

Vostro 15 5510

Service Manual

Notes, cautions, and warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your product.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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Working on your computer

Topics:

- [Safety instructions](#)

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 rechargeable Li-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.

Working inside your computer


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. Click **Start > Power > Shut down**.

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

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

 **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.

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.

Entering Service Mode

Service Mode allows users to immediately cut off electricity from the computer and conduct repairs without disconnecting the battery cable from the system board.

To enter **Service Mode**:

1. Shut down your computer and disconnect the AC adapter.
2. Hold **** key on the keyboard and press the power button for 3 seconds or until the Dell logo appears on the screen.
3. Press any key to continue.

NOTE: If the power adapter has not been disconnected, a message prompting you to remove the AC adapter appears on the screen. Remove the AC adapter and then press any key to continue the **Service Mode** procedure.

NOTE: The **Service Mode** procedure automatically skips the following step if the **Owner Tag** of the computer is not set up in advance by the manufacturer.

4. When the ready-to-proceed message appears on the screen, press any key to proceed. The computer emits three short beeps and shuts down immediately.

Once the computer shuts down, you may perform the replacement procedures without disconnecting the battery cable from the system board.

Exiting Service Mode

Service Mode allows users to immediately cut off electricity from the computer and conduct repairs without disconnecting the battery cable from the system board.

To exit **Service Mode**:

1. Connect the AC adapter to the power-adapter port on your computer.
2. Press the power button to turn on the computer. Your computer will automatically return to normal functioning mode.

After working inside your computer

About this task

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

Steps

1. Replace all screws and ensure that no stray screws remain inside your computer.
2. Connect any external devices, peripherals, or cables you removed before working on your computer.
3. Replace any media cards, discs, or any other parts that you removed before working on your computer.
4. Connect your computer and all attached devices to their electrical outlets.
5. Turn on your computer.

Removing and installing components

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

Topics:

- Recommended tools
- Screw list
- Major components of your system
- Base cover
- Battery
- Battery cable
- Memory
- Solid-state drive—M.2 slot one
- Solid-state drive—M.2 slot two
- Wireless card
- Fan
- Coin-cell battery
- Heat sink
- Network-port bracket
- I/O board
- Speakers
- Touchpad
- Display assembly
- Power button with optional fingerprint reader
- Power-adaptor port
- System board
- Palm-rest and keyboard assembly

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Plastic scribe
















Screw list

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

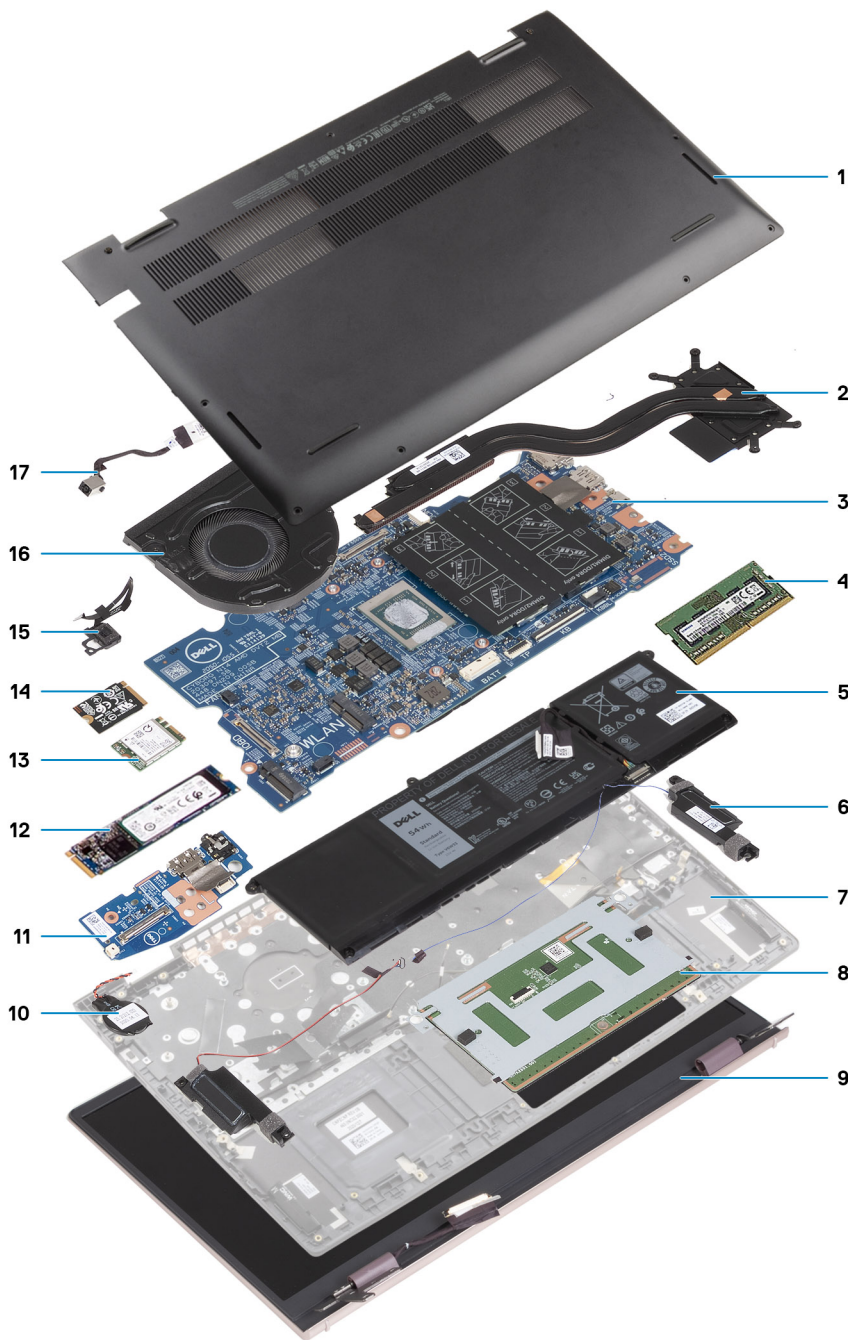
NOTE: Some computers have magnetic surfaces. Ensure that the screws are not left attached to such surface when replacing a component.

NOTE: Screw color may vary with the configuration ordered.

Table 1. Screw list

Component	Screw type	Quantity	Screw image
Base cover	<ul style="list-style-type: none"> • Captive screws - M2x7.5 • M2x4 	<ul style="list-style-type: none"> • 2 • 7 	
3-cell battery	M2x3	3	
4-cell battery	M2x3	4	
Wireless card	M2x3	1	
Solid-state drive - Slot 1	M2x3	1	
Solid-state drive - Slot 2	M2x3	1	
Fan	M2x3	2	
Heat sink	Captive screws	4	
System board	M2x2	3	
USB Type-C bracket	M2x4	2	
Power button with fingerprint reader	M2x3	1	
Network-port bracket	M2x5	2	
I/O board	M2x2	1	
Touchpad	M1.6x2 M2x1.8	3 2	
Power-adaptor port	M2.5x4.5	3	
Display assembly	M2.5x4.5	6	

Major components of your system



1. Base cover
2. Heat sink
3. System board
4. Memory module
5. Battery
6. Speakers
7. Palm-rest and keyboard assembly
8. Touchpad
9. Display assembly
10. Coin-cell battery
11. I/O board
12. M.2 2280 SSD card

- 13. WLAN
- 14. M.2 2230 SSD card
- 15. Power button with optional fingerprint reader
- 16. Fan
- 17. Power-adaptor port

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

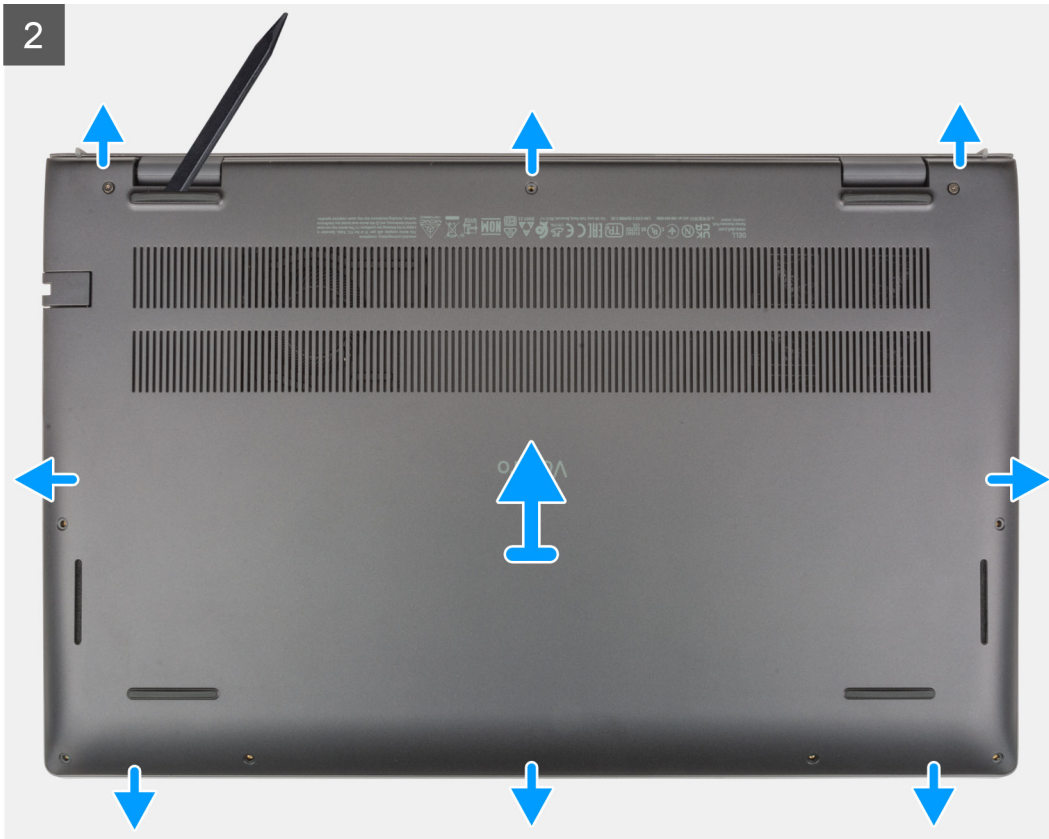
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).

About this task

The following images indicate the location of the base cover and provide a visual representation of the removal procedure.





Steps

1. Loosen the two (M2x7.5) captive screws that secure the base cover to the palm-rest and keyboard assembly.
2. Remove the seven (M2x4) screws that secure the base cover to the palm-rest and keyboard assembly.
3. Using a plastic scribe, pry the base cover from the U-shaped indents at the top edge of the base cover and continue to work on the sides to release the base cover from the palm-rest and keyboard assembly.
4. Lift the base cover off the palm-rest and keyboard assembly.

Installing the base cover

Prerequisites

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

About this task

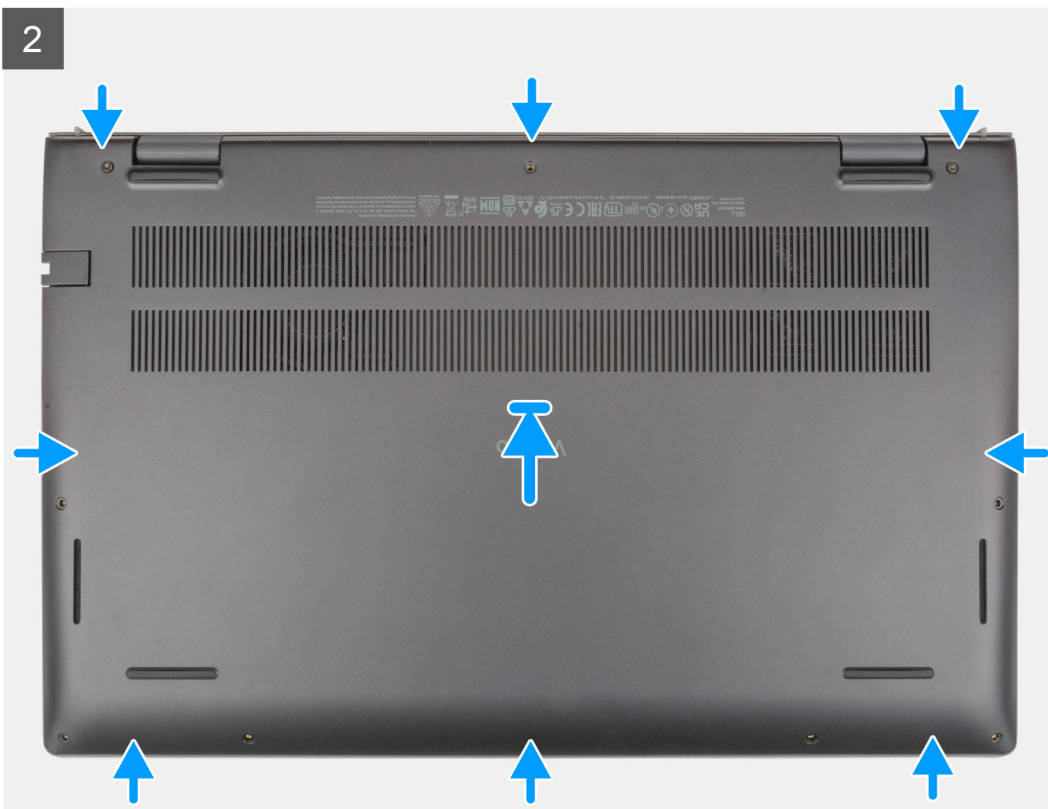
The following images indicate the location of the base cover and provide a visual representation of the installation procedure.



7x
M2x4



2x
M2x7.5



3



Steps

1. Place the base cover on top of the palm-rest and keyboard assembly.
2. Align the screw holes on the base cover with the screw holes on the palm-rest and keyboard assembly, and then snap the base cover into place.
3. Tighten the two (M2x7.5) captive screws that secure the base cover to the palm-rest and keyboard assembly.
4. Replace the seven (M2x4) screws that secure the base cover to the palm-rest and keyboard assembly.

Next steps

1. Exit [Service Mode](#).
2. Follow the procedure in [After working inside your computer](#).

Battery

Rechargeable Li-ion battery precautions

⚠ CAUTION:

- Exercise caution when handling rechargeable Li-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 rechargeable Li-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 rechargeable Li-ion batteries, see [Handling swollen rechargeable Li-ion batteries](#).

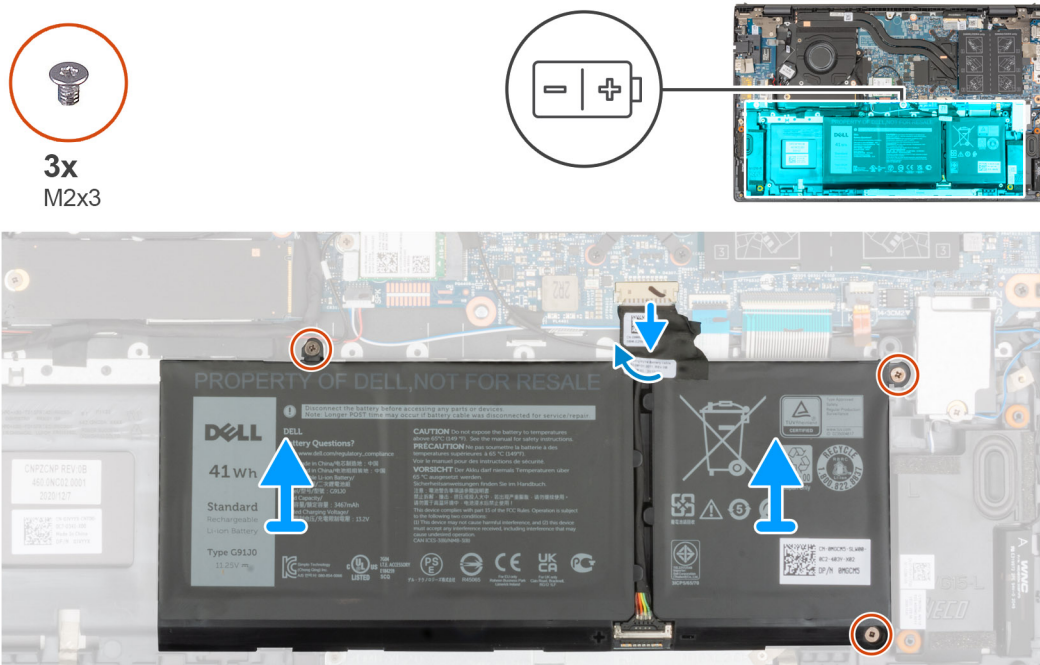
Removing the 3-cell battery

Prerequisites

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

About this task

The following image indicates the location of the 3-cell (41 Wh) battery and provides a visual representation of the removal procedure.



Steps

1. Peel the tape that secures the battery cable to the system board.
2. Disconnect the battery cable from the system board.
3. Remove the three (M2x3) screws that secure the 3-cell battery to the palm-rest and keyboard assembly.
4. Lift the 3-cell battery, along with its cable, off the palm-rest and keyboard assembly.

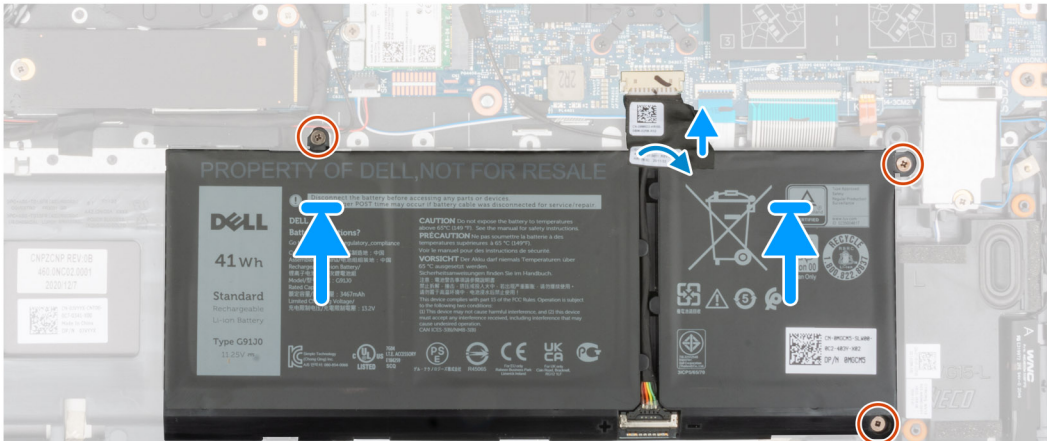
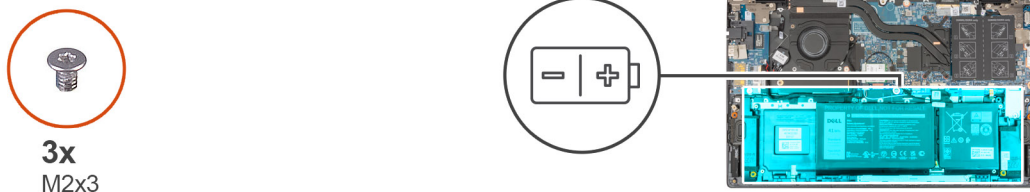
Installing the 3-cell battery

Prerequisites

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

About this task

The following image indicates the location of the 3-cell (41 Wh) battery and provides a visual representation of the installation procedure.



Steps

1. Using the alignment posts, place the 3-cell battery on the palm-rest and keyboard assembly.
2. Align the screw holes on the 3-cell battery with the screw holes on the palm-rest and keyboard assembly.
3. Replace the three (M2x3) screws that secure the 3-cell battery to the palm-rest and keyboard assembly.
4. Connect the battery cable to the system board.
5. Adhere the tape that secures the battery cable to the system board.

Next steps

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

Removing the 4-cell battery

Prerequisites

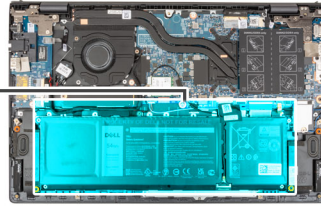
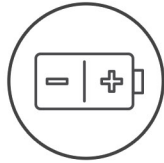
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).

About this task

The following image indicates the location of the 4-cell (54 Wh) battery and provides a visual representation of the removal procedure.



4x
M2x3



Steps

1. Peel the tape that secures the battery cable to the system board.
2. Disconnect the battery cable from the system board.
3. Remove the four (M2x3) screws that secure the 4-cell battery to the palm-rest and keyboard assembly.
4. Lift the 4-cell battery, along with its cable, off the palm-rest and keyboard assembly.

Installing the 4-cell battery

Prerequisites

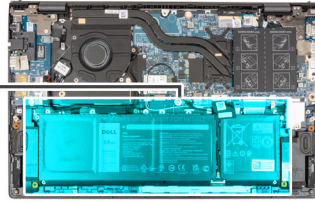
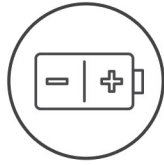
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the 4-cell (54 Wh) battery and provides a visual representation of the installation procedure.



4x
M2x3



Steps

1. Using the alignment posts, place the 4-cell battery on the palm-rest and keyboard assembly.
2. Align the screw holes on the 4-cell battery with the screw holes on the palm-rest and keyboard assembly.
3. Replace the four (M2x3) screws that secure the 4-cell battery to the palm-rest and keyboard assembly.
4. Connect the battery cable to the system board.
5. Adhere the tape that secures the battery cable to the system board.

