Vostro 5402

Service Manual

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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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1

Working on your computer

Topics:

- Safety instructions

Safety instructions

Prerequisites

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 the following conditions exist:

- You have read the safety information that shipped with your computer.
- A component can be replaced or, if purchased separately, installed by performing the removal procedure in reverse order.

About this task

NOTE: Disconnect all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting to the power source.

WARNING: Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage

CAUTION: Many repairs may only be done by a certified service technician. You should only perform troubleshooting and simple repairs as authorized in your product documentation, or as directed by the online or telephone service and support team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. Read and follow the safety instructions that came with the product.

CAUTION: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

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

Before working inside your computer

About this task

To avoid damaging your computer, perform the following steps before you begin working inside the computer.

Steps

1. Ensure that you follow the Safety Instruction.
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.

3. Turn off your computer.
4. Disconnect all network cables from the computer.

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

5. Disconnect your computer and all attached devices from their electrical outlets.
6. Press and hold the power button while the computer is unplugged to ground the system board.

   NOTE: To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface at the same time as touching a connector on the back of the computer.

Safety precautions

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

Observe the following safety precautions before you perform any installation or break/fix procedures involving disassembly or reassembly:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power.
- Disconnect all network cables, telephone, and telecommunications lines from the system.
- Use an ESD field service kit when working inside any notebook to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to reduce the chance of getting electrocuted.

Standby power

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

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

Bonding

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

Electrostatic discharge—ESD protection

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

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

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

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

the damage. The weakened trace may take weeks or months to melt, and in the meantime may cause degradation of memory integrity, intermittent memory errors, etc.

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

Perform the following steps to prevent ESD damage:

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

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components
- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

ESD protection summary

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

After working inside your computer

About this task

After you complete any replacement procedure, ensure that you connect any external devices, cards, and cables before turning on your computer.

Steps

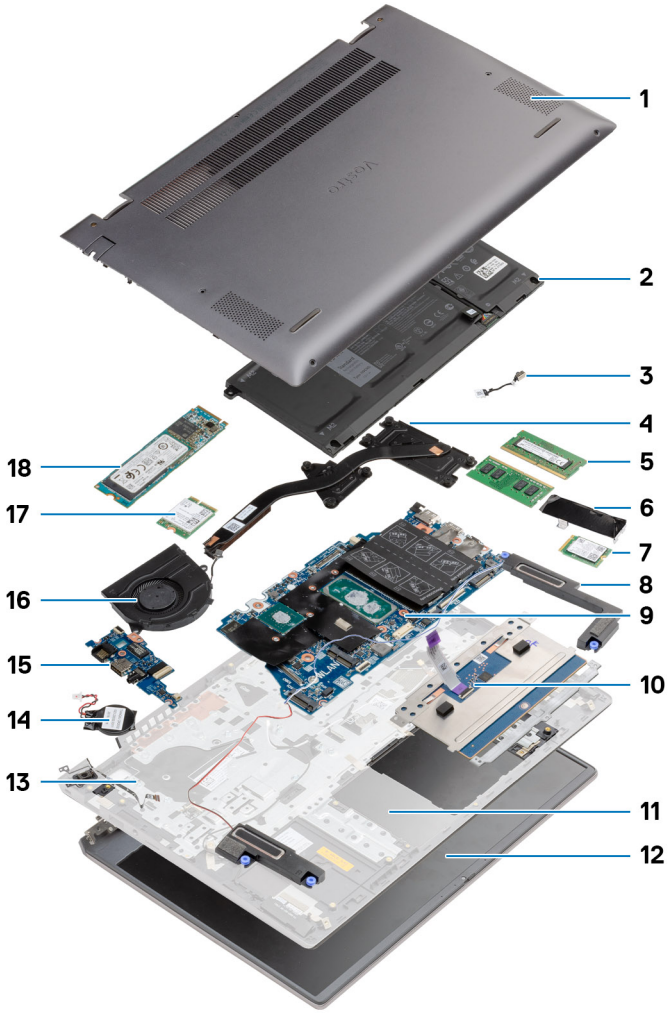
1. Connect any telephone or network cables to your computer.

   CAUTION: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

2. Connect your computer and all attached devices to their electrical outlets.
3. Turn on your computer.
4. If required, verify that the computer works correctly by running **SupportAssist diagnostics**.

2

Major components of your system



1. Base cover
2. Battery
3. DC-in port
4. Heat sink
5. Memory module
6. Solid-state drive shield
7. M.2 2230 SSD
8. Speaker
9. System board
10. Touchpad
11. Palm-rest and keyboard assembly
12. Display assembly
13. Power button with fingerprint reader
14. Coin-cell battery
15. I/O board
16. System fan
17. WLAN card

18. M.2 2280 SSD

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.

3

Disassembly and reassembly

Topics:

- Recommended tools
- Screw list
- Base cover
- Battery
- WLAN card
- Memory modules
- Solid-state drive
- Speakers
- System fan
- Heat sink
- Coin-cell battery
- I/O board
- Power button with fingerprint reader (optional)
- DC-in port
- Touchpad
- Display assembly
- System board
- Palm-rest and keyboard assembly

Recommended tools

The procedures in this document may require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe (recommended for field technicians)

NOTE: The #0 screw driver is for screws 0-1, and the #1 screw driver is for screws 2-4.

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	M2x8.8 - captive M2x4	2 5	

Table 1. Screw list (continued)

Component	Screw type	Quantity	Screw image
Battery	M2x3	4	
WLAN	M2x3	1	
Solid-state drive -1	M2x3	1	
Solid-state drive - 2	M2x3	2	
Solid-state drive -2 support bracket	M1.6x2	1	
System fan	M2x2	2	
Heat sink - UMA	M2x5.35 - captive	4	
Heat sink - discrete	M2x5.35 - captive	7	
Hinge screws	M2.5x4 M2x3	3 1	
I/O board	M2x3	3	
Power button with fingerprint reader	M2x2.5	2	
DC-in port	M2x3	1	
Touchpad	1.6x2 M2x2	3 2	
Display assembly	M2.5x4 M2x3	3 1	
System board	M2x3	2	

Base cover

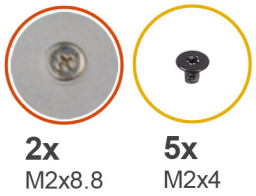
Removing the base cover

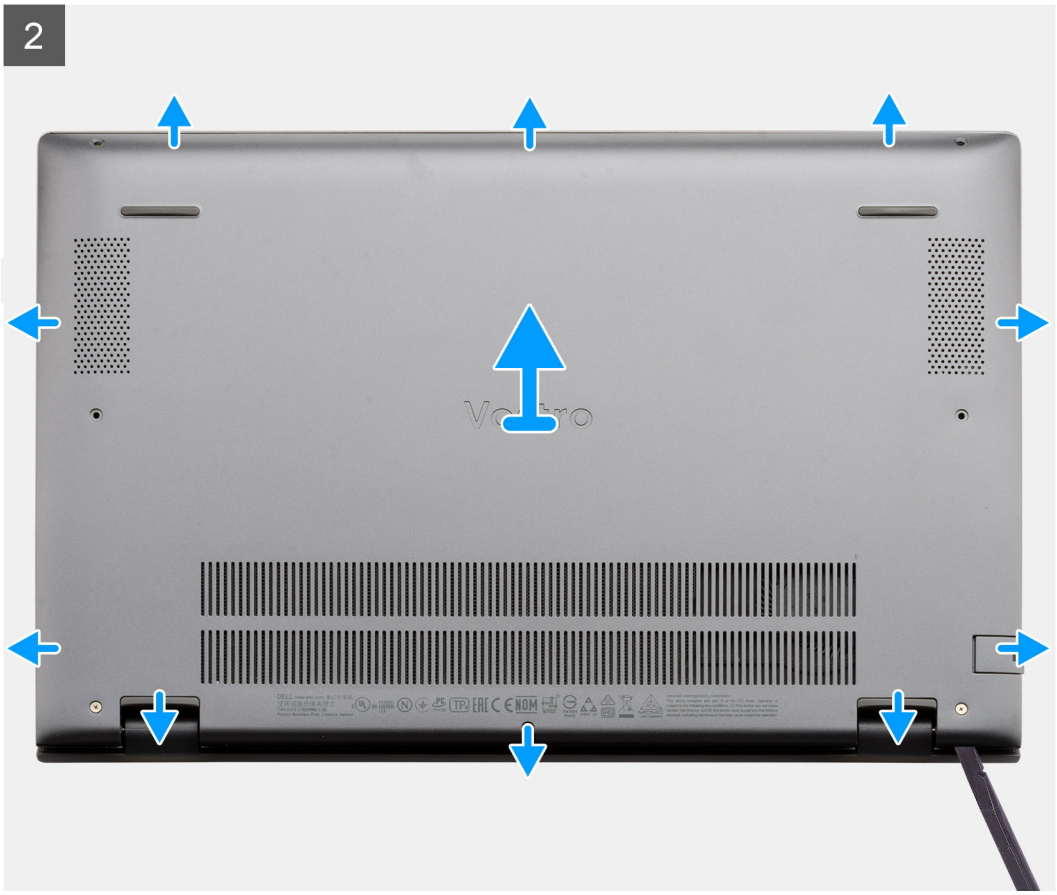
Prerequisites

Follow the procedure in before working inside your computer.

About this task

The figure indicates the location of the base cover and provides a visual representation of the removal procedure.





Steps

1. Remove the five screws (M2x4) that secure the base cover to the palm-rest and keyboard assembly.
2. Loosen the two captive screws (M2x8.8) that secure the base cover to the palm-rest and keyboard assembly.
3. Pry open the base cover starting from the recess at the hinge area and work your way around and follow the "guidance line" indicated in the image to remove the base cover.
4. Lift the base cover off the palm-rest and keyboard assembly.

Installing the base cover

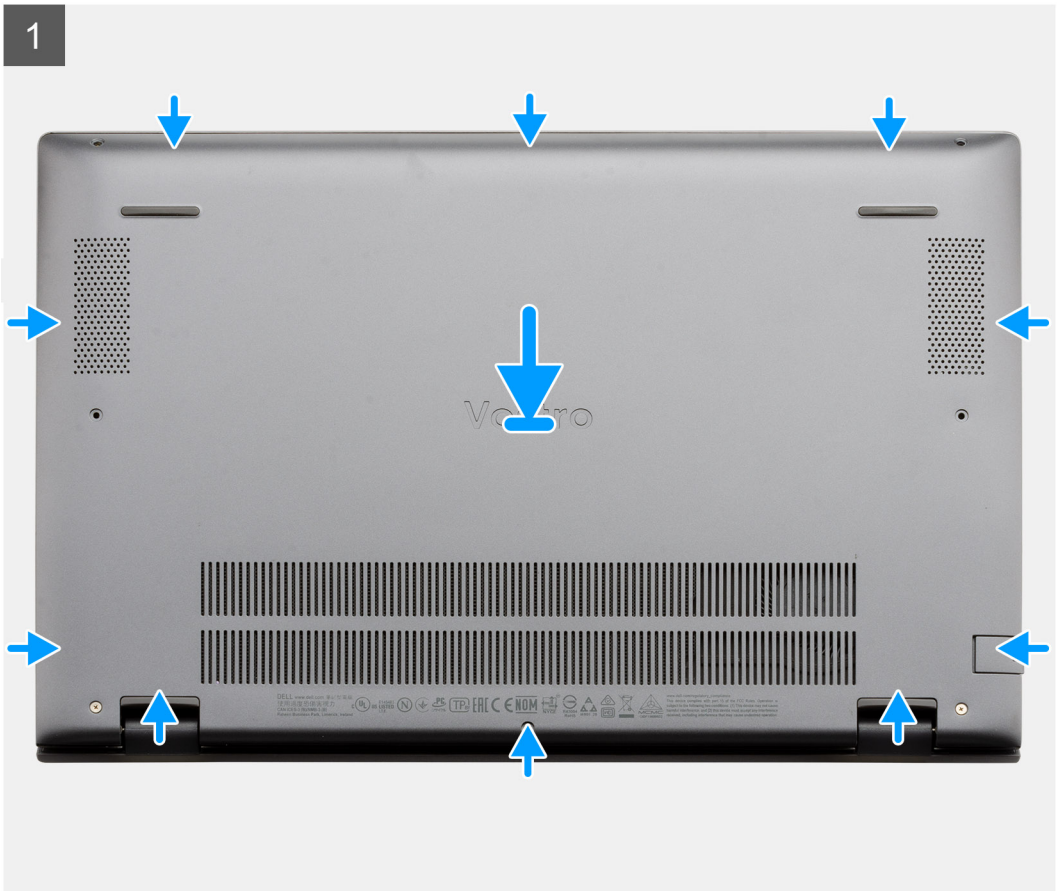
Prerequisites

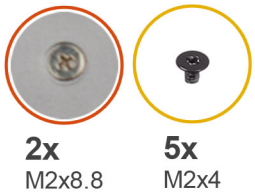
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the base cover and provides a visual representation of the installation procedure.

1





Steps

1. Place the base cover on the palm-rest and keyboard assembly, and snap the base cover into place.
2. Tighten the two captive screws (M2x8.8) that secure the base cover to the palm-rest and keyboard assembly.
3. Replace the five screws (M2x4) that secure the base cover to the palm-rest and keyboard assembly.

Next steps

Follow the procedure in after working inside your computer.

Battery

Lithium-ion battery precautions

CAUTION:

- **Exercise caution when handling Lithium-ion batteries.**
- **Discharge the battery completely before removing it. Disconnect the AC power adapter from the system and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**
- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**

- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**
- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.**

Removing the 3-cell battery - UMA/discrete

Prerequisites

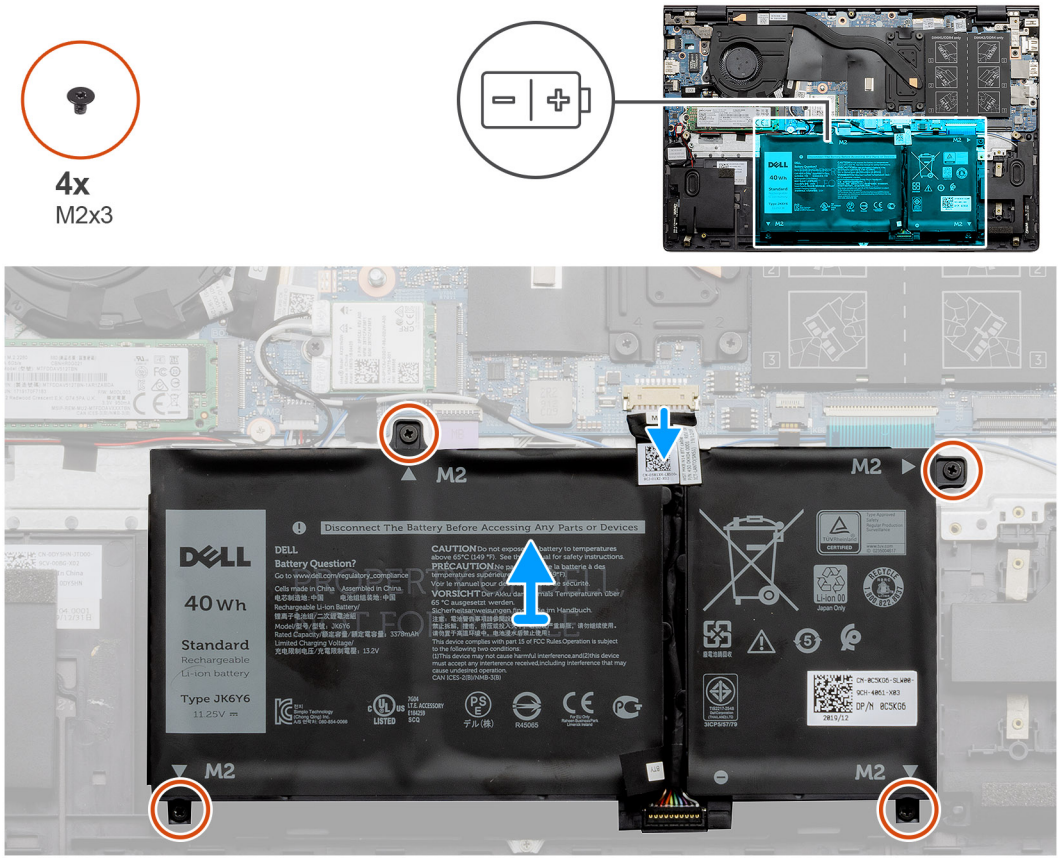
NOTE:

The battery type in your computer varies depending on the configuration ordered.

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

About this task

The figure indicates the location of the 3-cell battery in an UMA configuration and provides a visual representation of the removal procedure.



Steps

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

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

Installing the 3-cell battery - UMA/discrete

Prerequisites

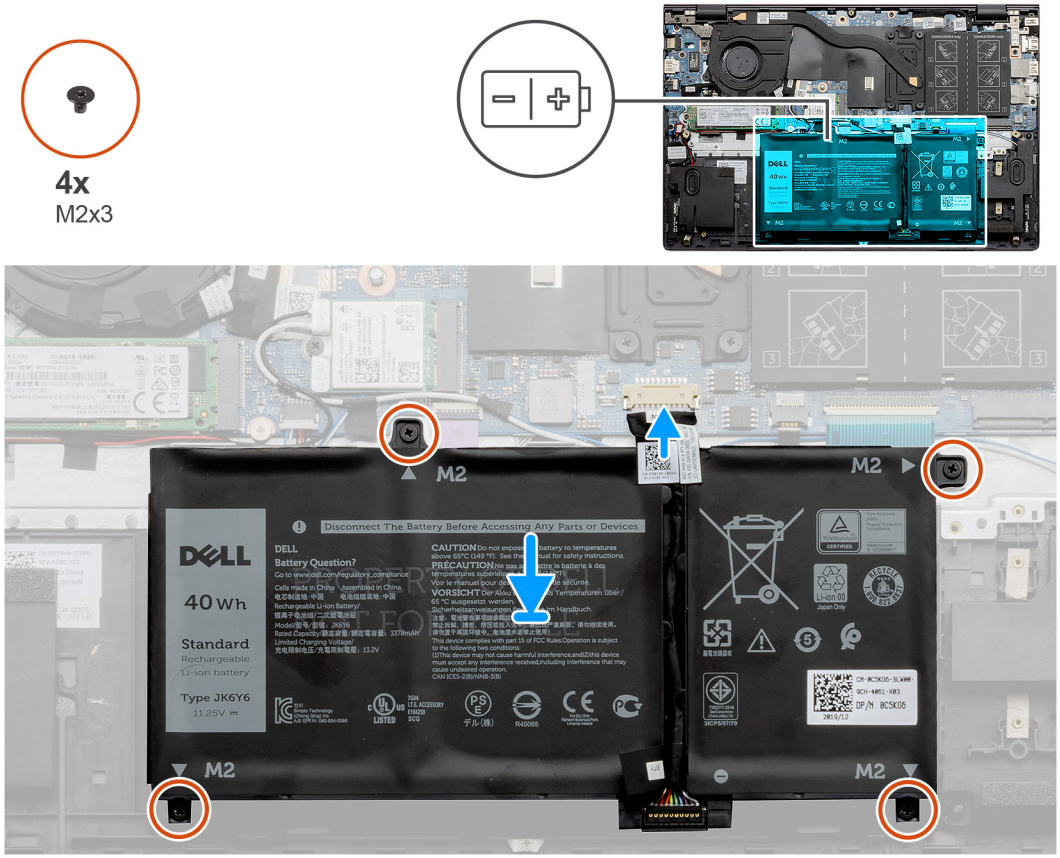
NOTE:

The battery type in your computer varies depending on the configuration ordered.

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

About this task

The figure indicates the location of the 3-cell battery in an UMA configuration and provides a visual representation of the installation procedure.



Steps

1. Place the battery on the palm-rest and keyboard assembly and align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly.
2. Install the four screws (M2x3) that secure the battery to the system board and palm-rest and keyboard assembly.
3. Connect the battery cable to the system board.

Next steps

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

Removing the 4-cell battery - UMA/discrete

Prerequisites

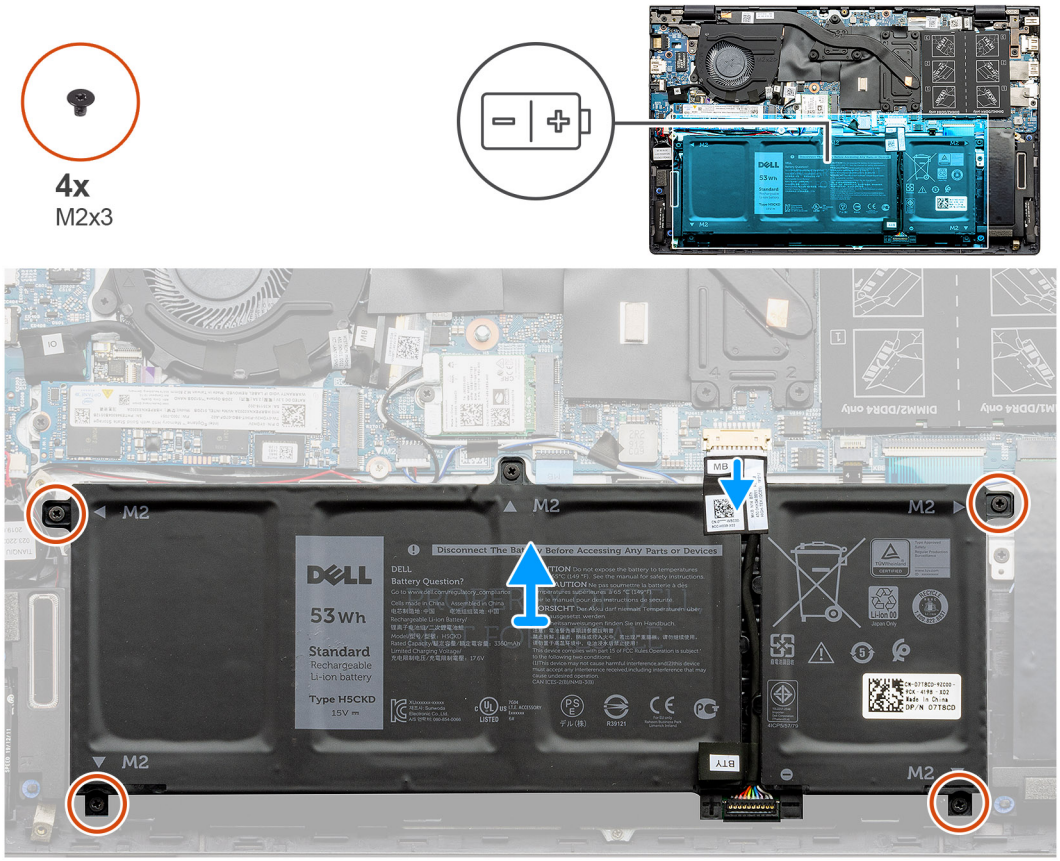
NOTE:

The battery type in your computer varies depending on the configuration ordered.

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

About this task

The figure indicates the location of the battery in a discrete configuration and provides a visual representation of the removal procedure.



Steps

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

Installing the 4-cell battery - UMA/discrete

Prerequisites

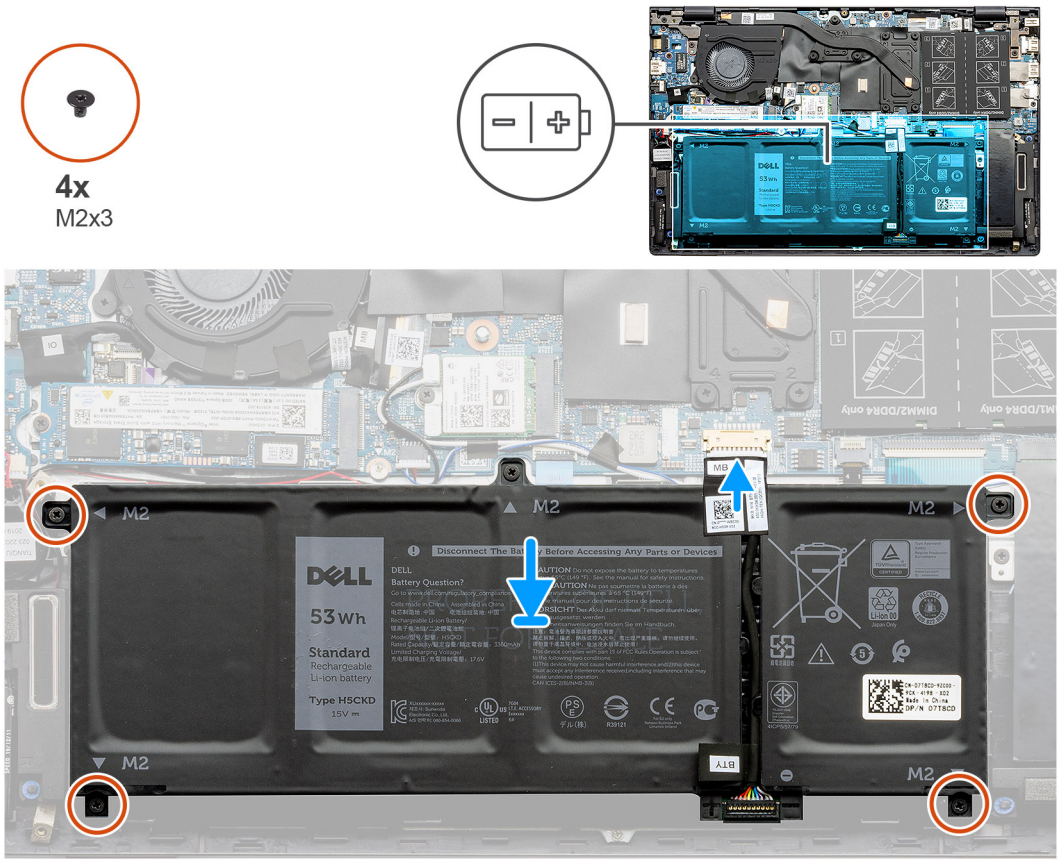
NOTE:

The battery type in your computer varies depending on the configuration ordered.

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

About this task

The figure indicates the location of the battery in a discrete configuration and provides a visual representation of the installation procedure.



Steps

1. Place the battery on the palm-rest and keyboard assembly and align the screw holes on the battery with the screw holes on the palm-rest and keyboard assembly.
2. Install the four screws (M2x3) that secure the battery to the system board and palm-rest and keyboard assembly.
3. Connect the battery cable to the system board.

Next steps

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

WLAN card

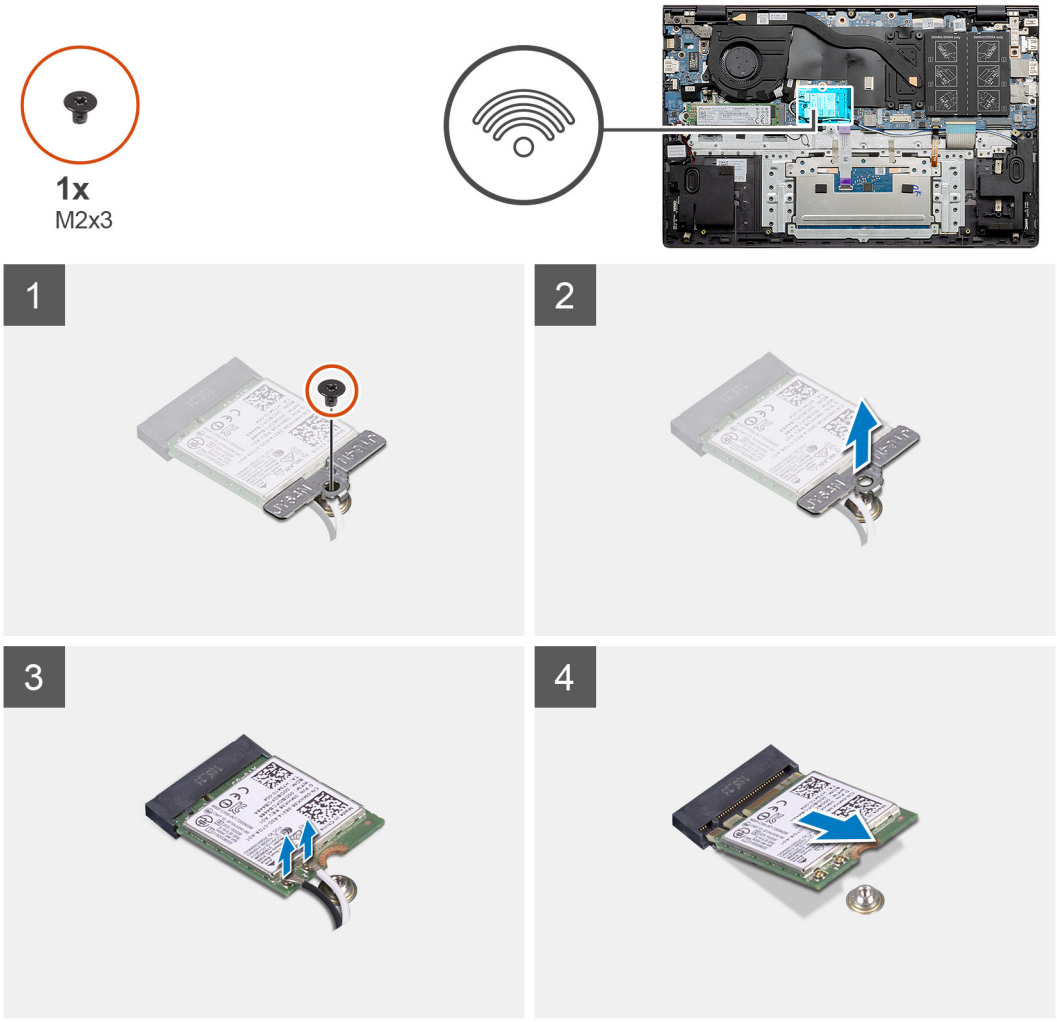
Removing the WLAN card - UMA

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the WLAN card and provides a visual representation of the removal procedure.



Steps

1. Remove the single screw (M2x3) that secures the WLAN card bracket to the WLAN card.
2. Remove the WLAN card bracket from the WLAN card.
3. Disconnect the antenna cables from the WLAN card.
4. Slide and remove the WLAN card from the WLAN card slot.

