

Dell Precision 5530 2-in-1

Service Manual

Notes, cautions, and warnings

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

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

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

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Working on your computer

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.

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

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

1. Ensure that you follow the [Safety Instruction](#).
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.

3. Turn off your computer.
4. Disconnect all network cables from the computer.

 **CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.**

5. Disconnect your computer and all attached devices from their electrical outlets.
6. Press and hold the power button while the computer is unplugged to ground the system board.

 **NOTE: 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.**

After working inside your computer

After you complete any replacement procedure, ensure that you connect any external devices, cards, and cables before turning on your computer.

1. Connect any telephone or network cables to your computer.

 **CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.**

2. Connect your computer and all attached devices to their electrical outlets.
3. Turn on your computer.
4. If required, verify that the computer works correctly by running **ePSA diagnostics**.

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:

- [HDMI 1.4](#)
- [USB features](#)
- [USB Type-C](#)

HDMI 1.4

This topic explains the HDMI 1.4 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 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.

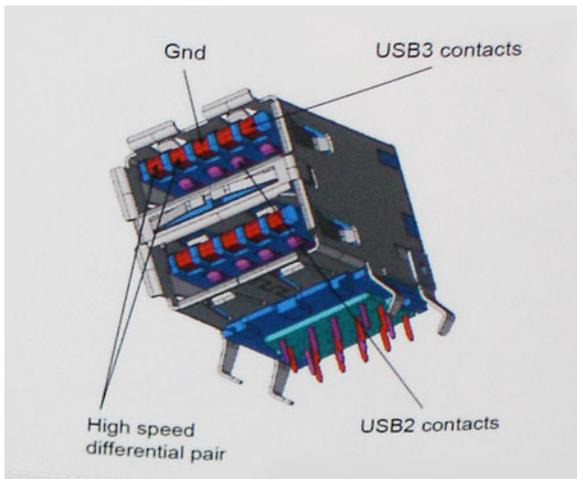


Speed

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.

USB Type-C

USB Type-C is a new, tiny physical connector. The connector itself can support various exciting new USB standards like USB 3.1 and USB power delivery (USB PD).

Alternate Mode

USB Type-C is a new connector standard that is very small. It is about a third the size of an old USB Type-A plug. This is a single connector standard that every device should be able to use. USB Type-C ports can support a variety of different protocols using “alternate modes,” which allows you to have adapters that can output HDMI, VGA, DisplayPort, or other types of connections from that single USB port

USB Power Delivery

The USB PD specification is also closely intertwined with USB Type-C. Currently, smartphones, tablets, and other mobile devices often use a USB connection to charge. A USB 2.0 connection provides up to 2.5 watts of power — that'll charge your phone, but that's about it. A laptop might require up to 60 watts, for example. The USB Power Delivery specification ups this power delivery to 100 watts. It's bi-directional, so a device can either send or receive power. And this power can be transferred at the same time the device is transmitting data across the connection.

This could spell the end of all those proprietary laptop charging cables, with everything charging via a standard USB connection. You could charge your laptop from one of those portable battery packs you charge your smartphones and other portable devices from today. You could plug your laptop into an external display connected to a power cable, and that external display would charge your laptop as you used it as an external display — all via the one little USB Type-C connection. To use this, the device and the cable have to support USB Power Delivery. Just having a USB Type-C connection doesn't necessarily mean they do.

USB Type-C and USB 3.1

USB 3.1 is a new USB standard. USB 3's theoretical bandwidth is 5 Gbps, while USB 3.1's is 10 Gbps. That's double the bandwidth, as fast as a first-generation Thunderbolt connector. USB Type-C isn't the same thing as USB 3.1. USB Type-C is just a connector shape, and the underlying technology could just be USB 2 or USB 3.0. In fact, Nokia's N1 Android tablet uses a USB Type-C connector, but underneath it's all USB 2.0 — not even USB 3.0. However, these technologies are closely related.

Thunderbolt over USB Type-C

Thunderbolt is a hardware interface that combines data, video, audio, and power in a single connection. Thunderbolt combines PCI Express (PCIe) and DisplayPort (DP) into one serial signal, and additionally provides DC power, all in one cable. Thunderbolt 1 and Thunderbolt 2 use the same connector as miniDP (DisplayPort) to connect to peripherals, while Thunderbolt 3 uses a USB Type-C connector.

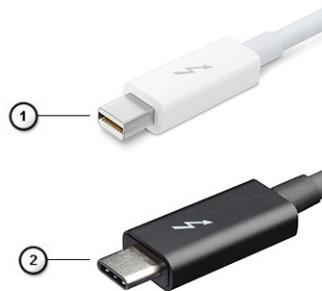


Figure 1. Thunderbolt 1 and Thunderbolt 3

1. Thunderbolt 1 and Thunderbolt 2 (using a miniDP connector)
2. Thunderbolt 3 (using a USB Type-C connector)

Thunderbolt 3 over USB Type-C

Thunderbolt 3 brings Thunderbolt to USB Type-C at speeds up to 40 Gbps, creating one compact port that does it all - delivering the fastest, most versatile connection to any dock, display or data device like an external hard drive. Thunderbolt 3 uses a USB Type-C connector/port to connect to supported peripherals.

1. Thunderbolt 3 uses USB Type-C connector and cables - It is compact and reversible
2. Thunderbolt 3 supports speed up to 40 Gbps

- 3. DisplayPort 1.4 – compatible with existing DisplayPort monitors, devices and cables
- 4. USB Power Delivery - Up to 130W on supported computers

Key Features of Thunderbolt 3 over USB Type-C

- 1. Thunderbolt, USB, DisplayPort and power on USB Type-C on a single cable (features vary between different products)
- 2. USB Type-C connector and cables which are compact and reversible
- 3. Supports Thunderbolt Networking (*varies between different products)
- 4. Supports up to 4K displays
- 5. Up to 40 Gbps

NOTE: Data transfer speed may vary between different devices.

Thunderbolt Icons

Protocol	USB Type-A	USB Type-C	Notes
Thunderbolt	Not Applicable		Will use industry standard icon regardless of port style (i.e., mDP or USB Type-C)
Thunderbolt w/ Power Delivery	Not Applicable		Up to 130 Watts via USB Type-C

Figure 2. Thunderbolt Iconography Variations

Removing and installing components

Recommended tools

The procedures in this document may require the following tools:

- Phillips #00 and #01 screwdriver
- Torx #5 (T5) screwdriver
- Plastic scribe

Screw list

The following table provides the list of screws that are used for securing different components.

Table 2. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Base cover	Palm-rest and keyboard assembly	Torx head M2x3	8	
Battery	Palm-rest and keyboard assembly	M2x5	8	
Display assembly	Palm-rest and keyboard assembly	M2.5x4	6	
Display-cable bracket	System board	M1.6x1.8	2	
Fans	Palm-rest and keyboard assembly	M2x3	4	
Fingerprint-reader	Palm-rest and keyboard assembly	M1.6x1.8	1	
Heat sink	System board	M2x3	5	
I/O board	Palm-rest and keyboard assembly	M2x3	1	
I/O-board interposer	Palm-rest and keyboard assembly	M1.6x5.5	4	
Power button	Palm-rest and keyboard assembly	M2x1.7	1	
Speakers	Palm-rest and keyboard assembly	M2x1.7	2	
Solid-state drive	System board	M2x3	1	
System board	Palm-rest and keyboard assembly	M2x3	2	

Component	Secured to	Screw type	Quantity	Screw image
USB Type-C bracket	I/O board	M2x4	3	
Type-C USB bracket	System board	M2x4	3	
Wireless-antenna bracket	System board	M2x4	2	

Base cover

Removing the base cover

1. Follow the procedure in [Before working inside your computer](#)
2. To remove the base cover:
 - a) Remove the eight torx head screws (M2x3) that secure the base cover to the palm-rest and keyboard assembly.



- b) Using a plastic scribe, pry the base cover from the right corner of the palm-rest and keyboard assembly.

NOTE: Do not begin to pry the base cover from top edge (next to hinges), as this may break the plastic clips and lead to cosmetic damage.

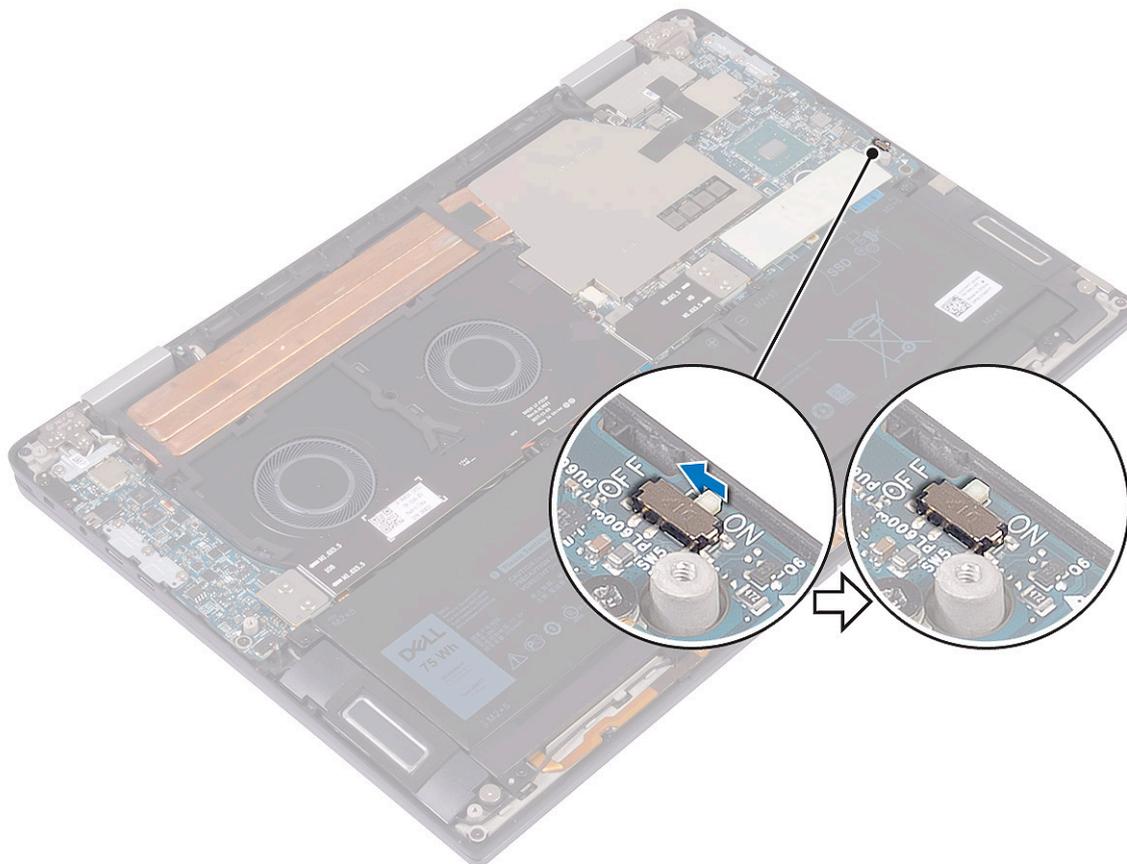
- c) Pry the base cover starting from the right side of palm-rest and keyboard assembly.
 - d) Pry the base cover from the bottom left corner of the palm-rest and keyboard assembly.
 - e) Pry the base cover from the left side of the palm-rest and keyboard assembly.



f) Move the base cover from left to right and lift the base cover from the palm-rest and keyboard assembly.



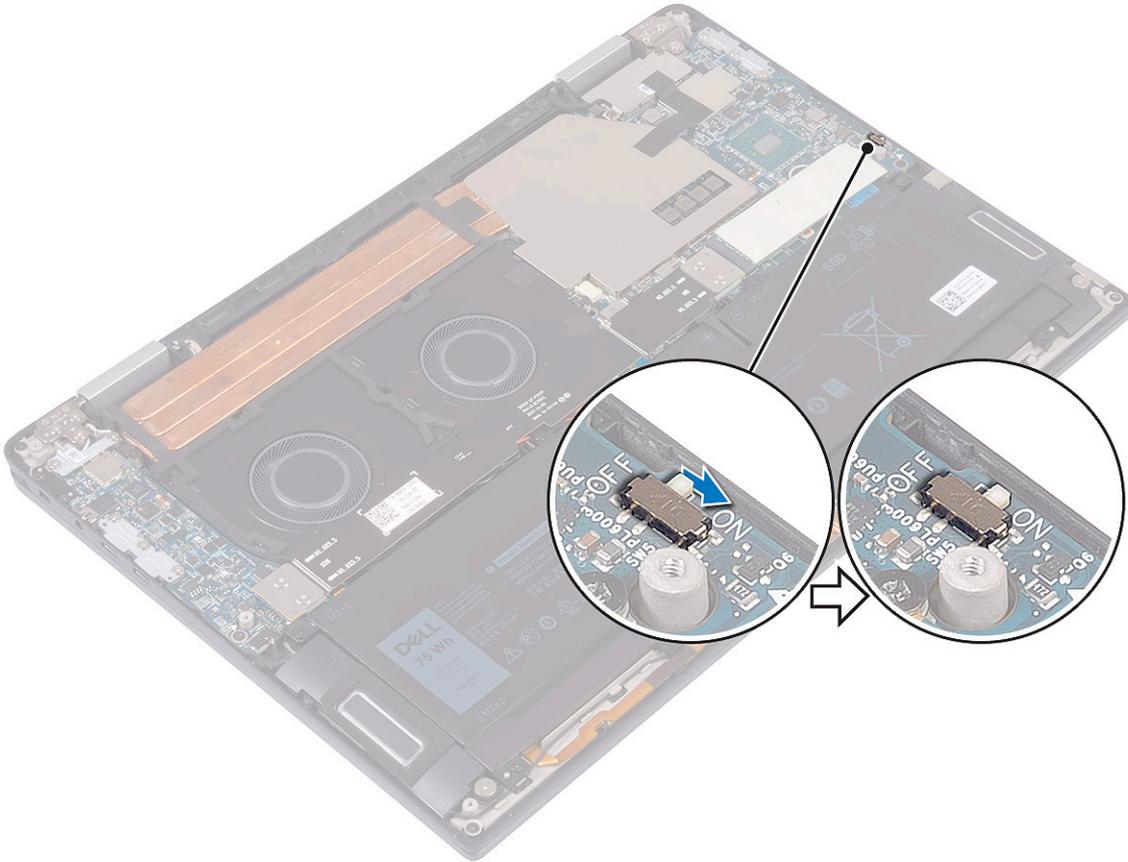
g) Turn-off the battery switch.



NOTE: Turn-off the battery switch before you proceed to remove any other component from your computer.

Installing the base cover

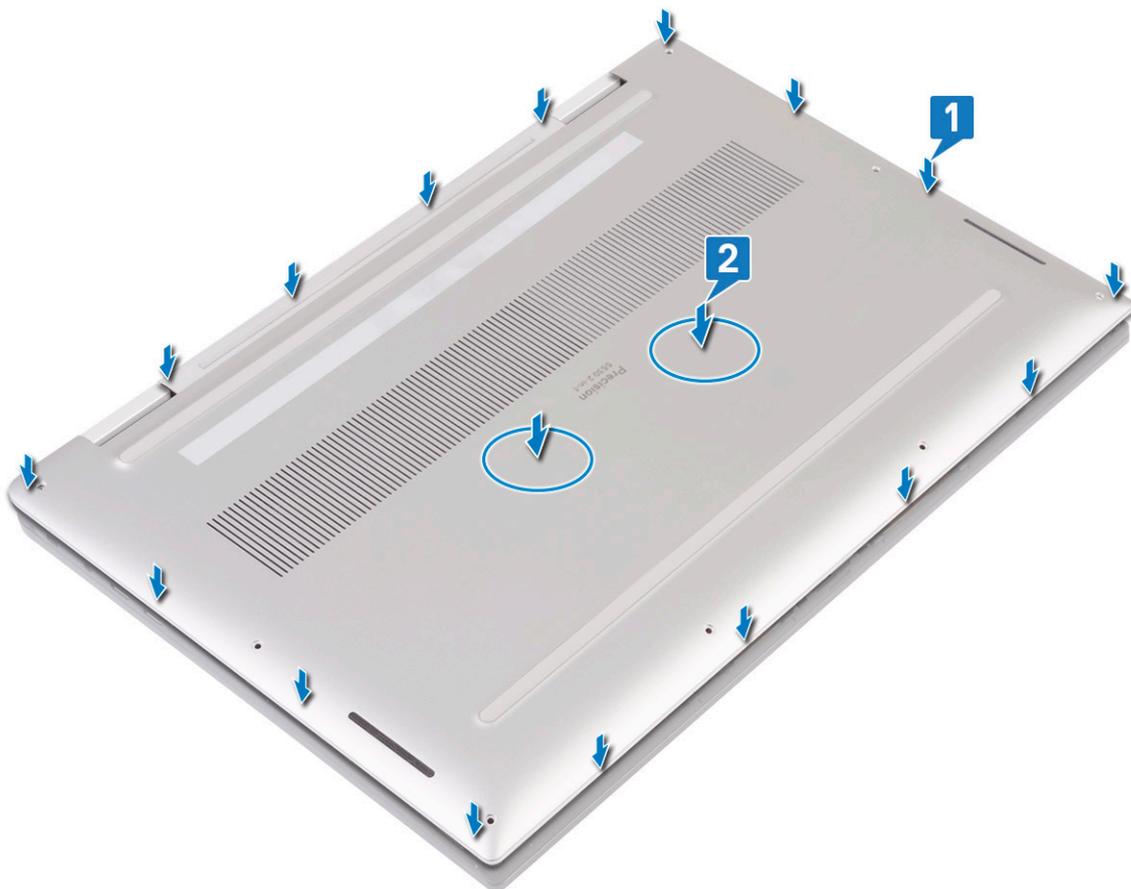
1. Turn-on the battery switch, it was turned off earlier.



