# Vostro 16 5630

Service Manual

**D&LL**Technologies

## Notes, cautions, and warnings

(i) **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

## 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.**

△ **CAUTION: Exercise caution when handling Lithium-ion batteries in laptops. Swollen batteries should not be used and should be replaced and disposed properly.**

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

## Before working inside your computer

**About this task**

ⓘ **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. For Windows operating system, 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 precautions

The safety precautions chapter details the primary steps to be taken before performing any disassembly instructions.

Observe the following safety precautions before you perform any installation or break/fix procedures involving disassembly or reassembly:
- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

## Standby power

Dell products with standby power must be unplugged before you open the case. Systems that incorporate standby power are essentially powered while turned off. The internal power enables the system to be remotely turned on (wake on LAN) and suspended into a sleep mode and has other advanced power management features.

Unplugging, pressing and holding the power button for 15 seconds should discharge residual power in the system board.

## Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done through the use of a field service electrostatic discharge (ESD) kit. When connecting a bonding wire, ensure that it is connected to bare metal and never to a painted or non-metal surface. The wrist strap should be secure and in full contact with your skin, and ensure that you remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

# 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 to 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 to 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.

## After working inside your computer

**About this task**

(i) **NOTE:** 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.

## BitLocker

⚠ **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 reinstall. For more information about this subject, see Knowledge Article: updating the BIOS on Dell systems with BitLocker enabled.**

⚠ **CAUTION: If BitLocker is not suspended, replacing parts like system board or storage drives on a system with BitLocker / Device encryption enabled will also trigger the encryption and lock the user out. The recovery key is required to regain access to Windows. The recovery key is automatically saved to the user's Microsoft Account (MSA) when the device is encrypted and can be retrieved from https://account.microsoft.com/devices/recoverykey**

For more information, refer to Windows Support article: Finding your BitLocker recovery key in Windows

# 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
- Phillips screwdriver #1
- 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 | Screw type | Quantity | Screw image |
|---|---|---|---|
| Base cover | M2x7.5 - captive screws | 2 | |
| Base cover | M2x4 | 7 | |
| Battery | M2x3 | 5 | |
| Wireless card | M2x3 | 1 | |
| Solid-state drive | M2x3 | 1 | |
| Solid-state drive | M2x1.8 | 1 | |
| Fan | M2x3 | 2 | |
| Heat sink | captive screw | 7 | |
| System board | M2x1.8 | 2 | |

**Table 1. Screw list (continued)**

| Component | Screw type | Quantity | Screw image |
|-----------|------------|----------|-------------|
| USB Type-C bracket | M2x4 | 2 | |
| Power button with optional fingerprint reader | M2x3 | 1 | |
| TPM Board | M2x3.5 | 2 | |
| Power button | M2x3 | 1 | |
| I/O board | M2x3 | 2 | |
| RJ45 network-port assembly | M2x5 | 3 | |
| Touchpad bracket | M1.6x2 | 3 | |
| Touchpad | M2x1.8 | 2 | |
| Display hinges | M2.5x5 | 6 | |

# Major components of Vostro 16 5630

The following image shows the major components of Vostro 16 5630.

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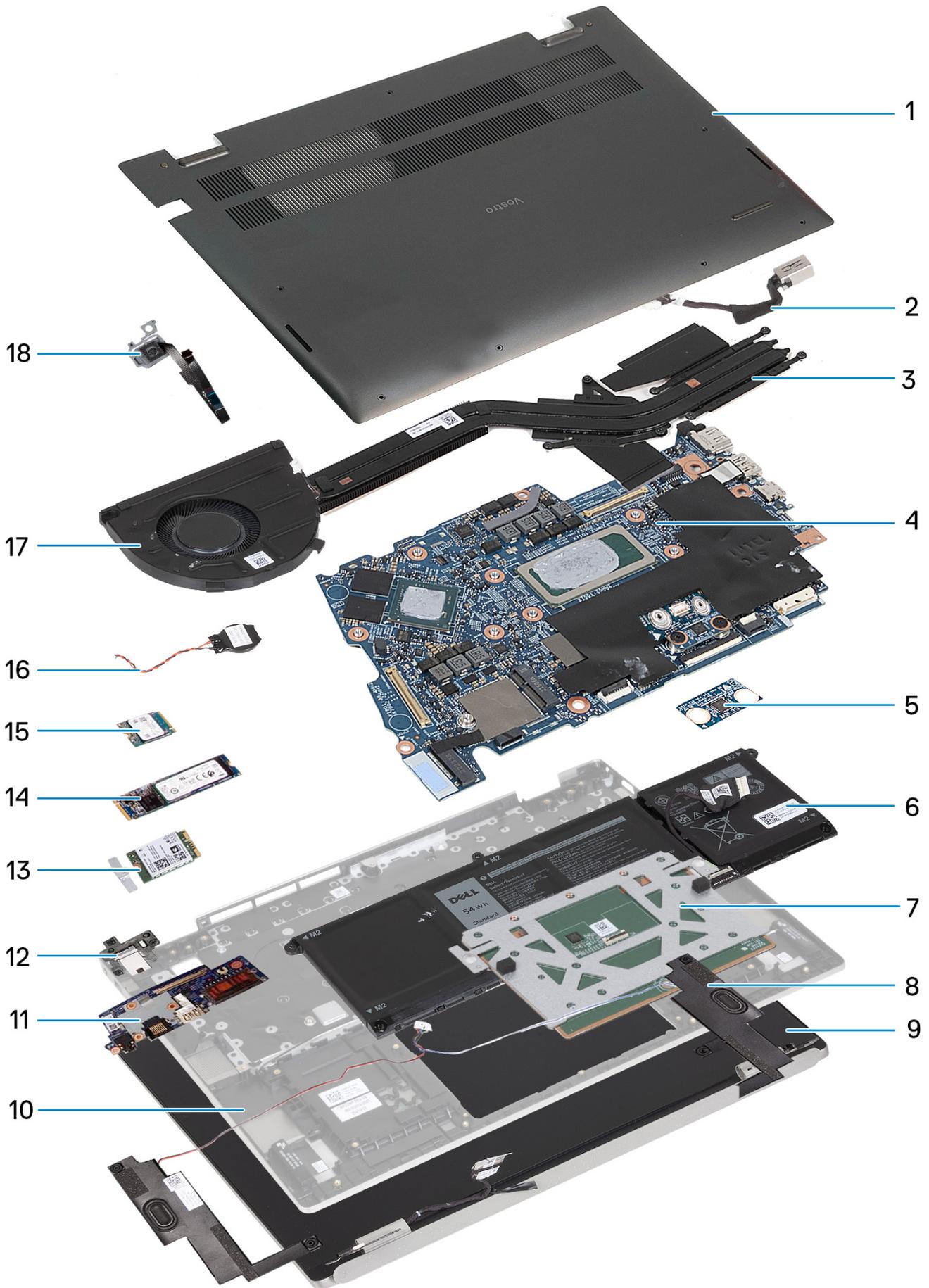
1. Base cover
2. Power-adapter port
3. Heat sink
4. System board
5. Trusted Platform Module (TPM) board
6. Battery
7. Touchpad module
8. Speaker module
9. Display assembly
10. Palm-rest and keyboard assembly
11. I/O board
12. RJ45 bracket
13. Wireless card
14. M.2 2280 solid-state drive
15. M.2 2230 solid-state drive
16. Coin-cell battery
17. Fan
18. Fingerprint module

ⓘ **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.

# Base cover

## Removing the base cover

**Prerequisites**

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

**About this task**

ⓘ **NOTE:** Before removing the base cover, ensure that there is no SD card installed in the SD card slot on your computer.
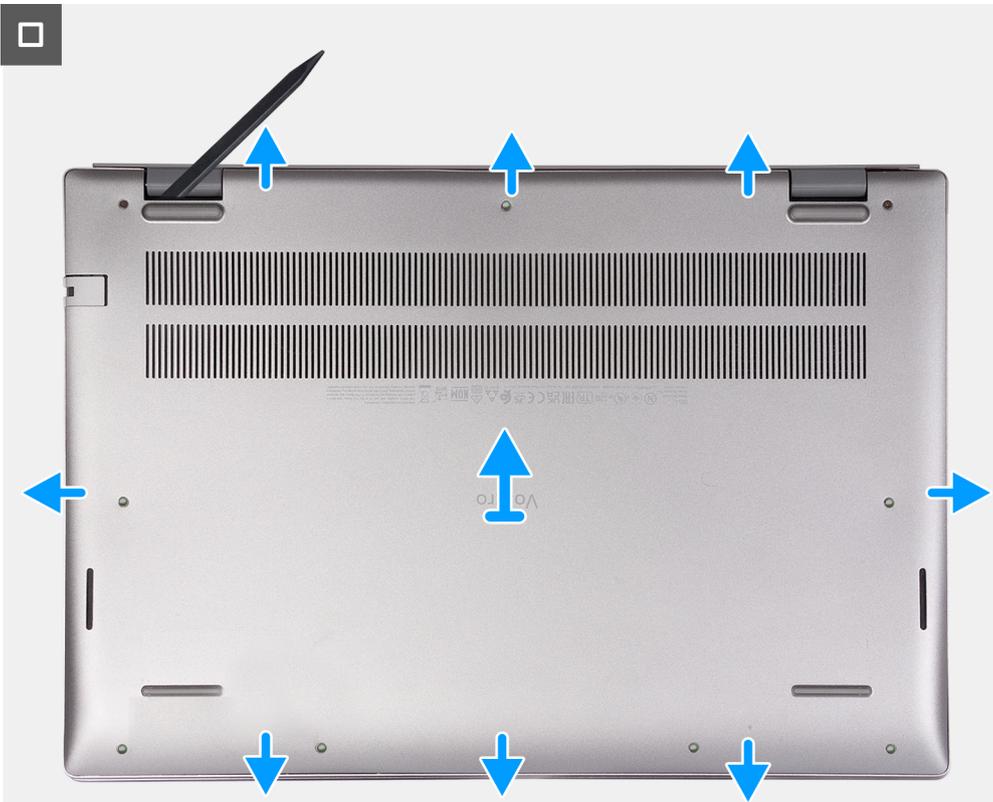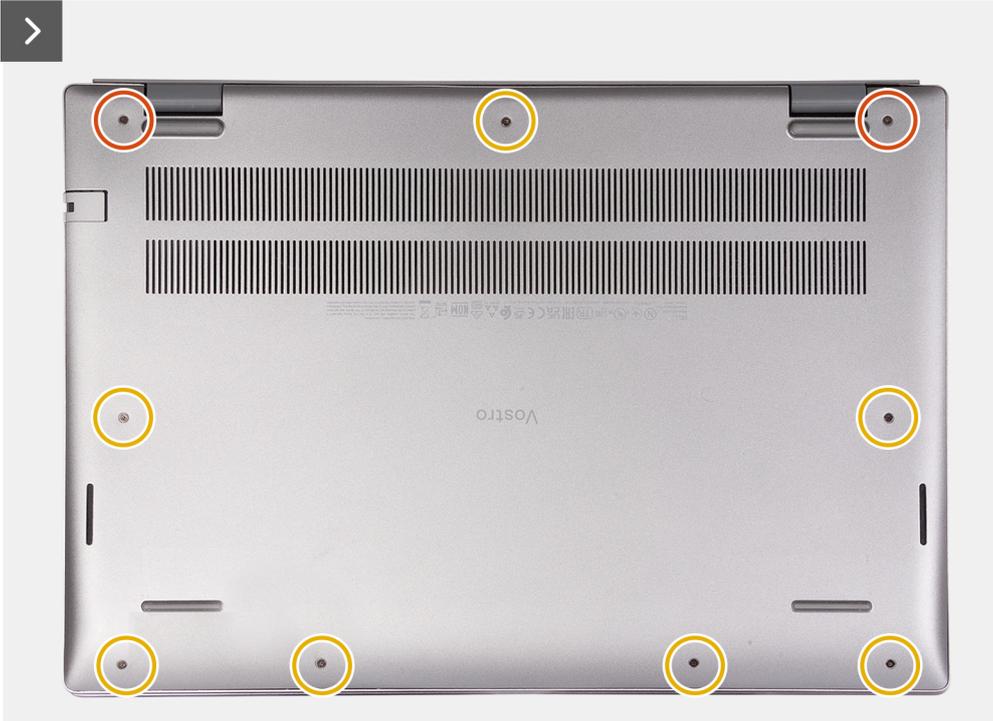
The following image(s) indicate the location of the base cover and provides a visual representation of the removal procedure.

**2x**

**7x**
M2x4

**Steps**

1. Remove the seven screws (M2x4) that secure the base cover to the palm-rest and keyboard assembly.
2. Loosen the two captive screws that secure the base cover to the palm-rest and keyboard assembly.
3. Using a plastic scribe, pry the base cover from the top 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.

# Installing the base cover

**Prerequisites**

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

**About this task**

ⓘ **NOTE:** The following image(s) shows the base cover and provides a visual representation of the installation procedure.

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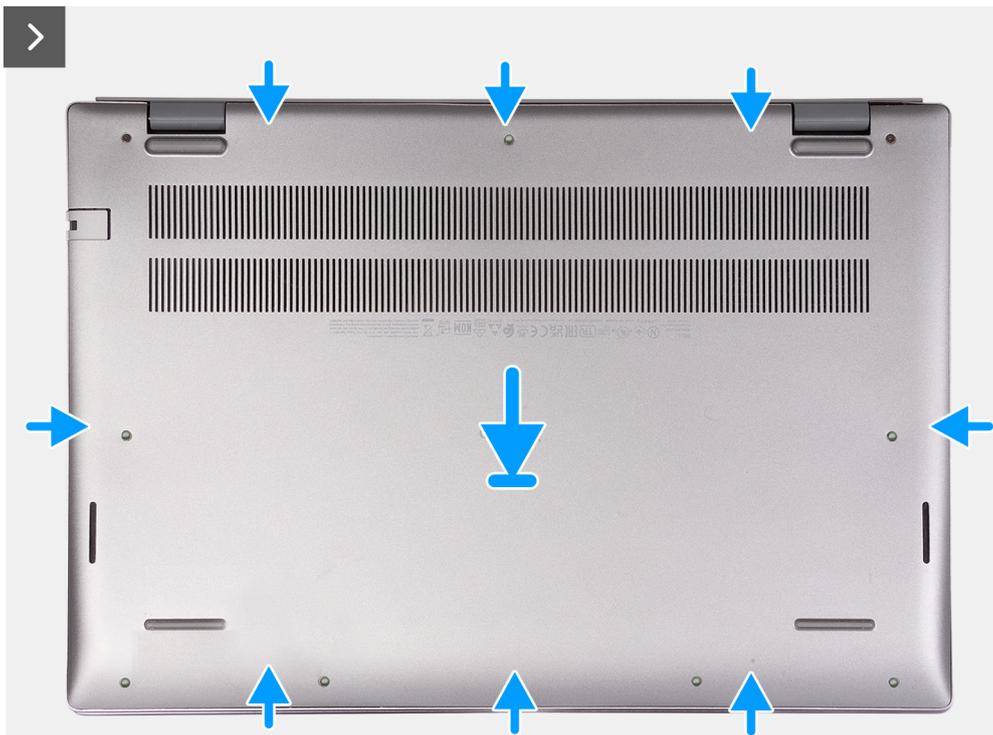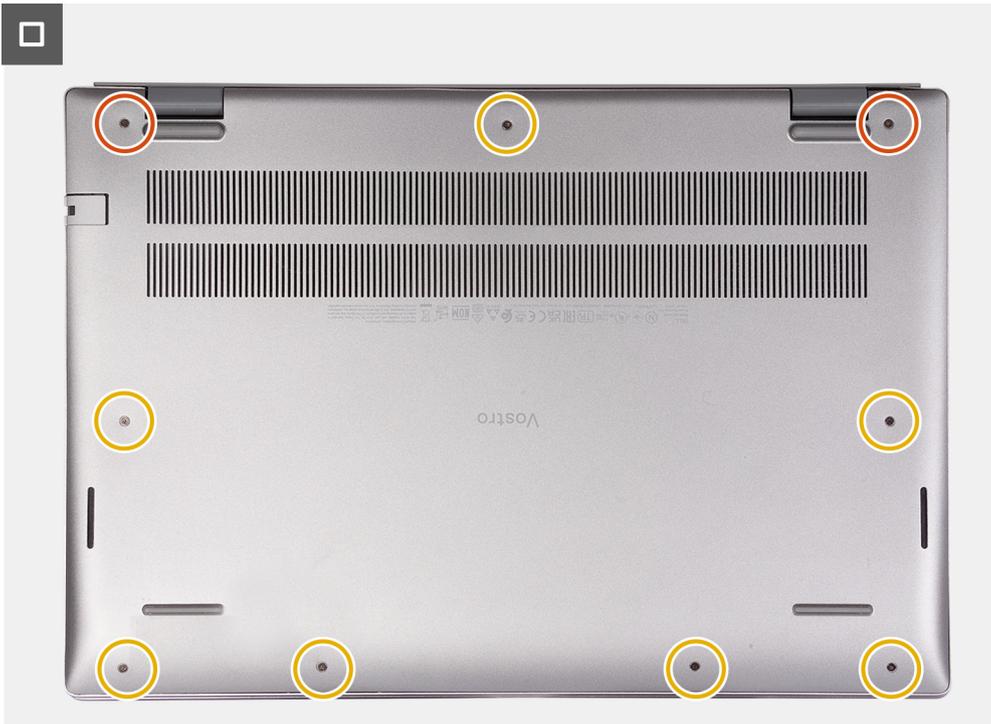
**Steps**

1. Ensure the battery cable has been connected to the system board.
2. Place and snap the base cover into place on the palm-rest and keyboard assembly.
3. Tighten the two captive screws on the base cover.
4. Replace the seven screws (M2x7) that secure the base cover to the palm-rest and keyboard assembly.

