Dell Latitude 3301

Service Manual

Regulatory Model: P114G
Regulatory Type: P114G001
August 2021
Rev. A03

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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Contents

1

Working on your computer

Topics:

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 the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in reverse order.

NOTE: Disconnect 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 to the power source.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

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

CAUTION: System will shut down if side covers are removed while the system is running. The system will not power on if the side cover is removed.

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Turning off your computer — Windows 10

CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer or remove the side cover.

1. Click or tap  .
2. Click or tap and then click or tap **Shut down**.

   NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

Before working inside your computer

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

After working inside your computer

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

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

2

Technology and components

NOTE: Instructions provided in this section are applicable on computers shipped with Windows 10 operating system. Windows 10 is factory-installed with this computer.

Topics:

LPDDR3

LPDDR3 (double data rate third generation low voltage) memory is a higher-speed successor to the DDR2 and DDR3 technologies and allows up to 512 GB in capacity, compared to the DDR3's maximum of 128 GB per DIMM.

LPDDR3 needs 20 percent less or just 1.35 volts, compared to DDR3 which requires 1.5 volts of electrical power to operate. LPDDR3 also supports a new, deep power-down mode that allows the host device to go into standby without needing to refresh its memory. Deep power-down mode is expected to reduce standby power consumption by 40 to 50 percent.

Memory Errors

Memory errors on the system display the new ON-FLASH-FLASH or ON-FLASH-ON failure code. If all memory fails, the LCD does not turn on. Troubleshoot for possible memory failure by trying known good memory modules in the memory connectors on the bottom of the system or under the keyboard, as in some portable systems.

NOTE: The LPDDR3 memory is imbedded in board and not a replaceable DIMM as shown and referred.

HDMI 1.4- HDMI 2.0

This topic explains the HDMI 1.4/2.0 and its features along with the advantages.

HDMI (High-Definition Multimedia Interface) is an industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any compatible digital audio/video source, such as a DVD player, or A/V receiver and a compatible digital audio and/or video monitor, such as a digital TV (DTV). The intended applications for HDMI TVs, and DVD players. The primary advantage is cable reduction and content protection provisions. HDMI supports standard, enhanced, or high-definition video, plus multichannel digital audio on a single cable.

NOTE: The HDMI 1.4 will provide 5.1 channel audio support.

HDMI 1.4- HDMI 2.0 Features

- **HDMI Ethernet Channel** - Adds high-speed networking to an HDMI link, allowing users to take full advantage of their IP-enabled devices without a separate Ethernet cable
- **Audio Return Channel** - Allows an HDMI-connected TV with a built-in tuner to send audio data "upstream" to a surround audio system, eliminating the need for a separate audio cable
- **3D** - Defines input/output protocols for major 3D video formats, paving the way for true 3D gaming and 3D home theater applications
- **Content Type** - Real-time signaling of content types between display and source devices, enabling a TV to optimize picture settings based on content type

- **Additional Color Spaces** - Adds support for additional color models used in digital photography and computer graphics
- **4K Support** - Enables video resolutions far beyond 1080p, supporting next-generation displays that will rival the Digital Cinema systems used in many commercial movie theaters
- **HDMI Micro Connector** - A new, smaller connector for phones and other portable devices, supporting video resolutions up to 1080p
- **Automotive Connection System** - New cables and connectors for automotive video systems, designed to meet the unique demands of the motoring environment while delivering true HD quality

Advantages of HDMI

- Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
- Low -cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner
- Audio HDMI supports multiple audio formats from standard stereo to multichannel surround sound
- HDMI combines video and multichannel audio into a single cable, eliminating the cost, complexity, and confusion of multiple cables currently used in A/V systems
- HDMI supports communication between the video source (such as a DVD player) and the DTV, enabling new functionality

USB features

Universal Serial Bus, or USB, was introduced in 1996. It dramatically simplified the connection between host computers and peripheral devices like mice, keyboards, external drivers, and printers.

Let's take a quick look on the USB evolution referencing to the table below.

Table 1. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 2.0	480 Mbps	High Speed	2000
USB 3.0/USB 3.1 Gen 1	5 Gbps	Super Speed	2010
USB 3.1 Gen 2	10 Gbps	Super Speed	2013

USB 3.0/USB 3.1 Gen 1 (SuperSpeed USB)

For years, the USB 2.0 has been firmly entrenched as the de facto interface standard in the PC world with about 6 billion devices sold, and yet the need for more speed grows by ever faster computing hardware and ever greater bandwidth demands. The USB 3.0/USB 3.1 Gen 1 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.1 Gen 1 features are as follows:

- Higher transfer rates (up to 5 Gbps)
- Increased maximum bus power and increased device current draw to better accommodate power-hungry devices
- New power management features
- Full-duplex data transfers and support for new transfer types
- Backward USB 2.0 compatibility
- New connectors and cable

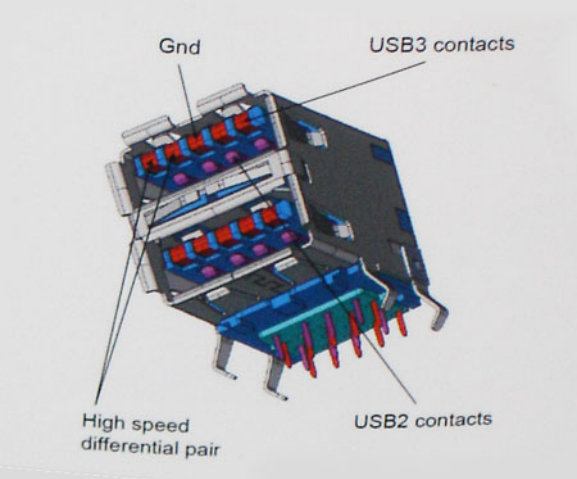
The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

Speed

Currently, there are 3 speed modes defined by the latest USB 3.0/USB 3.1 Gen 1 specification. They are Super-Speed, Hi-Speed and Full-Speed. The new SuperSpeed mode has a transfer rate of 4.8Gbps. While the specification retains Hi-Speed, and Full-Speed USB mode, commonly known as USB 2.0 and 1.1 respectively, the slower modes still operate at 480Mbps and 12Mbps respectively and are kept to maintain backward compatibility.

USB 3.0/USB 3.1 Gen 1 achieves the much higher performance by the technical changes below:

- An additional physical bus that is added in parallel with the existing USB 2.0 bus (refer to the picture below).
- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.0/USB 3.1 Gen 1 adds four more for two pairs of differential signals (receive and transmit) for a combined total of eight connections in the connectors and cabling.
- USB 3.0/USB 3.1 Gen 1 utilizes the bidirectional data interface, rather than USB 2.0's half-duplex arrangement. This gives a 10-fold increase in theoretical bandwidth.



With today's ever increasing demands placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, making data transfer at around 320Mbps (40MB/s) — the actual real-world maximum. Similarly, USB 3.0/USB 3.1 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400MB/s with overheads. At this speed, USB 3.0/USB 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.0/USB 3.1 Gen 1 opens up the laneways and provides more headroom for devices to deliver a better overall experience. Where USB video was barely tolerable previously (both from a maximum resolution, latency, and video compression perspective), it's easy to imagine that with 5-10 times the bandwidth available, USB video solutions should work that much better. Single-link DVI requires almost 2Gbps throughput. Where 480Mbps was limiting, 5Gbps is more than promising. With its promised 4.8Gbps speed, the standard will find its way into some products that previously weren't USB territory, like external RAID storage systems.

Listed below are some of the available SuperSpeed USB 3.0/USB 3.1 Gen 1 products:

- External Desktop USB 3.0/USB 3.1 Gen 1 Hard Drives
- Portable USB 3.0/USB 3.1 Gen 1 Hard Drives
- USB 3.0/USB 3.1 Gen 1 Drive Docks & Adapters
- USB 3.0/USB 3.1 Gen 1 Flash Drives & Readers
- USB 3.0/USB 3.1 Gen 1 Solid-state Drives
- USB 3.0/USB 3.1 Gen 1 RAIDs
- Optical Media Drives
- Multimedia Devices
- Networking
- USB 3.0/USB 3.1 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0/USB 3.1 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0/USB 3.1 Gen 1 specifies new physical connections and thus new cables to take advantage of the higher speed capability of the new protocol, the connector itself remains the same rectangular shape with the four USB 2.0 contacts in the exact same location as before. Five new connections to carry receive and transmitted data independently are present on USB 3.0/USB 3.1 Gen 1 cables and only come into contact when connected to a proper SuperSpeed USB connection.

Windows 10 will be bringing native support for USB 3.1 Gen 1 controllers. This is in contrast to previous versions of Windows, which continue to require separate drivers for USB 3.0/USB 3.1 Gen 1 controllers.

Intel Optane memory

Intel Optane memory functions only as a storage accelerator. It neither replaces nor adds to the memory (RAM) installed on your computer.

NOTE: Intel Optane memory is supported on computers that meet the following requirements:

- 7th Generation or higher Intel Core i3/i5/i7 processor
- Windows 10 64-bit version 1607 or higher
- Intel Rapid Storage Technology driver version 15.9.1.1018 or higher

Table 2. Intel Optane memory specifications

Feature	Specifications
Interface	PCIe 3x2 NVMe 1.1
Connector	M.2 card slot (2230/2280)
Configurations supported	• 7th Generation or higher Intel Core i3/i5/i7 processor • Windows 10 64-bit version 1607 or higher • Intel Rapid Storage Technology driver version 15.9.1.1018 or higher
Capacity	16 GB

Enabling Intel Optane memory

1. On the taskbar, click the search box, and type **"Intel Rapid Storage Technology"**.
2. Click **Intel Rapid Storage Technology**.
3. On the **Status** tab, click **Enable** to enable the Intel Optane memory.
4. On the warning screen, select a compatible fast drive, and then click **Yes** to continue enabling Intel Optane memory.
5. Click **Intel Optane memory > Reboot** to enable the Intel Optane memory.

   NOTE: Applications may take up to three subsequent launches after enablement to see the full performance benefits.

Disabling Intel Optane memory

CAUTION: After disabling Intel Optane memory, do not uninstall the driver for Intel Rapid Storage Technology as it will result in a blue screen error. The Intel Rapid Storage Technology user interface can be removed without uninstalling the driver.

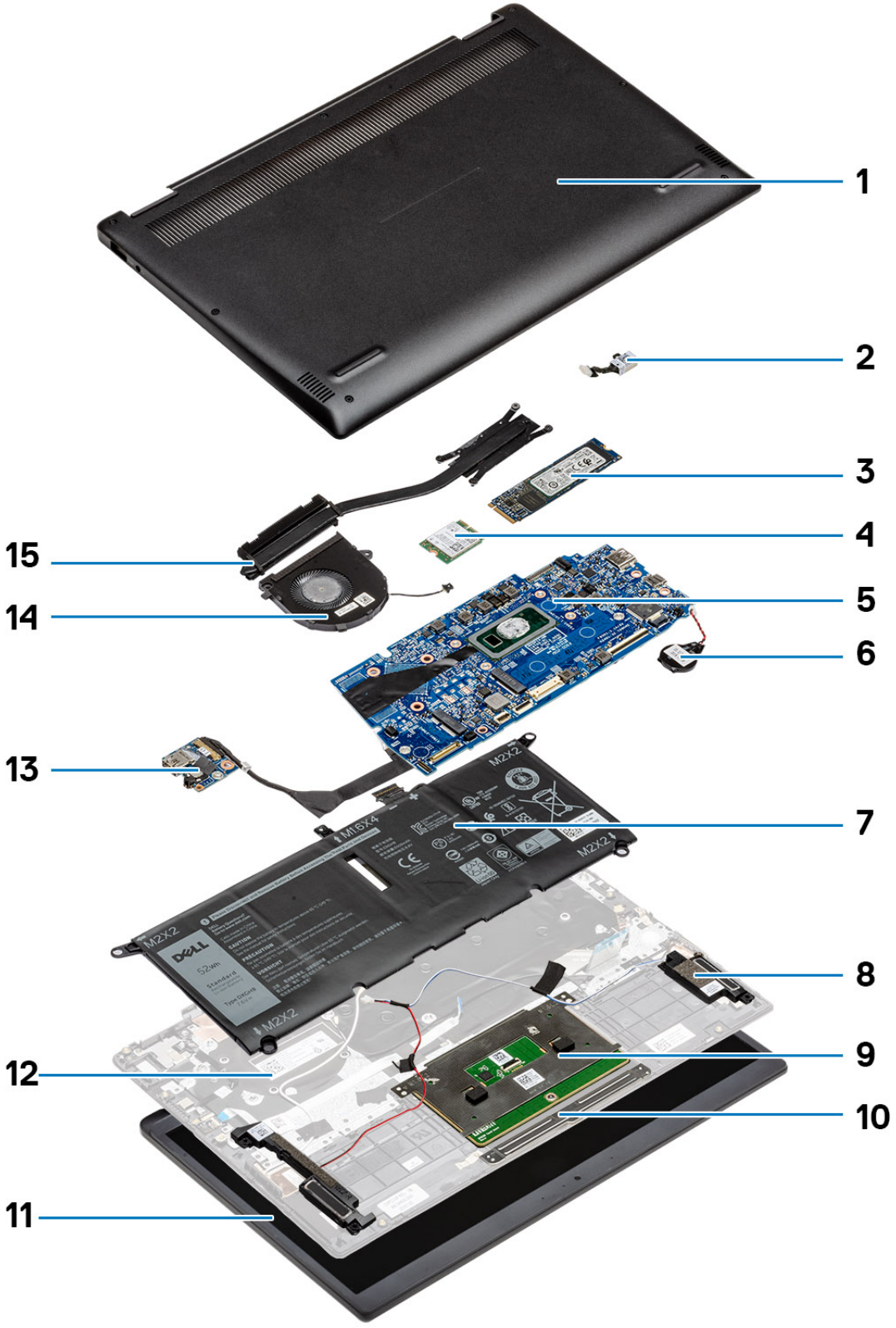
NOTE: Disabling Intel Optane memory is required before removing the SATA storage device, accelerated by the Intel Optane memory module, from the computer.

1. On the taskbar, click the search box, and then type **"Intel Rapid Storage Technology"**.
2. Click **Intel Rapid Storage Technology**. The **Intel Rapid Storage Technology** window is displayed.
3. On the **Intel Optane memory** tab, click **Disable** to disable the Intel Optane memory.

4. Click **Yes** if you accept the warning.
   The disabling progress is displayed.
5. Click **Reboot** to complete disabling Intel Optane memory and restart your computer.

3

Major components of your system



1. Base cover
2. Power-adapter port
3. Solid-state drive
4. WLAN card
5. System board
6. Coin-cell battery
7. Battery
8. Speakers
9. Touchpad
10. Touchpad buttons
11. Display assembly
12. Palmrest assembly
13. I/O board
14. Fan
15. Heatsink

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.

4

Removing and installing components

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

Topics:

Recommended tools

The procedures in this document may require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Philips #2 screwdriver
- Plastic scribe-Recommended for field technician
- T-30 torx screwdriver

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 computers 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 3. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Base cover	Palm rest and keyboard assembly	M2x6 Captive screws	4 3	 **NOTE:** Screw color may vary depending on the configuration ordered.
Battery	Palm rest and keyboard assembly	M2x3	4	
Battery	Palm rest and keyboard assembly	M1.6x4	1	
Fan	Palm rest and keyboard assembly	M2x3	2	

Table 3. Screw list (continued)

Component	Secured to	Screw type	Quantity	Screw image
WLAN Card	WLAN Card bracket	M2x2.5	1	
WWAN Card	WWAN Card bracket	M2x2.5	1	
Touchpad	Palm-rest keyboard assembly.	M1.6x2	5	
M.2 2230/2280 Solid State Drive	Palm rest and keyboard assembly	M2x2.5	1	
Heat sink	System board	Captive screws	7	
Hinges	Palm rest and keyboard assembly	M2.5x3.5	2	
Hinge brackets	Display back-cover and antenna assembly	M2.5x3.5	1	
Hinge brackets	Display back-cover and antenna assembly	M2x2	2	
I/O board	Palm rest and keyboard assembly	M2.5x3.5	2	
I/O board	Palm rest and keyboard assembly	M2x3	1	
USB Type-C port bracket	System board	M2.5x3.5	1	
Power-adapter port	Palm rest and keyboard assembly	M2x3	1	
Power-button board	Palm rest and keyboard assembly	M2x2	1	
Power button with fingerprint reader (optional)	Palm rest and keyboard assembly	M2x2	1	
System board	Palm rest and keyboard assembly	M2x4	2	
Wireless-card bracket	System board	M2x3	1	

Disassembly and reassembly

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

Base cover

Removing the base cover

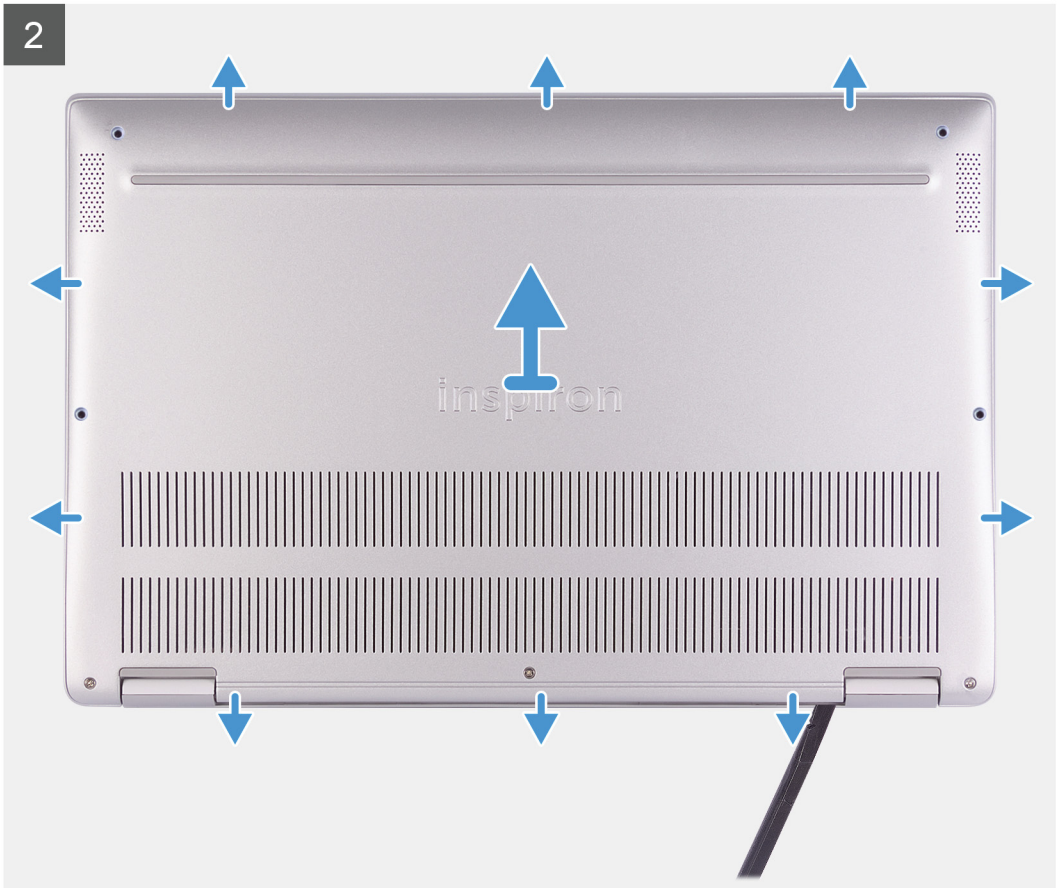
1. Follow the procedure in Before working inside your computer.

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

4x
M2x6

4x
M2x6

1



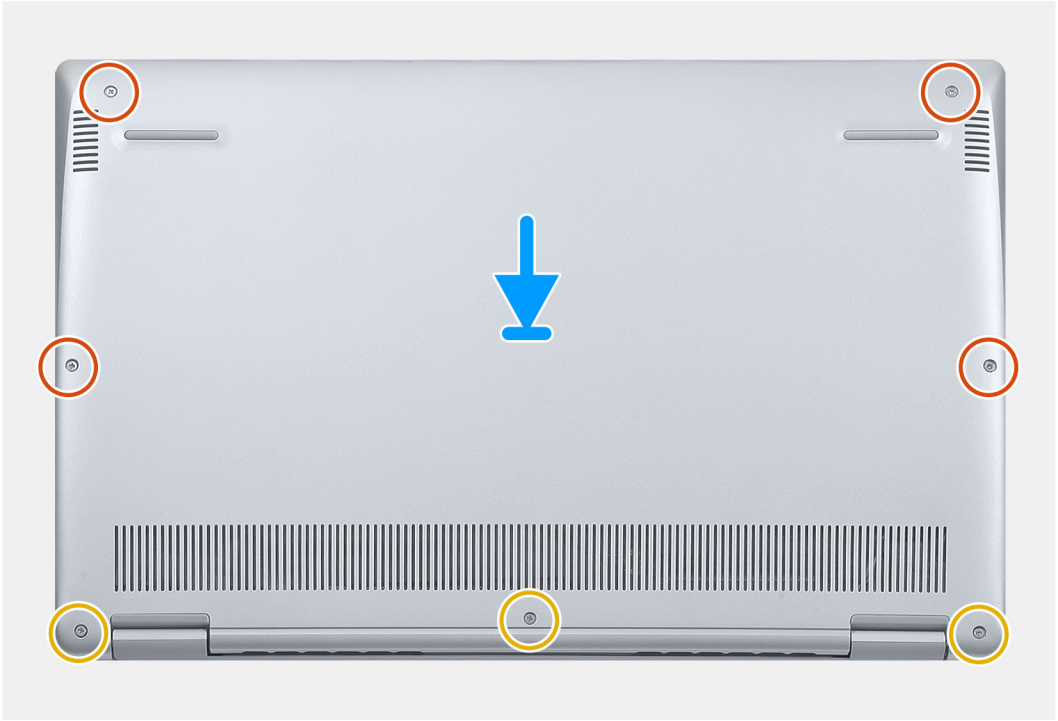
1. Loosen the three captive screws on the base cover.
2. Remove the four screws (M2x6) that secure the base cover to the palm-rest and keyboard assembly.
3. Pry the base cover starting from the top-left corner of the palm-rest and keyboard assembly.
4. Using a plastic scribe, pry the base cover from the palm-rest and keyboard assembly.
5. Lift the base cover off the palm-rest and keyboard assembly.

Installing the base cover

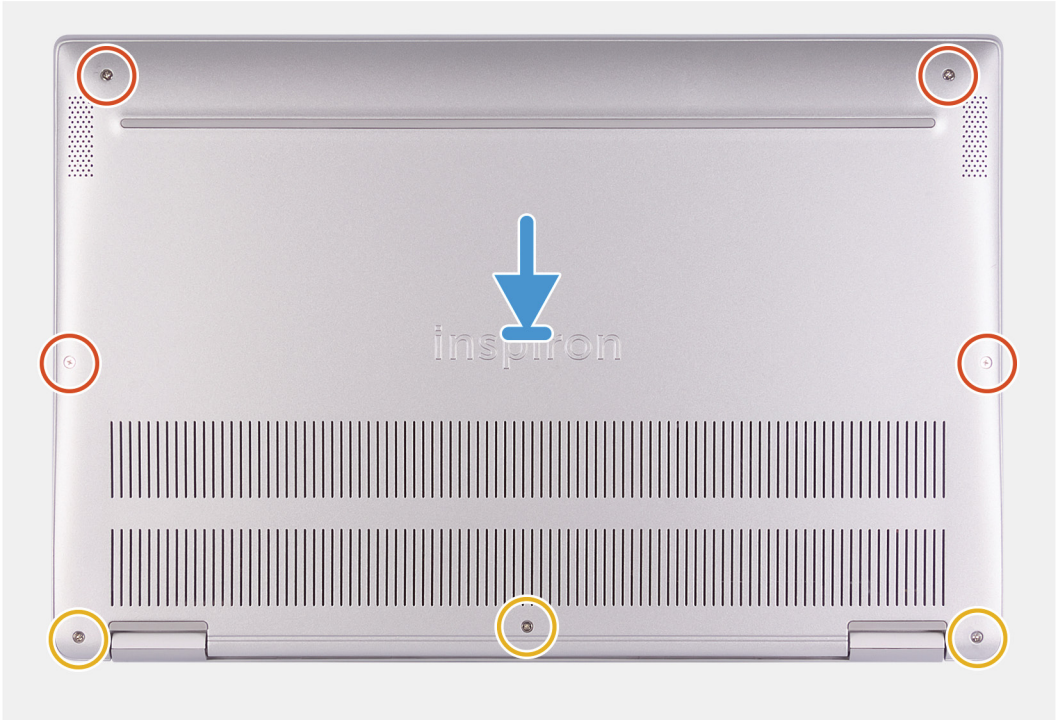
If you are replacing a component, remove the existing component before performing the installation procedure.

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

4x
M2x6



4x
M2x6



1. Place the computer with the hinges facing towards you.
2. Align the base cover on the palm-rest and keyboard assembly, and snap the base cover into place.
3. Replace the four screws (M2x6) that secure the base cover to the palm-rest and keyboard assembly.
4. Tighten the three captive screws that secure the base cover to the palm-rest and keyboard assembly.

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

Battery

Lithium-ion battery precautions

CAUTION:

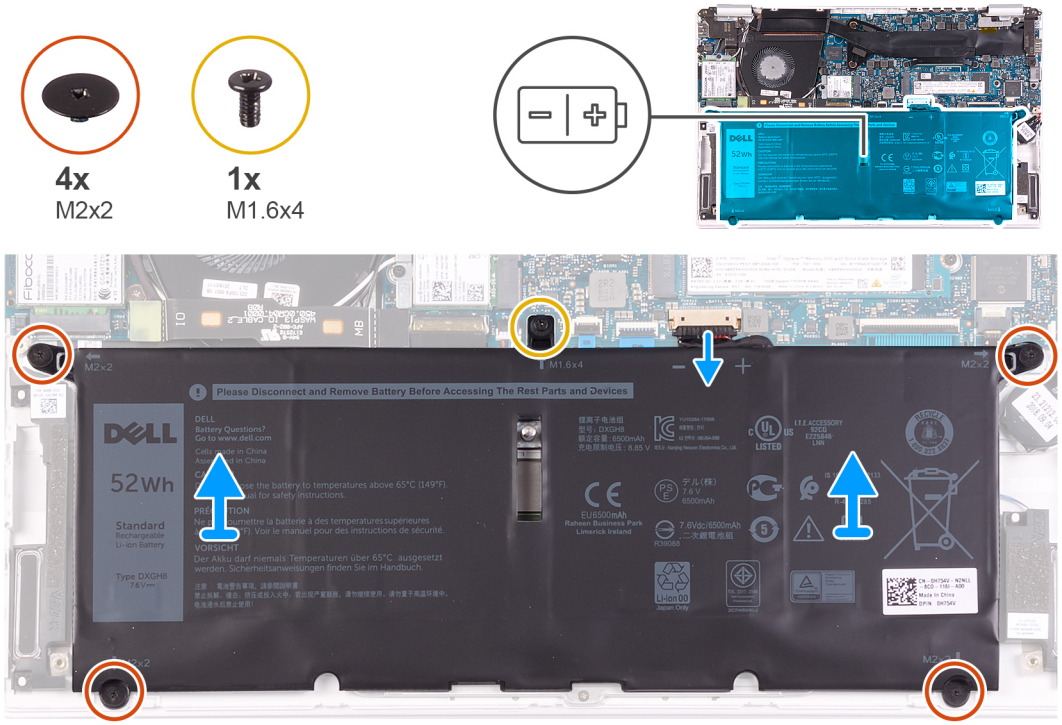
- **Exercise caution when handling Lithium-ion batteries.**
- **Discharge the battery completely before removing it. Disconnect the AC power adapter from the system and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**
- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**
- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**

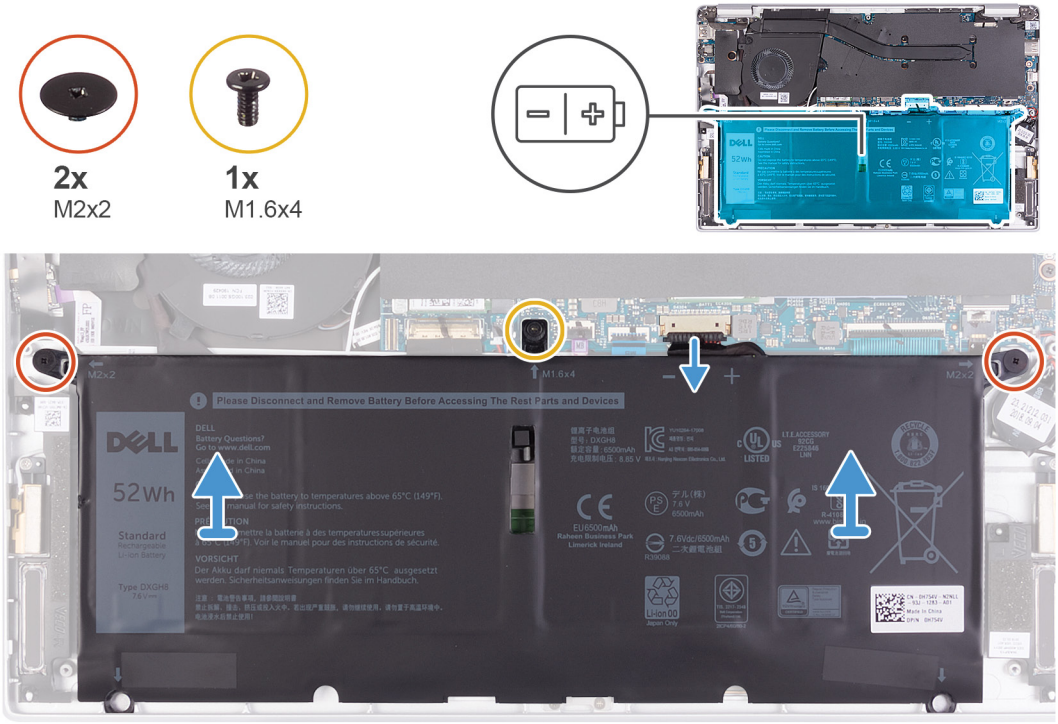
- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.**

Removing the battery

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.

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



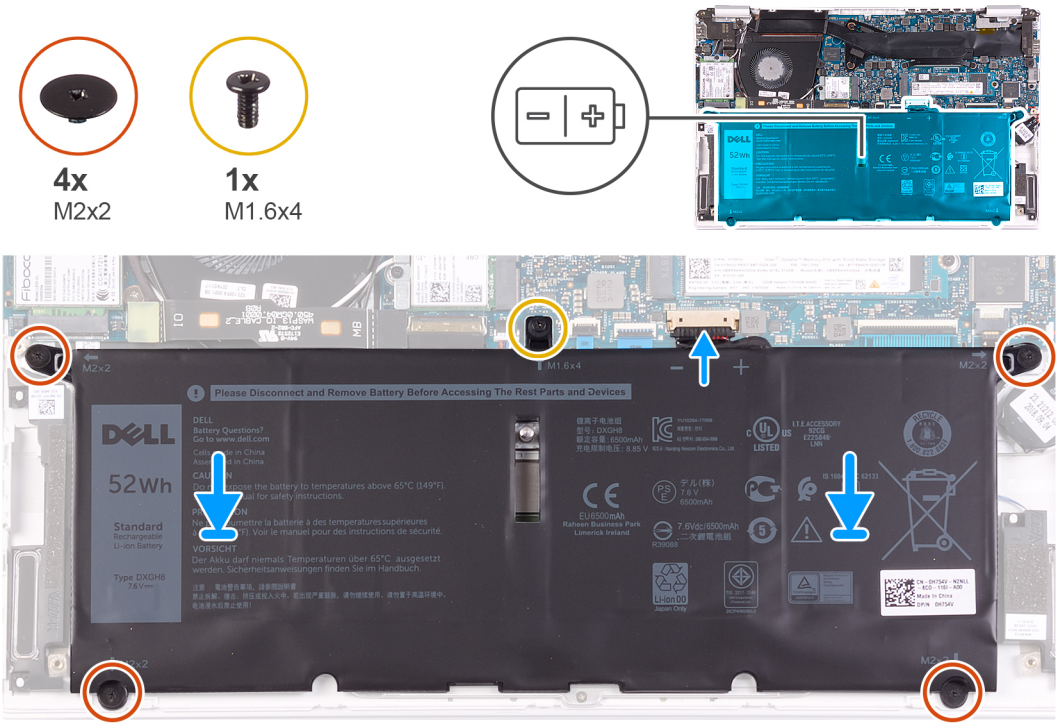


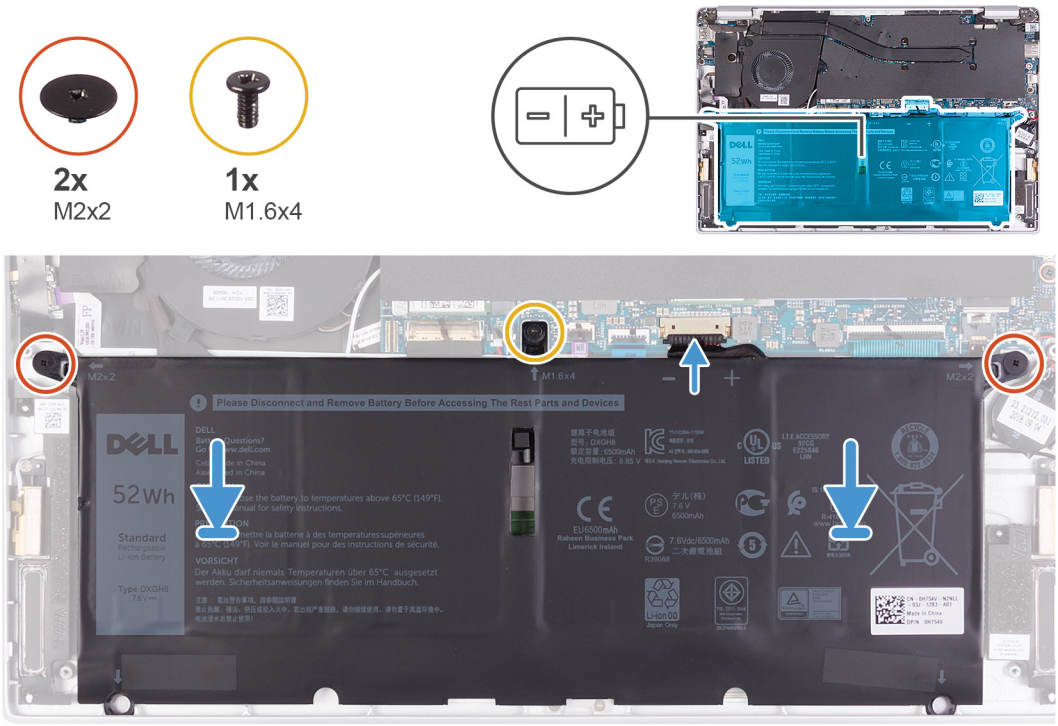
1. Disconnect the battery cable from the system board.
2. Remove the fourtwo screws (M2x2) that secure the battery to the palm-rest and keyboard assembly.
3. Remove the screw (M1.6x4) that secures the battery to the system board and palm-rest and keyboard assembly.
4. Lift the battery off the palm-rest and keyboard assembly.