2. Align the screw holes on the base cover with the screw holes on the palm-rest and keyboard assembly.



3. Snap the base cover into the tabs on the palm-rest and keyboard assembly [1, 2].



4. Replace the eight torx head screws (M2x3) that secure the base cover to the palm-rest and keyboard assembly.

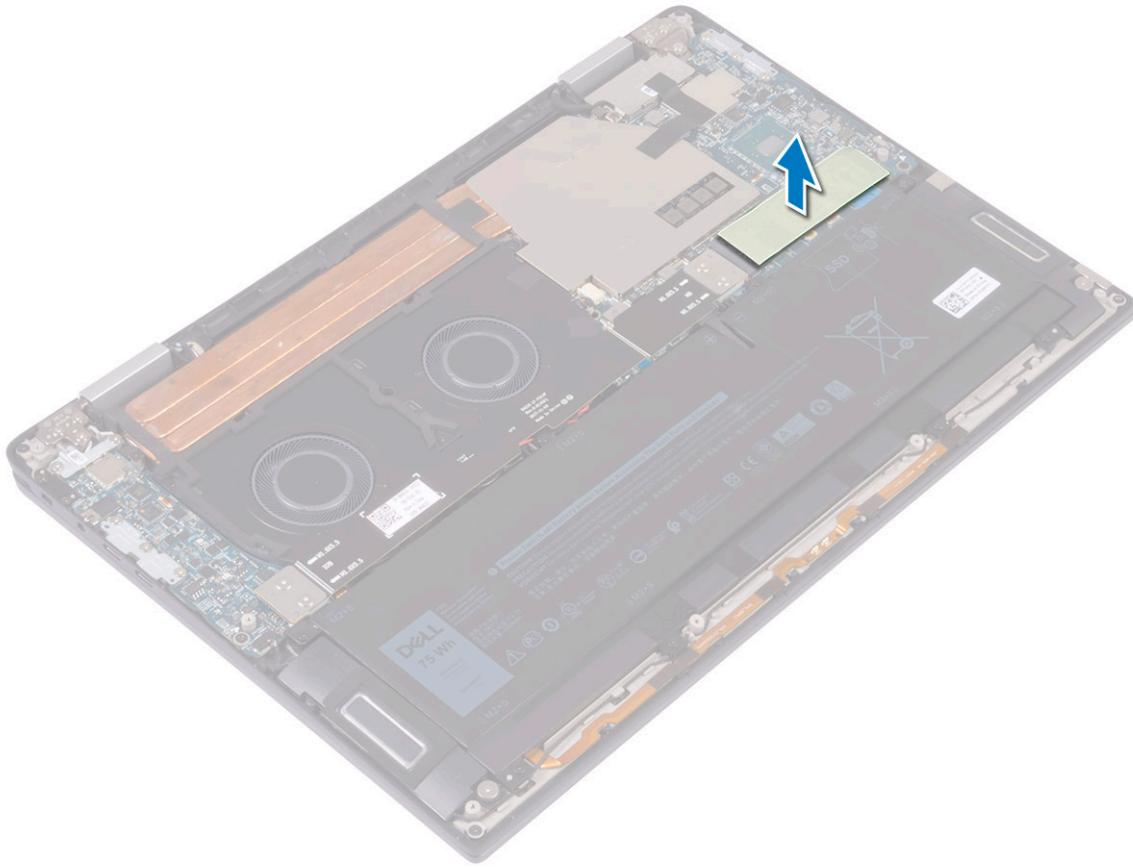


5. Follow the procedure in [After working inside your computer](#)

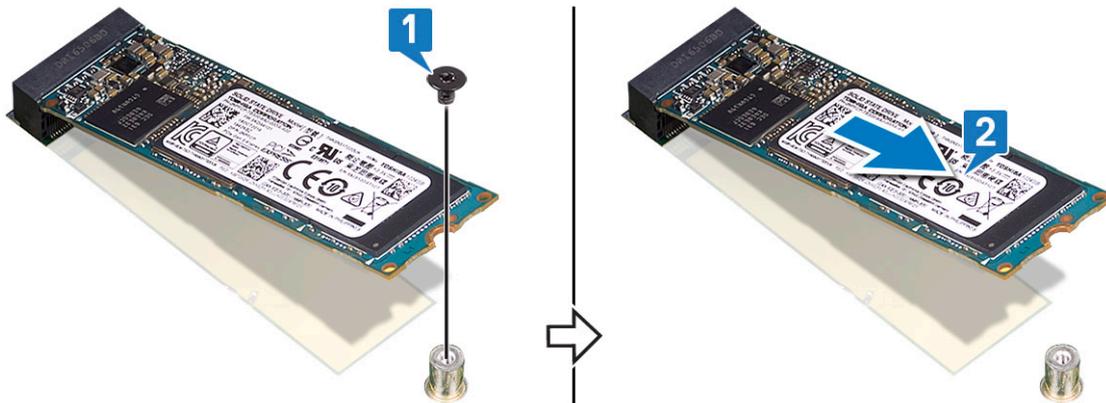
Solid-state drive

Removing the solid-state drive

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. To remove the solid-state drive (SSD):
 - a) Peel and remove the thermal pad from the solid-state drive.

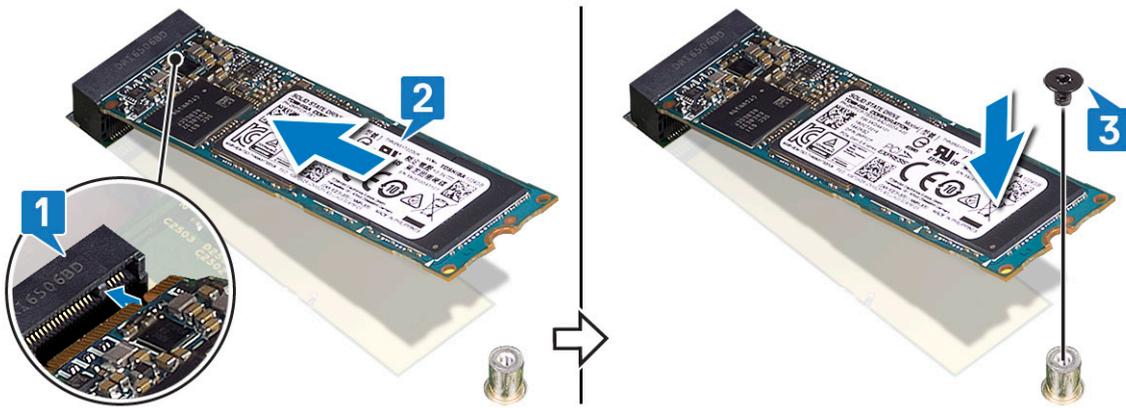


- b) Remove the screw (M2x3) that secures the solid-state drive to the system board [1].
- c) Lift the solid-state drive at an angle, then slide and remove the solid-state drive from the solid-state drive slot [2].

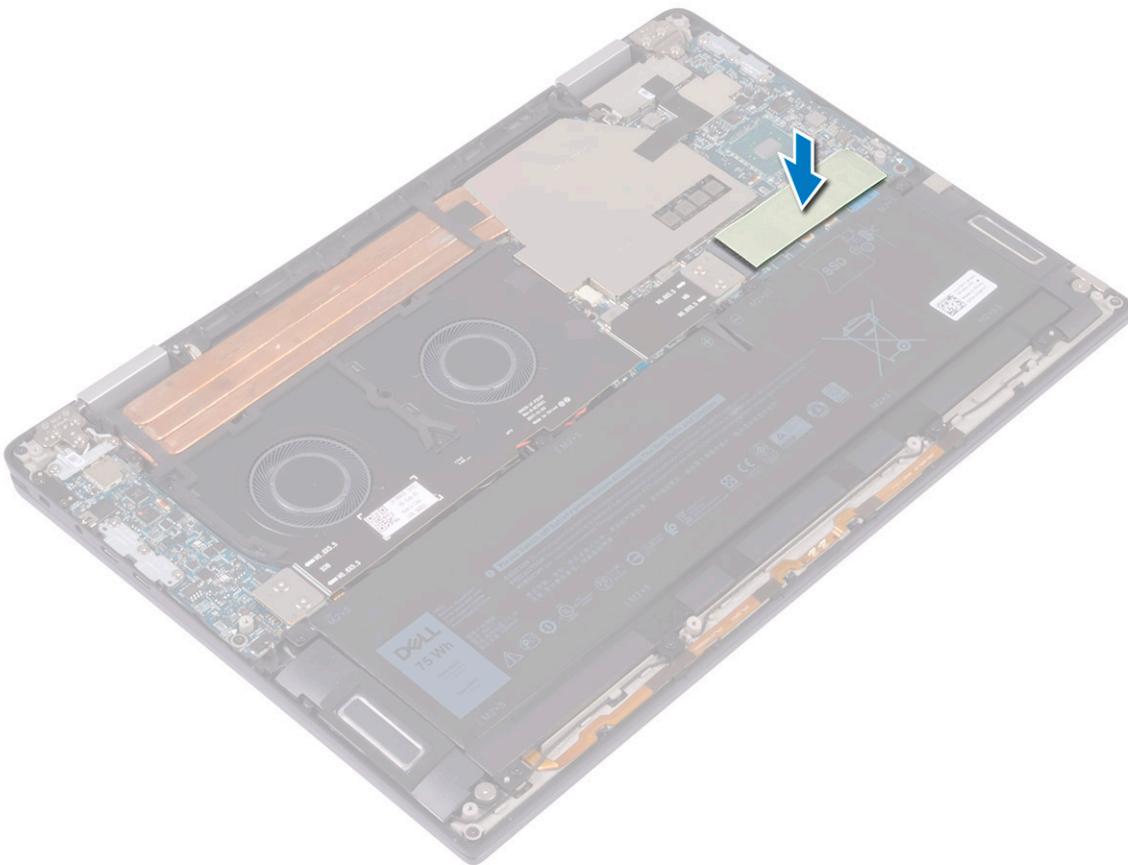


Installing the solid-state drive

- 1. Align the notch on the solid-state drive with the tab on the solid-state drive slot [1].
- 2. At an angle, slide the solid-state drive into the solid-state drive slot [2].
- 3. Replace the screw (M2x3) that secures the solid-state drive to the system board [3].



4. Affix the thermal pad on the solid-state drive.

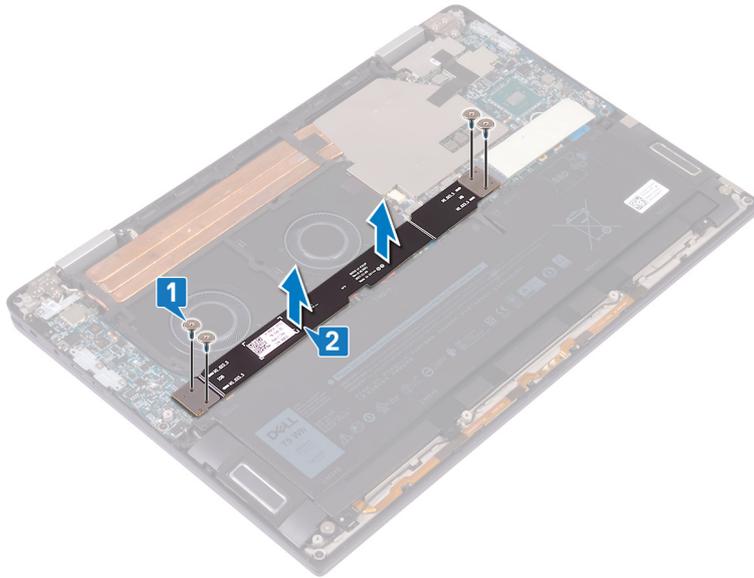


5. Install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).

I/O-board interposers

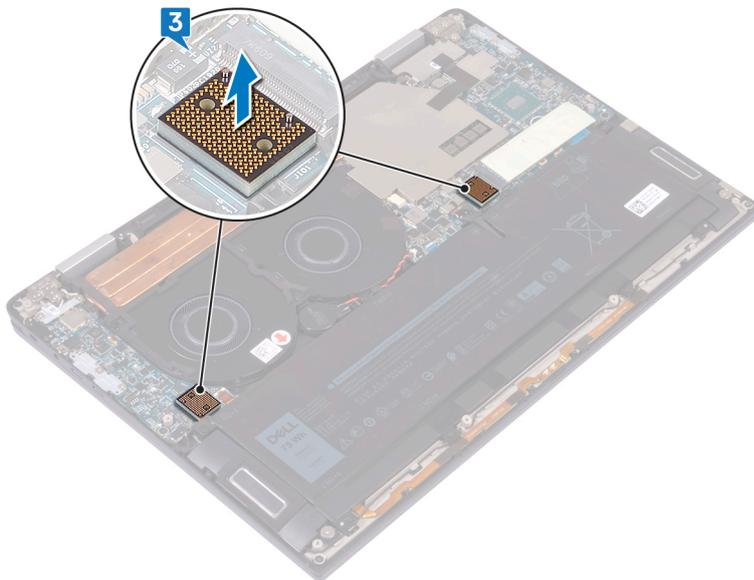
Removing the IO board interposer

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. To remove the IO board interposer:
 - a) Remove the four screws (M1.6x5.5) that secure the I/O-board cable to the system board [1].
 - b) Peel and remove the I/O-board cable from the fans [2].



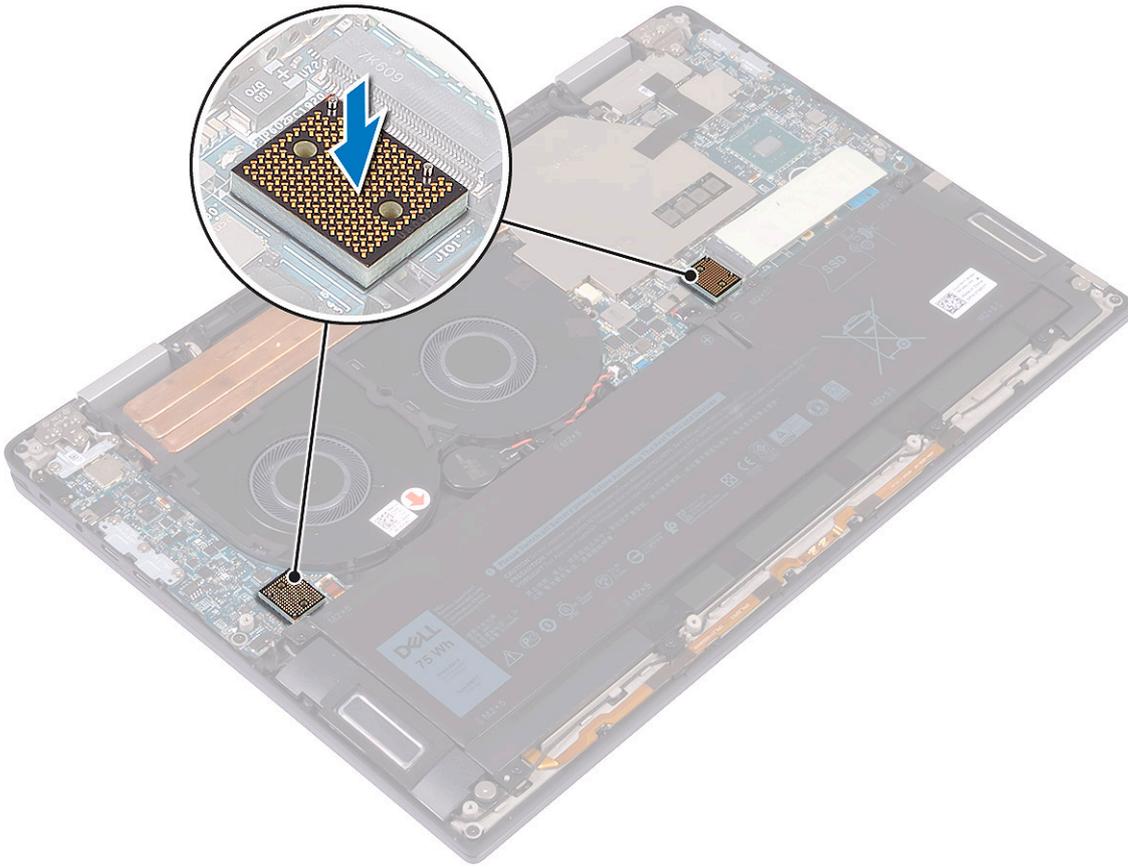
c) Remove the two I/O-board interposers from the system board [3].

i **NOTE:** Remove the I/O-board interposers immediately after removing the I/O-board cable to prevent the interposers from falling out of your computer. The pins on the interposer boards are very fragile. Avoid contact with the pins or bottom of the boards, instead handle the boards by lifting and holding from the edges or side. After removing the interposer boards from the system, place them on an ESD mat in a location where contact and movement can be avoided. DO NOT push or apply pressure to the pins on the interposer boards and DO NOT use any motion that may scratch the pins, such as rotating/turning the boards while they are in contact with any surface.



Installing the IO board interposer

1. Using the alignment posts, place the two I/O-board interposers on the system board.

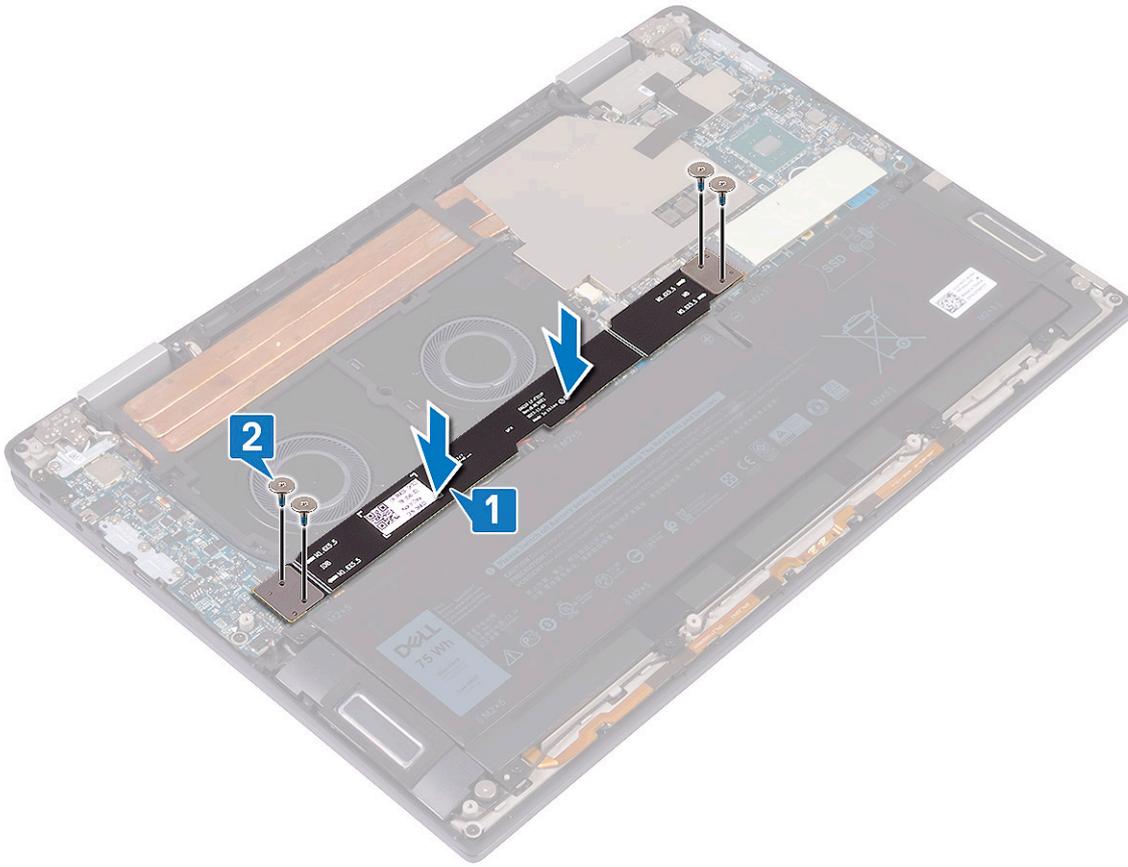


2. Align the screw holes on the I/O-board cable with the screw holes on the I/O-board interposers and adhere the I/O-board cable to the fans [1].

i **NOTE:** When installing the I/O board cable, align and connect the I/O board end to the I/O board side and the system board end to the system board side.

⚠ **CAUTION:** Wrong alignment of the cable might cause damage to the connectors.

