode of the keyboard illumination feature. The keyboard brightness level can be set from 0% to 100%. The options are: • Disabled • Dim • Bright This option is enabled by default.  NOTE: The <Fn+F10> hotkey can be used to change the setting.
Keyboard Backlight Timeout on AC	Allows you to define the time-out value for the keyboard Backlight when an AC adapter is plugged into the system. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: • 5 seconds • 10 seconds This option is enabled by default. • 15 seconds • 30 seconds • 1 minute • 5 minute • 15 minute • never
Keyboard Backlight Time-out on Battery	Allows you to define the Keyboard Backlight Time-out dims out with Battery option. The main keyboard illumination feature is not affected. Keyboard Illumination will continue to support the various illumination levels. This field has an effect when the backlight is enabled. The options are: • 5 seconds • 10 seconds This option is enabled by default. • 15 seconds

Option	Description
	• 30 seconds • 1 minute • 5 minute • 15 minute • never
Touchscreen	Does not support this option
Unobtrusive Mode	Allows you to select the option. When enabled, pressing Fn+F7 turns off all light and sound emissions in the system. To resume normal operation, press Fn+F7 again. This option is disabled by default.
Miscellaneous Devices	Allows you to enable or disable various on board devices: • Enable Camera This option is enabled by default. • Enable Secure Digital(SD) Card This option is enabled by default. • Secure Digital(SD) Card read only mode

Video screen options

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source (On Battery and On AC).

 **NOTE:** The video setting will be visible only when a video card is installed into the system.

Security screen options

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password.  NOTE: You must set the admin password before you set the system or hard drive password. Deleting the admin password automatically deletes the system password and the hard drive password.  NOTE: Password changes take effect immediately. By default, the drive will not have a password set.
System Password	Allows you to set, change or delete the system password.  NOTE: Password changes take effect immediately. By default, the drive will not have a password set.
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Password Bypass	Allows you to disable or enable the permission to bypass the System and the Internal hard drive password, when they are set. The options are: • Disabled. This option is selected by default. • Reboot bypass
Password Change	Allows you to enable or disable permission to the System and Hard Drive passwords when the admin password is set. Allow Non-Admin Password Changes This option is selected by default.
UEFI Capsule Firmware Updates	This option controls whether the system allows BIOS updates via UEFI capsule update packages. Enable UEFI Capsule Firmware Updates option is selected by default.  NOTE: Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS).

Option	Description
TPM 2.0 Security	Allows you to enable the Trusted Platform Module (TPM) during POST. You can control whether the trusted platform module is visible to the operating system. The option is: • TPM on This option is selected by default. • Clear • PPI Bypass for Disable Commands • PPI Bypass for Clear Command" in TPM 2.0 Security. • Attestation Enable. This option is selected by default. • PPI Bypass for Disable Commands • Key Storage Enable. This option is selected by default. • SHA-256. This option is selected by default.  CAUTION: For the TPM upgrade/downgrade process, it is recommended to complete the process in an AC power with AC adapter plugged into the computer. The upgrade/downgrade process without the AC adapter plugged in might damage the computer or hard disk.  NOTE: Disabling this option does not change any settings you have made to the TPM, nor does it delete or change any information or keys you may have stored in the TPM. Changes to this setting take effect immediately.
Absolute (R)	Allows you to activate or disable the optional Computrace Service from Absolute software. The options are: • Deactivate • Disable • Activate  NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed Default setting: Activate
Admin Setup Lockout	Allows you to prevent users from entering the setup when an Administrator password is set. Enable Admin Setup Lockout This option is not selected by default.
Master Password Lockout	Allows you to prevent users from entering the setup when an Master password is set. Hard disk passwords need to be cleared before the setting can be changed. Enable Master Password Lockout This option is not selected by default.
SSM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protections. The OS can use the feature to help protect the secure environment created by virtualization based security. SSM Security Mitigation This option is disabled by default.

Secure Boot

Option	Description
Secure Boot Enable	This option enables or disables the Secure Boot feature. • Disabled • Enabled Default setting: Enabled.
Expert Key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The Enable Custom Mode option is disabled by default.
Custom Mode Key Management	Allows you to manage the security key databases only if the system is in Custom Mode .The options are: • PK. This option is selected by default. • KEK

Option	Description
	• db • dbx  NOTE: If you disable the Enable Custom Mode, all the changes made will be erased and the keys will restore to default settings. Save to File will save the key to a user-selected file.

