Inspiron 5580

Service Manual

Computer Model: Inspiron 5580
Regulatory Model: P77F
Regulatory Type: P77F001

Identifier	GUID-5B8DE7B7-879F-45A4-88E0-732155904029
Status	Released

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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Status	Released

Before working inside your computer

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

Identifier	GUID-B2521C24-A407-4ABB-8022-6D88B53F0B94
Status	Released

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.

Identifier	GUID-06588814-2678-4667-9FF9-C
Status	Released

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.

Identifier	GUID-71128823-CE64-4E17-9439-D
Status	Released

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.

Identifier	GUID-E1EAA29F-F785-45A4-A7F8-3E717B40D541
Status	Released

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.

Identifier	GUID-A48EDCBD-2D76-4460-B709-223F43658255
Status	Released

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.

Identifier	GUID-0332D293-B3CC-4042-8A0D-795B07BE277E
Status	Released

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.

Identifier	GUID-EA979CC8-84EC-4827-86C4-
Status	Released

4

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #1
- Plastic scribe

Screw list

NOTE: Screw color may vary with the configuration ordered.

Table 1. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Base cover	Palm-rest and keyboard assembly	M2x7	6	
Battery	Palm-rest and keyboard assembly	M2x3	2	
Fan	Palm-rest and keyboard assembly	M2x3	2	
Hard-drive assembly	Palm-rest and keyboard assembly	M2x3	4	
Hard-drive bracket	Hard drive	M3x3	4	
Hinges	Palm-rest and keyboard assembly	M2.5x5	5	
I/O board	Palm-rest and keyboard assembly	M2x3	2	
Power-adapter port	Palm-rest and keyboard assembly	M2x3	1	
Power button with fingerprint reader (optional)	Palm-rest and keyboard assembly	M2x3	2	
Solid-state drive/Intel Optane memory module	Palm-rest and keyboard assembly	M2x3	1	
System board	Palm-rest and keyboard assembly	M2x2 Big Head	5	
Touchpad	Palm-rest and keyboard assembly	M2x3	4	
USB Type-C bracket	System board	M2x3	2	
Wireless-card bracket	System board	M2x3	1	

Identifier	GUID-98068FC2-1C1C-46DE-B3FA
Status	Released

Removing the base cover

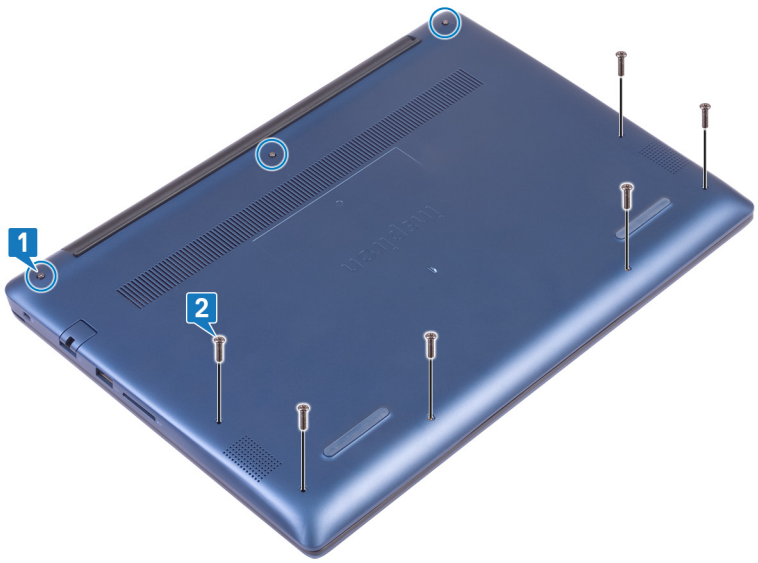
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

Identifier	GUID-F1F0B5BB-963C-47BD-94DB-58838EB24EA2
Status	Released

Procedure

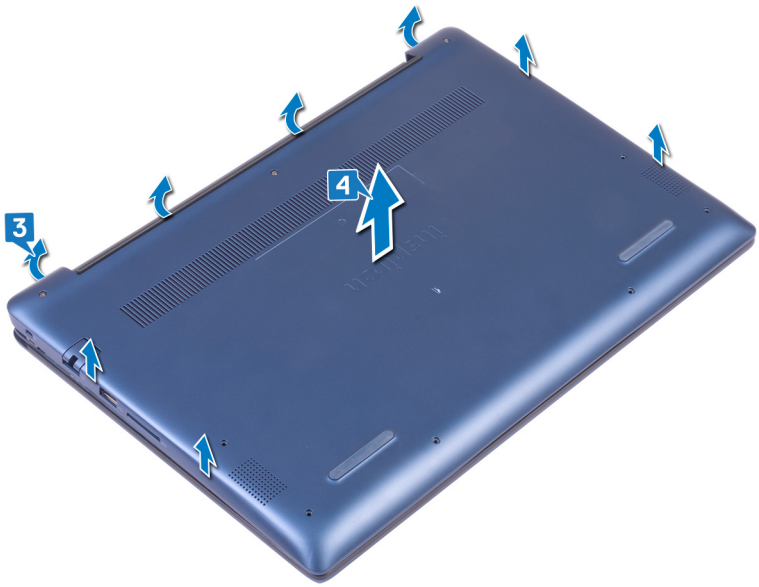
1 Loosen the three captive screws that secure the base cover to the palm-rest and keyboard assembly.

2 Remove the 6 screws (M2x7) that secure the base cover to the palm-rest and keyboard assembly.



3 Using a plastic scribe, pry the base cover off the palm-rest and keyboard assembly, starting from the top-left corner of the computer base.

4 Lift the base cover off the palm-rest and keyboard assembly.

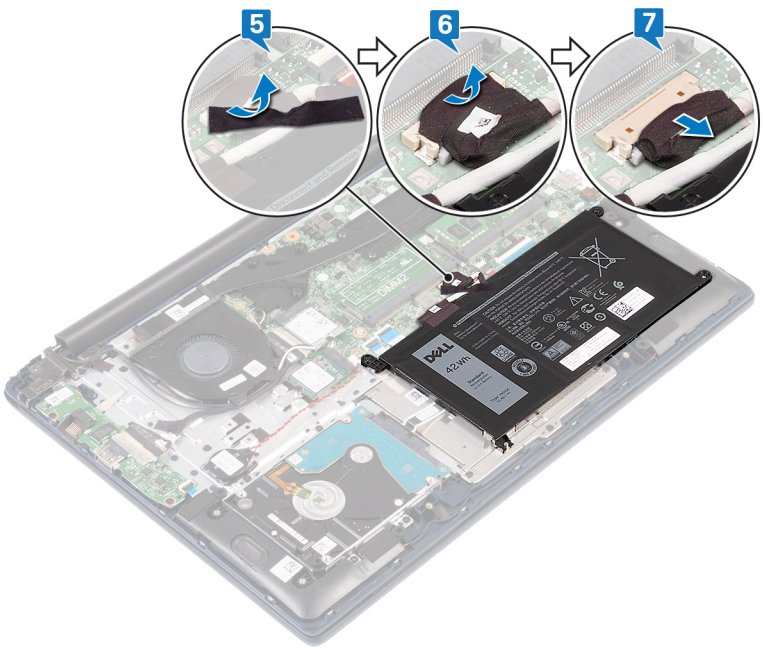


NOTE: The following steps are applicable only if you want to further remove other components from your computer.

5 Peel the tape that secures the battery cable to the system board.

6 Peel the tape that secures the battery cable connection to the system board.

7 Disconnect the battery cable from the system board.



8 Press and hold the power button for five seconds to ground the computer and drain the flea power.

Identifier	GUID-27446428-82D7-4881-9220-9
Status	Released

Replacing the base cover

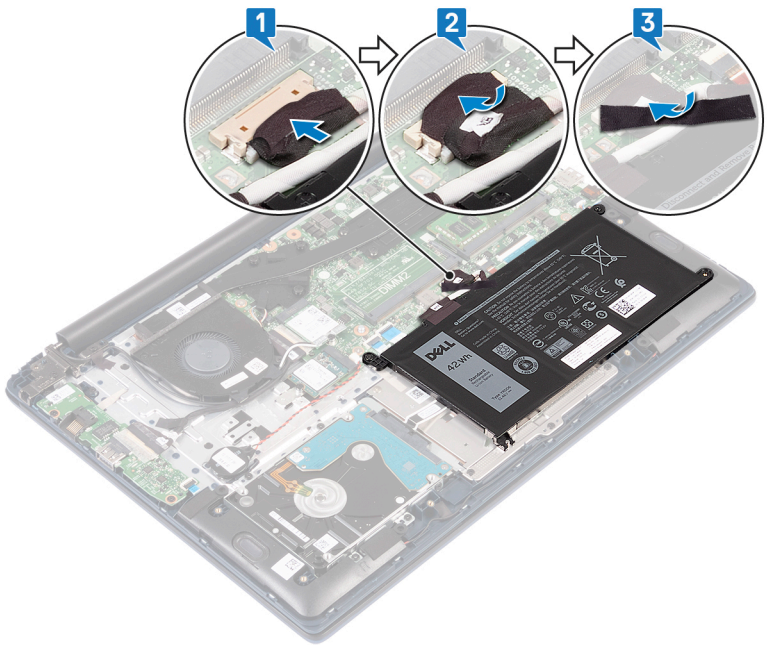
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

Identifier	GUID-CC744AED-EC0A-45BC-9091-68771047910D
Status	Released

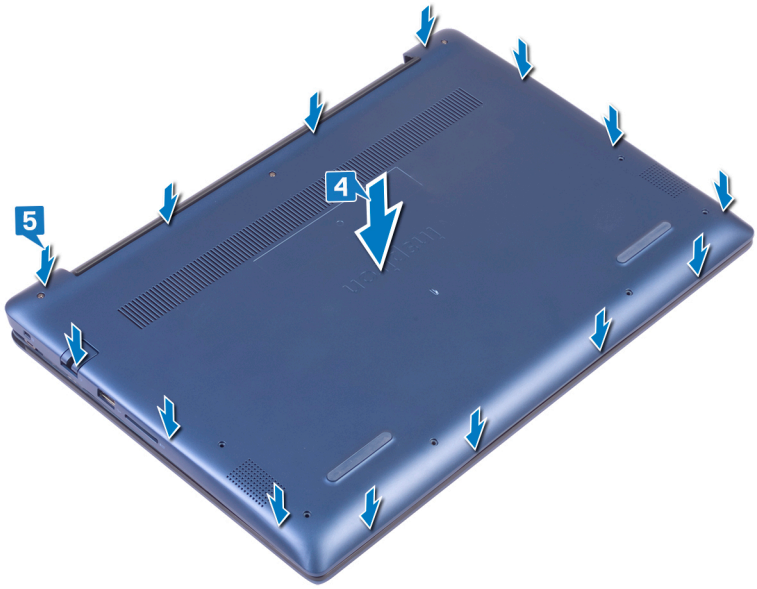
Procedure

NOTE: Steps 1 and 2 are applicable only if you have disconnected the battery prior to removing other components from your computer.

1 Connect the battery cable to the system board.
2 Adhere the tape that secures the battery cable connection to the system board.
3 Adhere the tape that secures the battery cable to the system board.

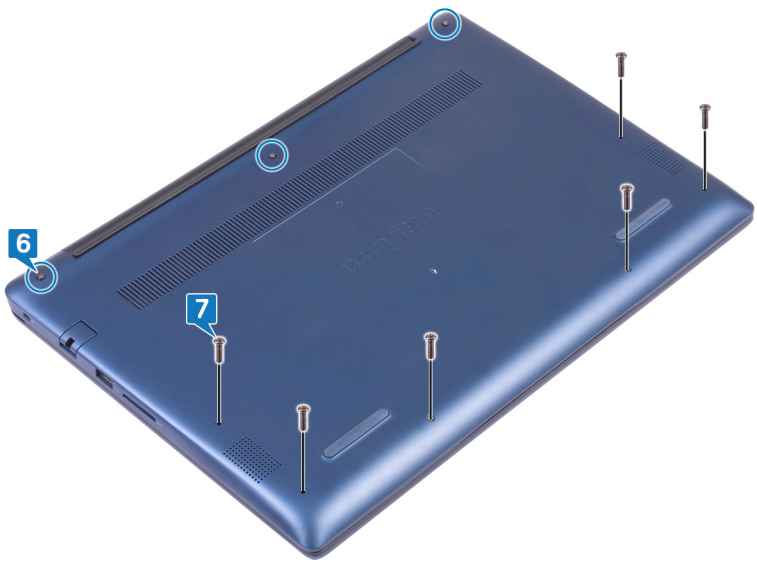


4 Align the base cover with the palm-rest and keyboard assembly.
5 Snap the base cover into place.



6 Tighten the three captive screws that secure the base cover to the palm-rest and keyboard assembly.

7 Replace the 6 screws (M2x7) that secure the base cover to the palm-rest and keyboard assembly.



Identifier	GUID-D9015C06-6CEE-42EA-9215-
Status	Released

Removing the battery

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.

Identifier	GUID-1D91EB9F-9870-493D-9225-E3E61A08C928
Status	Released

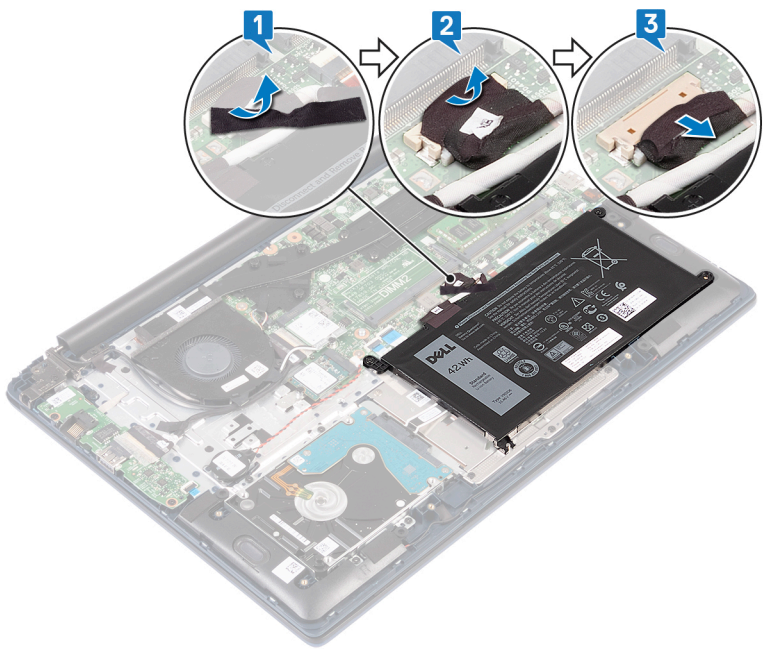
Prerequisites

Remove the base cover.