3. Replace the four screws (M1.6x5.5) that secure the I/O-board cable to the system board [2].



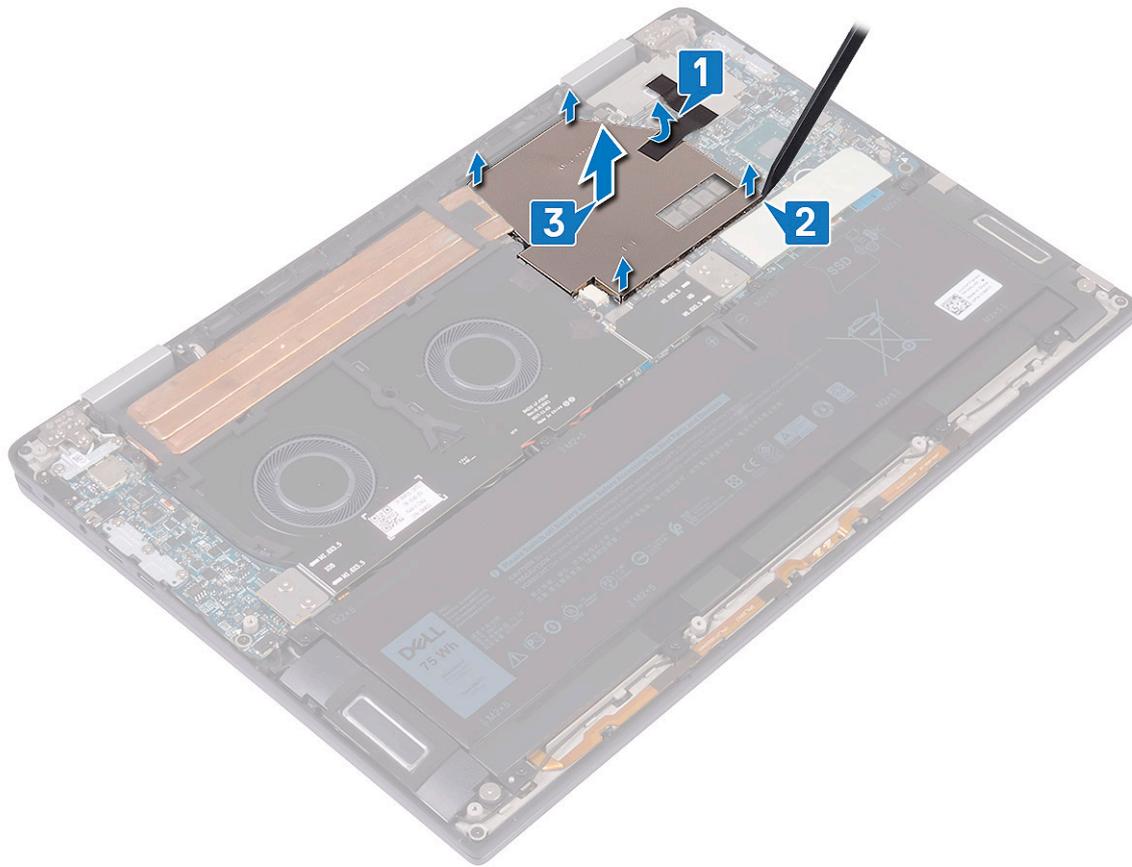
4. Install the [base cover](#).
5. Follow the procedure in [After working inside your computer](#).

Heat sink

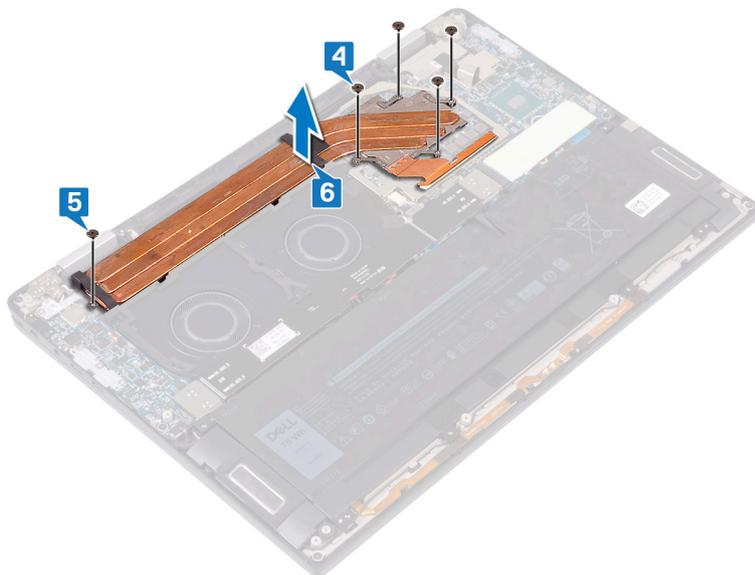
Removing the heat sink

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. To remove the heat sink:
 - a) Peel the tape that secures the heat-sink shield to the system board [1].

NOTE: The tape on the heat-sink shield is necessary to reduce the noise for the system. The tape can be reused and has to be adhered when the heat-sink shield is installed.
 - b) Using a plastic scribe, release the heat-sink shield from the slots on the system board [2].
 - c) Lift the heat-sink shield off the system board [3].

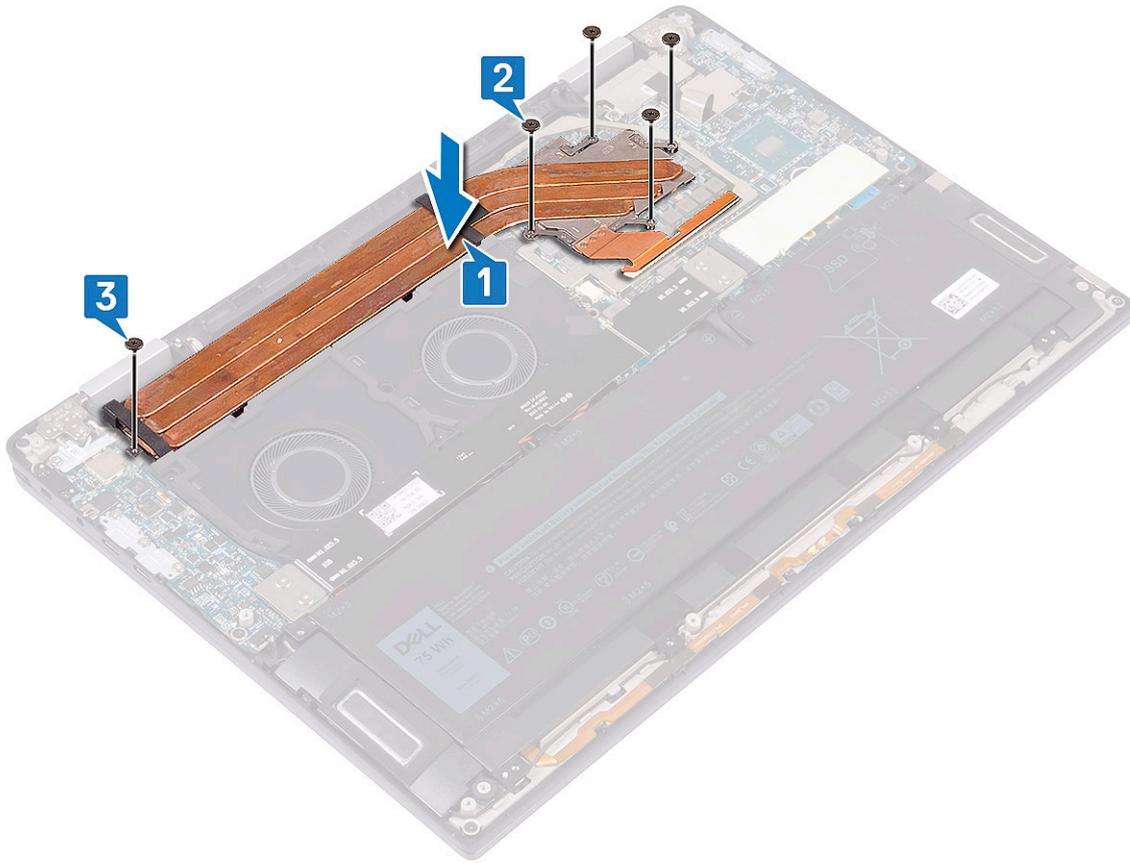


- d) In reverse sequential order (as indicated on the heat sink), remove the four screws (M2x3) that secure the heat sink to the system board [4].
- e) Remove the screw (M2x3) that secures the heat sink to the palm-rest and keyboard assembly [5].
- f) Lift the heat sink off the system board [6].

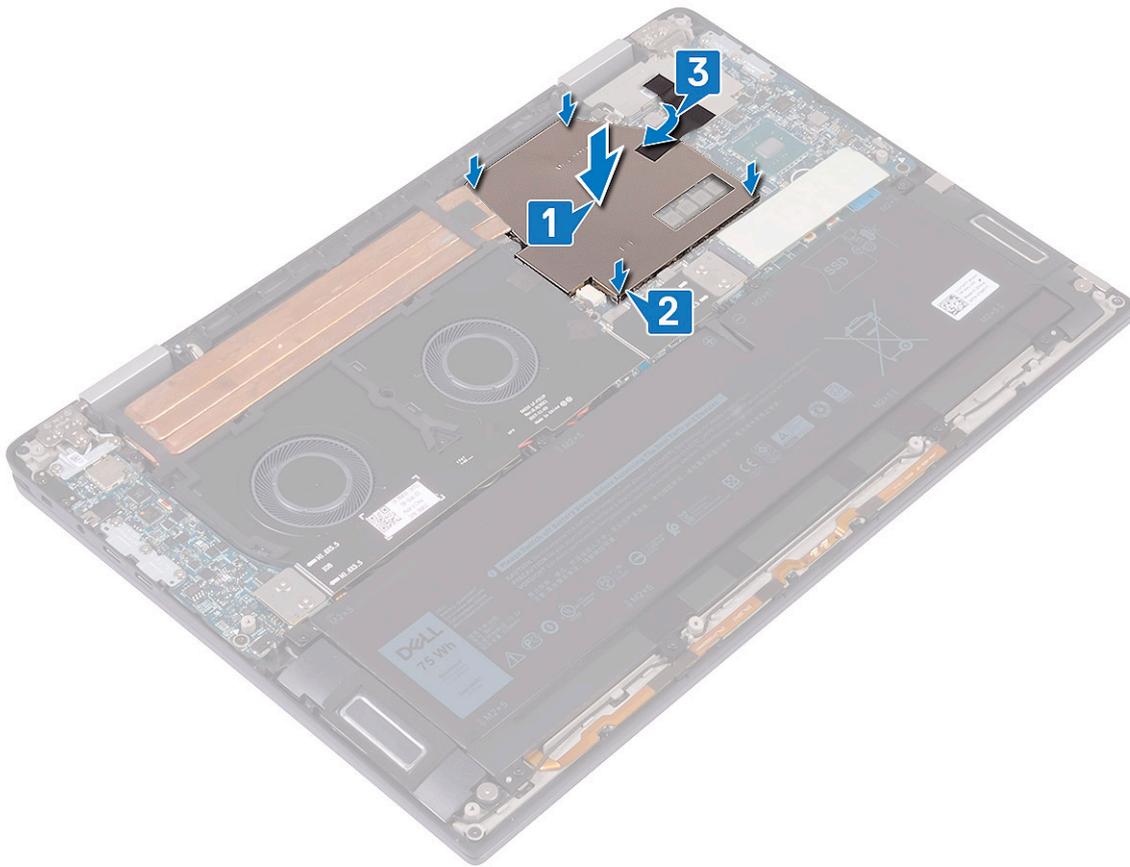


Installing the heat sink

- 1. Place the heat sink on the system board and align the screw holes on the heat sink with the screw holes on the system board [1].
- 2. In sequential order (as indicated on the heat sink), replace the five screws (M2x3) that secure the heat sink to the system board [2].
- 3. Replace the screw (M2x3) that secures the heat sink to the palm-rest and keyboard assembly [3].



4. Place the heat-sink shield on the slots on the system board [1] and press down the heat-sink shield to snap it into place [2].
5. Affix the tape that secures the heat-sink shield to the system board [3].

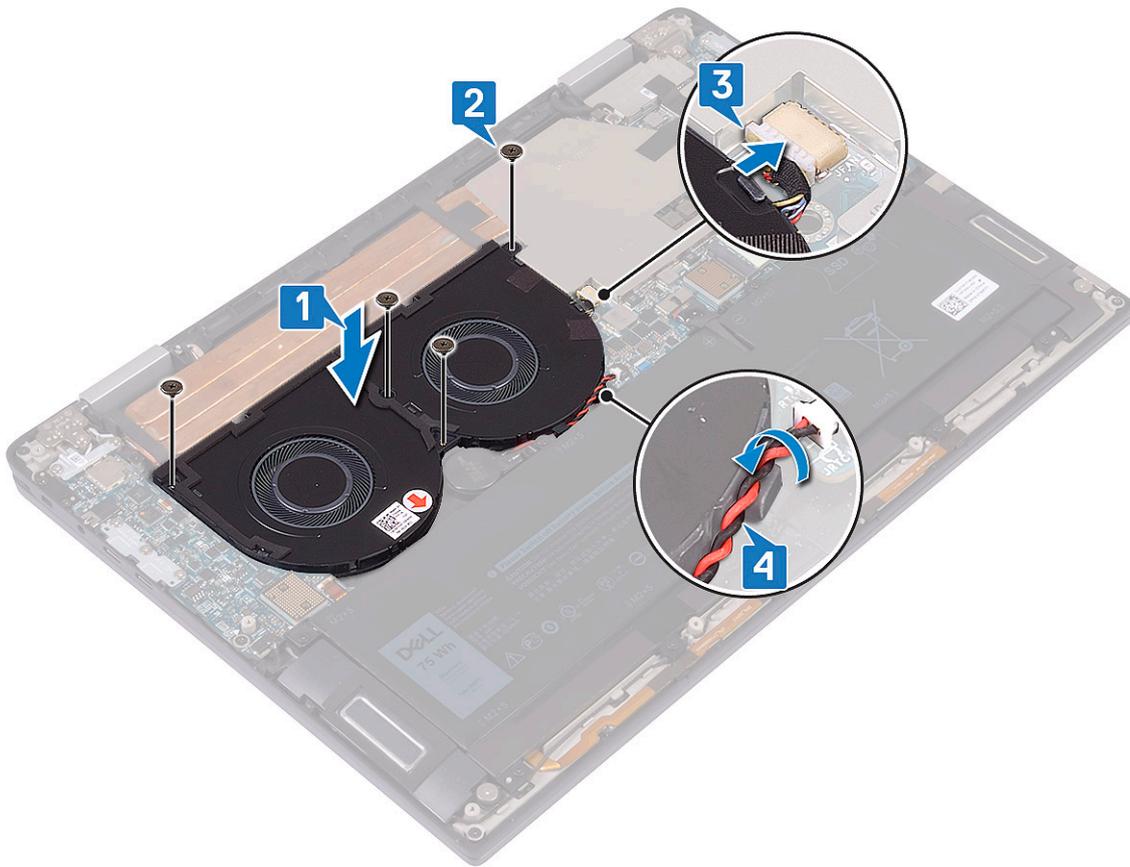


6. Install the [base cover](#).
7. Follow the procedure in [After working inside your computer](#).

System fans

Installing the system fans

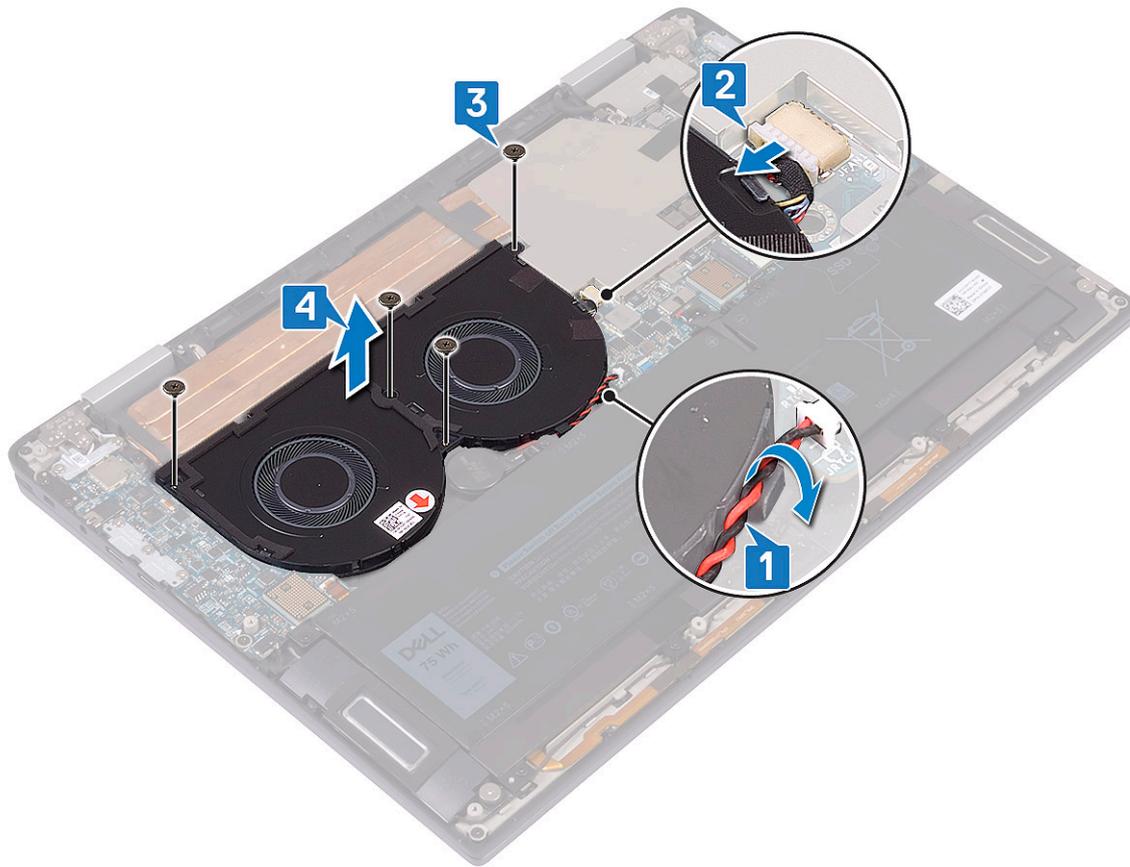
1. Align the screw holes on the system fans with the screw holes on the palm-rest and keyboard assembly [1].
2. Replace the four screws (M2x3) that secure the system fans to the palm-rest and keyboard assembly [2].
3. Connect the system fan cable to the system board [3].
4. Route the coin-cell battery cable through the routing guides on the system fans [4].



5. Install the [I/O-board interposers](#).
6. Install the [base cover](#).
7. Follow the procedure in [After working inside your computer](#).

Removing the system fans

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [I/O-board interposers](#).
4. To remove the system fans:
 - a) Remove the coin-cell battery cable from the routing guides on the system fans [1].
 - b) Disconnect the system fan cable from the system board [2].
 - c) Remove the four screws (M2x3) that secure the system fans to the palm-rest and keyboard assembly [3].
 - d) Lift the system fans along with their cable, off the system board [4].



Battery

Lithium-ion battery precautions

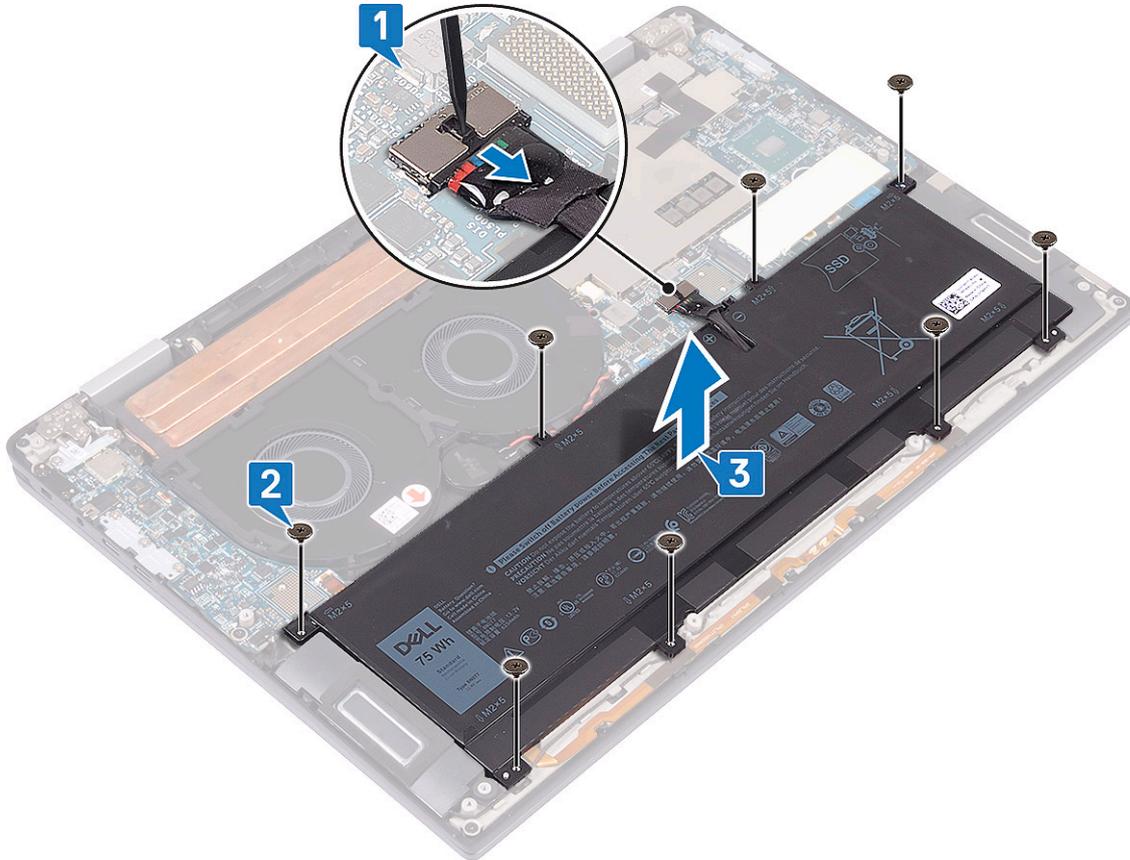
⚠ CAUTION:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery as much as possible before removing it from the system. This can be done by disconnecting the AC adapter from the system to allow the battery to drain.
- 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](#).