Next steps

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

Battery cable

Removing the battery cable

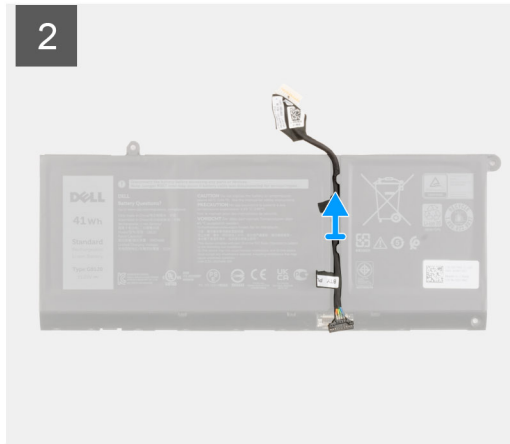
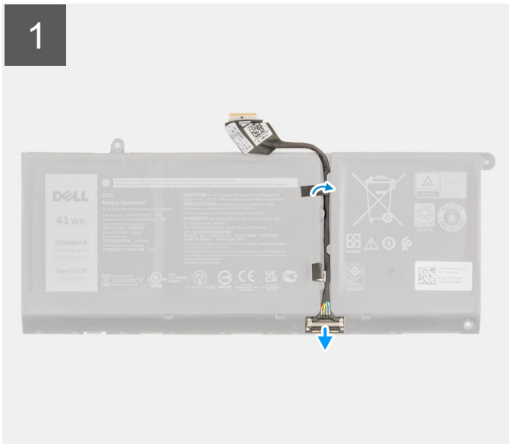
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [3-cell battery](#) or [4-cell battery](#), whichever applicable.

i NOTE: If battery is disconnected from system board for service, then there is a delay during system boot as the system undergoes RTC battery reset.

About this task

The following images indicate the location of the battery cable and provide a visual representation of the removal procedure.



Steps

1. Flip the battery and remove the battery cable from the routing guides on the battery.
2. Disconnect the battery cable from the connector on the battery.
3. Lift the battery cable off the battery.

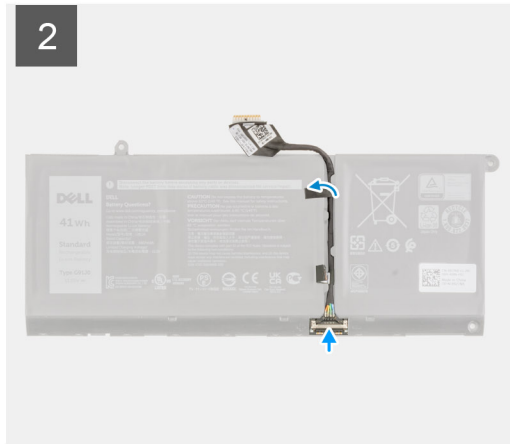
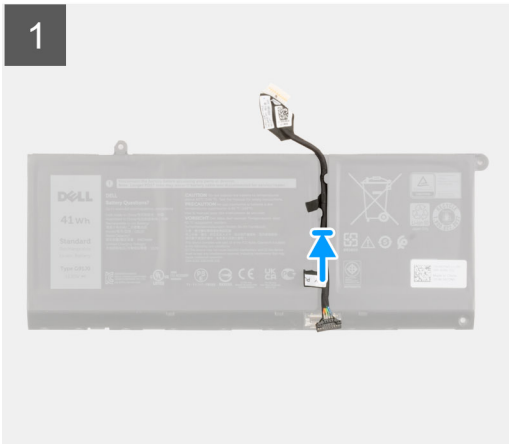
Installing the battery cable

Prerequisites

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

About this task

The following image indicates the location of the battery cable and provides a visual representation of the installation procedure.



Steps

1. Align and place the battery cable on the battery.
2. Route the battery cable through the routing guides on the battery.
3. Connect the battery cable to the connector on the battery.

Next steps

1. Install the [3-cell battery](#) or [4-cell battery](#), whichever applicable.
2. Install the [base cover](#).
3. Follow the procedure in [After working on your computer](#).

Memory

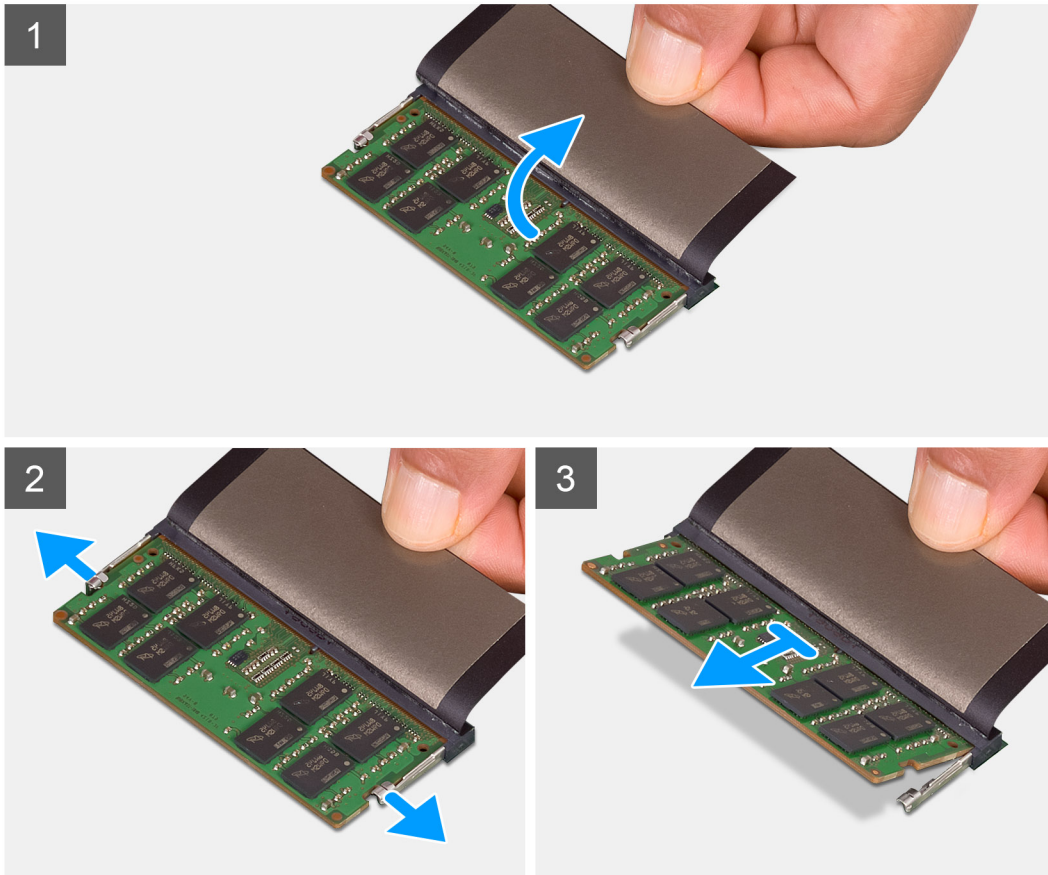
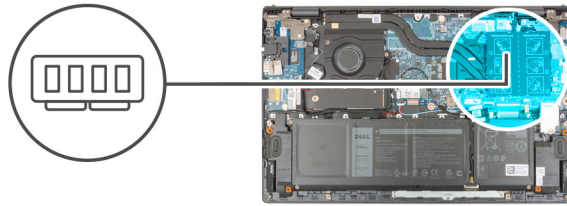
Removing the memory module

Prerequisites

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


About this task

The following images indicate the location of the memory module and provide a visual representation of the removal procedure.



Steps

1. Lift the Mylar to access the memory module.
2. Use your fingertips to pull the securing clips from both sides of the memory module until the memory module pops-up.
3. Remove the memory module from the memory-module slot.

 **NOTE:** Repeat step 1 to step 3 to remove any other memory modules installed in your computer.

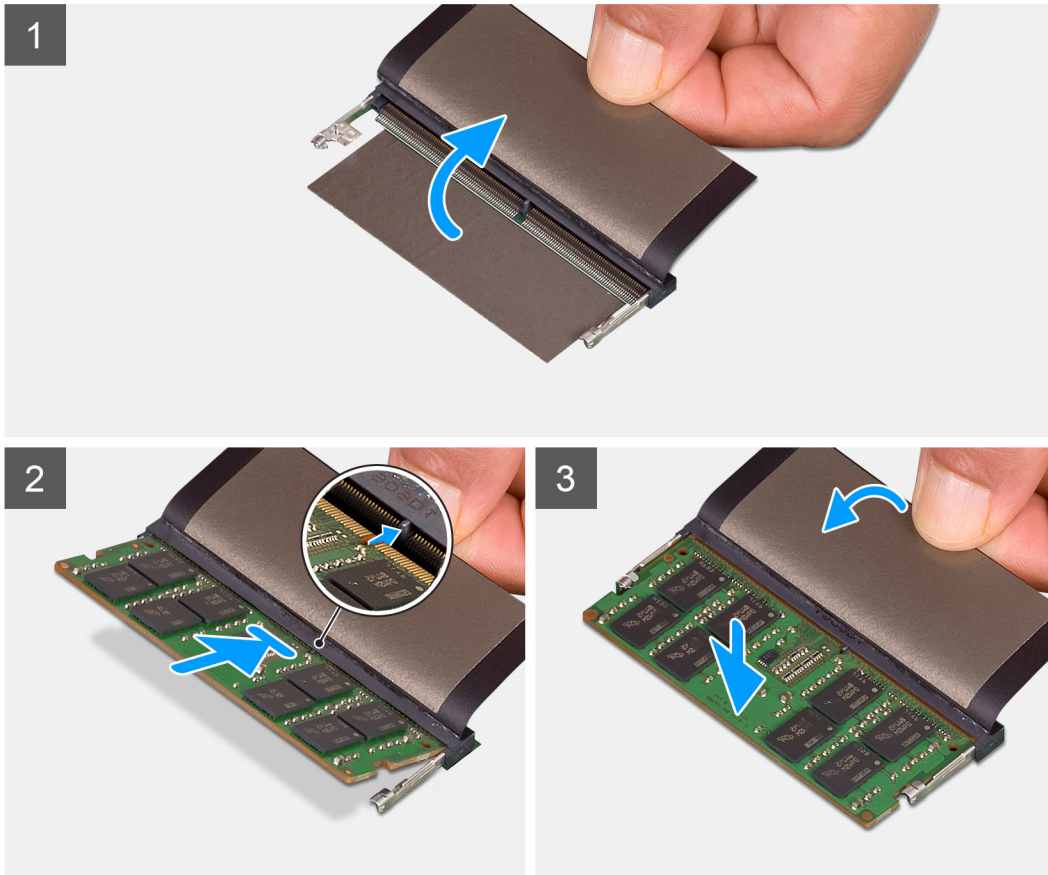
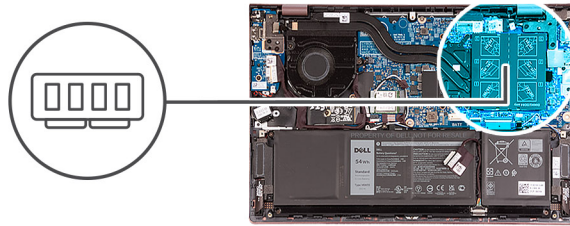
Installing the memory module

Prerequisites

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

About this task

The following image indicates the location of the memory module and provides a visual representation of the installation procedure.



Steps

1. Lift the Mylar to access the memory-module slot.
2. Align the notch on the memory module with the tab on the memory-module slot.
3. Slide the memory module firmly at an angle, into the memory-module slot.
4. Press the memory module down until it clicks into place.

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

i **NOTE:** Repeat step 1 to step 4 to install any other memory modules in your computer.

Next steps

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

Solid-state drive—M.2 slot one

Removing the 2230 solid-state drive from M.2 slot one

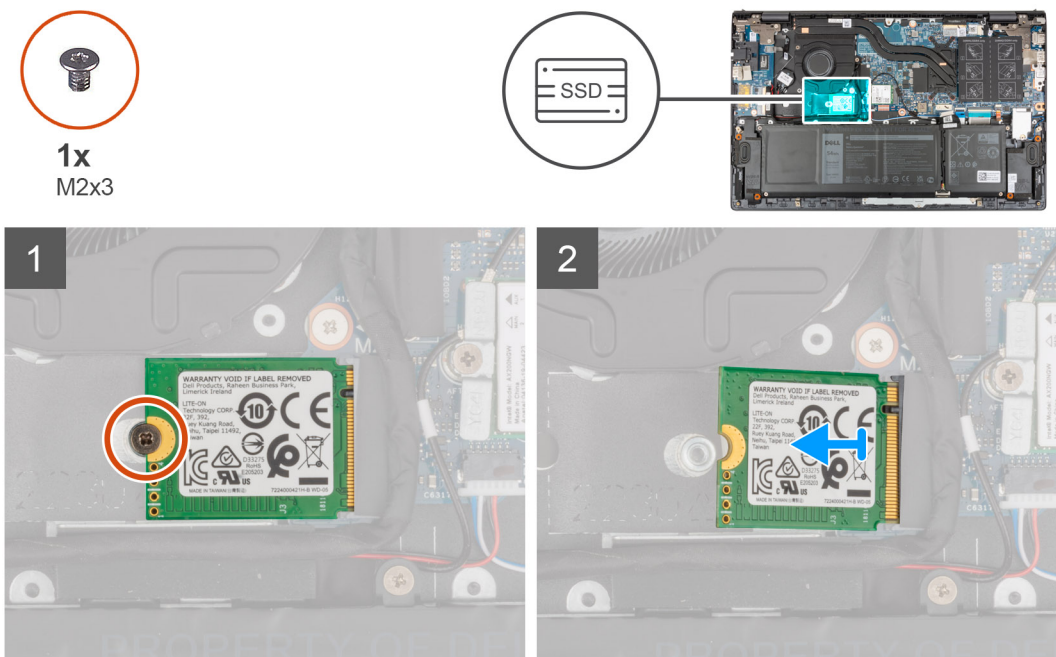
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
 - NOTE:** Solid-state drives are fragile. Exercise care when handling the solid-state drive.
 - NOTE:** To avoid data loss, do not remove the solid-state drive while the computer is in sleep or on state.
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

- NOTE:** Depending on the configuration ordered, your computer may support a 2230 solid-state drive, or a 2280 solid-state drive in M.2 slot one.
- NOTE:** This procedure applies only to computers shipped with a 2230 solid-state drive installed in M.2 slot one.

The following image indicates the location of the 2230 solid-state drive that is installed in M.2 slot one and provides a visual representation of the removal procedure.



Steps

1. Remove the screw (M2x3) that secures the 2230 solid-state drive to the palm-rest and keyboard assembly.
2. Slide and remove the solid-state drive from the M.2 slot one.

Installing the 2230 solid-state drive in M.2 slot one

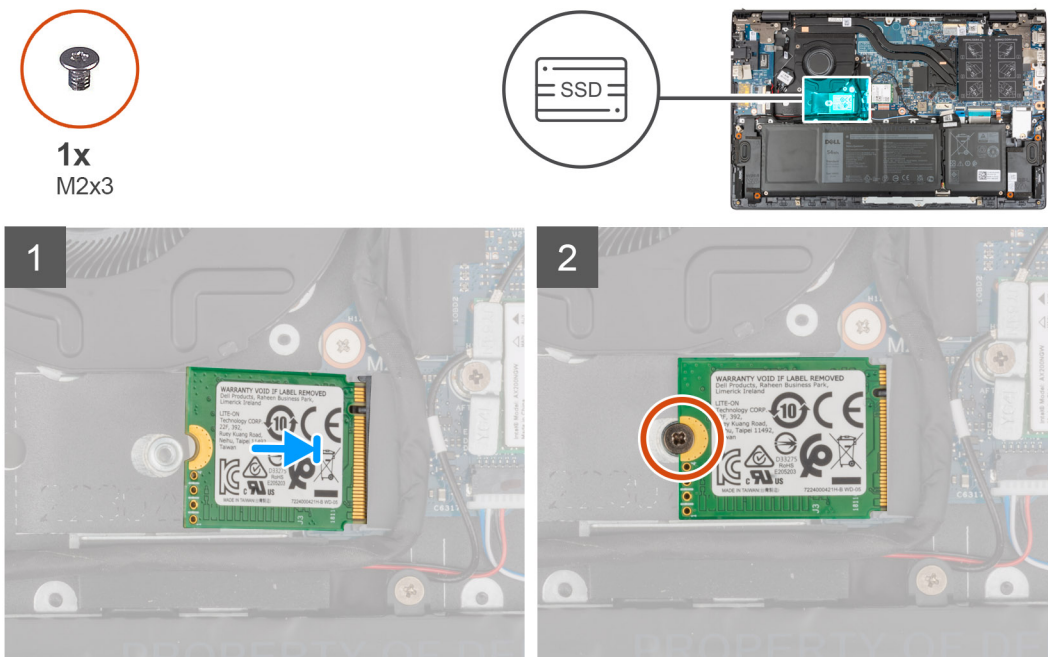
Prerequisites

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

About this task

- NOTE:** Solid-state drives are fragile. Exercise care when handling the solid-state drive.
- NOTE:** Depending on the configuration ordered, your computer may support a 2230 solid-state drive, or a 2280 solid-state drive in M.2 slot one.
- NOTE:** This procedure applies only if you are installing a 2230 solid-state drive in M.2 slot one.
- NOTE:** Before installing your 2230 or 2280 solid-state drive, ensure that the mounting bracket is in the correct location. For more information, see [Installing the solid-state drive mounting bracket](#).

The following image indicates the location of the 2230 solid-state drive that is installed in M.2 slot one and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the 2230 solid-state drive with the tab on the solid-state drive slot.
2. Slide the 2230 solid-state drive firmly into the solid-state drive slot at an angle.
3. Align the screw hole on the solid-state drive with the screw hole on the palm-rest and keyboard assembly.
4. Replace the screw (M2x3) that secures the 2230 solid-state drive to the palm-rest and keyboard assembly.

Next steps

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

Removing the 2280 solid-state drive from M.2 slot one

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
 - NOTE:** Solid-state drives are fragile. Exercise care when handling the solid-state drive.
 - NOTE:** To avoid data loss, do not remove the solid-state drive while the computer is in sleep or on state.

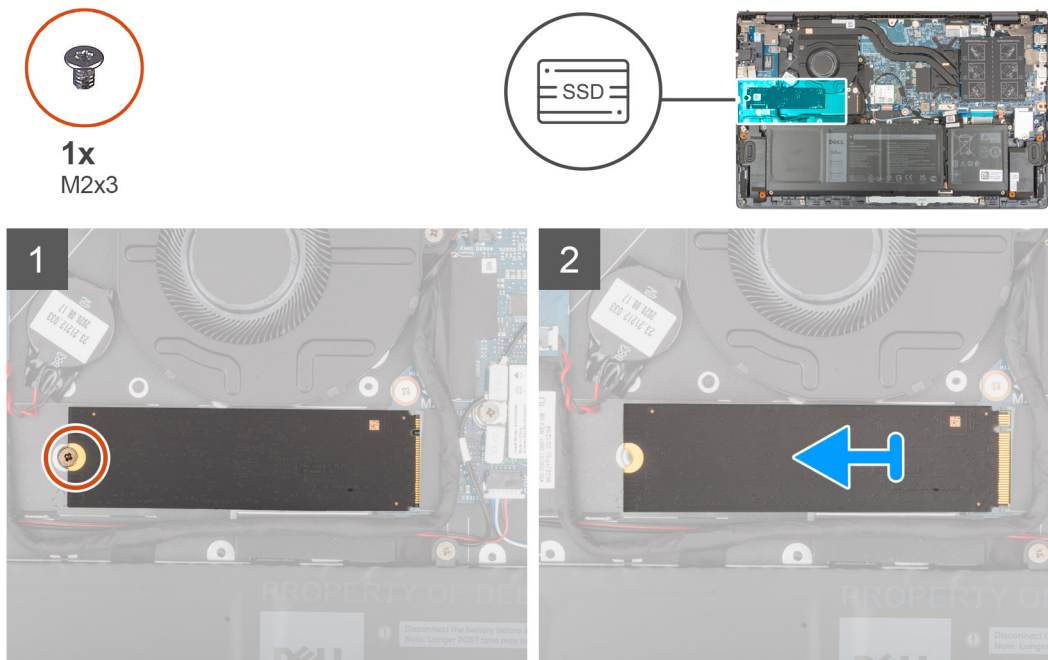
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

NOTE: Depending on the configuration ordered, your computer may support a 2280 solid-state drive, or a 2230 solid-state drive in M.2 slot one.

NOTE: This procedure applies only to computers shipped with a 2280 solid-state drive installed in M.2 slot one.

The following image indicates the location of the 2280 solid-state drive that is installed in M.2 slot one and provides a visual representation of the removal procedure.



Steps

1. Remove the screw (M2x3) that secures the solid-state drive to the palm-rest and keyboard assembly.
2. Slide and lift the 2280 solid-state drive off the M.2 solid-state drive slot one on the system board.

Installing the 2280 solid-state drive in M.2 slot one

Prerequisites

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

About this task

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

NOTE: Depending on the configuration ordered, the computer one may support a 2280 solid-state drive, or a 2230 solid-state drive in M.2 slot one.

