

Latitude 9510

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 on your computer

Topics:

- [Safety instructions](#)


Safety instructions

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


 **WARNING:** Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.


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

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

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

 **CAUTION:** You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that is shipped with the product or at www.dell.com/regulatory_compliance.

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


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


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

 **NOTE:** The color of your computer and certain components may appear differently than shown in this document.

Before working inside your computer


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

6. After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

 **CAUTION:** Place the computer on a flat, soft, and clean surface to avoid scratches on the display.

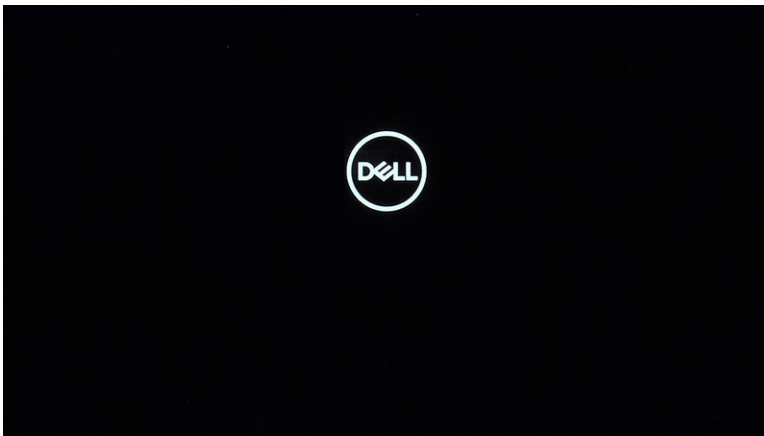
7. Place the computer face down.

Enter service mode

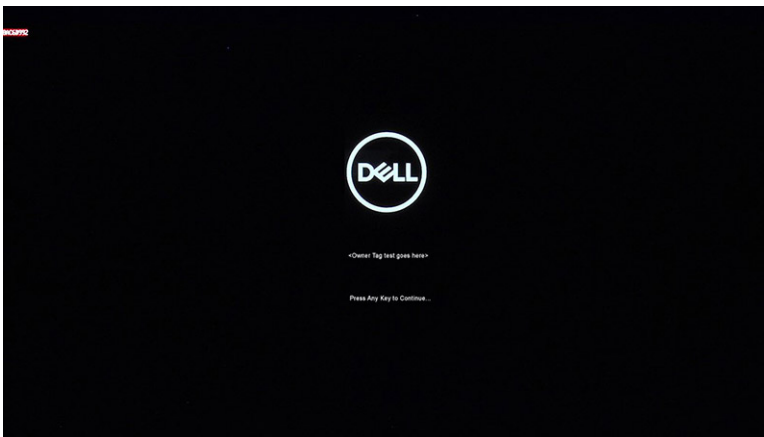
Service Mode allows you to immediately cut the power from the system without disconnecting the battery cable or removing the battery from the system.

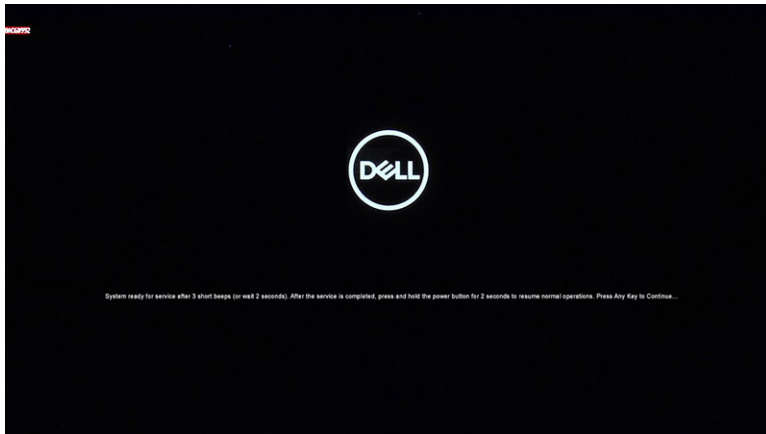
Steps

1. Shut down the system and disconnect the AC adapter from the system.
2. Press and hold the **** key on the keyboard, and then press the power button.
The system will boot.



3. Press any key to proceed, when the **Owner Tag** information is displayed on the screen.
The system will emit three short beeps and shuts down.





4. To exit from the Service Mode, press the power button to power on the system.

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.

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.

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

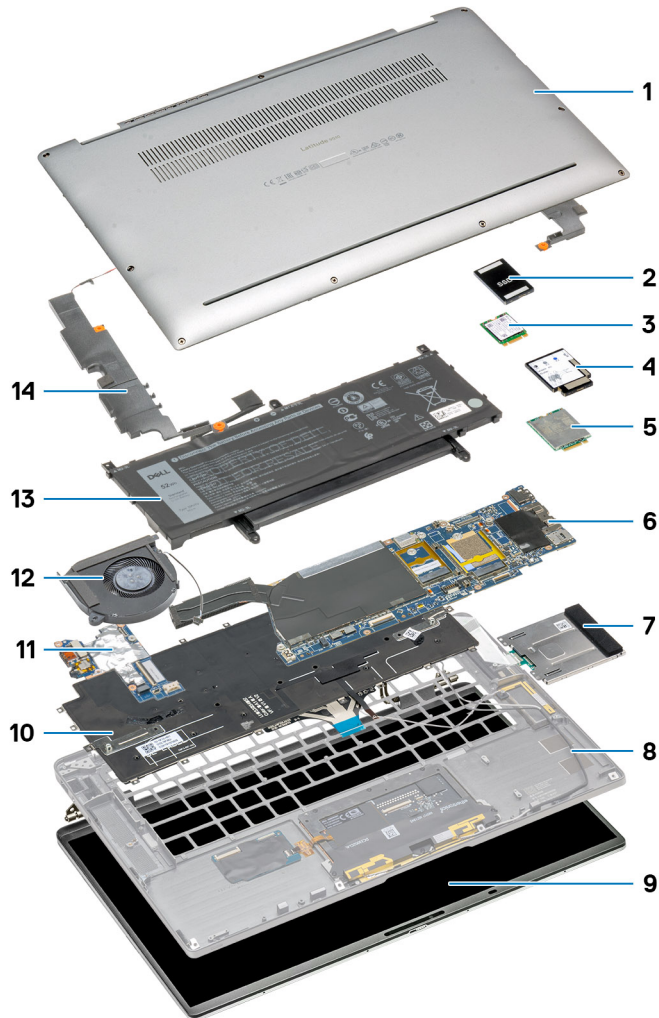
About this task

 **NOTE:** 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.

Major components of your system



1. Base cover
2. SSD shield cover
3. SSD memory
4. WWAN card shielding cover
5. WWAN card
6. System board
7. Smart card reader (optional)
8. Palmrest assembly
9. LCD panel
10. Keyboard
11. I/O board
12. System fan
13. Battery
14. Speaker

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

Removing and Installing Components

Topics:

- [Recommended tools](#)
- [Screw list](#)
- [Disassembly and reassembly](#)

Recommended tools

The procedures in this document may require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe - Recommended for field technician



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 9510 screw list





















Component	Screw type	Quantity	Image
Base cover	Captive screws	9	
4-cell battery	M1.6x3.5	1	
	M2x3	4	
6-cell battery	M1.6x3.5	1	
	M2x3	8	
WWAN	Captive screw	1	
	M1.6x4.5	1	
Smart card reader	M2x2	2	
Solid-state drive	M2x2	1	
Speaker	M1.6x1.8	4	
I/O board	M1.6x3.5	4	
System fan	M2x3	2	
Display cable bracket	M1.6x3.5	1	
Display assembly	M2.5x5	6	

Table 1. Latitude 9510 screw list (continued)

Component	Screw type	Quantity	Image
	M1.6x3.5	1	
Power button	M1.5x2.5	3	
	M2.5x5	3	
Fingerprint bracket	M1.5x2.5	3	
System board	M1.6x3.5	9	
	M2.5x5	1	
	M1.6x4.5	1	
Keyboard	M1.6x2	4	
	M1.6x1.5	36	

Disassembly and reassembly

SIM card tray

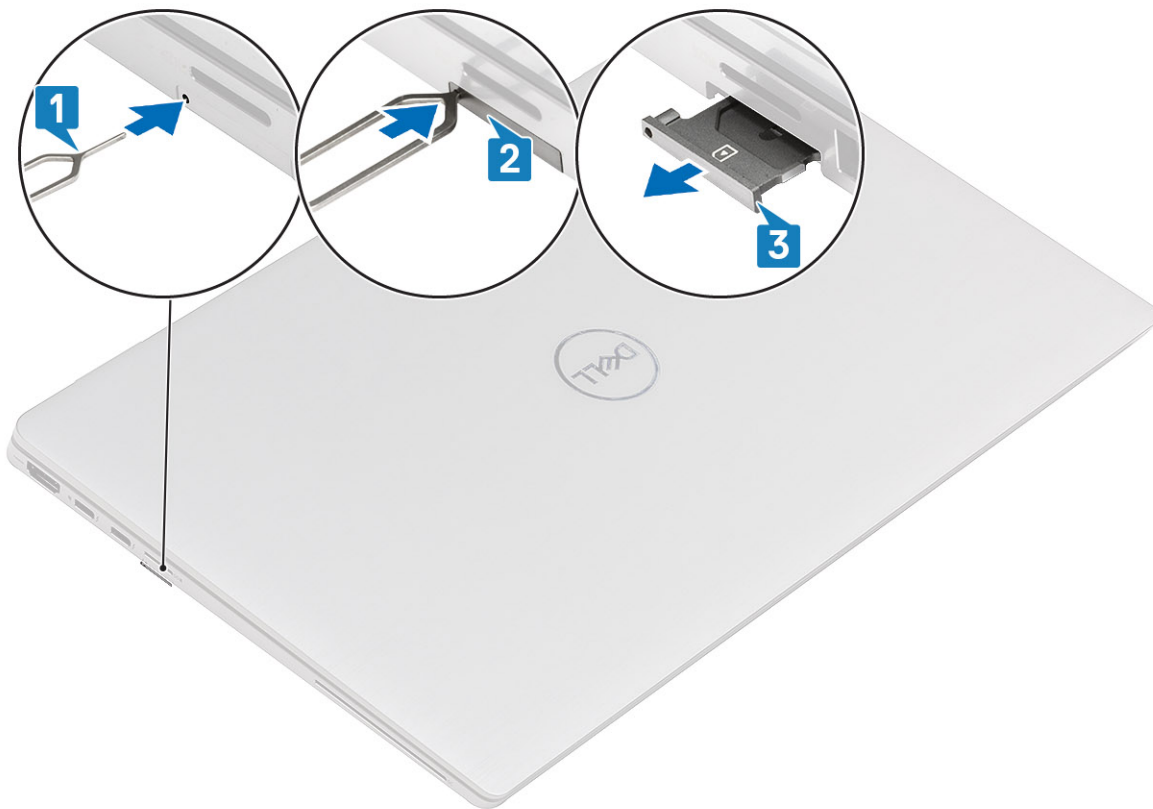
Removing the SIM card tray

Prerequisites

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

About this task

The following image provides a visual representation of the SIM card tray removal procedure.



Steps

1. Insert a pin into the release hole to release the SIM card tray [1].
2. Push the pin to disengage the lock, and eject the SIM card tray [2].
3. Slide the SIM card tray out of the slot on the system [3].

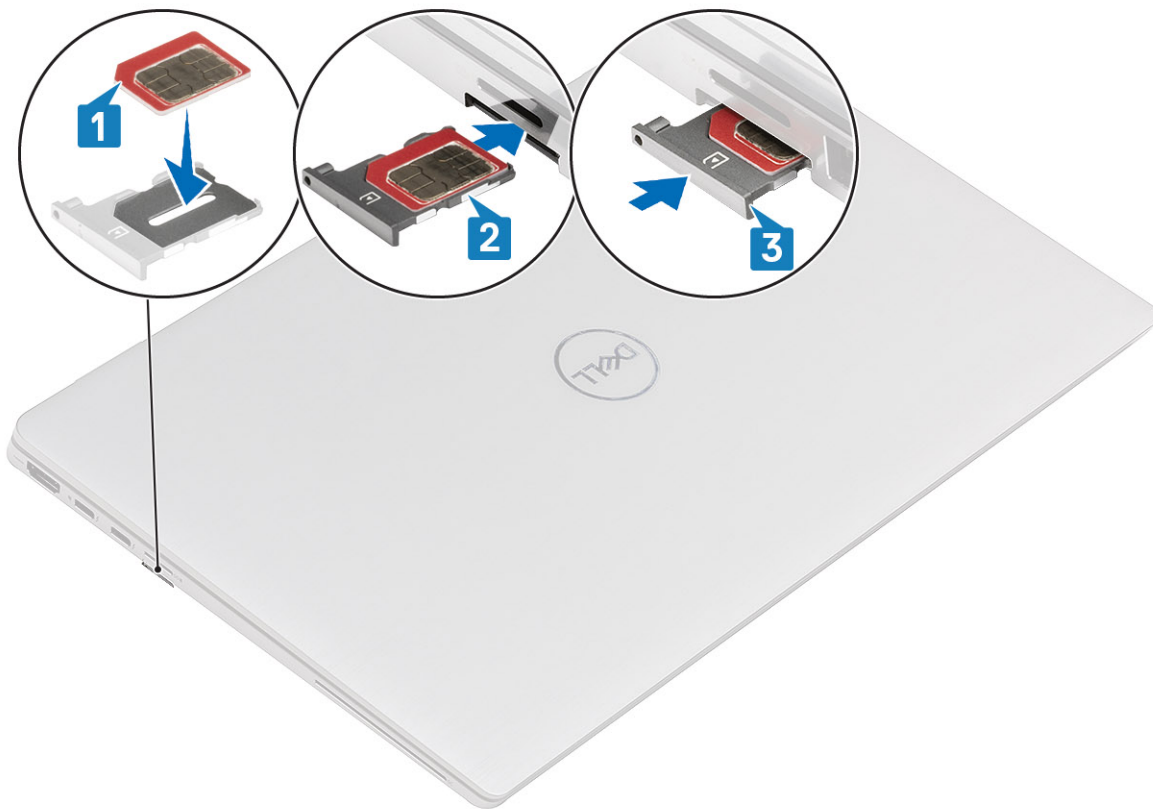
Installing the SIM card tray

Prerequisites

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

About this task

The following image provides a visual representation of the SIM card tray installation procedure.



Steps

1. Align and place the SIM card in the dedicated slot on the SIM card tray [1].
2. Slide the SIM card tray into the slot in the system [2], and push it to lock in place [3].

Next steps

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

MicroSD card

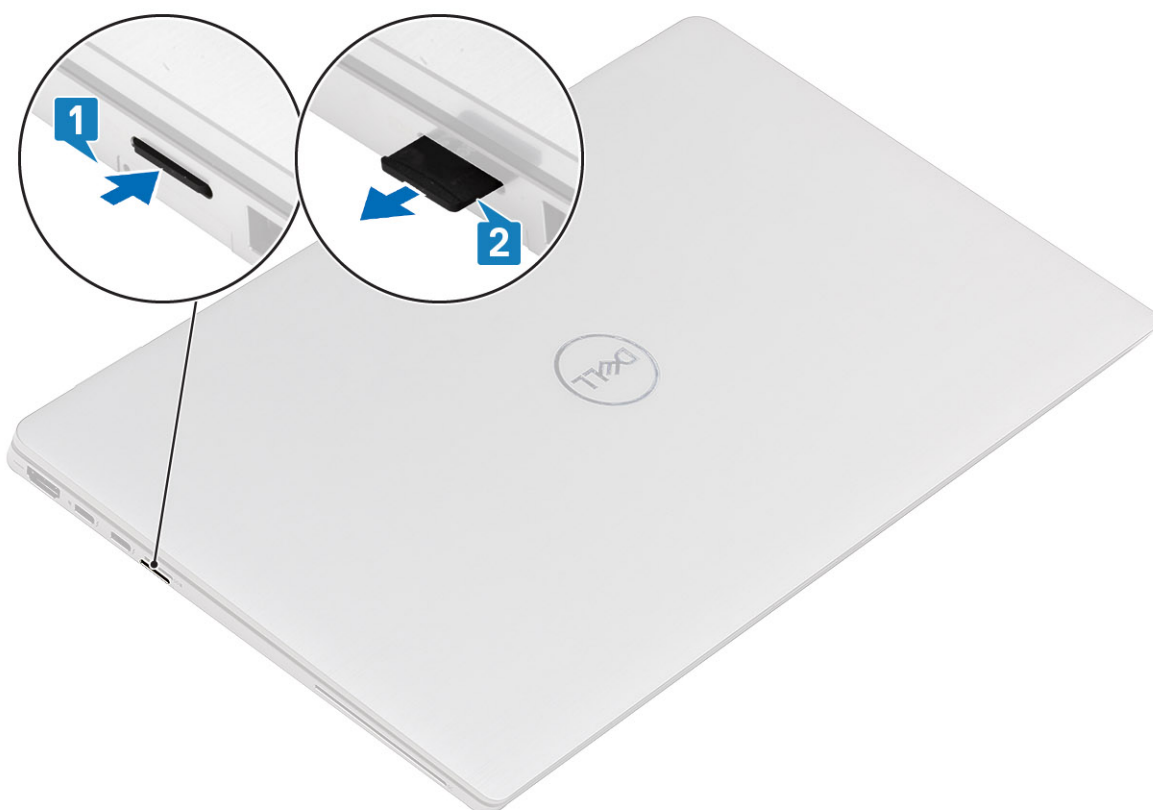
Removing the microSD card

Prerequisites

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

About this task

The following image provides a visual representation of the microSD card removal procedure.