**Next steps**

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

# 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.**
- **Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how to handle and replace swollen Lithium-ion batteries, see Handling swollen Lithium-ion batteries.**
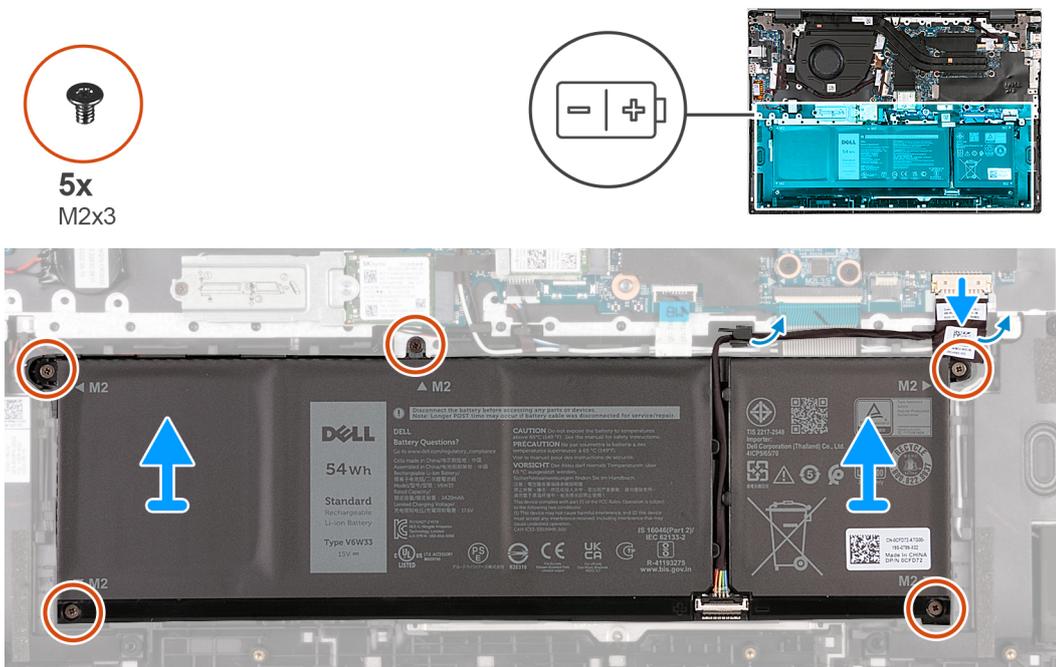
# Removing the battery

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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



**Steps**

1. Peel the tape that secures the battery cable to the battery
2. Disconnect the battery cable and disengage it from the tabs on the system board.
3. Remove the five screws (M2x3) that secure the battery to the palm-rest and keyboard assembly.
4. Lift the battery off the palm-rest and keyboard assembly.

# Installing the battery

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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.
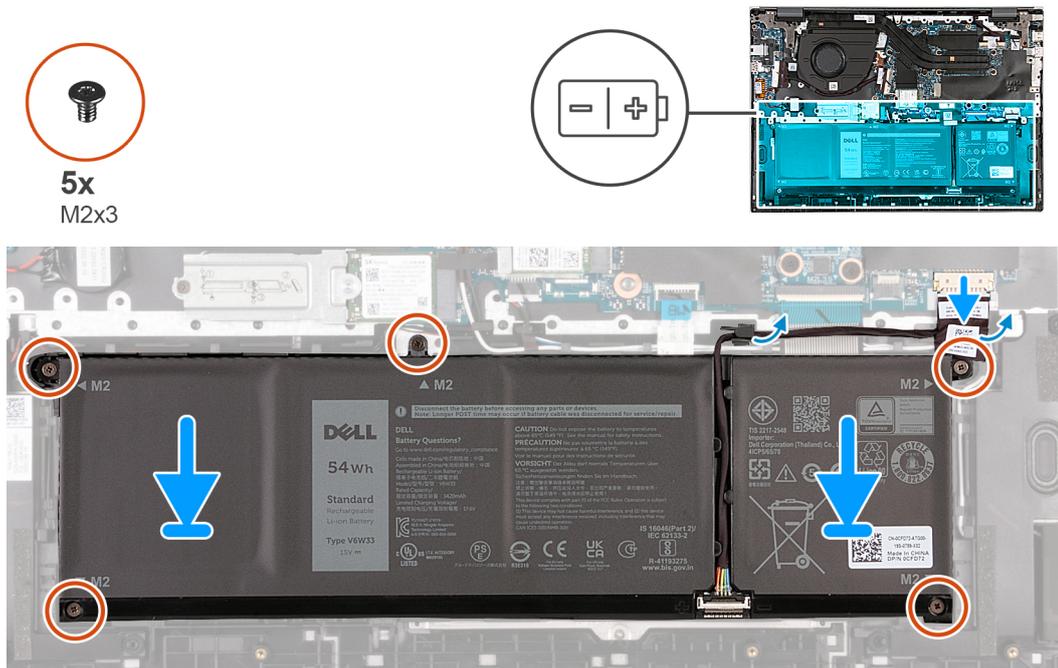


**Steps**

1. Align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly.
2. Replace the five screws (M2x3) that secure the battery to the palm-rest and keyboard assembly.
3. Route the battery cable through the tabs and reconnect it to the system board.
4. Adhere the tape that secures the battery cable to the battery

**Next steps**

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

# Fan

## Removing the fan

**Prerequisites**

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

**About this task**

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

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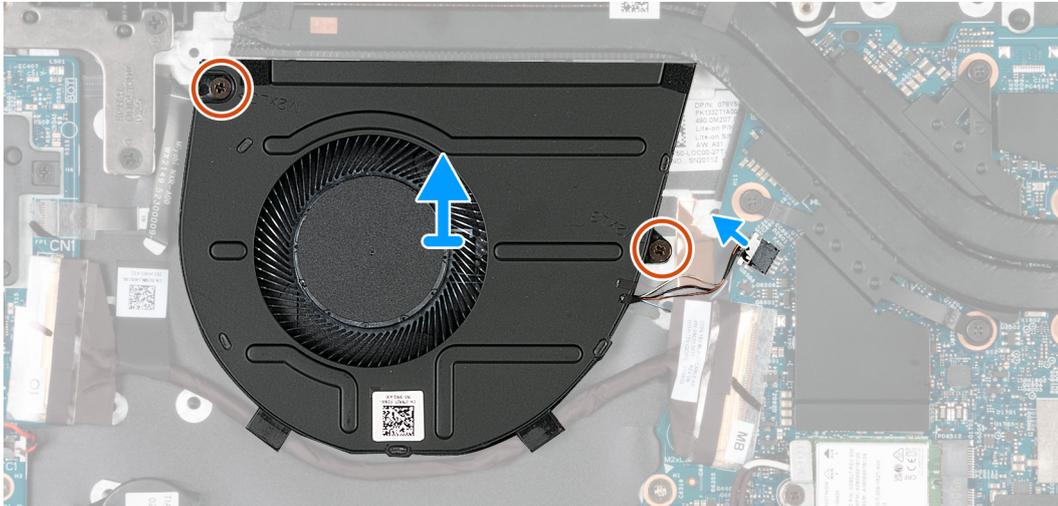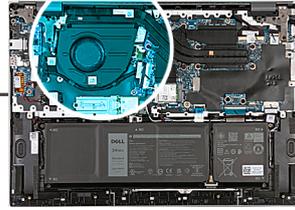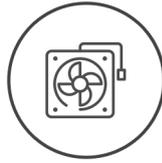
## Steps

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

# Installing the fan

### 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 fan and provides a visual representation of the installation procedure.
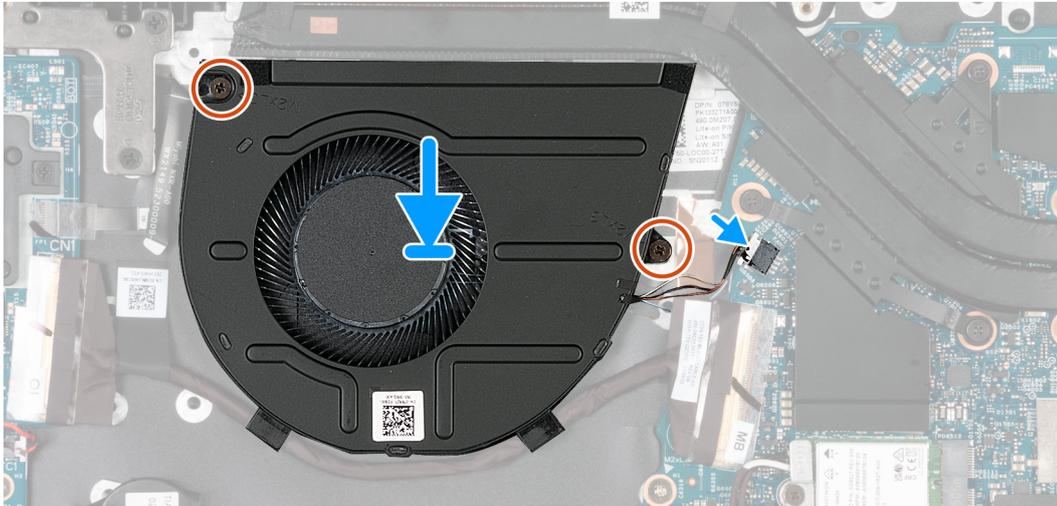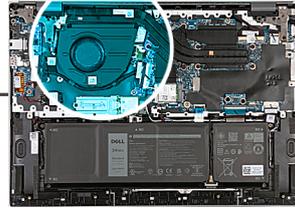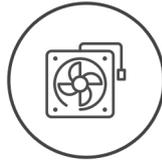
**Steps**

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

**Next steps**

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

# Wireless card

## Removing the wireless card

**Prerequisites**

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

**About this task**

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

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

**Steps**

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

# Installing the wireless card

**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 wireless card and provides a visual representation of the installation procedure.

**1x**
M2x3
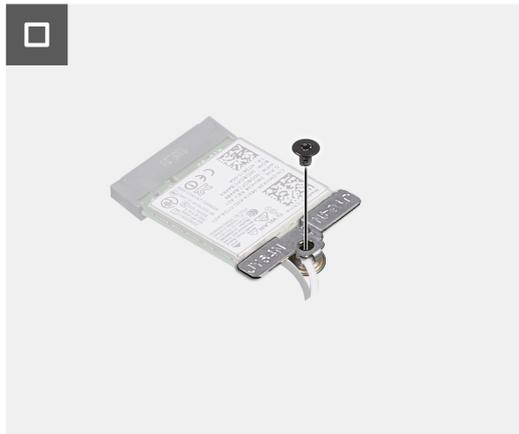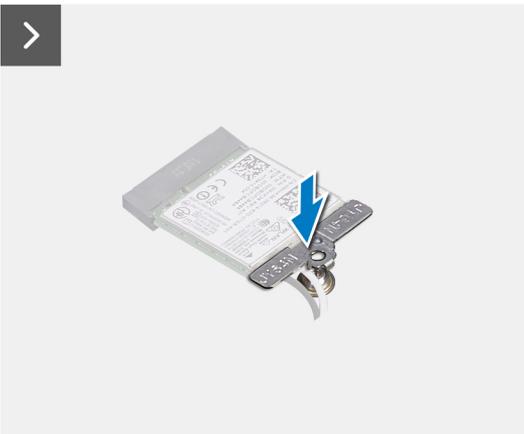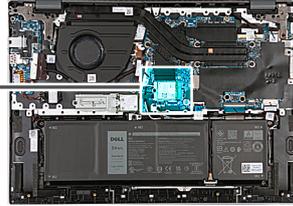
**Steps**

1. Align the notch on the wireless card with the tab on the wireless-card slot and insert the wireless card at an angle into the wireless-card slot.
2. Connect the antenna cables to the wireless card.
3. Align and place the wireless-card bracket on the wireless card.
4. Replace the screw (M2x3) that secures the wireless-card bracket to the system board and palm-rest and keyboard assembly.

**Next steps**

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

# Solid-state drive

## Removing the M.2 2230 solid-state drive

### Prerequisites

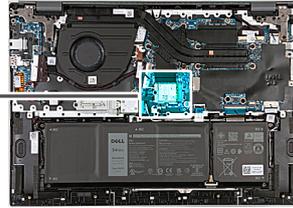1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.

### About this task

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

(i) **NOTE:** If you are replacing the M.2 2230 solid-state drive with an M.2 2280 solid-state drive, the following images indicate how to remove the M.2 2230 solid-state drive from the M.2 2230 solid-state drive bracket.

(i) **NOTE:** Device Encryption will be triggered when either the system board or storage (SSD) is replaced. Refer to BitLocker for more information on suspending BitLocker.

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



### Steps

1. Remove the M2x3 screw that secures the M.2 2230 solid-state drive with bracket from the solid-state drive slot.
2. Slide the M.2 2230 solid-state drive with bracket from the peg and lift it from the system board.
3. Remove the M2x1.8 screw that secures the M.2 2230 solid-state drive to the M.2 solid-state drive bracket.
4. Lift the M.2 2230 solid-state drive off the M.2 solid-state drive bracket.

## 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**

ⓘ **NOTE:** This computer supports two solid-state drive form factors.
- M.2 2230
- M.2 2280

If you are replacing the M.2 2280 solid-state drive with an M.2 2230 solid-state drive, the following images indicate how to install the solid-state drive bracket to the M.2 2230 solid-state drive card before installing the 2230 solid-state drive to the computer.

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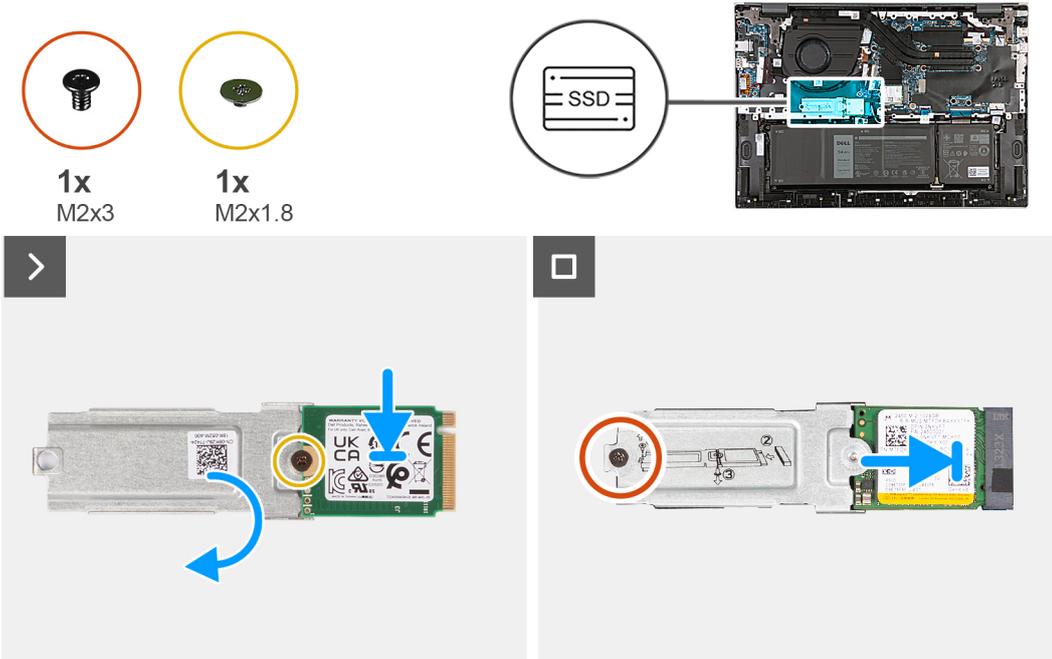


**Steps**

1. With the printed side of the solid-state drive facing up, align the screw hole on the M.2 2230 solid-state drive with the screw hole on the M.2 solid-state drive bracket.
2. Secure the M.2 2230 solid-state drive to the M.2 solid-state drive bracket with a M2x1.8 screw.
3. Align the notch on the M.2 2230 solid-state drive with the tab on the solid-state drive slot.
4. Gently slide the M.2 2230 solid-state drive with bracket into the solid-state drive slot.
5. Replace the screw (M2x3) that secures the M.2 solid-state drive with bracket to the system board.

**Next steps**

1. Install the base cover.
2. Follow the procedure in After working inside your computer.
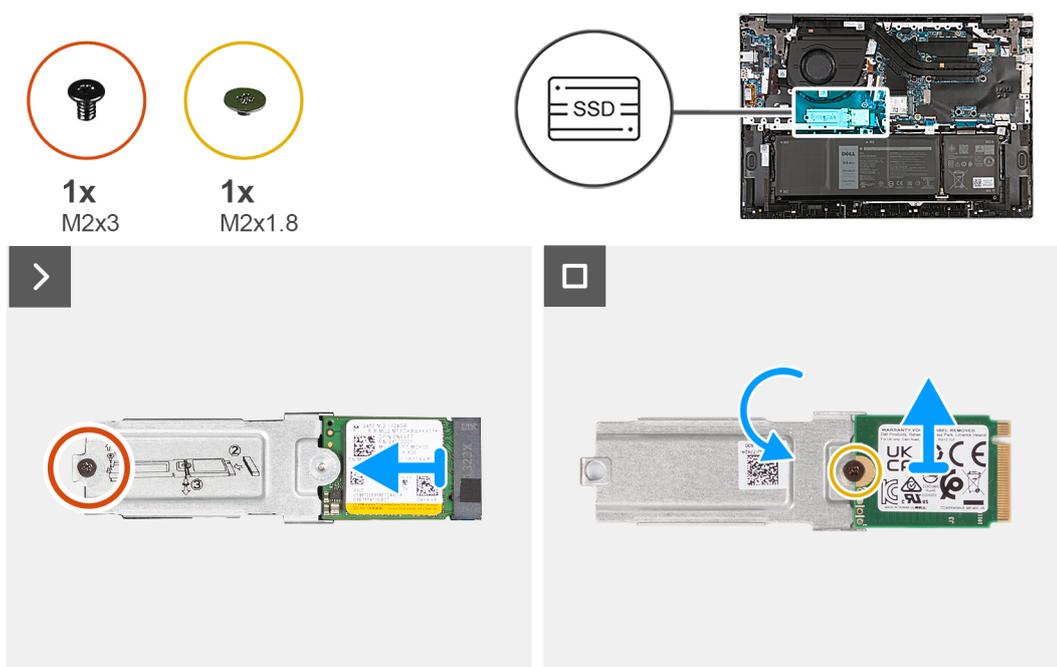
# Removing the M.2 2280 solid-state drive

**Prerequisites**

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

**About this task**

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

(i) **NOTE:** Device Encryption will be triggered when either the system board or storage (SSD) is replaced. Refer to BitLocker for more information on suspending BitLocker

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



## Steps

1. Remove the screw (M2x3) that secures the M.2 2280 solid-state drive to the system board.
2. Slide and remove the M.2 2280 solid-state drive from the solid-state drive slot.

