# Inspiron 7586

## Service Manual

Regulatory Model: P76F
Regulatory Type: P76F001

## 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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1

# Before working inside your computer

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

## Before you begin

1 Save and close all open files and exit all open applications.

2 Shut down your computer. Click **Start** > **Power** > **Shut down**.

**NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.**

3 Disconnect your computer and all attached devices from their electrical outlets.

4 Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.

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

2

# 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.

# 3

# Safety instructions

Use the following safety guidelines to protect your computer from potential damage and ensure your personal safety.

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

**WARNING: 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 electrical outlet.**

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

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

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

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

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

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

# Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.

- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

# ESD field service kit

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

# Components of an ESD field service kit

The components of an ESD field service kit are:

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

# ESD protection summary

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

# Transporting sensitive components

When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

# Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

**CAUTION: Do not lift greater than 50 pounds. Always obtain additional resources or use a mechanical lifting device.**

1 Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2 Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
3 Lift with your legs, not your back.
4 Keep the load close. The closer it is to your spine, the less force it exerts on your back.
5 Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
6 Follow the same techniques in reverse to set the load down.

# 4

# Recommended tools

The procedures in this document may require the following tools:

- Philips screwdriver #1
- Flat-head screwdriver
- Plastic scribe

# 5

# Screw list

**Table 1. Screw list**

| Component | Secured to | Screw type | Quantity | Screw image |
|---|---|---|---|---|
| Base cover | Palm-rest assembly | M2x5 | 6 | |
| Battery | Palm-rest assembly | M2x3 | 5 | |
| Wireless-card bracket | System board | M2x3 | 1 | |
| Hard-drive assembly | Palm-rest assembly | M2x3 | 3 | |
| Solid-state drive | Palm-rest and keyboard assembly | M2x3 | 1 | |
| Touchpad-bracket | Palm-rest assembly | M2x3 | 3 | |
| Touchpad | Palm-rest assembly | M2x2 | 4 | |
| Fan | Palm-rest assembly | M2x3 | 2 | |
| Display hinges | Palm-rest assembly | M2.5x5 | 4 | |
| Power-adapter port | Palm-rest assembly | M2x3 | 1 | |
| I/O board | Palm-rest assembly | M2x3 | 1 | |
| Power button with fingerprint reader | Palm-rest assembly | M3x3 | 2 | |
| System board | Palm-rest assembly | M2x2 | 2 | |
| Keyboard bracket | Keyboard | M1.2x1.4 | 14 | |
| Keyboard | Palm-rest assembly | M1.2x1.4 | 14 | |
| Hinge brackets | Display back-cover and antenna assembly | M2.5x2.5 | 6 | |
| Hinge brackets | Display back-cover and antenna assembly | M2x3 | 2 | |

# Removing the base cover

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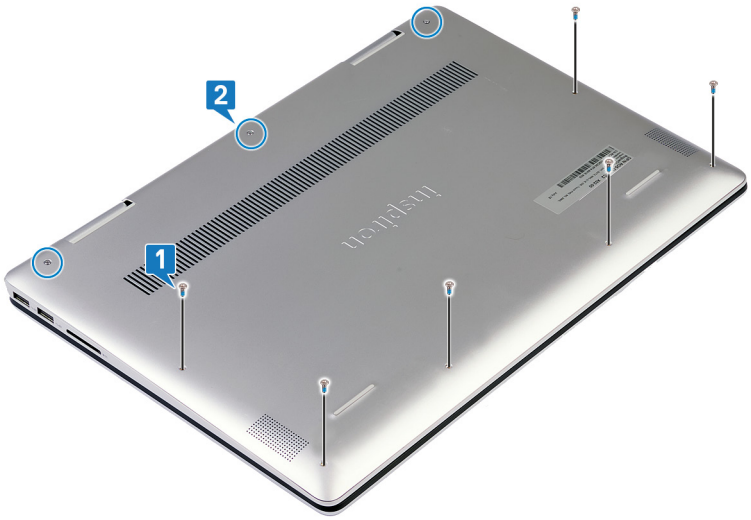
## Procedure

1 Remove the six screws (M2x5) that secure the base cover to the palm-rest assembly.

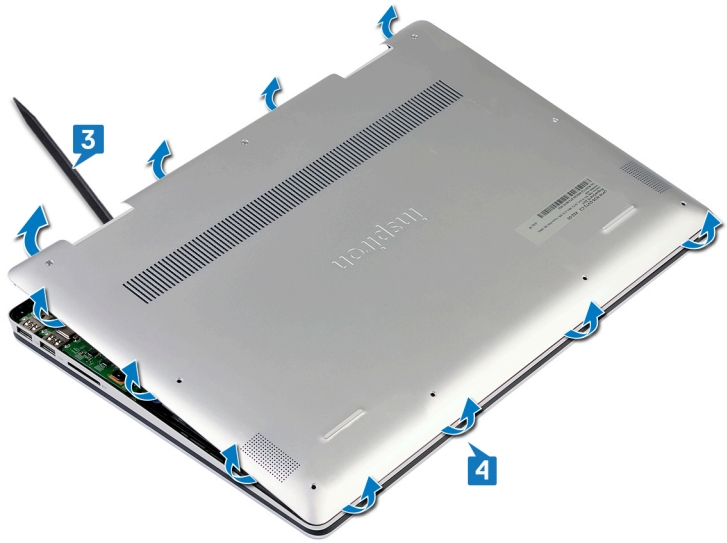
2 Loosen the three captive screws that secure the base cover to the palm-rest assembly.




3 Using a plastic scribe, pry the base cover from the tabs on the hinges and continue to pry the base cover from the slots on the palm-rest assembly.

**CAUTION: Do not pry the base cover from the middle as it might damage the chassis.**

4 Carefully remove the base cover off the palm-rest assembly.




**NOTE: The following step is applicable only if you want to further remove any other component from your computer.**

5 Disconnect the battery cable from the system board.

# 7

# Replacing the base cover

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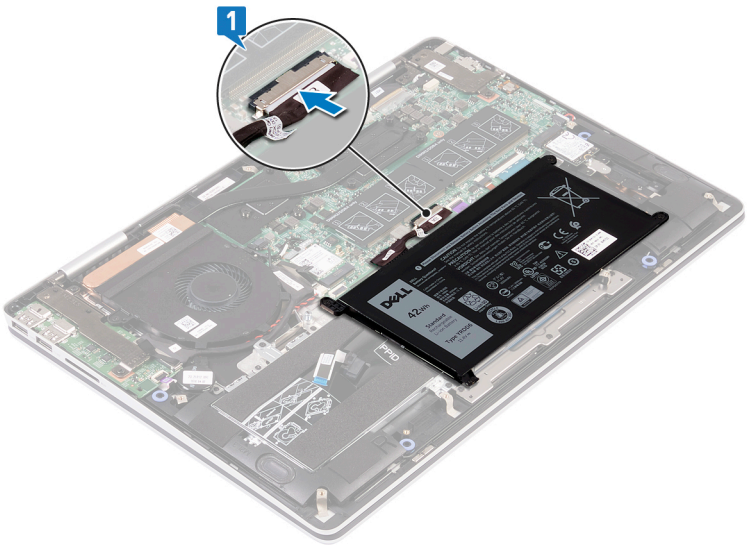
## Procedure

1 Connect the battery cable to the system board.

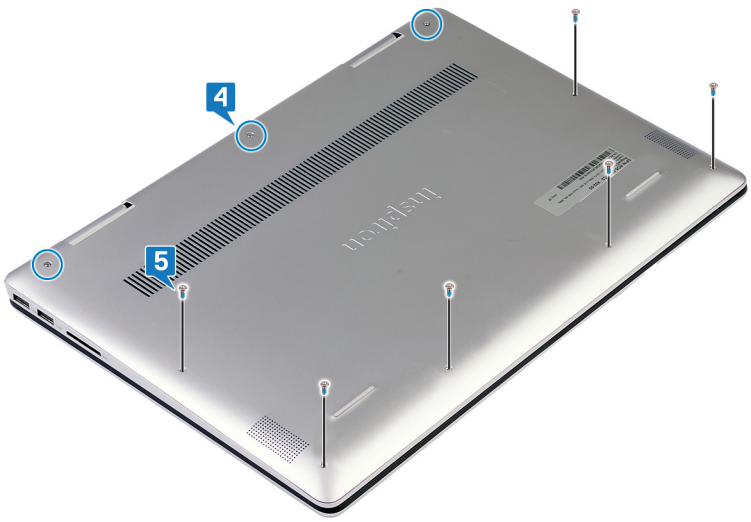



2 Align the tabs on the base cover with the slots on the palm-rest assembly.

3 Carefully snap the base cover onto the palm-rest assembly.

4 Tighten the three captive screws that secure the base cover to the palm-rest assembly.

5 Replace the six screws (M2x5) that secure the base cover to the palm-rest assembly.



# Removing the battery

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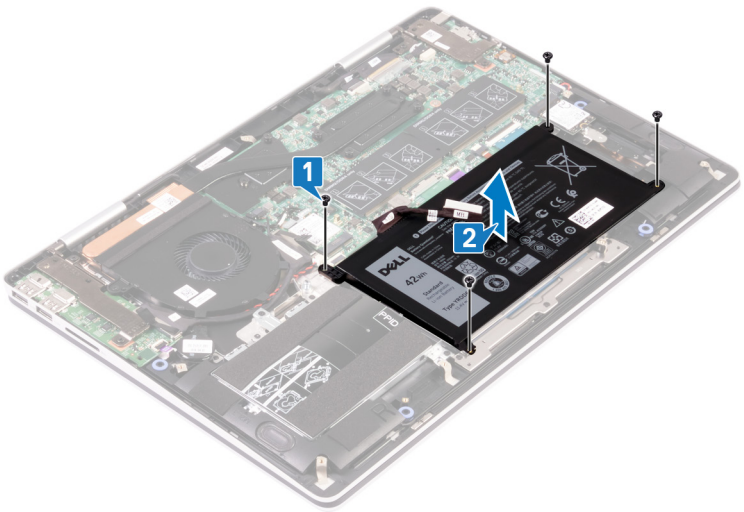
## Prerequisites

Remove the base cover.

## Procedure

1 Disconnect the battery cable from the system board (applicable only if not disconnected earlier).
2 Remove the four screws (M2x3) that secure the battery to the palm-rest assembly.
3 Lift the battery off the palm-rest assembly.




4 Turn the computer over, open the display, then press and hold the power button for five seconds to ground the system board.

# 9

# Replacing the battery

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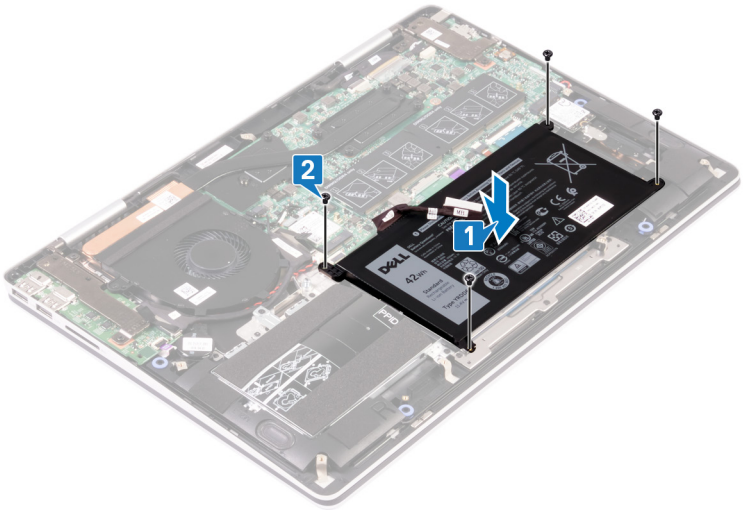
## Procedure

1 Using the alignment posts, place the battery on the palm-rest assembly.

2 Replace the four screws (M2x3) that secure the battery to the palm-rest assembly.




3 Connect the battery cable to the system board.

## Post-requisites

Replace the base cover.

# Removing the memory modules

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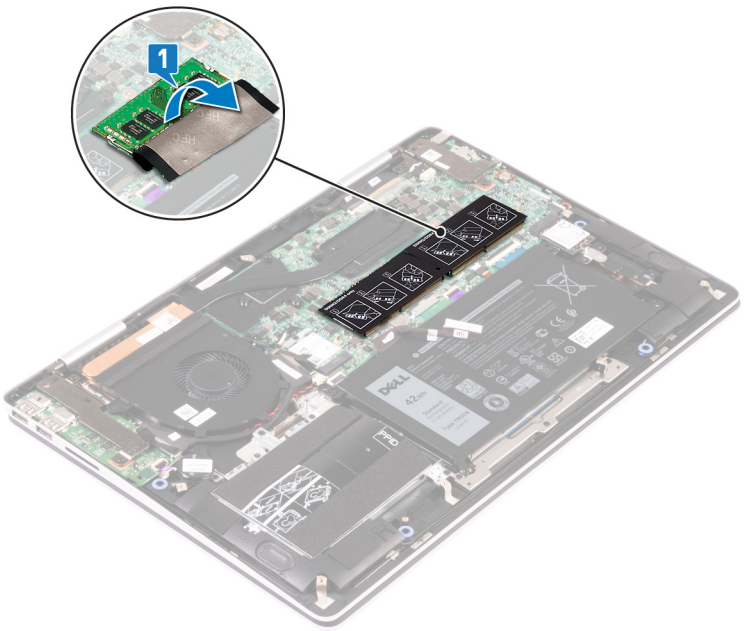
## Prerequisites

Remove the base cover.

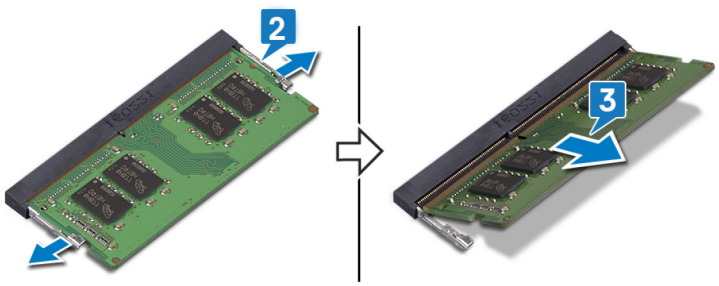
## Procedure

1 Lift the Mylar to access the memory module.




2 Use your fingertips to carefully spread apart the securing-clips on each end of the memory-module slot until the memory module pops up.

3 Slide and remove the memory module from the memory-module slot.



# Replacing the memory modules

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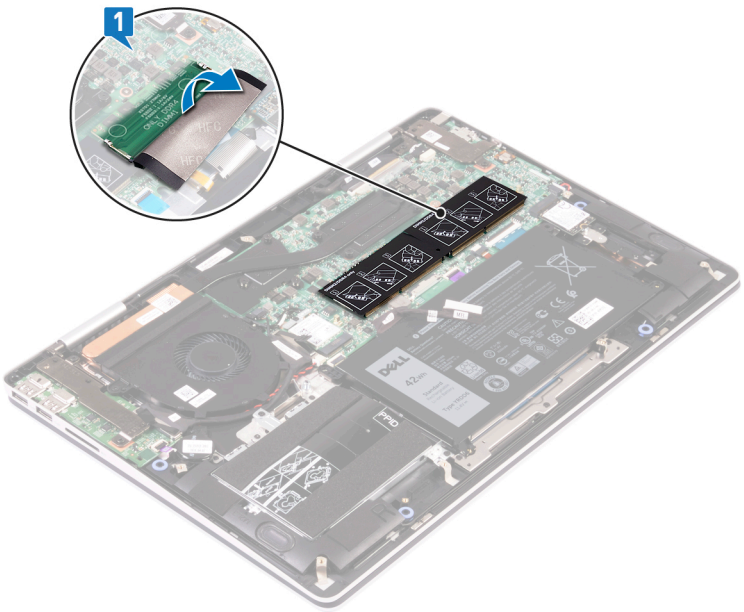
## Procedure

1 Lift the Mylar to access the memory-module slot.

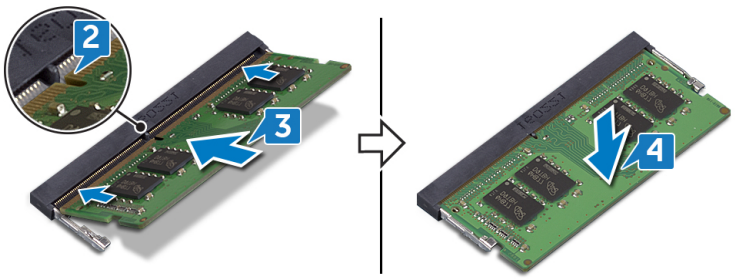



2 Align the notch on the memory module with the tab on the memory-module slot.

3 Slide the memory module firmly into the slot at an angle onto the memory-module slot.

4 Press the memory module down until it clicks into place.

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



# Post-requisites

Replace the base cover.