Identifier	GUID-322161AE-DB01-48BA-89DA-860795E4E3F7
Status	Released

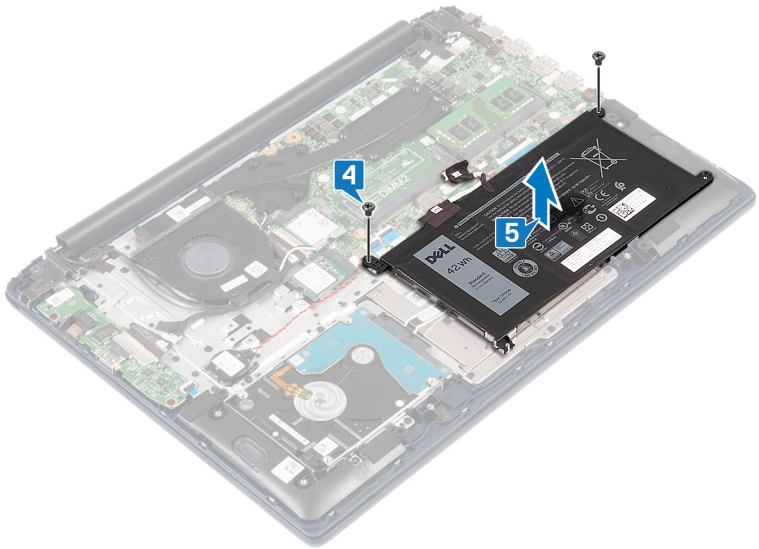
Procedure

1 Peel the tape that secures the battery cable to the system board.
2 Peel the tape that secures the battery cable connection to the system board.
3 Disconnect the battery cable from the system board.



4 Remove the two screws (M2x3) that secure the battery to the palm-rest and keyboard assembly.

5 Lift the battery off the palm-rest and keyboard assembly.



6 Press and hold the power button for five seconds to ground the computer and drain the flea power.

Identifier	GUID-E15EE482-44FD-4E71-91FC-
Status	Released

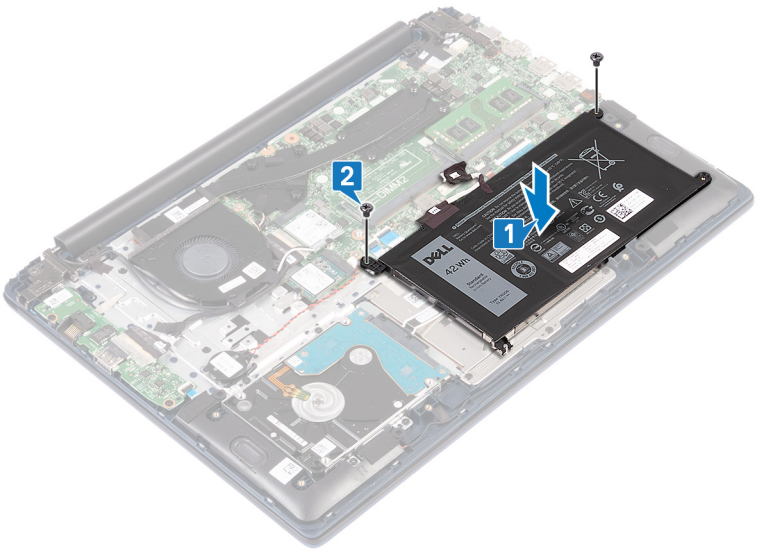
Replacing the battery

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.

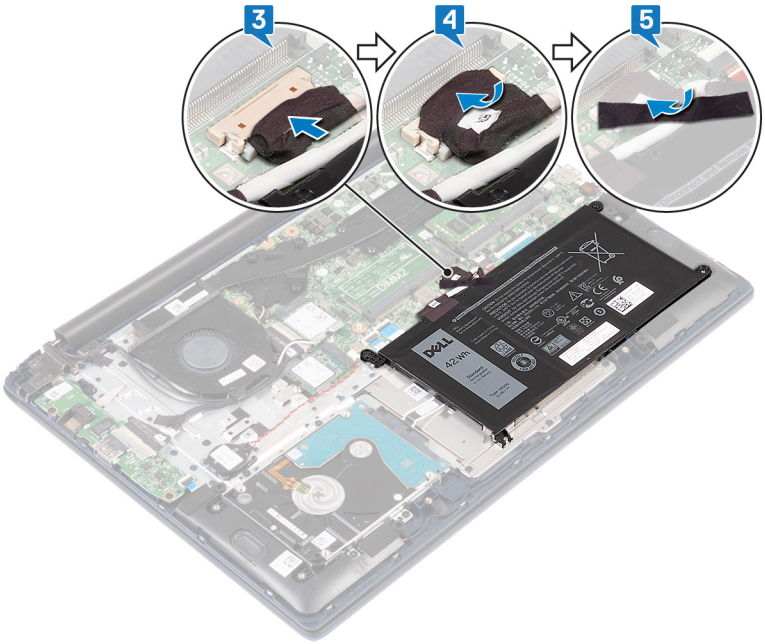
Identifier	GUID-EDC83D4B-DF04-46D4-B91F-7CAABD447F5D
Status	Released

Procedure

1 Align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly.
2 Replace the two screws (M2x3) that secure the battery to the palm-rest and keyboard assembly.



3 Connect the battery cable to the system board.
4 Adhere the tape that secures the battery cable connection to the system board.
5 Adhere the tape that secures the battery cable to the system board.



Identifier	GUID-E7C91A38-AAAB-4B1B-895E-F3264C634FA4
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-AAC0DC5A-1680-492D-804F
Status	Released

Removing the memory modules

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.

Identifier	GUID-5EDDCAAE-9F5F-475C-AC39-33AA7FABF15B
Status	Released

Prerequisites

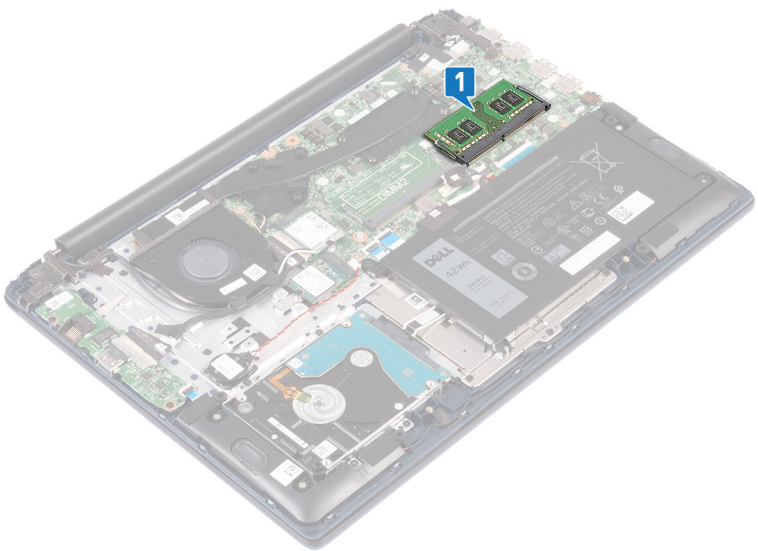
Remove the base cover.

Identifier	GUID-B1F32861-7073-4667-8708-9B72179A0387
Status	Released

Procedure

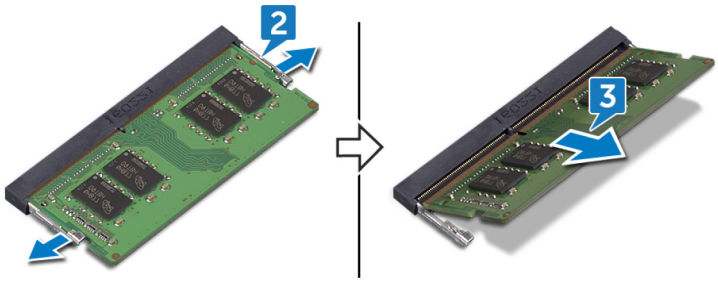
1 Locate the memory module.

NOTE: The number of memory modules may vary with the configuration that you ordered.



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 Remove the memory module from the memory-module slot.


2
3

Identifier	GUID-1F5023F5-9868-4AAF-A9F5-[illegible]
Status	Released

Replacing the memory modules

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Identifier	GUID-871D354C-2CA3-4704-88E9-27BA96219C8D
Status	Released

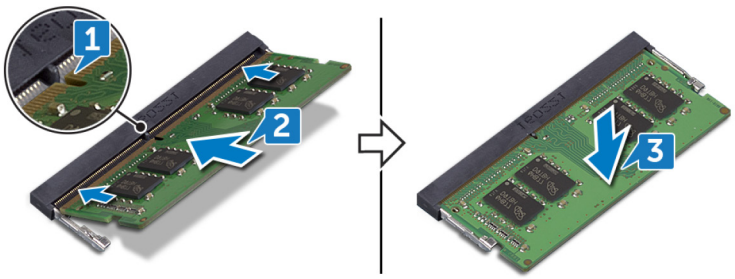
Procedure

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

NOTE: The number of memory modules may vary with the configuration that you ordered.

2 Slide the memory module firmly into the slot at an angle and 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.



Identifier	GUID-616A8334-6E20-451B-854B-D9A21EF769D8
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-4AF7A7F4-79DC-43F4-A4DF
Status	Released

Removing the wireless card

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Identifier	GUID-5382F40E-217A-421C-8D9B-DBCF36425F2F
Status	Released

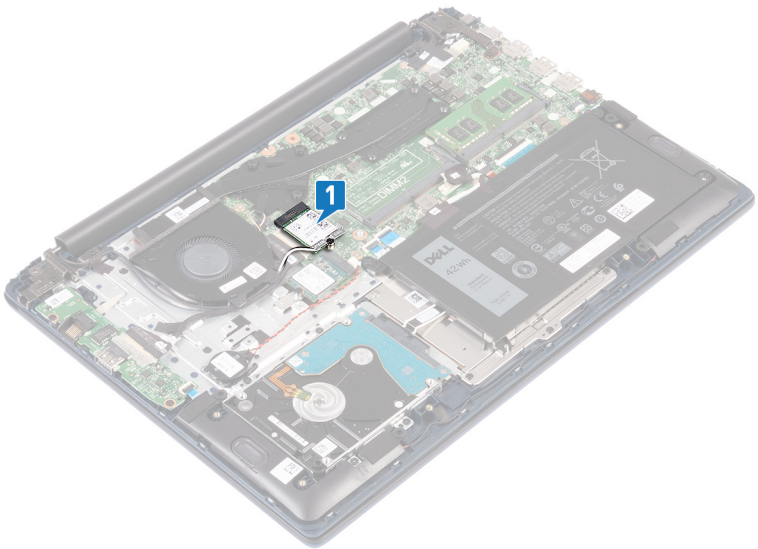
Prerequisites

Remove the base cover.

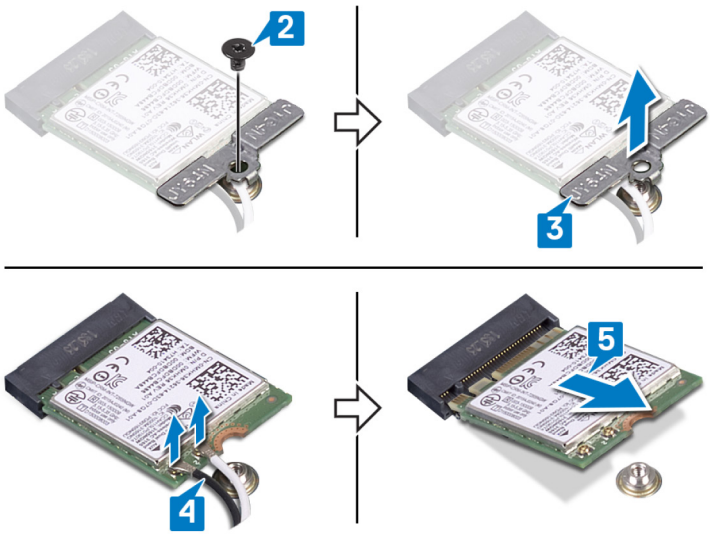
Identifier	GUID-8458AD59-E08C-466C-8711-70A721469520
Status	Released

Procedure

1 Locate the wireless card.



2 Remove the screw (M2x3) that secures the wireless-card bracket to the wireless card and the system board.
3 Remove the wireless-card bracket from the wireless card.
4 Using a plastic scribe, disconnect the antenna cables from the wireless card.
5 Slide and remove the wireless card from the wireless-card slot.


2
3

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5

Identifier	GUID-94E88AEC-6F12-4B0E-AA6A
Status	Released

Replacing the wireless card

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.

