Alienware m15 R4
Service Manual

A L I E N W A R E™

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.

Contents

Working inside your computer

Before working inside your computer

About this task

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

Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start** > ⏻ **Power** > **Shut down**.

   (i) **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.

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

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

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that you have read the safety information that shipped with your computer.

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

⚠ **WARNING: Disconnect your computer from 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 your computer to an electrical outlet.**

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

⚠ **CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the 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 is 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 it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.**

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

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

Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

- Use a wired ESD wrist strap that is properly grounded. The use of wireless anti-static straps is no longer allowed; they do not provide adequate protection. Touching the chassis before handling parts does not ensure adequate ESD protection on parts with increased sensitivity to ESD damage.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, ensure that you discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.

- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

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

Transporting sensitive components

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

Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

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

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

After working inside your computer

About this task

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

Steps

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.

Removing and installing components

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

Recommended tools

The procedures in this document may require the following tools:
- Phillips screwdriver #0
- Plastic scribe

Screw list

ⓘ **NOTE:** When removing screws from a component, it is recommended to note the screw type, the quantity of screws, and then place them in a screw storage box. This is to ensure that the correct number of screws and correct screw type is restored when the component is replaced.

ⓘ **NOTE:** Some computers have magnetic surfaces. Ensure that the screws are not left attached to such surfaces when replacing a component.

ⓘ **NOTE:** Screw color may vary with the configuration ordered.

Table 1. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Base cover	Palm-rest assembly	M2.5x5	2	
Battery	Palm-rest assembly	M2x3	4	
Battery	Palm-rest assembly	M2x4	4	
M.2 2230 solid-state drive	M.2 2230 mounting bracket	M2x2.5	1 per M.2 2230 solid-state drive	
M.2 2230 mounting bracket	Palm-rest assembly	M2x2.5	1 per M.2 2230 solid-state drive	
M.2 2280 solid-state drive	Palm-rest assembly	M2x2.5	1 per M.2 2280 solid-state drive	
M.2 2230 WWAN/ solid-state drive	M.2 2230 thermal shield	M2x2.5	1	
M.2 2230 thermal shield	Left I/O-board	M2x2.5	1	
Rear I/O-cover	Palm-rest assembly	M2x4	2	
Rear I/O-cover	Palm-rest assembly	M2.5x5	2	
Wireless-card bracket	Left I/O-board	M2x3	1	

Table 1. Screw list (continued)

Component	Secured to	Screw type	Quantity	Screw image
Display assembly	Palm-rest assembly	M2.5x4	8	
Touchpad	Palm-rest assembly	M2x1.9	4	
Keyboard-controller board	Palm-rest assembly	M2x1.9	2	
Right I/O-board cable	● System board ● Right I/O-board	M2x3	2	
Right I/O-board	Palm-rest assembly	M2x3	2	
M.2 solid-state drive (SSD) frame	System board	M2x4.5	3	
Fan and heat-sink assembly	Palm-rest assembly	M2x4.5	2	
Fan and heat-sink assembly	Palm-rest assembly	M2x3	3	
System board	Palm-rest assembly	M2x3	5	
Left I/O-board	Palm-rest assembly	M2x3	2	
Left I/O-board	System board	M2x4.5	4	
Fan and heat-sink assembly	System board	M2x3	10	
Power-adapter port bracket	Palm-rest assembly	M2x3	2	
Power-button assembly	Palm-rest assembly	M2x1.9	3	
Keyboard bracket	Keyboard	M1.2x2.1	12	
Keyboard	Palmrest	M1.2x1.6	19	

Major components of Alienware m15 R4

The following image shows the major components of Alienware m15 R4.
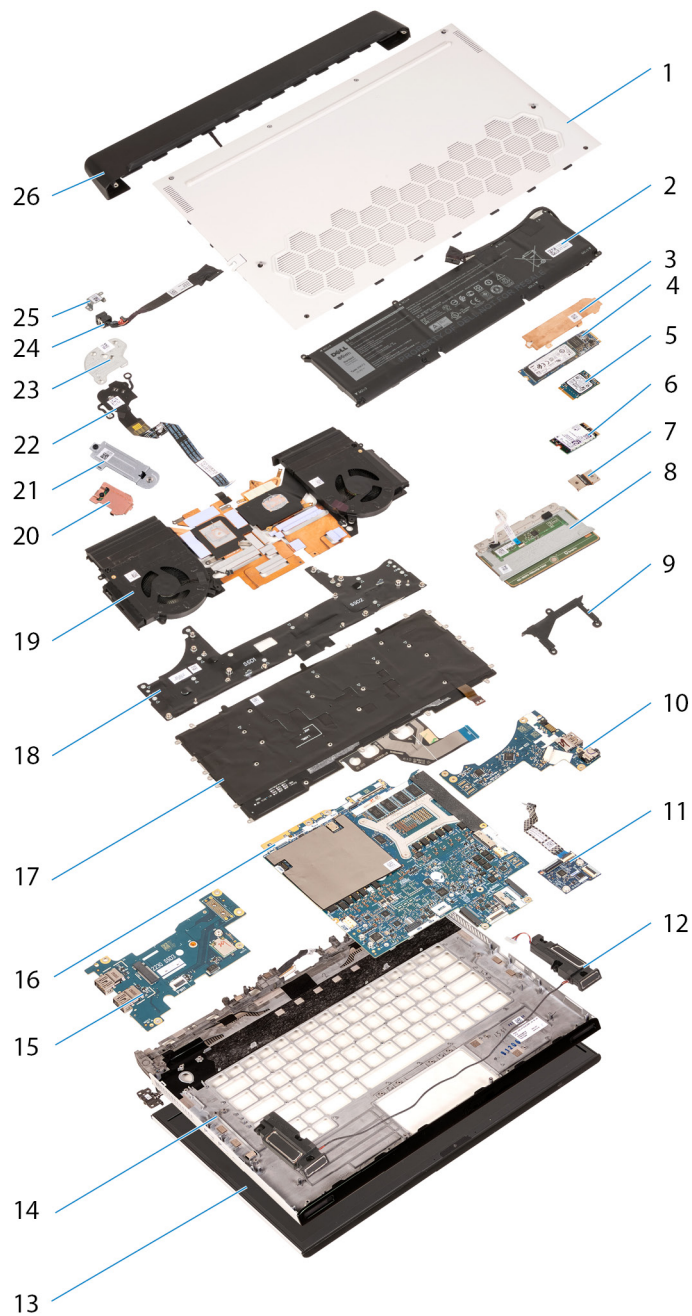
1. Base cover
2. Battery
3. M.2 2280 thermal shield (if applicable)
4. M.2 2280 solid-state drive (if applicable)
5. M.2 2230 solid-state drive (if applicable)
6. M.2 2280 solid-state drive/WWAN (if applicable)
7. Right I/O-board connector
8. Touchpad
9. M.2 mounting frame
10. Right I/O-board
11. Keyboard-controller board
12. Speakers
13. Display assembly
14. Palmrest
15. Left I/O-board
16. System board

17. Keyboard
18. Keyboard bracket
19. Fan and heat-sink assembly
20. M.2 2230 thermal shield (if applicable)
21. M.2 2230 mounting bracket (if applicable)
22. Power-button assembly
23. Power-button bracket
24. Power-adapter port
25. Power-adapter port bracket
26. Rear I/O-cover

ⓘ **NOTE:** Dell provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representative for purchase options.

ⓘ **NOTE:** Depending on the configuration ordered, some components may not be installed in your computer.

Base cover

Removing the base cover

Prerequisites

1. Follow the procedure in <u>Before working inside your computer</u>.

About this task

ⓘ **NOTE:** Before removing the base cover, ensure that there is no micro-SD card installed in the micro-SD card slot on your computer.

The following image(s) indicate the location of the base cover and provides a visual representation of the removal procedure.

2x
M2x5

6x
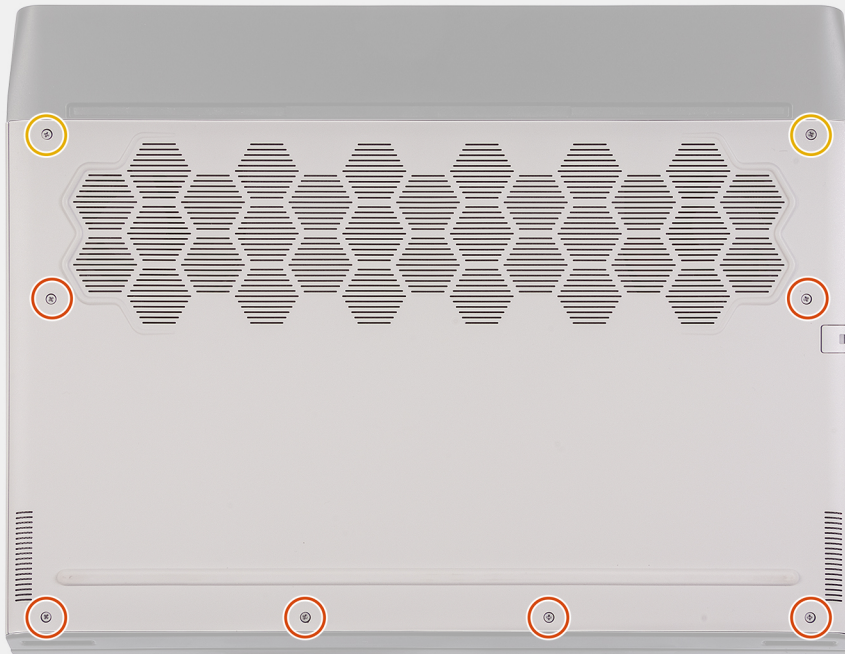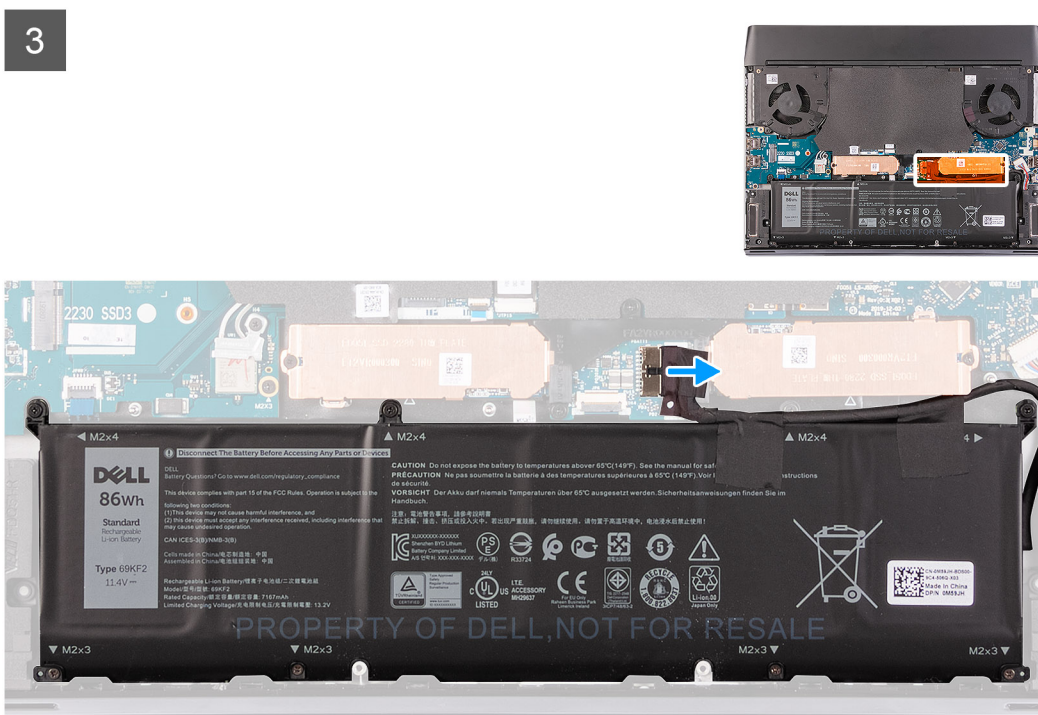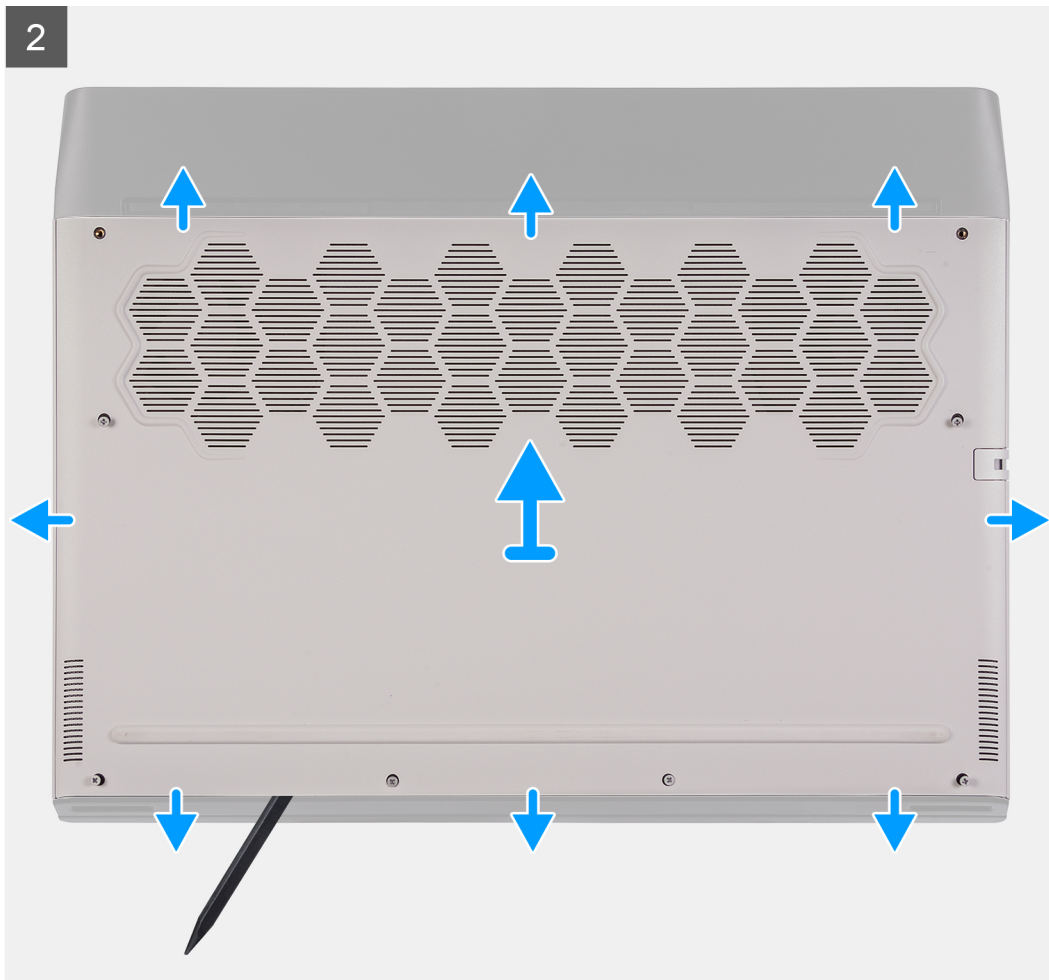
Steps

1. Remove the two screws (M2.5x5) that secure the base cover to the palm-rest assembly.

2. Loosen the six captive screws.
3. Using a plastic scribe, pry the base cover from the bottom left and continue to work on the sides to open the base cover.
4. Lift and slide the base cover off the palm-rest assembly.
5. Disconnect the battery cable from the system board.
6. Peel the tape that secures the battery cable to the battery.
7. Press and hold the power button for five seconds to ground the computer and drain the flea power.

Installing the base cover

Prerequisites

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

About this task

The following image(s) indicate the location of the base cover and provides a visual representation of the installation procedure.

2x
M2x5

6x
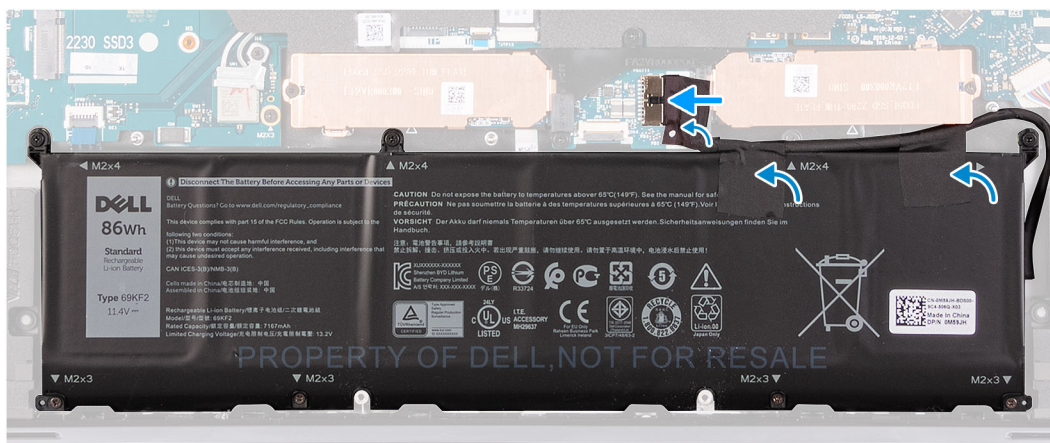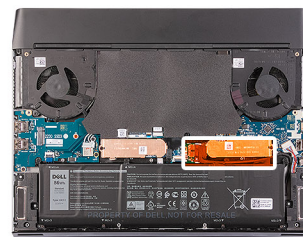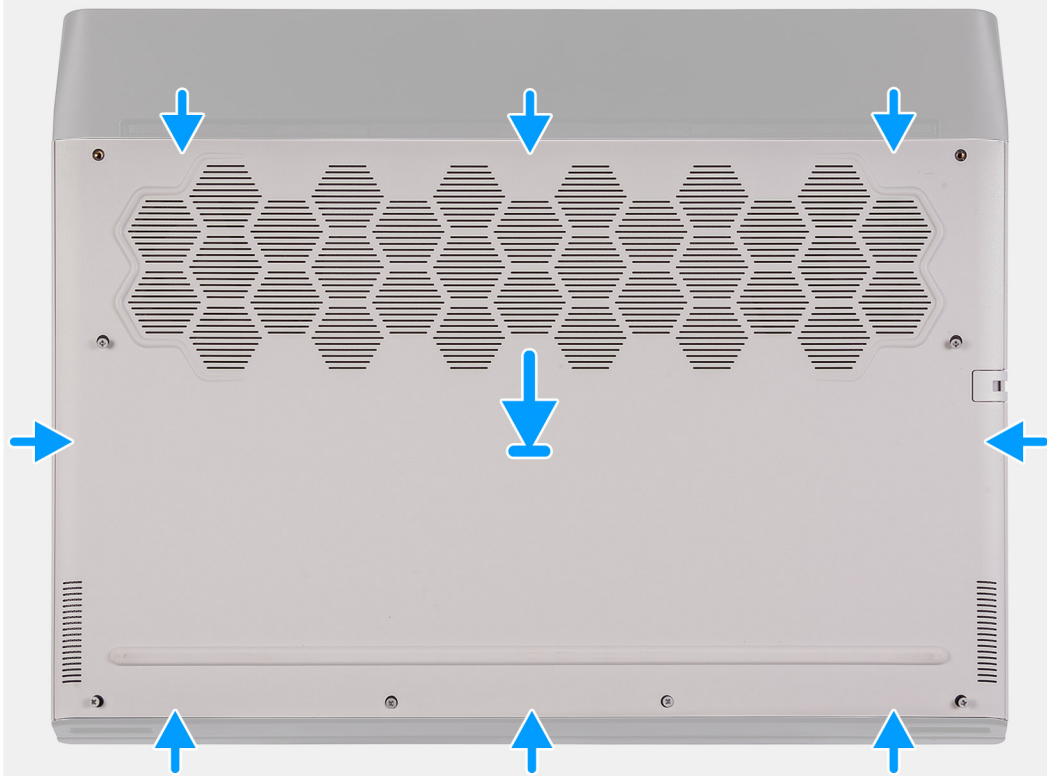
Steps

1. Connect the battery cable to the system board.
2. Adhere the tape that secures the battery cable to the battery.
3. Slide the notches on the top of the base cover under the rear I/O-cover and snap the base cover into place on the palm-rest assembly.
4. Tighten the six captive screws on the base cover.
5. Replace the two screws (M2.5x5) that secure the base cover to the palm-rest assembly.