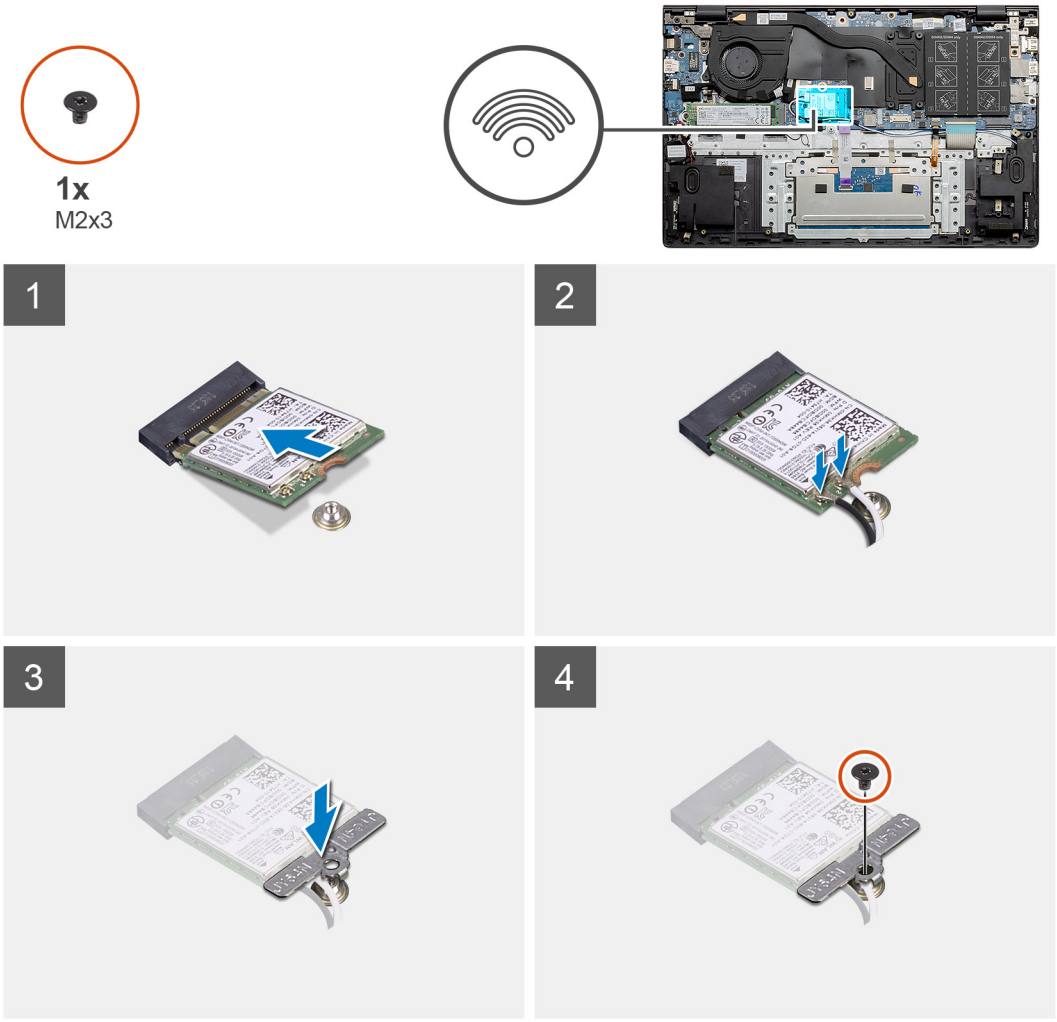
Installing the WLAN card - UMA

Prerequisites

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

About this task

The figure indicates the location of the WLAN card and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the WLAN card with the tab on the WLAN card slot and insert the WLAN card at an angle into the WLAN card slot.
2. Connect the antenna cables to the WLAN card.
3. Align and place the WLAN card bracket on the WLAN card.
4. Replace the screw (M2x3) to secure the WLAN card bracket to the WLAN card.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

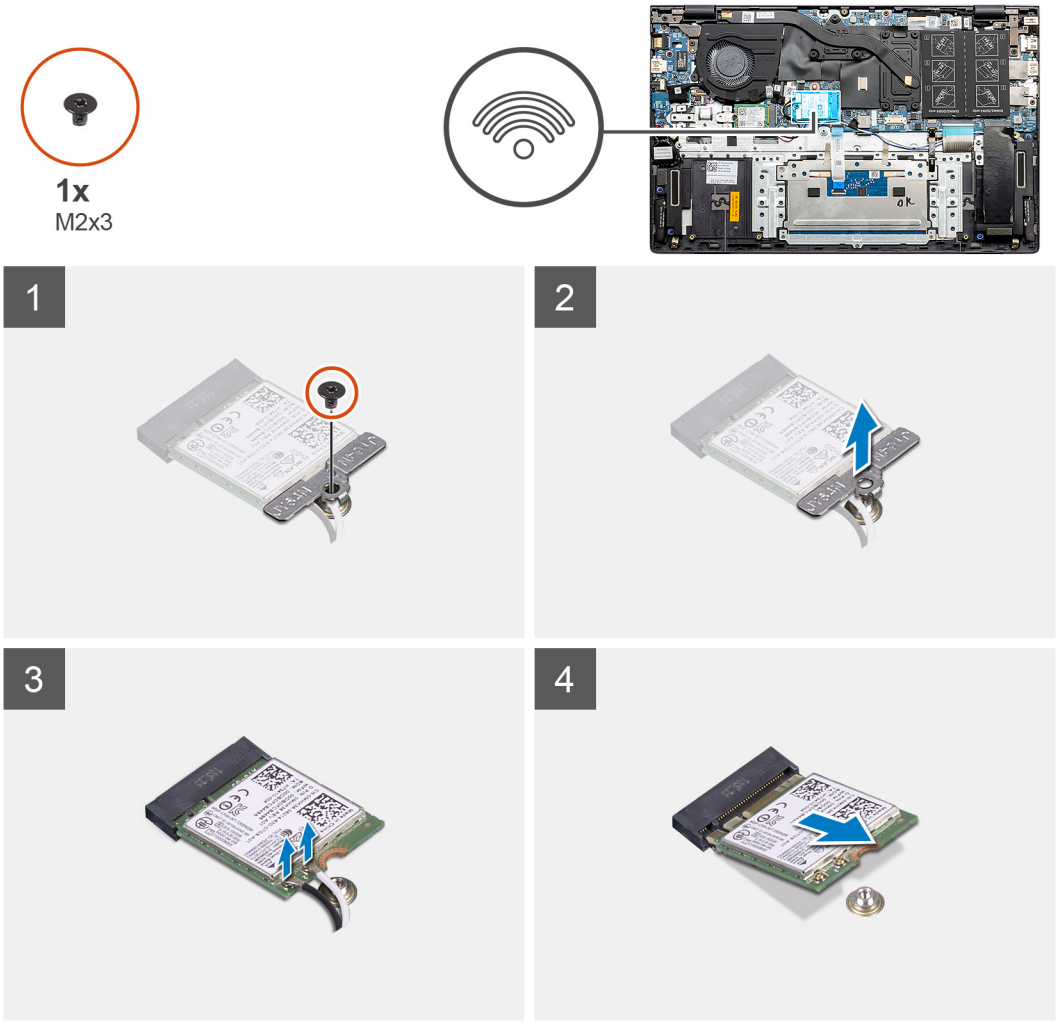
Removing the WLAN card - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the WLAN card and provides a visual representation of the removal procedure.



Steps

1. Remove the single screw (M2x3) that secures the WLAN card bracket to the WLAN card.
2. Remove the WLAN card bracket from the WLAN card.
3. Disconnect the antenna cables from the WLAN card.
4. Slide and remove the WLAN card from the WLAN card slot.

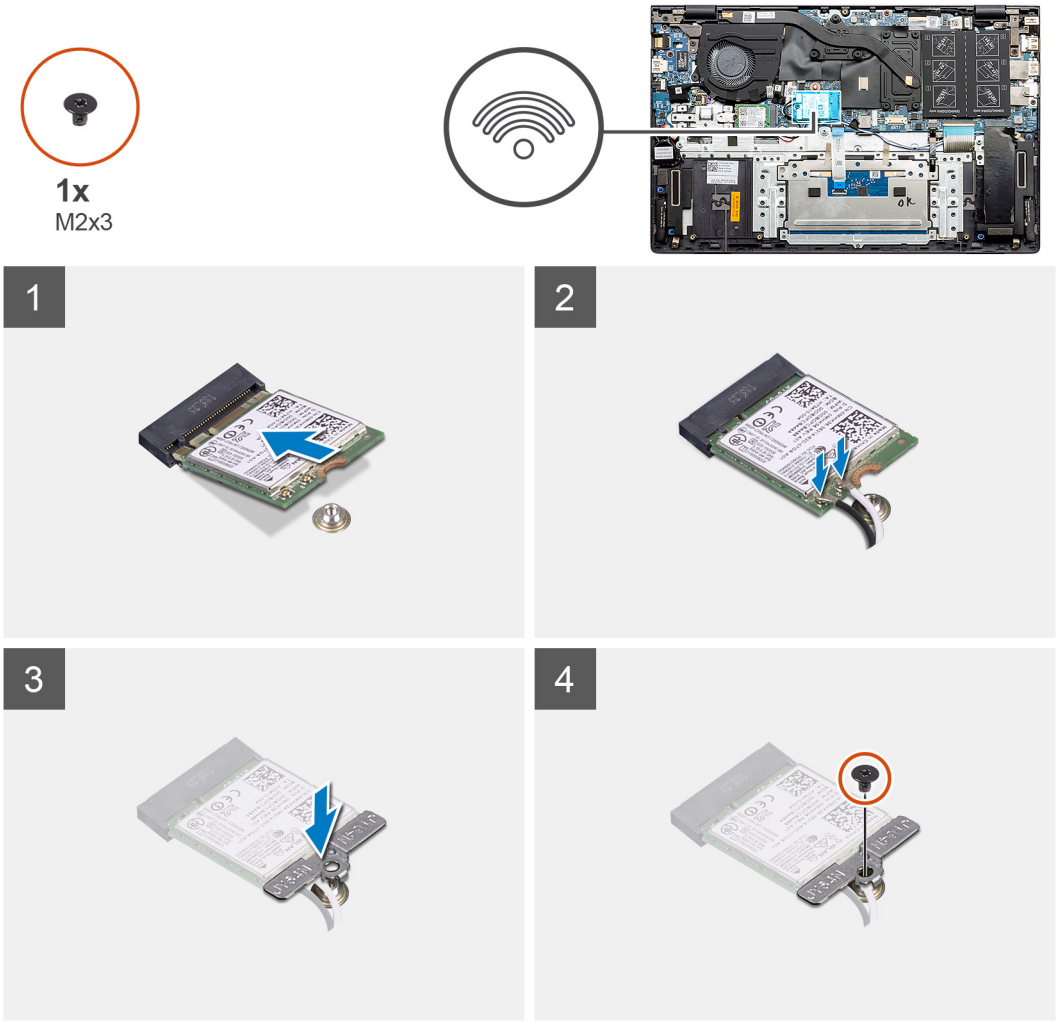
Installing the WLAN card - discrete

Prerequisites

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

About this task

The figure indicates the location of the WLAN card and provides a visual representation of the installation procedure.



Steps

1. Align the notch on the WLAN card with the tab on the WLAN card slot and insert the WLAN card at an angle into the WLAN card slot.
2. Connect the antenna cables to the WLAN card.
3. Align and place the WLAN card bracket on the WLAN card.
4. Replace the screw (M2x3) to secure the WLAN card bracket to the WLAN card.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Memory modules

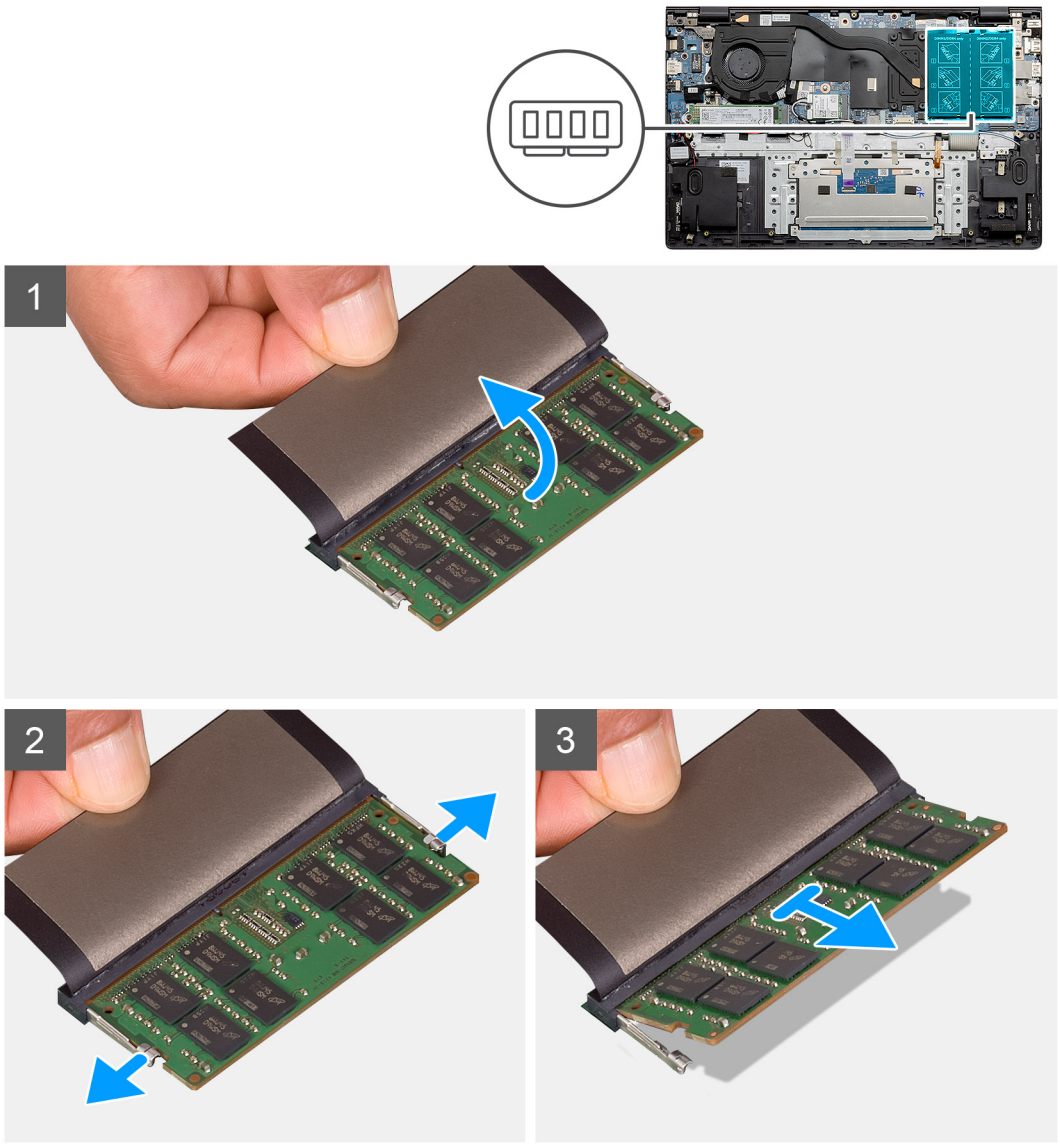
Removing the memory modules - UMA

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Disconnect the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the memory module and provides a visual representation of the removal procedure.



Steps

1. Lift the mylar covering the memory module.
2. Using your finger tips gently pry the retention clips away from the memory module until the memory module pops up.
3. Slide and remove the memory module off the memory module slot on the system board.

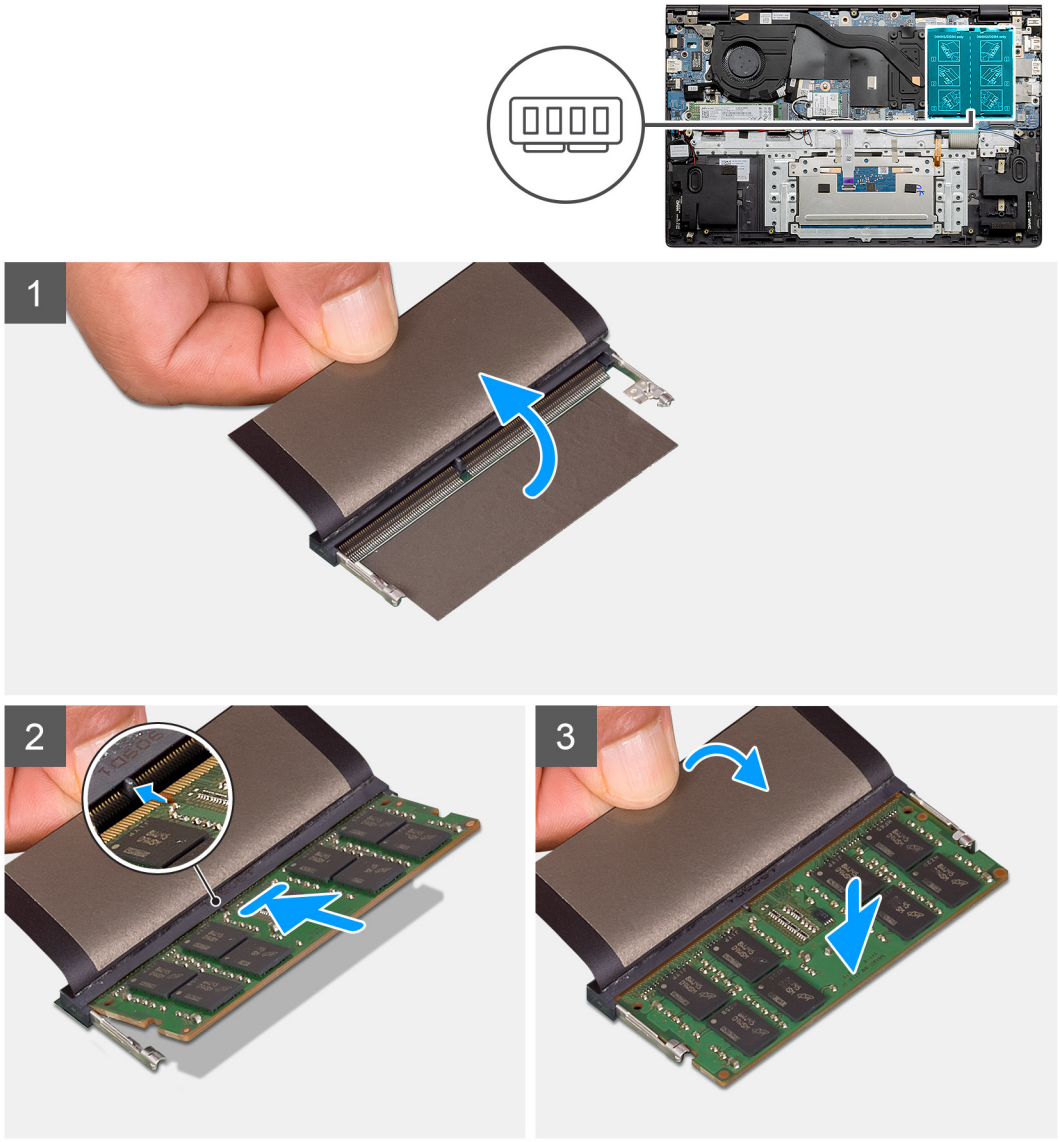
Installing the memory modules - UMA

Prerequisites

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

About this task

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



Steps

1. Lift the mylar, and align the notch on the memory module with the tab on the memory-module slot.
2. Slide the memory module firmly into the slot at an angle.
3. Press the memory module down until it clicks into place.

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

Next steps

1. Connect the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

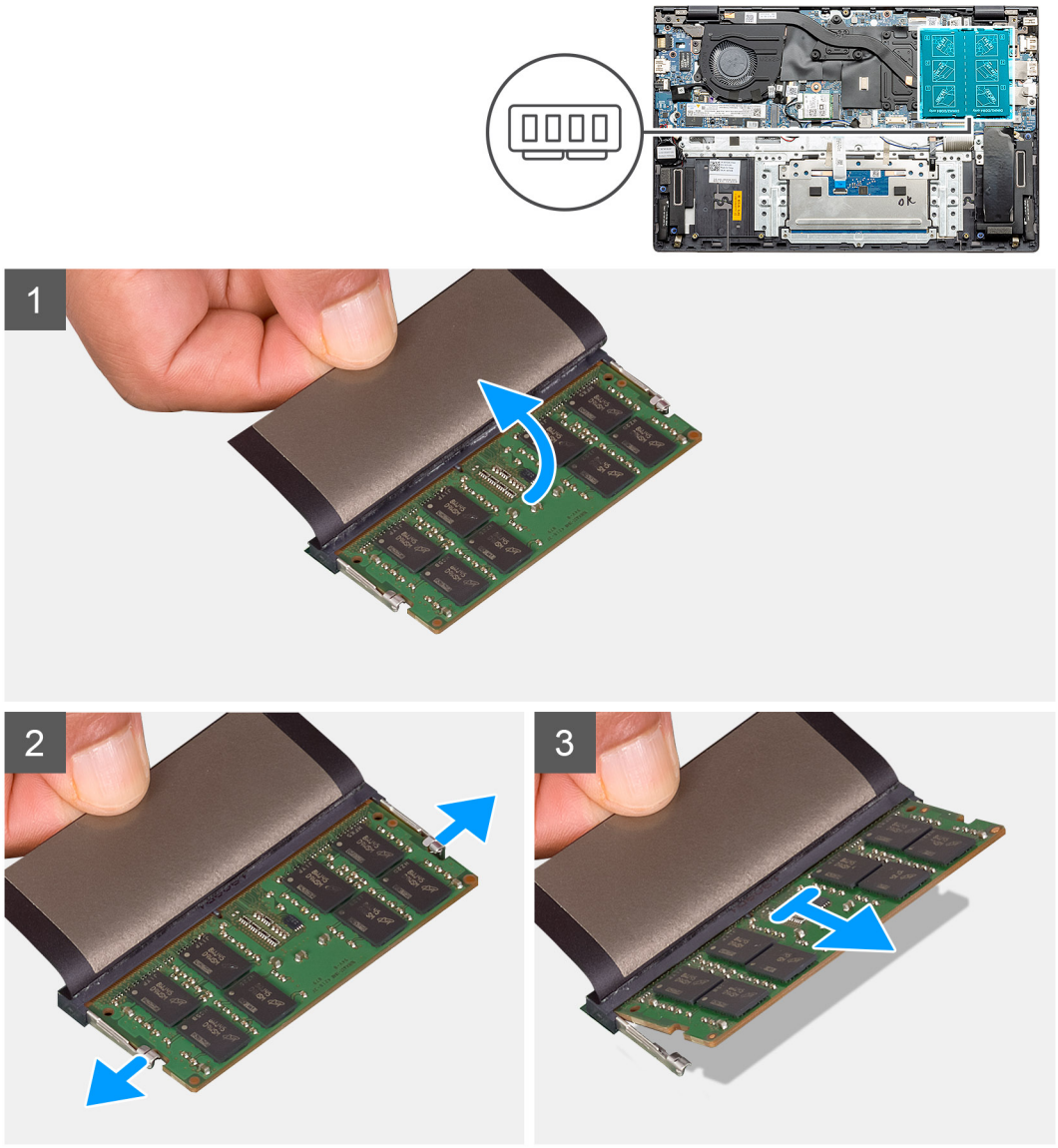
Removing the memory modules - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Disconnect the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the memory module and provides a visual representation of the removal procedure.



Steps

1. Lift the mylar covering the memory module.
2. Using your finger tips gently pry the retention clips away from the memory module until the memory module pops up.
3. Slide and remove the memory module off the memory module slot on the system board.

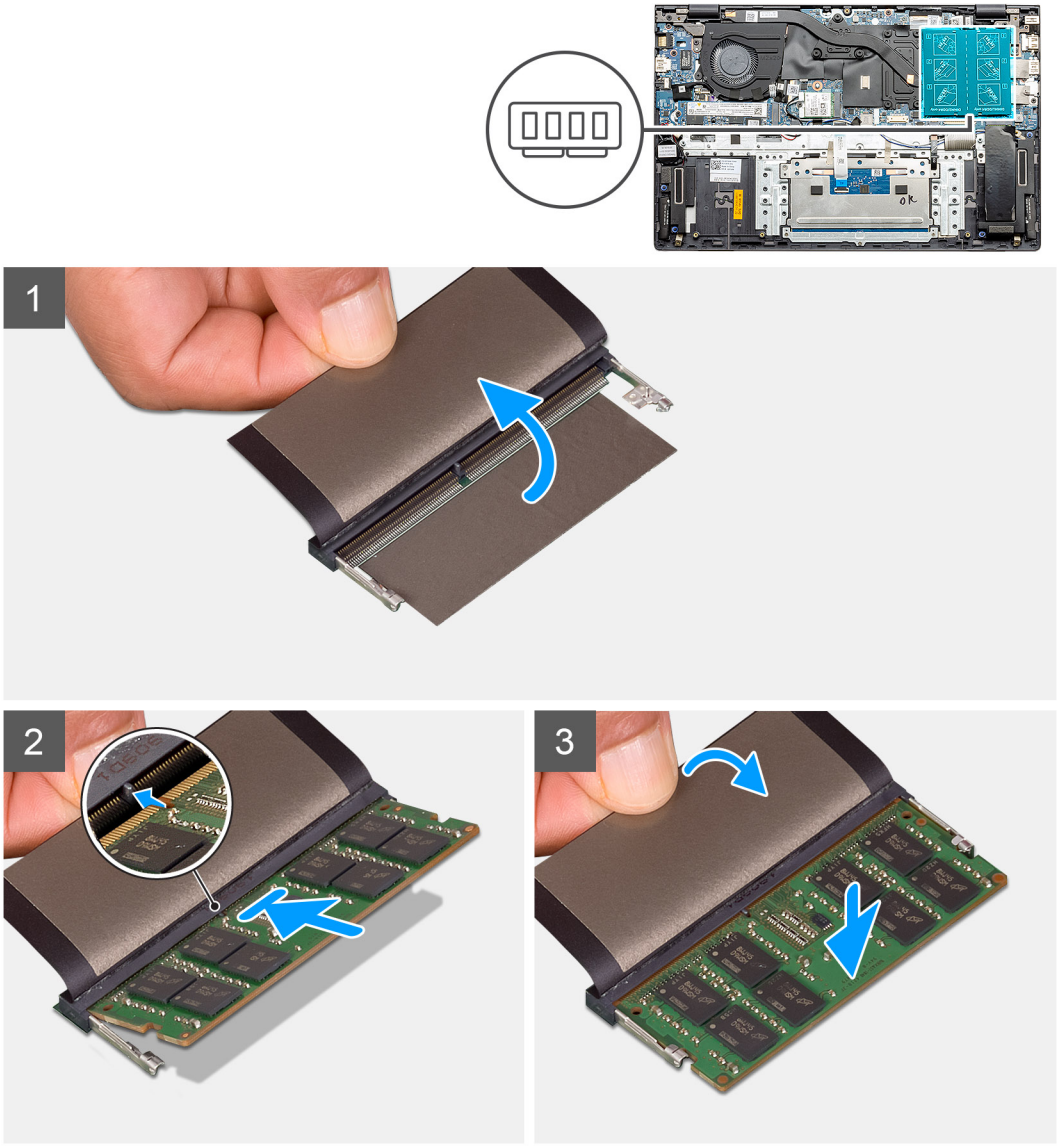
Installing the memory modules - discrete

Prerequisites

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

About this task

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



Steps

1. Lift the mylar, and align the notch on the memory module with the tab on the memory-module slot.
2. Slide the memory module firmly into the slot at an angle.
3. Press the memory module down until it clicks into place.

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

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Solid-state drive

Removing the M.2 2280 solid-state drive - UMA

Prerequisites

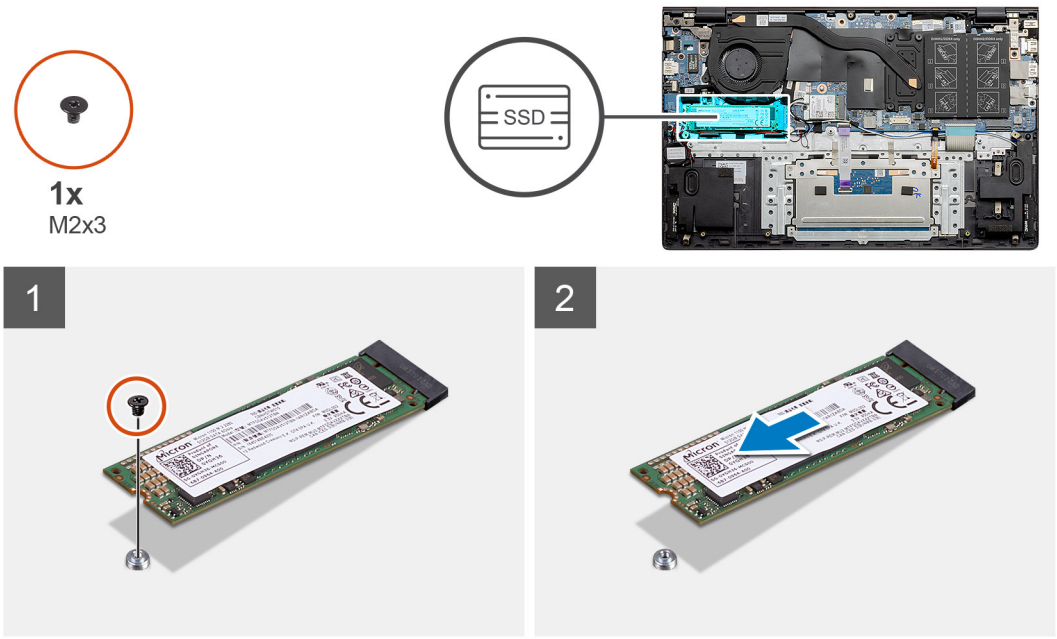
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

NOTE: If you have ordered a 3-cell (40 Wh) battery configuration, your computer can only support one SSD in M.2 slot one. M.2 slot two is only available if you have ordered an Intel Optane storage.

NOTE: If you have ordered a 4-cell (53 Wh) battery configuration, your computer may support a 2230 solid-state drive or a 2280 solid-state drive or an Intel Optane storage in M.2 slot two.

The figure indicates the location of the M.2 2280 solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Remove the single screw (M2x3) that secures the solid-state drive to the palm-rest and keyboard assembly.
2. Slide and remove the solid-state drive module from the solid-state drive slot on the system board.

Installing the M.2 2280 solid-state drive - UMA

Prerequisites

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

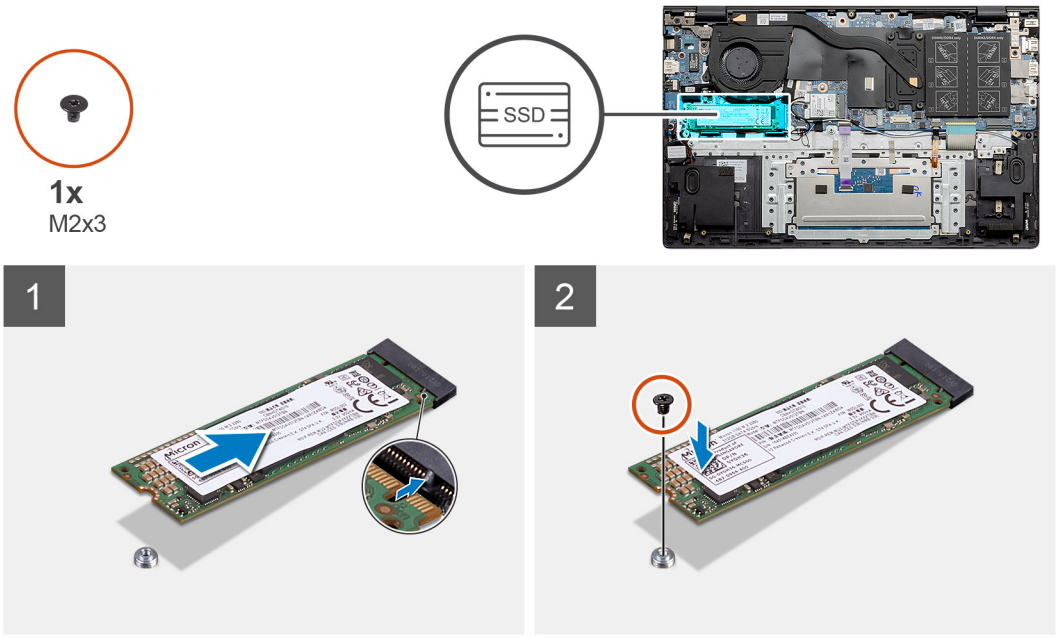
About this task

NOTE: If you have ordered a 3-cell (40 Wh) battery configuration, your computer can only support one SSD in M.2 slot one. M.2 slot two is only available if you have ordered an Intel Optane storage.

NOTE: If you have ordered a 4-cell (53 Wh) battery configuration, your computer may support a 2230 solid-state drive or a 2280 solid-state drive or an Intel Optane storage in M.2 slot two.

NOTE: If there is only one solid-state drive in the configuration you ordered, you can install another solid-state drive in the other M.2 slot. However, you may need a solid-state drive bracket (sold separately) to install the additional solid-state drive.

The figure indicates the location of the solid-state drive bracket and provides a visual representation of the bracket alignment procedure to accommodate the M.2 2280 solid-state drive.



Steps

1. Align the solid-state drive bracket to accommodate the M.2 2280 solid-state drive.
2. Replace the single (M2x3) screw to secure the solid-state drive module to the palm-rest and keyboard assembly.