Identifier	GUID-18A0612B-ED43-403F-9091-CF1823843DB8
Status	Released

Procedure

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:

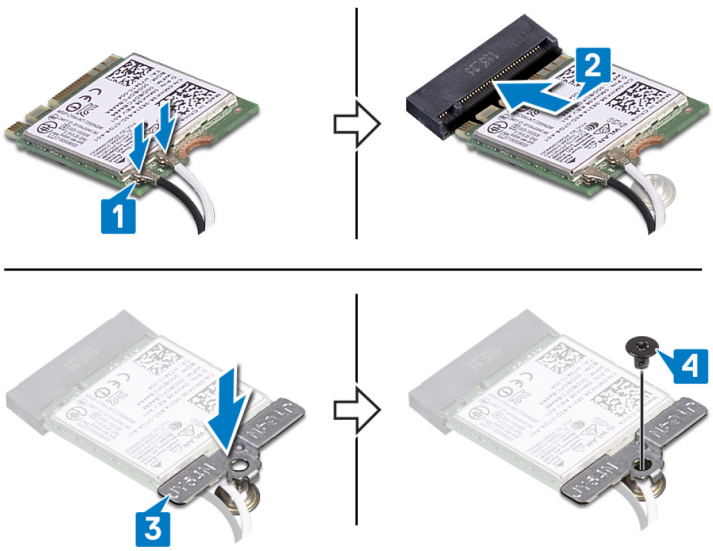
Table 2. Antenna-cable color scheme

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

2 Slide 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 the system board.

4 Replace the screw (M2x3) that secures the wireless-card bracket to the wireless card and the system board.



Identifier	GUID-0FE46778-D24D-4D1A-ABA3-97271F82267F
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-30EEBC49-DE3E-4C3F-8226
Status	Released

Removing the coin-cell battery

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: 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.

Identifier	GUID-1150EBF7-190B-4A2E-8059-0F1C08AEE27A
Status	Released

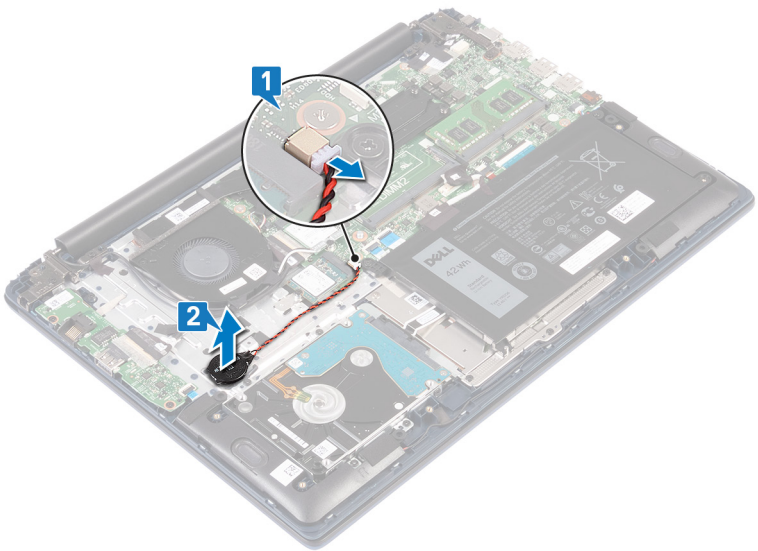
Prerequisites

Remove the base cover.

Identifier	GUID-012CD907-D445-443F-949E-64BC5DA1EBD7
Status	Released

Procedure

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



Identifier	GUID-5E22F4A0-F01F-4522-8155-E
Status	Released

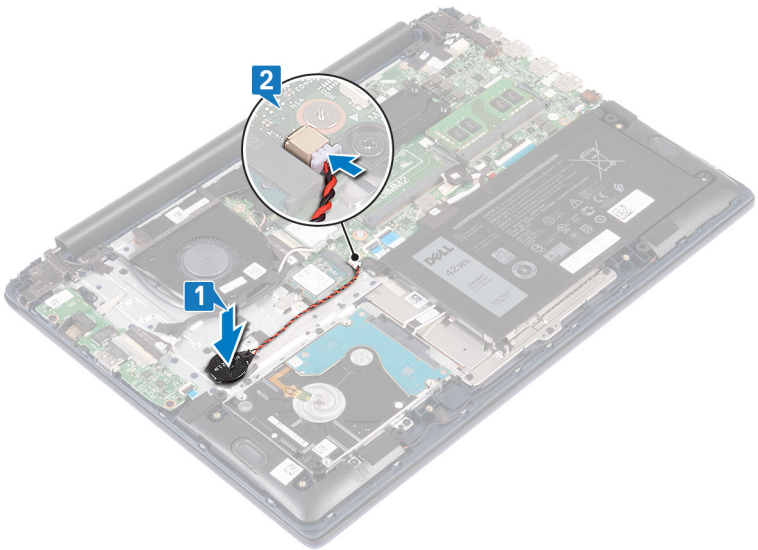
Replacing the coin-cell battery

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.

Identifier	GUID-381DD344-64CF-417B-AE0C-D4B6E6EAE6A9
Status	Released

Procedure

1 Adhere the coin-cell battery assembly to the palm-rest and keyboard assembly.
2 Connect the coin-cell battery to the system board.



Identifier	GUID-6D533483-42F6-4BE2-ADDF-C67D1B016ABE
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-FAA962E5-AD4D-4E85-BCA3
Status	Released

Removing 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.

Identifier	GUID-590FD151-5607-454F-B8DE-F38CF1D6CC81
Status	Released

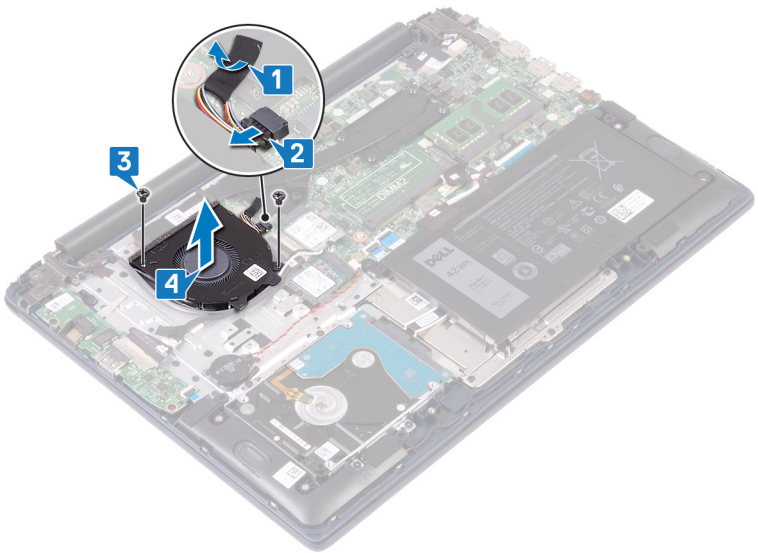
Prerequisites

Remove the base cover.

Identifier	GUID-03B810F6-A56B-45F7-B07D-46879A8F48E0
Status	Released

Procedure

1. Peel the tape off the heat sink.
2. Disconnect the fan cable from the system board. Note the cable routing and remove the fan cable and the antenna cable from the routing guides on the fan.
3. Remove the two screws (M2x3) that secure the fan to the palm-rest and keyboard assembly.
4. Lift the fan off the palm-rest and keyboard assembly.



Identifier	GUID-2596AFC0-F1E8-4A0E-A603-
Status	Released

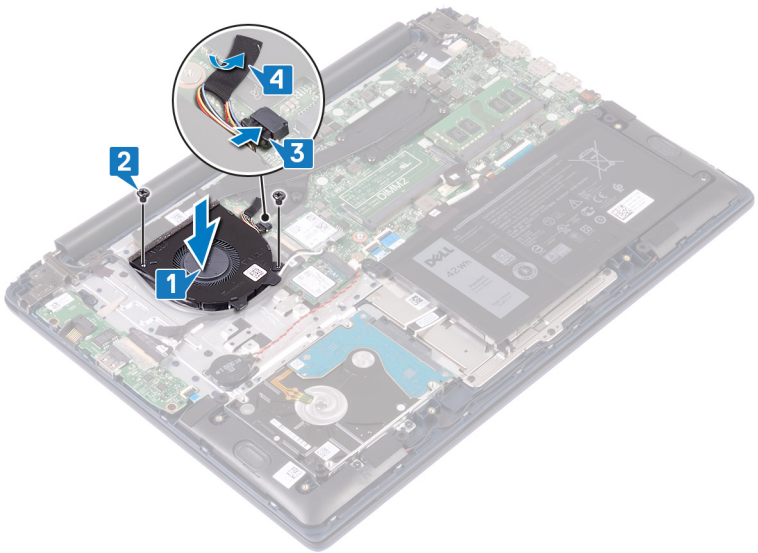
Replacing the fan

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.

Identifier	GUID-E00EE415-C55F-4F89-B88A-C283C2ACB9E0
Status	Released

Procedure

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



Identifier	GUID-CE25D2B6-7529-46B8-9400-69736F229BA6
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-EFFE3DA7-AFC7-4BB0-92C9
Status	Released

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.

Identifier	GUID-CD09EEA8-741A-4BAA-A575-6F939BF89EF0
Status	Released

Prerequisites

If you are removing the Intel Optane memory module (optional) from your computer, disable the Intel Optane memory so that all cached system data are moved from the Intel Optane memory module to the SATA drive. For more information about disabling the Intel Optane memory, see Disabling Intel Optane memory.

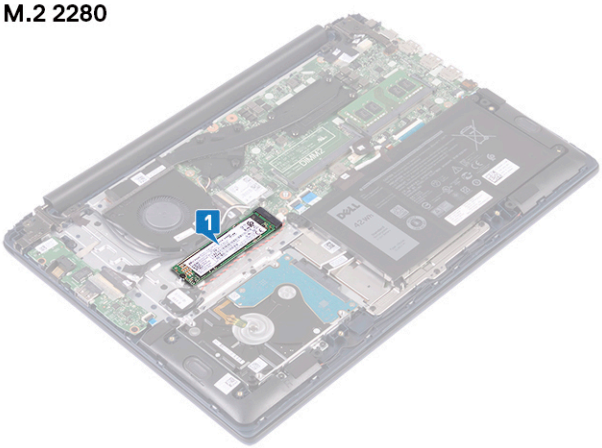
Remove the base cover.

Identifier	GUID-0EAC9E4B-7CBC-48CF-A394-5CFE1B2356EC
Status	Released

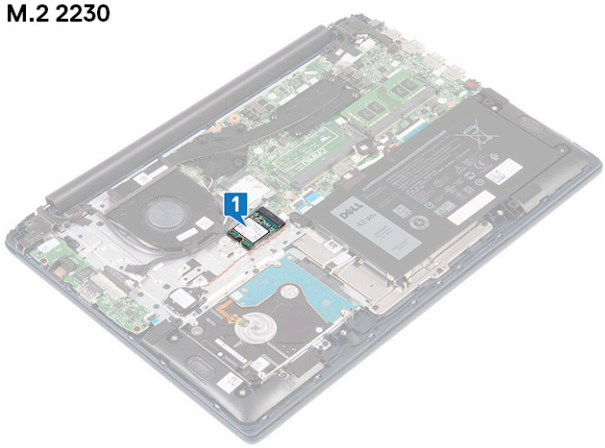
Procedure

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

M.2 2280



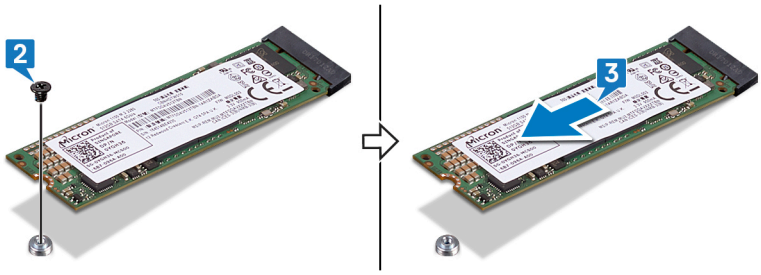
M.2 2230



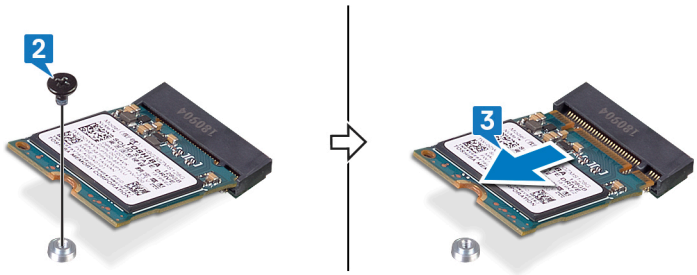
2 Remove the screw (M2x3) that secures the solid-state drive/Intel Optane memory module to the palm-rest and keyboard assembly.

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

M.2 2280



M.2 2230



Identifier	GUID-1876A74B-D56A-47F2-8EDF-
Status	Released

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.

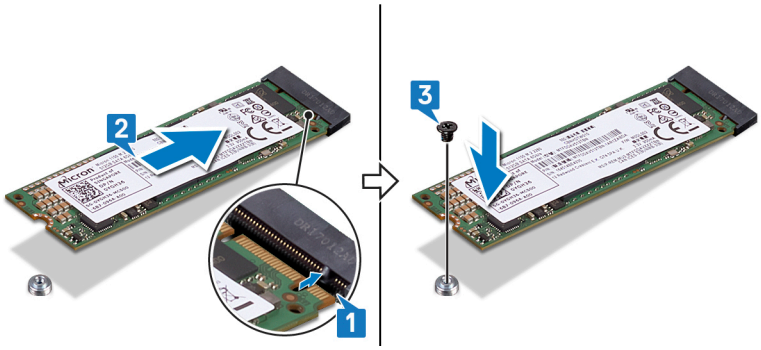
Identifier	GUID-B8436ECC-40E9-4C42-9B7A-2635E031538E
Status	Released

Procedure

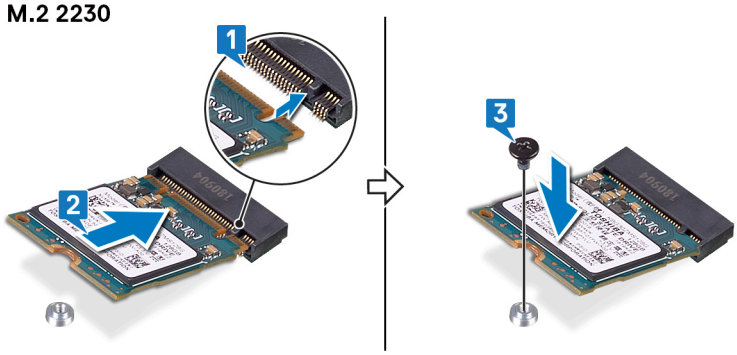
NOTE: See Procedure to move the screw mount to change the location of the screw mount, in case you are replacing the solid-state drive/Intel Optane memory module with another that has a different form factor.