# 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

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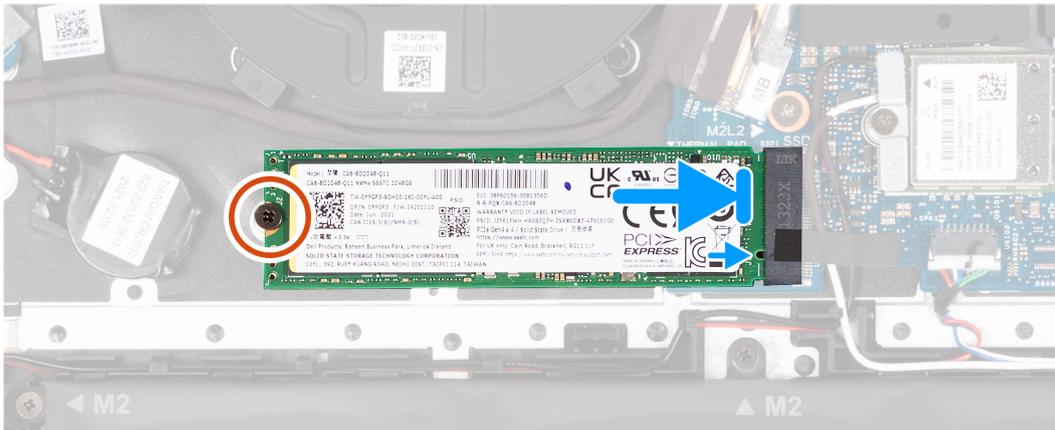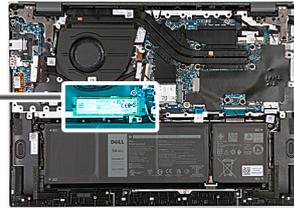
**Steps**

1. Align the notch on the M.2 2280 solid-state drive with the tab on the solid-state drive slot.
2. Gently slide the M.2 2280 solid-state drive into the solid-state drive slot.
3. Replace the screw (M2x3) that secures the M.2 2280 solid-state drive to the system board.

**Next steps**

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

# Heat sink

## Removing the heat sink for computers shipped with a NVIDIA GeForce RTX 2050 Ti graphics card

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

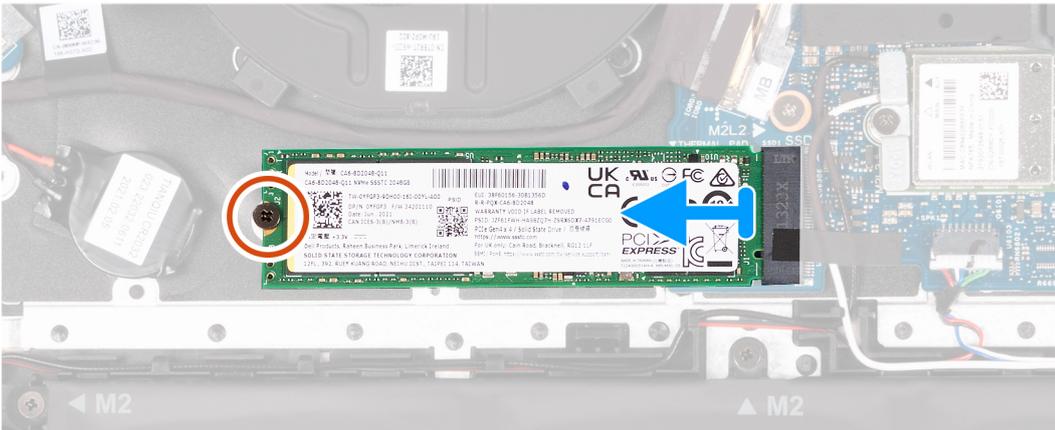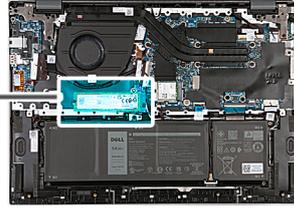ⓘ **NOTE:** Before removing the base cover, ensure that there is no SD card installed in the SD card slot on your computer.

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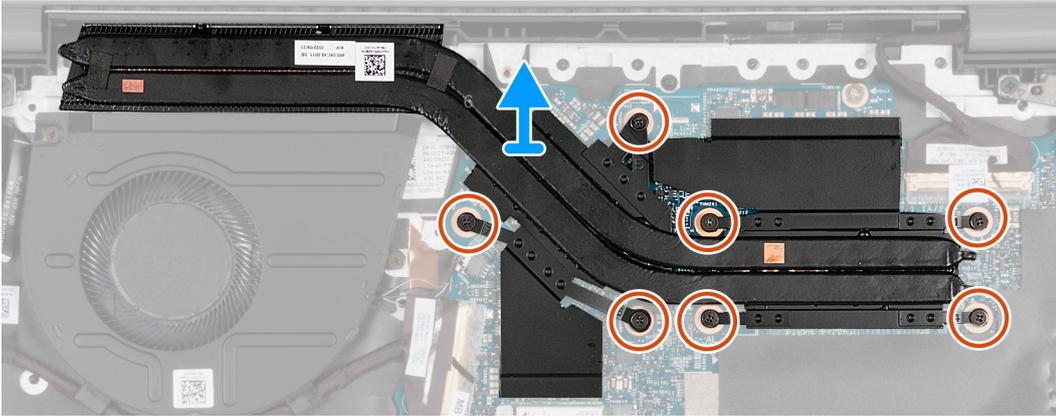
**Steps**

1. In reverse sequential order (7>6>5>4>3>2>1), loosen the seven captive screws that secure the heat sink to the system board.

2. Lift the heat sink off the system board.

# Installing the heat sink for computers shipped with a NVIDIA GeForce RTX 2050 Ti graphics card

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 heat sink and provides a visual representation of the installation procedure.

**Steps**

1. Align the captive screws on the heat sink to the screw holes on the system board.
2. In sequential order (1>2>3>4>5>6>7), tighten the seven captive screws that secure the heat sink to the system board.

**Next steps**

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

# Removing the heat sink for computers shipped without a discrete graphics card

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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

## Steps

1. In reverse sequential order (4>3>2>1), loosen the four captive screws that secure the heat sink to the system board.
2. Lift the heat sink off the system board.

# Installing the heat sink for computers shipped without a discrete graphics card

## Prerequisites

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 heat sink and provides a visual representation of the installation procedure.

**Steps**

1. Align the captive screws on the heat sink to the screw holes on the system board.
2. In sequential order (1>2>3>4), tighten the four captive screws that secure the heat sink to the system board.

**Next steps**

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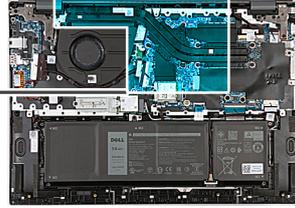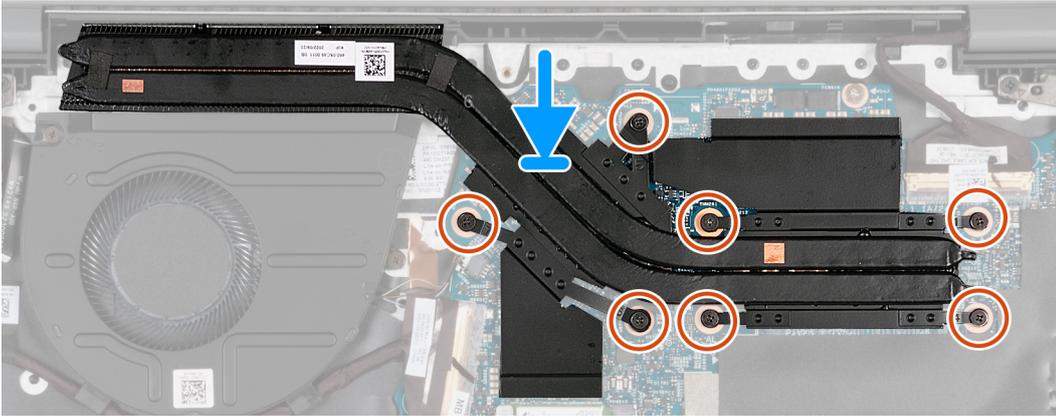
# Speaker

## Removing the speakers

**Prerequisites**

⚠ CAUTION: **The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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

## Steps

1. Open the latch and disconnect the touchpad cable from the system board.
2. Open the latch and disconnect the keyboard cable from the system board.
3. Peel the tapes that secure the WLAN cable to the system board.
4. Remove the WLAN cable from the routing guides on the palm-rest and keyboard assembly.
5. Remove the speaker cable from the routing guides on the palm-rest and keyboard assembly.
6. Lift the speakers along with their cables off the palm-rest and keyboard assembly.
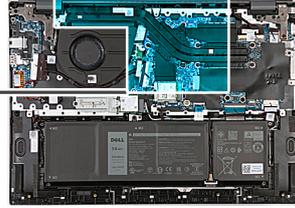
# Installing the speakers

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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.
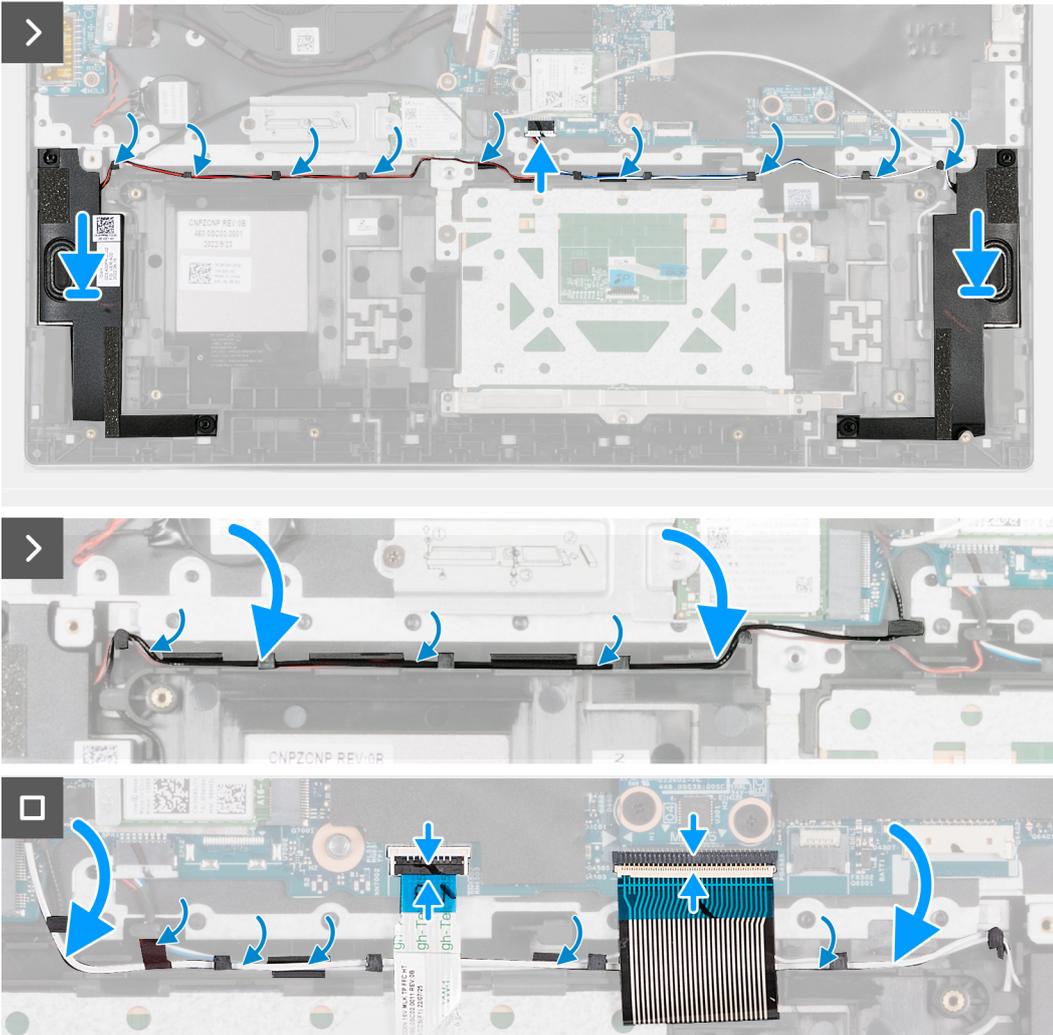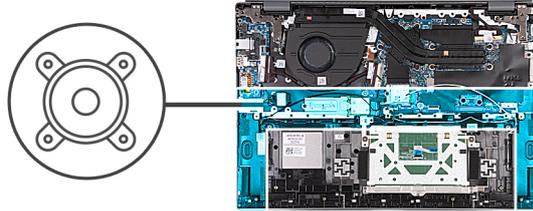


**Steps**

1. Using the alignment posts, place the speakers (woofers) on the palm-rest and keyboard assembly.
2. Ensure that the alignment posts are threaded through the rubber grommets on the speaker.
3. Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.
4. Route the WLAN cable through the routing guides on the palm-rest and keyboard assembly.
5. Adhere the tapes that secure the WLAN cable to the system board.
6. Connect the keyboard cable to the system board and close the latch.
7. Connect the touchpad cable to the system 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.

# Coin-cell battery
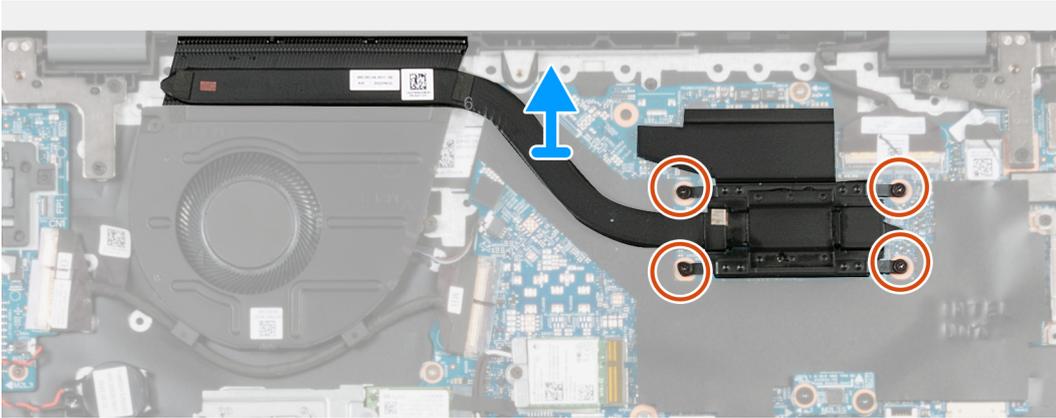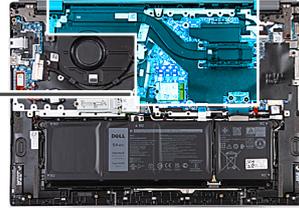
## Removing the coin-cell battery

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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



**Steps**

1. Disconnect the coin-cell battery cable from the system board.
2. Lift and remove the coin-cell battery off the system board.
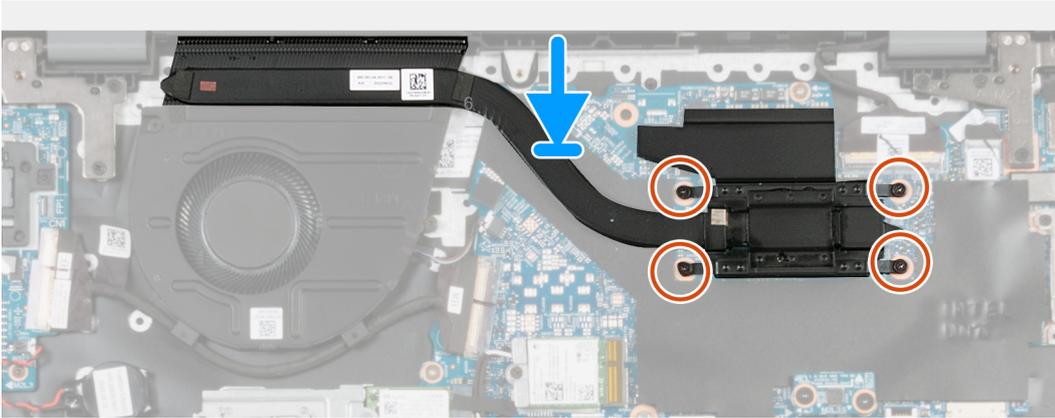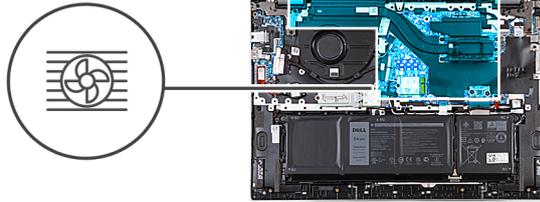
# Installing the coin-cell battery

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 coin-cell battery and provides a visual representation of the installation procedure.
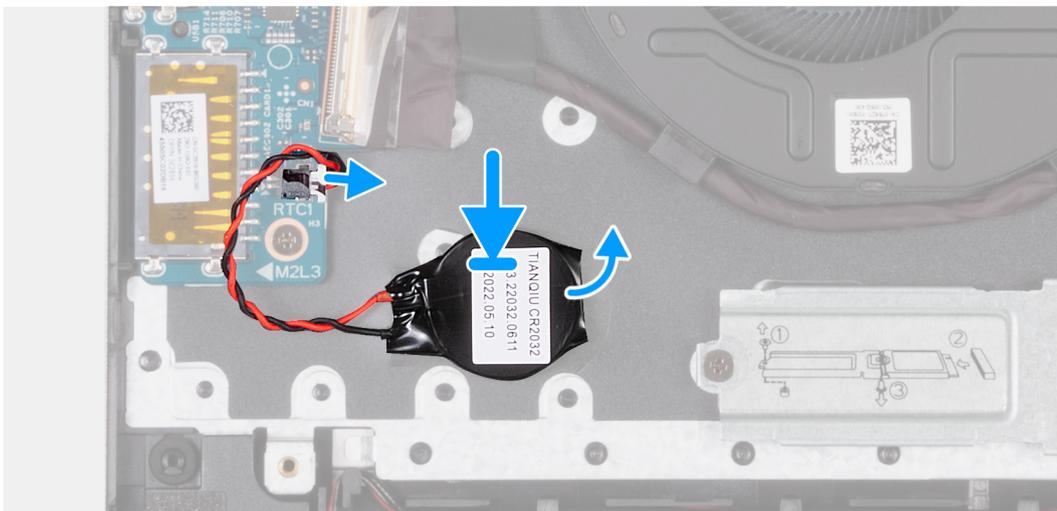