Installing the battery

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

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





1. Connect the battery cable to the system board.
2. Replace the fourtwo screws (M2x2) that secure the battery to the palm-rest and keyboard assembly.
3. Replace the screw (M1.6x4) that secures the battery to the system board and palm-rest and keyboard assembly.

1. Install the base cover.
2. Follow the procedure in After working inside your computer.

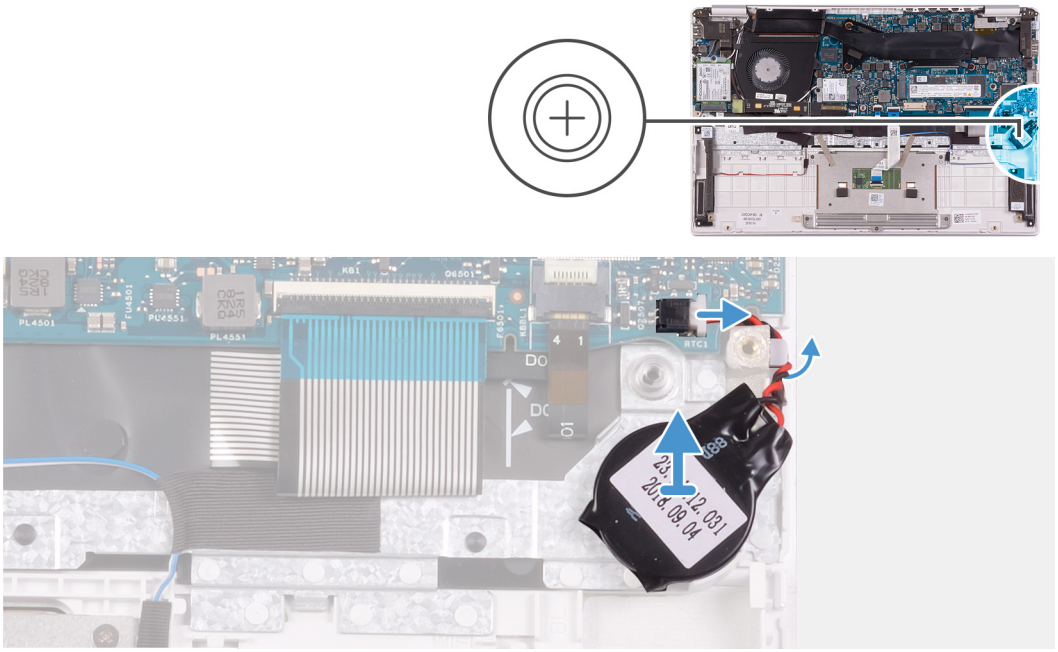
Coin-cell battery

Removing the coin-cell battery

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

   CAUTION: Removing the coin-cell battery resets the BIOS setup program's settings to default. It is recommended that you note the BIOS setup program's settings before removing the coin-cell battery.
2. Remove the base cover.
3. Remove the battery.

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

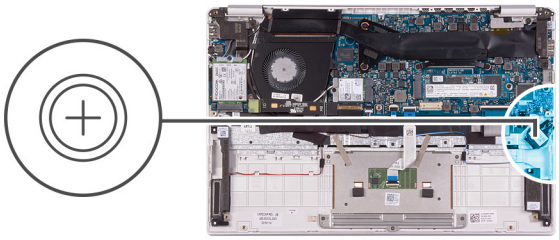


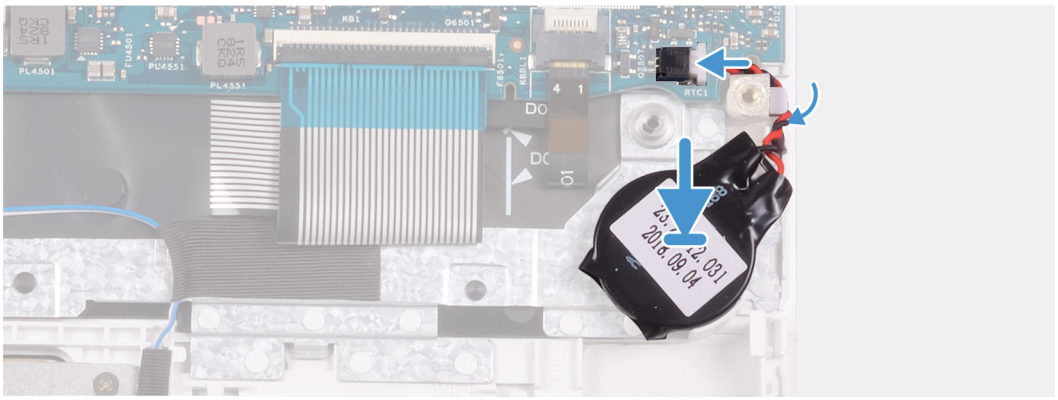
1. Disconnect the coin-cell battery cable from the system board.
2. Remove the coin-cell battery cable from the routing guide.
3. Peel the coin-cell battery off the palm-rest and keyboard assembly.

Installing the coin-cell battery

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

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





1. Adhere the coin-cell battery to the slot on the palm-rest and keyboard assembly.
2. Route the coin-cell battery cable through the routing guide.
3. Connect the coin-cell battery cable to the system board.

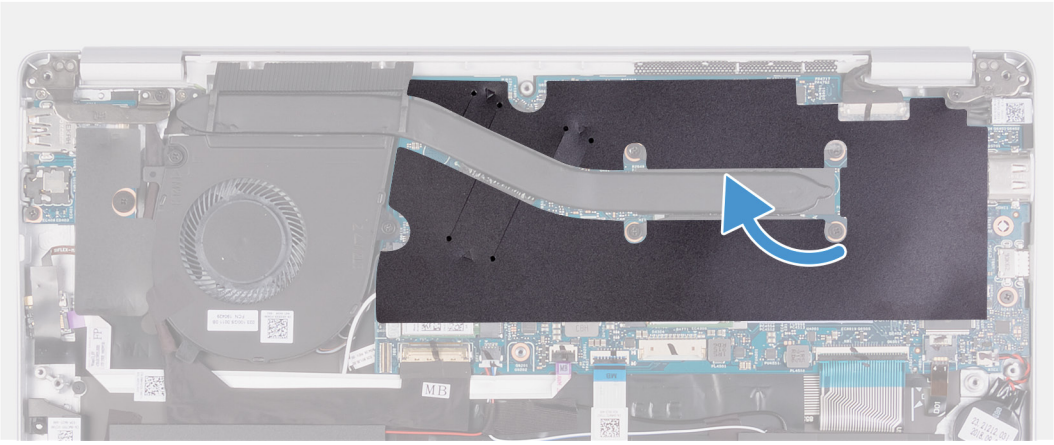
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

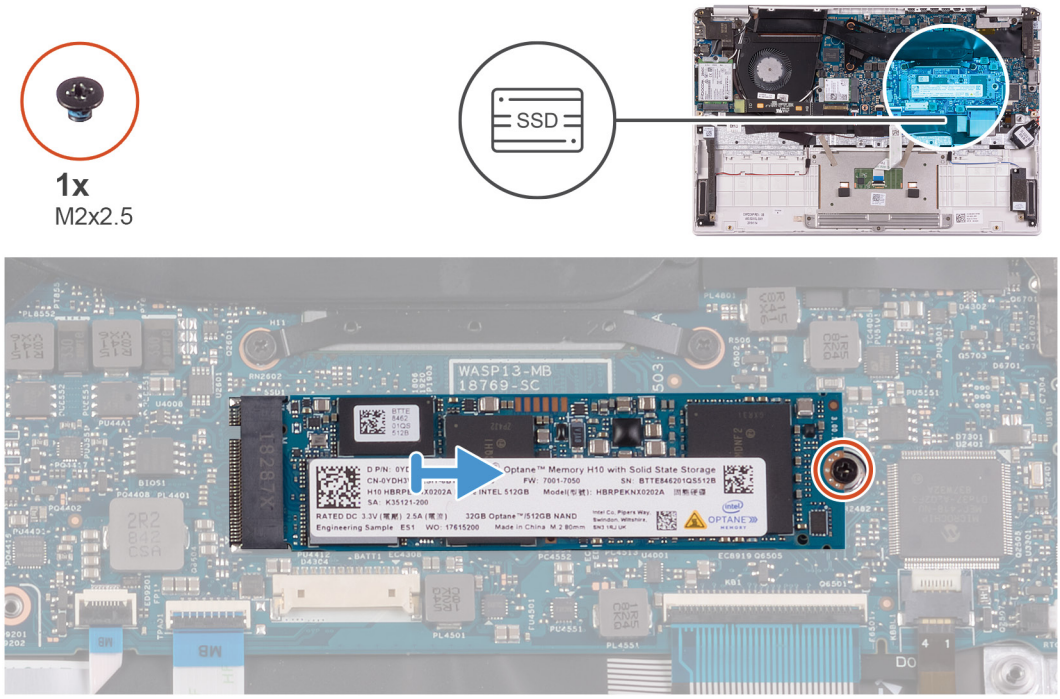
Solid-state drive

Removing the M.2 2280 solid-state drive

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

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



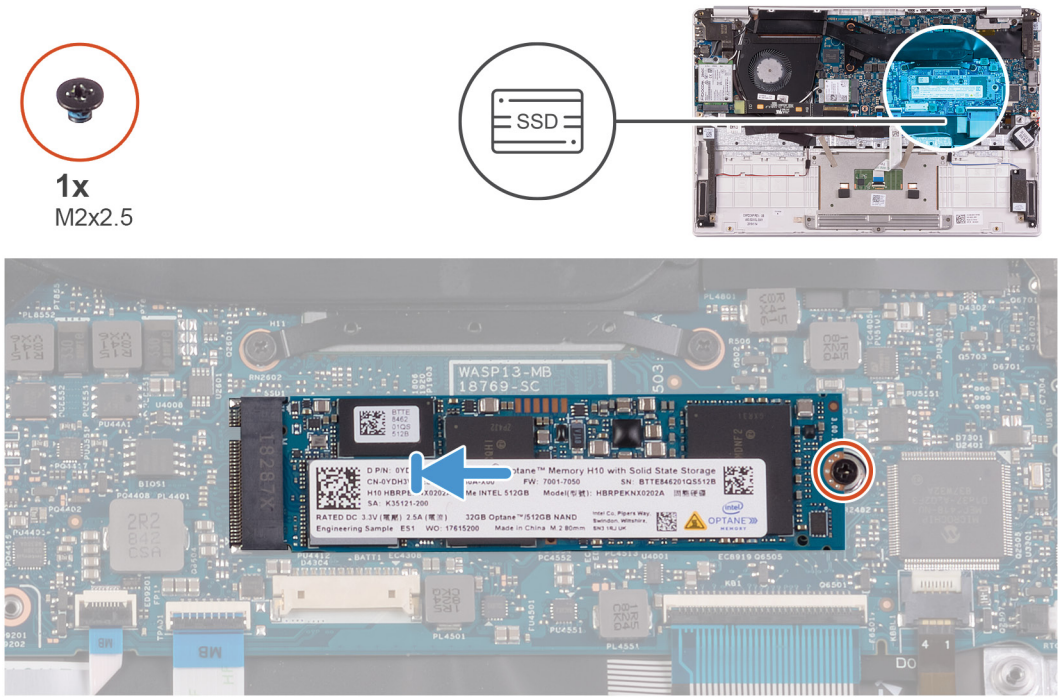


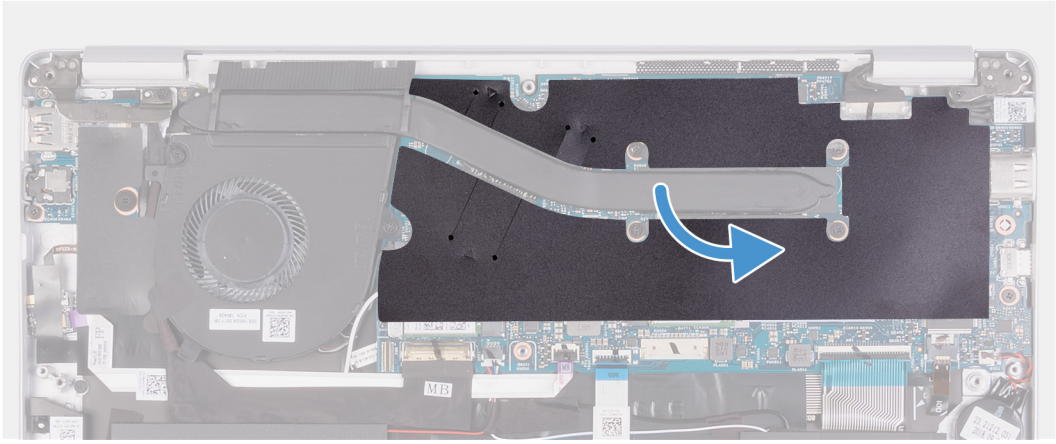
1. Peel the mylar tape that secures the heat sink to the system board.
2. Remove the screw (M2x2.5) that secures the solid-state drive to the system board.
3. Slide and remove the solid-state drive from the solid-state drive slot on the system board.

Installing the M.2 2280 solid-state drive

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

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





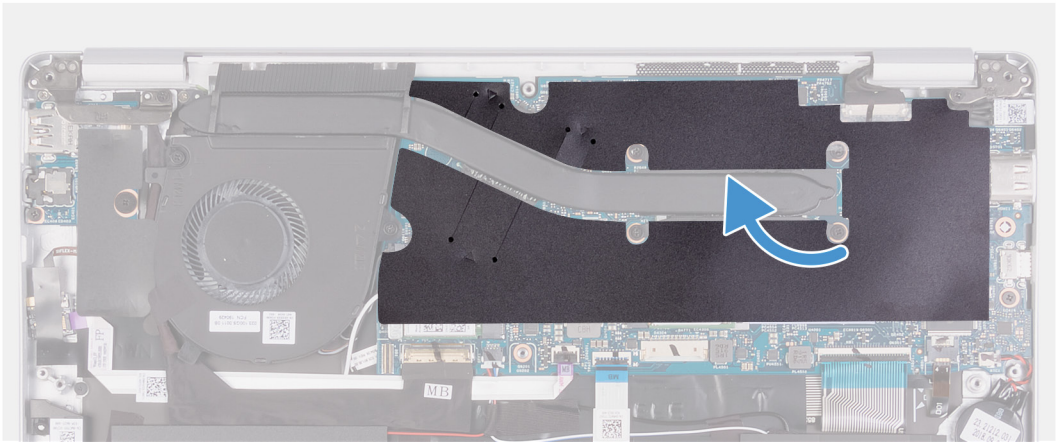
1. Align the notch on the solid-state drive with the tab on the solid-state drive slot and slide the solid-state drive into the solid-state drive slot on the system board.
2. Replace the screw (M2x2.5) that secures the solid-state drive to the system board.
3. Adhere the mylar tape that secures the heat sink to the system board.

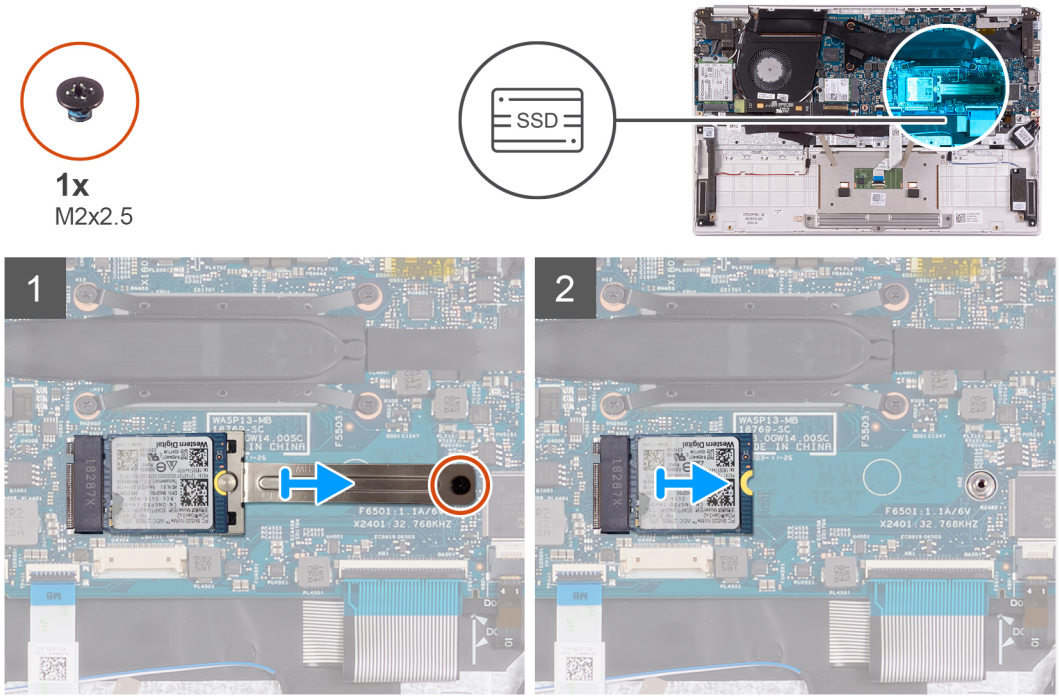
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Removing the M.2 2230 solid-state drive

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

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



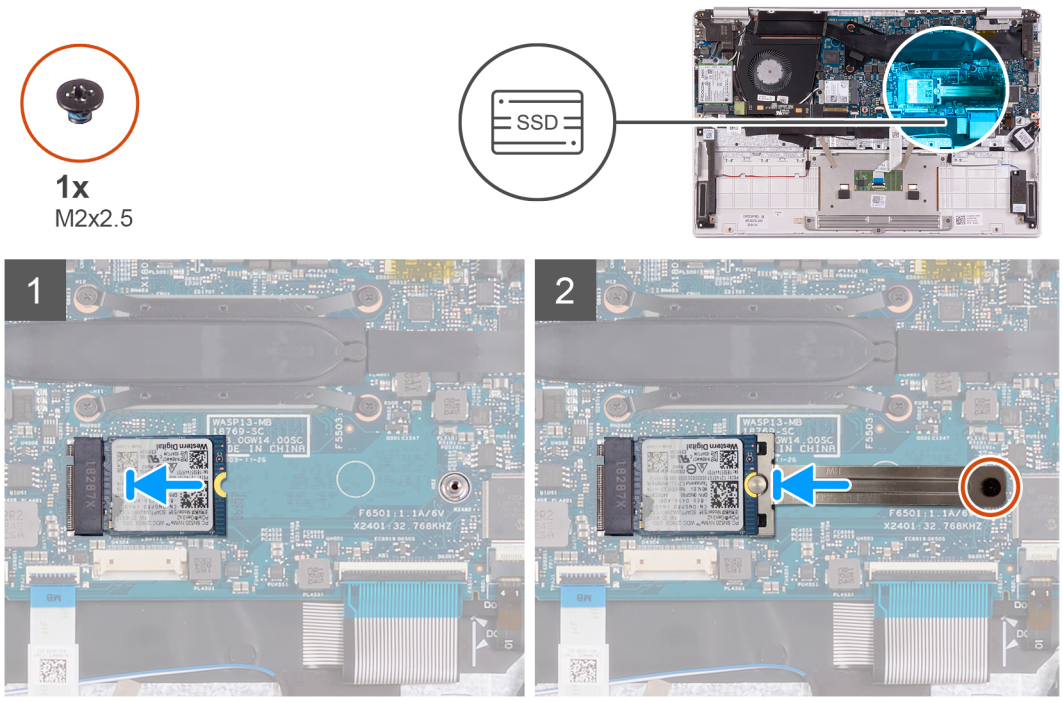


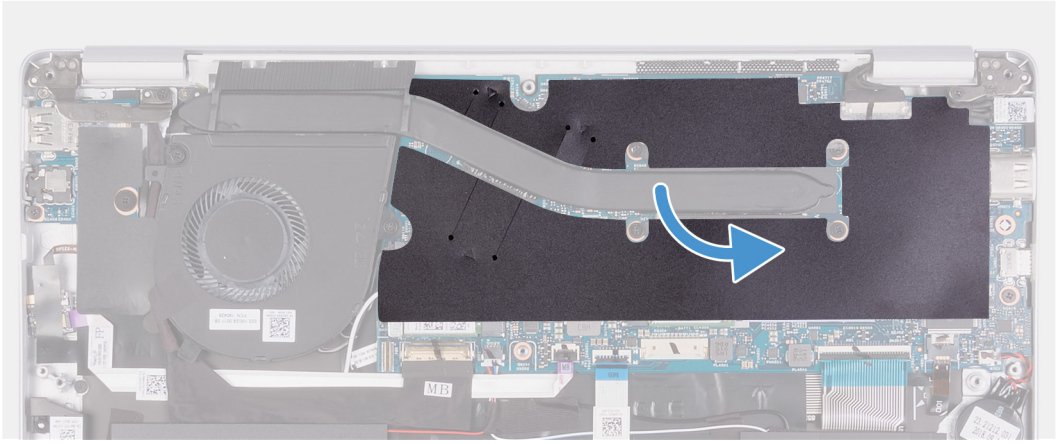
1. Peel the mylar tape that secures the heat sink to the system board.
2. Remove the screw (M2x2.5) that secures the solid-state drive bracket to the system board.
3. Slide and remove the solid-state drive bracket off the solid-state drive on the system board.
4. Slide and remove the solid-state drive off the solid-state drive slot on the system board.

Installing the M.2 2230 solid-state drive

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

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





1. Align the notch on the solid-state drive with the tab on the solid-state drive slot and slide the solid-state drive into the solid-state drive slot on the system board.
2. Slide the solid-state bracket on to the solid-state drive on the system board.
3. Replace the screw (M2x2.5) that secures the solid-state drive to the system board.
4. Adhere the mylar tape that secures the heat sink to the system board.

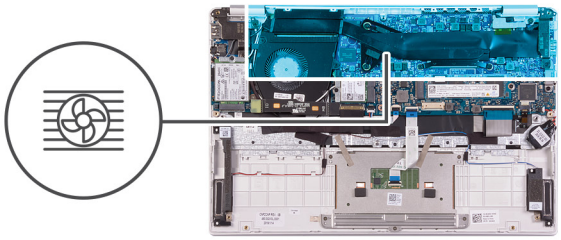
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

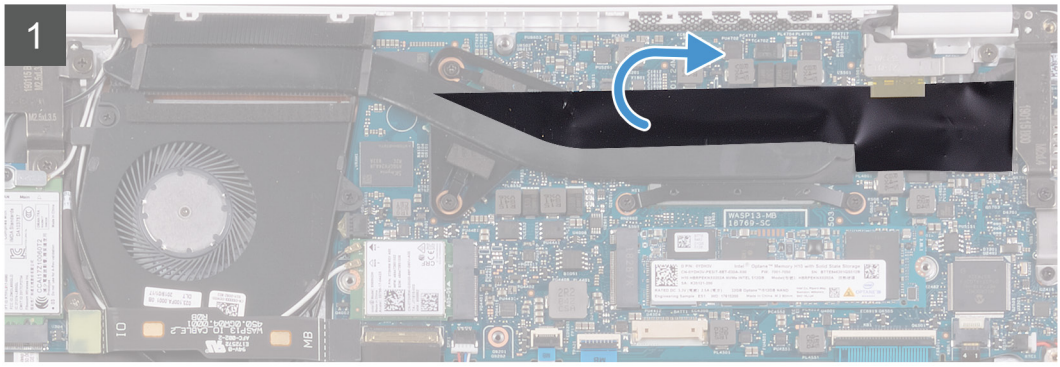
Heat sink

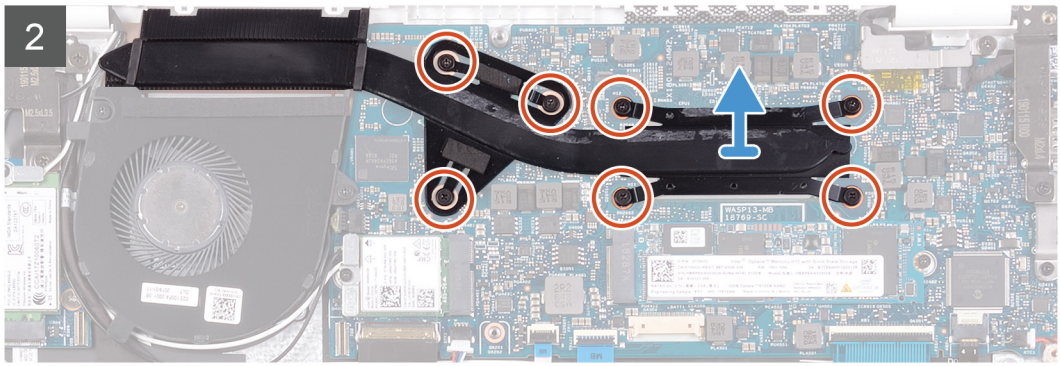
Removing the heat sink

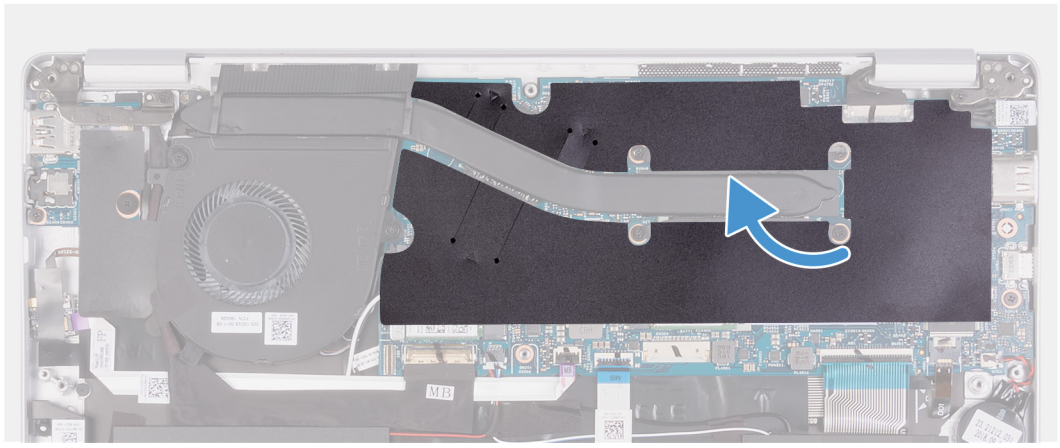
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

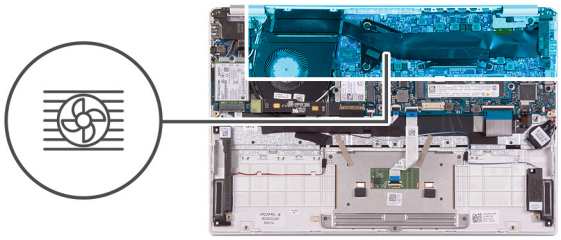
The following image indicates the location of the heat sink and provides a visual representation of the removal procedure.

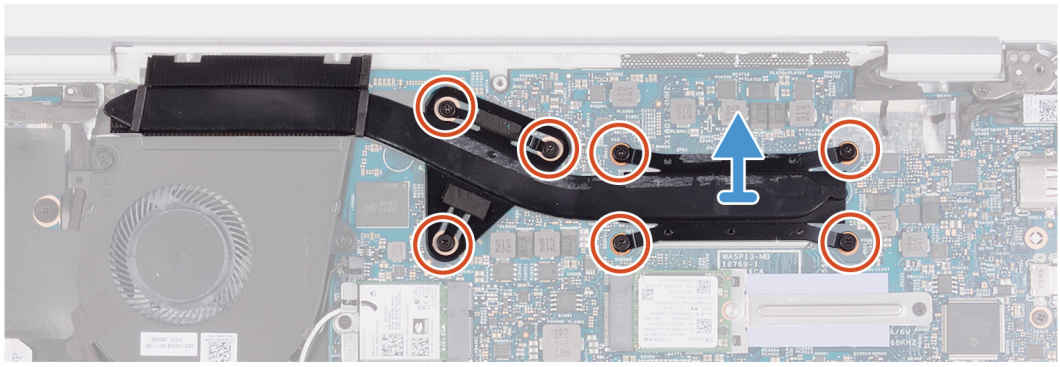



1


2





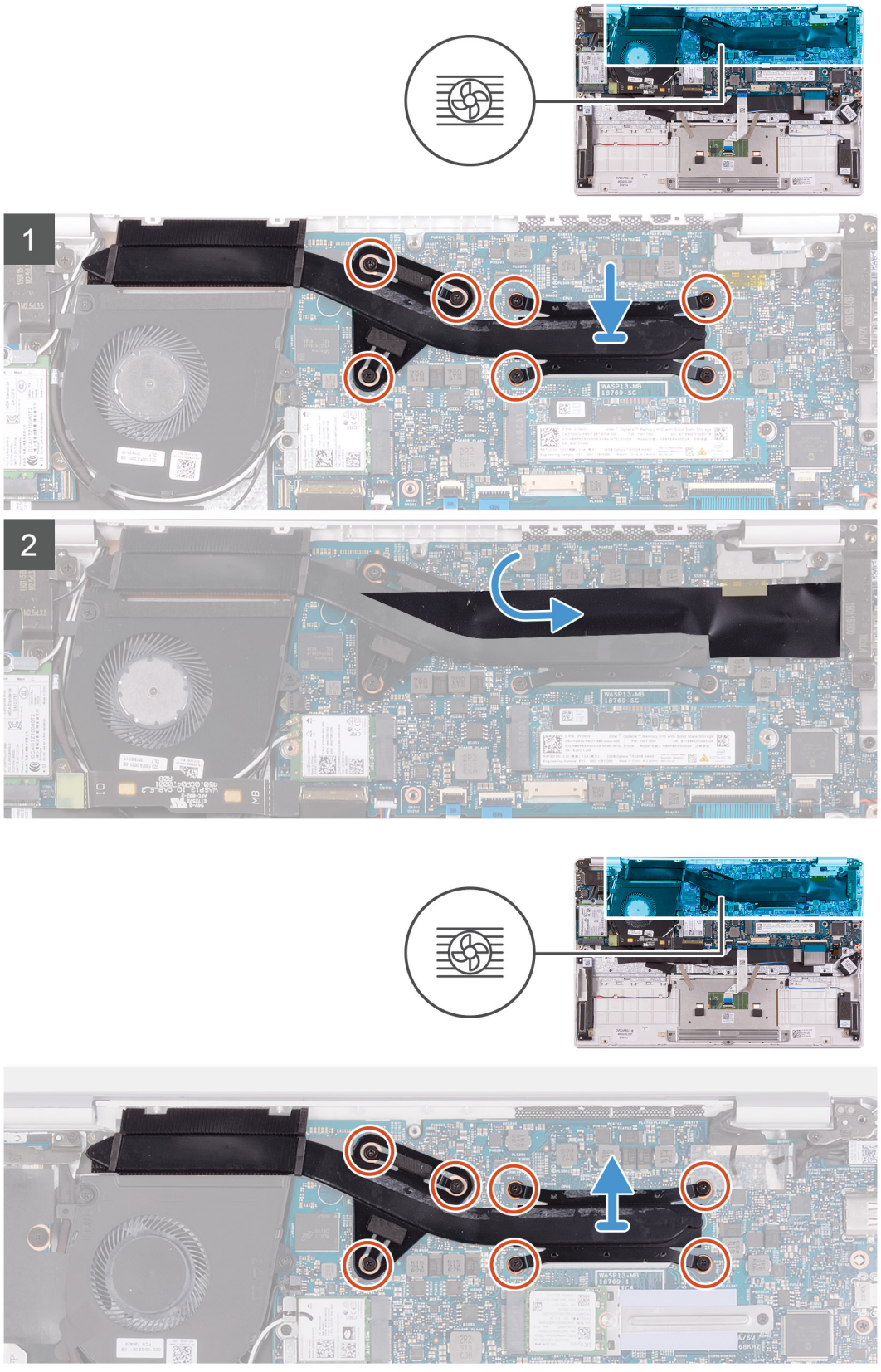


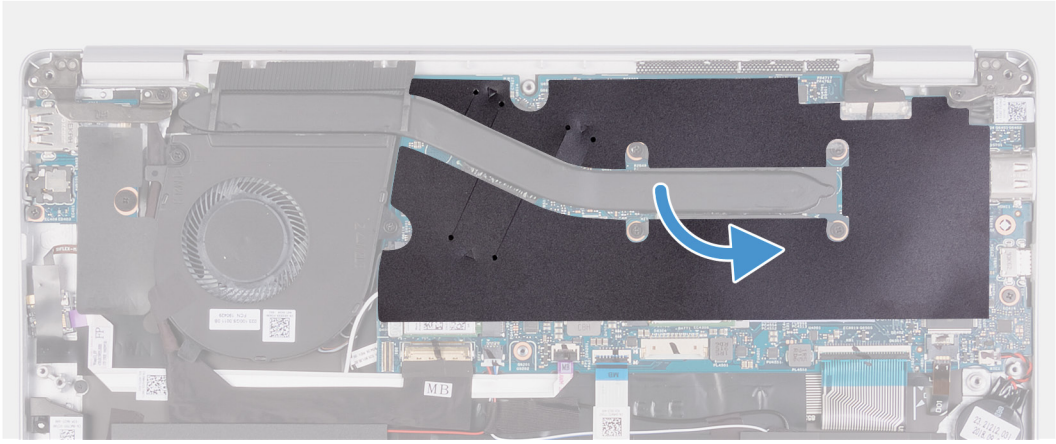
1. Peel the mylar tape that secures the heat sink to the system board.
2. In the reverse sequential order (7>6>5>4>3>2>1), loosen the seven captive screws that secure the heat sink to the system board.
3. Lift the heat sink off the system board.

Installing the heat sink

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

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


1
2



1. Align and place the screw holes on the heat sink with the screw holes on the system board.
2. In sequential order (as indicated on the heat sink), tighten the seven captive screws that secure the heat sink to the system board.
3. Adhere the mylar tape that secures the heat sink to the system board.

