Inspiron 5482

Service Manual

Computer Model: Inspiron 5482
Regulatory Model: P93G
Regulatory Type: P93G001

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.

Identifier	GUID-089FFA4B-3A62-4B51-BDE1-309C58A451D9
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Contents

1 Before working inside your computer 7
Before you begin 7

2 After working inside your computer 8

3 Safety instructions 9
Electrostatic discharge—ESD protection 9
ESD field service kit 10
Components of an ESD field service kit 10
ESD protection summary 11
Transporting sensitive components 11
Lifting equipment 11

4 Recommended tools 12

5 Screw list 13

6 Removing the base cover 14
Procedure 14

7 Replacing the base cover 16
Procedure 16

8 Removing the battery 18
Prerequisites 18
Procedure 18

9 Replacing the battery 20
Procedure 20
Post-requisites 21

10 Removing the coin-cell battery 22
Procedure 22

11 Replacing the coin-cell battery 23
Procedure 23

12 Removing the memory modules 24
Prerequisites 24
Procedure 24

13 Replacing the memory modules 26
Procedure 26
Post-requisites 27

14 Removing the solid-state drive/Intel Optane memory module..... 28
Prerequisites..... 28
Procedure..... 28

15 Replacing the solid-state drive/Intel Optane memory module..... 30
Procedure..... 30
Post-requisites..... 30

16 Removing the hard drive..... 31
Prerequisites..... 31
Procedure..... 31

17 Replacing the hard drive..... 33
Procedure..... 33
Post-requisites..... 34

18 Removing the heat sink..... 35
Prerequisites..... 35
Procedure..... 35

19 Replacing the heat sink..... 37
Procedure..... 37
Post-requisites..... 38

20 Removing the fan..... 39
Prerequisites..... 39
Procedure..... 39

21 Replacing the fan..... 40
Procedure..... 40
Post-requisites..... 40

22 Removing the speakers..... 41
Prerequisites..... 41
Procedure..... 41

23 Replacing the speakers..... 42
Procedure..... 42
Post-requisites..... 42

24 Removing the I/O board..... 43
Prerequisites..... 43
Procedure..... 43

25 Replacing the I/O board..... 44
Procedure..... 44
Post-requisites..... 44

26 Removing the power-adapter port....45
Prerequisites....45
Procedure....45

27 Replacing the power-adapter port....46
Procedure....46
Post-requisites....46

28 Removing the wireless card....47
Prerequisites....47
Procedure....47

29 Replacing the wireless card....49
Procedure....49
Post-requisites....50

30 Removing the display assembly....51
Prerequisites....51
Procedure....51

31 Replacing the display assembly....53
Procedure....53
Post-requisites....54

32 Removing the power button with fingerprint reader....55
Prerequisites....55
Procedure....55

33 Replacing the power button with fingerprint reader....57
Procedure....57
Post-requisites....58

34 Removing the system board....59
Prerequisites....59
Procedure....59

35 Replacing the system board....62
Procedure....62
Post-requisites....64

36 Removing the touchpad....65
Prerequisites....65
Procedure....65

37 Replacing the touchpad....67
Procedure....67
Post-requisites....68

38 Removing the palm-rest and keyboard assembly 69
Prerequisites 69
Procedure 69

39 Replacing the palm-rest and keyboard assembly 71
Procedure 71
Post-requisites 71

40 Device drivers 73
Intel Chipset Software Installation Utility 73
Video drivers 73
Intel Serial IO driver 73
Intel Serial IO driver 73
Intel Trusted Execution Engine Interface 74
Intel Virtual Button driver 74
Wireless and Bluetooth drivers 74

41 System setup 75
Boot Sequence 75
Navigation keys 75
BIOS overview 76
Entering BIOS setup program 76
System setup options 76
Clearing CMOS settings 81
Clearing BIOS (System Setup) and System passwords 81

42 Troubleshooting 83
Flashing the BIOS 83
Flashing BIOS (USB key) 83
Enhanced Pre-Boot System Assessment (ePSA) diagnostics 84
Running the ePSA diagnostics 84
Diagnostics 84
Enabling Intel Optane memory 85
Disabling Intel Optane memory 86
WiFi power cycle 86
Flea power release 86

43 Getting help and contacting Dell 87
Self-help resources 87
Contacting Dell 87

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Status	Released

1

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:

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

Identifier	GUID-CC648B28-FBF9-4A6F-BB11
Status	Released

5

Screw list

Table 1. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Base cover	Palm-rest and keyboard assembly	M2x6	6	
Battery	Palm-rest and keyboard assembly	M2x3	4	
Hard-drive assembly	Palm-rest and keyboard assembly	M2x3	4	
Hard-drive bracket	Hard drive	M3x3	4	
Solid-state drive	Palm-rest and keyboard assembly	M2x3	1	
I/O board	Palm-rest and keyboard assembly	M2x3	2	
Fan	Palm-rest and keyboard assembly	M2x3	2	
Wireless card	System board	M2x3	1	
Power-adapter port	Palm-rest and keyboard assembly	M2x3	1	
Power button	Palm-rest and keyboard assembly	M2x3	2	
USB Type-C bracket	System board	M2x3	2	
System board	Palm-rest and keyboard assembly	M2x2 Big Head	6	
Touchpad bracket	Palm-rest and keyboard assembly	M2x2 Big Head	3	
Touchpad	Palm-rest and keyboard assembly	M2x2 Big Head	4	
Display assembly	Palm-rest and keyboard assembly	M2.5x5	6	

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

Removing the base cover

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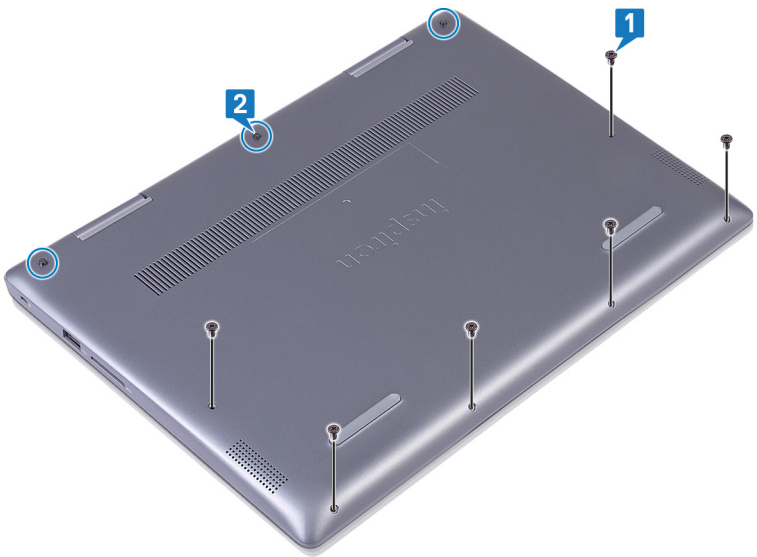
Identifier	GUID-E98A57DE-E602-4D42-AC30-97681E32572B
Status	Released

Procedure

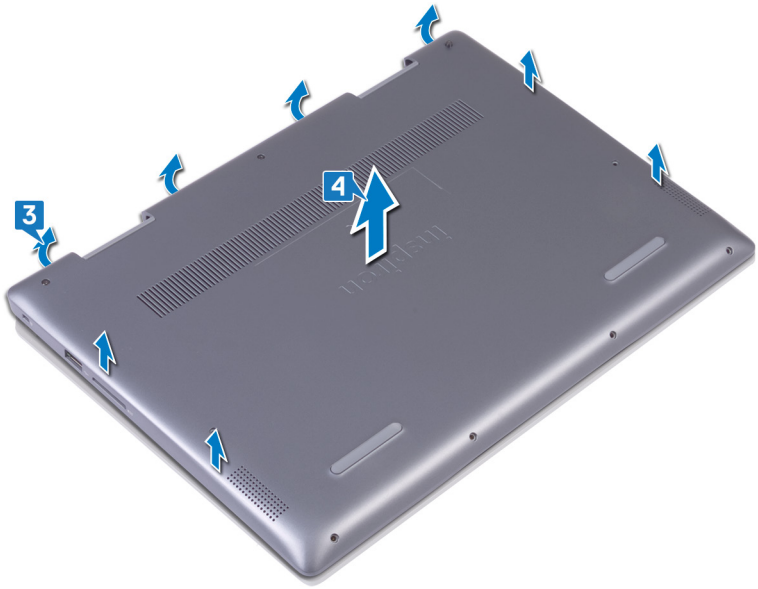
1 Remove the six screws (M2x6) that secure the base cover to the palm-rest and keyboard assembly.

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



3 Using your fingertips, pry the base cover off the palm-rest and keyboard assembly from the top left corner.

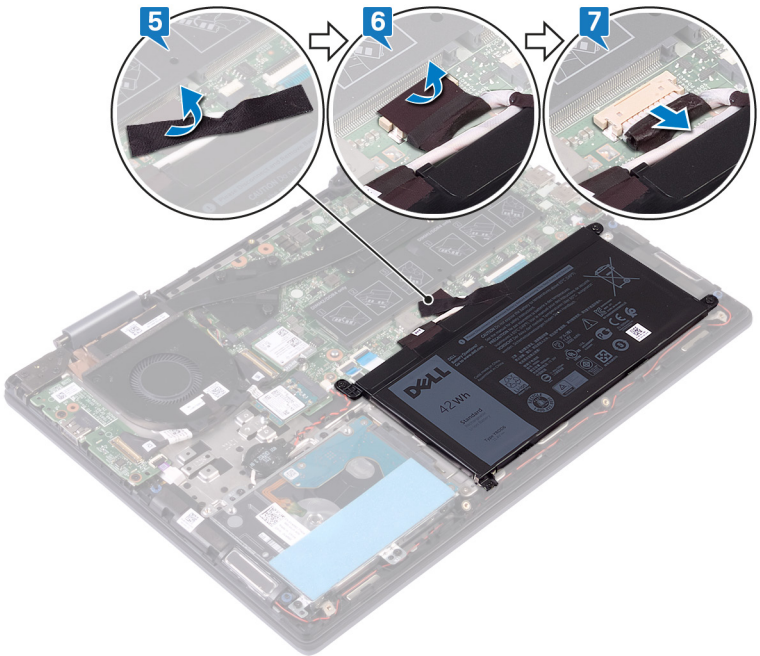
4 Lift the base cover off the palm-rest and keyboard assembly.



5 Peel off the tape that secures the battery cable to the battery.

6 Peel the tape that secures the battery cable to the battery-cable connector.

7 Disconnect the battery cable from the system board.



8 Turn the computer over, open the display, then press and hold the power button for 15 seconds to ground the system board.

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

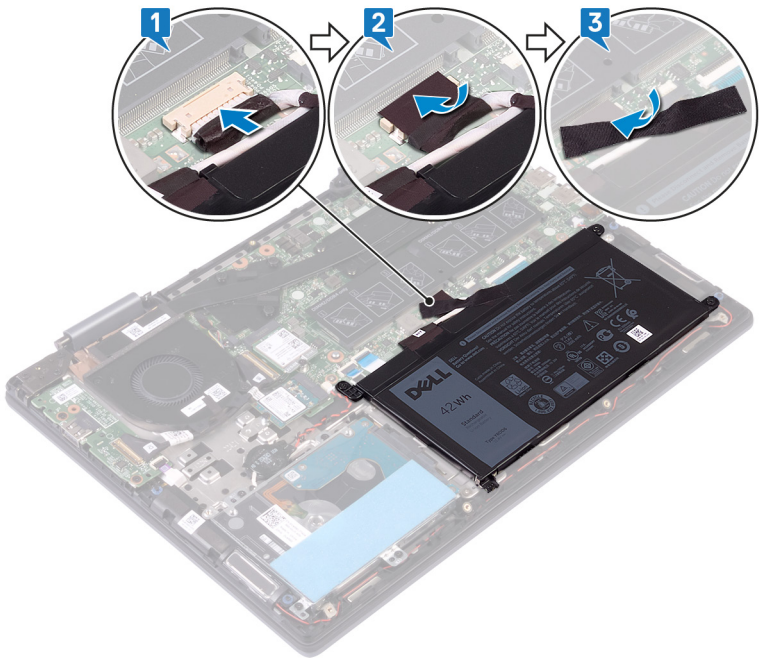
Replacing the base cover

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.