Next steps

1. Follow the procedure in <u>After working inside your computer</u>.

Battery

Lithium-ion battery precautions

⚠️ **CAUTION:**
- **Exercise caution when handling Lithium-ion batteries.**
- **Discharge the battery completely before removing it. Disconnect the AC power adapter from the system and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**
- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**
- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**
- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.**

Removing the battery

Prerequisites

1. Follow the procedure in <u>Before working inside your computer</u>.
2. Remove the <u>base cover</u>.

About this task

⚠️ **CAUTION: This computer is designed without an RTC coin cell-battery. After a service incident where the system battery is disconnected, when the battery is fully discharged, or when the system is reassembled and turned on, an RTC reset cycle will occur. When an RTC Reset cycle occurs, the system turns on and off three times. An "Invalid Configuration" error message is displayed prompting you to enter the BIOS and configure the date and time. The computer starts functioning normally after setting the date and time.**

⚠️ **CAUTION: Removing the 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 battery.**

The following image(s) indicate the location of the battery and provides a visual representation of the removal procedure.
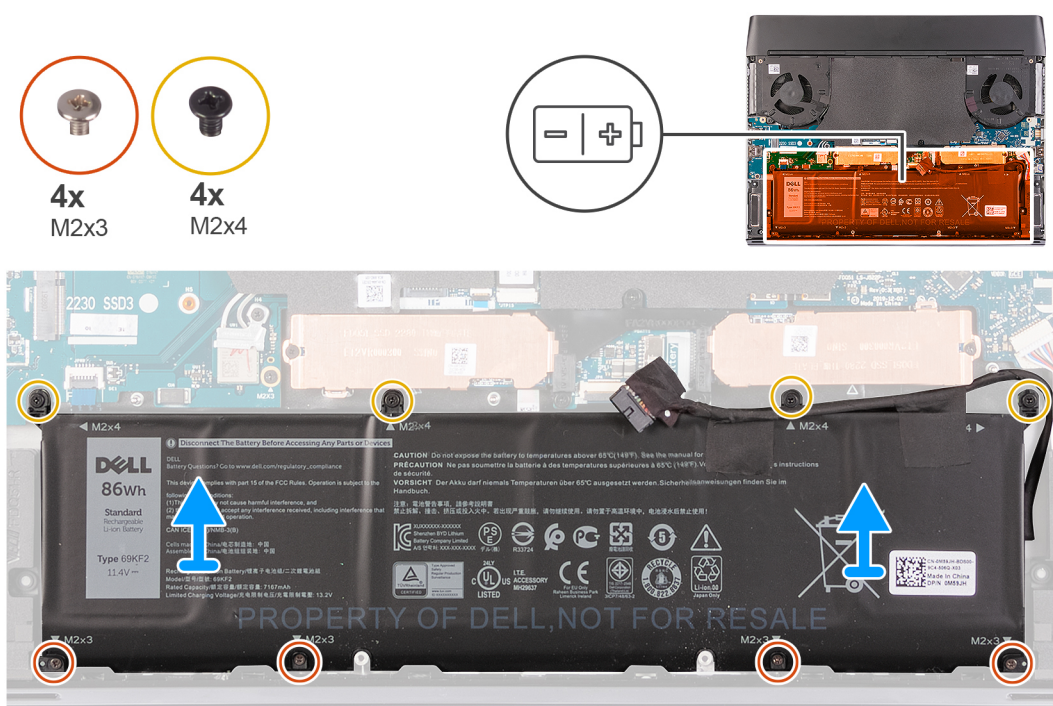
Steps

1. Ensure that the battery cable has been disconnected from the system board.
2. Remove the four screws (M2x4) that secure the battery to the palm-rest assembly.
3. Remove the four screws (M2x3) that secure the battery to the palm-rest assembly.
4. Remove the battery from the palm-rest assembly.

Installing the battery

Prerequisites

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

About this task

The following image(s) indicate the location of the battery and provides a visual representation of the installation procedure.
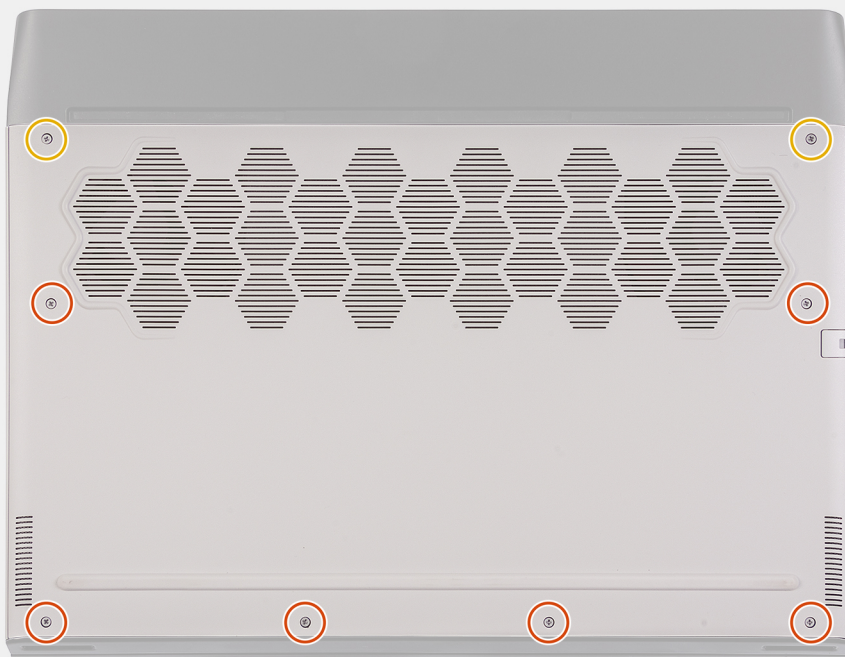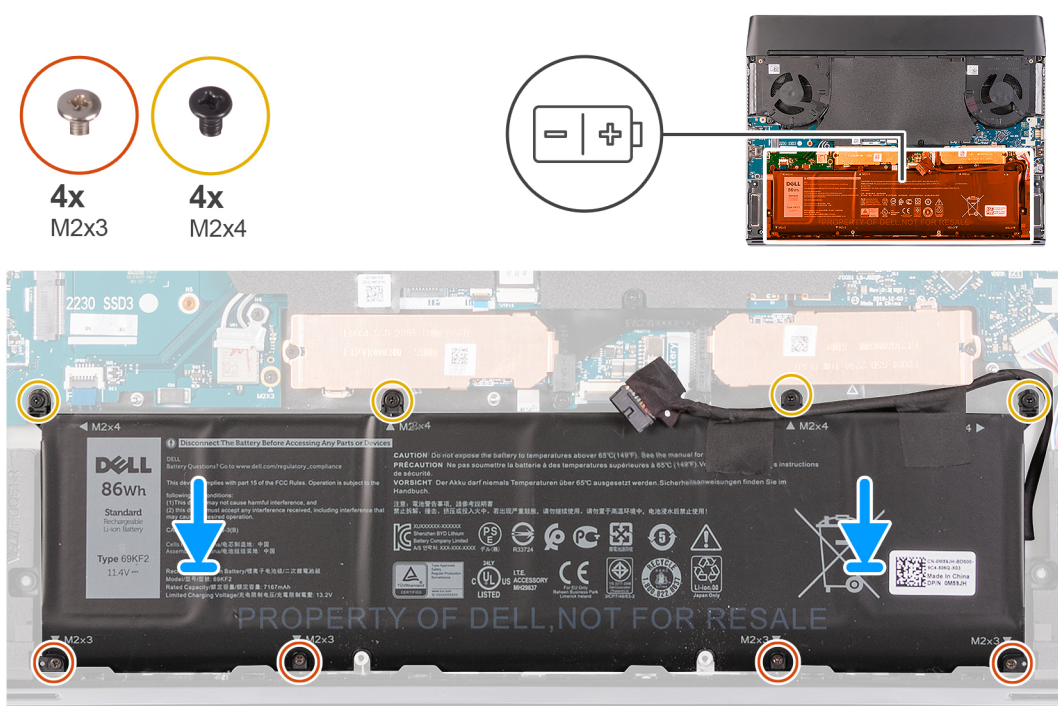
Steps

1. Place the battery on the palm-rest assembly.
2. Align the screw holes on the batery to the screw holes on the palm-rest assembly.
3. Replace the four screws (M2x4) that secure the battery to the palm-rest assembly.
4. Replace the four screws (M2x3) that secure the battery to the palm-rest assembly.

Next steps

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

M.2 solid-state drive

Removing the M.2 2230 solid-state drive

Prerequisites

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

About this task

(i) **NOTE:** This procedure applies only to computers shipped with a M.2 2230 solid-state drive installed in the following M.2 card slots:

- M.2 card slot 1
- M.2 card slot 2

The following image(s) indicate the location of the M.2 2230 solid-state drive and provides a visual representation of the removal procedure.

M.2 2230 solid-state drive in M.2 card slot 1

2x
M2x2.5
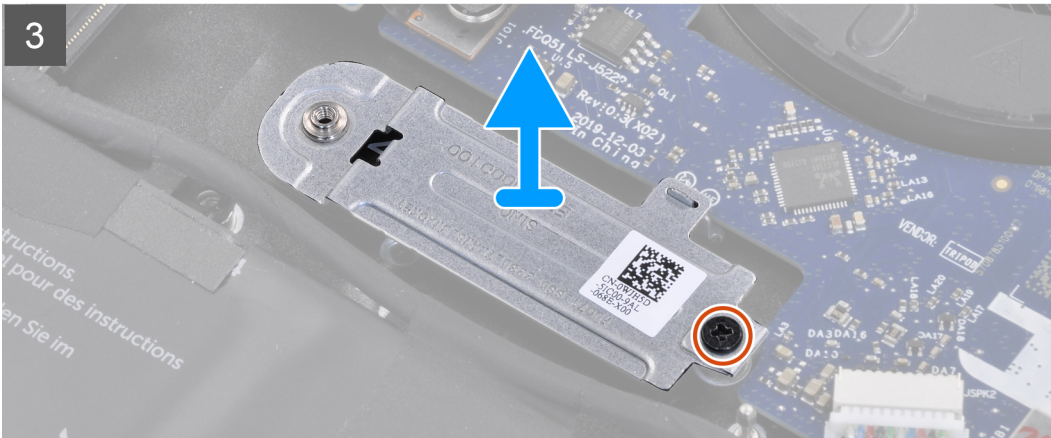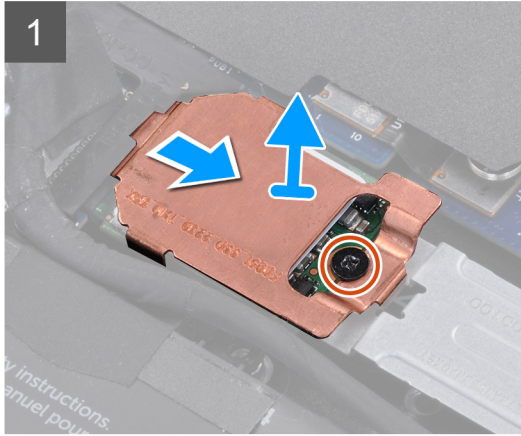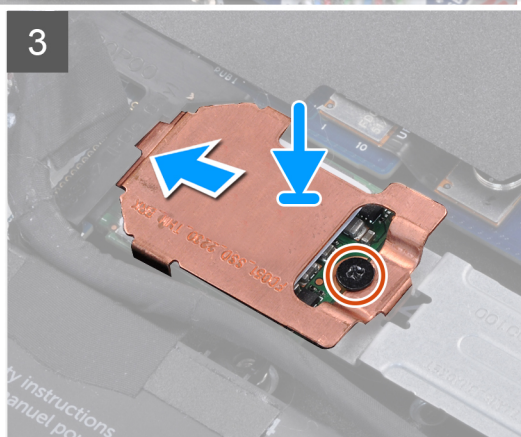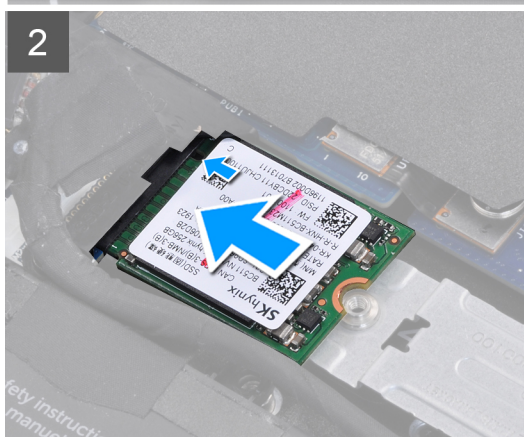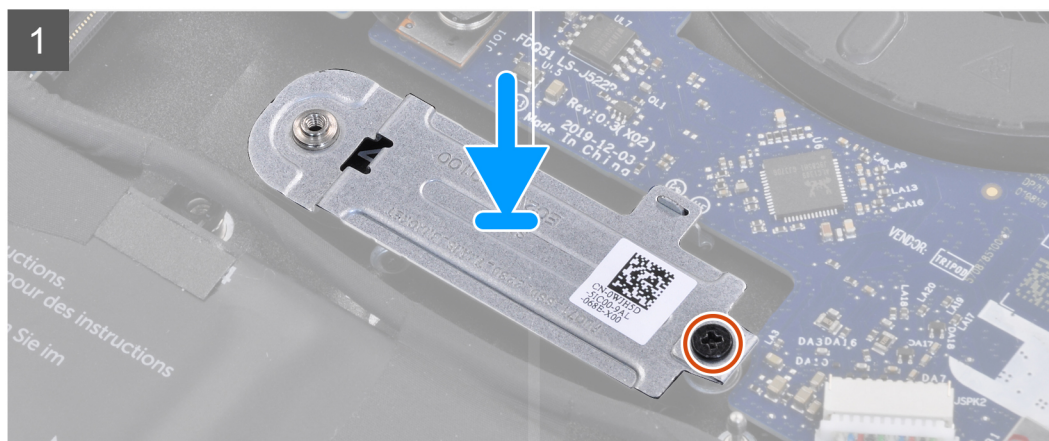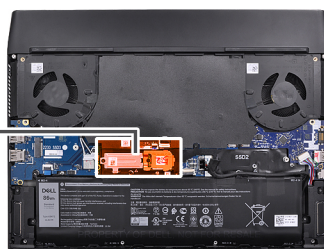
M.2 2230 solid-state drive in M.2 card slot 2

2x
M2x2.5

Steps

1. Remove the screw (M2x2.5) that secures the M.2 thermal shield to the M.2 2230 mounting bracket.
2. Remove the M.2 2230 thermal shield from the M.2 2230 solid-state drive.
3. Lift and remove the M.2 2230 solid-state drive from the M.2 card slot on the system board.
4. Remove the screw (M2x2.5) that secures the M.2 2230 mounting bracket to the palm-rest assembly.
5. Remove the M.2 2230 mounting bracket from the palm-rest assembly.

Installing the M.2 2230 solid-state drive

Prerequisites

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

About this task

(i) **NOTE:** This procedure applies if you are installing a M.2 2230 solid-state drive in the following M.2 card slots:
- M.2 card slot 1
- M.2 card slot 2

The following image(s) indicate the location of the M.2 2230 solid-state drive and provides a visual representation of the installation procedure.

M.2 2230 solid-state drive in M.2 card slot 1

M.2 2230 solid-state drive in M.2 card slot 2

Steps

1. Place the M.2 2230 mounting bracket on the palm-rest assembly.
2. Align the screw hole on the M.2 2230 mounting bracket to the screw hole on the palm-rest assembly.
3. Replace the screw (M2x2.5) that secures the M.2 2230 mounting bracket to the palm-rest assembly.
4. Align the notch on the M.2 2230 solid-state drive with the tab on the M.2 card slot on the system board.
5. Slide the M.2 2230 solid-state drive into the M.2 card slot on the system board.
6. Slide the M.2 2230 thermal shield into the slot on the M.2 SSD frame.
7. Align the screw hole on the M.2 2230 thermal shield to the screw hole on the M.2 2230 mounting bracket.
8. Replace the screw (M2x2.5) that secures the M.2 2230 solid-state drive and thermal shield to the M.2 2230 mounting bracket.

Next steps

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

Removing the M.2 2280 solid-state drive

Prerequisites

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

About this task

(i) **NOTE:** This procedure applies only to computers shipped with a M.2 2280 solid-state drive installed in the following M.2 card slots:

- M.2 card slot 1
- M.2 card slot 2

The following image(s) indicate the location of the M.2 2280 solid-state drive and provides a visual representation of the removal procedure.

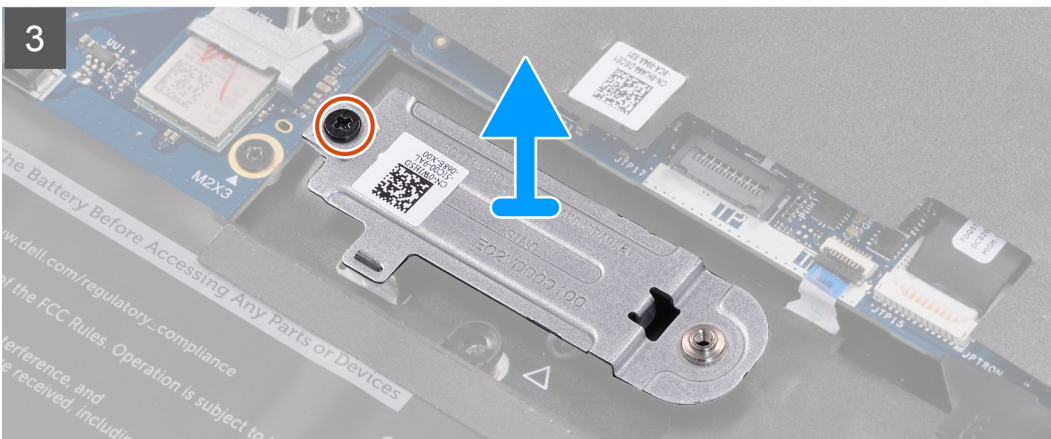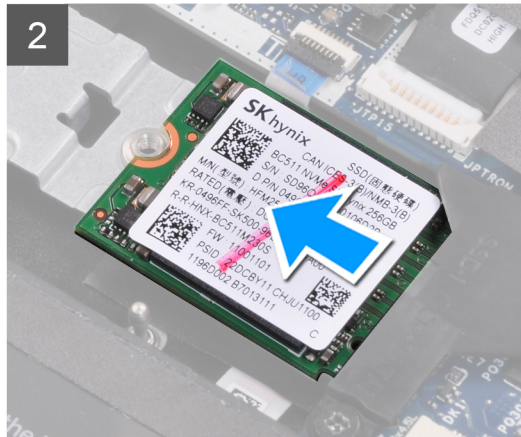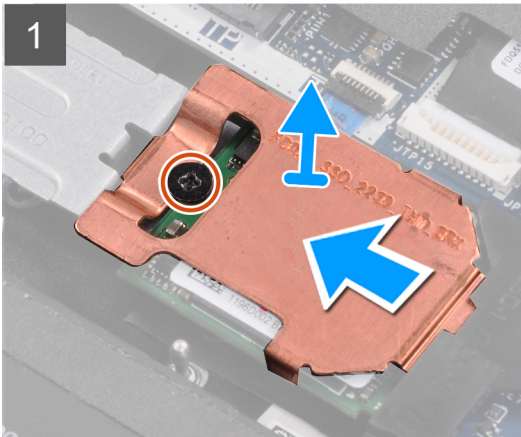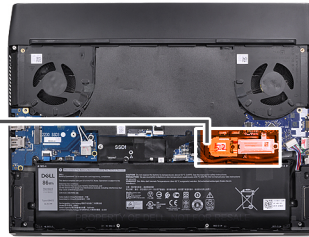**M.2 2280 solid-state drive in M.2 card slot 1**

1x
M2x2.5

M.2 2280 solid-state drive in M.2 card slot 2

Steps

1. Remove the screw (M2x2.5) that secures the M.2 2280 thermal shield to the palm-rest assembly.
2. Lift and remove the M.2 2280 thermal shield off the M.2 2280 solid-state drive.
3. Slide and remove the M.2 2280 solid-state drive from the M.2 card slot on the system board.

Installing the M.2 2280 solid-state drive

Prerequisites

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

About this task

(i) **NOTE:** This procedure applies if you are installing a M.2 2230 solid-state drive in the following M.2 card slots:
- M.2 card slot 1
- M.2 card slot 2

The following image(s) indicate the location of the M.2 2280 solid-state drive and provides a visual representation of the installation procedure.

M.2 2280 solid-state drive in M.2 card slot 1

1x
M2x2.5
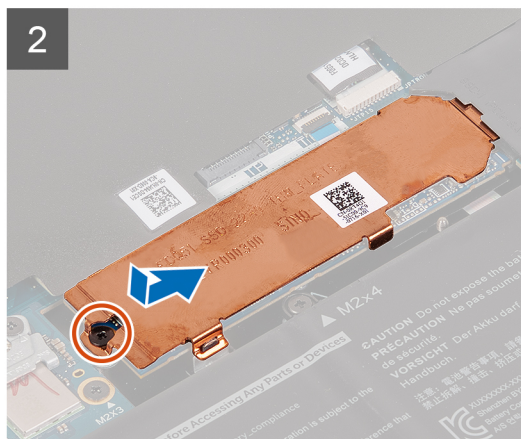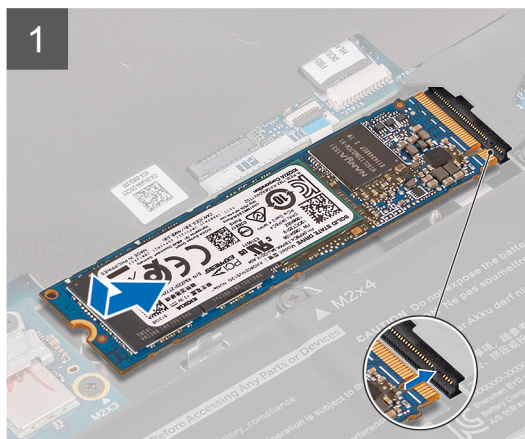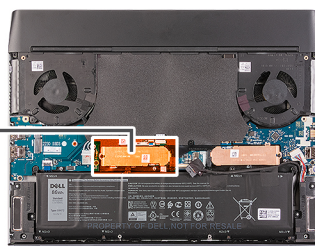
M.2 2280 solid-state drive in M.2 card slot 2

1x
M2x2.5
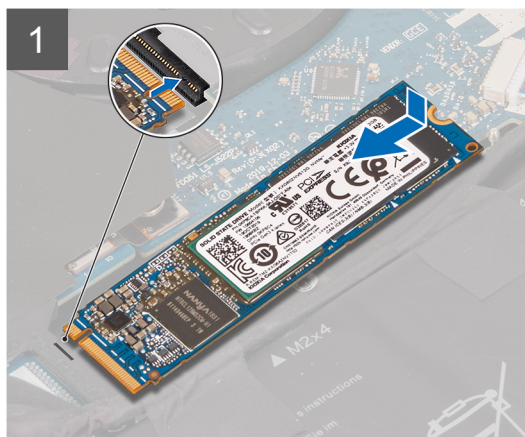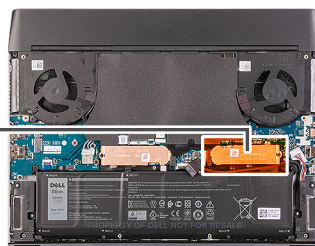
Steps

1. Align the notch on the M.2 2280 solid-state drive with the tab on the M.2 card slot on the system board.
2. Slide the M.2 2280 solid-state drive into the M.2 card slot on the system board.
3. Slide the M.2 2280 thermal shield into the slot on the M.2 SSD frame.
4. Align the screw hole on the M.2 2280 thermal shield to the screw hole on the palm-rest assembly.
5. Replace the screw (M2x2.5) that secures the M.2 2280 solid-state drive to the palm-rest assembly.