Steps

1. Push the microSD card to eject it from the slot [1].
2. Remove the microSD card from the system [2].

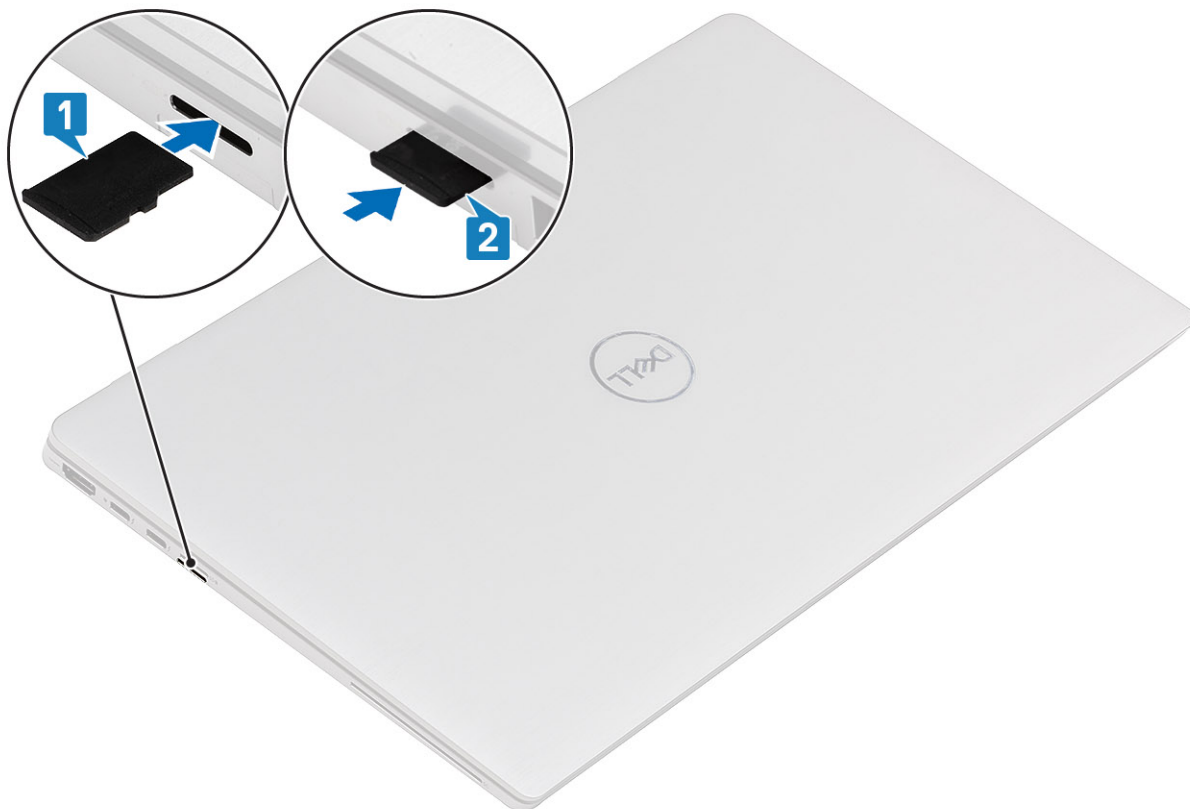
Installing the microSD card

Prerequisites

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

About this task

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



Steps

Insert the microSD card into its slot [1] until it clicks into place [2].

Next steps

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

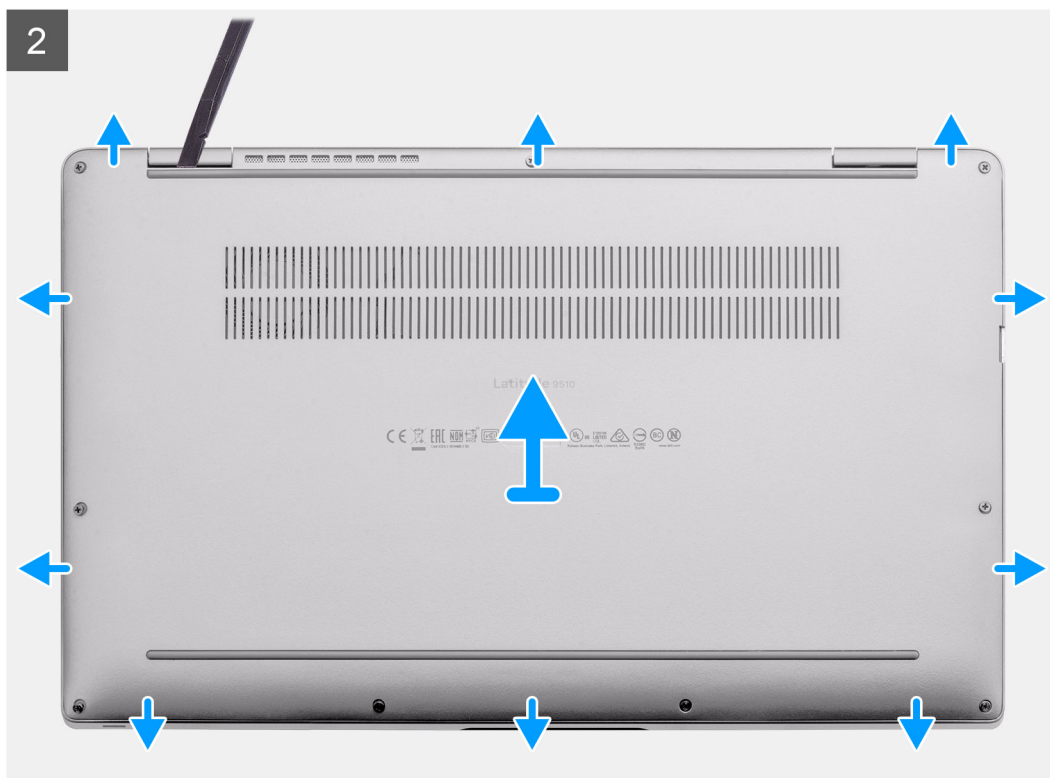
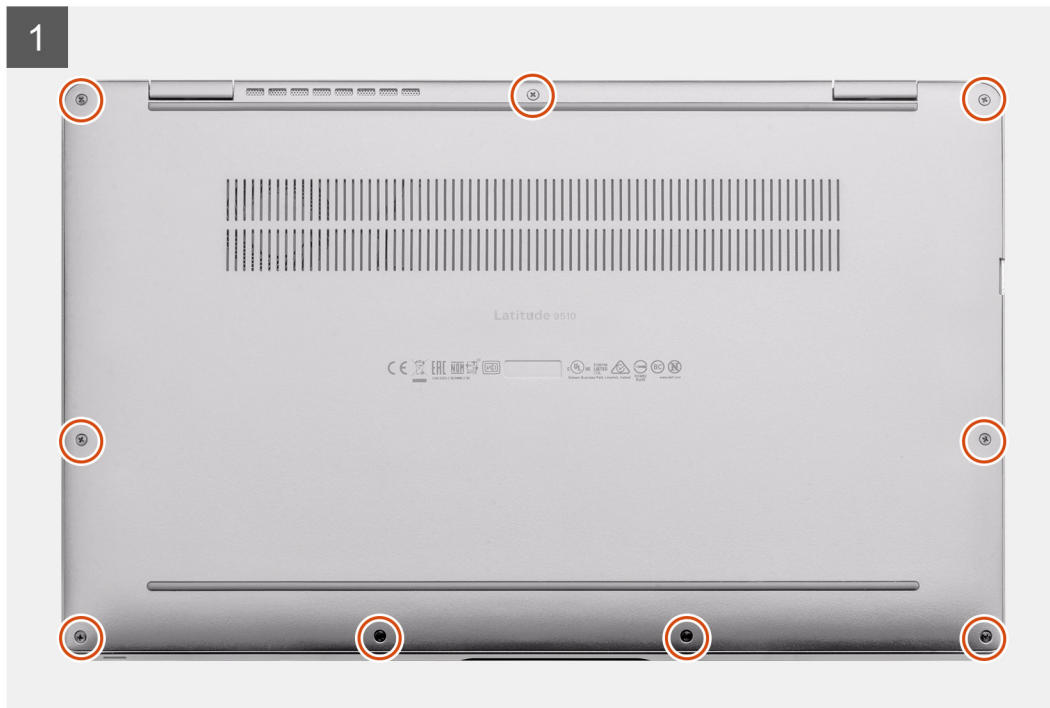
Base cover

Removing the base cover

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).

About this task



Steps

1. Loosen the nine captive screws that secure the base cover to the system.
2. Using a plastic scribe, pry open the base cover starting from the recesses located in the U-shaped indents near the hinges at the top edge of the base cover.

NOTE: Do not pull the base cover from the top side immediately after prying it from the recesses, as this will cause damage to the base cover.

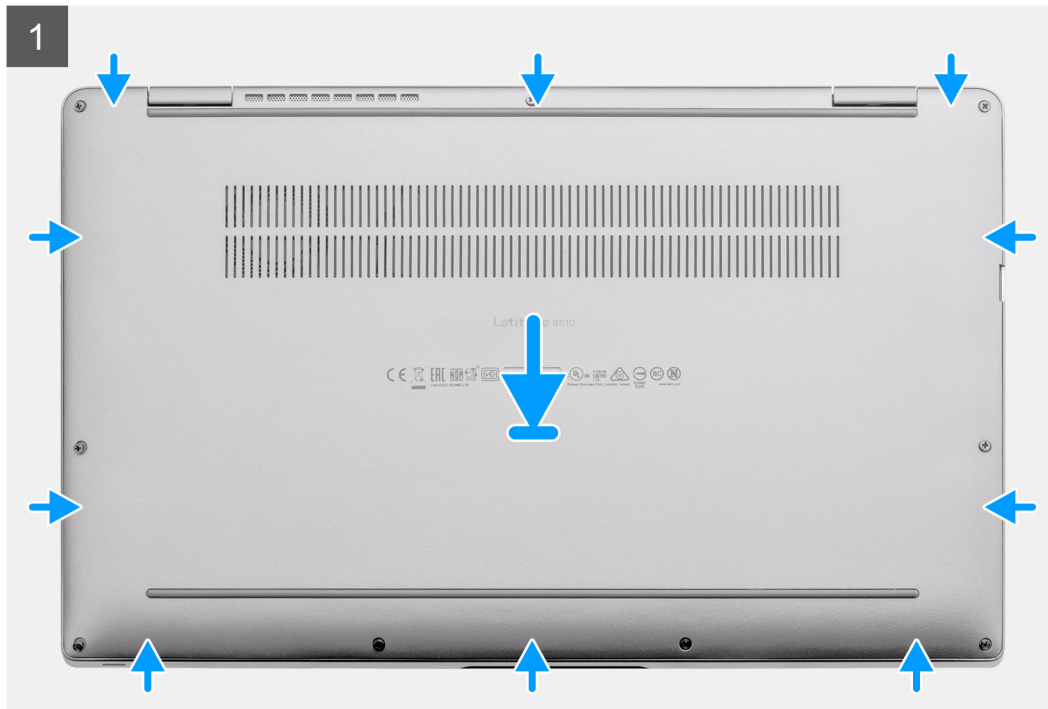
3. Pry open the left and right sides of the base cover.
4. Pry open the bottom side of the base cover.
5. Hold the left and right sides of the base cover and remove it from the system.

Installing the base cover

Prerequisites

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

About this task





Steps

1. Align and place the base cover on the palmrest and keyboard assembly, and snap the base cover into place.
2. Tighten the nine captive screws to secure the base cover to the system.

Next steps

1. Install the [SIM card tray](#).
2. Install the [microSD card](#).
3. Follow the procedure in [After working on your computer](#).

WWAN card

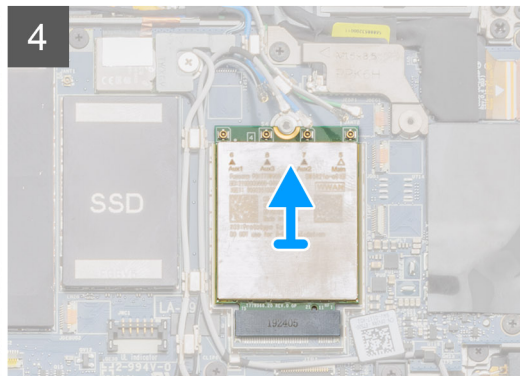
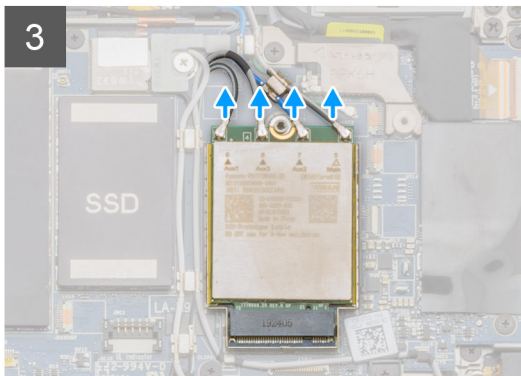
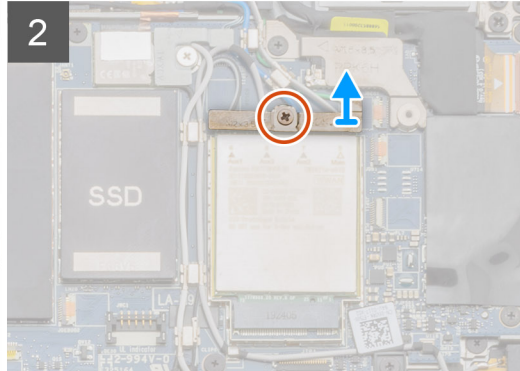
Removing the WWAN card

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).
5. Remove the [base cover](#).

About this task

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



Steps

1. Using a plastic scribe, pry open the WWAN card shield covering the WWAN card.
2. Loosen the single captive screw that secures the WWAN-card bracket to the WWAN card.
3. Lift the WWAN-card bracket out of the system.
4. Disconnect the antenna cables from the connectors on the WWAN card.
5. Slide and remove the WWAN card from the WWAN-card slot.

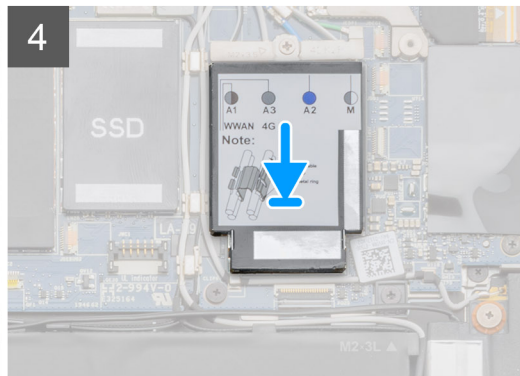
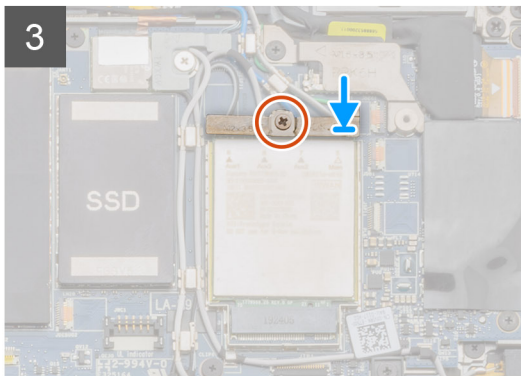
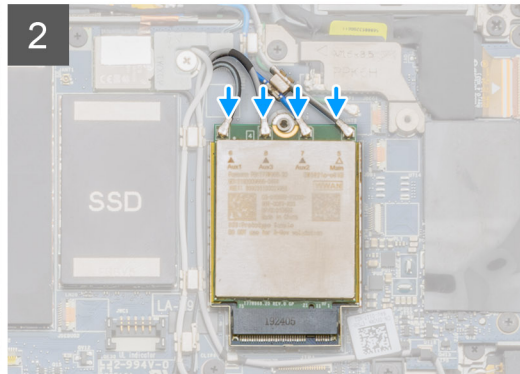
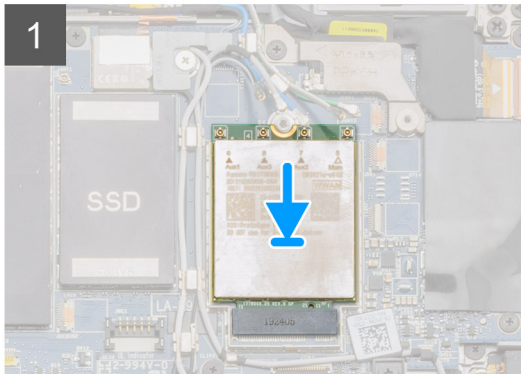
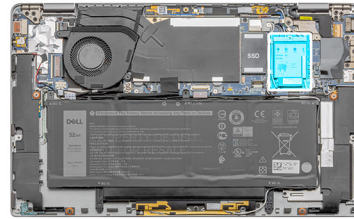
Installing the WWAN card

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-card slot.
2. Slide the WWAN card at an angle into the WWAN-card slot.
3. Connect the antenna cables to the connectors on the WWAN card.
4. Align and place the WWAN-card bracket on the system board and WWAN card, and tighten the single captive screw.
5. Align and place the WWAN-card shield, press to fit it firmly to cover the WWAN card.

Next steps

1. Install the [Base cover](#).
2. Install the [SIM card tray](#).
3. Install the [microSD card](#).
4. Follow the procedure in [After working on your computer](#).

Solid-state drive

Removing the solid-state drive

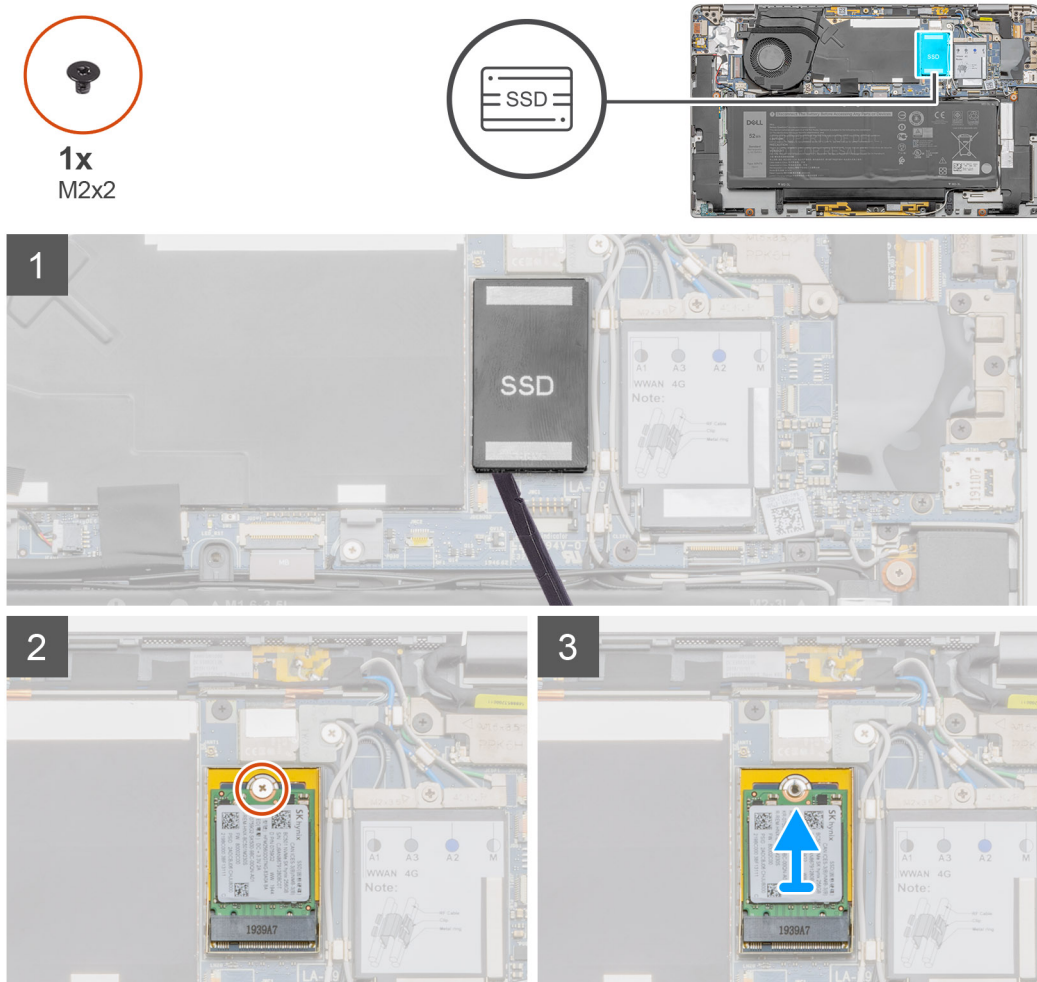
Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).