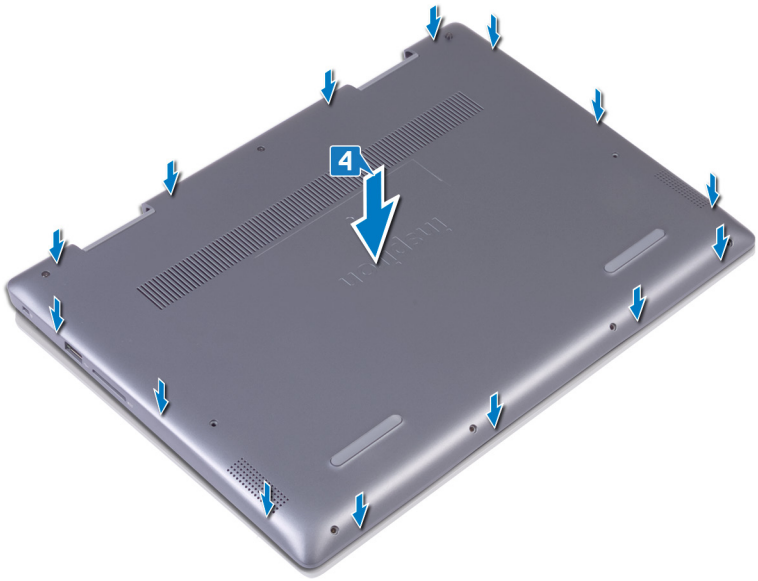
Identifier	GUID-07A09BBD-DBB9-4E77-8DBC-9377FF71E45C
Status	Released

Procedure

1 Close the display and turn the computer over. Connect the battery cable to the system board.
2 Adhere the tape that secures the battery cable to the battery-cable connector.
3 Adhere the tape that secures the battery cable to the battery.

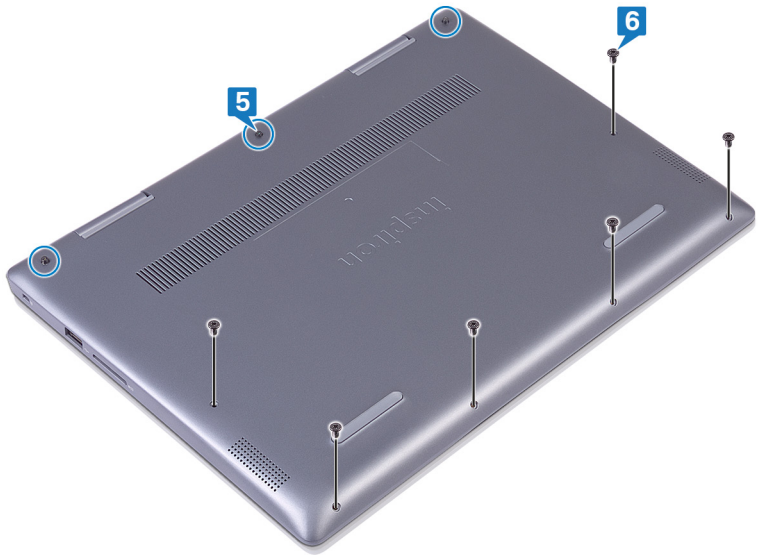


4 Align the tabs on the base cover with the slots on the palm-rest and keyboard assembly and snap the base cover into place.



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

6 Replace the six screws (M2x6) 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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

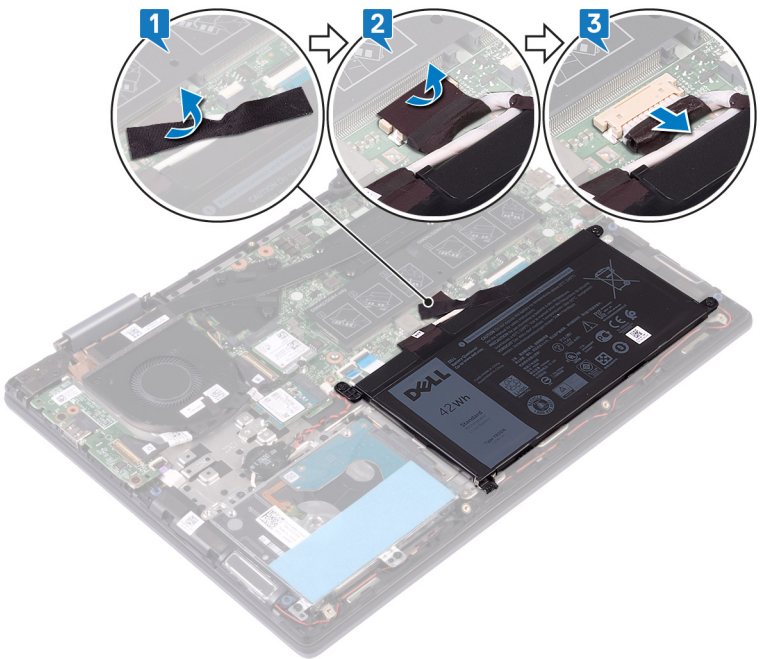
Prerequisites

Remove the base cover.

Identifier	GUID-1AB92B2D-03AD-4C22-A9EE-B12F78094F9D
Status	Released

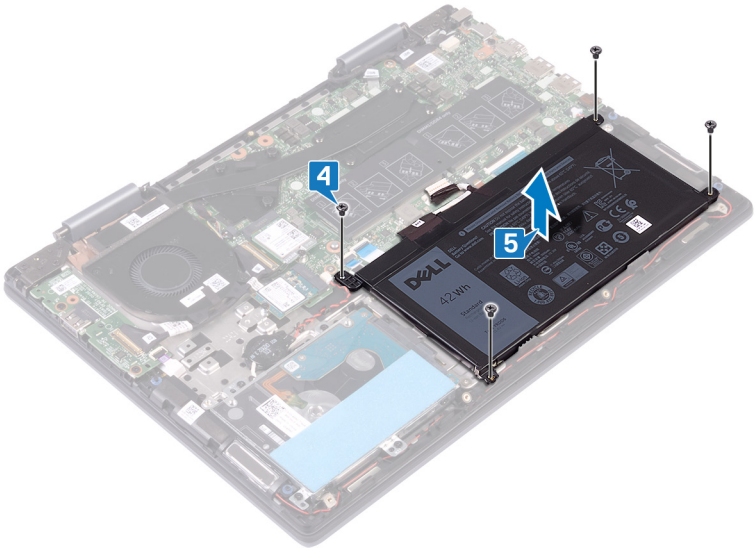
Procedure

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



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

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



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

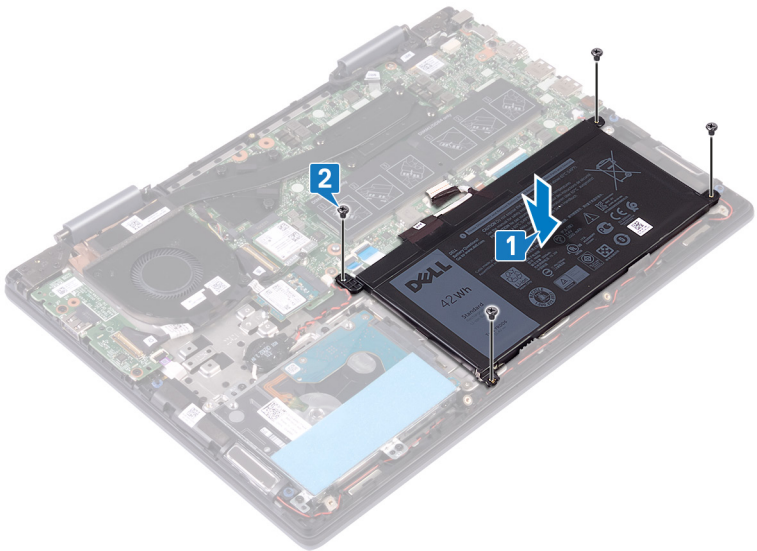
Replacing the battery

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.

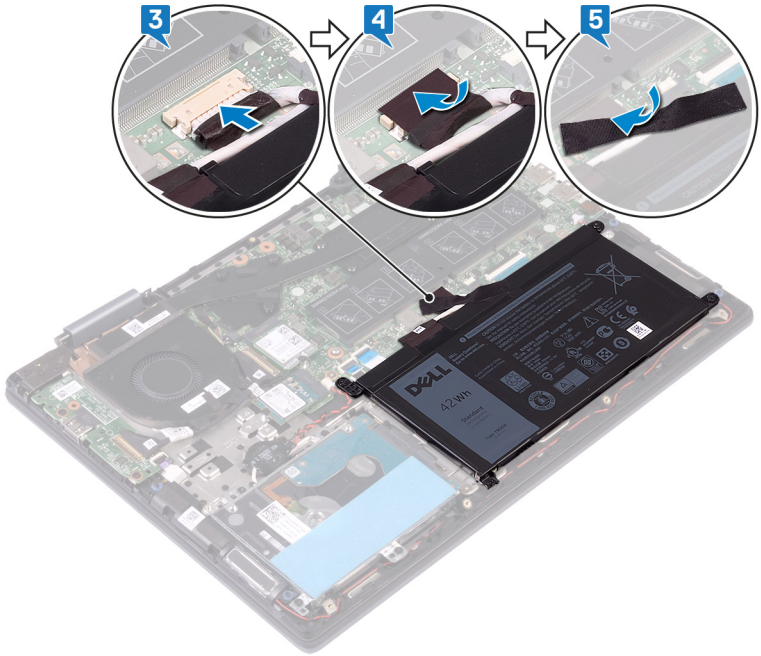
Identifier	GUID-A532206D-13F6-4CF0-8AAD-1AB86E79ADD3
Status	Released

Procedure

1 Align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly.
2 Replace the four 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 to the battery-cable connector.
5 Adhere the tape that secures the battery cable to the battery.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
Status	Released

Post-requisites

Replace the base cover.

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

Removing the coin-cell battery

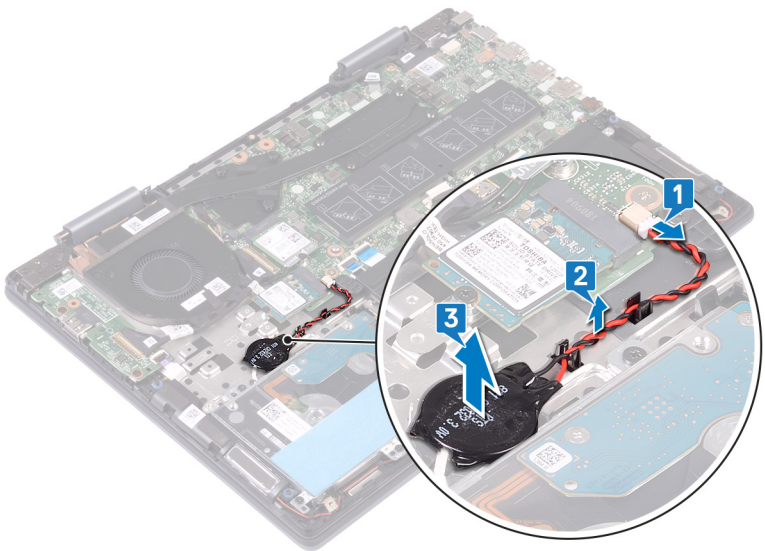
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see 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-60AEABD3-77A9-475A-98AD-D2179A07C951
Status	Released

Procedure

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



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

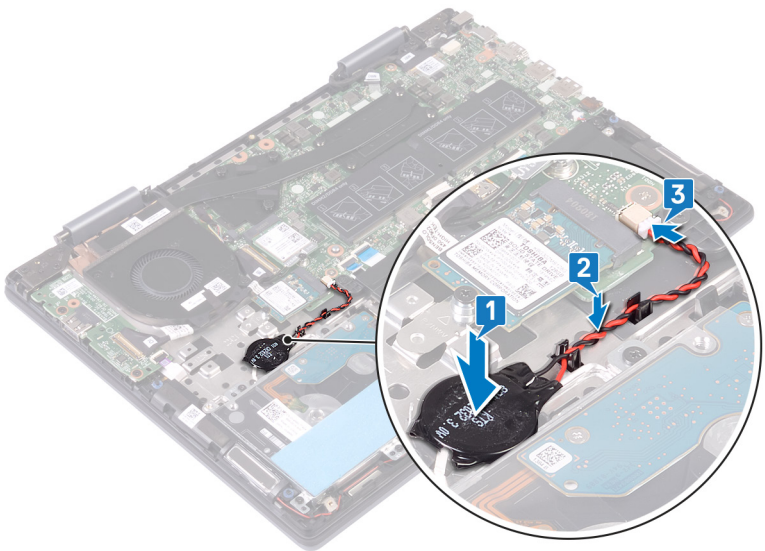
Replacing the coin-cell battery

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-773172E0-F977-4843-8F6E-6AC2917F9C9D
Status	Released

Procedure

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



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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

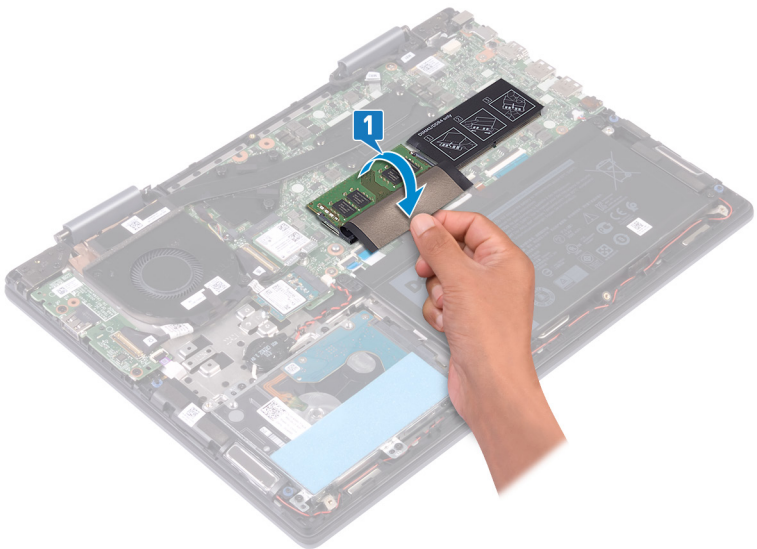
Prerequisites

Remove the base cover.