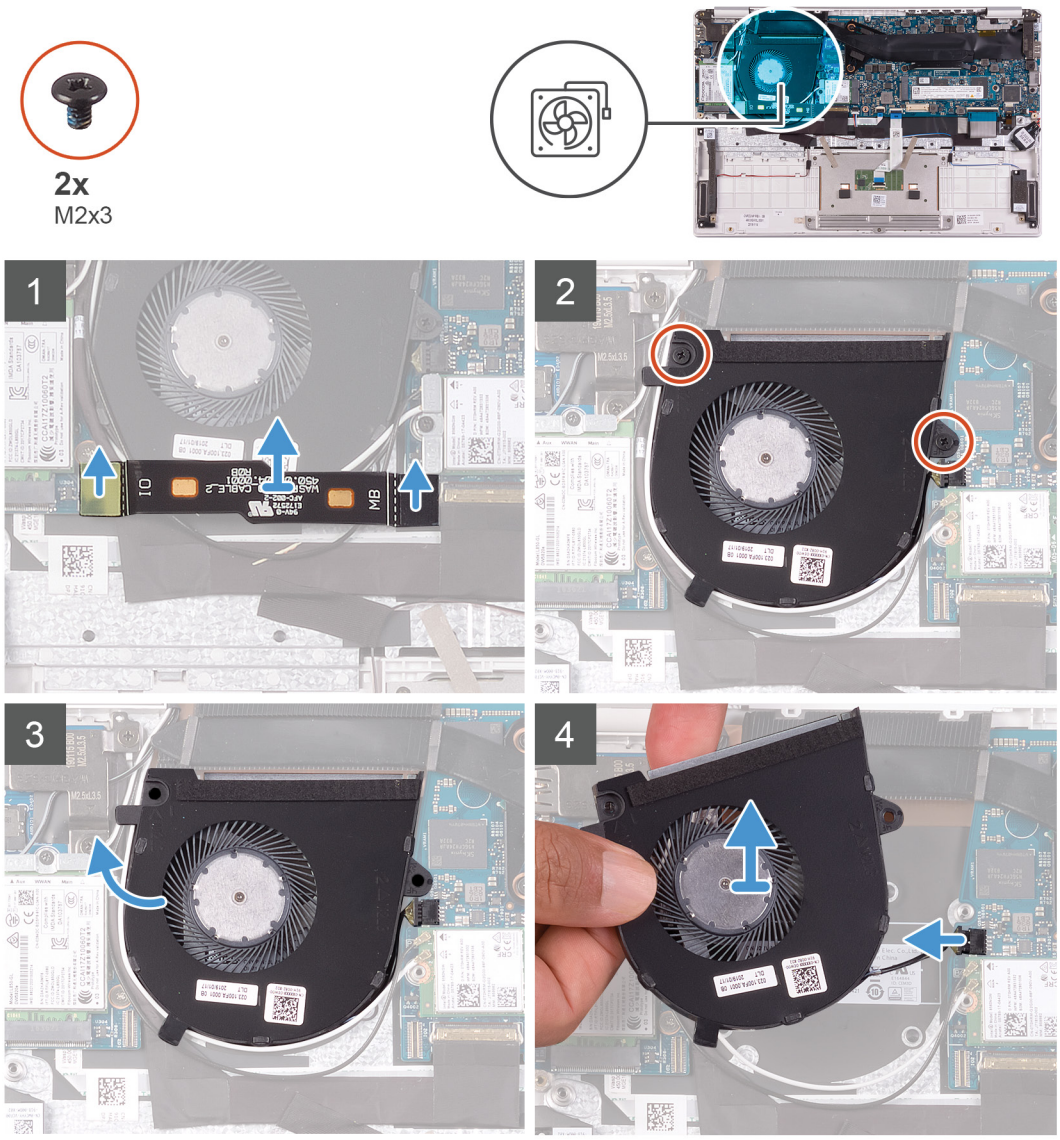
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Fan

Removing the fan

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

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



1. Disconnect the I/O-board cable from the system board and I/O board.

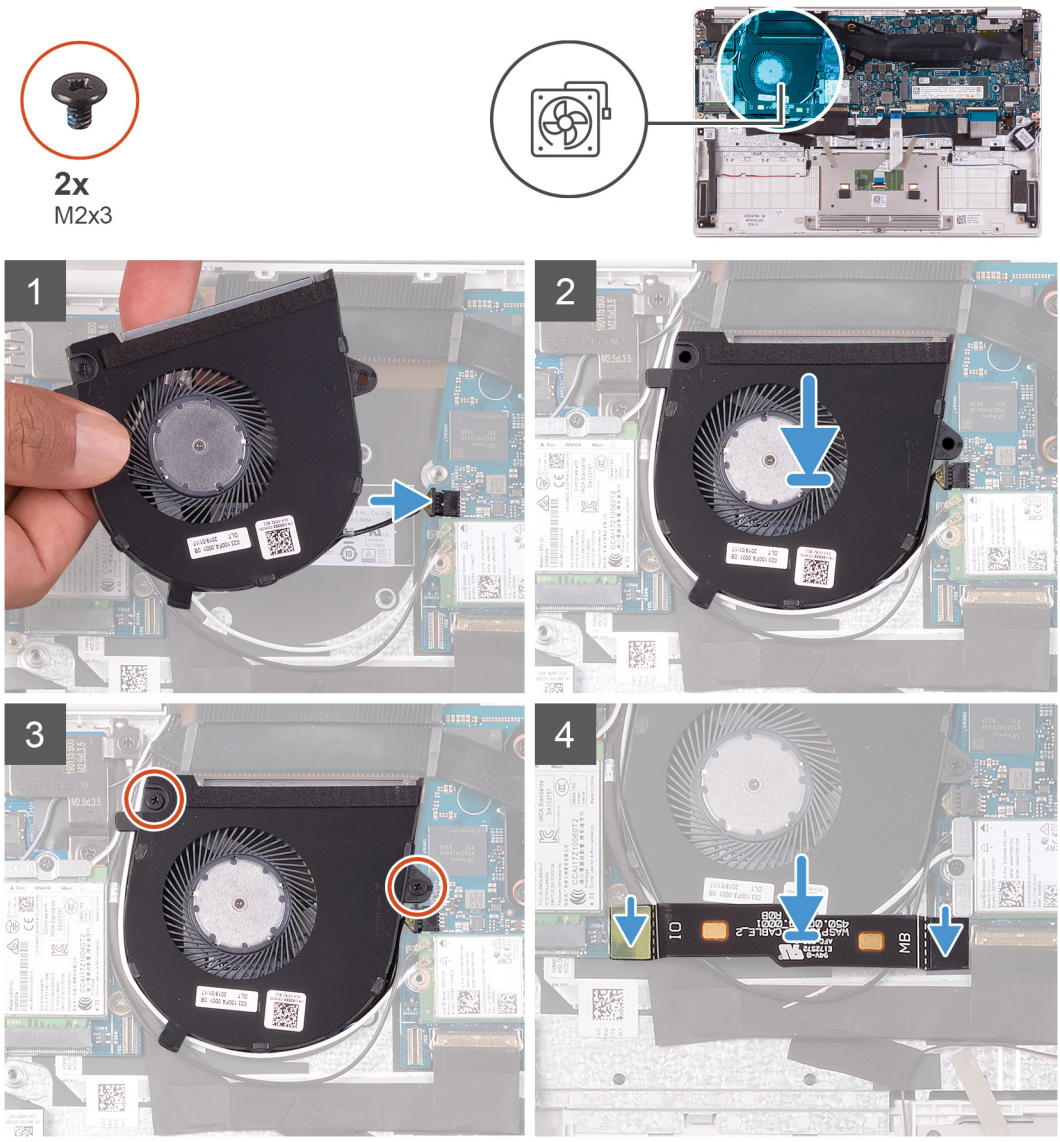
   NOTE: This step is only applicable for computers shipped with a WWAN configuration.

2. Remove the two (M2x3) screws that secure the fan to the system board.
3. Lift the fan slightly off the palm-rest and keyboard assembly.
4. Disconnect the fan cable from the system board and completely lift the fan off the palm-rest and keyboard assembly.

Installing the fan

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

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



1. Connect the fan cable to the system board.
2. Align the screw holes on the fan with the screw holes on the palm-rest and keyboard assembly.
3. Replace the two (M2x3) screws that secure the fan to the palm-rest and keyboard assembly.
4. Connect the I/O-board cable to the system board and I/O board.

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

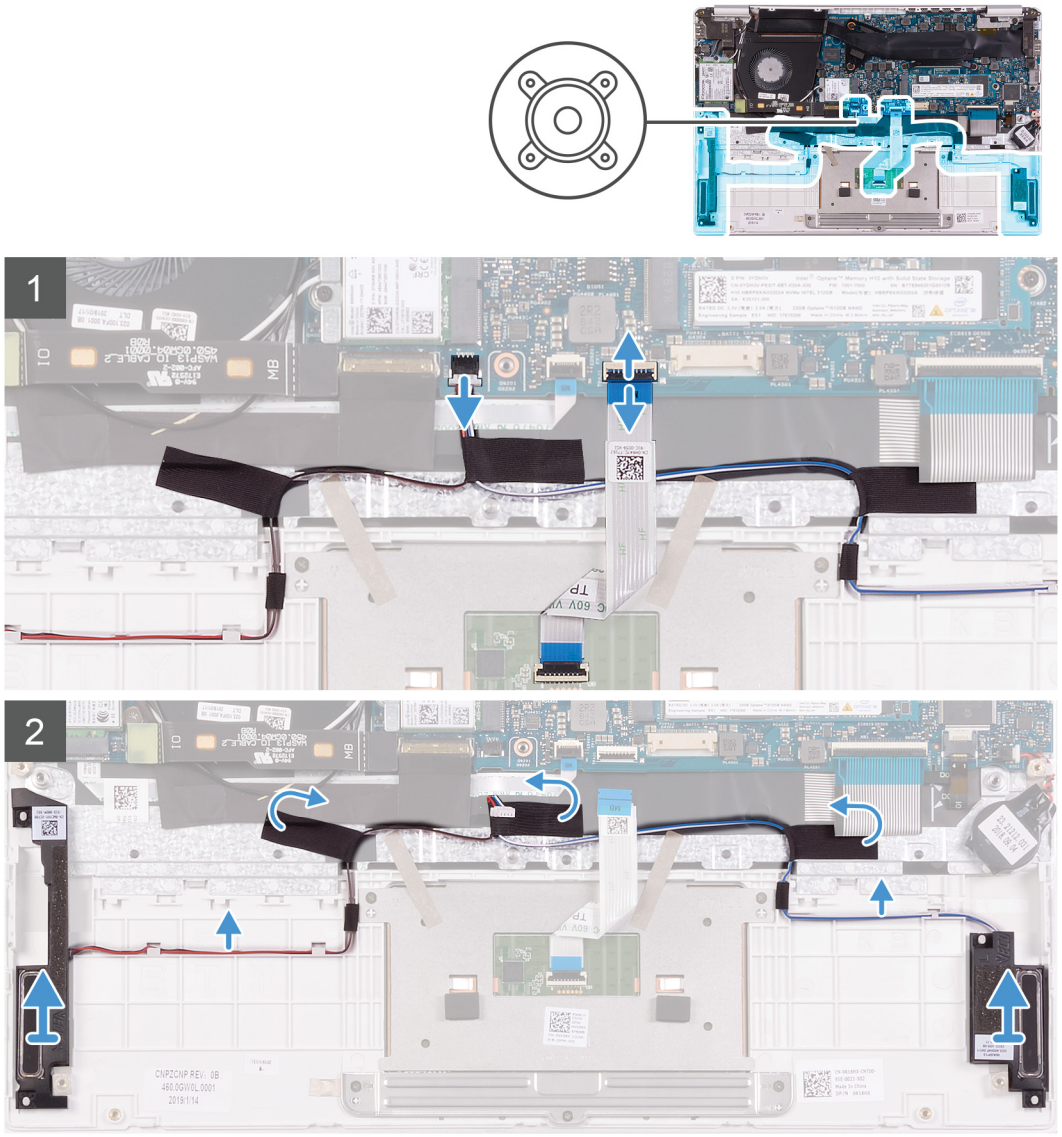
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Speakers

Removing the speakers

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

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



1. Open the latch and disconnect the touchpad cable from the system board.
2. Disconnect the speaker cable from the system board.
3. Peel the tapes that secure the speaker cable to the palm-rest and keyboard assembly.
4. Note the routing of the speaker cable and remove the speaker cable from the routing guides on the palm-rest and keyboard assembly.

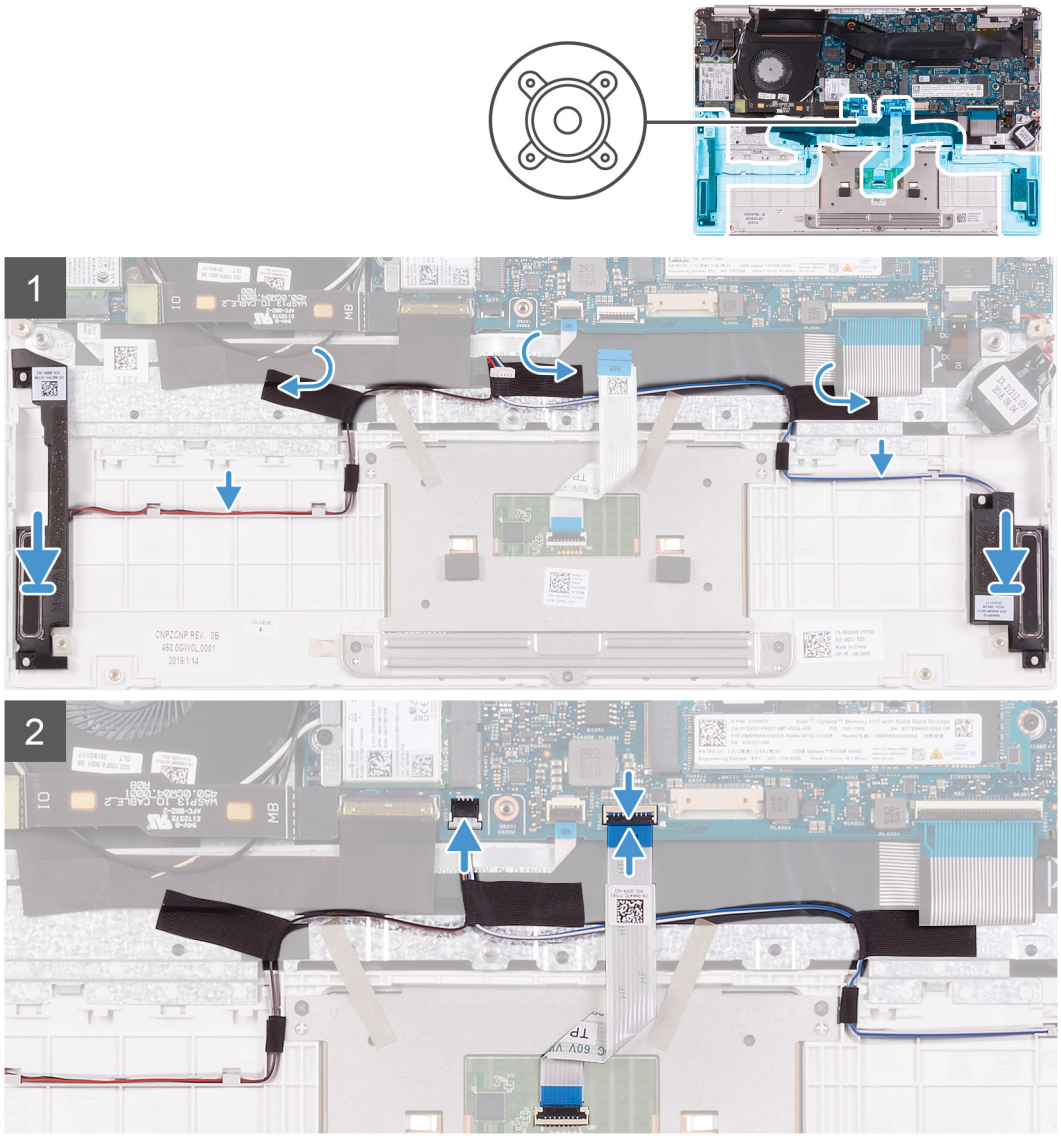
   NOTE: Note the position of the rubber grommets before lifting the speakers.

5. Lift the speakers, along with the cable, off the palm-rest and keyboard assembly.

Installing the speakers

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

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



1. Using the alignment posts and rubber grommets, place the speakers in the slots on the palm-rest and keyboard assembly.
2. Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.
3. Adhere the tapes that secure the speaker cable to the palm-rest and keyboard assembly.
4. Connect the speaker cable to the system board.
5. Connect the touchpad cable to the system board and close the latch to secure the cable.

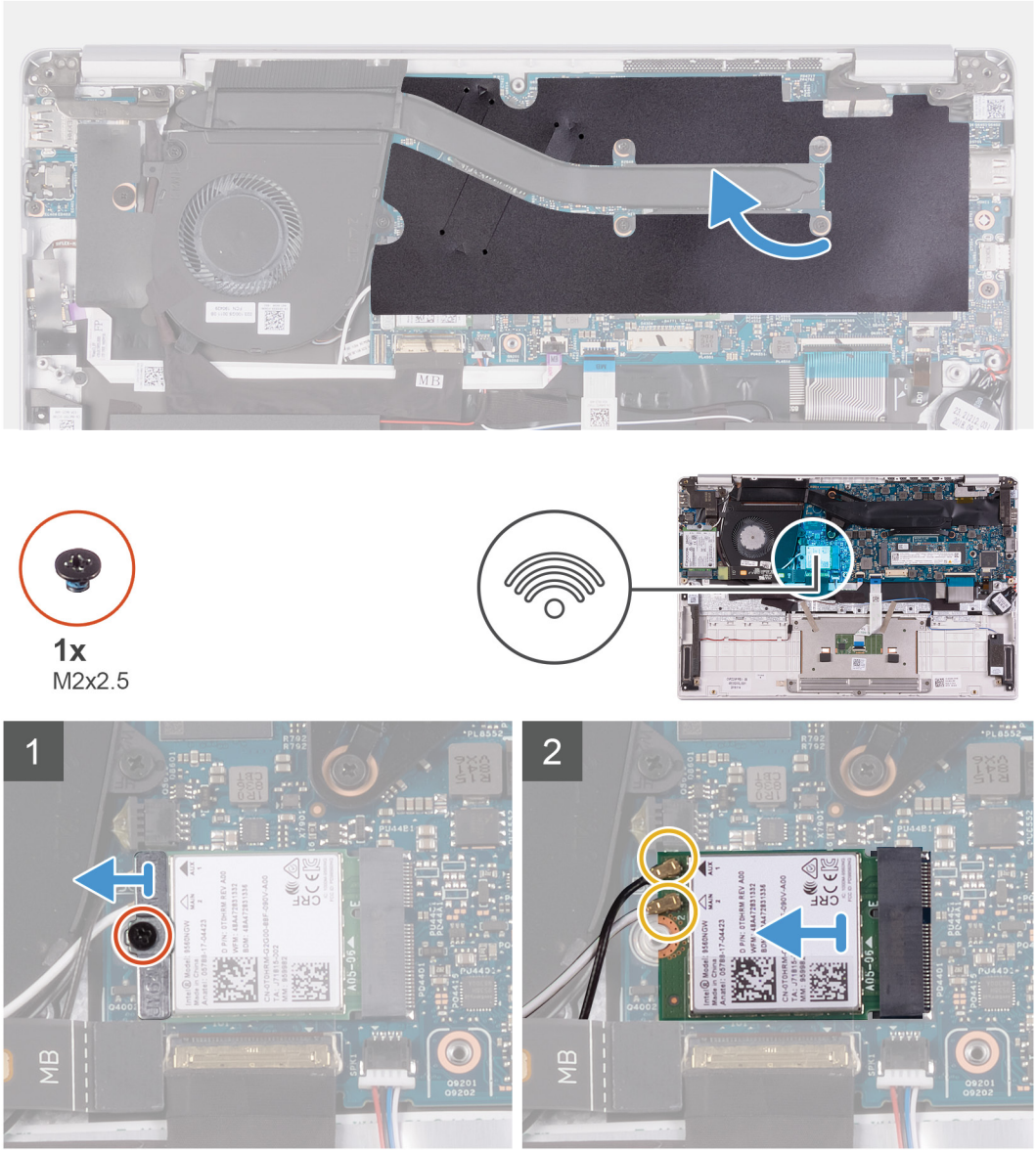
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

WLAN card

Removing the WLAN card

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

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

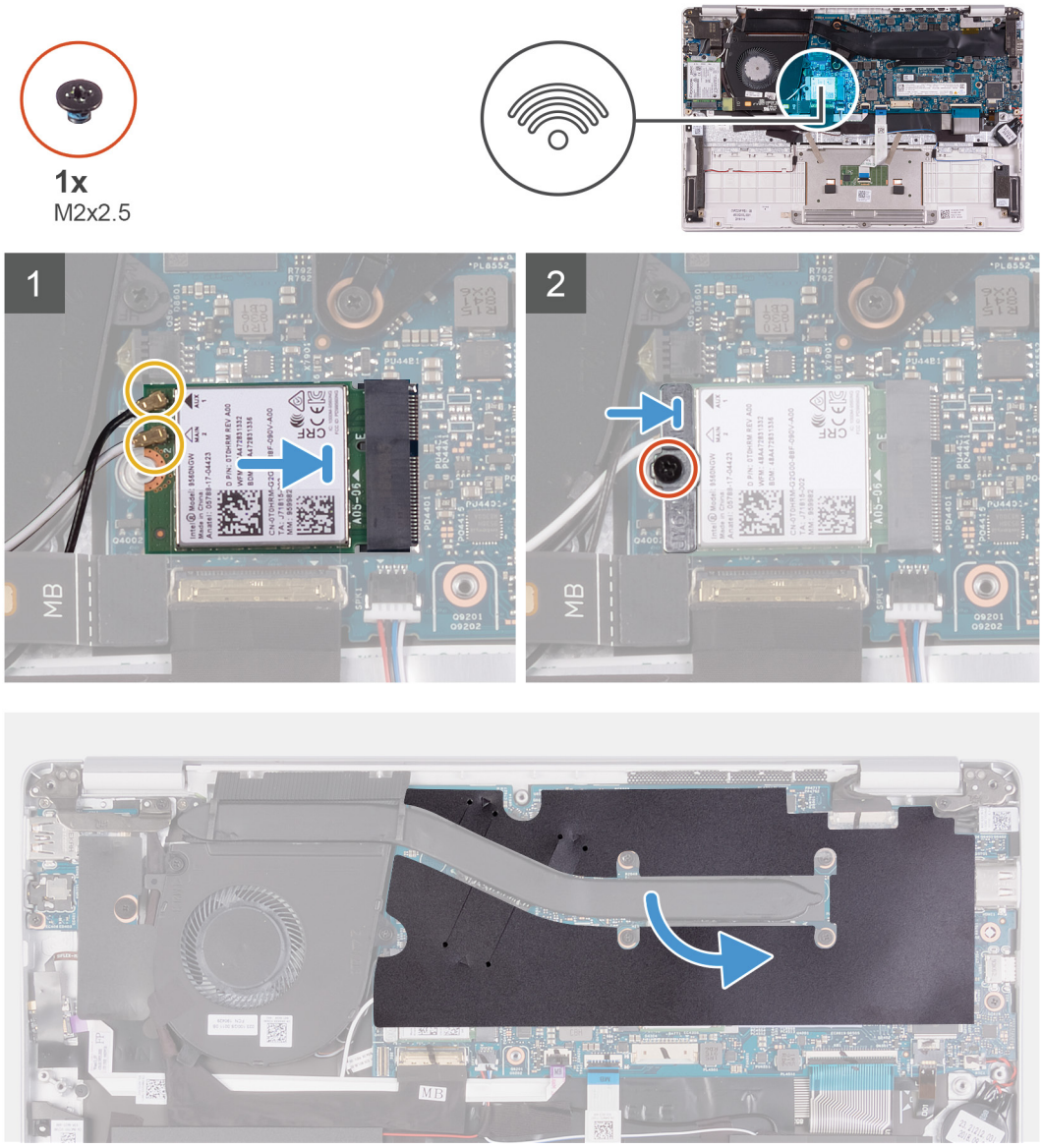


1. Peel the mylar tape that secures the heat sink to the system board.
2. Remove the screw (M2x2.5) that secures the WLAN-card bracket to the WLAN card and lift the WLAN-card bracket off the WLAN card.
3. Disconnect the antenna cables from the WLAN card.
4. Slide and remove the WLAN card from the WLAN-card slot.

Installing the WLAN card

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

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



1. Connect the antenna cables to the WLAN card.
2. Align the notch on the WLAN card with the tab on the WLAN card slot and insert the WLAN card at an angle into the WLAN card slot.
3. Align and place the WLAN card bracket on the WLAN card.
4. Replace the screw (M2x2.5) to secure the WLAN card bracket to the WLAN card.
5. Ahere the mylar tape that secures the heat sink to the system board.

1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

WWAN card

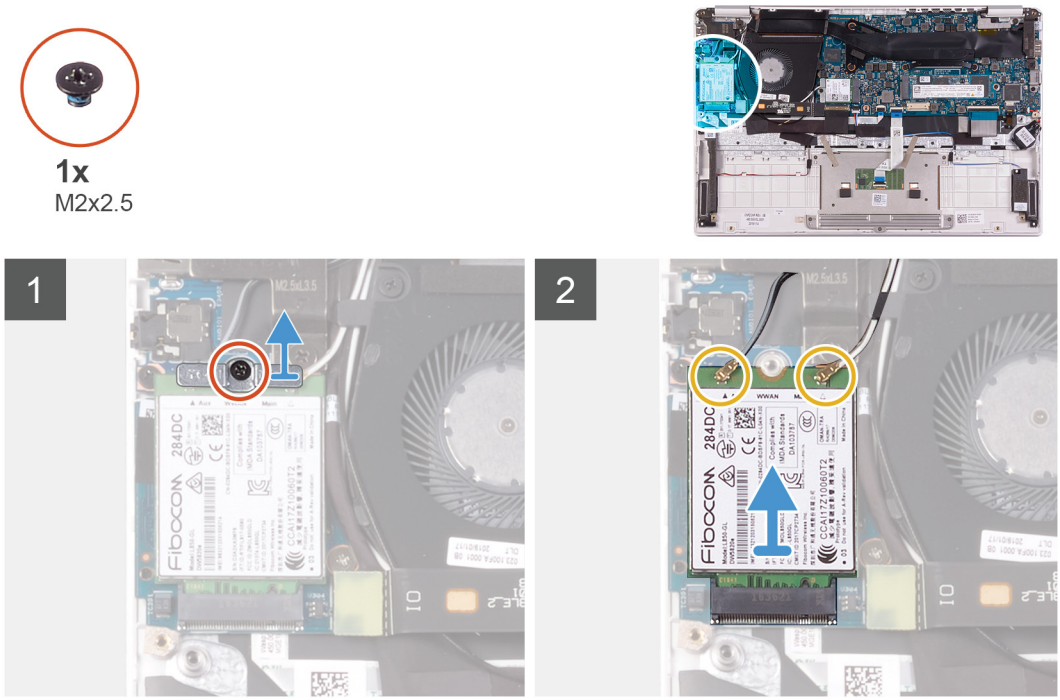
Removing the WWAN card

NOTE: This procedure is only applicable for computers shipped with a WWAN configuration.

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.

3. Remove the battery.

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



1. Remove the screw (M2x2.5) that secures the WWAN card bracket to the WWAN card.
2. Note the alignment of the WWAN-card bracket before lifting it off the WWAN card.
3. Disconnect the antenna cables from the WWAN card.
4. Slide and remove the WWAN card from the WWAN card slot.

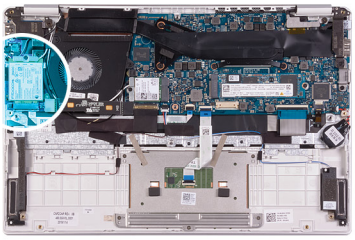
Installing the WWAN card

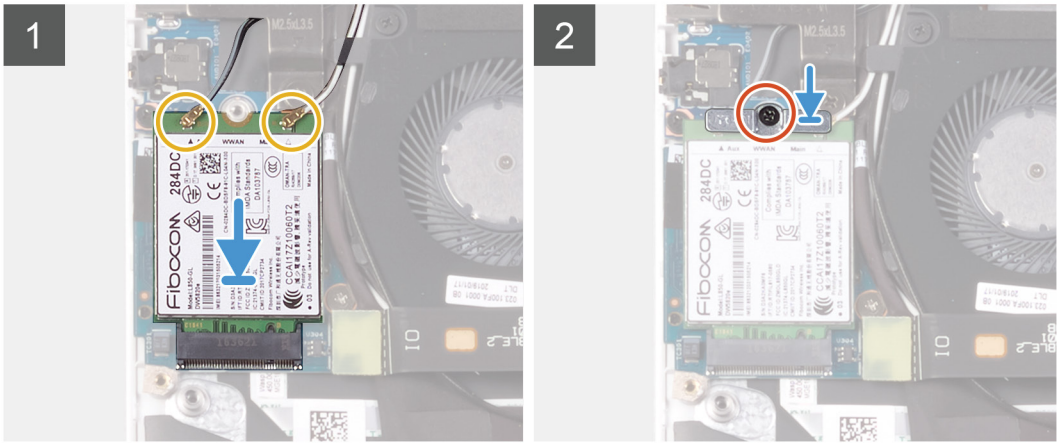
NOTE: This procedure is only applicable for computers shipped with a WWAN configuration.

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

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

1x
M2x2.5





1. Align the notch on the WWAN card with the tab on the WWAN-card slot and insert the WWAN card at an angle into the WWAN-card slot.
2. Connect the antenna cables to the WWAN card and align the WWAN-card bracket on the WWAN card.
3. Replace the screw (M2x2.5) that secures the WWAN bracket to the WWAN card.

1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

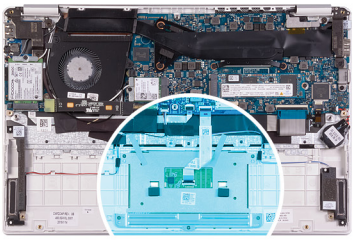
Touchpad

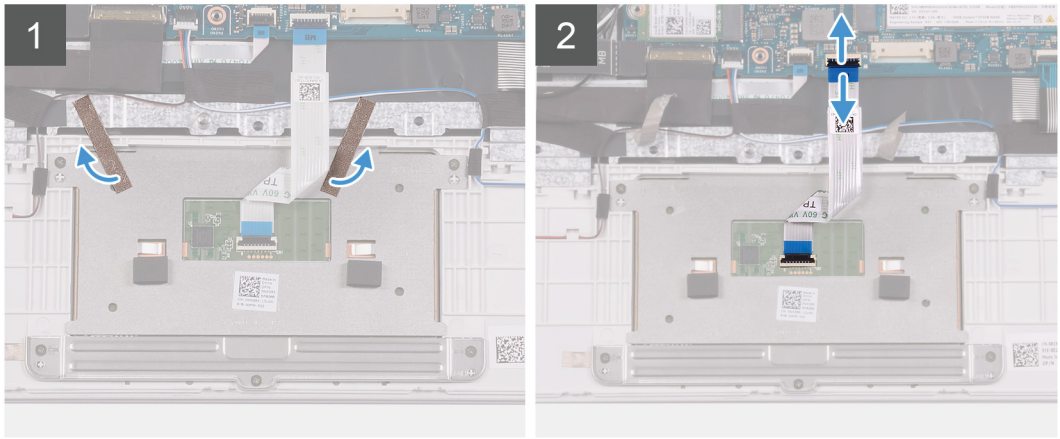
Removing the touchpad

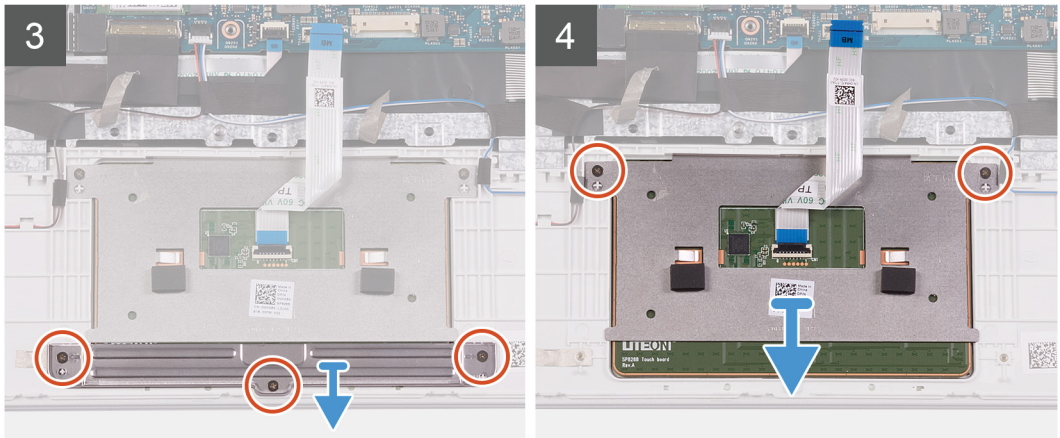
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

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

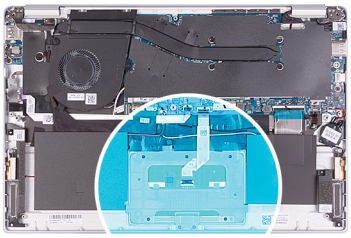
5x
M1.6x2

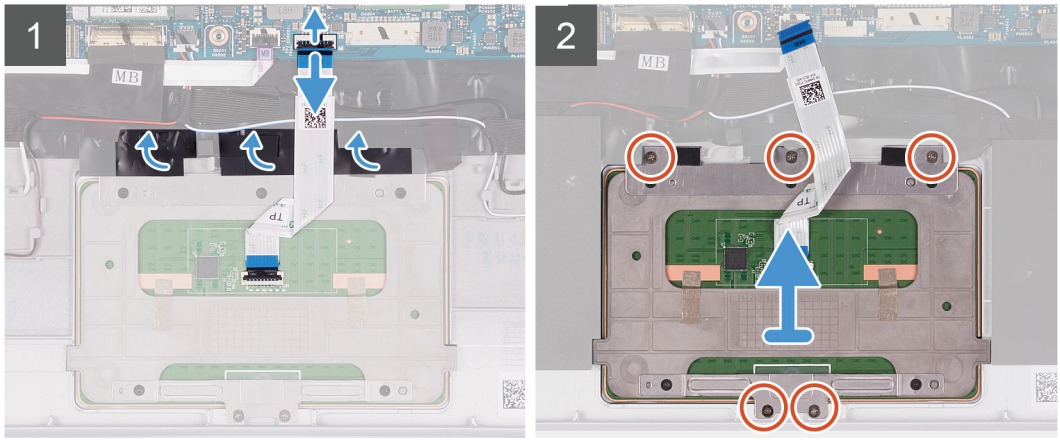






5x
M1.6x2





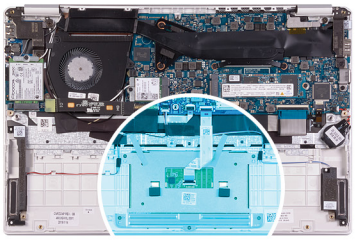
1. Peel the tapes that secure the touchpad to the palm-rest and keyboard assembly.
2. Open the latch and disconnect the touchpad cable from the system board.
3. Remove the three (M1.6x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
4. Lift the touchpad bracket off the palm-rest and keyboard assembly.
5. Remove the two (M1.6x2) screws that secure the touchpad to the palm-rest and keyboard assembly.
6. Lift the touchpad, along with the cable, off the palm-rest and keyboard assembly.