4. Enter [service mode](#).
5. Remove the [Base cover](#).

About this task

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



Steps

1. Using a plastic scribe, pry open the solid-state drive shield and lift it out of the system.
2. Remove the single screw (M2x2) that secures the solid-state drive to the system board.
3. Slide and remove the solid-state drive from the solid-state drive slot on the system board.

Installing the solid-state drive

Prerequisites

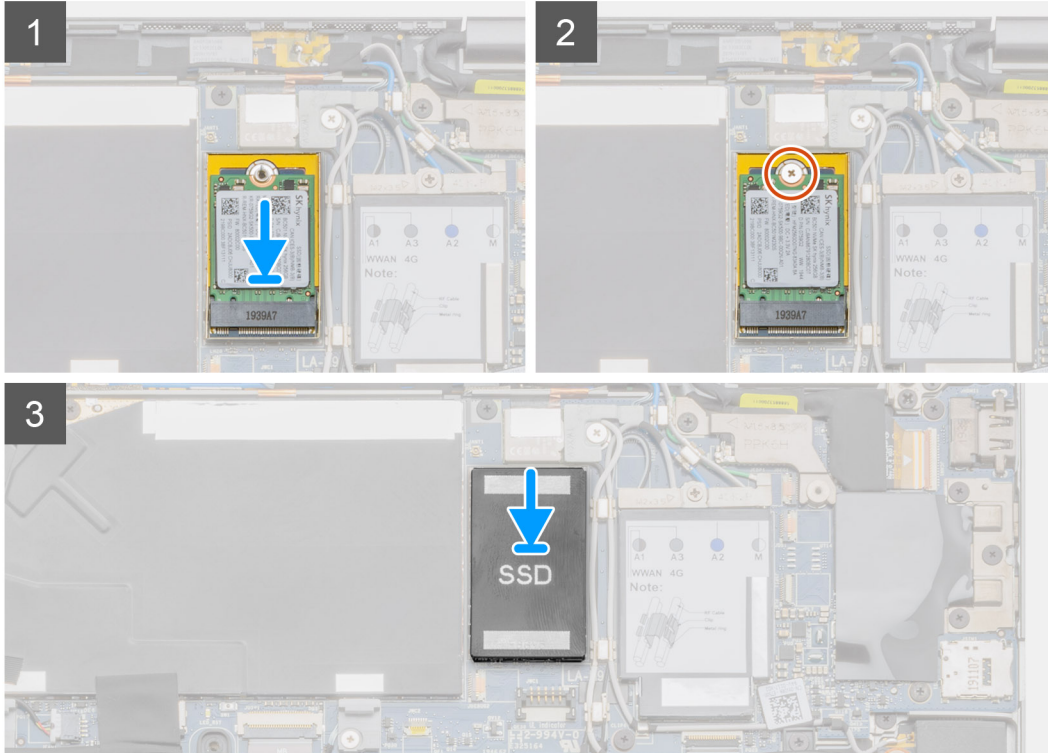
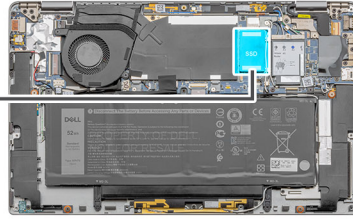
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



1x
M2x2



Steps

1. Align the notch on the solid-state drive with the tab on the M.2 card slot.
2. Slide the solid-state drive into the M.2 card slot on the system board.
3. Replace the screw (M2x2) that secures the solid-state drive to the system board.
4. Align and place the solid-state drive shield, press to fit it firmly to cover the solid-state drive.

Next steps

1. Install the [Base cover](#).
2. Install the [SIM card tray](#).
3. Install the [microSD card](#).
4. Follow the procedure in [After working on your computer](#).

Speakers

Removing the speaker

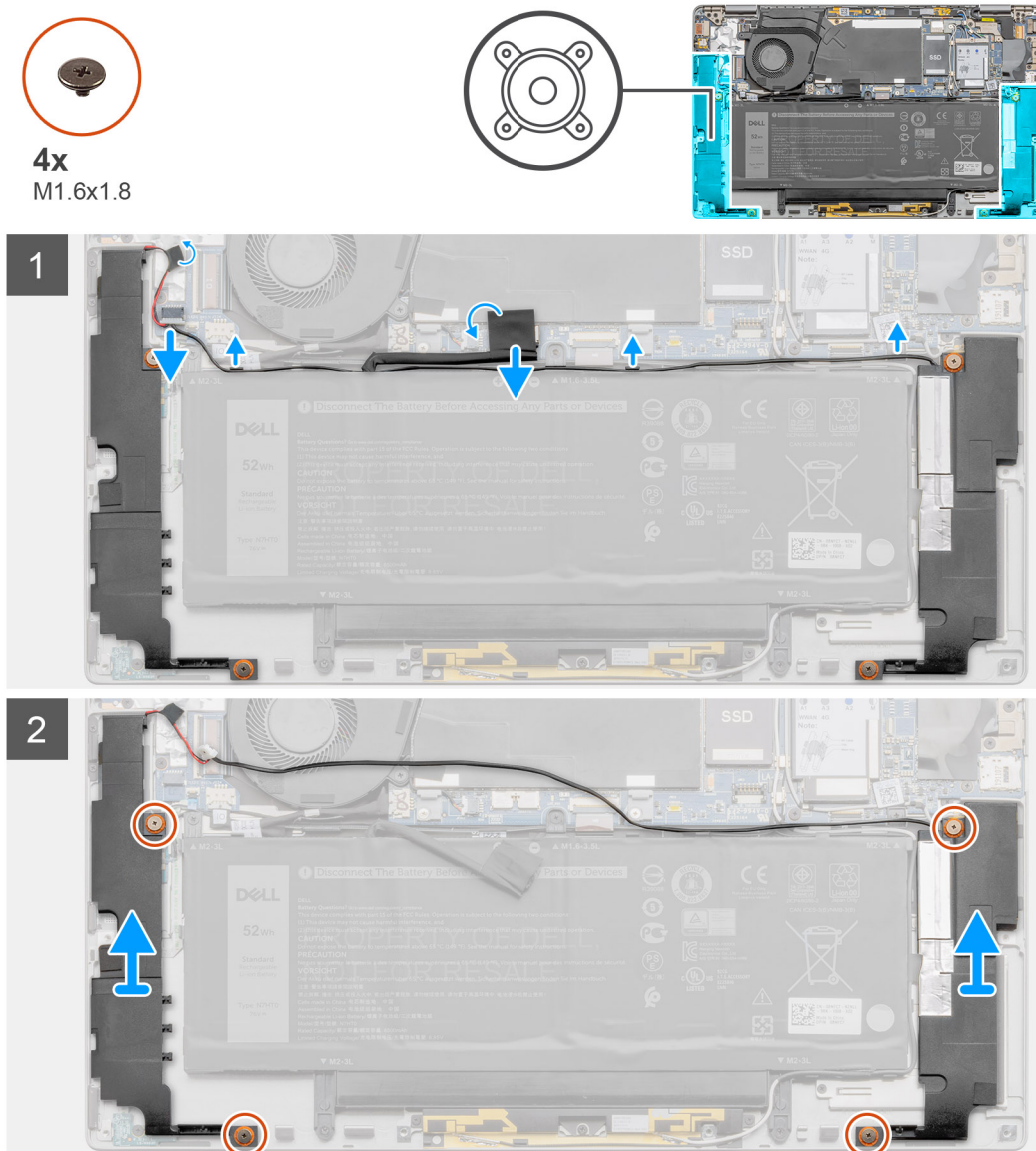
Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).

5. Remove the [Base cover](#).

About this task

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



Steps

1. Peel off the adhesive tape that secures the battery cable to the system board.
2. Disconnect the speaker cable, and unroute the speaker cable from the routing guide.
3. Remove the four (M1.6x1.8) screws that secure the speakers, and remove the speakers from the system.

Installing the speaker

Prerequisites

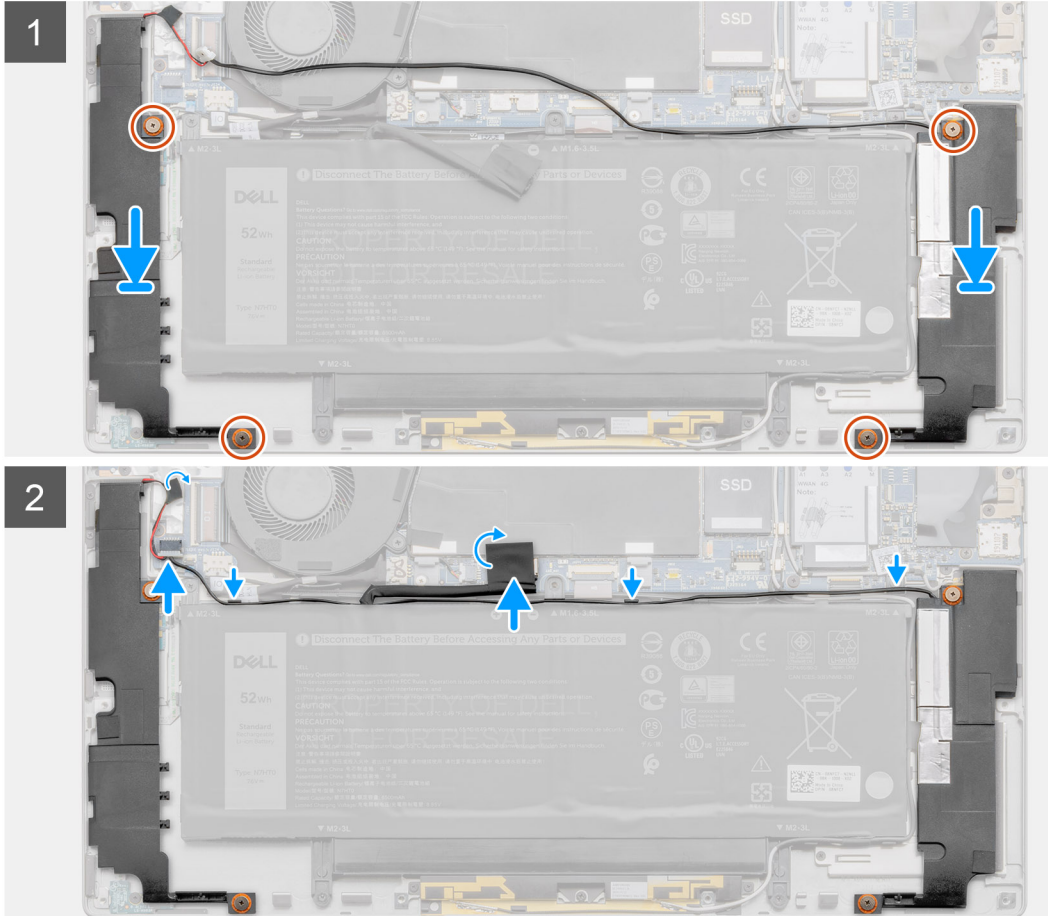
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



4x
M1.6x1.8



Steps

1. Align and place the speakers in the slot on the system.
2. Replace the four (M1.6x1.8) screws that secure the speakers to the system.
3. Route the speaker cables through the routing guide and connect the speaker cable to the connector.
4. Adhere the adhesive tape to secure the speaker cable.

Next steps

1. Install the [Base cover](#).
2. Install the [SIM card tray](#).
3. Install the [microSD card](#).
4. Follow the procedure in [After working on your computer](#).

System fan

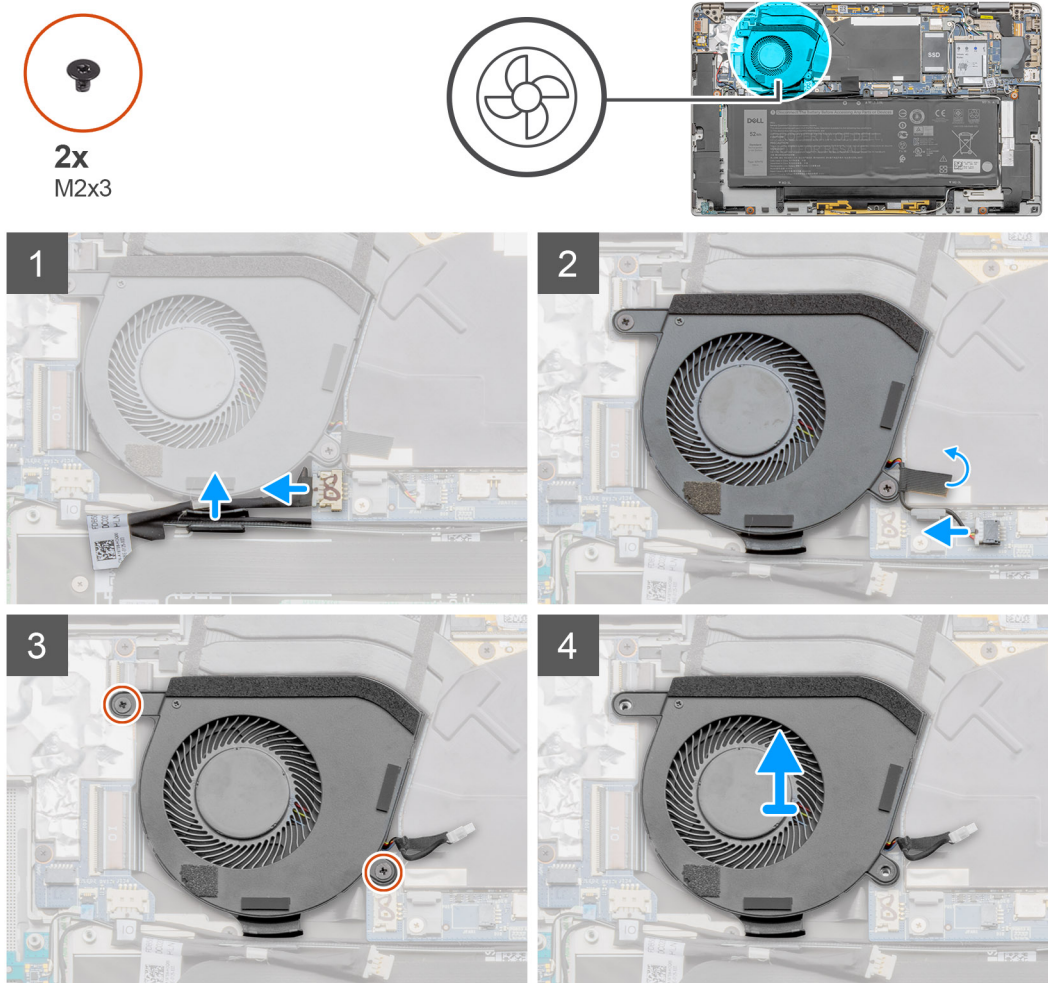
Removing the system fan

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).
5. Remove the [Base cover](#).

About this task

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



Steps

1. Disconnect the I/O cable and unroute the antenna cable through the routing guide.
2. Disconnect the system fan cable from the connector and peel the adhesive tape securing the system fan cable.
3. Remove the two (M2x3) screws that secure the system fan.
4. Lift the system fan off the palmrest assembly.

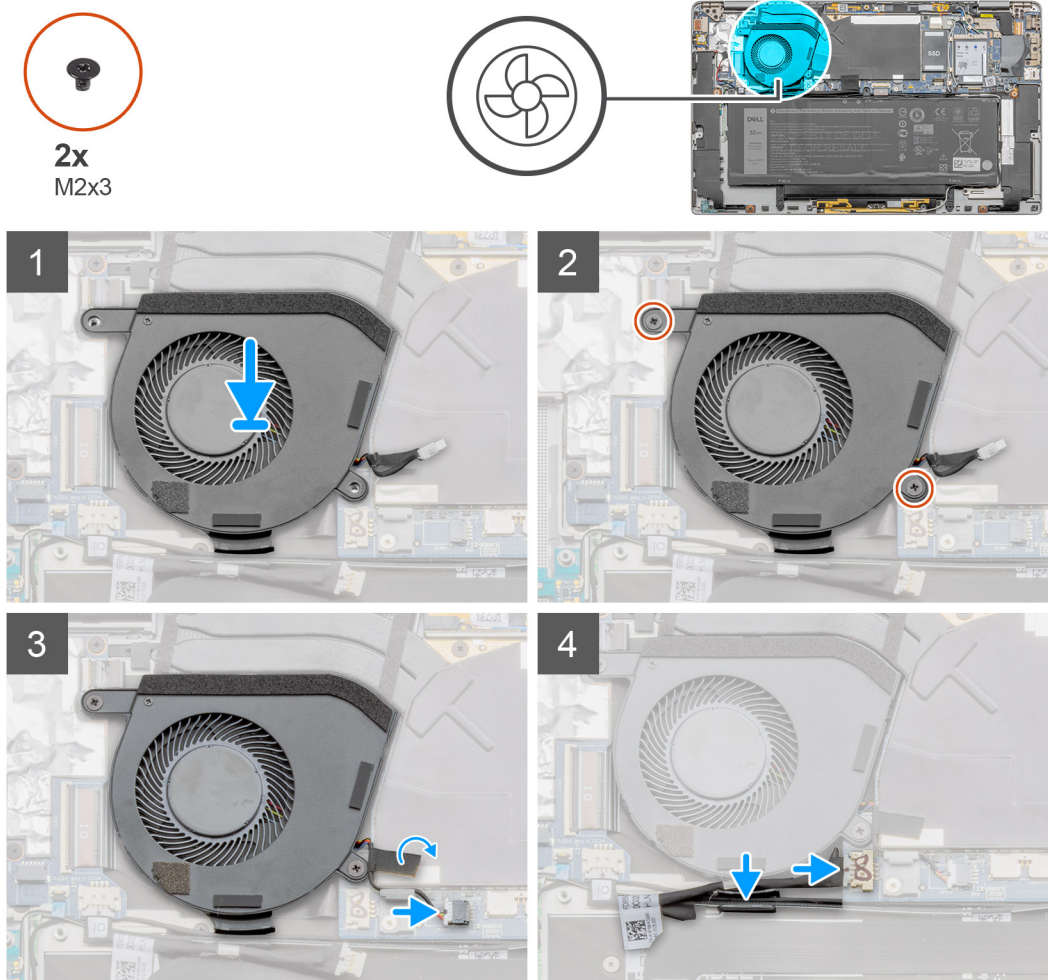
Installing the system fan

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 system fan and provides a visual representation of the installation procedure.