Identifier	GUID-BEF12B85-14DA-4A57-BA9A-407178F5E85A
Status	Released

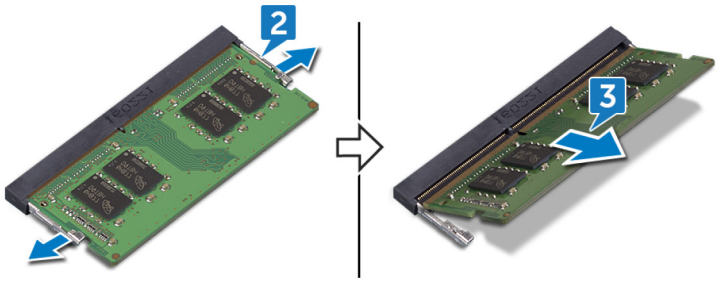
Procedure

1 Locate the memory module on the system board and lift the mylar that covers the memory modules.



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

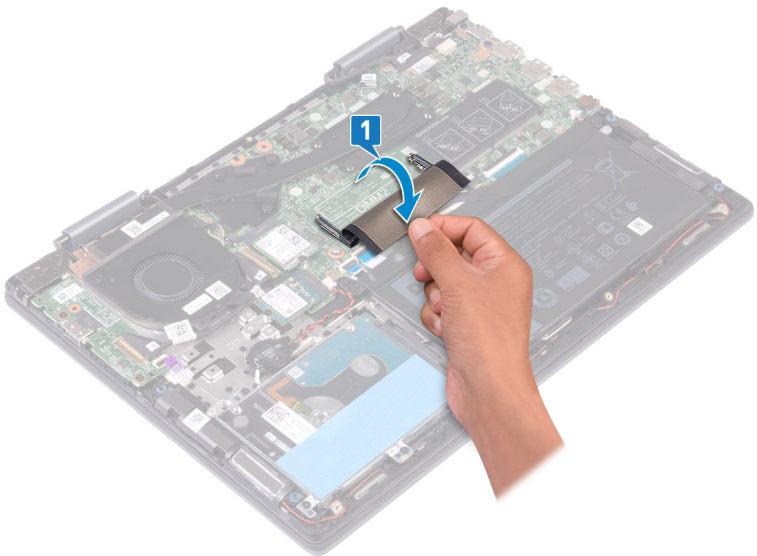
Replacing the memory modules

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-B9B09D3B-06CB-4FC4-949F-1F21A58D8CBE
Status	Released

Procedure

1 Locate the memory modules on the system board and lift the mylar that covers the memory modules.

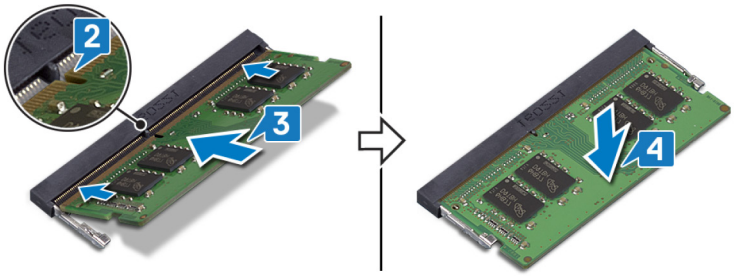


2 Align the notch on the memory module with the tab on the memory-module slot.

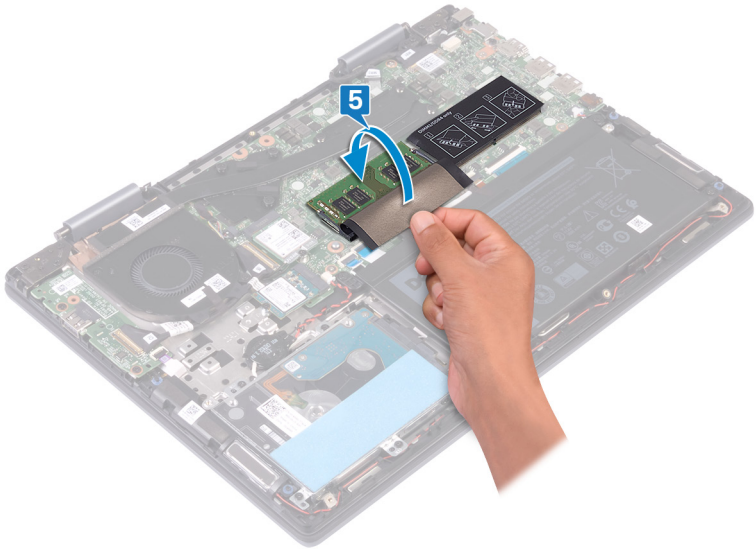
3 Slide the memory module firmly into the slot at an angle.

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

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



5 Release the mylar that covers the memory modules on the system board.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
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-E1875075-B275-40EC-988C-B3128B3FED81
Status	Released

Prerequisites

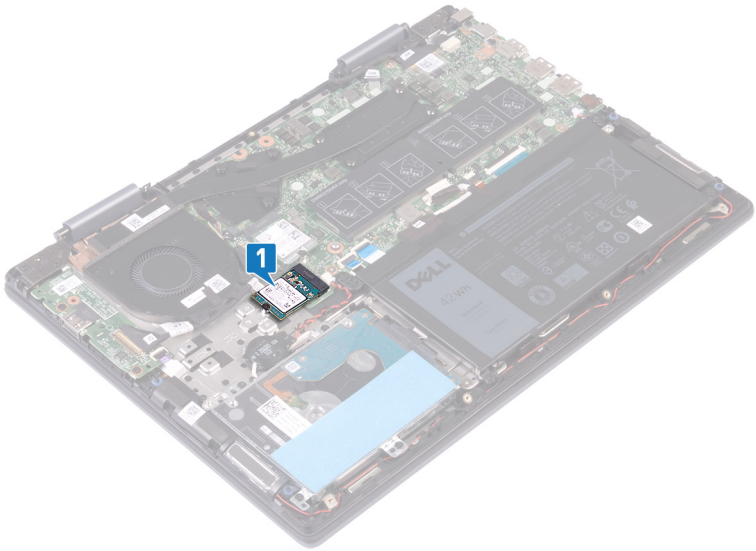
CAUTION: You need to disable the Intel Optane memory before removing Intel Optane memory module from your computer. For more information about disabling the Intel Optane memory, see Disabling Intel Optane memory.

Remove the base cover.

Identifier	GUID-E9AF48A5-9E95-4E29-AB0A-645D91C7D5FB
Status	Released

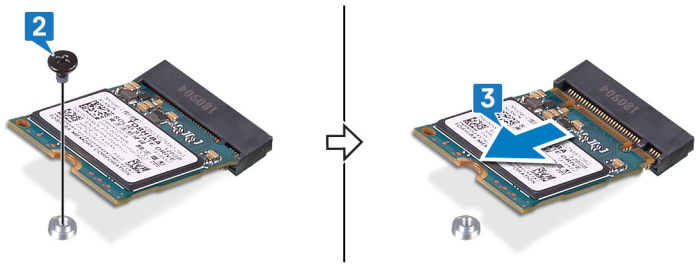
Procedure

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



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 module slot.



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.

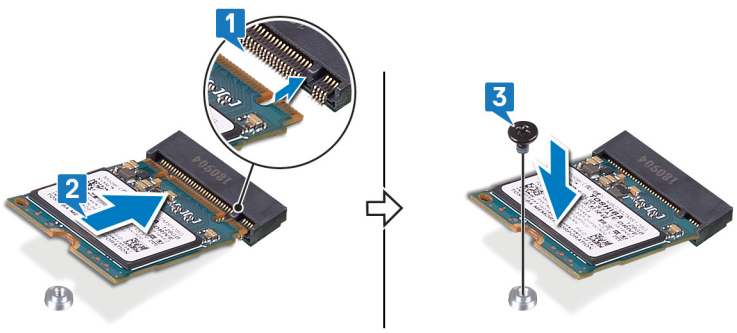
Identifier	GUID-2602721B-1198-47DB-94E8-EB3744EAC62F
Status	Released

Procedure

1 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.

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.



Identifier	GUID-501565F8-AAC1-4725-B4ED-535C66D45A8C
Status	Released

Post-requisites

Replace the base cover.

CAUTION: 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-3B11745F-7767-4F34-952B-9
Status	Released

Removing the hard drive

If your computer is using a SATA storage device accelerated by Intel Optane memory, disable Intel Optane before removing the SATA storage device. For more information about disabling the Intel Optane, see Disabling Intel Optane.

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-8634EF6C-5F40-4ED8-8387-8AEDF6DA2B61
Status	Released

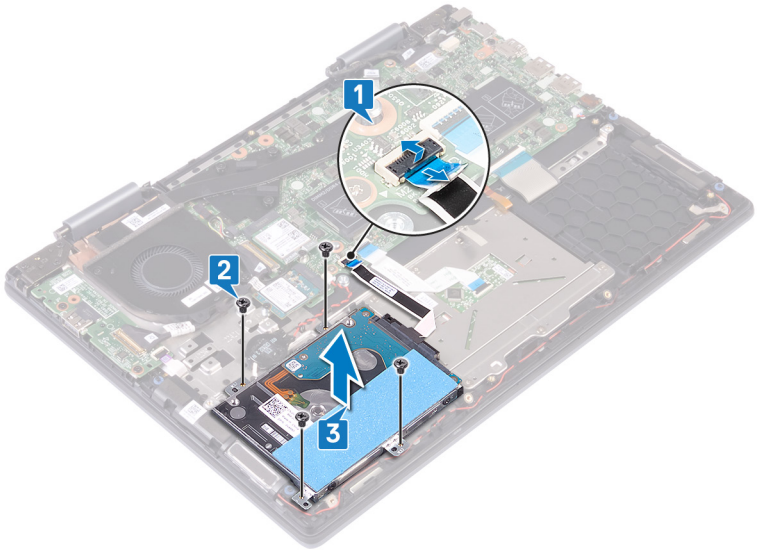
Prerequisites

1 Remove the base cover.
2 Remove the battery.

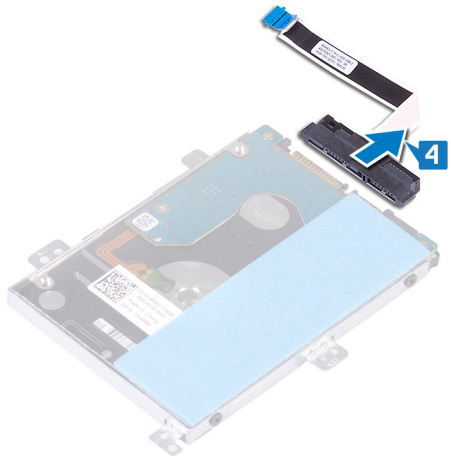
Identifier	GUID-941FC36B-456E-475E-B4BB-1DD5DB1259FE
Status	Released

Procedure

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

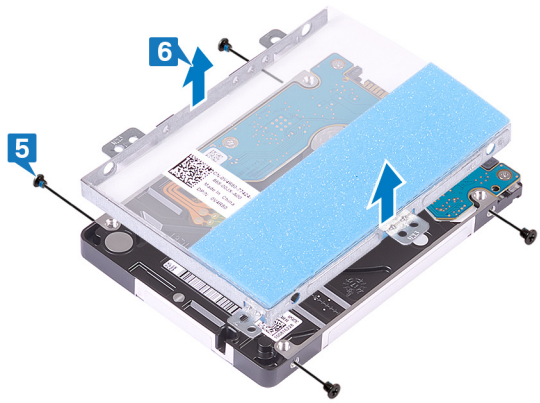


4 Disconnect the interposer from the hard-drive assembly.



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

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



Identifier	GUID-CE36C080-9344-4542-BEA8-
Status	Released

Replacing the hard drive

Enable Intel Optane after replacing the SATA storage. For more information about enabling the Intel Optane, see Enabling Intel Optane.