1. Align the notch on the solid-state drive/Intel Optane memory module with the tab on the solid-state drive/Intel Optane memory slot.
2. Slide the solid-state drive/Intel Optane memory module firmly into the solid-state drive/Intel Optane memory module 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 and keyboard assembly.

M.2 2280



M.2 2230



Identifier	GUID-B4781574-3E37-4354-A362-9FDC3568F59B
Status	Released

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.

Identifier	GUID-82917794-28BE-4720-9921-B3F1CBCD16F8
Status	Released

Procedure to move the screw mount

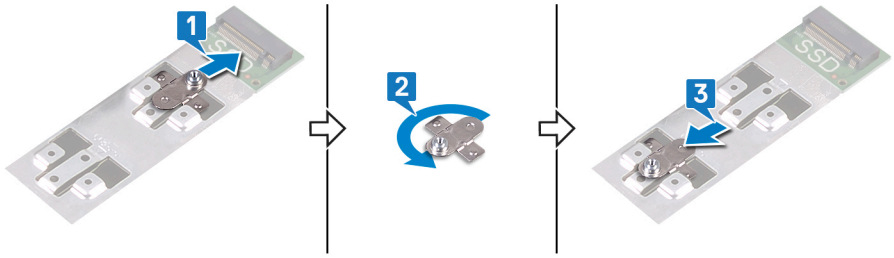
This computer supports two solid-state drive/Intel Optane memory module form factors:

- M.2 2230
- M.2 2280

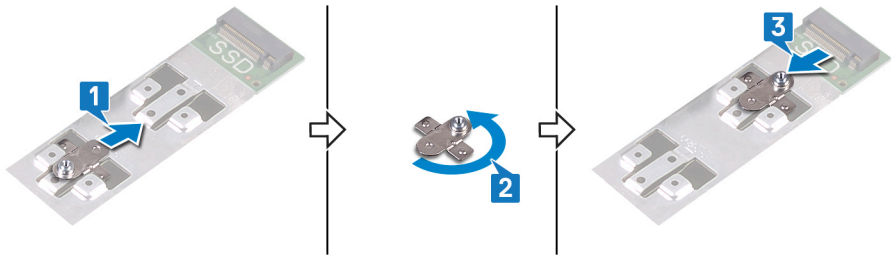
If you are replacing the solid-state drive/Intel Optane memory module with another that has a different form factor, perform the following procedure to move the screw mount to another location that accommodates the form factor.

1 Slide the screw mount out of the screw mount slot on the palm-rest and keyboard assembly.
2 Turn the screw mount 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

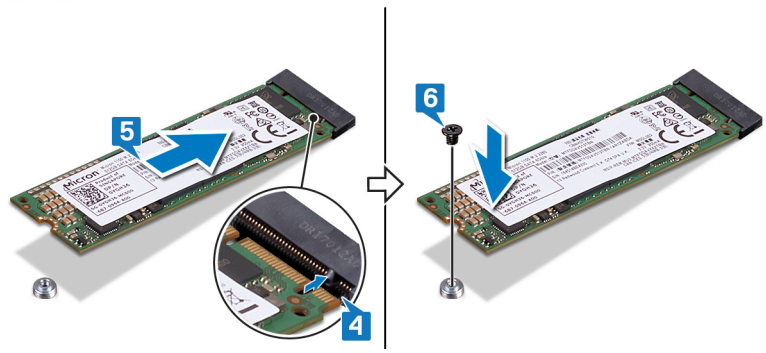


4 Align the notch on the solid-state drive/Intel Optane memory module with the tab on the solid-state drive/Intel Optane memory module slot.

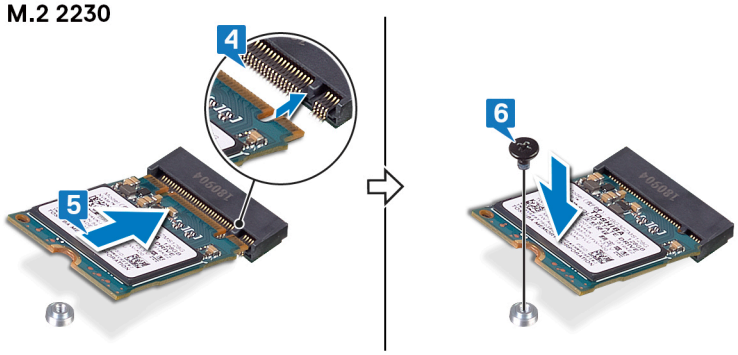
5 Slide the solid-state drive/Intel Optane memory module firmly into the solid-state drive/Intel Optane memory module slot at an angle.

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/Intel Optane memory module to the palm-rest and keyboard assembly.

M.2 2280



M.2 2230



Identifier	GUID-5DE1E07B-4633-4536-ACBF-
Status	Released

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.

Identifier	GUID-143C40EB-D9A9-4251-8A4D-CA9D4206D3A2
Status	Released

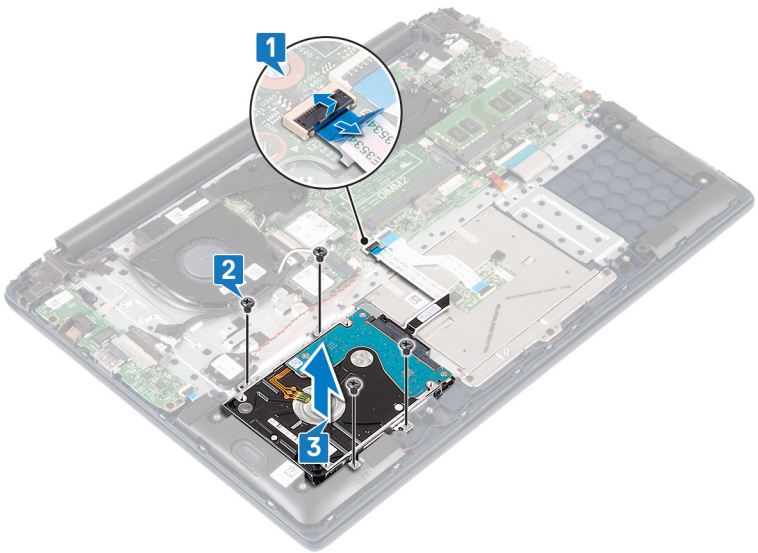
Prerequisites

1 Remove the base cover.
2 Remove the battery.

Identifier	GUID-36437EA0-620F-4FB6-A546-EE63686C69A6
Status	Released

Procedure

1 Remove the four screws (M2x3) that secure the hard-drive assembly to the palm-rest and keyboard assembly.
2 Lift the hard-drive assembly off the palm rest-and keyboard assembly.

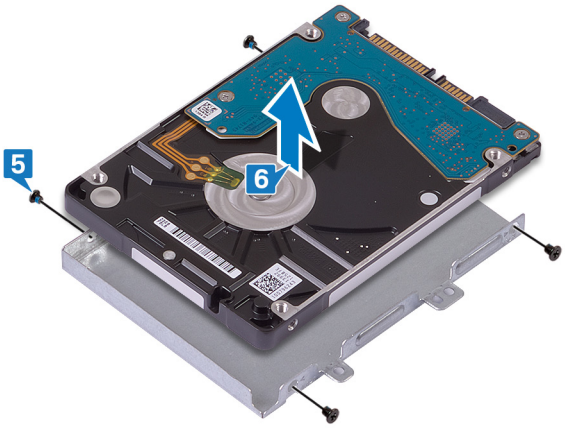


3 Disconnect the interposer from the hard-drive assembly.



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

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



Identifier	GUID-8D72BB77-0F8B-428E-A98E-
Status	Released

Replacing the hard drive

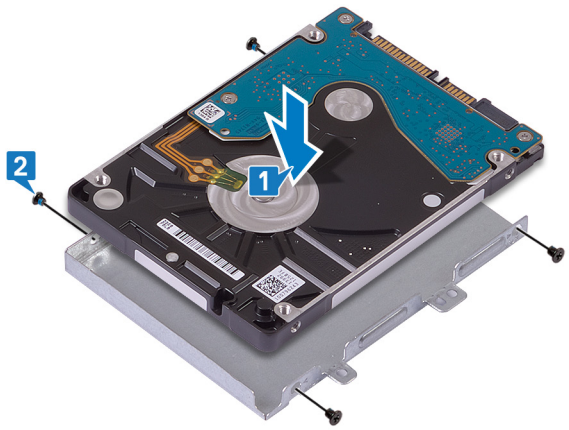
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

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

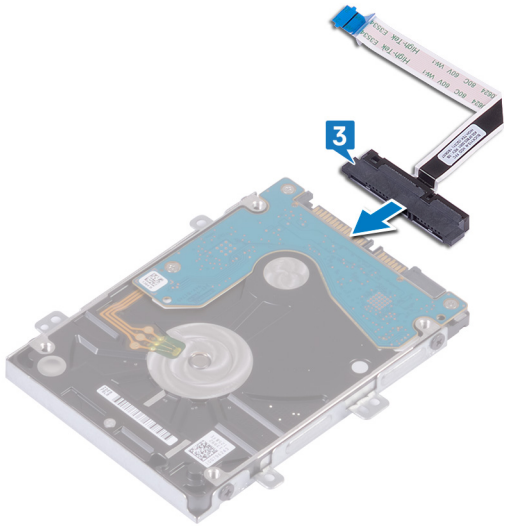
Identifier	GUID-858AEC90-746C-456C-B14D-50ED6CDA8E35
Status	Released

Procedure

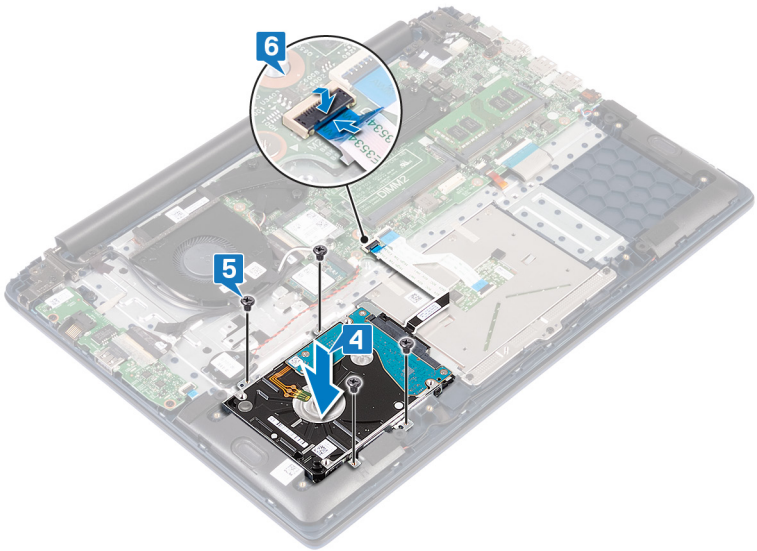
1 Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
2 Replace the four screws (M3x3) that secure the hard-drive bracket to the hard drive.



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 and keyboard assembly.
5 Replace the four screws (M2x3) that secure the hard-drive assembly to the palm-rest and keyboard assembly.
6 Slide the hard-drive cable into the connector on the system board and close the latch.



Identifier	GUID-540454ED-2454-499B-A2D9-110795B13265
Status	Released

Post-requisites

1 Replace the battery.
2 Replace the base cover.

Identifier	GUID-DC61C8F1-86D0-49DE-B8D8
Status	Released

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.

Identifier	GUID-08140AE5-7DA4-4221-974B-4E945A06BC06
Status	Released

Prerequisites

1 Remove the base cover.
2 Remove the fan.

Identifier	GUID-91252C7B-A452-4343-9B33-9C0073934F9B
Status	Released

Procedure

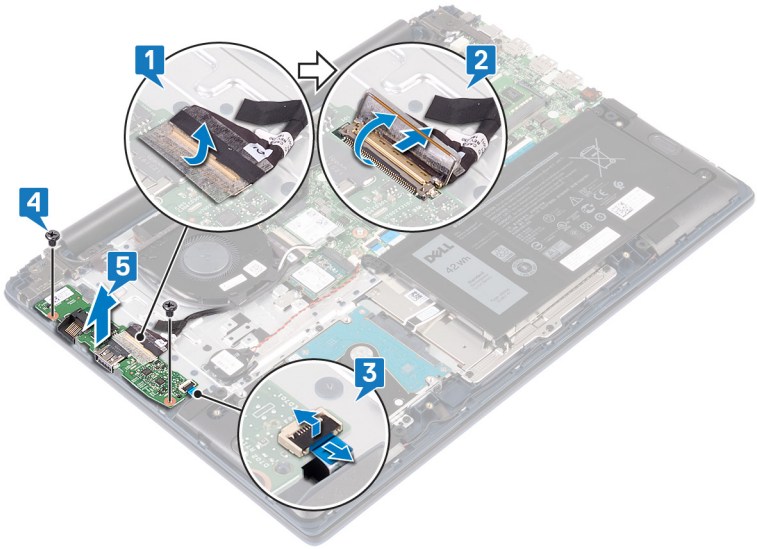
1 Peel the tape off the I/O-board connector.
2 Open the latch and disconnect the I/O-board cable from the I/O board.

NOTE: If necessary, use a plastic scribe to open the latch.

3 Disconnect the fingerprint reader cable from the I/O board.

NOTE: Applicable only to computers that are shipped with power button with fingerprint reader.