**Steps**

1. Adhere the coin-cell battery to the system board.
2. Connect the coin-cell battery cable to the system board.

**Next steps**

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

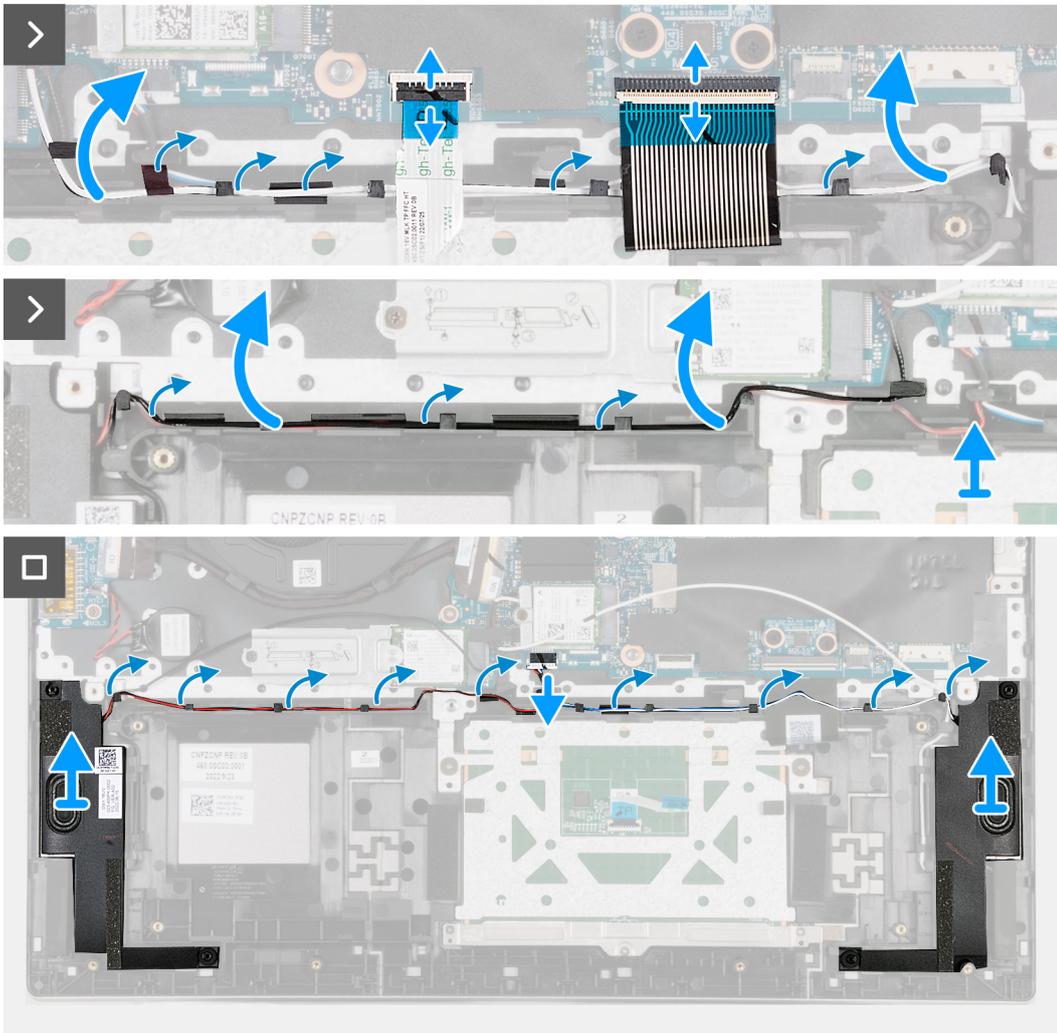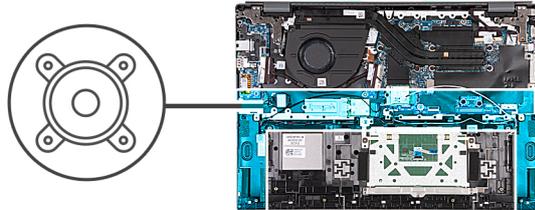# I/O board

## Removing the I/O board

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

ⓘ **NOTE:** The I/O board includes a RJ45 network-port assembly. If you are replacing the I/O board, ensure that you remove the RJ45 network-port assembly from the old I/O board and install it in the new I/O board.

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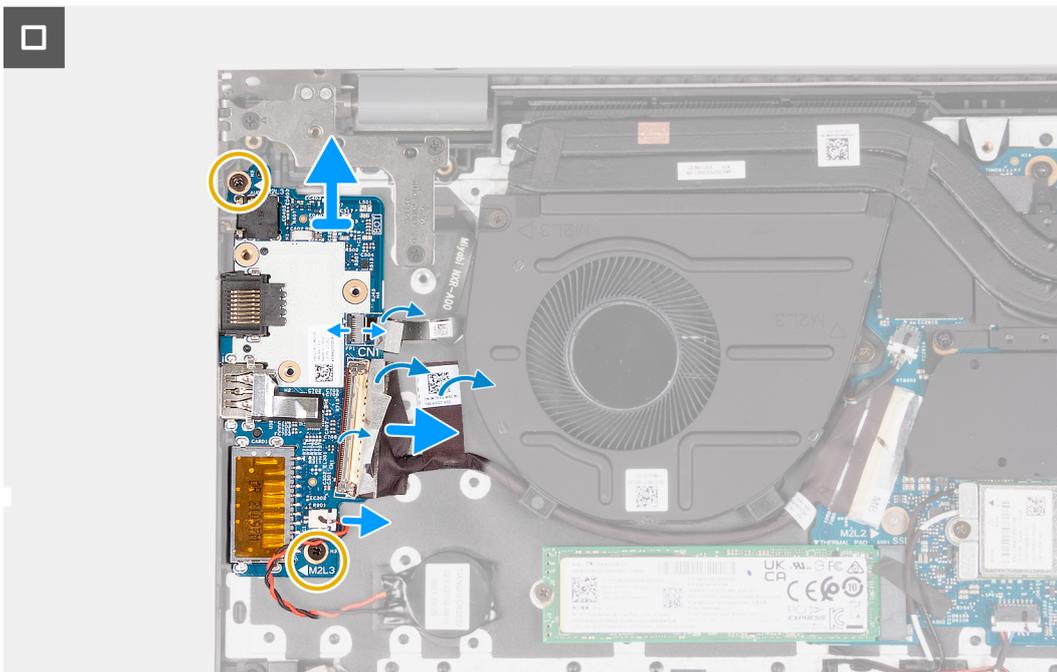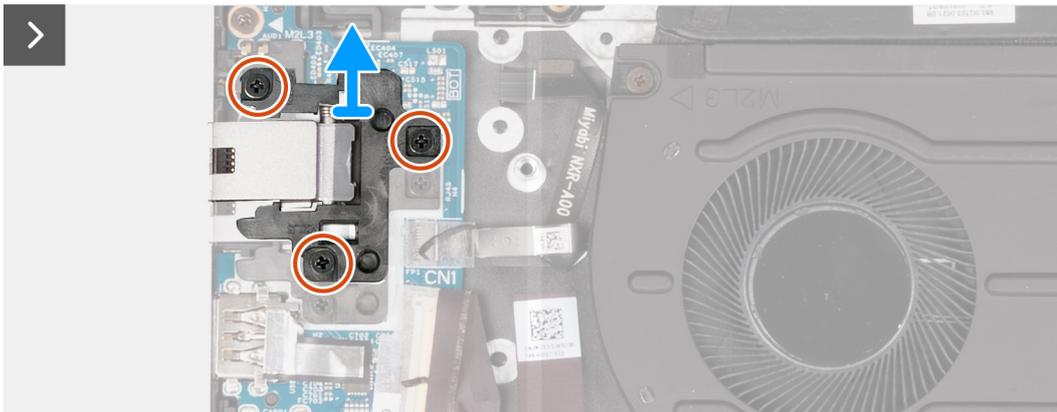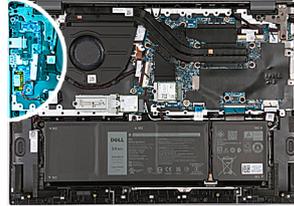


**Steps**

1. Remove the three screws (M2x5) that secure the RJ45 network-port assembly to the I/O board.
2. Lift the RJ45 network-port assembly off the I/O board.
3. Peel the tape that secures the I/O-board cable connector latch to the I/O board.
4. Open the latch and disconnect the power-button board cable from the I/O board.
5. Open the latch and disconnect the fingerprint-reader cable from the I/O board.

6. Remove the two screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
7. Lift the I/O board off the palm-rest and keyboard assembly.

# Installing the I/O board

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 I/O board and provides a visual representation of the installation procedure.
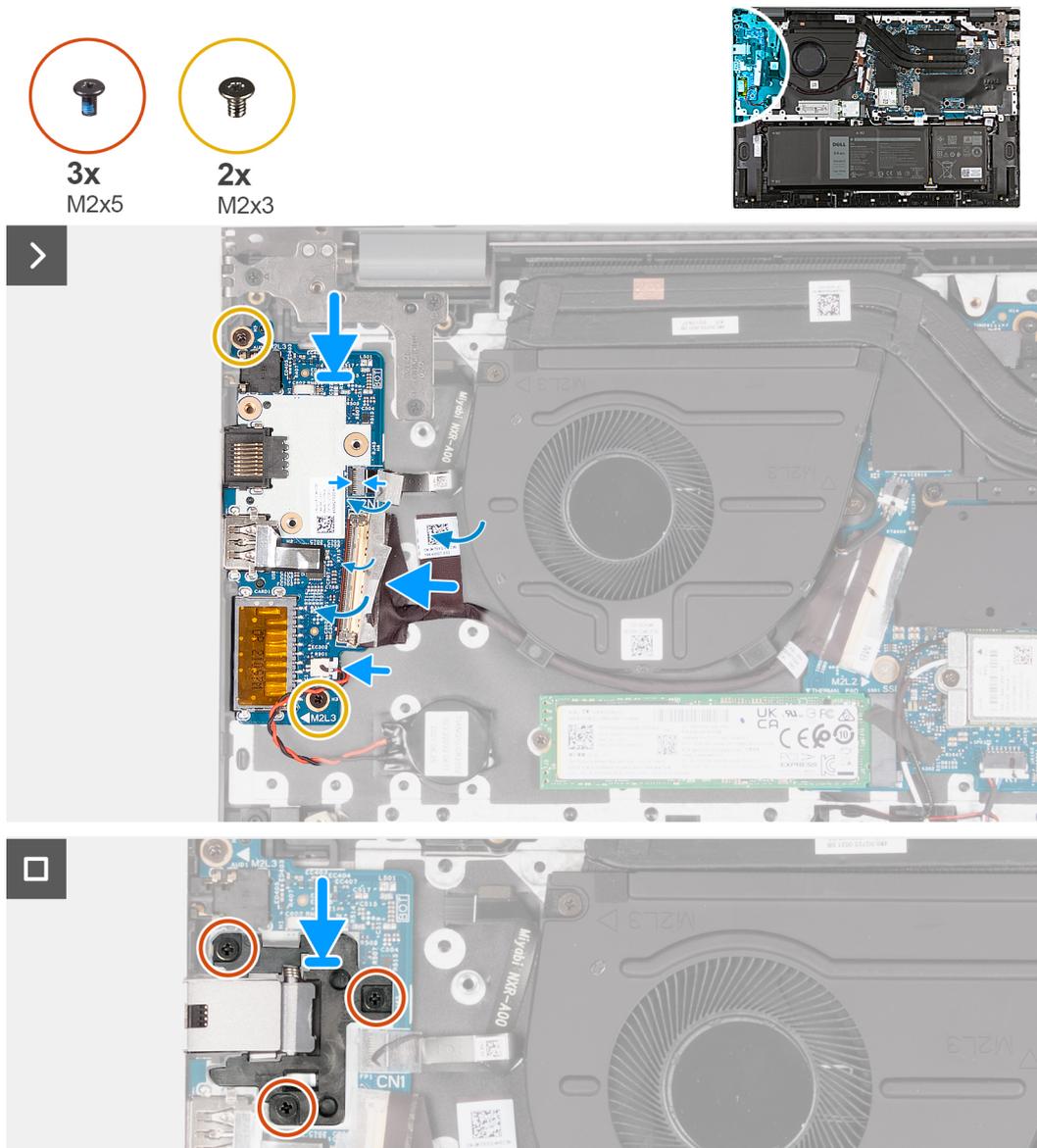


**Steps**

1. Align the screw holes on the I/O board with the screw holes on the system board and palm-rest and keyboard assembly.
2. Align the ports on the I/O board with the slots on the palm-rest and keyboard assembly.
3. Place the I/O board on the palm-rest and keyboard assembly.

4. Replace the two screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
5. Connect the I/O-board cable to the I/O board.
6. Close the latch and replace the clear adhesive tape.
7. Connect the fingerprint-reader cable to the I/O board and close the latch to secure the cable.
8. Align the screw holes on the RJ45 network-port assembly with the screw holes of the I/O board.
9. Replace the three screws (M2x5) that secure the RJ45 network-port assembly to the I/O board.

**Next steps**

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

# Power button with optional fingerprint reader

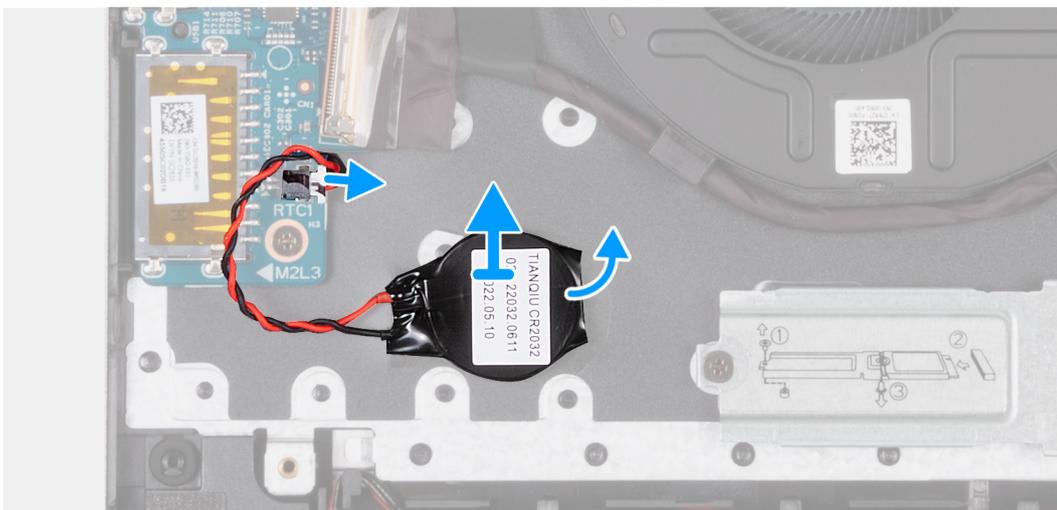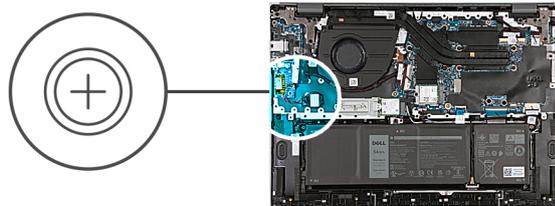## Removing the power button with optional fingerprint reader

**Prerequisites**

⚠ CAUTION: **The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

The following image(s) indicate the location of the power button with optional fingerprint reader and provides a visual representation of the removal procedure.

**Steps**

1. Remove the three screws (M2.5x5) that secure the left display hinge to the system board.
2. Open the left display hinge at an angle of 90 degrees.
3. Remove the screw (M2x3) that secures the power button with optional fingerprint reader with optional fingerprint reader to the palm-rest and keyboard assembly.
4. Lift the power button with optional fingerprint reader with optional fingerprint reader off the palm-rest and keyboard assembly.

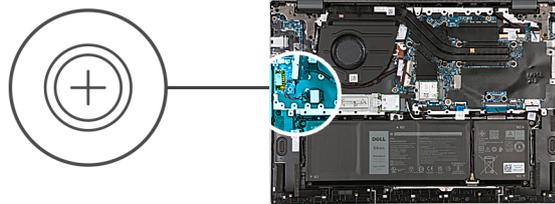# Installing the power button with optional fingerprint reader

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 with optional fingerprint reader and provides a visual representation of the installation procedure.



**Steps**

1. Place the power button with optional fingerprint reader with optional fingerprint reader on the palm-rest and keyboard assembly.
2. Align the screw hole on the power button with optional fingerprint reader with optional fingerprint reader with the screw hole on the palm-rest and keyboard assembly.
3. Replace the screw (M2x3) that secures the power button with optional fingerprint reader with optional fingerprint reader to the palm-rest and keyboard assembly.
4. Close the left display hinge and align the screw holes on the left display hinge with the screw holes on the palm-rest and keyboard assembly.
5. Replace the three screws (M2.5x5) that secure the left display hinge to the palm-rest and keyboard assembly.

**Next steps**

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

# Power-button module

## Removing the power button

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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



**Steps**

1. Remove the three screws (M2.5x5) that secure the left display hinge to the system board.
2. Open the left display hinge at an angle of 90 degrees.
3. Remove the screw (M2x3) that secures the power button to the palm-rest and keyboard assembly.
4. Lift the power button off the palm-rest and keyboard assembly.

# Installing the power button

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 and provides a visual representation of the installation procedure.
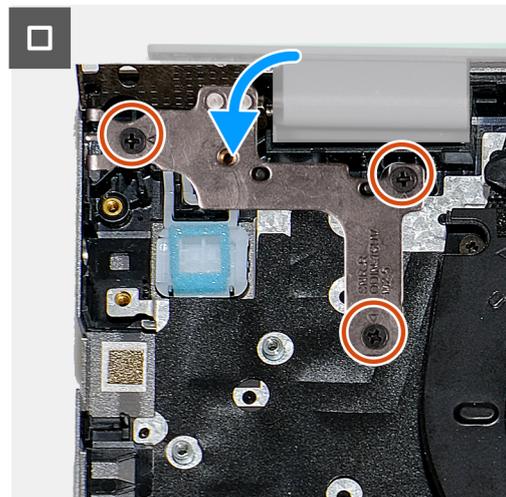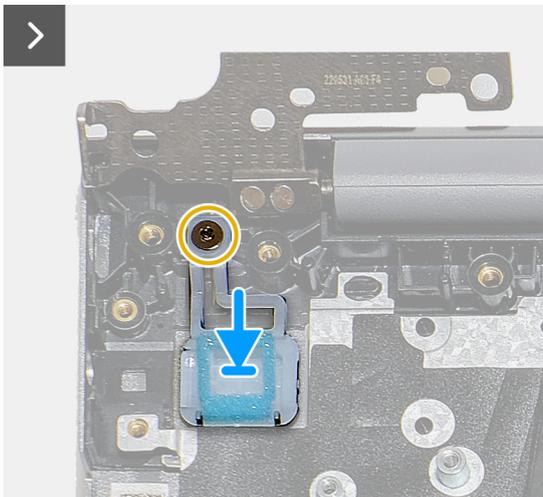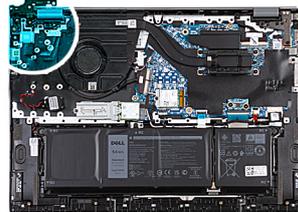


**Steps**

1. Place the power button on the palm-rest and keyboard assembly.
2. Align the screw hole on the power button with the screw hole on the palm-rest and keyboard assembly.
3. Replace the screw (M2x3) that secures the power buttonto the palm-rest and keyboard assembly.
4. Close the left display hinge and align the screw holes on the left display hinge with the screw holes on the palm-rest and keyboard assembly.
5. Replace the three screws (M2.5x5) that secure the left display hinge to the palm-rest and keyboard assembly.