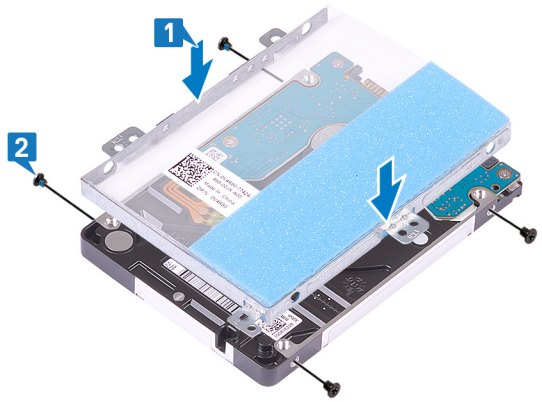
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

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

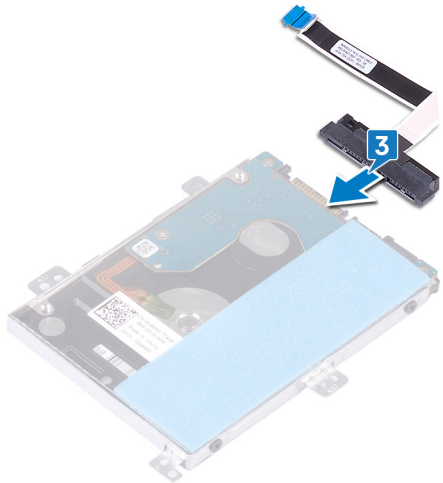
Identifier	GUID-B57E1E0D-A409-4FE6-9638-45E8ACAC81F4
Status	Released

Procedure

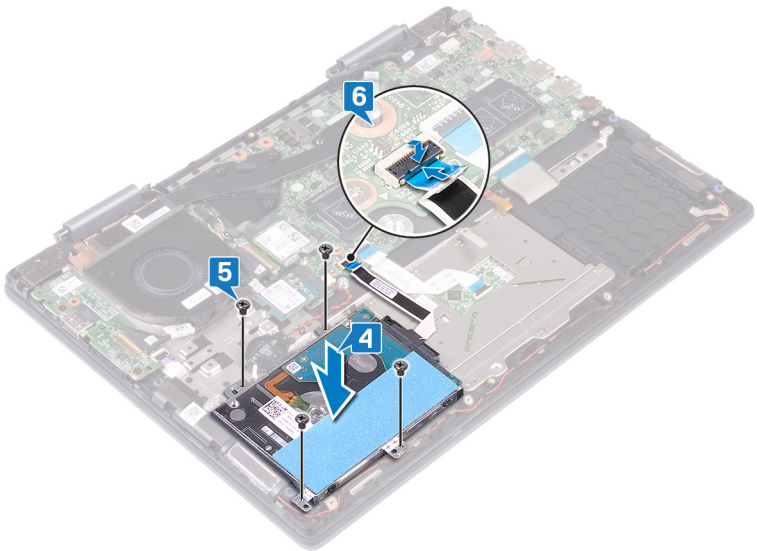
1 Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
2 Replace the four screws (M3x3) that secure the hard-drive bracket to the hard drive.



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 Connect the hard-drive cable to the connector on the system board.



Identifier	GUID-3BA713E2-9D49-47FC-85A0-D4A7F7BB5AB9
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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

Prerequisites

Remove the base cover.

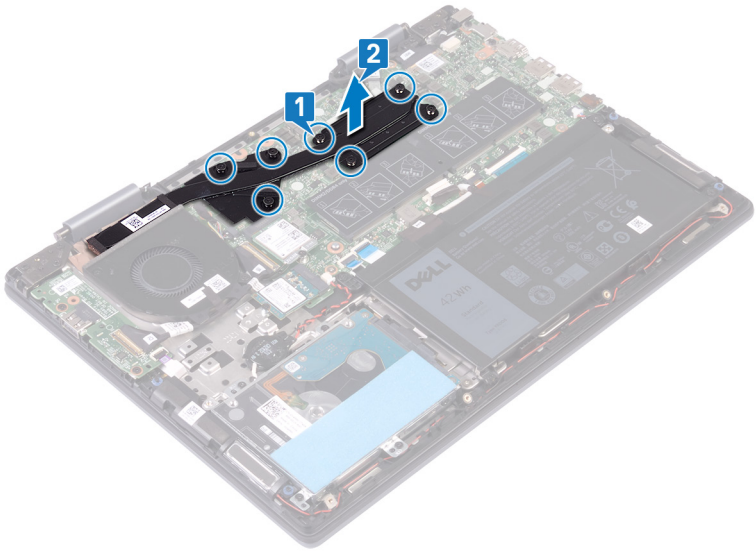
Identifier	GUID-319EA3B9-9DF7-41E8-BD9F-894AFCC8767F
Status	Released

Procedure

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

NOTE: The number of screws may vary depending on the configuration ordered.

2 Lift the heat sink off the system board.


2
1

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.

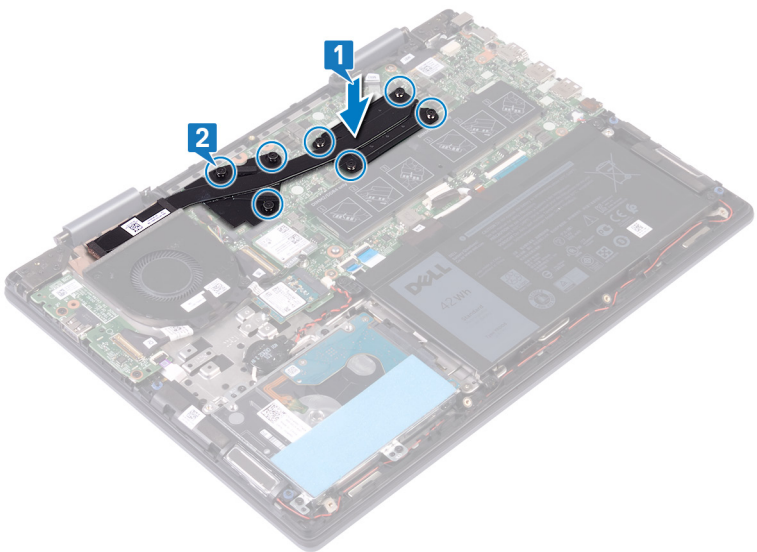
Identifier	GUID-CC215BED-BB13-4D5D-BE24-53678B2F76F6
Status	Released

Procedure

1 Align the screw holes on the heat sink with the screw holes on the system board.

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

NOTE: The number of screws may vary depending on the configuration ordered.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

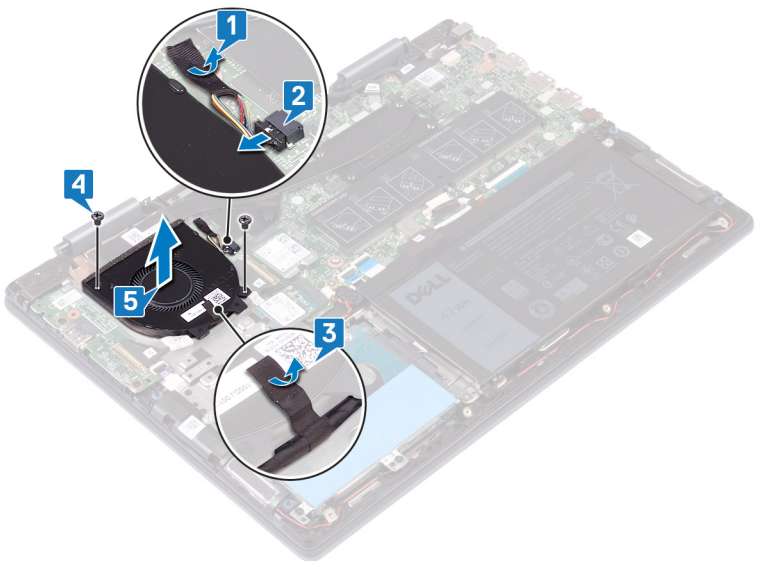
Prerequisites

Remove the base cover.

Identifier	GUID-24ED1697-AF22-4221-90A0-F995398DA09D
Status	Released

Procedure

1. Peel off the tape that secures the fan cable to the system board.
2. Disconnect the fan cable from the system board.
3. Peel off the tape that secures the I/O-board cable to the fan.
4. Remove the two screws (M2x3) that secure the fan to the palm-rest and keyboard assembly.
5. Lift the fan off the palm-rest and keyboard assembly.



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

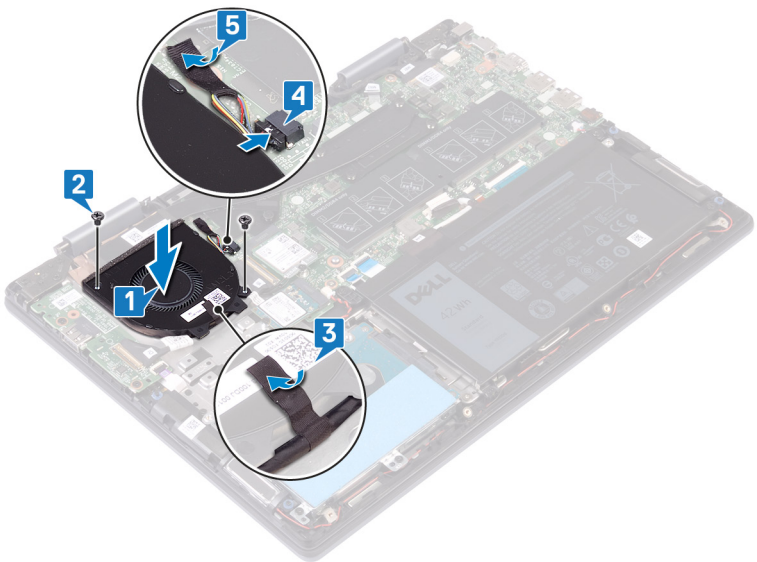
Replacing the fan

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-151D28A9-0BA1-4AA0-8D3D-D950B9945E74
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) securing the fan to the palm-rest and keyboard assembly.
3 Adhere the tape that secures the I/O-board cable to the fan.
4 Connect the fan cable to the system board.
5 Adhere the tape that secures the fan cable to the system board.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
Status	Released

Post-requisites

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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

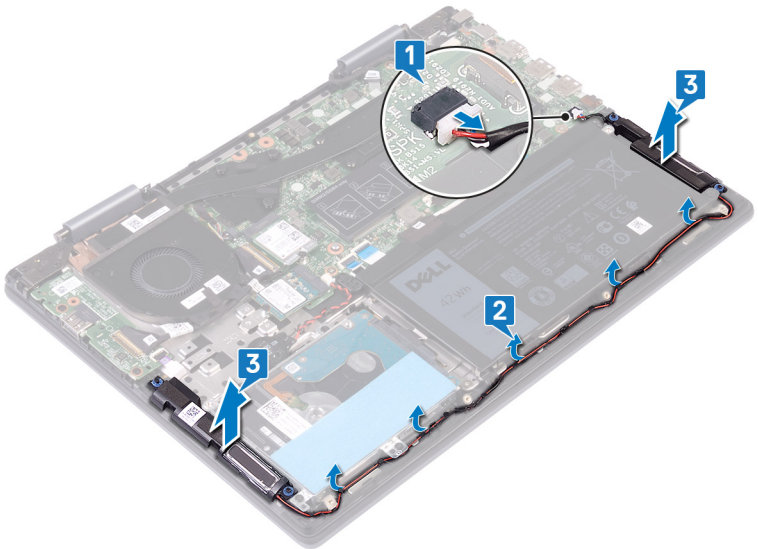
Prerequisites

Remove the base cover.

Identifier	GUID-2B4C91C7-395C-4AD7-834E-224BA2A82A95
Status	Released

Procedure

1 Disconnect the speaker cable from the system board.
2 Note the cable routing, and remove the speaker cable from the routing guides on the palm-rest and keyboard assembly.
3 Remove the speakers, along with the cable from 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-B2B0E8C4-F1F8-4FF1-B58E-DC31481CE4AC
Status	Released

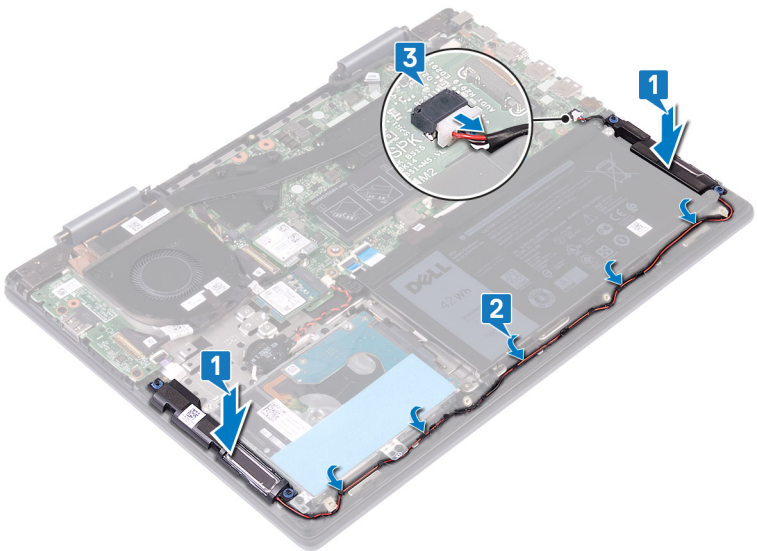
Procedure

1 Using the alignment posts, align and place the speakers on the palm-rest and keyboard assembly.

NOTE: Replace the rubber grommets if they are pushed up while replacing the speakers.