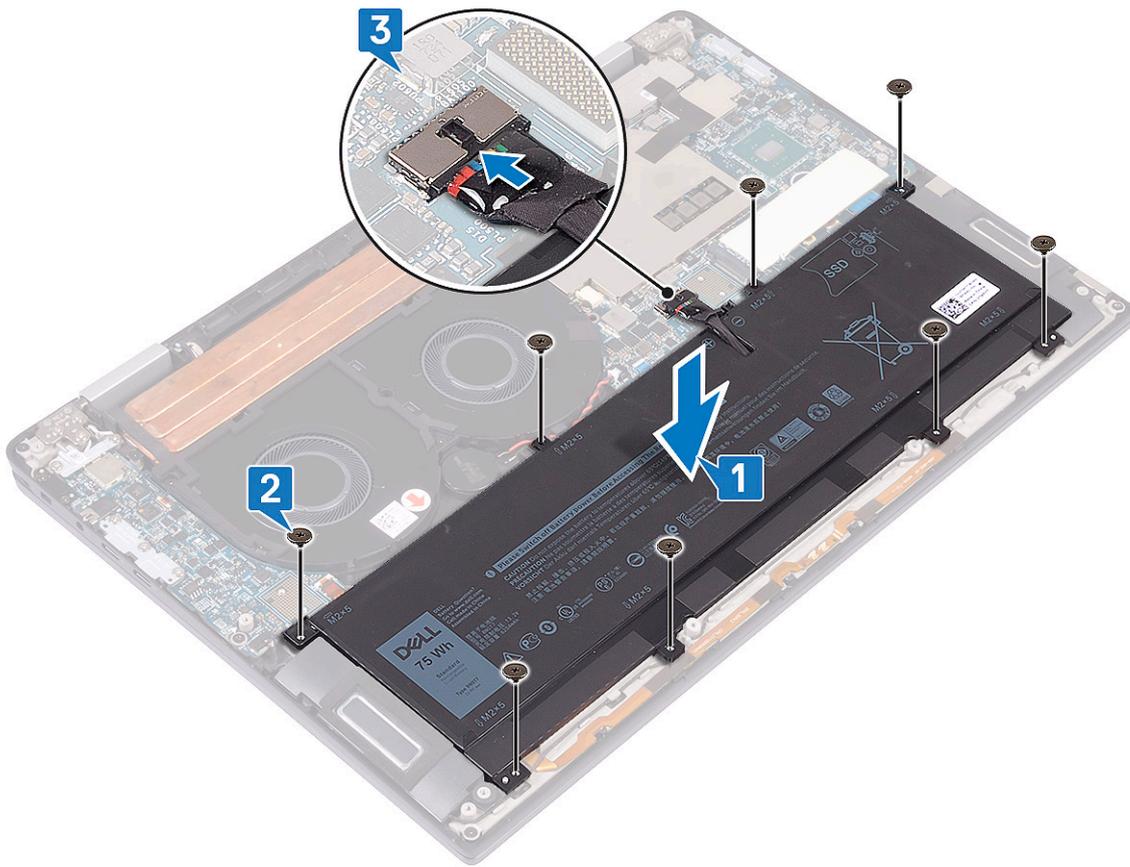
2. Remove the [base cover](#).
3. Remove the [I/O-board interposers](#).
4. To remove the battery:
 - a) Using a plastic scribe, push the tab and disconnect the battery cable from the system board [1].
 - b) Remove the eight screws (M2x5) that secure the battery to the palm-rest and keyboard assembly [2].
 - c) Lift the battery off the palm-rest and keyboard assembly [3].



5. Turn the computer over, open the display, and press the power button for about 5 seconds to ground the computer.

Installing the battery

1. Place the battery on the palm-rest and keyboard assembly and align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly [1].
2. Replace the eight screws (M2x5) that secure the battery to the palm-rest and keyboard assembly [2].
3. Connect the battery cable to the system board [3].

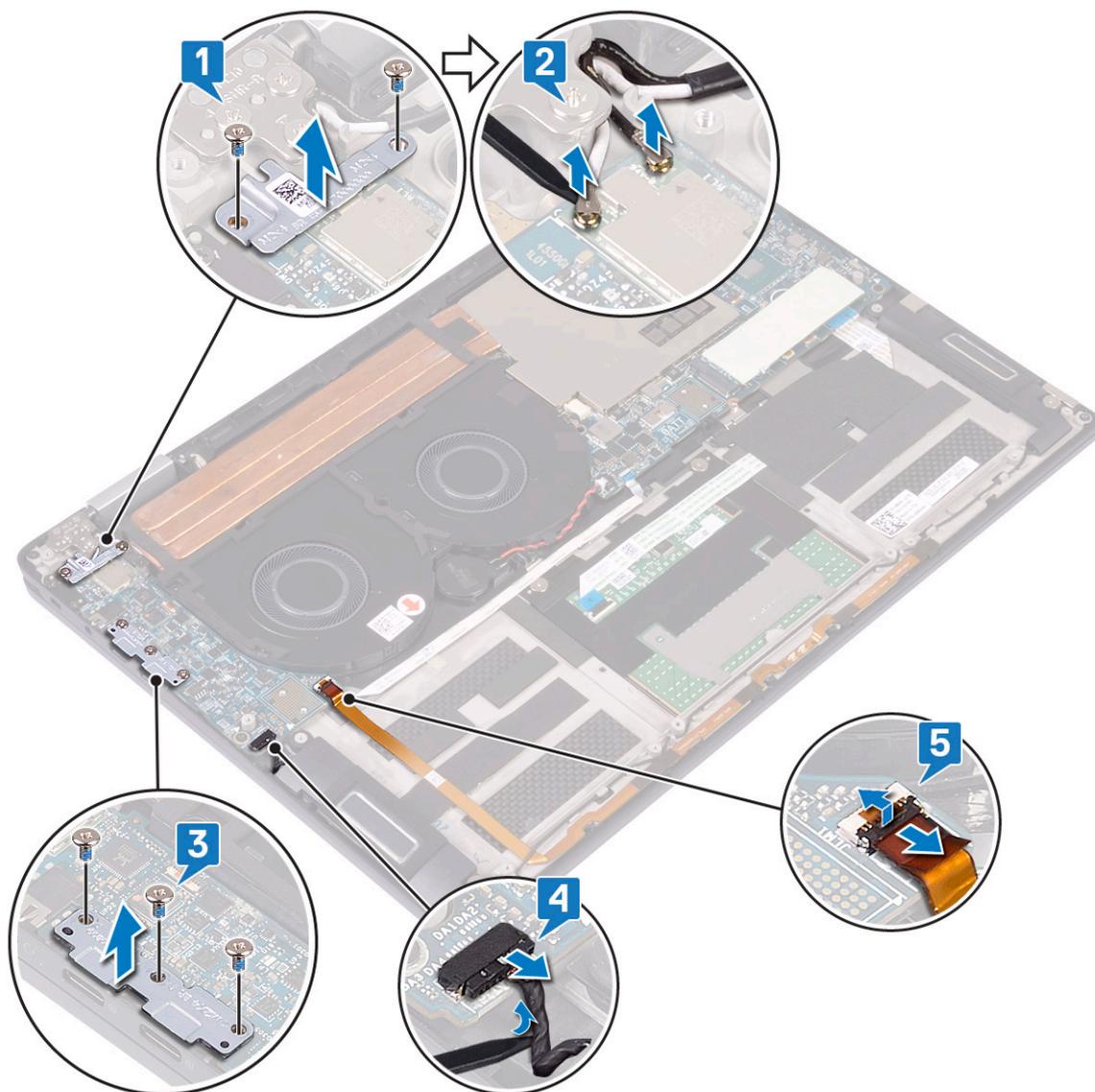


4. Install the [I/O-board interposers](#).
5. install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).

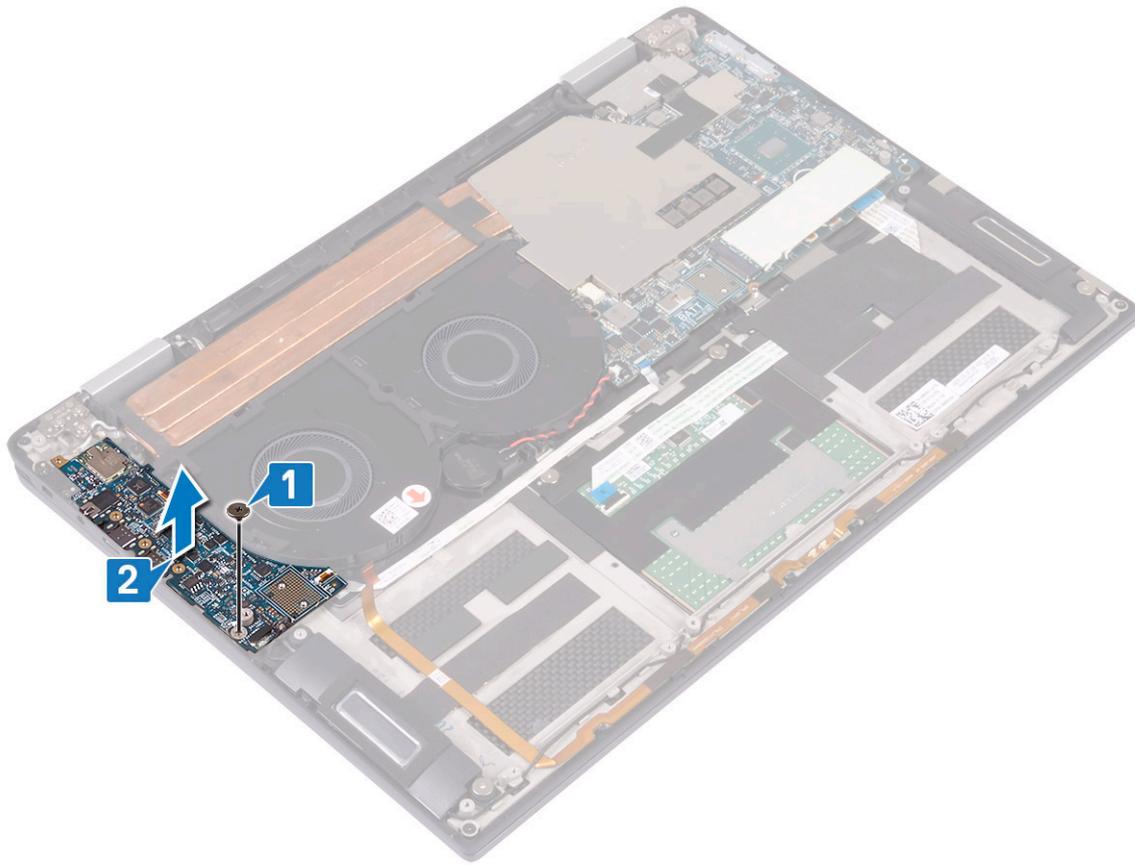
IO board

Removing the IO board

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [I/O-board interposers](#).
4. Remove the [battery](#).
5. To remove the I/O board:
 - a) Remove the two screws (M2x4) that secure the wireless-antenna bracket to the I/O board [1].
 - b) Using a plastic scribe, disconnect the antenna cables from the I/O board [2].
 - c) Remove the three screws (M2x4) that secure the Type-C USB bracket to the I/O board [3].
 - d) Using a plastic scribe, disconnect the speaker cable from the I/O board [4].
 - e) Disconnect the LED and microphone cable from the I/O board [5].

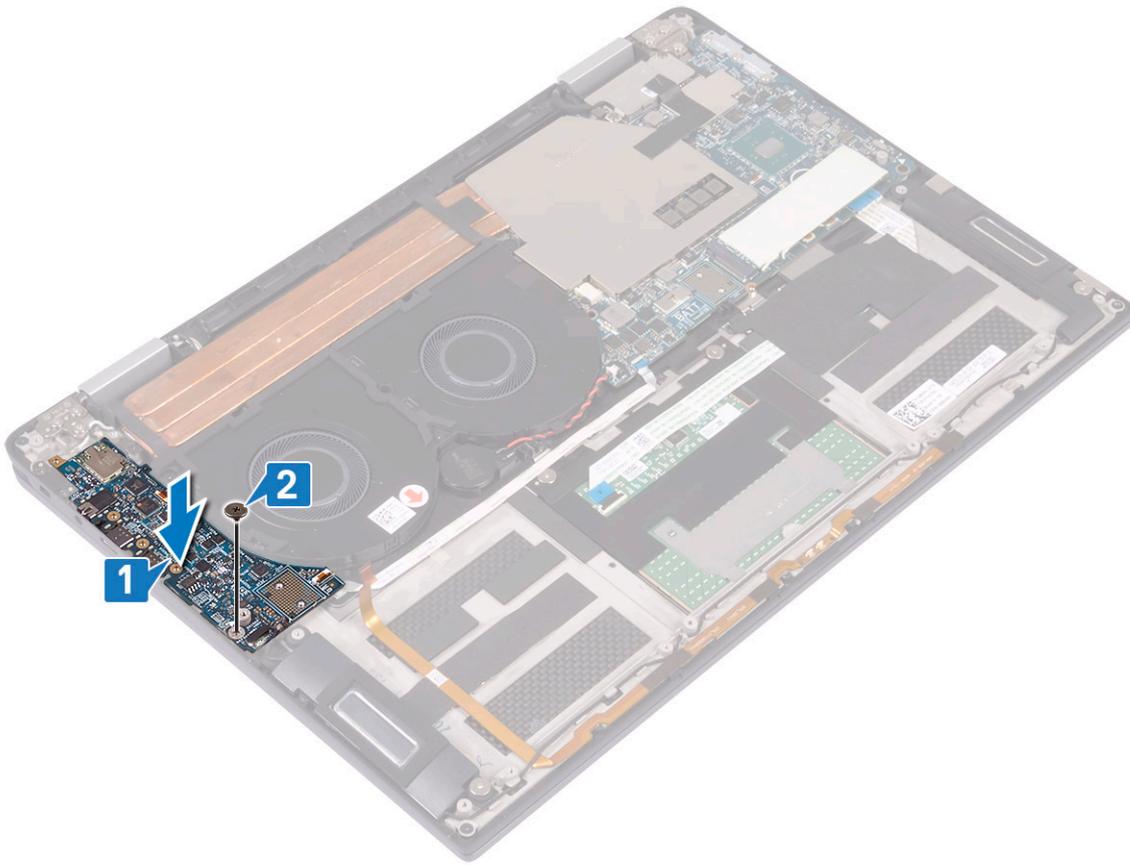


- f) Remove the screw (M2x3) that secures the I/O board to the palm-rest and keyboard assembly [1].
- g) Lift the I/O board off the palm-rest and keyboard assembly [2].

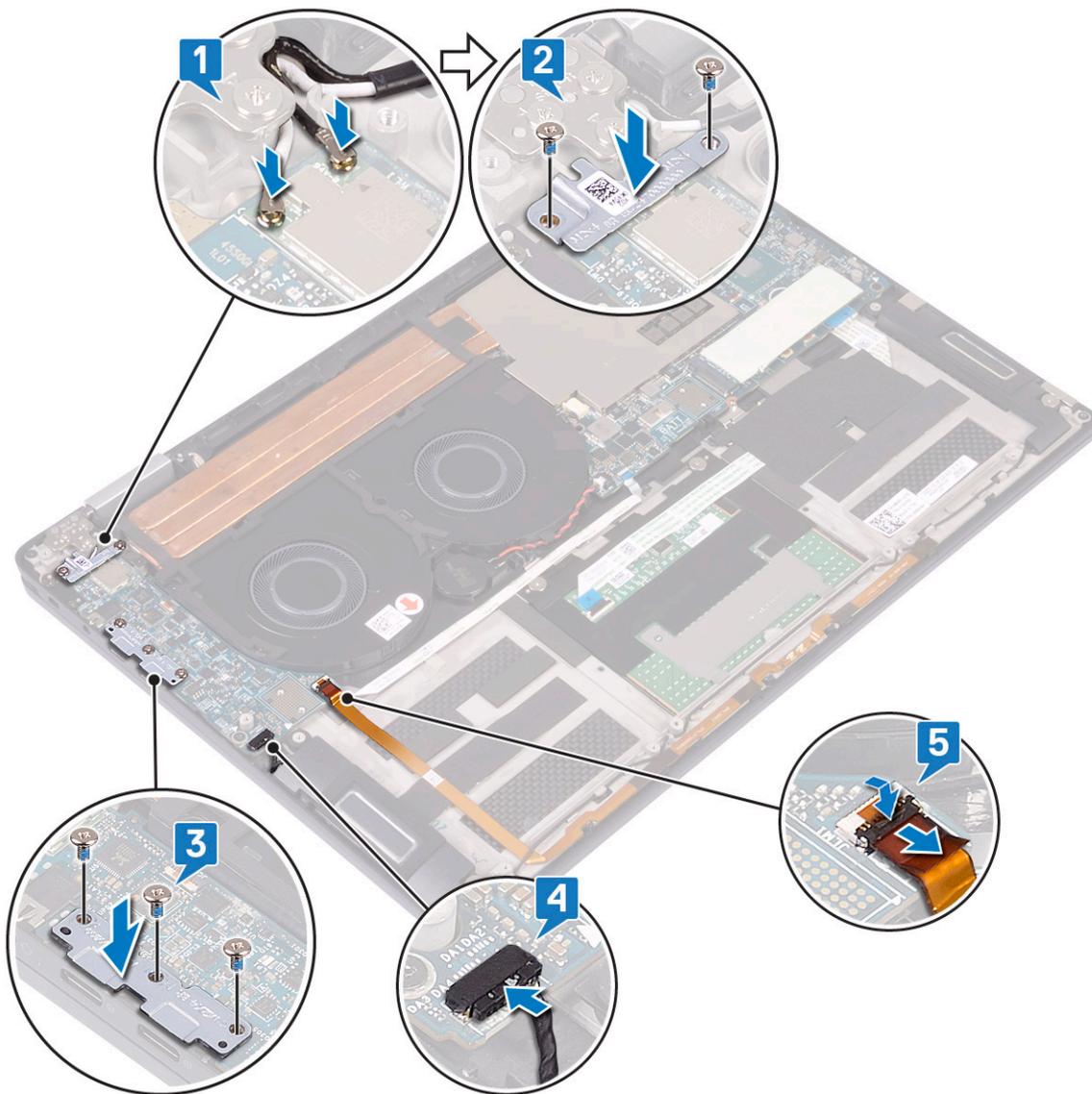


Installing the I/O board

1. Using the alignment posts, align the screw hole on the I/O board with the screw hole on the palm-rest and keyboard assembly [1].
2. Replace the screw (M2x3) that secures the I/O board to the palm-rest and keyboard assembly [2].