**Next steps**

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

# Power-adapter port
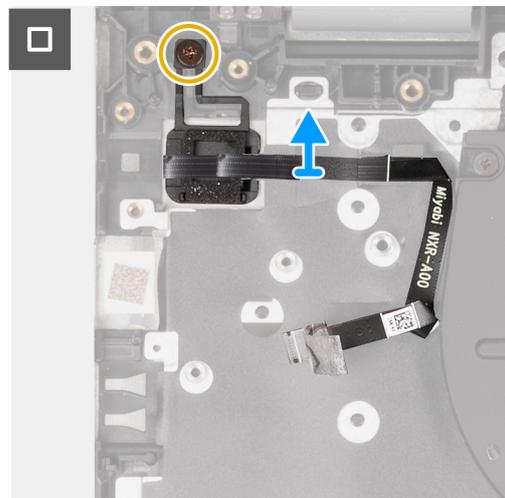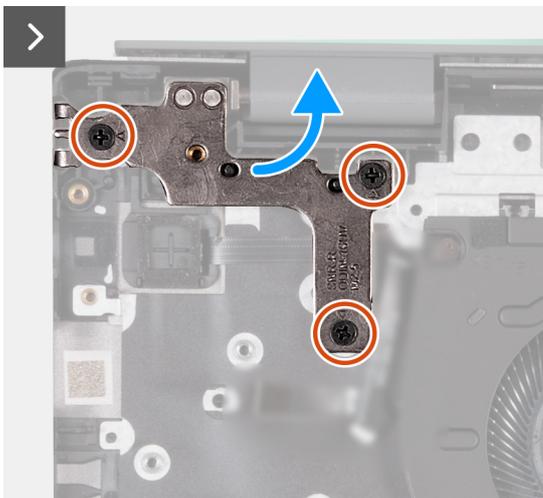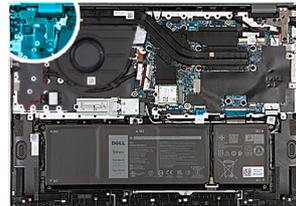
## Removing the power-adapter port

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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



**Steps**

1. Remove the three screws (M2.5x5) that secure the right display hinge to the system board.
2. Open the right display hinge at an angle of 90 degrees.
3. Peel the tapes that secure the power-adapter port cable to the system board.
4. Disconnect the power-adapter port cable from the system board.
5. Lift the power-adapter port and its cable off the palm-rest and keyboard assembly.
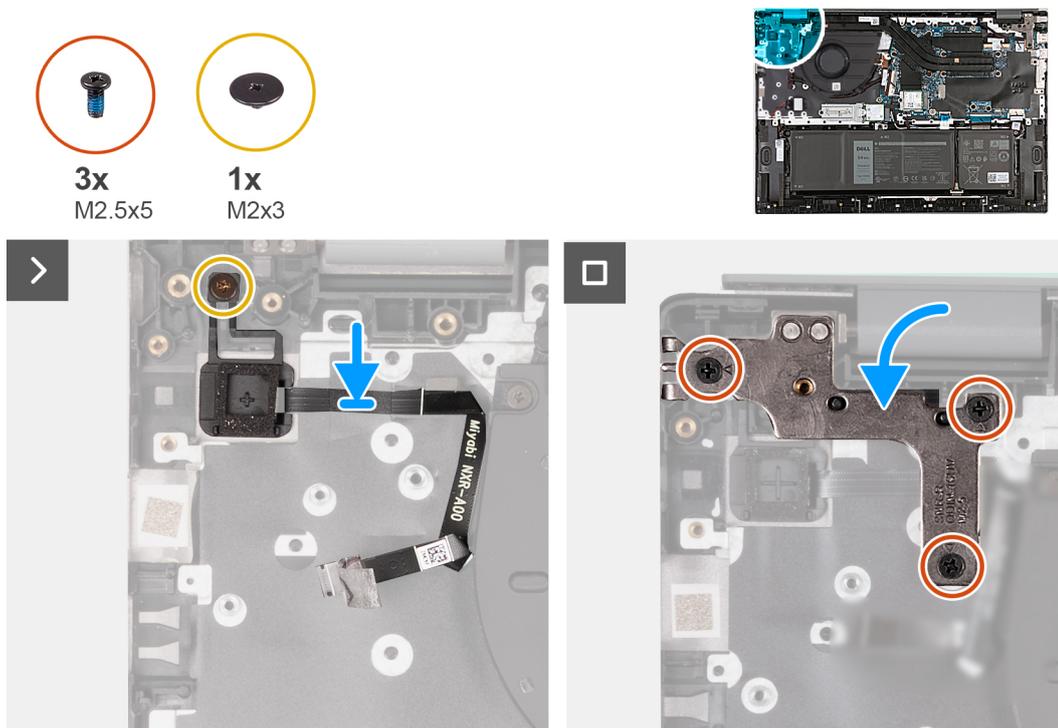
## Installing the power-adapter port

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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.
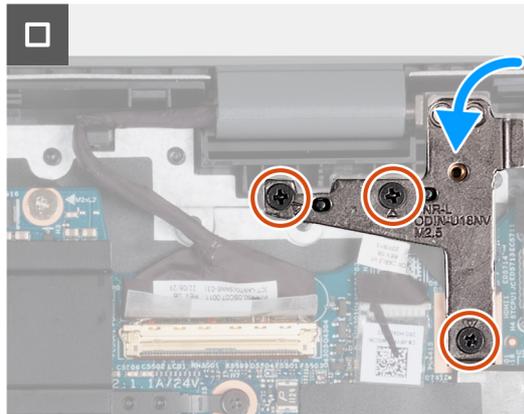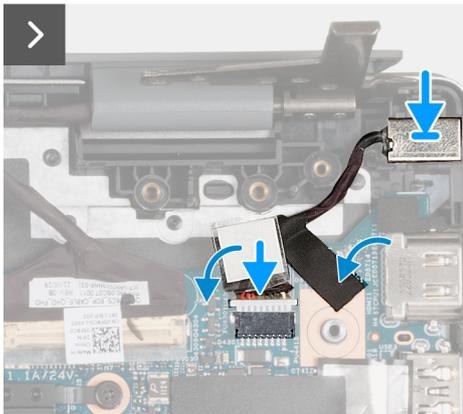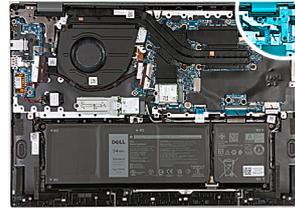


**Steps**

1. Place the power-adapter port into the slot on the palm-rest and keyboard assembly.
2. Connect the power-adapter port cable to the system board.
3. Adhere the tapes that secure the power-adapter port cable to the system board.
4. Close the right display hinge and align the screw holes on the right display hinge with the screw holes on the system board.
5. Replace the three screws (M2.5x5) that secure the right display hinge to 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**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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

**6x**
M2.5x5
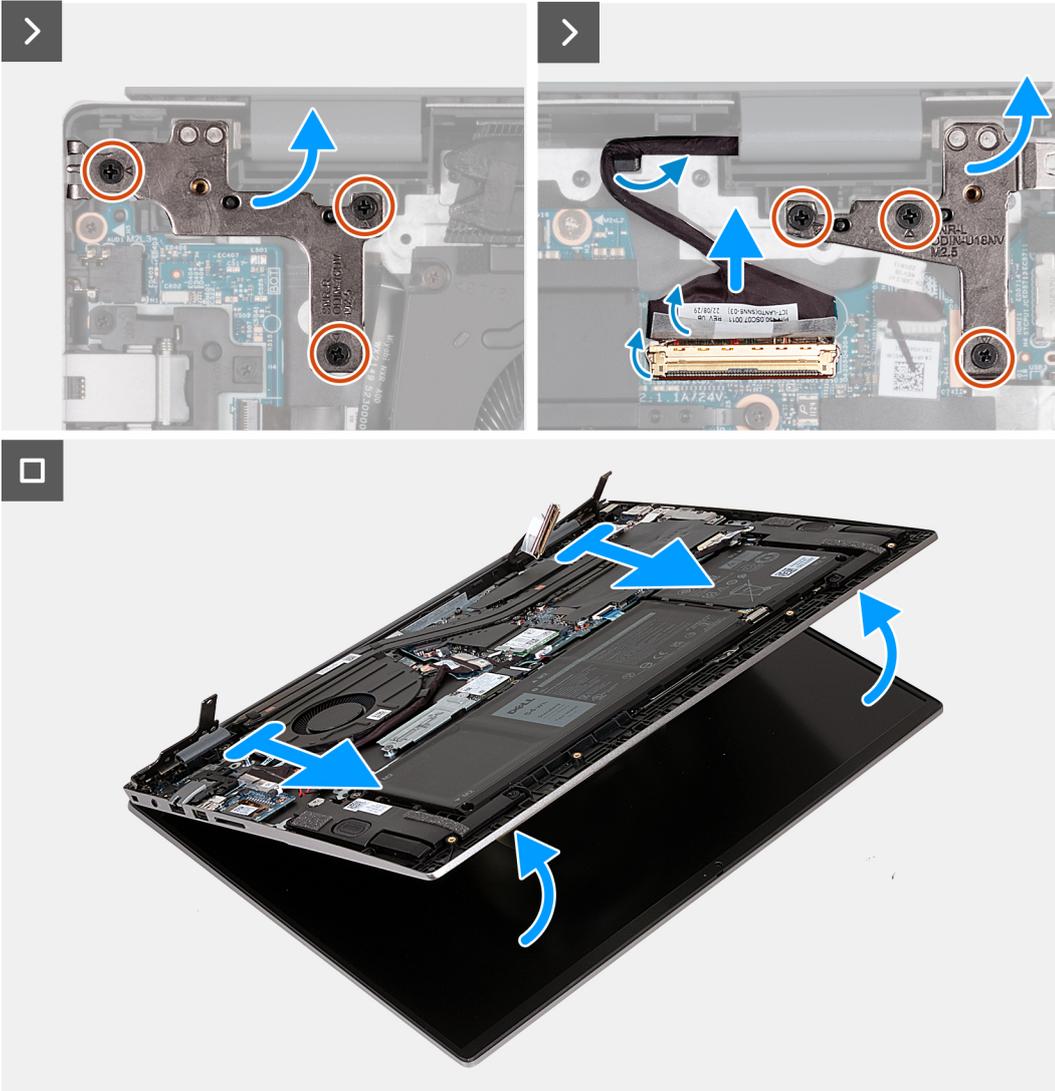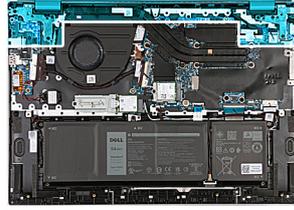
**Steps**

1. Remove the three screws (M2.5x5) that secure the left display hinge to the system board.
2. Open the left display hinge at an angle of 90 degrees.
3. Remove the three screws (M2.5x5) that secure the right display hinge to the system board.
4. Open the right display hinge at an angle of 90 degrees.
5. Peel the tape that secures the display-cable connector latch to the system board.
6. Open the latch and disconnect the display cable from the system board.
7. Remove the display cable from the routing guides on the palm-rest and keyboard assembly.
8. At an angle, gently lift the palm-rest and keyboard assembly off the display assembly.

# Installing the display assembly

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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 display assembly and provides a visual representation of the installation procedure.
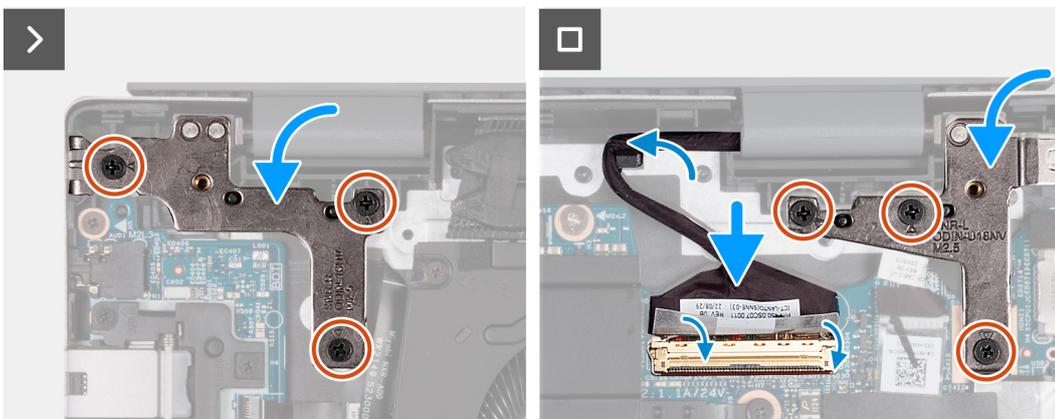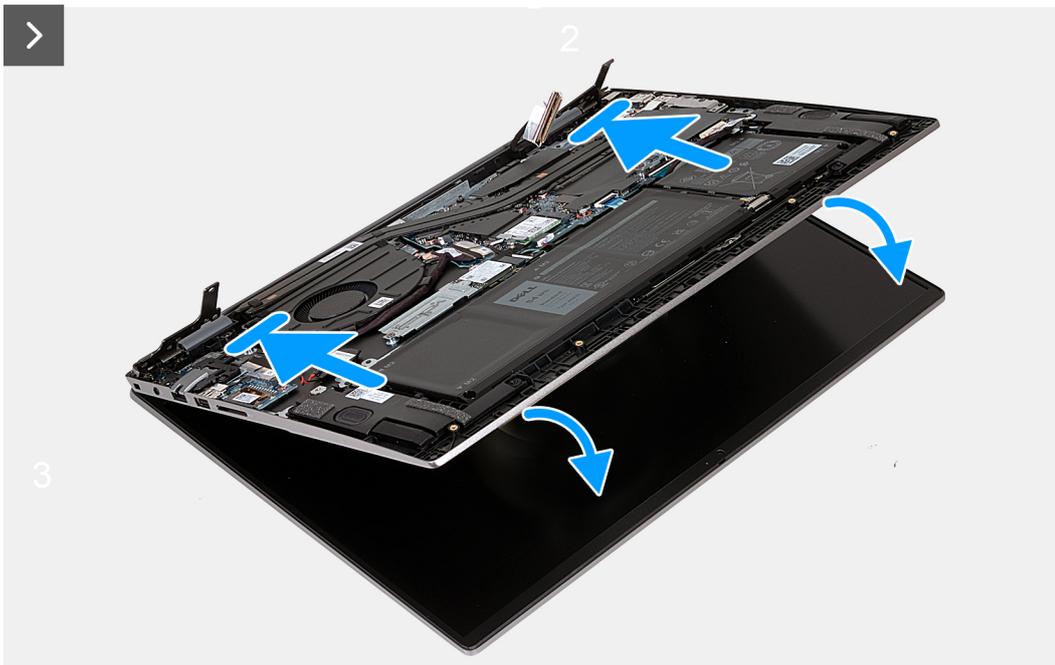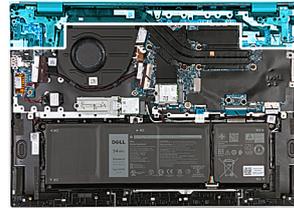


**Steps**

1. Place the display assembly on a clean and flat surface with the display panel facing up.

2. Gently place the palm-rest and keyboard assembly under the display hinges.
3. Close the left display hinge and align the screw holes on the left display hinge with the screw holes on the palm-rest and keyboard assembly.
4. Replace the three screws (M2.5x5) that secure the left display hinge to the palm-rest and keyboard assembly.
5. Close the right display hinge and align the screw holes on the right display hinge with the screw holes on the palm-rest and keyboard assembly.
6. Replace the three screws (M2.5x5) that secure the right display hinge to the palm-rest and keyboard assembly.
7. Route the display cable through the routing guides on the palm-rest and keyboard assembly.
8. Connect the display cable to the system board and close the latch.
9. Adhere the tape that secures the display-cable connector latch to the system board.

**Next steps**

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

# Trusted Platform Module

## Removing the Trusted Platform Module (TPM) board

**Prerequisites**

⚠ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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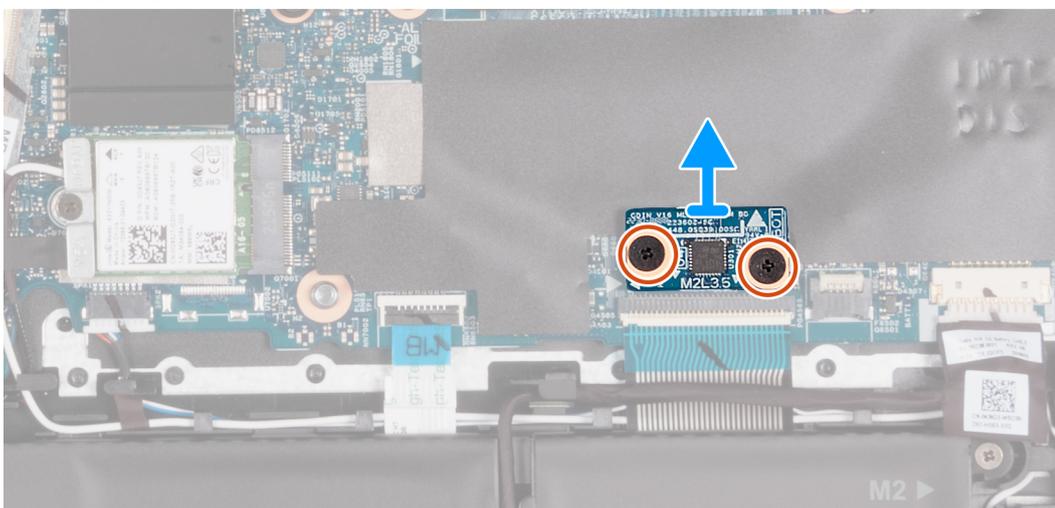
**Steps**

1. Remove the two screws (M2x3.5) that secure the TPM board to the system board.
2. Lift the TPM board off the system board.