2 Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.

3 Connect the speaker cable to the system board.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
Status	Released

Post-requisites

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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

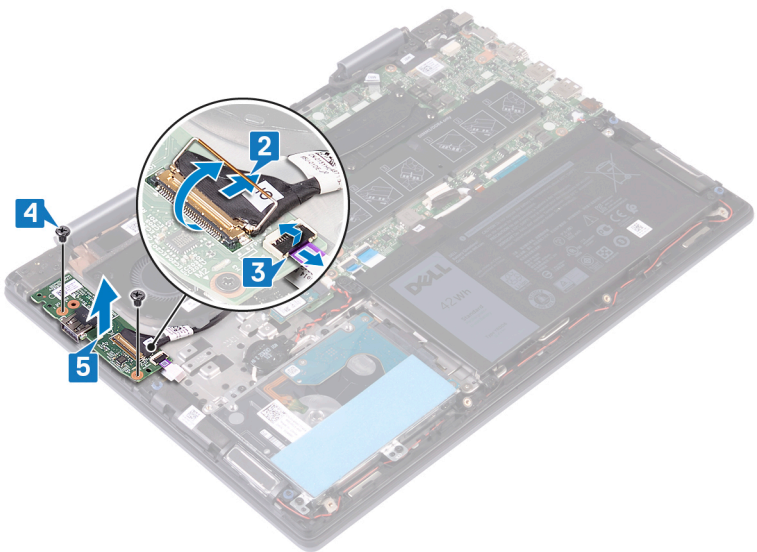
Prerequisites

Remove the base cover.

Identifier	GUID-18B0466B-66B7-4FA0-B52B-5072418C7CA8
Status	Released

Procedure

1. Peel off the tape that secures the I/O-board cable to the I/O board.
2. Open the latch, and disconnect the I/O-board cable from the I/O board.
3. Disconnect the fingerprint-reader board cable from the I/O board.
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.



Identifier	GUID-98F27B1C-9F09-48EC-83D7-
Status	Released

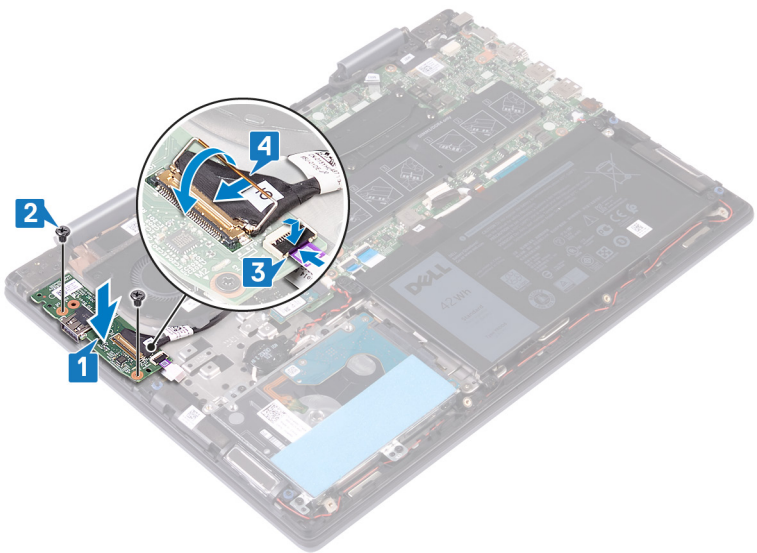
Replacing the I/O board

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-41224B55-62D6-4B12-A0F4-77D3367B5292
Status	Released

Procedure

1 Place the I/O board on the palm-rest and keyboard assembly, and then 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 Slide the fingerprint-reader cable into the connector on the I/O board and close the latch to secure the cable.
4 Slide the I/O-board cable into the connector on the I/O board and close the latch to secure the cable.
5 Adhere the tape that secures the I/O-board cable to the I/O board.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
Status	Released

Post-requisites

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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

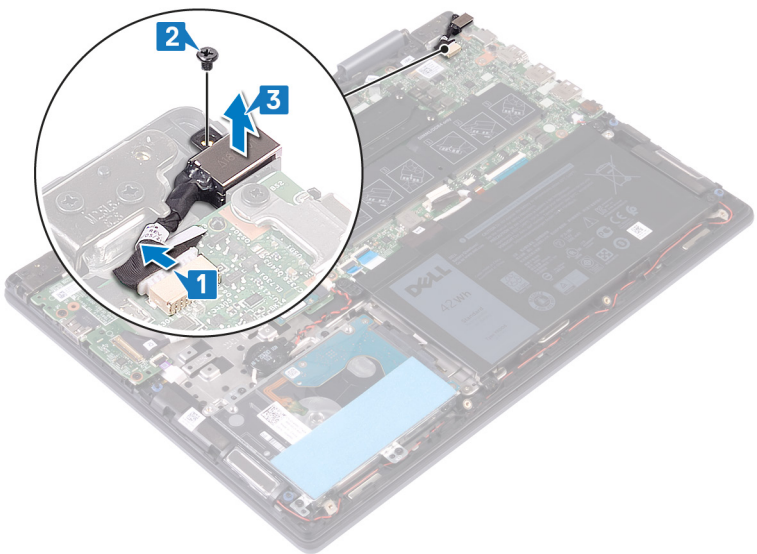
Prerequisites

Remove the base cover.

Identifier	GUID-2FE62435-E7EE-4E76-AF29-F1C26B35242A
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 its 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.

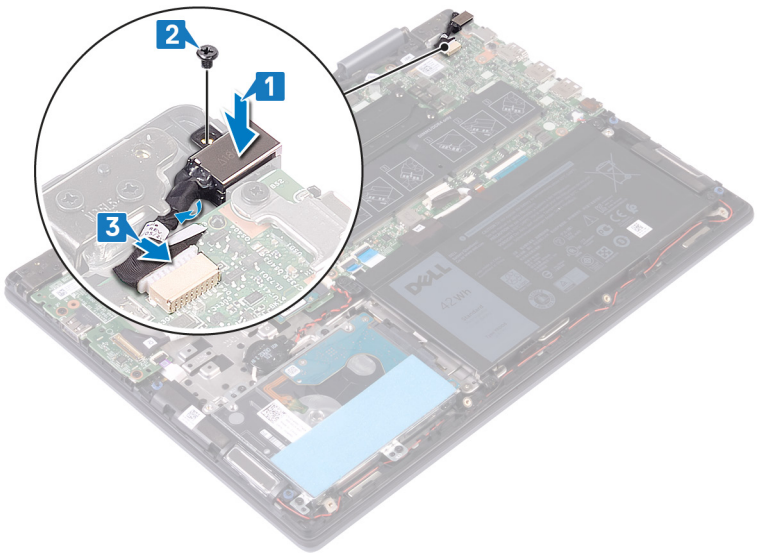
Identifier	GUID-AFBE4F6D-4267-44D1-AA97-773B080E2D06
Status	Released

Procedure

1 Place the power-adapter port into the slot on the palm-rest and keyboard assembly, and then 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-EE31644C-8CF0-4069-89C9-C081096D205E
Status	Released

Post-requisites

Replace the base cover.

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

Removing 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-0C370AA3-39CD-418F-B0C0-9747ADD48E61
Status	Released

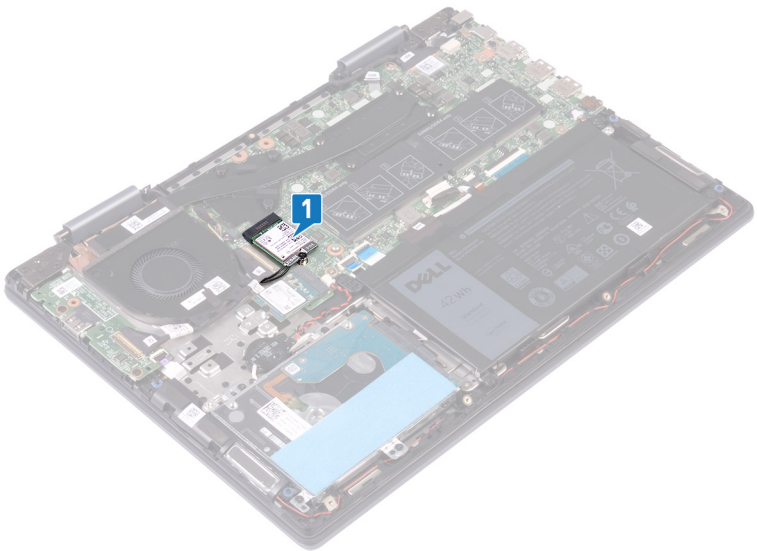
Prerequisites

Remove the base cover.

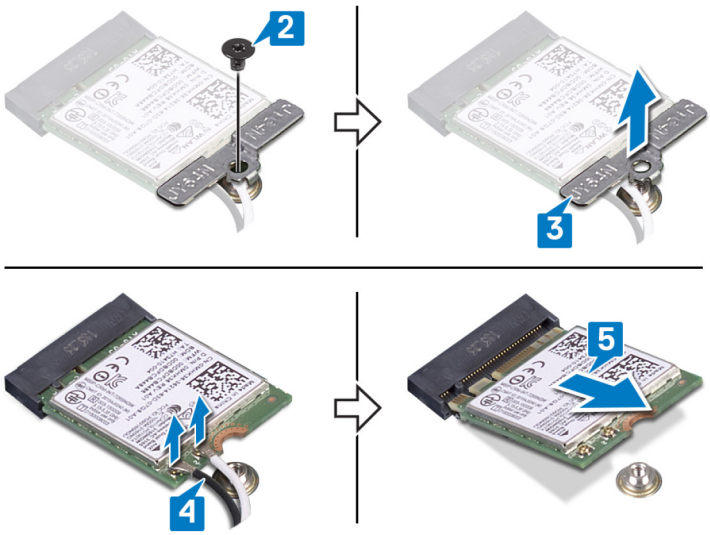
Identifier	GUID-357702E7-FE35-4F25-83B9-AEBB8715B8C4
Status	Released

Procedure

1 Locate the wireless card on the system board.



2 Remove the screw (M2x3) that secures the wireless-card bracket and wireless card to the system board.
3 Lift the wireless-card bracket off the wireless card.
4 Disconnect the antenna cables from the wireless card.
5 Slide and remove the wireless card from the wireless-card slot.


2
3

4
5

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-4A92B66D-A410-4413-AFFF-352F343998E3
Status	Released

Procedure

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

1 Connect the antenna cables to the wireless card.

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

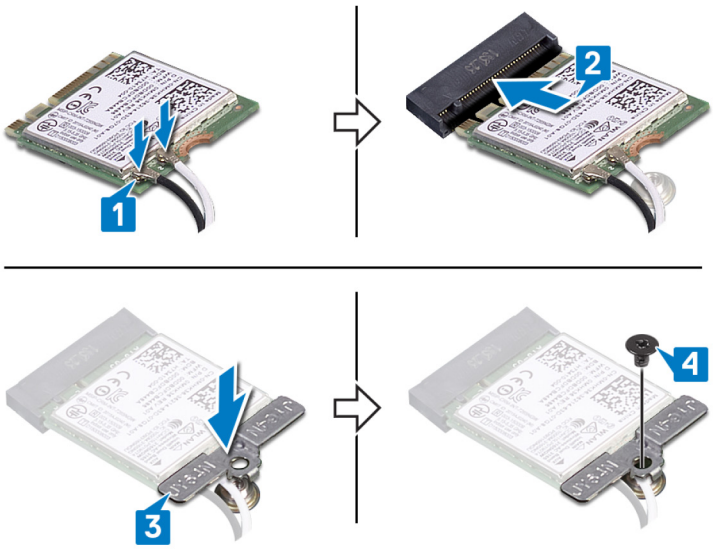
The following table provides the antenna-cable color scheme for the wireless card supported by your computer.

Table 2. Antenna-cable color scheme

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

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 and wireless card to the system board.