Next steps

1. Install the base cover.

2. Follow the procedure in <u>After working inside your computer</u>.

M.2 2230 WWAN/solid-state drive

Removing the M.2 2230 WWAN/solid-state drive

Prerequisites

1. Follow the procedure in <u>Before working inside your computer</u>.
2. Remove the <u>base cover</u>.

About this task

ⓘ **NOTE:** This procedure applies only to computers shipped with a M.2 2230 solid-state drive or M.2 2230 WWAN card installed in M.2 card slot 3.

The following image(s) indicate the location of the M.2 2230 WWAN/solid-state drive and provides a visual representation of the removal procedure.
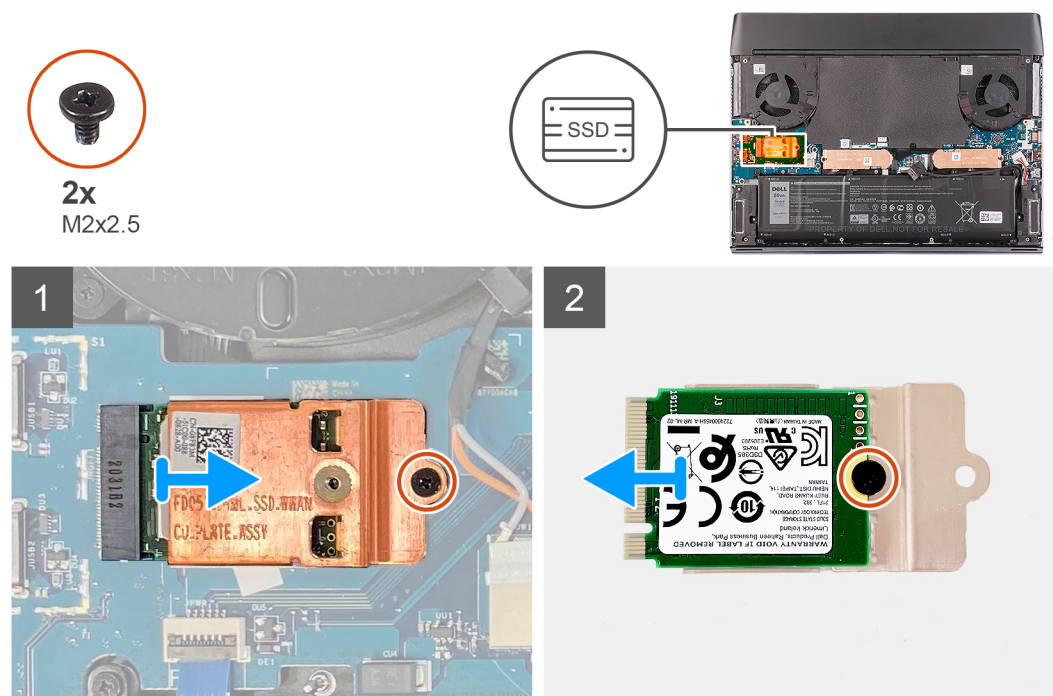
Steps

1. Remove the screw (M2x2.5) that secures the M.2 2230 thermal shield to the left I/O-board.
2. Lift and remove the M.2 2230 thermal shield from the left I/O-board.
3. Flip over the M.2 2230 thermal shield.
4. Remove the screw (M2x2.5) that secures the M.2 2230 WWAN/solid-state drive to the M.2 2230 thermal shield.
5. Remove the M.2 2230 WWAN/solid-state drive from the M.2 2230 thermal shield.

Installing the M.2 2230 WWAN/solid-state drive

Prerequisites

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

About this task

(i) **NOTE:** This procedure applies if you are installing a M.2 2230 solid-state drive or M.2 2230 WWAN card in M.2 card slot 3.

The following image(s) indicate the location of the M.2 2230 WWAN/solid-state drive and provides a visual representation of the installation procedure.
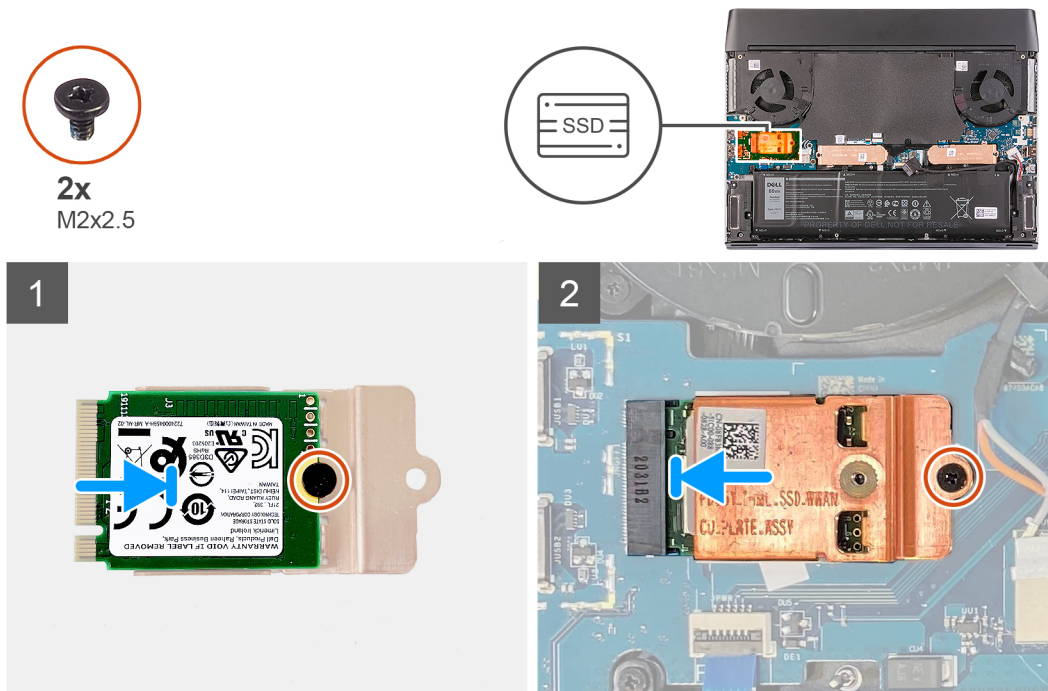
Steps

1. Place the M.2 2230 WWAN/solid-state drive on the M.2 2230 thermal shield.
2. Align the screw hole on the M.2 2230 WWAN/solid-state drive to the screw hole on the M.2 2230 thermal shield.
3. Replace the screw (M2x2.5) that secures the M.2 2230 WWAN/solid-state drive to the M.2 2230 thermal shield.
4. Flip over the M.2 2230 thermal shield.
5. Align the notch on the M.2 2230 WWAN/solid-state drive with the tab on the M.2 card slot on the left I/O-board.
6. Slide the M.2 2230 WWAN/solid-state drive into the M.2 card slot on the left I/O-board.
7. Align the screw hole on the M.2 2230 thermal shield with the screw hole on the left I/O-board.
8. Replace the screw (M2x2.5) that secures the M.2 2230 WWAN/solid-state drive and thermal shield to the left I/O-board.

Next steps

1. Install the base cover.
2. Follow the procedure in After working inside your computer.
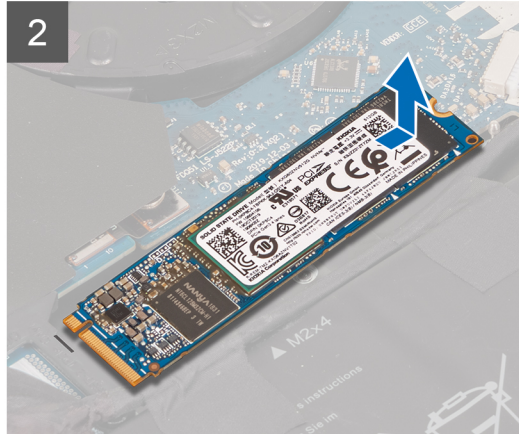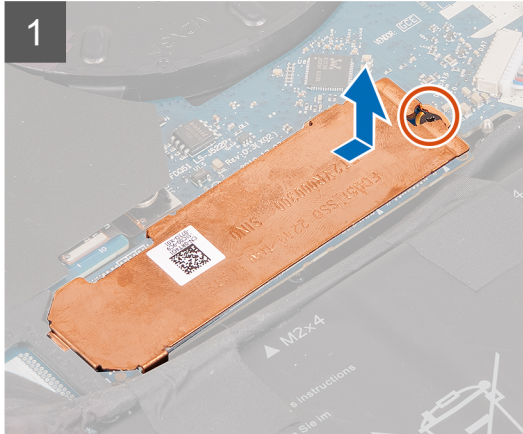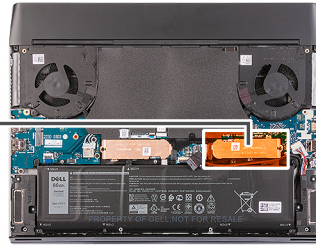
Rear-I/O cover

Removing the rear I/O-cover

Prerequisites

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

About this task

The following image(s) indicate the location of the rear I/O-cover and provides a visual representation of the removal procedure.
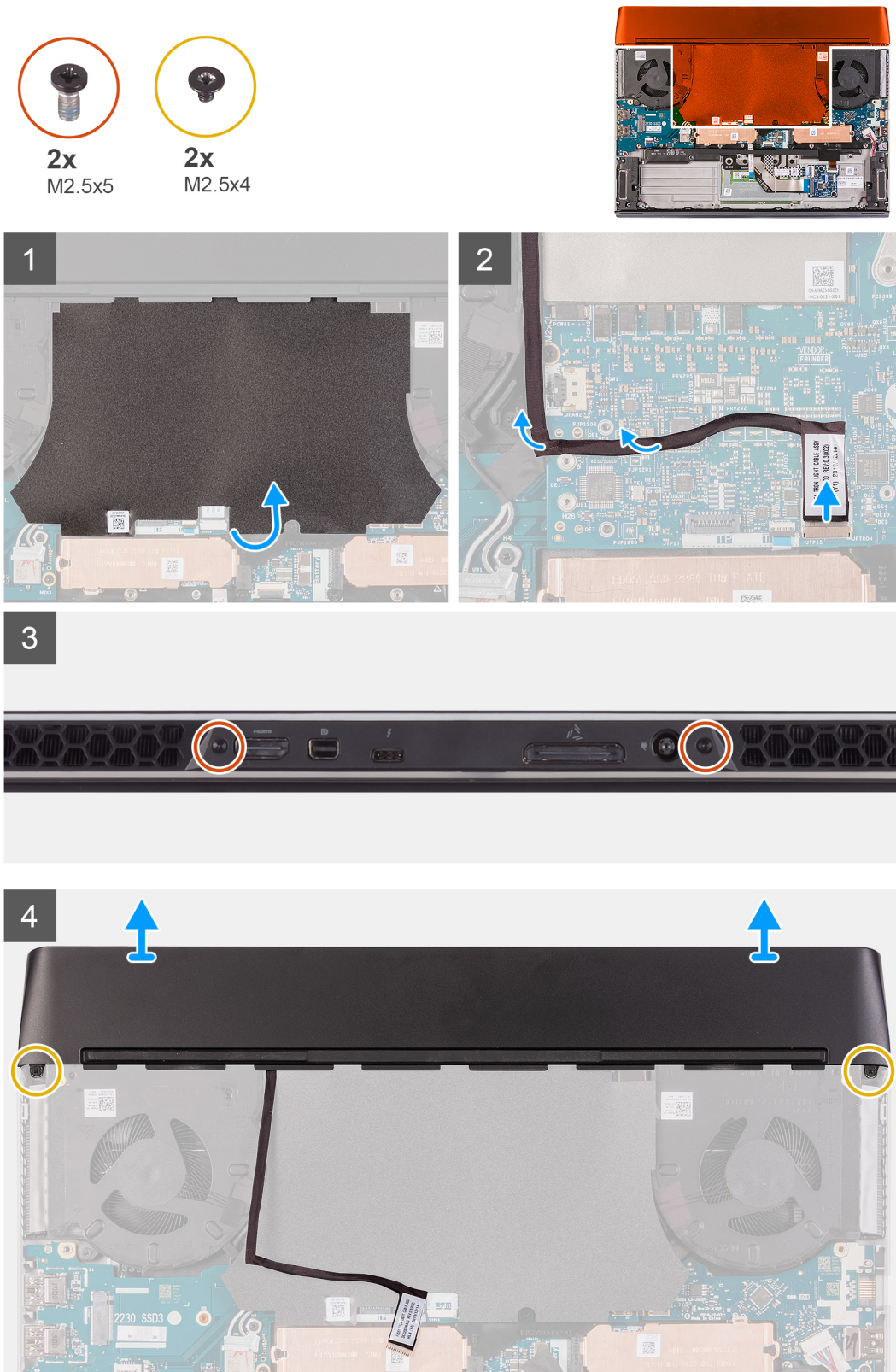
Steps

1. Peel and lift the Mylar covering the system board.
2. Disconnect and peel the Tron-light cable from the system board.

(i) **NOTE:** To prevent damaging your computer ensure the Tron-light cable has been disconnected from the system board before removing the rear I/O-cover.

3. Remove the two screws (M2.5x5) that secure the rear I/O-cover to the palm-rest assembly.
4. Remove the two screws (M2.5x4) that secure the rear I/O-cover to the palm-rest assembly.
5. Firmly grasp the sides of your computer with both hands and push the rubber feet on the rear I/O-cover outwards with your thumbs to release the rear I/O-cover from the palm-rest assembly.
6. Lift the rear I/O-cover from the palm-rest assembly.

Installing the rear I/O-cover

Prerequisites

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

About this task

The following image(s) indicate the location of the rear I/O-cover and provides a visual representation of the installation procedure.
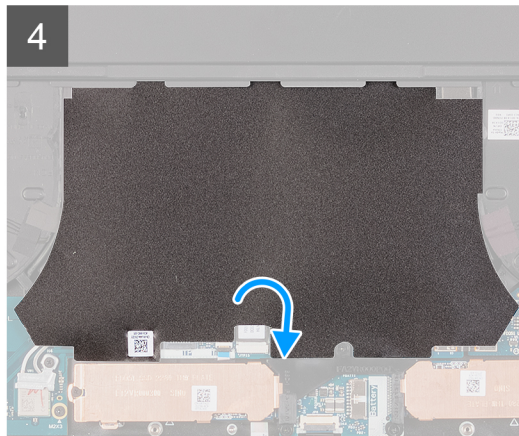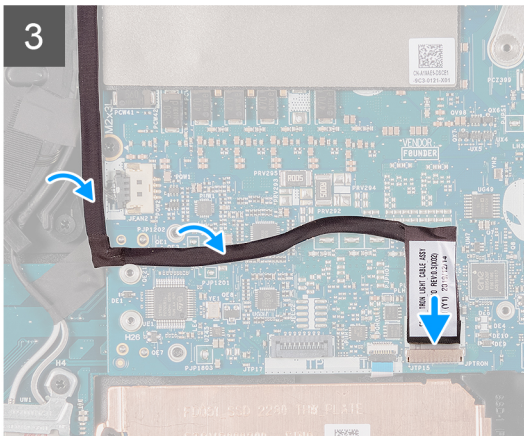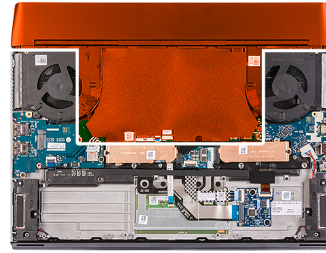
Steps

1. Push the rear I/O-cover into the palm-rest assembly snapping it into place.

   ⓘ **NOTE:** To avoiding damaging your computer, ensure the Tron-light cable is not pinched and that the Mylar is pasted on the system board before snapping the rear I/O-cover into place.

2. Replace the two screws (M2.5x4) that secure the rear I/O-cover to the palm-rest assembly.
3. Replace the two screws (M2.5x5) that secure the rear I/O-cover to the palm-rest assembly.
4. Peel and lift the Mylar from the system board.
5. Connect the Tron-light cable to the system board.
6. Route and adhere the Tron-light cable into place on the system board.
7. Adhere the Mylar into place onto the system board.

Next steps

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

Display assembly

Removing the display assembly

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the rear I/O-cover.

About this task

ⓘ **NOTE:** The display assembly is a Hinge-Up Display (HUD) and cannot be further disassembled. If components within the display assembly must be replaced, the entire display assembly is to be replaced.

The following image(s) indicate the location of the display assembly and provides a visual representation of the removal procedure.

1x
M2x3
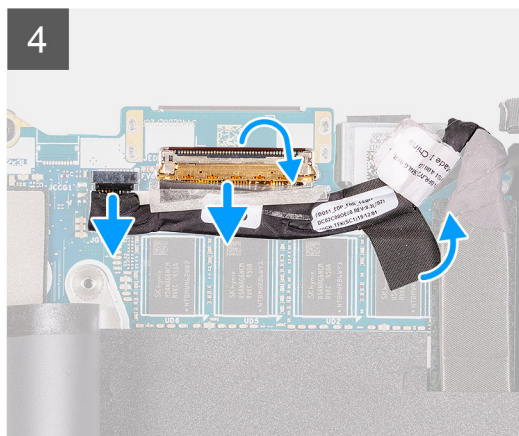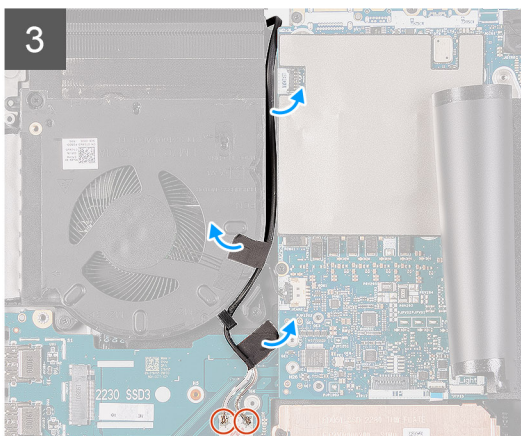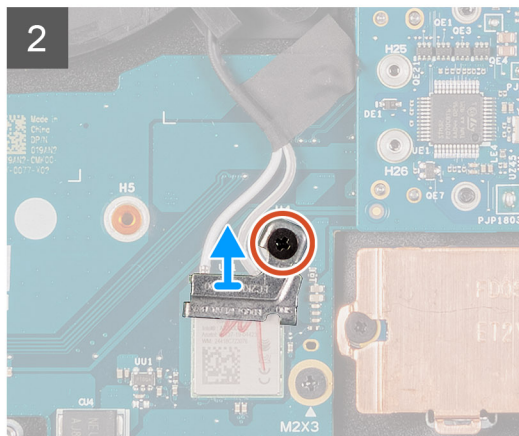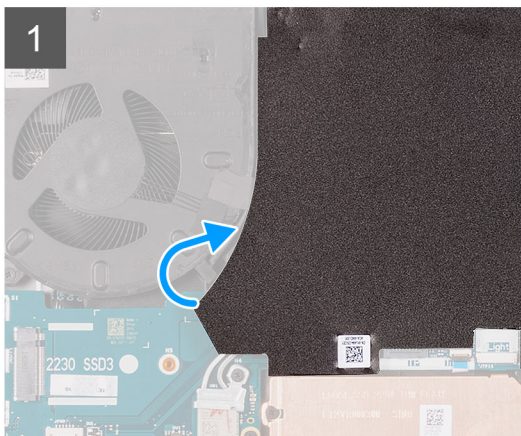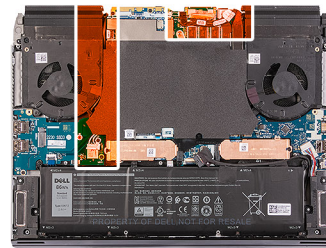
8x
M2.5x4
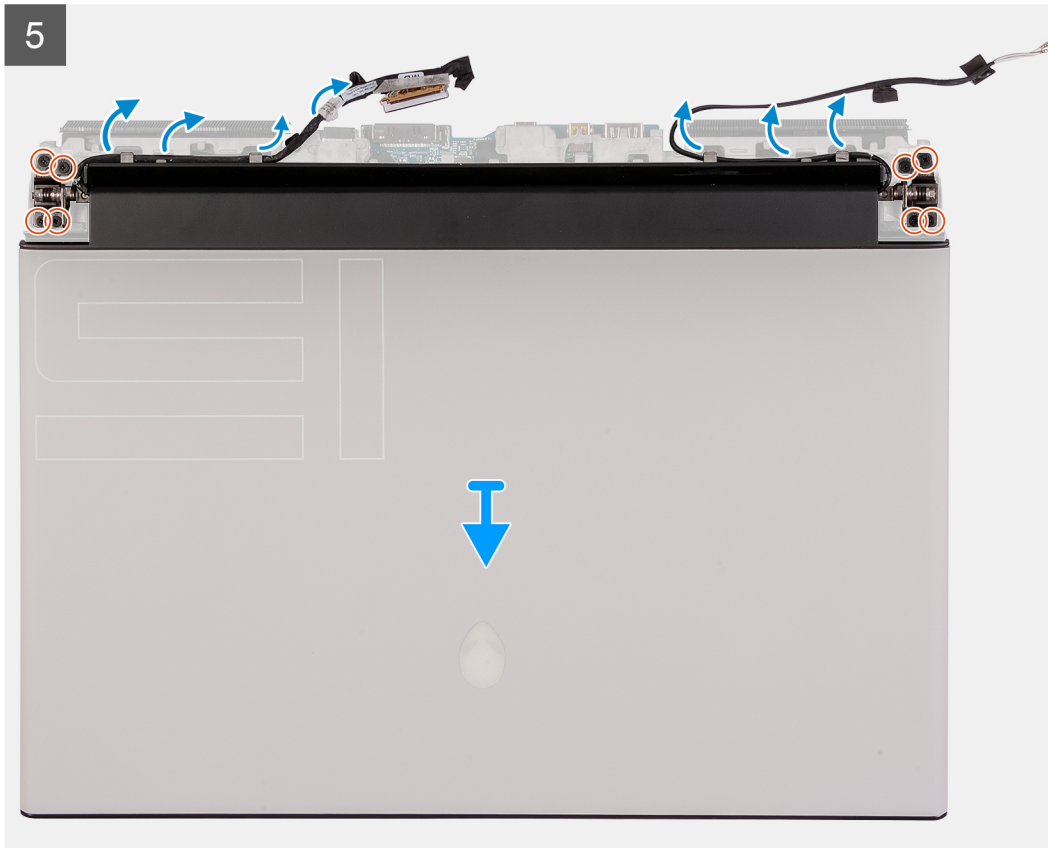
Steps

1. Peel the Mylar covering the system board.
2. Remove the screw (M2x3) that secures the wireless card bracket to the left I/O-board.
3. Lift the wireless card bracket off the left I/O-board.
4. Disconnect the antenna cables from the wireless card.
5. Peel the tapes securing the antenna cables to system board and left fan.
6. Remove the antenna cables from the routing guides on the left fan and system board.
7. Lift the latch and disconnect the display cable from the connector on the system board.