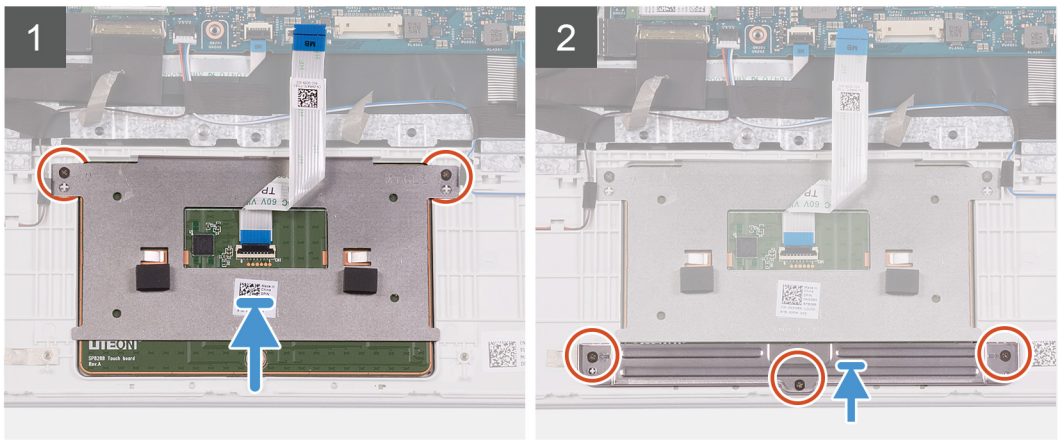
Installing the touchpad

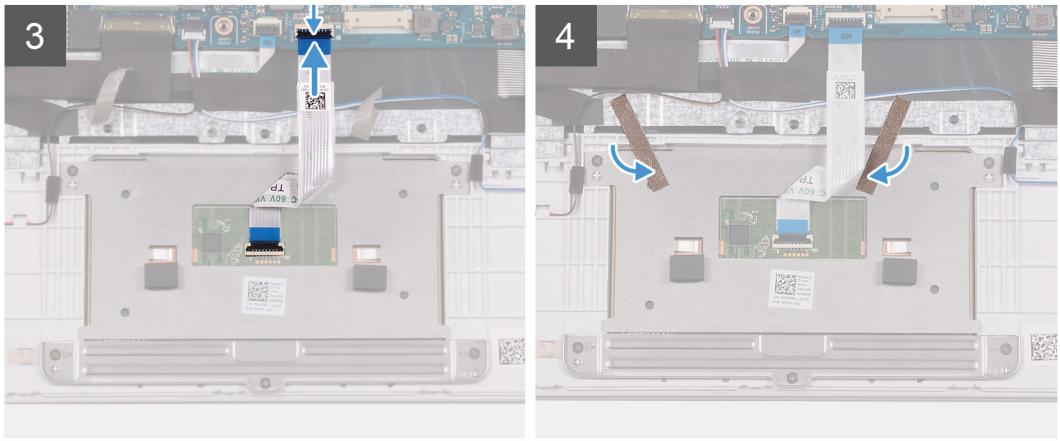
If you are replacing a component, remove the existing component before performing the installation procedure.

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

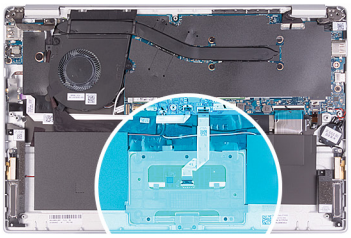
5x
M1.6x2







5x
M1.6x2



1. Align and place the touchpad into the slot on the palm-rest and keyboard assembly.
2. Replace the two (M1.6x2) screws that secure the touchpad to the palm-rest and keyboard assembly.
3. Align and place the touchpad bracket into the slot on the palm-rest and keyboard assembly.
4. Replace the three (M1.6x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
5. Slide the touchpad cable into its connector on the system board and close the latch to secure the cable.
6. Adhere the tape that secures the touchpad to the palm-rest and keyboard assembly.

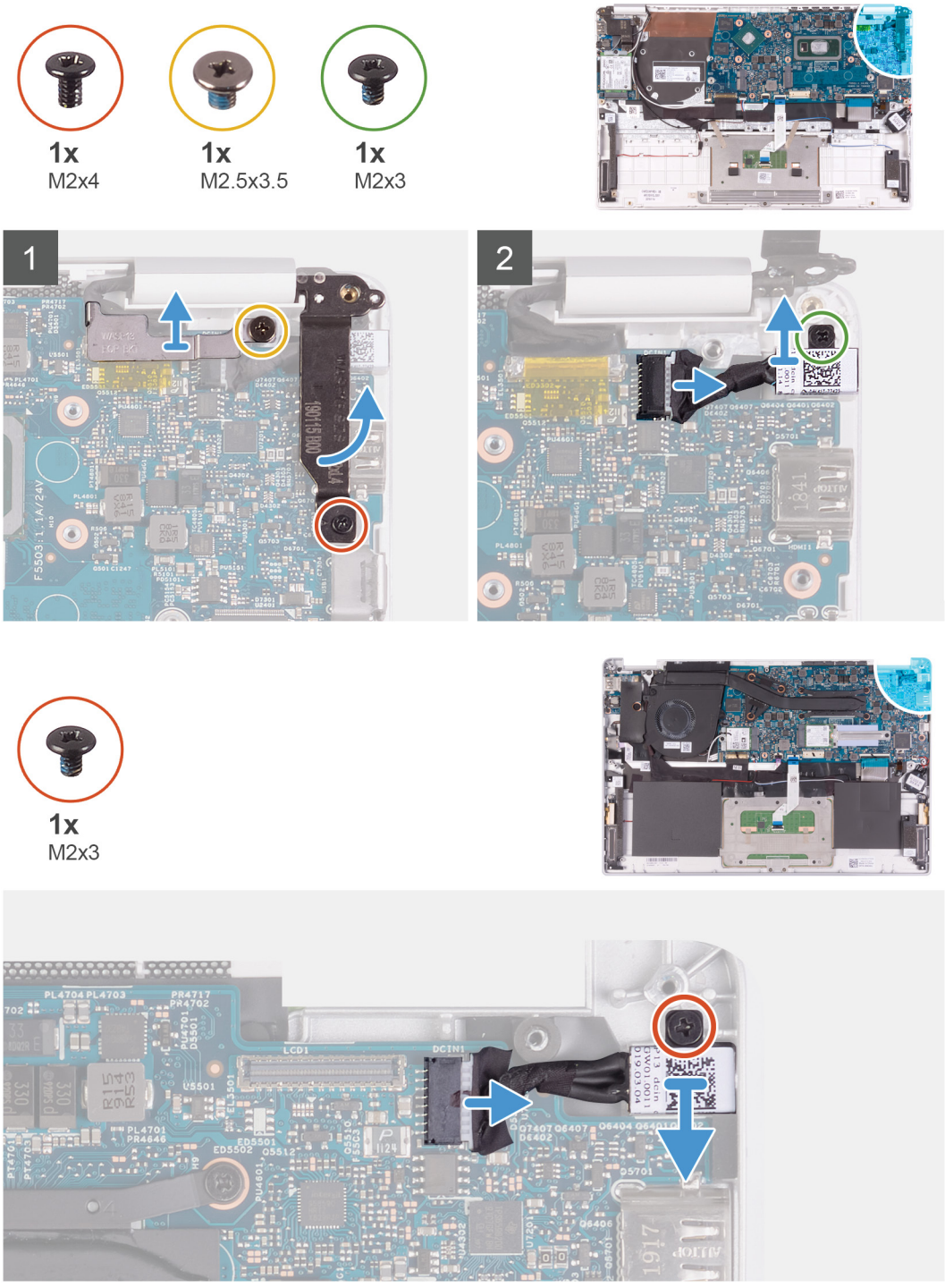
1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Power-adapter port

Removing the power-adapter port

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

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

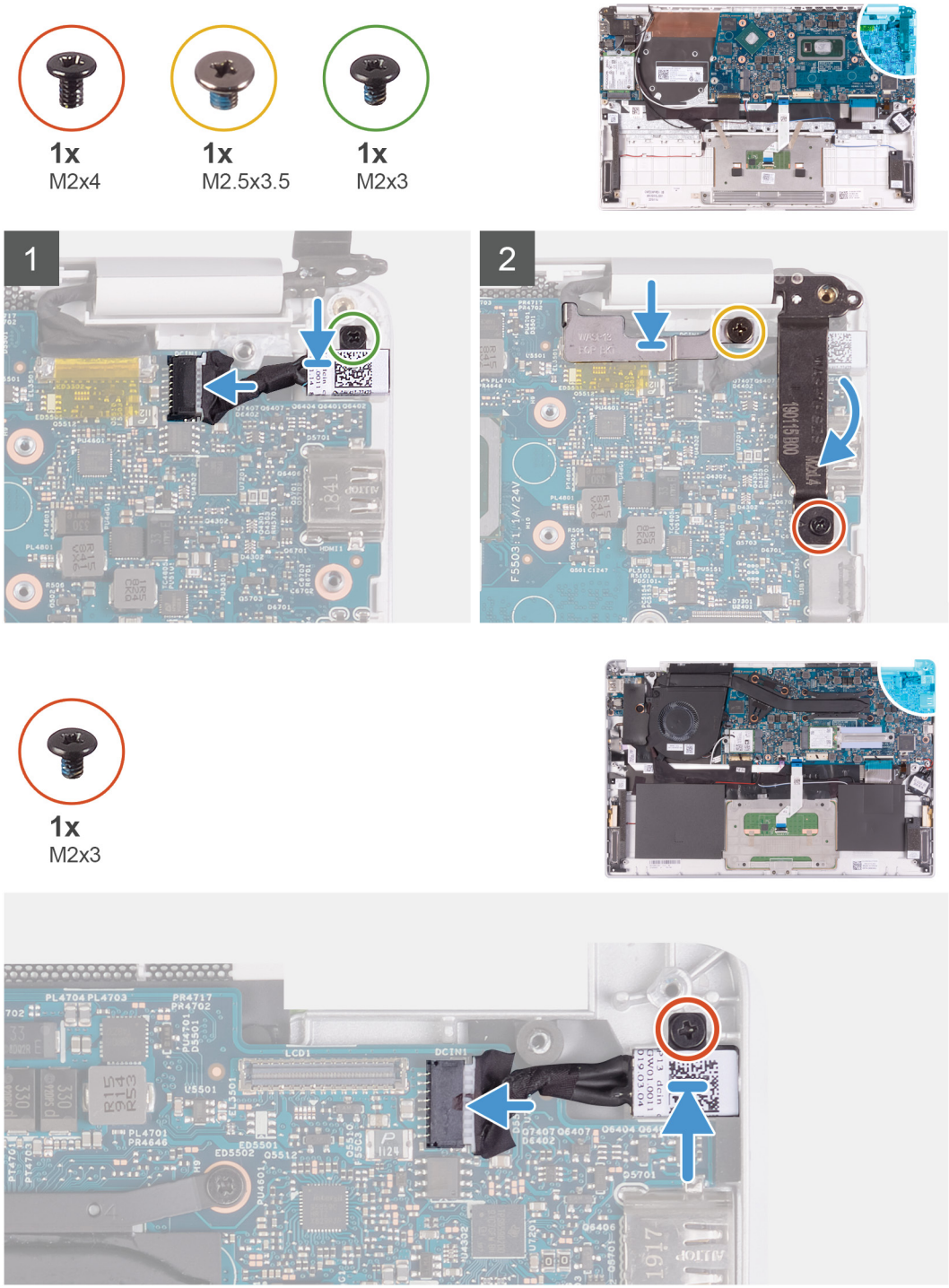


1. Remove the screw (M2.5x3.5) that secures the display-cable bracket to the system board.
2. Remove the screw (M2x4) that secures the right display hinge to the system board.
3. Open the display hinges at an angle of 90 degrees.
4. Disconnect the power-adapter port cable from the system board.
5. Remove the screw (M2x3) that secures the power-adapter port to the palm-rest and keyboard assembly.
6. Lift the power-adapter port, along with its cable, off the palm-rest and keyboard assembly.

Installing the power-adapter port

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

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



1. Connect the power-adapter port cable to the system board.
2. Replace the screw (M2x3) that secures the power-adapter port to the palm-rest and keyboard assembly.
3. Align and place the display-cable bracket on the system board.
4. Replace the screw (M2.5x3.5) that secure the display-cable bracket to the system board.
5. Using the alignment posts, close the display hinges.
6. Replace the screw (M2x4) that secure the right display hinge to the system board.

1. Install the display assembly.
2. Install the WLAN card.
3. Install the battery.

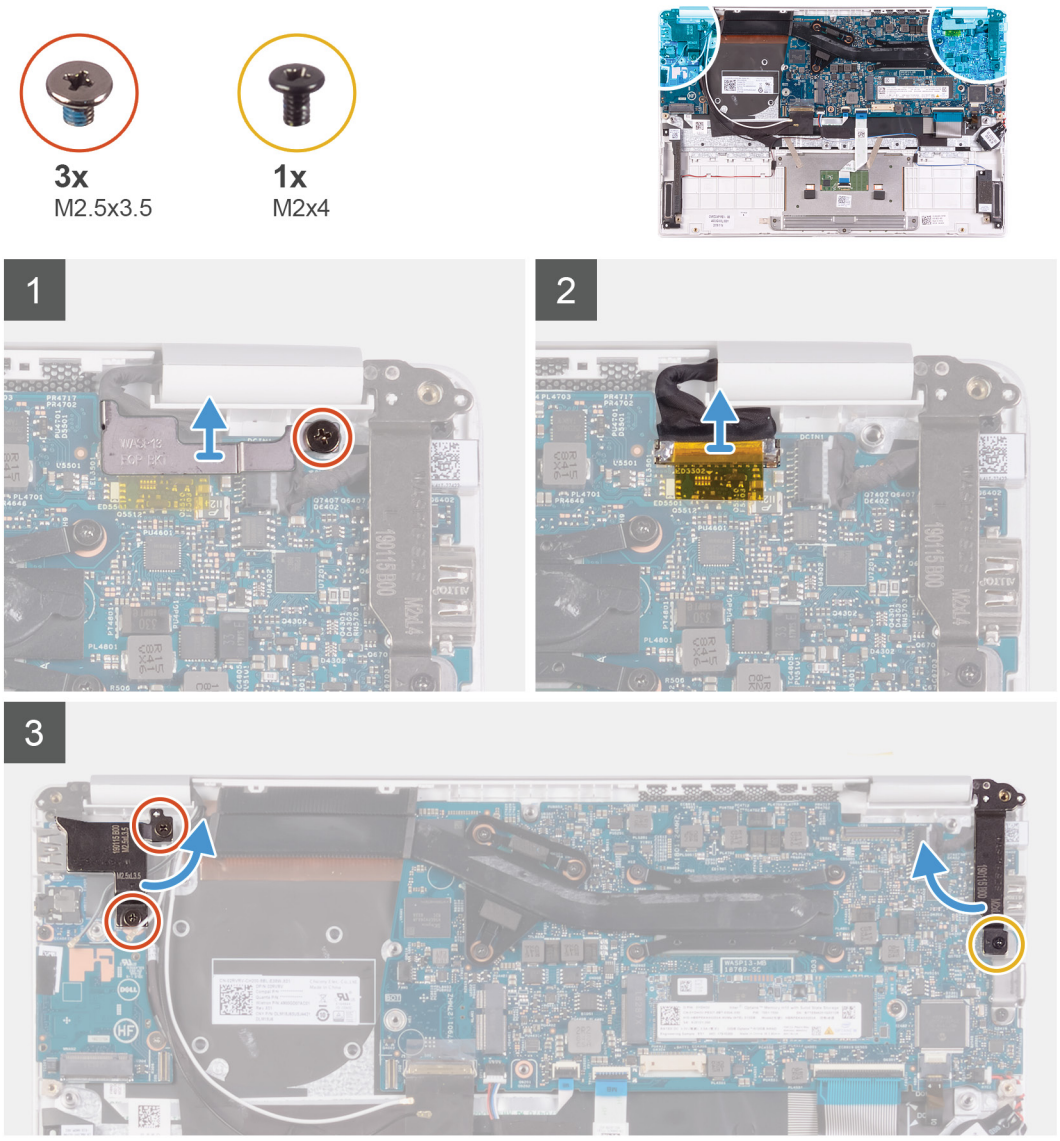
4. Install the base cover.
5. Follow the procedure in After working inside your computer.

Display assembly

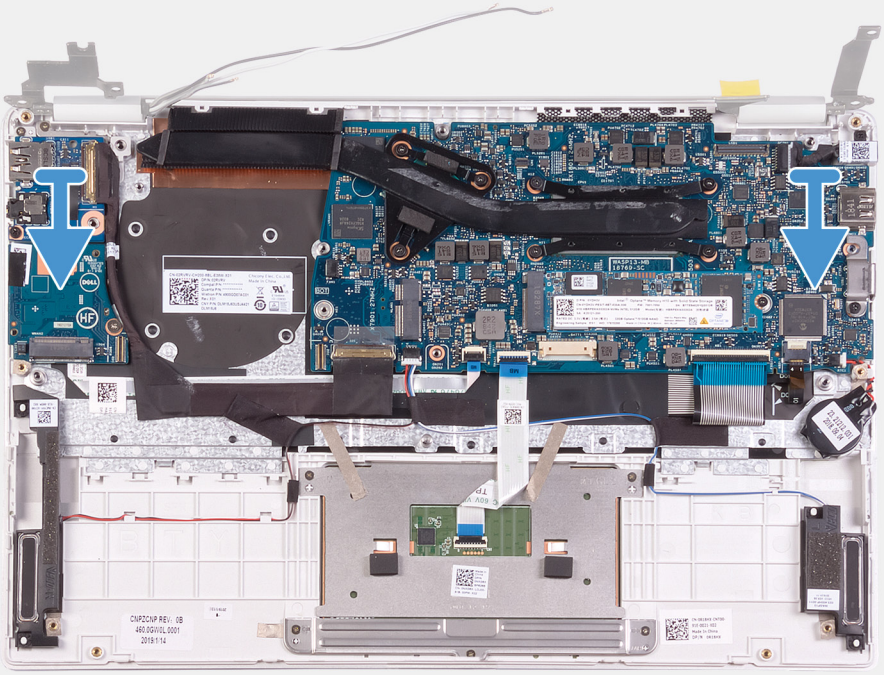
Removing the display assembly

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.

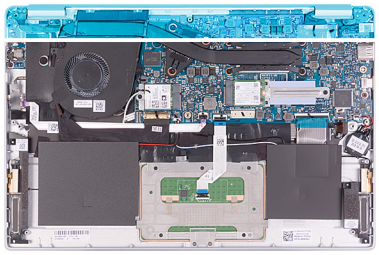
The following image indicates the location of display assembly and provides a visual representation of the removal procedure.



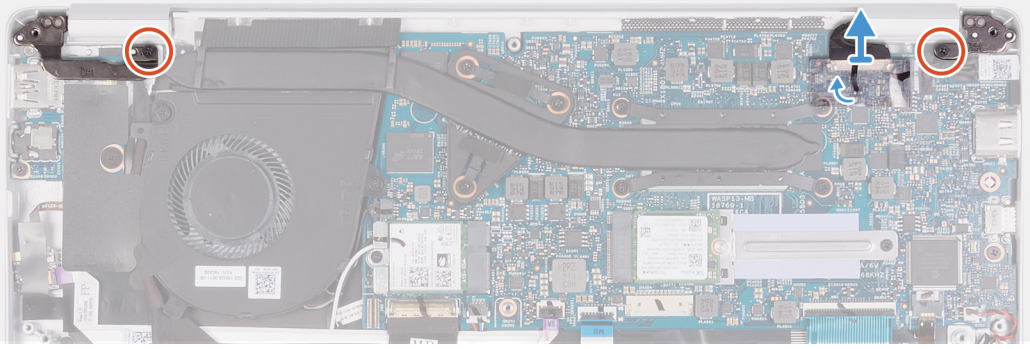
4

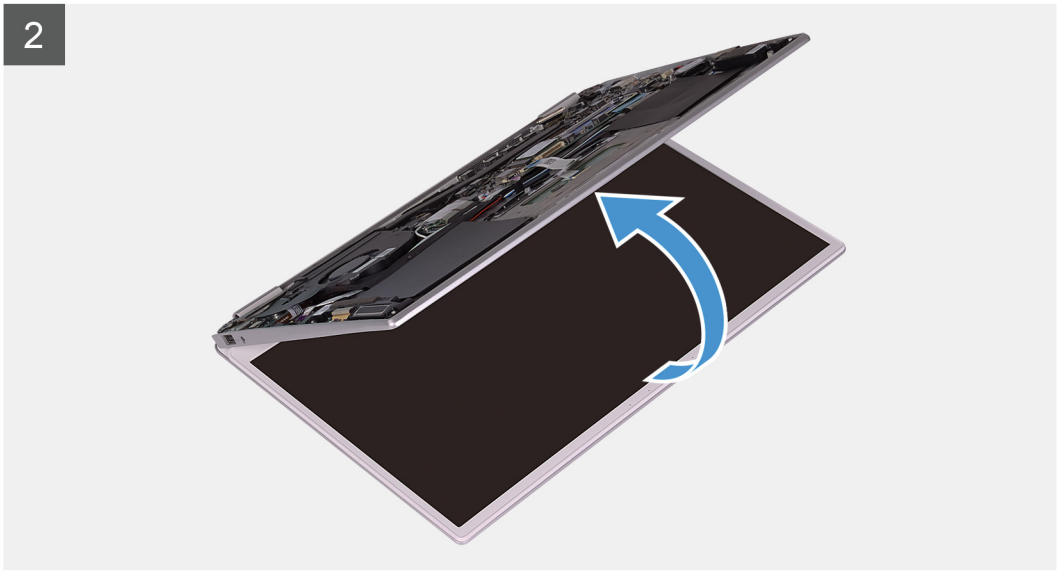


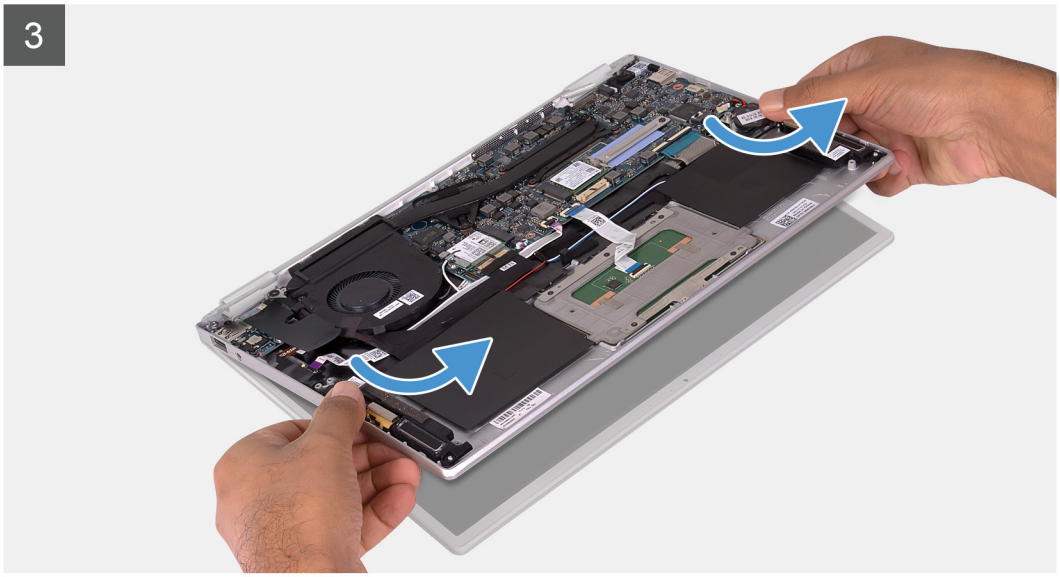
2x
M2x4



1







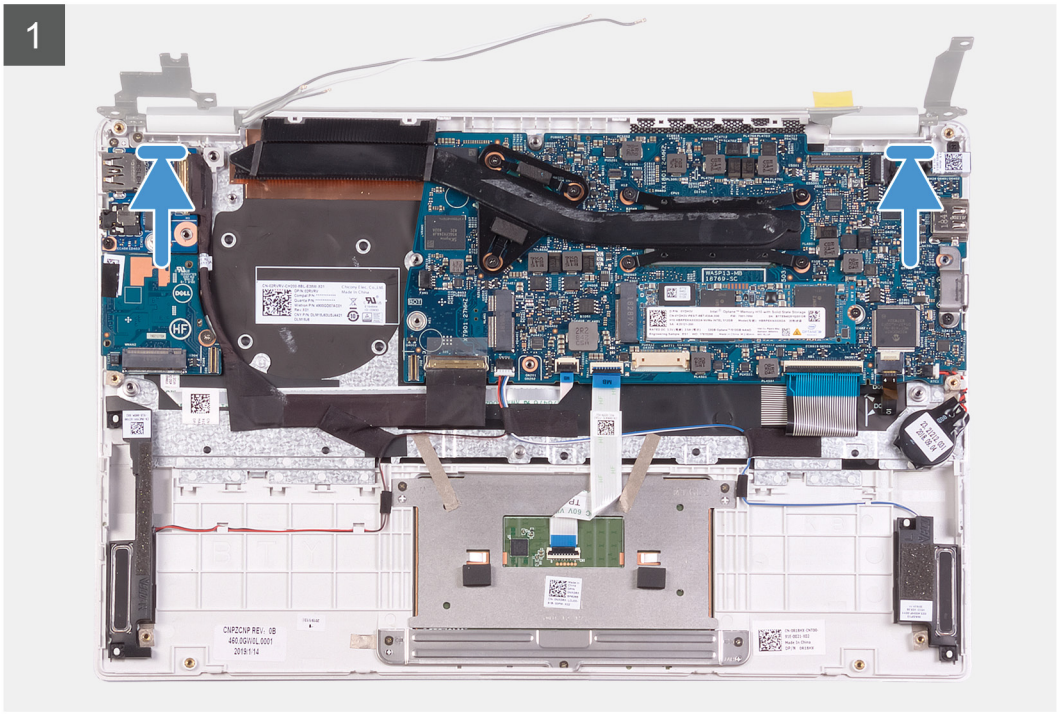
1. Remove the screw (M2.5x3.5) that secures the display-cable bracket to the system board.
2. Lift the display-cable bracket off the system board.
3. Using the pull tab, disconnect the display cable from the system board.
4. Remove the two screws (M2.5x3.5) that secure the left display hinge to the I/O board and palm-rest and keyboard assembly.
5. Remove the screw (M2x4) that secures the right display hinge to the system board.
6. Open the display hinges at an angle of 90 degrees.
7. Remove the two screws (M2x4) that secure the left and right display hinges to the I/O board and palm-rest and keyboard assembly.
8. Peel the tape and using the pull tab, remove the display cable from the system board.
9. Open the display assembly as far as possible.
10. Remove the palm-rest and keyboard assembly off the display assembly.

Installing the display assembly

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

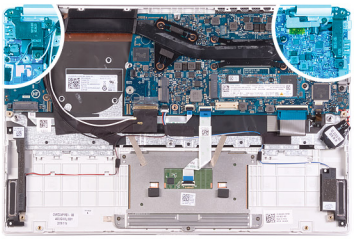
The following image indicates the location of display assembly and provides a visual representation of the installation procedure.

1

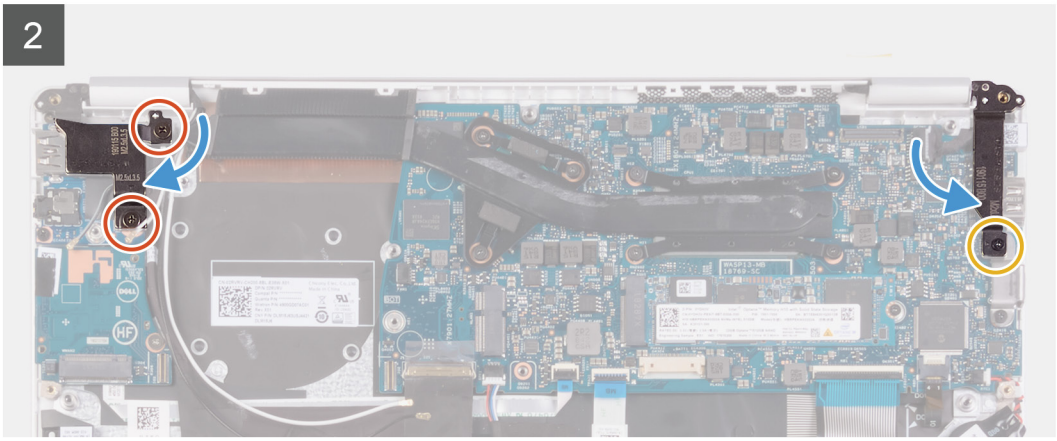


3x
M2.5x3.5

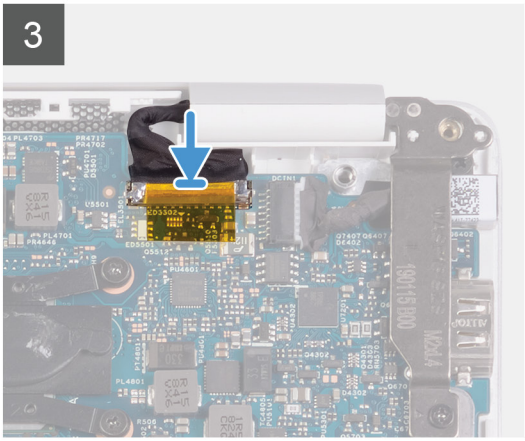
1x
M2x4



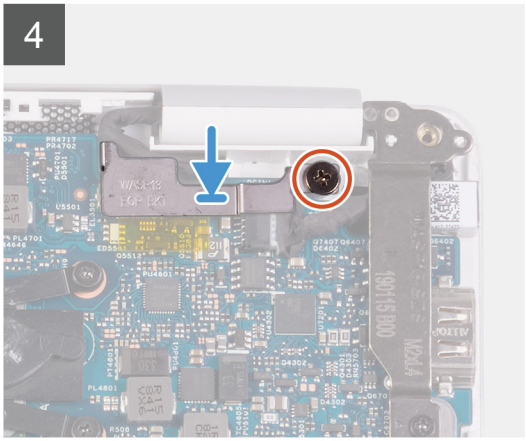
2



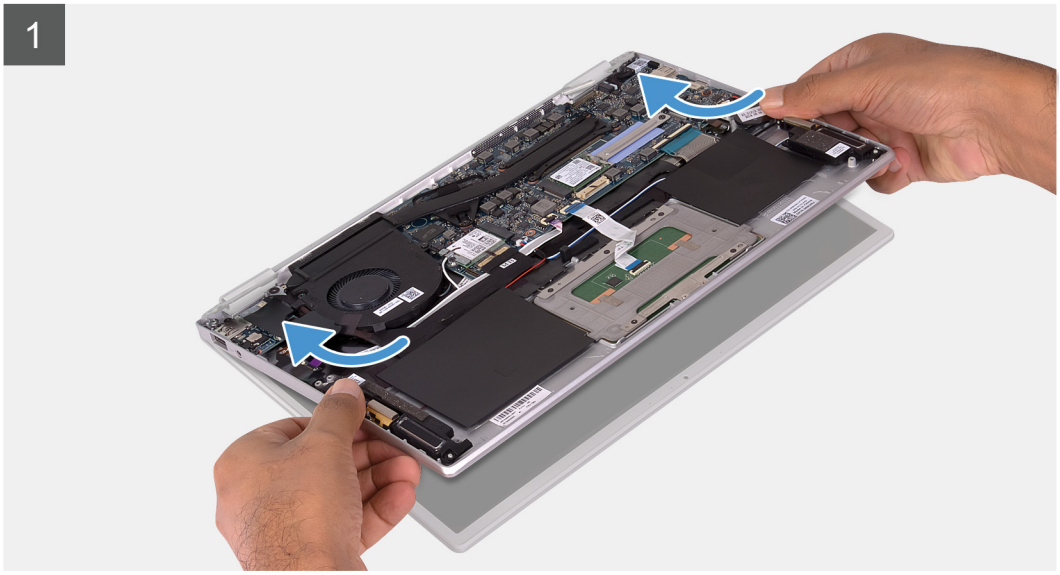
3



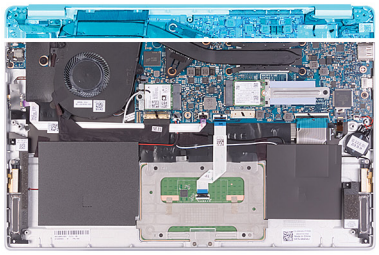
4

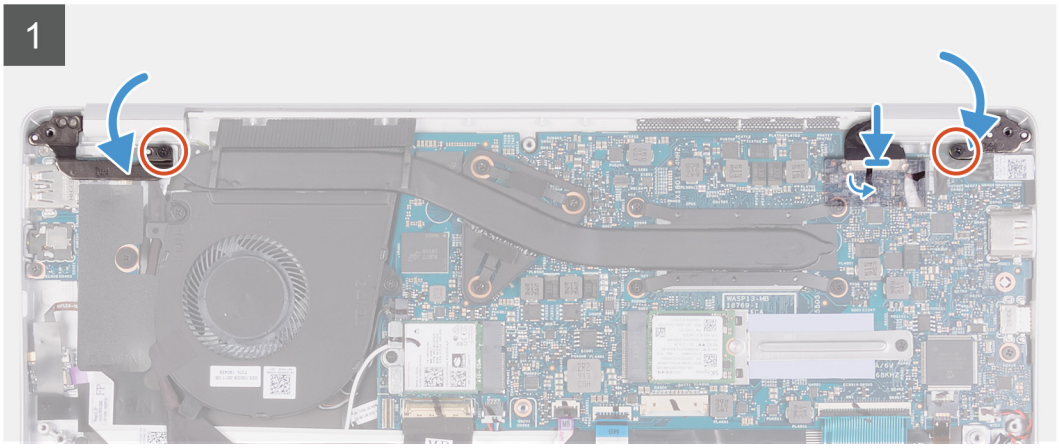


1



2x
M2x4





1. Align and place the palm-rest and keyboard assembly on the display assembly.
2. Using the alignment posts, close the display hinges.
3. Replace the two screws (M2.5x3.5) that secures the left display hinge to the I/O board and palm-rest and keyboard assembly.
4. Replace the two screws (M2x4) that secures the left and right display hinge to the I/O board and palm-rest and keyboard assembly.
5. Replace the screw (M2x4) that secures the right display hinge to the system board.
6. Connect the display cable on to the connector on the system board.
7. Connect the display cable on to the connector on the system board and adhere the tape that secures the display cable to the system board.
8. Align and place the display-cable bracket on the display cable.
9. Replace the screw (M2x4) that secures the display-cable bracket to the system board.