4 Remove the two screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
5 Lift the I/O board off the palm-rest and keyboard assembly.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Identifier	GUID-98F27B1C-9F09-48EC-83D7-
Status	Released

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.

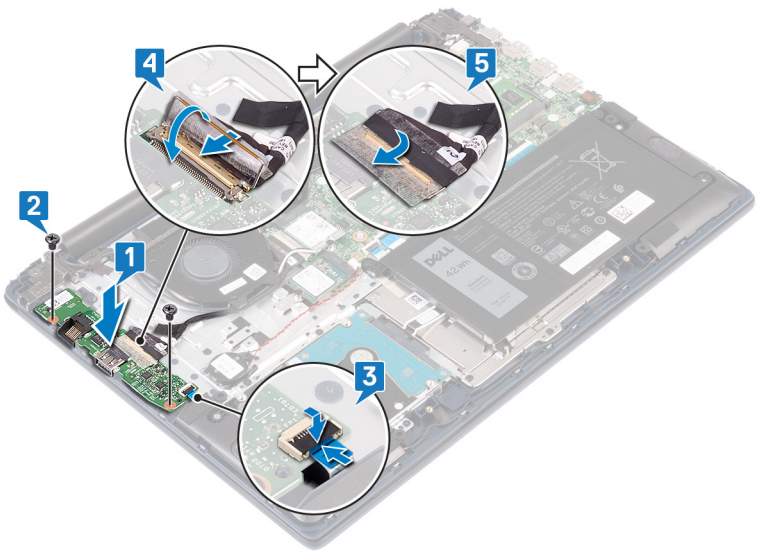
Identifier	GUID-983F9DD3-3BD8-43A9-AD20-92C38C4C3061
Status	Released

Procedure

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

NOTE: Applicable only to computers that are shipped with power button with fingerprint reader.

4 Adhere the tape to the I/O-board cable.
5 Connect the I/O-board cable to the I/O board and close the latch.



Identifier	GUID-8C7AC6C0-8DEA-485C-928B-A8BD78117D14
Status	Released

Post-requisites

1 Replace the fan.
2 Replace the base cover.

Identifier	GUID-8D2AE471-594B-46FC-808B-
Status	Released

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.

Identifier	GUID-8DCD2051-7D1E-417F-B772-987ECD2C96CA
Status	Released

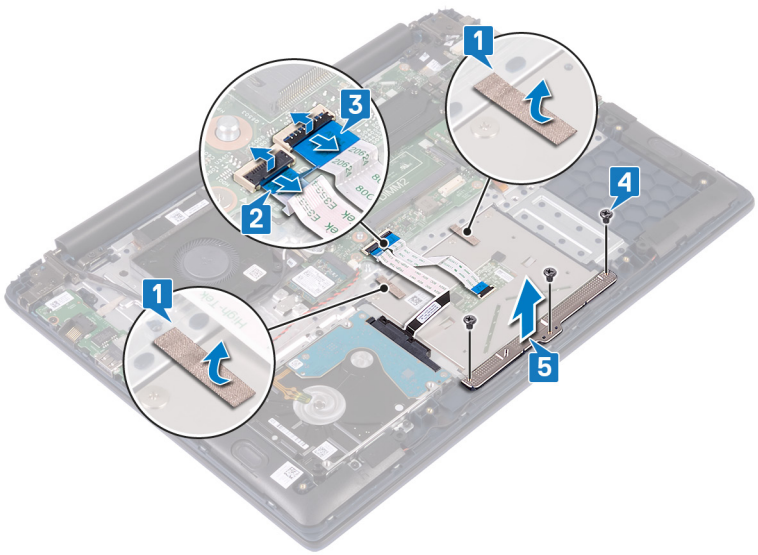
Prerequisites

1 Remove the base cover.
2 Remove the battery.

Identifier	GUID-30461449-F889-4A2A-8832-912C14D352B5
Status	Released

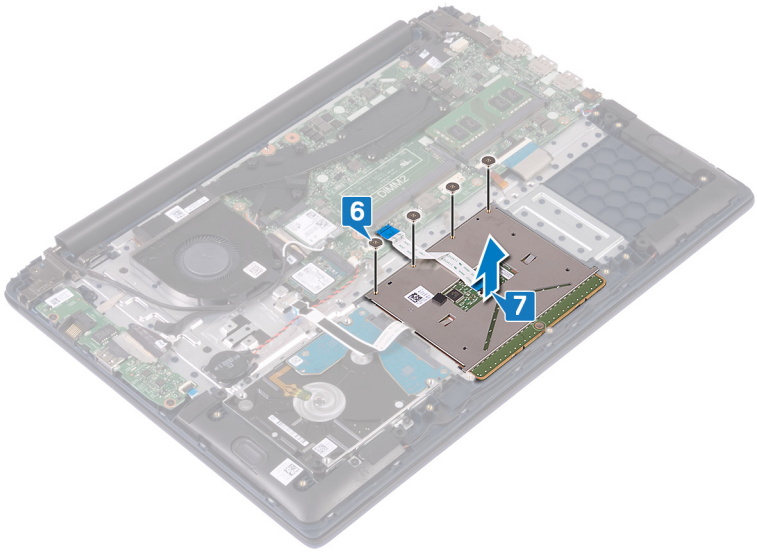
Procedure

1 Peel off the tapes that secure the touchpad to the palm-rest and keyboard assembly.
2 Open the latch and disconnect the hard-drive cable from the system board.
3 Open the latch and disconnect the touchpad cable from the system board.
4 Remove the three screws (M2x3) that secure the touchpad bracket to the palm-rest and keyboard assembly.
5 Lift the touchpad bracket off the palm-rest and keyboard assembly.



6 Remove the four screws (M2x2 Big Head) that secure the touchpad to the palm-rest and keyboard assembly.

7 Lift the touchpad off the palm-rest and keyboard assembly.



Identifier	GUID-B55423C5-03BB-46A2-9B5F-
Status	Released

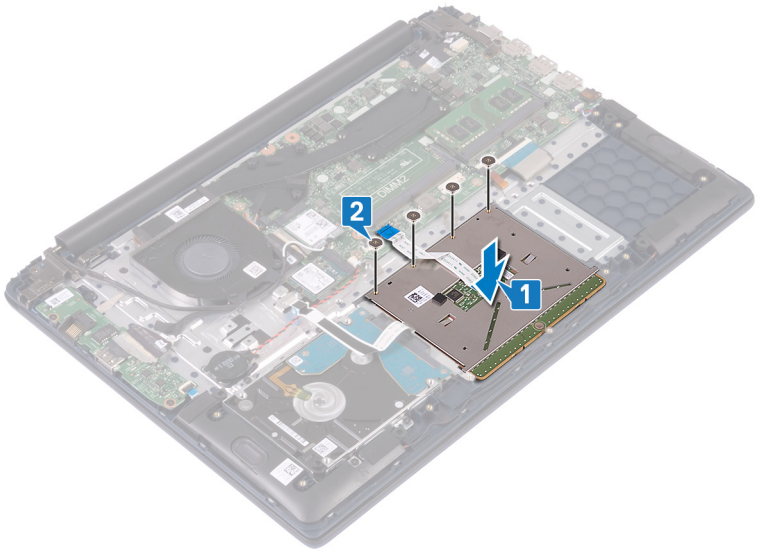
Replacing the touchpad

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.

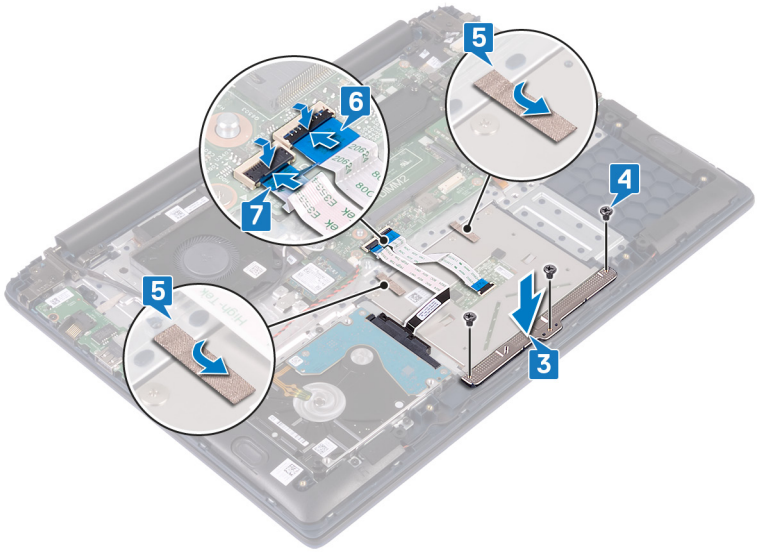
Identifier	GUID-B104E995-3A30-4F62-A1AD-975A2C618657
Status	Released

Procedure

1 Align the screw holes on the touchpad with the screw holes on the palm-rest and keyboard assembly.
2 Replace the four screws (M2x2 Big Head) that secure the touchpad to the palm-rest and keyboard assembly.



3 Align the screw holes on the touchpad bracket with the screw holes on the palm-rest and keyboard assembly.
4 Replace the three screws (M2x3) that secure the touchpad bracket to the palm-rest and keyboard assembly.
5 Adhere the tapes that secure the touchpad to the palm-rest and keyboard assembly.
6 Slide the touchpad cable into the connector on the system board and close the latch to secure the cable.
7 Slide the hard-drive cable into the connector on the system board and close the latch to secure the cable.



Identifier	GUID-14FE7459-8875-4EA0-8F24-EE41108CDBD8
Status	Released

Post-requisites

1 Replace the battery.
2 Replace the base cover.

Identifier	GUID-BF7F1ECA-BC62-4949-B1BE
Status	Released

Removing the speakers

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.

Identifier	GUID-AD8B3567-7E0F-4FCF-9C89-4C7ADF8D0843
Status	Released

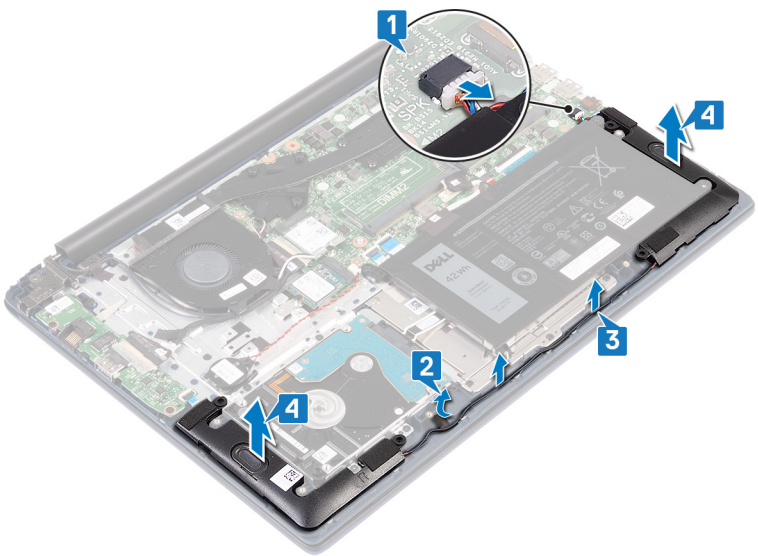
Prerequisites

1 Remove the base cover.
2 Remove the battery.

Identifier	GUID-6CF408DA-B2F7-4BBC-8026-6BB797E6711E
Status	Released

Procedure

1 Disconnect the speaker cable from the system board.
2 Peel the tape off the touchpad bracket.
3 Remove the speaker cable from the routing guides on the palm-rest and keyboard assembly.
4 Remove the speakers from the alignment posts and lift the speakers off the palm-rest and keyboard assembly.



Identifier	GUID-40DC76F7-B3EC-450A-848E-
Status	Released

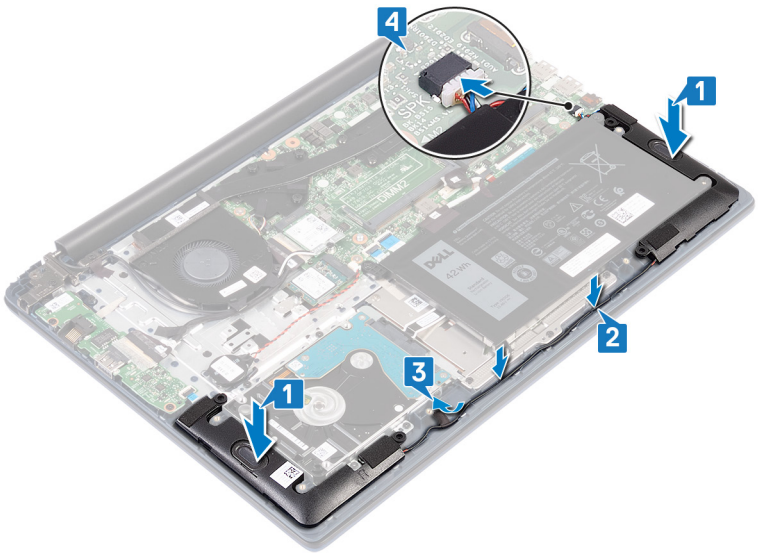
Replacing the speakers

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.

Identifier	GUID-5F8C8A76-4A5A-4B64-8651-2147B3D4E1B7
Status	Released

Procedure

1 Using the alignment posts, align and place the speakers on the palm-rest and keyboard assembly.
2 Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.
3 Adhere the tape to the touchpad bracket.
4 Connect the speaker cable to the system board.



Identifier	GUID-4DE06D76-F618-427D-A93D-AF0744DB57D3
Status	Released

Post-requisites

1 Replace the battery.
2 Replace the base cover.

Identifier	GUID-3AE08A92-614C-4411-90FB-
Status	Released

Removing 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.

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.