# Removing the coin-cell battery

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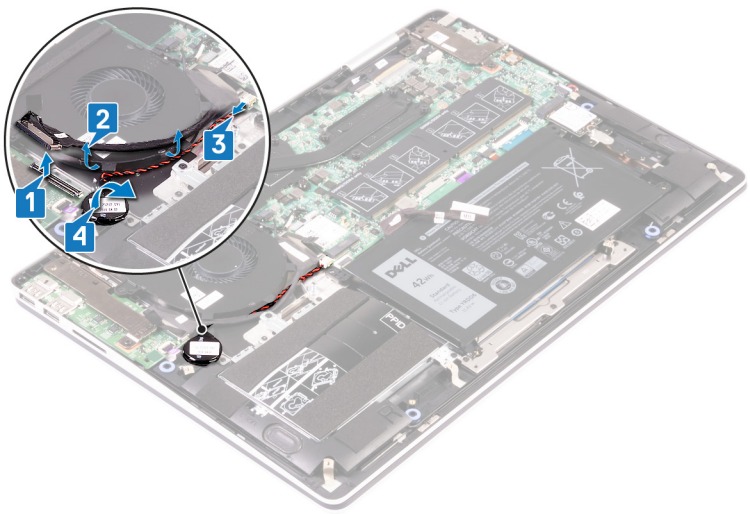
**CAUTION: Removing the coin-cell battery resets the BIOS setup program's settings to default. It is recommended that you note the BIOS setup program's settings before removing the coin-cell battery.**

## Prerequisites

Remove the base cover.

## Procedure

1 Disconnect the I/O-board cable from the I/O board.
2 Remove the I/O-board cable from the routing guides on the fan.
3 Disconnect the coin-cell battery cable from the system board.
4 Peel the coin-cell battery off the palm-rest assembly.



# Replacing the coin-cell battery

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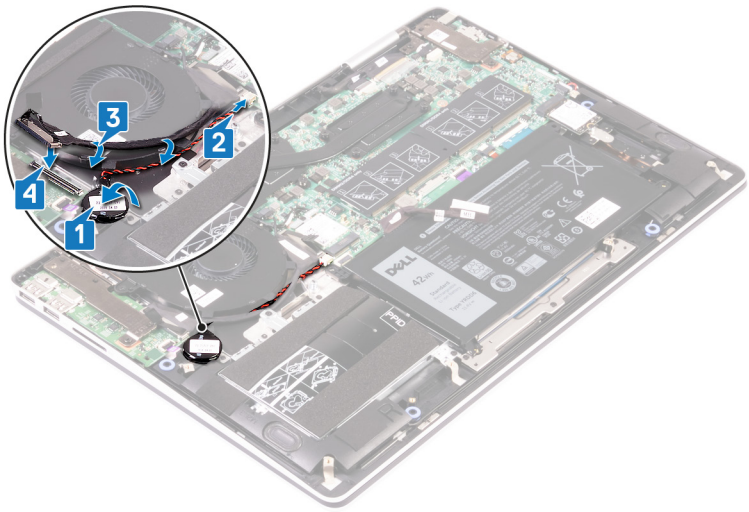
## Procedure

1 Adhere the coin-cell battery to the palm-rest assembly.
2 Connect the coin-cell battery cable to the system board.
3 Route the I/O-board cable through the routing guides on the fan.
4 Connect the I/O-board cable to the I/O board.




## Post-requisites

Replace the base cover.

# Removing the fan

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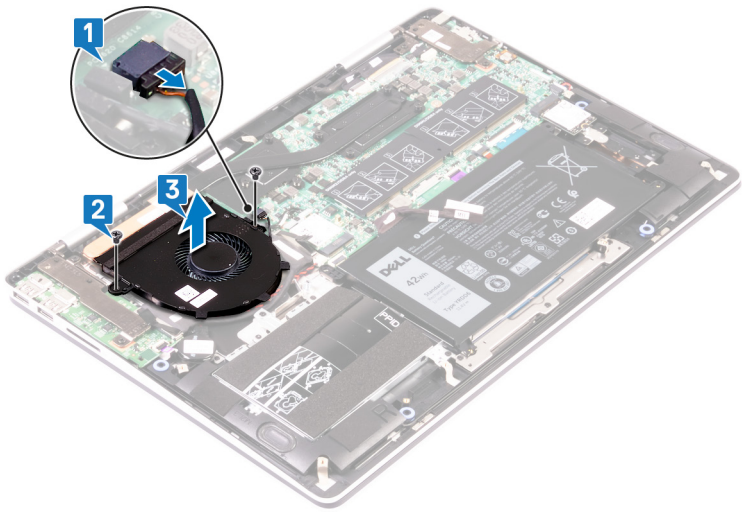
## Prerequisites

Remove the base cover.

## Procedure

1 Disconnect the fan cable from the system board.
2 Remove the two screws (M2x3) that secure the fan to the palm-rest assembly.
3 Lift the fan off the palm-rest assembly.

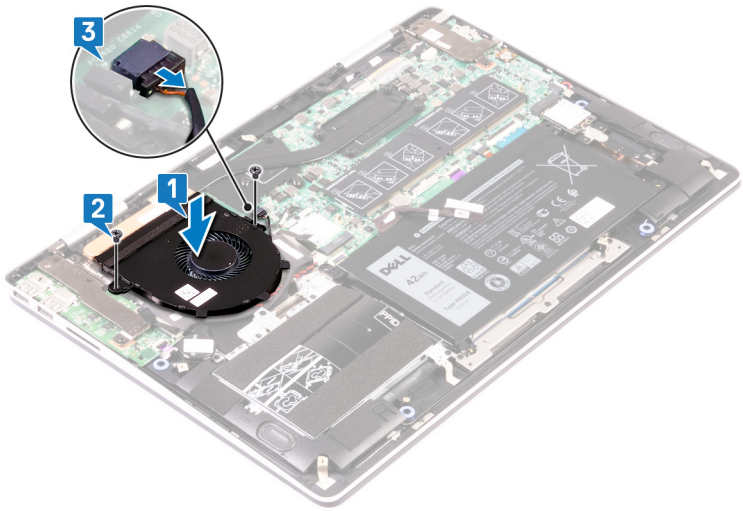


# Replacing the fan

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

## Procedure

1 Using the alignment posts, place the fan on the palm-rest assembly.
2 Replace the two screws (M2x3) that secure the fan to the palm-rest assembly.
3 Connect the fan cable to the system board.




## Post-requisites

Replace the base cover.

# Removing the heat sink

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

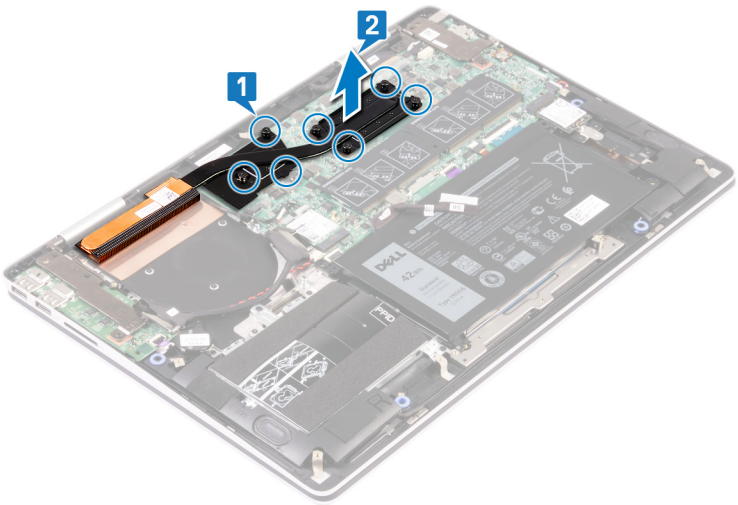
**CAUTION: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.**

## Prerequisites

1 Remove the base cover.
2 Remove the fan.

## Procedure

1 In reverse order (as indicated on the heat sink), loosen the seven captive screws that secure the heat sink to the system board.
2 Lift the heat sink off the system board.



# Replacing the heat sink

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

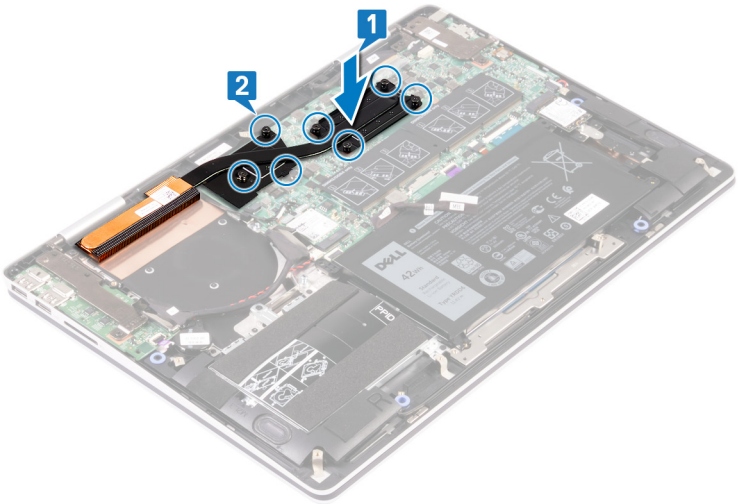
**CAUTION: Incorrect alignment of the heat sink can damage the system board and processor.**

**NOTE: If either the system board or the heat sink is replaced, use the thermal pad provided in the kit to ensure that thermal conductivity is achieved.**

## Procedure

1 Align 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.




## Post-requisites

1 Replace the fan.

2 Replace the base cover.

# Removing the hard drive

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

**CAUTION: Hard drives are fragile. Exercise care when handling the hard drive.**

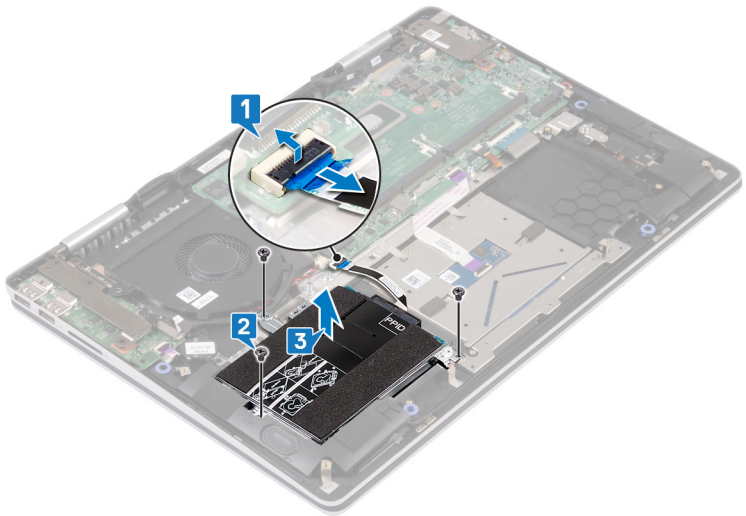
**CAUTION: To avoid data loss, do not remove the hard drive while the computer is in sleep or on state.**

## Prerequisites

1 Remove the base cover.
2 Remove the battery.

## Procedure

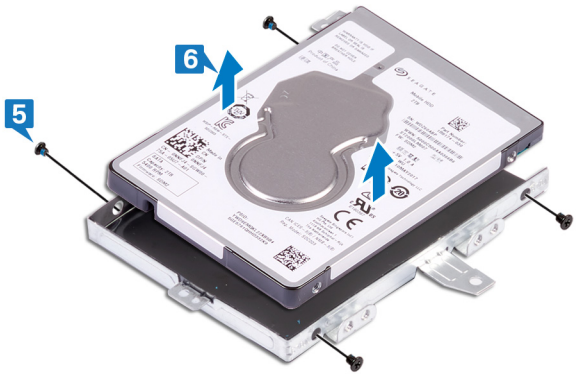
1 Open the latch and disconnect the hard-drive cable from the system board.
2 Remove the three screws (M2x3) that secure the hard-drive assembly to the palm-rest assembly.
3 Lift the hard-drive assembly, along with its cable, off the palm-rest assembly.




4 Disconnect the interposer from the hard-drive assembly.

5 Remove the four screws (M3x3) that secure the hard-drive bracket to the hard drive.

6 Lift the hard drive off the hard-drive bracket.



# Replacing the hard drive

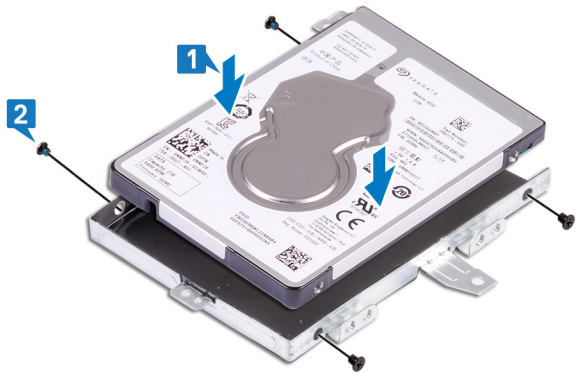
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

**CAUTION: Hard drives are fragile. Exercise care when handling the hard drive.**

## Procedure

1 Place the hard drive into the hard-drive bracket.

2 Align the screw holes on the hard-drive bracket with the screw holes on the hard drive, and then replace the four screws (M3x3) that secure the hard-drive bracket to the hard drive.

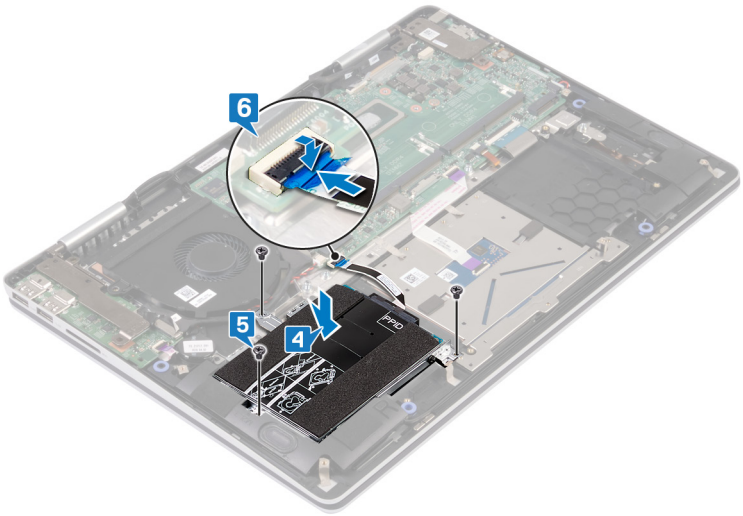



3 Connect the interposer to the hard-drive assembly.

4 Align the screw holes on the hard-drive assembly with the screw holes on the palm-rest assembly.

5 Replace the three screws (M2x3) that secure the hard-drive assembly to the palm-rest assembly.

6 Connect the hard-drive cable to the system board.




# Post-requisites

1 Replace the battery.
2 Replace the base cover.

# Removing the solid-state drive/Intel Optane memory module

You need to disable the Intel Optane memory before removing Intel Optane memory module from your computer. For more information about disabling the Intel Optane memory, see Disabling Intel Optane memory.

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

## Prerequisites

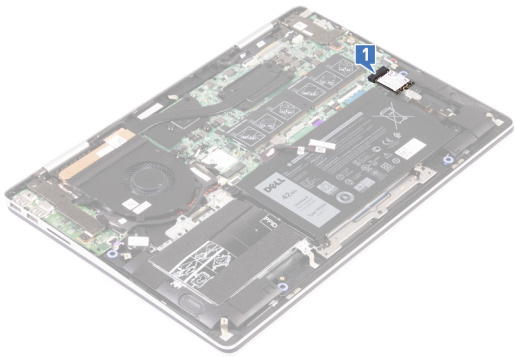
**You need to disable the Intel Optane memory before removing Intel Optane memory module from your computer. For more information about disabling the Intel Optane memory, see Disabling Intel Optane memory.**

Remove the base cover.