1. Install the battery.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

I/O board

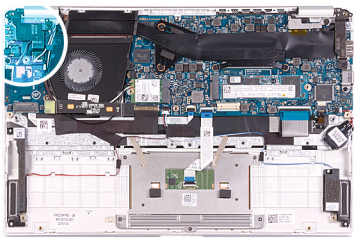
Removing the I/O board

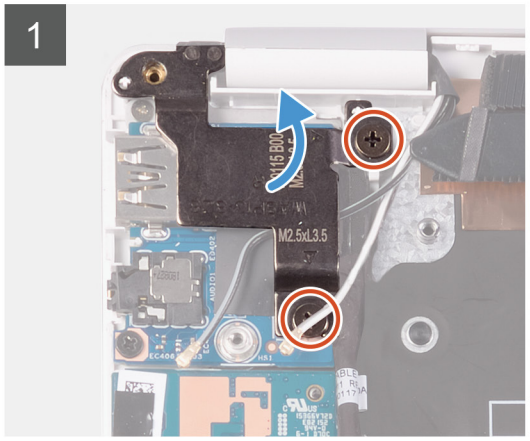
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the fan.

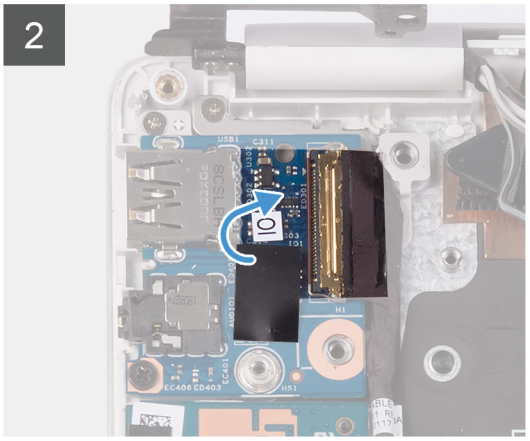
The following image indicates the location of I/O board and provides a visual representation of the removal procedure.

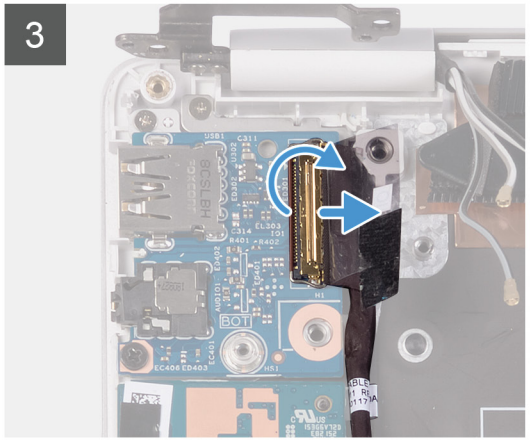
2x
M2.5x3.5

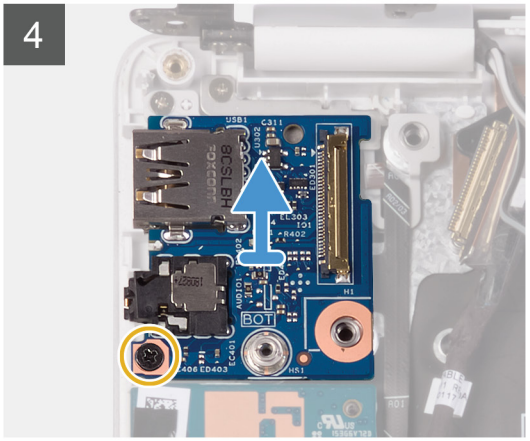
1x
M2x3

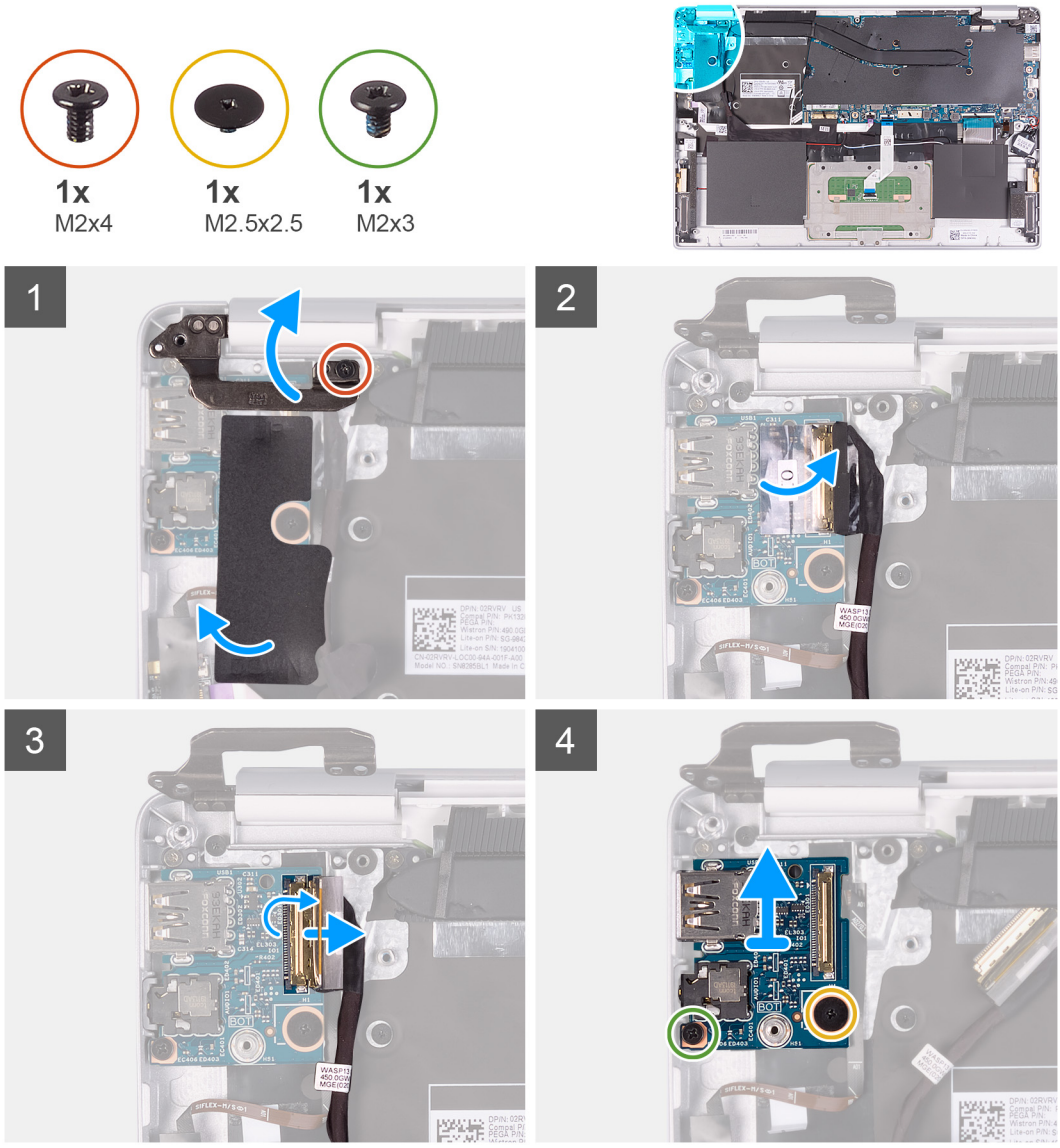












1. Remove the two screws (M2.5x3.5) that secure the left display hinge to the I/O board and palm-rest and keyboard assembly.
2. Remove the screw (M2x4) that secure the left display hinge to the palm-rest and keyboard assembly.
3. Open the display hinges at an angle of 90 degrees.
4. Peel the mylar tape that secures the I/O board to the palm-rest and keyboard assembly.
5. Peel the tape that secures the I/O-board cable to the I/O board.
6. Open the latch and disconnect the I/O-board cable from the I/O board.
7. Remove the screw (M2.5x2.5) that secures the I/O board to the palm-rest and keyboard assembly.
8. Remove the screw (M2x3) that secures the I/O board to the palm-rest and keyboard assembly.
9. Lift the I/O board off the palm-rest and keyboard assembly.

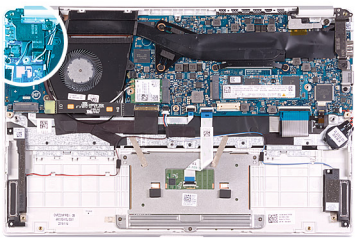
Installing the I/O board

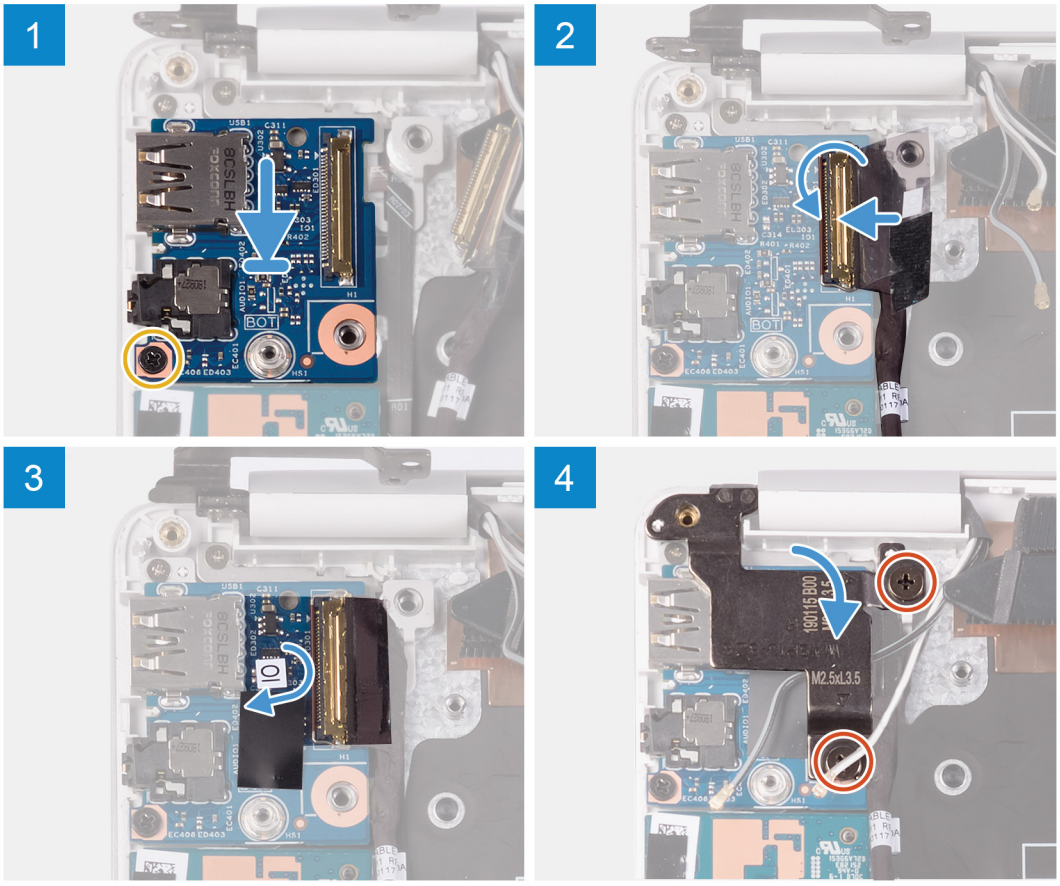
If you are replacing a component, remove the existing component before performing the installation procedure.

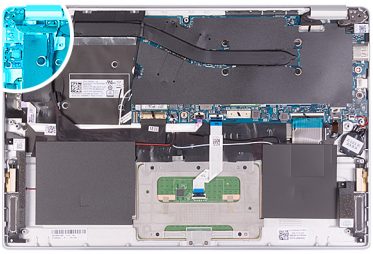
The following image indicates the location of I/O board and provides a visual representation of the installation procedure.

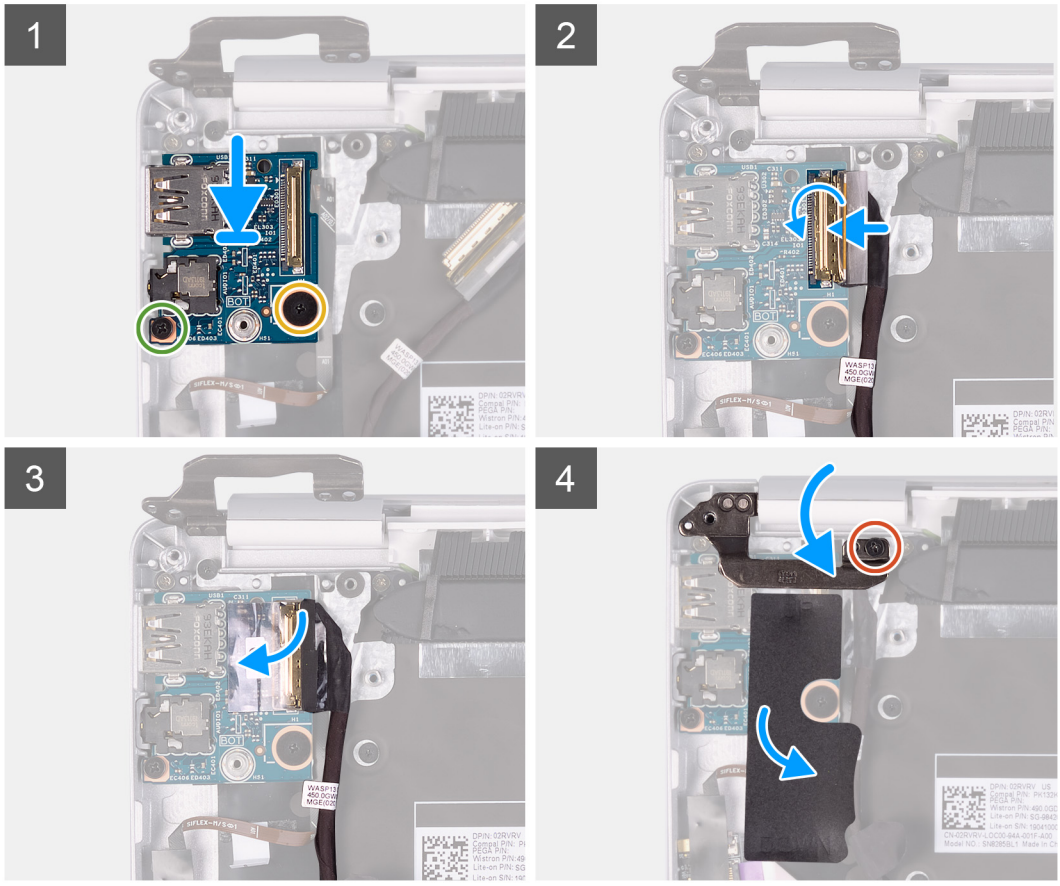
2x
M2.5x3.5

1x
M2x3









1. Align and place the I/O board on the palm-rest and keyboard assembly.
2. Replace the screw (M2x3) that secures the I/O board to the palm-rest and keyboard assembly.
3. Replace the screw (M2.5x2.5) that secures the I/O board to the palm-rest and keyboard assembly.
4. Connect the I/O-board cable to the I/O board and close the latch to secure the cable.
5. Adhere the tape that secures the I/O board to the I/O board.
6. Adhere the Mylar that secures the I/O board to the palm-rest and keyboard assembly.
7. Using the alignment posts, close the display hinges.
8. Replace the two screws (M2.5x3.5) that secure the left display hinge to the I/O board and palm-rest and keyboard assembly.
9. Replace the screw (M2x4) that secure the left display hinge to the palm-rest and keyboard assembly.

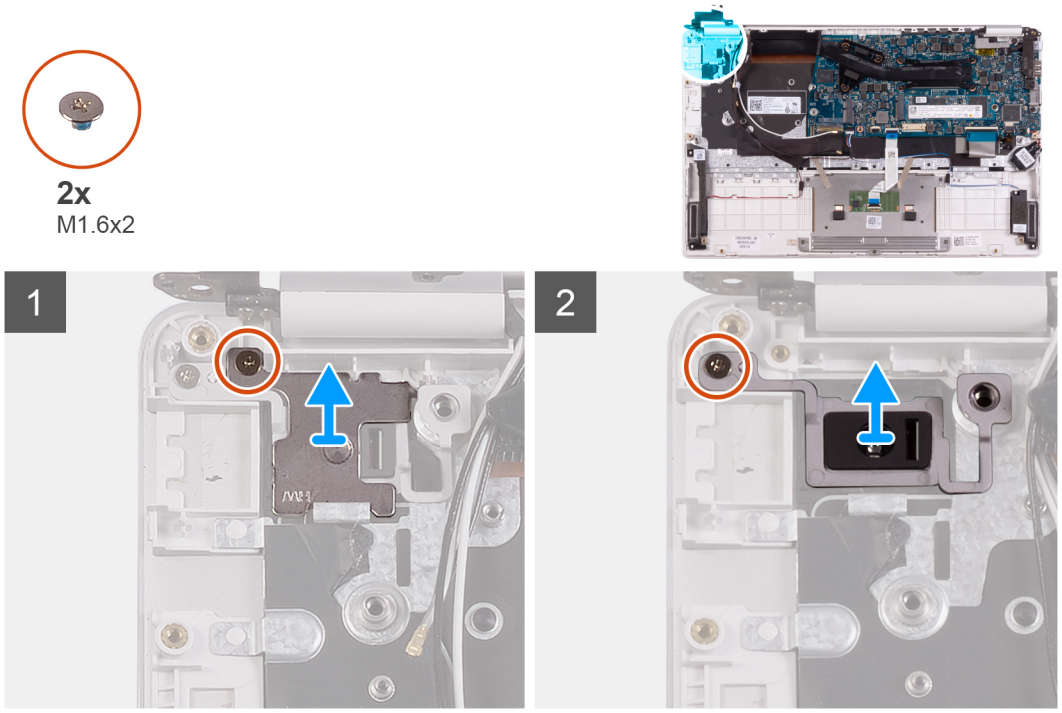
1. Install the fan.
2. Install the battery.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

Power-button board

Removing the power-button board

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the WLAN card.
5. Remove the fan.
6. Remove the I/O board.

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

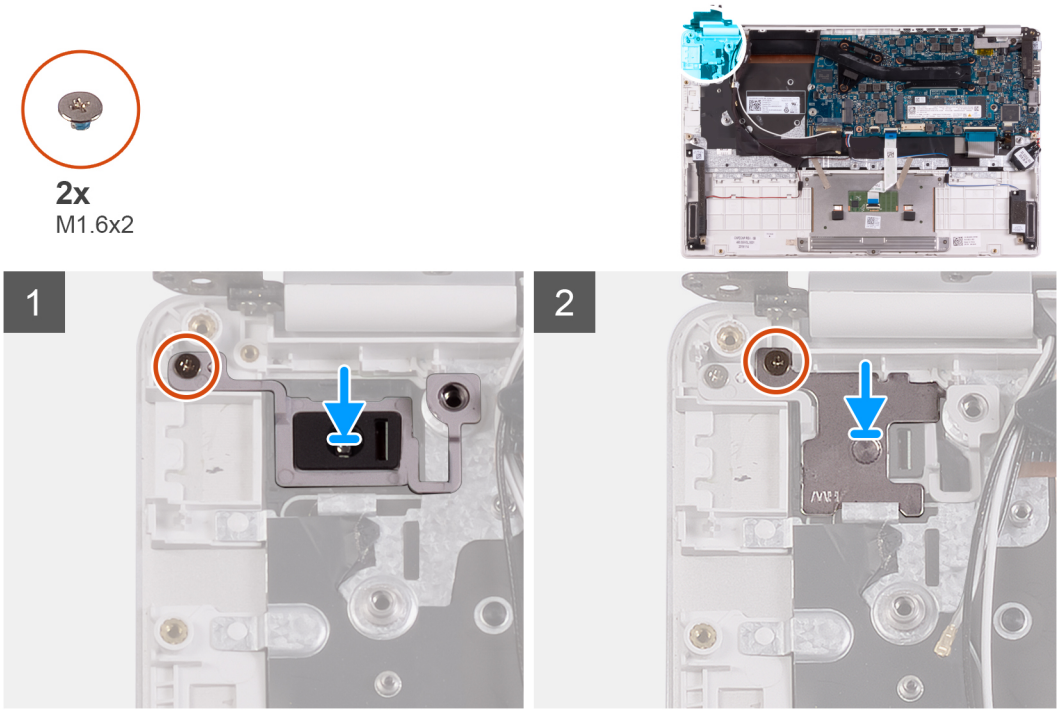


1. Remove the screw (M1.6x2) that secures the power-button bracket to the palm-rest and keyboard assembly.
2. Remove the screw (M1.6x2) that secures the power-button board to the palm-rest and keyboard assembly and lift the power-button board off the palm-rest and keyboard assembly.

Installing the power-button board

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

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



1. Align the screw hole on the power-button board with the screw hole on the palm-rest and keyboard assembly.
2. Replace the screw (M1.6x2) that secures the power-button board to the palm-rest and keyboard assembly.
3. Align the screw hole on the power-button bracket with the screw hole on the palm-rest and keyboard assembly.
4. Replace the screw (M1.6x2) that secures the power-button bracket to the palm-rest and keyboard assembly.

1. Install the I/O board.
2. Install the fan.
3. Install the WLAN card.
4. Install the battery.
5. Install the base cover.
6. Follow the procedure in After working inside your computer.

Power button with fingerprint reader

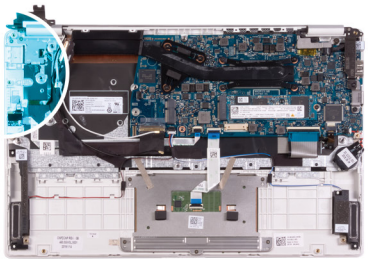
Removing the power button with fingerprint reader

NOTE: This procedure is only applicable for computers shipped with a fingerprint reader.

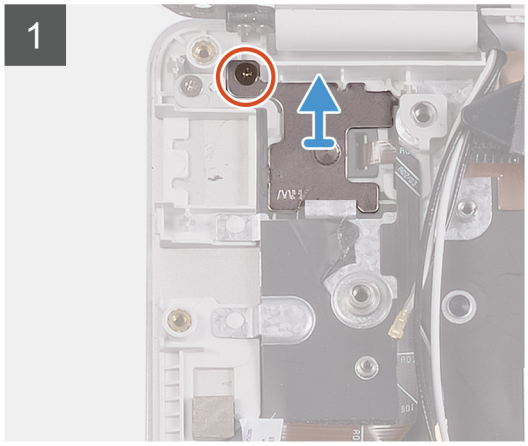
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the WLAN card.
5. Remove the fan.
6. Remove the I/O board.

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

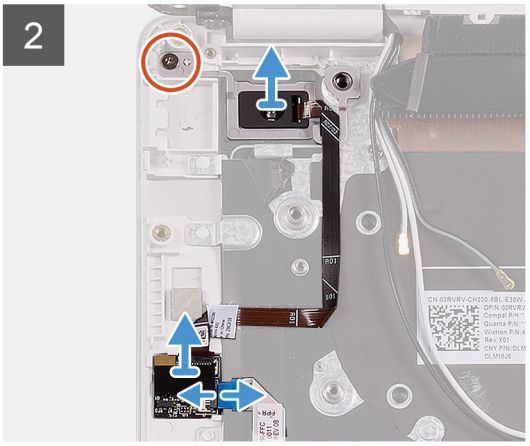
2x
M1.6x2

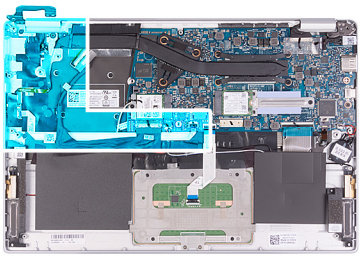


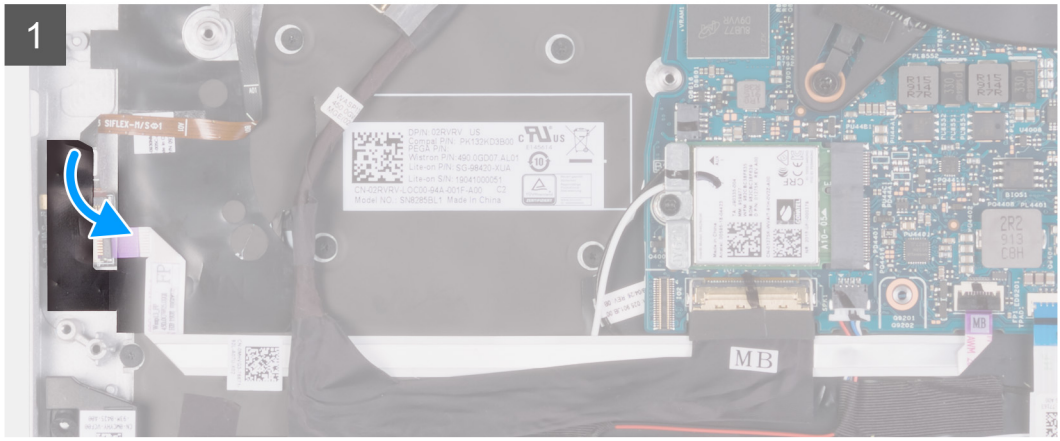
1

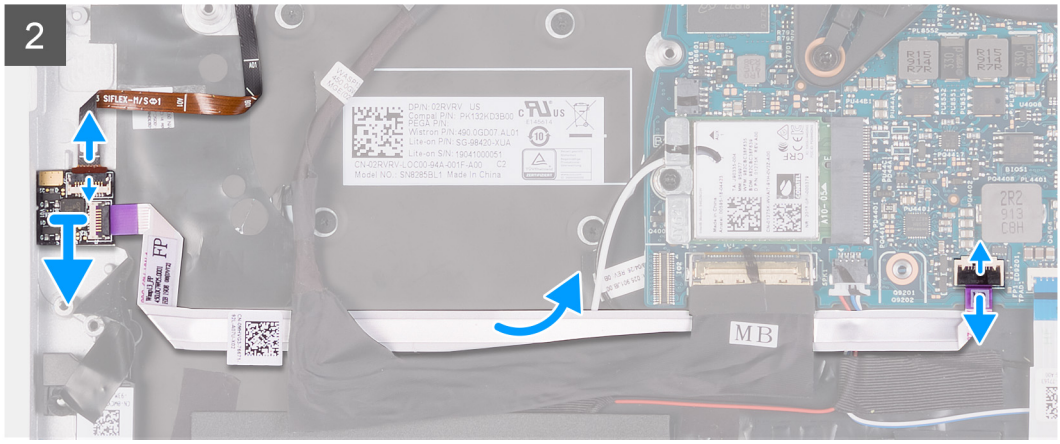


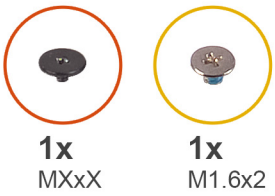
2

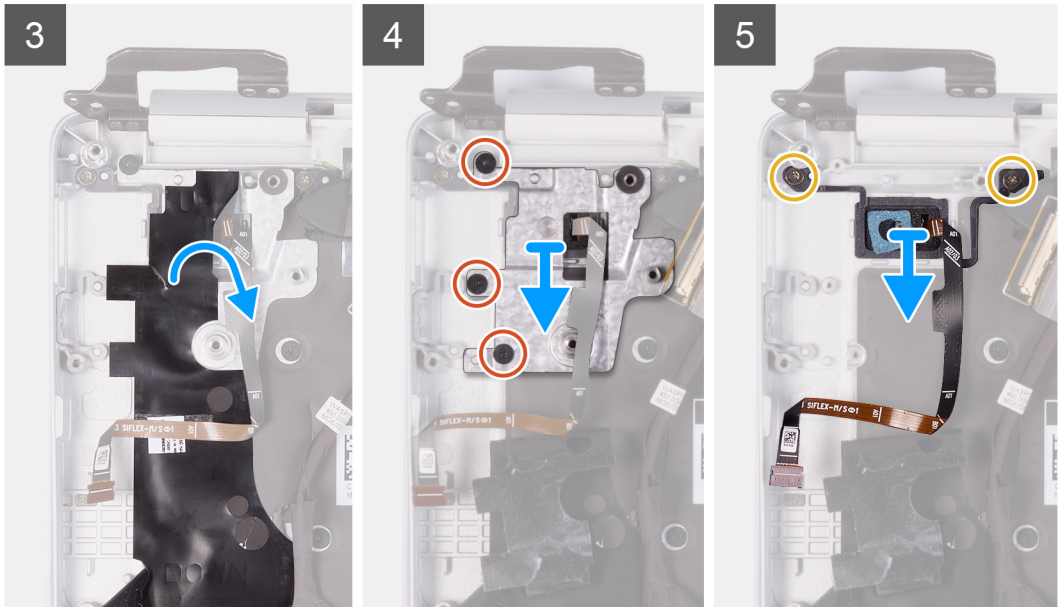





1
MB


2
MB





1. Peel the tape that secures the fingerprint-reader board to the palm-rest and keyboard assembly.
2. Remove the screw (M1.6x2) that secures the power-button bracket to the palm-rest and keyboard assembly.
3. Remove the screw (M1.6x2) that secures the power button with fingerprint reader to the palm-rest and keyboard assembly.
4. Open the latch and disconnect the fingerprint-reader cable from the fingerprint-reader board.
5. Lift the power button with fingerprint-reader, along with the power-button cable, off the palm-rest and keyboard assembly.
6. Open the latch and disconnect the fingerprint-reader cable from the fingerprint-reader board.
7. Open the latch and disconnect the fingerprint-reader cable from the system board.
8. Lift the power button with fingerprint-reader, along with the power-button cable, off the palm-rest and keyboard assembly.
9. Peel the Mylar that secures the power-button bracket to the keyboard and palm-rest assembly.
10. Remove the three screws that secures the power-button bracket to the palm-rest and keyboard assembly.
11. Lift the power-button bracket off the palm-rest and keyboard assembly.
12. Remove the two screws (M1.6x2) that secure the power button to the palm-rest and keyboard assembly.
13. Lift the power button off the palm-rest and keyboard assembly.

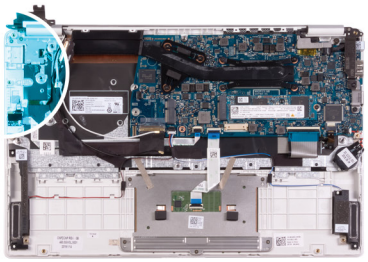
Installing the power button with fingerprint reader

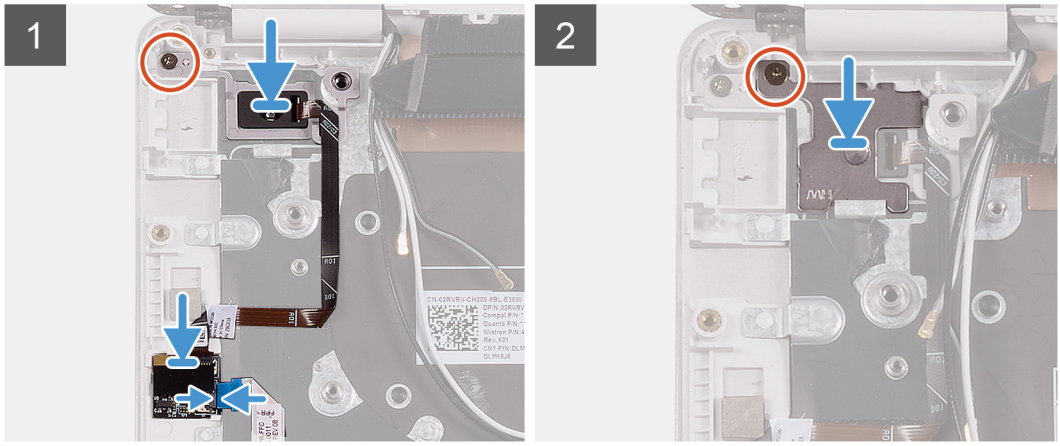
NOTE: This procedure is only applicable for computers shipped with a fingerprint reader.

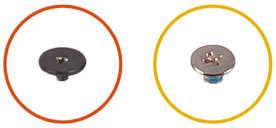
If you are replacing a component, remove the existing component before performing the installation procedure.