Identifier	GUID-525A1450-B0C5-46E5-9D06-61696A4BC26D
Status	Released

Prerequisites

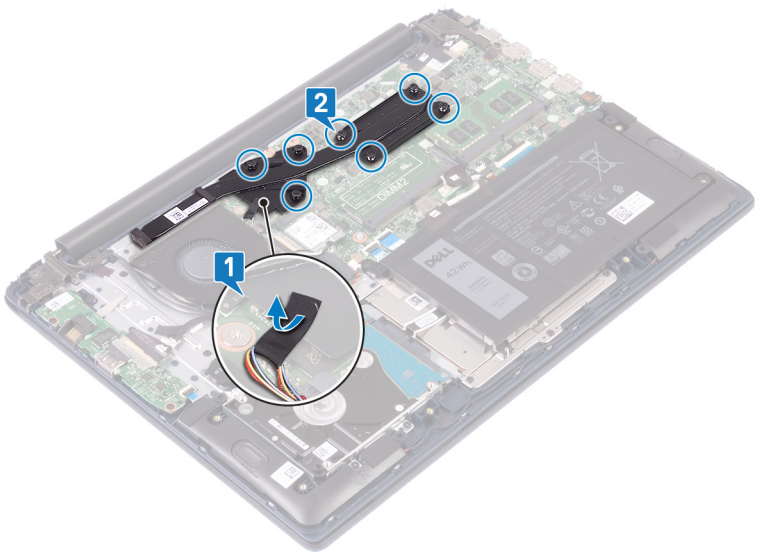
Remove the base cover.

Identifier	GUID-ABFECA1C-1EE7-4363-AF4D-647D59CF85A9
Status	Released

Procedure

1 Peel the tape off the heat sink.

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



3 Lift the heat sink off the system board.

Identifier	GUID-69332260-F504-4C70-A535-1
Status	Released

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.

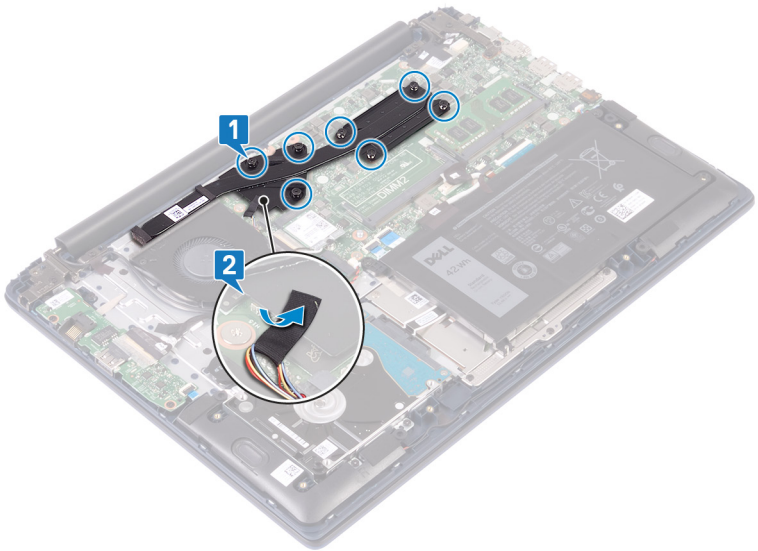
Identifier	GUID-D615E472-5820-4F2F-ADE4-EE3577B499DC
Status	Released

Procedure

1 Align the screw holes on the heat sink with the screw holes on the system board. In reverse sequential order (as indicated on the heat sink), tighten the seven captive screws that secure the heat sink to the system board.

NOTE: The number of captive screws may vary with the computer configuration.

2 Adhere the black tab to the heat sink.



Identifier	GUID-0575DE45-CEA6-4C00-8787-8FD3B4552272
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-AB1F153B-621B-42FC-89BE
Status	Released

Removing the display assembly

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.

Identifier	GUID-0D38E3DF-34E0-44D9-B706-B60CB9471A80
Status	Released

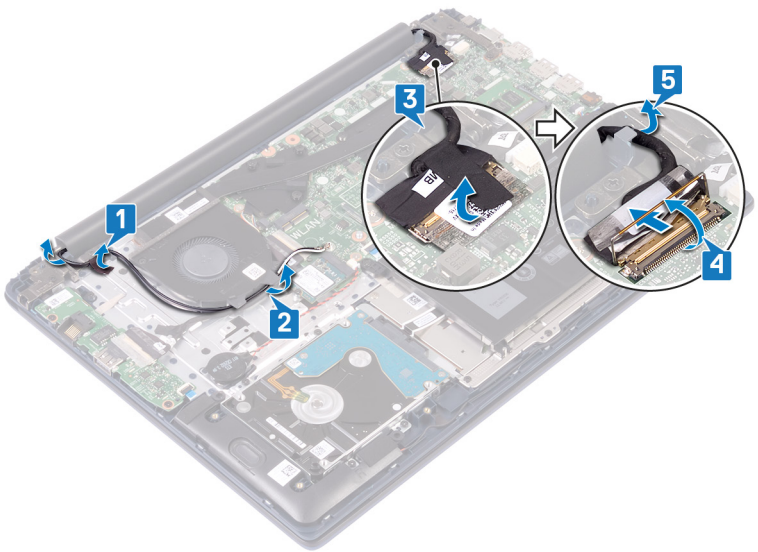
Prerequisites

1 Remove the base cover.
2 Remove the wireless card.

Identifier	GUID-0F15570E-8EF0-485C-865F-FF4B3F8D5AAF
Status	Released

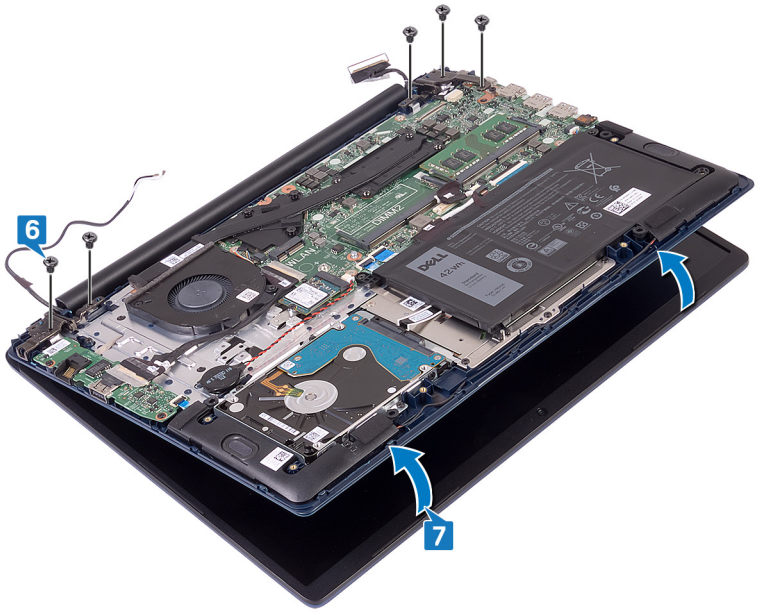
Procedure

1 Peel off the tape that secures the I/O-board cable to the I/O board.
2 Note the routing and remove the I/O-board cable from the routing guides.
3 Peel off the tape that secures the display cable to the display cable connector.
4 Open the latch and disconnect the display cable from the system board.
5 Remove the display cable from the routing guide.

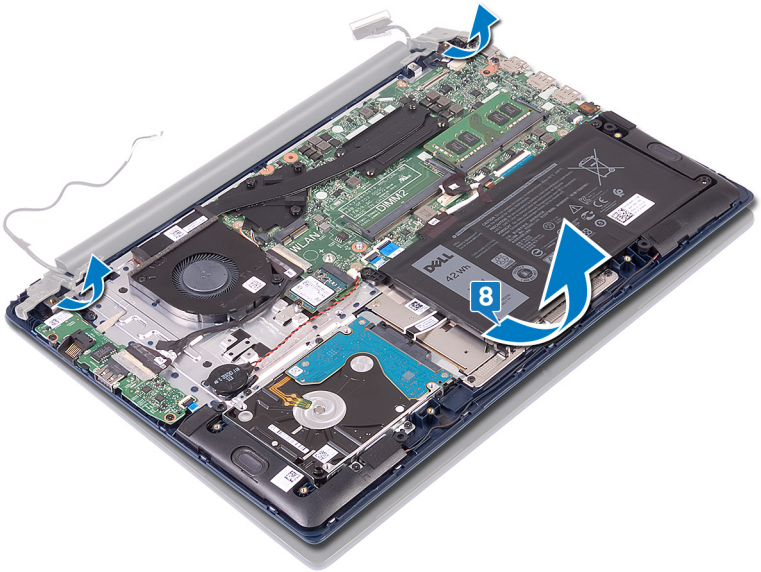


6 Remove the five screws (M2.5x5) that secure the display hinges to the palm-rest and keyboard assembly.

7 Open the display at an angle of 90 degrees.



8 Lift the display assembly off the palm-rest and keyboard assembly.



Identifier	GUID-2DF70EB1-9D26-4051-8B7C-
Status	Released

Replacing the display assembly

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.

Identifier	GUID-1BE8180E-FF14-4810-8B32-31F1F2F9DF3B
Status	Released

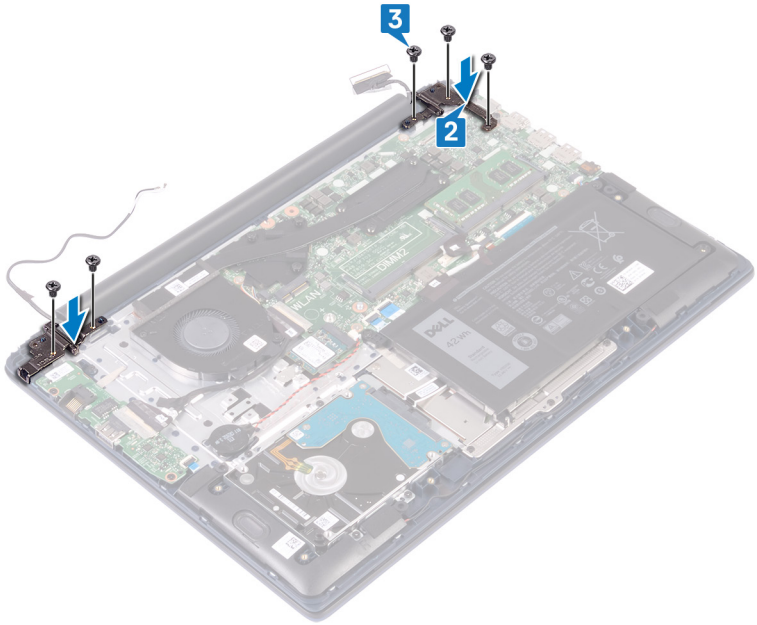
Procedure

1 Slide the palm-rest and keyboard assembly at an angle under the hinges on the display assembly.

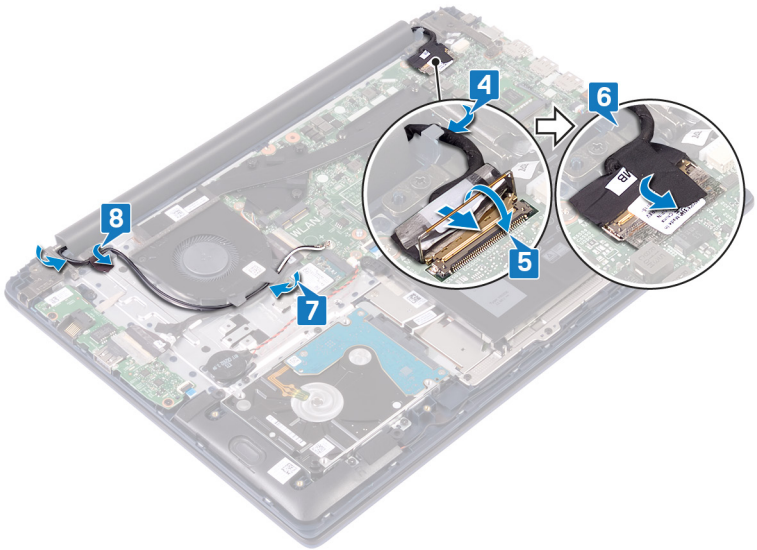


2 Align the screw holes on the display hinges with the screw holes on the palm-rest and keyboard assembly.

3 Replace the five screws (M2.5x5) that secure the display assembly to the palm-rest and keyboard assembly.



4 Route the display cable under the routing guide.
5 Slide the display cable into the connector on the system board and close the latch to secure the cable.
6 Adhere the tape to secure the display cable to the system board.
7 Route the I/O-board cable through the routing guides on the fan.
8 Adhere the tape to secure the I/O-board cable to the palm-rest and keyboard assembly.



Identifier	GUID-16D53CDB-5B64-4F42-A02D-7C206B9C02C0
Status	Released

Post-requisites

1 Replace the wireless card.
2 Replace the base cover.

Identifier	GUID-43423BFB-7BAA-4C7E-BA7A
Status	Released

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.

Identifier	GUID-665125D1-C891-48B2-B666-4C11701A860A
Status	Released

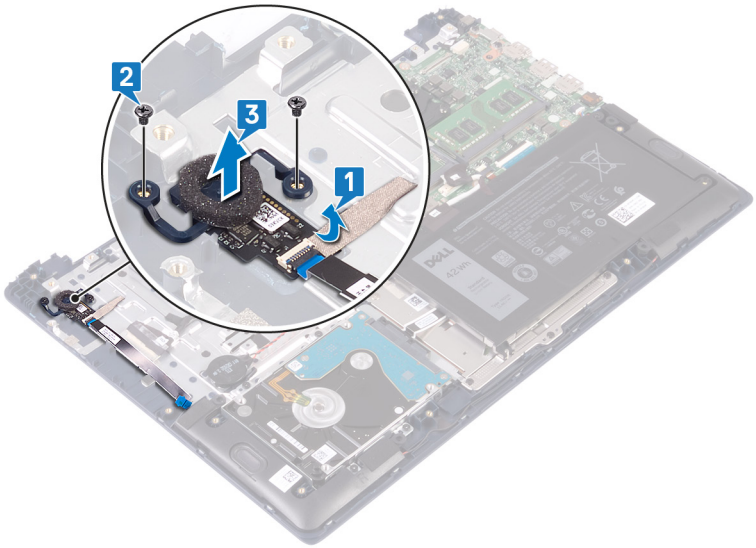
Prerequisites

1 Remove the base cover.
2 Remove the fan.
3 Remove the display assembly.
4 Remove the I/O board.

Identifier	GUID-C981D222-1652-4C94-BAE6-DA5FE755FECE
Status	Released

Procedure

1 Peel the tape off the palm-rest and keyboard assembly.
2 Remove the two screws (M2x3) that secure the power-button with fingerprint reader to the palm-rest and keyboard assembly.
3 Lift the fingerprint-reader board off the palm-rest and keyboard assembly.