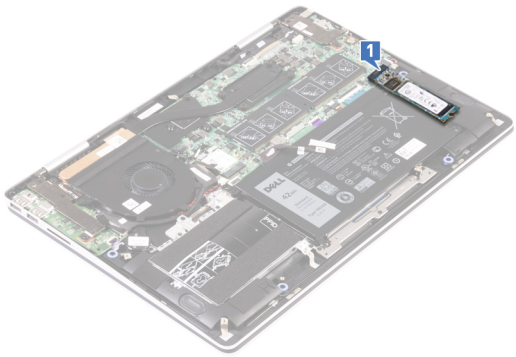
## Procedure

1 Locate the solid-state drive/Intel Optane memory module on the system board.

**M.2 2230**



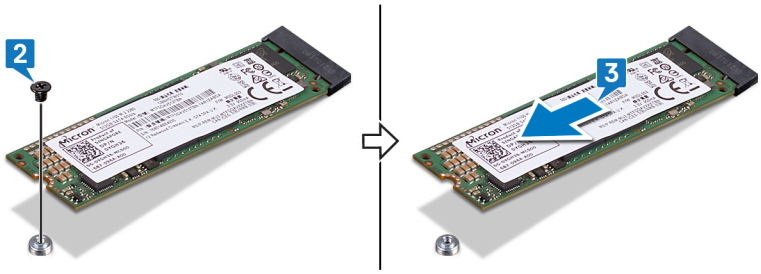

**M.2 2280**



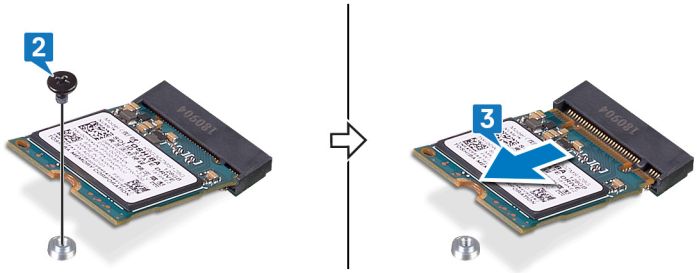

2 Remove the screw (M2x3) that secures the solid-state drive/Intel Optane memory module to the palm-rest assembly.

3 Slide and remove the solid-state drive/Intel Optane memory module from the solid-state drive slot.

M.2 2280




M.2 2230



# Replacing the solid-state drive/Intel Optane memory module

Enable the Intel Optane memory after you replace the Intel Optane memory module. For more information about enabling the Intel Optane memory, see Enabling Intel Optane memory.

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

**CAUTION: Solid-state drives are fragile. Exercise care when handling the solid-state drive.**

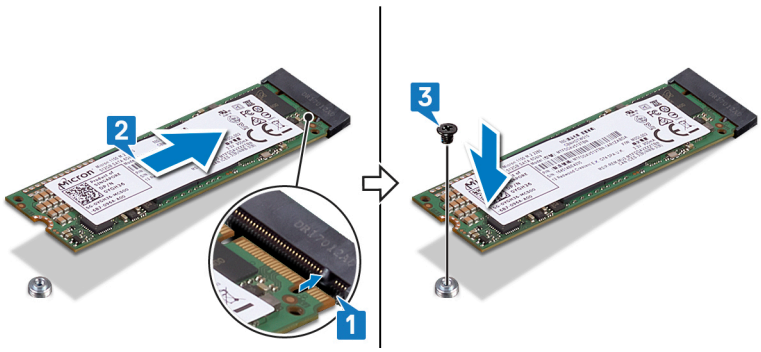
## Procedure

1 Align the notch on the solid-state drive/Intel Optane memory module with the tab on the solid-state drive slot.

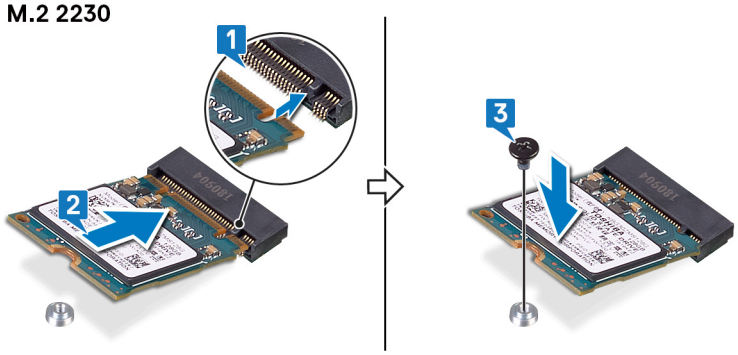
2 Slide the solid-state drive/Intel Optane memory module firmly into the solid-state drive slot at an angle.

3 Press the other end of the solid-state drive/Intel Optane memory module and replace the screw (M2x3) that secures the solid-state drive/Intel Optane memory module to the palm-rest assembly.

**M.2 2280**




**M.2 2230**




## Post-requisites

Replace the base cover.

**Enable the Intel Optane memory after you replace the Intel Optane memory module. For more information about enabling the Intel Optane memory, see Enabling Intel Optane memory.**

# Procedure to move the screw mount

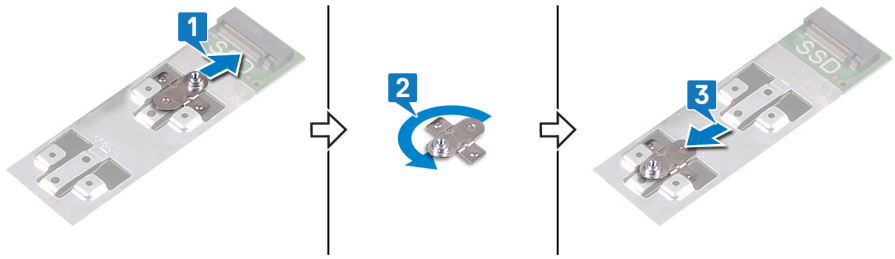
This computer supports two solid-state drive form factors:

- M.2 2230
- M.2 2280

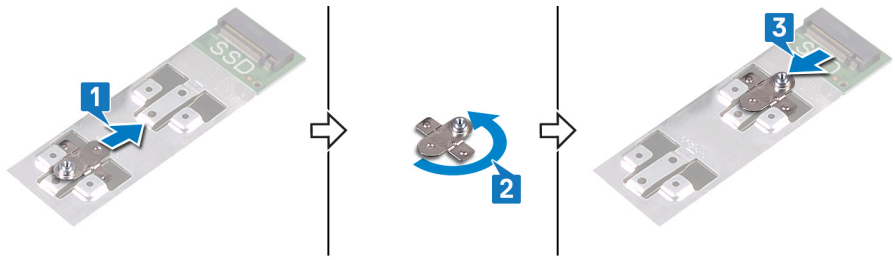
If you are replacing the solid-state drive of a different form factor other than the one removed, see the following procedure to move the location of the screw mount.

1 Remove the screw mount from the palm-rest and keyboard assembly.
2 Turn the screw mount to 180 degrees.
3 Insert the screw mount into the other screw mount slot on the palm-rest and keyboard assembly.

**M.2 2230 → M.2 2280**

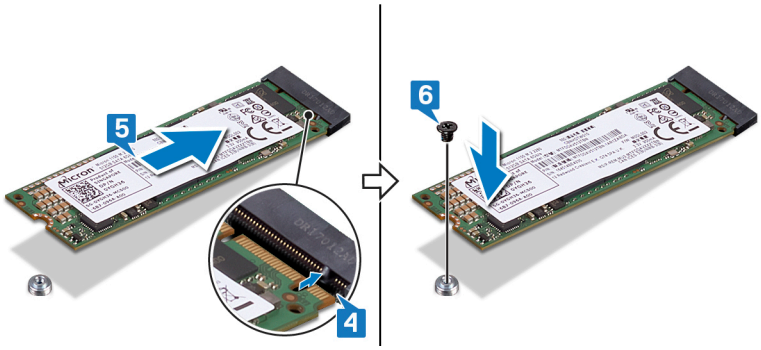



**M.2 2280 → M.2 2230**

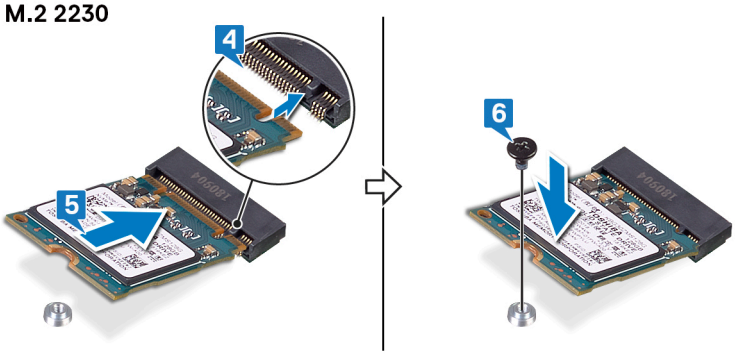



4 Align the notch on the solid-state drive/Intel Optane memory module with the tab on the solid-state drive slot.
5 Slide the solid-state drive/Intel Optane memory module firmly into the solid-state drive slot at an angle.
6 Press the other end of the solid-state drive/Intel Optane memory module and replace the screw (M2x3) that secures the solid-state drive to the palm-rest assembly.

**M.2 2280**




**M.2 2230**



# Removing the speakers

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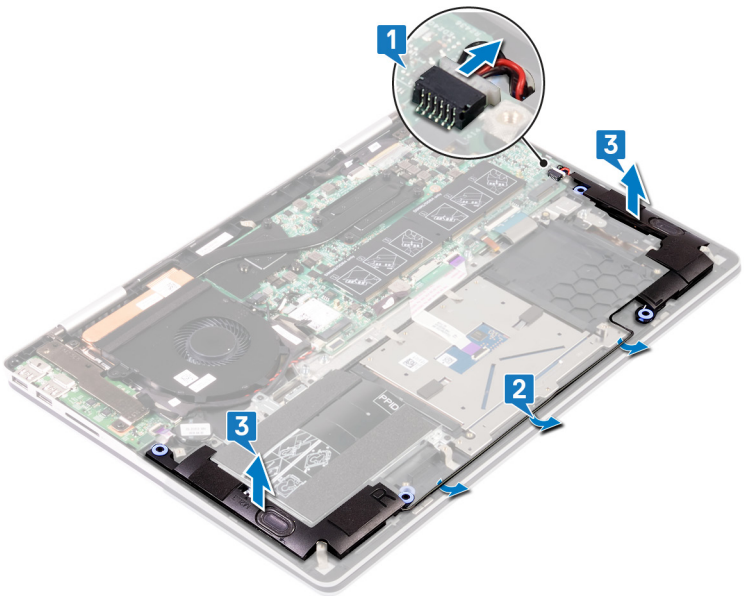
## Prerequisites

1 Remove the base cover.
2 Remove the battery.

## Procedure

1 Disconnect the speaker cable from the system board.
2 Lift the right speaker from the alignment posts, and then remove the speaker cable from the routing guides on the palm-rest assembly.
3 Remove the left speaker from the alignment posts and lift the speakers off the palm-rest assembly.



# Replacing the speakers

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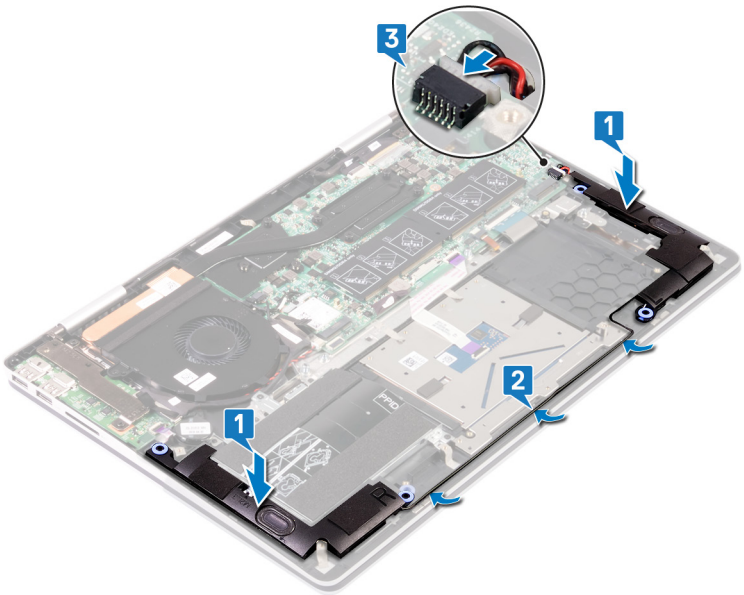
## Procedure

1 Using the alignment posts on the palm-rest assembly, place the left speaker on the palm-rest assembly.

2 Route the speaker cable through the routing guides on the palm-rest assembly and then place the right speaker on the palm-rest assembly.

3 Connect the speaker cable to the system board.




## Post-requisites

1 Replace the battery.

2 Replace the base cover.

# Removing the wireless card

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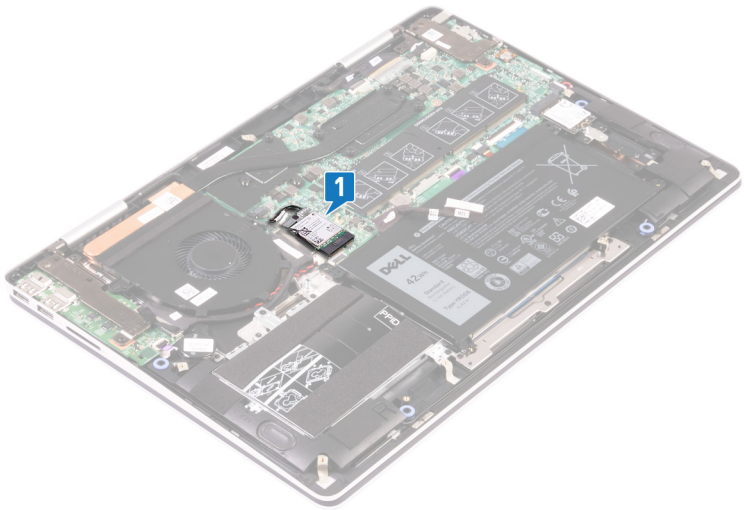
## Prerequisites

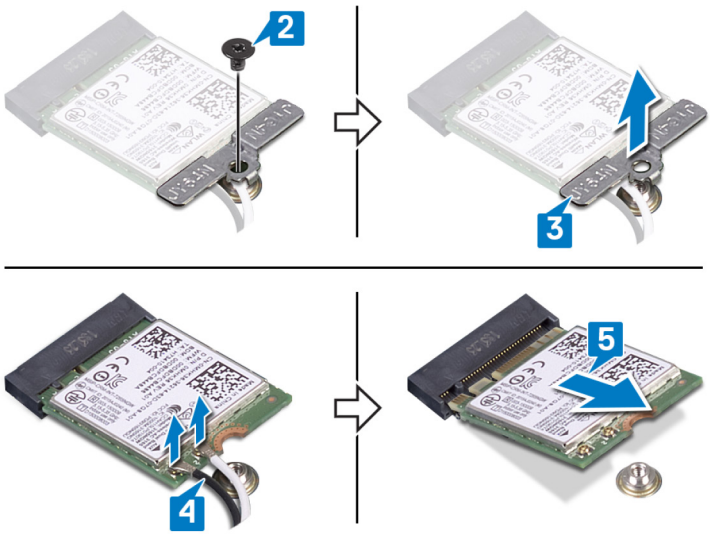
Remove the base cover.

## Procedure

1 Locate the wireless card on the system board.




2 Remove the screw (M2x3) that secures the wireless-card bracket to the wireless card and palm-rest assembly.
3 Remove the wireless-card bracket from the wireless card.
4 Disconnect the antenna cables from the wireless card.
5 Slide and remove the wireless card from the wireless-card slot.


2
3


4
5

# Replacing the wireless card

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## Procedure

**CAUTION: To avoid damage to the wireless card, do not place any cables under it.**

1 Connect the antenna cables to the wireless card.

The following table provides the antenna-cable color scheme for the wireless card supported by your computer.

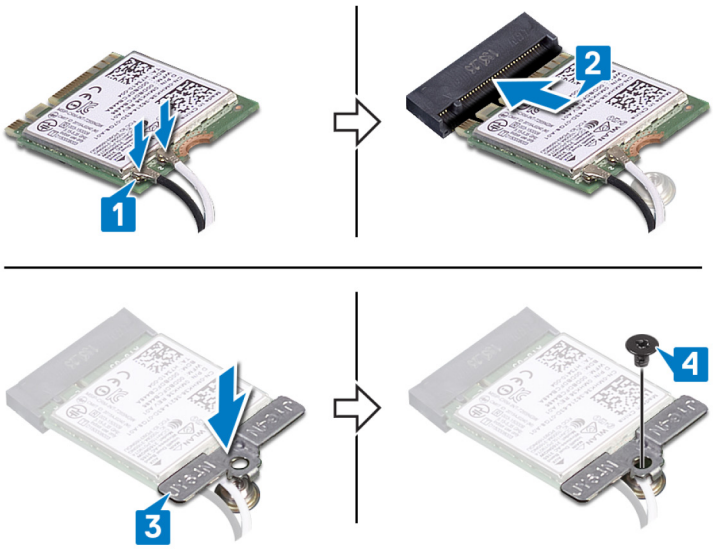
**Table 2. Antenna-cable color scheme**

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

2 Align the notch on the wireless card with the tab on the wireless-card slot and insert the wireless card at an angle into the wireless-card slot.