   (i) **NOTE:** Ensure that you disconnect the display cable before disconnecting the G-sensor cable.

8. Disconnect the G-sensor cable from the connector on the system board.
9. Disconnect the Tobii eye tracker cable from the connector on the system board.

   (i) **NOTE:** This step is only applicable to computers shipped with a Tobii eye tracker.

10. Place the computer face up.
11. Remove the following cables from the routing guides on the palm-rest assembly.
    - Display cable
    - G-sensor cable
    - Tobii eye tracker cable (optional)

● Antenna cables

12. Remove the eight screws (M2.5x4) securing the display assembly to the palm-rest assembly.

13. Lift the display assembly off the palm-rest assembly.

14. After performing the steps above you are left with the display assembly.


Installing the display assembly

Prerequisites

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

About this task

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

ⓘ **NOTE:** The display assembly is a Hinge-Up Display (HUD) and cannot be further disassembled. If components within the display assembly must be replaced, the entire display assembly is to be replaced.

The following image(s) indicate the location of the display assembly and provides a visual representation of the installation procedure.

8x
M2.5x4
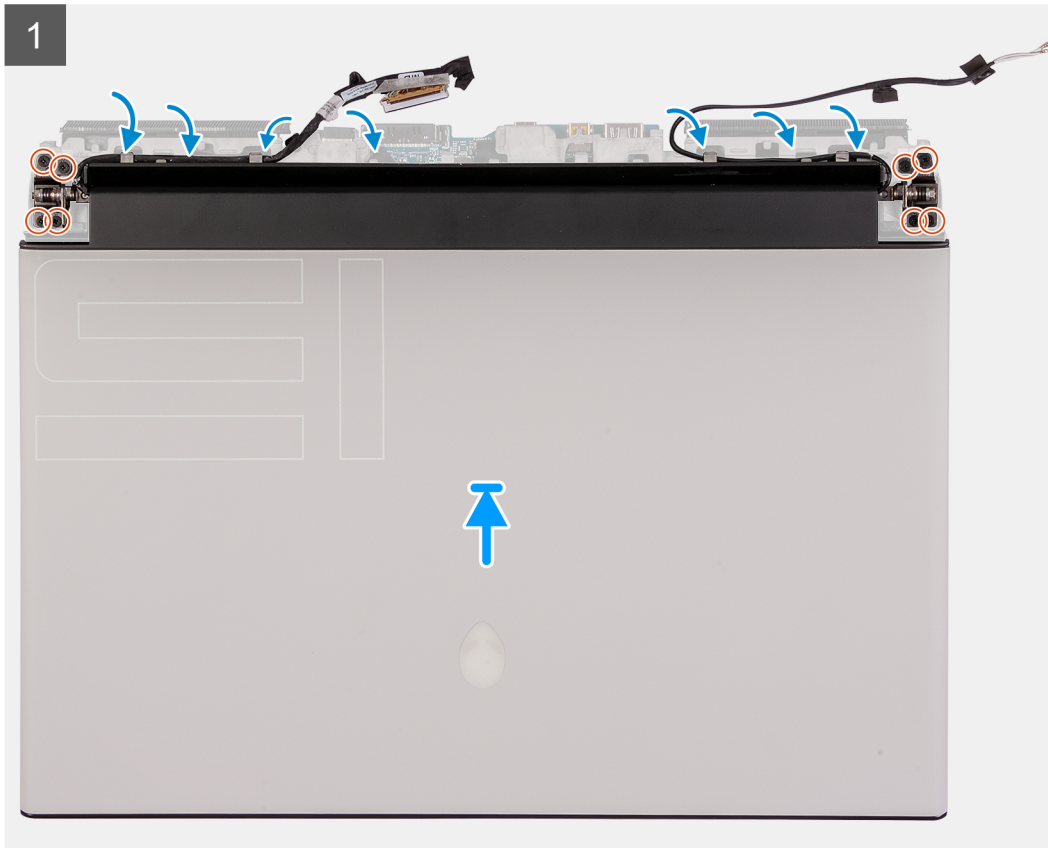
1x
M2x3
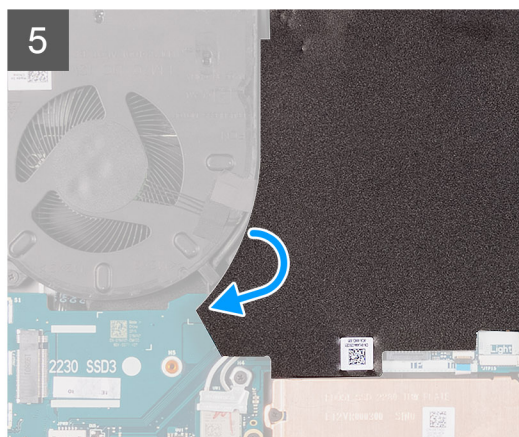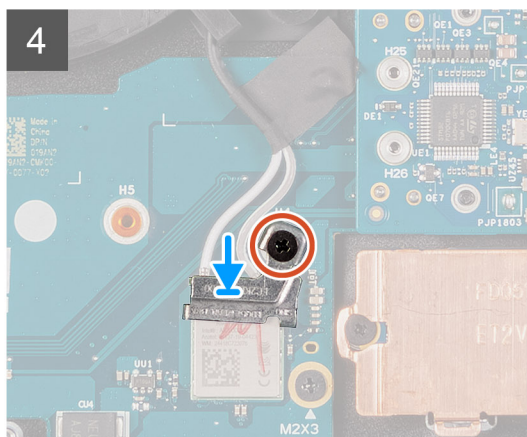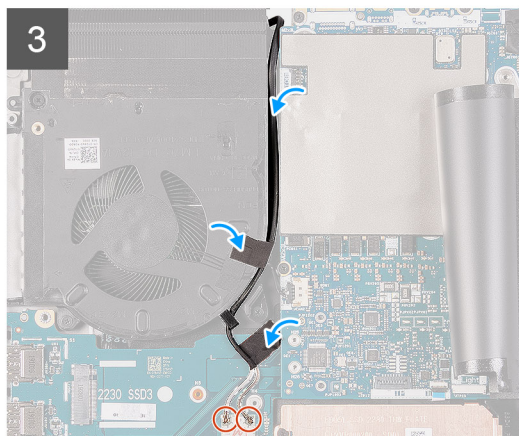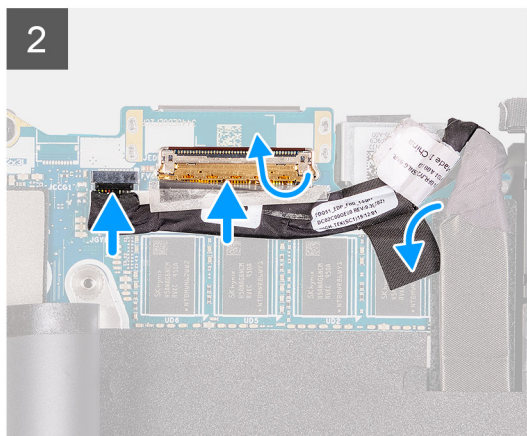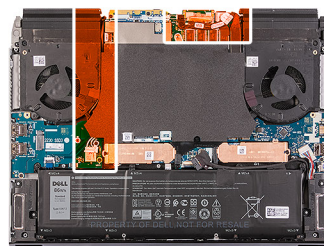
Steps

1. Ensure that the palm-rest assembly is placed face up with the keyboard facing you.
2. Gently place the display assembly on the palm-rest assembly.

   (i) **NOTE:** Ensure that the screw holes on the display hinges are aligned with the screw holes on the palm-rest assembly.

3. Align the screw holes on the display assembly with the screw holes on the palm-rest assembly.
4. Replace the eight screws (M2.5x4) that secure the display assembly to the palm-rest assembly.
5. Route the following cables to the routing guides on the palm-rest assembly.
   - Display cable
   - G-sensor cable
   - Tobii eye tracker cable (optional)
   - Antenna cables
6. Place the computer face down.
7. Connect the Tobii eye tracker cable to the connector on the system board.

   (i) **NOTE:** This step is only applicable to computers shipped with a Tobii eye tracker.

8. Connect the G-sensor cable to the connector on the system board.

> (i) **NOTE:** Ensure that you connect the G-sensor cable before you connect the display cable.

9. Connect the display cable to the connector on the system board and close the latch.
10. Route the antenna cables to the routing guides on the left fan and system board.
11. Adhere the tapes that secure the antenna cables to system board and left fan.
12. Connect the antenna cables to the wireless card.

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

    Table 2. Antenna-cable color scheme

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

13. Place the wireless card bracket on the wireless card.
14. Replace the screw (M2x3) that secures the wireless card bracket to the left I/O-board.
15. Adhere the Mylar over the system board.

Next steps

1. Install the rear I/O-cover.
2. Install the base cover.
3. Follow the procedure in After working inside your computer.

Speakers

Removing the speakers

Prerequisites

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

About this task

The following image(s) indicate the location of the speakers and provides a visual representation of the removal procedure.
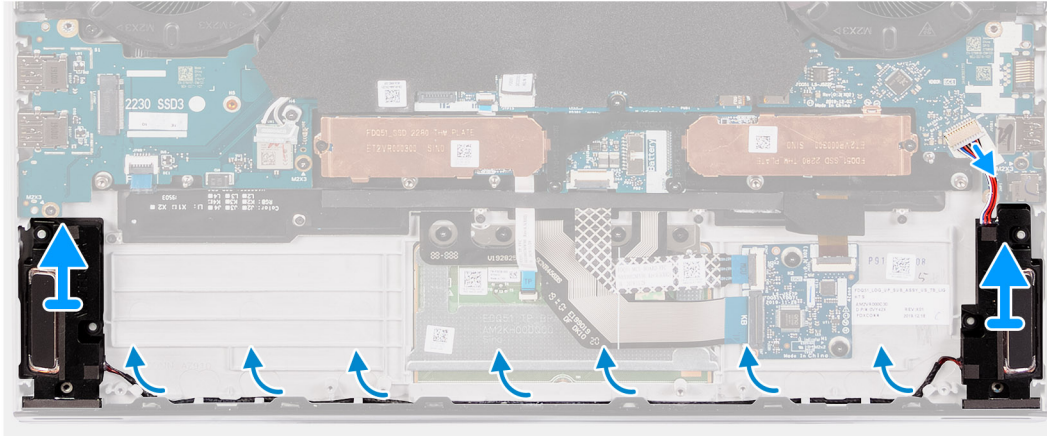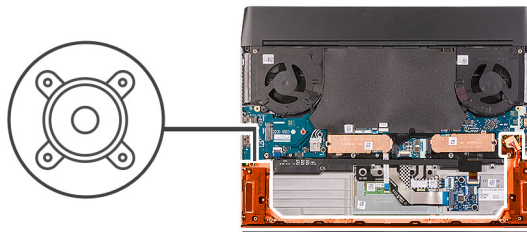
Steps

1. Disconnect the speaker cable from the right I/O-board.
2. Lift the right speaker off the palm-rest assembly.
3. Remove the speaker cables from the routing guides on the palm-rest assembly.
4. Lift the left speaker off the palm-rest assembly.

Installing the speakers

Prerequisites

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

About this task

The following image(s) indicate the location of the speakers and provides a visual representation of the installation procedure.
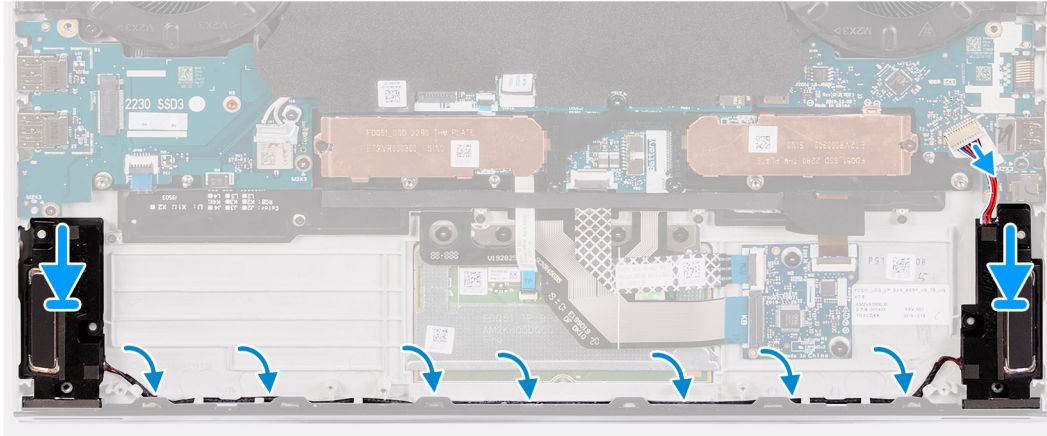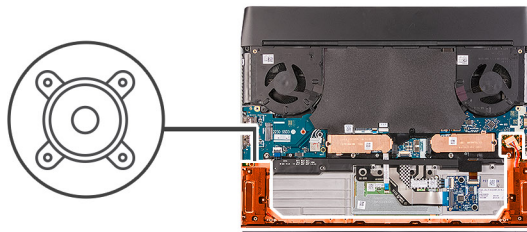
Steps

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

   (i) **NOTE:** Ensure that the alignment posts are threaded through the rubber grommets on the speaker.

2. Route the speaker cable through the routing guides on the palm-rest assembly.
3. Using the alignment posts, place the right speaker on the palm-rest assembly.

   (i) **NOTE:** Ensure that the alignment posts are threaded through the rubber grommets on the speaker.

4. Connect the speaker cable to the right I/O-board.

Next steps

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

Touchpad

Removing the touchpad

Prerequisites

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

About this task

The following image(s) indicate the location of the touchpad and provides a visual representation of the removal procedure.

4x
M2x1.9
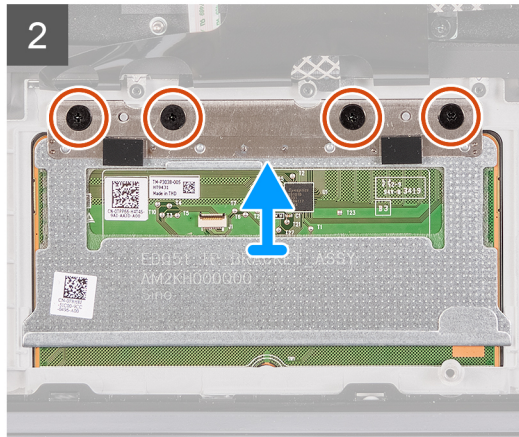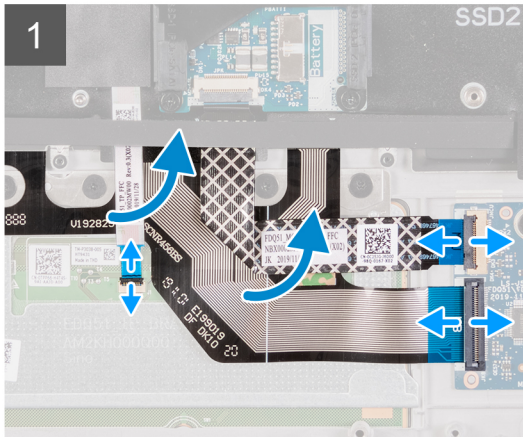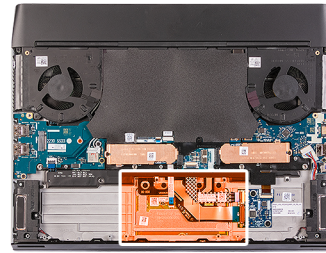
Steps

1. Open the latch and disconnect the keyboard-controller board-cable from keyboard-controller board.
2. Lift the keyboard-controller board-cable off the palm-rest assembly.
3. Open the latch and disconnect the keyboard cable from the keyboard-controller board.
4. Fold up the keyboard cable.
5. Open the latch and disconnect the touchpad cable from the touchpad.
6. Lift the touchpad cable from the palm-rest assembly.
7. Remove the four (M2x1.9) screws that secure the touchpad to the palm-rest assembly.
8. Lift the touchpad off the palm-rest assembly.

Installing the touchpad

Prerequisites

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

About this task

The following image(s) indicate the location of the touchpad and provides a visual representation of the installation procedure.

4x
M2x1.9
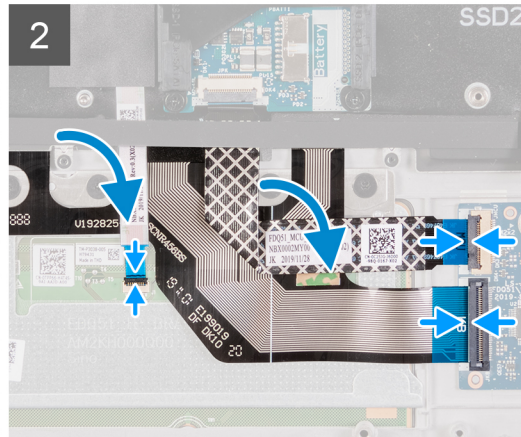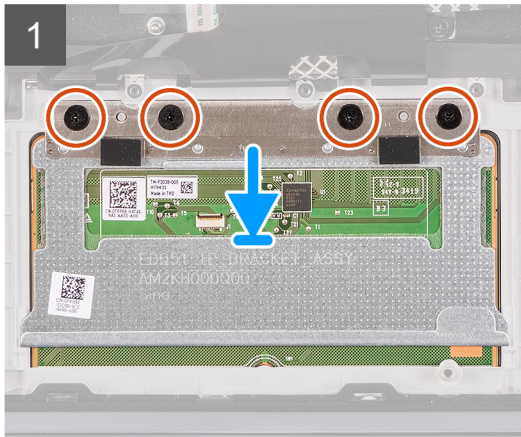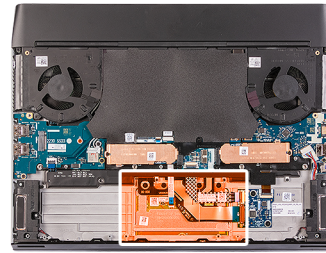
Steps

1. Place the touchpad into the slot on the palm-rest assembly.

   (i) **NOTE:** Turn the computer over and open the display. Ensure that the touchpad is equally aligned along all four sides.

2. Replace the four (M2x1.9) screws that secure the touchpad to the palm-rest assembly.
3. Connect the touchpad cable to the touchpad and close the latch.

   (i) **NOTE:** This step is only applicable when the touchpad cable is not being replaced.

4. Fold down the keyboard cable.
5. Connect the keyboard cable to the keyboard-controller board and close the latch.
6. Connect the keyboard-controller board cable to the keyboard-controller board and close the latch.

Next steps

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

Keyboard-controller board

Removing the keyboard-controller board

### Prerequisites

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

About this task

The following image(s) indicate the location of the keyboard-controller board and provides a visual representation of the removal procedure.
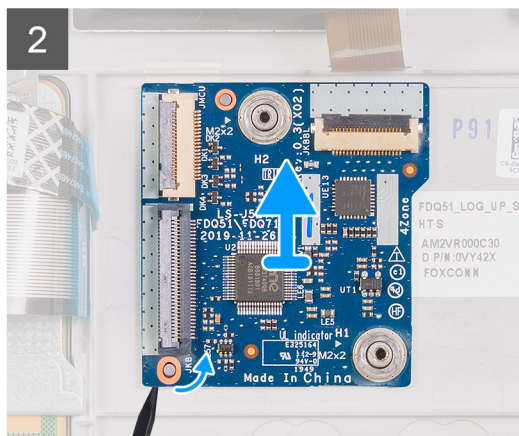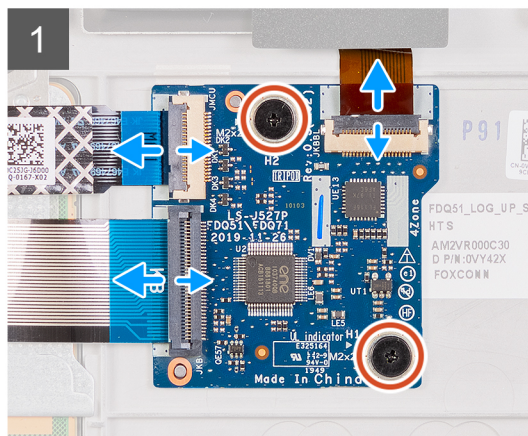
Steps

1. Open the latch and disconnect the keyboard-backlight cable from the keyboard-controller board.
2. Open the latch and disconnect the keyboard-controller board cable from the keyboard-controller board.
3. Open the latch and disconnect the keyboard cable from the keyboard-controller board.
4. Remove the two screws (M2x1.9) that secure the keyboard-controller board to the palm-rest assembly.
5. Pull on the securing tab to release the keyboard-controls board from the palm-rest assembly.
6. Using the plastic tab, pry and remove the keyboard-controller board from the palm-rest assembly.

Installing the keyboard-controller board
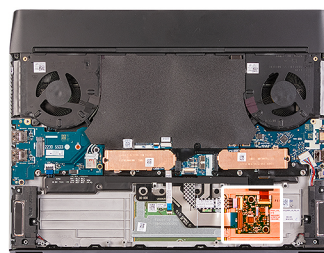
Prerequisites

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

About this task

The following image(s) indicate the location of the keyboard-controller board and provides a visual representation of the installation procedure.