Steps

1. Align and place the system fan onto the palmrest assembly.
2. Replace the two (M2x3) screws that secure the system fan in place.
3. Connect the system fan cable and adhere the adhesive tape to secure the system fan cable.
4. Route the antenna cable through the routing guide, and connect the I/O cable.

NOTE: Reconnect the battery after system repair.

Next steps

1. Install the [Speakers](#).
2. Install the [Base cover](#).
3. Install the [SIM card tray](#).
4. Install the [microSD card](#).
5. Follow the procedure in [After working on your computer](#).

I/O daughter board power cable

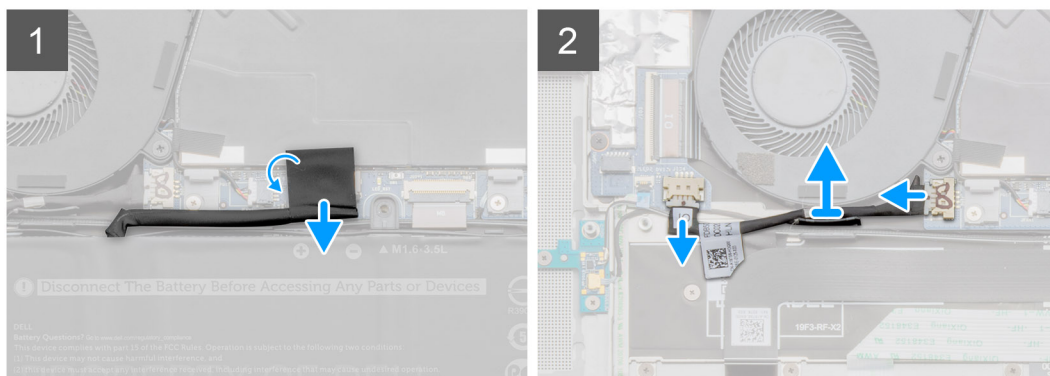
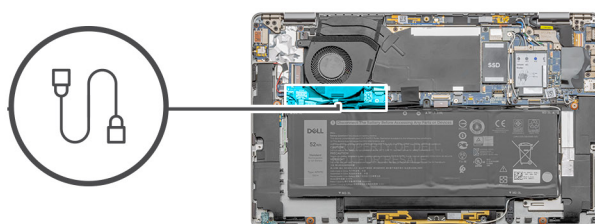
Removing the I/O daughter board power cable

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).
5. Remove the [Base cover](#).

About this task

The following images indicate the location of the I/O daughter board power cable and provide a visual representation of the removal procedure.



Steps

1. Disconnect the I/O daughter board power cable from the I/O board, and system board.
2. Unroute the I/O daughter board power cable from the routing channels adjacent to the system fan.
3. Remove the I/O daughter board power cable from the system.

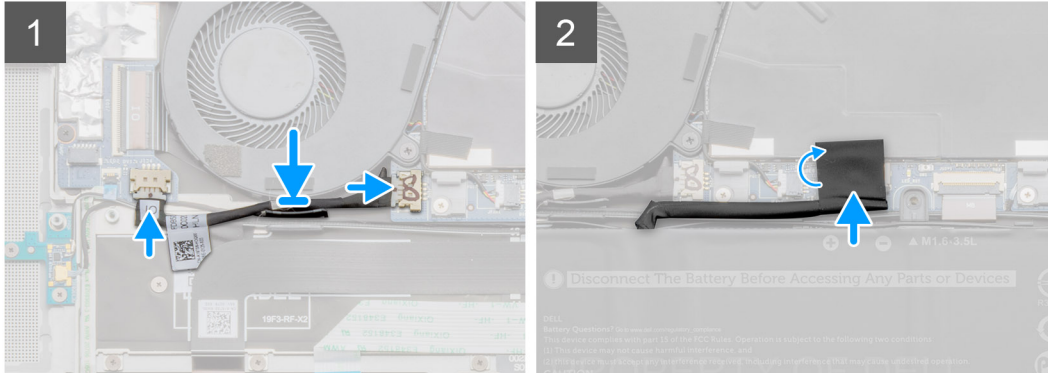
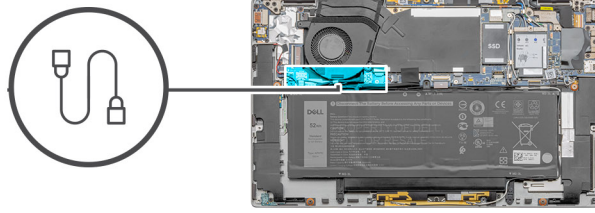
Installing the I/O daughter board power cable

Prerequisites

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

About this task

The following image indicates the location of the I/O daughter board power cable and provides a visual representation of the installation procedure.



Steps

1. Route the I/O daughter board power cable on the routing channels adjacent to the system fan.
2. Connect the I/O daughter board power cable to the I/O board, and system board.

Next steps

1. Install the [Base cover](#).
2. Install the [SIM card tray](#)
3. Install the [microSD card](#).
4. Follow the procedure in [After working on your computer](#).

I/O board

Removing the I/O board

Prerequisites

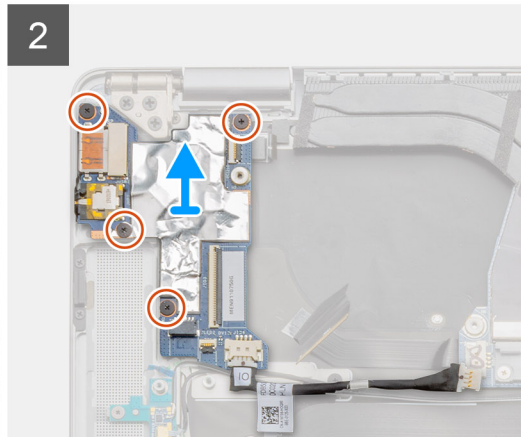
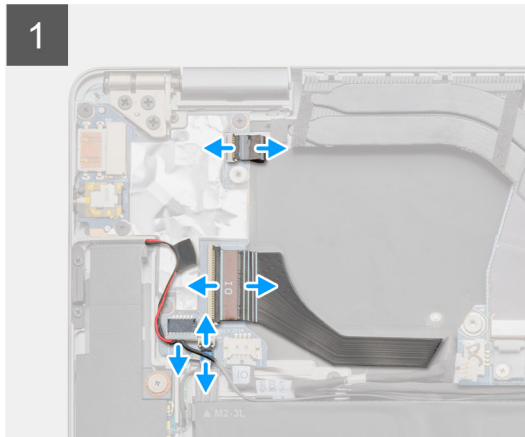
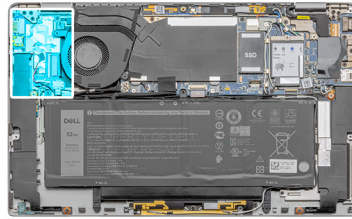
1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).
5. Remove the [Base cover](#).
6. Remove the [System Fan](#).

About this task

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



4x
M1.6x3.5



Steps

1. Disconnect the I/O daughter board data cable, fingerprint reader cable, and LED board cable from the I/O board.
2. Remove the four (M1.6x3.5) screws and lift the I/O board out of the laptop.

Installing the I/O board

Prerequisites

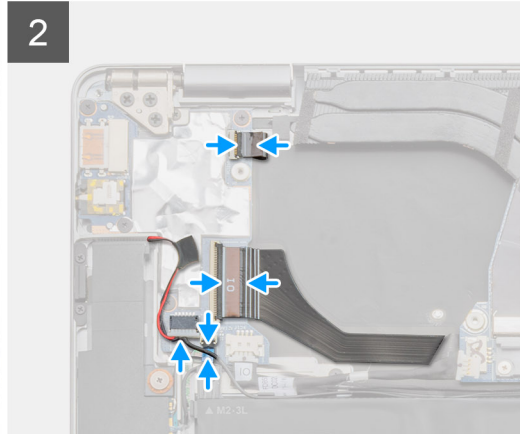
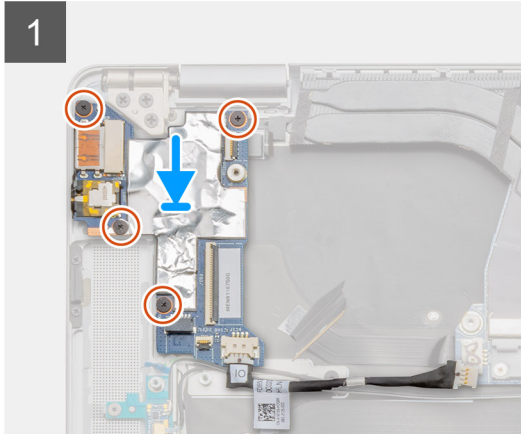
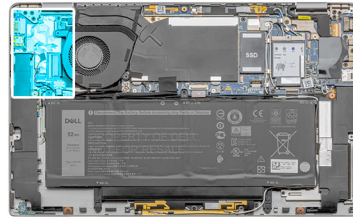
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



4x
M1.6x3.5



Steps

1. Align and place the I/O board on the system.
2. Replace the four (M1.6x3.5) screws to secure the I/O board in place.
3. Connect the LED board cable, fingerprint reader cable, and I/O daughter board data cable to the connectors on the I/O board.

NOTE: Reconnect the battery cable after laptop repair is completed.

Next steps

1. Install the [System Fan](#).
2. Install the [Base cover](#).
3. Install the [SIM card tray](#).
4. Install the [microSD card](#).
5. Follow the procedure in [After working on your computer](#).

Power button

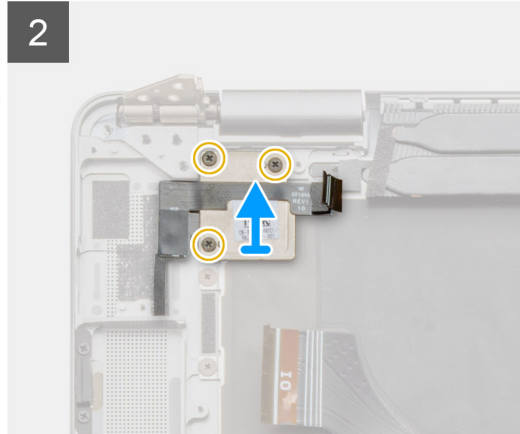
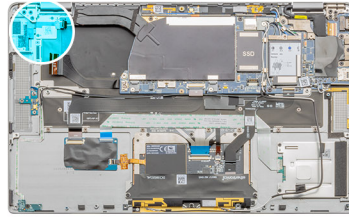
Removing the power button

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).
5. Remove the [Base cover](#).
6. Remove the [Fan](#).
7. Remove the [I/O board](#).

About this task

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



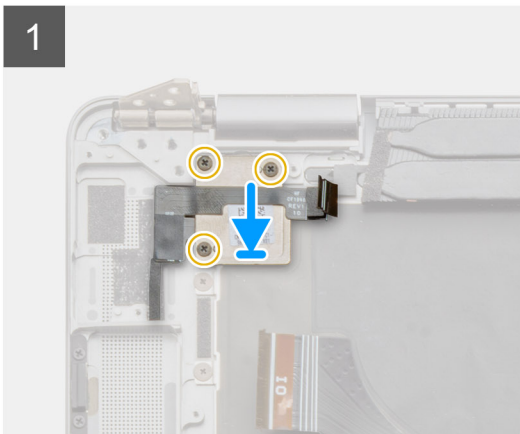
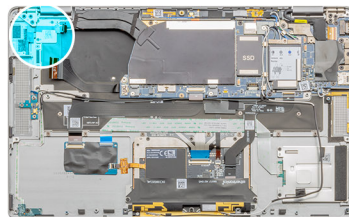
Steps

1. Remove the three M1.5x2.5 screws securing the fingerprint reader bracket.
2. Remove the power button bracket from the system.
3. Peel off the power button assembly from the palm rest and remove the power button assembly from the system.

Installing the power button

About this task

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



Steps

1. Align and place the power button assembly on the system. Adhere the power button assembly on the palm rest.
2. Install the power button bracket on the system.
3. Install the three M1.5x2.5 screws securing the fingerprint reader bracket.

Next steps

1. Install the [I/O board](#).
2. Install the [Fan](#).
3. Install the [Base cover](#).
4. Install the [SIM card tray](#).
5. Install the [microSD card](#).
6. Follow the procedure in [After working on your computer](#) .

Power button with finger print reader (optional)

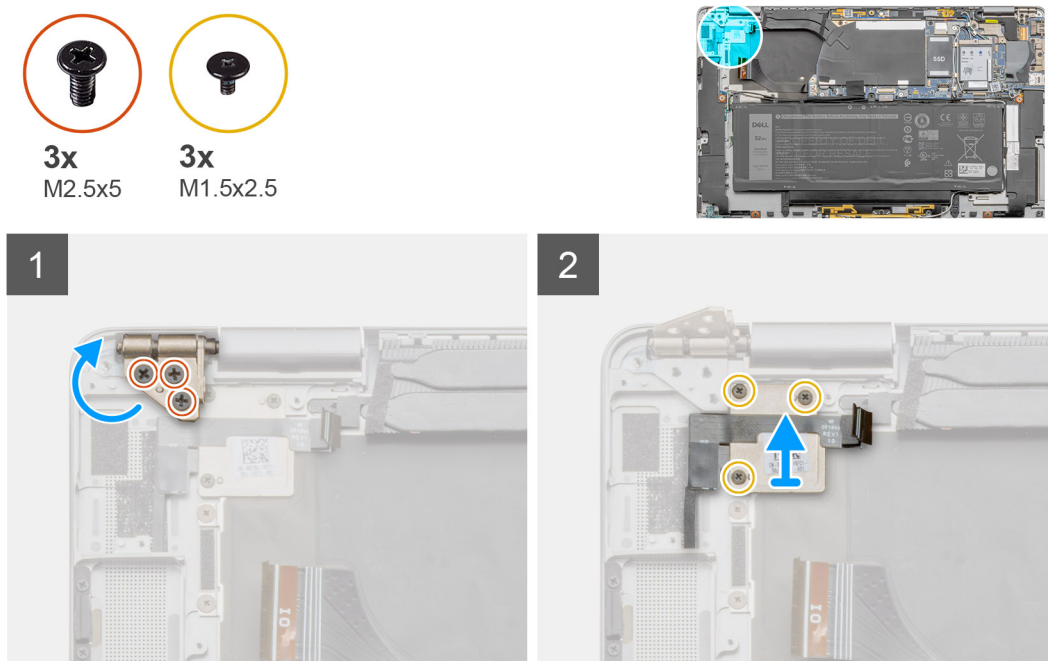
Removing the power button with fingerprint reader

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Enter [service mode](#).
5. Remove the [Base cover](#).
6. Remove the [system fan](#).
7. Remove the [I/O 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. Remove the three (M2.5x5) screws securing the LCD hinges in place.

2. Rotate and lift the hinges up to remove the hinges.
3. Remove the three (M1.5x2.5) screws securing the fingerprint bracket in place.
4. Remove the fingerprint reader bracket from the system.
5. Peel off the power button with the fingerprint reader assembly from the sponge on the palm rest, and remove the power button with fingerprint reader assembly from the system.

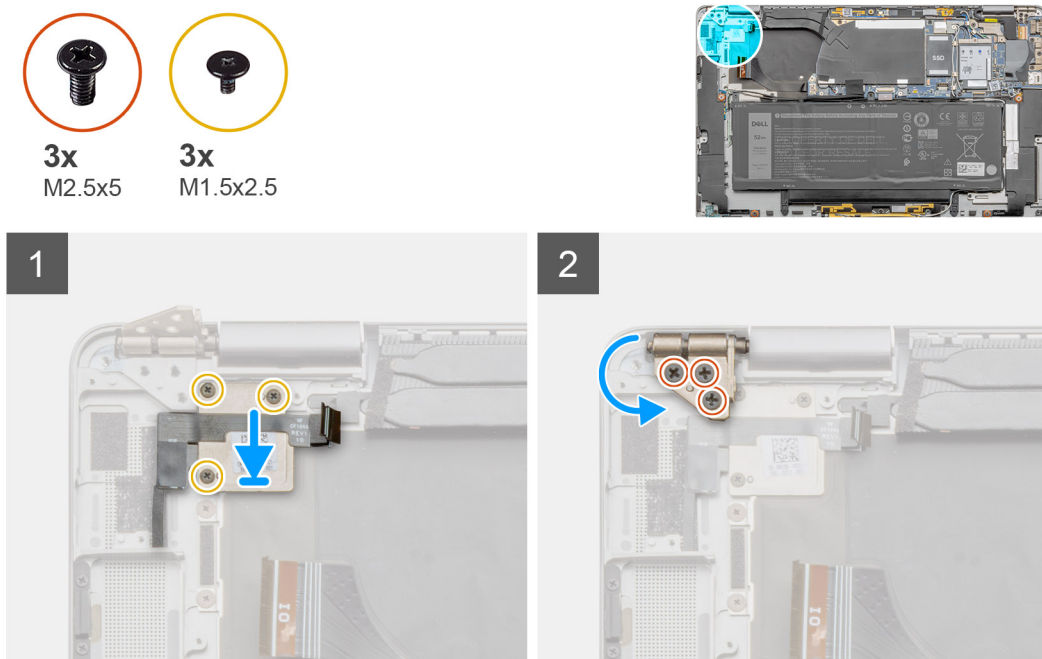
Installing the power button with fingerprint reader

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 fingerprint reader and provide a visual representation of the installation procedure.



Steps

1. Align and place the fingerprint reader assembly on the system and adhere the power button with the fingerprint reader assembly on the sponge on the palmrest.
2. Align and place the fingerprint reader bracket in place, and install the three (M1.5x2.5) screws securing the fingerprint bracket.
3. Rotate and align the hinges down in place.
4. Install the three (M2.5x5) screws securing the LCD hinges in place.