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

2x
M1.6x2

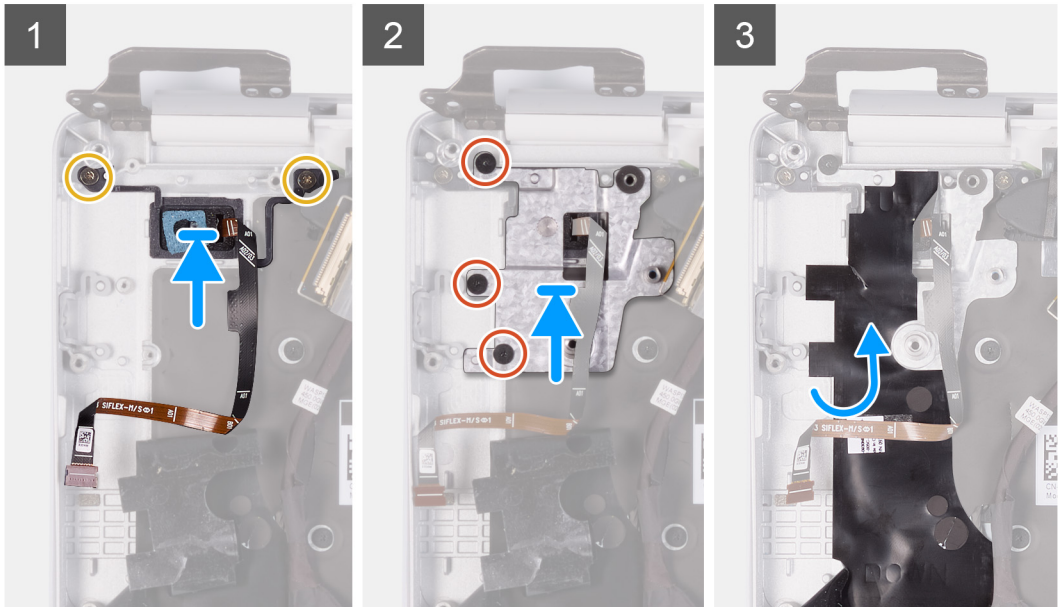


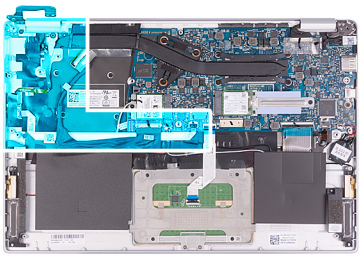


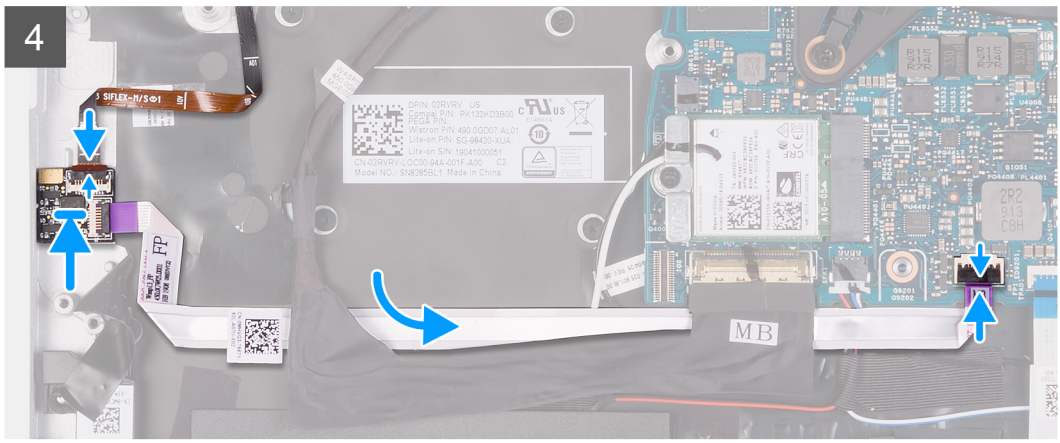


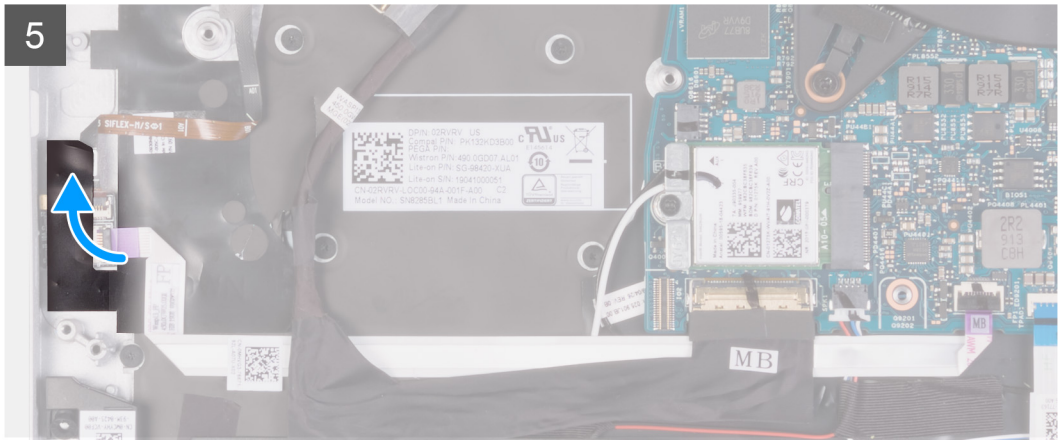
1x
MXxX

1x
M1.6x2









1. Align and place the power button with fingerprint reader on the palm-rest and keyboard assembly.
2. Replace the screw (M1.6x2) that secure the power button with fingerprint reader to the palm-rest and keyboard assembly.
3. Align the screw holes on the power-button bracket with the screw holes on the palm-rest and keyboard assembly.
4. Replace the three screws that secures the power-button bracket to the palm-rest and keyboard assembly.
5. Adhere the Mylar that secures the power-button bracket to the keyboard and palm-rest assembly.
6. Connect the fingerprint-reader cable to the system board and close the latch to secure the cable.
7. Connect the fingerprint-reader cable to the fingerprint-reader board and close the latch to secure the cable.
8. Align and place the power-button bracket on the palm-rest and keyboard assembly.
9. Replace the screw (M1.6x2) that secure the power-button bracket to the palm-rest and keyboard assembly.
10. Adhere the tape that secures the fingerprint-reader board to the palm-rest and keyboard assembly.

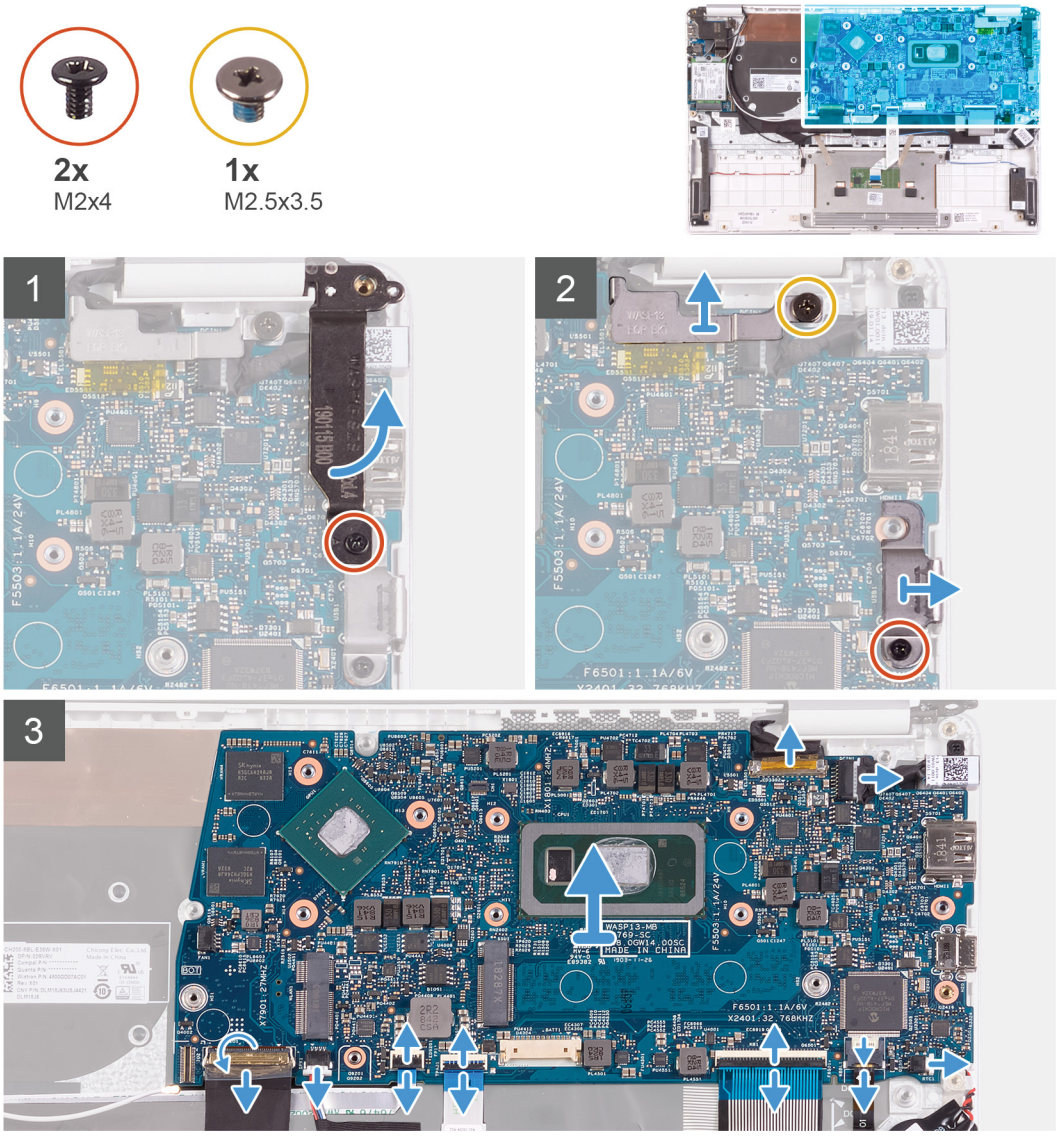
1. Install the I/O board.
2. Install the fan.
3. Install the WLAN card.
4. Install the battery.
5. Install the base cover.
6. Follow the procedure in After working inside your computer.

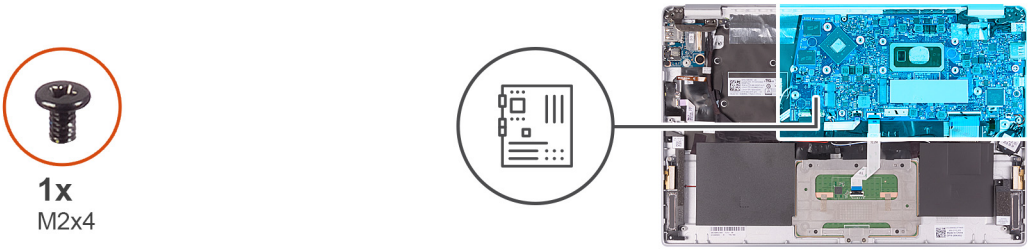
System board

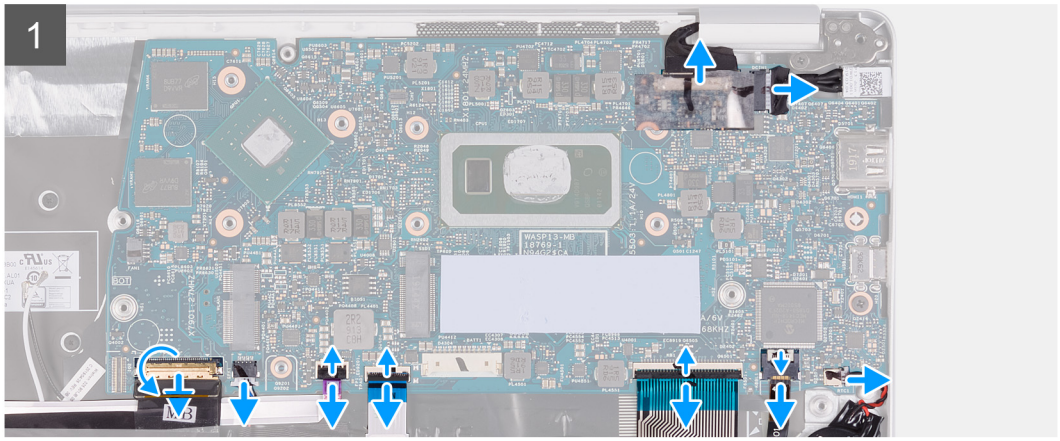
Removing the system board

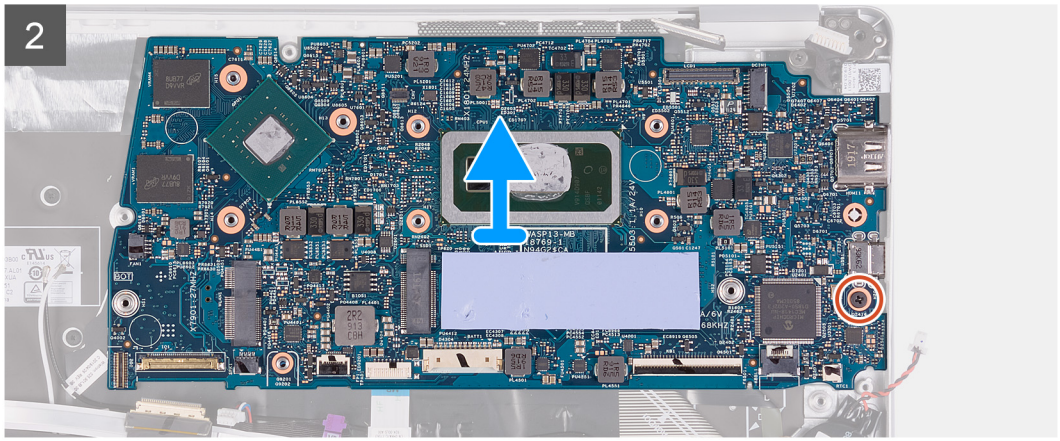
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2280 solid-state drive or M,2 2230 solid-state drive, whichever applicable.
5. Remove the WLAN card.
6. Remove the fan.
7. Remove the heat sink.

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







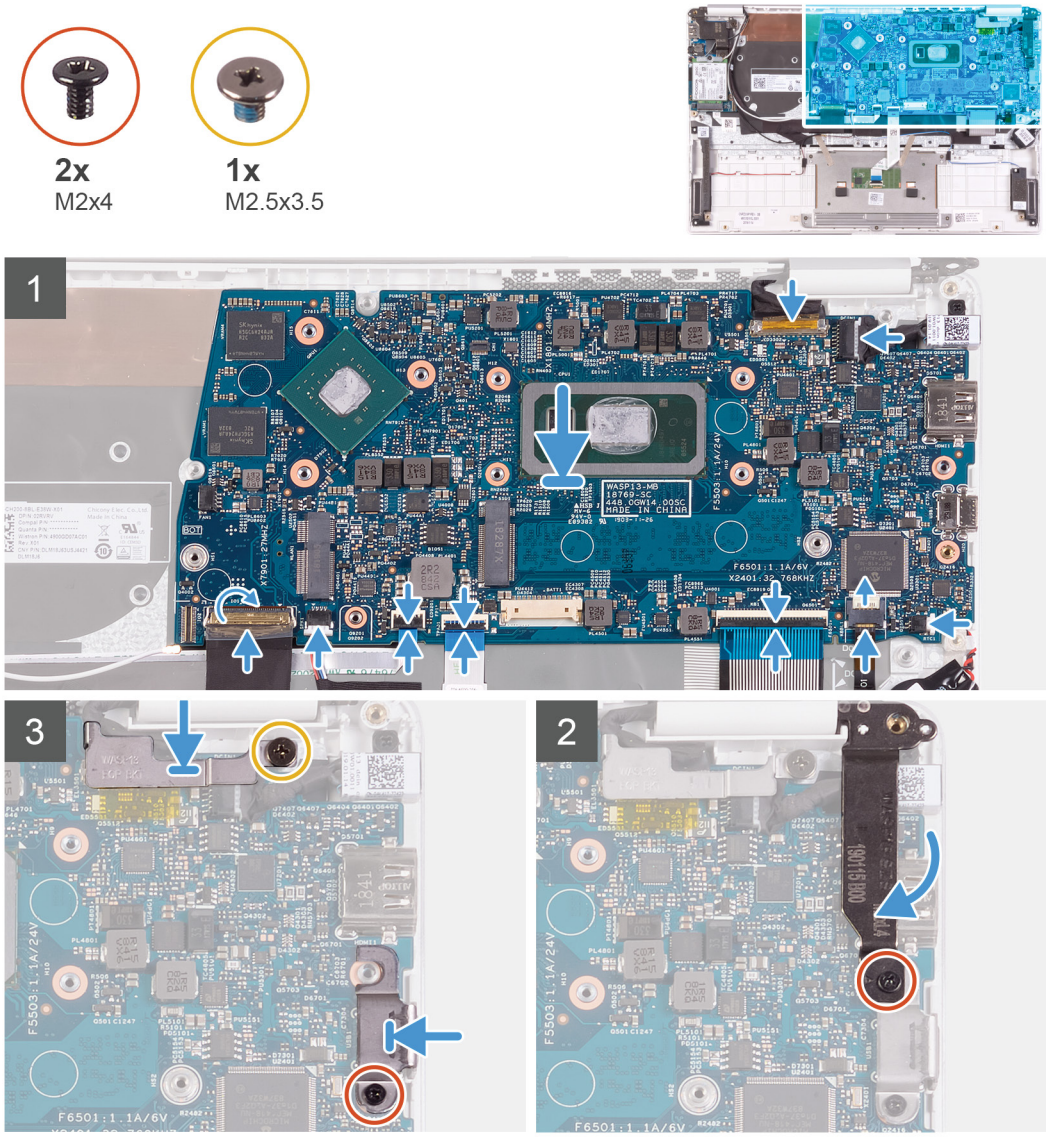


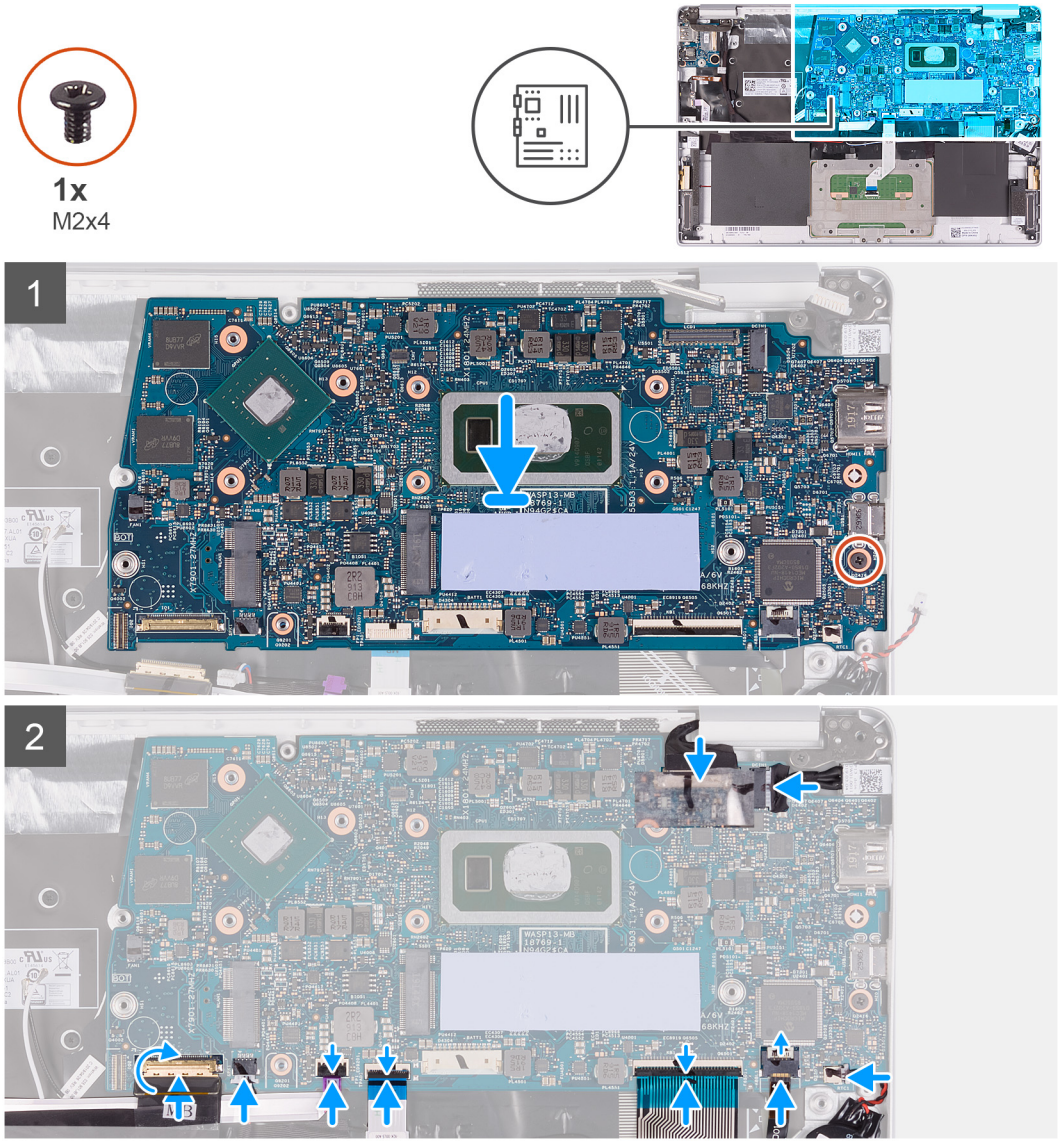
1. Remove the screw (M2x4) screw that secures the right display hinge to the system board.
2. Remove the screw (M2x4) that secures the display-cable bracket to the system board.
3. Remove the screw (M2.5x3.5) screw that secures the USB Type-C port bracket to the system board.
4. Peel the tape that secures the I/O-board cable to the system board.
5. Open the latch and disconnect the I/O-board cable from the system board.
6. Disconnect the speaker cable from the system board.
7. Open the latch and disconnect the fingerprint-reader cable from the system board.
8. Open the latch and disconnect the touchpad cable from the system board.
9. Open the latch and disconnect the keyboard cable from the system board.
10. Open the latch and disconnect the keyboard backlit cable from the system board.
11. Disconnect the coin-cell battery cable from the system board.
12. Disconnect the power-adapter port cable from the system board.
13. Using the pull tab, disconnect the display cable from the system board.
14. Remove the screw (M2x4) that secures the system board to the palm-rest and keyboard assembly.
15. Gently release the ports on the system board from the slots on the palm-rest and keyboard assembly and lift the system board off the palm-rest and keyboard assembly.

Installing the system board

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

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





1. Slide the ports on the system board into the slots on the palm-rest and keyboard assembly and align the screw holes on the system board with the screw holes on the palm-rest and keyboard assembly.
2. Replace the screw (M2x4) that secures the system board to palm-rest and keyboard assembly.
3. Connect the display cable on to the connector on the system board6
4. Connect the power-adapter port cable to the system board.
5. Connect the coin-cell battery cable to the system board.
6. Connect the keyboard backlit cable to the system board and close the latch to secure the cable.
7. Connect the keyboard cable to the system board and close the latch to secure the cable.
8. Connect the touchpad cable to the system board and close the latch to secure the cable.
9. Connect the fingerprint-reader cable to the system board and close the latch to secure the cable.
10. Connect the speaker cable to the system board.
11. Connect the I/O-board cable to the system board and close the latch to secure the cable.
12. Adhere the tape that secures the I/O-board cable to the system board.
13. Replace the screw (M2x4) screw that secures the right display hinge to the system board.
14. Replace the screw (M2x4) that secures the display-cable bracket to the system board.
15. Replace the screw (M2.5x3.5) screw that secures the USB Type-C port bracket to the system board.

1. Install the power-adapter port.
2. Install the display assembly.
3. Install the heat sink.

4. Install the fan.
5. Install the WLAN card.
6. Install the M.2 2280 solid-state drive or M.2 2230 solid-state drive, whichever applicable.
7. Install the battery.
8. Install the base cover.
9. Follow the procedure in After working inside your computer.

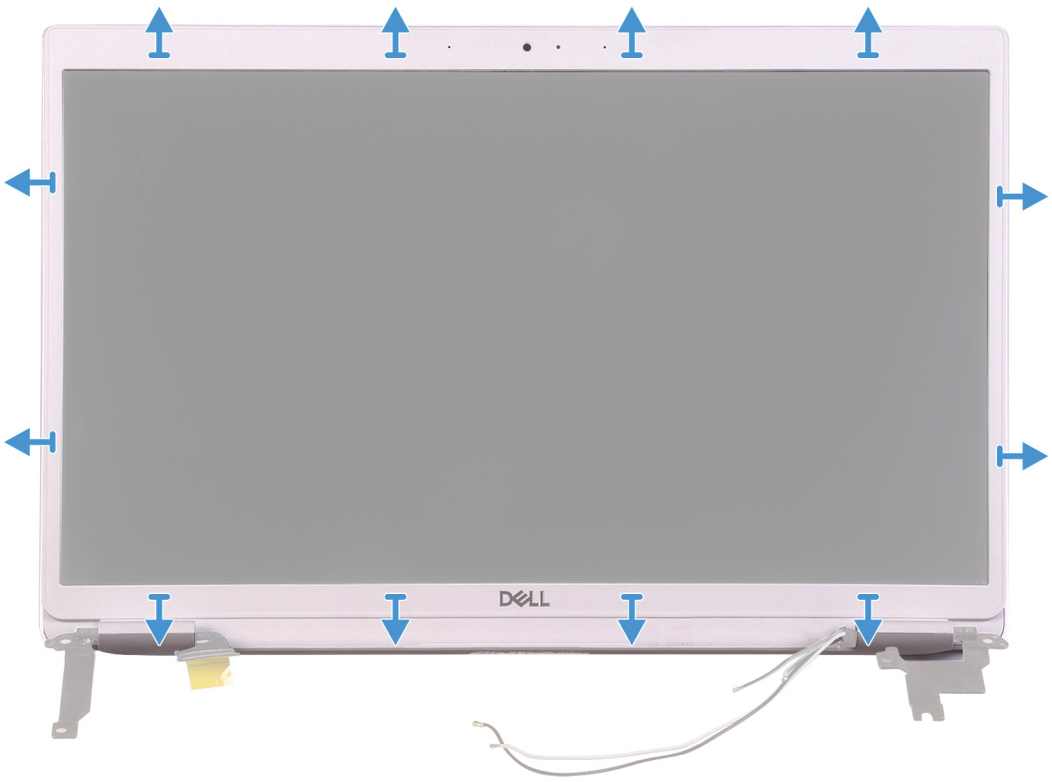
Display bezel

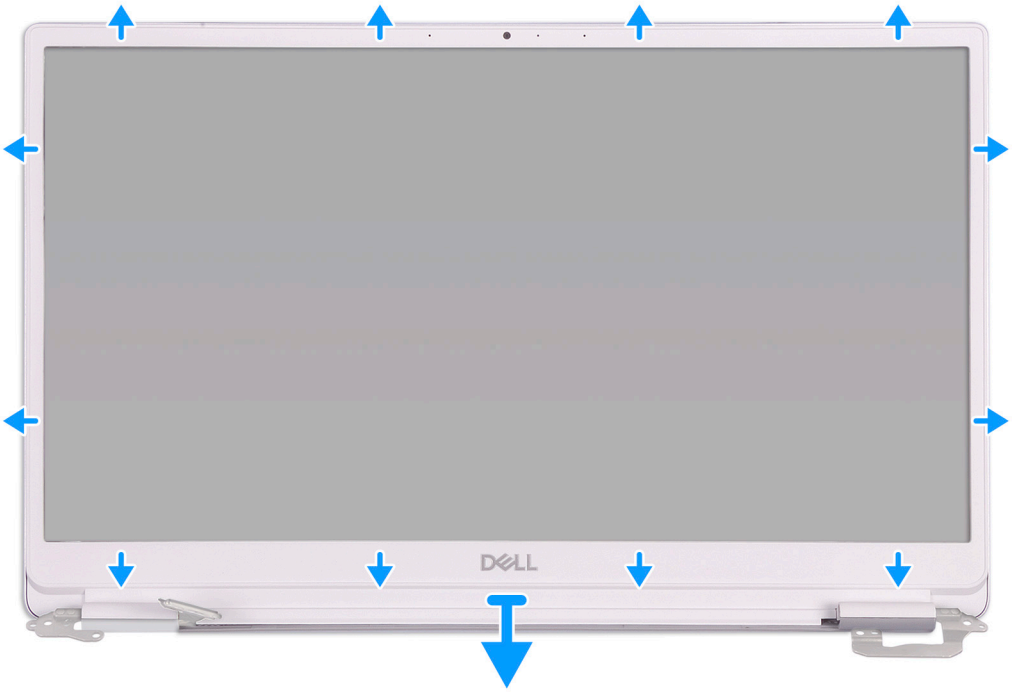
Removing the display bezel

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

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





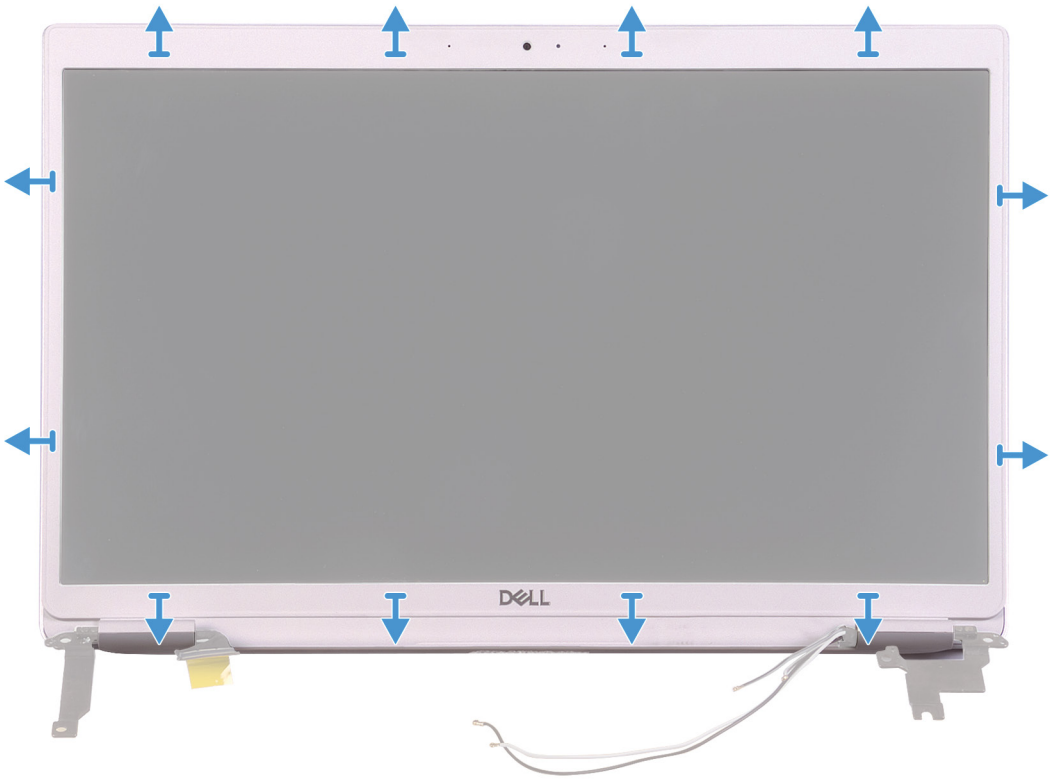
1. Carefully pry the edges of the display bezel off the display back-cover and antenna assemblydisplay back-cover.
2. Remove the display bezel off the display back-cover and antenna assemblydisplay back-cover.

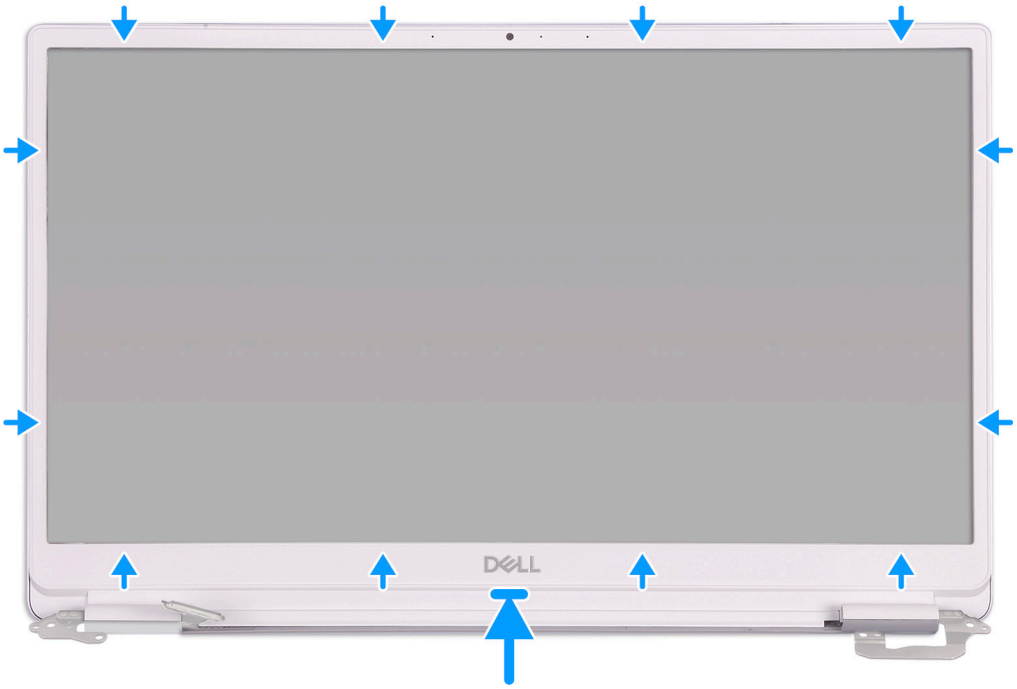
Installing the display bezel

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

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





Align the display bezel with the display back-cover and antenna assemblydisplay back-cover, and gently snap the display bezel into place.

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

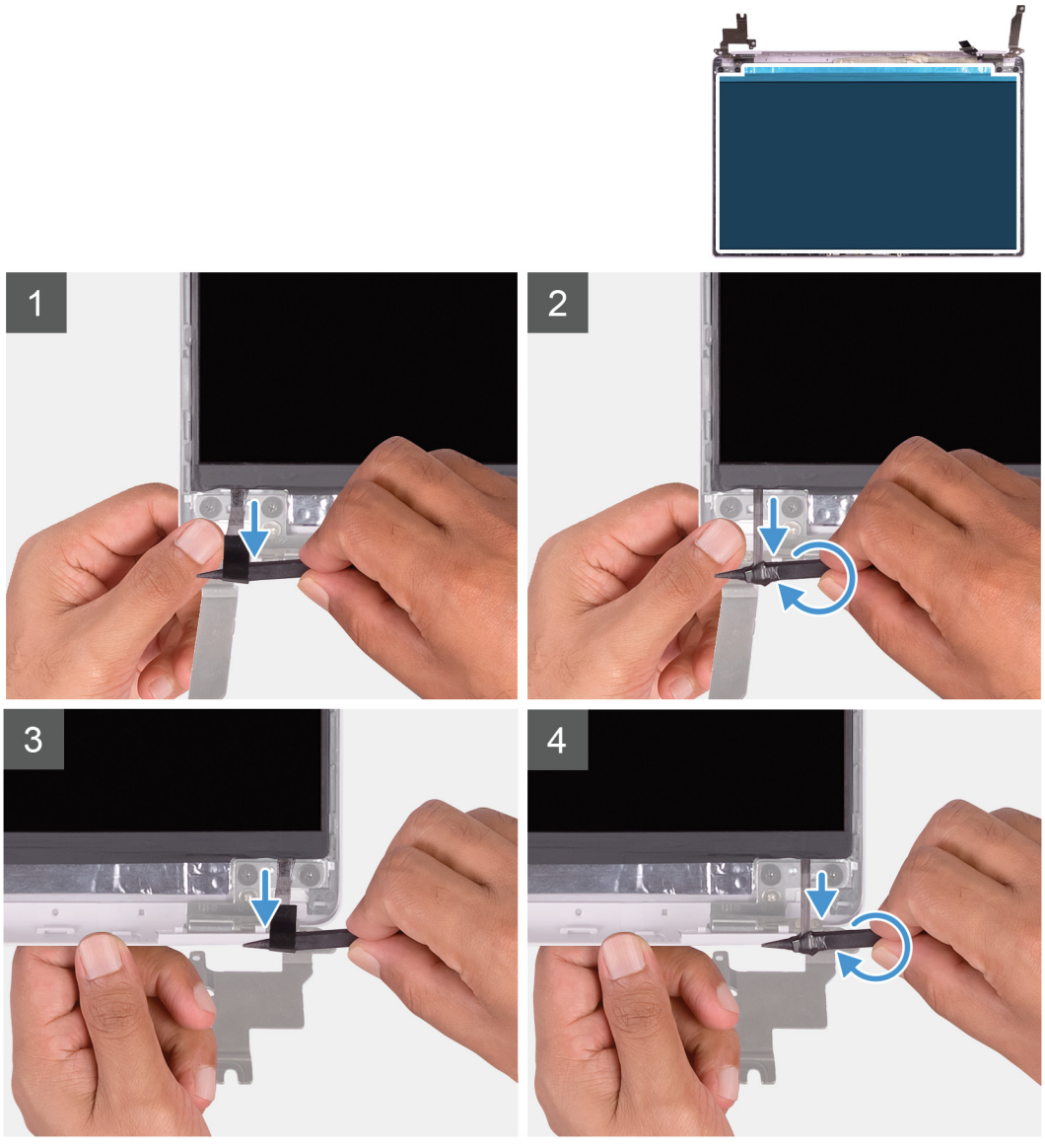
Display panel

Removing the display panel

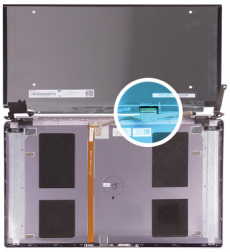
NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the WLAN card.
5. Remove the display assembly.
6. Remove the display bezel.