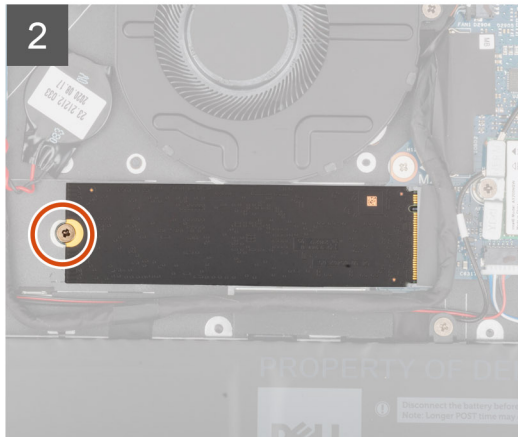
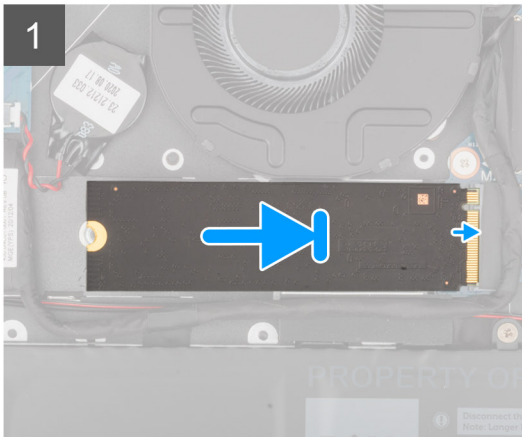
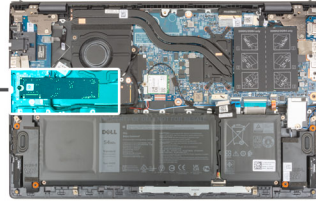
NOTE: This procedure is applicable if you are installing a 2280 solid-state drive in M.2 slot one.

NOTE: Before installing your 2230 or 2280 solid-state drive, ensure that the mounting bracket is in the correct location. For more information, see [Installing the solid-state drive mounting bracket](#).

The following image indicates the location of the 2280 solid-state drive that is installed in M.2 slot one and provides a visual representation of the installation procedure.



1x
M2x3



Steps

1. Align the notch on the 2280 solid-state drive with the tab on the solid-state drive slot.
2. Slide the 2280 solid-state drive firmly into the solid-state drive slot at an angle.
3. Align the screw hole on the solid-state drive with the screw hole on the palm-rest and keyboard assembly.
4. Replace the screw (M2x3) that secures the 2280 solid-state drive to the palm-rest and keyboard assembly.

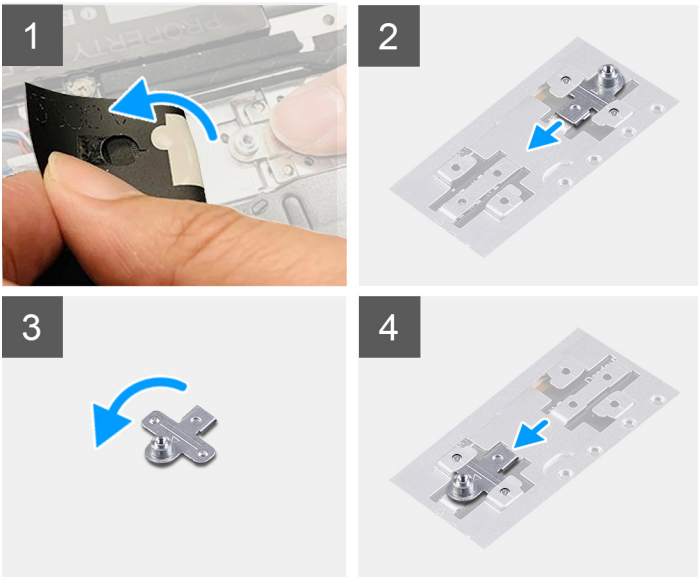
Next steps

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

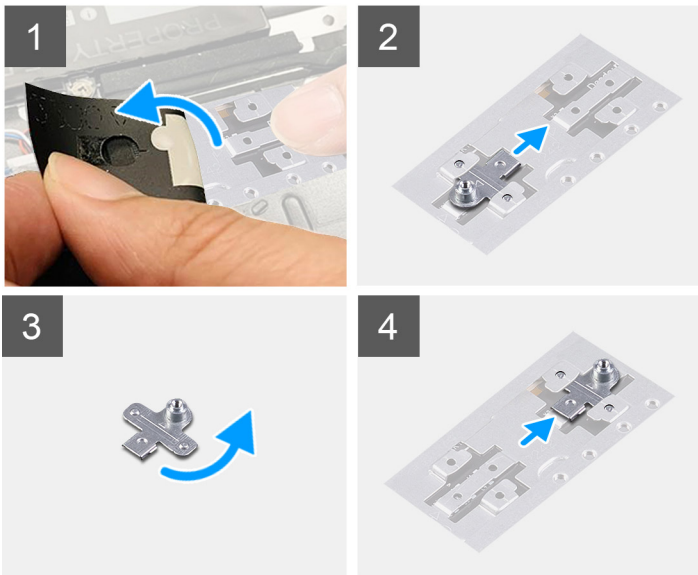
Installing the solid-state drive mounting bracket on M.2 slot one

About this task

The following image provides a visual representation of the procedure to install the solid-state drive mounting bracket when replacing M.2 2230 solid-state drive with M.2 2280 solid-state drive in M.2 slot one.



The following image provides a visual representation of the procedure to install the solid-state drive mounting bracket when replacing M.2 2280 solid-state drive with M.2 2230 solid-state drive in M.2 slot one.



Steps

1. Slide and remove the solid-state drive mounting bracket from the mounting bracket slot on the palm-rest and keyboard assembly.
2. Rotate the solid-state drive mounting bracket to 180 degrees.
3. Slide the solid-state mounting bracket into the mounting slot on the palm-rest and keyboard assembly.
4. Install the [2230 solid-state drive](#) or [2280 solid-state drive](#), whichever applicable.

Solid-state drive—M.2 slot two

Removing the 2230 solid-state drive from M.2 slot two

Prerequisites

 **NOTE:** M.2 slot two supports only 2230 solid-state drive.

NOTE: This procedure applies only to computers shipped with a 2230 solid-state drive installed in M.2 slot two.

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

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

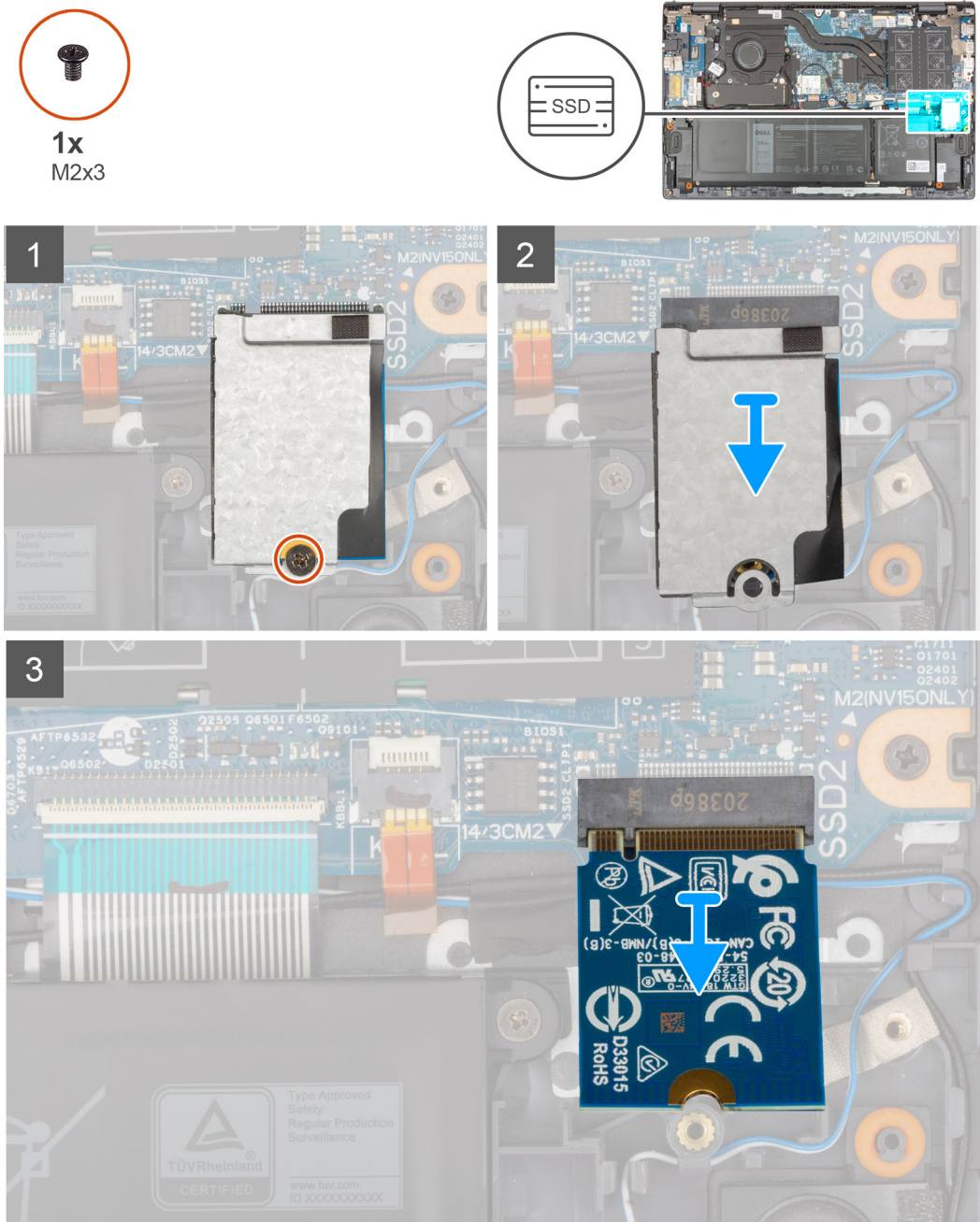
NOTE: To avoid data loss, do not remove the solid-state drive while the computer is in sleep or on state.

2. Enter [Service Mode](#).

3. Remove the [base cover](#).

About this task

The following image indicates the location of the 2230 solid-state drive that is installed in M.2 slot two and provides a visual representation of the removal procedure.



Steps


1. Remove the screw (M2x3) that secures the solid-state drive thermal shield and the solid-state drive to the palm-rest and keyboard assembly.
2. Slide and lift the solid-state drive thermal shield off the solid-state drive.
3. Slide and remove the solid-state drive from the M.2 slot two.

Installing the 2230 solid-state drive in M.2 slot two


Prerequisites

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

About this task

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

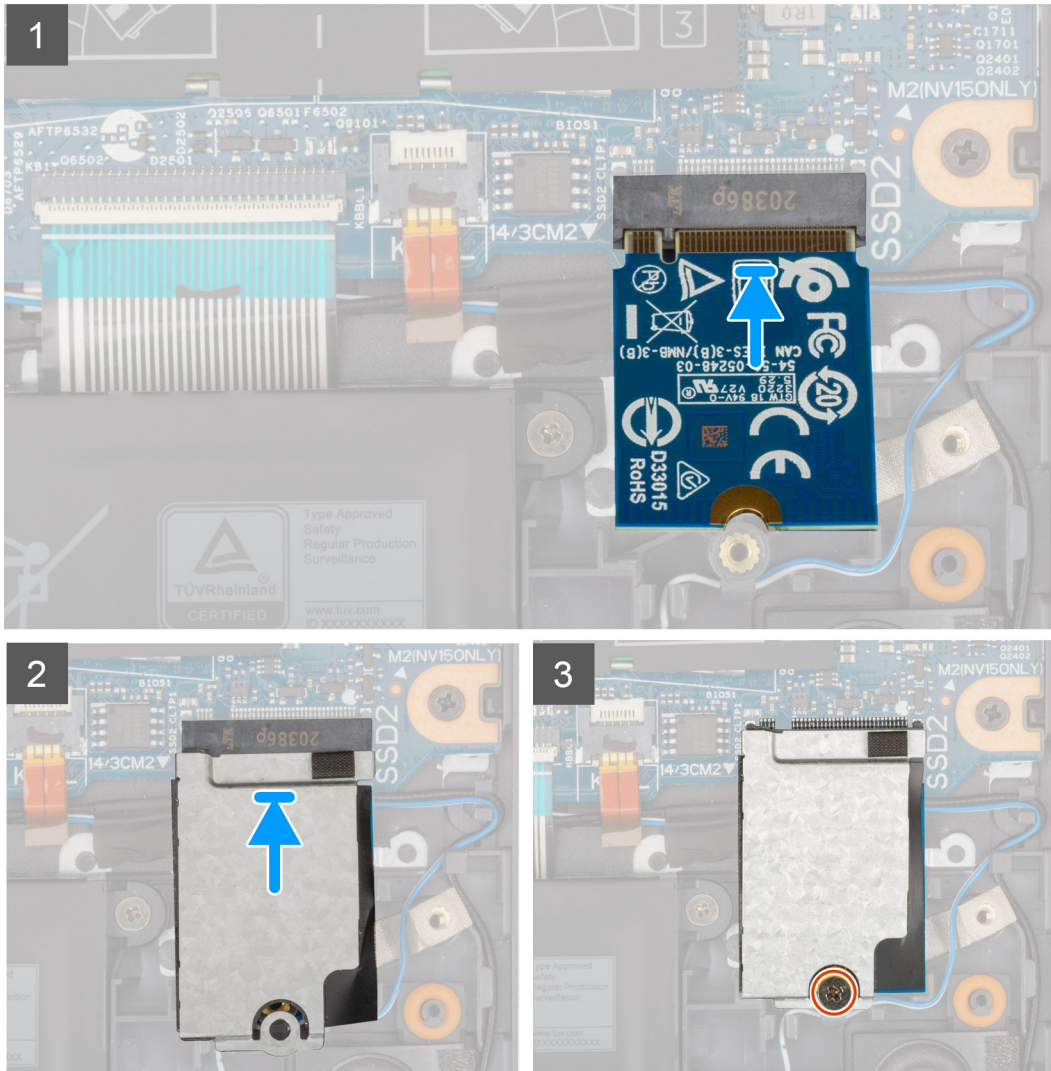
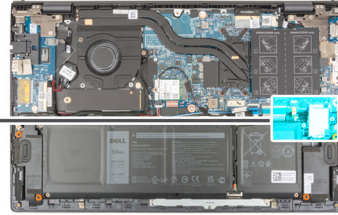
 **NOTE:** M.2 slot two supports only 2230 solid-state drive.

 **NOTE:** This procedure applies only to computers shipped with a 2230 solid-state drive installed in M.2 slot two.

The following image indicates the location of the 2230 solid-state drive that is installed in M.2 slot two and provides a visual representation of the installation procedure.



1x
M2x3



Steps

1. Align the notch on the 2230 solid-state drive with the tab on M.2 slot two on the system board.
2. Slide the 2230 solid-state drive into M.2 slot two on the system board.
3. Place the solid-state drive thermal shield on the solid-state drive.
4. Align the screw hole on the solid-state drive thermal shield with the screw hole on the palm-rest and keyboard assembly.
5. Replace the screw (M2x3) that secures the solid-state drive thermal shield and solid-state drive to the palm-rest and keyboard assembly.

Next steps

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

Wireless card

Removing the wireless card

Prerequisites

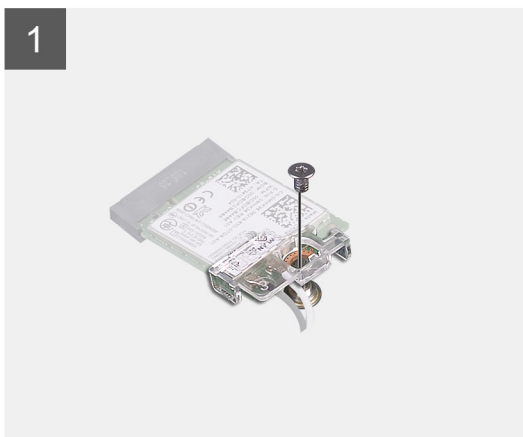
1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following images indicate the location of the wireless card and provide a visual representation of the removal procedure.



1x
M2x3



Steps

1. Remove the screw (M2x3) that secures the wireless-card bracket to the wireless card and system board.
2. Remove the wireless-card bracket from 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

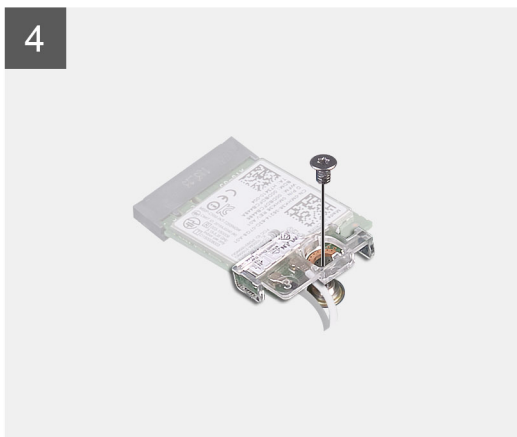
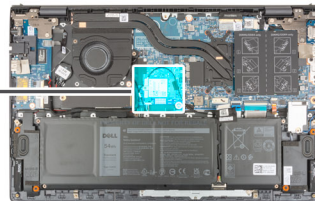
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the wireless card and provides a visual representation of the installation procedure.



1x
M2x3



Steps

1. Connect the antenna cables to the wireless card.

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

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color	Silkscreen marking	
Main	White	MAIN	△ (white triangle)
Auxiliary	Black	AUX	▲ (black triangle)

2. Align the notch on the wireless card with the tab on the wireless-card slot on the system board.
3. Slide and insert the wireless card at an angle into the wireless-card slot on the system board.
4. Align the screw hole on the wireless-card bracket to the screw hole on the wireless card and system board.
5. Replace the screw (M2x3) that secures the wireless-card bracket to the wireless card and the system board.

Next steps

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

Fan

Removing the fan

Prerequisites

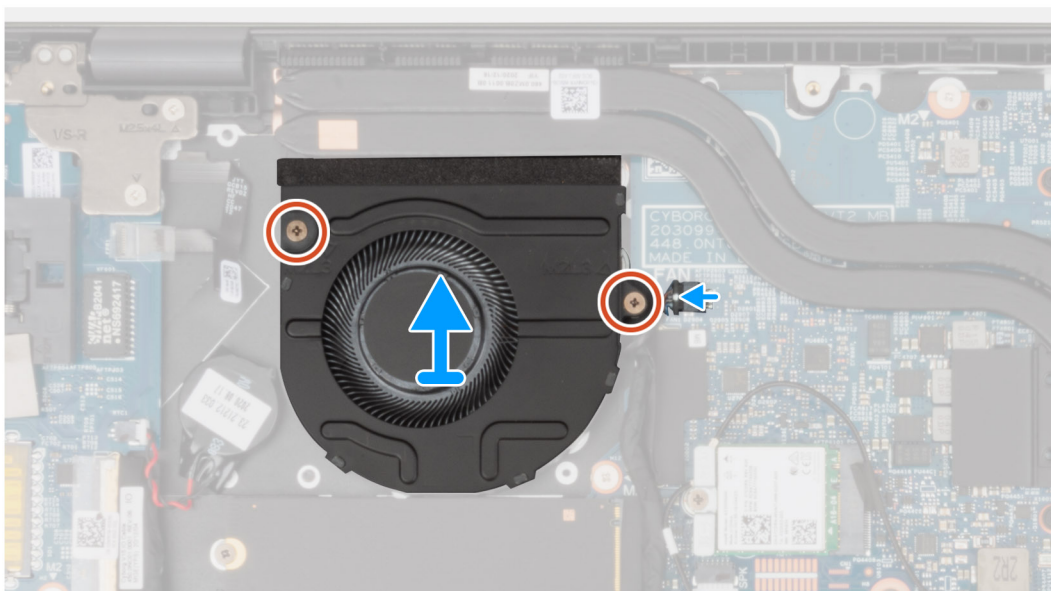
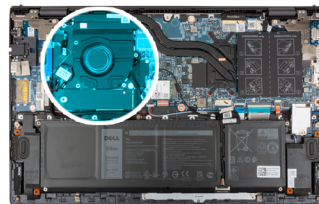
1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following images indicate the location of the fan and provide a visual representation of the removal procedure.