Next steps

1. Connect the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

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

Prerequisites

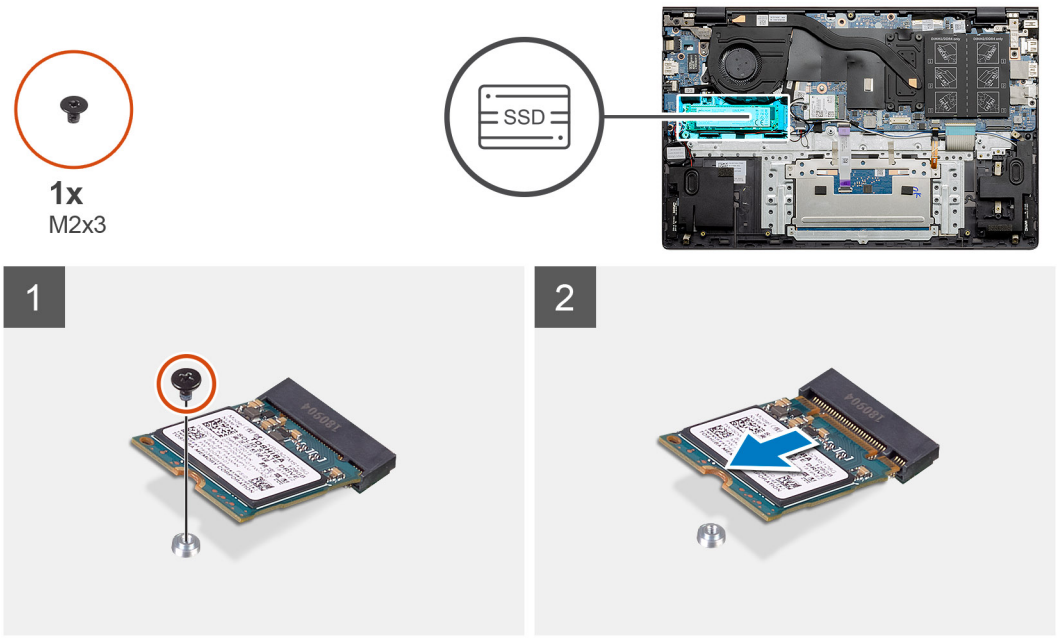
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Disconnect the battery (3-cell or 4-cell).

About this task

NOTE: If you have ordered a 3-cell (40 Wh) battery configuration, your computer can only support one SSD in M.2 slot one. M.2 slot two is only available if you have ordered an Intel Optane storage.

NOTE: If you have ordered a 4-cell (53 Wh) battery configuration, your computer may support a 2230 solid-state drive or a 2280 solid-state drive or an Intel Optane storage in M.2 slot two.

The figure indicates the location of the M.2 2230 solid-state drive and provides a visual representation of the removal procedure.



Steps

1. Remove the single screw (M2x3) that secures the solid-state drive to the palm-rest and keyboard assembly.
2. Slide and remove the solid-state drive module from the solid-state drive slot on the system board.

Installing the M.2 2230 solid-state drive - UMA

Prerequisites

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

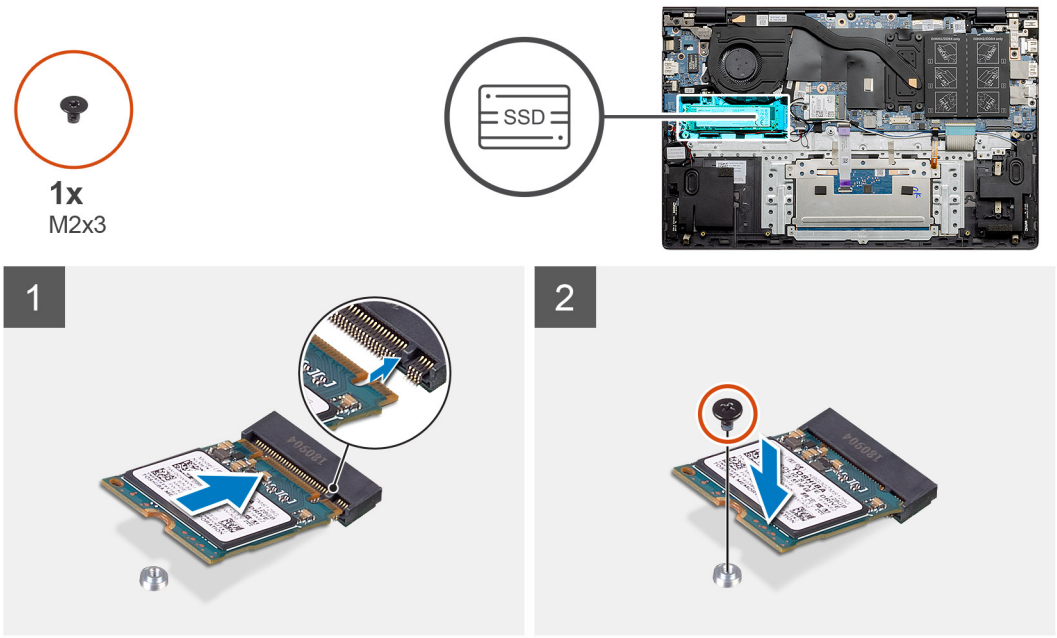
About this task

NOTE: If you have ordered a 3-cell (40 Wh) battery configuration, your computer can only support one SSD in M.2 slot one. M.2 slot two is only available if you have ordered an Intel Optane storage.

NOTE: If you have ordered a 4-cell (53 Wh) battery configuration, your computer may support a 2230 solid-state drive or a 2280 solid-state drive or an Intel Optane storage in M.2 slot two.

NOTE: If there is only one solid-state drive in the configuration you ordered, you can install another solid-state drive in the other M.2 slot. However, you may need a solid-state drive bracket (sold separately) to install the additional solid-state drive.

The figure indicates the location of the solid-state drive bracket and provides a visual representation of the bracket alignment procedure to accommodate the M.2 2230 solid-state drive.



Steps

1. Align the solid-state drive bracket to accommodate the M.2 2230 solid-state drive.
2. Replace the single (M2x3) screw to secure the solid-state drive module to the palm-rest and keyboard assembly.

Next steps

1. Connect the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Removing the M.2 2280 solid-state drive - SSD-1 - discrete

Prerequisites

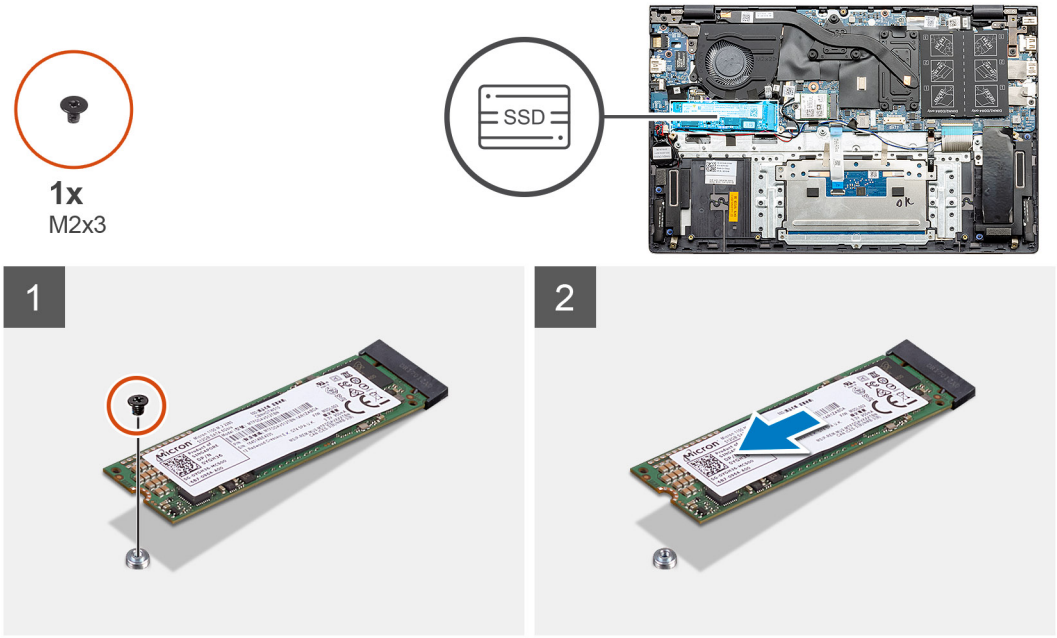
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Disconnect the battery (3-cell or 4-cell).

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: M.2 slot two supports one PCIe Gen3 x4 NVMe or SATA solid-state drive (M.2 2230 or M.2 2280) or one Intel Optane memory H10 with solid state storage.

The figure indicates the location of the M.2 2280 solid-state drive in slot one and provides a visual representation of the removal procedure.



Steps

1. Remove the single screw (M2x3) that secures the solid-state drive to the palm-rest and keyboard assembly.
2. Slide and remove the solid-state drive module from the solid-state drive slot on the system board.

Installing the M.2 2280 solid-state drive - SSD-1 - discrete

Prerequisites

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

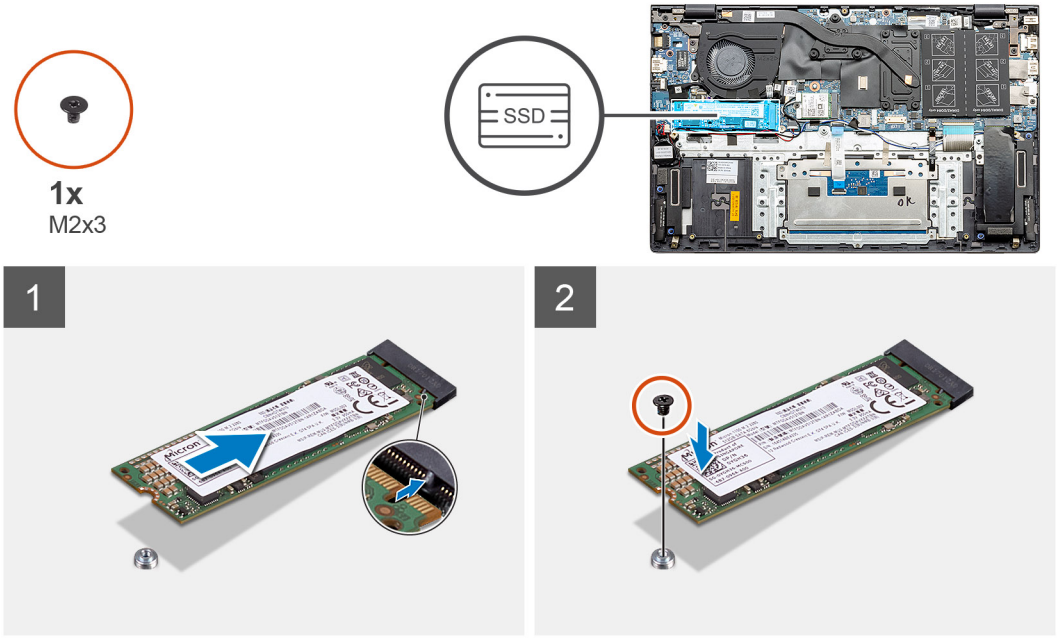
About this task

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: M.2 slot two supports one PCIe Gen3 x4 NVMe or SATA solid-state drive (M.2 2230 or M.2 2280) or one Intel Optane memory H10 with solid state storage.

NOTE: If there is only one solid-state drive in the configuration you ordered, you can install another solid-state drive in the other M.2 slot. However, you may need a solid-state drive bracket (sold separately) to install the additional solid-state drive.

The figure indicates the location of the solid-state drive in slot one and provides a visual representation of the alignment procedure to accommodate the M.2 2280 solid-state drive.



Steps

1. Align the solid-state drive bracket to accommodate the M.2 2280 solid-state drive.
2. Replace the single (M2x3) screw to secure the solid-state drive module to the palm-rest and keyboard assembly.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Removing the M.2 2230 solid-state drive - SSD-1 - discrete

Prerequisites

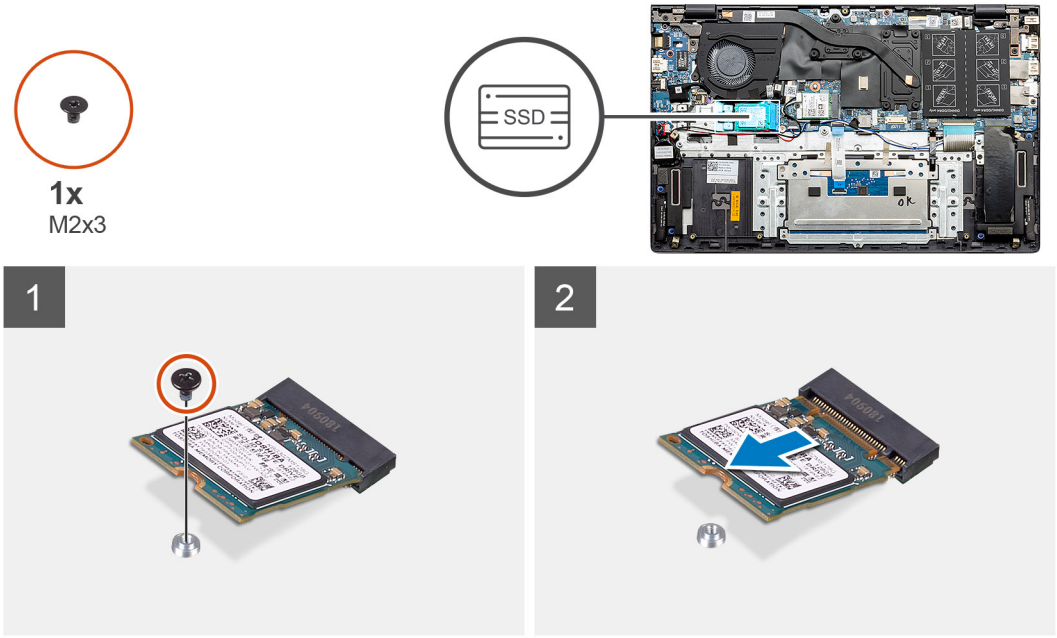
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Disconnect the battery (3-cell or 4-cell).

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: M.2 slot two supports one PCIe Gen3 x4 NVMe or SATA solid-state drive (M.2 2230 or M.2 2280) or one Intel Optane Memory H10 with solid state storage.

The figure indicates the location of the M.2 2230 solid-state drive in slot one and provides a visual representation of the removal procedure.



Steps

1. Remove the single screw (M2x3) that secures the solid-state drive to the palm-rest and keyboard assembly.
2. Slide and remove the solid-state drive module from the solid-state drive slot on the system board.

Installing the M.2 2230 solid-state drive - SSD-1 - discrete

Prerequisites

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

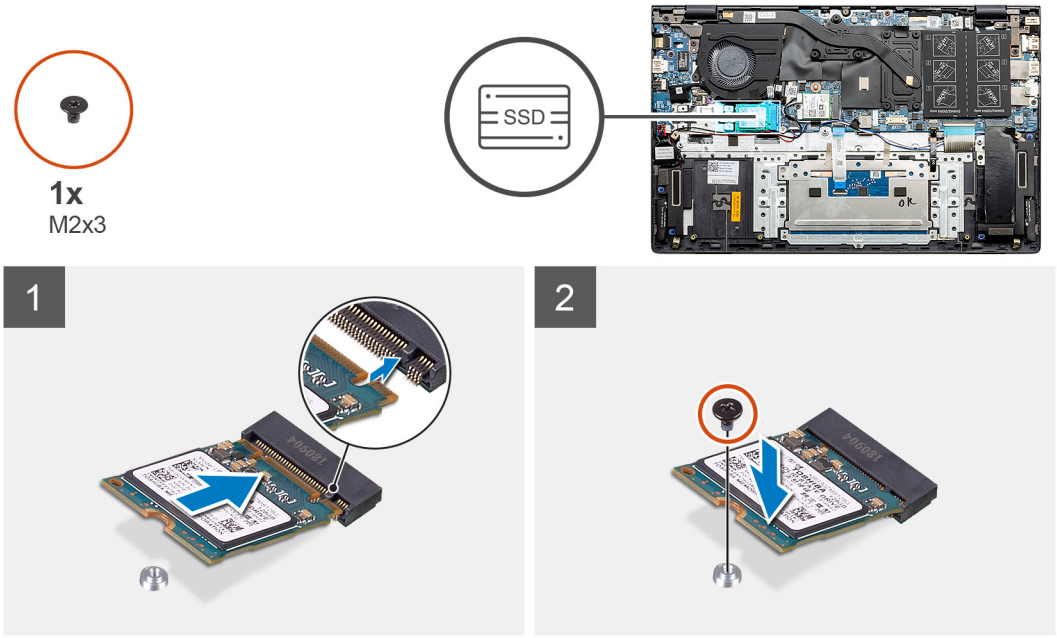
About this task

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: M.2 slot two supports one PCIe Gen3 x4 NVMe or SATA solid-state drive (M.2 2230 or M.2 2280) or one Intel Optane Memory H10 with solid state storage.

NOTE: If there is only one solid-state drive in the configuration you ordered, you can install another solid-state drive in the other M.2 slot. However, you may need a solid-state drive bracket (sold separately) to install the additional solid-state drive.

The figure indicates the location of the solid-state drive in slot one and provides a visual representation of the bracket alignment procedure to accommodate the M.2 2230 solid-state drive.



Steps

1. Align the solid-state drive bracket to accommodate the M.2 2230 solid-state drive.
2. Replace the single (M2x3) screw to secure the solid-state drive module to the palm-rest and keyboard assembly.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

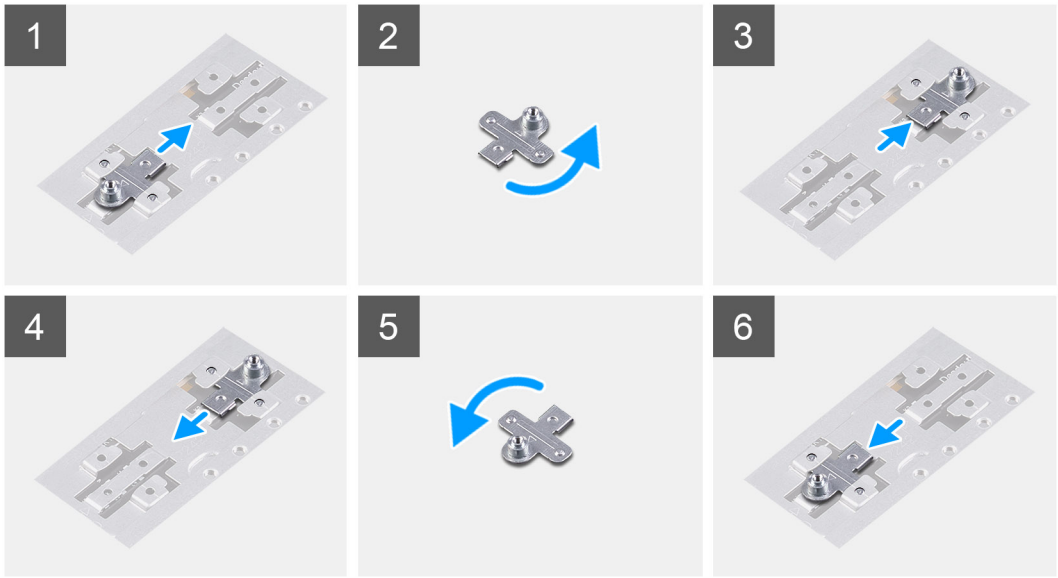
Replacing the SSD-1 support bracket

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the UMA (M.2 2230 SSD or M.2 2280 SSD) or discrete (M.2 2230 SSD or M.2 2280 SSD).

About this task

The figure provides a visual representation of the replace procedure.



Steps

1. Slide and remove the SSD support bracket from the support bracket slot.
2. Depending on the type of solid-state drive (M.2 2230/ M.2 2280), align and insert the SSD support bracket into the support bracket slot.
3. Install the solid-state drive.

Removing the M.2 2280 solid-state drive - SSD-2 - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Disconnect the battery (3-cell or 4-cell).

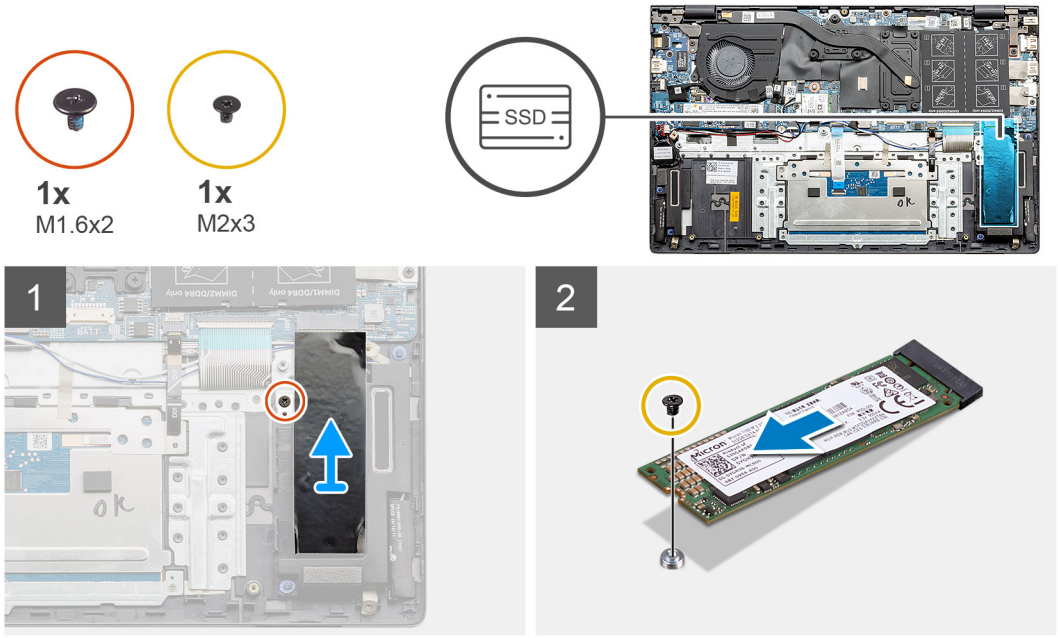
About this task

NOTE: If you have ordered a 3-cell (40 Wh) battery configuration, your computer can only support one SSD in M.2 slot one. M.2 slot two is only available if you have ordered an Intel Optane storage.

NOTE: If you have ordered a 4-cell (53 Wh) battery configuration, your computer may support a 2230 solid-state drive or a 2280 solid-state drive or an Intel Optane storage in M.2 slot two.

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

The figure indicates the location of the solid-state drive and provides a visual representation of the removal procedure of M.2 2280 SSD from slot two.



Steps

1. Remove the single screw (M1.6x2) that secures the solid-state drive module support bracket to the palm-rest and keyboard assembly.
2. Lift and remove the solid-state drive support bracket from the solid-state drive slot.
3. Remove the single screw (M2x3) that secures the solid-state drive module to the palm-rest and keyboard assembly.
4. Slide and remove the solid-state drive module from the solid-state drive slot.

Installing the M.2 2280 solid-state drive - SSD-2 - discrete

Prerequisites

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

NOTE: Slot two supports both M.2 2230 and M.2 2280 SSD.

NOTE: If you have ordered a 3-cell (40 Wh) battery configuration, your computer can only support one SSD in M.2 slot one. M.2 slot two is only available if you have ordered an Intel Optane storage.

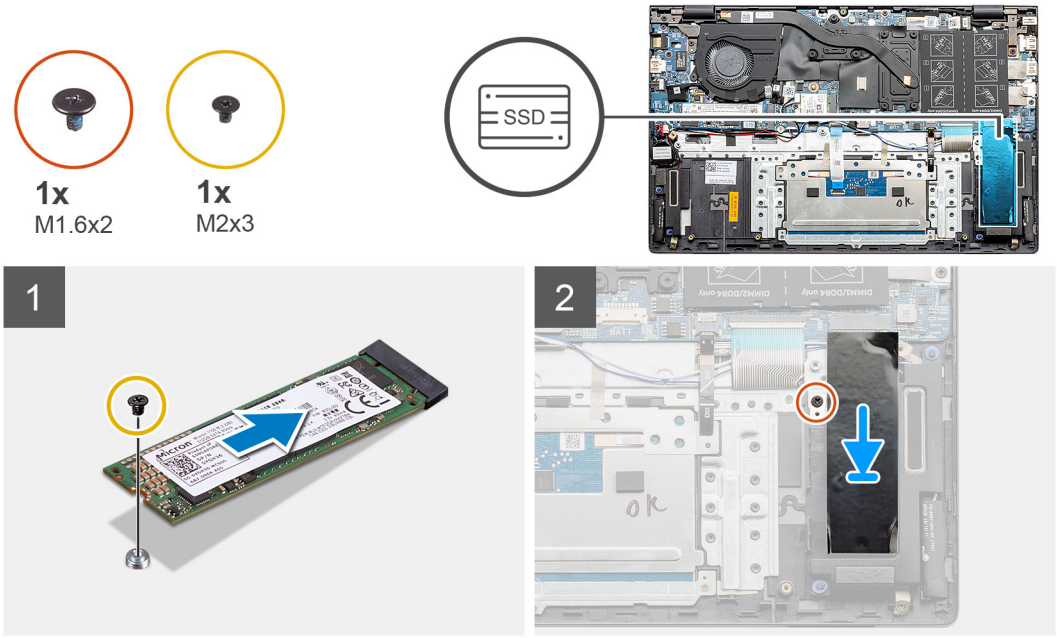
NOTE: If you have ordered a 4-cell (53 Wh) battery configuration, your computer may support a 2230 solid-state drive or a 2280 solid-state drive or an Intel Optane storage in M.2 slot two.

NOTE: If there is only one solid-state drive in the configuration you ordered, you can install another solid-state drive in the other M.2 slot. However, you may need a solid-state drive bracket (sold separately) to install the additional solid-state drive.

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

About this task

The figure indicates the location of the solid-state drive support bracket and provides a visual representation of the bracket alignment procedure to accommodate the M.2 2280 solid-state drive from slot two.



Steps

1. Align the solid-state drive bracket to accommodate the M.2 2280 solid-state drive.
2. Replace the single screw (M2x3) that secures the solid-state drive module to the palm-rest and keyboard assembly.
3. Place the solid-state drive module bracket.
4. Replace the single (M1.6x2) screw to secure the solid-state drive bracket to the palm-rest and keyboard assembly.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Speakers

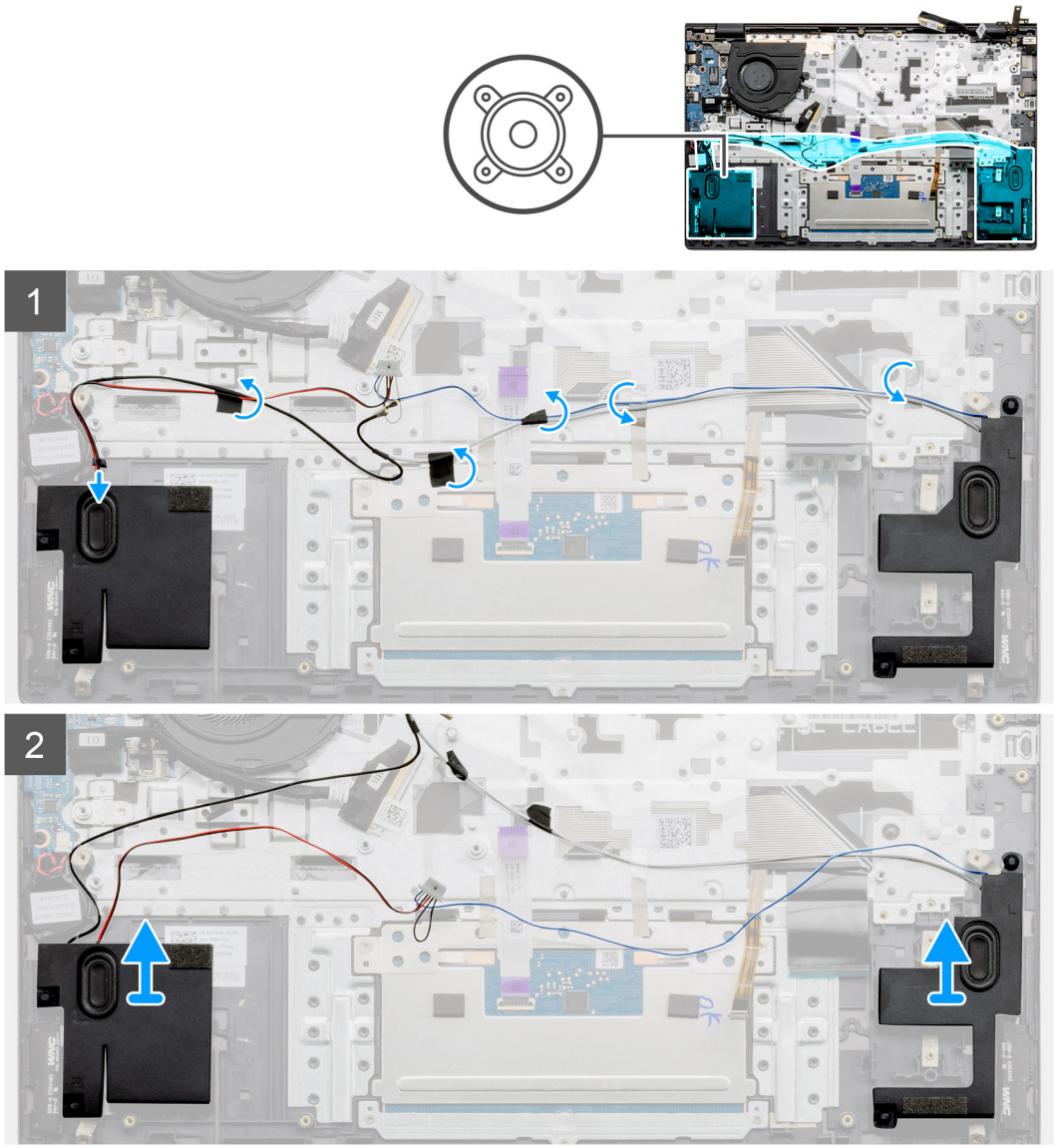
Removing the speakers (in 3-cell battery configuration)

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the speakers in a system configuration with 3-cell battery and provides a visual representation of the removal procedure.



Steps

1. Locate the speakers on your computer.
2. Disconnect the speaker cable from the connector on the system board.
3. Peel the adhesive tape that secures the speaker cable.
4. Unroute the speaker cables from the retention clips on the computer.
5. Lift the speakers, along with the cable, off the palm-rest and keyboard assembly.

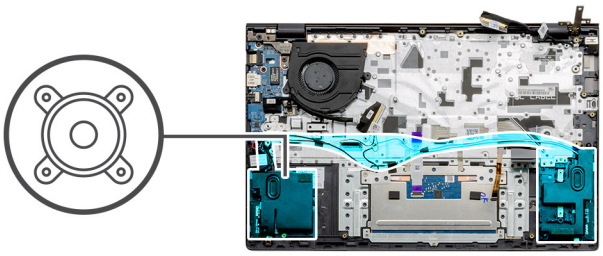
Installing the speakers (in 3-cell battery configuration)

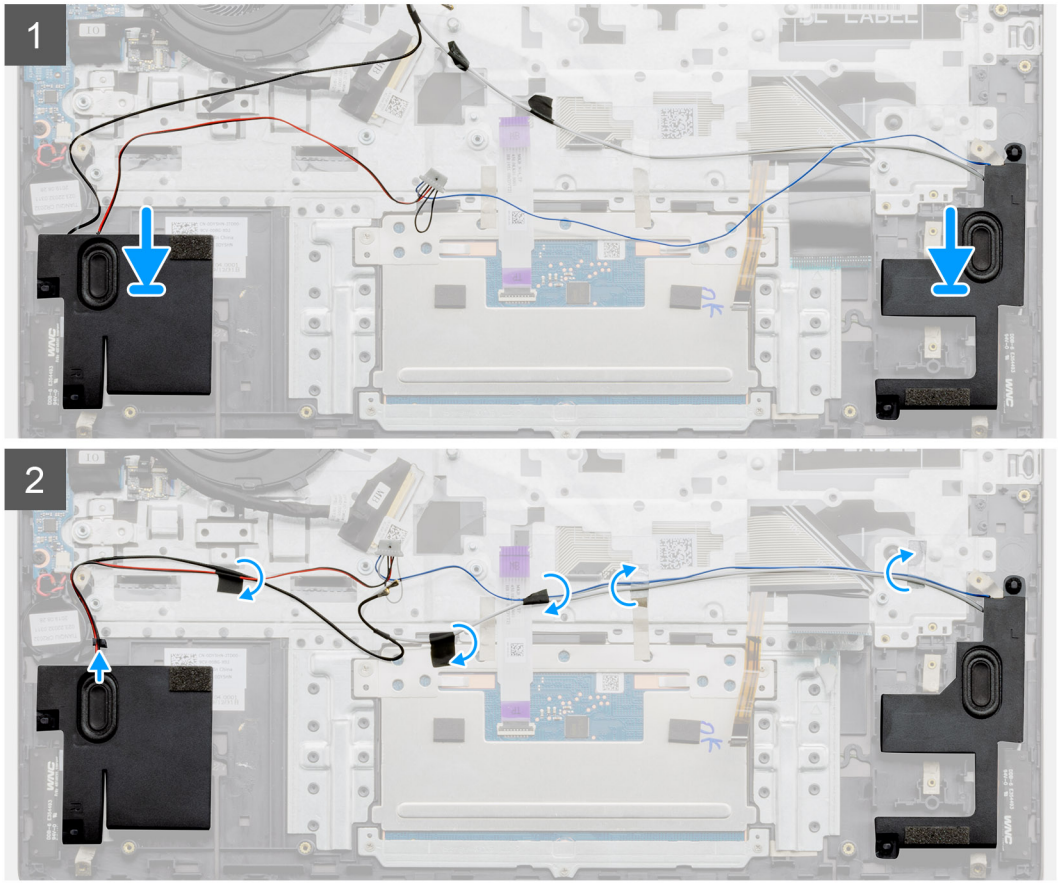
Prerequisites

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

About this task

The figure indicates the location of the speakers in a system configuration with 3-cell battery and provides a visual representation of the installation procedure.