Intel software Guard Extensions

Option	Description
Intel SGX Enable	This option enables or disables to provide a secured environment for running code/storing sensitive information in the context of the main OS. The options are: • Disabled • Enabled • Software Controlled. This option is selected by default.
Enclave Memory Size	Allows you to reserve the memory size. The memory size can be set from 32 MB to 128 MB, these options are disabled by default. The options are: • 32 MB • 64 MB • 128 MB

Performance screen options

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. This option is enabled by default. Allows you to enable or disable multi-core support for the processor. • All This option is enabled by default. • 1 • 2 • 3
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of the processor. • Enable Intel SpeedStep Default setting: The option is enabled.
C-States Control	Allows you to enable or disable the additional processor sleep states. • C states Default setting: The option is enabled.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. • Enable Intel TurboBoost Default setting: The option is enabled.
HyperThread Control	Allows you to enable or disable the HyperThreading in the processor. • Disabled • Enabled This option is enabled by default.

Power Management screen options

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Wake on AC This option is disabled by default.
Enable Intel Speed Shift Technology	Allows you to enable or disable the Intel speed Shift Technology support. Setting to enable option, allows the operating system to automatically select the required processor performance. Enable Intel Speed Shift Technology This option is enabled by default.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled This option is enabled by default. • Every Day • Weekdays • Select Days
USB Wake Support	Does not allow this option.
Lid Switch	Allows this option.
Thermal Management	Allows this option..
Wireless Radio Control	Allows you to sense the connection of the system to a wired network and subsequently disable the selected wireless radios (WLAN and/or WWAN) Upon disconnection from the wired network, the selected wireless radios is re-enabled. By default none of the option is enabled. The options are: • Control WLAN radio • Control WWAN radio
Wake on WLAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled This option is selected by default. • LAN with PXE Boot • LAN Only
Peak Shift	Allows you to minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached. • Enable Peak Shift This option is not selected by default.
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours to improve the battery health. • Enable Advanced Battery Charge Mode This option is not selected by default.
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • Adaptive This option is enabled by default. • Standard Fully charges your battery at a standard rate. • ExpressCharge The battery charges over a shorter period of time using Dell's fast charging technology. • Primarily AC use • Custom If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.  NOTE: All charging mode may not be available for all the batteries. To enable this option, disable the Advanced Battery Charge Configuration option.

POST Behavior

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. Enable Adapter Warnings This option is selected by default.
Numlock Enable	Allows you to enable the Numlock option when the computer boots. • Enable Network This option is enabled by default.
Fn Lock Options	Allows you to let hot key combinations Fn + Esc toggle the primary behavior of F1 – F12, between their standard and secondary functions. If you disable this option, you cannot toggle dynamically the primary behavior of these keys. The available options are: • Lock Mode Disable/Standard This option is selected by default. • Lock Mode Enable/Secondary
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: • Minimal This option is selected by default. • Thorough • Auto
Extended BIOS POST Time	Allows you to create an additional pre-boot delay. The options are: • 0 seconds This option is enabled by default. • 5 seconds • 10 seconds
Warnings and Errors	Allows you to select in the BIOS setup options that cause the boot process to pause only, when warnings or errors are detected rather than stop, prompt and wait for user input. The options are: Prompt on Warnings and Errors. This option is enabled by default. Continue on Warnings Sign of Life Indication

Virtualization Support options

Option	Description
Virtualization	Allows you to enable or disable the Intel Virtualization Technology. Enable Intel Virtualization Technology This option is selected by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. Enable VT for Direct I/O This option is selected by default.
Trusted Execution	This option specifies whether a Measured Virtual Machine Monitor (MVMM) can utilize the additional hardware capabilities provided by Intel Trusted Execution Technology. The TPM Virtualization Technology, and Virtualization technology for direct I/O must be enabled to use this feature. Trusted Execution This option is disabled by default.

Wireless screen options

Option	Description
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. • WWAN/GPS • WLAN

Option	Description
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- Bluetooth

All the options are enabled by default.