2x
M2x3



Steps

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

3. Lift the fan off the palm-rest and keyboard assembly.

Installing the fan

Prerequisites

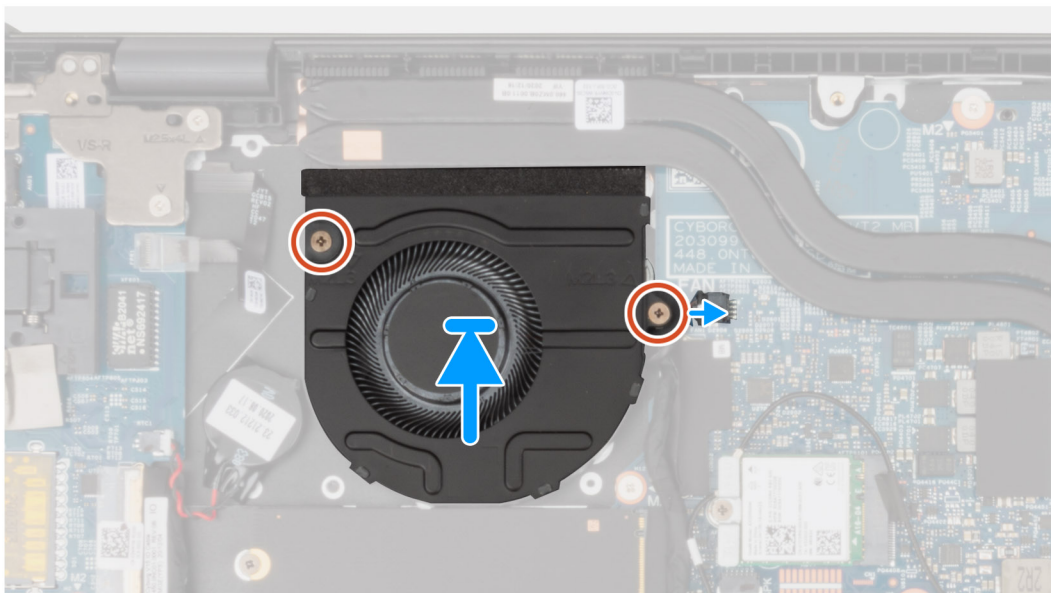
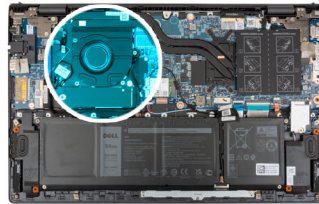
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the fan and provides a visual representation of the installation procedure.



2x
M2x3



Steps

1. Using the alignment posts, place the fan on the palm-rest and keyboard assembly.
2. Replace the two (M2x3) screws to 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. Exit [Service Mode](#).
3. Follow the procedure in [After working inside your computer](#).

Coin-cell battery

Removing the coin-cell battery

Prerequisites

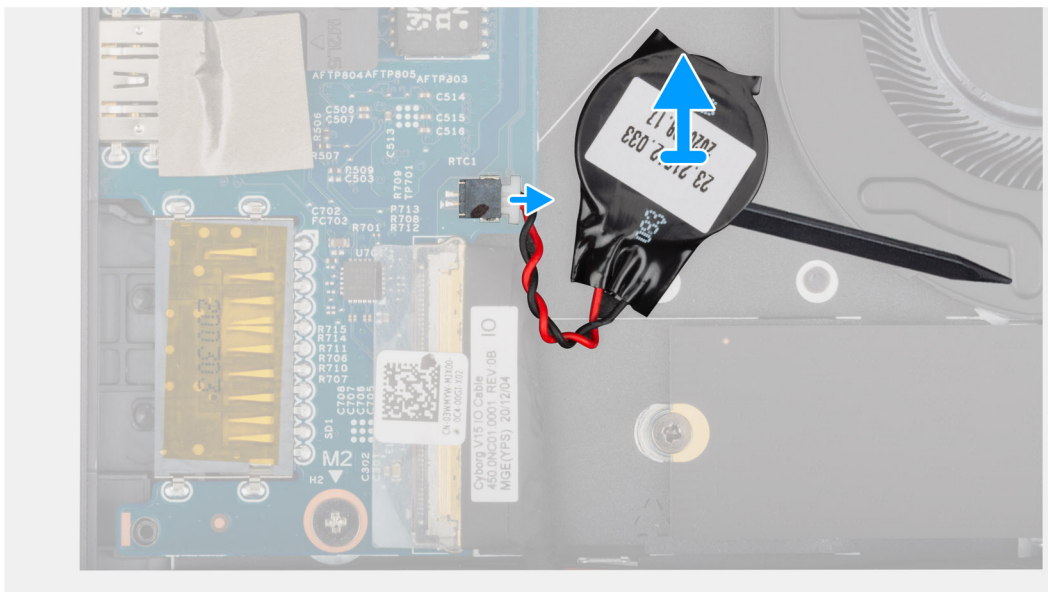
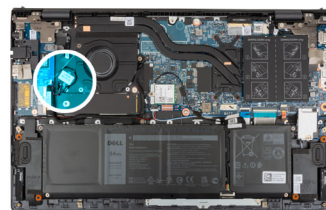
1. Follow the procedure in [Before working inside your computer](#).

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

2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following images indicate the location of the coin-cell battery and provide a visual representation of the removal procedure.



Steps

1. Disconnect the coin-cell battery cable from the I/O board.
2. Using the flat-end of a plastic scribe, peel the coin-cell battery from the palm-rest and keyboard assembly.

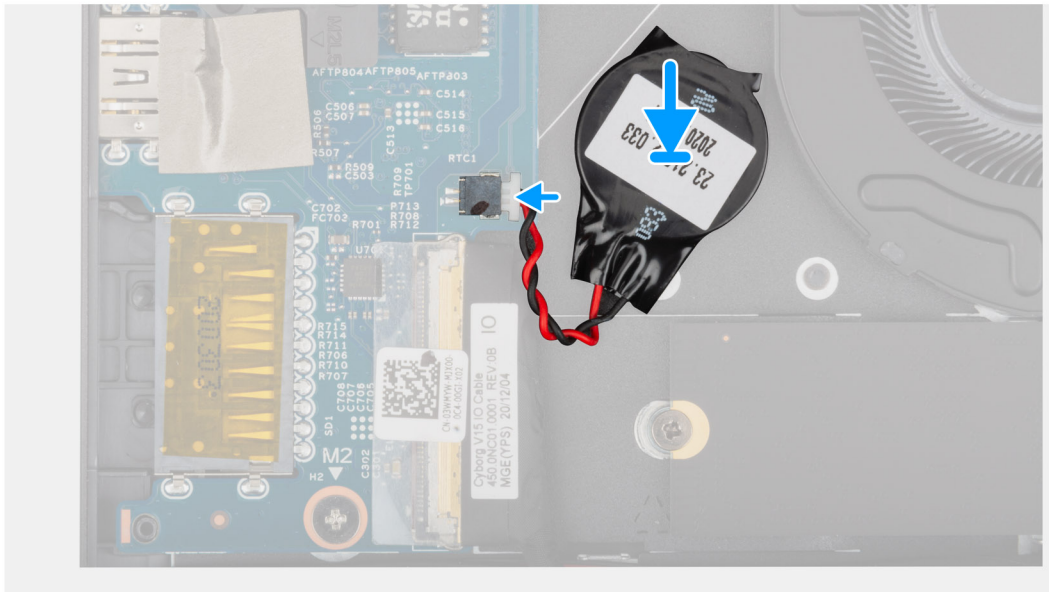
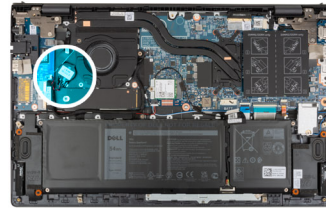
Installing the coin-cell battery

Prerequisites

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

About this task

The following image indicates 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 slot on the palm-rest and keyboard assembly.
2. Connect the coin-cell battery cable to the I/O board.

Next steps

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

Heat sink

Removing the heatsink

Prerequisites

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

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

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

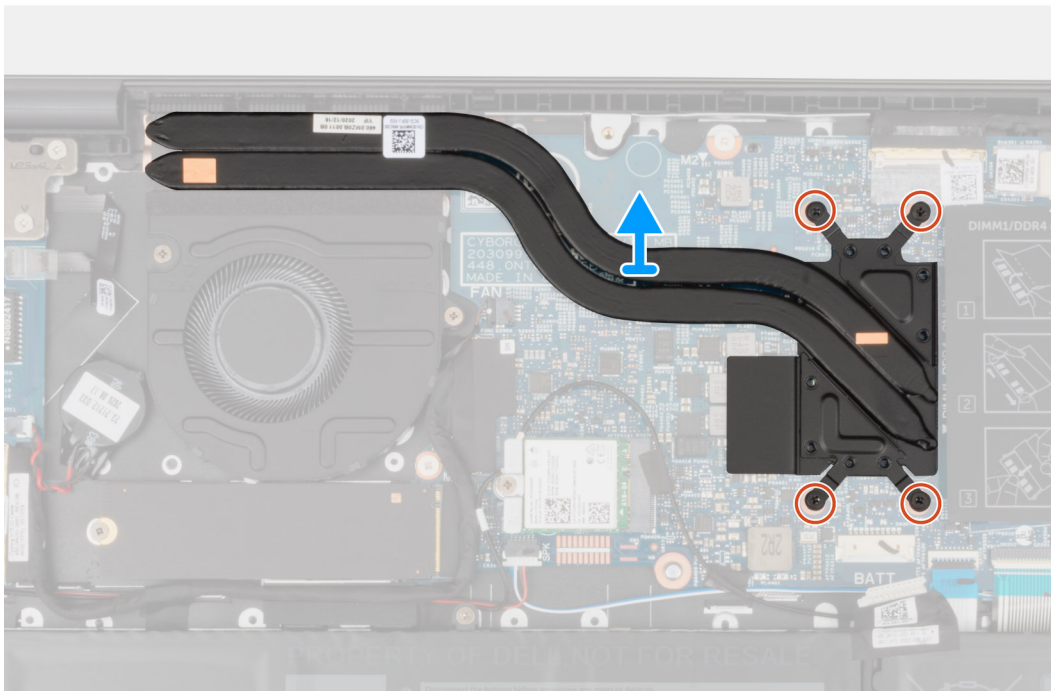
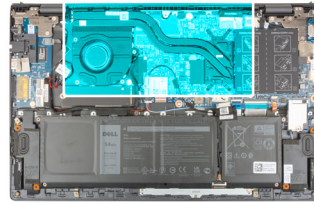
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following images indicate the location of the heatsink and provide a visual representation of the removal procedure.



4x



Steps

1. In reverse sequential order (as indicated on the heat sink), 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 heatsink

Prerequisites

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

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

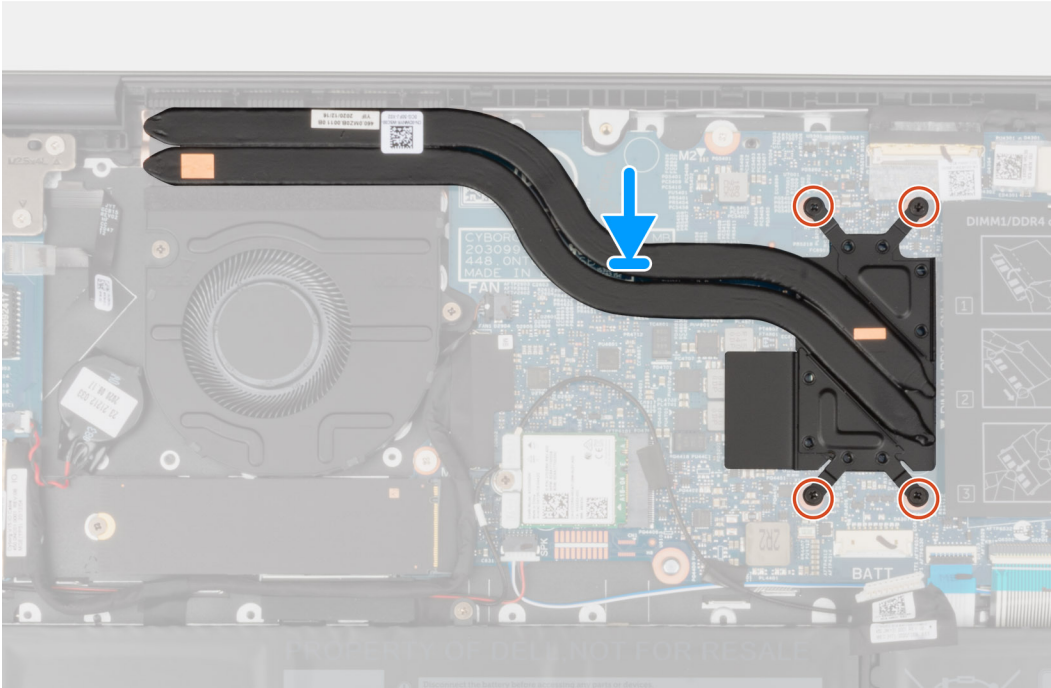
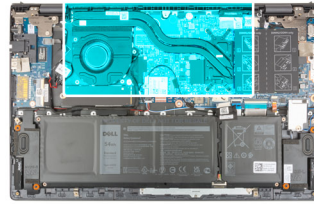
i NOTE: If either the system board or the heat sink is replaced, use the thermal pad/paste provided in the kit to ensure that thermal conductivity is achieved.

About this task

The following image indicates the location of the heatsink and provides a visual representation of the installation procedure.



4x



Steps

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

Next steps

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

Network-port bracket

Removing the network-port bracket

Prerequisites

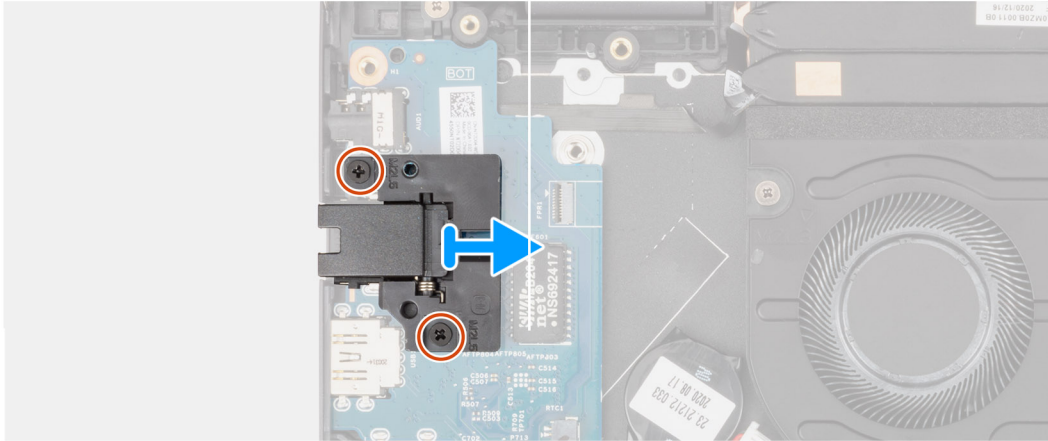
1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following image(s) indicate the location of the network-port bracket and provide a visual representation of the removal procedure.



2x
M2x5



Steps

1. Remove the two (M2x5) screws that secure the network-port bracket to the I/O board.
2. Lift the network-port bracket off the I/O board.

Installing the network-port bracket

Prerequisites

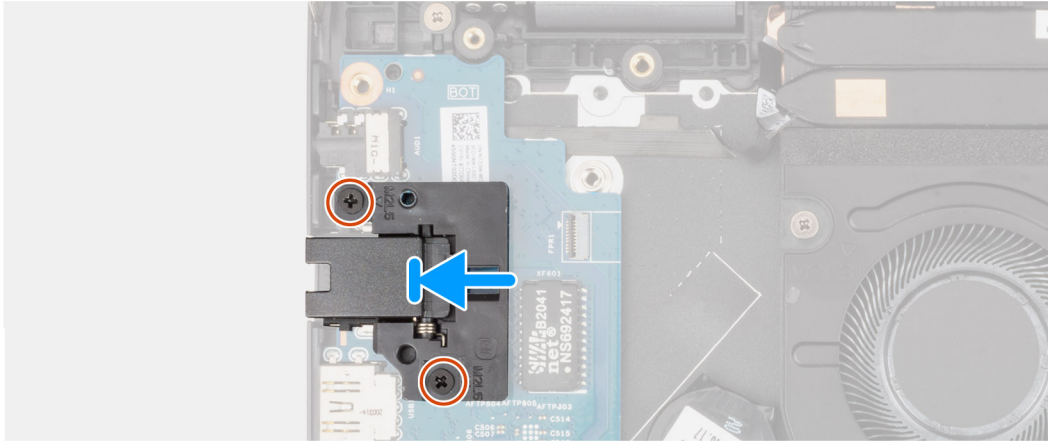
If you are replacing a component, remove the existing component before performing the installation process.

About this task

The following image(s) indicate the location of the network-port bracket and provide a visual representation of the installation procedure.



2x
M2x5



Steps

1. Place the network-port bracket on the I/O board.
2. Align the screw holes on the network-port bracket to the screw holes on the I/O board.
3. Replace the two (M2x5) screws that secure the network-port bracket to the I/O board.

Next steps

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

I/O board

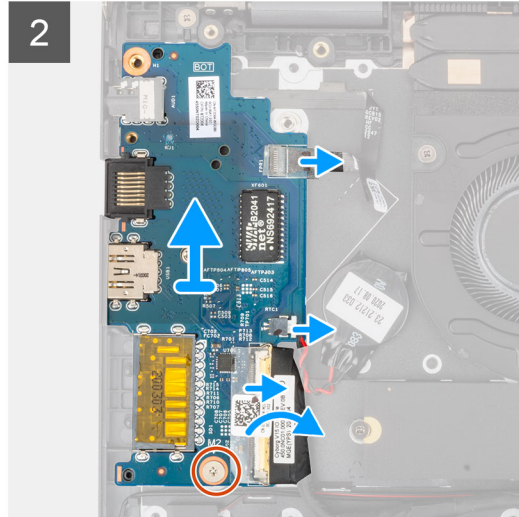
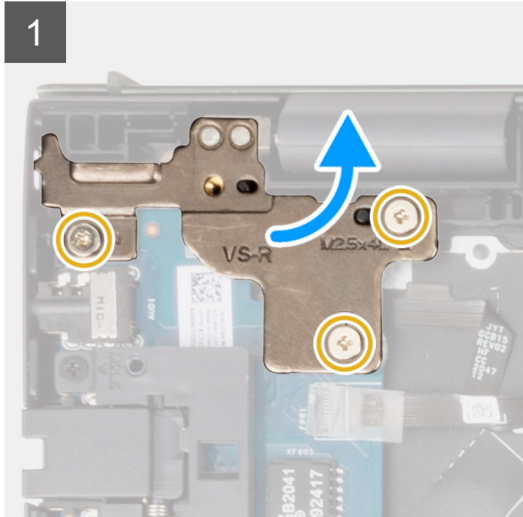
Removing the I/O board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).
4. Remove the [network-port bracket](#).

About this task

The following images indicate the location of the I/O board and provide a visual representation of the removal procedure.



Steps

1. Remove the three (M2.5x4.5) screws that secure the left hinge to the palm-rest and keyboard assembly.
2. Open the display hinge at an angle of 90 degrees.
3. Open the latch, and disconnect the power button with optional fingerprint reader cable from the I/O board.
4. Disconnect the coin-cell battery cable from the I/O board.
5. Peel the tape that secures the I/O-board cable to the I/O board.
6. Open the latch and disconnect the I/O-board cable from the I/O board.
7. Remove the screw (M2x2) that secures the I/O board to the palm-rest and keyboard assembly.
8. Lift the I/O board off the palm-rest and keyboard assembly.

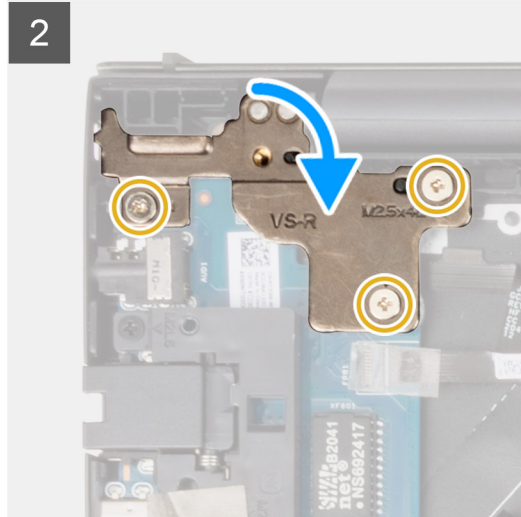
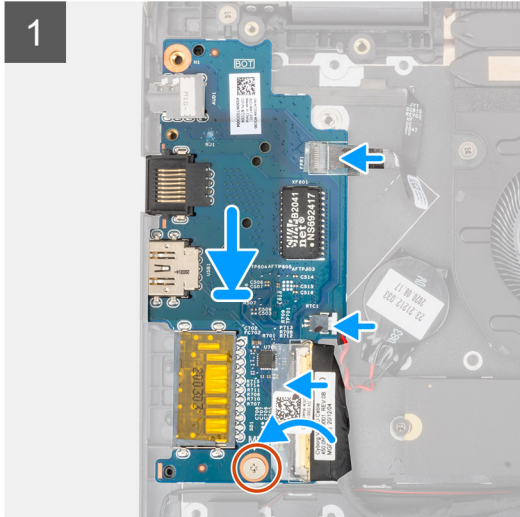
Installing the I/O board

Prerequisites

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

About this task

The following image indicates the location of the I/O board and provides a visual representation of the installation procedure.



Steps

1. Slide the I/O board into the slots on the palm-rest and keyboard assembly.
2. Align the screw hole on the I/O board with the screw hole on the palm-rest and keyboard assembly.
3. Replace the screw (M2x2) that secures the I/O board to the palm-rest and keyboard assembly.
4. Connect the power-button with optional fingerprint reader cable into the connector on the I/O board and close the latch to secure the cable.
5. Connect the coin-cell battery cable to the I/O board.
6. Connect the I/O-board cable to the I/O board and close the latch to secure the cable.
7. Adhere the tape that secures the I/O-board cable to the I/O board.
8. Close the left display hinge.
9. Replace the three (M2.5x4.5) screws that secure the left display hinge to the palm-rest and keyboard assembly.