3 Align the screw hole on the wireless-card bracket with the screw hole on the wireless card and palm-rest assembly.

4 Replace the screw (M2x3) that secures the wireless-card bracket to the wireless card and palm-rest assembly.




## Post-requisites

Replace the base cover.

# Removing the display assembly

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## Prerequisites

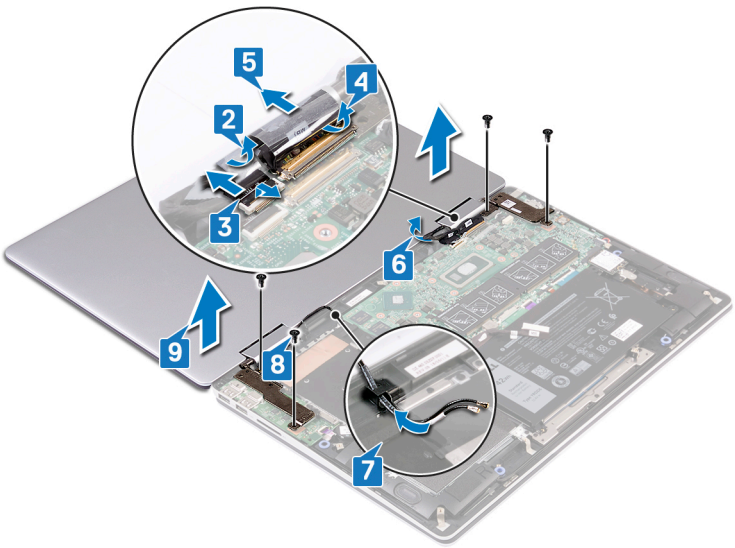
1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.

## Procedure

1 Turn the computer over and open the display as far as possible.

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

2 Peel the tape that secures the touch-screen cable to the system board.
3 Open the latch and disconnect the touch-screen board cable from the system board.
4 Peel the tape that secures the display cable to the system board.
5 Open the latch and disconnect the display cable from the system board.
6 Remove the display cable and touch-screen board cable from the routing guides on the palm-rest assembly.
7 Remove the antenna cables from the routing guides on the palm-rest assembly.
8 Remove the four screws (M2.5x5) that secure the display hinges to the I/O board and system board.
9 Lift the display assembly off the palm-rest assembly.



# Replacing the display assembly

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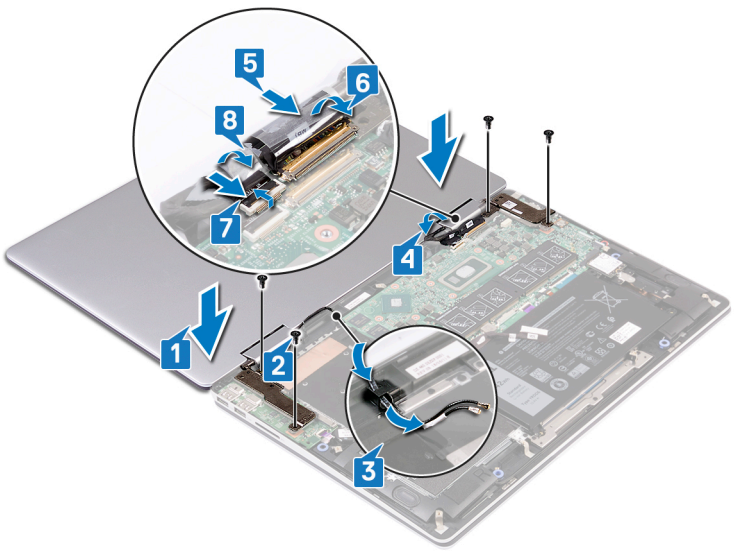
## Procedure

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

1. Place the display assembly on the palm-rest assembly and align the screw holes on the display hinges with the screw holes on the palm-rest assembly.
2. Replace the four screws (M2.5x5) that secure the display hinges to the I/O board and system board.
3. Route the antenna cables through the routing guides on the palm-rest assembly.
4. Route the display cable and touch-screen cable on the routing guides on the palm-rest assembly.
5. Connect the display cable to the system board and close the latch to secure the cable.
6. Adhere the tape that secures the display cable to the system board.
7. Connect the touch-screen cable to the system board and close the latches to secure the cables.
8. Adhere the tape that secures the touch-screen cable to the system board.




## Post-requisites

1. Replace the heat sink.
2. Replace the fan.
3. Replace the wireless card.
4. Replace the base cover.

# Removing the power-adapter port

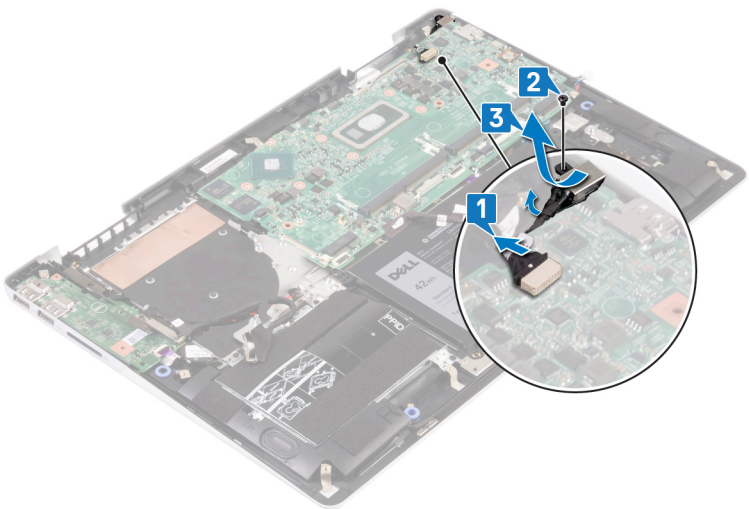
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.

## Procedure

1 Disconnect the power-adapter port cable from the system board.
2 Remove the screw (M2x3) that secures the power-adapter port to the palm-rest assembly.
3 Lift the power-adapter port, along with its cable, off the palm-rest assembly.



# Replacing the power-adapter port

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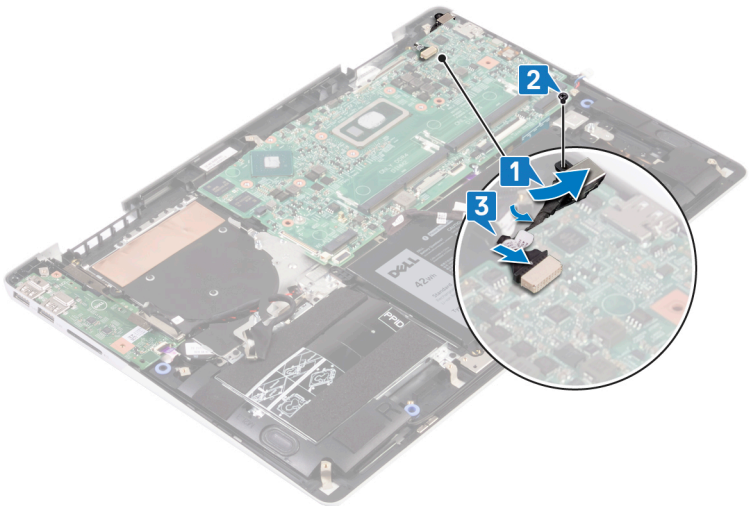
## Procedure

1 Place the power-adapter port into the slot on the palm-rest assembly.

2 Align the screw hole on the power-adapter port with the screw hole on the palm-rest assembly and replace the screw (M2x3) that secures the power-adapter port to the palm-rest assembly.

3 Connect the power-adapter port cable to the system board.




## Post-requisites

1 Replace the display assembly.

2 Replace the heat sink.

3 Replace the fan.

4 Replace the wireless card.

5 Replace the base cover.

# Removing the I/O board

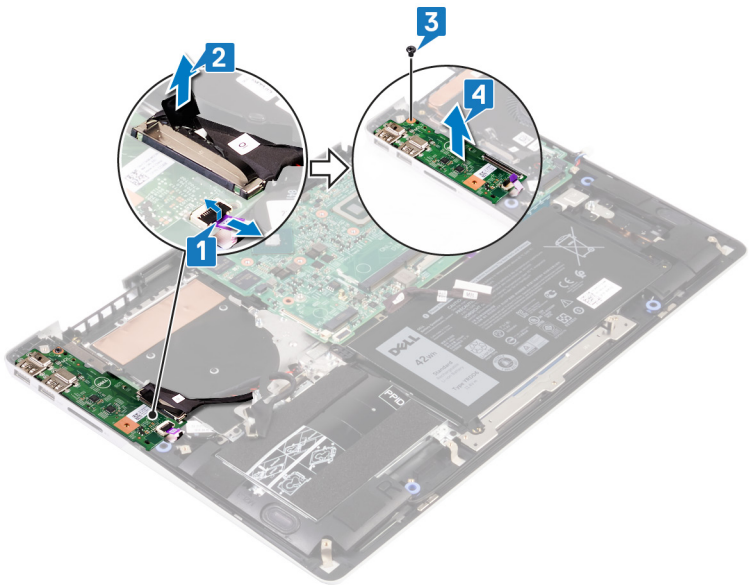
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.

## Procedure

1 Open the latch and disconnect the fingerprint-reader cable from the I/O board.
2 Using the pull tab, disconnect the I/O-board cable from the I/O board.
3 Remove the screw (M2x3) that secures the I/O board to the palm-rest assembly.
4 Lift the I/O board off the palm-rest assembly.

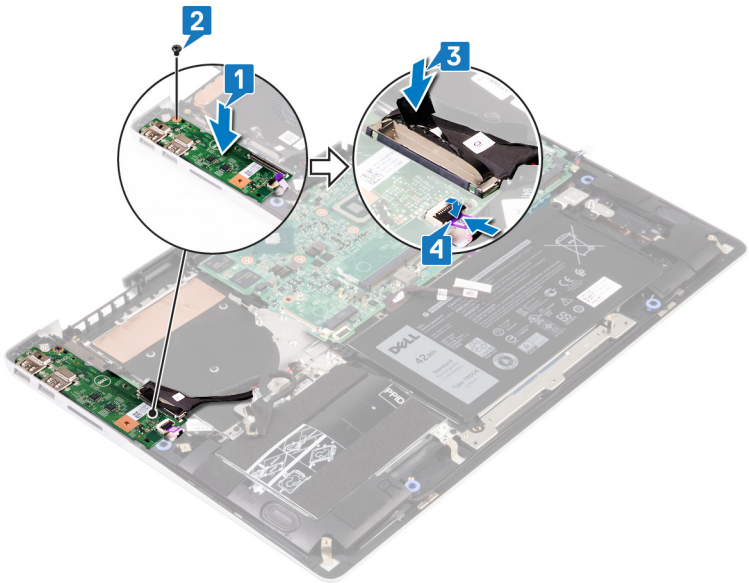


# Replacing the I/O board

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

## Procedure

1 Align the USB ports on the I/O board with the slots on the palm-rest assembly.
2 Align the screw hole on the I/O board with the screw hole on the palm-rest assembly and replace the screw (M2x3) that secures the I/O board to the palm-rest assembly.
3 Connect the I/O-board cable to the I/O board and close the latch to secure the cable.
4 Slide the fingerprint-reader cable into the connector on the I/O board and close the latch to secure the cable.




## Post-requisites

1 Replace the display assembly.
2 Replace the heat sink.
3 Replace the fan.
4 Replace the wireless card.
5 Replace the base cover.

# Removing the power button with fingerprint reader

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

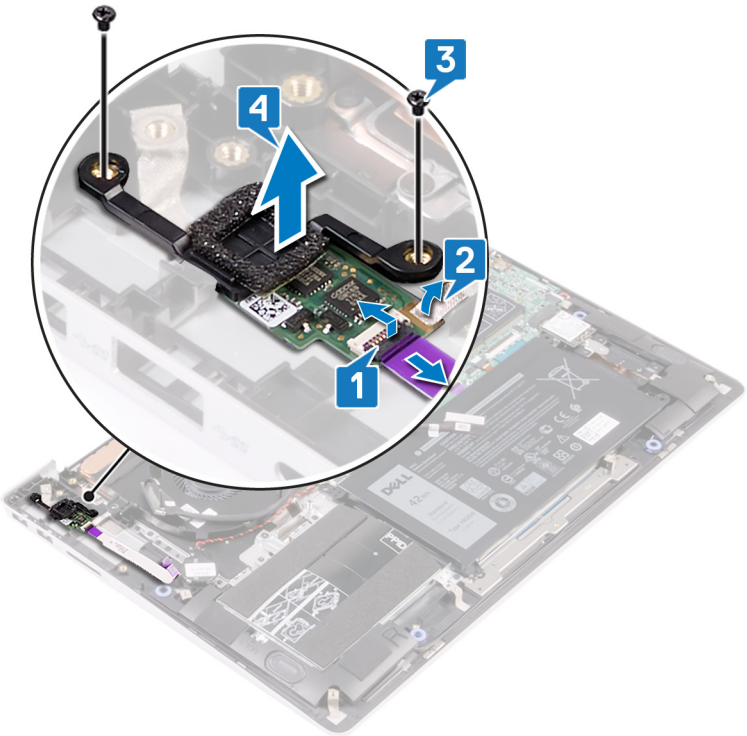
**NOTE: Applicable only for computers that are shipped with fingerprint reader.**

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.
6 Remove the I/O board.

## Procedure

1 Open the latch, and disconnect the fingerprint-reader cable from the power-button board.
2 Peel the tape that secures the power-button board to the palm-rest assembly.
3 Remove the two screws (M3x3) that secure the power-button board to the palm-rest assembly.
4 Lift the power-button board off the palm-rest assembly.


3
4
2
1

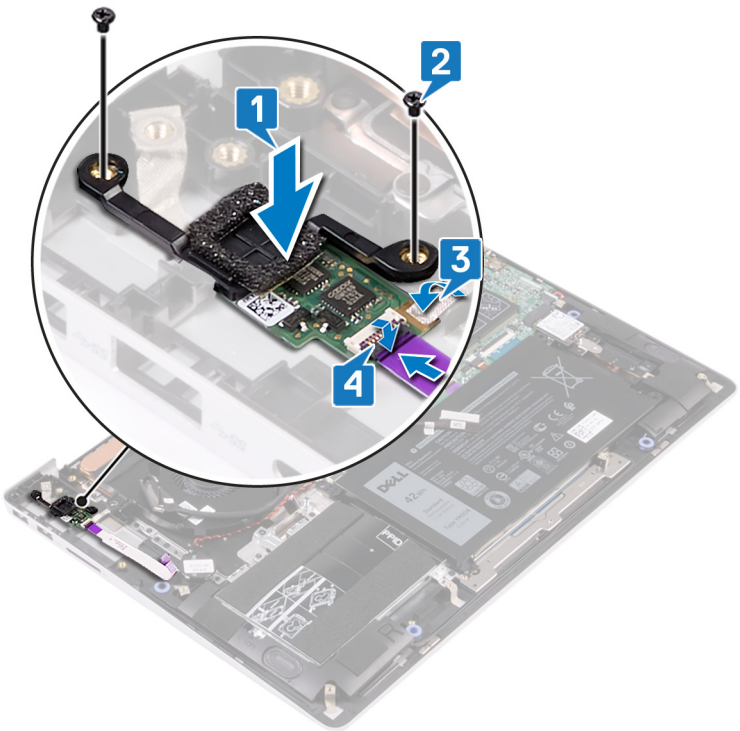
# Replacing the power button with fingerprint reader

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

**NOTE: Applicable only for computers that are shipped with fingerprint reader.**

## Procedure

1 Align the screw hole on the power-button board with the screw hole on the palm-rest assembly.
2 Replace the two screws (M3x3) that secure the power-button board to the palm-rest assembly.
3 Connect the fingerprint-reader cable to the power-button board and close the latch to secure the cable.
4 Adhere the tape that secures the power-button board to the palm-rest assembly.