Steps

1. Using the alignment posts and rubber grommets, place the speakers in the slots on the palm-rest and keyboard assembly.
2. Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.
3. Connect the speaker cable to the system board.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

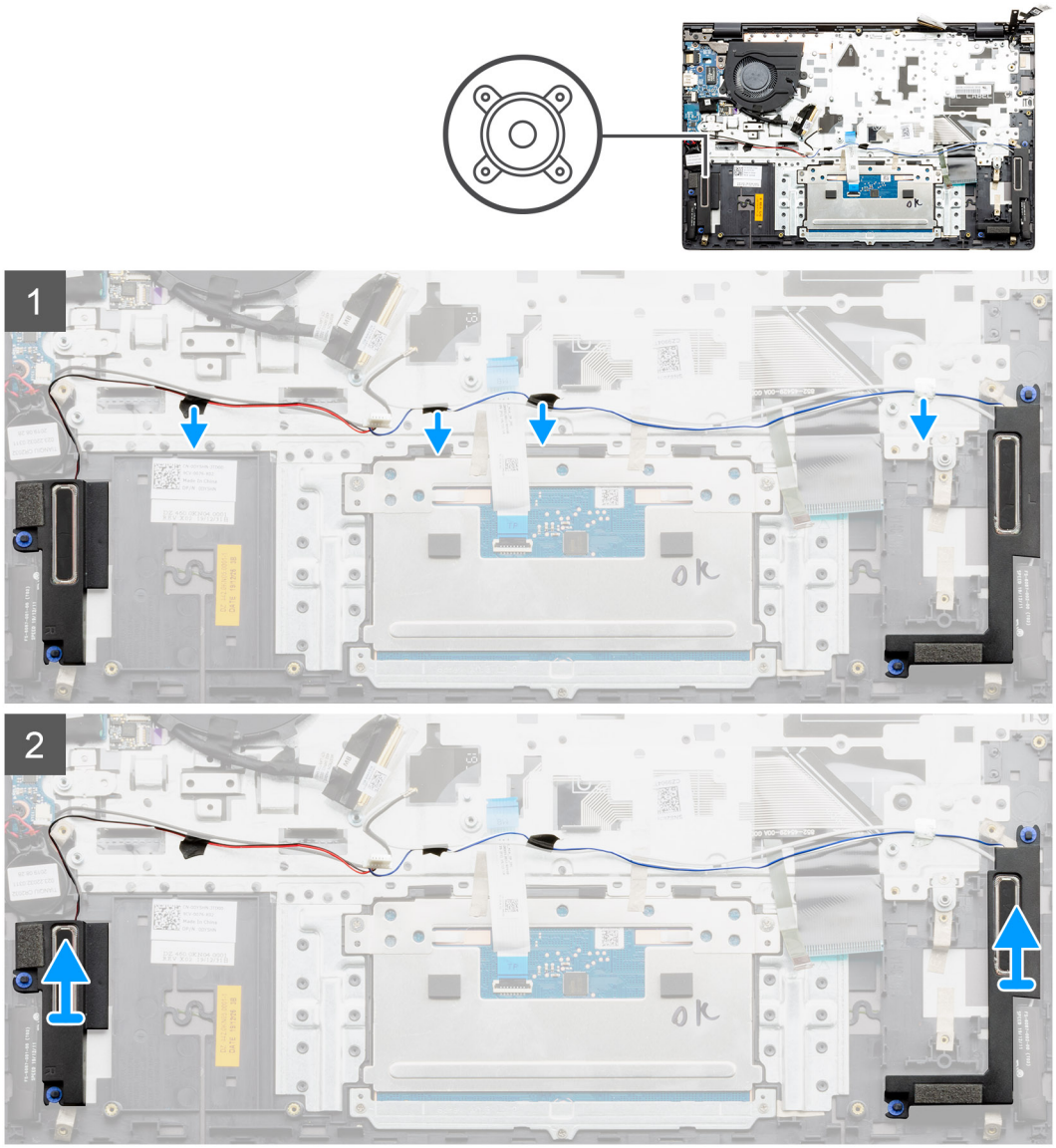
Removing the speakers (in 4-cell battery configuration)

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the speakers in a system configuration with 4-cell battery and provides a visual representation of the removal procedure.



Steps

1. Locate the speakers on your computer.
2. Disconnect the speaker cable from the connector on the system board.
3. Peel the adhesive tape that secures the speaker cable.
4. Unroute the speaker cables from the retention clips on the computer.
5. Lift the speakers, along with the cable, off the palm-rest and keyboard assembly.

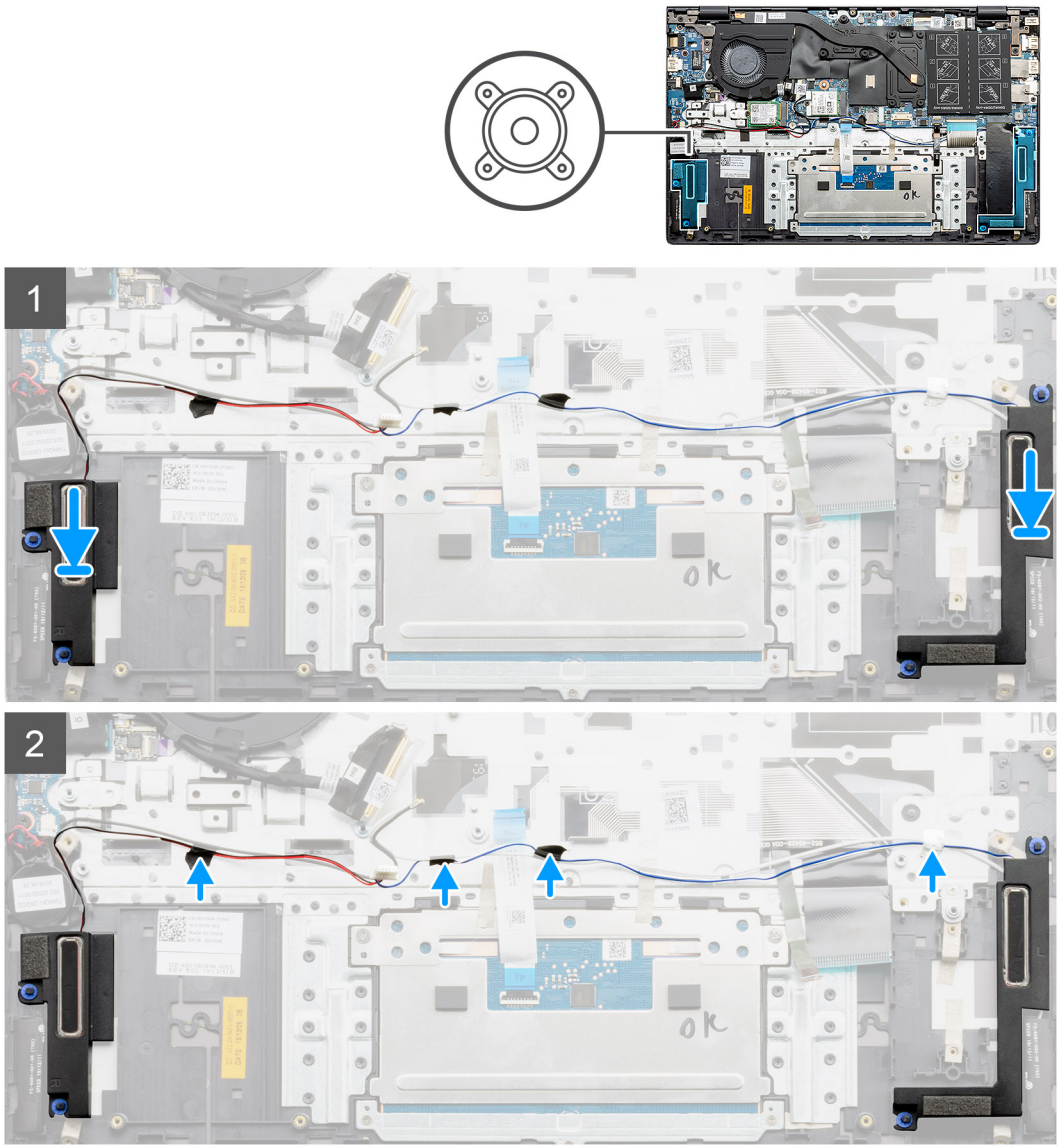
Installing the speakers (in 4-cell battery configuration)

Prerequisites

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

About this task

The figure indicates the location of the speakers in a system configuration with 4-cell battery and provides a visual representation of the installation procedure.



Steps

1. Using the alignment posts and rubber grommets, place the speakers in the slots on the palm-rest and keyboard assembly.
2. Route the speaker cable through the routing guides on the palm-rest and keyboard assembly.
3. Connect the speaker cable to the system board.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

System fan

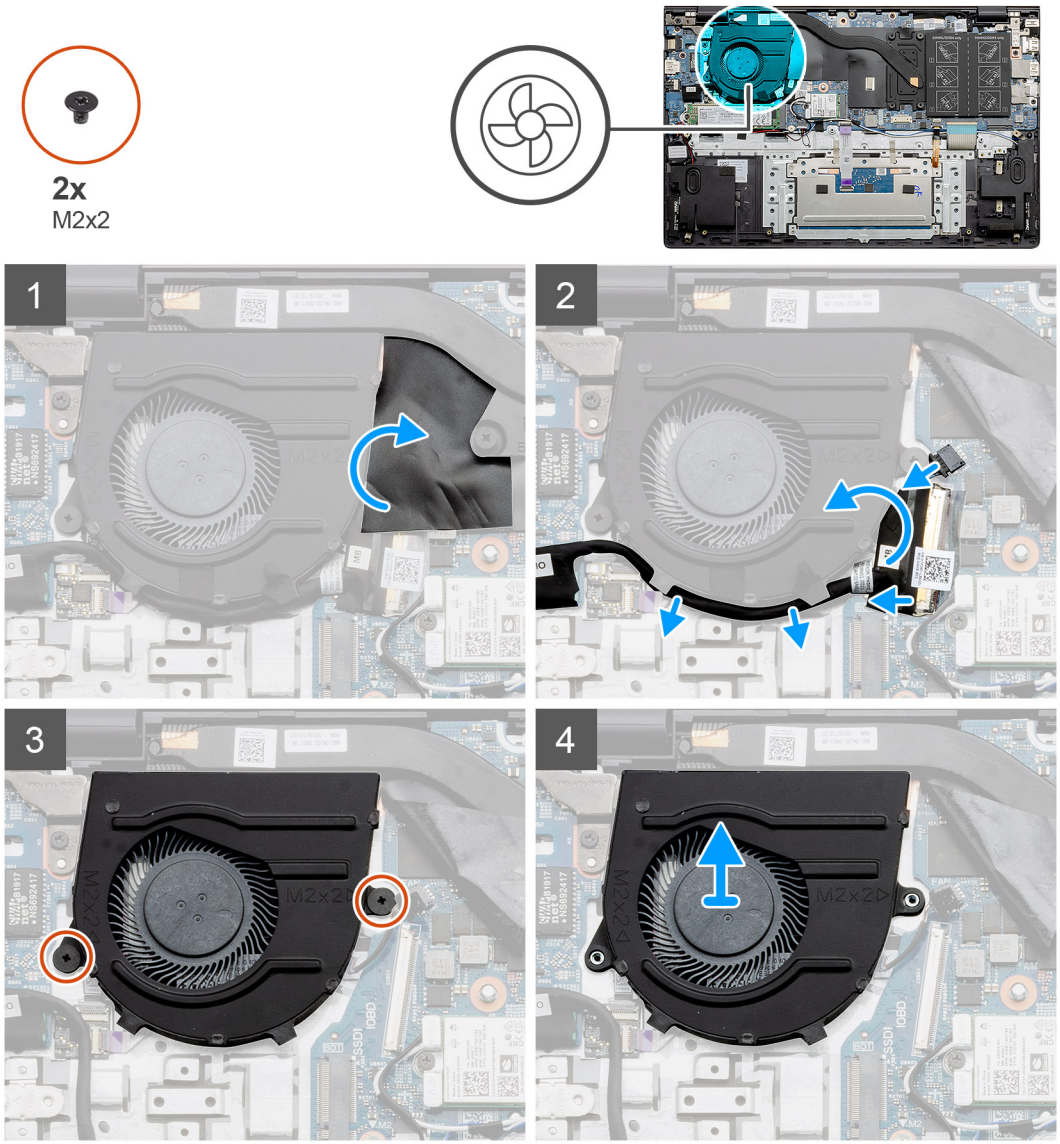
Removing the system fan - UMA

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the system fan and provides a visual representation of the removal procedure.



Steps

1. Lift the mylar cover.
2. Disconnect the system fan cable from the system board.
3. Peel the adhesive tape, and unroute the I/O cable.
4. Remove the two (M2x2) screws that secure the system fan to the palm-rest and keyboard assembly.

5. Slide and lift the system fan off the palm-rest and keyboard assembly.

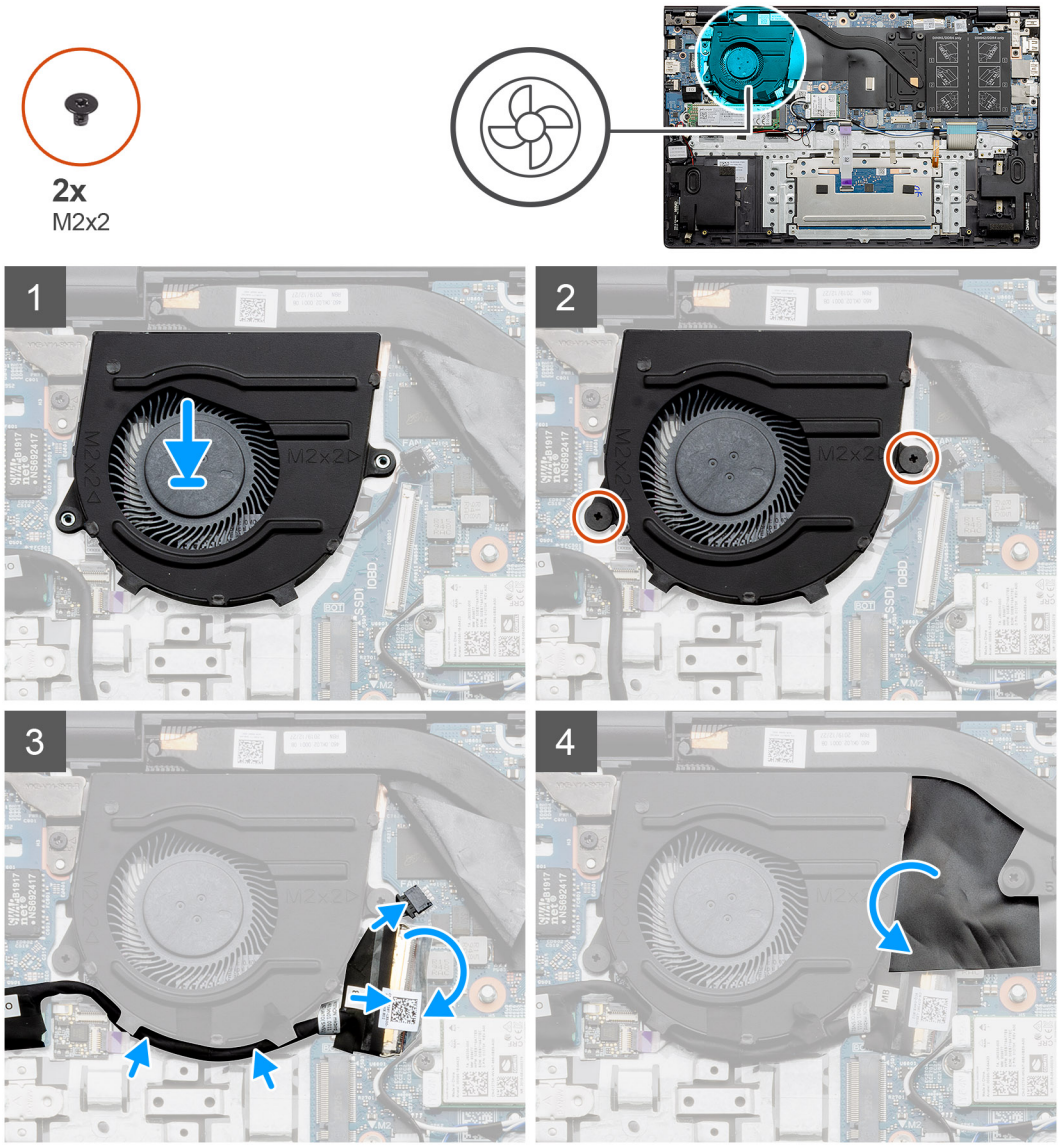
Installing the system fan - UMA

Prerequisites

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

About this task

The figure indicates the location of the system fan and provides a visual representation of the installation procedure.



Steps

1. Slide and place the system fan on the palm-rest and keyboard assembly.
2. Align the screw holes on the system fan with the screw holes on the palm-rest and keyboard assembly.
3. Replace the two (M2x2) screws to secure the system fan to the palm-rest and keyboard assembly.
4. Connect the system fan cable to the system board.
5. Route the I/O cable underneath the system fan and connect it to the system board.
6. Place the mylar cover back.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

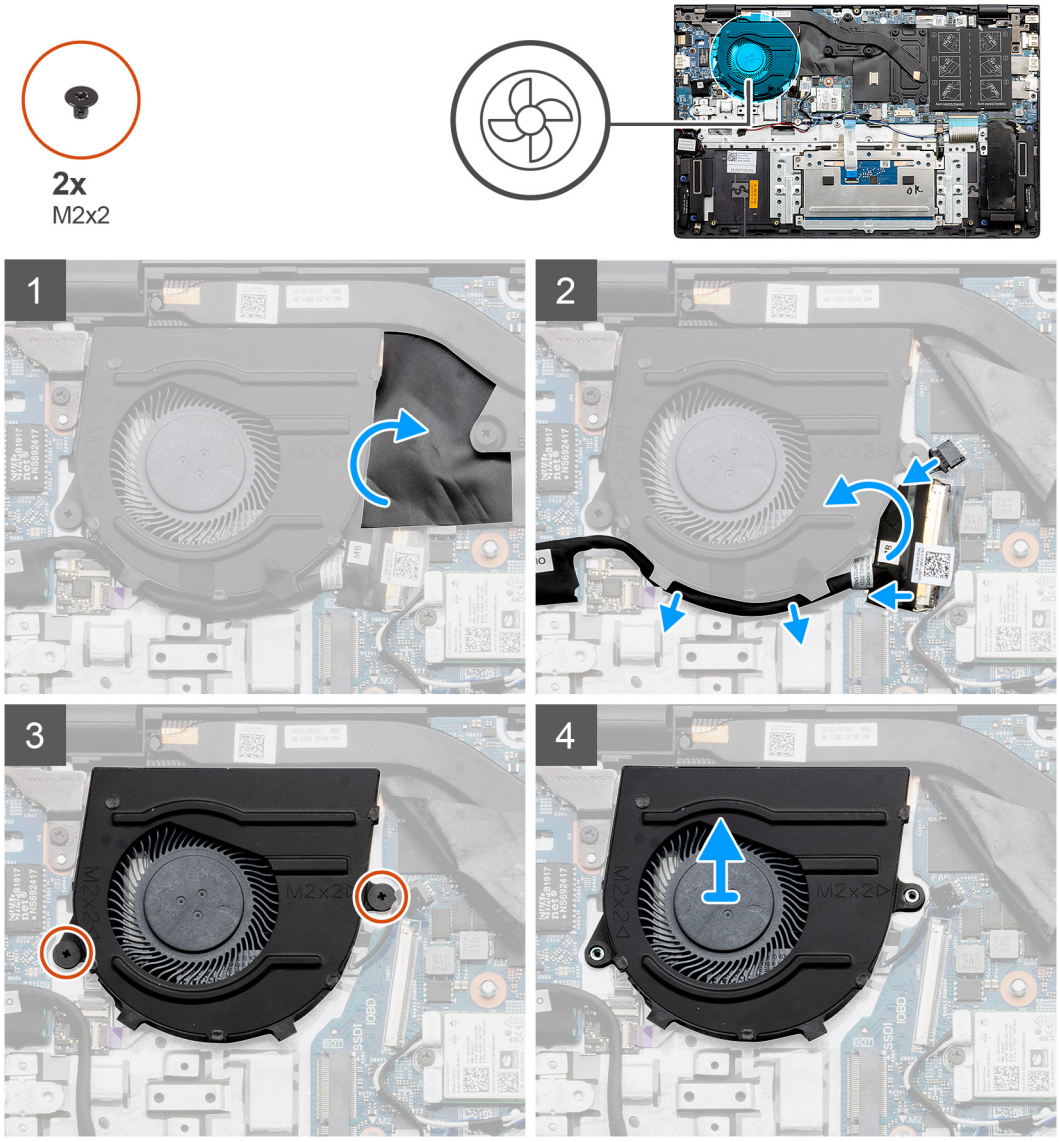
Removing the system fan - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the system fan and provides a visual representation of the removal procedure.



Steps

1. Lift the mylar cover.
2. Disconnect the system fan cable from the system board.

3. Peel the adhesive tape, and unroute the I/O cable.
4. Remove the two (M2x2) screws that secure the system fan to the palm-rest and keyboard assembly.
5. Slide and lift the system fan off the palm-rest and keyboard assembly.

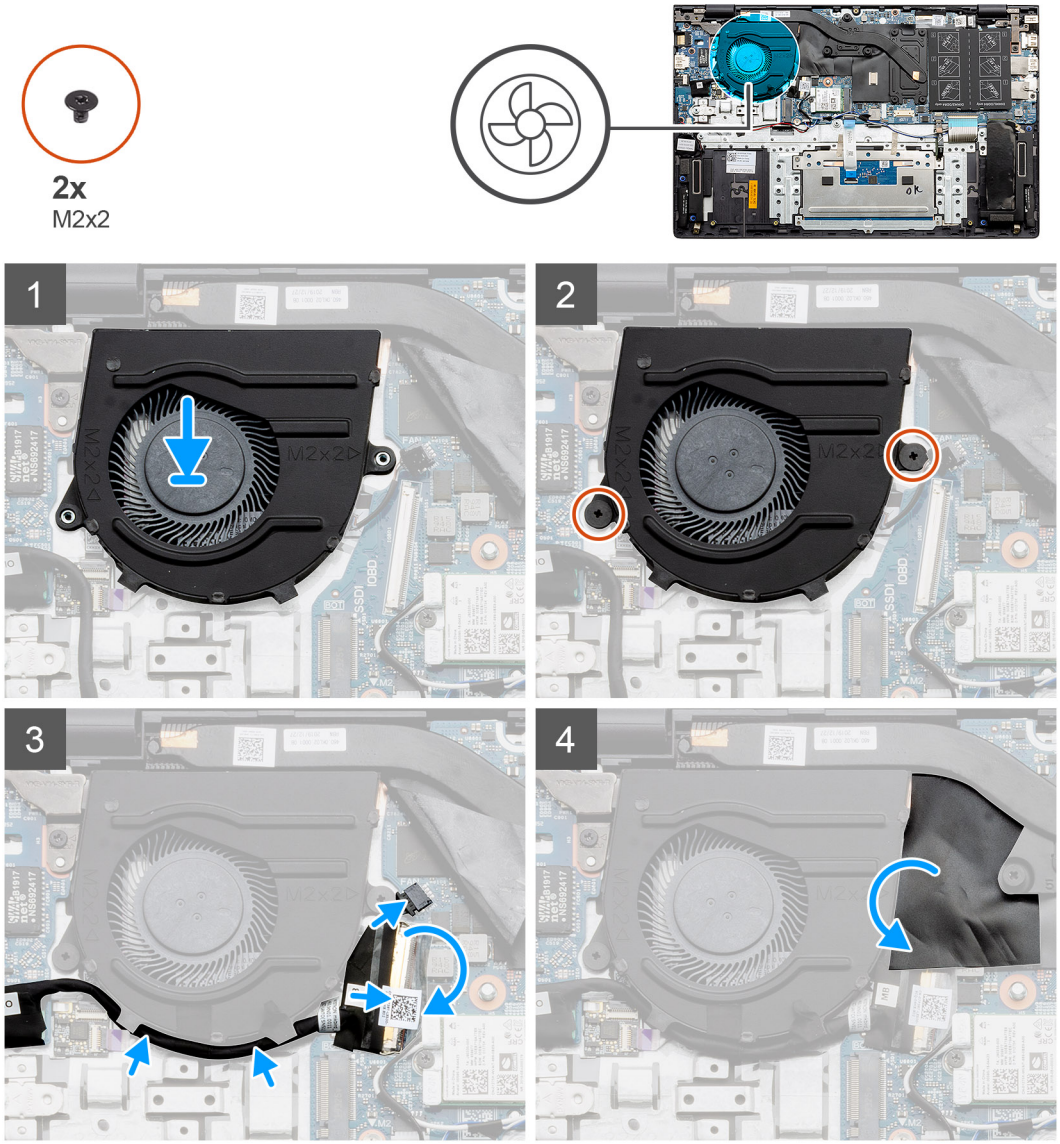
Installing the system fan - discrete

Prerequisites

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

About this task

The figure indicates the location of the system fan and provides a visual representation of the installation procedure.



Steps

1. Slide and place the system fan on the palm-rest and keyboard assembly.
2. Align the screw holes on the system fan with the screw holes on the palm-rest and keyboard assembly.
3. Replace the two (M2x2) screws to secure the system fan to the palm-rest and keyboard assembly.
4. Connect the system fan cable to the system board.
5. Route the I/O cable underneath the system fan and connect it to the system board.

6. Place the mylar cover back.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Heat sink

Removing the heat sink - UMA

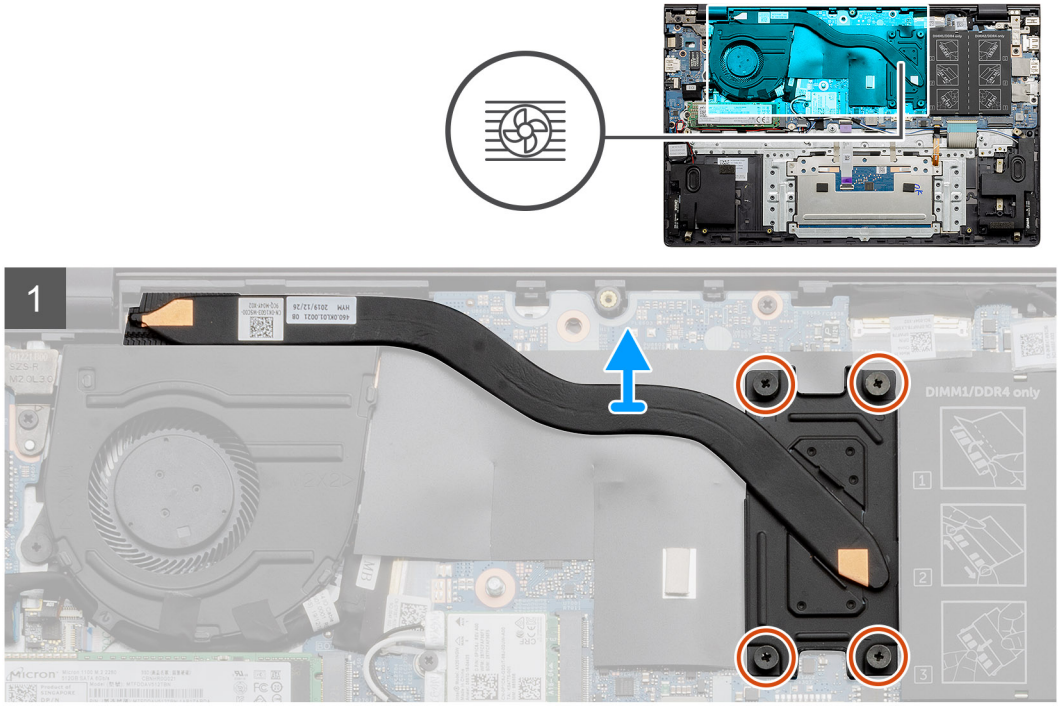
NOTE: The heat sink type in your computer varies depending on the configuration ordered.

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the system fan.

About this task

The figure indicates the location of the heat sink and provides a visual representation of the removal procedure.



Steps

1. In sequential order (as indicated on the heat sink), loosen the four captive screws that secure the heat sink to the system board.
2. Lift and remove the heat sink off the system board.

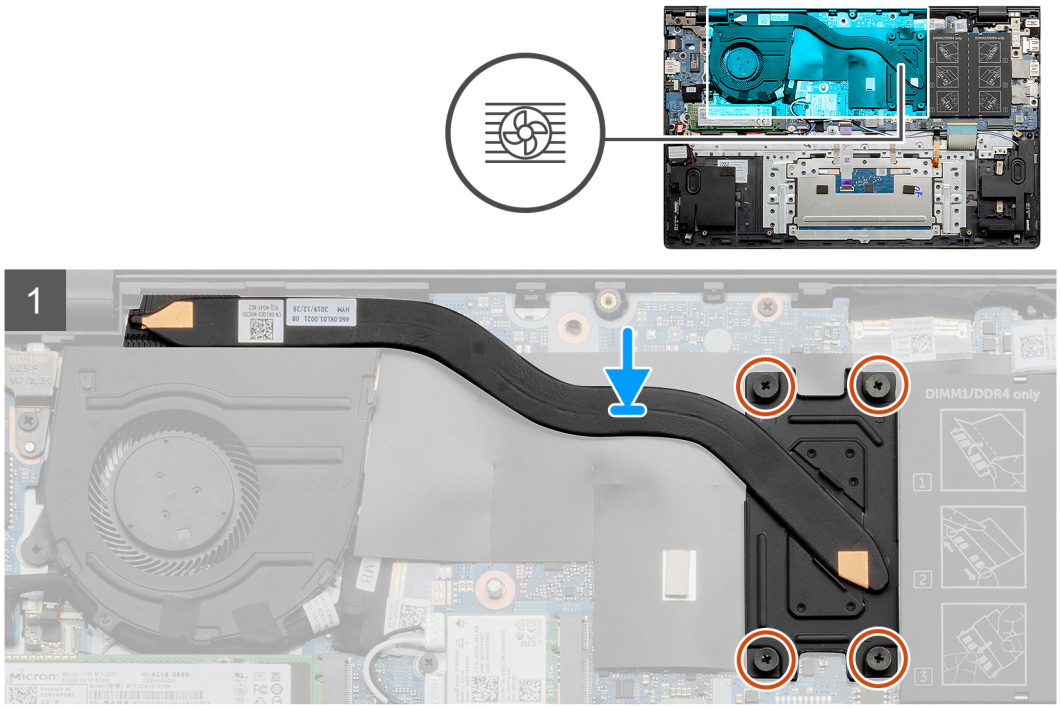
Installing the heat sink - UMA

Prerequisites

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

About this task

The figure indicates the location of the heat sink and provides a visual representation of the installation procedure.



Steps

1. Place the heat sink on the system board and 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 system fan.
2. Install the battery (3-cell or 4-cell) based on the configuration.
3. Install the base cover.
4. Follow the procedure in after working inside your computer.