Next steps

1. Install the [network-port bracket](#).
2. Install the [base cover](#).
3. Exit [Service Mode](#).
4. Follow the procedure in [After working inside your computer](#).

Speakers

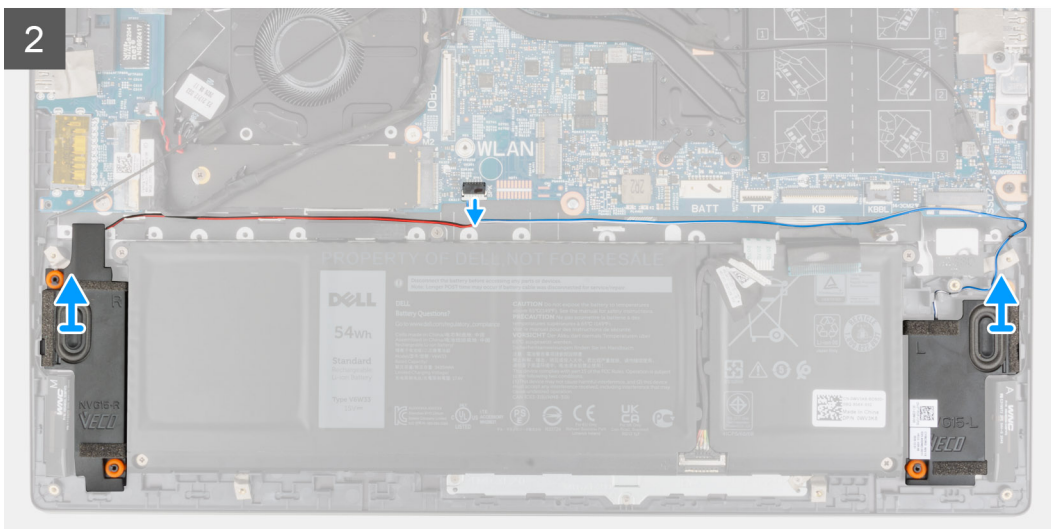
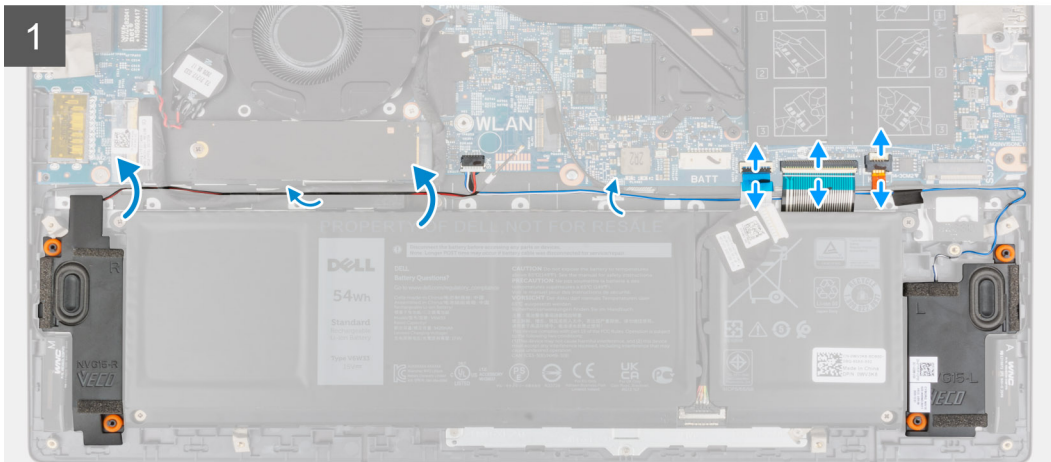
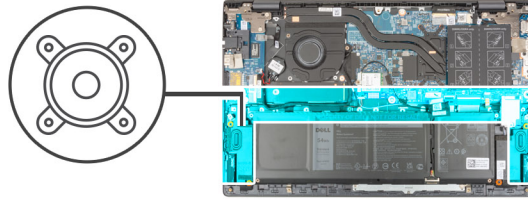
Removing the speakers

Prerequisites

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

About this task

The following images indicate the location of the speakers and provide a visual representation of the removal procedure.



Steps

1. Open the latch and disconnect the keyboard backlit cable, keyboard cable, and the touchpad cable from the system board.
2. Note the speaker cable routing, and remove the speaker cable from the routing guides on the palm-rest and keyboard assembly.
3. Peel the tape that secures the speaker cable to the palm-rest and keyboard assembly.
4. Disconnect the speaker cable from the system board.
5. Lift the speakers, along with the cable, off the palm-rest and keyboard assembly.

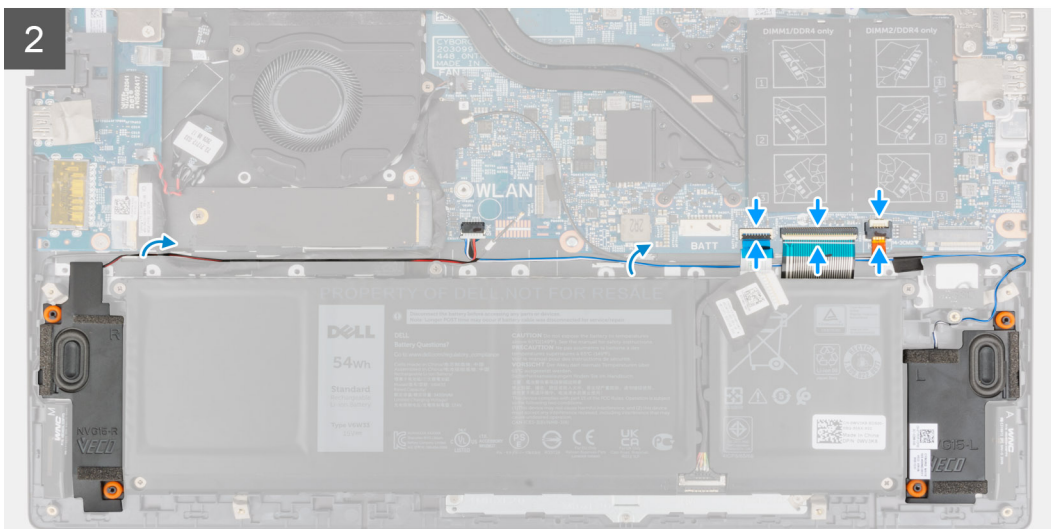
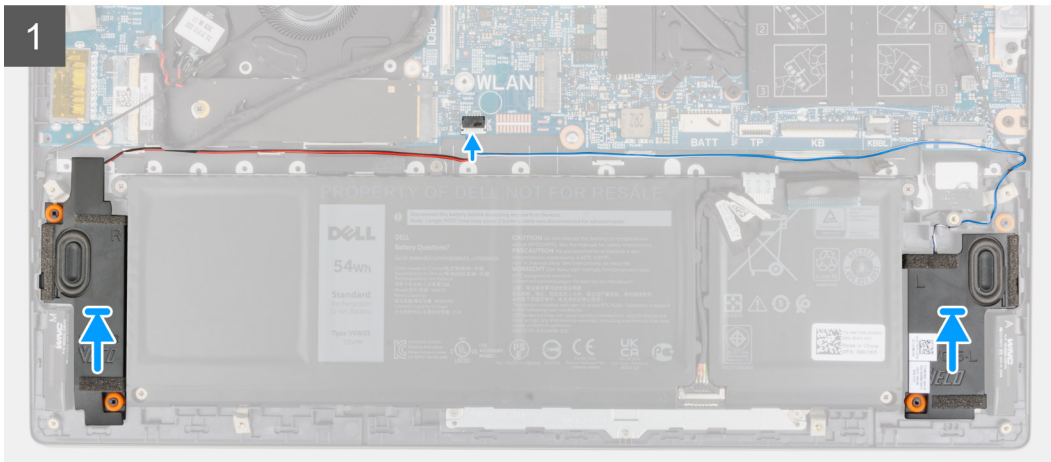
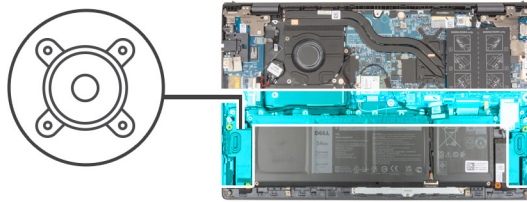
Installing the speakers

Prerequisites

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

About this task

The following image indicates the location of the speaker and provides a visual representation of the installation procedure.



Steps

1. Using the alignment posts and rubber grommets, place the speakers on the slots of the palm-rest and keyboard assembly.
2. Connect the speaker cable to the system board.
3. Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.
4. Connect the keyboard backlit cable, keyboard cable, and the touchpad cable to its connectors on the system board and close the latch to secure the cable.

Next steps

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

Touchpad

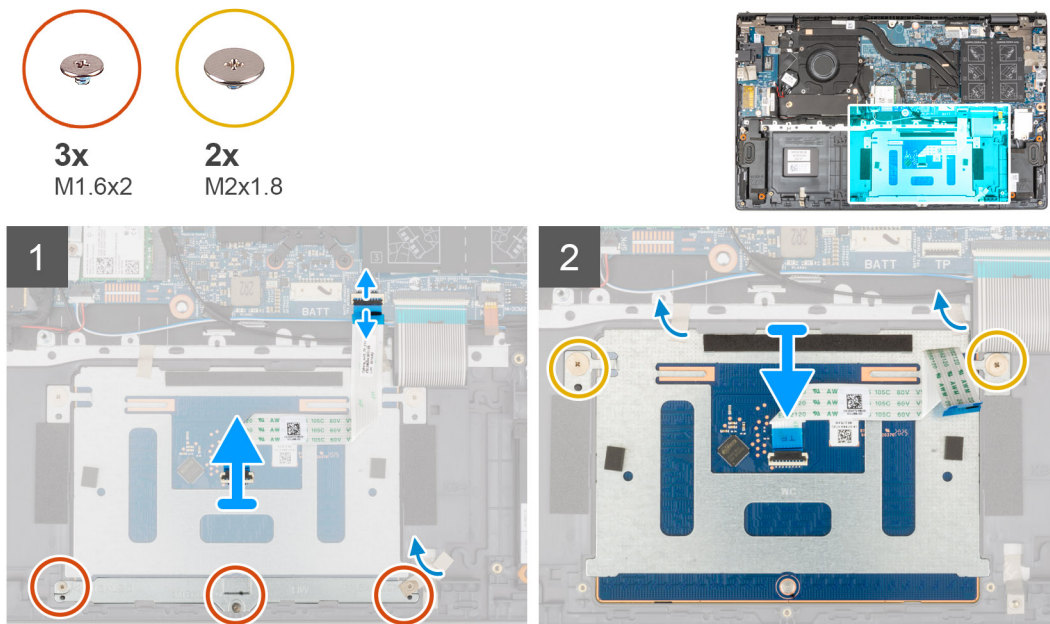
Removing the touchpad

Prerequisites

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

About this task

The following images indicate the location of the touchpad and provide a visual representation of the removal procedure.



Steps

1. Open the latch and disconnect the touchpad cable from the system board.
2. Remove the three (M1.6x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
3. Peel the tape that secures the touchpad bracket to the palm-rest and keyboard assembly.
4. Lift the touchpad bracket off the palm-rest and keyboard assembly.
5. Remove the two (M2x1.8) screws that secure the touchpad to the palm-rest and keyboard assembly.
6. Peel the tapes that secure the touchpad to the palm-rest and keyboard assembly.
7. Lift the touchpad, along with the touchpad cable, off the palm-rest and keyboard assembly.

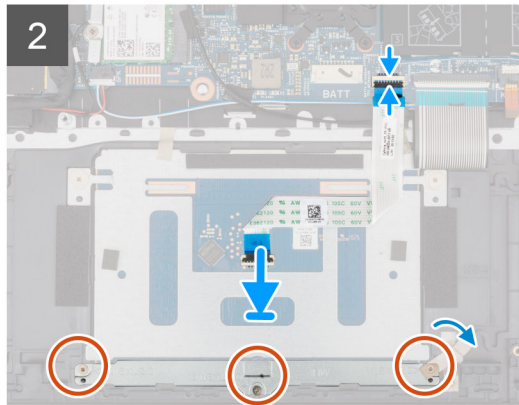
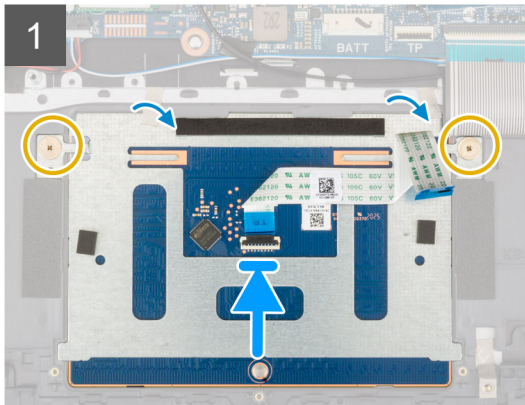
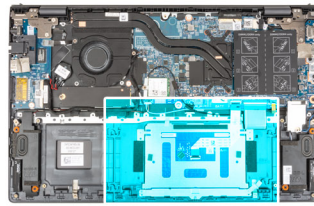
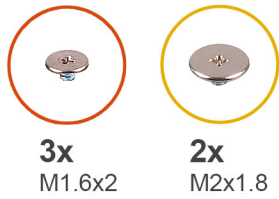
Installing the touchpad

Prerequisites

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

About this task

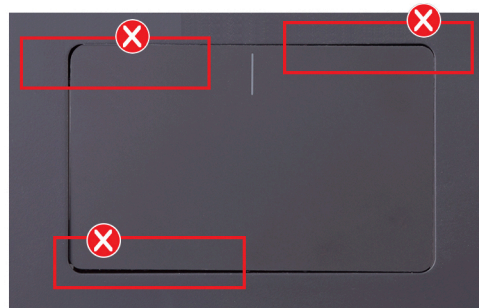
The following image indicates the location of the touchpad and provides a visual representation of the installation procedure.



Steps

1. Slide the touchpad into the slot on the palm-rest and keyboard assembly.

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



2. Replace the two (M2x1.8) screws that secure the touchpad to the palm-rest and keyboard assembly.
3. Adhere the tapes that secure the touchpad to the palm-rest and keyboard assembly.
4. Align the screw holes on the touchpad bracket with the screw holes on the palm-rest and keyboard assembly.
5. Replace the three (M1.6x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
6. Adhere the tape that secures the touchpad bracket to the palm-rest and keyboard assembly.
7. Slide the touchpad cable into the connector on the touchpad and close the latch to secure the cable.

Next steps

1. Install the [3-cell battery](#) or [4-cell battery](#), whichever applicable.
2. Install the [base cover](#).
3. Follow the procedure in [After working inside your computer](#).

Display assembly

Removing the display assembly

Prerequisites

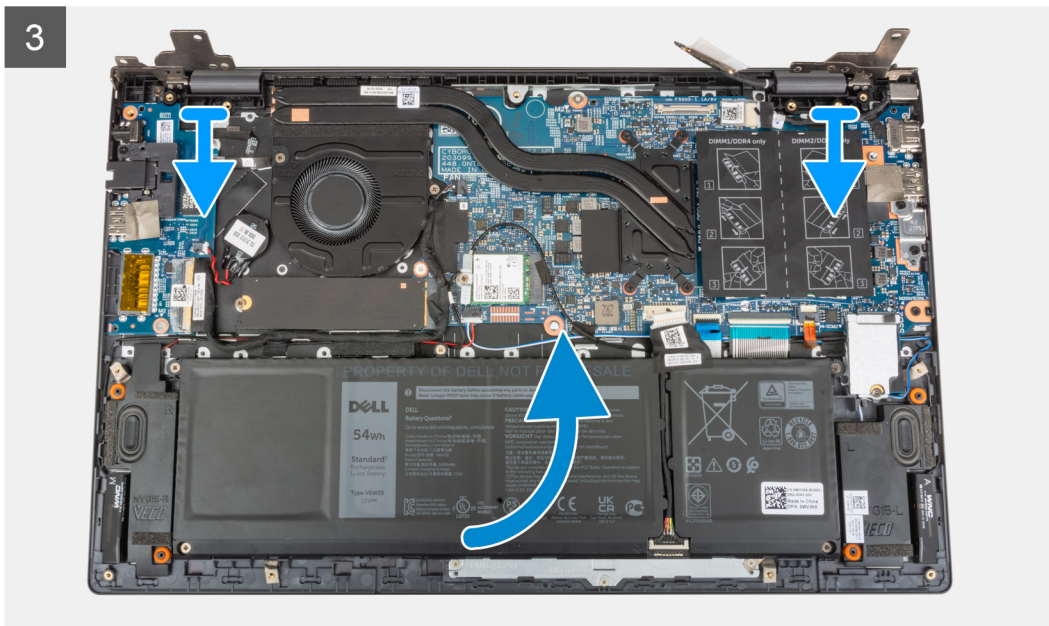
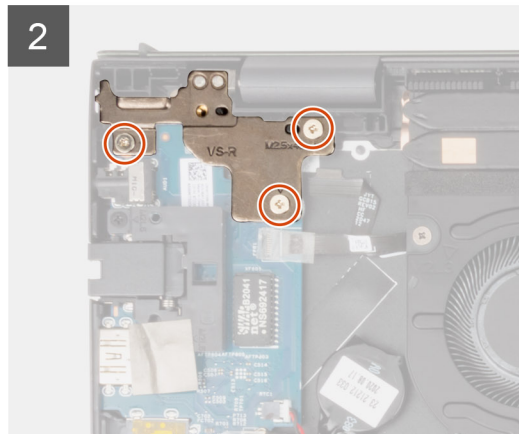
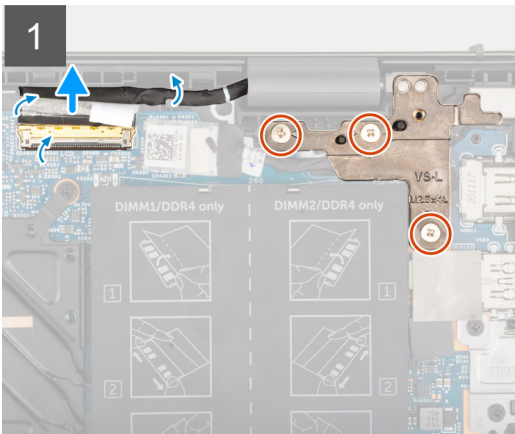
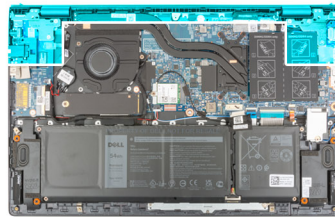
1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following images indicate the location of the display assembly and provide a visual representation of the removal procedure.



6x
M2.5x4.5





Steps

1. Peel the tape that secures the display cable to the system board.
2. Open the latch and disconnect the display cable from the system board.
3. Remove the three (M2.5x4.5) screws that secure the left-display hinge to the system board.
4. Remove the three (M2.5x4.5) screws that secure the right-display hinge to the system board.
5. Open the display hinges at an angle of 90 degrees.
6. Gently slide the palm-rest and keyboard assembly off the display assembly.