Next steps

1. Install the [I/O board](#).
2. Install the [system fan](#).
3. Install the [Base cover](#).
4. Install the [SIM card tray](#)
5. Install the [microSD card](#).
6. Follow the procedure in [After working on 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 4-cell battery

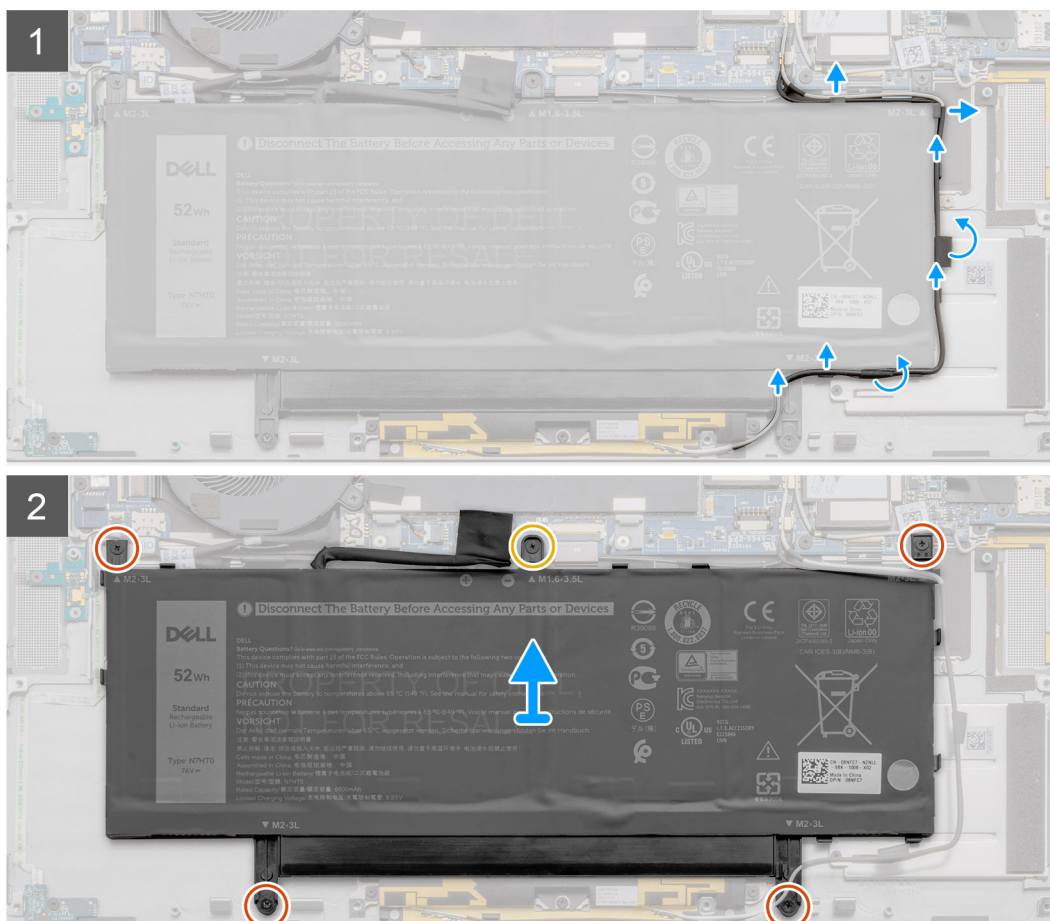
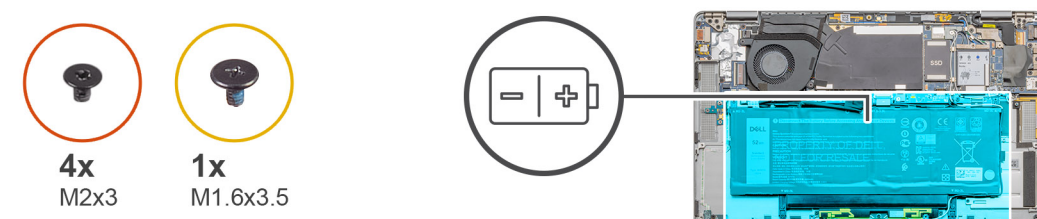
Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Remove the [Base cover](#).
5. Remove the [Speakers](#).

 **NOTE:** If battery was disconnected from system board for service, there will be a delay during system boot-up as the system will undergo RTC battery reset.

About this task

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



Steps

1. Peel off the adhesive tape securing the wireless antenna cables in place and unroute the wireless antenna cables from the routing guides.

NOTE: The cables for the wireless antennas are routed over the plastic bracket at the upper left corner and within the routing channels along the left and bottom side of the battery. Technicians must be careful when unrouting the antenna cables from their routing guides while they are still attached to the wireless card.

2. Remove the single (M1.6x3.5) screw and four (M2x3) screws that secures the battery.
3. Lift the battery from the left side of the system, and remove the battery from the laptop.

Installing the 4-cell battery

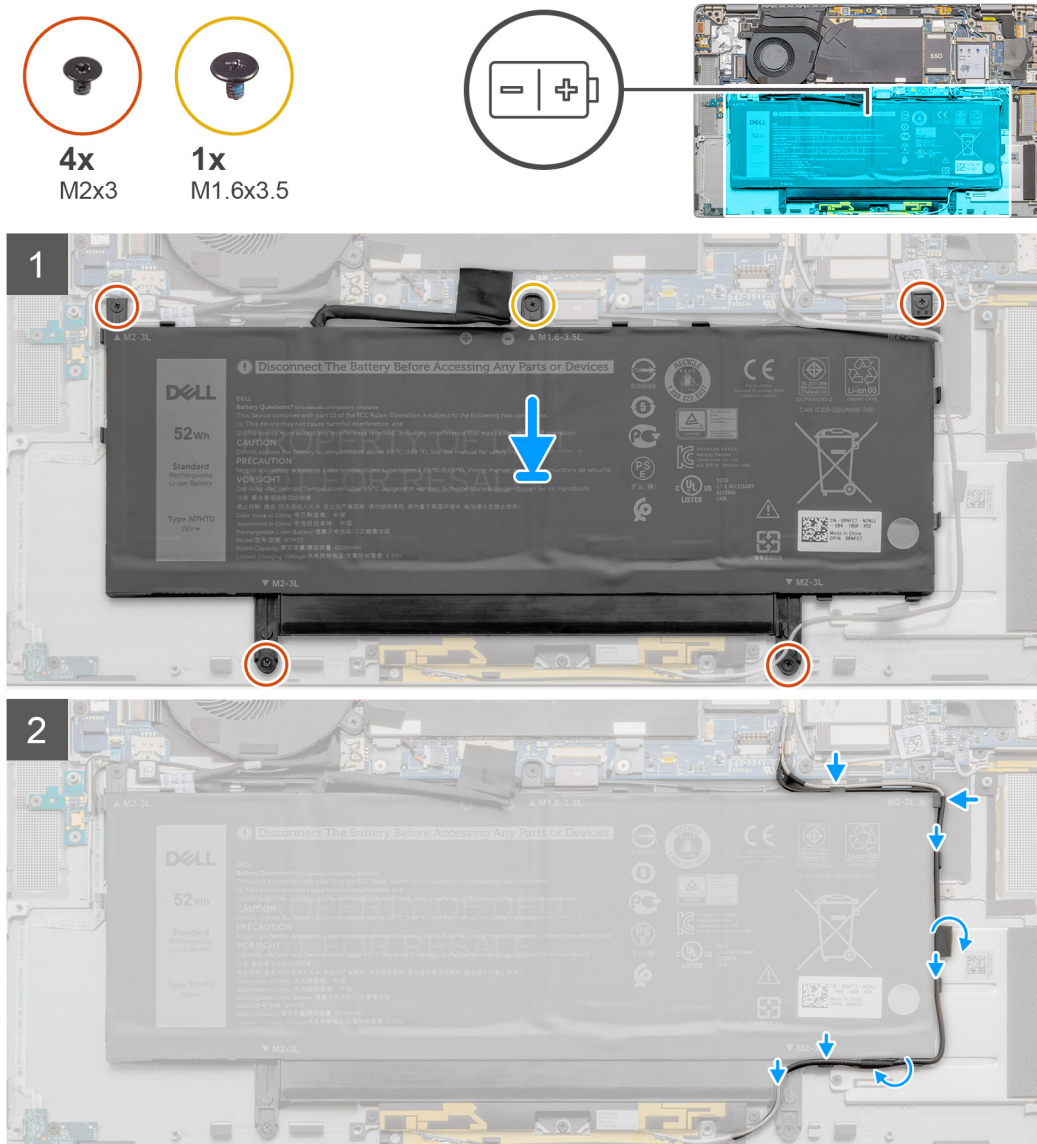
Prerequisites

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

About this task

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

NOTE: If battery was disconnected from system board for service, there will be a delay during system boot-up as the system will undergo RTC battery reset.



Steps

1. Align and place the battery from the left side on the laptop.
2. Replace the single (M1.6x3.5) screw and four (M2x3) screws to secure the battery in place.
3. Route the wireless antenna cables on the routing guides and adhere the adhesive tape.

Next steps

1. Install the [Speakers](#).
2. Install the [Base cover](#).
3. Install the [SIM card tray](#)
4. Install the [microSD card](#).
5. Follow the procedure in [After working on your computer](#) .

Removing the 6-cell battery

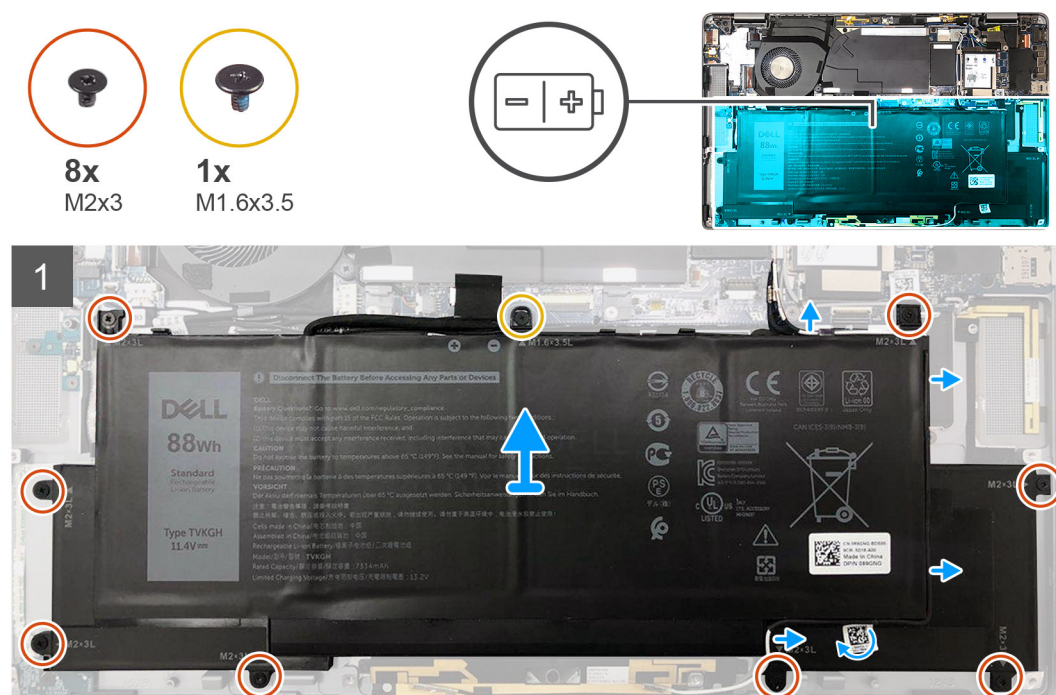
Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Remove the [Base cover](#).
5. Remove the [Speakers](#).

About this task

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

NOTE: If battery was disconnected from system board for service, there will be a delay during system boot-up as the system will undergo RTC battery reset.



Steps

1. Peel off the adhesive tape securing the wireless antenna cables in place and unroute the wireless antenna cables from the routing guides.

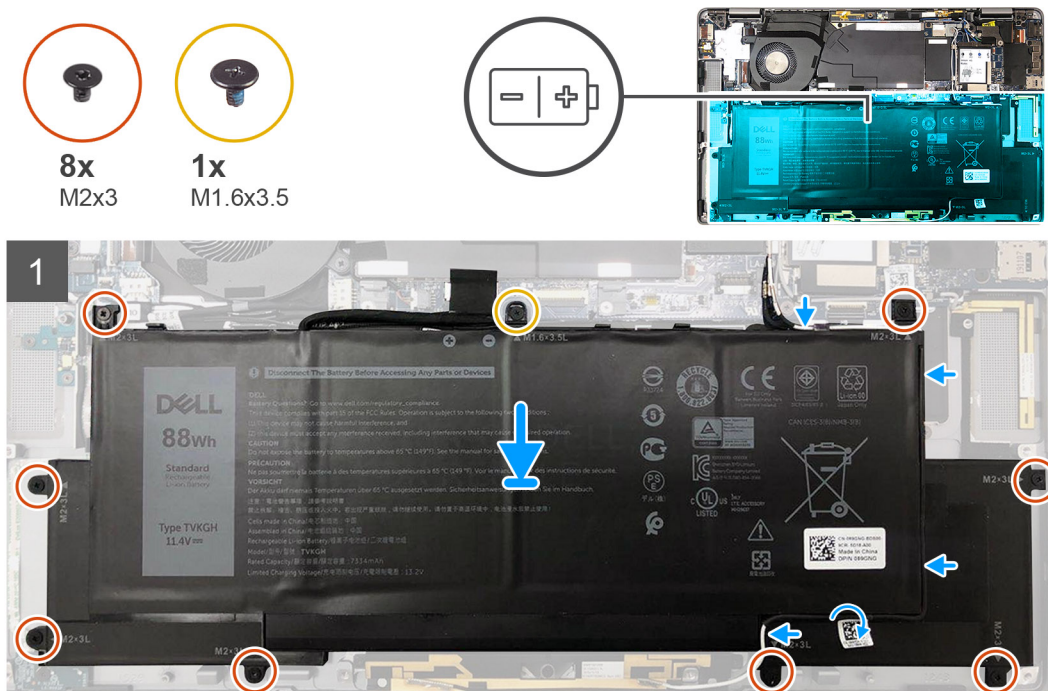
NOTE: The cables for the wireless antennas are routed over the plastic bracket at the upper left corner and within the routing channels along the left and bottom side of the battery. Technicians must be careful when unrouting the antenna cables from their routing guides while they are still attached to the wireless card.

2. Remove the single (M1.6x3.5) screw and eight (2x3) that secures the battery.
3. Lift the battery from the left side and remove the battery from the laptop.

Installing the 6-cell battery

About this task

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



NOTE: If battery was disconnected from system board for service, there will be a delay during system boot-up as the system will undergo RTC battery reset.

Steps

1. Align and place the battery from the left side on the laptop.
2. Install the single (M1.6x3.5) screw and eight (M2x3) screws to secure the battery in place.
3. Route the wireless antenna cables on the routing guides and adhere the adhesive tape.

Next steps

1. Install the [Speakers](#).
2. Install the [Base cover](#).
3. Install the [SIM card tray](#)
4. Install the [microSD card](#).
5. Follow the procedure in [After working on your computer](#).

Smart card reader

Removing the smart card reader

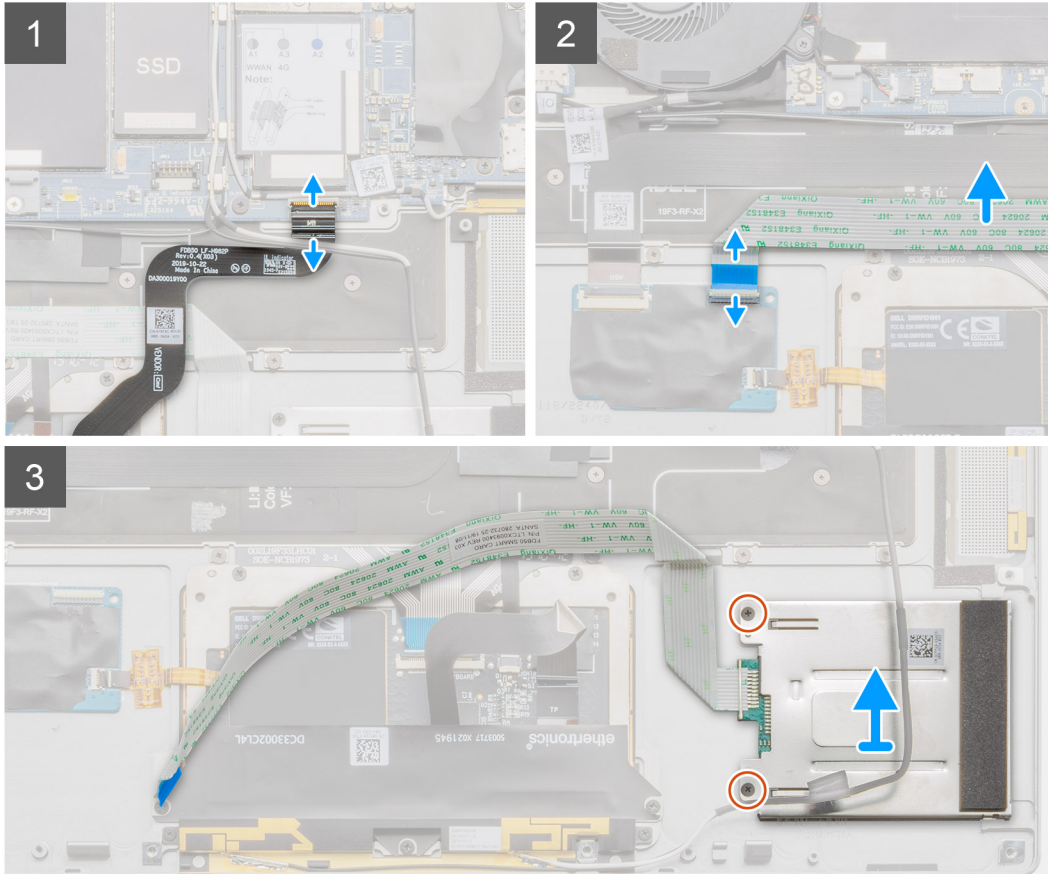
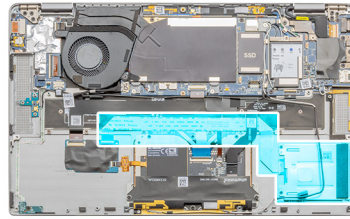
Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Remove the [Base cover](#).
5. Remove the [Battery](#).
6. Remove the [Speakers](#).

About this task



2x
M2x2



Steps

1. Open the latch and disconnect the touchpad FPC from the system board.
2. Open the latch and disconnect the smart card reader cable from the I/O-daughter board.
3. Remove the two screws (M2x2) that secure the smart card reader to the palmrest assembly.
4. Lift the smart card reader away from the palmrest assembly.