Identifier	GUID-EE31644C-8CF0-4069-89C9-C081096D205E
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-F1FE6F5E-F0BA-474E-9DE4-51B339F81D20
Status	Released

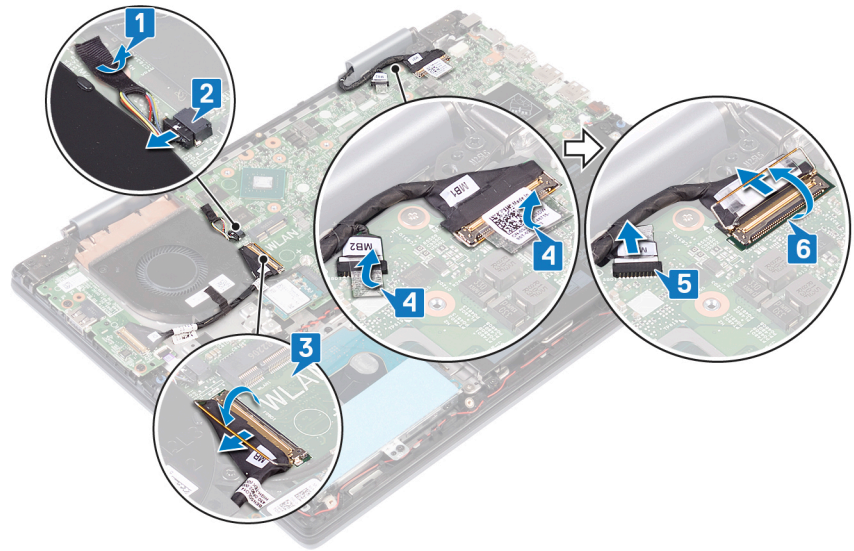
Prerequisites

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

Identifier	GUID-E66EFBCB-06E8-47A1-93AA-A4E9B422F375
Status	Released

Procedure

1 Peel off the tape that secures the fan cable to the system board.
2 Disconnect the fan cable from the system board.
3 Open the latch, and disconnect the I/O cable from the system board.
4 Peel off the tape that secures the touchscreen cable and the display cable to their respective connectors on the system board.
5 Open the latch, and disconnect the touchscreen cable from the system board.
6 Open the latch, and disconnect the display cable from the system board.



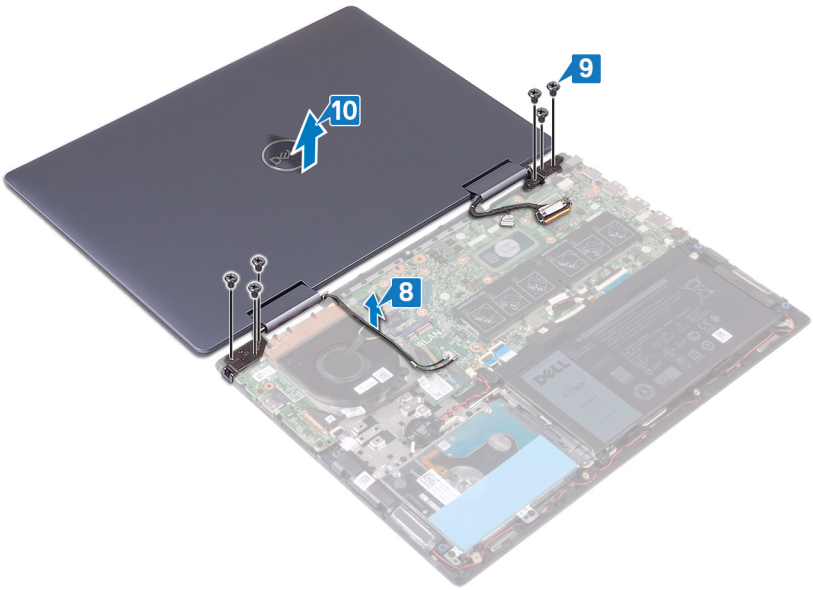
7 Turn the computer over, and open the display as far as possible. Then place the computer face down on a flat surface.

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

8 Remove the antenna cables from the routing guides on the palm-rest and keyboard assembly.

9 Remove the six screws (M2.5x5) that secure the display assembly to the palm-rest and keyboard assembly.

10 Gently lift the display assembly off the palm-rest and keyboard assembly.



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

Replacing the display assembly

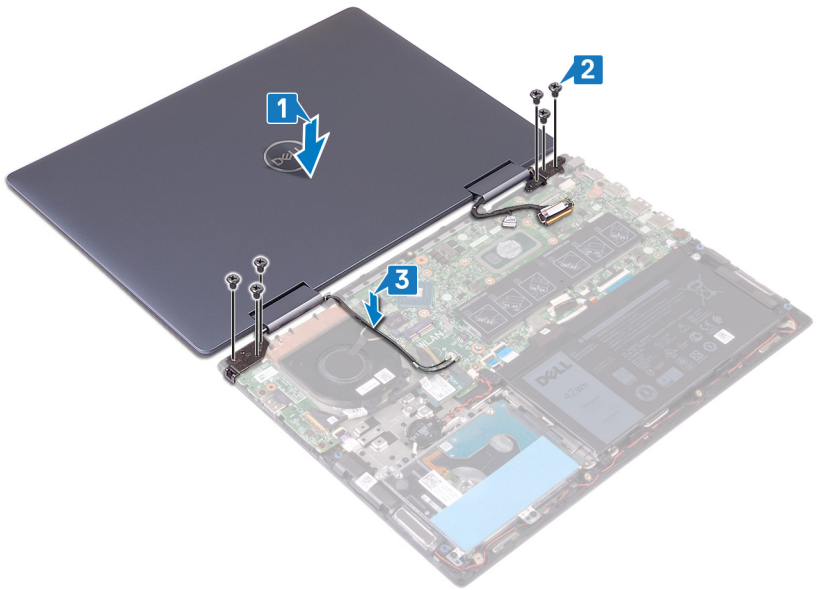
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in Before working inside your computer. After working inside your computer, follow the instructions in After working inside your computer. For more safety best practices, see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

Identifier	GUID-224E829B-C8F4-43FE-AEE6-7C15EC752832
Status	Released

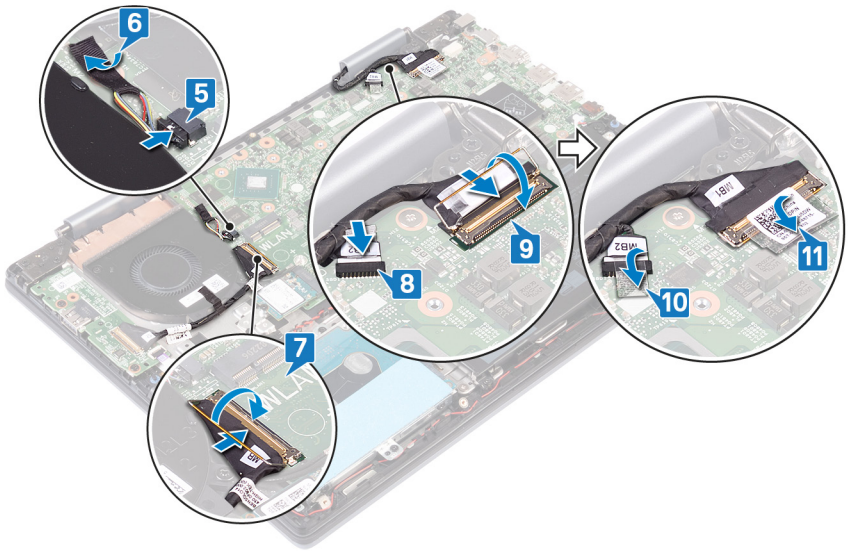
Procedure

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

1 Align the screw holes on the display assembly with the screw holes on the palm-rest and keyboard assembly.
2 Replace the six screws (M2.5x5) that secure the display assembly to the palm-rest and keyboard assembly.
3 Route the antenna cables through the routing guides on the palm-rest and keyboard assembly.



4 Close the display, and turn the computer over.
5 Connect the fan cable to the system board.
6 Adhere the tape that secures the fan cable to the system board.
7 Slide the I/O cable into the slot on the system board and close the latches to secure the cable.
8 Slide the touchscreen cable into the slot on the system board and close the latch to secure the cable.
9 Slide the display cable into the slot on the system board and close the latch to secure the cable.
10 Adhere the tape that secures the touchscreen cable to the system board.
11 Adhere the tape that secures the display cable to the system board.



Identifier	GUID-58B6535B-CB82-46EB-99E7-8E3C6C108464
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-B2A7A97E-62A3-40B0-A45E-C3B93E09A4B5
Status	Released

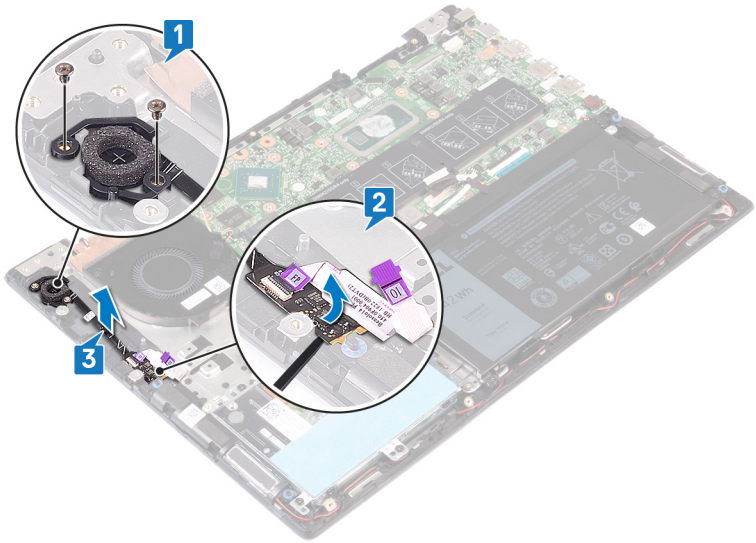
Prerequisites

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

Identifier	GUID-1463FCF5-D9A3-41FE-9ED3-177F4F749155
Status	Released

Procedure

1 Remove the two screws (M2x3) that secure the power button with fingerprint reader from the palm-rest and keyboard assembly.
2 Open the latch, and disconnect the power button with fingerprint reader cable from the power button with fingerprint reader cable connector.
3 Peel off the power button with fingerprint reader from the palm-rest and keyboard assembly.


1
2
3

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.

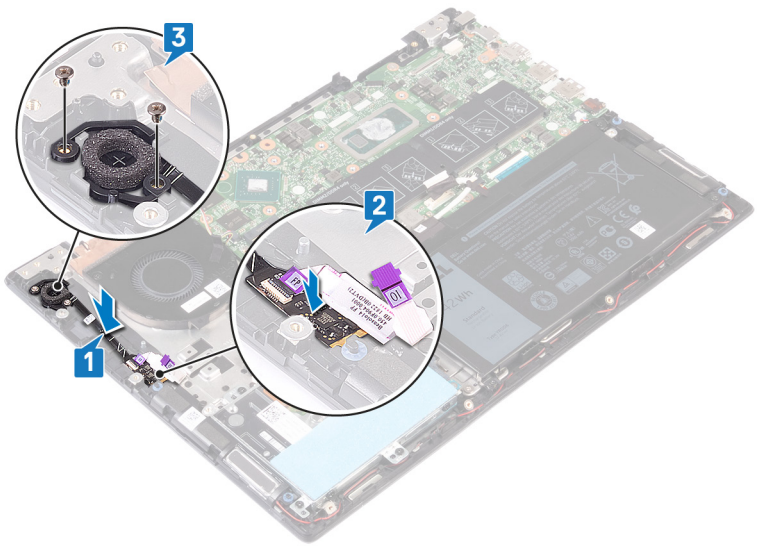
Identifier	GUID-31B24856-3F3B-4C35-87CC-D92A1311723F
Status	Released

Procedure

1 Place the power button with fingerprint reader into the slot on the palm-rest and keyboard assembly.

2 Open the power button with fingerprint reader cable connector latch and connect the power button with fingerprint reader cable to the power button with fingerprint reader.

3 Replace the two screws (M2x3) that secure the power button with fingerprint reader to the palm-rest and keyboard assembly.