 **NOTE:** IMEI number for WWAN can be found on the outer box or the WWAN card.

Maintenance

Option	Description
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Service Tag	Displays the Service Tag of your computer.
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Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
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BIOS Downgrade	Allows you to control flashing of the system firmware to previous revisions. The option are: Allows BIOS Downgrade This option is enabled by default.
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Data Wipe	Allows you to securely erase data from all internal storage devices. The process adheres to Serial ATA Security Erase and eMMC JEDEC Sanitize specifications. The option are: Wipe on Next Boot This option is disabled by default.
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BIOS Recovery	Allows you to recover from certain computed BIOS conditions from a recovery file on the user primary hard drive or an external USB key. When 'Enabled' is selected BIOS stores the recovery file on the user primary hard drive. The option are: BIOS Recovery from Hard Drive This option is enabled by default.
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System logs screen options

Option	Description
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BIOS Events	Allows you to view and clear the System Setup (BIOS) POST events.
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Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
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Power Events	Allows you to view and clear the System Setup (Power) events.
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Updating the BIOS

Updating the BIOS in Windows

About this task

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: <https://www.dell.com/support/article/sln153694>

Steps

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

 **NOTE:** If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.

For more information, see knowledge base article [000124211](https://www.dell.com/support/article/000124211) at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article [000131486](https://www.dell.com/support/article/000131486) at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

About this task

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: <https://www.dell.com/support/article/sln153694>

Steps

1. Follow the procedure from step 1 to step 6 in [Updating the BIOS in Windows](#) to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article [000145519](https://www.dell.com/support/article/000145519) at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12**.
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the F12 One-Time boot menu

Update your computer BIOS using the BIOS update.exe file that is copied to a FAT32 USB drive and booting from the F12 One-Time boot menu.

About this task

 **CAUTION:** If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: <https://www.dell.com/support/article/sln153694>

BIOS Update

You can run the BIOS update file from Windows using a bootable USB drive or you can also update the BIOS from the F12 One-Time boot menu on the computer.

Most of the Dell computers built after 2012 have this capability, and you can confirm by booting your computer to the F12 One-Time Boot Menu to see if BIOS FLASH UPDATE is listed as a boot option for your computer. If the option is listed, then the BIOS supports this BIOS update option.

 **NOTE:** Only computers with BIOS Flash Update option in the F12 One-Time boot menu can use this function.

Updating from the One-Time boot menu

To update your BIOS from the F12 One-Time boot menu, you need the following:

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

Perform the following steps to perform the BIOS update flash process from the F12 menu:

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

Steps

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

System and setup password

Table 3. System and setup password

Password type	Description
System password	Password that you must enter to log on to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

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

 **CAUTION:** The password features provide a basic level of security for the data on your computer.

 **CAUTION:** Anyone can access the data stored on your computer if it is not locked and left unattended.

 **NOTE:** System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

You can assign a new **System or Admin Password** only when the status is in **Not Set**.

About this task

To enter the system setup, press 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 assign the system password:
 - A password can have up to 32 characters.
 - The password can contain the numbers 0 through 9.
 - Only lower case letters are valid, upper case letters are not allowed.
 - Only the following special characters are allowed: space, ("), (+), (.), (-), (.), (/), (:), ([], (\), (]), (`).
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press **Esc** and a message prompts you to save the changes.
5. Press **Y** to save the changes.
The computer reboots.

Deleting or changing an existing system setup password

Prerequisites

Ensure that the **Password Status** is Unlocked (in the System Setup) before attempting to delete or change the existing System and Setup password. You cannot delete or change an existing System or Setup password, if the **Password Status** is Locked.

About this task

To enter the System Setup, press **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 **Password Status** is **Unlocked**.
3. Select **System Password**, alter or delete the existing system password and press **Enter** or **Tab**.
4. Select **Setup Password**, alter or delete the existing setup password and press **Enter** or **Tab**.
 **NOTE:** If you change the System and/or Setup password, re enter the new password when prompted. If you delete the System and Setup password, confirm the deletion when prompted.
5. Press **Esc** and a message prompts you to save the changes.
6. Press **Y** to save the changes and exit from System Setup.
The computer restarts.

Clearing BIOS (System Setup) and System passwords

About this task

To clear the system or BIOS passwords, contact Dell technical support as described at www.dell.com/contactdell.

-  **NOTE:** For information on how to reset Windows or application passwords, refer to the documentation accompanying Windows or your application.