Installing the smart card reader

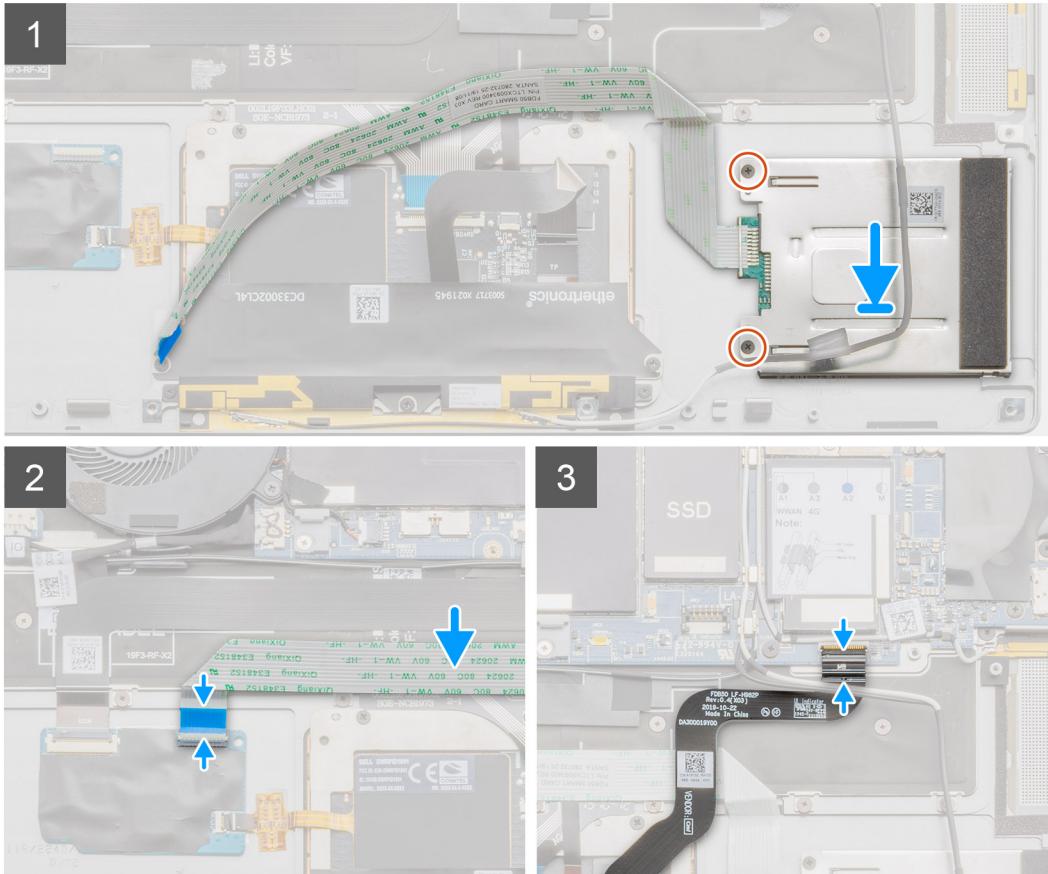
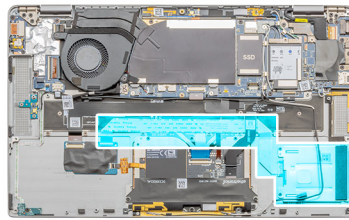
Prerequisites

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

About this task



2x
M2x2



Steps

1. Align and place the smart card reader on the palmrest assembly.
2. Replace the two screws (M2x2) to secure the smart card reader to the palmrest assembly.
3. Connect the smart card reader cable to the connector on the I/O-daughter board and close the latch.
4. Connect the touchpad FPC to the connector on the system board and close the latch.

Next steps

1. Install the [Speakers](#).
2. Install the [Battery](#).
3. Install the [Base cover](#).
4. Install the [SIM card tray](#).
5. Install the [microSD card](#).
6. Follow the procedure in [After working on your computer](#).

System board

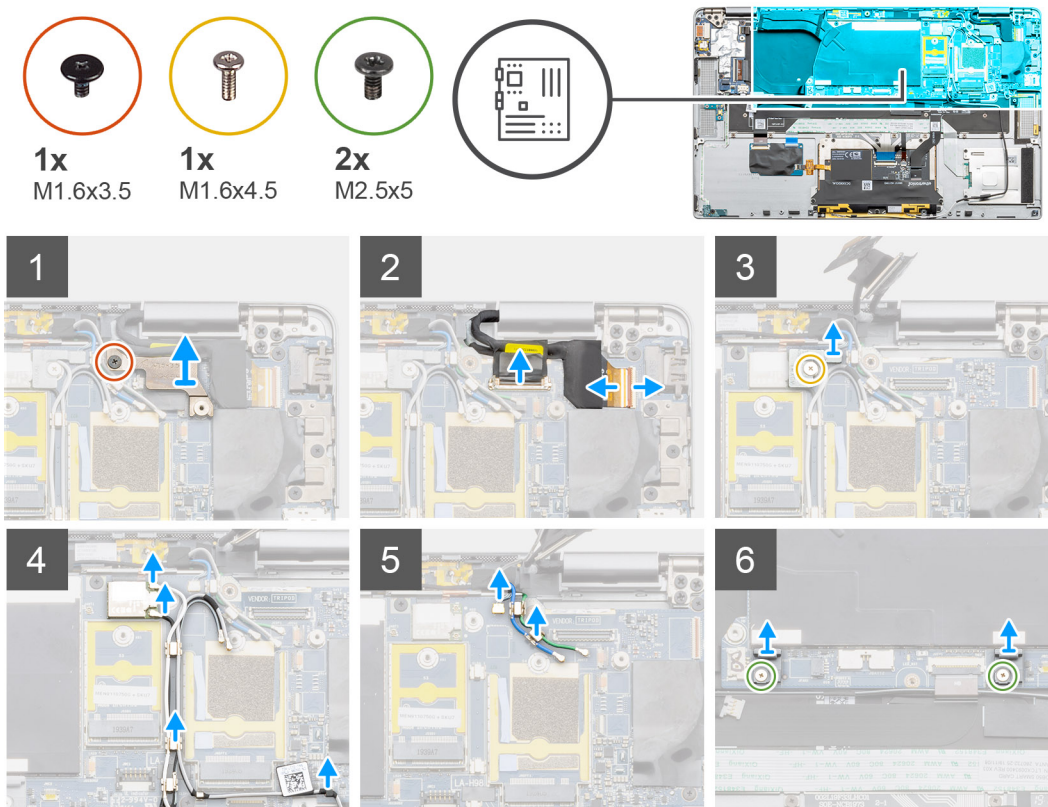
Removing the system board

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Remove the [Base cover](#).
5. Remove the [Solid-state drive](#).
6. Remove the [WWAN](#).
7. Remove the [Battery](#).
8. Remove the [Speakers](#).
9. Remove the [System Fan](#).

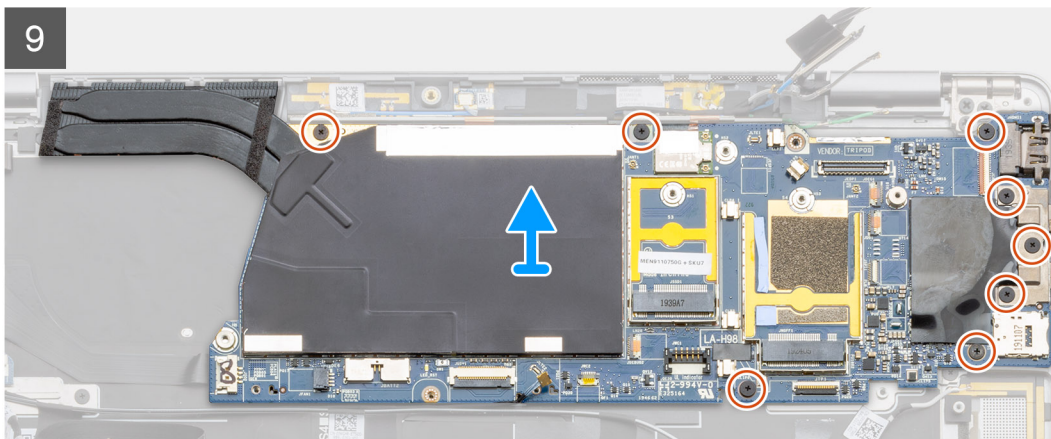
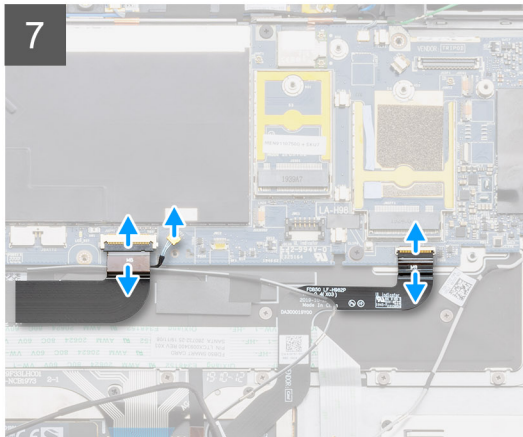
About this task

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





8x
M1.6x3.5



Steps

1. Remove the single (M1.6x3.5) screw that secures the display-cable bracket to the system board. Push the display-cable bracket from the bottom edge, and rotate the bracket in a counterclockwise direction to release the bracket from the securing peg, and remove it from the system.
2. Disconnect the display cable, and camera cable from the system board.

NOTE: Technicians must disconnect the display cable from the system board by pulling the pull tab in a direct upward motion to prevent damage to the connector.

3. Remove the single (M2x2) screw that secures the wireless module bracket to the system board.
4. Lift and remove the wireless module bracket away from the system board.
5. Disconnect the Darwin antenna cables from the wireless module, and unroute the cables from the routing guides on the system board.
6. Unroute the WWAN antenna cable from the routing guides on the system board.
7. Remove the two (M1.6x4.5) screws that secure the two system board hooks to the system board.
8. Disconnect the USH daughter board FFC cable, WWAN Darwin cable, and touchpad FPC from the connector on the system board.

NOTE: To disconnect the WWAN Darwin cable from the system board, insert a plastic scribe close to the rear side of the connector, and carefully pry in an upward direction.

9. Disconnect the I/O daughter board data FPC cable from the I/O daughter board.
10. Remove the three (M1.6x3.5) screws that secure the USB Type-C bracket to the system board.
11. Remove the five (M1.6x3.5) screws that secure the system board to the palmrest and keyboard assembly. Hold the left side of the system board and partially lift the system board from the system.
12. Flip over the system board from the top side of the system board. Disconnect the I/O daughter board data cable, and remove the system board from the system.

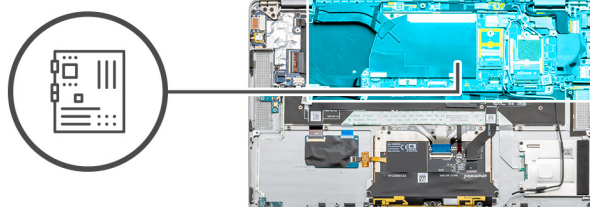
Installing the system board

Prerequisites

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

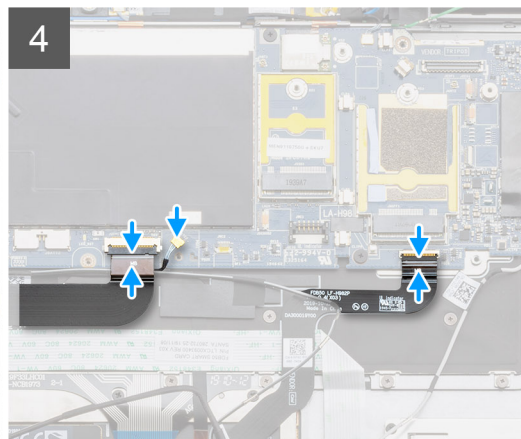
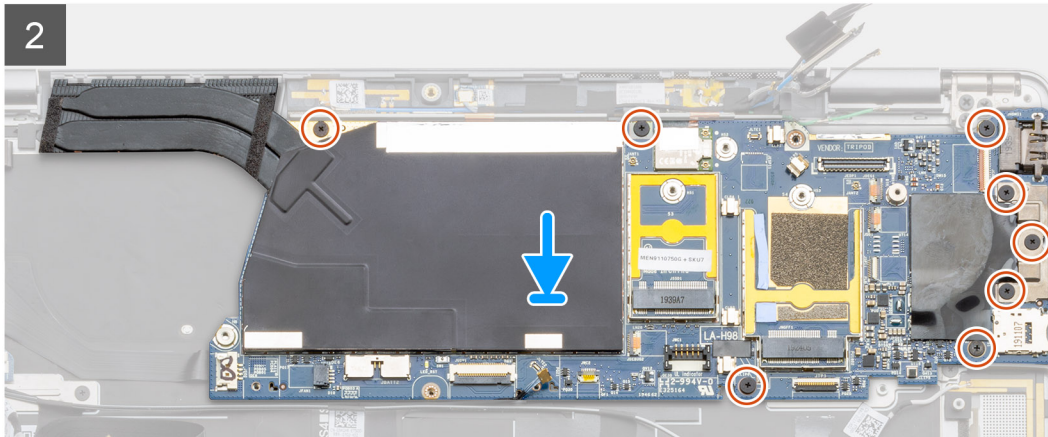
About this task

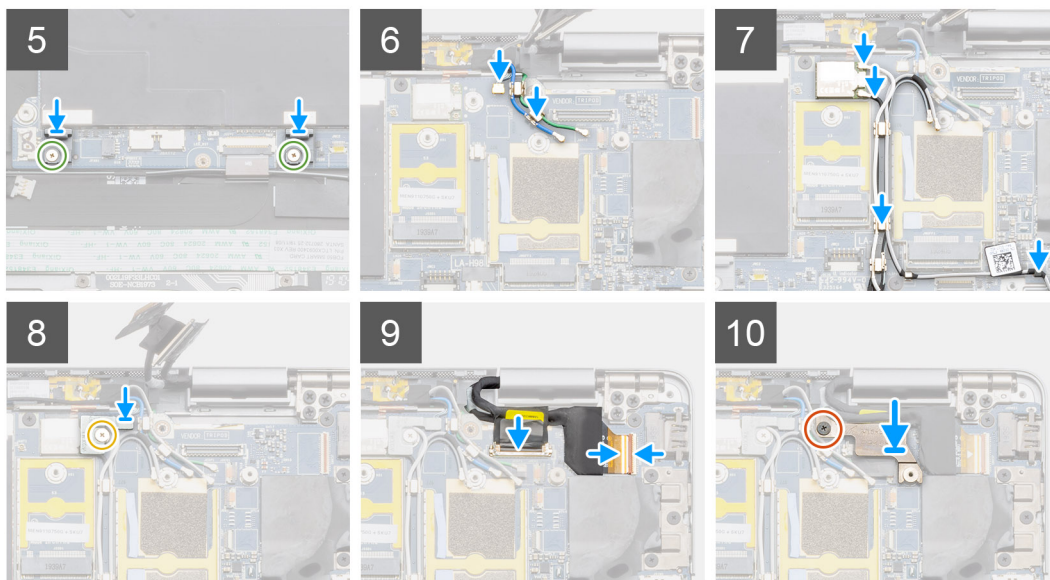
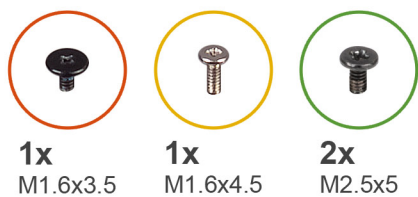
The following image indicates the location of the system board and provides a visual representation of the installation procedure.





8x
M1.6x3.5





Steps

1. Flip the system board over and connect the I/O daughter board data cable.
 2. Align and place the system board on the palmrest and keyboard assembly.
 3. Replace the five (M1.6x3.5) screws to secure the system board to the palmrest and keyboard assembly .
 4. Replace the three (M1.6x3.5) screws to secure the USB Type-C bracket to the system board.
 5. Connect the I/O daughter board data FPC cable to the connector on the I/O daughter board.
 6. Connect the USH daughter board FFC cable, WWAN Darwin cable, and Touchpad FPC to the connector on the system board.
 7. Replace the two (M1.6x4.5) screws to secure the two system board hooks to the system board.
- NOTE:** Do not slide the hooks on the system board to fit the positioning studs into the openings, as this will damage the system board. When installing the hooks, align the positioning studs on the hooks over the openings on the system board and then install the hooks on the system board.
8. Route the WWAN antenna cable through the routing guides on the system board.
 9. Connect the Darwin antenna cables to the wireless module, and route the cables through the routing guides on the system board.
 10. Align and place the wireless module bracket on the system board.
 11. Replace the single (M2x2) screw to secure the wireless module bracket to the system board.
 12. Connect the display cable, and camera cable to the system board.
 13. Replace the single (M1.6x3.5) screw to secure the display-cable bracket to the system board.

Next steps

1. Install the [System Fan](#).
2. Install the [Speakers](#).
3. Install the [Battery](#).
4. Install the [Solid-state drive](#).
5. Install the [WWAN](#).
6. Install the [Base cover](#).
7. Install the [SIM card tray](#)

8. Install the [microSD card](#).
9. Follow the procedure in [After working on your computer](#).

Display assembly

Removing the display assembly

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Remove the [Base cover](#).
5. Remove the [Battery](#).