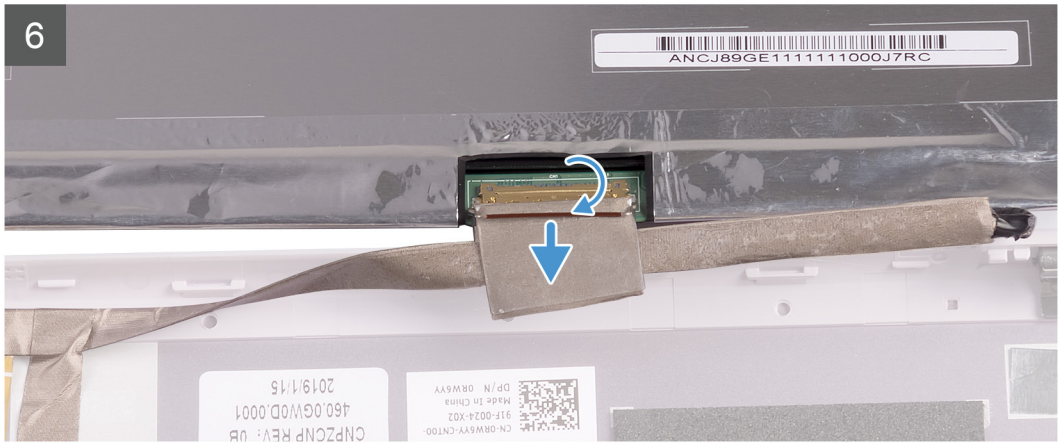
The following image indicates the location of display panel and provides a visual representation of the removal procedure.

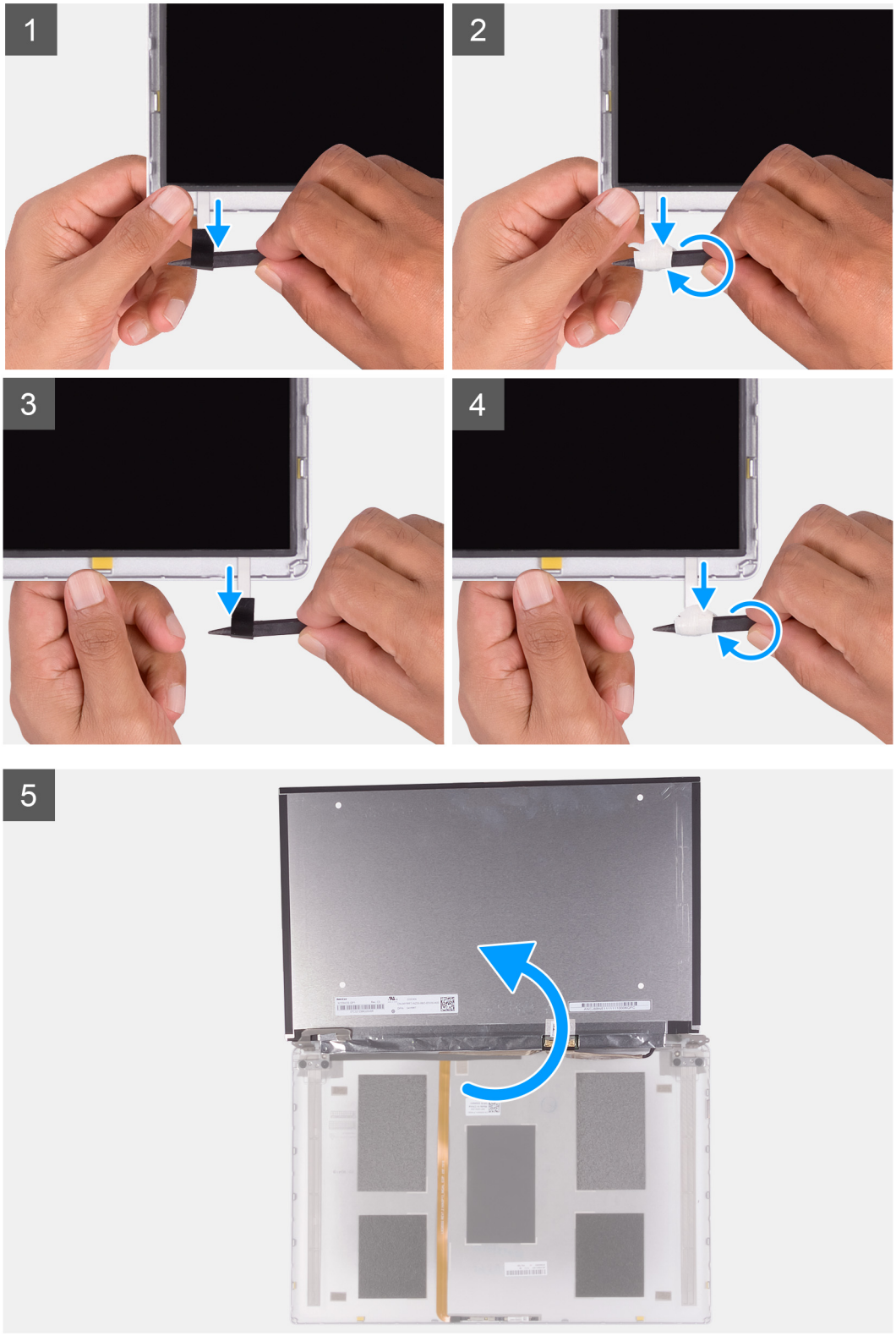


5



6

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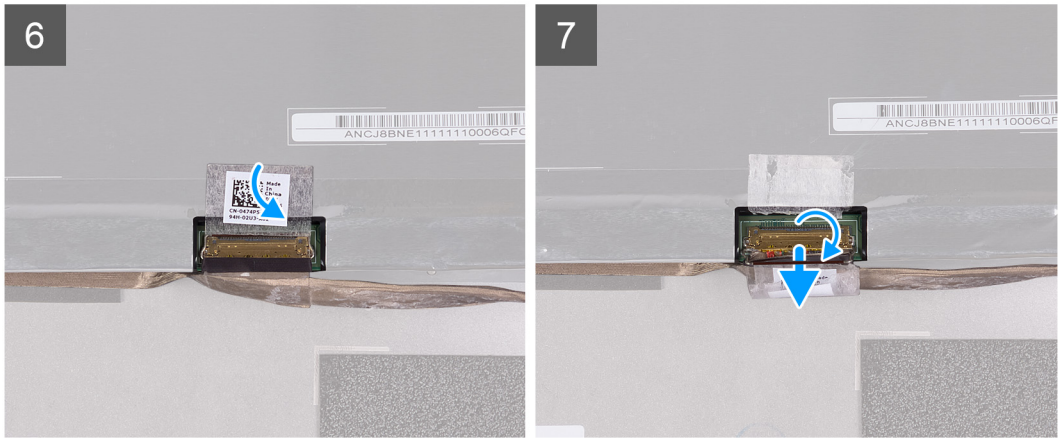


1. Using a plastic scribe, slide out the pull tab of the SR tape from both sides of the display panel.
2. Pull out a small section of the SR tape.
3. Roll the SR tape around the plastic scribe.

   NOTE: To avoid severing/breaking the SR tape, pull out only a small section of the SR tape and then roll the SR tape around the scribe.

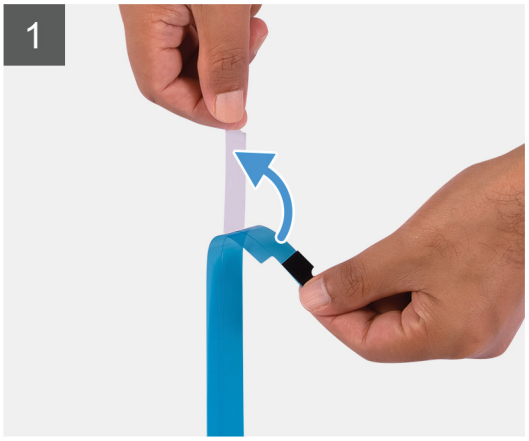
4. Lift the display panel off the display back-cover.
5. Peel the tape that secures the display cable to the display back-cover.
6. Open the latch and disconnect the display cable from the display back-cover.

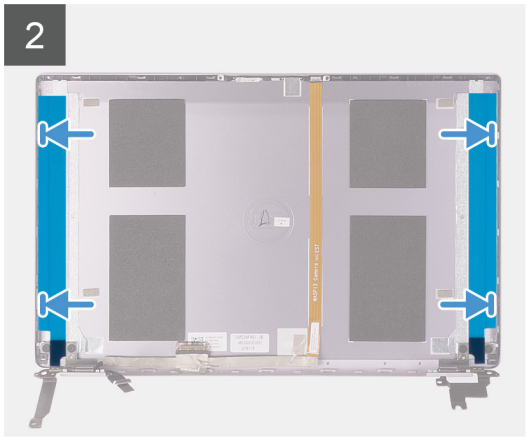
Installing the display panel

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

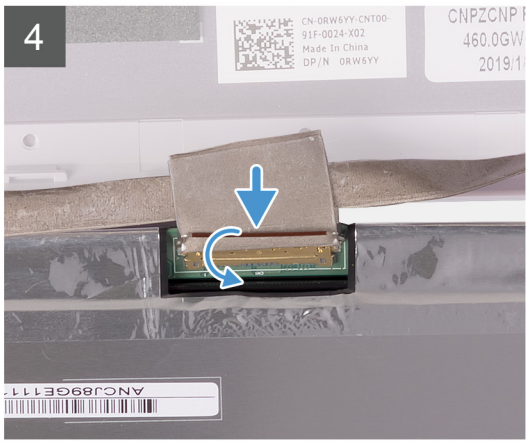
If you are replacing a component, remove the existing component before performing the installation procedure.

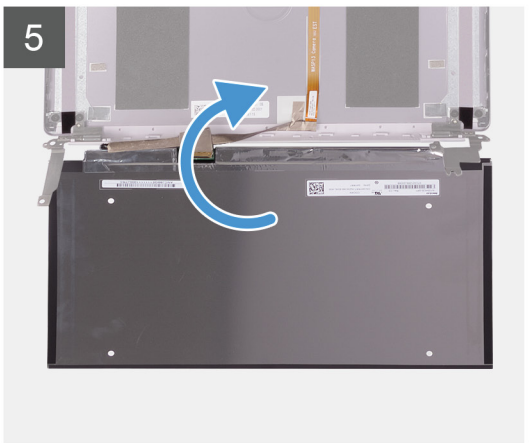
The following image indicates the location of display panel and provides a visual representation of the installation procedure.


1


2


3


4
CN-0RW6YY-CNT00-
91F-0024-X02
Made In China
DP/N 0RW6YY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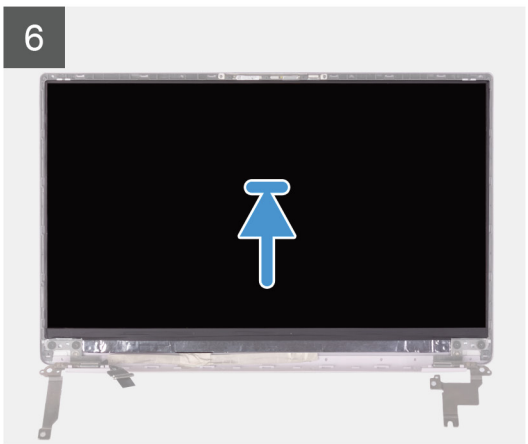
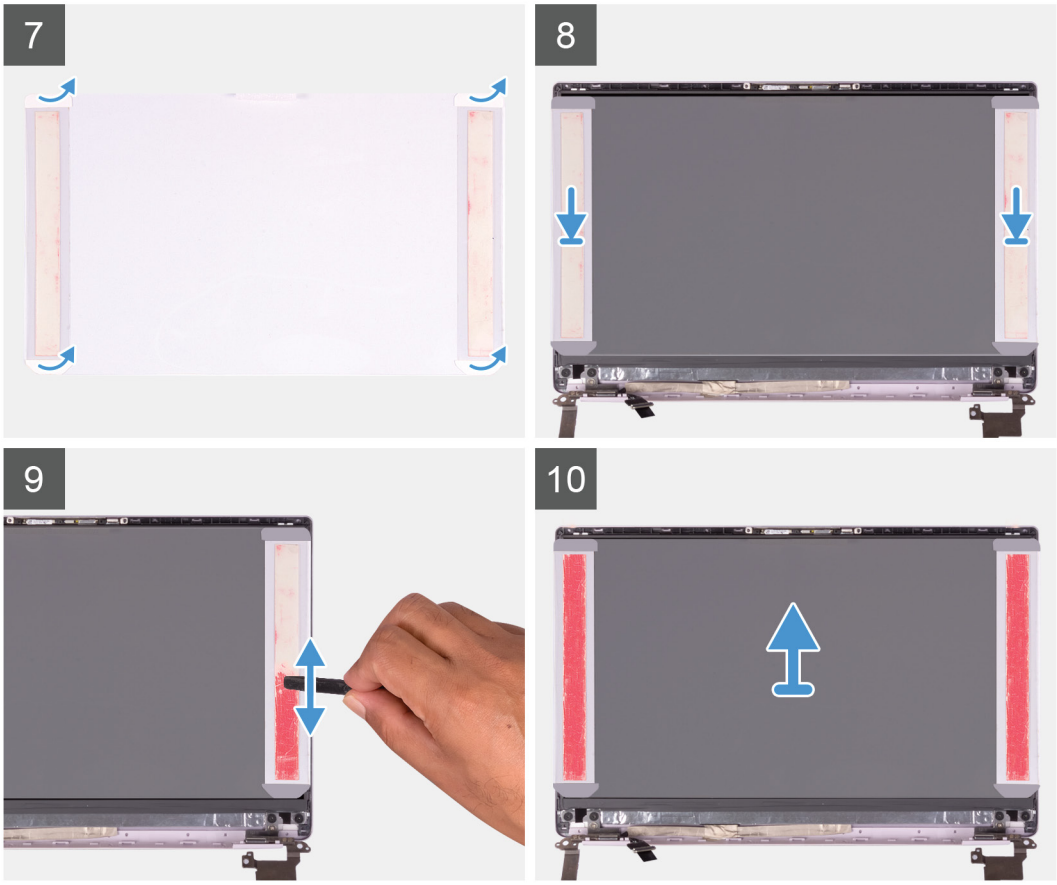

6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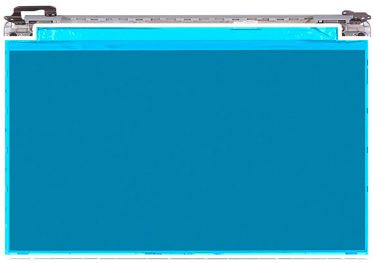
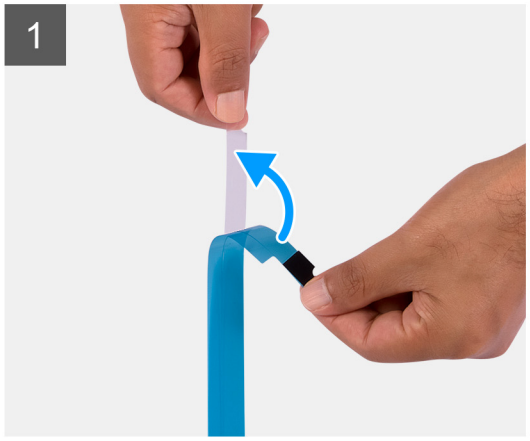
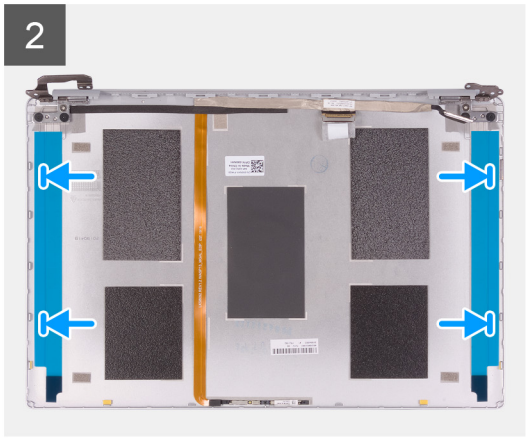
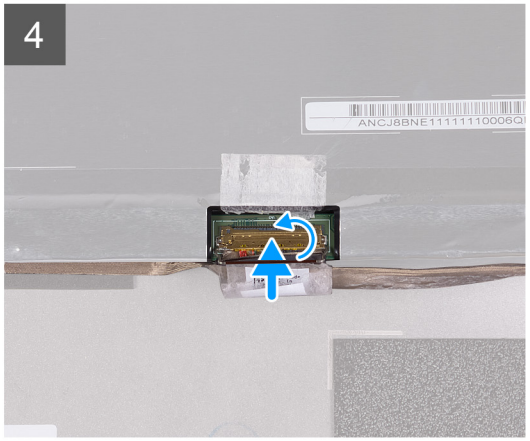
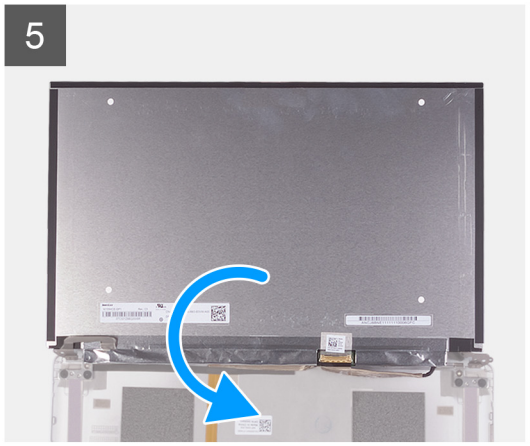


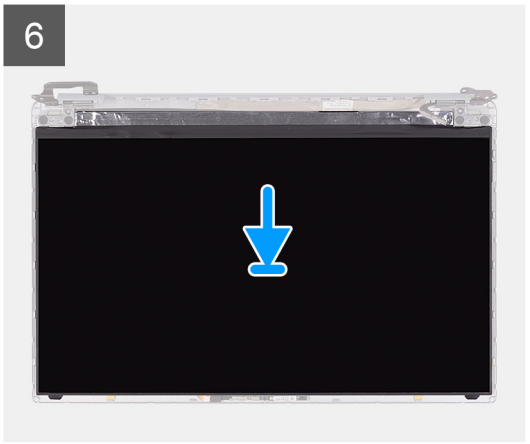

1

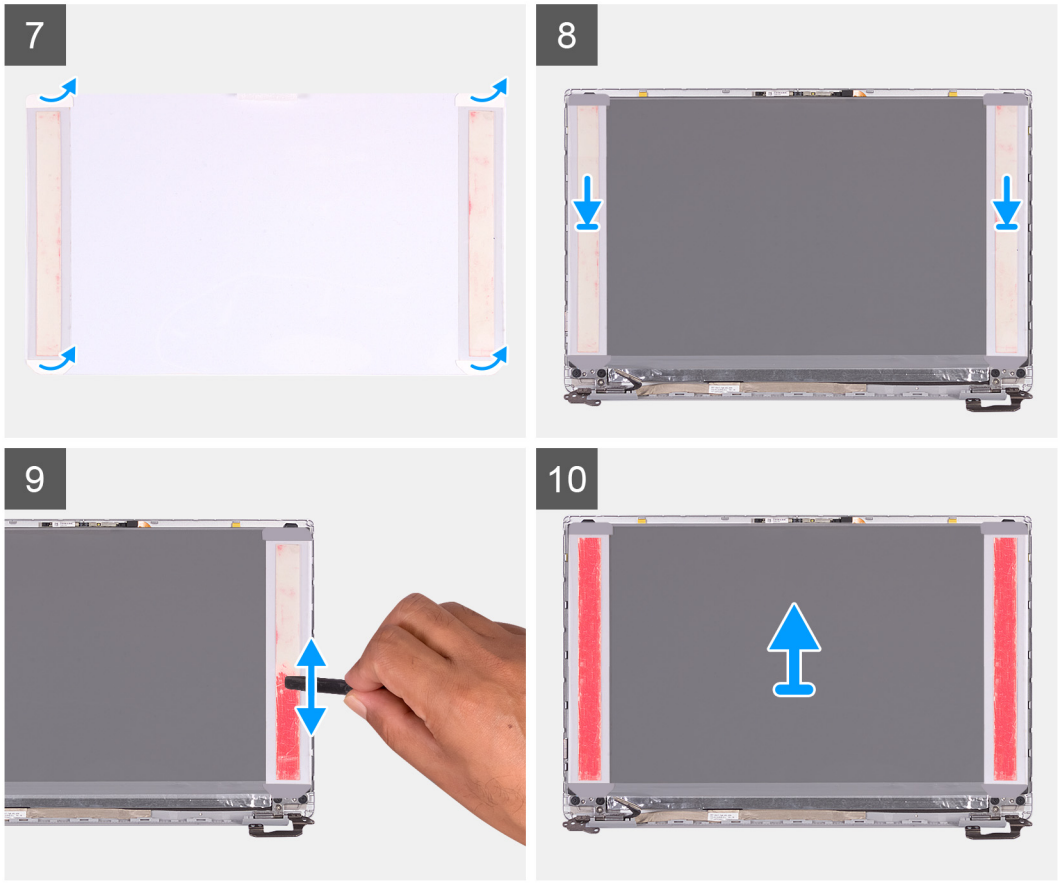

2


3


4


5


6



1. Peel off the transparent protective films from the SR tapes.
2. Align and adhere both the SR tapes to the plastic edge of the display back-cover.
3. Peel off the blue protective films from the SR tapes.
4. Starting from the top, align and place the display panel on the display back-cover.
5. Remove the release paper from the pressure film.
6. Adhere the pressure film on the display panel.
7. Using the flat end of the plastic scribe or handle of the screwdriver, press and roll over the pressure films until they turn pink.
8. Peel off the pressure film from the display panel.
9. Place the display bezel on the display back-cover and snap it into place.

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

Display hinges

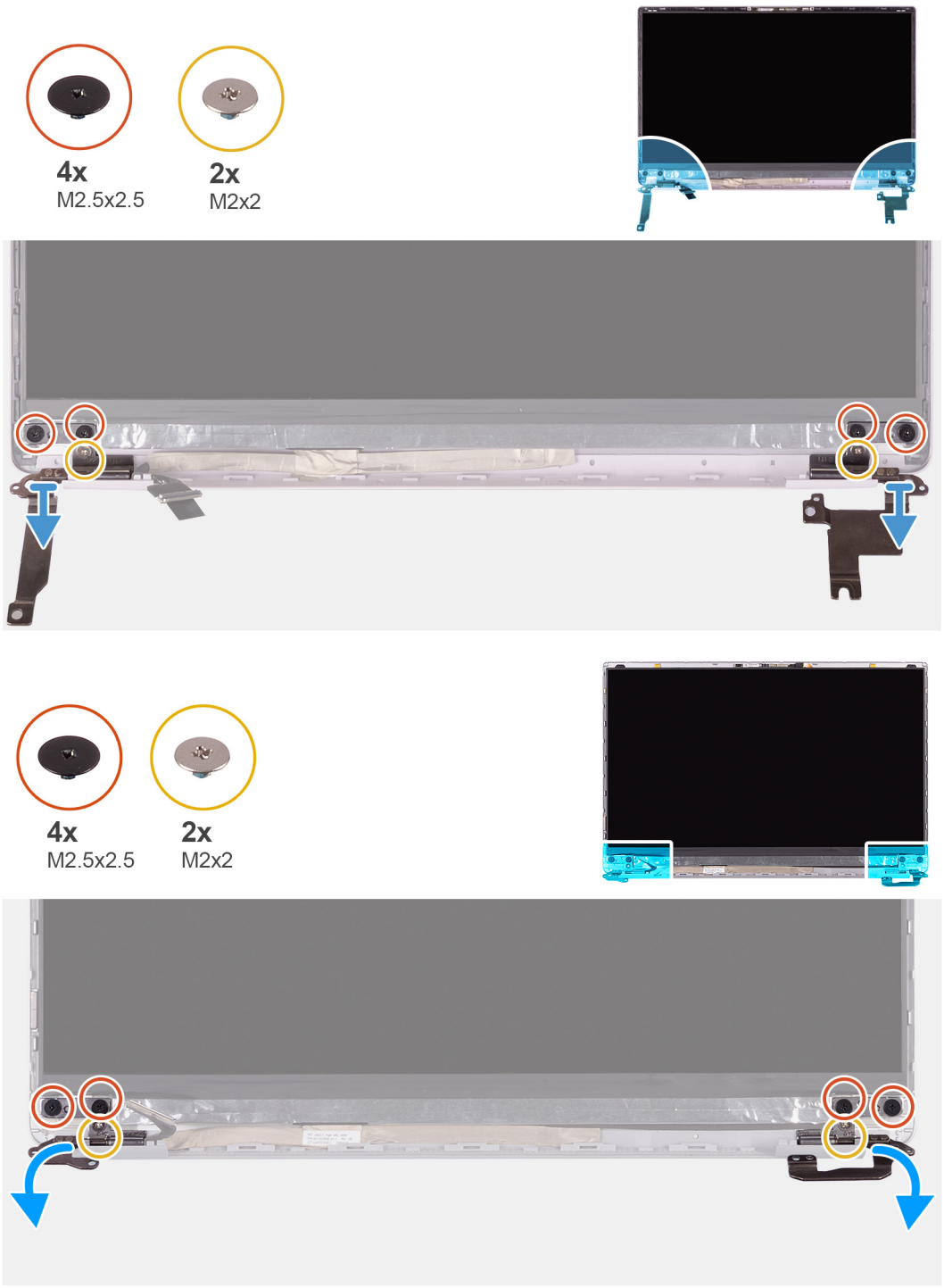
Removing the display hinges

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

5. Remove the display assembly.
6. Remove the display bezel.

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



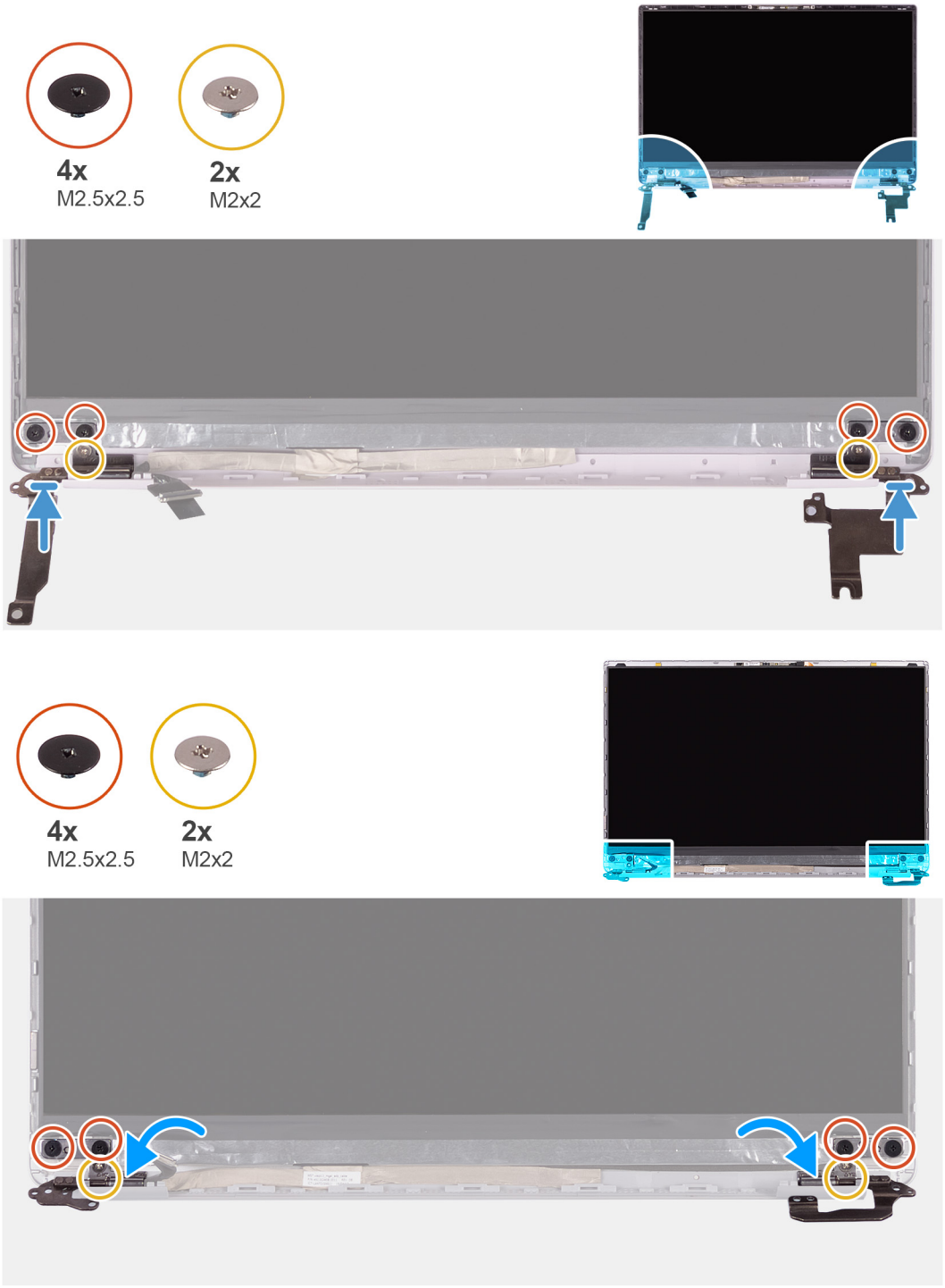
1. Remove the four (M2.5x2.5) screws that secure the display hinges to the display back-cover.
2. Remove the two (M2x2) screws that secure the display hinges to the display back-cover.
3. LiftSlide and remove the display hinges off the display back-cover.

Installing the display hinges

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

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



1. Align the screw holes on the hinges with the screw holes on the display back-cover.
2. Replace the two (M2x2) screws that secure the display hinges to the display back-cover.
3. Replace the four (M2.5x2.5) screws to secure the display hinges to the display back-cover.

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

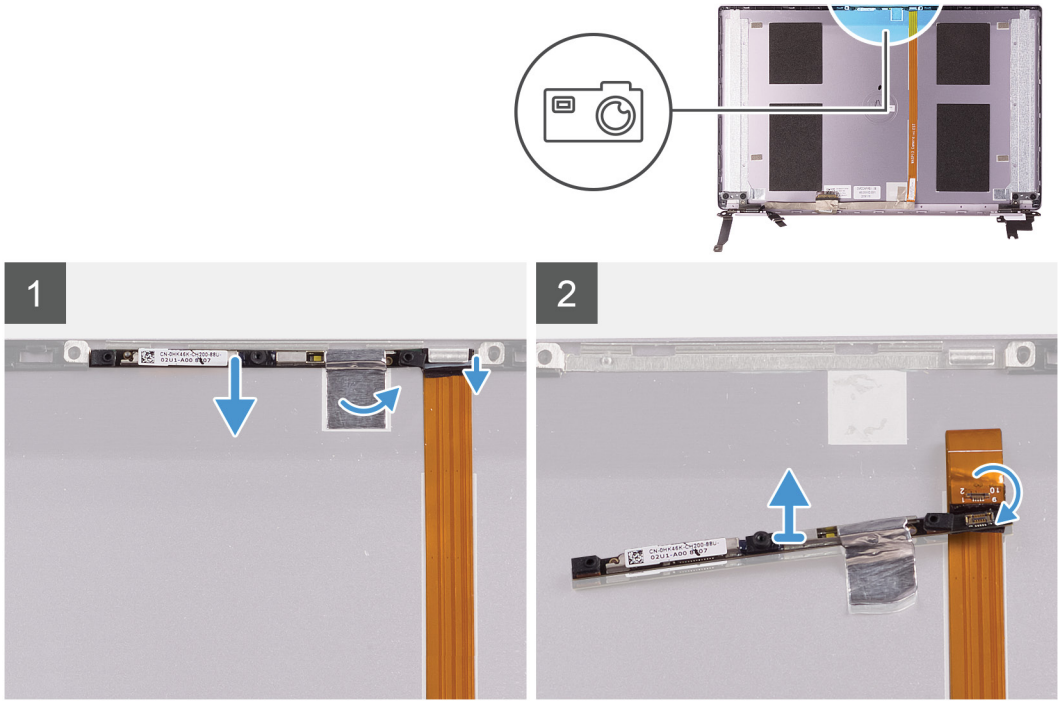
Camera

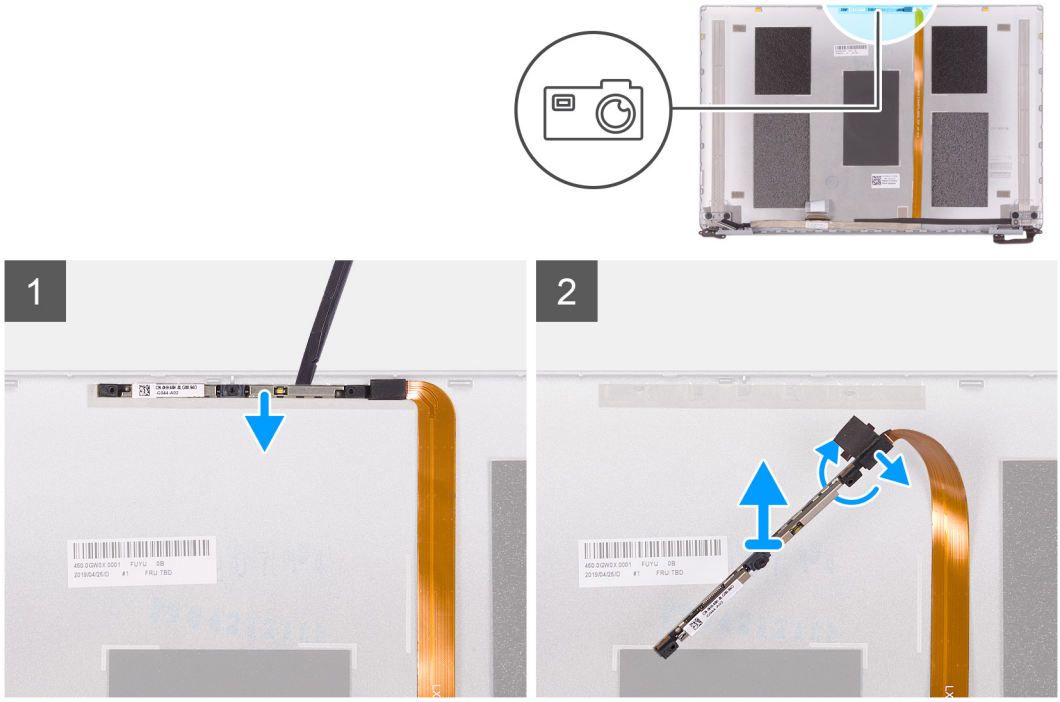
Removing the camera

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the WLAN card.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display panel.