# Installing the Trusted Platform Module (TPM) board

**Prerequisites**

⚠ CAUTION: **The information in this section is intended for authorized service technicians only.**

If you are replacing a component, remove the existing component before performing the installation process.
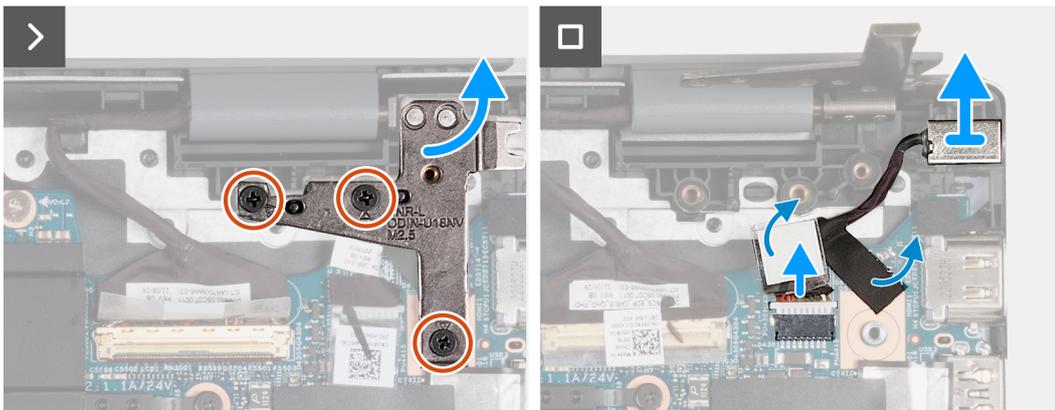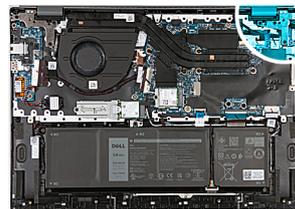
**About this task**

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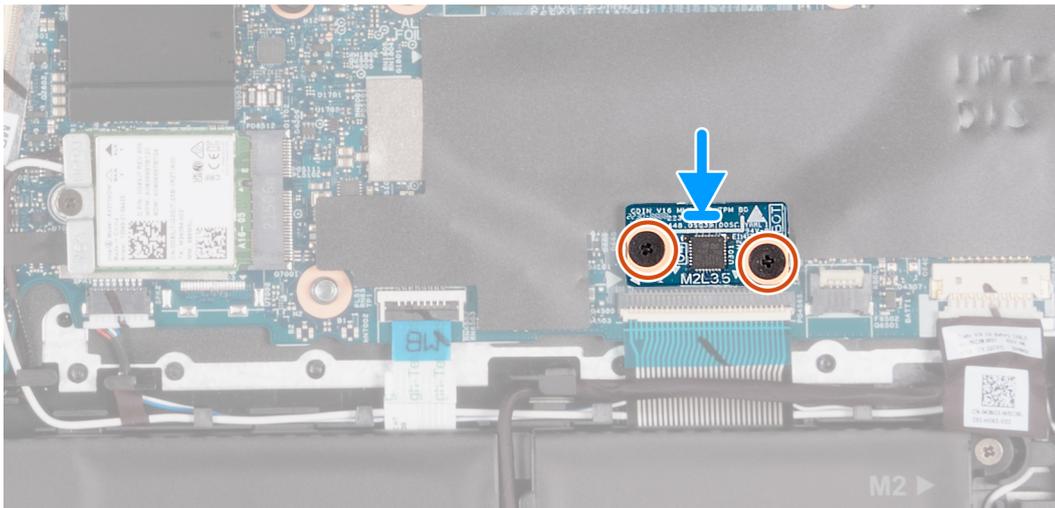


**Steps**

1. Align the screw holes on the TPM board with the screw holes on the system board.
2. Align the ports on the TPM board with the slots on the system board.
3. Place the TPM board on the system board.
4. Replace the two screws (M2x3) that secure the TPM board to the system board.

**Next steps**

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

# System board

## Removing the system board

**Prerequisites**

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the M.2 2230 solid-state drive or M.2 2280 solid-state drive, whichever applicable.
4. Remove the wireless card.
5. Remove the heat sink for computers shipped with a NVIDIA GeForce RTX 2050 Ti graphics card or heat sink for computers shipped without a discrete graphics card, whichever applicable.

**About this task**

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

ⓘ **NOTE:** The system board can be removed and installed along with the heat sink, when you replace the palm-rest and keyboard assembly. This simplifies the removal and installation procedure and also prevents damage to the thermal bond between the system board and heat sink.

ⓘ **NOTE:** Device Encryption will be triggered when either the system board or storage (SSD) is replaced. Refer to BitLocker for more information on suspending BitLocker.

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



1. Display cable connector
2. Power-cable connector
3. Battery-cable connector
4. Keyboard-cable connector
5. Touchpad-cable connector
6. Keyboard-backlight cable connector
7. Speaker cable connector
8. I/O board-cable connector
9. Fan-cable connector
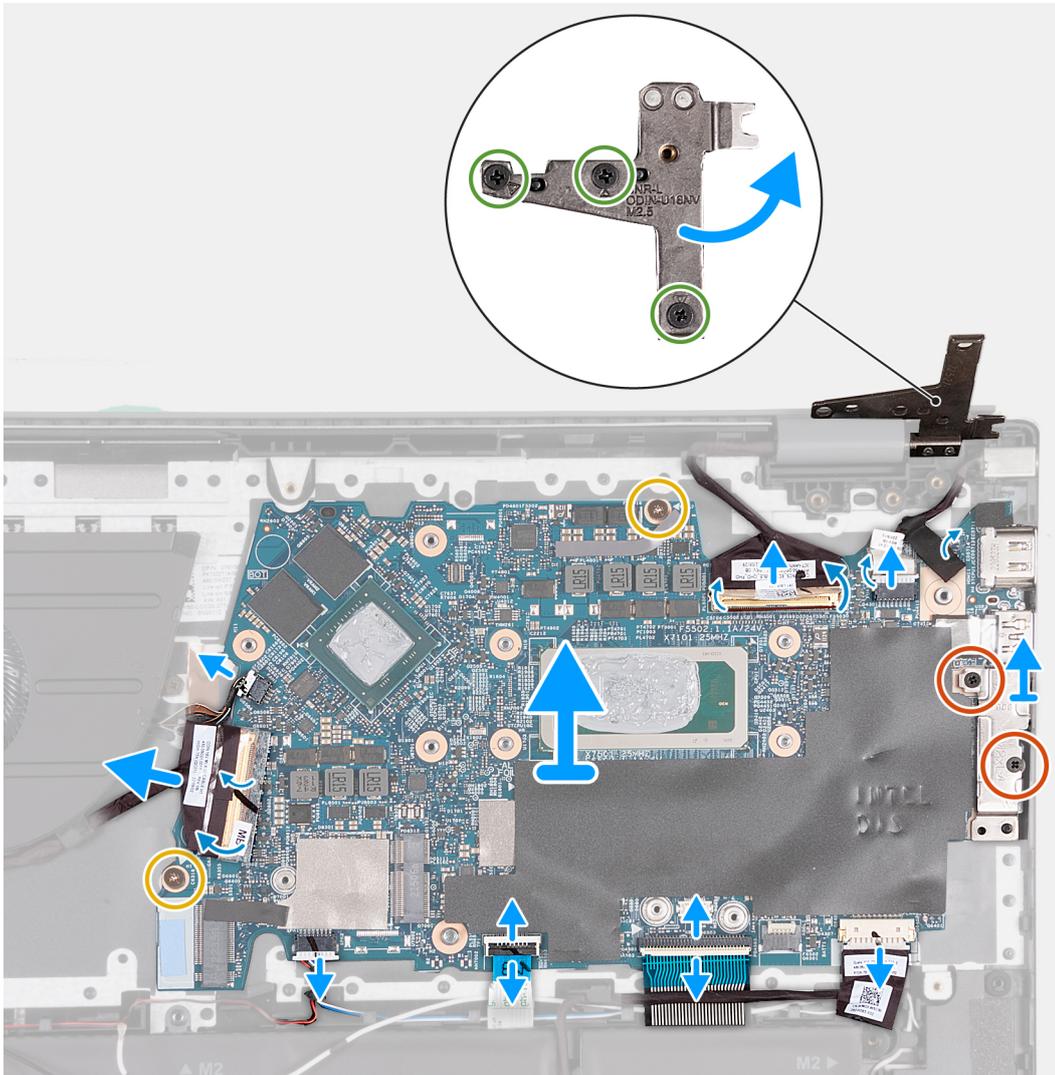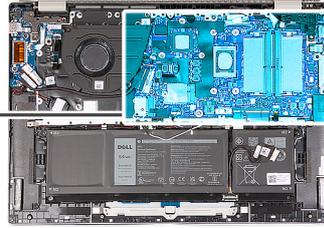
**Steps**

1. Remove the three screws (M2.5x5) that secure the right display hinge to the system board.
2. Open the right display hinge at an angle of 90 degrees.
3. Peel the tape that secures the display-cable connector latch to the system board.
4. Open the latch and disconnect the display cable from the system board.
5. Peel the tapes that secure the power-adapter port cable to the system board.
6. Disconnect the power-adapter port cable from the system board.
7. Remove the two screws (M2x4) that secure the Type-C port bracket to the system board.
8. Lift the Type-C port-bracket off the system board.
9. Disconnect the battery cable from the system board.
10. Open the latch and disconnect the keyboard cable from the system board.
11. Open the latch and disconnect the touchpad cable from the system board.
12. Disconnect the keyboard-backlight cable from the system board.

13. Open the latch and disconnect the I/O board cable from the system board

14. Disconnect the fan cable from the system board.

15. Remove the two screws (M2x1.8) that secure the system board to the palm-rest and keyboard assembly.

16. Lift the system board at angle off the palm-rest and keyboard assembly, to clear the ports from the port openings.

# Installing the system board

**Prerequisites**

⚠ CAUTION: **The information in this section is intended for authorized service technicians only.**

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.



1. Display cable connector
2. Power-cable connector
3. Battery-cable connector
4. Keyboard-cable connector
5. Touchpad-cable connector
6. Keyboard-backlight cable connector
7. Speaker cable connector
8. I/O board-cable connector
9. Fan-cable connector

ⓘ NOTE: The system board can be removed and installed along with the heat sink, when you replace the palm-rest and keyboard assembly. This simplifies the removal and installation procedure and also prevents damage to the thermal bond between the system board and heat sink.
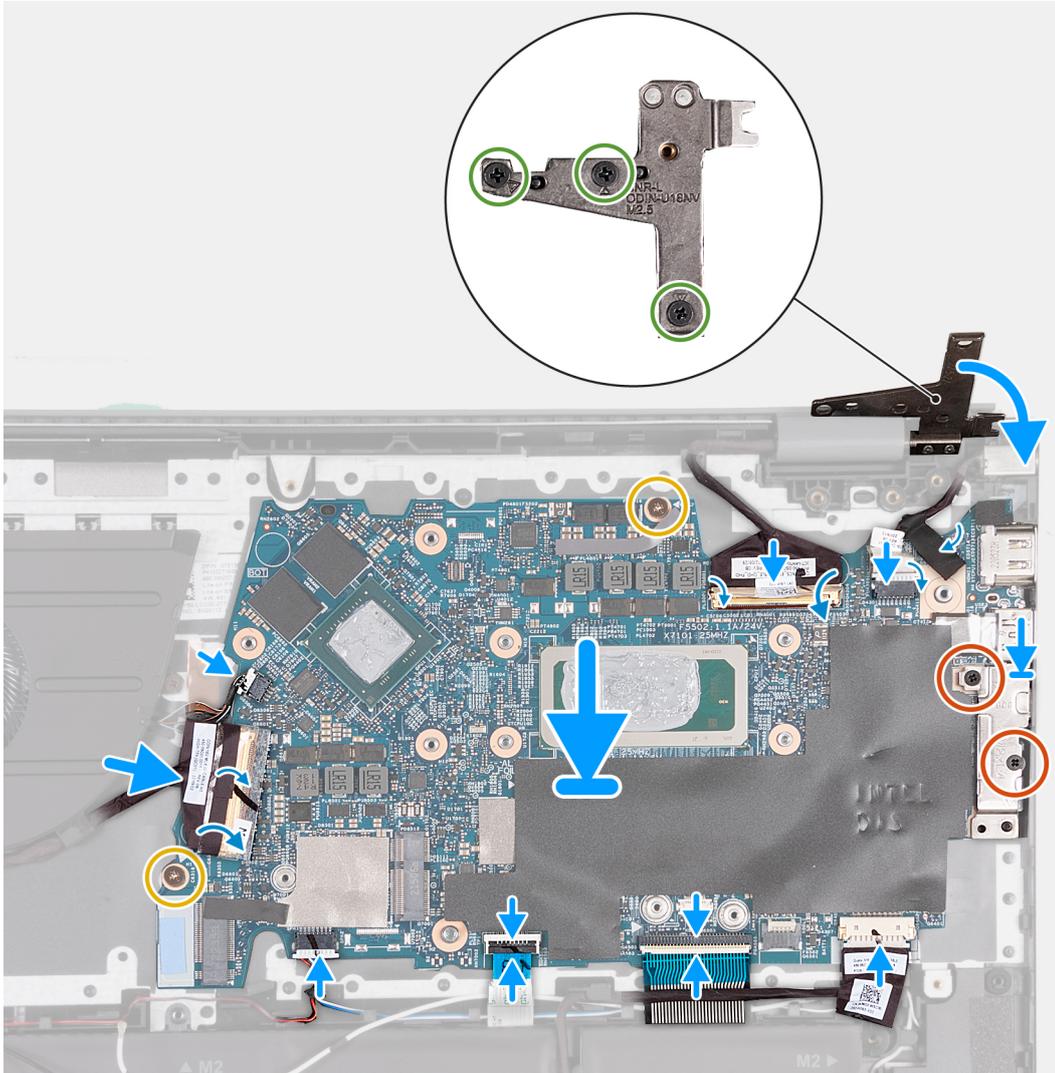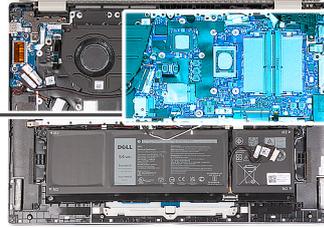
**Steps**

1. Install the system board at an angle and ensure that the ports are properly aligned with the port openings.
2. Place the system board on the palm-rest and keyboard assembly.
3. Align the screw holes on the system board with the screw holes on the palm-rest and keyboard assembly.
4. Replace the two screws (M2x1.8) that secure the system board to the palm-rest and keyboard assembly.
5. Connect the fan cable to the system board.
6. Connect the I/O board cable to the system board and close the latch.
7. Connect the keyboard-backlight cable to the system board.
8. Connect the touchpad cable to the system board and close the latch.
9. Connect the keyboard cable to the system board and close the latch.
10. Connect the battery cable to the system board.
11. Align the screw holes of the Type-C port-bracket with the screw holes of the system board.
12. Place the Type-C port-bracket on the system board.

13. Replace the two screws (M2x4) that secure the Type-C port-bracket to the system board.
14. Connect the power-adapter port cable to the system board.
15. Adhere the tapes that secure the power-adapter port cable to the system board.
16. Connect the display cable from the system board and close the latch.
17. Adhere the tape that secures the display-cable connector latch to the system board.
18. Connect the power-adapter port cable to the system board.
19. Adhere the tapes that secure the power-adapter port cable to the system board.
20. Connect the display cable to the system board and close the latch.
21. Adhere the tape that secures the display-cable connector latch to the system board.
22. Close the right display hinge and align the screw holes on the right display hinge with the screw holes on the palm-rest and keyboard assembly.
23. Replace the three screws (M2.5x5) that secure the right display hinge to the palm-rest and keyboard assembly.

**Next steps**

1. Install the heat sink for computers shipped with a NVIDIA GeForce RTX 2050 Ti graphics card or heat sink for computers shipped without a discrete graphics card, whichever applicable.
2. Install the wireless card.
3. Install the M.2 2230 solid-state drive or M.2 2280 solid-state drive, whichever applicable.
4. Install the base cover.
5. Follow the procedure in After working inside your computer.

# Touchpad

## Removing the touchpad

**Prerequisites**

⚠️ **CAUTION: The information in this section is intended for authorized service technicians only.**

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

**About this task**

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

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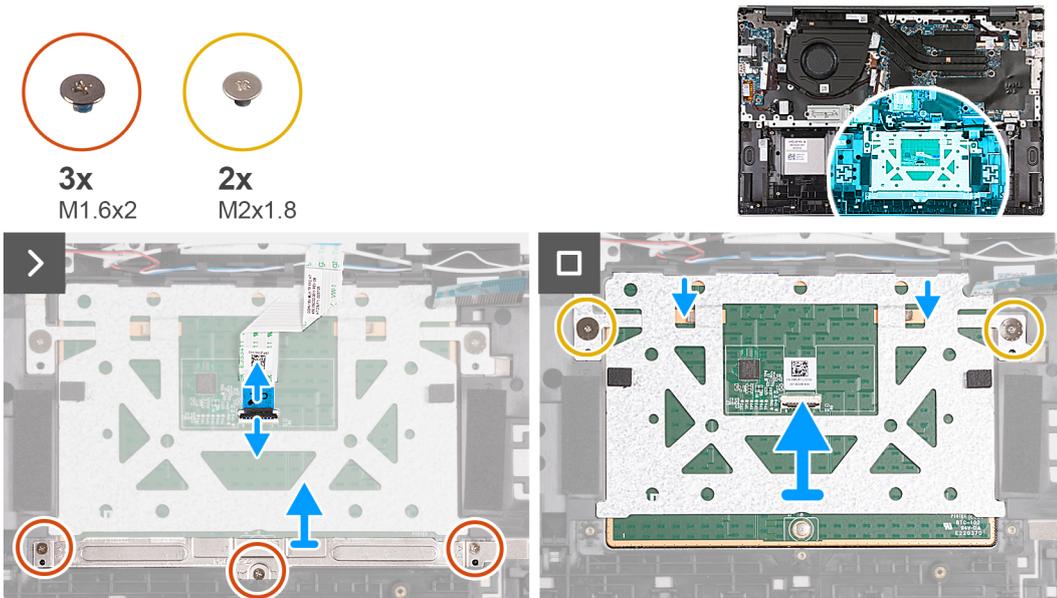
**Steps**

1. Open the latch of the touchpad connector and disconnect the touchpad cable from the touchpad.
2. Remove the three screws (M1.6x2) that secure the touchpad bracket to the palm-rest and keyboard assembly.
3. Lift the touchpad bracket off the palm-rest and keyboard assembly.
4. Remove the two screws (M2x1.8) that secure the touchpad to the palm-rest and keyboard assembly.
5. Lift the touchpad assembly off the palm-rest and keyboard 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.
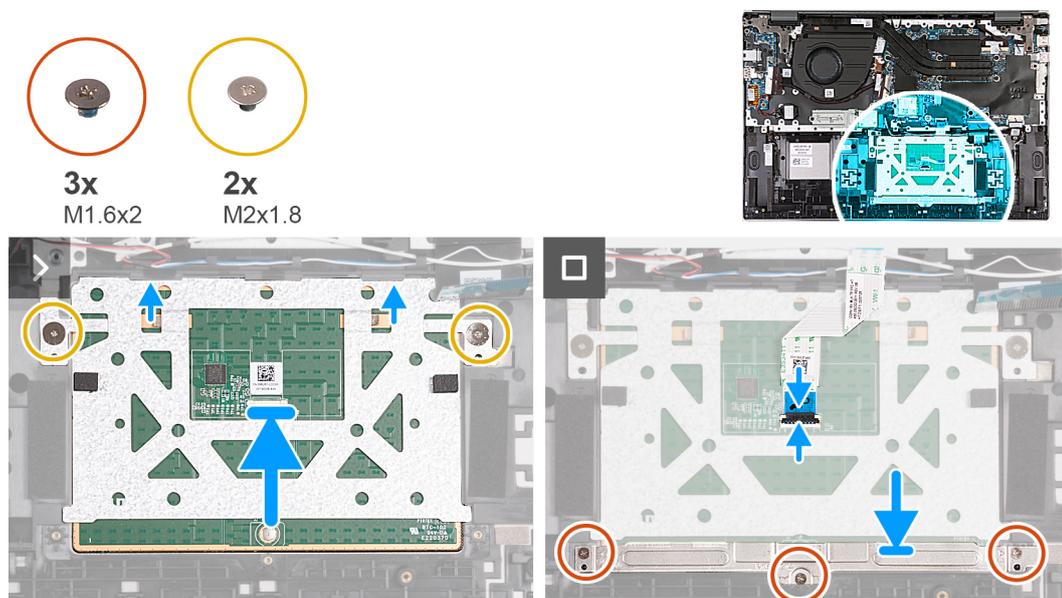
**Steps**

1. Slide the touchpad onto the palm-rest and keyboard assembly.
2. Replace the two screws (M2x1.8) that secure the touchpad to the palm-rest and keyboard assembly.
3. Align the touchpad bracket and place it on the palm-rest and keyboard assembly.
4. Replace the three screws (M1.6x2) that secure the touchpad bracket to the palm-rest and keyboard assembly.
5. Connect the touchpad cable to the touchpad 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.