Removing the heat sink - discrete

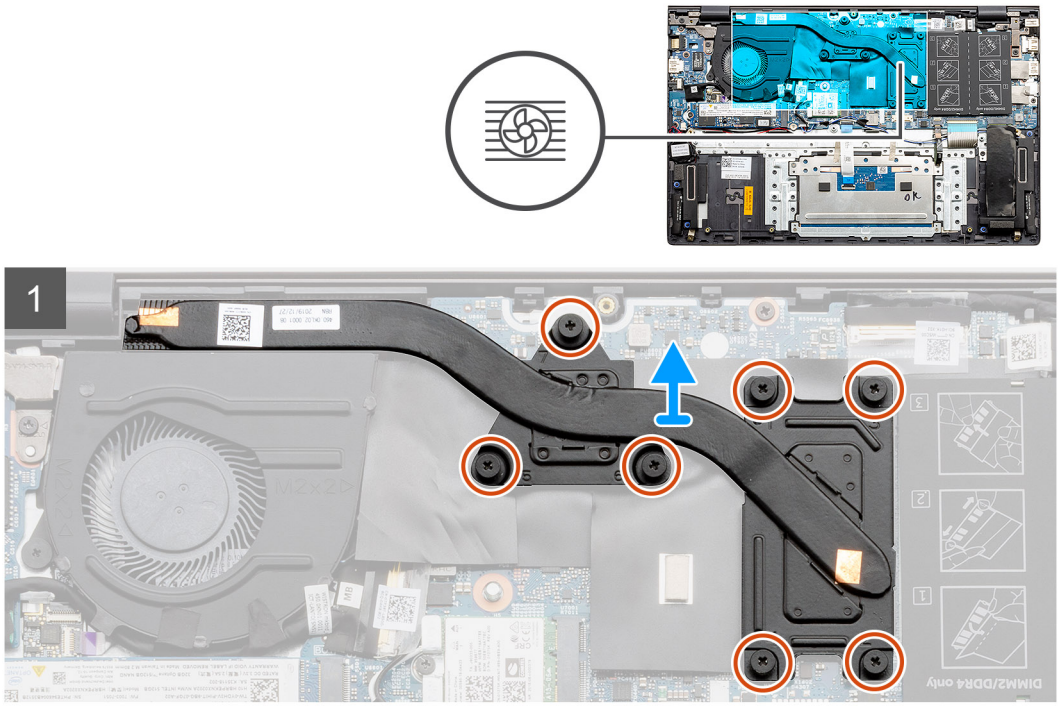
NOTE: The heat sink type in your computer varies depending on the configuration ordered.

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the system fan.

About this task

The figure indicates the location of the heat sink and provides a visual representation of the removal procedure.



Steps

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

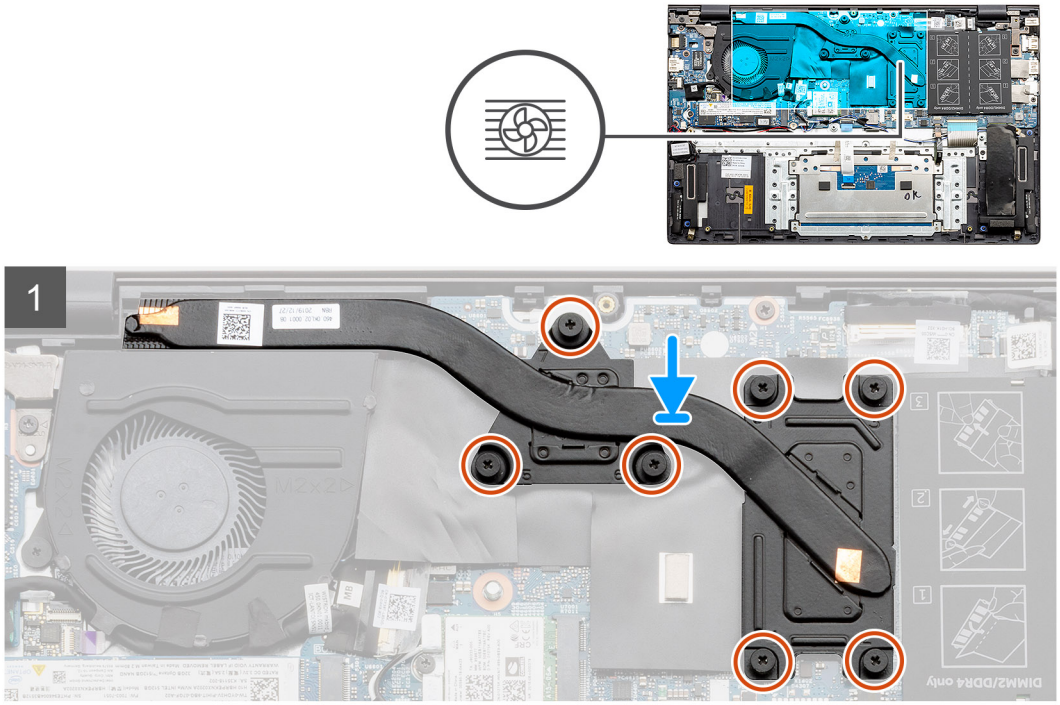
Installing the heat sink - discrete

Prerequisites

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

About this task

The figure indicates the location of the heat sink and provides a visual representation of the installation procedure.



Steps

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

Next steps

1. Install the system fan.
2. Install the battery (3-cell or 4-cell) based on the configuration.
3. Install the base cover.
4. Follow the procedure in after working inside your computer.

Coin-cell battery

Removing the coin-cell battery - UMA

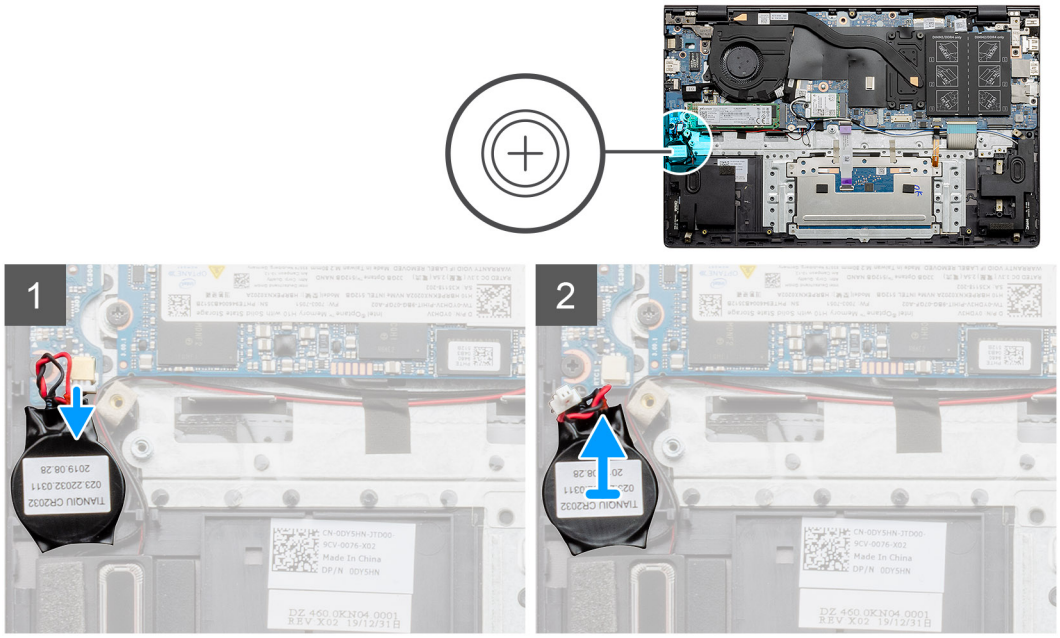
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

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

About this task

The figure indicates the location of the coin-cell battery and provides a visual representation of the removal procedure.



Steps

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

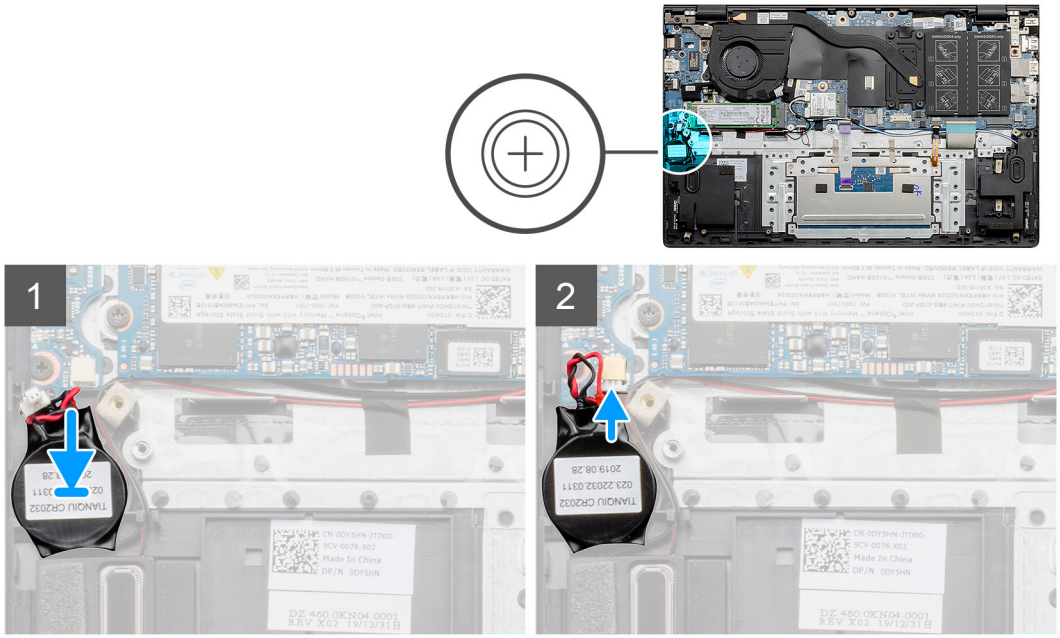
Installing the coin-cell battery - UMA

Prerequisites

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

About this task

The figure 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. Route the coin-cell battery cable as illustrated and connect it to the I/O board.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Removing the coin-cell battery - discrete

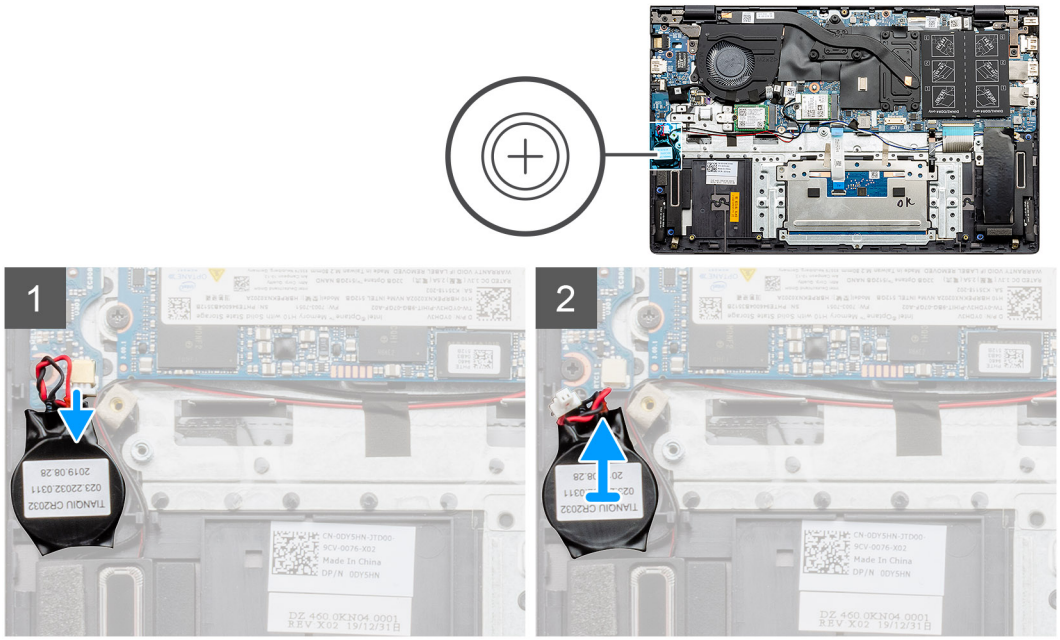
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

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

About this task

The figure indicates the location of the coin-cell battery and provides a visual representation of the removal procedure.



Steps

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

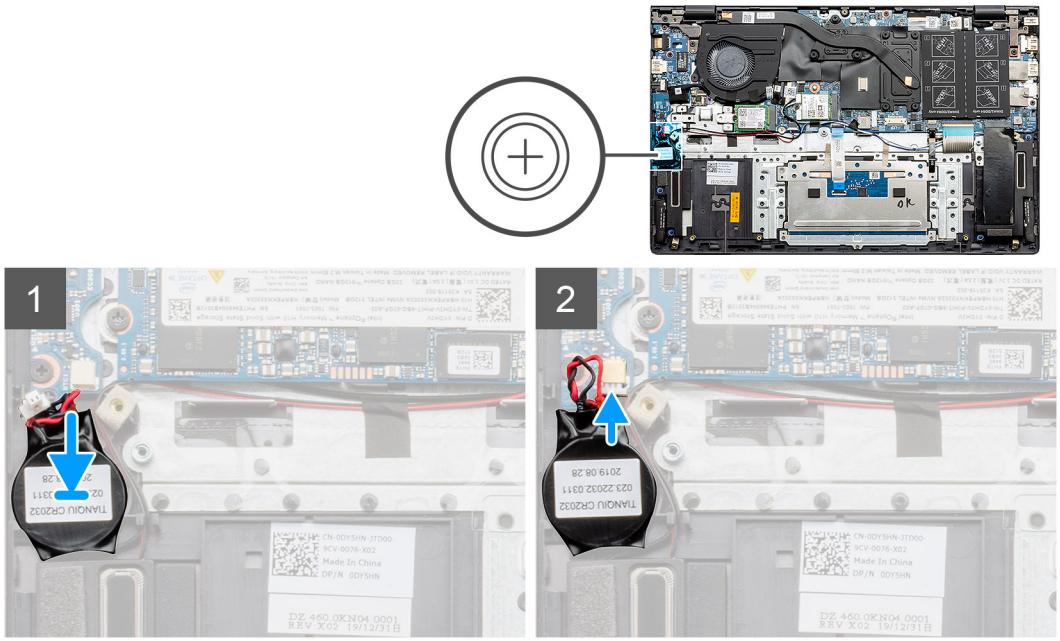
Installing the coin-cell battery - discrete

Prerequisites

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

About this task

The figure 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. Route the coin-cell battery cable as illustrated and connect it to the I/O board.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

I/O board

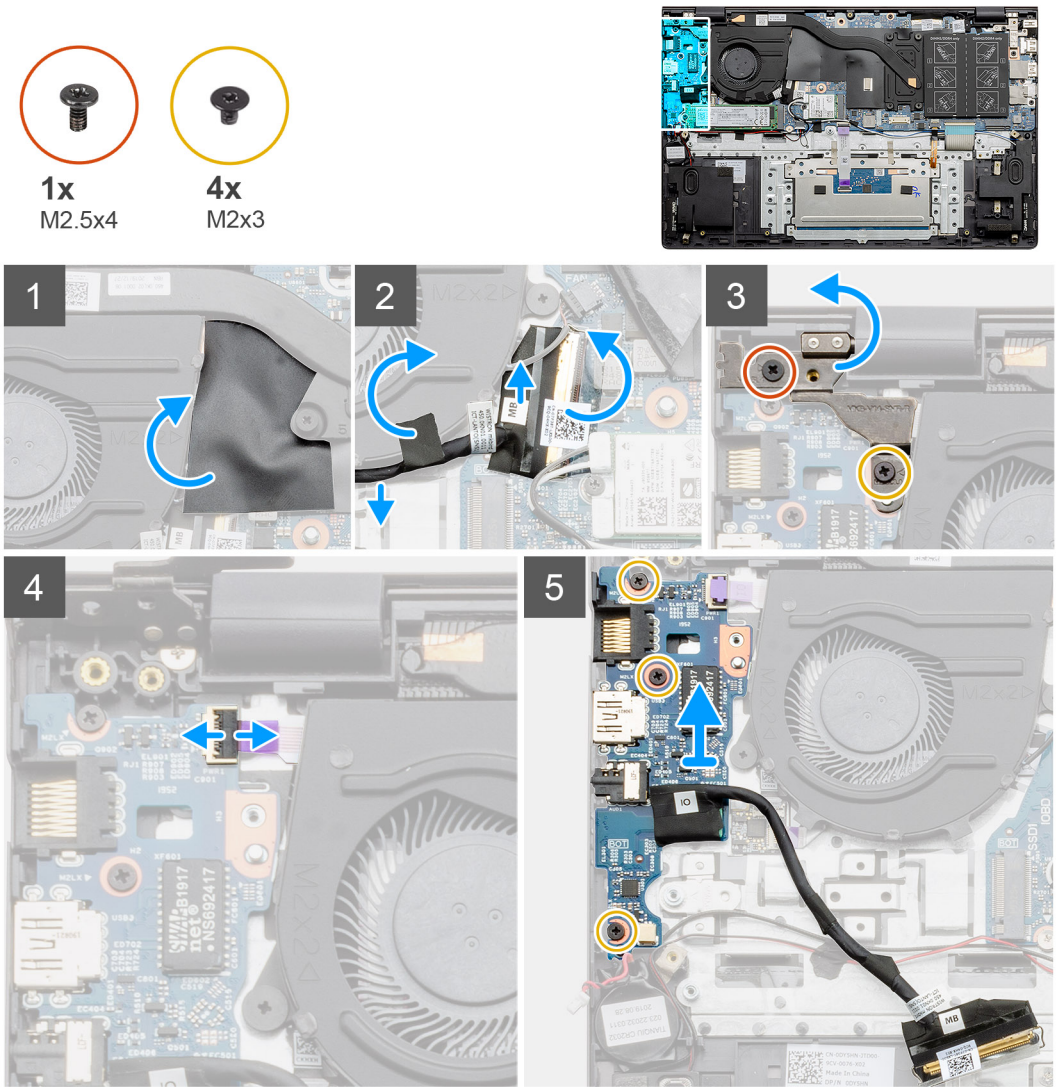
Removing the I/O board - UMA

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the system fan.
5. Remove the coin-cell battery.

About this task

The figure indicates the location of the I/O board and provides a visual representation of the removal procedure.



Steps

1. Locate the I/O board on your computer.
2. Lift the mylar cover.
3. Peel the adhesive tape to unroute the I/O cable.
4. Open the latch, and disconnect the I/O-board cable from the I/O board.
5. Remove the two screws (M2.5x4) and (M2x3) that secure the left display hinge to the computer.
6. Open the latch, and disconnect the fingerprint reader cable from the I/O board.
7. Remove the three screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
8. Lift the I/O board off the palm-rest and keyboard assembly.

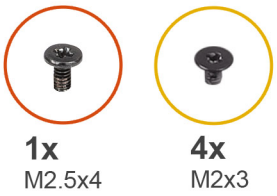
Installing the I/O board - UMA

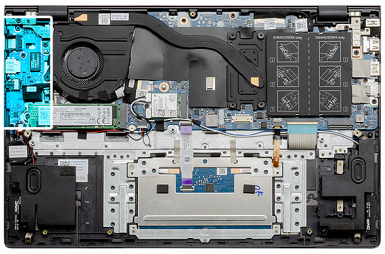
Prerequisites

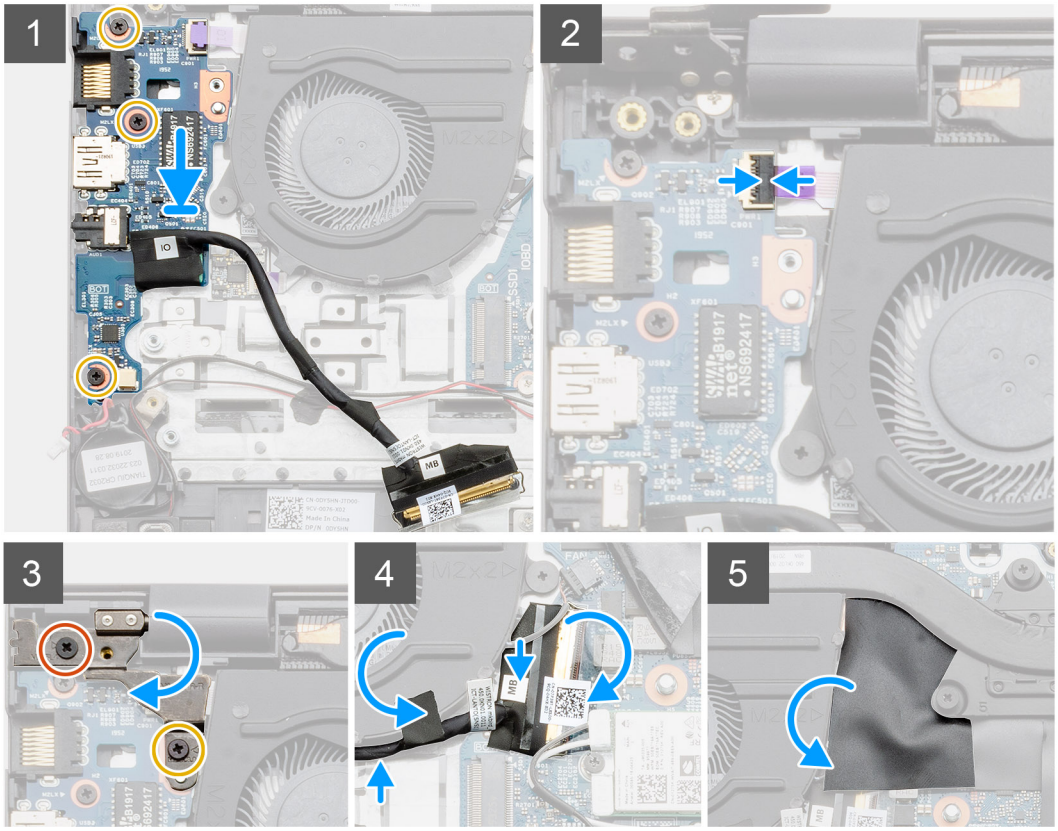
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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







Steps

1. Place the I/O board on the palm-rest and keyboard assembly.
2. Align the screw holes on the I/O board with the screw holes on the palm-rest and keyboard assembly.
3. Replace the three screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
4. Connect the fingerprint reader cable to the I/O board and close the latch to secure the cable.
5. Lower the left hinge, and replace the two screws (M2.5x4) and (M2x3).
6. Route the I/O cable underneath the system fan using adhesive tape.
7. Connect the I/O-board cable to the I/O board and close the latch to secure the cable.
8. Place the mylar cover back.

Next steps

1. Install the coin-cell battery.
2. Install the system fan.
3. Install the battery (3-cell or 4-cell) based on the configuration.
4. Install the base cover.
5. Follow the procedure in after working inside your computer.

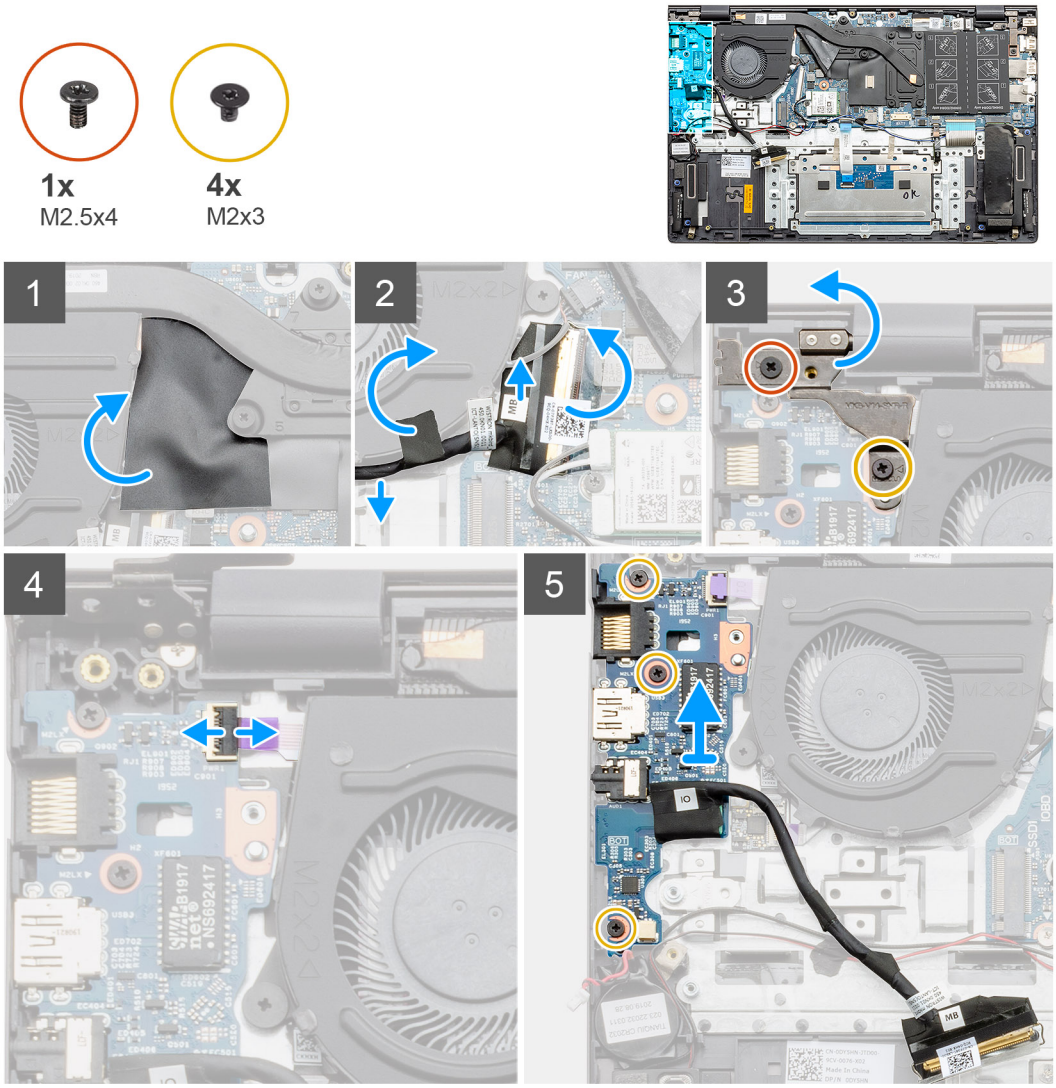
Removing the I/O board - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the system fan.
5. Remove the coin-cell battery.

About this task

The figure indicates the location of the I/O board and provides a visual representation of the removal procedure.



Steps

1. Locate the I/O board on your computer.
2. Lift the mylar cover.
3. Peel the adhesive tape to unroute the I/O cable.
4. Open the latch, and disconnect the I/O-board cable from the I/O board.
5. Remove the two screws (M2.5x4) and (M2x3) that secure the left hinge to the computer.
6. Lift the left hinge.
7. Open the latch, and disconnect the fingerprint reader cable from the I/O board.

8. Remove the three screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
9. Lift the I/O board off the palm-rest and keyboard assembly.

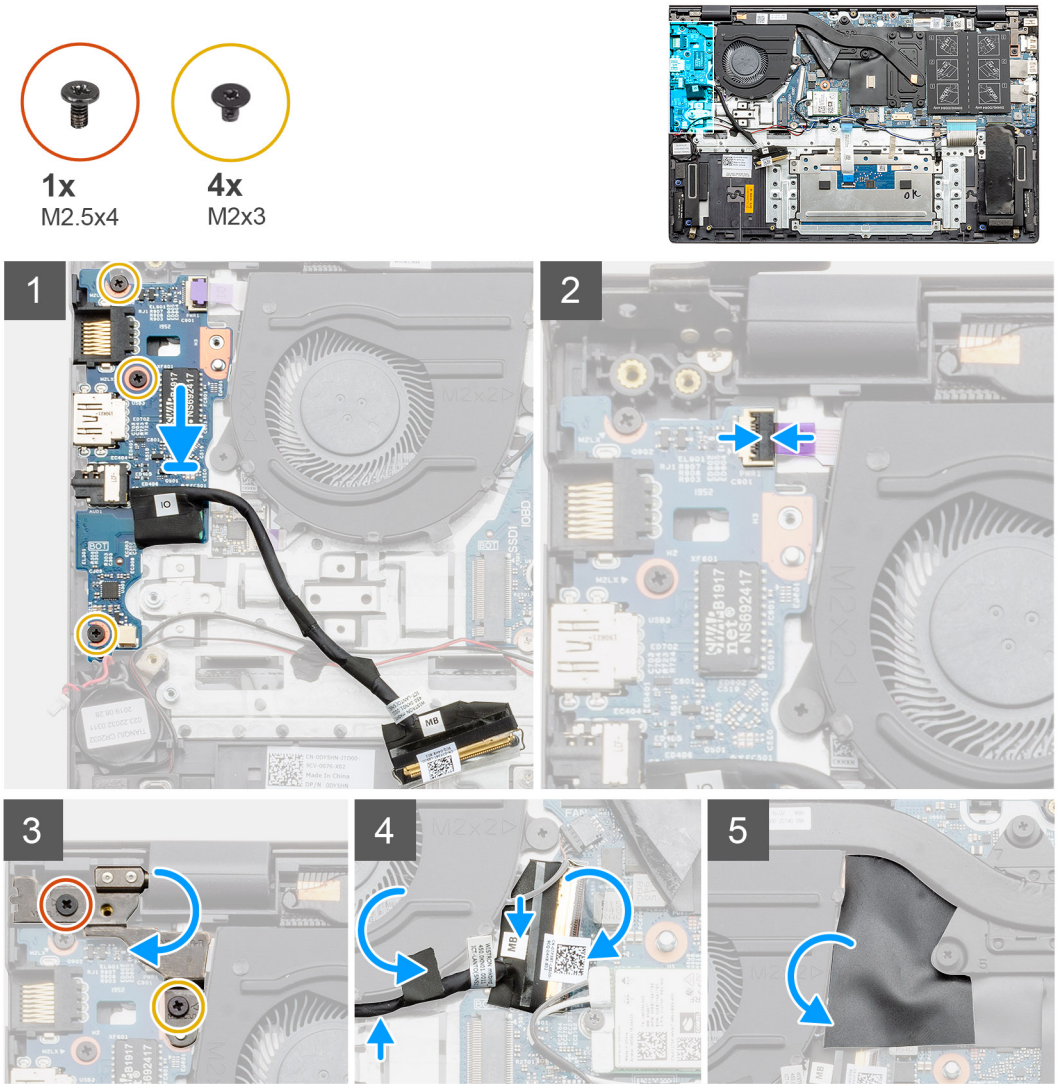
Installing the I/O board - discrete

Prerequisites

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

About this task

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



Steps

1. Place the I/O board on the palm-rest and keyboard assembly.
2. Align the screw holes on the I/O board with the screw holes on the palm-rest and keyboard assembly.
3. Replace the three screws (M2x3) that secure the I/O board to the palm-rest and keyboard assembly.
4. Connect the fingerprint reader cable to the I/O board and close the latch to secure the cable.
5. Lower the left hinge, and replace the two screws (M2.5x4) and (M2x3).
6. Route the I/O cable underneath the system fan using adhesive tape.
7. Connect the I/O-board cable to the I/O board and close the latch to secure the cable.

8. Place the mylar cover back.

Next steps

1. Install the coin-cell battery.
2. Install the system fan.
3. Install the battery (3-cell or 4-cell) based on the configuration.
4. Install the base cover.
5. Follow the procedure in after working inside your computer.