2
3
1

Identifier	GUID-0C3EE813-46D4-4A46-9435-[illegible]
Status	Released

Replacing the power button with fingerprint reader

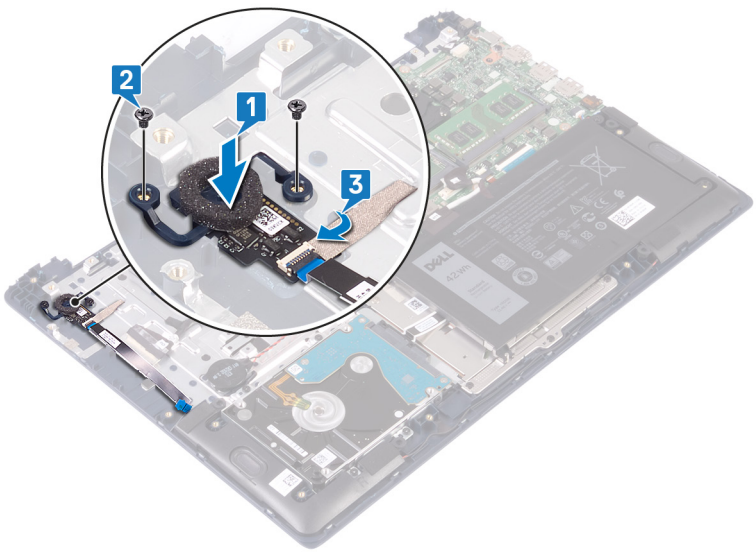
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

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

Identifier	GUID-AA037B33-D477-473F-92CE-8986165D3F64
Status	Released

Procedure

1 Align the screw holes on the power button with fingerprint reader with the screw holes on the palm-rest and keyboard assembly.
2 Replace the two screws (M2x3) that secure the power button with fingerprint reader to the palm-rest and keyboard assembly.
3 Adhere the fingerprint-reader board to the palm-rest and keyboard assembly.



Identifier	GUID-F553B2B0-358D-423B-B37A-D40A94B19B7A
Status	Released

Post-requisites

1 Replace the I/O board.
2 Replace the display assembly.
3 Replace the fan.
4 Replace the base cover.

Identifier	GUID-35D5032D-9652-403C-9A8A-
Status	Released

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.

Identifier	GUID-8F340A7E-C63A-4050-9582-BE0E0AA2A551
Status	Released

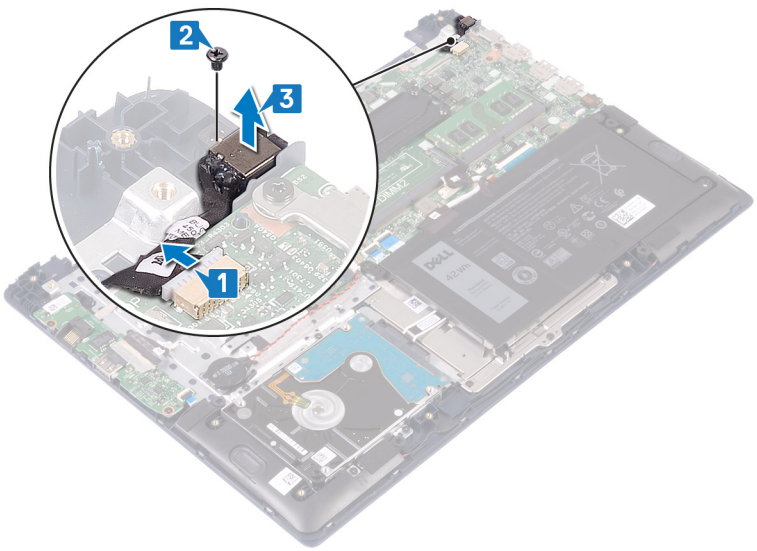
Prerequisites

Remove the base cover.

Identifier	GUID-D892C09B-EEE9-4AE9-8A56-51628588E6A7
Status	Released

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 and keyboard assembly.
3 Lift the power-adapter port along with the cable off the palm-rest and keyboard assembly.



Identifier	GUID-A99140DB-7AF3-4218-B305-
Status	Released

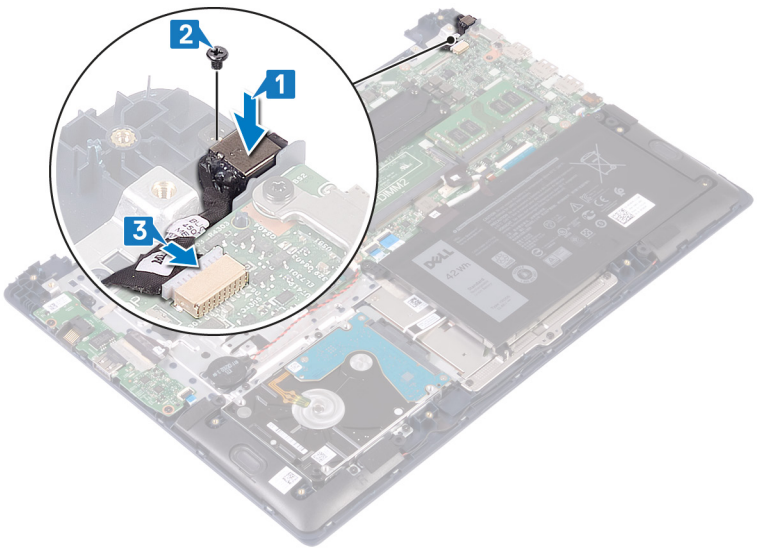
Replacing the power-adapter port

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.

Identifier	GUID-463CABFA-650C-4870-9F8D-445BE2521995
Status	Released

Procedure

1 Align the screw hole on the power-adapter port with the screw hole on the palm-rest and keyboard assembly.
2 Replace the screw (M2x3)that secures the power-adapter port to the palm-rest and keyboard assembly.
3 Connect the power-adapter port cable to the system board.



Identifier	GUID-CFD9A9C7-C9DF-4E88-AE74-95F849AA2CCB
Status	Released

Post-requisites

Replace the base cover.

Identifier	GUID-B54497E8-5AD5-4FF9-AD4A
Status	Released

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.

Identifier	GUID-2118AB63-935B-4B10-BD81-0A077EBEA48C
Status	Released

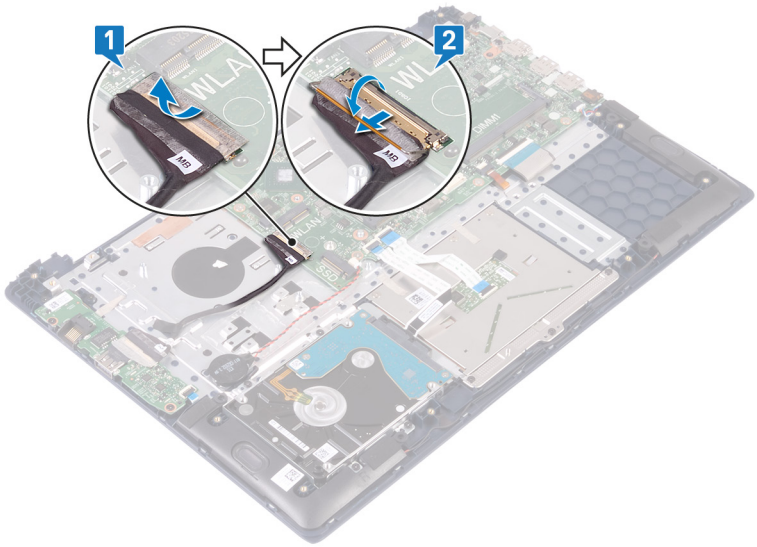
Prerequisites

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

Identifier	GUID-8E6C4AB8-7C99-4A48-9004-AF1D9602BF20
Status	Released

Procedure

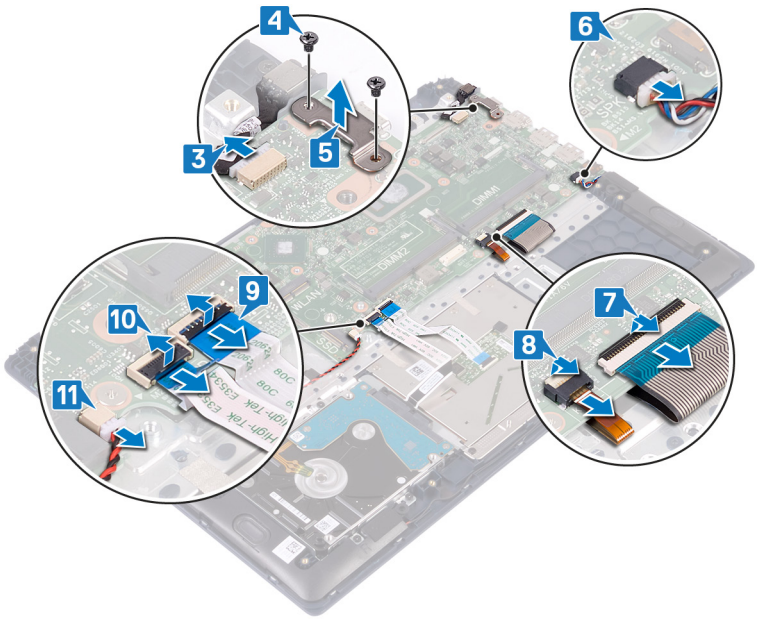
1 Peel the tape off the I/O-board connector.
2 Open the latch and disconnect the I/O-board cable from the system board.



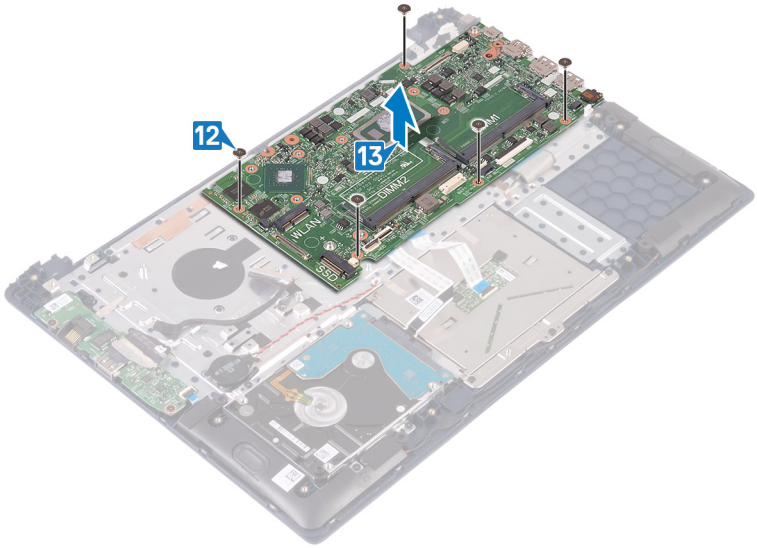
3 Disconnect the power-adapter port cable from the system board.
4 Remove the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
5 Lift the USB Type-C port bracket off the system board.
6 Disconnect the speaker cable from the system board.
7 Open the latch and disconnect the keyboard cable from the system board.
8 Open the latch and disconnect the keyboard-backlight cable (optional) from the system board.

NOTE: Applicable only if your computer is shipped with a backlit keyboard.

9 Open the latch and disconnect the touchpad cable from the system board.
10 Open the latch and disconnect the hard-drive cable from the system board.
11 Disconnect the coin-cell battery cable from the system board.



12 Remove the five screws (M2x2 Big Head) that secure the system board to the palm-rest and keyboard assembly.
13 Lift the system board off the palm-rest and keyboard assembly.


12
13
DIMM2
WLAN
SSD

Identifier	GUID-67274E98-E2F1-4B7B-A903-
Status	Released

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.

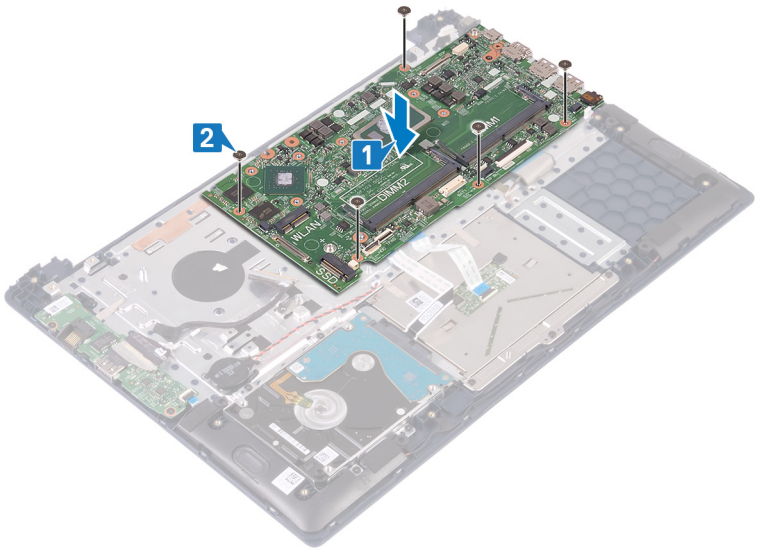
NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Identifier	GUID-F4525D25-9D3E-4FC5-B502-890A00755F33
Status	Released

Procedure

CAUTION: To avoid damaging the system board, ensure that no cables are placed under it.