2x
M2x1.9
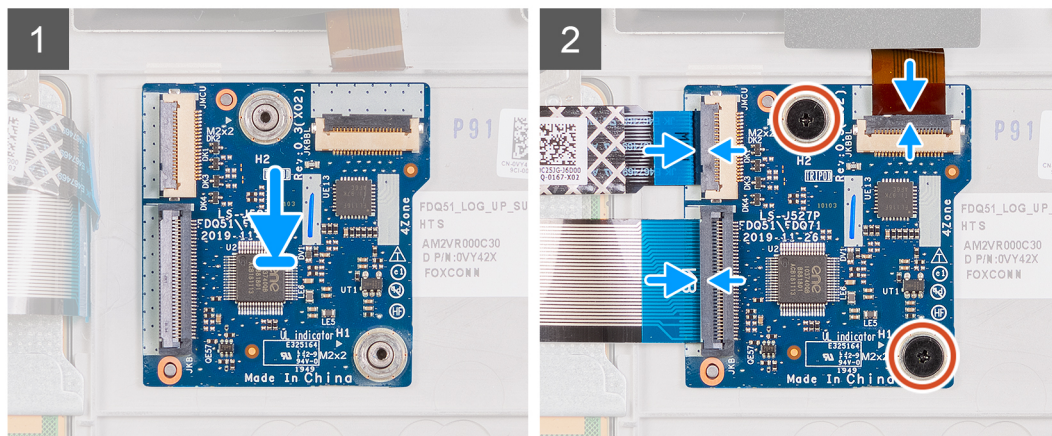
Steps

1. Using the alignment posts, adhere the keyboard-controller board into place on the palm-rest assembly.
2. Replace the two screws (M2x1.9) that secure the keyboard-controller board to the palm-rest assembly.
3. Connect the keyboard-controller board-cable to the keyboard-controller board and close the connector latch.
4. Connect the keyboard cable to the keyboard-controller board and close the connector latch.
5. Connect the keyboard-backlight cable to the keyboard-controller board and close the connector latch.

Next steps

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

Right I/O-board

Removing the right I/O-board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2230 or 2280 solid-state drive, if one was installed in M.2 card slot 2.

About this task

The following image(s) indicate the location of the right I/O-board and provides a visual representation of the removal procedure.
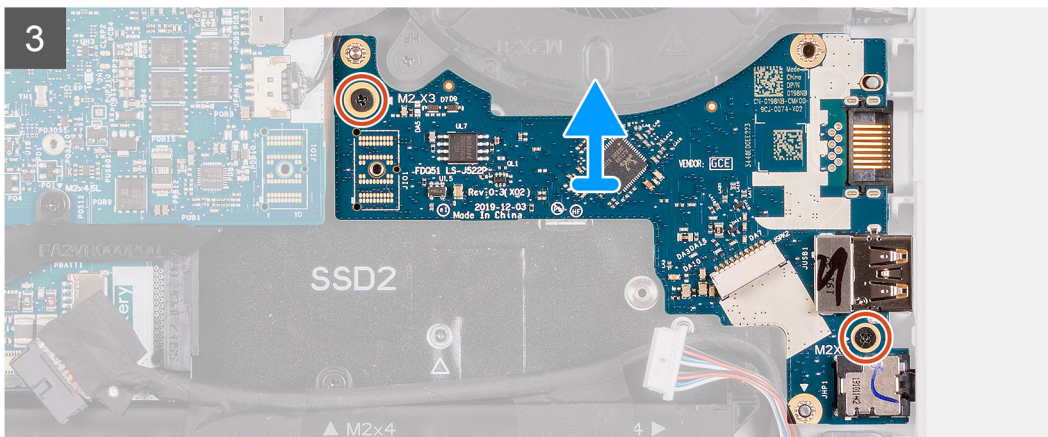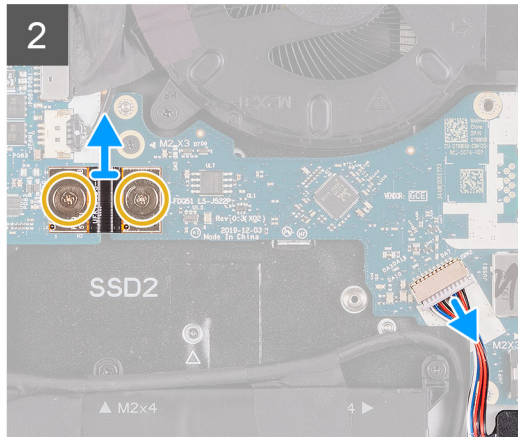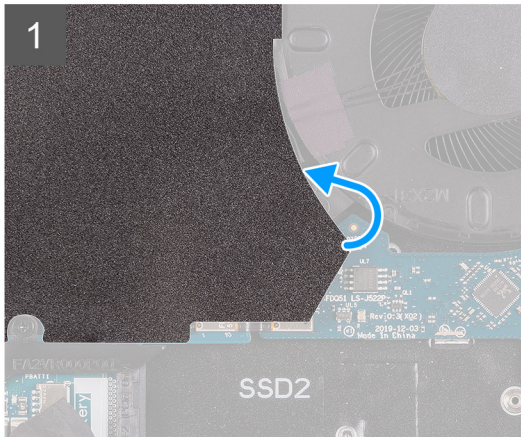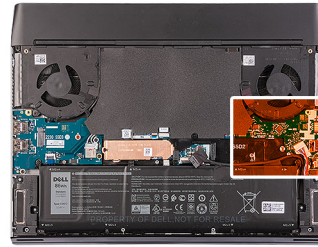
Steps

1. Peel and lift the Mylar covering the system board.
2. Disconnect the speaker cable from the right I/O-board.
3. Remove the two screws (M2x3) that secure the right I/O-board cable connecting the right I/O-board and the system board.
4. Lift the right I/O-board cable off the right I/O-board and system board.
5. Remove the two screws (M2x3) that secure the right I/O-board to the palm-rest assembly.
6. Lift the right I/O-board off the palm-rest assembly.

# Installing the right I/O-board

Prerequisites

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

About this task

The following image(s) indicate the location of the right I/O-board and provides a visual representation of the installation procedure.
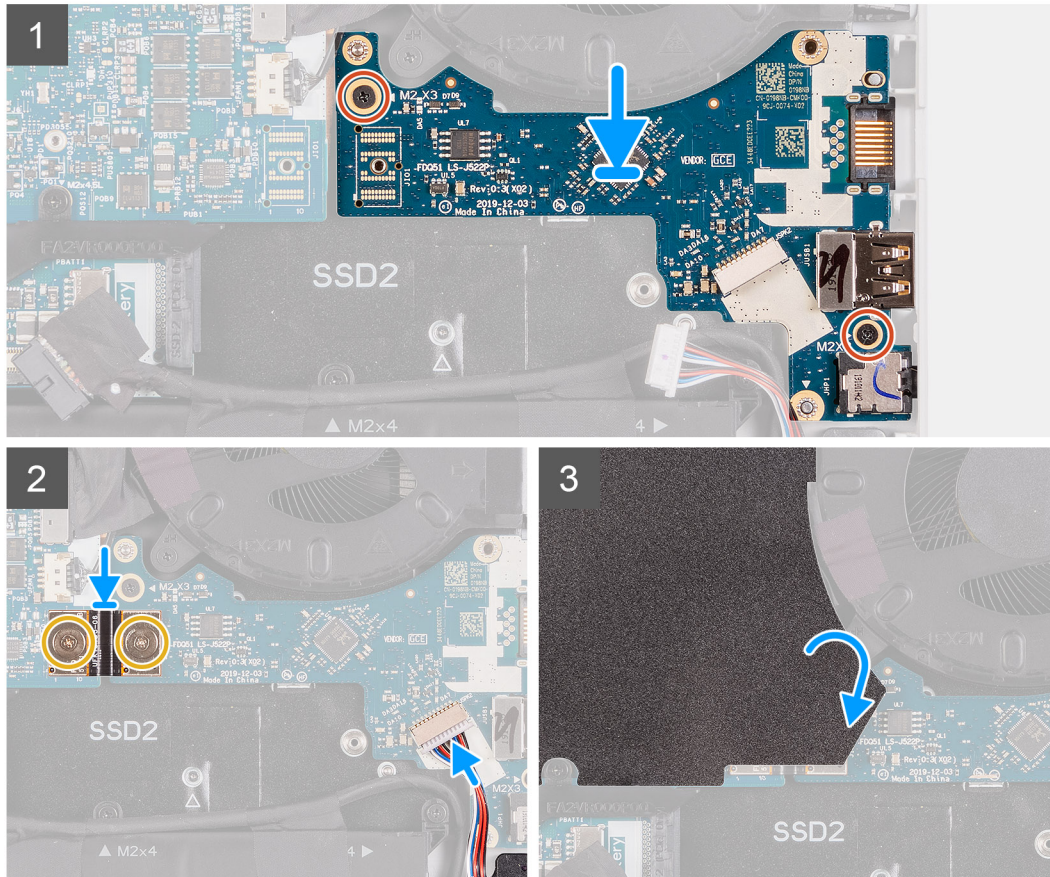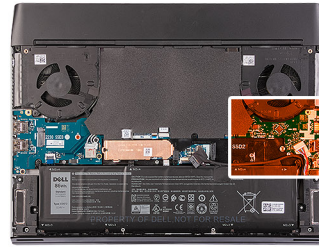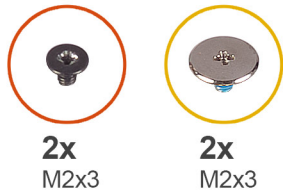
Steps

1. Using the alignment posts, place the right I/O-board in place on the palm-rest assembly.
2. Replace the two screws (M2x3) that secure the right I/O-board to the palm-rest asssembly.
3. Connect the speaker cable to the connector on the right I/O-board.
4. Using the alignment pins, connect the right I/O-board cable on the right I/O-board and the system board.

   (i) **NOTE:** The I/O-board cable is polarity sensitive. To prevent damage to your computer ensure that the MB UMT end of the cable is connected to the system board.

5. Replace the two screws (M2x3) that secure the right I/O-board cable to the right I/O-board and system board.
6. Adhere the Mylar to the system board.

Next steps

1. Install the M.2 2230 or 2280 solid-state drive, if one was installed in M.2 card slot 2.
2. Install the battery.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

System board

Removing the system board

Prerequisites

1. Follow the procedure in <u>Before working inside your computer</u>.
2. Remove the <u>base cover</u>.
3. Remove the <u>battery</u>.
4. Remove the <u>M.2 2230 solid-state drive</u>, if applicable.
5. Remove the <u>M.2 2280 solid-state drive</u>, if applicable.
6. Remove the <u>M.2 2230 WWAN/solid-state drive</u>, if applicable.
7. Remove the <u>rear I/O-cover</u>.
8. Remove the <u>right I/O-board</u>.

About this task

The following image(s) indicate the location of the system board and provides a visual representation of the removal procedure.
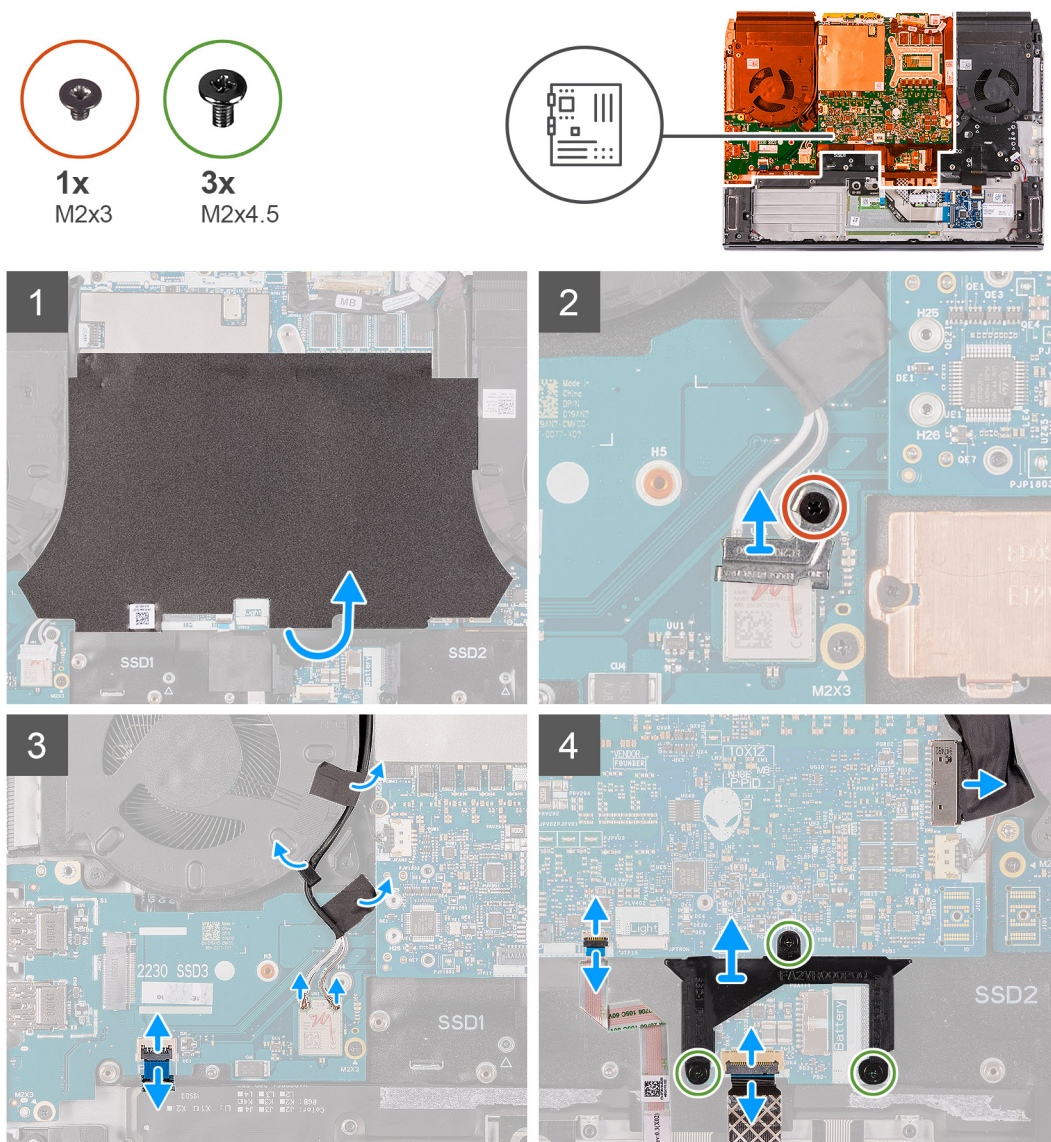
2x M2x4.5   **10x** M2x3

Steps

1. Peel the Mylar covering the system board.
2. Remove the screw (M2x3) that secures the wireless card bracket to the left I/O-board.
3. Lift the wireless-card bracket off the left I/O-board.
4. Disconnect the antenna cables from the wireless card on the left I/O-board.
5. Peel the tapes securing the antenna cables to system board and left fan.
6. Lift the latch and disconnect the power-button cable from the left I/O-board.
7. Disconnect the power-adapter port cable from the system board.
8. Remove the three screws (M2x4.5) that secures the M.2 SSD frame to the system board.
9. Lift the M.2 SSD frame from the system board.
10. Lift the latch and disconnect the keyboard-controller board-cable from the system board.
11. Lift the latch and disconnect the touchpad cable from the system board.
12. Lift the latch and disconnect the display cable from the connector on the system board.

   (i) **NOTE:** Ensure that you disconnect the display cable before disconnecting the G-sensor cable.

13. Disconnect the Tobii eye tracker cable from the connector on the system board.

   (i) **NOTE:** This step is only applicable to computers shipped with a Tobii eye tracker.

14. Disconnect the G-sensor cable from the connector on the system board.

15. Remove the two (M2x4.5) screws that secure the fan and heat-sink assembly to the palm-rest assembly.

16. Remove the three (M2x3) screws that secure the fan and heat-sink assembly to the palm-rest assembly.

17. Remove the five (M2x3) screws that secure the system board to the palm-rest assembly.

18. Remove the two (M2x3) screws that secure the left I/O-board to the palm-rest assembly.

19. Lift the system-board assembly from the palm-rest assembly and turn the system-board assembly over.

> (i) **NOTE:** When the system board is removed it is removed as an assembly consisting of:
>
> - system board
> - left I/O-board
> - fan and heat-sink assembly

> (i) **NOTE:** When lifting the system board, hold firmly on the left and right sides of the fan and heat-sink assembly.

> ⚠ **CAUTION: To avoid damaging your computer, do not support the system board by the left I/O-board when lifting the system board.**

20. Remove the left I/O-board.

21. Remove the fan and heat-sink assembly.

Installing the system board

Prerequisites

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

About this task

The following image(s) indicate the location of the system board and provides a visual representation of the installation procedure.
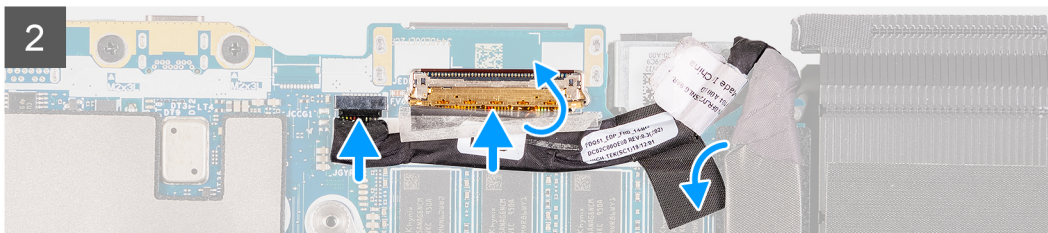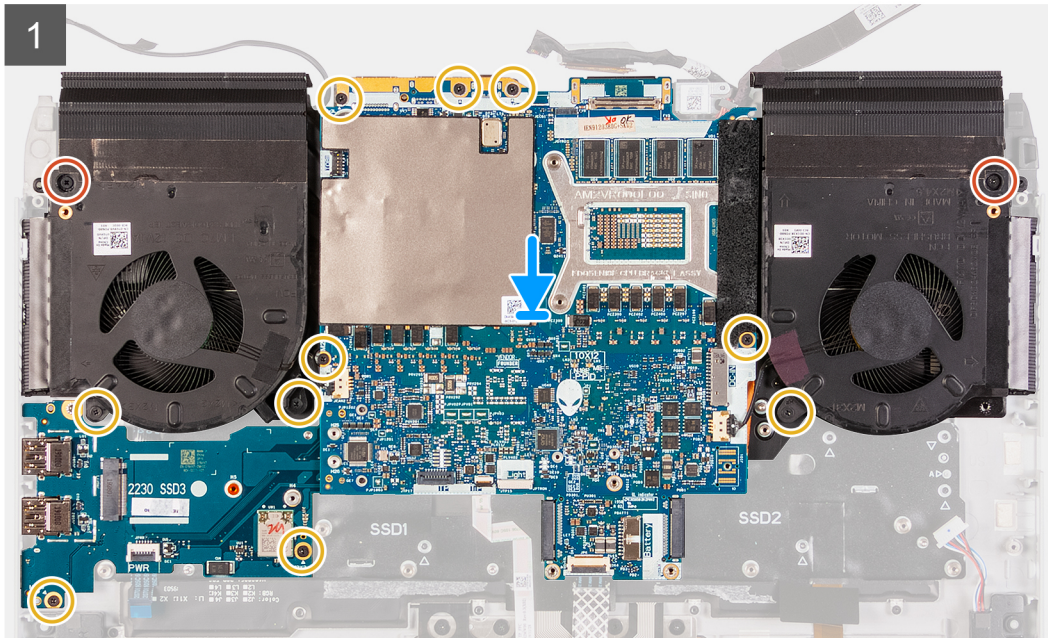
Steps

1. Install the [fan and heat-sink assembly](#).
2. Install the [left I/O-board](#).
3. Turn the system-board assembly over and place the system-board assembly on the palm-rest assembly.

   ⓘ **NOTE:** When placing the system board in place, hold firmly on the left and right sides of the fan and heat-sink assembly.

   ⚠ **CAUTION: To avoid damaging your computer, do not support the system board by the left I/O-board when placing the system board.**

4. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
5. Replace the two (M2x3) screws that secure the left I/O-board to the palm-rest assembly.
6. Replace the eight (M2x3) screws that secure the system board to the palm-rest assembly.
7. Replace the three (M2x3) screws that secure the fan and heat-sink assembly to the palm-rest assembly.
8. Replace the two (M2x4.5) screws that secure the fan and heat-sink assembly to the palm-rest assembly.
9. Connect the G-sensor cable to the connector on the system board.

   ⓘ **NOTE:** Ensure that you connect the G-sensor cable before you connect the display cable.

10. Connect the Tobii eye tracker cable to the connector on the system board.

> (i) **NOTE:** This step is only applicable to computers shipped with a Tobii eye tracker.

11. Connect the display cable to the connector on the system board and close the latch.
12. Connect the touchpad cable to the touchpad and close the latch.
13. Connect the keyboard-controller board-cable to the system board and close the latch.
14. Connect the power-adapter port cable to the system board.
15. Using the tabs on the M.2 SSD frame and the slots on the system board, align the screw holes of the M.2 SSD frame with the screw holes on the system board.
16. Replace the three screws (M2x4.5) that secure the M.2 SSD frame to the system board.
17. Route the antenna cables to the routing guides on the left fan and system board.
18. Adhere the tapes that secure the antenna cables to system board and left fan.
19. Connect the antenna cables to the wireless card on the left I/O-board.

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

Table 3. Antenna-cable color scheme

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

20. Connect the power-button cable to the left I/O-board and close the latch.
21. Place the wireless card bracket on the wireless card.
22. Align the screw hole on the wireless card bracket to the screw hole on the wireless card.
23. Replace the screw (M2x3) that secures the wireless card bracket to the left I/O-board.
24. Adhere the Mylar over the system board.

Next steps

1. Install the right I/O-board.
2. Install the rear I/O-cover.
3. Install the M.2 2230 solid-state drive, if applicable.
4. Install the M.2 2280 solid-state drive, if applicable.
5. Install the M.2 2230 WWAN/solid-state drive, if applicable.
6. Install the battery.
7. Install the base cover.
8. Follow the procedure in After working inside your computer.