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





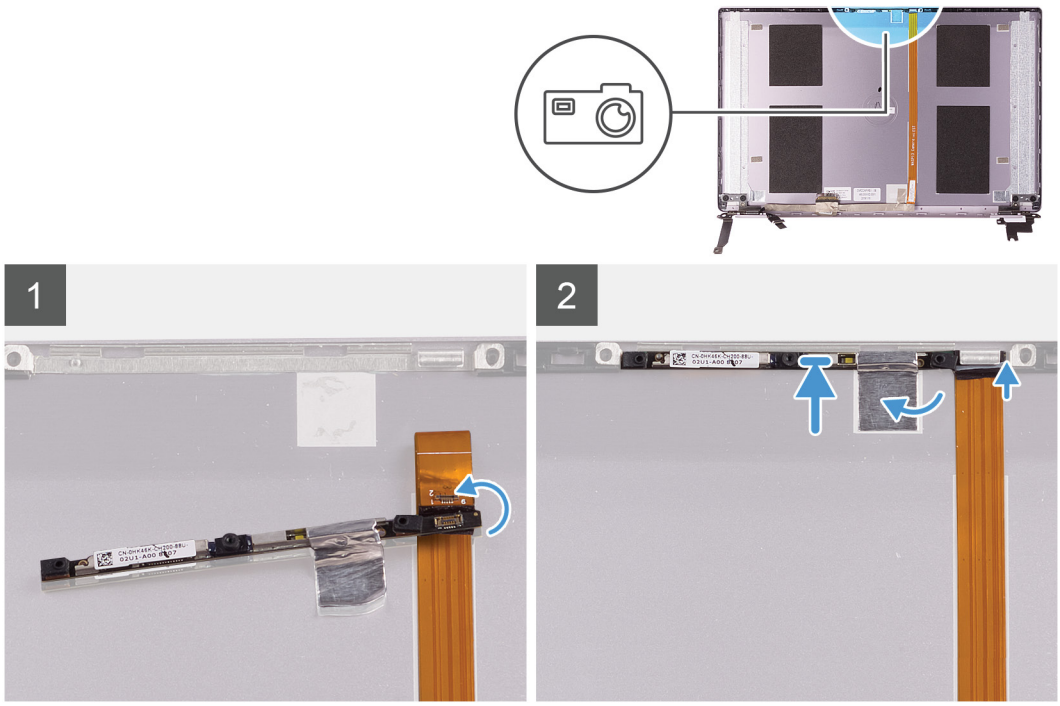
1. Peel the tape that secures the camera to the display back-cover
2. Using a plastic scribe, pry the camera from the alignment post on the display back-cover.
3. Turn over the camera and disconnect the camera cable off the camera.
4. Peel the tape off the camera and lift the camera off the display back-cover.

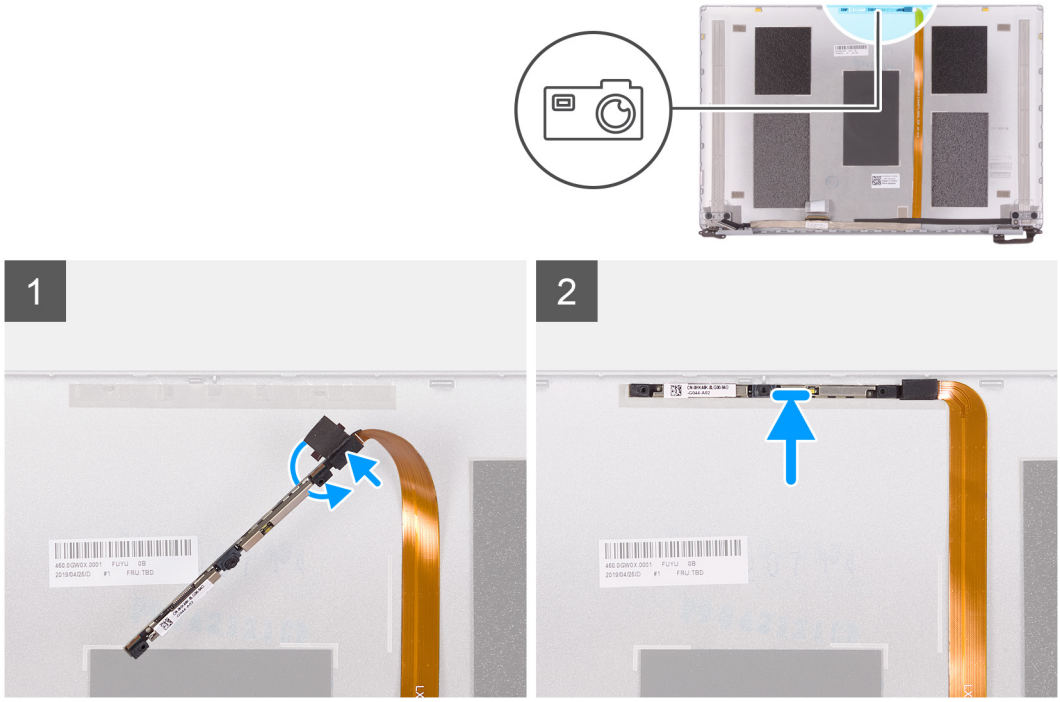
Installing the camera

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

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





1. Adhere the camera to the display cable (tape) and connect the camera cable to the camera and turn it over.
2. Using the alignment post, turn the camera over and adhere to the display back-cover.
3. Adhere the tape that secures the camera to the display back-cover.

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

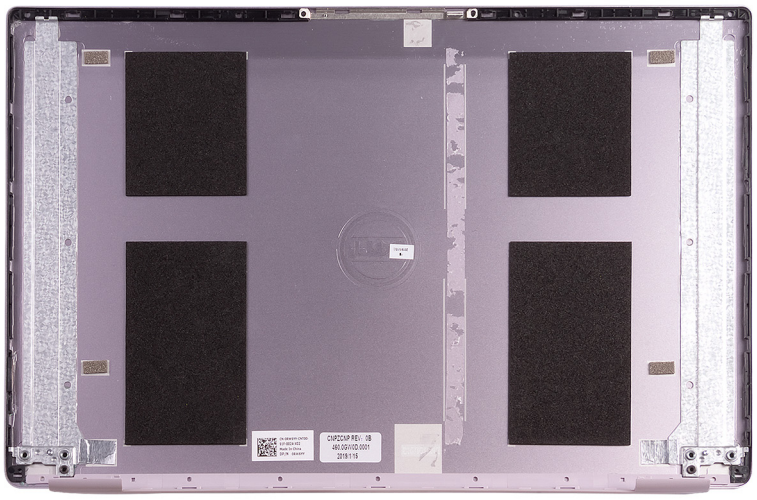
Display back-cover

Removing the display back-cover

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the WLAN card.
5. Remove the display assembly.
6. Remove the display bezel.
7. Remove the display hinges.
8. Remove thedisplay panel.
9. Remove the display cable.
10. Remove the camera.

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



After performing all the prerequisites, we are left with the display back-cover.

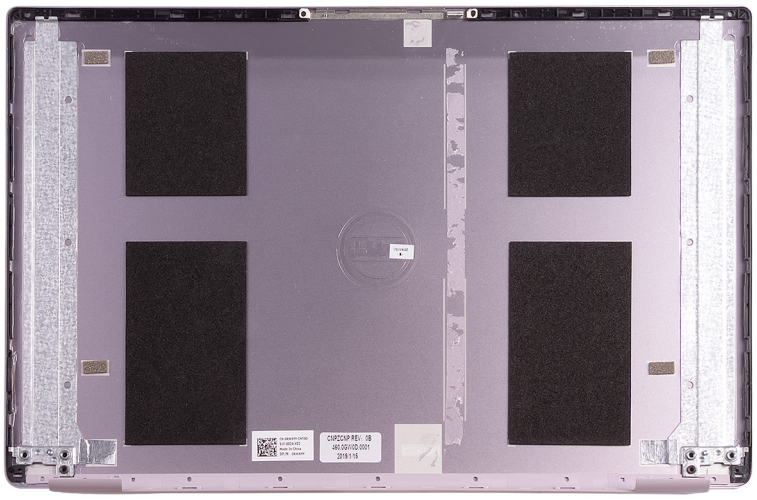
NOTE: Antenna cables are a part of the palm-rest and keyboard assembly for computers shipping with WLAN configurations.

Installing the display back-cover

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

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



Place the display back-cover on a flat surface.

NOTE: Antenna cables are a part of the palm-rest and keyboard assembly for computers shipping with WLAN configurations.

1. Install the camera.
2. Install the display cable.
3. Install the display panel.
4. Install the display hinges.
5. Install the display bezel.
6. Install the display assembly.
7. Install the WLAN card.
8. Install the battery.
9. Install the base cover.
10. Follow the procedure in After working inside your computer.

Display cable

Removing the display cable

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the display assembly.
5. Remove the display panel.
6. Remove the display bezel.

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

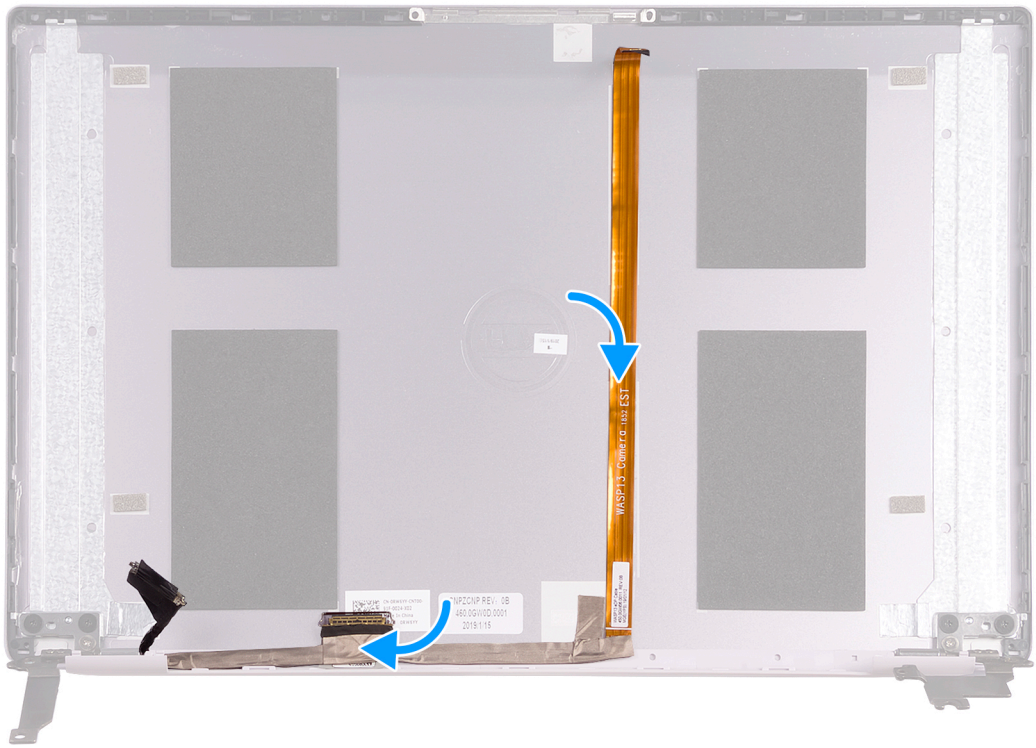
1. Peel off the tape securing the display cable to the back-cover.
2. Peel the display cable off the display back-cover.

Installing the display cable

NOTE: This procedure is not applicable to computers shipped with a WWAN configuration.

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

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



1. Adhere the tape securing the display cable to the back-cover.
2. Adhere the display cable to the display back-cover.

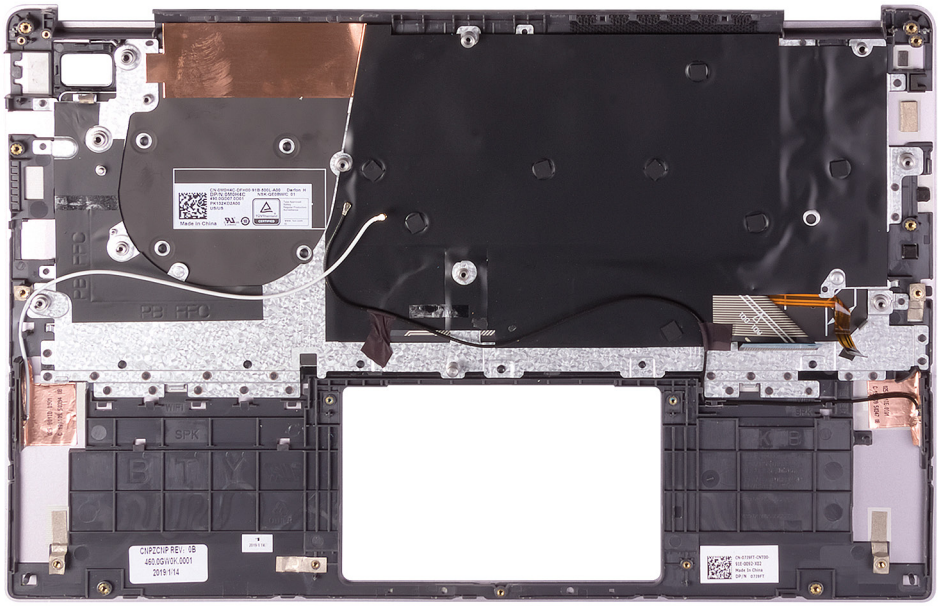
1. Install the display bezel.
2. Install the display panel.
3. Install the display assembly.
4. Install the battery.
5. Install the base cover.
6. Follow the procedure in After working inside your computer.

Palm-rest and keyboard assembly

Removing the palm-rest and keyboard assembly

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the WLAN card.
5. Remove the speakers.
6. Remove the system board.
7. Remove the display assembly.
8. Remove the power button with fingerprint reader or power-button board, whichever applicable.
9. Remove the power-adapter port.
10. Remove the touchpad.

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



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

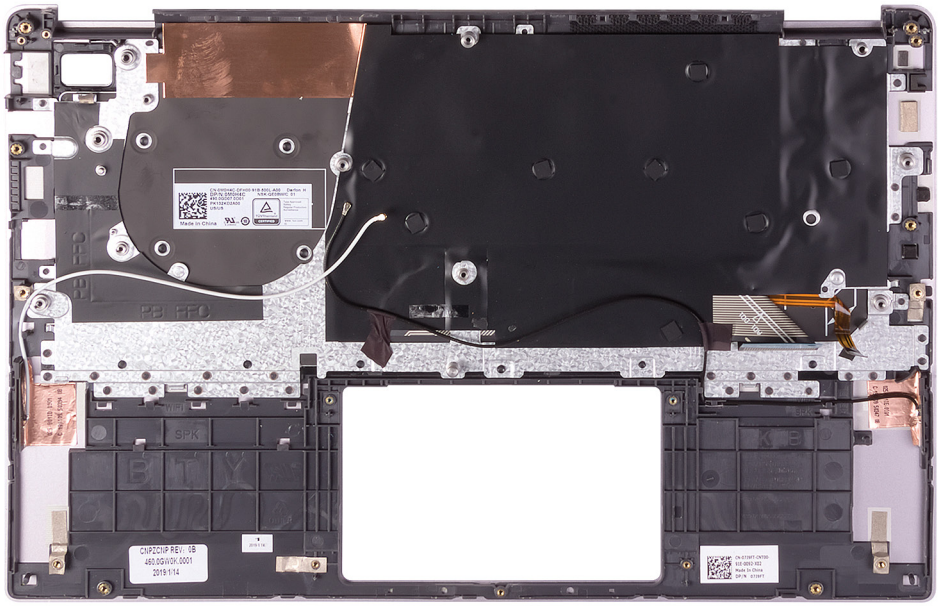
NOTE: Antenna cables are a part of the display back-cover for computers shipping with WWAN configuration.

NOTE: System board can be removed with heatsink attached.

Installing the palm-rest and keyboard assembly

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

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



Place the palm-rest and keyboard assembly on a flat surface.

NOTE: Antenna cables are a part of the display back-cover for computers shipping with WWAN configuration.

1. Install the touchpad.

2. Install the power-adapter port.
3. Install the power button with fingerprint reader or power-button board, whichever applicable.
4. Install the display assembly.
5. Install the system board.
6. Install the speakers.
7. Install the WLAN card.
8. Install the battery.
9. Install the base cover.
10. Follow the procedure in After working inside your computer.

5

System setup

System setup enables you to manage your tabletdesktopnotebook hardware and specify BIOS level options. From the System setup, you can:

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

Topics:

BIOS overview

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

Entering BIOS setup program

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

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

Boot menu

Press <F12> when the Dell logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not make any changes to the boot order stored in the BIOS.

The options are:

- UEFI Boot:
  - Windows Boot Manager
-
- Other Options:
  - BIOS Setup
  - BIOS Flash Update

- Diagnostics
- Change Boot Mode Settings

Navigation keys

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

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

One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F12 immediately.

NOTE: It is recommended to shutdown the computer if it is on.

The one-time boot menu displays the devices that you can boot from including the diagnostic option. The boot menu options are:

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

  NOTE: XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

The boot sequence screen also displays the option to access the System Setup screen.

System setup options

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

General options

Table 4. General

Option	Description
System Information	Displays the following information: • System Information: Displays **BIOS Version, Service Tag, Asset Tag, Ownership Tag, Ownership Date, Manufacture Date, Express Service Code** and the **Signed Firmware Update**. • Battery Information: Displays the battery status health and whether the AC adapter is installed.

Table 4. General (continued)

Option	Description
	• Processor Information: Displays **Processor Type, Core Count, Processor ID, Current Clock Speed, Minimum Clock Speed, Maximum Clock Speed, Processor L2 Cache, Processor L3 Cache, Microcode Version, HT Capable,** and **64-Bit Technology.** • Memory Information: Displays **Memory Installed, Memory Available, Memory Speed, Memory Channel Mode, Memory Technology** • Device Information: Displays **Pass Through MAC Address, Video Controller, Video BIOS Version, Video Memory, Panel type, Native Resolution, Audio Controller, Wi-Fi Device, Cellular Device and Bluetooth Device.**
Boot Sequence	Allows you to specify the order in which the computer attempts to find an operating system from the devices specified in this list.
Advanced Boot Options	Allows you to select the Legacy Option ROMs option, when in UEFI boot mode. By default, no option is selected. • Enable Legacy Option ROMs • Enable Attempt Legacy Boot
UEFI Boot Path Security	This option controls whether or not the system will prompt the user to enter the Admin password when booting a UEFI boot path from the F12 Boot Menu. • Always, Except Internal HDD—Default • Always • Never

.

System information

Table 5. System Configuration

Option	Description
Date/Time	Allows you to set the date and time settings. Changes to the system date and time take effect immediately.
Smart Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. The **Enable Smart Reporting option** is disabled by default.
Audio	Allows you to enable or disable the integrated audio controller. The option **Enable Audio** is selected by default. • Enable Microphone • Enable Internal Speaker Both the options are selected by default.
USB Configuration	Allows you to enable or disable the integrated USB controller for: • Enable USB Boot Support • Enable External USB Port All the options are enabled by default.
SATA Operation	Allows you to configure the operating mode of the integrated hard drive controller. • Disabled = The SATA controllers are hidden • AHCI = SATA is configured for AHCI mode • RAID ON = SATA is configured to support RAID mode (selected by default)
Drives	Allows you to enable or disable the various drives on-board: • M.2 PCIe SSD-0/SATA-0 (enabled by default) • M.2 PCIe SSD-1/SATA-1 (enabled by default)
Miscellaneous Devices	Allows you to enable or disable the following devices:

Table 5. System Configuration (continued)

Option	Description
	• Enable Camera (enabled by default) • Enable Secure Digital (SD) Card (enabled by default) • Secure Digital (SD) Card Boot
Keyboard Illumination	Allows you to change the keyboard illumination settings: • Disabled • Dim • Bright (enabled by default)
Keyboard Backlight Timeout on AC	Allows you to set the timeout value for the keyboard backlight when an AC adaptor is plugged into the system: • 5 seconds • 10 seconds (enabled by default) • 15 seconds • 30 seconds • 1 minute • 5 minutes • 15 minutes • Never
Keyboard Backlight Timeout on Battery	Allows you to set the timeout value for the keyboard backlight when the system is running only on battery power: • 5 seconds • 10 seconds (enabled by default) • 15 seconds • 30 seconds • 1 minute • 5 minutes • 15 minutes • Never
Dell Type-C Dock Configuration	**Always Allow Dell Docks**(enabled by default)

Video

Option	Description
LCD Brightness	Allows you to set the display brightness depending up on the power source—On Battery and On AC. The LCD brightness is independent for battery and AC adapter. It can be set using the slider.

EcoPower(enabled by default)

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

Security

Table 6. Security

Option	Description
Enable Admin Setup Lockout	**OFF**(enabled by default)
Password Bypass	This option lets you bypass the System (Boot) Password and the internal HDD password prompts during a system restart.

Table 6. Security (continued)

Option	Description
	• Disabled — Always prompt for the system and internal HDD password when they are set. This option is enabled by default. • Reboot Bypass — Bypass the password prompts on Restarts (warm boots). **NOTE:** The system will always prompt for the system and internal HDD passwords when powered on from the off state (a cold boot). Also, the system will always prompt for passwords on any module bay HDDs that may be present.
Non-Admin Password Change	This option lets you determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set. **Allow Non-Admin Password Changes** - This option is enabled by default.
Non-Admin Setup Changes	Determines whether changes to the setup option are permitted when an administrator password is set.
UEFI Capsule Firmware Updates	This option controls whether this system allows BIOS updates via UEFI capsule update packages. This option is selected by default. Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS)
Computrace(R)	This field lets you Activate or Disable the BIOS module interface of the optional Computrace Service from Absolute Software. Enables or disables the optional Computrace service designed for asset management. • Deactivate Computrace - This option is selected by default. • Activate Computrace • Disable Computrace
TPM 2.0 Security	Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system. • TPM On (default) • PPI Bypass for Enable Commands (default) • PPI Bypass for Disable Commands • PPI Bypass for Clear Commands • Attestation Enable (default) • Key Storage Enable (default) • SHA-256 (default) • TPM **Enabled**(default)
Intel SGX	Software Guard Extensions (SGX) provide a secured environment for running code/storing sensitive information in the context of the main OS. **Software Control**(enabled by default)
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protections. This option is not set by default.

Passwords

Table 7. Passwords

Option	Description
Enable Strong Passwords	Enforces stricter rules for admin and system passwords.
Password Configuration	Allows you to set the minimum and maximum number of characters allowed for admin and system passwords.
Admin Password	Allows you to set, change or delete the administrator password.
System Password	Allows you to reset the system password.

Table 7. Passwords (continued)

Option	Description
Enable Master Password Lockout	**Disabled**(default)

Secure boot

Table 8. Secure Boot

Option	Description
Enable Secure Boot	Allows you to enable or disable Secure Boot feature • Secure Boot Enable This option is selected by default.
Secure Boot Mode	Allows you to modify the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. • Deployed Mode (default) • Audit Mode
Expert key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The **Enable Custom Mode** option is disabled by default. The options are: • PK (default) • KEK • db • dbx If you enable the **Custom Mode**, the relevant options for **PK, KEK, db, and dbx** appear. The options are: • **Save to File**- Saves the key to a user-selected file • **Replace from File**- Replaces the current key with a key from a user-selected file • **Append from File**- Adds a key to the current database from a user-selected file • **Delete**- Deletes the selected key • **Reset All Keys**- Resets to default setting • **Delete All Key**s- Deletes all the keys **NOTE:** If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.

Intel Software Guard Extensions

Table 9. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	This field specifies you to provide a secured environment for running code/storing sensitive information in the context of the main OS. Click one of the following options: • **Disabled** • **Enabled** • **Software controlled—Default**
Enclave Memory Size	This option sets **SGX Enclave Reserve Memory Size** Click one of the following options: • **32 MB** • **64 MB** • **128 MB**—Default

Performance

Table 10. Performance

Option	Description
Hyper-Threading Technology	Allows you to enable or disable the HyperThreading in the processor. • **Disabled** • **Enabled**—Default
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of processor. • **Enable Intel SpeedStep** This option is set by default.
Intel TurboBoost	Allows you to enable or disable the Intel TurboBoost mode of the processor. • **Enable Intel TurboBoost** This option is set by default.
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. • **All**—Default • **1**
C-States Control	Allows you to enable or disable the additional processor sleep states. • **C states** This option is set by default.

Power management

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. Default setting: Wake on AC is not selected.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • Disabled • Every Day • Weekdays • Select Days Default setting: Disabled
Peak Shift	This option enables you to minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached. • Enable peak shift—is disabled • Set battery threshold (15% to 100%) - 15 % (enabled by default)
Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • Adaptive—enabled by default • Standard—Fully charges your battery at a standard rate. • ExpressCharge—The battery charges over a shorter time using Dell's fast charging technology.

Option	Description
	• Primarily AC use • Custom If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop. **NOTE:** All charging mode may not be available for all the batteries. To enable this option, disable the **Advanced Battery Charge Configuration** option.
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non work hours to improve the battery health. Enable Advanced Battery Charge Mode- is disabled
Enable Intel Speed Shift Technology	• Enable Intel Speed Shift Technology Default setting: Enabled
USB Wake Support	Allows you to enable USB devices to wake the system from Standby. **NOTE:** This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed during Standby, the system setup removes power from all the USB ports to conserve battery power. • Enable USB Wake Support
Wake on WLAN	Allows you to enable or disable the feature that powers on the computer from the Off state when triggered by a LAN signal. • Disabled • WLAN Default setting: Disabled

Wireless

Option Description	
WWAN/GPS	Allows to enable/disable internal WWAN/GPS device. Enabled by default.
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. • WLAN • Bluetooth All the options are 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. Default setting: Enable Adapter Warnings
Extended BIOS POST Time	Allows you to create an extra preboot delay. The options are: • 0 seconds—enabled by default. • 5 seconds • 10 seconds
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are:

Option	Description
	• Minimal—enabled by default • Thorough • Auto
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: • Fn Lock—enabled by default • Lock Mode Disable/Standard—enabled by default • Lock Mode Enable/Secondary
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Enable Network. This option is enabled by default.
Full Screen Logo	• Enable Full Screen Logo—not enabled
Warnings and errors	• Prompt on warnings and errors—enabled by default • Continue on warnings • Continue on warnings and errors
MAC Address Pass-Through	Replaces the external NIC MAC address with the selected MAC address from the system. • System Unique MAC Address (default option) • Disabled

Virtualization support

Option	Description
Virtualization Technology	This field specifies whether a virtual Machine Monitor (VMM) can utilize the conditional hardware capabilities provided by Intel Virtualization Technology. Enable Intel Virtualization Technology—enabled 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 - enabled by default.

Maintenance screen

Option	Description
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.
Service Tag	Displays the Service Tag of your computer.
BIOS Recovery	This field allows you to recover from certain corrupted BIOS conditions from a recover file on the user primary hard drive or an external USB key. • BIOS Recovery from Hard Drive—enabled by default • Always perform integrity check—disabled by default
Data Wipe	This field allows users to erase the data securely from all internal storage devices. Option 'Wipe on Next boot' is not enabled by default. The following is list of devices affected: • Internal SATA HDD/SSD • Internal M.2 SATA SDD • Internal M.2 PCIe SSD • Internal eMMC
BIOS Downgrade	This controls flashing of the system firmware to previous revisions. Option 'Allow BIOS downgrade' is enabled by default.

System logs

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

SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	Allows you to control the automatic boot flow for SupportAssist System. Options are: • Off • 1 • 2 (Enabled by default) • 3
SupportAssist OS Recovery	Allows you to recover the SupportAssist OS Recovery (Disabled Enabledby default)

Updating the BIOS

Updating the BIOS in Windows

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

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

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

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, see knowledge base article 000124211 at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

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

Updating the BIOS using the USB drive in Windows

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

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

Updating the BIOS from the F12 One-Time boot menu

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

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

BIOS Update

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

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

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

Updating from the One-Time boot menu

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

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

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

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

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.

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

System and setup password

Table 11. System and setup password

Password type	Description
System password	Password that you must enter to log in 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 that is 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

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

To enter the system setup, press F12 immediately after a power-on or reboot.

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.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

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

To enter the System Setup, press F12 immediately after a power-on or reboot.

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**, update, or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

   NOTE: If you change the System and/or Setup password, reenter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

5. Press Esc and a message prompts you to save the changes.
6. Press Y to save the changes and exit from System Setup.
   The computer restarts.

Clearing CMOS settings

CAUTION: Clearing CMOS settings will reset the BIOS settings on your computer.

1. Remove the base cover.
2. Disconnect the battery cable from the system board.
3. Remove the coin-cell battery.
4. Wait for one minute.
5. Replace the coin-cell battery.
6. Connect the battery cable to the system board.
7. Replace the base cover.

Clearing BIOS (System Setup) and System passwords

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

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

6

Troubleshooting

Topics:

Handling swollen Lithium-ion batteries

Like most laptops, Dell laptops use lithium-ion batteries. One type of lithium-ion battery is the lithium-ion polymer battery. Lithium-ion polymer batteries have increased in popularity in recent years and have become standard in the electronics industry due to customer preferences for a slim form factor (especially with newer ultra-thin laptops) and long battery life. Inherent to lithium-ion polymer battery technology is the potential for swelling of the battery cells.

Swollen battery may impact the performance of the laptop. To prevent possible further damage to the device enclosure or internal components leading to malfunction, discontinue the use of the laptop and discharge it by disconnecting the AC adapter and letting the battery drain.

Swollen batteries should not be used and should be replaced and disposed of properly. We recommend contacting Dell product support for options to replace a swollen battery under the terms of the applicable warranty or service contract, including options for replacement by a Dell authorized service technician.

The guidelines for handling and replacing Lithium-ion batteries are as follows:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery before removing it from the system. To discharge the battery, unplug the AC adapter from the system and operate the system only on battery power. When the system will no longer power on when the power button is pressed, the battery is fully discharged.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any type to pry on or against the battery.
- If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a battery can be dangerous.
- Do not attempt to reassemble a damaged or swollen battery into a laptop.
- Swollen batteries that are covered under warranty should be returned to Dell in an approved shipping container (provided by Dell)—this is to comply with transportation regulations. Swollen batteries that are not covered under warranty should be disposed of at an approved recycling center. Contact Dell product support at https://www.dell.com/support for assistance and further instructions.
- Using a non-Dell or incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell that is designed to work with your Dell computer. Do not use a battery from other computers with your computer. Always purchase genuine batteries from https://www.dell.com or otherwise directly from Dell.

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

Dell SupportAssist Pre-boot System Performance Check diagnostics

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

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

Built-in self-test (BIST)

M-BIST

M-BIST (Built In Self-Test) is the system board's built-in self-test diagnostics tool that improves the diagnostics accuracy of system board embedded controller (EC) failures.

NOTE: M-BIST can be manually initiated before POST (Power On Self Test).

How to run M-BIST

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

1. Press and hold both the **M** key on the keyboard and the **power button** to initiate M-BIST.
2. With both the **M** key and the **power button** held down, the battery indicator LED may exhibit two states:
   a. OFF: No fault detected with the system board
   b. AMBER: Indicates a problem with the system board
3. If there is a failure with the system board, the battery status LED will flash one of the following error codes for 30 seconds:

Table 12. LED error codes

Blinking Pattern		Possible Problem
Amber	**White**	
2	1	CPU Failure
2	8	LCD Power Rail Failure
1	1	TPM Detection Failure
2	4	Unrecoverable SPI Failure

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

LCD Power rail test (L-BIST)

L-BIST is an enhancement to the single LED error code diagnostics and is automatically initiated during POST. L-BIST will check the LCD power rail. If there is no power being supplied to the LCD (i.e., the L-BIST circuit fails), the battery status LED will flash either an error code [2,8] or an error code [2,7].

NOTE: If L-BIST fails, LCD-BIST cannot function as no power will be supplied to the LCD.

How to invoke L-BIST Test:

1. Press the power button to start the system.
2. If the system does not start up normally, look at the battery status LED:
   - If the battery status LED flashes an error code [2,7], the display cable may not be connected properly.
   - If the battery status LED flashes an error code [2,8], there is a failure on the LCD power rail of the system board, hence there is no power supplied to the LCD.
3. For cases, when a [2,7] error code is shown, check to see if the display cable is properly connected.
4. For cases when a [2,8] error code is shown, replace the system board.

LCD Built-in Self Test (BIST)

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

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

How to invoke LCD BIST Test

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

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

System diagnostic lights

Battery-status light

Indicates the power and battery-charge status.

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

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

Off

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

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

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

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

Table 13. 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.

Recovering the operating system

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

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

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

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

Real-Time Clock (RTC Reset)

The Real Time Clock (RTC) reset function allows you or the service technician to recover Dell Latitude systems from No POST/No Power/No Boot situations. The legacy jumper enabled RTC reset has been retired on these models.

Start the RTC reset with the system powered off and connected to AC power. Press and hold the power button for thirty (30) seconds. The system RTC Reset occurs after you release the power button.

Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell 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

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.

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.

Drain residual flea power (perform hard reset)

Flea power is the residual static electricity that remains in the computer even after it has been powered off and the battery is removed.

For your safety, and to protect the sensitive electronic components in your computer, you are requested to drain residual flea power before removing or replacing any components in your computer.

Draining residual flea power, also known as a performing a "hard reset", is also a common troubleshooting step if your computer does not power on or boot into the operating system.

To drain residual flea power (perform a hard reset)

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Remove the base cover.
4. Remove the battery.
5. Press and hold the power button for 20 seconds to drain the flea power.

6. Install the battery.
7. Install the base cover.
8. Connect the power adapter to your computer.
9. Turn on your computer.

NOTE: For more information about performing a hard reset, see the knowledge base article 000130881 at www.dell.com/support.

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Getting help

Topics:

- Contacting Dell

Contacting Dell

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.

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:

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.