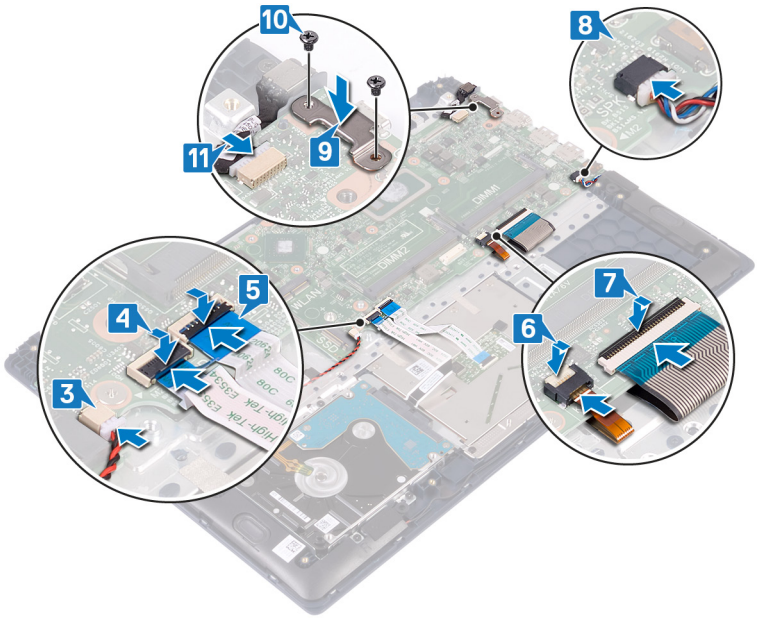
1 Align the screw holes on the system board with the screw holes on the palm-rest and keyboard assembly.
2 Replace the five screws (M2x2 Big Head) that secure the system board to the palm-rest and keyboard assembly.



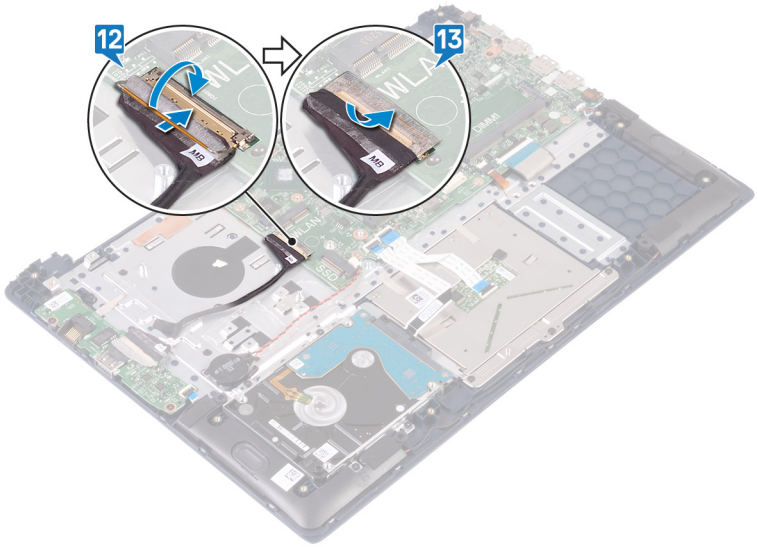
3 Slide the coin-cell battery cable into the connector on the system board and close the latch to secure the cable.
4 Slide the hard-drive cable into the connector on the system board and close the latch to secure the cable.
5 Slide the touchpad cable into the connector on the system board and close the latch to secure the cable.
6 Slide the keyboard-backlight cable (optional) into the connector on the system board and close the latch to secure the cable.

NOTE: Applicable only if your computer is shipped with a backlit keyboard.

7 Slide the keyboard cable into the connector on the system board and close the latch to secure the cable.
8 Connect the speaker cable to the system board.
9 Align the screw holes on the USB Type-C port bracket with the screw holes on the system board.
10 Replace the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
11 Connect the power-adapter port cable to the system board.



12 Connect the I/O cable to the system board and close the latch.
13 Adhere the tape that secures the I/O cable to the system board.



Identifier	**GUID-EC1A9597-9714-4F74-99EF-FD03C3719814**
Status	**Released**

Post-requisites

1 Replace the heat sink.
2 Replace the solid-state drive/Intel Optane memory module.
3 Replace the fan.

4 Replace the wireless card.
5 Replace the memory modules.
6 Replace the battery.
7 Replace the base cover.

Identifier	GUID-631184FE-18D9-4002-8F9F-D
Status	Released

Removing the palm-rest and keyboard assembly

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.

Identifier	GUID-AF63D982-ECBD-41B1-857A-D253608E1D98
Status	Released

Prerequisites

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

Identifier	GUID-F9F567BC-D818-4002-B6F0-C3CD79787D49
Status	Released

Procedure

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



Identifier	GUID-A7F798E1-C24C-44A0-9D6E-
Status	Released

Replacing the palm-rest and keyboard assembly

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.

Identifier	GUID-131F66D4-7F59-48E7-9387-F89138DA1179
Status	Released

Procedure

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

Identifier	GUID-EC5EDB69-C162-4F7D-85B3-A17BBE15DD54
Status	Released

Post-requisites

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

Identifier	GUID-B7285CF1-FC18-4DE7-8A89-
Status	Released

Device drivers

Identifier	GUID-C959B142-CF42-4306-A9EA-A640C509AB98
Status	Released

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.

Identifier	GUID-925A39C4-0B26-40F8-9404-94B0BFCC4742
Status	Released

Video drivers

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

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

Identifier	GUID-43531ABB-B77D-45B5-AFBA-B90BDF782CFC
Status	Released

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.

Identifier	GUID-B021278B-5FB5-429E-B0B5-BF580C34D140
Status	Released

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.

Identifier	GUID-E13FC788-9CE7-4370-AFF0-51C6169ADAC3
Status	Released

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.

Identifier	GUID-543661C6-4009-4F1B-BB4F-6CF5FF28149D
Status	Released

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.

Identifier	GUID-4D6759B1-4017-4F54-87E6-9
Status	Released

System setup

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

Identifier	GUID-C50BED7F-226B-4768-AB61-9725153DF132
Status	Released

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.

Identifier	GUID-7A7EB30A-4A48-422B-AE30-B8DC236A1790
Status	Released

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.

Keys	Navigation
Tab	Moves to the next focus area. **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.

Identifier	GUID-E8E05C46-BC9D-4CF1-AC84-34B87FDCCFB7
Status	Released

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.

Identifier	GUID-1432A924-49E9-4080-961D-2AFBDAF42039
Status	Released

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.

Identifier	GUID-2BFF5CD9-699A-403F-A761-CDC191A7F33E
Status	Released

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	
BIOS Version	Display the BIOS version number.
Service Tag	Display the Service Tag of the computer.
Asset Tag	Display the Asset Tag of the computer.

General	
Ownership Tag	Display the Ownership Tag of the computer.
Manufacture Date	Display the manufacture date of the computer.
Ownership Date	Display the ownership date of the computer.
Express Service Code	Display the express service code of the computer.
Memory Information	
Memory Installed	Display the total computer memory installed.
Memory Available	Display the total computer memory available.
Memory Speed	Display the memory speed.
Memory Channel Mode	Display single or dual channel mode.
Memory Technology	Display the technology used for the memory.
DIMM A Size	Display the DIMM A memory size.
DIMM B Size	Display the DIMM B memory size.
Processor Information	
Processor Type	Display the processor type.
Core Count	Display the number of cores on the processor.
Processor ID	Display the processor identification code.
Current Clock Speed	Display the current processor clock speed.
Minimum Clock Speed	Display the minimum processor clock speed.
Maximum Clock Speed	Display the maximum processor clock speed.
Processor L2 Cache	Display the processor L2 Cache size.
Processor L3 Cache	Display the processor L3 Cache size.
HT Capable	Display whether the processor is HyperThreading (HT) capable.
64-Bit Technology	Display whether 64-bit technology is used.
Device Information	
SATA-0	Display the SATA-0 device information of the computer.
SATA-2	Display the SATA-2 device information of the computer.
M.2 PCIe SSD-0	Display the M.2 PCIe SSD device information of the computer.
LOM MAC Address	Display the LAN On Motherboard (LOM) MAC address of the computer.
Video Controller	Display the video controller type of the computer.
dGPU Video Controller	Display the discrete graphics information of the computer.
Video BIOS Version	Display the video BIOS version of the computer.
Video Memory	Display the video memory information of the computer.
Panel Type	Display the Panel Type of the computer.
Native Resolution	Display the native resolution of the computer.
Audio Controller	Display the audio controller information of the computer.
Wi-Fi Device	Display the wireless device information of the computer.
Bluetooth Device	Display the Bluetooth device information of the computer.
Battery Information	Display the battery information of the computer.
Boot Sequence	

General	
Boot Sequence	Display the boot sequence.
Boot List Option	Display the available boot options.
Advanced Boot Options	
Enable Legacy Option ROMs	Enable or disable the Legacy Option ROMs.
UEFI Boot Path Security	Control the prompt for the user to enter the Admin password (if set) when booting a UEFI boot path from the F12 Boot Menu.
Date/Time	Display 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	
Integrated NIC	Control the on-board LAN controller.
Enable UEFI Network Stack	Enable or disable UEFI Network Stack.
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 Self-Monitoring, Analysis, and Reporting Technology (SMART) 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.
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	Select the operating mode of the keyboard illumination feature.
Keyboard Backlight Timeout on AC	Select the timeout value for the keyboard backlight when an AC adapter is plugged into the system.
Keyboard Backlight Timeout on Battery	Select the timeout value for the keyboard backlight when the system is running only on battery power.
Miscellaneous Devices	Enable or disable various onboard devices.
Enable Camera	Enable or disable the camera.

Table 5. System setup options—Video menu

Video	
LCD Brightness	Set the panel brightness independently for Battery and AC power.

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-2 Password	Set, change, or delete the internal hard-disk drive password.
Strong Password	Enable or disable strong passwords.

Security	
Password Configuration	Control the minimum and maximum number of characters allowed for the 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	Determine 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	Disable the master password support.
SMM Security Mitigation	Enable or disable additional UEFI SMM Security Mitigation protections.

Table 7. System setup options—Secure Boot menu

Secure Boot	
Secure Boot Enable	Enable or disable the secure boot feature.
Secure Boot Mode	Select the operating mode to allow evaluation or enforcement of UEFI driver signatures.
Expert Key Management	
Enable Custom Mode	Enable or disable custom mode.
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. Default: Enabled.
Intel SpeedStep	Enable or disable Intel Speedstep Technology. Default: Enabled. **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. Default: Enabled.
Intel TurboBoost	Enable or disable Intel TurboBoost mode of the processor. Default: Enabled.

Intel Software Guard Extensions	
HyperThread Control	Enable or disable HyperThreading in the processor. Default: Enabled.
Power Management	
AC Behavior	Enable the system to turn on automatically, when AC is inserted.
Enable Intel Speed Shift Technology	Enable or disable the operating system to select the appropriate processor performance automatically.
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. Default: Disabled.
USB Wake Support	Enable the USB devices to wake the computer from Standby.
Wake on LAN/WLAN	Select the option to power up from the off state when triggered by a special LAN signal or from the hibernate state when triggered by a special wireless LAN signal.
Block Sleep	Select the mode to block entering to sleep in the OS environment.
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. Default: Adaptive.
POST Behavior	
Adapter Warnings	Enable adapter warnings. Default: Enabled.
Fn Lock Options	Enable or disable the Fn lock mode.
Fastboot	Enable to set the speed of the boot process. Default: Thorough.
Extend BIOS POST Time	Set the BIOS POST time.
Full Screen Logo	Display full screen logo.
Warning and Errors	Control the boot process to only pause when warnings or errors are detected.
MAC Address Pass-Through	Replace the external NIC MAC address (in a supported dock or dongle) with the selected MAC address from the system.

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.

Table 12. System setup options—System Logs menu

System Logs	
BIOS Events	Display BIOS events.
Thermal Events	Display the Thermal events.
Power Events	Display the 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 the Dell OS Recovery tool.
SupportAssist OS Recovery	Enable or disable the boot flow for the SupportAssist OS Recovery tool when certain system errors.

Identifier GUID-CA599AD5-9996-4BE8-9643-1C626DB94E2D

Status Released

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.

Identifier	GUID-5941E06E-ABCB-4468-ACE5-D51EF6AAA083
Status	Released

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.

Identifier	GUID-F93F7E34-BE30-464B-886E-
Status	Released

Troubleshooting

Identifier	GUID-F5899359-C2E1-41C0-9663-4C79969506EB
Status	Released

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.

Identifier	GUID-060D210F-C287-462B-AC38-81183D440A9D
Status	Released

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.

Identifier	GUID-EE9A5D95-88BE-4EE7-983E-D97C680BDECD
Status	Released

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.

Identifier	GUID-0B893EED-EFBC-4831-A9C4-7298A7A9F619
Status	Released

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.

Identifier	GUID-23944A79-0EF5-473C-8DCA-DCA6DC5DC0A7
Status	Released

Diagnostics

Power and battery-status light:

Indicates the power state and battery state of the computer.

Solid white – Power adapter is connected and the battery is charging.

Solid amber – Battery charge is low or critical.

Off – Battery is fully charged.

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 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/video card failure
3,3	Recovery image not found
3,4	Recovery image found but invalid

Camera status light: Indicates whether the camera is in use.

- Solid white – Camera is in use.
- Off – Camera is not in use.

Caps Lock status light: Indicates whether Caps Lock is enabled or disabled.

- Solid white – Caps Lock enabled.
- Off – Caps Lock disabled.

Identifier	GUID-FE39A314-6129-4A79-A5FA-B69617360582
Status	Released

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.

Identifier	GUID-CD2E8B90-160E-43C9-BA9D-F0F6C6BAA458
Status	Released

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.

Identifier	GUID-B4DD52FB-C0FE-4818-9D7C-A0D2BF4491D7
Status	Released

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.

Identifier	GUID-8CEF1F7A-1327-43EB-9E2E-8EC169AEFE4A
Status	Released

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.