Identifier	GUID-26F83A7D-4EC8-47FB-A940-4F877368D9E9
Status	Released

Post-requisites

1 Replace the display assembly.
2 Replace the wireless card.
3 Replace the I/O board.
4 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-098F2C29-6EDC-44D1-8343-8815301D49B4
Status	Released

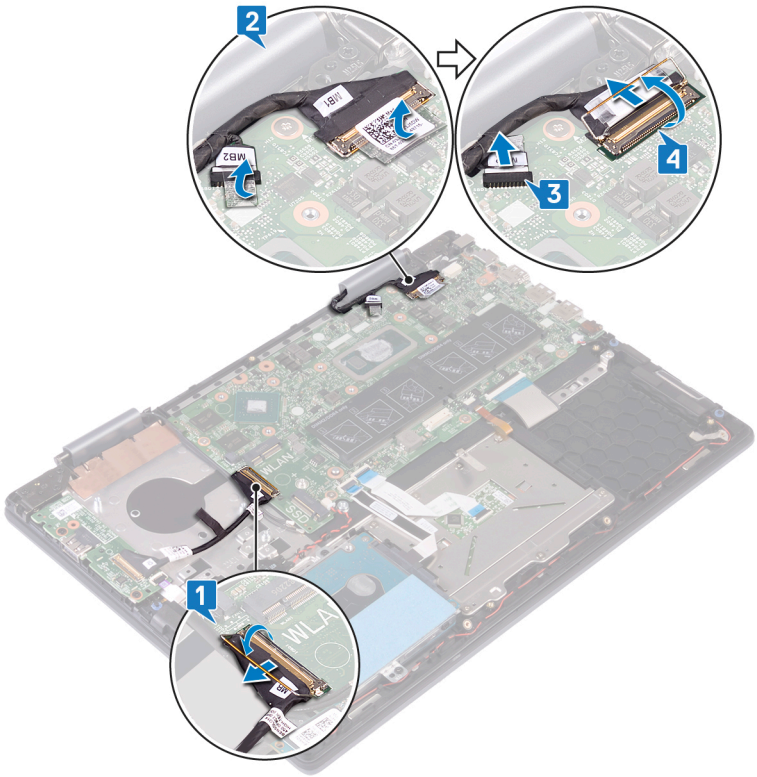
Prerequisites

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

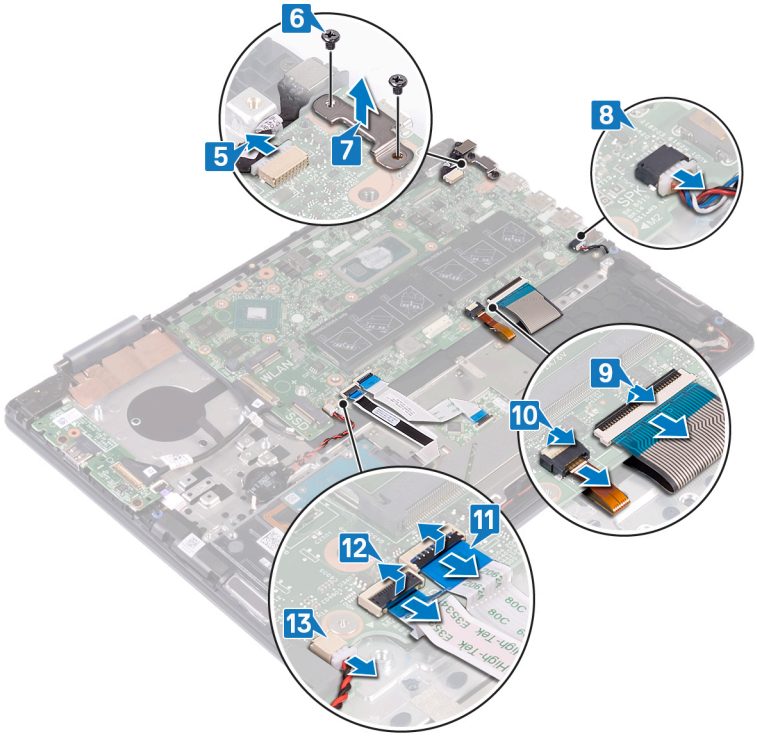
Identifier	GUID-982755BA-C3C7-4CC6-920A-104E7990A1CE
Status	Released

Procedure

1 Open the latch, and disconnect the I/O-board cable from the system board.
2 Peel off the tapes that secure the display cable and touch-screen board cable to the system board.
3 Disconnect the touch-screen board cable from the system board.
4 Open the latches, and disconnect the display cable from the system board.

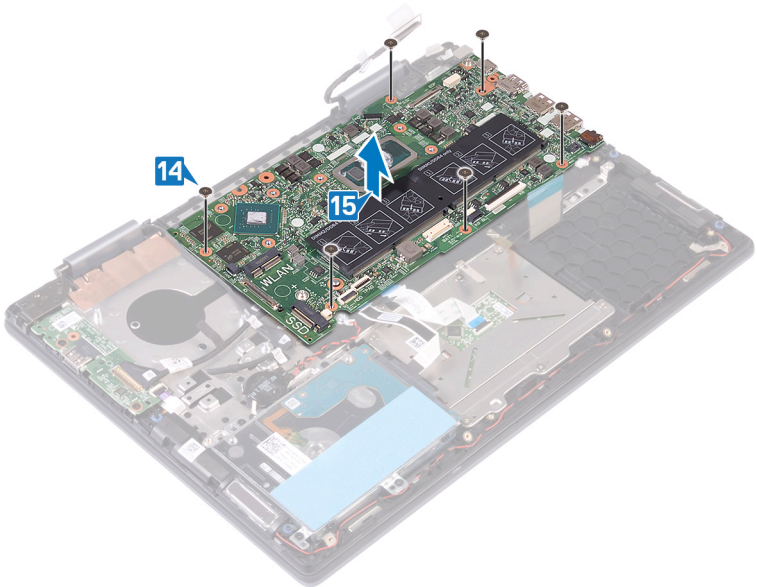


5 Disconnect the power-adapter port cable from the system board.
6 Remove the two screws (M2x3) that secure the USB Type-C port bracket to the system board and palm-rest assembly.
7 Lift the USB Type-C port bracket off the system board.
8 Disconnect the speaker cable from the system board.
9 Open the latch, and disconnect the keyboard cable from the system board.
10 Open the latch, and disconnect the keyboard-backlight cable from the system board.
11 Open the latch, and disconnect the touchpad cable from the system board.
12 Open the latch, and disconnect the hard-drive cable from the system board.
13 Disconnect the coin-cell battery cable from the system board.



14 Remove the six screws (M2x2) that secure the system board to the palm-rest and keyboard assembly.

15 Lift the system board off the palm-rest and keyboard assembly.



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.

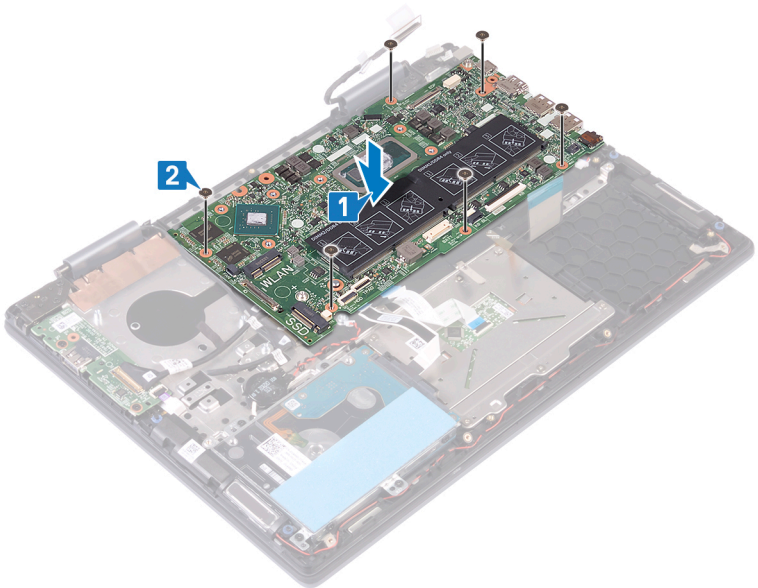
NOTE: Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

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-3E31BD37-C0BB-468B-828E-98D418A9AF9B
Status	Released

Procedure

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

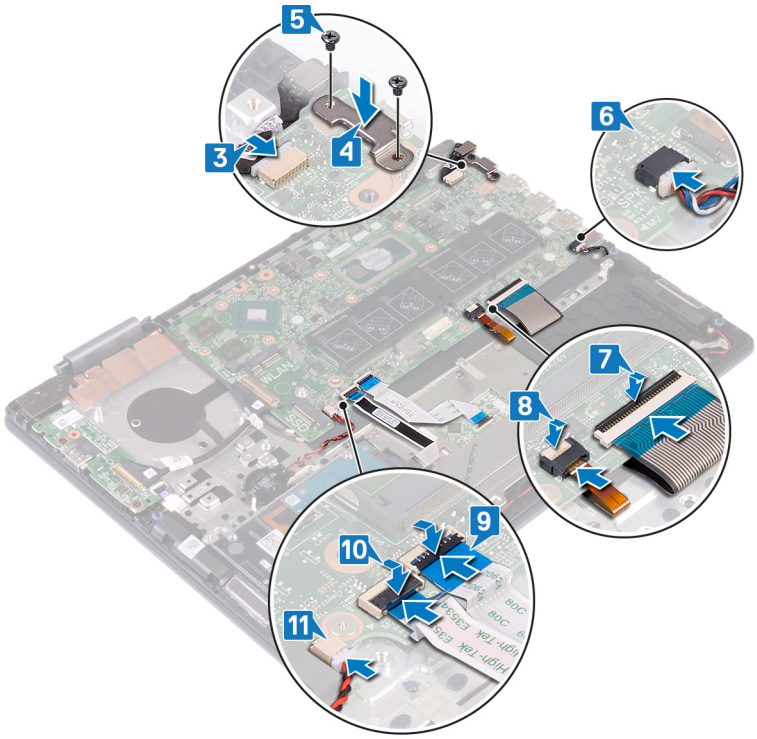


3 Connect the power-adapter port cable to the system board.
4 Align the screw holes on the USB Type-C port bracket with the screw holes on the system board.
5 Replace the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
6 Connect the speaker cable to the system board.
7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

9 Slide the touchpad cable into the connector on the system board and close the latch to secure the cable.

10 Slide the hard-drive cable into the connector on the system board and close the latch to secure the cable.

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

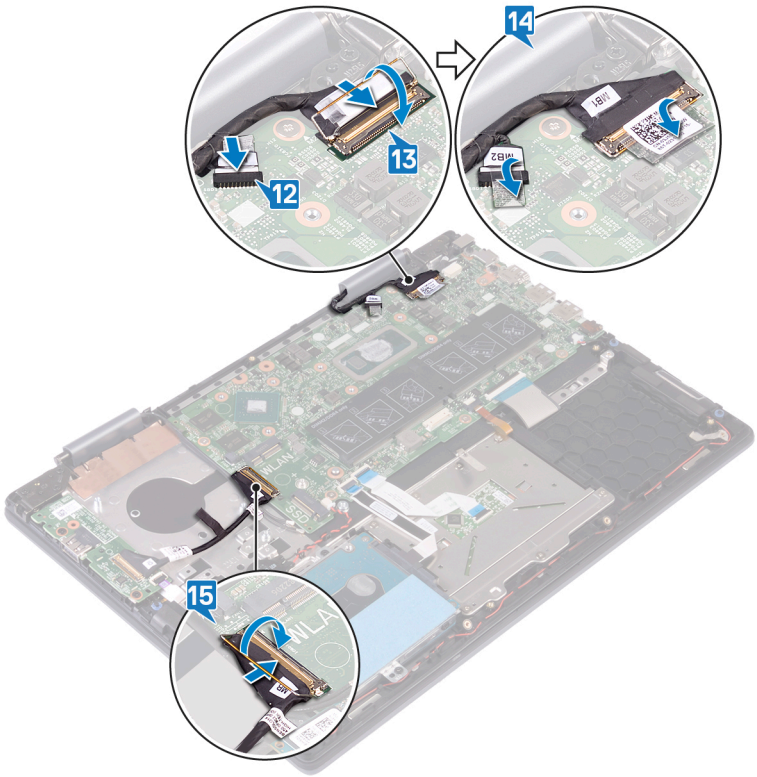


12 Connect the touch-screen board cable to the system board.

13 Slide the display cable into the connector on the system board and close the latch to secure the cable.

14 Adhere the tapes that secure the display cable and touch-screen board cable to their respective connectors on the system board.