# Palm-rest and keyboard assembly

## Removing the palm-rest and keyboard assembly

**Prerequisites**

⚠ CAUTION: **The information in this section is intended for authorized service technicians only.**

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the fan.
4. Remove the wireless card.
5. Remove the M.2 2230 solid-state drive or M.2 2280 solid-state drive, whichever applicable.
6. Remove the battery.
7. Remove the speakers.
8. Remove the coin-cell battery.
9. Remove the I/O board.
10. Remove the power button with optional fingerprint reader or power button, whichever applicable.
11. Remove the power-adapter port.
12. Remove the display assembly.
13. Remove the TPM board.
14. Remove the system board.
15. Remove the touchpad.

**About this task**

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

ⓘ NOTE: The system board can be removed and installed along with the heat sink, when you replace the palm-rest and keyboard assembly. This simplifies the removal and installation procedure and also prevents damage to the thermal bond between the system board and heat sink.

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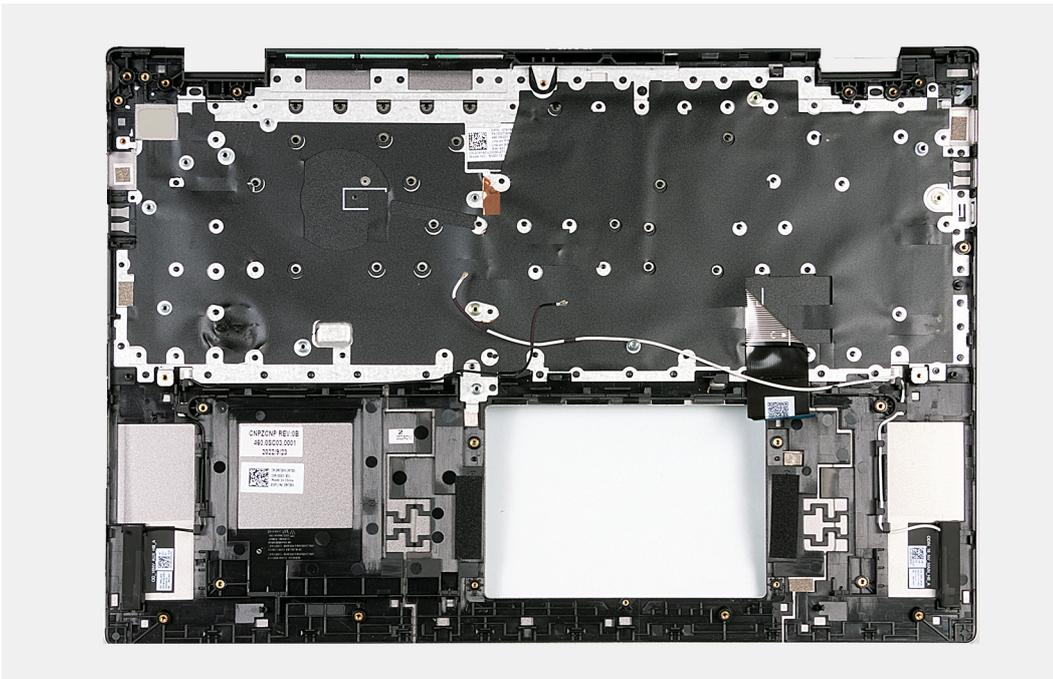
**Steps**

After performing the pre-requisites, you are left with the palm-rest and keyboard assembly.

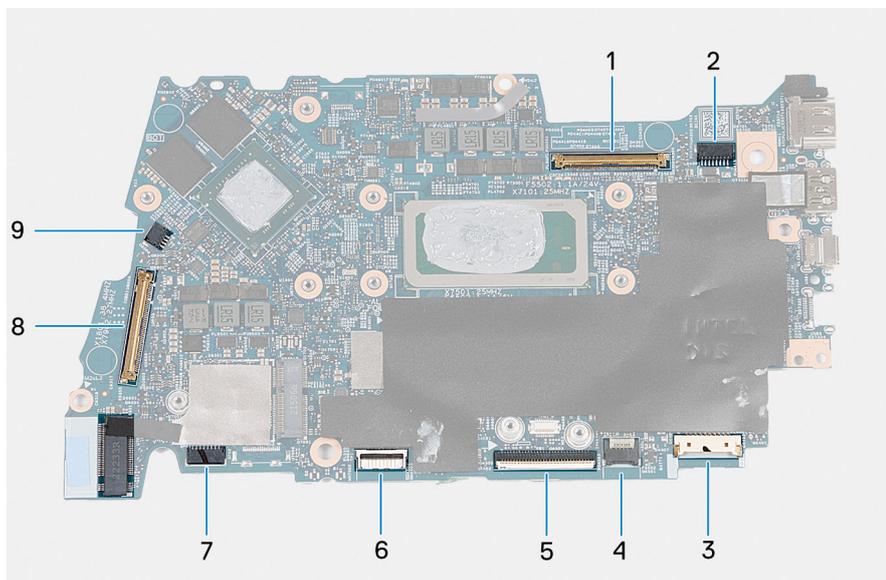# Installing the palm-rest and keyboard assembly

**Prerequisites**

⚠ CAUTION: **The information in this section is intended for authorized service technicians only.**

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 palm-rest and keyboard assembly and provides a visual representation of the installation procedure.
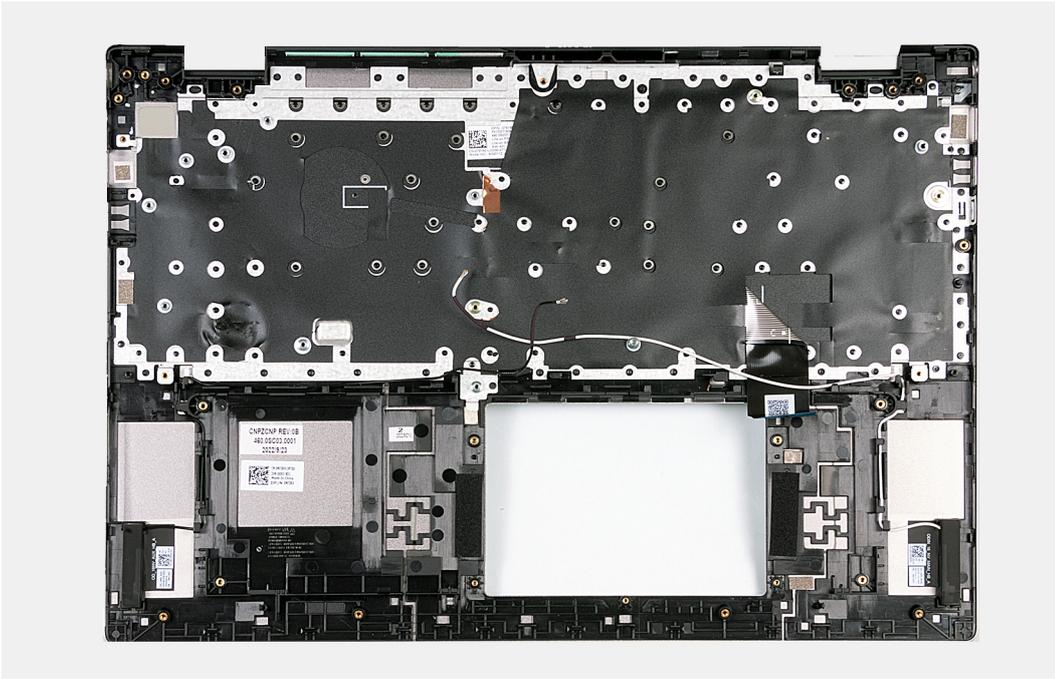
**Steps**

Place the palm-rest and keyboard assembly on a flat and clean surface and perform the post-requisites to install the palm-rest and keyboard assembly.

**Next steps**

> (i) **NOTE:** The system board can be removed and installed along with the heat sink, when you replace the palm-rest and keyboard assembly. This simplifies the removal and installation procedure and also prevents damage to the thermal bond between the system board and heat sink.

1. Install the touchpad.
2. Install the system board.
3. Install the tpm board.
4. Install the display assembly.
5. Install the power adapter port.
6. Install the power button with optional fingerprint reader or power button, whichever applicable.
7. Install the I/O board.
8. Install the coin-cell battery.
9. Install the speakers.
10. Install the battery.
11. Install the M.2 2230 solid-state drive or M.2 2280 solid-state drive, whichever applicable.
12. Install the wireless card.
13. Install the fan.
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 000123347.

# 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.

## BIOS overview

The BIOS manages data flow between the computer's operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

## Entering BIOS setup program

**About this task**

Turn on (or restart) your computer and press F2 immediately.

## 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 2. 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.<br>ⓘ **NOTE:** For the standard graphics browser only. |
| Esc | Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system. |

# Boot Sequence

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

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

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

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

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

# System setup options

(i) **NOTE:** Depending on your system and its installed devices, the items that are listed in this section may or may not appear.

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

| Overview | |
|---|---|
| **Lattitude 3320** | |
| BIOS Version | Displays the BIOS version number. |
| Service Tag | Displays the Service Tag of the system. |
| Asset Tag | Displays the Asset Tag of the system. |
| Manufacture Date | Displays the manufacture date of the system. |
| Ownership Date | Displays the ownership date of the system. |
| Express Service Code | Displays the express service code of the system. |
| Ownership Tag | Displays the Ownership Tag of the system. |
| Signed Firmware Update | Displays whether the Signed Firmware Update is enabled on your system. |
| **Battery Information** | |
| Primary | Displays that battery is primary. |
| Battery Level | Displays the battery level of the system. |
| Battery State | Displays the battery state of the system. |
| Health | Displays the battery health of the system. |
| AC Adapter | Displays whether the AC adapter is connected or not. |
| **Processor Information** | |
| Processor Type | Displays the processor type. |
| Maximum Clock Speed | Displays the maximum processor clock speed. |
| Minimum Clock Speed | Displays the minimum processor clock speed. |
| Current Clock Speed | Displays the current processor clock speed. |
| Core Count | Displays the number of cores on the processor. |
| Processor ID | Displays the processor identification code. |

**Table 3. System setup options—System information menu (continued)**

| Overview | |
|---|---|
| Processor L2 Cache | Displays the processor L2 Cache size. |
| Processor L3 Cache | Displays the processor L3 Cache size. |
| Microcode Version | Displays the microcode version. |
| Intel Hyper-Threading Capable | Displays whether the processor is Hyper-Threading (HT) capable. |
| 64-Bit Technology | Displays whether 64-bit technology is used. |
| **Memory Information** | |
| Memory Installed | Displays the total system memory installed. |
| Memory Available | Displays the total system memory available. |
| Memory Speed | Displays the memory speed. |
| Memory Channel Mode | Displays single or dual channel mode. |
| Memory Technology | Displays the technology that is used for the memory. |
| **Devices Information** | |
| Panel Type | Displays the Panel Type of the system. |
| Video Controller | Displays the video controller type of the system. |
| Video Memory | Displays the video memory information of the system. |
| Wi-Fi Device | Displays the wireless device information of the system. |
| Native Resolution | Displays the native resolution of the system. |
| Video BIOS Version | Displays the video BIOS version of the system. |
| Audio Controller | Displays the audio controller information of the system. |
| Bluetooth Device | Displays the Bluetooth device information of the system. |

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

| Boot Configuration | |
|---|---|
| **Boot Sequence** | |
| Boot mode | Displays the boot mode. |
| Boot Sequence | Displays the boot sequence. |
| Secure Digital (SD) Card Boot | Enable or disable the SD card read-only boot. |
| | By default, the **Secure Digital (SD) Card Boot** option is not enabled. |
| **Secure Boot** | |
| Enable Secure Boot | Enable or disable the secure boot feature. |
| | By default, the option is not enabled. |
| Secure Boot Mode | Enable or disable to change the secure boot mode options. |
| | By default, the **Deployed Mode** is enabled. |
| **Expert Key Management** | |
| Enable Custom Mode | Enable or disable custom mode. |
| | By default, the **custom mode** option is not enabled. |
| Custom Mode Key Management | Select the custom values for expert key management. |

**Table 5. System setup options—Integrated Devices menu**

| Integrated Devices | |
|---|---|
| **Date/Time** | Displays the current date in MM/DD/YYYY format and current time in HH:MM:SS AM/PM format. |
| **Camera** | Enables or disable the camera. |
| | By default, the **Enable Camera** option is selected |
| **Audio** | |
| Enable Audio | Enable or disable the integrated audio controller. |
| | By default, all the options are enabled. |
| **USB Configuration** | ● Enable or disable booting from USB mass storage devices that are connected to external USB ports. |
| | By default, the **Enable External USB Ports** option is enabled. |
| | ● Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive. |
| | By default, the **Enable USB Boot Support** option is enabled. |
| **Disable USB4 PCIE Tunneling** | Disable the USB4 PCIE Tunneling option. |
| | By default, the option is disabled. |
| **Video/Power only on Type-C Ports** | Enable or disable the Type-C port functionality to video or power only. |
| | By default, the **Video/Power only on Type-C Ports** option is disabled. |

**Table 6. System setup options—Storage menu**

| Storage | |
|---|---|
| **SATA/NVMe Operation** | |
| SATA/NVMe Operation | Set the operating mode of the integrated storage device controller. |
| | By default, the **RAID On** option is enabled. |
| **Storage interface** | |
| Port Enablement | This page allows you to enable the onboard drives. |
| | By default, the **M.2 PCIe SSD** option is enabled. |
| **SMART Reporting** | |
| Enable SMART Reporting | Enable or disable Self-Monitoring, Analysis, and Reporting Technology (SMART) during system startup. |
| | By default, the **Enable SMART Reporting** option is not enabled. |
| **Drive Information** | |
| **M.2 PCIe SSD** | |
| Type | Displays the M.2 PCIe SSD type information of the system. |
| Device | Displays the M.2 PCIe SSD device information of the system. |
| **Enable MediaCard** | |
| Secure Digital (SD) Card | Enable or disable the SD card. |
| | By default, the **Secure Digital (SD) Card** option is enabled. |
| Secure Digital (SD) Card Read-Only Mode | Enable or disable the SD card read-only mode. |
| | By default, the **Secure Digital (SD) Card Read-Only Mode** option is not enabled. |

**Table 7. System setup options—Display menu**

| Display | |
|---|---|
| **Display Brightness** | |
| Brightness on battery power | Enable to set screen brightness when the system is running on battery power. |
| Brightness on AC power | Enable to set screen brightness when the system is running on AC power. |
| **EcoPower** | Enable or disable EcoPower Feature in your panel. EcoPower can increase the battery life of your system by reducing the display brightness when appropriate. |
| | By default, **Enable EcoPower** option is enabled. |
| **Full Screen Logo** | Enable or disable full screen logo. |
| | By default, the option is not enabled. |

**Table 8. System setup options—Connection menu**

| Connection | |
|---|---|
| **Wireless Device Enable** | |
| WLAN | Enable or disable the internal WLAN device. |
| | By default, the option enabled. |
| Bluetooth | Enable or disable the internal Bluetooth device |
| | By default, the option enabled. |
| **Enable UEFI Network Stack** | Enable or disable UEFI Network Stack and controls the on-board LAN Controller. |
| | By default, the **Enable UEFI Network Stack** option is enabled. |
| **HTTPs Boot Feature** | |
| HTTPs Boot | Enable or disable the HTTPs Boot feature. |
| | By default, the **HTTPs Boot** option is disabled. |

**Table 9. System setup options—Power menu**

| Power | |
|---|---|
| **Battery configuration** | Enables the system to run on battery during peak power usage hours. Use the table **Custom Charge Start** and **Custom Charge Stop**, to prevent AC power usage between certain times of each day. |
| | By default, the **Adaptive** option is enabled. |
| **Advanced Configuration** | |
| Enable Advanced Battery Charge Configuration | Enable or disable the advanced battery charge configuration. |
| | By default, the **Enable Advanced Battery Charge Configuration** option is disabled. |
| **Peak Shift** | Enables the system to run on battery during peak power usage hours. |
| Enable Peak Shift | By default, the **Enable Peak Shift** option is disabled. |
| **Thermal Management** | Enables to cool the fan and processor heat management to adjust the system performance, noise, and temperature. |
| | By default, the **Optimized** option is enabled. |
| **USB Wake Support** | |
| Enable USB Wake Support | When enabled, the USB devices like a mouse or keyboard can be used to wake the system from Standby, Hibernate, and Power Off. |