Installing the display assembly

Prerequisites

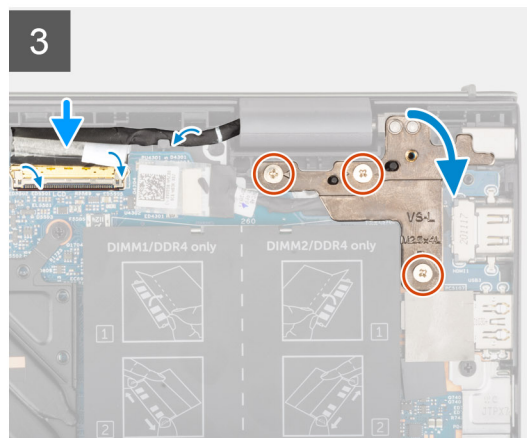
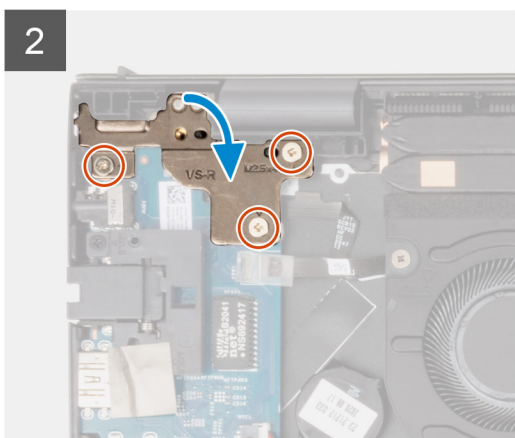
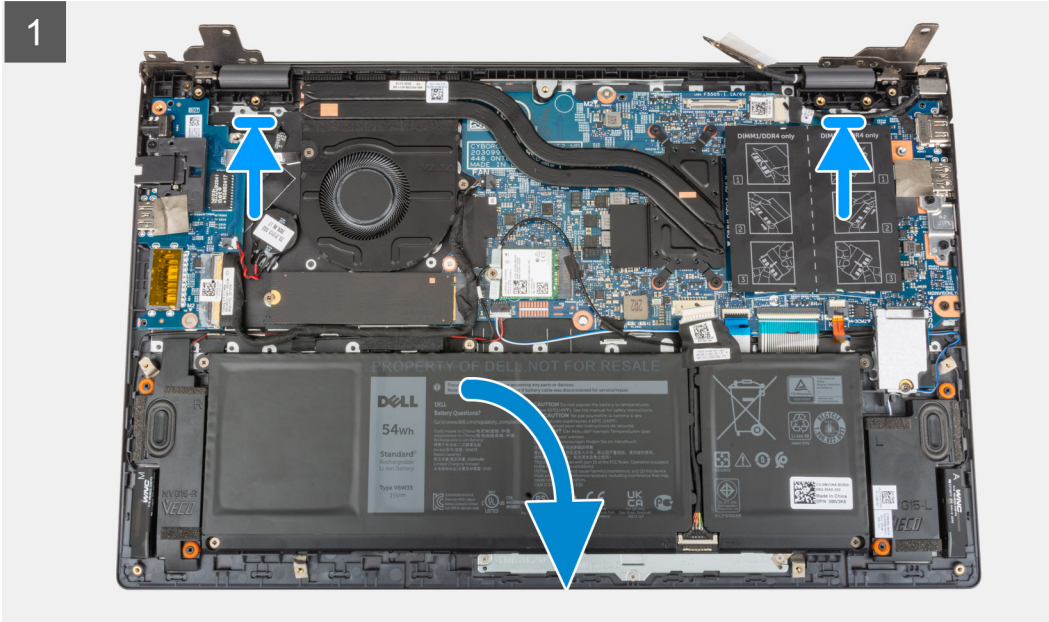
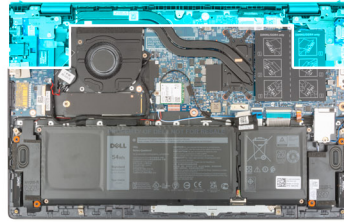
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the display assembly and provides a visual representation of the installation procedure.



6x
M2.5x4.5



Steps

1. Slide the display assembly at an angle, and place the display assembly on the palm-rest and keyboard assembly.
2. Using the alignment posts, close the display hinges.
3. Replace the three (M2.5x4.5) screws that secure the right-display hinge to the system board.
4. Replace the three (M2.5x4.5) screws that secure the left-display hinge to the system board.
5. Slide the display cable into the connector on the system board and close the latch to secure the cable.
6. Adhere the tape that secures the display cable to the system board.

Next steps

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

Power button with optional fingerprint reader

Removing the power button with optional fingerprint reader

Prerequisites

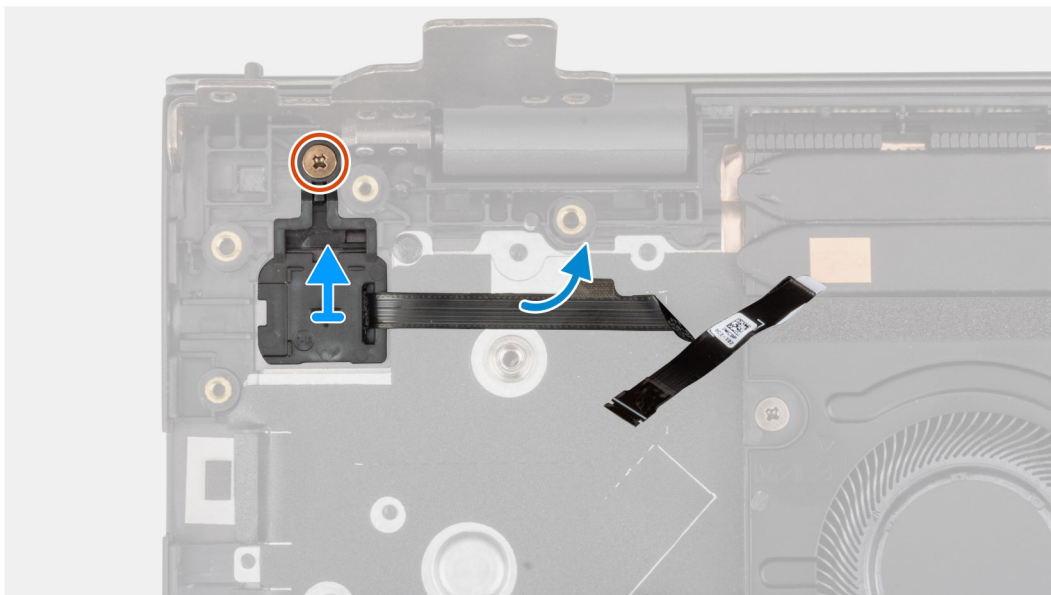
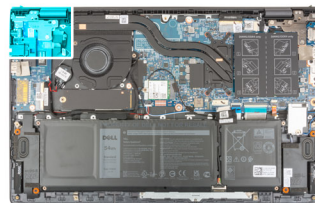
1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).
4. Remove the [I/O board](#).

About this task

The following images indicate the location of the power-button with optional fingerprint reader and provide a visual representation of the removal procedure.



1x
M2x3



Steps

1. Remove the screw (M2x3) that secures the power button with optional fingerprint reader to the palm-rest and keyboard assembly.
2. Lift the power button with optional fingerprint reader off the palm-rest and keyboard assembly.

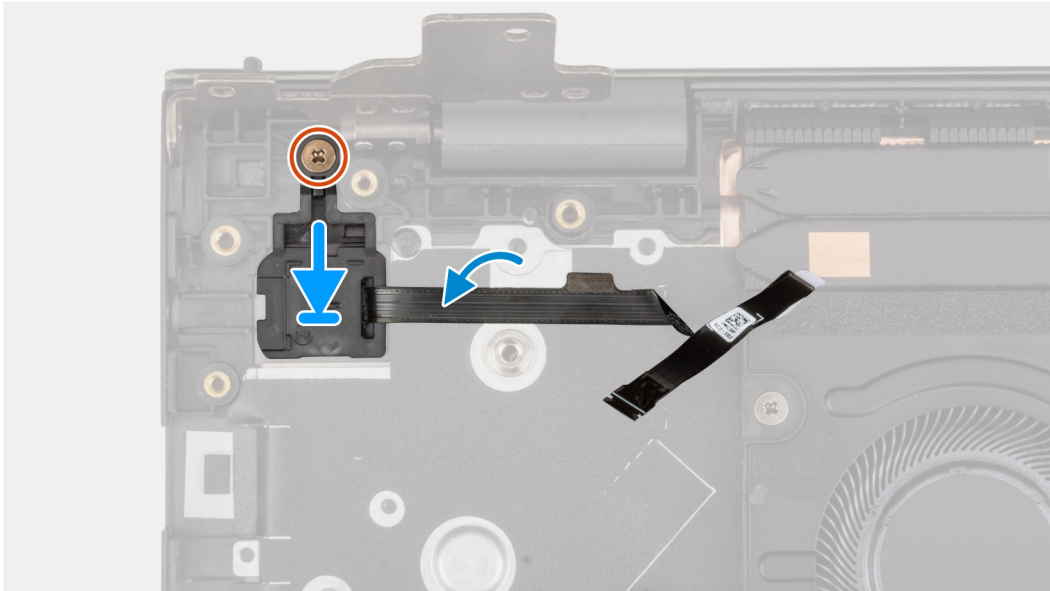
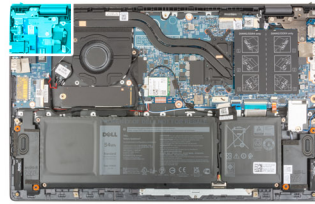
Installing the power button with optional fingerprint reader

About this task

The following images indicate the location of the power button with optional fingerprint reader and provide a visual representation of the installation procedure.



1x
M2x3



Steps

1. Align and place the power button with optional fingerprint reader on the palm-rest and keyboard assembly.
2. Replace the screw (M2x3) that secures the power button with optional fingerprint reader to the palm-rest and keyboard assembly.

Next steps

1. Install the [I/O board](#).
2. Install the [base cover](#).
3. Exit [Service Mode](#).
4. Follow the procedure in [After working inside your computer](#).

Power-adapter port

Removing the power-adapter port

Prerequisites

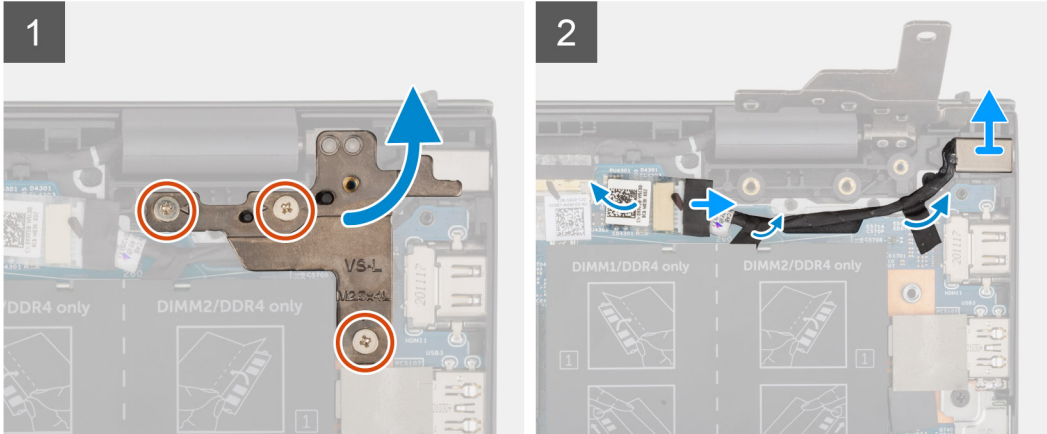
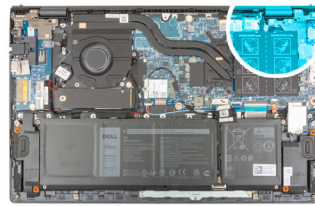
1. Follow the procedure in [Before working inside your computer](#).
2. Enter [Service Mode](#).
3. Remove the [base cover](#).

About this task

The following images indicate the location of the power-adapter port and provide a visual representation of the removal procedure.



3x
M2.5x4.5



Steps

1. Remove the three (M2.5x4.5) screws that secure the right display-hinge to the system board.
2. Open the display hinge at an angle of 90 degrees.
3. Disconnect the power-adapter port cable from the system board.
4. Peel the tape that secures the power-adapter port cable to the system board.
5. Remove the power-adapter port cable from the routing guide on the palm-rest and keyboard assembly.
6. Lift the power-adapter port, along with its cable, off the palm-rest and keyboard assembly.

Installing the power-adapter port

Prerequisites

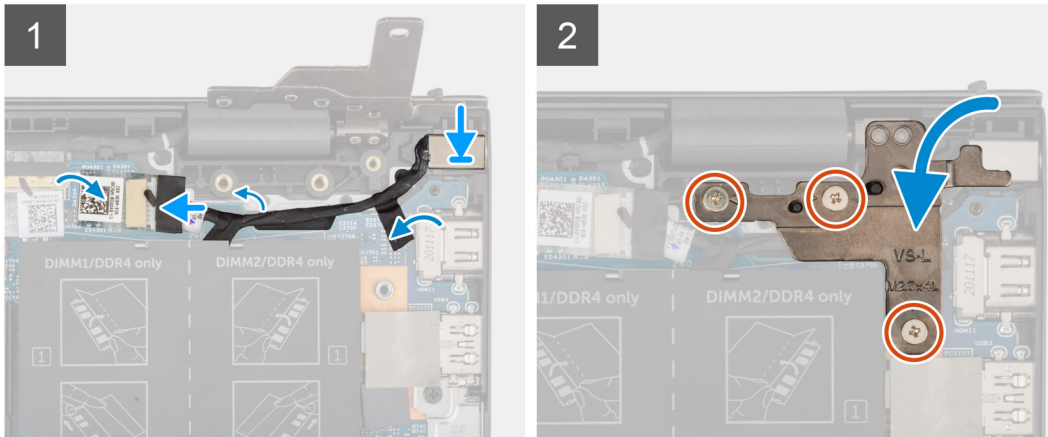
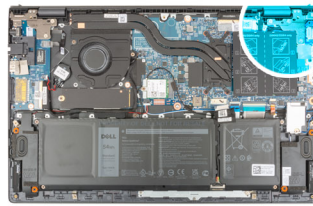
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following image indicates the location of the power-adapter port and provides a visual representation of the installation procedure.



3x
M2.5x4.5



Steps

1. Place the power-adaptor port, along with its cable, into the slot on the palm-rest and keyboard assembly.
2. Route the power-adaptor port cable through the routing guide on the palm-rest and keyboard assembly.
3. Adhere the tape that secures the power-adaptor port cable to the system board.
4. Connect the power-adaptor port cable to the system board.
5. Close the right display-hinge and align the screw holes on the right display-hinge with the screw holes on the system board and palm-rest and keyboard assembly.
6. Replace the three (M2.5x4.5) screws that secure the right display-hinge to the system board and palm-rest and keyboard assembly.

Next steps

1. Install the [base cover](#).
2. Exit [Service Mode](#).
3. 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](#).
 - NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.
 - NOTE:** Replacing the system board removes any changes that you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.
 - NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.
2. Remove the [base cover](#).
3. Remove the [3-cell battery](#) or [4-cell battery](#), whichever applicable.

4. Remove the [memory module](#).
5. Remove the [M.2 2280 solid-state drive](#) or [M.2 2230 solid-state drive](#) from M.2 slot one, whichever applicable.
6. Remove the [M.2 2230 solid-state drive](#) from M.2 slot two, if applicable.
7. Remove the [wireless card](#).
8. Remove the [fan](#).
9. Remove the [heat sink](#).

About this task

NOTE: When removing the system board to replace/access other parts, the system board can be removed and installed with the heat sink attached in order to simplify the procedure and preserve the thermal bond between the system board and heat-sink.

The following image indicates the connectors on your system board.

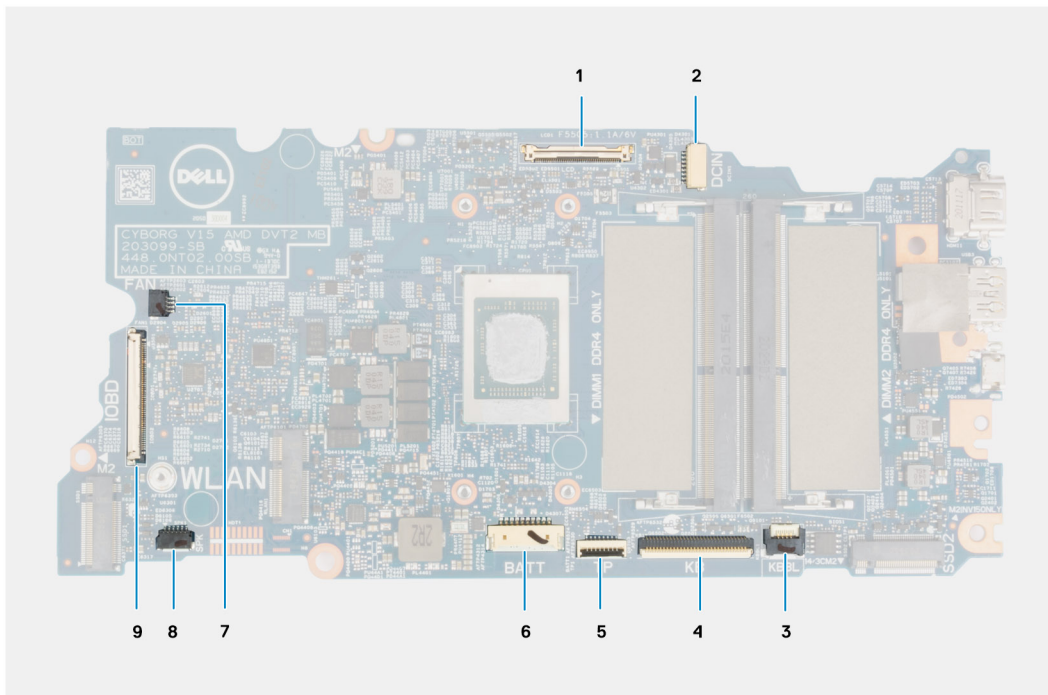
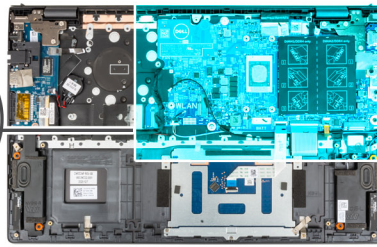
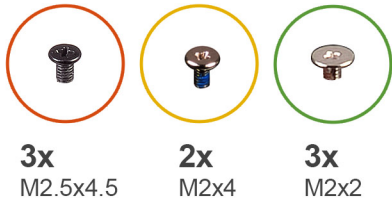


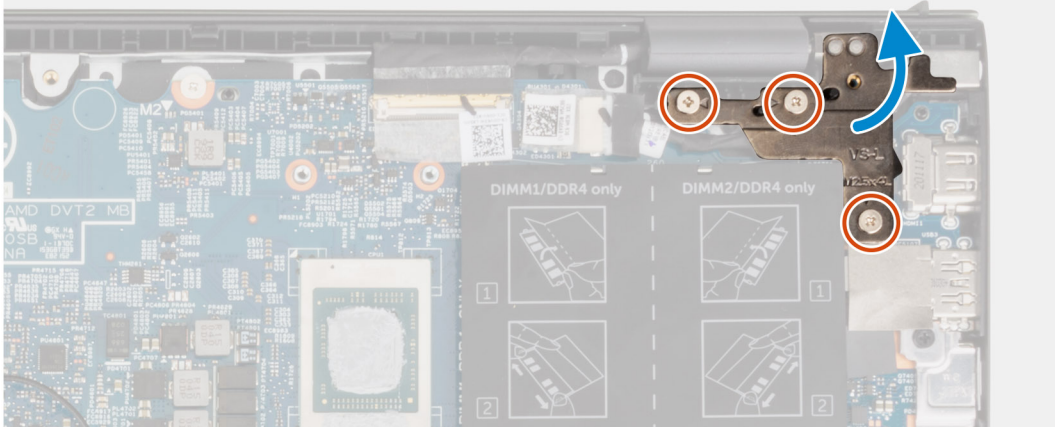
Figure 1. System board connectors

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

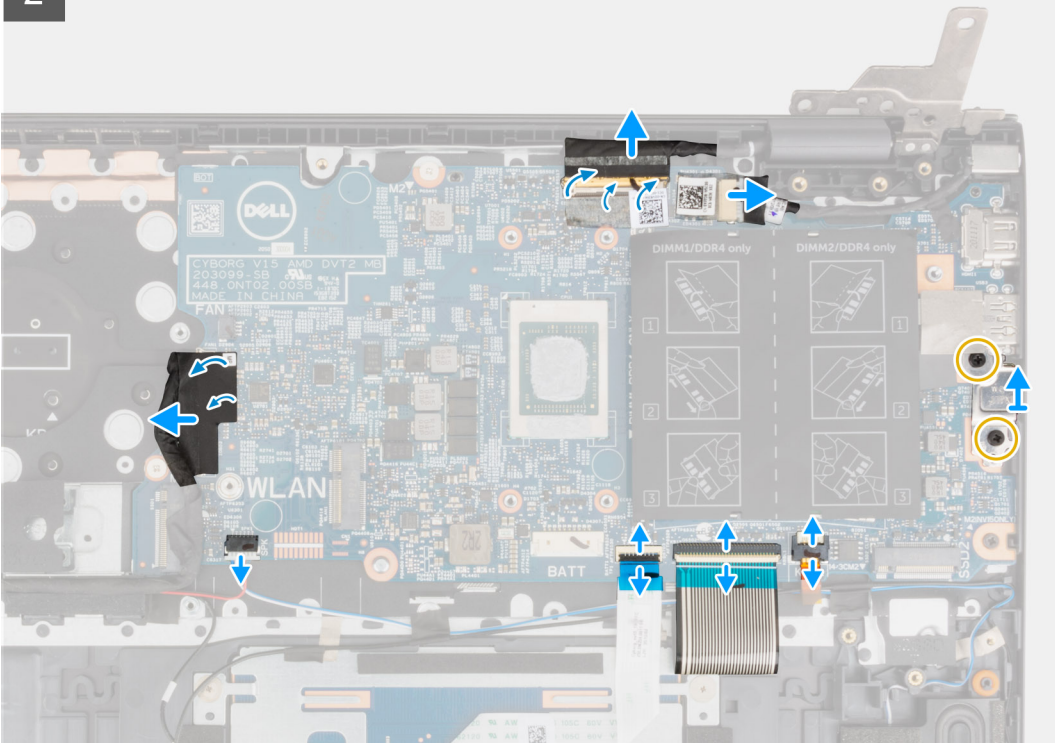
The following images indicate the location of the system board and provide a visual representation of the removal procedure.