## Post-requisites

1 Replace the I/O board.
2 Replace the display assembly.
3 Replace the heat sink.
4 Replace the fan.

5 Replace the wireless card.

6 Replace the base cover.

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# Removing the system board

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

**NOTE: Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.**

**NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.**

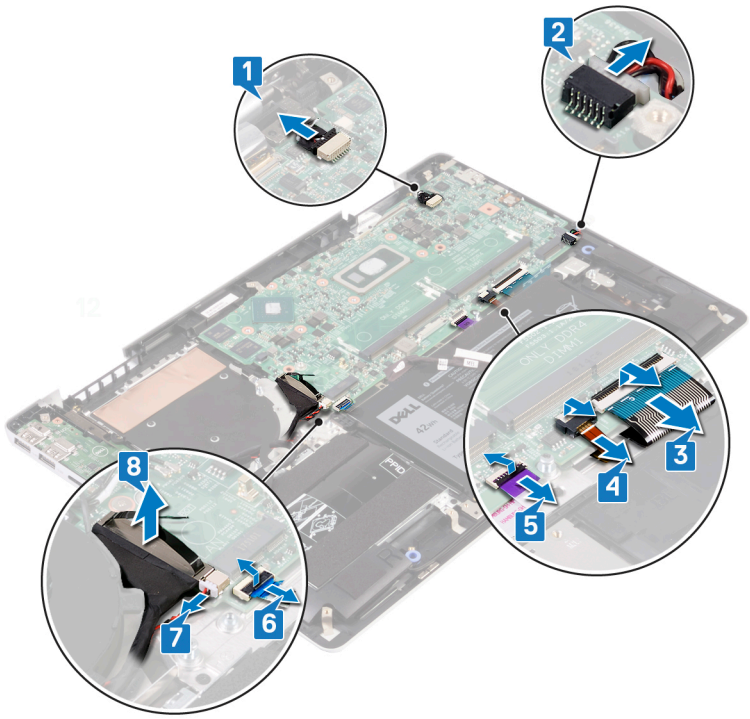
**NOTE: Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.**

## Prerequisites

1 Remove the base cover.
2 Remove the memory modules.
3 Remove the solid-state drive/Intel Optane memory module.
4 Remove the wireless card.
5 Remove the fan.
6 Remove the heat sink.
7 Remove the display assembly.

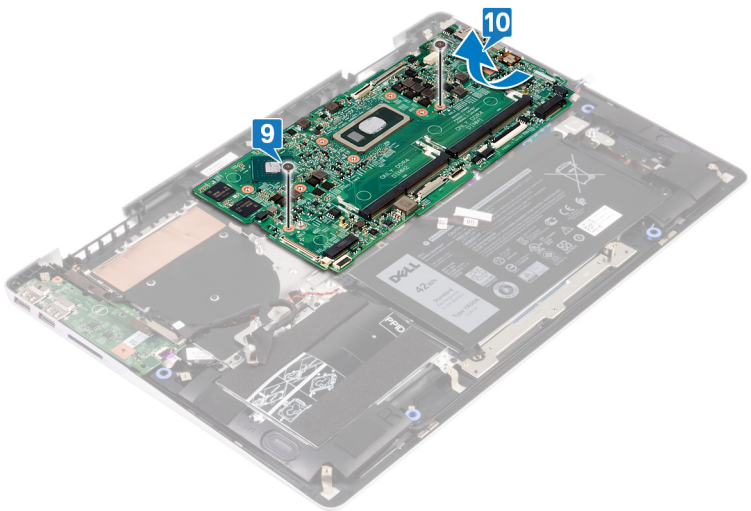
## Procedure

1 Disconnect the power-adapter port cable from the system board.
2 Disconnect the speaker cable from the system board.
3 Open the latch, and disconnect the keyboard cable from the system board.
4 Open the latch, and disconnect the keyboard-backlight cable from the system board.
5 Open the latch, and disconnect the touchpad cable from the system board.
6 Open the latch, and disconnect the hard-drive cable from the system board.
7 Using the pull tab, disconnect the I/O-board cable from the system board.
8 Disconnect the coin-cell battery cable from the system board.




9 Remove the two screws (M2x2) that secure the system board to the palm-rest assembly.

10 Slide and lift the system board off the palm-rest assembly.



# Replacing the system board

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

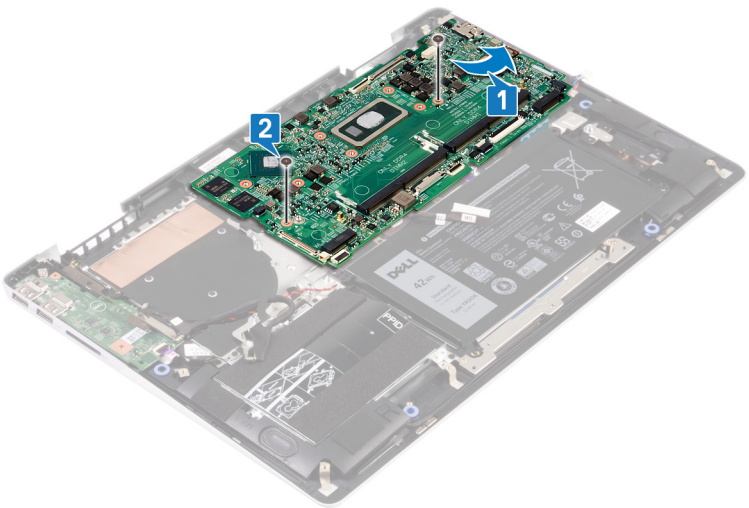
**NOTE: Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.**

**NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.**

## Procedure

1 Slide the I/O ports on the system board into the slots on the palm-rest assembly.

2 Align the screw holes on the system board with the screw holes on the palm-rest assembly, and then replace the two screws (M2x2) that secure the system board to the palm-rest assembly.




3 Connect the power-adapter port cable to the system board.

4 Connect the speaker cable to the system board.

5 Connect the keyboard cable to the system board and close the latch to secure the cable.

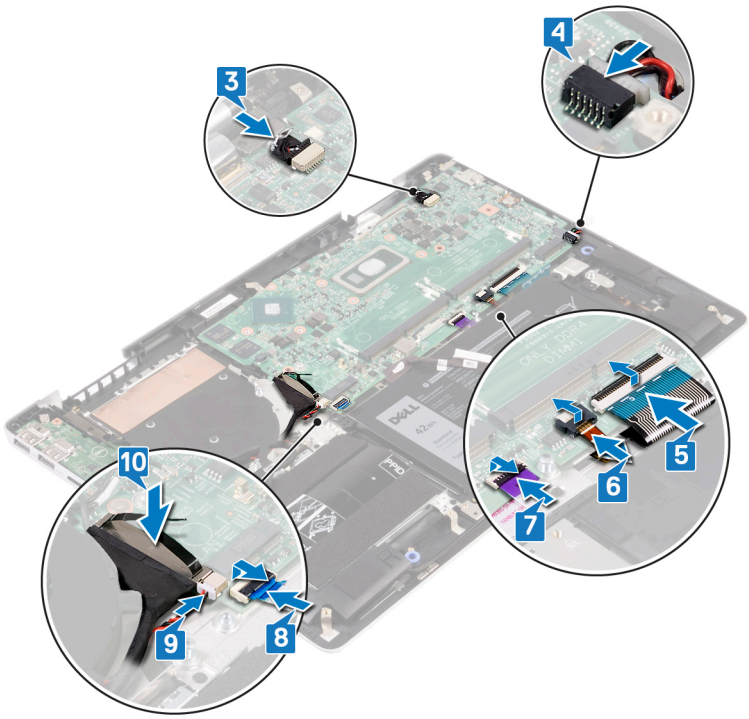
6 Connect the keyboard-backlit cable to the system board and close the latch to secure the cable.

7 Connect the touchpad cable to the system board and close the latch to secure the cable.

8 Connect the hard-drive cable to the system board and close the latch to secure the cable.

9 Connect the coin-cell battery to the system board.

10 Connect the I/O-board cable to the system board.




# Post-requisites

1 Replace the display assembly.
2 Replace the heat sink.
3 Replace the fan.
4 Replace the solid-state drive/Intel Optane.
5 Replace the wireless card.
6 Replace the memory modules.
7 Replace the base cover.

# Entering the Service Tag in the BIOS setup program

1 Turn on or restart your computer.
2 Press F2 when the Dell logo is displayed to enter the BIOS setup program.
3 Navigate to the **Main** tab and enter the Service Tag in the **Service Tag Input** field.

**NOTE: Service tag is the alphanumeric identifier located at the back side of your computer.**

# Removing the touchpad

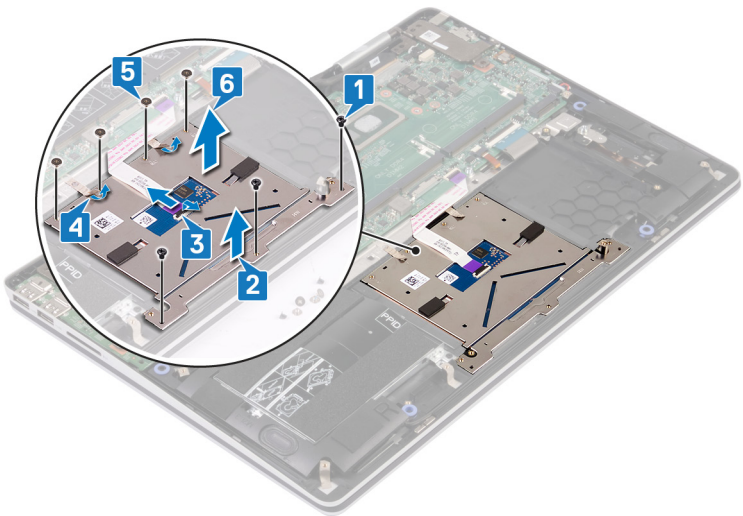
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the battery.

## Procedure

1 Remove the three screws (M2x3) that secure the touch-pad bracket to the palm-rest assembly.
2 Lift the touch-pad bracket off the palm-rest assembly.
3 Open the latch, and disconnect the touch-pad cable from touch-pad assembly.
4 Peel off the tapes that secure the touch-pad assembly to the palm-rest assembly.
5 Remove the four screws (M2x2) that secure the touchpad to the palm-rest assembly.
6 Lift the touchpad off the palm-rest assembly.

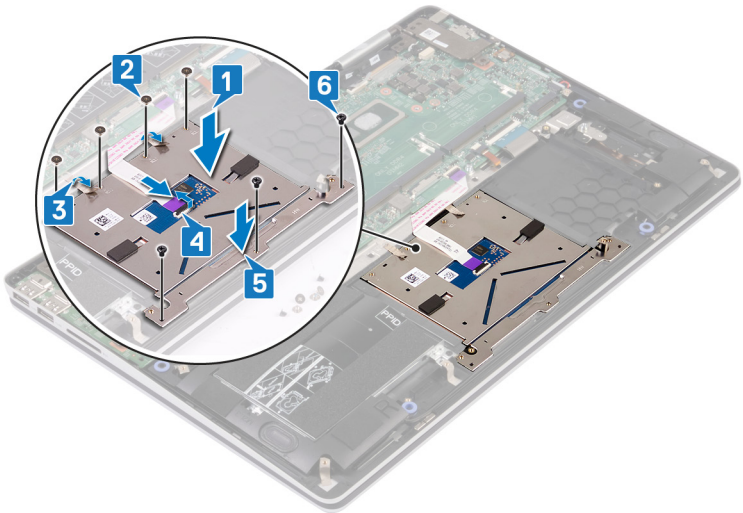


# Replacing the touchpad

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

## Procedure

1 Align the screw holes on the touch pad with the screw holes on the palm-rest assembly.
2 Replace the four screws (M2x2) that secure the touch pad to the palm-rest assembly.
3 Adhere the tapes that secure the touch-pad assembly to the palm-rest assembly.
4 Slide the touch-pad cable into the connector on the touch-pad assembly and close the latches to secure the cable.
5 Align the screw holes touch-pad bracket with the screw holes on the palm-rest assembly.
6 Replace the three screws (M2x3) that secure the touch-pad bracket to the palm-rest assembly.




## Post-requisites

1 Replace the battery.
2 Replace the base cover.

# Removing the keyboard

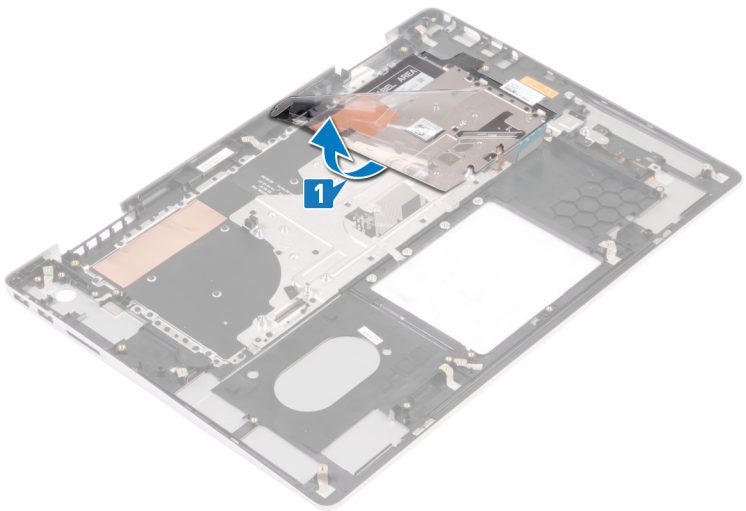
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the battery.
3 Remove the solid-state drive/Intel Optane memory module.
4 Remove the memory modules.
5 Remove the hard drive.
6 Remove the coin-cell battery.
7 Remove the wireless card.
8 Remove the speakers.
9 Remove the fan.
10 Remove the heat sink.
11 Remove the display assembly.
12 Remove the power-adapter port.
13 Remove the I/O board.
14 Remove the power button with fingerprint reader.
15 Remove the system board.
16 Remove the touchpad.

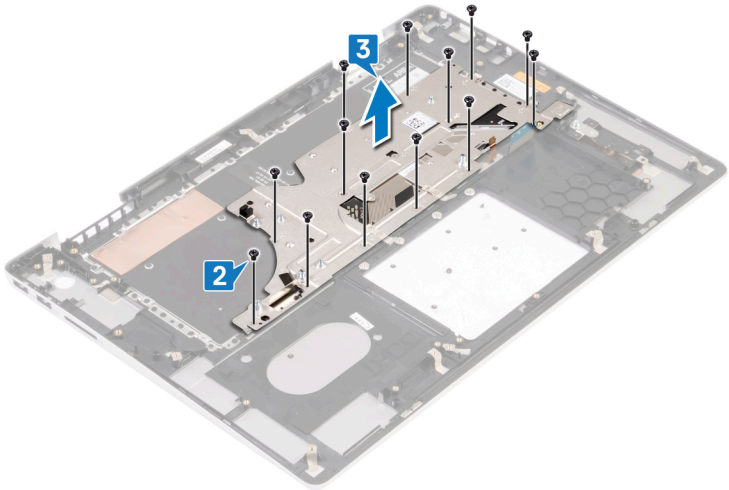
## Procedure

1 Peel the tape that secures the keyboard bracket to the keyboard..



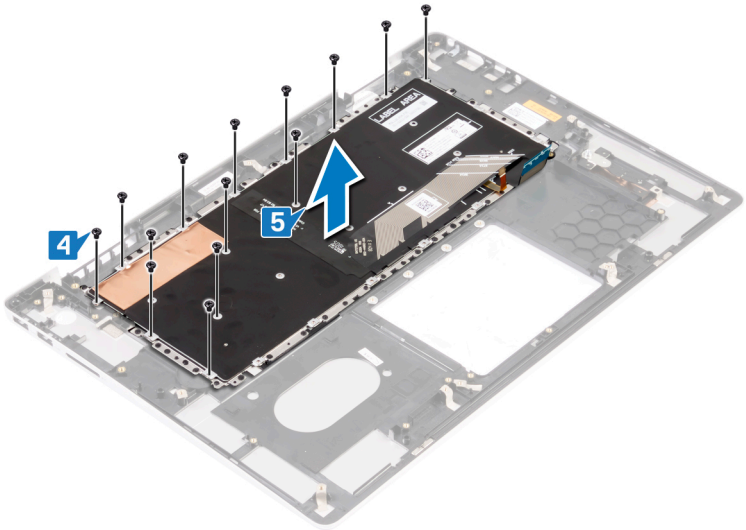

2 Remove the 14 screws (M1.4x2) that secures the keyboard bracket to the keyboard.

3 Lift the keyboard bracket off the keyboard.




4 Remove the 14 screws (M1.2x1.5) that secures the keyboard to the palm-rest assembly.

5 Lift the keyboard off the palm-rest assembly.

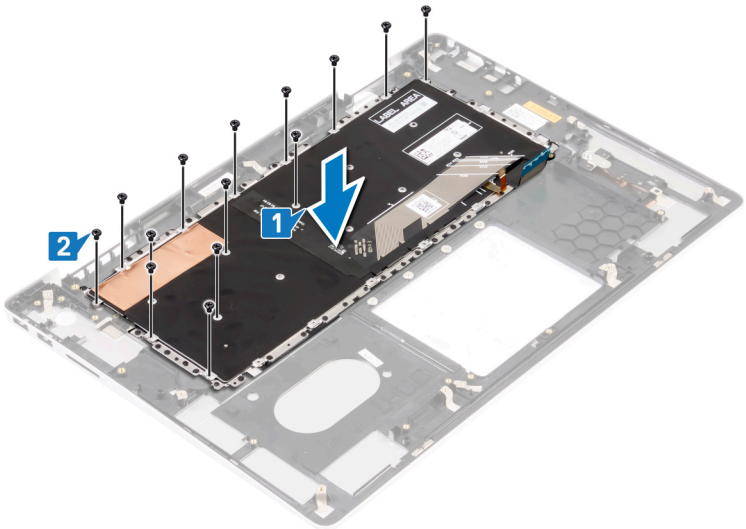


# Replacing the keyboard

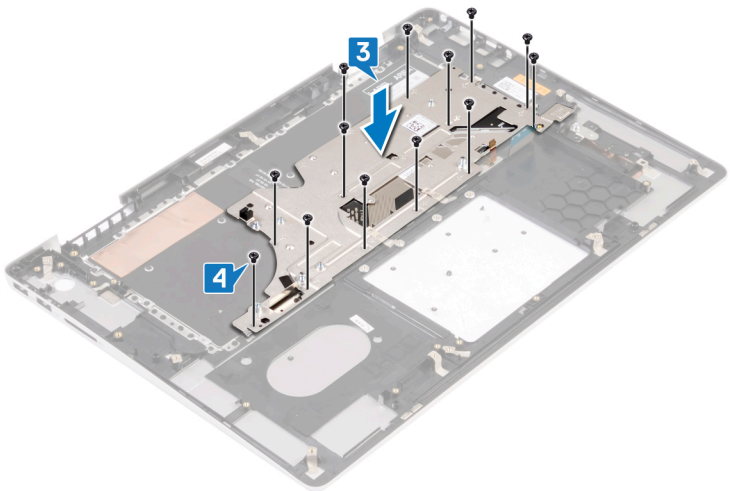
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Procedure