Power button with fingerprint reader (optional)

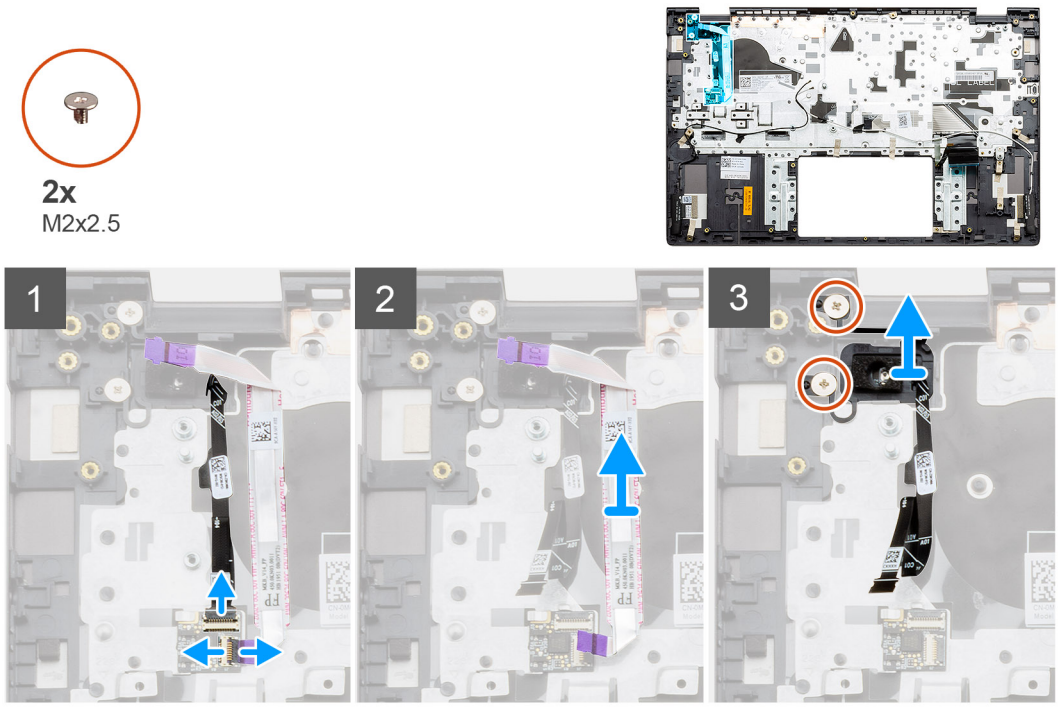
Removing the power button and optional fingerprint reader - UMA

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the system fan.
5. Remove the M.2 2280 SSD or M.2 2230 SSD.
6. Remove the I/O board.
7. Remove the coin-cell battery.

About this task

The figure indicates the location of the power button with optional fingerprint reader and provides a visual representation of the removal procedure.



Steps

1. Unplug the fingerprint reader cable from the connector on the palm-rest and keyboard assembly.
2. Lift the latch, and unplug the I/O cable from the connector on the palm-rest and keyboard assembly.
3. Remove the I/O cable from the palm-rest and keyboard assembly.

4. Remove the two screws (M2x2.5) that secure the power button with optional fingerprint reader to the palm-rest and keyboard assembly.
5. Lift the power button with optional fingerprint reader, along with the fingerprint reader cable, off the palm-rest and keyboard assembly.

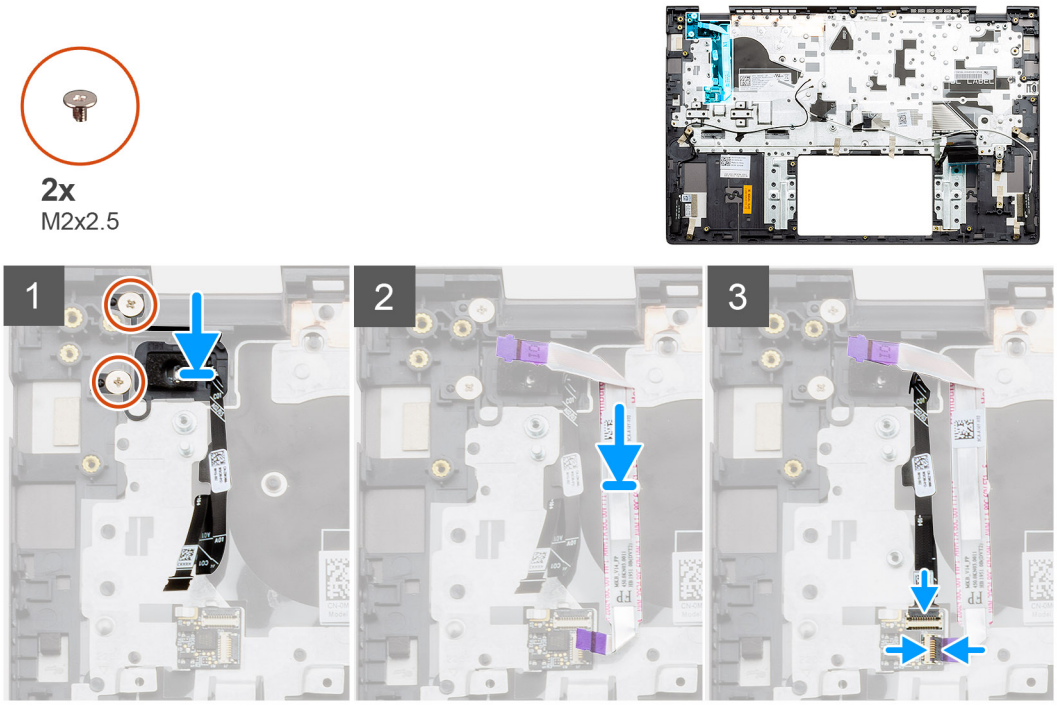
Installing the power button with finger reader - UMA

Prerequisites

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

About this task

The figure indicates the location of the power button with fingerprint reader and provides a visual representation of the installation procedure.



Steps

1. Using the alignment post, place the power button with fingerprint reader on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x2.5) to secure the power button with optional fingerprint reader to the palm-rest and keyboard assembly.
3. Plug the I/O cable into the connector on palm-rest and keyboard assembly and close the latch.
4. Plug the fingerprint reader cable into the connector on palm-rest and keyboard assembly.

Next steps

1. Install the I/O board.
2. Install the system fan.
3. Install the coin-cell battery.
4. Install the M.2 2280 SSD card or M.2 2230 SSD card.
5. Install the battery (3-cell or 4-cell) based on the configuration.
6. Install the base cover.
7. Follow the procedure in after working inside your computer.

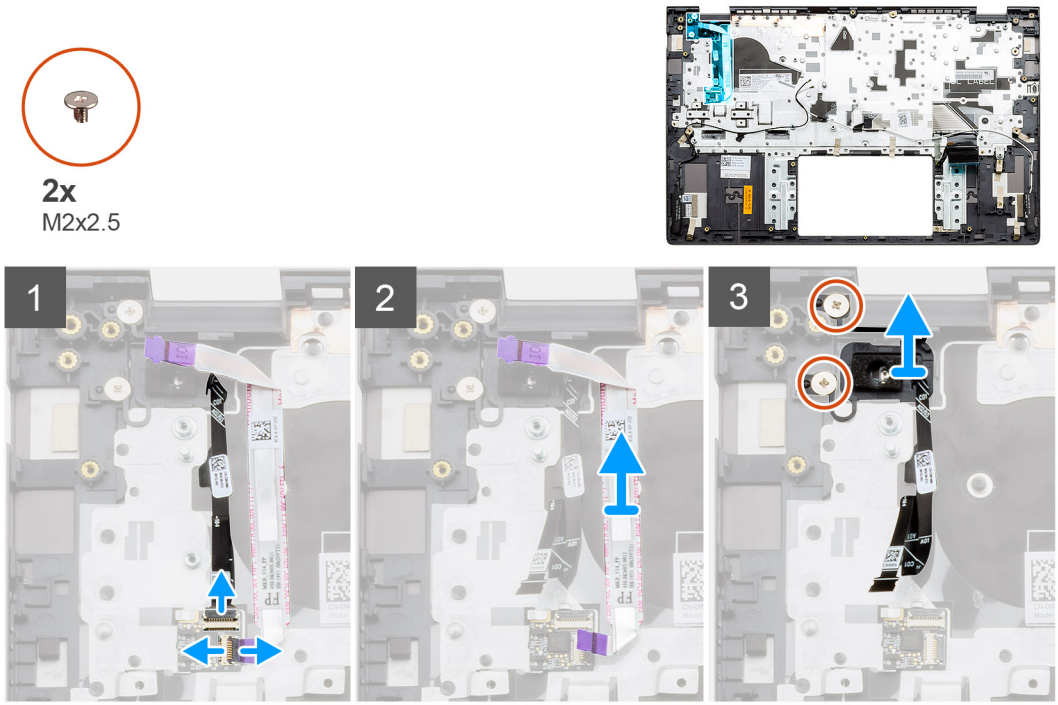
Removing the power button and optional fingerprint reader - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the system fan.
5. Remove the M.2 2280 SSD or M.2 2230 SSD.
6. Remove the I/O board.
7. Remove the coin-cell battery.

About this task

The figure indicates the location of the power button with optional fingerprint reader and provides a visual representation of the removal procedure.



Steps

1. Unplug the fingerprint reader cable from the connector on the palm-rest and keyboard assembly.
2. Lift the latch, and unplug the I/O cable from the connector on the palm-rest and keyboard assembly.
3. Remove the I/O cable from the palm-rest and keyboard assembly.
4. Remove the two screws (M2x2.5) that secure the power button with optional fingerprint reader to the palm-rest and keyboard assembly.
5. Lift the power button with optional fingerprint reader, along with the fingerprint reader cable, off the palm-rest and keyboard assembly.

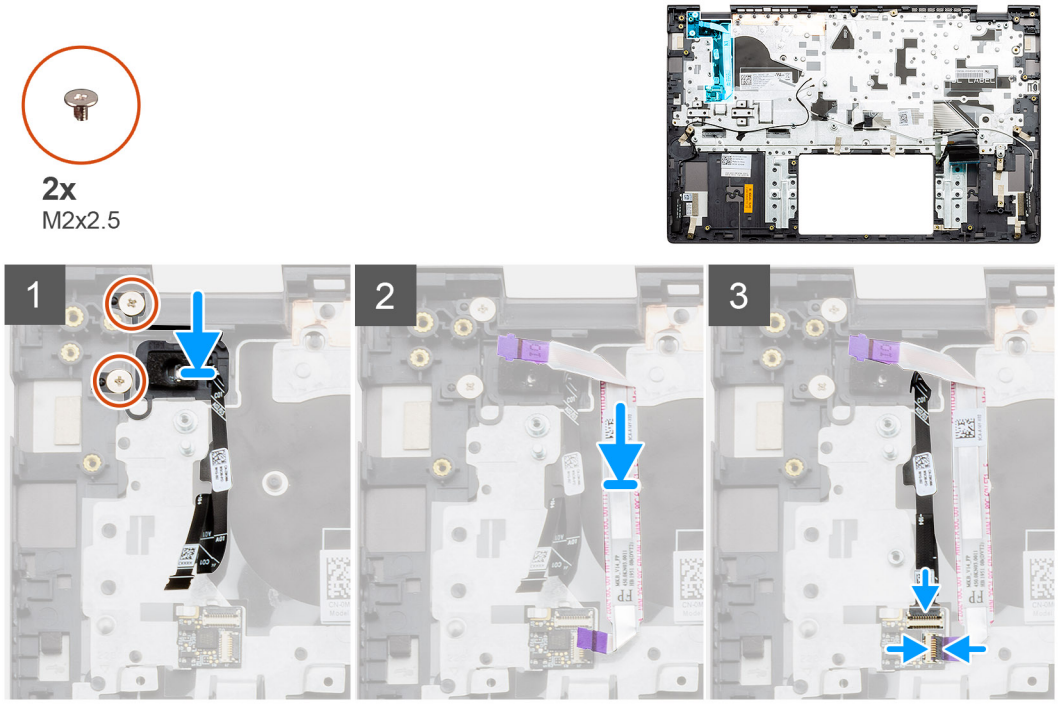
Installing the power button with finger reader - discrete

Prerequisites

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

About this task

The figure indicates the location of the power button with fingerprint reader and provides a visual representation of the installation procedure.



Steps

1. Using the alignment post, place the power button with fingerprint reader on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x2.5) to secure the power button with optional fingerprint reader to the palm-rest and keyboard assembly.
3. Plug the I/O cable into the connector on palm-rest and keyboard assembly and close the latch.
4. Plug the fingerprint reader cable into the connector on palm-rest and keyboard assembly.

Next steps

1. Install the I/O board.
2. Install the system fan.
3. Install the coin-cell battery.
4. Install the M.2 2280 SSD card or M.2 2230 SSD card.
5. Install the battery (3-cell or 4-cell) based on the configuration.
6. Install the base cover.
7. Follow the procedure in after working inside your computer.

DC-in port

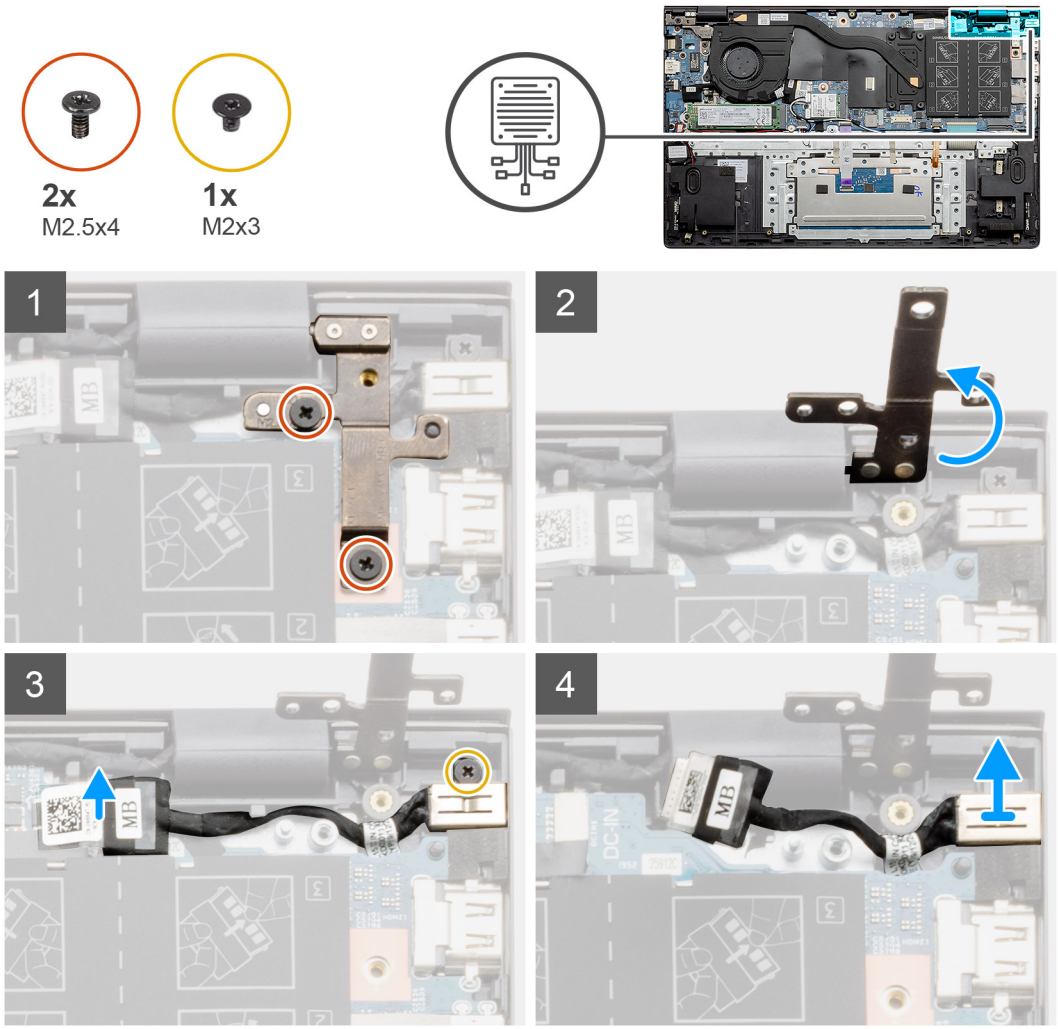
Removing the DC-in port - UMA

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the DC-in and provides a visual representation of the removal procedure.



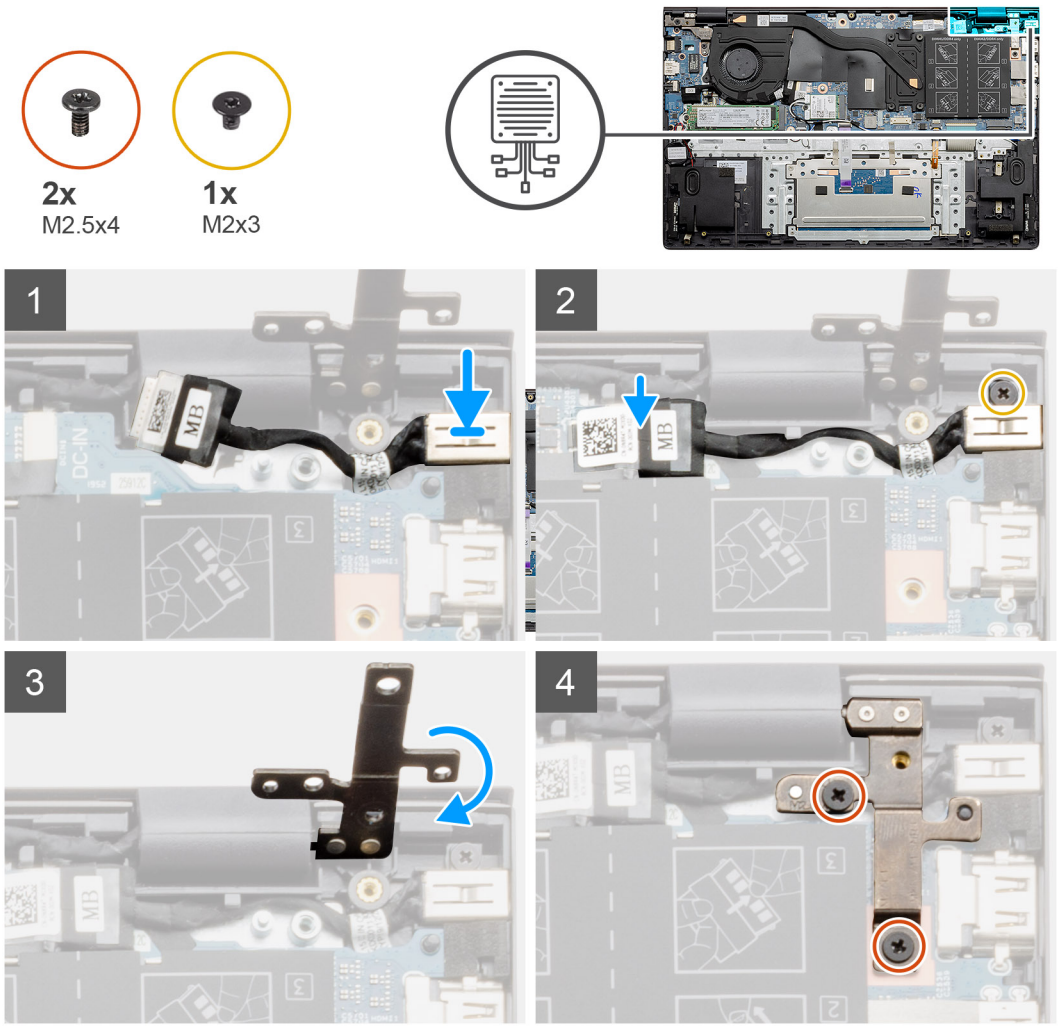
Steps

1. Locate the DC-in port on your computer.
2. Remove the two (M2.5x4) screws, and lift the metal hinge.
3. Remove the single screw (M2x3) screw and lift the DC-in port.
4. Peel the transparent sticker covering the DC-in port.
5. Disconnect the DC-in cable from the system board.
6. Lift the DC-in port off the palm-rest and keyboard assembly.

Installing the DC-in port - UMA

About this task

The figure indicates the location of the DC-in and provides a visual representation of the removal procedure.



Steps

1. Place the DC-in port on the palm-rest and keyboard assembly.
2. Replace the single screw (M2x3) on the DC-in port using bracket.
3. Connect the DC-in cable to the system board.
4. Adhere the transparent sticker.
5. Lower the metal hinge.
6. Replace the two (M2.5x4) screws, and tighten it.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

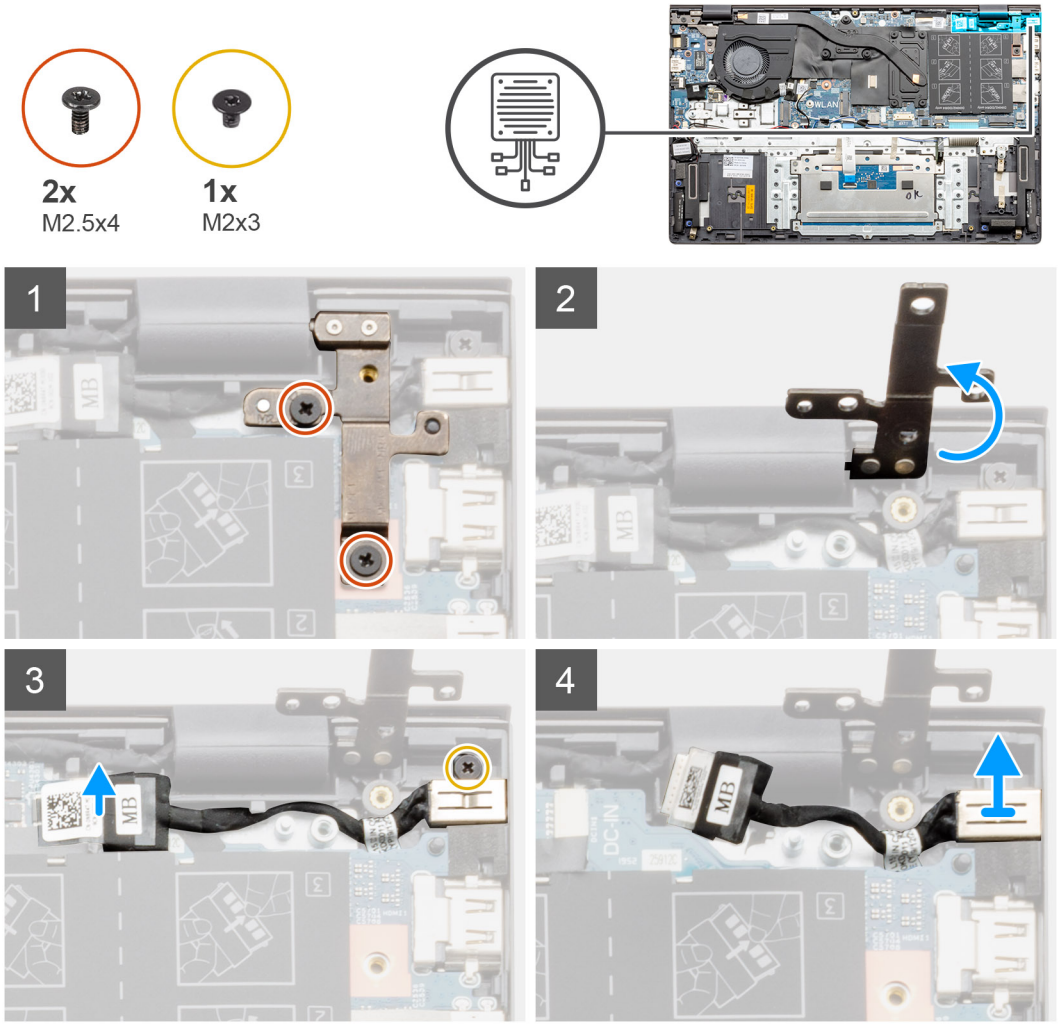
Removing the DC-in port - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).

About this task

The figure indicates the location of the DC-in and provides a visual representation of the removal procedure.



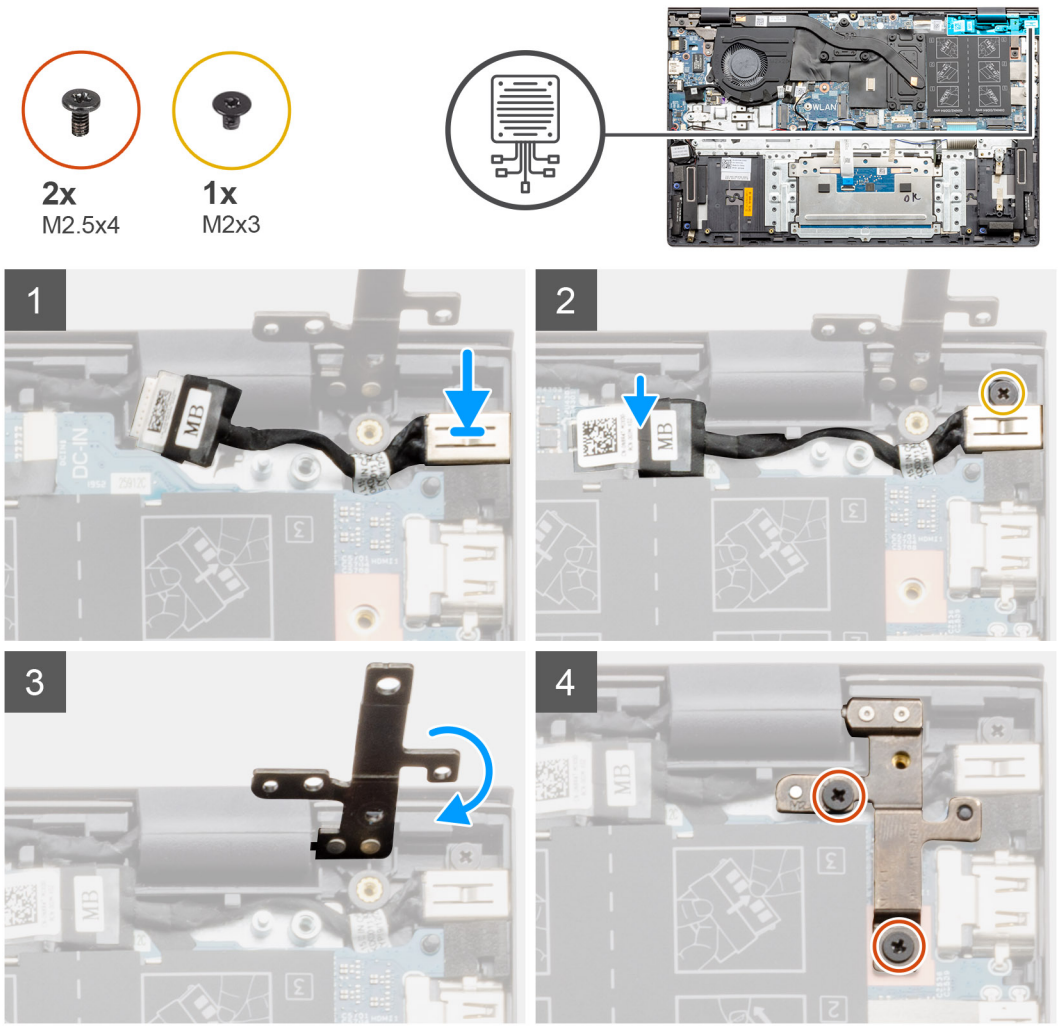
Steps

1. Locate the DC-in port on your computer.
2. Remove the two (M2.5x4) screws, and lift the metal hinge.
3. Remove the single screw (M2x3) screw and lift the DC-in port.
4. Peel the transparent sticker.
5. Disconnect the DC-in cable from the system board.
6. Lift the DC-in port off the palm-rest and keyboard assembly.

Installing the DC-in port - discrete

About this task

The figure indicates the location of the DC-in and provides a visual representation of the removal procedure.



Steps

1. Place the DC-in port on the palm-rest and keyboard assembly.
2. Replace the single screw (M2x3) on the DC-in port using bracket.
3. Connect the DC-in cable to the system board.
4. Adhere the transparent sticker.
5. Lower the metal hinge.
6. Replace the two (M2.5x4) screws, and tighten it.

Next steps

1. Install the battery (3-cell or 4-cell) based on the configuration.
2. Install the base cover.
3. Follow the procedure in after working inside your computer.

Touchpad

Removing the touchpad - UMA

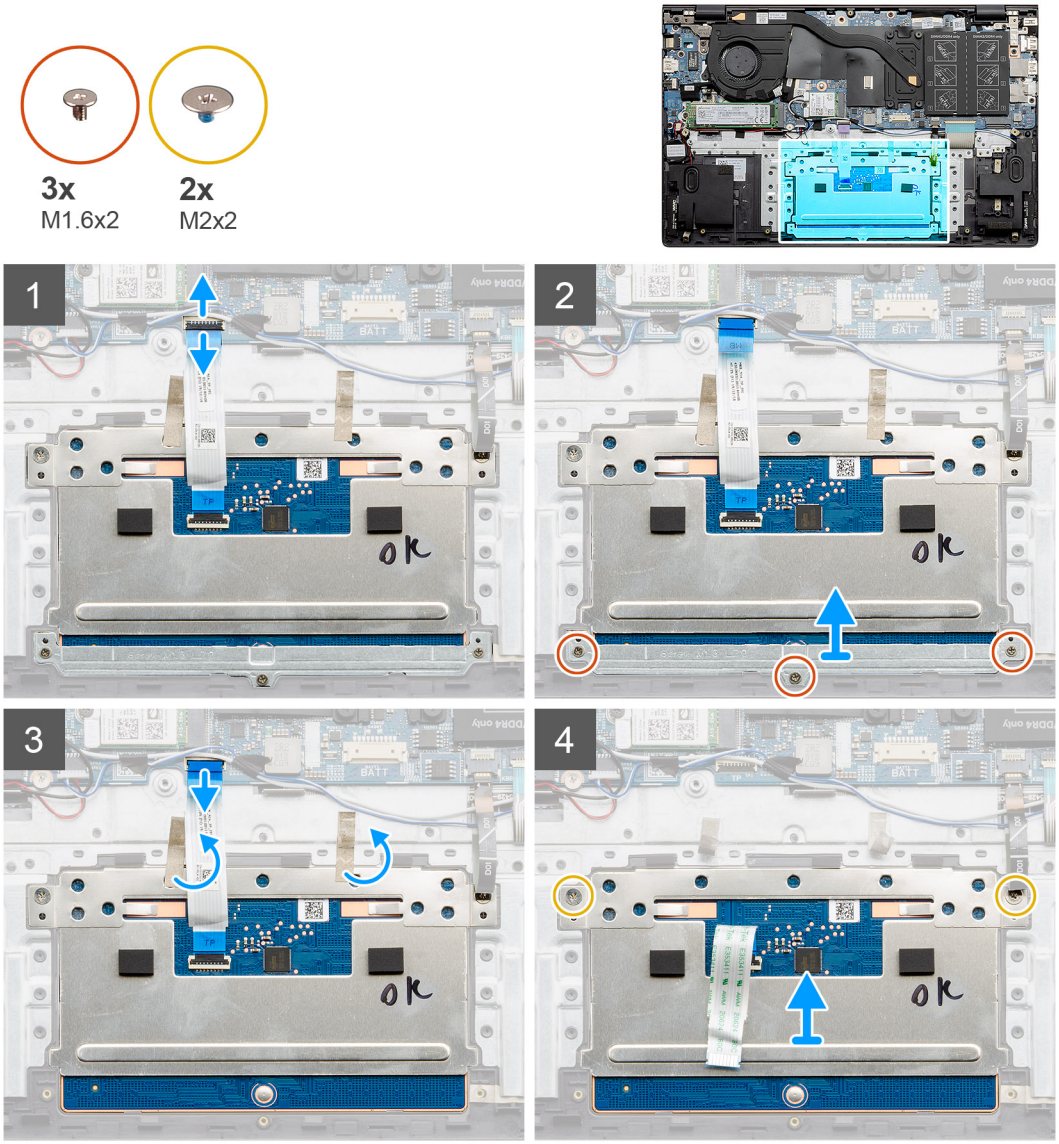
Prerequisites

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

3. Remove the battery (3-cell or 4-cell).
4. Remove the speaker (3-cell battery configuration or 4-cell battery configuration).

About this task

The figure indicates the location of the touchpad and provides a visual representation of the removal procedure.



Steps

1. Peel adhesive tape, and unroute the speaker cable.
2. Remove the three (M1.6x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
3. Lift the touchpad bracket off the palm-rest and keyboard assembly.
4. Open the latch, and disconnect the touchpad cable from the system board.
5. Remove the adhesive tape from the touchpad bracket.
6. Remove the two (M2x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
7. Lift the touchpad, along with the cable, off the palm-rest and keyboard assembly.