Left I/O-board

Removing the left I/O-board

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2230 solid-state drive, if applicable.
5. Remove the M.2 2280 solid-state drive, if applicable.
6. Remove the M.2 2230 WWAN/solid-state drive, if applicable.
7. Remove the rear I/O-cover.
8. Remove the right I/O-board.
9. Follow the procedure from step 1 to step 19 in Removing the system board.

About this task

The following image(s) indicate the location of the left I/O-board and provides a visual representation of the removal procedure.
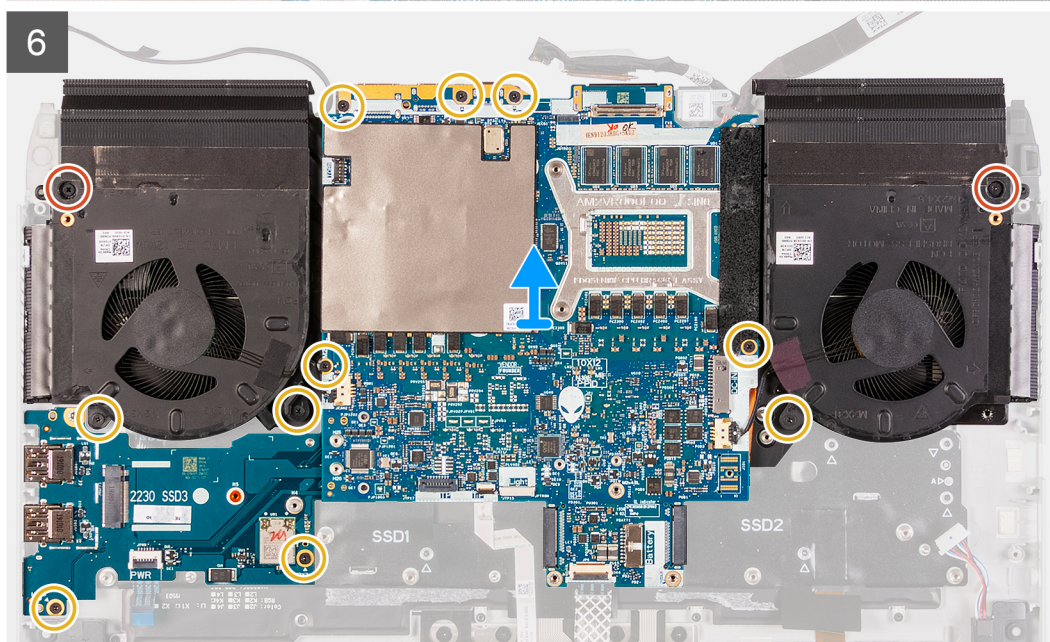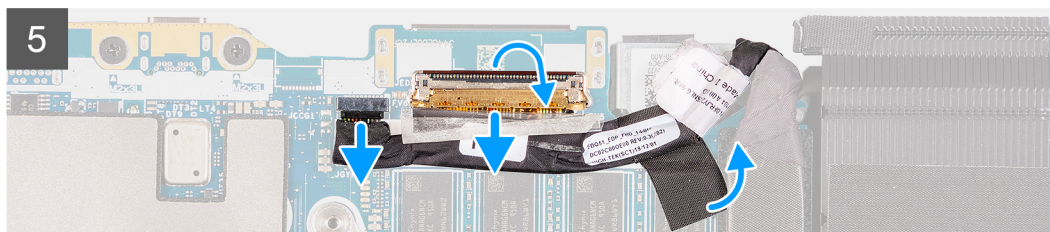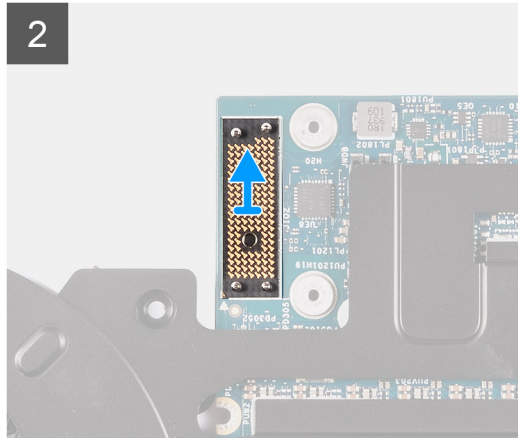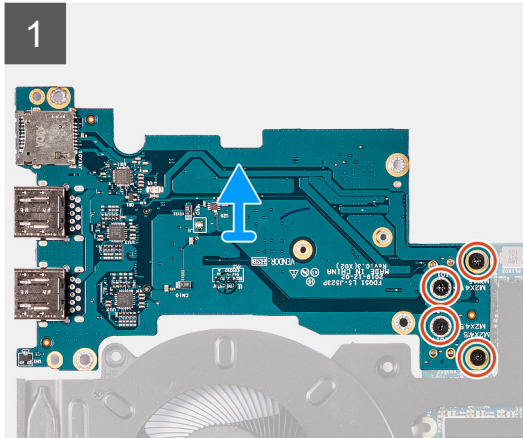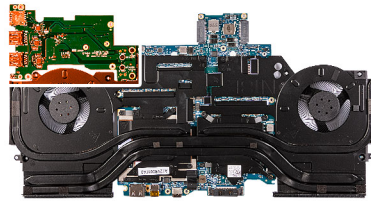

Steps

1. Flip the system-board assembly over.
2. Remove the four screws (M2x4.5) that secure the left-I/O board
3. Lift the left I/O-board from the system-board assembly.
4. Lift the left I/O-board connector board from the system-board assembly.

Installing the left I/O-board

Prerequisites

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

About this task

The following image(s) indicate the location of the left I/O-board and provides a visual representation of the installation procedure.
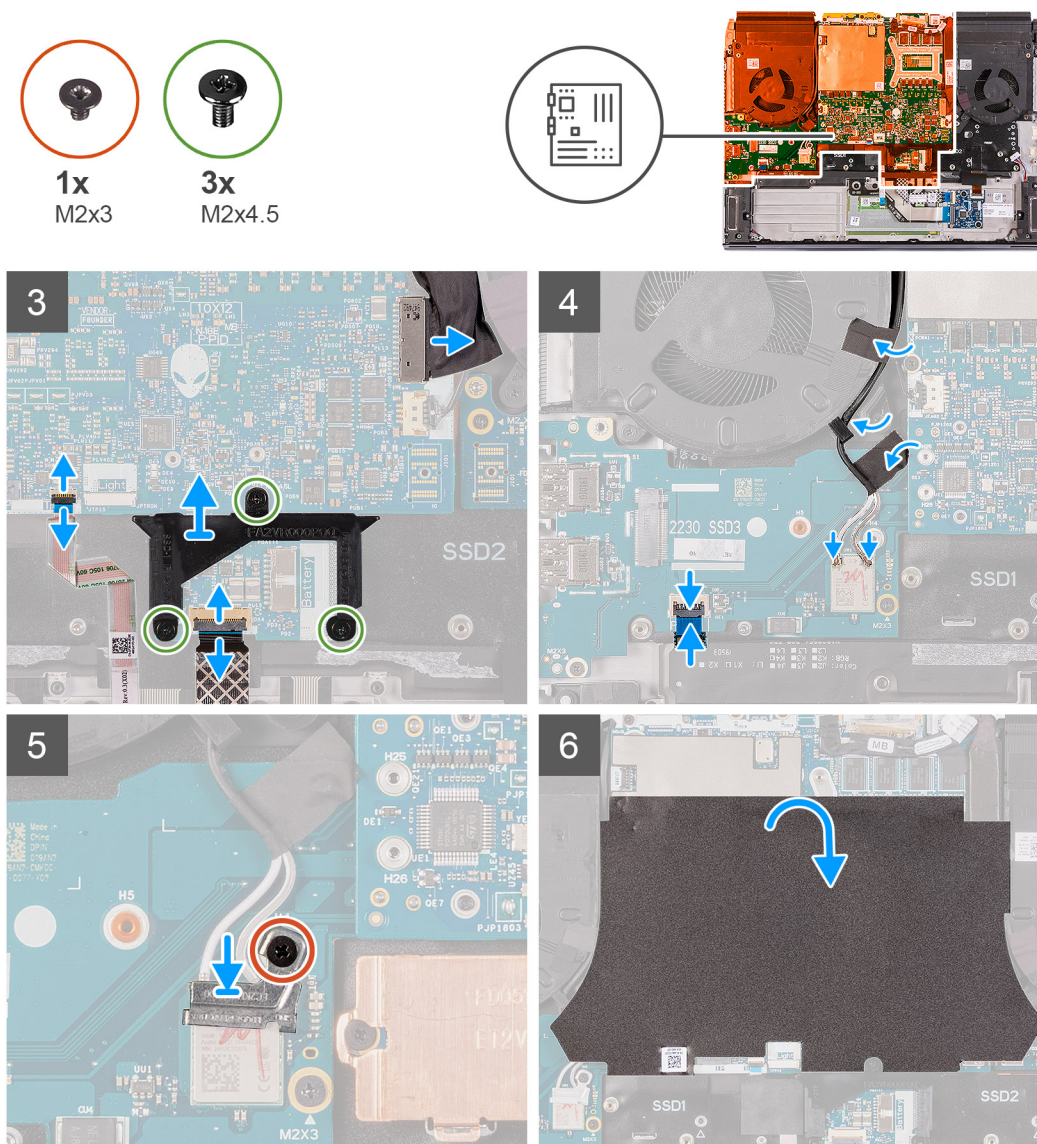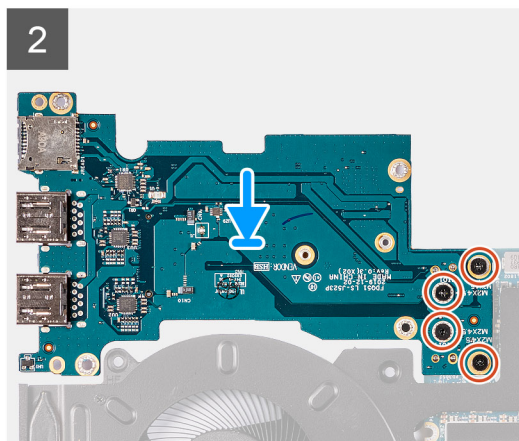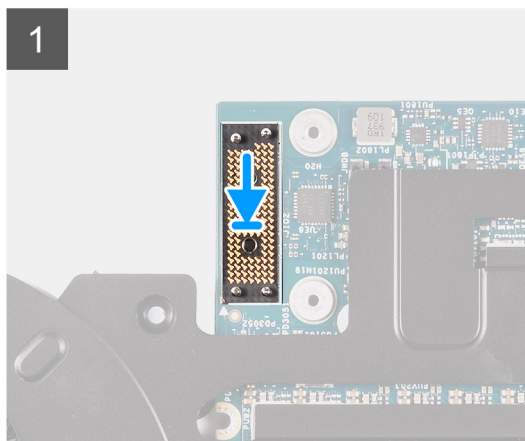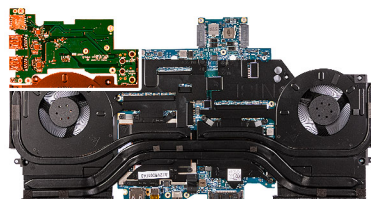
Steps

1. Using the alignment posts, connect the left I/O-board connector board to the system-board assembly

   (i) **NOTE:** The I/O-board connector board is polarity sensitive. To prevent damaging your computer, utilize the alignment pins to correctly replace the I/O-board connector board.

2. Using the alightment posts, replace and connect the left I/O-board to the connector on the system-board assembly.
3. Replace the four screws (M2x4.5) that secure the left I/O-board to the system-board assembly.

Next steps

1. Follow the procedure from step 3 to step 24 in <u>Installing the system board</u>.
2. Install the <u>right I/O-board</u>.
3. Install the <u>rear I/O-cover</u>.
4. Install the <u>M.2 2230 solid-state drive</u>, if applicable.
5. Install the <u>M.2 2280 solid-state drive</u>, if applicable.
6. Install the <u>M.2 2230 WWAN/solid-state drive</u>, if applicable.
7. Install the <u>battery</u>.
8. Install the <u>base cover</u>.
9. Follow the procedure in <u>After working inside your computer</u>.

Fan and heat-sink assembly

Removing the fan and heat-sink assembly

Prerequisites

1. Follow the procedure in <u>Before working inside your computer</u>.
2. Remove the <u>base cover</u>.
3. Remove the <u>battery</u>.
4. Remove the <u>M.2 2230 solid-state drive</u>, if applicable.
5. Remove the <u>M.2 2280 solid-state drive</u>, if applicable.
6. Remove the <u>rear I/O-cover</u>.

7. Remove the [right I/O-board](#).
8. Follow the procedure from step 1 to step 19 in [Removing the system board](#).

About this task

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

ⓘ **NOTE:** 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.

The following image(s) indicate the location of the fan and heat–sink assembly and provides a visual representation of the removal procedure.
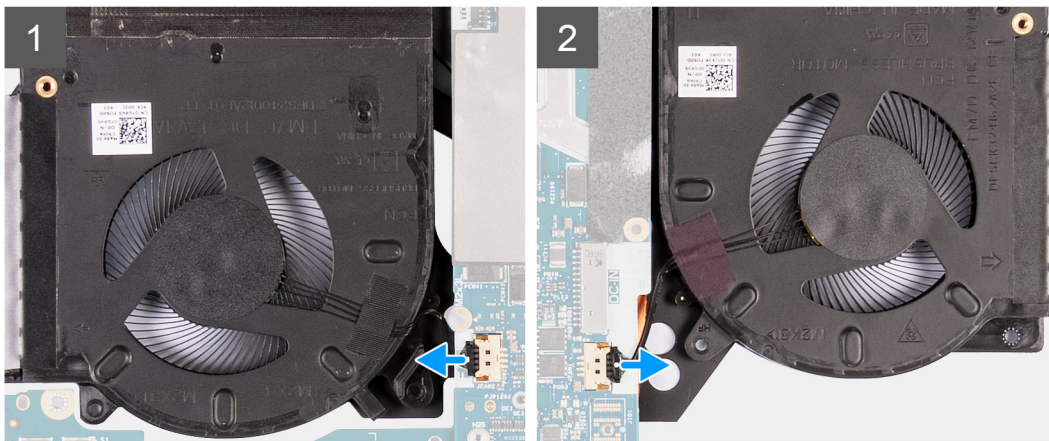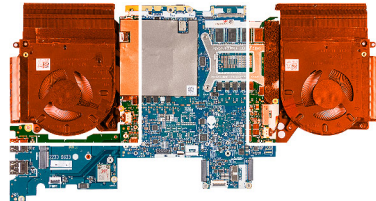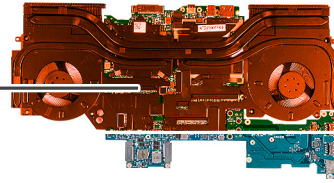
10x
M2x3

Steps

1. Disconnect the left and right fan cables from the system board.
2. Flip the system-board assembly over.
3. In reverse sequential order (10>9>8>7>6>5>4>3>2>1) remove the 10 screws (M2x3) that secure the fan and heat-sink assembly to the system board.

   (i) **NOTE:** Depending on the discrete graphics processing unit installed in your computer, the number of screws securing the fan and heat-sink assembly to the system board may be 8 or 10.

4. Lift the fan and heat-sink assembly from the system board.

Installing the fan and heat-sink assembly

Prerequisites

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

About this task

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

The following image(s) indicate the location of the fan and heat-sink assembly and provides a visual representation of the installation procedure.
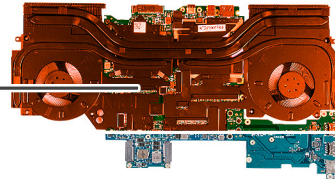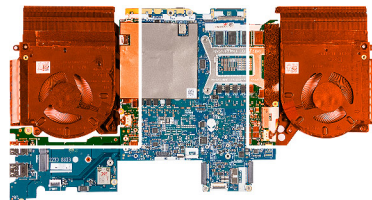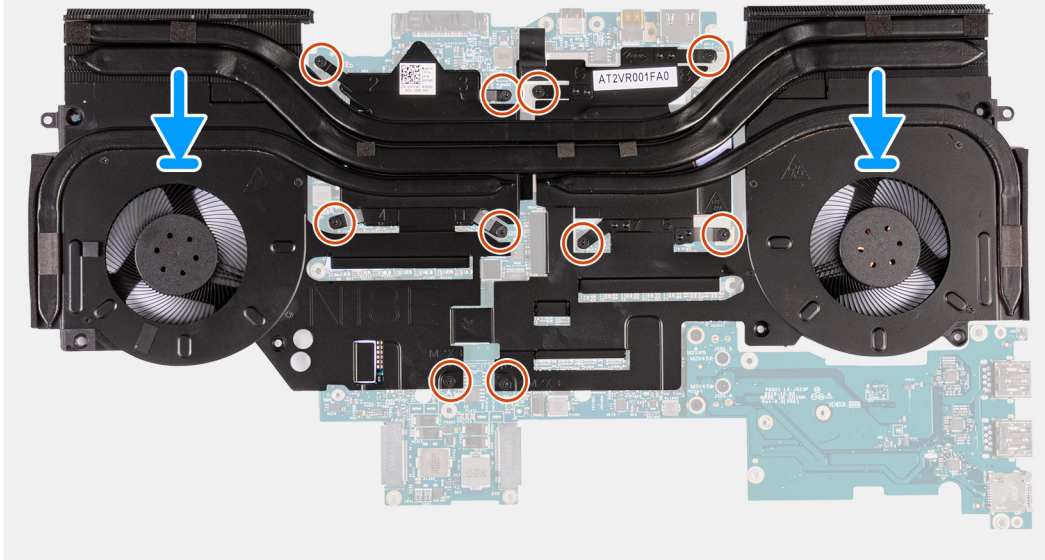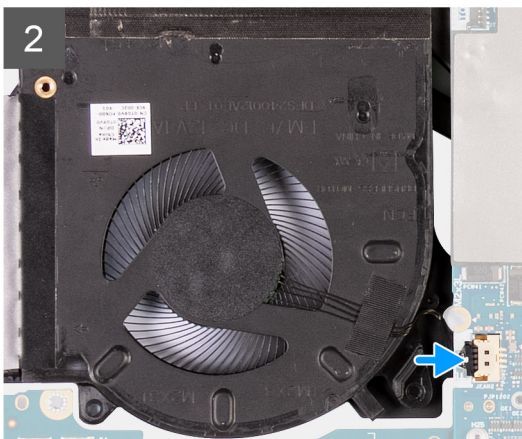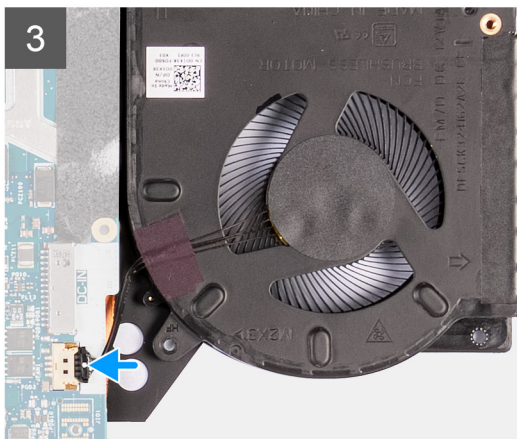
Steps

1. Place the fan and heat-sink assembly on the system board.
2. Align the screw holes on the fan and heat-sink assembly to the screw holes on the system board.

3. In sequential order (1>2>3>4>5>6>7>8>9>10) replace the 10 screws (M2x3) that secure the fan and heat-sink assembly to the system board.

(i) **NOTE:** Depending on the discrete graphics processing unit installed in your computer, the number of screws securing the fan and heat-sink assembly to the system board may be 8 or 10.

4. Turn the system-board assembly over.
5. Connect the left and right fan cables to the system board.

Next steps

1. Follow the procedure from step 3 to step 24 in Installing the system board.
2. Install the right I/O-board.
3. Install the rear I/O-cover.
4. Install the M.2 2230 solid-state drive, if applicable.
5. Install the M.2 2280 solid-state drive, if applicable.
6. Install the battery.
7. Install the base cover.
8. Follow the procedure in After working inside your computer.

# Power-adapter port

Removing the power-adapter port

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2230 solid-state drive, if applicable.
5. Remove the M.2 2280 solid-state drive, if applicable.
6. Remove the rear I/O-cover.
7. Remove the right I/O-board.
8. Follow the procedure from step 1 to step 19 in Removing the system board.

About this task

The following image(s) indicate the location of the power-adapter port and provides a visual representation of the removal procedure.

2x
M2x3
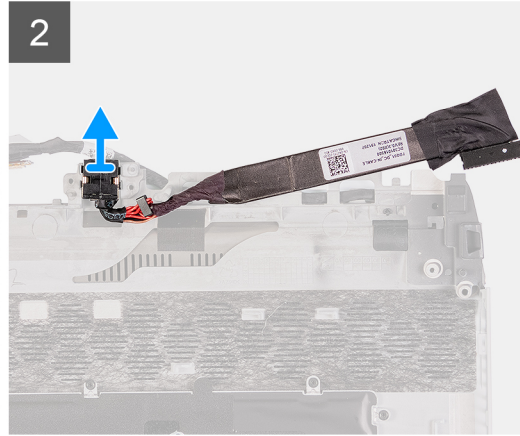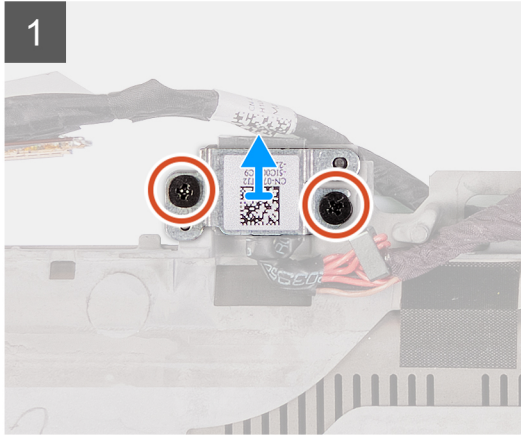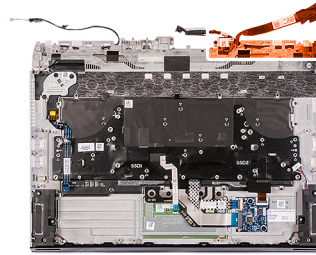
Steps

1. Remove the two screws (M2x3) that secure the power-adapter port bracket to the palm-rest assembly.

2. Lift the power-adapter port bracket off the palm-rest assembly.

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

# Installing the power-adapter port

Prerequisites

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

About this task

The following image(s) indicate the location of the power-adapter port and provides a visual representation of the installation procedure.