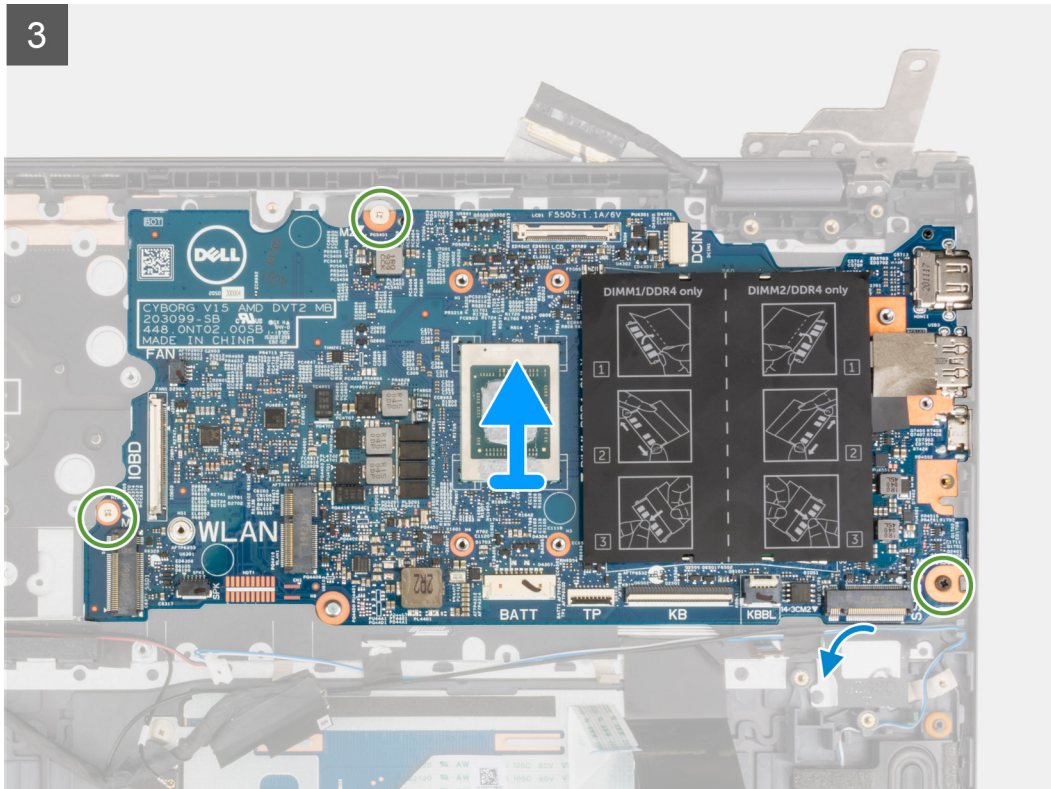
1



2



3



Steps

1. Remove the three (M2.5x4.5) screws that secure the right display hinge to the palm-rest and keyboard assembly.
2. Open the right display hinge at an angle of 90 degrees.
3. Peel the tape that secures the display cable to the system board.
4. Open the latch and disconnect the display cable from the system board.
5. Peel the tape and disconnect the power-adaptor port cable from the system board.
6. Remove the two (M2x4) screws that secure the USB Type-C bracket to the system board.
7. Open the latch, and disconnect the keyboard backlit cable from the system board.
8. Open the latch, and disconnect the keyboard cable from the system board.
9. Open the latch, and disconnect the touchpad cable from the system board.
10. Disconnect the speaker cable from the system board.
11. Peel the tape and disconnect the I/O-board cable from the system board.
12. Remove the three (M2x2) screws that secure the system board to the palm-rest and keyboard assembly.
13. Lift the system board off the palm-rest and keyboard assembly.

Installing the system board

Prerequisites

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

About this task

- i** **NOTE:** When replacing/accessing other parts, the system board can be installed with the heat sink attached in order to simplify the procedure and preserve the thermal bond between the system board and heat-sink.
- i** **NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

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

The following image indicates the connectors on your system board.

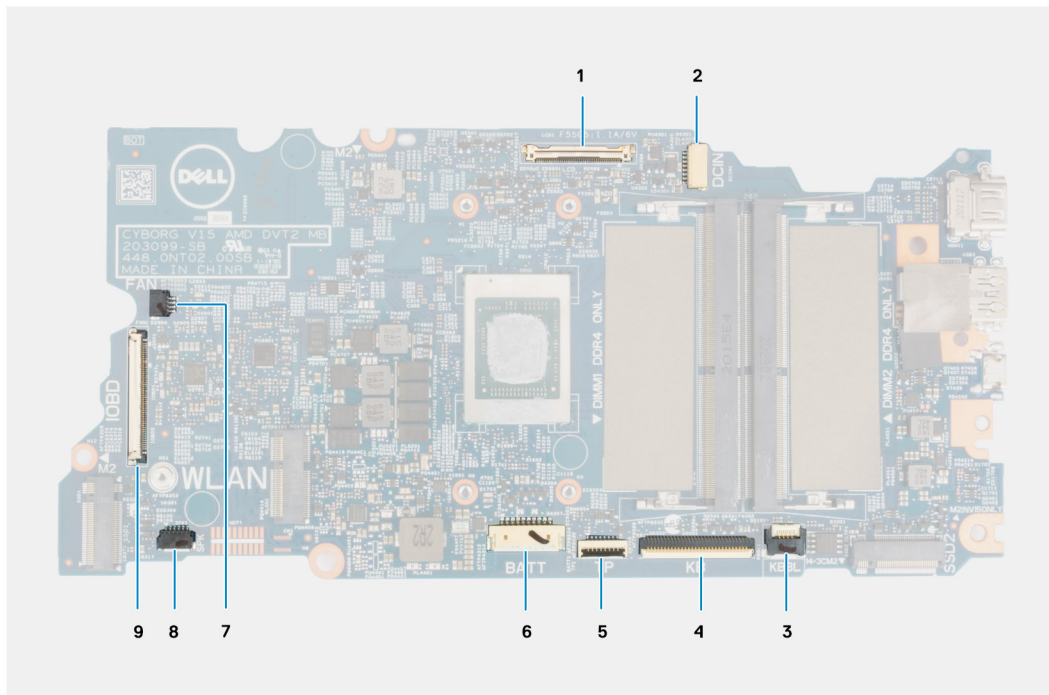


Figure 2. System board connectors

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

The following image indicates the location of the system board and provides a visual representation of the installation procedure.



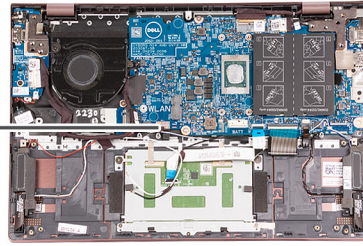
3x
M2.5x4.5



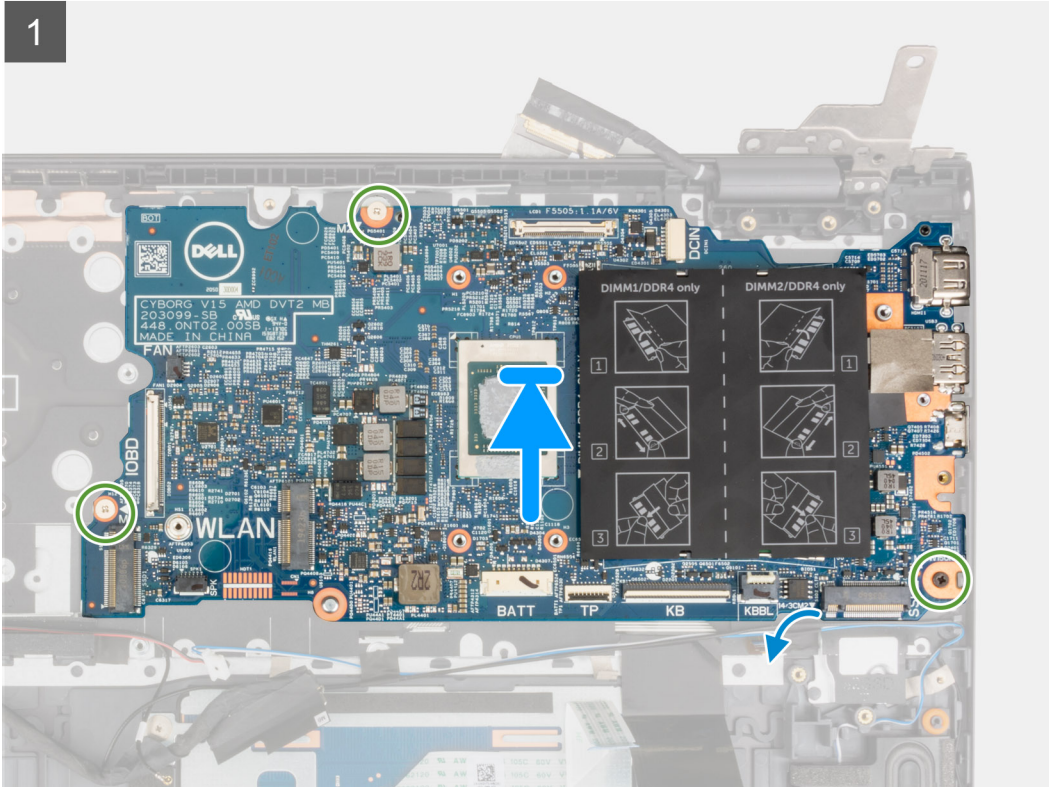
2x
M2x4



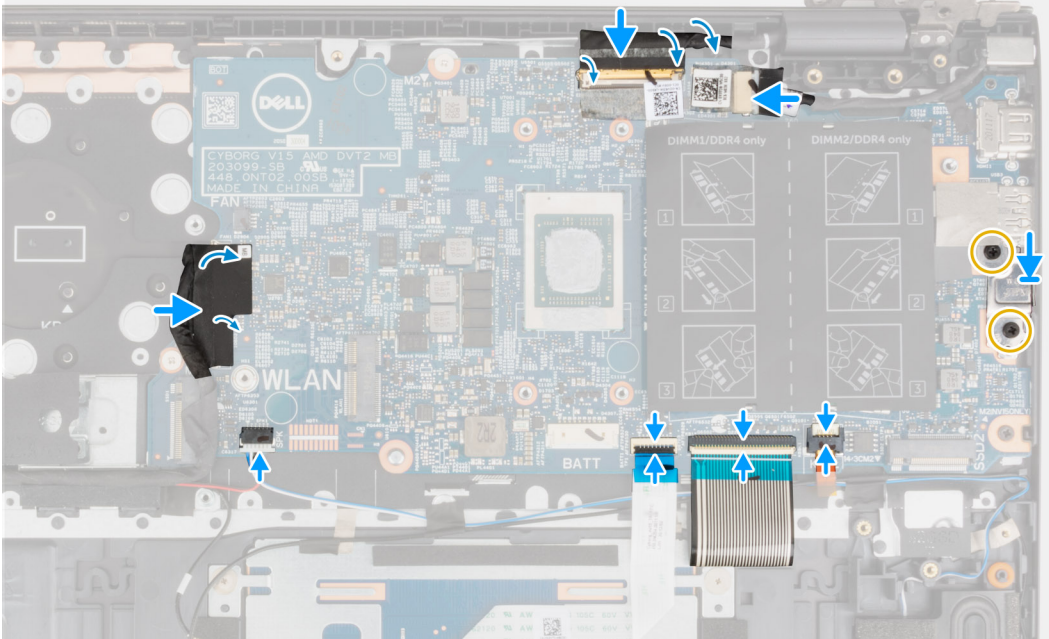
3x
M2x2



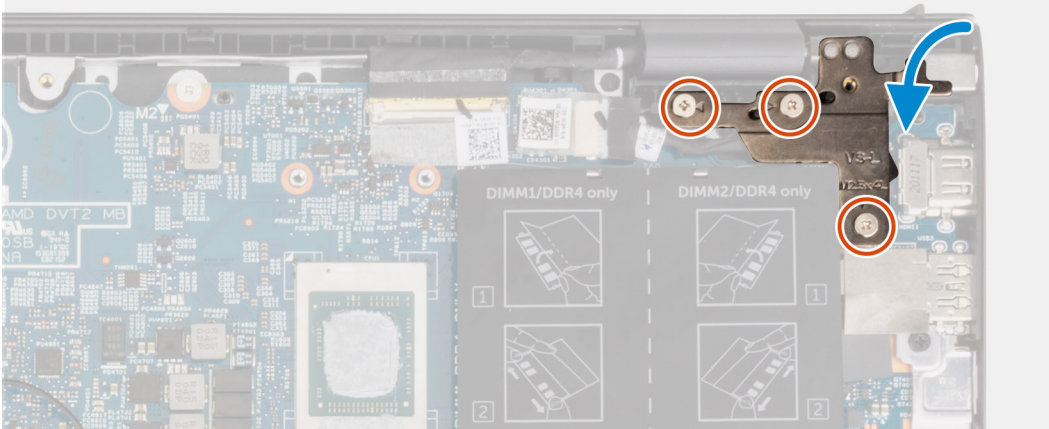
1



2



3



Steps

1. Align and place the system board on the palm-rest and keyboard assembly.
2. Replace the three (M2x2) screws that secure the system board to the palm-rest and keyboard assembly.
3. Connect the display cable to the system board and close the latch to secure the cable.
4. Adhere the tape that secures the display cable to the system board.
5. Connect the power-adaptor port cable to the system board.
6. Adhere the tape that secures the power-adaptor port cable to the system board.
7. Align the screw holes on the USB Type-C port bracket with the screw holes on the system board.
8. Replace the two (M2x4) screws that secure the USB Type-C port bracket to the system board.
9. Connect the keyboard backlit cable to the system board and close the latch to secure the cable.
10. Connect the keyboard cable to the system board and close the latch to secure the cable.
11. Connect the touchpad cable to the system board and close the latch to secure the cable.
12. Connect the speaker cable to the system board.

13. Connect the I/O-board cable to the system board.
14. Adhere the tape that secures the I/O-board cable to the system board.
15. Close the right display hinge.
16. Replace the three (M2.5x4.5) screws that secure the right display-hinge to the palm-rest and keyboard assembly.


Next steps

1. Install the [heat sink](#).
2. Install the [fan](#).
3. Install the [wireless card](#).
4. Install the [M.2 2280 solid-state drive](#) or [M.2 2230 solid-state drive](#) in M.2 slot one, whichever applicable.
5. Install the [M.2 2230 solid-state drive](#) in M.2 slot two, if applicable.
6. Install the [memory module](#).
7. Install the [3-cell battery](#) or [4-cell battery](#), whichever applicable.
8. Install the [base cover](#).
9. Follow the procedure in [After working inside your computer](#).

Palm-rest and keyboard assembly

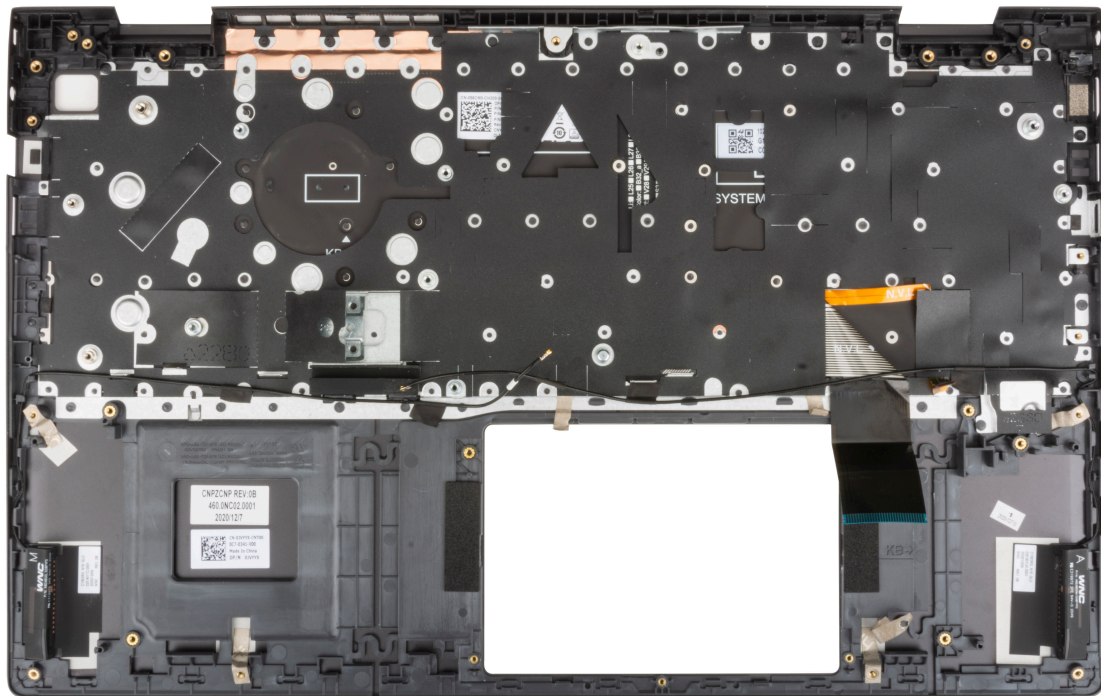
Removing the palm-rest and keyboard assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [3-cell battery](#) or [4-cell battery](#), whichever applicable.
4. Remove the [memory module](#).
5. Remove the [M.2 2280 solid-state drive](#) or [M.2 2230 solid-state drive](#) from M.2 slot one, whichever applicable.
6. Remove the [M.2 2230 solid-state drive](#) from M.2 slot two, if applicable.
7. Remove the [wireless card](#).
8. Remove the [fan](#).
9. Remove the [coin-cell battery](#).
10. Remove the [I/O board](#).
11. Remove the [system board](#).
 **NOTE:** The system board can be removed along with the heat sink.
12. Remove the [power-button with optional fingerprint reader](#).
13. Remove the [power-adaptor port](#).
14. Remove the [speakers](#).
15. Remove the [touchpad](#).
16. Remove the [display assembly](#).

About this task

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



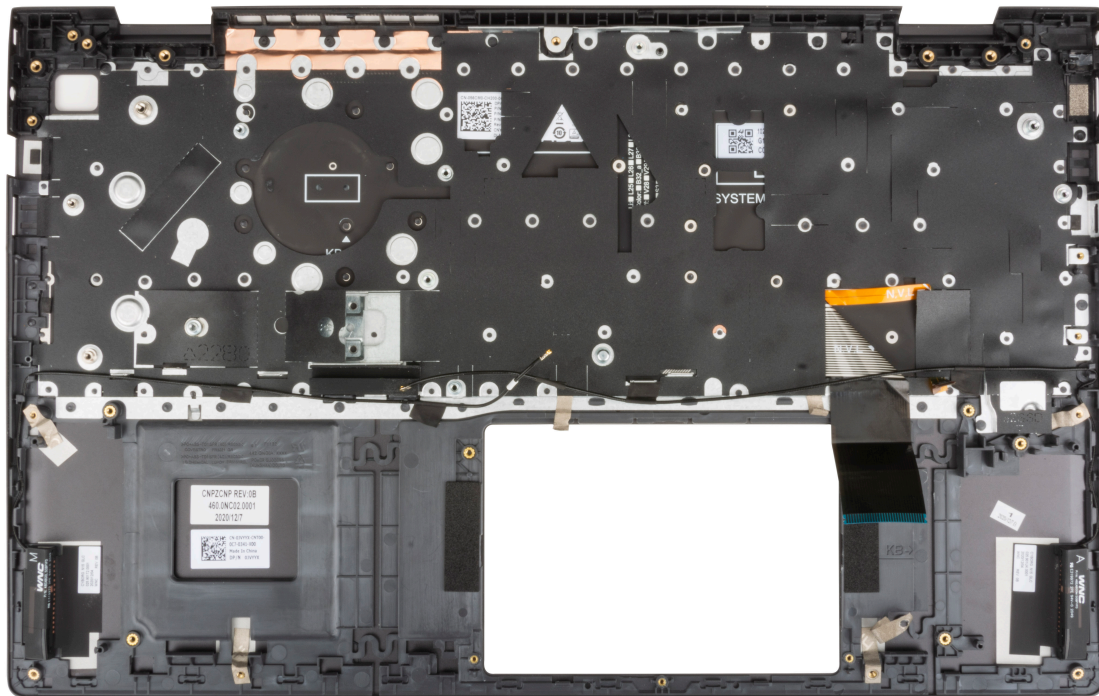
Installing the palm-rest and keyboard assembly

Prerequisites

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

About this task

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



Next steps

1. Install the [display assembly](#).
2. Install the [touchpad](#).
3. Install the [speakers](#).
4. Install the [power-adapter port](#).
5. Install the [power-button with optional fingerprint reader](#).
6. Install the [system board](#).
i **NOTE:** The system board can be installed along with the heat sink.
7. Install the [I/O board](#).
8. Install the [fan](#).
9. Install the [coin-cell battery](#).
10. Install the [wireless card](#).
11. Install the [M.2 2280 solid-state drive](#) or [M.2 2230 solid-state drive](#) in M.2 slot one, whichever applicable.
12. Install the [M.2 2230 solid-state drive](#) in M.2 slot two, if applicable.
13. Install the [memory module](#).
14. Install the [3-cell battery](#) or [4-cell battery](#), whichever applicable.
15. Install the [base cover](#).
16. Follow the procedure in [After working inside your computer](#).

Drivers and downloads




This chapter details the supported operating systems along with instructions on how to install the drivers.