3. Connect the antenna cables to the I/O board [1].
4. Place the wireless-antenna bracket on the I/O board and replace the two screws (M2x4) that secure the wireless-antenna bracket to the I/O board [2].
5. Place the Type-C USB bracket on the I/O board and replace the three screws (M2x4) that secure the Type-C USB bracket to the I/O board [3].
6. Connect the speaker cable to the I/O board [4].
7. Connect the LED and microphone cable to the I/O board [5].

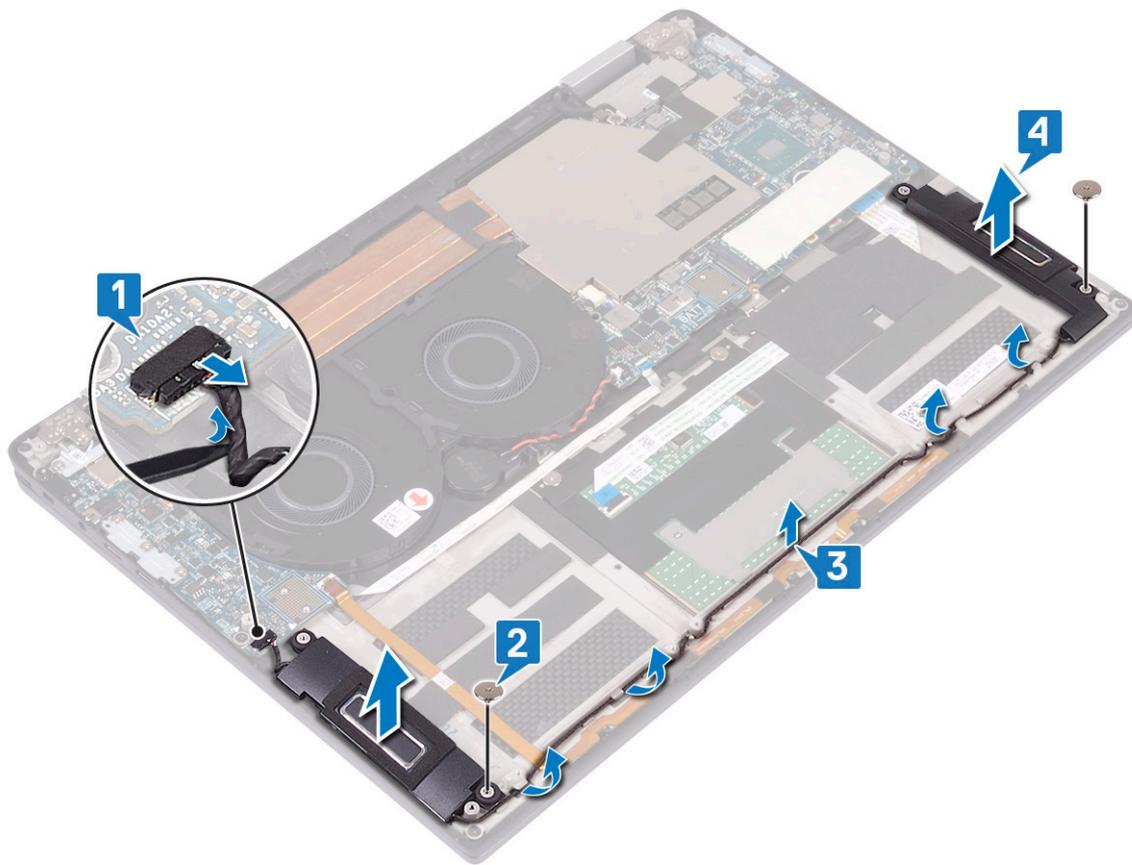


8. Install the [battery](#).
9. Install the [I/O-board interposers](#).
10. install the [base cover](#).
11. Follow the procedure in [After working inside your computer](#).

Speakers

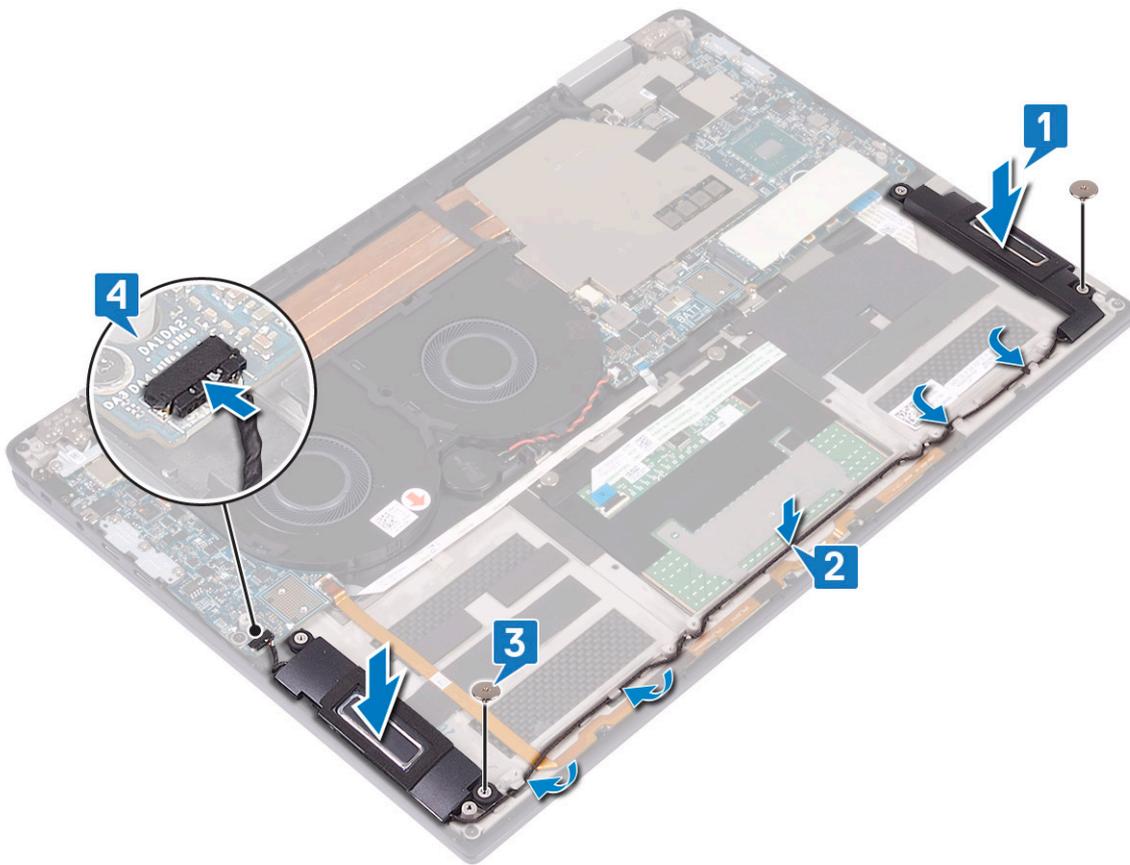
Removing the speakers

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [I/O-board interposers](#).
4. Remove the [battery](#).
5. To remove the speakers:
 - a) Disconnect the speaker cable from the I/O board [1].
 - b) Remove the two screws (M2x1.7) that secure the left and right speakers to the palm-rest and keyboard assembly [2].
 - c) Unroute the speaker-cable and remove the cable from the routing guides on the palm-rest and keyboard assembly [3].
 - d) Lift the left and right speakers, along with their cables, off the palm-rest and keyboard assembly [4].



Installing the speakers

1. Using the alignment posts, place the left and right speaker on the palm-rest and keyboard assembly [1].
2. Using the routing guides, route the speaker cable on the palm-rest and keyboard assembly [2].
3. Replace the two screws (M2x1.7) that secure the left and right speakers to the palm-rest and keyboard assembly [3].
4. Connect the speaker cable to the I/O board [4].

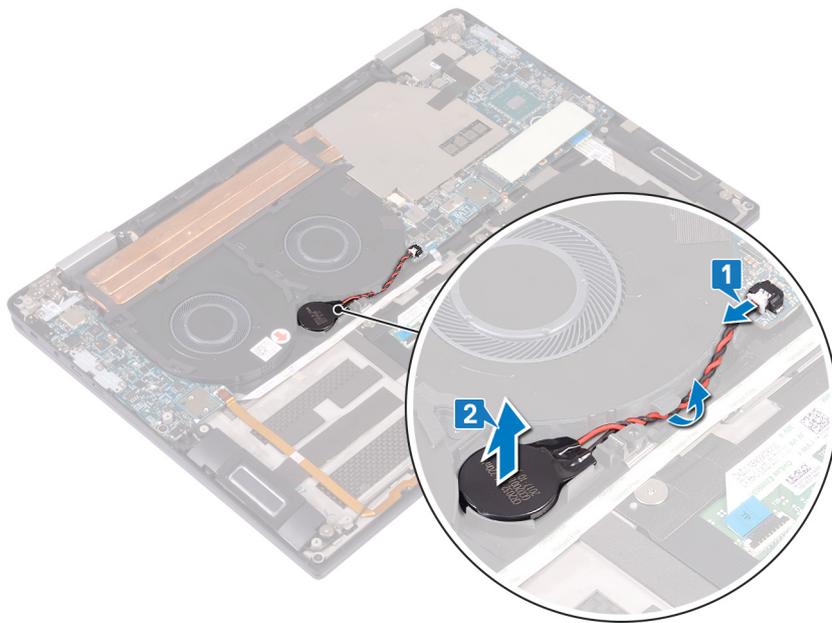


5. Install the [battery](#).
6. Install the [I/O-board interposers](#).
7. install the [base cover](#).
8. Follow the procedure in [After working inside your computer](#).

Coin-cell battery

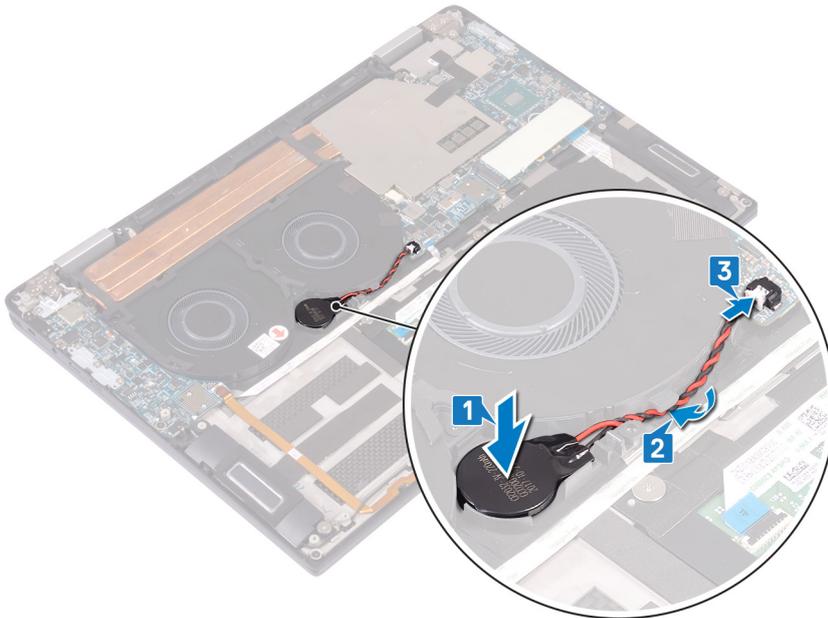
Removing the coin cell battery

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [I/O-board interposers](#).
4. Remove the [battery](#).
5. To remove the coin cell battery:
 - a) Disconnect the coin-cell battery cable from the system board and release the coin-cell battery cable from the routing guides on the fan [1].
 - b) Note the location of the coin-cell battery and pry it off the system board [2].



Installing the coin cell battery

1. Affix the coin-cell battery to the system board [1].
2. Using the routing guides, route the coin-cell battery cable on the system fans [2].
3. Connect the coin-cell battery cable to the system board [3].



4. Install the [battery](#).
5. Install the [I/O-board interposers](#).
6. install the [base cover](#).
7. Follow the procedure in [After working inside your computer](#).

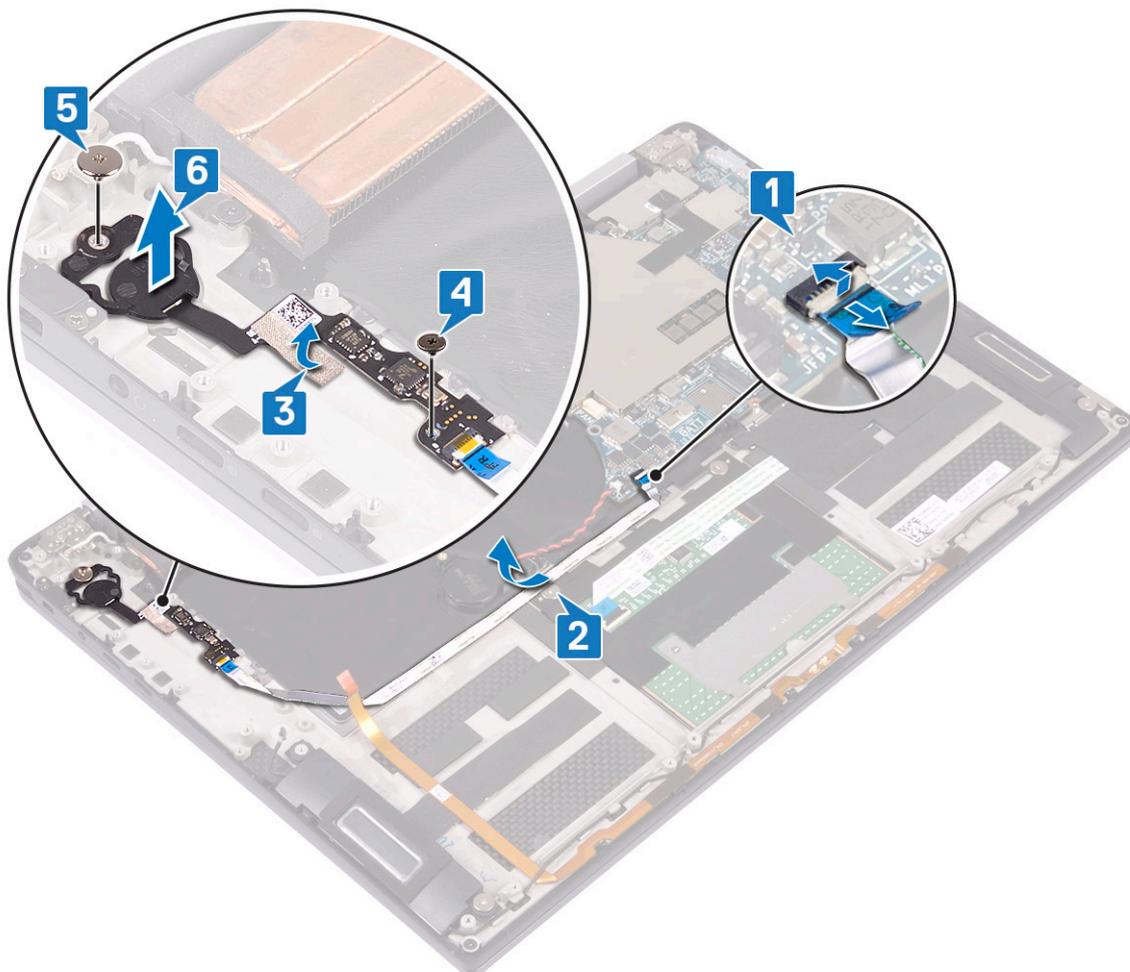
Power button with fingerprint reader

Removing the power button with fingerprint reader

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [I/O-board interposers](#).
4. Remove the [battery](#).
5. Remove the [I/O board](#).
6. To remove the power button with fingerprint (optional):

i **NOTE:** Step 1, 2, and 4 are applicable only for the computers that are shipped with fingerprint reader.

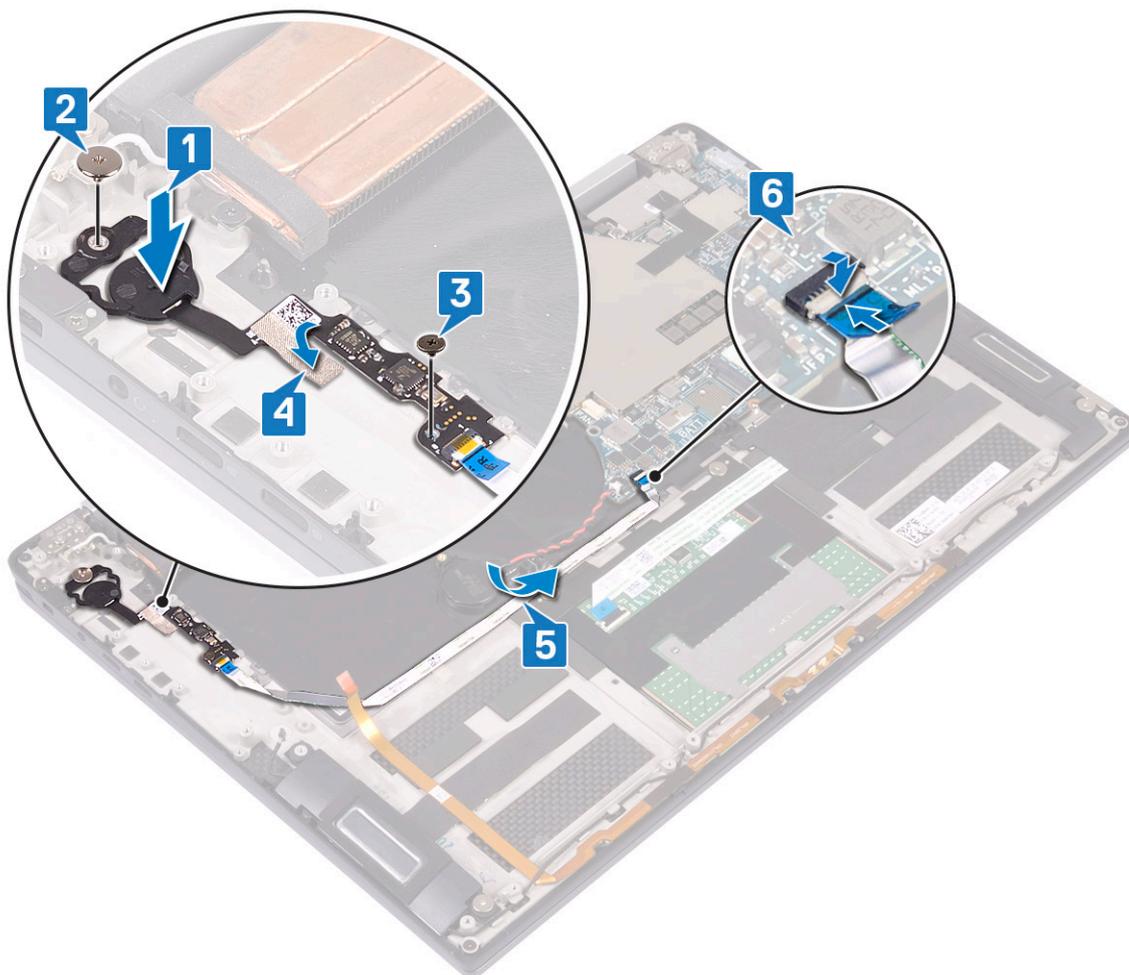
- a) Open the latch and disconnect the fingerprint-reader cable from the system board and peel the fingerprint-reader cable from the palm-rest and keyboard assembly [1].
- b) Unroute the fingerprint reader cable [2].
- c) Peel the tape that secures the power button cable to the palm-rest and keyboard assembly [3].
- d) Remove the screw (M1.6x1.8) that secures the fingerprint-reader to the palm-rest and keyboard assembly [4].
- e) Remove the screw (M2x1.7) that secures the power button to the palm-rest and keyboard assembly [5].
- f) Peel and lift the power button and fingerprint reader (optional), along with its cable, off the palm-rest and keyboard assembly [6].