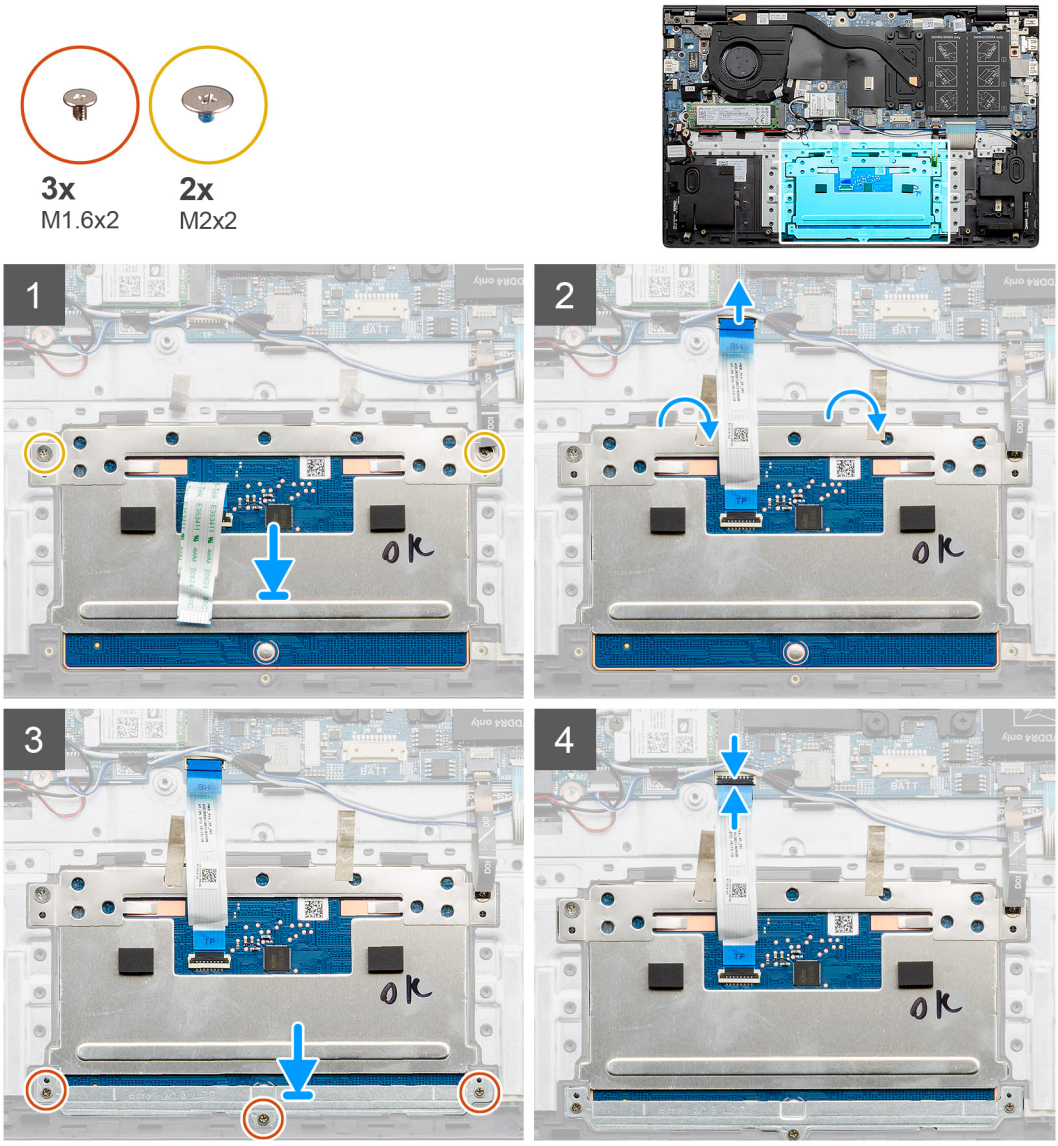
Installing the touchpad - UMA

Prerequisites

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

About this task

The figure indicates the location of the component and provides a visual representation of the installation procedure.



Steps

1. Align and place the touchpad into the slot on the palm-rest and keyboard assembly.
2. Replace the two (M2x2) screws along with the bracket to secure the touchpad to the palm-rest and keyboard assembly.
3. Slide the touchpad cable onto its connector on the system board and close the latch to secure the cable.
4. Align and place the touchpad bracket into the slot 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. Lower the latch of the touchpad cable once it is connected to the connector on the system board.

Next steps

1. Install the speakers (3-cell battery configuration or 4-cell battery configuration).

2. Install the battery (3-cell or 4-cell) based on the configuration.
3. Install the base cover.
4. Follow the procedure in after working inside your computer.

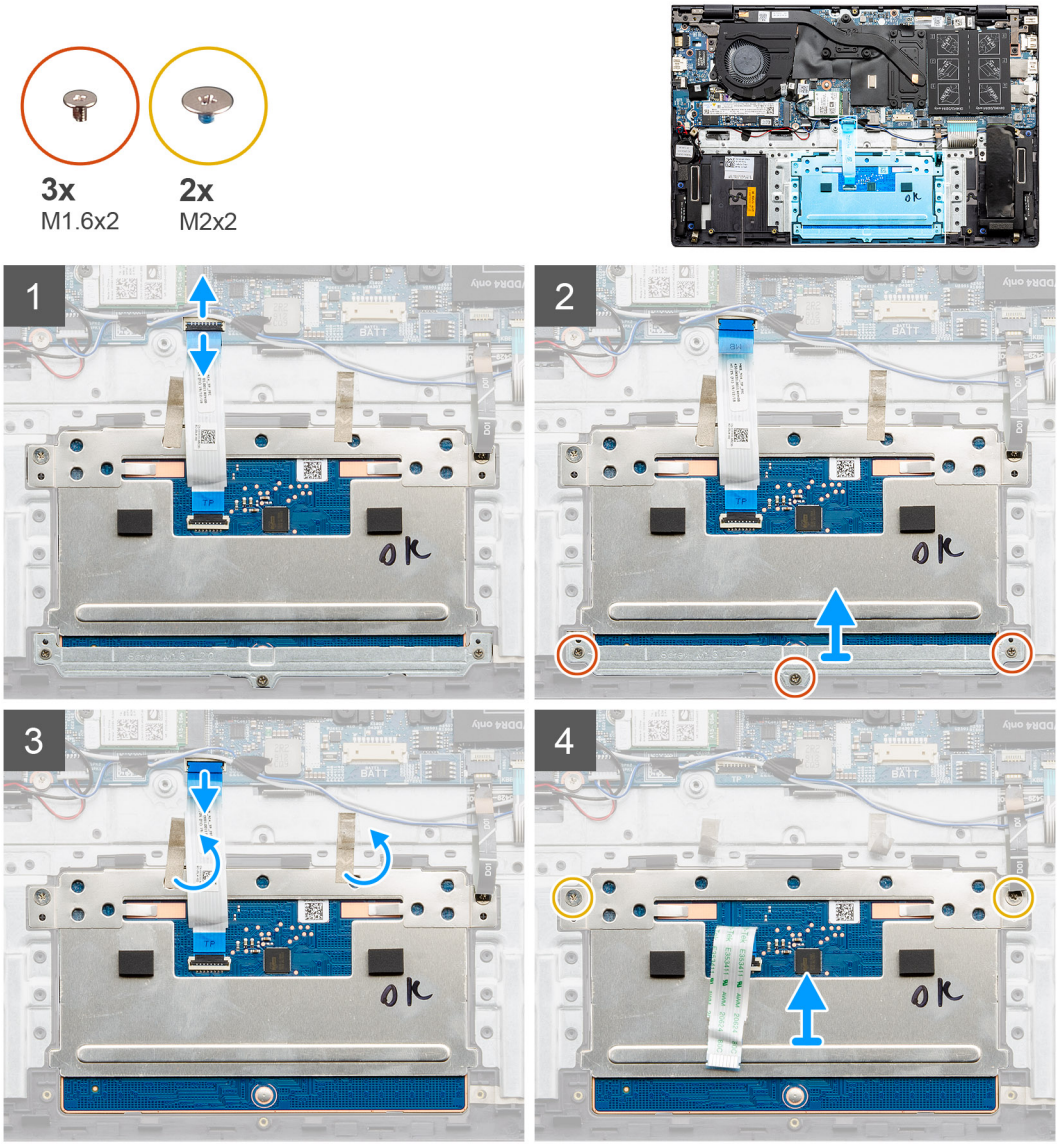
Removing the touchpad - discrete

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the speaker (3-cell battery configuration or 4-cell battery configuration).

About this task

The figure indicates the location of the touchpad and provides a visual representation of the removal procedure.



Steps

1. Peel adhesive tape, and unroute the speaker cable.
2. Remove the three (M1.6x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.

3. Lift the touchpad bracket off the palm-rest and keyboard assembly.
4. Open the latch, and disconnect the touchpad cable from the system board.
5. Remove the adhesive tape from the touchpad bracket.
6. Remove the two (M2x2) screws that secure the touchpad bracket to the palm-rest and keyboard assembly.
7. Lift the touchpad, along with the cable, off the palm-rest and keyboard assembly.

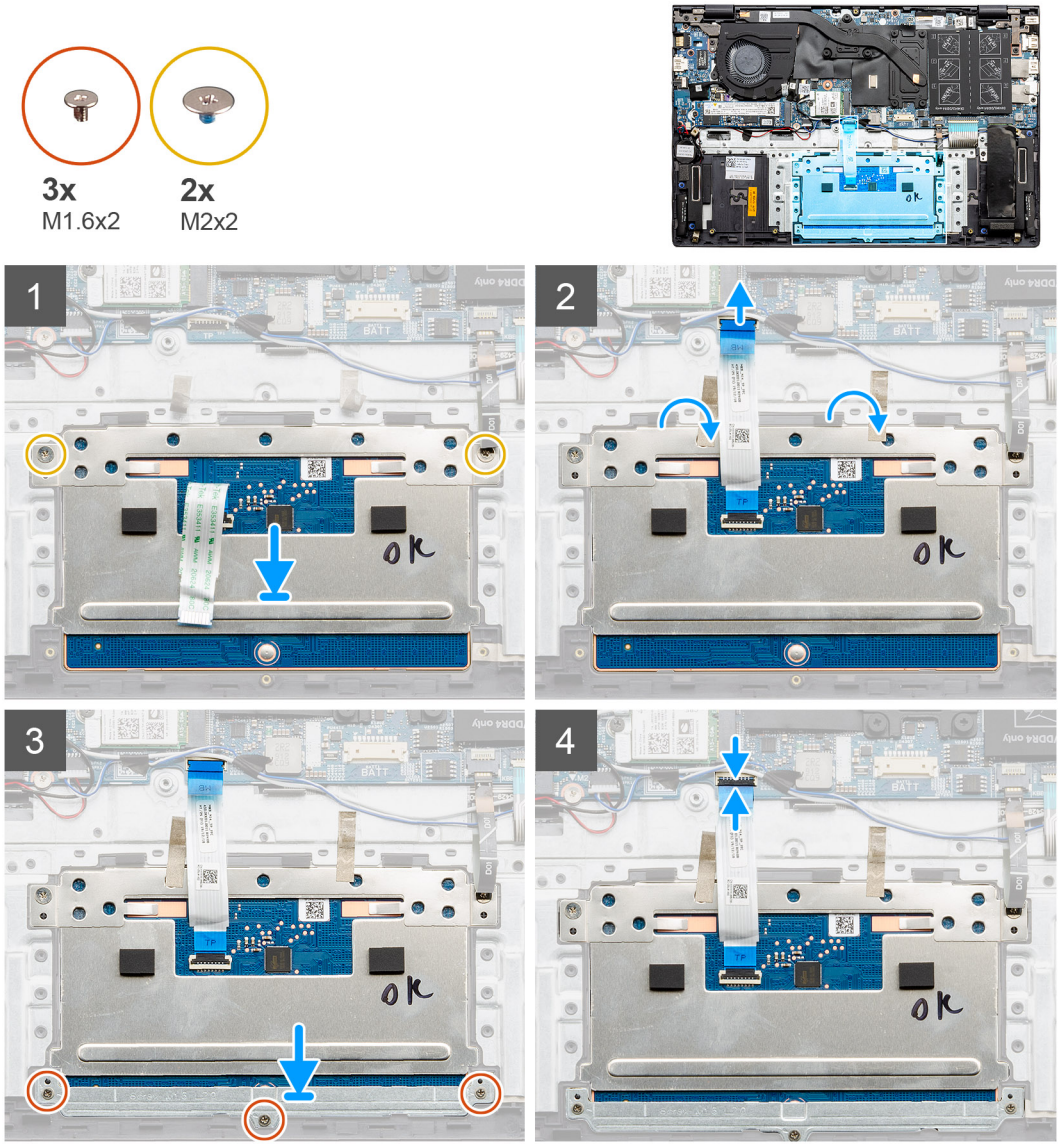
Installing the touchpad - discrete

Prerequisites

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

About this task

The figure indicates the location of the component and provides a visual representation of the installation procedure.



Steps

1. Align and place the touchpad into the slot on the palm-rest and keyboard assembly.
2. Replace the two (M2x2) screws along with the bracket to secure the touchpad to the palm-rest and keyboard assembly.
3. Slide the touchpad cable onto its connector on the system board and close the latch to secure the cable.

4. Align and place the touchpad bracket into the slot 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. Lower the latch on the touchpad cable once it is connected to the connector on the system board.

Next steps

1. Install the speakers (3-cell battery configuration or 4-cell battery configuration).
2. Install the battery (3-cell or 4-cell) based on the configuration.
3. Install the base cover.
4. Follow the procedure in after working inside your computer.

Display assembly

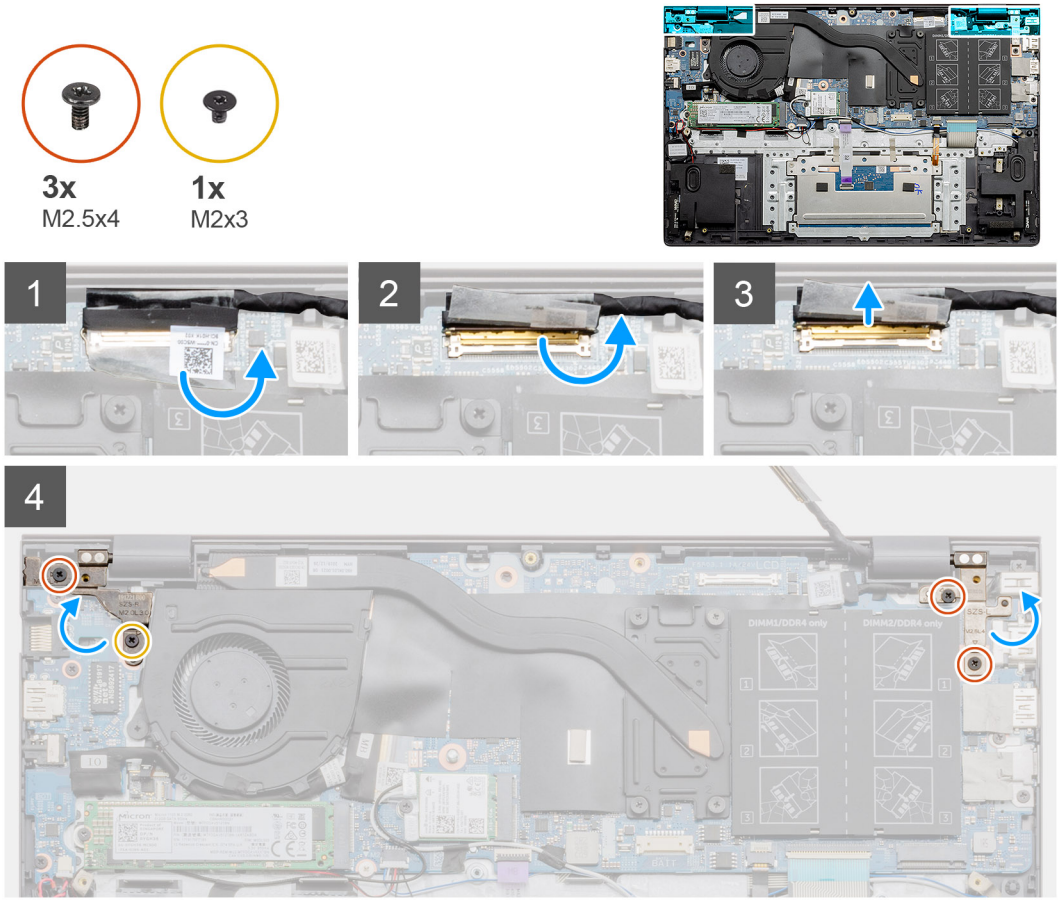
Removing the display assembly - UMA

Prerequisites

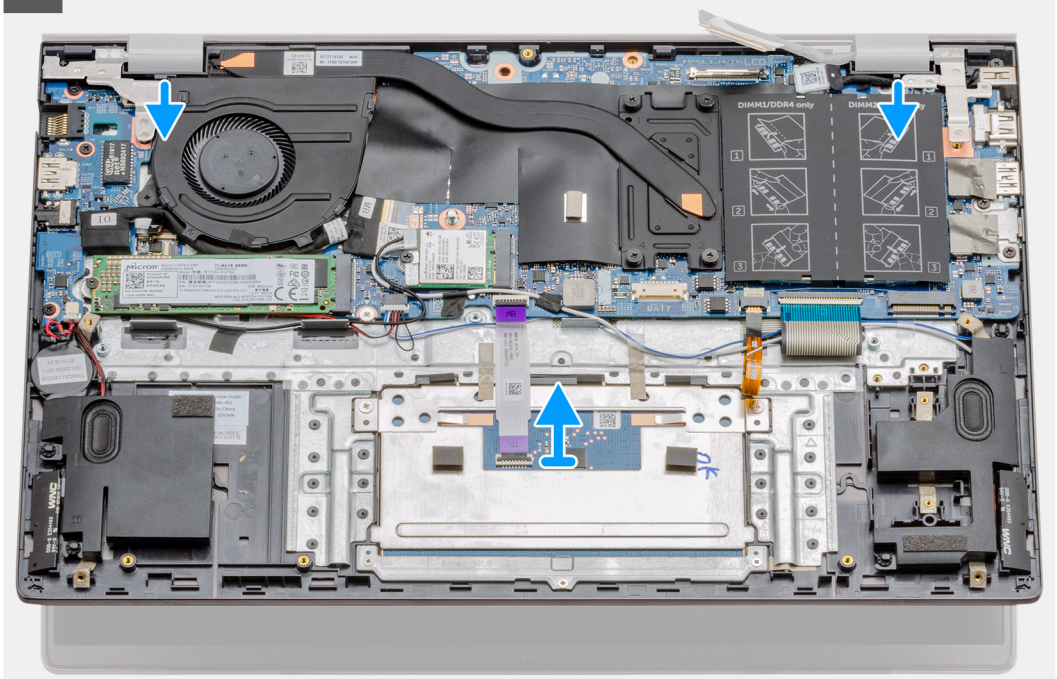
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the WLAN card.

About this task

The figure indicates the location of the display assembly and provides a visual representation of the removal procedure.



5



6

Steps

1. Locate the display cable and display hinges on your computer.
2. Remove the transparent sticker covering the display cable to the system board.
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. Remove the two screws (M2.5x4) and (M2x3) that secure the left-display hinge to the system board.
6. Remove the two screws (M2.5x4) that secure the right-display hinge to the system board.
7. Open the display hinges at an angle of 90 degrees.
8. Gently slide the palm-rest and keyboard assembly off the display assembly carefully.

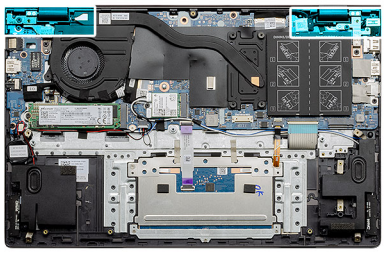
Installing the display assembly - UMA

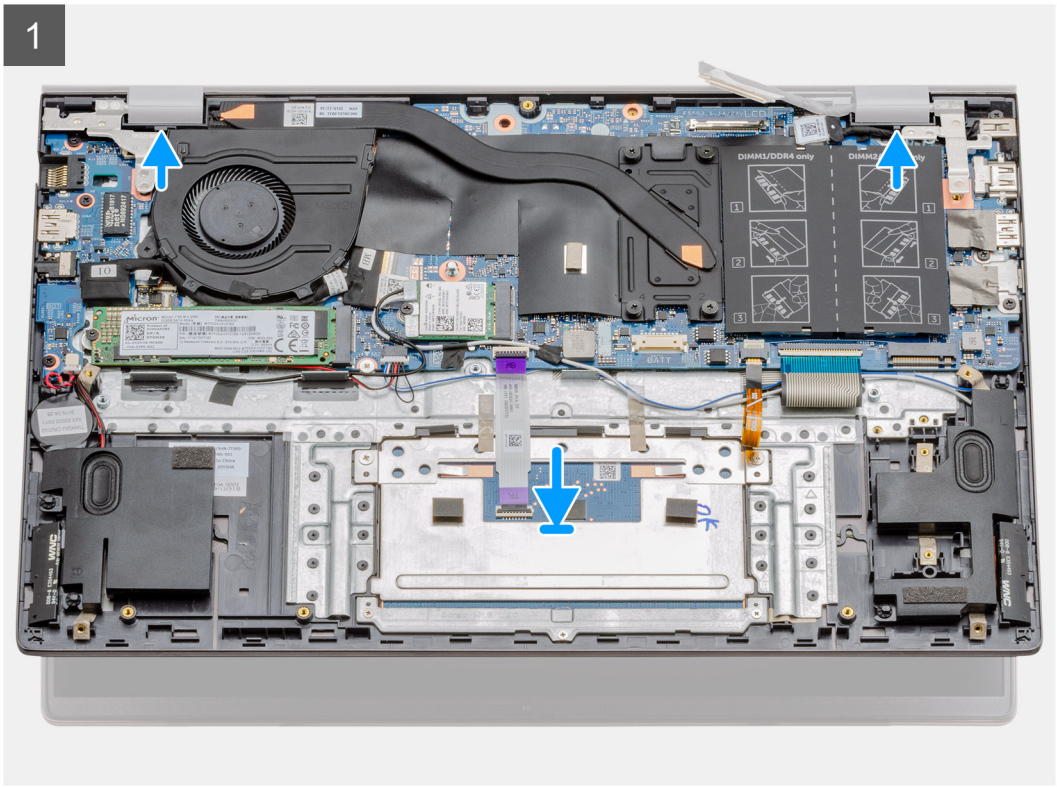
Prerequisites

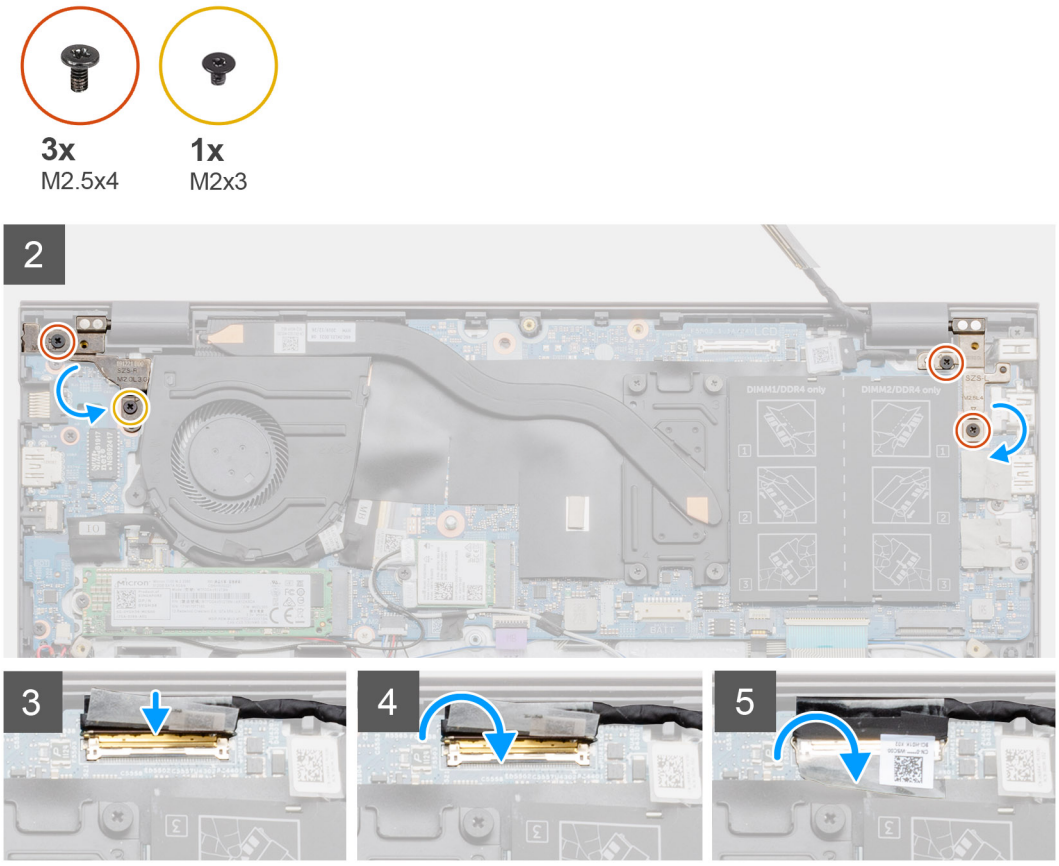
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the component and provides a visual representation of the installation procedure.







Steps

1. Place the display assembly on a clean and flat surface.
2. Align and place the palm-rest and keyboard assembly on the display assembly.
3. Using the alignment posts, close the display hinges.
4. Replace the two screws (M2.5x4) and (M2x3) that secure the left-display hinge to the system board.
5. Replace the two screws (M2.5x4) that secure the right-display hinge to the system board.
6. Connect the display cable on to the connector on the system board and adhere the tape to the system board.

Next steps

1. Install the WLAN card.
2. Install the battery (3-cell or 4-cell) based on the configuration.
3. Install the base cover.
4. Follow the procedure in after working inside your computer.

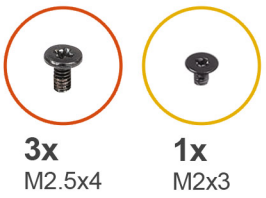
Removing the display assembly - discrete

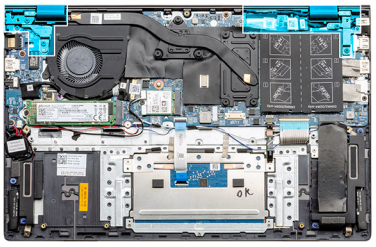
Prerequisites

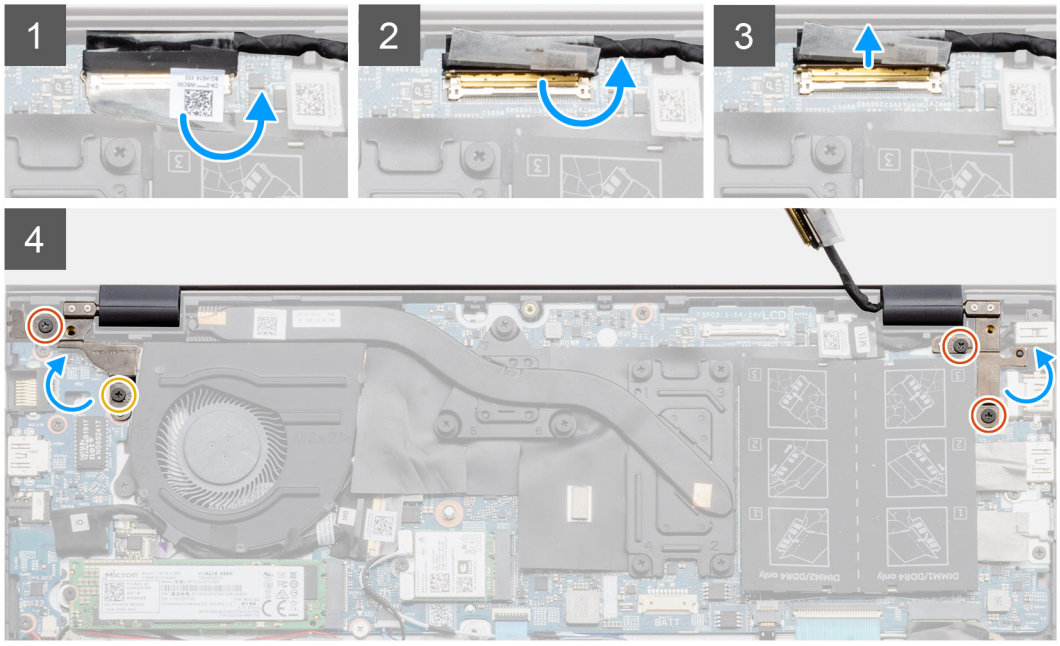
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the WLAN card.

About this task

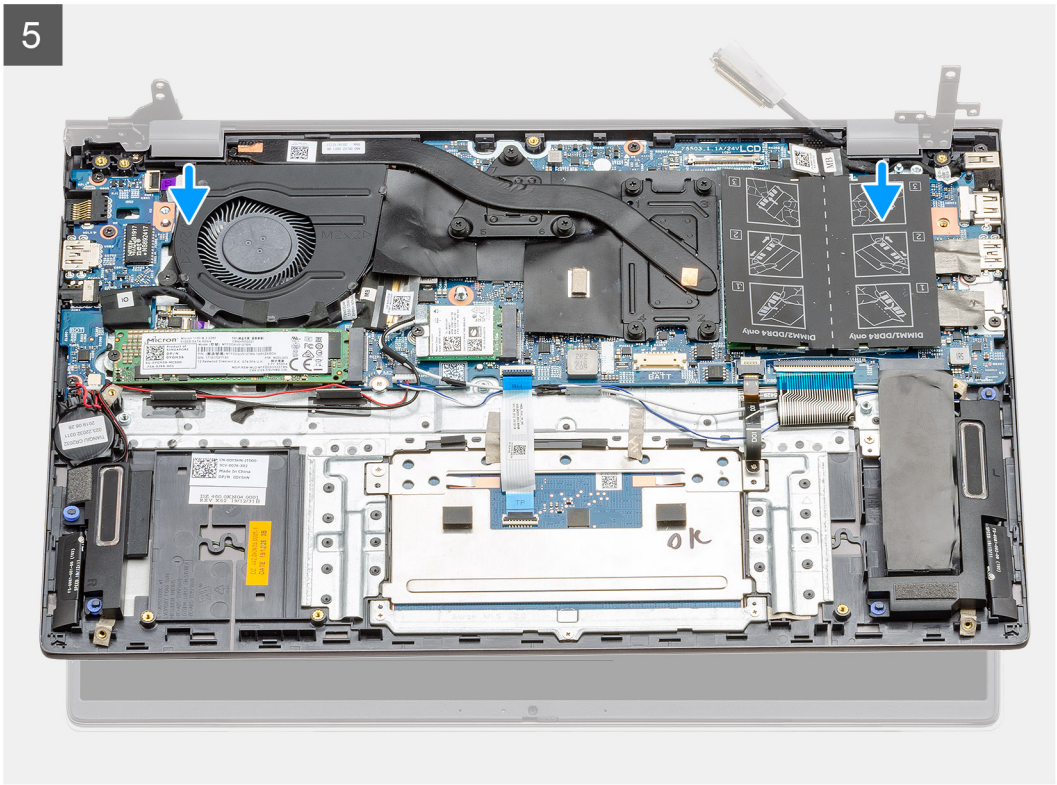
The figure indicates the location of the display assembly and provides a visual representation of the removal procedure.


3x
M2.5x4
1x
M2x3




1
2
3
4

5



Steps

1. Locate the display cable and display hinges on your computer.
2. Remove the transparent sticker covering the display cable to the system board.
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. Remove the two screws (M2.5x4) and (M2x3) that secure the left-display hinge to the system board.
6. Remove the two screws (M2.5x4) that secure the right-display hinge to the system board.
7. Open the display hinges at an angle of 90 degrees.
8. Gently slide the palm-rest and keyboard assembly off the display assembly carefully.