15 Slide the I/O-board cable into the connector on the system board and close the latch to secure the cable.



Identifier	GUID-433047ED-4AA7-4B51-9DD2-3FDA47D0FE2B
Status	Released

Post-requisites

1 Replace the wireless card.
2 Replace the heat sink.
3 Replace the fan.
4 Replace the solid-state drive/Intel Optane memory module.
5 Replace the coin-cell battery.
6 Replace the memory modules.
7 Replace the battery.
8 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-700DE9D7-C060-4C5B-BBD0-F827BDFE4F44
Status	Released

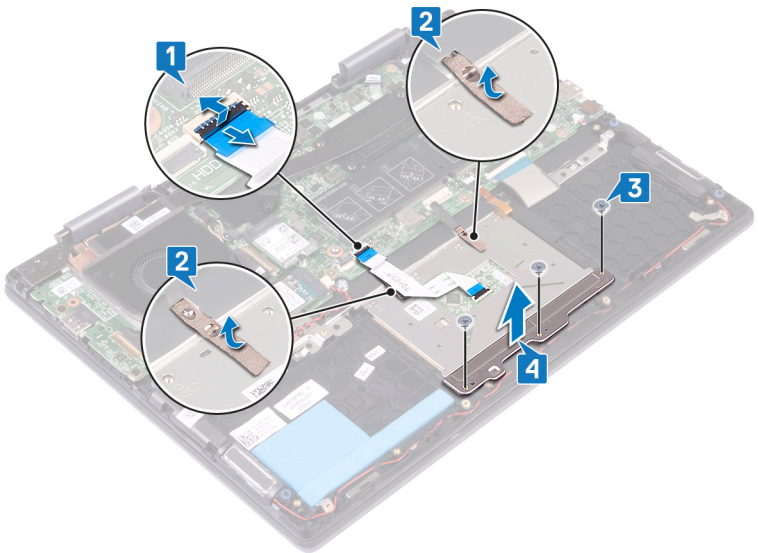
Prerequisites

1 Remove the base cover.
2 Remove the battery.

Identifier	GUID-3A17F03C-394C-4EA4-BA4C-5EC183C0904A
Status	Released

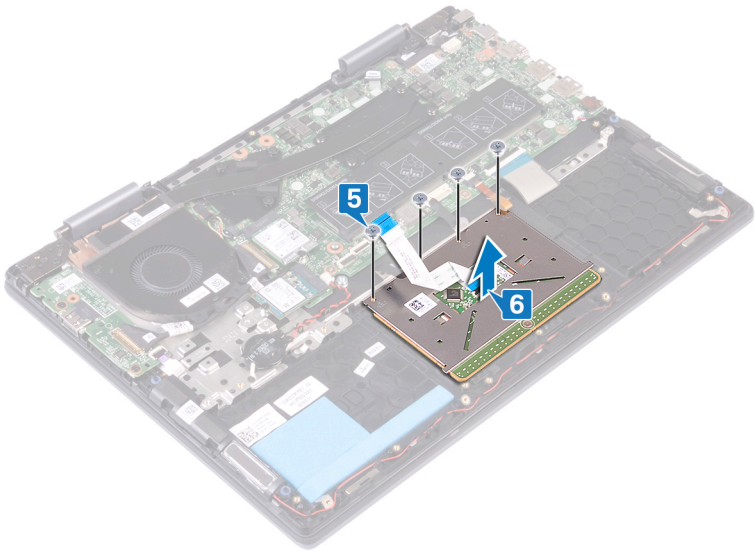
Procedure

1 Open the latch, and disconnect the touchpad cable from the system board.
2 Peel the tapes that secure the touchpad to the palm-rest and keyboard assembly.
3 Remove the three screws (M2x2) that secure the touchpad bracket to the palm-rest and keyboard assembly.
4 Lift the touchpad bracket off the palm-rest and keyboard assembly.



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

6 Lift the touchpad, along with the cable, at an angle from under the touch-pad bracket off the palm-rest and keyboard assembly.



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

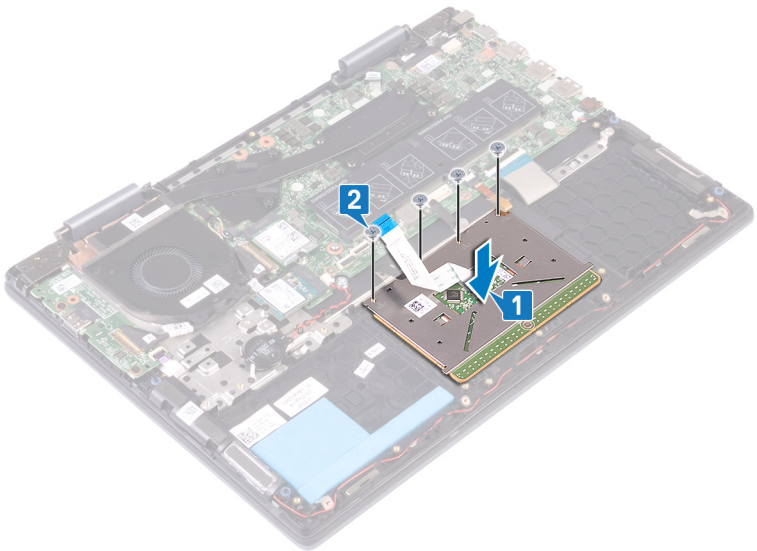
Replacing the touchpad

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.

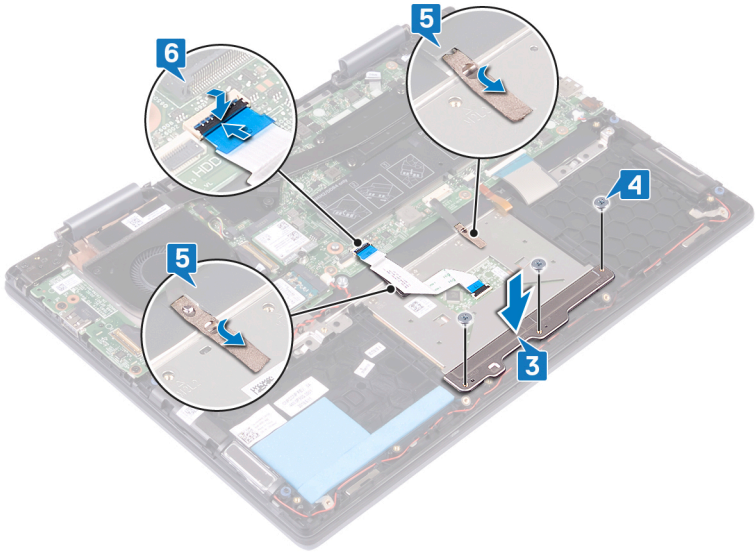
Identifier	GUID-EBE74838-9AAB-4DE2-A94F-D5FC20FB53A3
Status	Released

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) 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 touchpad.
4 Replace the three screws (M2x2) that secure the touchpad bracket to the touchpad.
5 Adhere the tapes that secure the touchpad to the keyboard shield.
6 Slide the touchpad cable into the connector on the system board and close the latch to secure the cable.



Identifier	GUID-1AEA0DB7-765D-4602-BD20-70B982BBB458
Status	Released

Post-requisites

1 Replace the battery.
2 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-EBCFE04D-5618-474E-8DF7-2685A46C50AC
Status	Released

Prerequisites

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

Identifier	GUID-D6A1E085-A2F9-445A-9277-6F63E0ED9F20
Status	Released

Procedure

After performing the steps in 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-0068406C-ADC0-45A5-B20B-B2B5FC5DA965
Status	Released

Procedure

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

Identifier	GUID-EC46BF92-43B3-4137-98DE-86948B771BF7
Status	Released

Post-requisites

1. Replace the touchpad.
2. Replace the system board.
3. Replace the power button with fingerprint reader. (if installed)
4. Replace the display assembly.
5. Replace the wireless card.
6. Replace the power-adapter port.

7 Replace the speakers.
8 Replace the I/O board.
9 Replace the fan.
10 Replace the heat sink.
11 Replace the hard drive.
12 Replace the solid-state drive/Intel Optane memory module.
13 Replace the coin-cell battery.
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-4DD27E61-C558-4F8F-BD02-38B32A938285
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-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-6AB8CB62-0D9B-4C9E-BB74-4E688A684227
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	
System Information	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.

General-System Information	
Ownership Tag	Displays the Ownership Tag of the computer.
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the express service code of the computer.
Memory Information	
Memory Installed	Displays the total computer memory installed.
Memory Available	Displays the total computer memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology used for the memory.
DIMM A Size	Displays the DIMM A memory size.
DIMM B Size	Displays the DIMM B memory size.
Processor Information	
Processor Type	Displays the processor type.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Current Clock Speed	Displays the current processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Maximum Clock Speed	Displays the maximum processor clock speed.
Processor L2 Cache	Displays the processor L2 Cache size.
Processor L3 Cache	Displays the processor L3 Cache size.
HT Capable	Displays whether the processor is HyperThreading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Device Information	
SATA-0	Displays the SATA-0 device information of the computer.
SATA-1	Displays the SATA-1 device information of the computer.
LOM MAC Address	Displays the LAN On Motherboard (LOM) MAC address of the computer.
Video Controller	Displays the video controller type of the computer.
dGPU Video Controller	Displays the discrete graphics information of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.
Video Memory	Displays the video memory information of the computer.
Panel Type	Displays the Panel Type of the computer.
Native Resolution	Displays the native resolution of the computer.
Audio Controller	Displays the audio controller information of the computer.
Wi-Fi Device	Displays the wireless device information of the computer.
Bluetooth Device	Displays the bluetooth device information of the computer.
Battery Information	Displays whether bluetooth is installed in the computer.
Boot Sequence	
Boot Sequence	Displays the boot sequence.

General-System Information	
Boot List Option	Displays the available boot options.
Advanced Boot Options	
Enable Legacy Option ROMs	Enables or disables the Legacy Option ROMs.
UEFI Boot Path Security	Enables or disables the user to enter Admin password when booting a UEFI boot path from the F12 Boot Menu.
Date/Time	Displays the current date in MM/DD/YY format and current time in HH:MM:SS AM/PM format.

Table 4. System setup options—System Configuration menu

System Configuration	
SATA Operation	Configure operating mode of the integrated SATA hard drive controller.
Drives	Enables or disables various drives on board.
SMART Reporting	Enables or disables Self-Monitoring, Analysis, and Reporting Technology (SMART) during system startup.
USB Configuration	
Enable Boot Support	Enables or disables booting from USB mass storage devices such as external hard drive, optical drive, and USB drive.
Enable External USB Port	Enables or disables booting from USB mass storage devices connected to external USB port.
USB PowerShare	Enables or disables the USB PowerShare.
Audio	Enables or disables the integrated audio controller.
Keyboard Illumination	Enables you to choose the mode of the keyboard illumination feature.
Keyboard Backlight Timeout on AC	Enables you to define the timeout value for the keyboard backlight when a power adaper is plugged.
Keyboard Backlight Timeout on Battery	Enables you to define the timeout value for the keyboard backlight when the computer is running on battery.
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-0 Password	Set, change, or delete the internal hard-disk drive password.
Strong Password	Enable or disable strong passwords.
Password Configuration	Control the minimum and maximum number of characters allowed for the Admin and System passwords.

Security	
Password Bypass	Bypass the System (Boot) Password and the internal HDD password prompts during a system restart.
Password Change	Enable or disable changes to the System and Hard Disk passwords when an administrator password is set.
Non-Admin Setup Changes	Determines whether changes to the setup option are permitted when an administrator password is set.
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update packages.
PTT Security	Enable or disable Platform Trust Technology (PTT) visibility to the operating system.
Computrace(R)	Enable or disable the BIOS module interface of the optional Computrace(R) Service from Absolute Software.
Admin Setup Lockout	Enable to prevent users from entering Setup when an Admin Password is set.
Master Password Lockout	Enables or disables the master password lockout support.
SMM Security Mitigation	Enables or disables additional UEFI Security Mitigation protections.

Table 7. System setup options—Secure Boot menu

Secure Boot	
Secure Boot Enable	Enables or disables the secure boot feature.
Secure Boot Mode	Enables or disables the user to choose the secure boot mode.
Expert Key Management	
Enable Custom Mode	Enables or disables custom mode.
Expert Key Management	Enables or disables 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.
HyperThread Control	Enable or disable HyperThreading in the processor. Default: Enabled.

Intel Software Guard Extensions	
Power Management	
AC Behavior	Enables the system to turn on automatically, when AC is inserted.
Enable Intel Speed Shift Technology	Enables or disables the Intel Speed Shift technology support.
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	Enables the USB devices to wake the computer from Standby.
Block Sleep	Enables you to block entering to sleep mode in OS environment.
Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period.
Primary Battery Charge Configuration	Sets 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	Enables you to display full screen logo if your image matches screen resolution.
Warning and Errors	Enables the computer to pause when warnings and errors are detected during boot process.
MAC Address Pass Through	Replaces the external NIC MAC address.

Table 9. System setup options—Virtualization Support menu

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

Table 10. System setup options—Wireless menu

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

Table 11. System setup options—Maintenance menu

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

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: Do not try to remove the Intel Rapid Storage Technology driver after disabling Intel Optane memory, 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 or the Intel Optane memory module from the system.

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.

Getting help and contacting Dell

Self-help resources

You can get information and help on Dell products and services using these self-help resources:

Table 15. Self-help resources

Information about Dell products and services	www.dell.com
Dell Help & Support app	
Accessing help	In Windows search, type `Help and Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows
Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.	www.dell.com/support
Dell knowledge base articles for a variety of computer concerns.	1 Go to www.dell.com/support. 2 Type the subject or keyword in the **Search** box. 3 Click **Search** to retrieve the related articles.
Learn and know the following information about your product: • Product specifications • Operating system • Setting up and using your product • Data backup • Troubleshooting and diagnostics • Factory and system restore • BIOS information	See *Me and My Dell* at www.dell.com/support/manuals. To locate the *Me and My Dell* relevant to your product, identify your product through one of the following: • Select **Detect Product**. • Locate your product through the drop-down menu under **View Products**. • Enter the **Service Tag number** or **Product ID** in the search bar.

Contacting Dell

To contact Dell for sales, technical support, or customer service issues, see www.dell.com/contactdell.

NOTE: Availability varies by country and product, and some services may not be available in your country.

NOTE: If you do not have an active internet connection, you can find contact information on your purchase invoice, packing slip, bill, or Dell product catalog.