**Table 9. System setup options—Power menu (continued)**

| Power | |
|---|---|
| | (i) **NOTE:** This feature requires Deep Sleep Control to be disabled. |
| | (i) **NOTE:** This feature is only functional when the AC power adapter is connected. If the AC power adapter is removed before Standby, the BIOS will remove power from all of the USB ports to conserve battery power. |
| | By default, the **Enable USB Wake Support** option is disabled. |
| Wake on Dell USB-C Dock | When enabled, connecting a Dell USB-C Dock will wake the system from Standby, Hibernate, and Power Off. |
| | By default, the **Wake on Dell USB-C Dock** option is enabled. |
| **Block Sleep** | Enables to block entering sleep (S3) mode in the operating system. |
| | By default, the **Block Sleep** option is disabled. |
| **Lid Switch** | |
| Enabled Lid Switch | Enable or disable the lid switch. |
| | By default, the **Enable Lid Switch** option is enabled. |
| Power On Lid Open | When enabled, allows the system to power up from the off state whenever the lid is opened. |
| | By default, the **Power On Lid Open** option is enabled. |
| **Intel Speed Shift Technology** | Enable or disable the Intel speed shift technology support. |
| | By default, the **Intel Speed Shift Technology** option is enabled. |

**Table 10. System setup options—Security menu**

| Security | |
|---|---|
| **TPM 2.0 Security** | |
| TPM 2.0 Security On | Allows you to enable or disable TPM visibility to operating system. |
| | By default, the **TPM 2.0 Security On** option is enabled. |
| Attestation Enable | Enables to control whether the Trusted Platform Module (TPM) Endorsement Hierarchy is available to the operating system. |
| | By default, the **Attestation Enable** option is enabled. |
| Key Storage Enable | Enables to control whether the Trusted Platform Module (TPM) Storage Hierarchy is available to the operating system. |
| | By default, the **Key Storage Enable** option is enabled. |
| SHA-256 | When enabled, the BIOS and TPM will use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot. |
| | By default, the **SHA-256** option is enabled. |
| Clear | Enables to clear the TPM owner information and returns the TPM to the default state. |
| | By default, the **Clear** option is disabled. |
| PPI Bypass for Clear Commands | Controls the TPM Physical Presence Interface (PPI). |
| | By default, the **PPI ByPass for clear Commands** option is disabled. |
| **SMM Security Mitigation** | Enable or disable additional UEFI SMM Security Mitigation protections. |
| | By default, the option is enabled. |
| **Data Wipe on Next Boot** | |

**Table 10. System setup options—Security menu (continued)**

| Security | |
|---|---|
| Start Data Wipe | Enable or disable the data wipe on next boot. |
| | By default, the **Start Data Wipe** option is disabled. |
| Absolute | Enable or disable or permanently disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute software. |
| | By default, the option is enabled. |
| | ⚠ **WARNING: The 'Permanently Disabled' option can only be selected once. When 'Permanently Disabled' is selected, Absolute Persistence cannot be re-enabled. No further changes to the Enable/Disable states are allowed.** |
| | ⓘ **NOTE:** The Enable/Disable options will be unavailable while Computrace is in the activated state. |
| UEFI Boot Path Security | Controls whether the system will prompt the user to enter the admin password (if set) when booting to a UEFI boot path device from the F12 boot menu. |
| | By default, the **Always Except Internal HDD** option is enabled. |

**Table 11. System setup options—Passwords menu**

| Passwords | |
|---|---|
| **Admin Password** | Set, change, or delete the administrator password. |
| **System Password** | Set, change, or delete the system password. |
| **NVMe SSD0** | Set, change, or delete the NVMe SSD0 password. |
| **Password Configuration** | |
| Upper Case Letter | Reinforces password must have at least one upper case letter. |
| | By default, the option is disabled. |
| Lower Case Letter | Reinforces password must have at least one lower case letter. |
| | By default, the option is disabled. |
| Digit | Reinforces password must have at least one digit number. |
| | By default, the option is disabled. |
| Special Character | Reinforces password must have at least one special character. |
| | By default, the option is disabled. |
| Minimum Characters | Set the minimum characters allowed for password. |
| Password Bypass | When enabled, this always prompts for system and internal hard drive passwords when powered on from the off state. |
| | By default, the **Disabled** option is selected. |
| **Password Changes** | |
| Enable Non-Admin Password Changes | Enable or disable to change system and hard drive password without the need for admin password. |
| | By default, the option is enabled. |
| **Admin Setup Lockout** | |
| Enable Admin Setup Lockout | Enables administrators control over how their users can or cannot access BIOS setup. |
| | By default, the option is disabled. |

**Table 11. System setup options—Passwords menu (continued)**

| Passwords | |
|---|---|
| **Master Password Lockout** | |
| Enable Master Password Lockout | When enabled, this disables the master password support. |
| | By default, the option is disabled. |
| **Allow Non-Admin PSID Revert** | |
| Enable Allow Non-Admin PSID Revert | Controls access to the Physical Security ID (PSID) revert of NVMe hard-drives from the Dell Security Manager prompt. |
| | By default, the option is disabled. |

**Table 12. System setup options—Update, Recovery menu**

| Update, Recovery | |
|---|---|
| **UEFI Capsule Firmware Updates** | Enable or disable BIOS updates through UEFI capsule update packages.<br>ⓘ **NOTE:** Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS). |
| | By default, the option is enabled. |
| **BIOS Recovery from Hard Drive** | Enables the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key. |
| | By default, the option is enabled. |
| | ⓘ **NOTE:** BIOS Recovery from Hard Drive is not available for self-encrypting drives (SED). |
| **BIOS Downgrade** | |
| Allow BIOS Downgrade | This field controls the flashing of the system firmware to previous revisions. |
| | By default, the option is enabled. |
| **SupportAssist OS Recovery** | Enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors. |
| | By default, the option is enabled. |
| **BIOSConnect** | Enable or disable cloud Service operating system recovery if the main operating system fails to boot with the number of failures equal to or greater than the value specified by the Auto operating system Recovery Threshold setup option and local Service operating system does not boot or is not installed. |
| | By default, the option is enabled. |
| **Dell Auto operating system Recovery Threshold** | Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery Tool. |
| | By default, the threshold value is set to 2. |

**Table 13. System setup options—System Management menu**

| System Management | |
|---|---|
| **Service Tag** | Displays the Service Tag of the system. |
| **Asset Tag** | Create a system Asset Tag. |
| **AC Behavior** | |
| Wake on AC | Enable or disable the wake on AC option. |
| | By default, the option is disabled. |

**Table 13. System setup options—System Management menu (continued)**

| System Management | |
| --- | --- |
| Auto on Time | Enable to set the system to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days. |
| | By default, the option is disabled. |

**Table 14. System setup options—Keyboard menu**

| Keyboard | |
| --- | --- |
| **Numlock Enable** | Allows you to enable or disable the Numlock function when the system boots. |
| | By default, the option **Fn Lock Options** is enabled. |
| **Fn Lock Options** | By default, the Fn lock option is enabled. |
| **Lock Mode** | By default, the **Lock Mode Secondary** option is enabled. With this option, the F1-F2 keys scan the code for their secondary functions. |

**Table 15. System setup options—Pre-boot Behavior menu**

| Pre-boot Behavior | |
| --- | --- |
| **Adapter Warnings** | |
| Enable Adapter Warnings | Enable or disable the warning messages during boot when the adapters with less power capacity are detected. |
| | By default, the option is enabled. |
| **Warning and Errors** | Enable or disable the action to be done when a warning or error is encountered. |
| | By default, the **Prompt on Warnings and Errors** option is enabled. |
| **USB-C Warnings** | |
| Enable Dock Warning Messages | By default, the option is enabled. |
| **Fastboot** | Allows you to configure the speed of the UEFI boot process. |
| | By default, the **Minimal** option is enabled. |
| **Extend BIOS POST Time** | Set the BIOS POST load time. |
| | By default, the **0 seconds** option is enabled. |

**Table 16. System setup options—Virtualization menu**

| Virtualization | |
| --- | --- |
| **Intel Virtualization Technology** | |
| Enable Intel Virtualization Technology (VT) | When enabled, the system will be able to run a Virtual Machine Monitor (VMM). |
| | By default, the option is enabled. |
| **VT for Direct I/O** | When enabled, the system will be able to perform Virtualization Technology for Direct I/O (VT-d). |
| | By default, the option is enabled. |
| **Intel Trusted Execution Technology (TXT)** | |
| Enable Intel Trusted Execution Technology (TXT) | Specifies whether a measured Virtual Machine Monitor (MVMM) can use the additional hardware capabilities that are provided by Intel Trusted Execution Technology. The following must be enabled in order to enable Intel TXT. <br> ● Trusted Platform Module (TPM) |

**Table 16. System setup options—Virtualization menu (continued)**

| Virtualization | |
|---|---|
| | ● Intel Hyper-Threading<br>● All CPU cores (Multi-Core Support)<br>● Intel Virtualization Technology<br>● Intel VT for Direct I/O<br><br>By default, the option is disabled. |

**Table 17. System setup options—Performance menu**

| Performance | |
|---|---|
| **Multi Core Support** | |
| Active Cores | Enables to change the number of CPU cores available to the operating system.<br><br>By default, the **All Cores** option is enabled. |
| **Intel SpeedStep** | |
| Enable Intel SpeedStep Technology | Enables the system to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production.<br><br>By default, the option is enabled. |
| **C-States Control** | |
| Enable C-State Control | Enable the ability of the CPU to enter and exit low power state. When disabled, it disabled all C-states. When enabled, it enabled all C-states that the chipset or platform allows.<br><br>By default, the option is enabled. |
| **Intel Turbo Boost Technology** | |
| Enable Intel Turbo Boost Technology | Enable or disable the Intel TurboBoost mode of the processor.<br><br>By default, the option is enabled. |
| **Intel Hyper-Threading Technology** | |
| Enable Intel Hyper-Threading Technology | Enable or disable Hyper-Threading in the processor.<br><br>By default, the option is enabled. |
| **Dynamic Tuning:Machine Learning** | |
| Enable Dynamic Tuning:Machine Learning | Enables the operating system capability to enhance dynamic power tuning capabilities based on detected workloads.<br><br>By default, the option is disabled. |

**Table 18. System setup options—System Logs menu**

| System Logs | |
|---|---|
| **BIOS Event Log** | |
| Clear Bios Event Log | Displays BIOS events.<br><br>By default, the **Keep Log** option is enabled. |
| **Thermal Event Log** | |
| Clear Thermal Event Log | Displays Thermal events.<br><br>By default, the **Keep Log** option is enabled. |
| **Power Event Log** | |
| Clear Power Event Log | Displays power events.<br><br>By default, the **Keep Log** option is enabled. |

**Table 18. System setup options—System Logs menu (continued)**

| System Logs | |
| --- | --- |
| License Information | Displays the license information of the system. |

# System and setup password

**Table 19. System and setup password**

| Password type | Description |
| --- | --- |
| System password | Password that you must enter to log on 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 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.
   ● At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [ \ ] ^ _ ` { | }
   ● Numbers 0 through 9.
   ● Upper case letters from A to Z.
   ● Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
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.

   ⓘ **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. Remove the coin-cell battery.
4. Wait for one minute.
5. Replace the coin-cell battery.
6. Connect the battery cable to the system board.
7. Replace the base cover.

# Clearing BIOS (System Setup) and System passwords

**About this task**

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

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

# Updating the BIOS

## Updating the BIOS in Windows

**Steps**

1. Go to www.dell.com/support.
2. Click **Product support**. In the **Search support** box, enter the Service Tag of your computer, and then click **Search**.

   ⓘ **NOTE:** If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.

3. Click **Drivers & Downloads**. Expand **Find drivers**.

4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, see knowledge base article 000124211 at www.dell.com/support.

# Updating the BIOS using the USB drive in Windows

**Steps**

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article 000145519 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** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

# Updating the BIOS in Linux and Ubuntu

To update the system BIOS on a computer that is installed with Linux or Ubuntu, see the knowledge base article 000131486 at www.dell.com/support.

# Updating 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.

(i) **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.

# Troubleshooting

## Handling swollen Lithium-ion batteries

Like most laptops, Dell laptops use lithium-ion batteries. One type of lithium-ion battery is the lithium-ion polymer battery. Lithium-ion polymer batteries have increased in popularity in recent years and have become standard in the electronics industry due to customer preferences for a slim form factor (especially with newer ultra-thin laptops) and long battery life. Inherent to lithium-ion polymer battery technology is the potential for swelling of the battery cells.

Swollen battery may impact the performance of the laptop. To prevent possible further damage to the device enclosure or internal components leading to malfunction, discontinue the use of the laptop and discharge it by disconnecting the AC adapter and letting the battery drain.

Swollen batteries should not be used and should be replaced and disposed of properly. We recommend contacting Dell product support for options to replace a swollen battery under the terms of the applicable warranty or service contract, including options for replacement by a Dell authorized service technician.

The guidelines for handling and replacing Lithium-ion batteries are as follows:

● Exercise caution when handling Lithium-ion batteries.
● Discharge the battery before removing it from the system. To discharge the battery, unplug the AC adapter from the system and operate the system only on battery power. When the system will no longer power on when the power button is pressed, the battery is fully discharged.
● 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 type to pry on or against the battery.
● If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a battery can be dangerous.
● Do not attempt to reassemble a damaged or swollen battery into a laptop.
● Swollen batteries that are covered under warranty should be returned to Dell in an approved shipping container (provided by Dell)—this is to comply with transportation regulations. Swollen batteries that are not covered under warranty should be disposed of at an approved recycling center. Contact Dell product support at https://www.dell.com/support for assistance and further instructions.
● Using a non-Dell or incompatible battery may increase the risk of fire or explosion. Replace the battery only with a compatible battery purchased from Dell that is designed to work with your Dell computer. Do not use a battery from other computers with your computer. Always purchase genuine batteries from https://www.dell.com or otherwise directly from Dell.

Lithium-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high heat. For more information on how to improve the performance and lifespan of the laptop battery and to minimize the possibility of occurrence of the issue, search Dell Laptop Battery in the Knowledge Base Resource at www.dell.com/support.

## Locate the Service Tag or Express Service Code of your Dell computer

Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, we recommend entering the Service Tag or Express Service Code at www.dell.com/support.

For more information on how to find the Service Tag for your computer, see Locate the Service Tag for your Dell Laptop.

# 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.

ⓘ **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 20. Diagnostic-light LED codes**

| Diagnostic light codes (Amber,White) | Problem description |
| --- | --- |
| 1,1 | M-BIST: TPM |
| 1,2 | M-BIST: SPI flash |
| 1,3 | Hinge cable OCP1 |
| 1,4 | Hinge cable OCP2 |
| 1,5 | i-Fuse failure |
| 1,6 | EC internal failure |
| 2,1 | Processor failure |
| 2,2 | System board: BIOS or ROM (Read-Only Memory) failure |
| 2,3 | No memory or RAM (Random-Access Memory) detected |
| 2,4 | Memory or RAM (Random-Access Memory) failure |
| 2,5 | Invalid memory installed |
| 2,6 | System-board or chipset error |
| 2,7 | Display failure - SBIOS message |
| 2,8 | Display failure - EC detection of power rail failure |
| 3,1 | Coin-cell battery failure |
| 3,2 | PCI, video card/chip failure |
| 3,3 | Recovery image not found |
| 3,4 | Recovery image found but invalid |
| 3,5 | Power-rail failure |
| 3,6 | System BIOS Flash incomplete |
| 3,7 | ME error |

**Table 20. Diagnostic-light LED codes (continued)**

| Diagnostic light codes (Amber,White) | Problem description |
|---|---|
| **4,1** | Memory error |
| **4,2** | Power rail error |

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

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

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

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

# SupportAssist diagnostics

**About this task**

The SupportAssist diagnostics (previously known as ePSA diagnostics) performs a complete check of your hardware. The SupportAssist diagnostics is embedded in the BIOS and is launched by it internally. The SupportAssist diagnostics provides a set of options for particular devices or device groups. It allows you to:

- Run tests automatically or in an interactive mode.
- Repeat tests
- Display or save test results
- Run thorough tests to introduce additional test options and provide extra information about the failed device(s)
- View status messages that indicate if the tests are completed successfully
- View error messages that indicate if problems were encountered during the test

ⓘ **NOTE:** Some tests are meant for specific devices and require user interaction. Ensure that you are present in front of the computer when the diagnostic tests are performed.

For more information, see SupportAssist Pre-Boot System Performance Check.

# Built-in self-test (BIST)

## M-BIST

M-BIST (Built In Self-Test) is the system board's built-in self-test diagnostics tool that improves the diagnostics accuracy of system board embedded controller (EC) failures.

ⓘ **NOTE:** M-BIST can be manually initiated before POST (Power On Self Test).

## How to run M-BIST

ⓘ **NOTE:** M-BIST must be initiated on the system from a power-off state either connected to AC power or with battery only.

1. Press and hold both the **M** key on the keyboard and the **power button** to initiate M-BIST.
2. With both the **M** key and the **power button** held down, the battery indicator LED may exhibit two states:
   a. OFF: No fault detected with the system board
   b. AMBER: Indicates a problem with the system board
3. If there is a failure with the system board, the battery status LED will flash one of the following error codes for 30 seconds:

**Table 21. LED error codes**

| Blinking Pattern | | Possible Problem |
|---|---|---|
| **Amber** | **White** | |
| 2 | 1 | CPU Failure |
| 2 | 8 | LCD Power Rail Failure |
| 1 | 1 | TPM Detection Failure |
| 2 | 4 | Unrecoverable SPI Failure |

4. If there is no failure with the system board, the LCD will cycle through the solid color screens described in the LCD-BIST section for 30 seconds and then power off.

# LCD Built-in Self Test (BIST)

Dell laptops have a built-in diagnostic tool that helps you determine if the screen abnormality you are experiencing is an inherent problem with the LCD (screen) of the Dell laptop or with the video card (GPU) and PC settings.

When you notice screen abnormalities like flickering, distortion, clarity issues, fuzzy or blurry image, horizontal or vertical lines, color fade etc., it is always a good practice to isolate the LCD (screen) by running the Built-In Self Test (BIST).

## How to invoke LCD BIST Test

1. Power off the Dell laptop.
2. Disconnect any peripherals that are connected to the laptop. Connect only the AC adapter (charger) to the laptop.
3. Ensure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold **D** key and **Power on** the laptop to enter LCD built-in self test (BIST) mode. Continue to hold the D key, until the system boots up.
5. The screen will display solid colors and change colors on the entire screen to white, black, red, green, and blue twice.
6. Then it will display the colors white, black and red.
7. Carefully inspect the screen for abnormalities (any lines, fuzzy color or distortion on the screen).
8. At the end of the last solid color (red), the system will shut down.

(i) **NOTE:** Dell SupportAssist Pre-boot diagnostics upon launch, initiates an LCD BIST first, expecting a user intervention confirm functionality of the LCD.

# Recovering the operating system

When your computer is unable to boot to the operating system even after repeated attempts, it automatically starts Dell SupportAssist OS Recovery.

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

You can also download it from the Dell Support website to troubleshoot and fix your computer when it fails to boot into their primary operating system due to software or hardware failures.

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at www.dell.com/serviceabilitytools. Click **SupportAssist** and then, click **SupportAssist OS Recovery**.

# 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:

(i) **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.