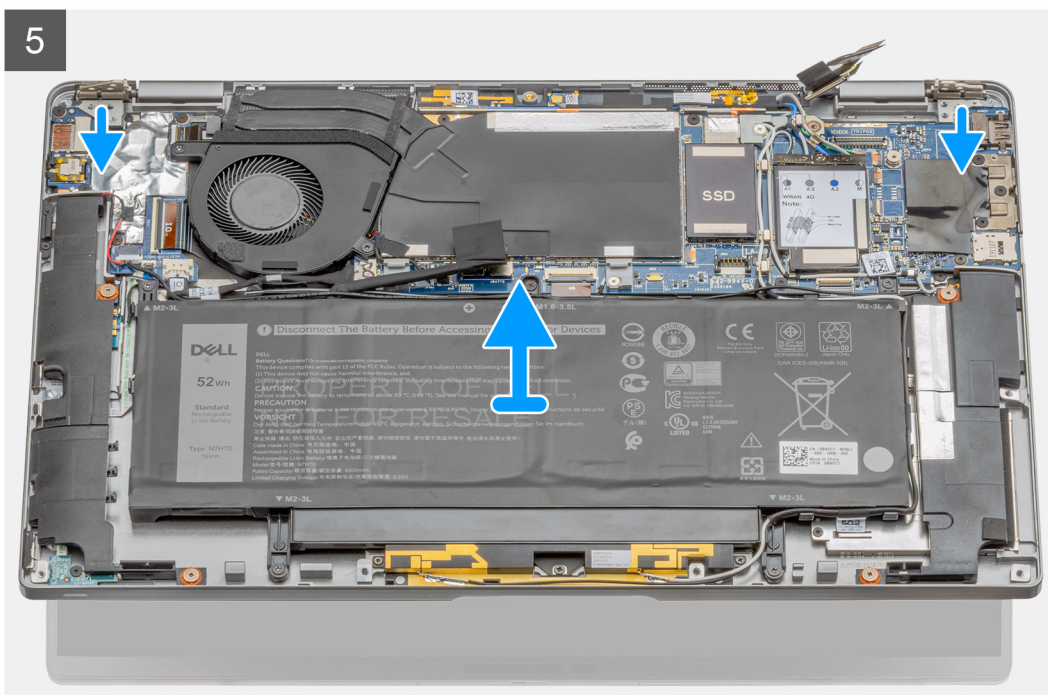
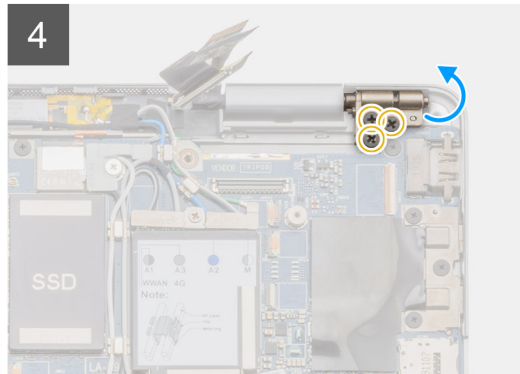
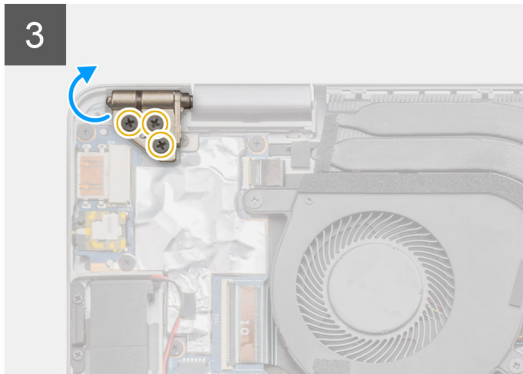
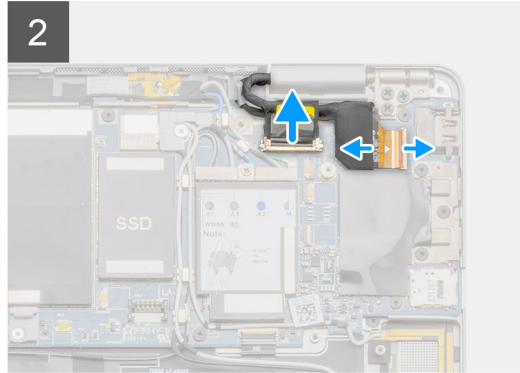
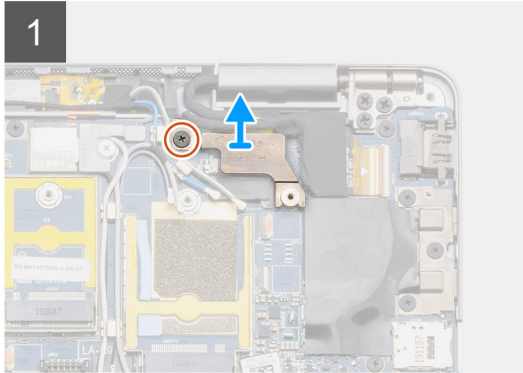
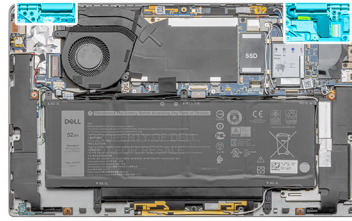
About this task

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

 **NOTE:** The display assembly removal procedure is the same for both laptop and convertible chassis.



6x
M2.5x5



6



Steps

1. Remove the single M1.6x3.5 screw securing the display-cable bracket, and remove the display-cable bracket .
2. Disconnect the display cable from the system board by pulling the pull tab in a direct upward motion, and disconnect and peel back the camera cable from the system board.



NOTE: Technicians must disconnect the display cable from the system board by pulling the pull tab in a direct upward motion to prevent damage to the connector's pins.

3. Open the display assembly to 90-degree angle and flip over the system, and then place the system on a flat surface.
4. Remove the six M2.5x5 screws that secure the display assembly to the laptop, press the edges of the laptop near the hinges, and lift the hinges in the upward direction away from the laptop.
5. Lift the display assembly off the laptop.

Installing the display assembly

Prerequisites

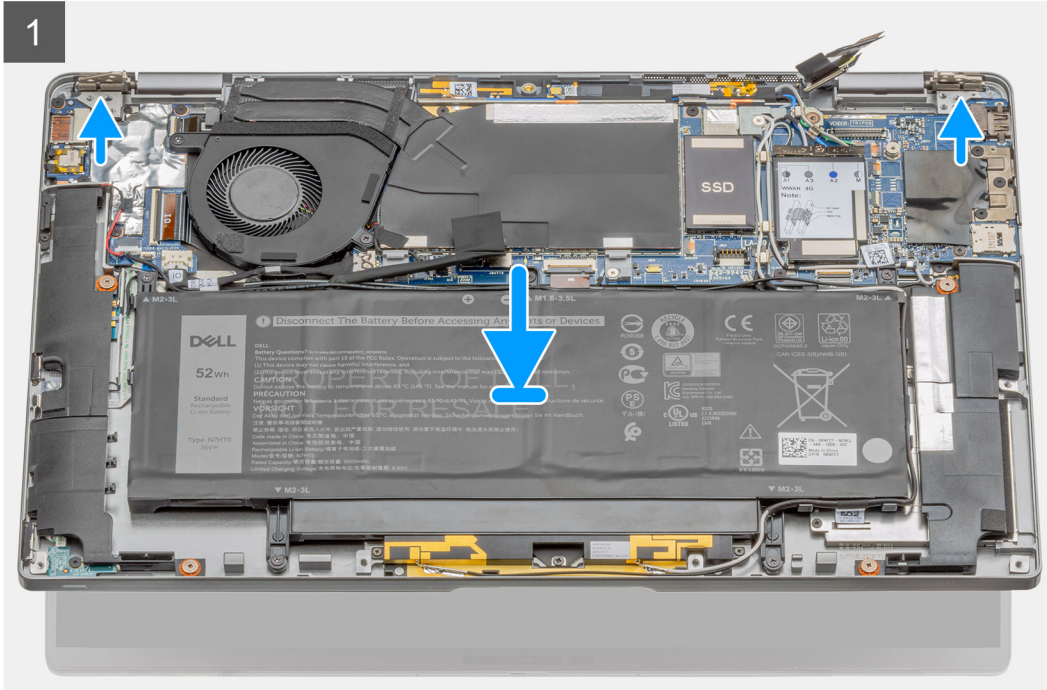
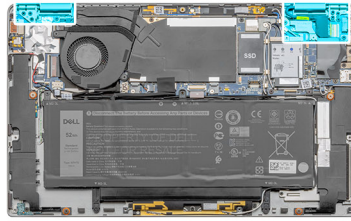
If you are replacing a component, remove the existing component before performing the installation procedure.



NOTE: The display assembly installation procedure is the same for both laptop and convertible chassis.

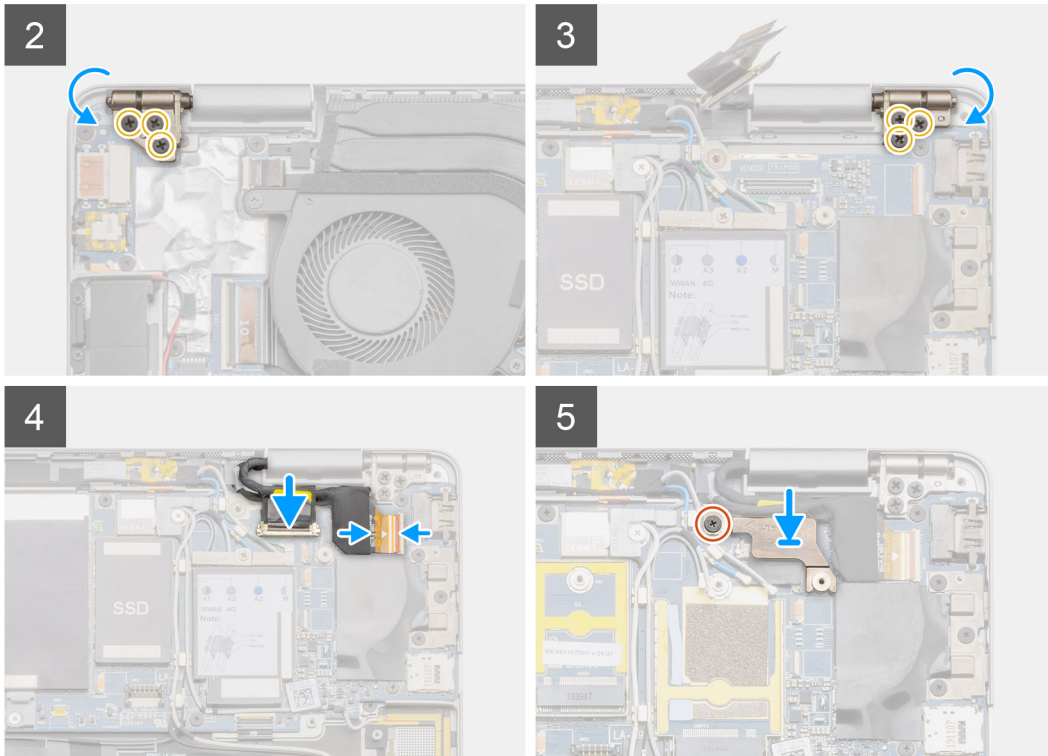
About this task

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





6x
M2.5x5



Steps

1. Align and place the system chassis under the hinges of the display assembly.
2. Install the six (M2.5x5) screws that secure the display hinges to the laptop.
3. Connect the display cable to the system board. Connect and adhere the camera cable to the system board.
4. Place the display cable bracket in place and install the single (M1.6x3.5) screw securing the display cable bracket.

Next steps

1. Install the [Battery](#).
2. Install the [Base cover](#).
3. Install the [SIM card tray](#)
4. Install the [microSD card](#).
5. Follow the procedure in [After working on your computer](#) .

Keyboard

Removing the keyboard

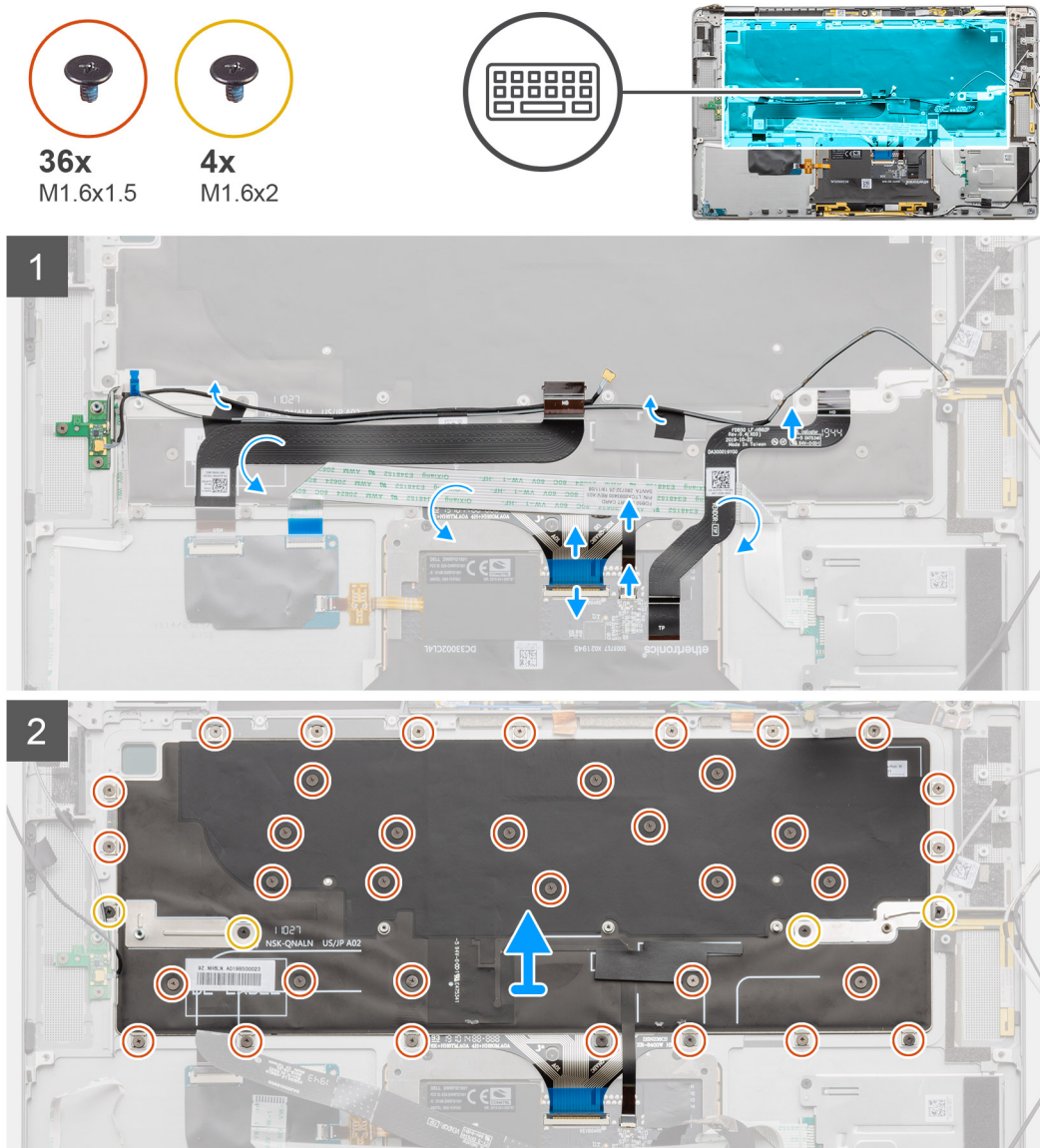
Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).

4. Remove the [Base cover](#).
5. Remove the [Solid-state drive](#).
6. Remove the [Speakers](#).
7. Remove the [Battery](#).
8. Remove the [Display assembly](#).
9. Remove the [Fan](#).
10. Remove the [I/O board](#).
11. Remove the [System board](#).

About this task

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



Steps

1. Peel back the antenna cable, WWAN Darwin cable, touchpad FPC, LED FFC from the keyboard.
2. Disconnect the backlight cable and the keyboard cable from the connectors on the touchpad.
3. Remove the four M1.6x2 and thirty-six M1.6x1.5 screws that secures the keyboard to the palmrest.
4. Lift the keyboard from the palmrest.

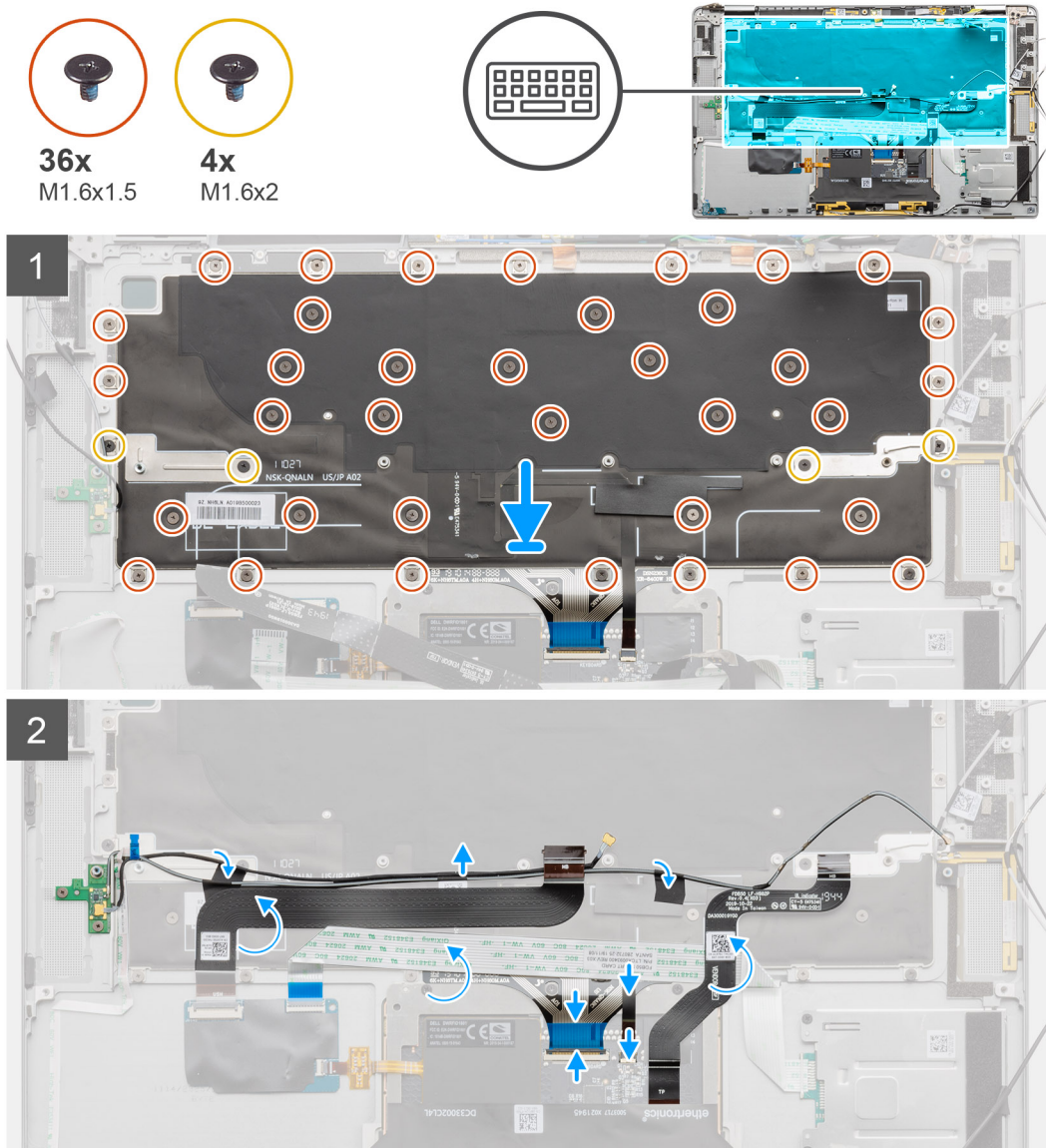
Installing the keyboard

Prerequisites

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

About this task

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



Steps

1. Align and place the keyboard on the palmrest.
2. Install the four M1.6x2 and thirty-six M1.6x1.5 screws to secure the keyboard.
3. Connect the keyboard cable and backlight cable to the connectors on the touchpad.
4. Adhere the antenna cable, WWAN Darwin cable, touchpad FPC, LED FPC to the keyboard.

Next steps

1. Install the [System board](#)
2. Install the [I/O board](#).

3. Install the [Fan](#).
4. Install the [Display assembly](#).
5. Install the [Battery](#).
6. Install the [Speakers](#).
7. Install the [Solid-state drive](#).
8. Install the [Base cover](#).
9. Install the [SIM card tray](#).
10. Install the [microSD card](#).
11. Follow the procedure in [After working on your computer](#).