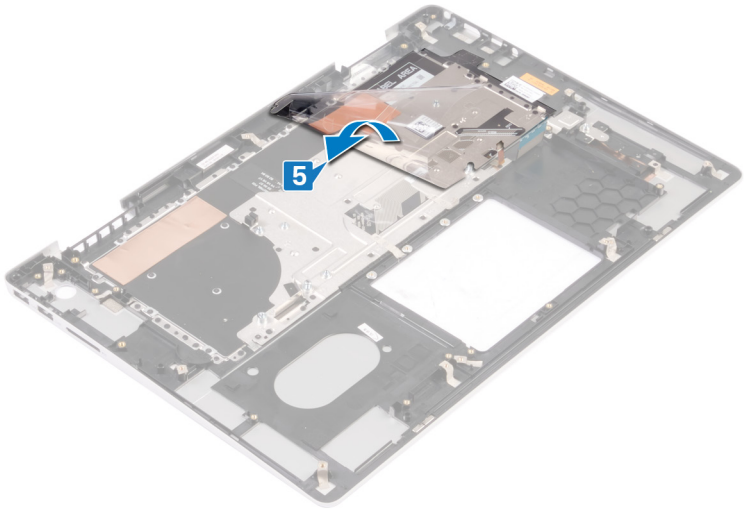
1 Align the screw holes on the keyboard with the screw holes on the palm-rest assembly.
2 Replace the 14 screws (M1.2x1.5) that secure the keyboard to palm-rest assembly.




3 Align the screws holes on the keyboard bracket with the screw holes on the keyboard.
4 Replace the 14 screws (M1.4x2) that secure the keyboard bracket to keybaord.




5 Adhere the tape that secures the keyboard bracket to the keyboard.




# Post-requisites

1 Replace the touchpad.
2 Replace the system board.
3 Replace the power button with fingerprint reader
4 Replace the I/O board.
5 Replace the power-adapter port.
6 Replace the display assembly.
7 Replace the heat sink.
8 Replace the fan.
9 Replace the speakers.
10 Replace the wireless card.
11 Replace the coin-cell battery.
12 Replace the hard drive.
13 Replace the memory modules.
14 Replace the solid-state drive/Intel Optane memory module.
15 Replace the battery.
16 Replace the base cover.

# Removing the palm rest

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

## Prerequisites

1 Remove the base cover.
2 Remove the battery.
3 Remove the memory modules.
4 Remove the coin-cell battery.
5 Remove the fan.
6 Remove the heat sink.
7 Remove the hard drive.
8 Remove the solid-state drive/Intel Optane memory module.
9 Remove the speakers.
10 Remove the wireless card.
11 Remove the display assembly.
12 Remove the power-adapter port.
13 Remove the I/O board.
14 Remove the power button with fingerprint reader.
15 Remove the system board.
16 Remove the touchpad.
17 Remove the keyboard.

## Procedure

After performing the steps in prerequisites we are left with the palm rest.

# Replacing the palm rest

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

## Procedure

Place the palm rest on a flat surface.

## Post-requisites

1. Replace the keyboard.
2. Replace the touchpad.
3. Replace the system board.
4. Replace the power button with fingerprint reader
5. Replace the I/O board.
6. Replace the power-adapter port.
7. Replace the display assembly.
8. Replace the wireless card.
9. Replace the speakers.
10. Replace the solid-state drive/Intel Optane memory module.
11. Replace the hard drive.
12. Replace the heat sink.
13. Replace the fan.
14. Replace the coin-cell battery.
15. Replace the memory modules.
16. Replace the battery.
17. Replace the base cover.

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# Removing the display panel

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

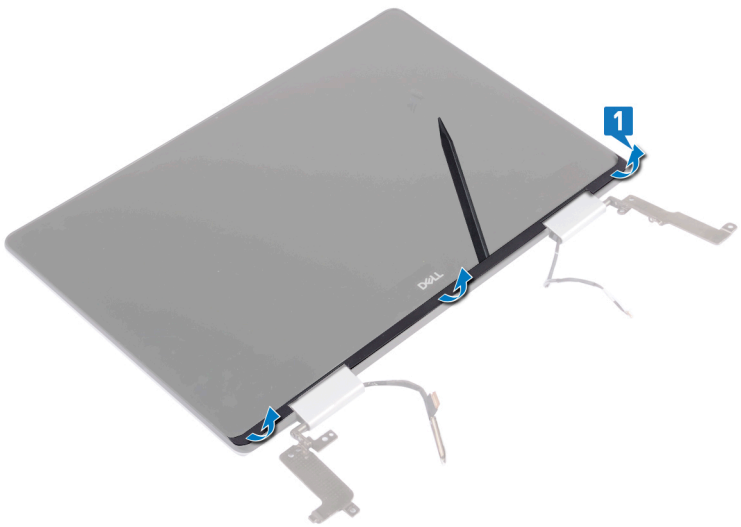
## Prerequisites

**NOTE: Piece parts replacement of the display panel using SR tapes and pressure films is only limited to RFR (Return For Repair – Depot/CIS/CAR/MIS) service incidents. The complete display assembly (LCD Hinge-Up Display Assembly) must be dispatched for onsite service incidents.**

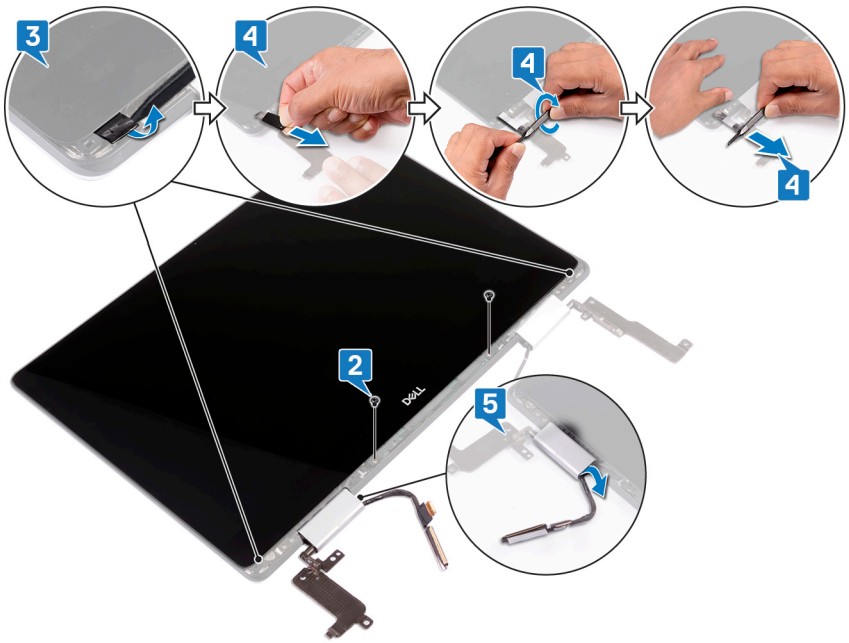
1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.

## Procedure

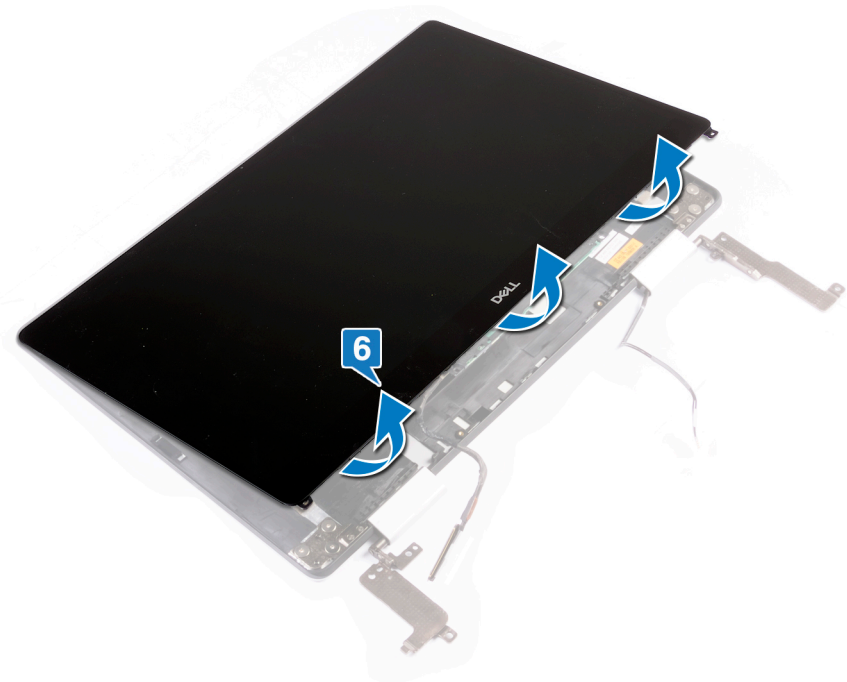
1 Using the flat side of the plastic scribe, pry up the display bezel and remove it from the display back-cover and antenna assembly.




2 Remove the two screws (M2x3) that secure the display panel to the display back-cover and antenna assembly.
3 Using a plastic scribe, flip out the pull tab of the SR tape from both sides of the display panel.
4 Pull out a small section of the SR tape and roll it around the plastic scribe. Repeat the process until the SR tape is fully released.
5 Remove the display cable and touchscreen-board cable from the routing guides on the display hinges.




6 Lift the display panel off the display back-cover and antenna assembly.




7 Remove the camera.

8 Remove the display cable.

9 After performing all the above procedures, we are left with the display panel.

# Replacing the display panel

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

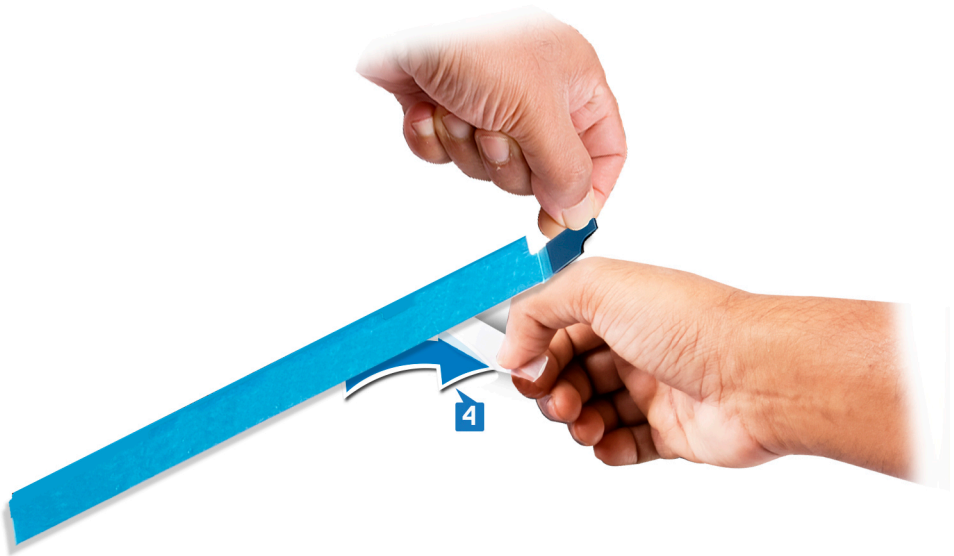
## Procedure

1 Place the display panel on a clean and flat surface.

2 Replace the display cable.

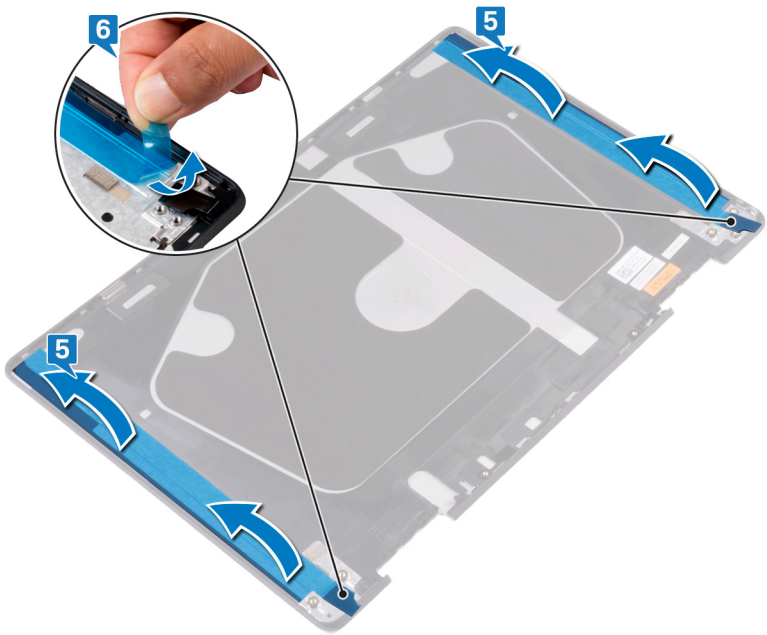
3 Replace the camera.

4 Remove the release paper from the SR tapes.

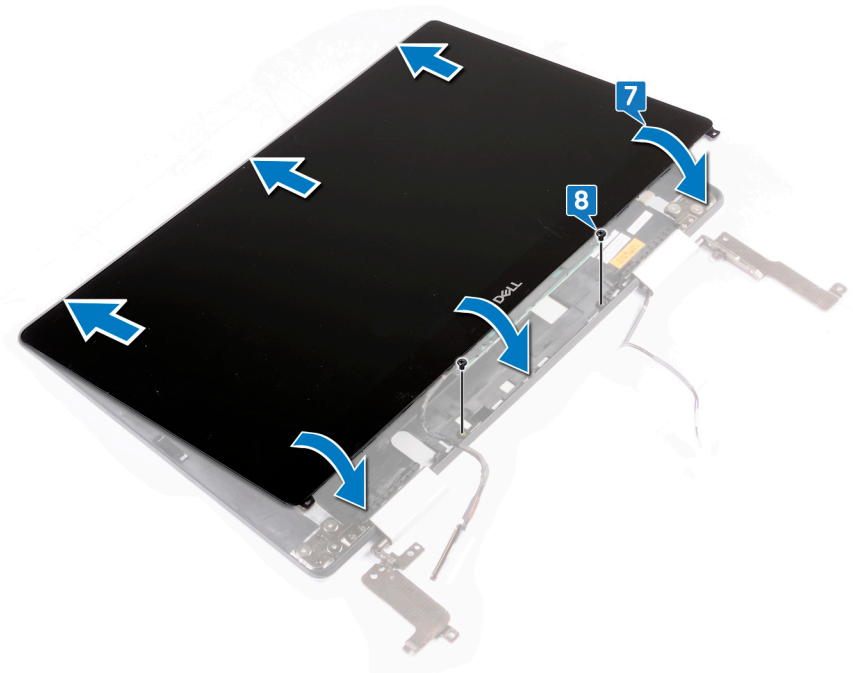


5 Align both the SR tapes to the plastic edge of the display back-cover and antenna assembly and paste them.

6 Remove the blue release paper of SR tape.



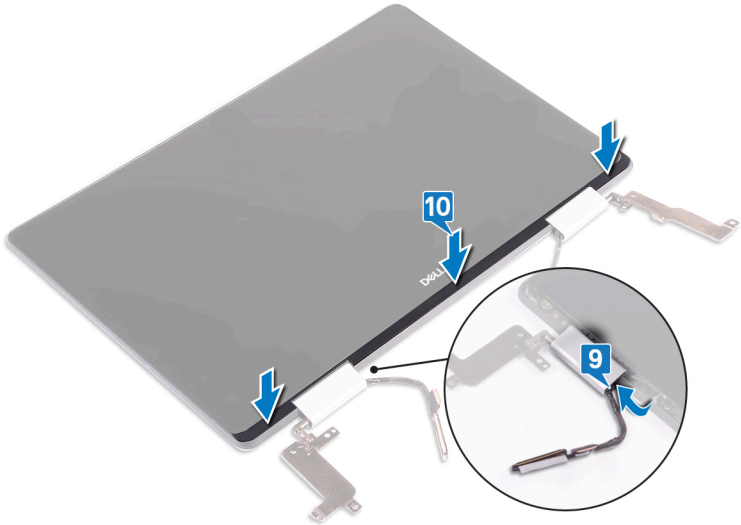

7 Slide the top of display panel into the display back-cover and antenna assembly and place the display panel onto the display back-cover and antenna assembly.