Installing the power button with fingerprint reader

NOTE: Step 3, 4, and 5 are applicable only for the computers that are shipped with fingerprint reader.

1. Place the power button and fingerprint reader (optional) into its slot on the palm-rest and keyboard assembly [1].
2. Replace the screw (M2x1.7) that secures the power button to the palm-rest and keyboard assembly [2].
3. Replace the screw (M1.6x1.8) that secures the fingerprint-reader to the palm-rest and keyboard assembly [3].
4. Affix the tape that secures the power button cable to the palm-rest and keyboard assembly [4].
5. Route the fingerprint-reader cable to the palm-rest and keyboard assembly [5].
6. Connect the fingerprint-reader cable to the system board and close the latch [6].



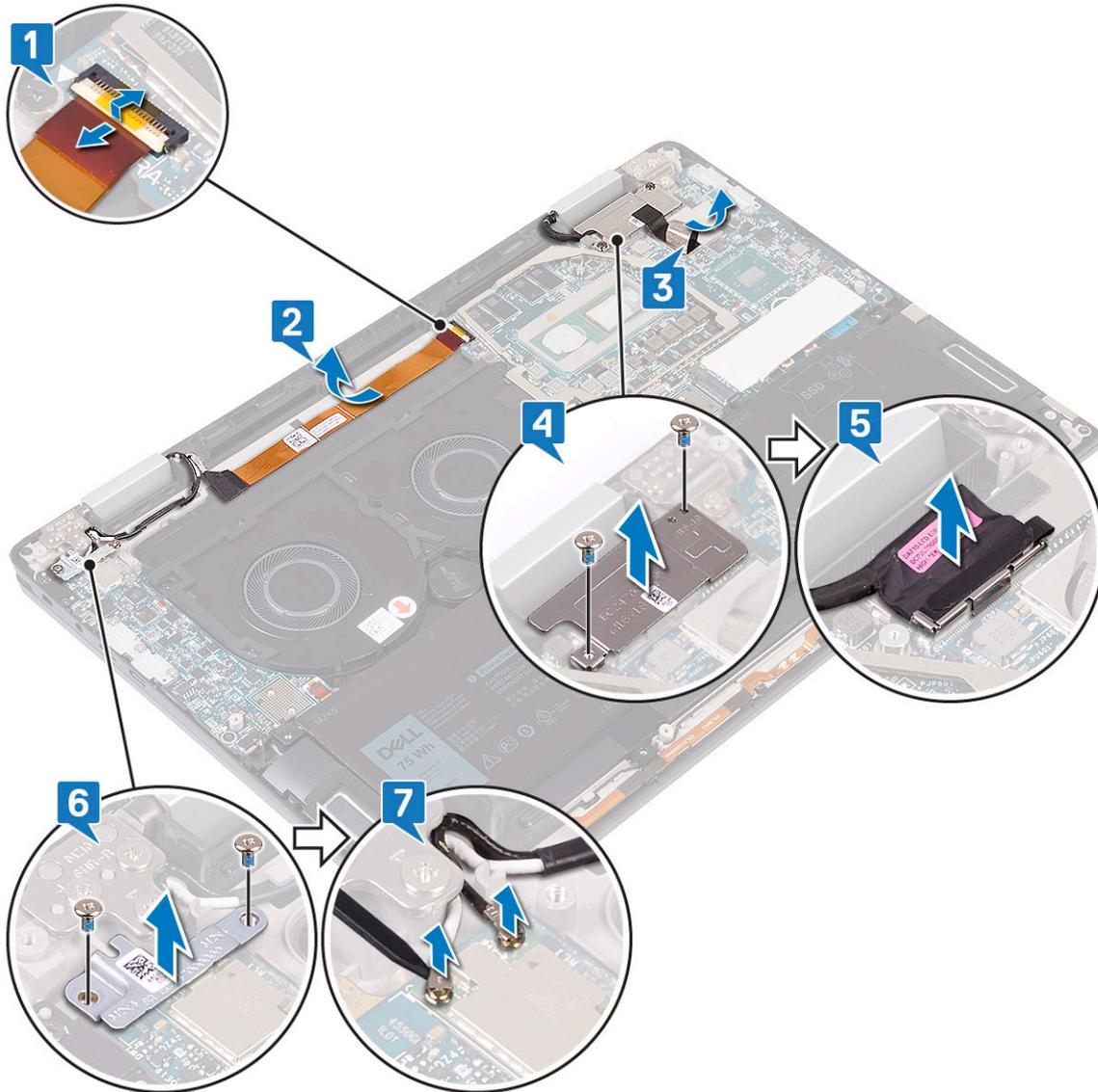
7. Install the [I/O board](#).
8. Install the [battery](#).
9. Install the [I/O-board interposers](#).
10. install the [base cover](#).
11. Follow the procedure in [After working inside your computer](#).

Display assembly

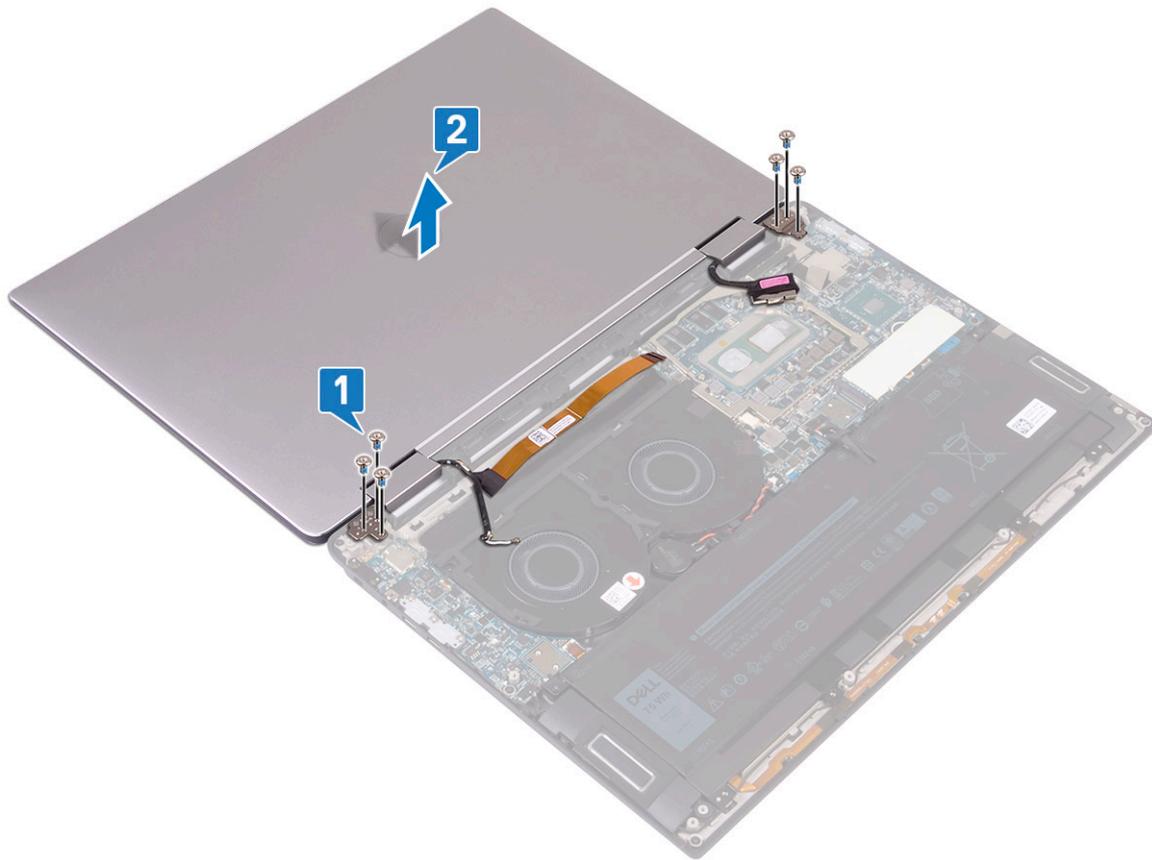
Removing the display assembly

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).

3. Remove the I/O-board interposers.
4. Remove the heat sink.
5. To remove the display assembly:
 - a) Open the latch and disconnect the camera cable from the system board [1].
 - b) Peel the camera cable from the palm-rest and keyboard assembly [2].
 - c) Peel the tape that secures the display-cable bracket to the system board [3].
 - d) Remove the two screws (M1.6x1.8) that secure the display-cable bracket to the system board and lift the bracket off the system board [4].
 - e) Using the pull tab, disconnect the display cable from the system board [5].
 - f) Remove the two screws (M2x4) that secure the wireless-antenna bracket to the I/O board and lift the bracket off the I/O board [6].
 - g) Disconnect the antenna cables from the I/O board [7].

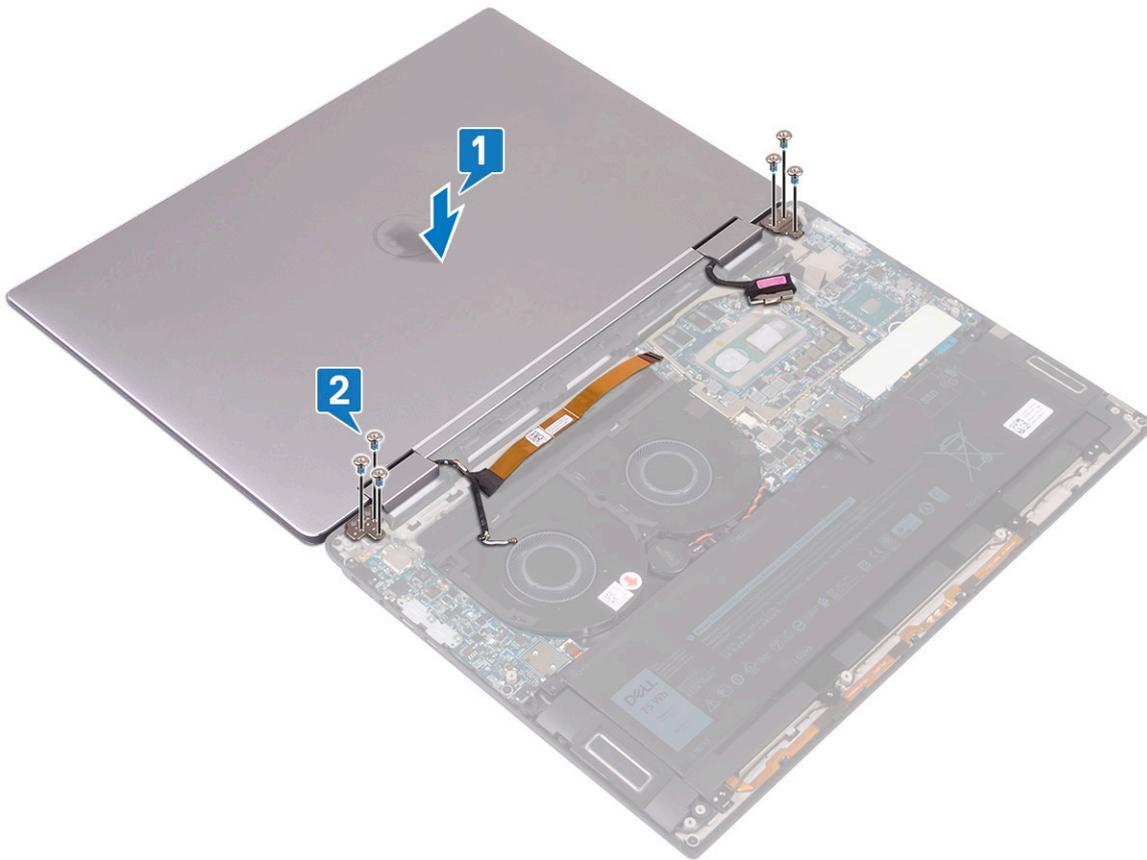


- h) Open the computer at a 180-degree angle and place it on a flat and clean surface with the display screen facing down.
- i) Remove the six screws (M2.5x4) that secure the display assembly to the palm-rest and keyboard assembly [1].
- j) Lift the display assembly from the palm-rest assembly [2].

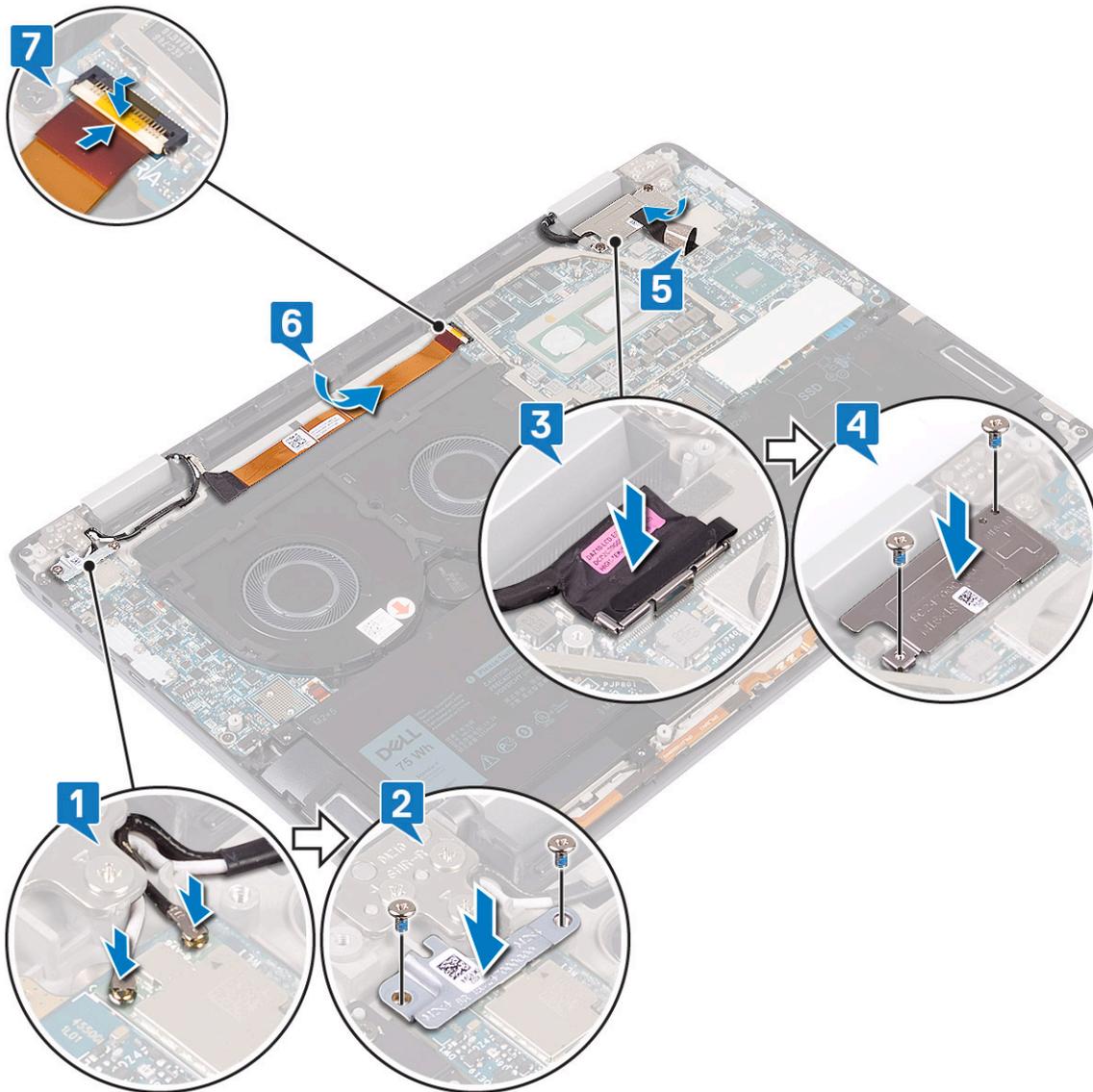


Installing the display assembly

1. With the display screen facing down, align the screw holes on the display assembly with the screw holes on the palm-rest and keyboard assembly [1].
2. Replace the six screws (M2.5x4) that secure the display assembly to the palm-rest and keyboard assembly [2].



3. Close the display.
4. Connect the antenna cables to the I/O board [1].
5. Align the screw holes on the wireless-antenna bracket with the screw holes on the I/O board and replace the two screws (M2x4) that secure the bracket to the I/O board [2].
6. Connect the display cable to the system board and close the latch [3].
7. Align the screw holes on the display-cable bracket with the screw holes on the system board and replace the two screws (M1.6x1.8) that secure the bracket to the system board [4].
8. Affix the tape that secures the display-cable bracket to the system board [5].
9. Affix the camera cable to the palm-rest and keyboard assembly [6].
10. Connect the camera cable to the system board and close the latch [7].



11. Install the [heat sink](#).
12. Install the [I/O-board interposers](#).
13. install the [base cover](#).
14. Follow the procedure in [After working inside your computer](#).

System board

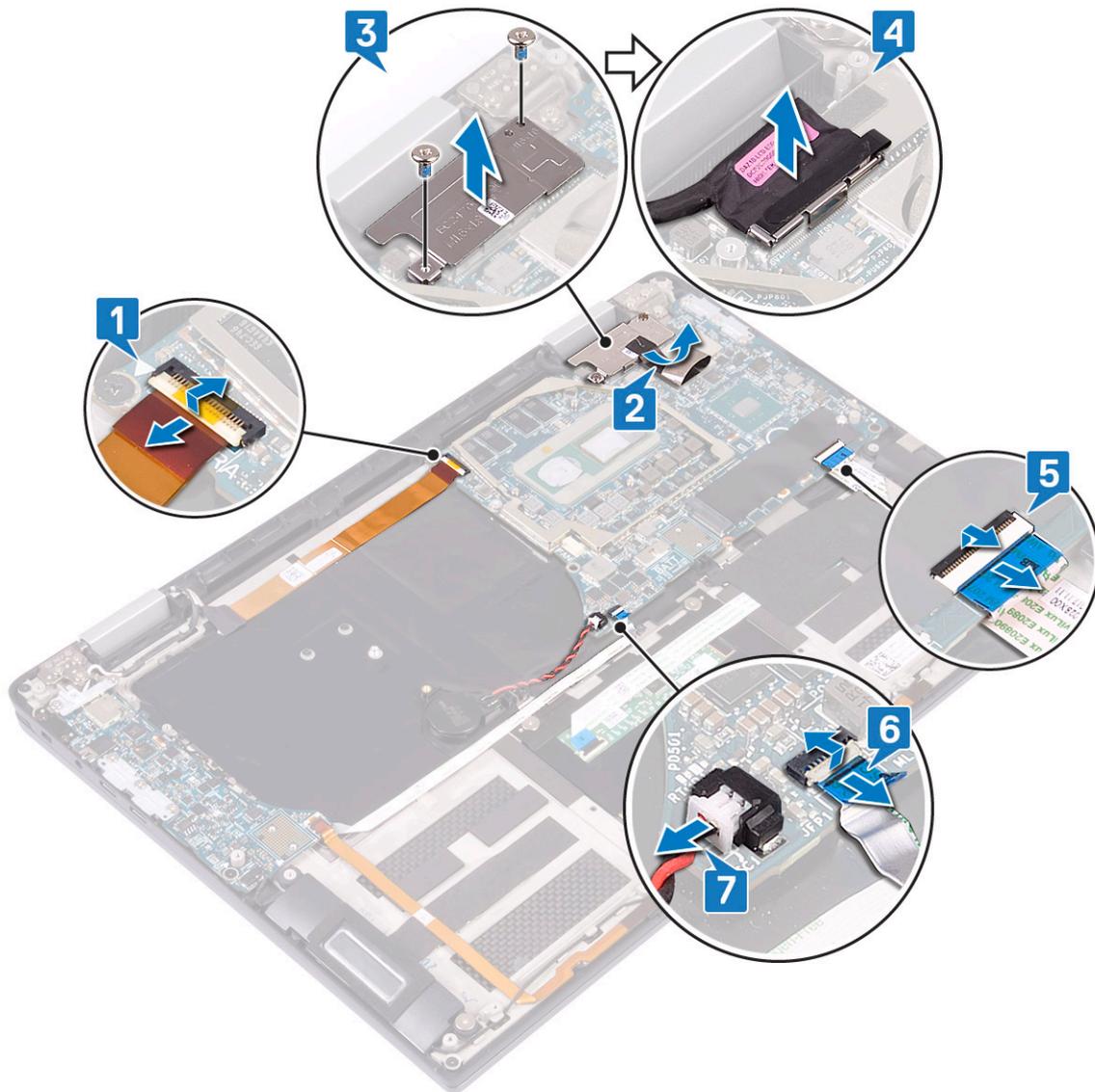
Removing the system board

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [solid state drive](#).
4. Remove the [I/O-board interposers](#).
5. Remove the [battery](#).
6. Remove the [heat sink](#).
7. Remove the [system fans](#).
8. To remove the system board:
 - a) Open the latch and disconnect the camera cable from the system board [1].