Palmrest assembly

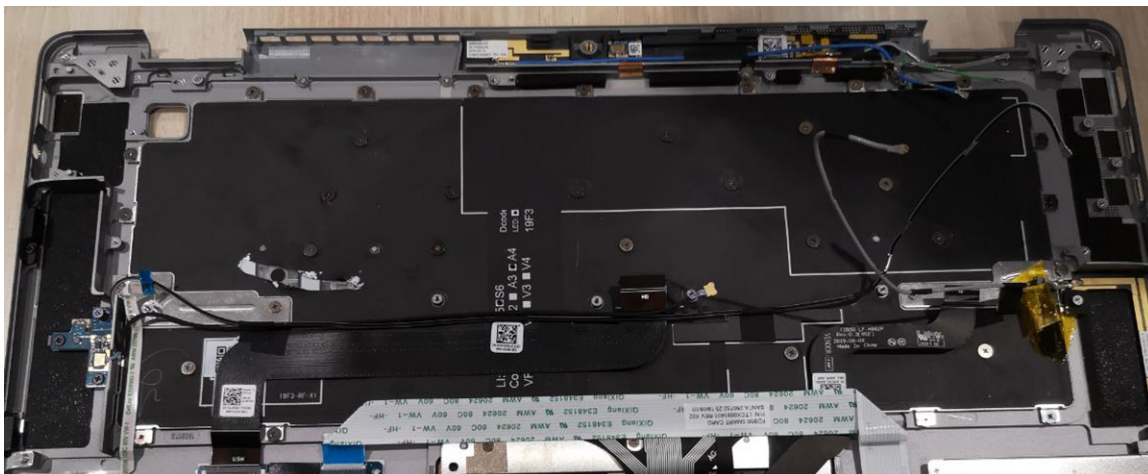
Removing the palmrest assembly

Prerequisites

1. Follow the procedure in [before working inside your computer](#).
2. Remove the [microSD card](#).
3. Remove the [SIM card tray](#).
4. Remove the [Base cover](#).
5. Remove the [Solid-state drive](#).
6. Remove the [Speakers](#).
7. Remove the [Battery](#).
8. Remove the [Display assembly](#).
9. Remove the [System Fan](#).
10. Remove the [I/O board](#).
11. Remove the [Power button](#).
12. Remove the [System board](#).
13. Remove the [Keyboard](#).

About this task

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



Steps

After performing the preceding steps, you are left with the palmrest assembly.

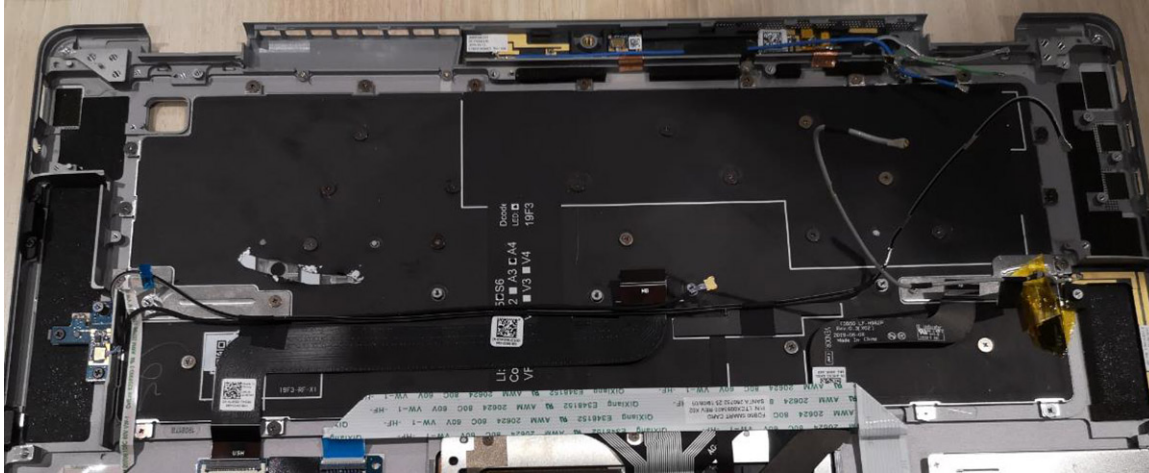
Installing the palmrest assembly

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 palmrest assembly and provides a visual representation of the installation procedure.



Steps

Transfer the components onto the new palmrest assembly.

Next steps

1. Install the [Keyboard](#).
2. Install the [System board](#)
3. Install the [FPC](#).
4. Install the [I/O board](#).
5. Install the [System Fan](#).
6. Install the [Display assembly](#).
7. Install the [Battery](#).
8. Install the [Speakers](#).
9. Install the [Solid-state drive](#).
10. Install the [Base cover](#).
11. Install the [SIM card tray](#)
12. Install the [microSD card](#).
13. Follow the procedure in [After working on your computer](#) .

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:

- [Entering BIOS without keyboard](#)
- [System setup options](#)
- [System Log](#)
- [Updating the BIOS](#)
- [Updating your system BIOS using a USB flash drive](#)
- [System and setup password](#)

Entering BIOS without keyboard

Steps

1. Press the power button to turn on your tablet.
2. Press and hold the **Volume Up** button when the Dell logo appears on the screen.
3. When the **F12** boot selection menu appears, select **BIOS Setup** using the **Volume Up** button.
4. Press the **Volume Down** button to enter BIOS setup program.


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	<ul style="list-style-type: none"> • 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 • 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.

Option	Description
Boot Sequence	<p>Boot Sequence Allows you to change the order in which the computer attempts to find an operating system. The options are:</p> <ul style="list-style-type: none"> Windows Boot Manager <p>By default, the options is checked.</p> <p>Boot List Options Allows you to change the boot list option:</p> <ul style="list-style-type: none"> 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	<p>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.</p> <ul style="list-style-type: none"> Always, Except Internal HDD. This option is enabled by default. Always, Except Internal HDD&PXE Never <p> NOTE: These options have no relevance if the Admin password is not set BIOS settings.</p>
Date/Time	Allows you to change the date and time.




System Configuration screen options

Option	Description
SMART Reporting	<p>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.</p> <ul style="list-style-type: none"> Enable SMART Reporting
USB Configuration	<p>This is an optional feature.</p> <p>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.</p> <p>If USB port is enabled, device attached to this port is enabled and available for OS.</p> <p>If USB port is disabled, the OS cannot see any device attached to this port.</p> <p>The options are:</p> <ul style="list-style-type: none"> Enable USB Boot Support—enabled by default Enable External USB Port—enabled by default <p> NOTE: USB keyboard and mouse always work in the BIOS setup irrespective of these settings.</p>
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	<p>This field enables or disables the integrated audio controller. By default, the Enable Audio option is selected. The options are:</p> <ul style="list-style-type: none"> Enable Microphone—enabled by default Enable Internal Speaker—enabled by default
Keyboard Illumination	<p>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:</p> <ul style="list-style-type: none"> Bright (default) Dim (50%)

Option	Description
Keyboard Backlight Timeout on Battery	<p>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:</p> <ul style="list-style-type: none"> • 5 sec • 10 sec—enabled by default • 15 sec • 30 sec • 1 min • 5 min • 15 min • Never
Keyboard Backlight Timeout on AC	<p>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:</p> <ul style="list-style-type: none"> • 5 sec • 10 sec—enabled by default • 15 sec • 30 sec • 1 min • 5 min • 15 min • Never
Unobtrusive Mode	<p>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.</p>
Miscellaneous Devices	<p>Allows you to enable or disable the following devices:</p> <ul style="list-style-type: none"> • 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	<p>Does not allow you to control the on-board LAN controller. The options are:</p> <ul style="list-style-type: none"> • 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	<p>Allows you to configure the various drives on board. All drives are enabled by default. The option is:</p> <ul style="list-style-type: none"> • M.2 2230 PCI-e SSD
SMART Reporting	<p>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.</p> <ul style="list-style-type: none"> • Enable SMART Reporting
USB Configuration	<p>This is an optional feature.</p> <p>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).</p> <p>If USB port is enabled, device attached to this port is enabled and available for OS.</p>

Option	Description
	<p>If USB port is disabled, the OS cannot see any device attached to this port.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Enable USB Boot Support • Enable External USB Port <p> NOTE: Both the option is enabled by default.</p>
Dell Type-C dock configuration	Does not support this configuration
Thunderbolt Adapter configuration:	<p>Allows you to configure the Thunderbolt™ adapter security settings within the Operating System.</p> <p> NOTE: Security Levels are not applicable or enforced in the Pre-boot environment.</p> <p>The options are:</p> <ul style="list-style-type: none"> • 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	<p>Allows you to enable or disable the integrated audio controller. By default, the Enable Audio option is selected.</p> <p>The options are:</p> <ul style="list-style-type: none"> • Enable Microphone This option is enabled by default. • Enable Internal Speaker This option is enabled by default.
Keyboard Illumination	<p>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:</p> <ul style="list-style-type: none"> • Disabled • Dim • Bright This option is enabled by default. <p> NOTE: The <Fn+F10> hotkey can be used to change the setting.</p>
Keyboard Backlight Timeout on AC	<p>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:</p> <ul style="list-style-type: none"> • 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	<p>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:</p> <ul style="list-style-type: none"> • 5 seconds • 10 seconds This option is enabled by default. • 15 seconds




Option	Description
	<ul style="list-style-type: none"> • 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	<p>Allows you to enable or disable various on board devices:</p> <ul style="list-style-type: none"> • 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	<p>Allows you to set, change, or delete the administrator (admin) password.</p> <p> 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.</p> <p> NOTE: Password changes take effect immediately.</p> <p>By default, the drive will not have a password set.</p>
System Password	<p>Allows you to set, change or delete the system password.</p> <p> NOTE: Password changes take effect immediately.</p> <p>By default, the drive will not have a password set.</p>
Password Configuration	Allows you to determine the minimum and maximum length of Administrator and System passwords.
Password Bypass	<p>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:</p> <ul style="list-style-type: none"> • Disabled. This option is selected by default. • Reboot bypass
Password Change	<p>Allows you to enable or disable permission to the System and Hard Drive passwords when the admin password is set.</p> <p>Allow Non-Admin Password Changes This option is selected by default.</p>
UEFI Capsule Firmware Updates	<p>This option controls whether the system allows BIOS updates via UEFI capsule update packages.</p> <p>Enable UEFI Capsule Firmware Updates option is selected by default.</p>

Option	Description
	<p> NOTE: Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS).</p>
TPM 2.0 Security	<p>Allows you to enable the Trusted Platform Module (TPM) during POST.</p> <p>You can control whether the trusted platform module is visible to the operating system. The option is:</p> <ul style="list-style-type: none"> • 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. <p> 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.</p> <p> 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.</p>
Absolute (R)	<p>Allows you to activate or disable the optional Computrace Service from Absolute software. The options are:</p> <ul style="list-style-type: none"> • Deactivate • Disable • Activate <p> NOTE: The Activate and Disable options will permanently activate or disable the feature and no further changes will be allowed</p> <p>Default setting: Activate</p>
Admin Setup Lockout	<p>Allows you to prevent users from entering the setup when an Administrator password is set.</p> <p>Enable Admin Setup Lockout This option is not selected by default.</p>
Master Password Lockout	<p>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.</p> <p>Enable Master Password Lockout This option is not selected by default.</p>
SSM Security Mitigation	<p>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.</p> <p>SSM Security Mitigation This option is disabled by default.</p>

Secure Boot

Option	Description
Secure Boot Enable	<p>This option enables or disables the Secure Boot feature.</p> <ul style="list-style-type: none"> • Disabled • Enabled <p>Default setting: Enabled.</p>
Expert Key Management	<p>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.</p>
Custom Mode Key Management	<p>Allows you to manage the security key databases only if the system is in Custom Mode .The options are:</p>

Option	Description
	<ul style="list-style-type: none"> • PK. This option is selected by default. • KEK • db • dbx <p> 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.</p>

Intel software Guard Extensions

Option	Description
Intel SGX Enable	<p>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:</p> <ul style="list-style-type: none"> • Disabled • Enabled • Software Controlled. This option is selected by default.
Enclave Memory Size	<p>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:</p> <ul style="list-style-type: none"> • 32 MB • 64 MB • 128 MB

Performance screen options

Option	Description
Multi Core Support	<p>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.</p> <ul style="list-style-type: none"> • All This option is enabled by default. • 1 • 2 • 3
Intel SpeedStep	<p>Allows you to enable or disable the Intel SpeedStep mode of the processor.</p> <ul style="list-style-type: none"> • Enable Intel SpeedStep <p>Default setting: The option is enabled.</p>
C-States Control	<p>Allows you to enable or disable the additional processor sleep states.</p> <ul style="list-style-type: none"> • C states <p>Default setting: The option is enabled.</p>
Intel TurboBoost	<p>Allows you to enable or disable the Intel TurboBoost mode of the processor.</p> <ul style="list-style-type: none"> • Enable Intel TurboBoost <p>Default setting: The option is enabled.</p>
HyperThread Control	<p>Allows you to enable or disable the HyperThreading in the processor.</p> <ul style="list-style-type: none"> • Disabled • Enabled This option is enabled by default.

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. <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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. <ul style="list-style-type: none">• WWAN/GPS

Option	Description
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- WLAN
- 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.
--------------------	--------------------------------------------

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.
------------------	----------------------------------------------------------------------------------------------------------------

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.

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.

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.

System logs screen options

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

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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System Log

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

Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
-----------------------	-----------------------------------------------------------------

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

Prerequisites

It is recommended to update your BIOS (System setup) on replacing the system board or if an update is available. Ensure that your tablet/notebook/desktop battery is fully charged and connected to a power outlet.

Steps

1. Restart the tablet/notebook/desktop.
2. Go to **Dell.com/support**.


3. Enter the **Service Tag** or **Express Service Code** and click **Submit**.

 **NOTE:** To locate the Service Tag, click [Where is my Service Tag?](#)

 **NOTE:** If you cannot find your Service Tag, click **Detect My Product**. Proceed with the instructions on screen.

4. If you are unable to locate or find the Service Tag, click the Product Category of your tablet/notebook/desktop.
5. Choose the **Product Type** from the list.
6. Select your tablet/notebook/desktop model and the **Product Support** page of your tablet/notebook/desktop appears.
7. Click **Get drivers** and click **View All Drivers**.
The Drivers and Downloads page opens.
8. On the Drivers and Downloads screen, under the **Operating System** drop-down list, select **BIOS**.
9. Identify the latest BIOS file and click **Download File**.
You can also analyze which drivers need an update. To do this for your product, click **Analyze System for Updates** and follow the instructions on the screen.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.
The **File Download** window appears.
11. Click **Save** to save the file on your tablet/notebook/desktop.
12. Click **Run** to install the updated BIOS settings on your tablet/notebook/desktop.
Follow the instructions on the screen.

Next steps

 **NOTE:** It is recommended not to update the BIOS version for more than 3 revisions. For example: If you want to update the BIOS from 1.0 to 7.0, then install version 4.0 first and then install version 7.0.

Updating your system BIOS using a USB flash drive

About this task

If the system cannot load into Windows, but there is still a need to update the BIOS, download the BIOS file using another system and save it to a bootable USB Flash Drive.

 **NOTE:** You will need to use a bootable USB flash drive. Please refer to the following article for further details [How to Create a Bootable USB Flash Drive using Dell Diagnostic Deployment Package \(DDDP\)](#)

Steps

1. Download the BIOS update .EXE file to another system.
2. Copy the file e.g. O9010A12.EXE onto the bootable USB flash drive.
3. Insert the USB flash drive into the system that requires the BIOS update.
4. Restart the system and press F12 when the Dell splash logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and click **Enter**.
6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename, for example, O9010A12.exe and press **Enter**.
8. The BIOS Update Utility will load. Follow the instructions on screen.

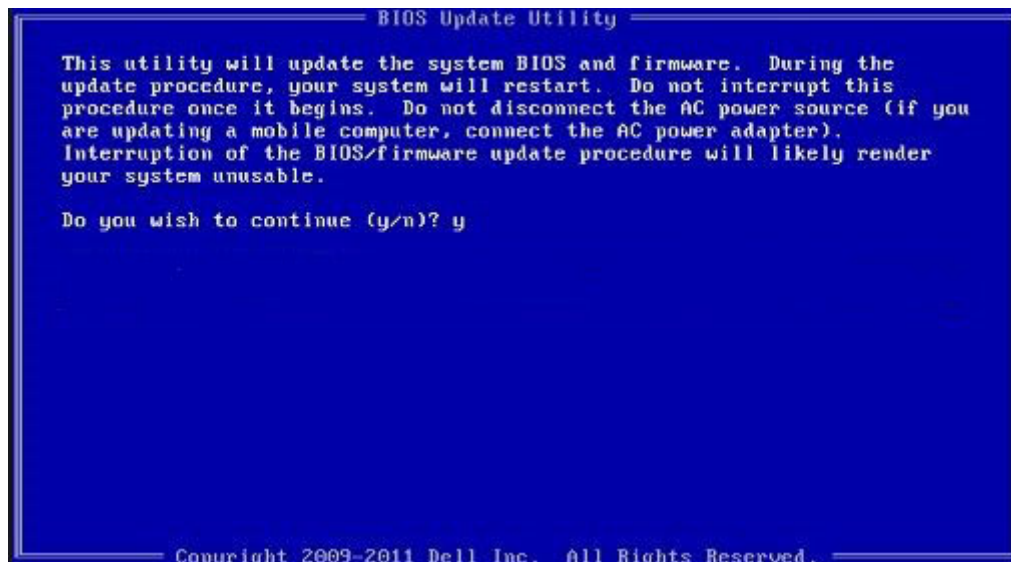


Figure 1. DOS BIOS Update Screen

System and setup password

Table 2. 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.

Troubleshooting

Topics:

- [Dell SupportAssist Pre-boot System Performance Check diagnostics](#)
- [System diagnostic lights](#)
- [Flashing BIOS \(USB key\)](#)
- [Flashing the BIOS](#)
- [Backup media and recovery options](#)
- [WiFi power cycle](#)
- [Flea power release](#)

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

The 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.

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.

Table 3. LED codes

Diagnostic light codes	Problem description
2,1	Processor failure
2,2	System board: BIOS or ROM (Read-Only Memory) failure
2,3	No memory or RAM (Random-Access Memory) detected
2,4	Memory or RAM (Random-Access Memory) failure
2,5	Invalid memory installed
2,6	System-board or chipset error
2,7	Display failure
2,8	LCD power rail failure. Replace system board and LCD
3,1	Coin-cell battery failure
3,2	PCI, video card/chip failure
3,3	Recovery image not found
3,4	Recovery image found but invalid
3,5	Power-rail failure
3,6	System BIOS Flash incomplete
3,7	Management Engine (ME) error

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.

Flashing BIOS (USB key)

Steps

1. Follow the procedure from step 1 to step 7 in "[Flashing the BIOS](#)" to download the latest BIOS setup program file.

2. Create a bootable USB drive. For more information see the knowledge base article [SLN143196](#) 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** when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
8. The **BIOS Update Utility** appears. Follow the instructions on the screen to complete the BIOS update.


Flashing the BIOS

About this task

You may need to flash (update) the BIOS when an update is available or when you replace the system board.

Follow these steps to flash the BIOS:

Steps

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support**, 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 > Find it myself**.
5. Select the operating system installed on your computer.
6. Scroll down the page and expand **BIOS**.
7. Click **Download** to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon and follow the instructions on the screen.

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

Topics:

- [Contacting Dell](#)

Contacting Dell

Prerequisites

 **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.

About this task

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

Steps

1. Go to **Dell.com/support**.
2. Select your support category.
3. Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.