2x
M2x3
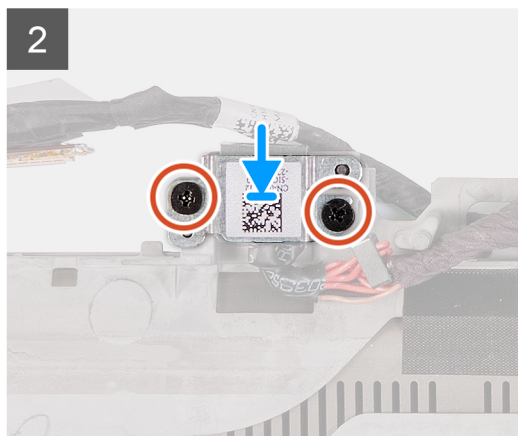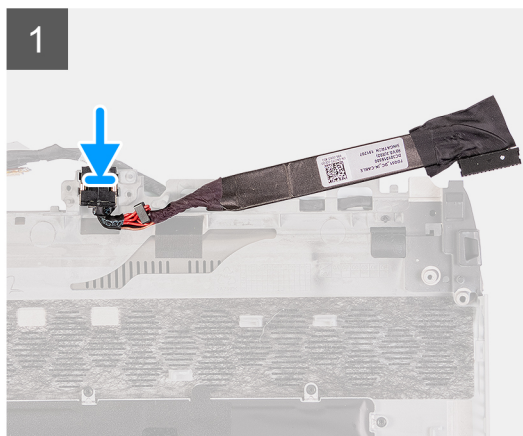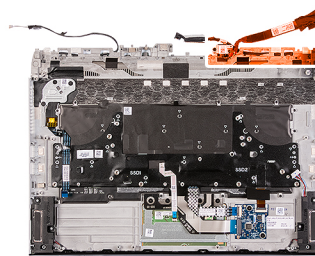
Steps

1. Place the power-adapter port into the slot on the palm-rest assembly.
2. Place the power-adapter port bracket on the power-adapter port.
3. Align the screw holes on the power-adapter port bracket to the screw holes on the palm-rest assembly.
4. Replace the two screws (M2x3) that secure the power-adapter port bracket to the palm-rest assembly.

Next steps

1. Follow the procedure from step 3 to step 24 in Installing the system board.
2. Install the right I/O-board.
3. Install the rear I/O-cover.
4. Install the M.2 2230 solid-state drive, if applicable.
5. Install the M.2 2280 solid-state drive, if applicable.
6. Install the battery.
7. Install the base cover.
8. Follow the procedure in After working inside your computer.

# Power-button assembly

Removing the power-button assembly

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2230 solid-state drive, if applicable.
5. Remove the M.2 2280 solid-state drive, if applicable.
6. Remove the rear I/O-cover.
7. Remove the right I/O-board.
8. Follow the procedure from step 1 to step 19 in Removing the system board.

About this task

The following image(s) indicate the location of the power-button assembly and provides a visual representation of the removal procedure.
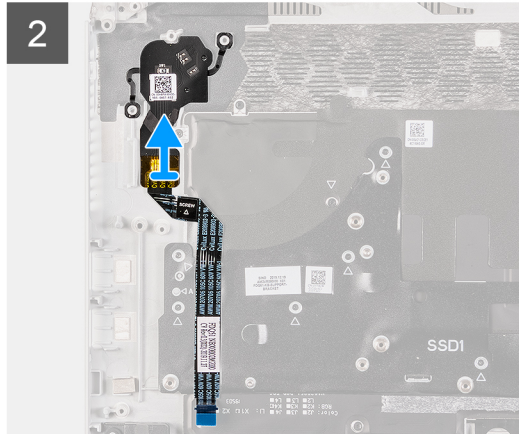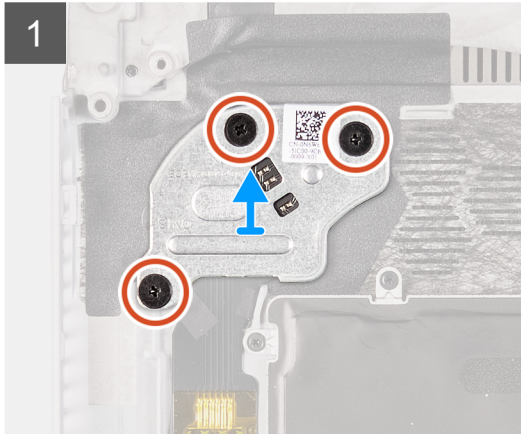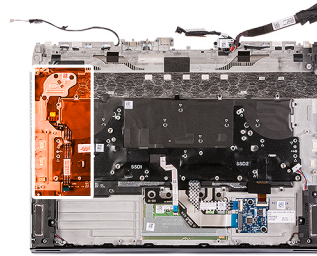
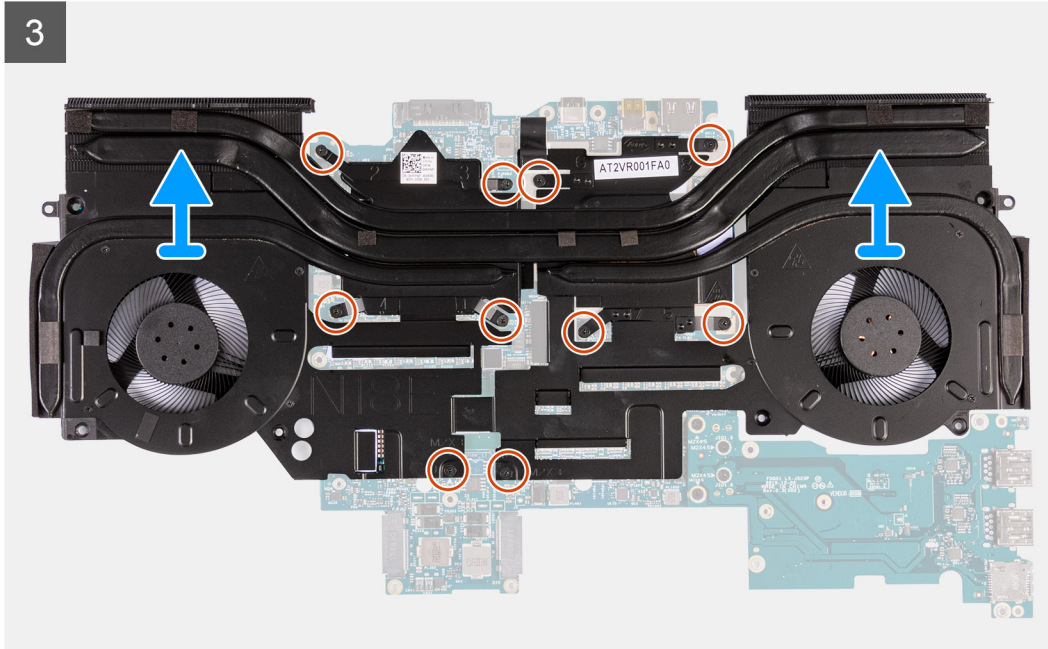**Steps**

1. Remove the three (M2x1.9) screws that secure the power-button bracket to the palm-rest assembly.
2. Lift the power-button bracket off the power-button assembly.
3. Peel the power-button assembly and its cable off the palm-rest assembly.

Installing the power-button assembly

Prerequisites

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

**About this task**

The following image(s) indicate the location of the power-button assembly and provides a visual representation of the installation procedure.

3x
M2x1.9
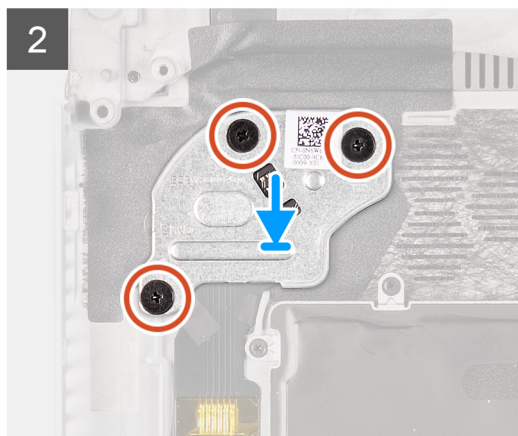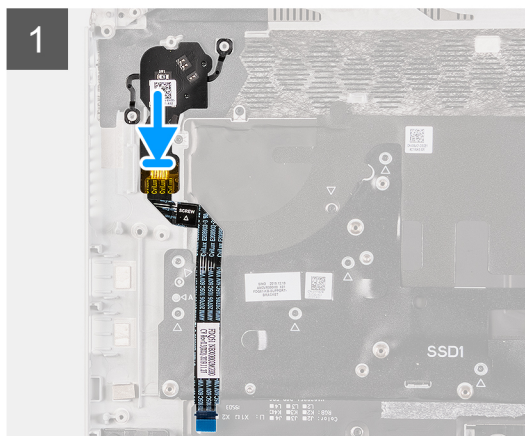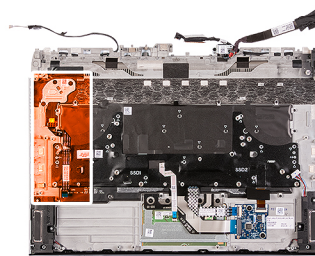
Steps

1. Place the power-button assembly and its cable in the slot on the palm-rest assembly.
2. Place the power-button bracket on the power-button assembly.
3. Align the screw holes on the power-button bracket to the screw holes on the palm-rest assembly.
4. Replace the three (M2x1.9) screws that secure the power-button bracket to the palm-rest assembly.
5. Adhere the power-button assembly cable on the palm-rest assembly.

Next steps

1. Follow the procedure from step 3 to step 24 in Installing the system board.
2. Install the right I/O-board.
3. Install the rear I/O-cover.
4. Install the M.2 2230 solid-state drive, if applicable.
5. Install the M.2 2280 solid-state drive, if applicable.
6. Install the battery.
7. Install the base cover.
8. Follow the procedure in After working inside your computer.

Keyboard

Removing the keyboard

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2230 solid-state drive, if applicable.
5. Remove the M.2 2280 solid-state drive, if applicable.
6. Remove the rear I/O-cover.
7. Remove the speakers.
8. Remove the right I/O-board.

9. Follow the procedure from step 1 to step 19 in [Removing the system board](#).
10. Remove the [power-adapter port](#).

About this task

The following image(s) indicate the location of the keyboard and provides a visual representation of the removal procedure.

12x
M1.2x2.1

19x
M1.2x1.6
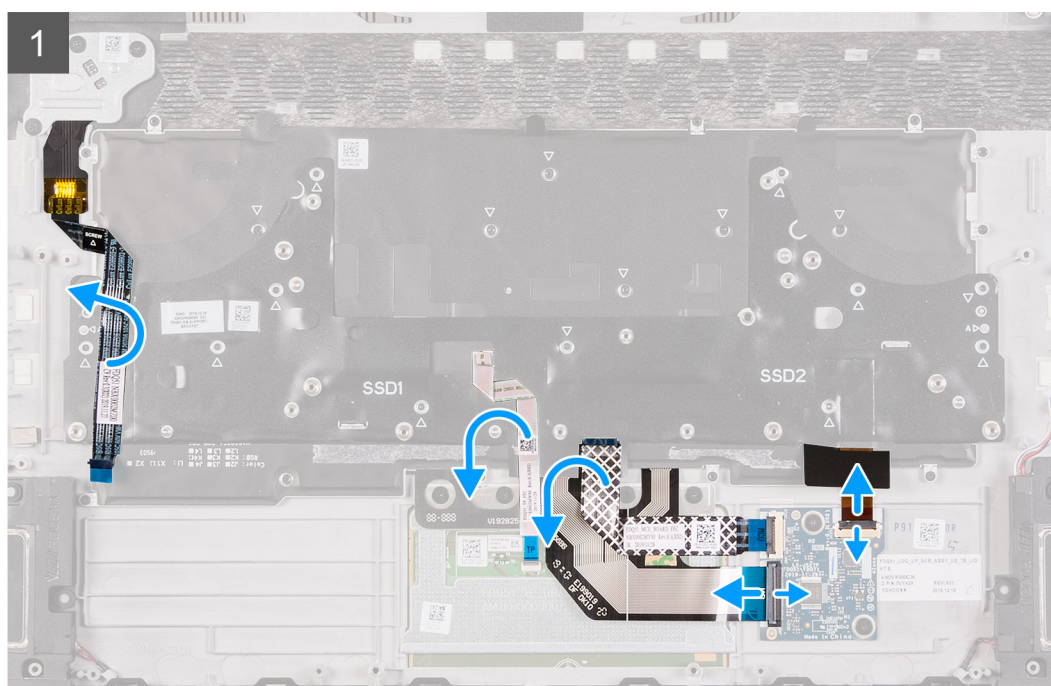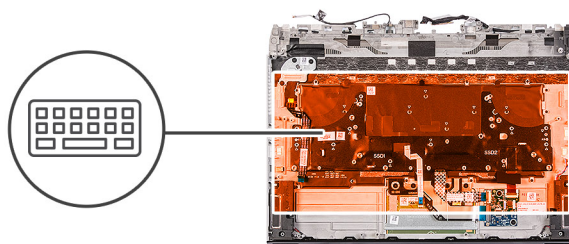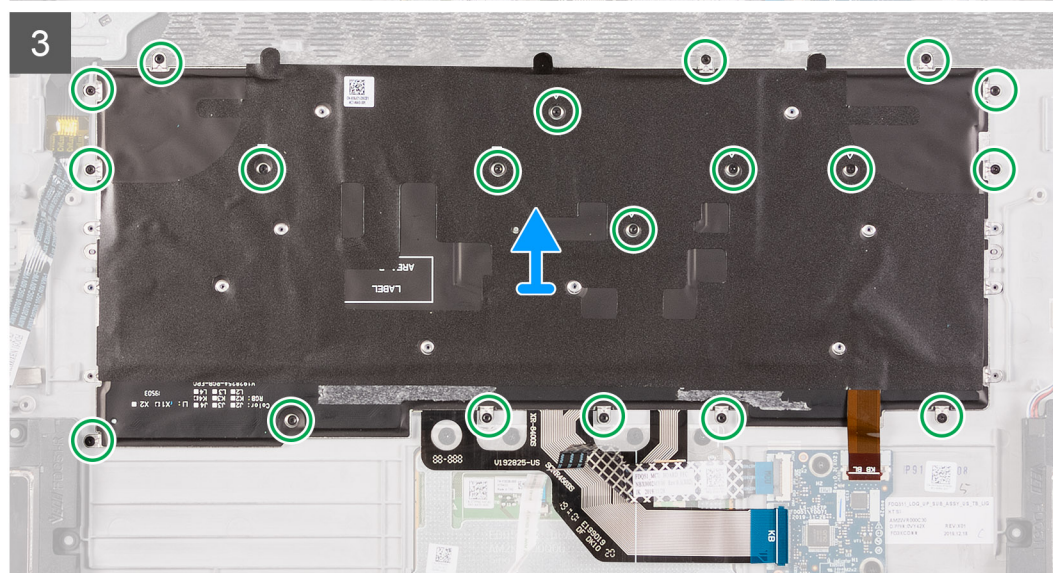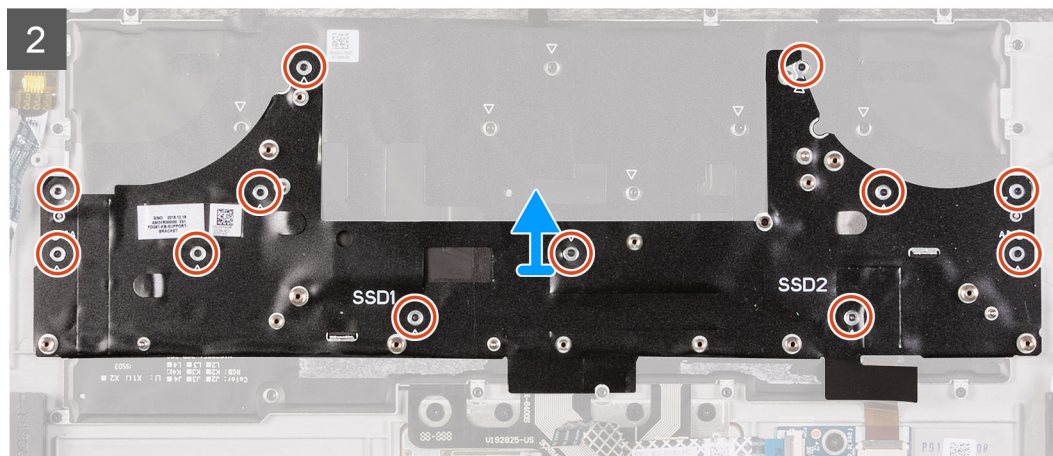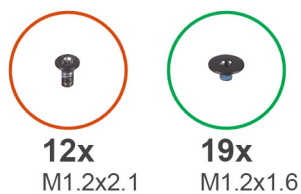
Steps

1. Open the latch and disconnect the keyboard-backlight cable from the keyboard-controller board.
2. Open the latch and disconnect the keyboard-controller board cable from the keyboard-controller board.
3. Open the latch and disconnect the keyboard cable from the keyboard-controller board.
4. Fold up the touchpad cable so that it is no longer resting on the keyboard.
5. Fold up the power-button assembly cable so that it is no longer resting on the keyboard.
6. Remove the 12 screws (M1.2x2.1) that secure the keyboard bracket to the keyboard and palmrest.
7. Lift the keyboard bracket off the keyboard.
8. Remove the 19 screws (M1.2x1.6) that secure the keyboard to the palmrest.

Installing the keyboard

Prerequisites

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

## About this task

The following image(s) indicate the location of the keyboard and provides a visual representation of the installation procedure.
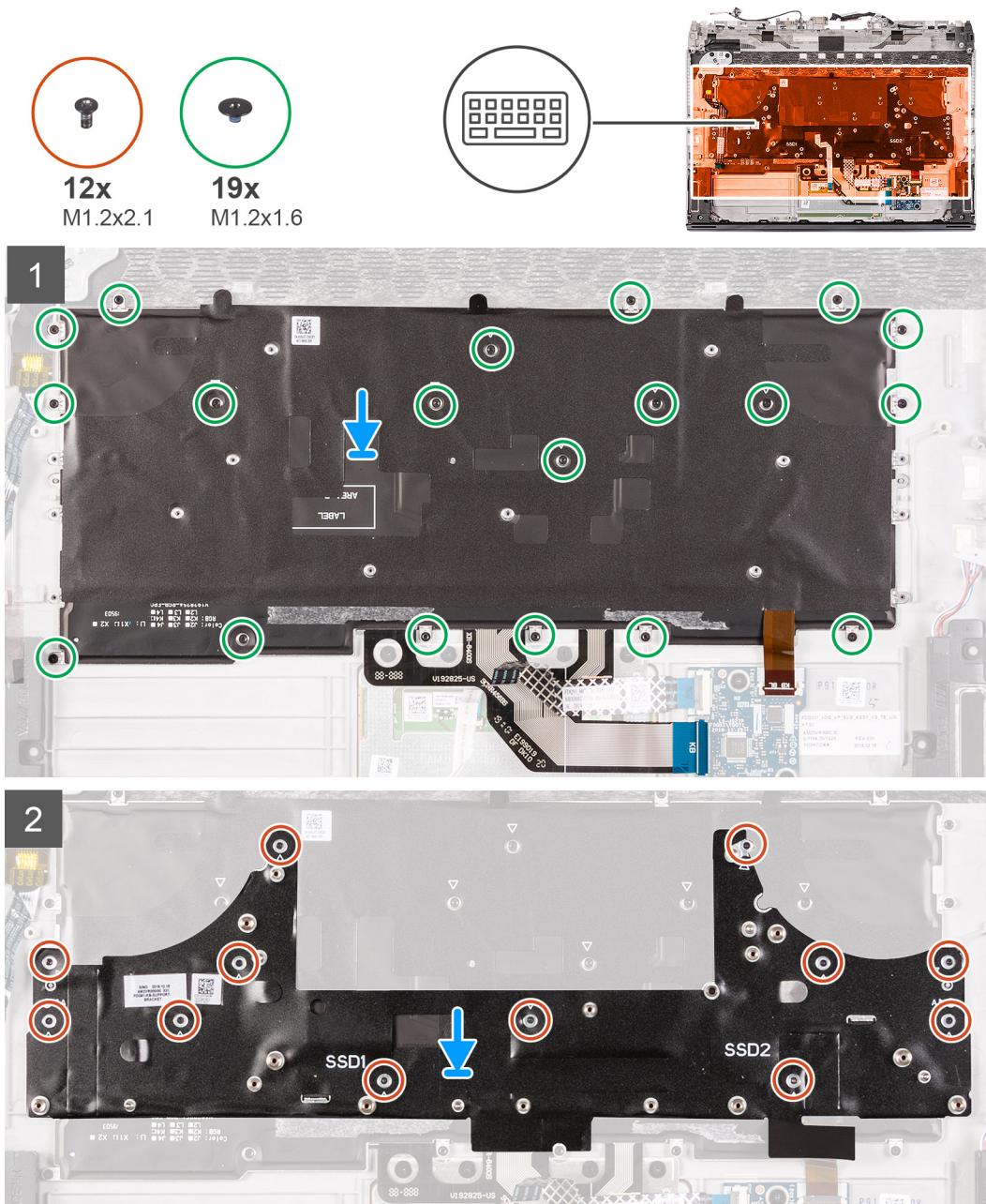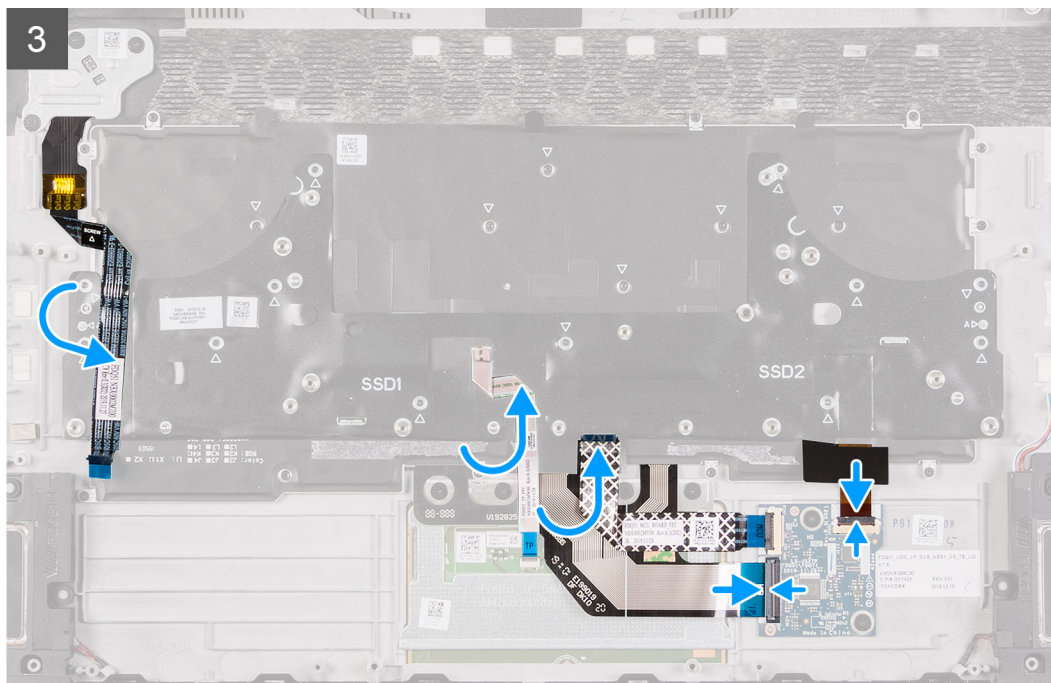
Steps

1. Place the keyboard and its cables on the palmrest.
2. Align the screw holes on the keyboard to the screw holes on the palmrest.
3. Replace the 19 screws (M1.2x1.6) that secure the keyboard to the palmrest.
4. Place the keyboard bracket on the keyboard.
5. Align the screw holes on the keyboard bracket to the screw holes on the keyboard and palmrest.
6. Replace the 12 screws (M1.2x2.1) that secure the keyboard bracket to the palmrest.
7. Fold down the touchpad cable so that it rests on the keyboard.
8. Fold down the power-button assembly cable so that it rests on the keyboard.
9. Connect the keyboard-backlight cable to the keyboard-controller board and close the latch.
10. Connect the keyboard-controller board cable to the keyboard-controller board and close the latch.
11. Connect the keyboard cable to the keyboard-controller board and close the latch.