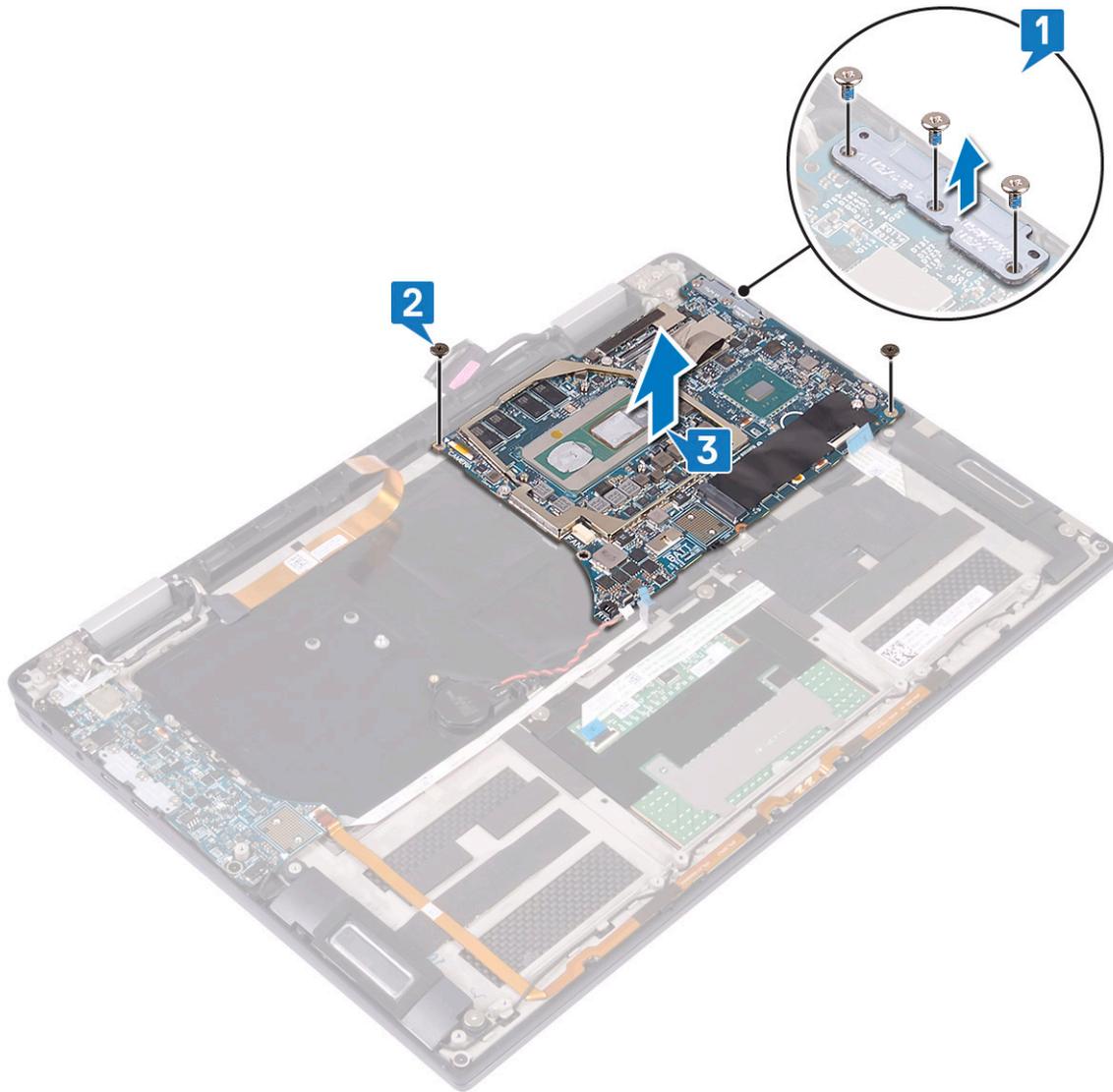
- b) Peel the tape that secures the display-cable bracket to the system board [2].
- c) Remove the two screws (M1.6x1.8) that secure the display-cable bracket to the system board and lift the bracket off the system board [3].
- d) Using the pull tab, disconnect the display cable from the system board [4].
- e) Open the latch and disconnect the keyboard-back light cable from the system board [5].
- f) Open the latch and disconnect the fingerprint-reader cable from the system board [6].

NOTE: 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.

- g) Disconnect the coin-cell battery cable from the system board [7].

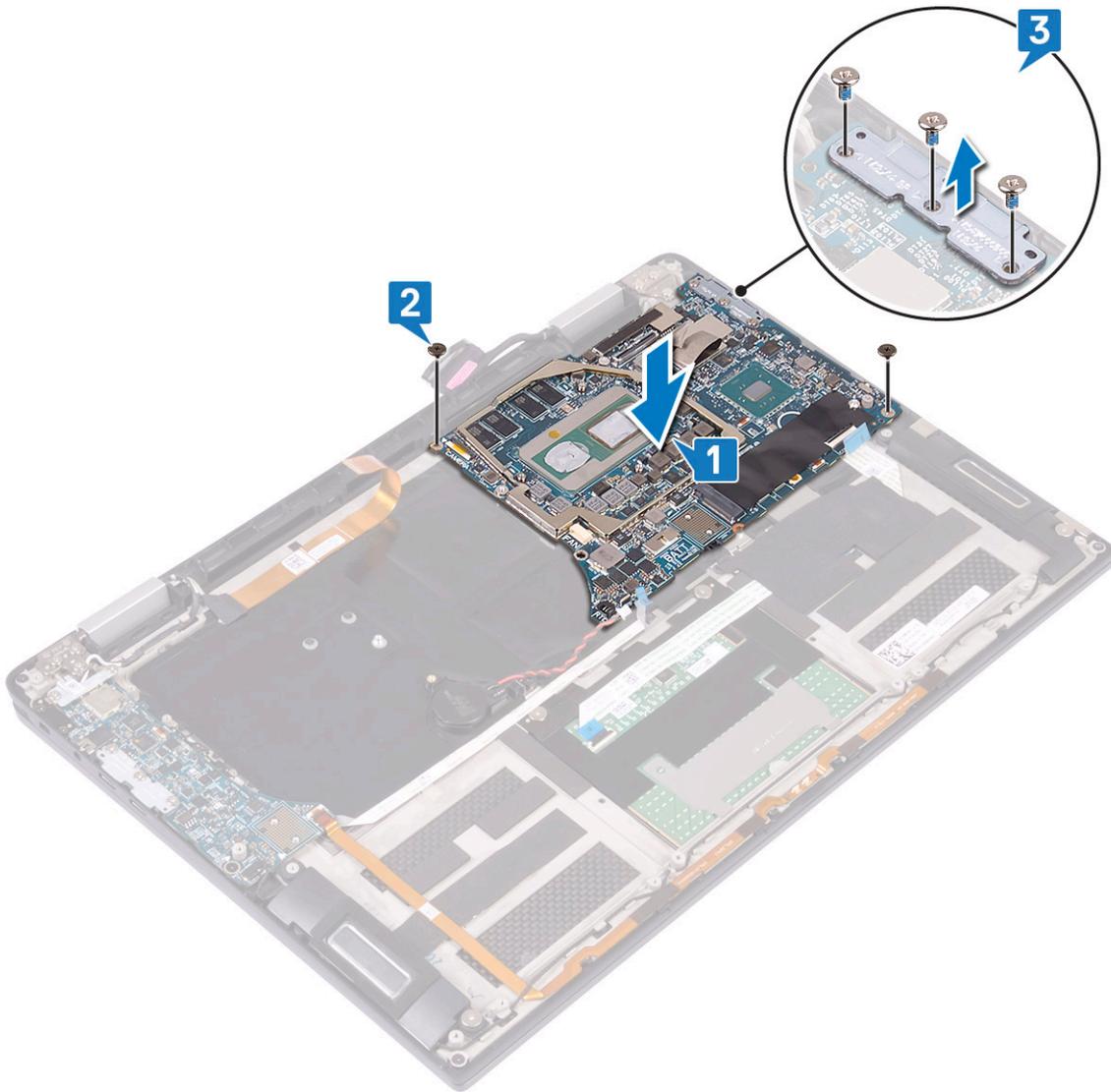


- h) Remove the three screws (M2x4) that secure the Type-C USB bracket to system board and lift the bracket off the system board [1].
- i) Remove the two screws (M2x3) that secure the system board to the palm-rest and keyboard assembly [2].
- j) Lift the system board off the palm-rest assembly [3].

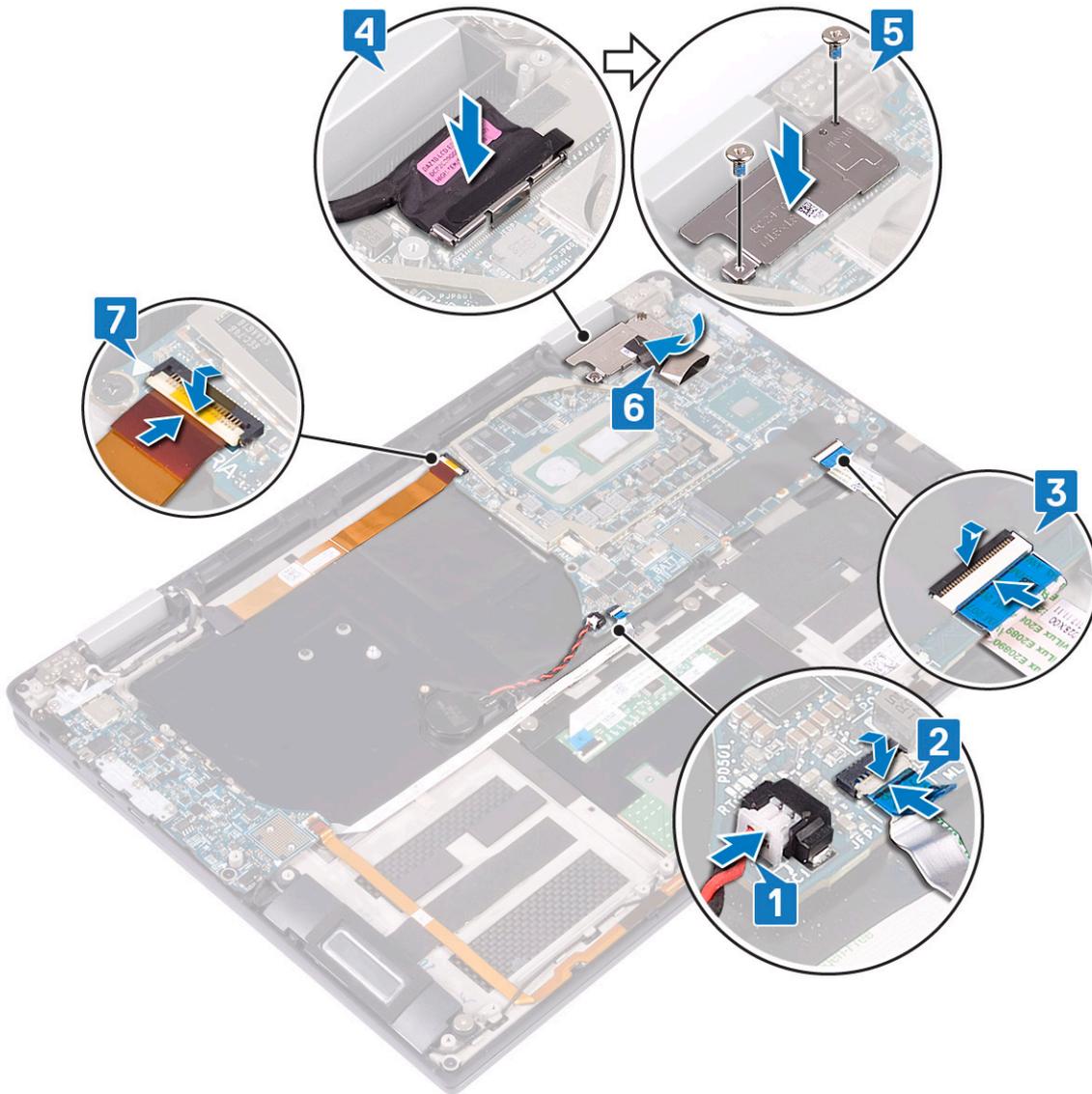


Installing the system board

1. Using the alignment posts, place the system board on the palm-rest and keyboard assembly and align the screw holes on the system board with the screw holes on the palm-rest assembly [1].
2. Replace the two screws (M2x3) that secure the system board to the palm-rest and keyboard assembly [2].
3. Align the screw holes on the Type-C USB bracket with the screw holes on the system board and replace the three screws (M2x4) that secure the Type-C USB bracket to system board [3].



4. Connect the coin-cell battery cable to the system board [1].
5. Connect the fingerprint-reader cable to the system board and close the latch [2].
6. Connect the keyboard-back light cable to the system board and close the latch [3].
7. Connect the display cable to the system board [4].
8. Place the display-cable bracket on the system board and replace the two screws (M1.6x1.8) that secure the bracket to the system board [5].
9. Affix the tape that secures the display-cable bracket to the system board [6].
10. Connect the camera cable to the system board and close the latch [7].



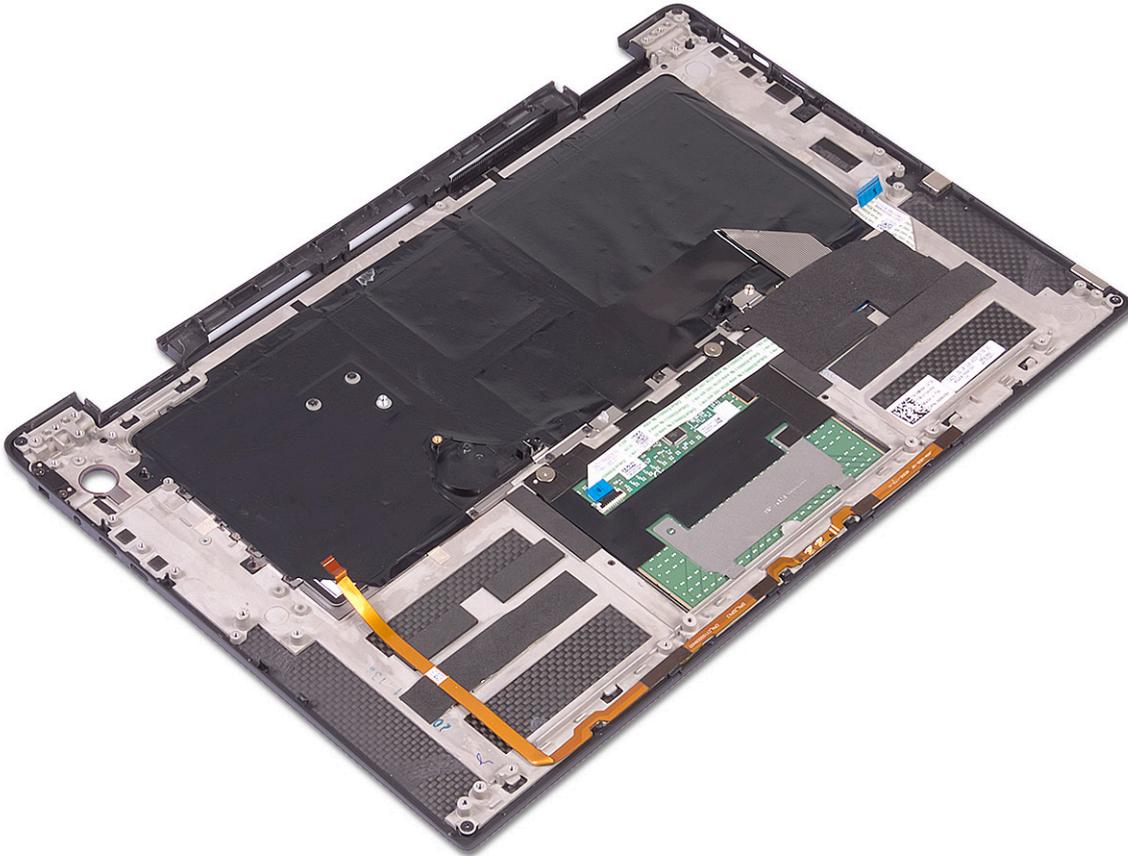
11. Install the [system fans](#).
12. Install the [heat sink](#).
13. Install the [battery](#).
14. Install the [I/O-board interposers](#).
15. Install the [solid state drive](#).
16. install the [base cover](#).
17. Follow the procedure in [After working inside your computer](#).

Palm-rest and keyboard assembly

Removing the palmrest and keyboard assembly

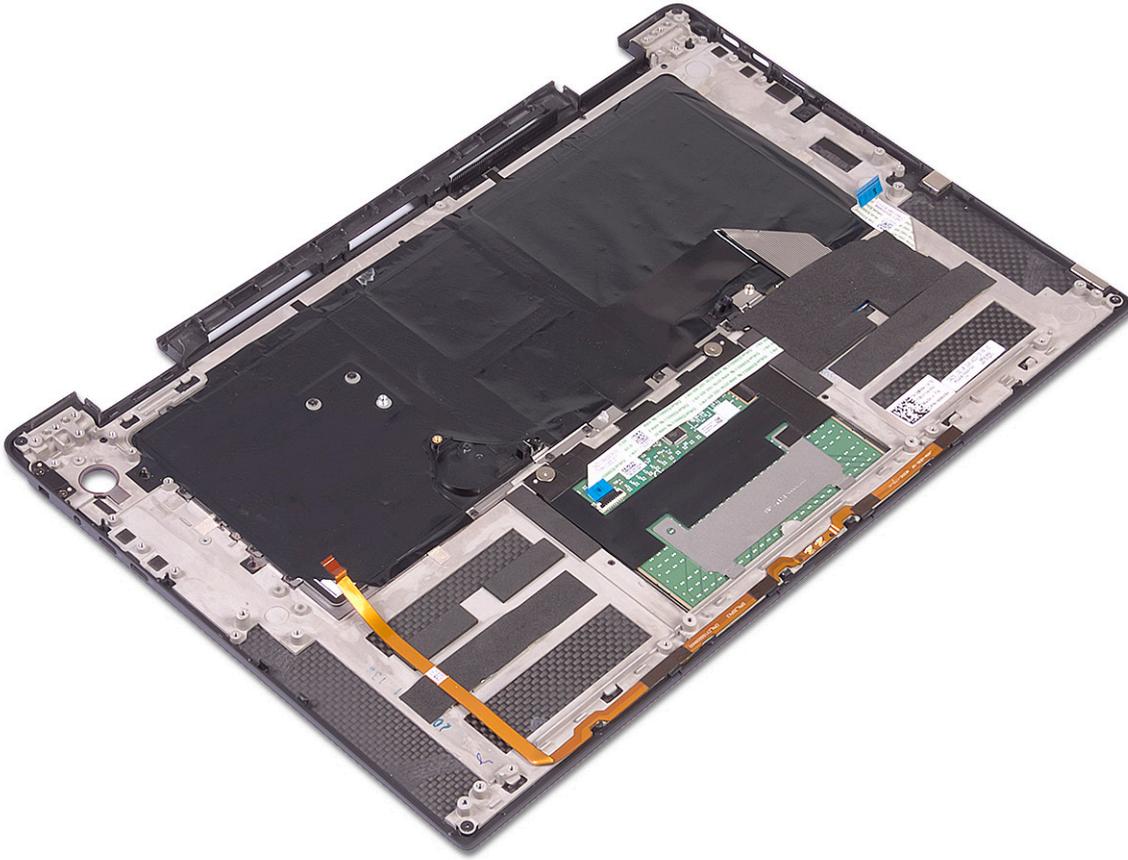
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [solid state drive](#).
4. Remove the [I/O-board interposers](#).
5. Remove the [battery](#).
6. Remove the [heat sink](#).