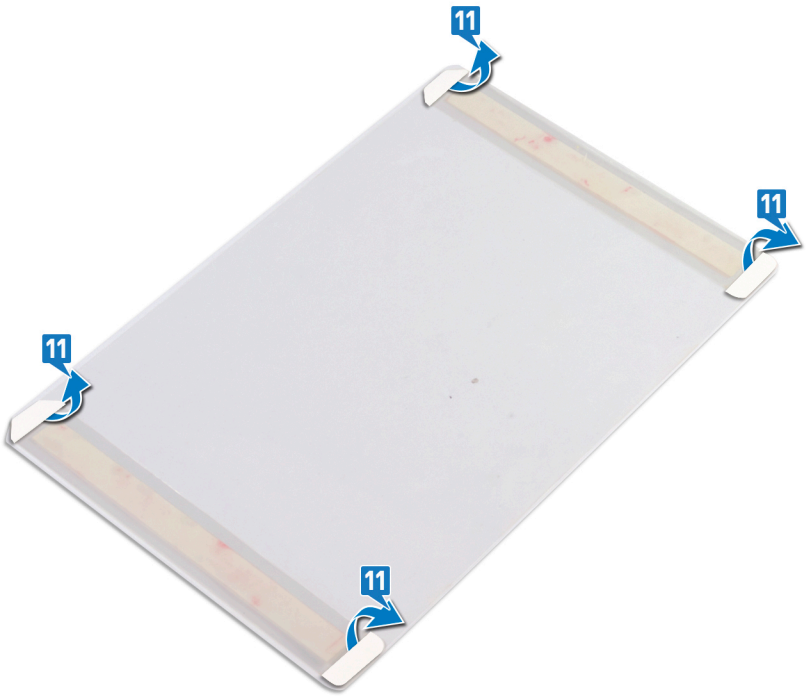

8 Replace the two screws (M2x3) that secure the display panel to the display back-cover and antenna assembly.

9 Route the display cable and the touchscreen-board cable through the routing guides on the display hinge.

10 Place the display bezel on the display back-cover and antenna assembly and snap it into place.



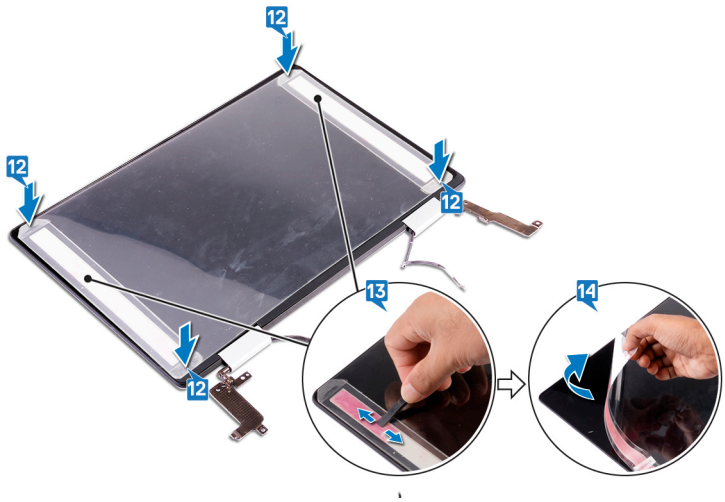

11 Remove the release paper from the pressure film.




12 Adhere the pressure film on the display panel.

13 Using the flat end of the plastic scribe, press the pressure film until it turns red.

14 Peel off the pressure film from the display panel.




# Post-requisites

1 Replace the display assembly.
2 Replace the heat sink.
3 Replace the fan.
4 Replace the wireless card.
5 Replace the base cover.

# Removing the camera

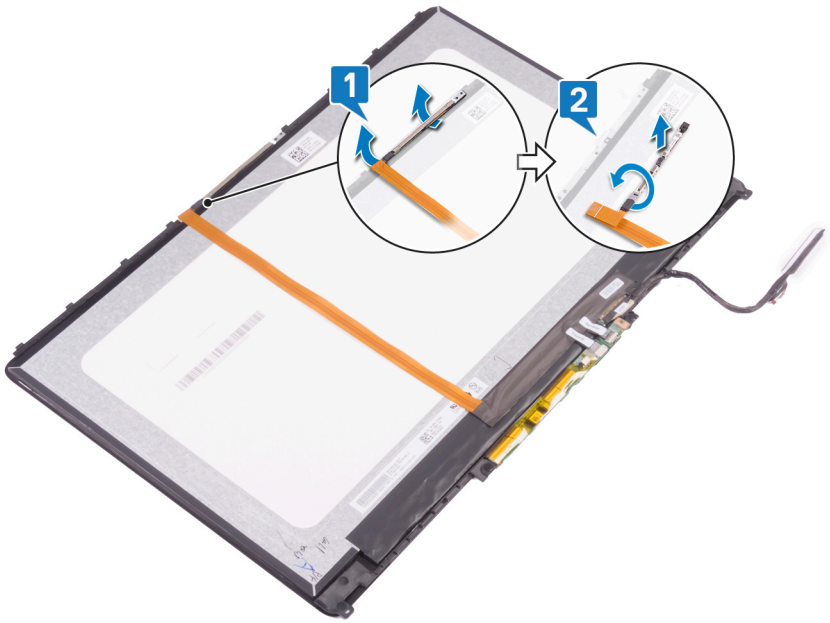
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.
6 Follow the procedure from step 1 to step 6 in "Removing the display panel".

## Procedure

1 Using a plastic scribe, gently loosen the camera module from the display-panel assembly.
2 Roll over the camera module until it is released from the black adhesive tape and the camera cable is disconnected from the camera module.

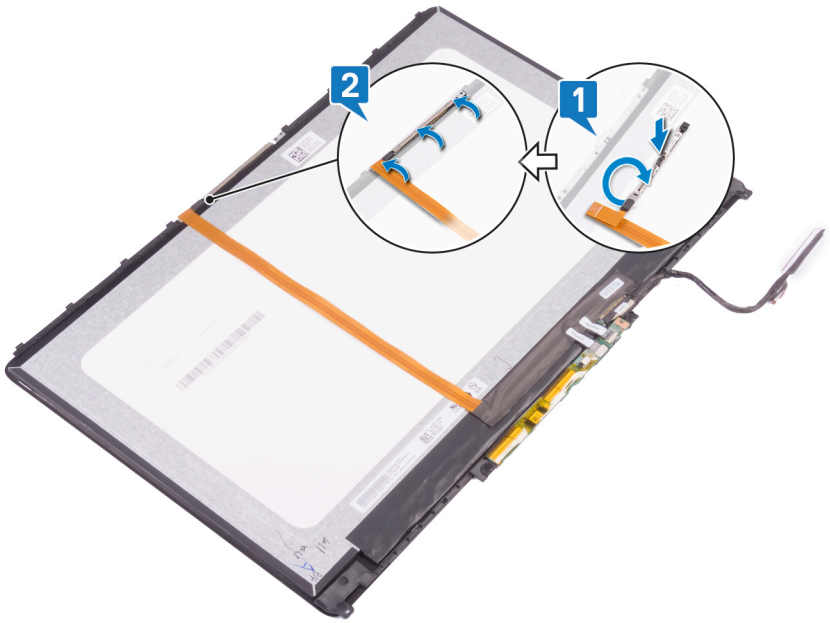


# Replacing the camera

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

## Procedure

1 Connect the camera cable to the camera module.
2 Using the alignment post, adhere the camera to the display-panel assembly.




## Post-requisites

1 Follow the procedure from step 4 to step 9 in "Replacing the display panel".
2 Replace the display assembly.
3 Replace the heat sink.
4 Replace the fan.
5 Replace the wireless card.
6 Replace the base cover.

# Removing the display hinges

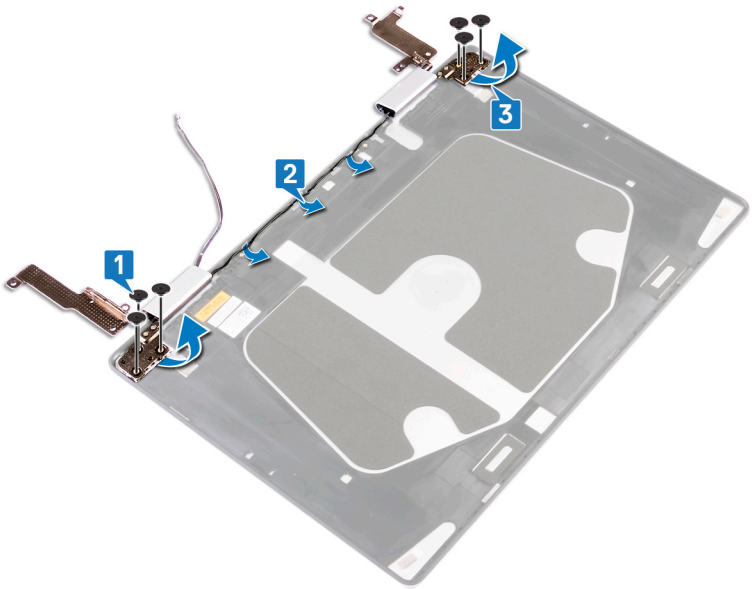
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.
6 Remove the display panel.

## Procedure

1 Remove the six screws (M2.5x2.5) that secure the hinges to the display back cover.
2 Remove the antenna cables from the routing guides on the display back cover.
3 Lift the hinges and brackets off the display back cover.



# Replacing the display hinges

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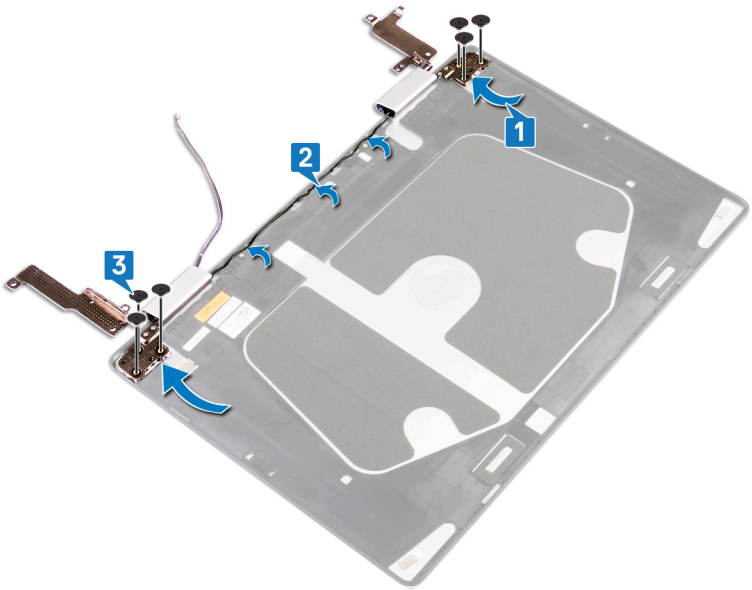
## Procedure

1 Align the screw holes on the hinges and brackets with the screw holes on the display back cover.
2 Route the antenna cables through the routing guides on the display back cover.
3 Replace the six screws (M2.5x2.5) that secure the hinges to the display back cover.




## Post-requisites

1 Replace the display panel.
2 Replace the display assembly.
3 Replace the heat sink.
4 Replace the fan.
5 Replace the wireless card.
6 Replace the base cover.

# Removing the display cable

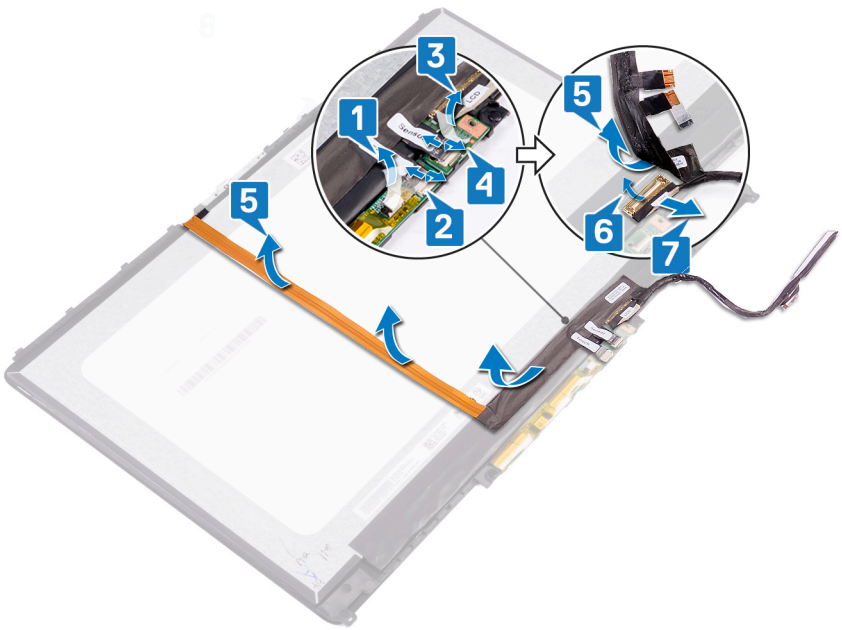
**WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.
6 Follow the procedure from step 1 to step 6 in "Removing the display panel".
7 Remove the camera.

## Procedure

1 Peel the tape that secures the camera cable to the display panel.
2 Open the latch and disconnect the camera cable from the connector on the display panel.
3 Peel the tape that secures the touchscreen-board cable to the display panel.
4 Open the latch and disconnect the touchscreen-board cable from the connector on the display panel.
5 Peel off the camera cable and touchscreen-board cable from the display panel.
6 Peel the tape that secures the display cable to the display panel.
7 Open the latch and disconnect the display cable from the connector on the display panel.

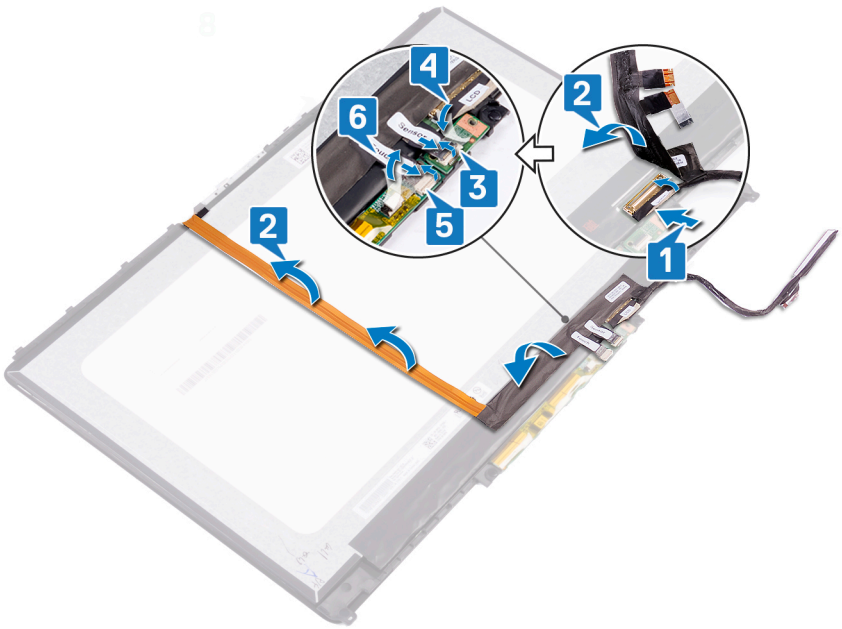


# Replacing the display cable

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

## Procedure

1 Connect the display cable and close the latch to secure the cable.
2 Adhere the camera cable and touchscreen-board cable to the display panel.
3 Connect the touchscreen-board cable and close the latch to secure the cable.
4 Adhere the tape that secures the touchscreen-board cable to the display panel.
5 Connect the camera cable and close the latch to secure the cable.
6 Adhere the tape that secures the camera cable to the display panel.