Next steps

1. Install the power-adapter port.
2. Follow the procedure from step 3 to step 24 in Installing the system board.
3. Install the right I/O-board.
4. Install the rear I/O-cover.
5. Install the M.2 2230 solid-state drive, if applicable.
6. Install the M.2 2280 solid-state drive, if applicable.
7. Install the battery.
8. Install the base cover.
9. Follow the procedure in After working inside your computer.

Palmrest

Removing the palmrest

Prerequisites

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

2. Remove the base cover.
3. Remove the battery.
4. Remove the M.2 2230 solid-state drive, if applicable.
5. Remove the M.2 2280 solid-state drive, if applicable.
6. Remove the rear I/O-cover.
7. Remove the display assembly.
8. Remove the speakers.
9. Remove the touchpad.
10. Remove the keyboard-controller board.
11. Remove the right I/O-board.
12. Follow the procedure from step 1 to step 19 in Removing the system board.
13. Remove the power-adapter port.
14. Remove the power-button assembly.
15. Remove the keyboard.

About this task

The following image(s) indicate the location of the palmrest and provides a visual representation of the removal procedure.

Steps

After performing the pre-requisites, you are left with the palmrest.

Installing the palmrest

Prerequisites

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

About this task

The following image(s) indicate the location of the palmrest and provides a visual representation of the installation procedure.
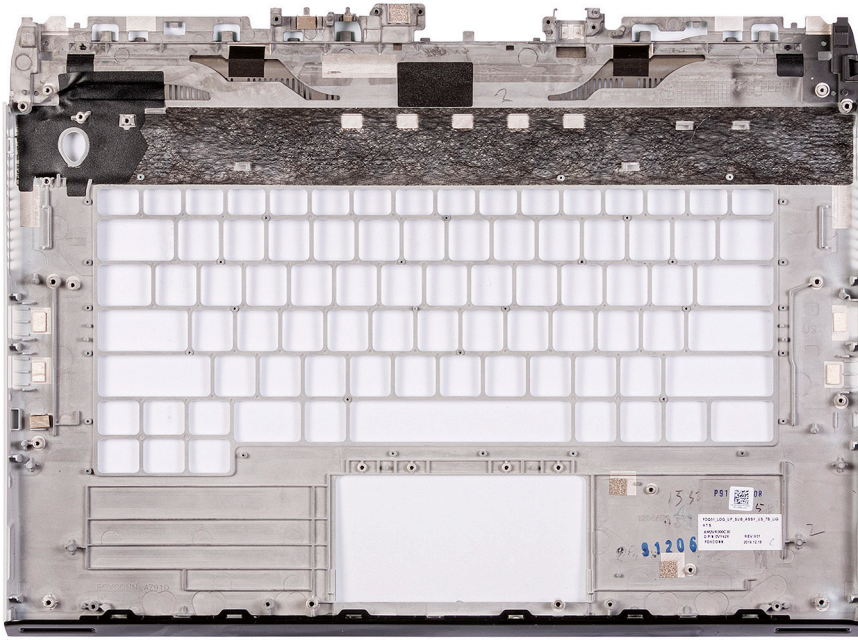
Steps

To install the palmrest perform the post-requisites.

Next steps

1. Install the keyboard.
2. Install the power-button assembly.
3. Install the power-adapter port.
4. Follow the procedure from step 3 to step 24 in Installing the system board.
5. Install the right I/O-board.
6. Install the keyboard-controller board.
7. Install the touchpad.
8. Install the speakers.
9. Install the display assembly.
10. Install the rear I/O-cover.
11. Install the M.2 2230 solid-state drive, if applicable.
12. Install the M.2 2280 solid-state drive, if applicable.
13. Install the battery.
14. Install the base cover.
15. Follow the procedure in After working inside your computer.

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ SLN128938.

System setup

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

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

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

Entering BIOS setup program

Steps

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

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

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.

Table 4. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. ⓘ **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.

One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F2 immediately.

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

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

- Removable Drive (if available)
- STXXXX Drive (if available)
  - ⓘ **NOTE:** XXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics
  - ⓘ **NOTE:** Choosing **Diagnostics**, will display the **ePSA diagnostics** screen.

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

System setup options

Main

Table 5. Main

Option	Description
System Time	Displays the current time in hh:mm:ss format.
System Date	Displays the current date in mm/dd/yyyy format.
BIOS Version	Displays the BIOS version.
Product Name	Displays the model number of your computer.
Service Tag	Displays the service tag of your computer.
Asset Tag	Displays the asset tag of your computer.
CPU Type	Displays the processor type.
CPU Speed	Displays the processor speed.
CPU ID	Displays the processor identification code.
CPU L1 Cache	Displays the processor L1 cache size.
CPU L2 Cache	Displays the processor L2 cache size.
CPU L3 Cache	Displays the processor L3 cache size.
Integrated Graphics	Displays the integrated graphics.
Discrete Graphics 1	Displays the first discrete graphics that are installed on your computer.
Discrete Graphics 2	Displays the second discrete graphics that are installed on your computer.
M.2 PCIe SSD-1	Displays the type of primary SSD installed.
AC Adapter Type	Displays the AC adapter type.
System Memory	Displays the system memory information.
Memory Speed	Displays the memory speed information.

Advanced

Table 6. Advanced

Option	Description
Chassis Color	Sets the chassis color.

Table 6. Advanced (continued)

Option	Description
Keyboard Language	Sets the keyboard language.
Keyboard Color	Sets the keyboard color.
Intel SpeedStep	Enables or disables the Intel SpeedStep mode of processor. • **Enable Intel SpeedStep** Default: Enabled
Intel Speed Shift Technology	Enables or disables the Intel Speed Shift Technology. This option enables the operating system to select the appropriate processor performance automatically. • **Enabled** Default: Enabled
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. • **Disabled** • **Enabled** Default: Enabled
Integrated NIC	Enables you to configure the onboard LAN controller. Choose one of the following options: • **Disabled:** The internal LAN is off and not visible to the operating system • **Enabled:** The internal LAN is enabled • **Enabled w/PXE:**The internal LAN is enabled (with PXE boot) Default: Enabled w/PXE
Power on LID open	Enables or disables the computer to turn on from opening the lid. Default: Enabled
USB Emulation	Enables or disables the USB emulation feature. This feature defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST. Default: Enabled ⓘ **NOTE:** You cannot boot any type of USB device (floppy, hard drive, or memory key) when this option is off.
USB PowerShare	Enables or disables the USB PowerShare feature. This option enables you to charge external devices using the stored system battery power through the USB PowerShare port when the computer is turned off or in standby mode. • **Enable USB PowerShare** Default: Enabled
USB Wake Support	Enables or disables the USB devices to wake the computer from Standby. • **Enable USB Wake Support** Default: Disabled

Table 6. Advanced (continued)

Option	Description
	ⓘ **NOTE:** If USB PowerShare is enabled, a device that is connected to the USB PowerShare connector may not wake the computer.
SATA Operation	Enables you to configure the operating mode of the integrated SATA drive controller. Choose one of the following options: ● **Disabled:** The SATA controllers are hidden ● **AHCI:** SATA is configured for AHCI mode ● **RAID On:** SATA is configured to support RAID mode Default: RAID On
Adapter Warnings	Enables or disables the system setup (BIOS) warning messages when you use certain power adapters. ● **Enable Adapter Warnings** Default: Enabled
Function Key Behavior	Enables you to set function key or multimedia key as the default function key behavior. Default: Function key
Battery Health	Displays the battery health.
Intel Software Guard Extensions	Enables or disables Intel Software Guard Extensions. Default: Software Controlled
Intel Software Guard Extensions allocated memory size	Displays the allocated memory size for Intel Software Guard Extensions.
Camera	
Thunderbolt	Enables or disables Thunderbolt technology support. The options are: ● **Enabled** ● **Disabled** Default: Disabled
Thunderbolt Boot Support	Enables or disables booting from storage devices connected to Thunderbolt port. Default: Disabled

Security

Table 7. Security

Option	Description
Unlock Setup Status	Displays if the setup status is unlocked.
Admin Password Status	Displays if the administrator password is clear or set. Default: Not set
System Password Status	Displays if the system password is clear or set. Default: Not set

Table 7. Security (continued)

Option	Description
Admin Password	Allows you to set, change, or delete the administrator(admin) password. The entries to set password are: ● **Enter the old password:** ● **Enter the new password:** ● **Confirm new password:** Click **OK** once you set the password. ⓘ **NOTE:** For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.
System Password	Allows you to set, change, or delete the System password. The entries to set password are: ● **Enter the old password:** ● **Enter the new password:** ● **Confirm new password:** Click **OK** once you set the password. ⓘ **NOTE:** For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.
Strong Password	Allows you to enforce the option to always set strong password. ● **Enable Strong Password** This option is not set by default.
Password Configuration	You can define the length of your password. Min = 4, Max = 32
Password Bypass	Allows you to bypass the System password and the Internal HDD password, when it is set, during a system restart. Choose one of the options: ● **Disabled:**Always prompt for the system and internal HDD password when they are set. This option is enabled by default.—Default ● **Reboot bypass:**Bypass the password prompts on Restarts (warm boots).
Password Change	Allows you to change the System password when the administrator password is set. ● **Allow Non-Admin Password Changes** This option is enabled by default.
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled the setup options are locked by the admin password. ● **Allow Wireless Switch Changes** This option is not set by default.
UEFI Capsule Firmware Updates	Allows you to update the system BIOS via UEFI capsule update packages. ● **Enable UEFI Capsule Firmware Updates** This option is enabled by default.
TPM 2.0 Security	Allows you to enable or disable the Trusted Platform Module (TPM) during POST. The options are:

Table 7. Security (continued)

Option	Description
	• **TPM On**—Default • **Clear** • **PPI Bypass for Enable Command**—Default • **PPI Bypass for Disbale Command** • **PPI Bypass for Clear Command** • **Attestation Enable**—Default • **Key Storage Enable**—Default • **SHA-256**—Default Choose one of the options: • **Disbaled** • **Enabled**—Default
TPM Security	Allows you to enable the Trusted Platform Module (TPM) during POST. Default Setting: This option is not set by default.
PPI Bypass for Clear Command	Enables you to control the TPM Physical Presence Interface (PPI). When enabled, this setting will allow the OS to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately.
Computrace (R)	Allows you to activate or disable the optional Computrace software. The options are: • **Deactivate** • **Disable** • **Activate**—Default

Secure boot

Table 8. Secure Boot

Option	Description
Boot List Option	Displays the available boot options. • Legacy • UEFI Default: UEFI
File Browser Add Boot Option	Enables you to add the boot options.
File Browser Del Boot Option	Enables you to delete the boot options.
Secure Boot	Enables or disables the Secure Boot Feature. Choose one of the options: • **Secure Boot Enable** • **Secure Boot Disable** Default: Enabled
Legacy Option ROMs	Enables or disables the Legacy Option ROMs. Default: Disabled
Attempt Legacy Boot	Enables or disables Attempt Legacy Boot. Default: Disabled
Boot Option Priorities	Displays the boot sequence.

Secure boot

Table 9. Secure Boot

Option	Description
Boot List Option	Displays the available boot options. ● Legacy ● UEFI Default: UEFI
File Browser Add Boot Option	Enables you to add the boot options.
File Browser Del Boot Option	Enables you to delete the boot options.
Secure Boot	Enables or disables the Secure Boot Feature. Choose one of the options: ● **Secure Boot Enable** ● **Secure Boot Disable** Default: Enabled
Legacy Option ROMs	Enables or disables the Legacy Option ROMs. Default: Disabled
Attempt Legacy Boot	Enables or disables Attempt Legacy Boot. Default: Disabled
Boot Option Priorities	Displays the boot sequence.
Boot Option #1	Displays the available first boot option.
Boot Option #2	Displays the available second boot option.
Boot Option #3	Displays the available third boot option.

Updating the BIOS in Windows

Prerequisites

It is recommended to update your BIOS (System Setup), when you replace the system board or if an update is available. For laptops, ensure that your computer battery is fully charged and connected to a power outlet.

About this task

(i) **NOTE:** If BitLocker is enabled, it must be suspended before updating the system BIOS, and then re-enabled after the BIOS update is completed.

Steps

1. Restart the computer.
2. Go to www.dell.com/support.

- Enter the **Service Tag** or **Express Service Code** and click **Search.**
- Click **Drivers & Downloads.**
- Click **Detect Drivers** and follow the on-screen instructions.
3. If you are unable to detect or find the Service Tag, click **Browse all products.**
4. Choose the appropriate category to reach the product page.
5. Select your computer model, followed by its model number.

   (i) **NOTE:** The **Product Support** page of your computer appears.

6. Click **Drivers & Downloads.**

   (i) **NOTE:** The Drivers & Downloads section is displayed.

7. Click **Category**, and select **BIOS** from the drop-down list.
8. Click the toggle button **Show downloads for only THIS PC XXXXXXX.**

   (i) **NOTE:** XXXXXXX denotes the Service Tag.

9. Select the latest BIOS file and click **Download.**
10. After the download is complete, browse to the folder where you saved the system BIOS executable file.
11. Double-click the system BIOS executable file.

   (i) **NOTE:** Follow the on-screen instructions.

Updating BIOS on systems with BitLocker enabled

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

Updating your system BIOS using a USB flash drive

About this task

If the computer cannot load into Windows but there is still a need to update the BIOS, download the BIOS file using another computer and save it to a bootable USB flash drive.

(i) **NOTE:** You must use a bootable USB flash drive. For more information, see the knowledge base article SLN143196.

Steps

1. Download the BIOS update .exe file to another computer.
2. Copy the .exe file onto the bootable USB flash drive.
3. Insert the USB flash drive into the computer that requires the BIOS update.
4. Restart the computer and press F12 when the Dell logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and press Enter.
6. The computer restarts to a Diag C:\> prompt.
7. Run the file by typing the complete filename and press Enter.
8. The BIOS Update Utility is displayed. Follow the on-screen instructions.

```
================= BIOS Update Utility =================

   This utility will update the system BIOS and firmware.  During the
   update procedure, your system will restart.  Do not interrupt this
   procedure once it begins.  Do not disconnect the AC power source (if you
   are updating a mobile computer, connect the AC power adapter).
   Interruption of the BIOS/firmware update procedure will likely render
   your system unusable.

   Do you wish to continue (y/n)? y




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```

Flashing the BIOS from the F12 One-Time boot menu

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

About this task

BIOS Update

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

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

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

Updating from the One-Time boot menu

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

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

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

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

Steps

1. From a turn off state, insert the USB drive where you copied the flash into a USB port of the computer.
2. Turn on the computer and press F12 to access the One-Time Boot Menu, select BIOS Update using the mouse or arrow keys then press Enter.
   The flash BIOS menu is displayed.
3. Click **Flash from file.**
4. Select external USB device.
5. Select the file and double-click the flash target file, and then click **Submit**.
6. Click **Update BIOS.** The computer restarts to flash the BIOS.

7. The computer will restart after the BIOS update is completed.

System and setup password

Table 10. System and setup password

Password type	Description
System password	Password that you must enter to log in to your system.
Setup password	Password that you must enter to access and make changes to the BIOS settings of your computer.

You can create a system password and a setup password to secure your computer.

⚠️ **CAUTION: The password features provide a basic level of security for the data on your computer.**

⚠️ **CAUTION: Anyone can access the data that is stored on your computer if it is not locked and left unattended.**

ⓘ **NOTE:** System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

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

About this task

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

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - The password can contain the numbers 0 through 9.
   - Only lower case letters are valid, upper case letters are not valid.
   - Only the following special characters are valid: Space, ("), (+), (,), (-), (.), (/), (;), ([), (\), (]), (`).
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and a message prompt's you to save the changes.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

Prerequisites

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

About this task

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

Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, update, or delete the existing system password, and press Enter or Tab.
4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

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

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

Clearing CMOS settings

About this task

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

Steps

1. Remove the base cover.
2. Disconnect the battery cable from the system board.
3. Press the power button for 15 seconds.
4. Wait for one minute.
5. Connect the battery cable to the system board.
6. Replace the base cover.

Clearing BIOS (System Setup) and System passwords

About this task

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

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

Troubleshooting

System-diagnostic lights

Power and battery-status light

The power and battery status light indicates the power and battery status of the computer. These are the power states:

Solid white: Power adapter is connected and the battery has more than 5% charge.

Amber: Computer is running on battery and the battery has less than 5% charge.

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

The power and battery-status light may blink amber or white according to pre-defined "beep codes" indicating various failures.

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

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

> (i) **NOTE:** The following diagnostic light codes and recommended solutions are intended for Dell service technicians to troubleshoot problems. 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.

Table 11. Diagnostic-light LED codes

Diagnostic light codes (Amber, White)	Problem description	Recommended solutions
2,1	Processor failure	Replace the system board.
2,2	System board: BIOS or ROM (Read-Only Memory) failure	Flash latest BIOS version. If problem persists, replace the system board.
2,3	No memory or RAM (Random-Access Memory) detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2,4	Memory or RAM (Random-Access Memory) failure	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2,5	Invalid memory installed	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2,6	System-board or chipset error	Flash latest BIOS version. If problem persists, replace the system board.
2,7	Display failure – SBIOS message	Flash latest BIOS version. If problem persists, replace the system board.
3,1	Coin-cell battery failure	Reset the CMOS battery connection. If problem persists, replace the RTC battery.
3,2	PCI, video card/chip failure	Replace the system board.
3,3	Recovery image not found	Flash latest BIOS version. If problem persists, replace the system board.
3,4	Recovery image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.
3,5	Power-rail failure	EC ran into power sequencing failure. If problem persists, replace the system board.
3,6	System BIOS Flash incomplete	Flash corruption detected by SBIOS. If problem persists, replace the system board.

Table 11. Diagnostic-light LED codes (continued)

Diagnostic light codes (Amber, White)	Problem description	Recommended solutions
3,7	Management Engine (ME) error	Timeout waiting on ME to reply to HECI message. If problem persists, replace the system board.

Flashing BIOS (USB key)

Steps

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.

Flashing the BIOS

About this task

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:

Steps

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**.

   (i) **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.

Backup media and recovery options

It is recommended to create a recovery drive to troubleshoot and fix problems that may occur with Windows. Dell proposes multiple options for recovering Windows operating system on your Dell PC. For more information. see Dell Windows Backup Media and Recovery Options.

WiFi power cycle

About this task

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.

Steps

1. Turn off your computer.
2. Turn off the modem.
3. Turn off the wireless router.
4. Wait for 30 seconds.
5. Turn on the wireless router.
6. Turn on the modem.
7. Turn on your computer.

Drain residual flea power (perform hard reset)

About this task

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

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

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

To drain residual flea power (perform a hard reset)

Steps

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

   ⓘ **NOTE:** For more information about performing a hard reset, see the knowledge base article SLN85632 at www.dell.com/support.

Getting help and contacting Alienware

Self-help resources

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

Table 12. Alienware products and online self-help resources

Self-help resources	Resource location
Information about Alienware products and services	www.alienware.com
Dell Help & Support app	
Tips	
Contact Support	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.alienware.com/gamingservices
Videos providing step-by-step instructions to service your computer	www.youtube.com/alienwareservices

Contacting Alienware

To contact Alienware for sales, technical support, or customer service issues, see www.alienware.com.

ⓘ **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.