Topics:

- [Downloading the drivers](#)

Downloading the drivers

Steps

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Enter the Service Tag of your computer, and then click **Submit**.
 **NOTE:** If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & downloads**.
5. Click the **Detect Drivers** button.
6. Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
7. If necessary, your computer starts to download and install **SupportAssist**.
 **NOTE:** Review on-screen instructions for browser-specific instructions.
8. Click **View Drivers for My System**.
9. Click **Download and Install** to download and install all driver updates detected for your computer.
10. Select a location to save the files.
11. If prompted, approve requests from **User Account Control** to make changes on the system.
12. The application installs all drivers and updates identified.
 **NOTE:** Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.
13. For manual download and installation, click **Category**.
14. From the drop-down list, select the preferred driver.
15. Click **Download** to download the driver for your computer.
16. After the download is complete, navigate to the folder where you saved the driver file.
17. Double-click the driver file icon and follow the instructions on the screen to install the driver.

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: 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.

Topics:

- [BIOS overview](#)
- [Entering BIOS setup program](#)
- [Navigation keys](#)
- [Boot Sequence](#)
- [Advanced or Engineering configurations](#)
- [SupportAssist system resolution](#)
- [System setup options](#)
- [Updating the BIOS](#)
- [Clearing BIOS \(System Setup\) and System passwords](#)

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.

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.

Keys

Esc

Navigation

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 enables 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:

- Windows Boot Manager
- UEFI HTTPs Boot
- UEFI RST BC711 NVMe SK hynix 256 GB DOBN6093129YBH26
- ONBOARD NIC (IPV4)
- ONBOARD NIC (IPV6)

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

Advanced or Engineering configurations

Table 3. Advanced or Engineering configurations

Option	Description
ASPM	<ul style="list-style-type: none">• Auto—Default• L1 Only• Disabled• L0s and L1• L0s Only
Pcie LinkSpeed	<ul style="list-style-type: none">• Auto—Default• Gen 1• Gen 2• Gen 3

SupportAssist system resolution

Table 4. SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	<p>The Auto OS Recovery Threshold setup option controls the automatic boot flow for Support Assist System Resolution Console and Dell OS Recovery tool.</p> <p>Choose one of the following options:</p> <ul style="list-style-type: none">• OFF• 1• 2—Default• 3
SupportAssist OS Recovery	Allows you to recover the SupportAssist OS Recovery (Disabled by default).

System setup options

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

Table 5. System setup options—System information menu

Overview	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.
Ownership Tag	Displays the ownership tag of the computer.
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the express service code of the computer.
Ownership Tag	Displays the ownership tag of the computer.
Signed Firmware Update	Displays whether the signed firmware update is enabled.
Battery	Displays the battery health information.
Primary	Displays the primary battery.
Battery Level	Displays the battery level.
Battery State	Displays the battery state.
Health	Displays the battery health.
AC Adapter	Displays whether an AC adapter is installed.
Processor Information	
Processor Type	Displays the processor type.
Maximum Clock Speed	Displays the maximum processor clock speed.
Core Count	Displays the number of cores on the processor.
Processor L2 Cache	Displays the processor L2 Cache size.
Processor ID	Displays the processor identification code.
Processor L3 Cache	Displays the processor L3 Cache size.
Current Clock Speed	Displays the current processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
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 computer memory installed.
Memory Available	Displays the total computer memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology that is used for the memory.
DIMM_SLOT 1	Displays capacity of the memory installed in the first DIMM slot.
DIMM_SLOT 2	Displays capacity of the memory installed in the second DIMM slot.

Table 5. System setup options—System information menu (continued)

Overview	
Device Information	
Panel Type	Displays the Panel Type of the computer.
Video Controller	Displays the graphics information of the computer.
Video Memory	Displays the video memory information of the computer.
Video BIOS Version	Displays the video BIOS version of the computer.
Native Resolution	Native Resolution
Audio Controller	Audio Controller
Wi-Fi Device	Wi-Fi Device
Bluetooth Device	Bluetooth Device
LOM Mac Address	Displays the unique MAC address for the computer

Table 6. System setup options—Boot Configuration menu

Boot options	
Boot Sequence	
Boot Mode: UEFI only	Displays the boot mode of this computer.
Boot Sequence	Displays the boot sequence.
Secure Boot	
Enable Secure Boot	Ensures the system boots using only to validated boot software.
Secure Boot Mode	Changes to Secure Boot operation mode modifies the behavior of the Secure Boot to allow evaluation of UEFI driver signatures. <ul style="list-style-type: none"> • Deployed Mode - Default: ON • Audit Mode - Default: OFF
Expert Key Management	
Enable Custom Mode	Enables or disables the PK, KEK, db and dbx security key databases to be manipulated. Default: OFF.
Custom Mode Key Management	Default: OFF.
Advanced Boot Options	
Enable UEFI Network Stack	Enables or disables UEFI Network Stack. Default: PK

Table 7. System setup options—Integrated Devices menu

System Configuration	
Date/Time	
Date	Sets the computer date in MM/DD/YYYY format. Changes to the date take effect immediately.
Time	Sets the computer time in HH/MM/SS 24-hour format. You can switch between 12-hour and 24-hour clock. Changes to the time take effect immediately.
Camera	
Enable Camera	Enables or disables the camera Default: ON.
Enable Audio	Enables or disables all integrated audio controller.

Table 7. System setup options—Integrated Devices menu (continued)

System Configuration	
	Default: ON.
Enable Microphone	Enables or disables microphone. Default: ON.
Enable Internal Speaker	Enables or disables internal speaker. Default: ON.
USB Configuration	
Enable External USB Ports	Enables or disables USB ports to be functional in an operating system environment. Default: ON.
Enable USB Boot Support	Enables or disables booting from USB mass storage devices such as external hard drive, optical drive, and USB drive. Default: ON.
Disable USB4 PCIE Tunneling	Enables or disables the USB4 PCIE tunneling. Default: OFF.
Video/Power only on Type-C Ports	Limits Type-C port functionality to video or power only. Default: OFF.
SATA Operation	
	Configures operating mode of the integrated SATA hard drive controller. Default: RAID. SATA is configured to support RAID (Intel Rapid Restore Technology).
Drives	
M.2 PCIe SSD-0/SATA-2	Enables or disables various onboard drives. Default: ON.
SATA-0	Default: ON.
Drive Information	Displays the information of various onboard drives.
Miscellaneous Devices	
Enable Camera	Enables or disables the camera. Default: ON.
Keyboard Illumination	Configures the operating mode of the keyboard illumination feature. Default: Disabled. The keyboard illumination will always be off.
Keyboard Backlight Timeout on AC	Configures the timeout value for the keyboard when an AC adapter is connected to the computer. The keyboard backlight timeout value is only effect when the backlight is enabled. Default: 10 seconds.
Keyboard Backlight Timeout on Battery	Configures the timeout value for the keyboard when the computer is running on battery. The keyboard backlight timeout value is only effect when the backlight is enabled. Default: 10 seconds.
Touchscreen	Enables or disables the touchscreen for the operating system. i NOTE: Touchscreen will always work in the BIOS setup irrespective of this setting. Default: ON.

Table 8. System setup options—Storage menu

Storage	
Storage Interface	
Port Enablement	Enables or disables onboard drives Default: ON.
SMART Reporting	
Enable SMART Reporting	Enables or disables the S.M.A.R.T.(Self-Monitoring, Analysis, and Reporting Technology) option on the system. Default: OFF.
Drive Information	
M.2 PCIe SSD-1	Provides information about the type and device on the computer.

Table 9. System setup options—Display menu

Storage	
Display Brightness	
Brightness on battery power	Sets the screen brightness when the computer is running on battery power.
Brightness on AC power	Sets the screen brightness when the computer is running on AC power.
EcoPower	
	Enables or disables EcoPower which increases the battery life by reducing the screen brightness when appropriate. Default: ON.
Full-Screen Logo	
	Displays full screen logo if the image matches screen resolution. Default: OFF.

Table 10. System setup options—Connection menu

Connection	
Network Controller Configuration	
Integrated NIC	Allows pre-OS and early OS networking features to use any enabled NICs. Enabled with PXE: Default
Wireless Device Enable	
WLAN	Enable or disable internal WLAN/Bluetooth devices. Default: ON.
Bluetooth	Default: ON.
Enable UEFI Network Stack	
	Allows pre-OS and early OS networking features to use any enabled NICs. This may be used without the PXE turned on. Default: ON.
HTTP(s) Boot Feature	
HTTP(s) Boot	This platform has HTTP(s) Boot capabilities. Default: ON.
	NOTE: Provisioning of the Certificate is necessary to connect to HTTP(s) Boot server.

Table 11. System setup options—Power Management menu

Power Management	
Battery Configuration	Enables the computer to run on battery during peak power usage hours. Use the below options to prevent AC power usage between certain times of each day. Default: Adaptive. Battery settings are adaptively optimized based on your typical battery usage pattern.
Enable Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day. Default: OFF.
Enable Peak Shift	Enables the system to run on battery during peak power usage hours. Default: OFF.
Thermal Management	Allows for cooling fan and processor heat management to adjust system performance, noise, and temperature. Default: Optimized.
Enable USB Wake Support	Enables the USB devices to wake the computer from Standby mode, Hibernate and Power Off. Default: OFF.
Enable on Dell USB-C Dock	Enables the Dell USB-C Dock when connected to wake the computer from Standby mode, Hibernate and Power Off. Default: ON.
Block Sleep	Blocks the computer from entering Sleep (S3) mode in the operating system. Default: OFF. NOTE: If enabled, the computer will not go to sleep, Intel Rapid Start will be disabled automatically, and the operating system power option will be blank if it was set to Sleep.
Lid Switch	
Enable Lid Switch	Enables or disables lid switch. Default: ON.
Power On Lid Open	Enables the computer to power up from the off state whenever the lid is opened. Default: ON.
Intel Speed Shift Technology	Enables or disables Intel Speed Shift Technology support which enables the operating system to select the appropriate processor performance automatically. Default: ON.

Table 12. System setup options—Security menu

Security	
TPM 2.0 Security	
TPM 2.0 Security On	Enable or disable TPM 2.0 security options. By default, the TPM 2.0 Security On option is enabled.
PPI Bypass for Enable Commands	Allows the OS to skip BIOS PPI user prompts when issuing TPM PPI enable and activate commands.

Table 12. System setup options—Security menu (continued)

Security	
PPI Bypass for Disable Commands	<p>By default, the PPI Bypass for Enable Commands option is disabled.</p> <p>Allows the OS to skip BIOS PPI user prompts when issuing TPM PPI disable and deactivate commands.</p> <p>By default, the PPI Bypass for Disable Commands option is disabled.</p>
Attestation Enable	<p>Enables to control whether the Trusted Platform Module (TPM) Endorsement Hierarchy is available to the operating system.</p> <p>By default, the Attestation Enable option is enabled.</p>
Key Storage Enable	<p>Enables to control whether the Trusted Platform Module (TPM) Storage Hierarchy is available to the operating system.</p> <p>By default, the Key Storage Enable option is enabled.</p>
SHA-256	<p>BIOS and the TPM will use the SHA-256 hash algorithm to extend measurements into the TPM PCRs during BIOS boot.</p> <p>By default, the SHA-256 option is enabled.</p>
Clear	<p>Enables to clear the TPM owner information and returns the TPM to the default state.</p> <p>By default, the Clear option is disabled.</p>
PPI ByPass for Clear Commands	<p>Controls the TPM Physical Presence Interface (PPI).</p> <p>By default, the PPI ByPass for clear Commands option is disabled.</p>
TPM State	<p>Enables or disables the TPM. this is the normal operating state for the TPM when you want to use its complete arrays of capabilities.</p> <p>By default, the TPM State option is enabled.</p>
SMM Security Mitigation	<p>Enable or disable SMM Security Mitigation.</p> <p>By default, the option is enabled.</p>
Data Wipe on Next Boot	
Start Data Wipe	<p>Enable or disable the data wipe on next boot.</p> <p>By default, the option is enabled.</p>
Absolute	<p>Enable or disable or permanently disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute software.</p> <p>By default, the option is enabled.</p>
UEFI Boot Path Security	<p>Controls whether or not the computer will prompt the user to enter the admin password (if set) when booting to a UEFI boot device from the F12 boot menu.</p> <p>By default, the Always Except Internal HDD option is enabled.</p>

Table 13. System setup options—Passwords menu

Passwords	
Admin Password	Set, change, or delete the administrator password.
System Password	Set, change, or delete the computer password.
NVMe SSD0	Set, change, or delete the NVMe SSD0 password.
Password Configuration	
Upper Case Letter	<p>Reinforces password must have at least one upper case letter.</p> <p>By default, the option is disabled.</p>

Table 13. System setup options—Passwords menu (continued)

Passwords	
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. 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 computer and internal hard drive passwords when powered on from the off state. By default, the Disabled option is enabled.
Password Changes	
Enable Non-Admin Password Changes	Enable or disable to change computer 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.
Master Password Lockout	
Enable Master Password Lockout	When enabled, this will disable 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 14. System setup options—Update, Recovery menu

Update, Recovery	
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update packages. 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.
BIOS Downgrade	
Allow BIOS Downgrade	Enable or disable the flashing of the computer firmware to previous revision is blocked. 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 computer errors. By default, the option is enabled.

Table 14. System setup options—Update, Recovery menu (continued)

Update, Recovery	
BIOSConnect	<p>Enable or disable cloud Service OS 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 OS Recovery Threshold setup option and local Service OS does not boot or is not installed.</p> <p>By default, the option is enabled.</p>
Dell Auto OS Recovery Threshold	<p>Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool.</p> <p>By default, the threshold value is set to 2.</p>

Table 15. System setup options—System Management menu

System Management	
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Create a computer Asset Tag.
AC Behavior	
Wake on AC	<p>Enable or disable the wake on AC option.</p> <p>By default, the option is disabled.</p>
Auto on Time	<p>Enable to set the computer to turn on automatically every day or on a preselected date and time. This option can be configured only if the Auto On Time is set to Everyday, Weekdays, or Selected Days.</p> <p>By default, the option is disabled.</p>

Table 16. System setup options—Keyboard menu

Keyboard	
Numlock Enable	<p>Enable or disable the Numlock function when the computer boots.</p> <p>By default, the option is enabled.</p>
Fn Lock Options	By default, the Fn lock option is enabled.
Lock Mode	<ul style="list-style-type: none"> • Lock Mode Standard - Traditional F1-F12 functions • Lock Mode Secondary - Enables secondary functions on the Fn keys.

Table 17. System setup options—Pre-boot Behavior menu

Pre-boot Behavior	
Adapter Warnings	
Enable Adapter Warnings	<p>Enable or disable the warning messages during boot when the adapters with less power capacity are detected.</p> <p>By default, the option is enabled.</p>
Warnings and Errors	<p>Enable or disable the action to be done when a warning or error is encountered.</p> <p>By default, the Prompt on Warnings and Errors option is enabled.</p>
USB-C Warnings	<p>Enable or disable dock warning messages.</p> <p>By default, the Enable Dock Warning Messages option is enabled.</p>
Fastboot	<p>Enable to set the speed of the boot process.</p> <p>By default, the Thorough option is enabled.</p>
Extend BIOS POST Time	<p>Set the BIOS POST time.</p> <p>By default, the 0 seconds option is enabled.</p>

Table 18. System setup options—Virtualization menu

Virtualization	
Intel Virtualization Technology	
Enable Intel Virtualization Technology (VT)	Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology. By default, the option is enabled.
VT for Direct I/O	
	Specify whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O. By default, the option is enabled.

Table 19. System setup options—Performance menu

Performance	
Multi Core Support	
Active Cores	Enables to change the number of CPU cores available to the operating system. By default, the All Cores options is enabled.
Intel SpeedStep	
Enable Intel SpeedStep Technology	Enables the computer to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production. By default, the option is enabled.
C-States Control	
Enable C-State Control	Enable or disable additional processor sleep states. By default, the option is enabled.
Intel Turbo Boost Technology	
Enable Intel Turbo Boost Technology	Enable or disable Intel TurboBoost mode of the processor. By default, the option is enabled.
Intel Hyper-Threading Technology	
Enable Intel Hyper-Threading Technology	Enable or disable Hyper-Threading in the processor. By default, the option is enabled.


Table 20. System setup options—System Logs menu

System Logs	
BIOS Event Log	
Clear Bios Event Log	Display BIOS events. By default, the Keep Log option is enabled.
Thermal Event Log	
Clear Thermal Event Log	Display Thermal events. By default, the Keep Log option is enabled.
Power Event Log	
Clear Power Event Log	Display power events. By default, the Keep Log option is enabled.
License Information	
	Displays the license information of the computer.

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 about how to update the system BIOS, search in the Knowledge Base Resource at www.dell.com/support.

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](https://www.dell.com/support/000131486) 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, search the Knowledge Base Resource 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 from the F12 One Time Boot menu


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

About this task

BIOS Update

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

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


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

Updating from the One Time Boot menu

To update your BIOS from the F12 **One Time Boot** menu, you need the following:

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

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

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

Steps

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

System and setup password


Table 21. System and setup password

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

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

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

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

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

Assigning a system setup password

Prerequisites

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

About this task

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

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.

Use the following guidelines to assign the system password:

- A password can have up to 32 characters.
- 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 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.

Troubleshooting

Topics:

- [Handling swollen rechargeable Li-ion batteries](#)
- [Dell SupportAssist Pre-boot System Performance Check diagnostics](#)
- [System diagnostic lights](#)
- [Recovering the operating system](#)
- [Updating the BIOS using the USB drive in Windows](#)
- [Updating the BIOS in Windows](#)
- [Backup media and recovery options](#)
- [Wi-Fi power cycle](#)
- [Drain residual flea power \(perform hard reset\)](#)

Handling swollen rechargeable Li-ion batteries

Like most laptops, Dell laptops use Lithium-ion batteries. One type of Lithium-ion battery is the rechargeable Li-ion battery. Rechargeable Li-ion 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 rechargeable Li-ion 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 rechargeable Li-ion batteries are as follows:

- Exercise caution when handling rechargeable Li-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.


Rechargeable Li-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.

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The Dell SupportAssist Pre-boot System Performance Check diagnostics is embedded with the BIOS and is launched by the BIOS internally. The embedded system diagnostics provides a set of options for particular devices or device groups allowing you to:

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

 **NOTE:** Some tests for specific devices require user interaction. Always ensure that you are present at the computer terminal when the diagnostic tests are performed.

For more information, see <https://www.dell.com/support/kbdoc/000180971>.

Running the SupportAssist Pre-Boot System Performance Check

Steps

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

System diagnostic lights

Battery-status light

Indicates the power and battery-charge status.

Solid white — Power adapter is connected and the battery has more than 5 percent charge.

Amber — Computer is running on battery and the battery has less than 5 percent charge.

Off

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

The power and battery-status light blinks amber along with beep codes indicating failures.

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

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

Blinking Pattern		Problem description	Suggested resolution
Amber	White		
1	1	TPM detection failure	Replace the system board.
1	2	Unrecoverable SPI flash failure	Replace the system board.
1	5	EC unable to program i-Fuse	Replace the system board.
1	6	Generic catch-all for ungraceful EC code flow errors	Disconnect all power source (AC, battery, coin cell) and drain flea power by pressing & holding down power button.
2	1	CPU failure	Run the Intel CPU diagnostics tools. If problem persists, replace the system board.
2	2	System Board failure (included BIOS corruption or ROM error)	Flash latest BIOS version. If problem persists, replace the system board.
2	3	No Memory / RAM detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2	4	Memory / RAM failure	Reset and swap memory modules amongst the slots. If problem persists, replace the memory module.
2	5	Invalid memory installed	Reset and swap memory modules amongst the slots. If problem persists, replace the memory module.
2	6	System board / Chipset Error	Replace the system board.
2	7	LCD failure (SBIOS message)	Replace the LCD module.
2	8	LCD failure (EC detection of power rail failure)	Replace the system board.
3	1	CMOS battery failure	Reset the CMOS battery connection. If problem persists, replace the RTC battery.
3	2	PCI or Video card/chip failure	Replace the system board.
3	3	BIOS recovery image not found	Flash latest BIOS version. If problem persists, replace the system board.
3	4	BIOS recovery image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.
3	5	Power rail failure	Replace the system board.
3	6	Flash corruption detected by SBIOS.	Replace the system board.
3	7	Timeout waiting on ME to reply to HECI message.	Replace the system board.

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.

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**.


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, search the Knowledge Base Resource 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 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 about how to update the system BIOS, search in the Knowledge Base Resource at www.dell.com/support.


Backup media and recovery options

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

Wi-Fi power cycle

About this task

If your computer is unable to access the Internet due to Wi-Fi connectivity issues a Wi-Fi power cycle procedure may be performed. The following procedure provides the instructions on how to conduct a Wi-Fi power cycle:

 **NOTE:** Some ISPs (Internet Service Providers) provide a modem/router combo device.

Steps

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

Drain residual flea power (perform hard reset)

About this task

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


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

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

To drain residual flea power (perform a hard reset)

Steps

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



 **NOTE:** For more information about performing a hard reset, search in the Knowledge Base Resource at www.dell.com/support.

Getting help and contacting Dell

Self-help resources


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


Table 22. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell app	
Tips	
Contact Support	In Windows search, type <code>Contact Support</code> , and press Enter.
Online help for operating system	www.dell.com/support/windows
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents.	Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter 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 on your computer .
Dell knowledge base articles for a variety of computer concerns	<ol style="list-style-type: none"> 1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support page, select Support > Knowledge Base. 3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

Contacting Dell

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

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

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