Troubleshooting

Topics:

- [Handling swollen Lithium-ion batteries](#)
- [Dell SupportAssist Pre-boot System Performance Check diagnostics](#)
- [Built-in self-test \(BIST\)](#)
- [System diagnostic lights](#)
- [Recovering the operating system](#)
- [Backup media and recovery options](#)
- [WiFi power cycle](#)
- [Flea power release](#)

Handling swollen Lithium-ion batteries

Like most laptops, Dell laptops use lithium-ion batteries. One type of lithium-ion battery is the lithium-ion polymer battery. Lithium-ion polymer batteries have increased in popularity in recent years and have become 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 lithium-ion polymer battery technology is the potential for swelling of the battery cells.

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 should be replaced and disposed of properly. We recommend contacting Dell product 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 Lithium-ion batteries are as follows:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery before removing it from the system. To discharge the battery, unplug the AC adapter from the system and operate the system only on battery power. When the system will no longer power on when the power button is pressed, the battery is fully discharged.
- 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 product support at <https://www.dell.com/support> 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 <https://www.dell.com> or otherwise directly from Dell.

Lithium-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high heat. For more information on how to improve the performance and lifespan of the laptop battery and to minimize the possibility of occurrence of the issue, see [Dell Laptop Battery - Frequently Asked Questions](#).

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

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

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing

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

For more information, see [Resolve Hardware Issues With Built-in and Online Diagnostics \(SupportAssist ePSA, ePSA or PSA Error Codes\)](#).

Running the SupportAssist Pre-Boot System Performance Check

Steps

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

Built-in self-test (BIST)

M-BIST

M-BIST (Built In Self-Test) is the system board's 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 POST (Power On Self Test).

How to run M-BIST

 **NOTE:** M-BIST must be initiated on the system from a power-off state either connected to AC power or with battery only.

1. Press and hold both the **M** key on the keyboard and the **power button** to initiate M-BIST.
2. With both the **M** key and the **power button** held down, the battery indicator LED may exhibit two states:
 - a. OFF: No fault detected with the system board
 - b. AMBER: Indicates a problem with the system board

3. If there is a failure with the system board, the battery status LED will flash one of the following error codes for 30 seconds:

Table 4. 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	Unrecoverable SPI Failure

4. If there is no failure with the system board, the LCD will cycle through the solid color screens described in the LCD-BIST section for 30 seconds and then power off.

LCD Power rail 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 (i.e., the L-BIST circuit fails), the battery status LED will flash 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 L-BIST Test:

1. Press the power button to start the system.
2. If the system 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 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 (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 PC settings.

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

How to invoke LCD BIST Test

1. Power off the Dell laptop.
2. Disconnect any peripherals that are connected to the laptop. Connect only the AC adapter (charger) to the laptop.
3. Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold **D** key and **Power on** the laptop to enter LCD built-in self test (BIST) mode. Continue to hold the D key, until the system boots up.
5. The screen will display solid colors and change colors on the entire screen to white, black, red, green, and blue twice.
6. Then it will display 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 system will shut down.

 **NOTE:** Dell SupportAssist Pre-boot diagnostics upon launch, initiates an LCD BIST first, expecting a user intervention 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 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.

Blinking Pattern		Problem description	Suggested resolution
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 & 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 amongst the slots. If problem persists, replace the memory module.
2	5	Invalid memory installed	Reset and swap memory modules amongst the slots. If problem persists, replace the memory module.
2	6	System board / Chipset Error	Replace the system board.
2	7	LCD failure (SBIOS message)	Replace the LCD module.
2	8	LCD failure (EC detection of power rail failure)	Replace the system board.
3	1	CMOS battery failure	Reset the CMOS battery connection. If problem persists, replace the RTC battery.

Blinking Pattern		Problem description	Suggested resolution
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.

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 standalone tool that is preinstalled in all Dell computers installed with Windows 10 operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

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

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/support.

Backup media and recovery options

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

WiFi power cycle

About this task

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

 **NOTE:** Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps

1. Turn off your computer.

2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

Flea power release

About this task

Flea power is the residual static electricity that remains on the computer even after it has been powered off and the battery has been removed. The following procedure provides the instructions on how to conduct flea power release:

Steps

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Press and hold the power button for 15 seconds to drain the flea power.
4. Connect the power adapter to your computer.
5. Turn on your computer.

Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 5. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
Tips	
Contact Support	In Windows search, type <code>Contact Support</code> , and press Enter.
Online help for operating system	www.dell.com/support/windows www.dell.com/support/linux
Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.	www.dell.com/support
Dell knowledge base articles for a variety of computer concerns.	1. Go to https://www.dell.com/support/home/?app=knowledgebase. 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 www.dell.com/contactdell.

 **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.