## Post-requisites

1 Replace the camera.
2 Follow the procedure from step 4 to step 9 in "Replacing the display panel".
3 Replace the display assembly.
4 Replace the heat sink.
5 Replace the fan.
6 Replace the wireless card.
7 Replace the base cover.

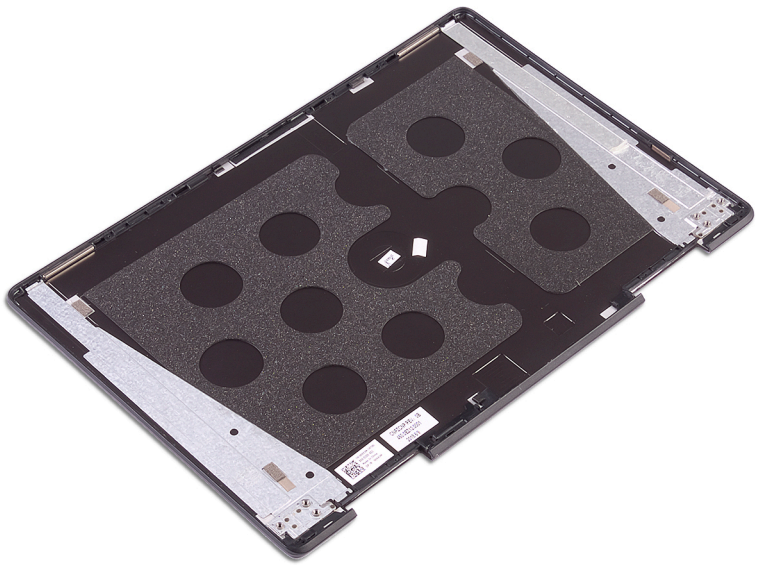
# Removing the display back cover

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

## Prerequisites

1 Remove the base cover.
2 Remove the wireless card.
3 Remove the fan.
4 Remove the heat sink.
5 Remove the display assembly.
6 Remove the display panel.
7 Remove the display hinges.

## Procedure



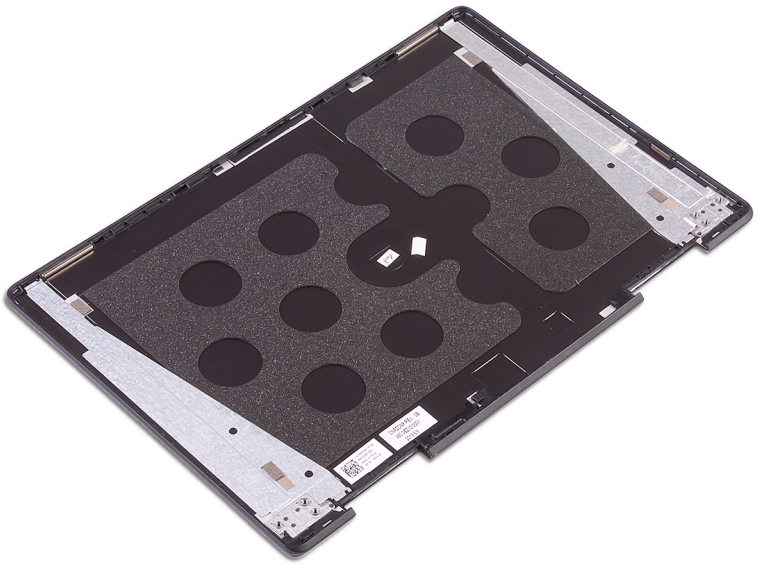
After performing all the prerequisites, we are left with the .

# Replacing the display back cover

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

## Procedure

Place the on a flat surface.



## Post-requisites

1. Replace the display hinges.
2. Replace the display panel.
3. Replace the display assembly.
4. Replace the heat sink.
5. Replace the fan.
6. Replace the wireless card.
7. Replace the base cover.

# Device drivers

## Intel Chipset Software Installation Utility

In the Device Manager, check if the chipset driver is installed.

Install the Intel chipset updates from www.dell.com/support.

## Video drivers

In the Device Manager, check if the video driver is installed.

Install the video driver update from www.dell.com/support.

## Intel Serial IO driver

In the Device Manager, check if the Intel Serial IO driver is installed.

Install the driver updates from www.dell.com/support.

## Intel Trusted Execution Engine Interface

In the Device Manager, check if the Intel Trusted Execution Engine Interface driver is installed.

Install the driver update from www.dell.com/support.

## Intel Virtual Button driver

In the Device Manager, check if the Intel Virtual Button driver is installed.

Install the driver updates from www.dell.com/support.

## Wireless and Bluetooth drivers

In the Device Manager, check if the network card driver is installed.

Install the driver updates from www.dell.com/support.

In the Device Manager, check if the Bluetooth driver is installed.

Install the driver updates from www.dell.com/support.

# System setup

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

## Boot Sequence

Boot Sequence allows you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key

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

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

  **NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.**

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

## 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.<br>**NOTE: For the standard graphics browser only.** |
| 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. |

## BIOS overview

**CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.**

**NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.**

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

# Entering BIOS setup program

1 Turn on (or restart) your computer.

2 During POST, when the DELL logo is displayed, watch for the F2 prompt to appear, and then press F2 immediately.

**NOTE: The F2 prompt indicates that the keyboard is initialized. This prompt can appear very quickly, so you must watch for it, and then press F2. If you press F2 before the F2 prompt, this keystroke is lost. If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Then, turn off your computer and try again.**

# System setup options

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

**Table 3. System setup options—System information menu**

| General-System Information | |
|---|---|
| **System Information** | |
| BIOS Version | Displays the BIOS version number. |
| Service Tag | Displays the Service Tag of the computer. |
| Asset Tag | Displays the Asset Tag of the computer. |
| Ownership Tag | Displays the ownership tag of the computer. |
| Manufacture Date | Displays the manufacture date of the computer. |
| Ownership Date | Displays the ownership date of the computer. |
| Express Service Code | Displays the express service code of the computer. |
| **Memory Information** | |
| Memory Installed | Displays the total computer memory installed. |
| Memory Available | Displays the total computer memory available. |
| Memory Speed | Displays the memory speed. |
| Memory Channel Mode | Displays single or dual channel mode. |
| Memory Technology | Displays the technology used for the memory. |
| DIMM A Size | Displays the DIMM A memory size. |
| DIMM B Size | Displays the DIMM B memory size. |
| **Processor Information** | |
| Processor Type | Displays the processor type. |
| Core Count | Displays the number of cores on the processor. |
| Processor ID | Displays the processor identification code. |
| Current Clock Speed | Displays the current processor clock speed. |
| Minimum Clock Speed | Displays the minimum processor clock speed. |

| General-System Information | |
|---|---|
| Maximum Clock Speed | Displays the maximum processor clock speed. |
| Processor L2 Cache | Displays the processor L2 Cache size. |
| Processor L3 Cache | Displays the processor L3 Cache size. |
| HT Capable | Displays whether the processor is HyperThreading (HT) capable. |
| 64-Bit Technology | Displays whether 64-bit technology is used. |
| **Device Information** | |
| SATA-0 | Displays the M.2 SATA SSD-0 device information of the computer. |
| SATA-1 | Displays the M.2 SATA SSD-1 device information of the computer. |
| M.2 PCIe SSD-0 | Displays the M.2 PCIe SSD-0 device information of the computer. |
| M.2 PCIe SSD-1 | Displays the M.2 PCIe SSD-1 device information of the computer. |
| Video Controller | Displays the video controller type of the computer. |
| dGPU Video Controller | Displays the discrete graphics information of the computer. |
| Video BIOS Version | Displays the video BIOS version of the computer. |
| Video Memory | Displays the video memory information of the computer. |
| Panel Type | Displays the Panel Type of the computer. |
| Native Resolution | Displays the native resolution of the computer. |
| Audio Controller | Displays the audio controller information of the computer. |
| Wi-Fi Device | Displays the wireless device information of the computer. |
| Bluetooth Device | Displays the bluetooth device information of the computer. |
| **Battery Information** | Displays the battery health information. |
| **Boot Sequence** | |
| Boot Sequence | Displays the boot sequence. |
| Boot List Option | Displays the available boot options. |
| **Advanced Boot Options** | |
| Enable Legacy Option ROMs | Enable or disable the Legacy Option ROMs. |
| Enable UEFI Network Stack | Enable or disable the UEFI Network Stack. |
| Enable Attempt Legacy Boot | Enable or disable Legacy Boot. |
| **UEFI Boot Path Security** | Enable or disable the system to prompt the user to enter the Admin password when booting a UEFI boot path from the F12 boot menu. |
| **Date/Time** | Displays the current date in MM/DD/YY format and current time in HH:MM:SS AM/PM format. |

**Table 4. System setup options—System Configuration menu**

| System Configuration | |
|---|---|
| **SATA Operation** | Configure operating mode of the integrated SATA hard drive controller. |
| **Drives** | Enable or disable various drives on board. |
| **SMART Reporting** | Enable or disable SMART Reporting during system startup. |
| **USB Configuration** | |
| Enable Boot Support | Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive. |

| System Configuration | |
|---|---|
| Enable External USB Port | Enable or disable booting from USB mass storage devices connected to external USB port. |
| **Audio** | Enable or disable the integrated audio controller. |
| **Keyboard Illumination** | Enables you to choose the operating mode of the keyboard illumination feature. |
| **Keyboard Backlight Timeout on AC** | When the backlight is enabled, this feature defines the timeout value for the keyboard backlight when an AC adapter is plugged into the computer. |
| **Keyboard Backlight Timeout on Battery** | When the backlight is enabled, this feature defines the timeout value for the keyboard backlight when the computer is running only on battery power. |
| **Miscellaneous Devices** | Enable or disable various onboard devices. |

### Table 5. System setup options—Video menu

| Video | |
|---|---|
| LCD Brightness | Set the panel brightness independently for Battery and AC power. |
| Dynamic Backlight Control | Enable or disable the dynamic backlight control. |

### Table 6. System setup options—Security menu

| Security | |
|---|---|
| Admin Password | Set, change, or delete the administrator password. |
| System Password | Set, change, or delete the system password. |
| Internal HDD-0 Password | Set, change, or delete the internal hard-disk drive password. |
| Strong Password | Enable or disable strong passwords. |
| Password Configuration | Control the minimum and maximum number of characters allowed for Admin and System passwords. |
| Password Bypass | Bypass the System (Boot) Password and the internal HDD password prompts during a system restart. |
| Password Change | Enable or disable changes to the System and Hard Disk passwords when an administrator password is set. |
| Non-Admin Setup Changes | Determines whether changes to the setup option are permitted when an administrator password is set. |
| UEFI Capsule Firmware Updates | Enable or disable BIOS updates through UEFI capsule update packages. |
| PTT Security | Enable or disable Platform Trust Technology (PTT) visibility to the operating system. |
| Computrace(R) | Enable or disable the BIOS module interface of the optional Computrace(R) Service from Absolute Software. |
| Admin Setup Lockout | Enable to prevent users from entering Setup when an Admin Password is set. |
| Master Password Lockout | Disables the master password support. Hard Disk passwords need to be cleared before changing the setting. |
| SMM Security Mitigation | Enable or disable the SMM Security Mitigation. |

### Table 7. System setup options—Secure Boot menu

| Secure Boot | |
|---|---|
| Secure Boot Enable | Enable or disable the secure boot feature. |
| Secure Boot Mode | Modifies the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. |
| **Expert Key Management** | |
| Expert Key Management | Enable or disable Expert Key Management. |
| Custom Mode Key Management | Select the custom values for expert key management. |

### Table 8. System setup options—Intel Software Guard Extensions menu

| Intel Software Guard Extensions | |
|---|---|
| Intel SGX Enable | Enable or disable Intel Software Guard Extensions. |
| Enclave Memory Size | Set the Intel Software Guard Extensions Enclave Reserve Memory Size. |
| **Performance** | |
| Multi Core Support | Enable multiple cores.<br>Default: Enabled. |
| Intel SpeedStep | Enable or disable Intel Speedstep Technology.<br>Default: Enabled.<br>**NOTE: If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.** |
| C-States Control | Enable or disable additional processor sleep states.<br>Default: Enabled. |
| Intel TurboBoost | Enable or disable Intel TurboBoost mode of the processor.<br>Default: Enabled. |
| HyperThread control | Enable or disable HyperThreading in the processor.<br>Default: Enabled. |
| **Power Management** | |
| AC Behavior | Enables the system to turn on automatically, when AC power is supplied. |
| Enable Intel Speed Shift Technology | Enable or disable Intel Speed Shift Technology. |
| Auto On Time | Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays or Selected Days.<br>Default: Disabled. |
| USB Wake Support | Enable the USB devices to wake the computer from Standby. |
| Block Sleep | Enable or disable Block Sleep. |
| Advanced Battery Charge Configuration | Enable Advanced Battery Charge Configuration from the beginning of the day to a specified work period. |
| Primary Battery Charge Configuration | Set the primary battery charge settings with a preselected custom charge start and stop.<br>Default: Adaptive. |

| Intel Software Guard Extensions | |
|---|---|
| **POST Behavior** | |
| Adapter Warnings | Enable adapter warnings.<br>Default: Enabled. |
| Numlock Enable | Enables the NumLock funclion when computer boots. |
| Fn Lock Options | Enable or disable the Fn lock mode. |
| Fastboot | Enable to set the speed of the boot process.<br>Default: Thorough. |
| Extend BIOS POST Time | Configure additional pre-boot delay. |
| Full Screen Logo | Enable or disable to display full screen logo. |
| Warnings and Errors | Sets the boot process to pause when Warnings or Errors are detected. |

### Table 9. System setup options—Virtualization Support menu

| Virtualization Support | |
|---|---|
| Virtualization | Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology. |
| VT for Direct I/O | Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O. |

### Table 10. System setup options—Wireless menu

| Wireless | |
|---|---|
| Wireless Switch | Determine which wireless devices can be controlled by the Wireless Switch. |
| Wireless Device Enable | Enable or disable internal wireless devices. |

### Table 11. System setup options—Maintenance menu

| Maintenance | |
|---|---|
| Service Tag | Display the system's Service Tag. |
| Asset Tag | Create a system Asset Tag. |
| BIOS Downgrade | Control flashing of the system firmware to previous revisions. |
| Data Wipe | Enable to securely erase data from all internal storage devices. |
| BIOS Recovery | Enable the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. |
| First Power On Date | Disable the First Power On Date |

### Table 12. System setup options—System Logs menu

| System Logs | |
|---|---|
| BIOS Events | Display BIOS events. |
| Thermal Events | Display Thermal events. |
| Power Events | Display Power events. |

Table 13. System setup options—SupportAssist System Resolution menu

| SupportAssist System Resolution | |
|---|---|
| Auto OS Recovery Threshold | Control the automatic boot flow for SupportAssist System Resolution Console and for Dell OS Recovery tool. |
| SupportAssist OS Recovery | Enable or disable the boot flow for SupportAssist OS Recovery tool in the even of certain system errors. |

# 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.**

# Troubleshooting

## 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 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 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.

## Enhanced Pre-Boot System Assessment (ePSA) diagnostics

**CAUTION: Use the ePSA diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.**

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.**

For more information, see Dell EPSA Diagnostic 3.0.

# Running the ePSA diagnostics

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

# System diagnostic lights

**Power and battery-status light/hard-drive activity light**

Indicates the battery-charge status or the hard-drive activity.

**NOTE: Press Fn+H to toggle this light between power and battery-status light and hard-drive activity light.**

**Hard-drive activity light**

Turns on when the computer reads from or writes to the hard drive.

**NOTE: Hard-drive activity light is supported only on computers shipped with hard drive.**

**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.

**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

**NOTE: Hard-drive activity light is supported only on computers shipped with hard drive.**

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 light patterns and describes what they indicate.

**Table 14. 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 |
| **3,5** | Power rail failure |
| **3,6** | SBIOS flash corruption |
| **3,7** | Timeout waiting on ME to reply to HECI message |

**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.

# Enabling Intel Optane memory

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 **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 complete enabling your 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 your Intel Optane memory and restart your computer.

# 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.

# 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 Disconnect the power adapter from your computer.

3 Press and hold the power button for 15 seconds to drain the flea power.

4 Connect the power adapter to your computer.

5 Turn on your computer.