7. Remove the [system fans](#).
8. Remove the [speakers](#).
9. Remove the [coin cell battery](#).
10. Remove the [display assembly](#).
11. Remove the [I/O board](#).
12. Remove the [power button with fingerprint reader](#).
13. Remove the [system board](#).
14. The component you are left with is the palmrest and the keyboard assembly.



Installing the palm-rest and keyboard assembly

1. Place the palm-rest and keyboard assembly face down on a clean and flat surface.



2. Install the [system board](#).
3. Install the [power button with fingerprint reader](#).
4. Install the [I/O board](#).
5. Install the [display assembly](#).
6. Install the [coin cell battery](#).
7. install the [speakers](#).
8. Install the [system fans](#).
9. Install the [heat sink](#).
10. Install the [battery](#).
11. Install the [I/O-board interposers](#).
12. Install the [solid state drive](#).
13. install the [base cover](#).
14. Follow the procedure in [After working inside your computer](#).

Troubleshooting

Enhanced Pre-Boot System Assessment — ePSA diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA 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.

Running the ePSA Diagnostics

Invoke diagnostics boot by either of the methods that are suggested below:

1. Power on the computer.
2. As the computer boots, press the F12 key when the Dell logo is displayed.
3. In the boot menu screen, use Up/Down arrow key to select the **Diagnostics** option and then press **Enter**.

NOTE: The Enhanced Pre-boot System Assessment window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.

4. Press the arrow in the lower-right corner to go to the page listing. The detected items are listed and tested.
 5. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
 6. Select the device from the left pane and click **Run Tests**.
 7. If there are any issues, error codes are displayed. Note the error code and contact Dell.
- or
8. Shut down the computer.
 9. Press and hold the Fn key, while pressing the power button, and then release both.
 10. Repeat steps 3–7 above.

System diagnostic lights

Power and 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.

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

Off

- Power adapter is connected and the battery is fully charged.
- Computer is running on battery and the battery has more than 5 percent charge.

- Computer is in sleep state, hibernation, or turned off.

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

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

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

Table 3. Diagnostics

Light pattern	Problem description
2,1	CPU failure
2,2	System board: BIOS and ROM failure
2,3	No memory or RAM detected
2,4	Memory or RAM failure
2,5	Invalid memory installed
2,6	System board or chipset error
2,7	LCD failure
3,1	CMOS battery failure
3,2	PCI or video card or chip failure
3,3	Recovery image not found
3,4	Recovery image found but invalid

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.

Diagnostic error messages

Table 4. Diagnostic error messages

Error messages	Description
AUXILIARY DEVICE FAILURE	The touchpad or external mouse may be faulty. For an external mouse, check the cable connection. Enable the Pointing Device option in the System Setup program.
BAD COMMAND OR FILE NAME	Ensure that you have spelled the command correctly, put spaces in the proper place, and used the correct path name.
CACHE DISABLED DUE TO FAILURE	The primary cache internal to the microprocessor has failed. Contact Dell
CD DRIVE CONTROLLER FAILURE	The optical drive does not respond to commands from the computer.
DATA ERROR	The hard drive cannot read the data.
DECREASING AVAILABLE MEMORY	One or more memory modules may be faulty or improperly seated. Reinstall the memory modules or, if necessary, replace them.
DISK C: FAILED INITIALIZATION	The hard drive failed initialization. Run the hard drive tests in Dell Diagnostics .
DRIVE NOT READY	The operation requires a hard drive in the bay before it can continue. Install a hard drive in the hard drive bay.

Error messages	Description
ERROR READING PCMCIA CARD	The computer cannot identify the ExpressCard. Reinsert the card or try another card.
EXTENDED MEMORY SIZE HAS CHANGED	The amount of memory recorded in non-volatile memory (NVRAM) does not match the memory module installed in the computer. Restart the computer. If the error appears again, Contact Dell
THE FILE BEING COPIED IS TOO LARGE FOR THE DESTINATION DRIVE	The file that you are trying to copy is too large to fit on the disk, or the disk is full. Try copying the file to a different disk or use a larger capacity disk.
A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > -	Do not use these characters in filenames.
GATE A20 FAILURE	A memory module may be loose. Reinstall the memory module or, if necessary, replace it.
GENERAL FAILURE	The operating system is unable to carry out the command. The message is usually followed by specific information. For example, <i>Printer out of paper</i> . Take the appropriate action.
HARD-DISK DRIVE CONFIGURATION ERROR	The computer cannot identify the drive type. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE CONTROLLER FAILURE 0	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE FAILURE	The hard drive does not respond to commands from the computer. Shut down the computer, remove the hard drive, and boot the computer from an optical drive. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
HARD-DISK DRIVE READ FAILURE	The hard drive may be defective. Shut down the computer, remove the hard drive, and boot the computer from an optical. Then, shut down the computer, reinstall the hard drive, and restart the computer. If the problem persists, try another drive. Run the Hard Disk Drive tests in Dell Diagnostics .
INSERT BOOTABLE MEDIA	The operating system is trying to boot to non-bootable media, such as an optical drive. Insert bootable media.
INVALID CONFIGURATION INFORMATION-PLEASE RUN SYSTEM SETUP PROGRAM	The system configuration information does not match the hardware configuration. The message is most likely to occur after a memory module is installed. Correct the appropriate options in the system setup program.
KEYBOARD CLOCK LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD CONTROLLER FAILURE	For external keyboards, check the cable connection. Restart the computer, and avoid touching the keyboard or the mouse during the boot routine. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD DATA LINE FAILURE	For external keyboards, check the cable connection. Run the Keyboard Controller test in Dell Diagnostics .
KEYBOARD STUCK KEY FAILURE	For external keyboards or keypads, check the cable connection. Restart the computer, and avoid touching the keyboard or keys

Error messages

	Description
LICENSED CONTENT IS NOT ACCESSIBLE IN MEDIADIRECT	during the boot routine. Run the Stuck Key test in Dell Diagnostics .
MEMORY ADDRESS LINE FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	Dell MediaDirect cannot verify the Digital Rights Management (DRM) restrictions on the file, so the file cannot be played.
MEMORY ALLOCATION ERROR	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY DOUBLE WORD LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	The software you are attempting to run is conflicting with the operating system, another program, or a utility. Shut down the computer, wait for 30 seconds, and then restart it. Run the program again. If the error message still appears, see the software documentation.
MEMORY ODD/EVEN LOGIC FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
MEMORY WRITE/READ FAILURE AT ADDRESS, READ VALUE EXPECTING VALUE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT DEVICE AVAILABLE	A memory module may be faulty or improperly seated. Reinstall the memory module or, if necessary, replace it.
NO BOOT SECTOR ON HARD DRIVE	The computer cannot find the hard drive. If the hard drive is your boot device, ensure that the drive is installed, properly seated, and partitioned as a boot device.
NO TIMER TICK INTERRUPT	The operating system may be corrupted, Contact Dell .
NOT ENOUGH MEMORY OR RESOURCES. EXIT SOME PROGRAMS AND TRY AGAIN	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
OPERATING SYSTEM NOT FOUND	You have too many programs open. Close all windows and open the program that you want to use.
OPTIONAL ROM BAD CHECKSUM SECTOR NOT FOUND	Reinstall the operating system. If the problem persists, Contact Dell .
SEEK ERROR	The optional ROM has failed. Contact Dell .
SHUTDOWN FAILURE	The operating system cannot locate a sector on the hard drive. You may have a defective sector or corrupted File Allocation Table (FAT) on the hard drive. Run the Windows error-checking utility to check the file structure on the hard drive. See Windows Help and Support for instructions (click Start > Help and Support). If a large number of sectors are defective, back up the data (if possible), and then format the hard drive.
TIME-OF-DAY CLOCK LOST POWER	The operating system cannot find a specific track on the hard drive.
TIME-OF-DAY CLOCK STOPPED	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics . If the message reappears, Contact Dell .
TIME-OF-DAY NOT SET-PLEASE RUN THE SYSTEM SETUP PROGRAM	System configuration settings are corrupted. Connect your computer to an electrical outlet to charge the battery. If the problem persists, try to restore the data by entering the System Setup program, then immediately exit the program. If the message reappears, Contact Dell .
	The reserve battery that supports the system configuration settings may require recharging. Connect your computer to an electrical outlet to charge the battery. If the problem persists, Contact Dell .
	The time or date stored in the system setup program does not match the system clock. Correct the settings for the Date and Time options.

Error messages	Description
TIMER CHIP COUNTER 2 FAILED	A chip on the system board may be malfunctioning. Run the System Set tests in Dell Diagnostics .
UNEXPECTED INTERRUPT IN PROTECTED MODE	The keyboard controller may be malfunctioning, or a memory module may be loose. Run the System Memory tests and the Keyboard Controller test in Dell Diagnostics or Contact Dell .
X:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY	Insert a disk into the drive and try again.

System error messages

Table 5. System error messages

System message	Description
Alert! Previous attempts at booting this system have failed at checkpoint [nnnn]. For help in resolving this problem, please note this checkpoint and contact Dell Technical Support	The computer failed to complete the boot routine three consecutive times for the same error.
CMOS checksum error	RTC is reset, BIOS Setup default has been loaded.
CPU fan failure	CPU fan has failed.
System fan failure	System fan has failed.
Hard-disk drive failure	Possible hard disk drive failure during POST.
Keyboard failure	Keyboard failure or loose cable. If reseating the cable does not solve the problem, replace the keyboard.
No boot device available	No bootable partition on hard disk drive, the hard disk drive cable is loose, or no bootable device exists. <ul style="list-style-type: none"> If the hard drive is your boot device, ensure that the cables are connected and that the drive is installed properly and partitioned as a boot device. Enter system setup and ensure that the boot sequence information is correct.
No timer tick interrupt	A chip on the system board might be malfunctioning or motherboard failure.
NOTICE - Hard Drive SELF MONITORING SYSTEM has reported that a parameter has exceeded its normal operating range. Dell recommends that you back up your data regularly. A parameter out of range may or may not indicate a potential hard drive problem	S.M.A.R.T error, possible hard disk drive failure.

Real Time Clock reset

The Real Time Clock (RTC) reset function allows you to recover your Dell system from **No POST/No Boot/No Power** situations. To initiate the RTC reset on the system make sure system is in a power-off state and is connected to power source . Press and hold the power button for 25 seconds and then release the power button. Go to [how to reset real time clock](#).

NOTE: If AC power is disconnected from the system during the process or the power button is held longer than 40 seconds, the RTC reset process is aborted.

The RTC reset will reset the BIOS to Defaults, un-provision Intel vPro and reset the system date and time. The following items are unaffected by the RTC reset:

- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password

- System Password
- HDD Password
- TPM on and Active
- Key Databases
- System Logs

The following items may or may not reset based on your custom BIOS setting selections:

- The Boot List
- Enable Legacy OROMs
- Secure Boot Enable
- Allow BIOS Downgrade

Flashing the BIOS

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

Follow these steps to flash the BIOS:

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support**, enter the Service Tag of your computer, and then click **Submit**.

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

4. Click **Drivers & downloads > Find it myself**.
5. Select the operating system installed on your computer.
6. Scroll down the page and expand **BIOS**.
7. Click **Download** to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon and follow the instructions on the screen.

Flashing the BIOS from the F12 One-Time boot menu

Updating your system BIOS using a BIOS update .exe file copied to a FAT32 USB key and booting from the F12 one time boot menu.

BIOS Update

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

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

 **NOTE: Only systems with BIOS Flash Update option in the F12 One-Time Boot Menu can use this function.**

Updating from the One-Time Boot Menu

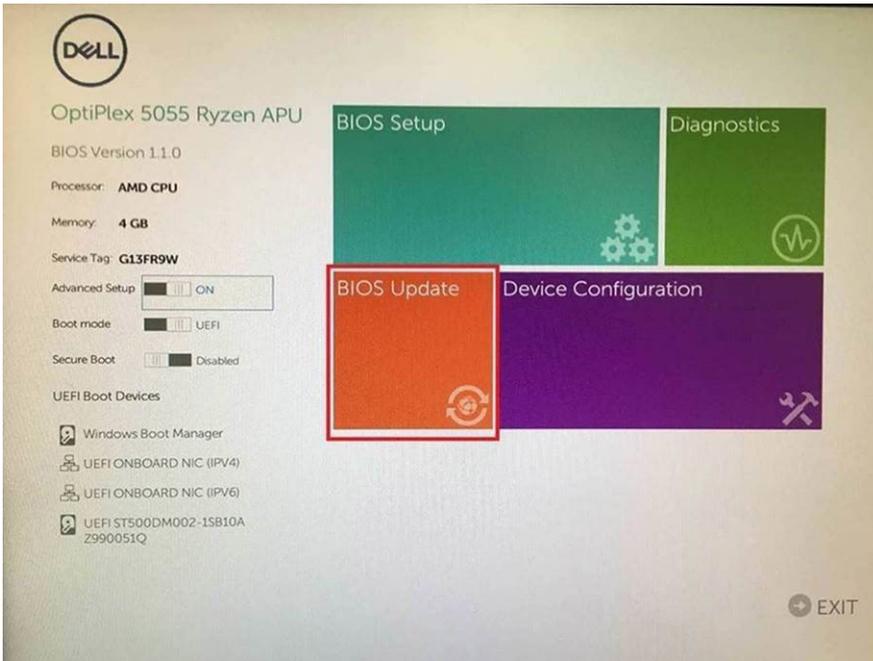
To update your BIOS from the F12 One-Time boot menu, you will need:

- USB key 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 key
- AC power adapter connected to the system
- Functional system battery to flash the BIOS

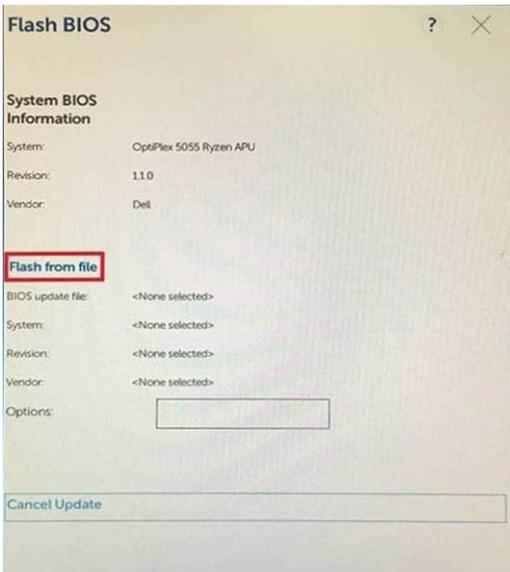
Perform the following steps to execute the BIOS update flash process from the F12 menu:

 **CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.**

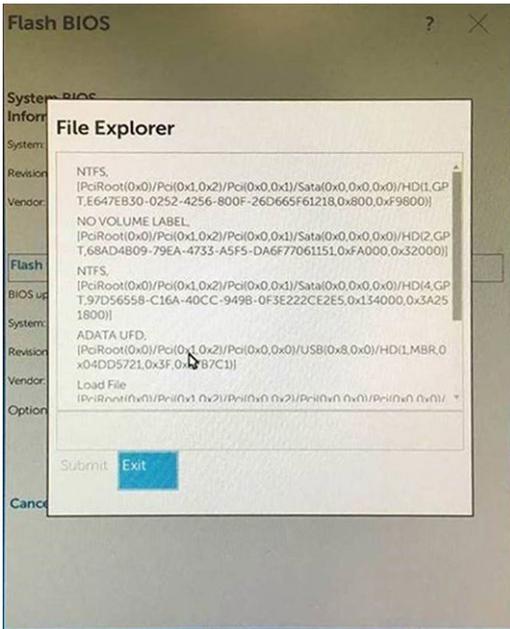
1. From a power off state, insert the USB key where you copied the flash into a USB port of the system .
2. Power on the system and press the F12 key to access the One-Time Boot Menu, Highlight BIOS Update using the mouse or arrow keys then press **Enter**.



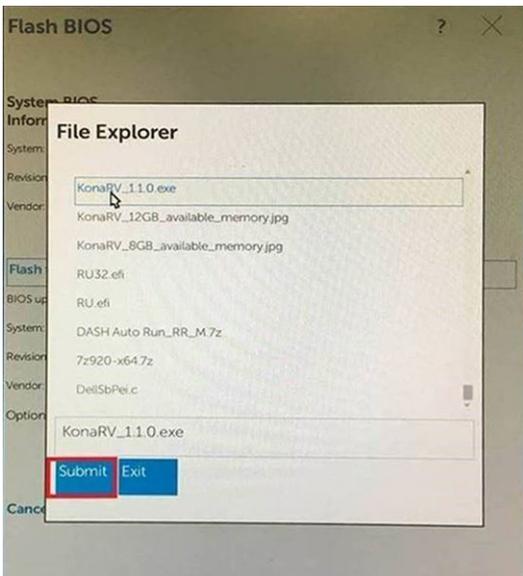
3. The Bios flash menu will open then click the **Flash from file**.



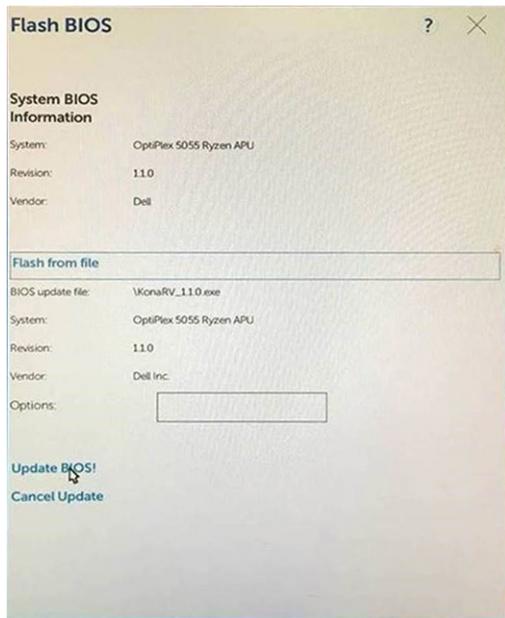
4. Select external USB device



5. Once the file is selected, Double click the flash target file, then press submit .



6. Click the **Update BIOS** then system will reboot to flash the BIOS.



7. Once complete, the system will reboot and the BIOS update process is completed.

Flashing BIOS (USB key)

1. Follow the procedure from step 1 to step 7 in "Flashing the BIOS" to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information see the knowledge base article [SLN143196](https://www.dell.com/support) at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
8. The **BIOS Update Utility** appears. Follow the instructions on the screen to complete the BIOS update.

Wi-Fi power cycle

If your computer is unable to access the Internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi 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.

Flea power release

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

1. Turn off your computer.
2. Remove the [base cover](#).
3. Press and hold the power button for 15 seconds to drain the flea power.

4. Replace the [base cover](#).
5. Turn on your computer.

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.