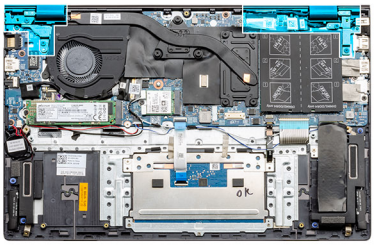
Installing the display assembly - discrete

Prerequisites

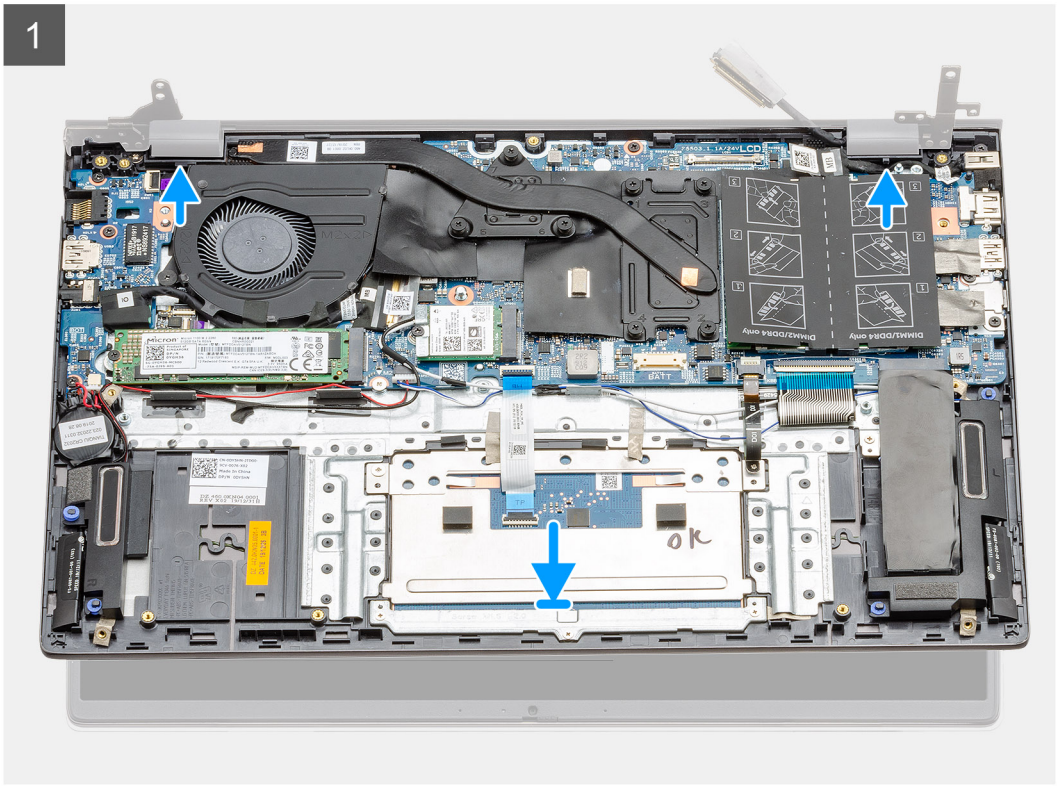
If you are replacing a component, remove the existing component before performing the installation procedure.

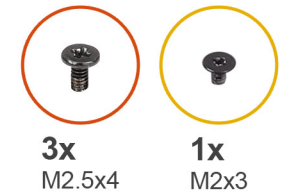
About this task

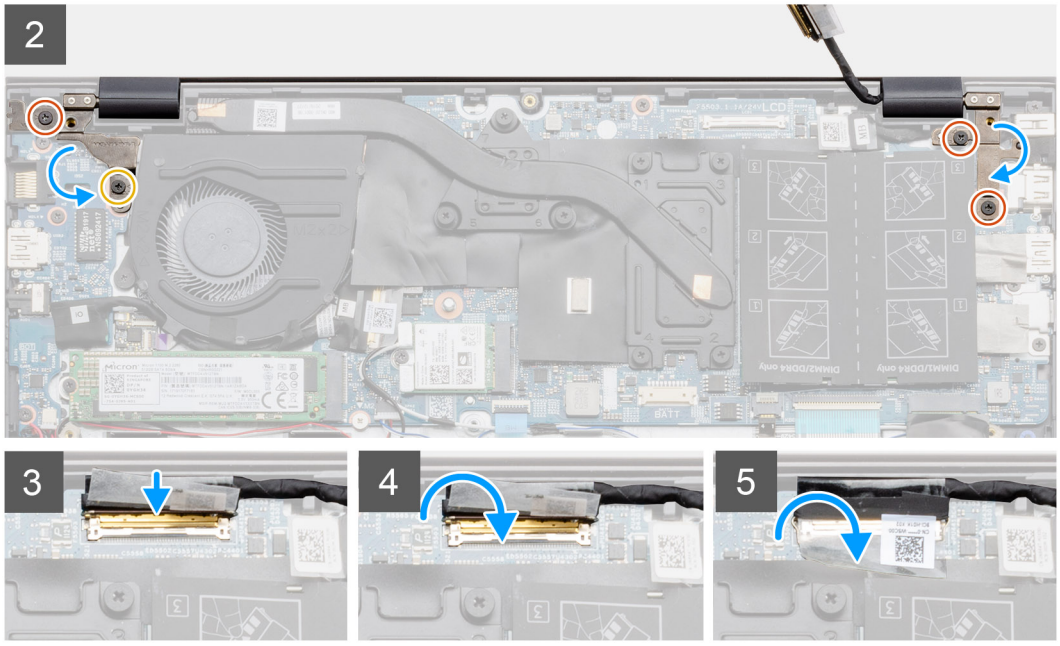
The figure indicates the location of the component and provides a visual representation of the installation procedure.



1







Steps

1. Place the display assembly on a clean and flat surface.
2. Align and place the palm-rest and keyboard assembly on the display assembly.
3. Using the alignment posts, close the display hinges.
4. Replace the two screws (M2.5x4) and (M2x3) that secure the left-display hinge to the system board.
5. Replace the two screws (M2.5x4) that secure the right-display hinge to the system board.
6. Connect the display cable on to the connector on the system board and adhere the tape to the system board.

Next steps

1. Install the WLAN card.
2. Install the battery 3-cell or 4-cell.
3. Install the base cover.
4. Follow the procedure in after working inside your computer.

System board

Removing the system board - UMA

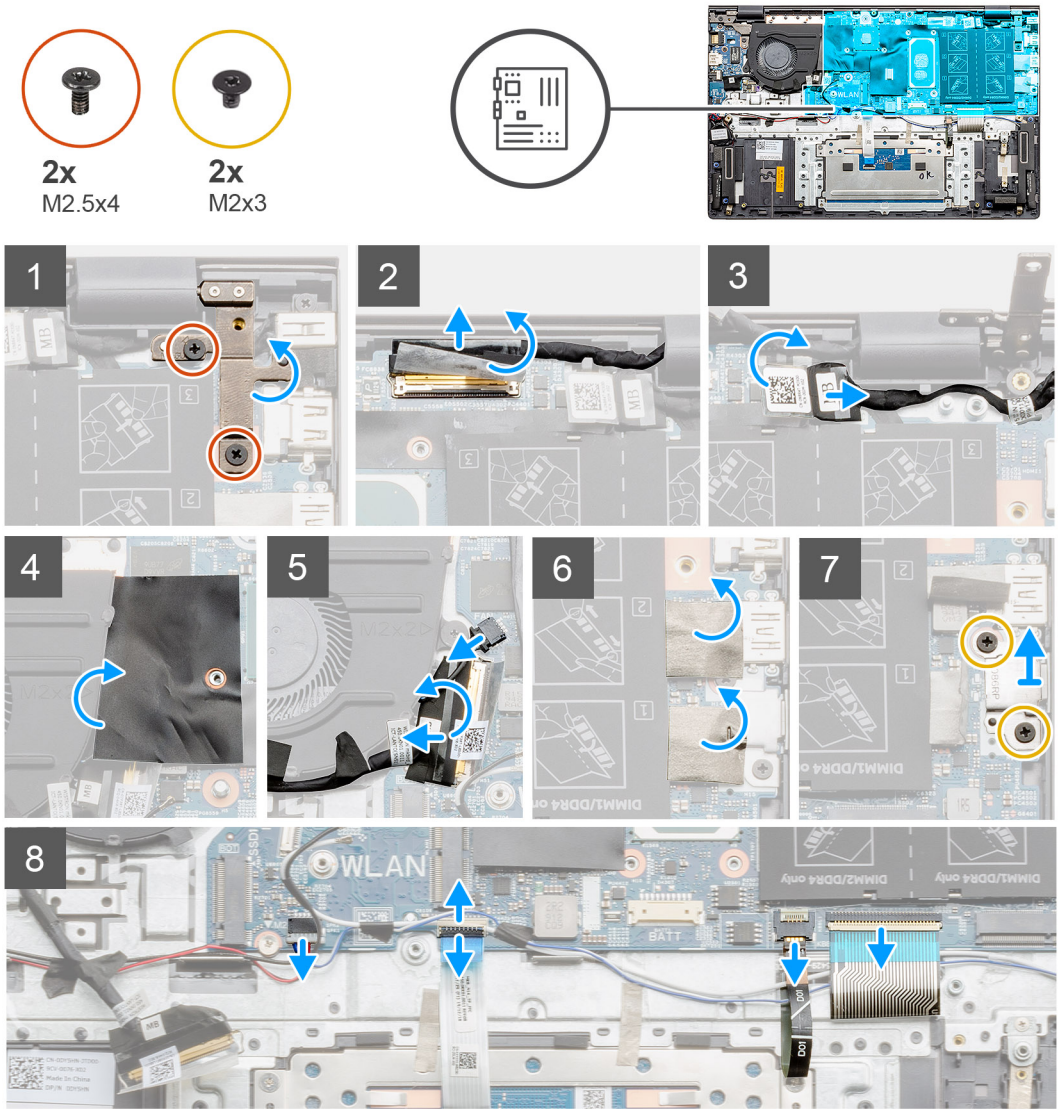
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the coin-cell battery.

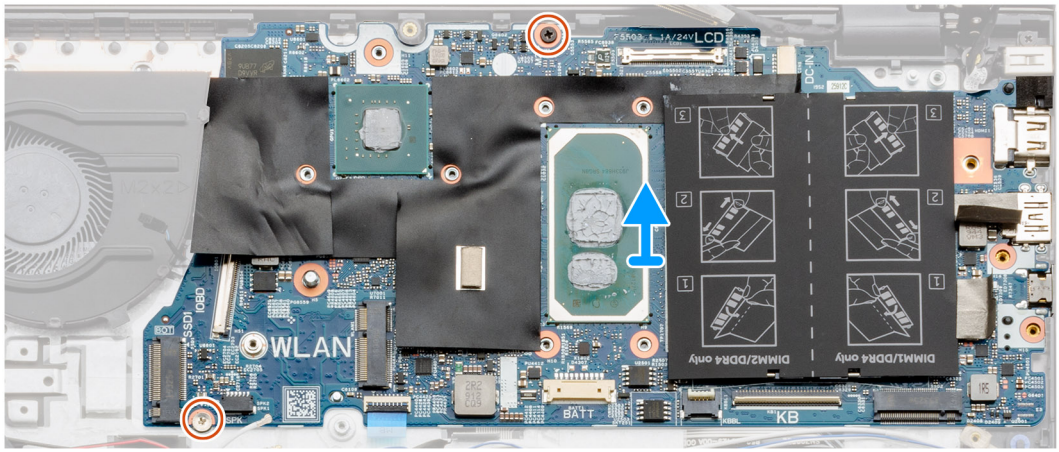
5. Remove the M.2 2280 SSD.
6. Remove the M.2 2230 SSD.
7. Remove the WLAN card.
8. Remove the system fan.
9. Remove the heat sink.
10. Remove the memory module.
11. Remove the display assembly.

About this task

The figure indicates the location of the system board and provides a visual representation of the removal procedure.



2x
M2x3



Steps

1. Remove two screws (M2.5x4), and lift the left hinge.
2. Remove the transparent sticker covering the display cable to the system board.
3. Open the latch, and disconnect the display cable from the system board.
4. Remove the transparent sticker covering the DC-in port cable to the system board.
5. Disconnect the DC-in port cable from the system board.
6. Lift the mylar cover, and disconnect the fan cable.
7. Peel the adhesive tape, open the latch, and disconnect the I/O cable to the system board.
8. Remove the adhesive stickers.
9. Remove the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
10. Disconnect the speaker cable from the system board.
11. Open the latch, and disconnect the touchpad cable from the system board.
12. Open the latch, and disconnect the keyboard-backlight cable from the system board.
13. Open the latch, and disconnect the keypad cable from the system board.
14. Remove two screws (M2x3) from the system board.
15. Gently release the ports on the system board from the slots on the palm-rest and keyboard assembly and lift the system board off the palm-rest and keyboard assembly.

Installing the system board - UMA

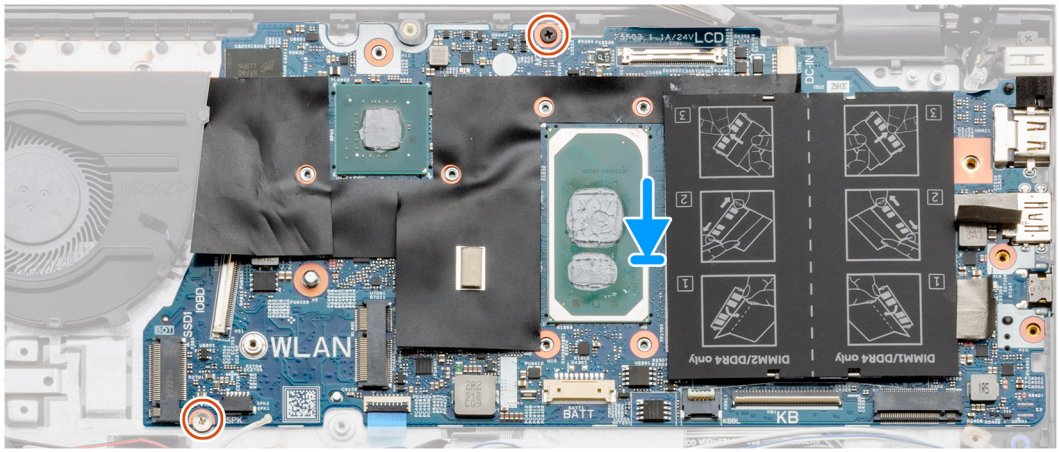
Prerequisites

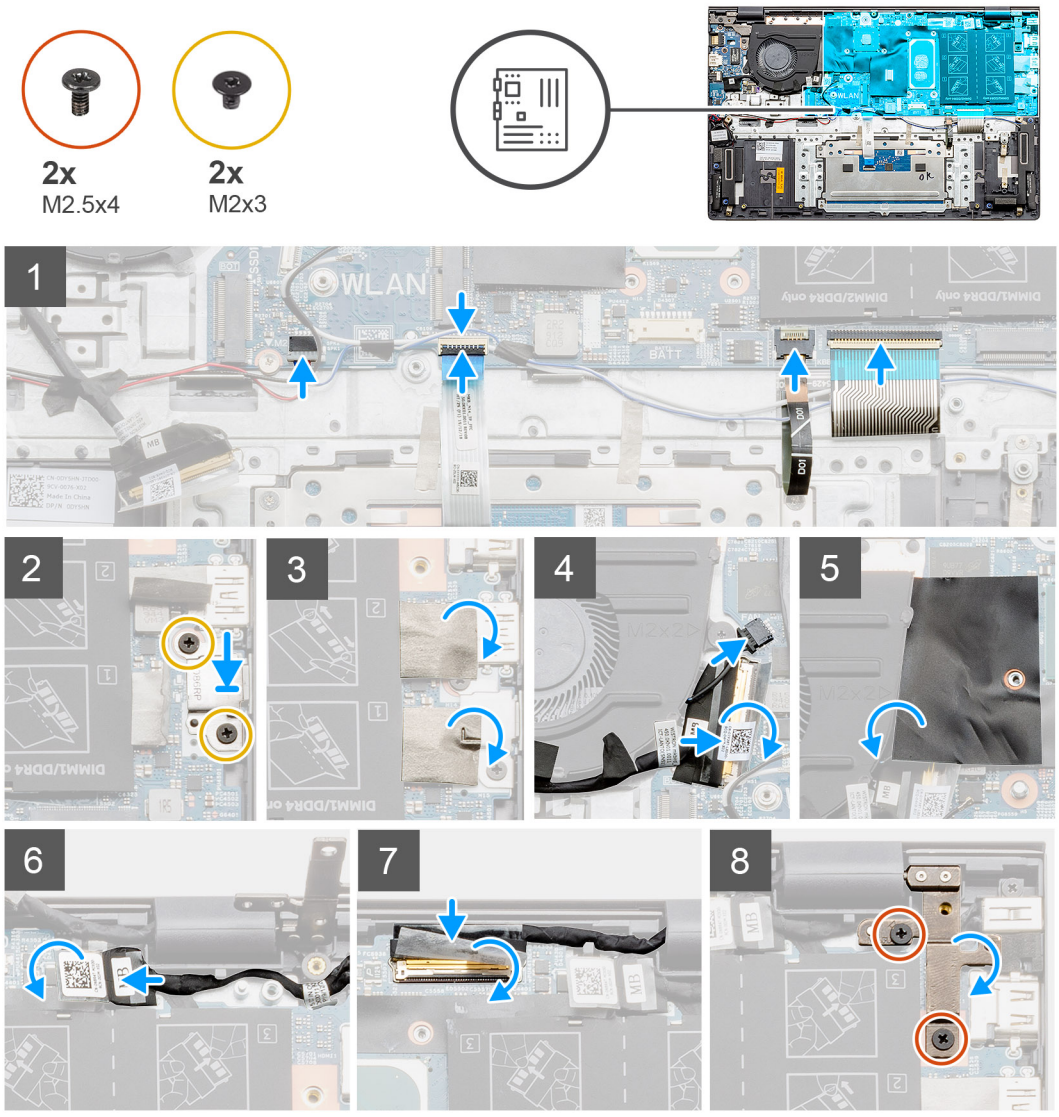
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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

2x
M2x3





Steps

1. Slide the ports on the system board into the slots on the palm-rest and keyboard assembly and align the screw holes on the system board with the screw holes on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x3) that secure the system board to the palm-rest and keyboard assembly.
3. Connect the speaker cable to the system board.
4. Connect the touchpad cable to the system board and close the latch to secure the cable.
5. Connect the keyboard-backlight cable to the system board and close the latch to secure the cable.
6. Connect the keyboard cable to the system board and close the latch to secure the cable.
7. Replace the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
8. Replace the adhesive sticker back.
9. Connect the fan cable onto the connector on the system board and close the latch.
10. Adhere the transparent sticker.
11. Lower the mylar flap.
12. Connect the I/O cable onto the connector on the system board and lower the latch.
13. Adhere the tape and transparent sticker that secures the I/O cable to the system board.
14. Connect the display cable onto the connector on the system board and lower the latch.
15. Adhere the tape and transparent sticker that secures the display cable to the system board.
16. Lower the right metal hinge, and replace the two screws (M2.5x4).

Next steps

1. Install the display assembly.
2. Install the memory module.
3. Install the heat sink UMA (based on configuration).
4. Install the system fan.
5. Install the WLAN card.
6. Install the M.2 2230 SSD card.
7. Install the M.2 2280 SSD card.
8. Install the battery (3-cell or 4-cell) based on the configuration.
9. Install the base cover.
10. Follow the procedure in after working inside your computer.

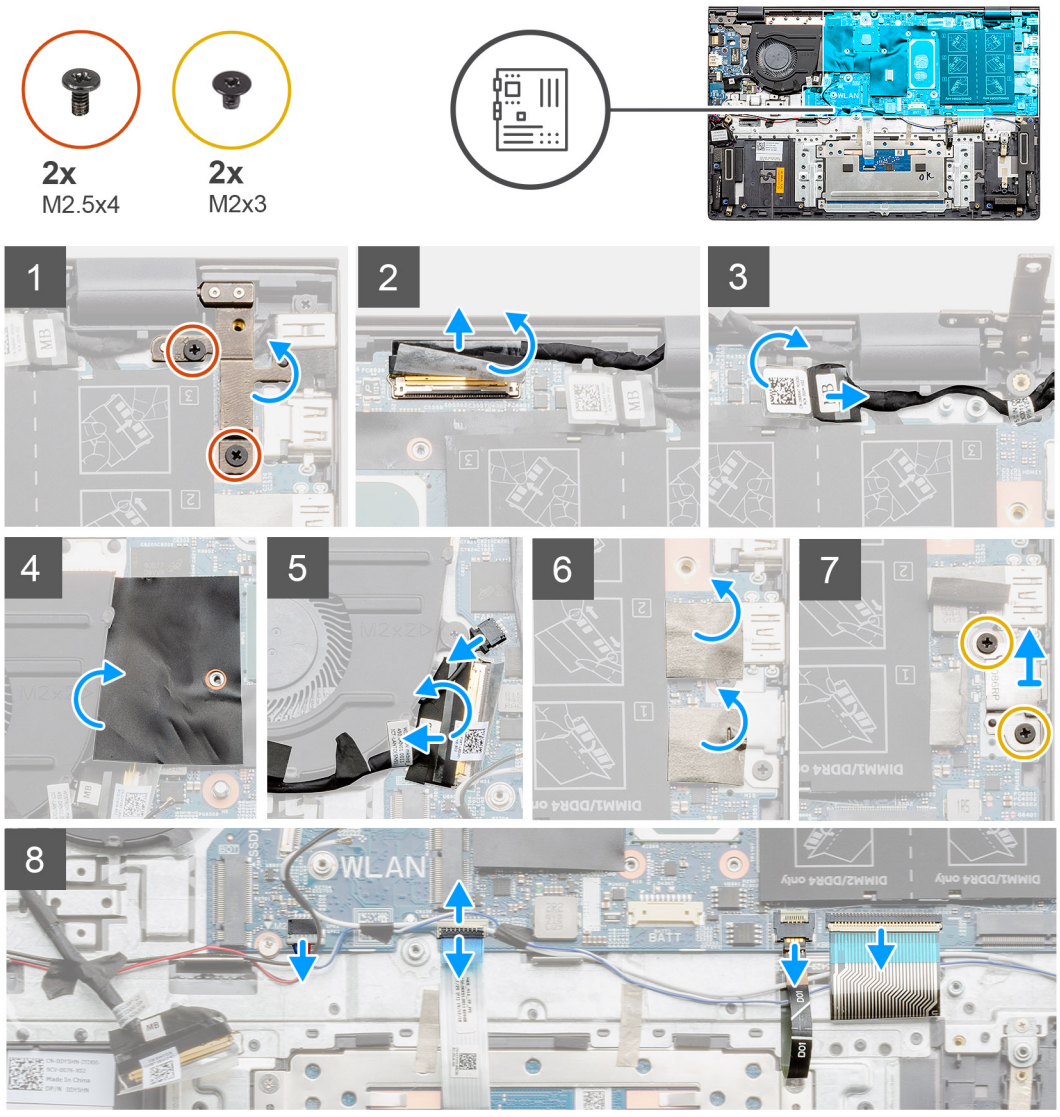
Removing the system board - discrete

Prerequisites

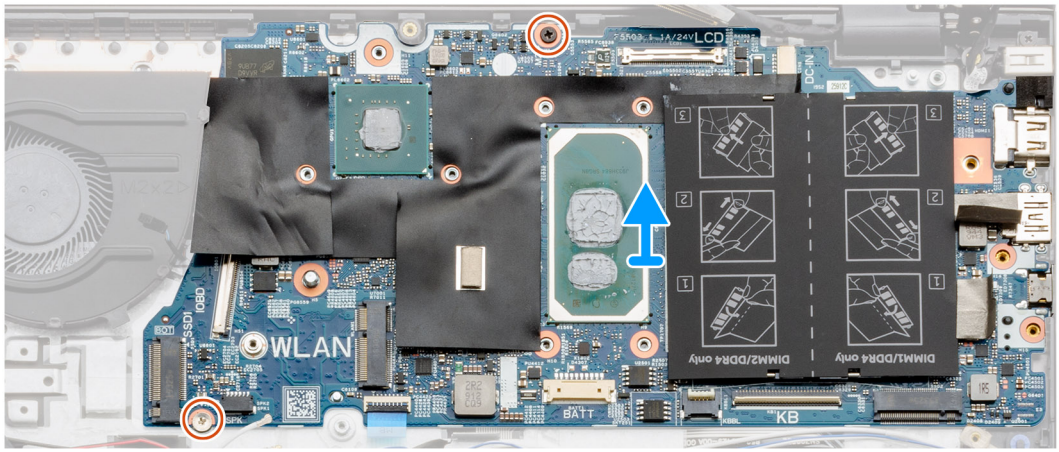
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the M.2 2280 SSD).
5. Remove the M.2 2230 SSD.
6. Remove the WLAN card.
7. Remove the system fan.
8. Remove the heat sink.
9. Remove the memory module.
10. Remove the display assembly.

About this task

The figure indicates the location of the system board and provides a visual representation of the removal procedure.


2x
M2.5x4
2x
M2x3
1
2
3
4
5
6
7
8
WLAN

2x
M2x3



Steps

1. Remove two screws (M2.5x4), and lift the left hinge.
2. Remove the transparent sticker covering the display cable to the system board.
3. Open the latch, and disconnect the display cable from the system board.
4. Remove the transparent sticker covering the DC-in port cable to the system board.
5. Disconnect the DC-in port cable from the system board.
6. Lift the mylar cover, and disconnect the fan cable.
7. Peel the adhesive tape, open the latch, and disconnect the I/O cable to the system board.
8. Remove the adhesive stickers.
9. Remove the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
10. Disconnect the speaker cable from the system board.
11. Open the latch, and disconnect the touchpad cable from the system board.
12. Open the latch, and disconnect the keyboard-backlight cable from the system board.
13. Open the latch, and disconnect the keypad cable from the system board.
14. Remove two screws (M2x3) from the system board.
15. Gently release the ports on the system board from the slots on the palm-rest and keyboard assembly and lift the system board off the palm-rest and keyboard assembly.

Installing the system board - discrete

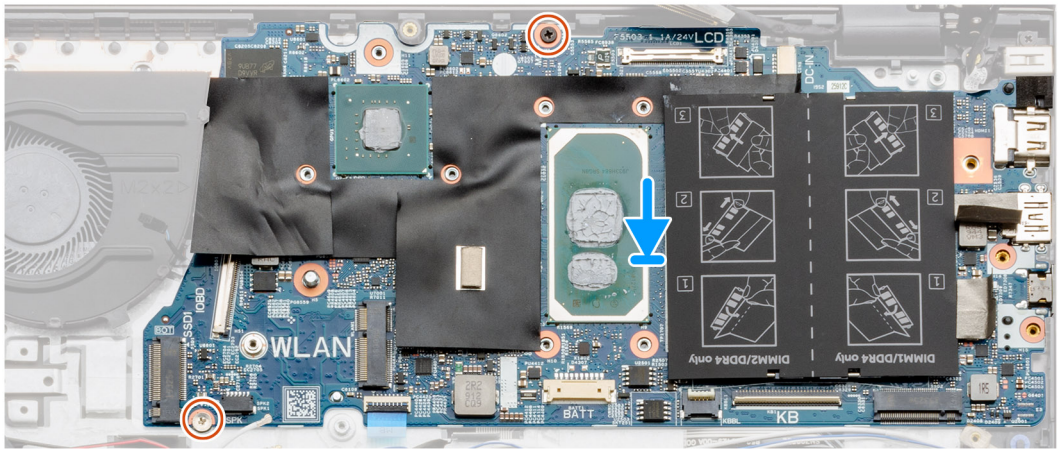
Prerequisites

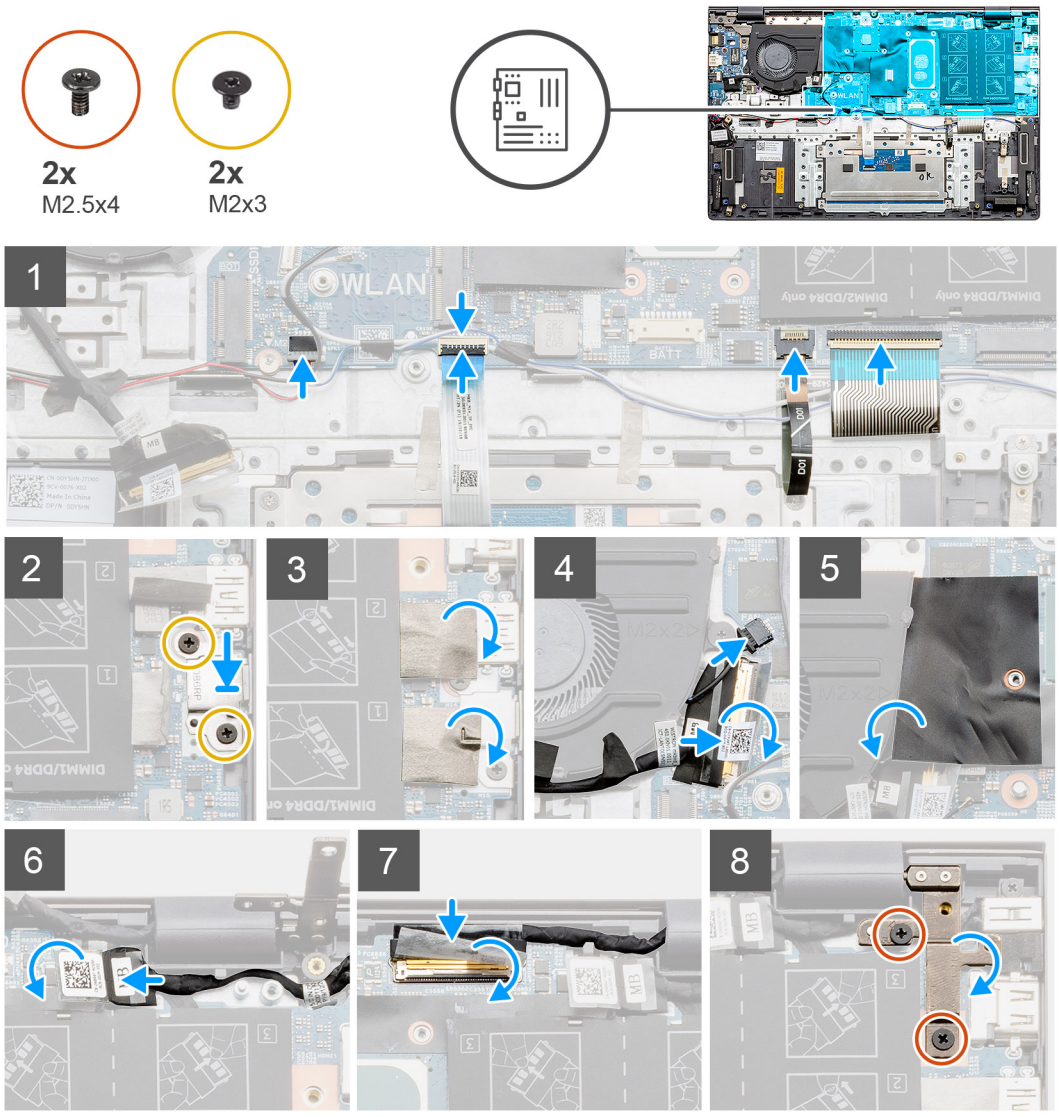
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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

2x
M2x3





Steps

1. Slide the ports on the system board into the slots on the palm-rest and keyboard assembly and align the screw holes on the system board with the screw holes on the palm-rest and keyboard assembly.
2. Replace the two screws (M2x3) that secure the system board to the palm-rest and keyboard assembly.
3. Connect the speaker cable to the system board.
4. Connect the touchpad cable to the system board and close the latch to secure the cable.
5. Connect the keyboard-backlight cable to the system board and close the latch to secure the cable.
6. Connect the keyboard cable to the system board and close the latch to secure the cable.
7. Replace the two screws (M2x3) that secure the USB Type-C port bracket to the system board.
8. Replace the adhesive sticker back.
9. Connect the fan cable onto the connector on the system board.
10. Lower the mylar flap.
11. Connect the I/O cable onto the connector on the system board and lower the latch.
12. Adhere the tape that secures the I/O cable to the system board.
13. Connect the display cable onto the connector on the system board and lower the latch.
14. Adhere the tape that secures the display cable to the system board.
15. Lower the right metal hinge, and replace the two screws (M2.5x4).

Next steps

1. Install the display assembly.
2. Install the memory modules.
3. Install the heat sink - discrete or UMA (based on configuration).
4. Install the system fan.
5. Install the WLAN card.
6. Install the M.2 2230 solid-state drive.
7. Install the M.2 2280 solid-state drive.
8. Install the 4-cell battery or 3-cell battery based on the configuration.
9. Install the base cover.
10. Follow the procedure in after working inside your computer.

Palm-rest and keyboard assembly

Removing the palm-rest and keyboard assembly - UMA

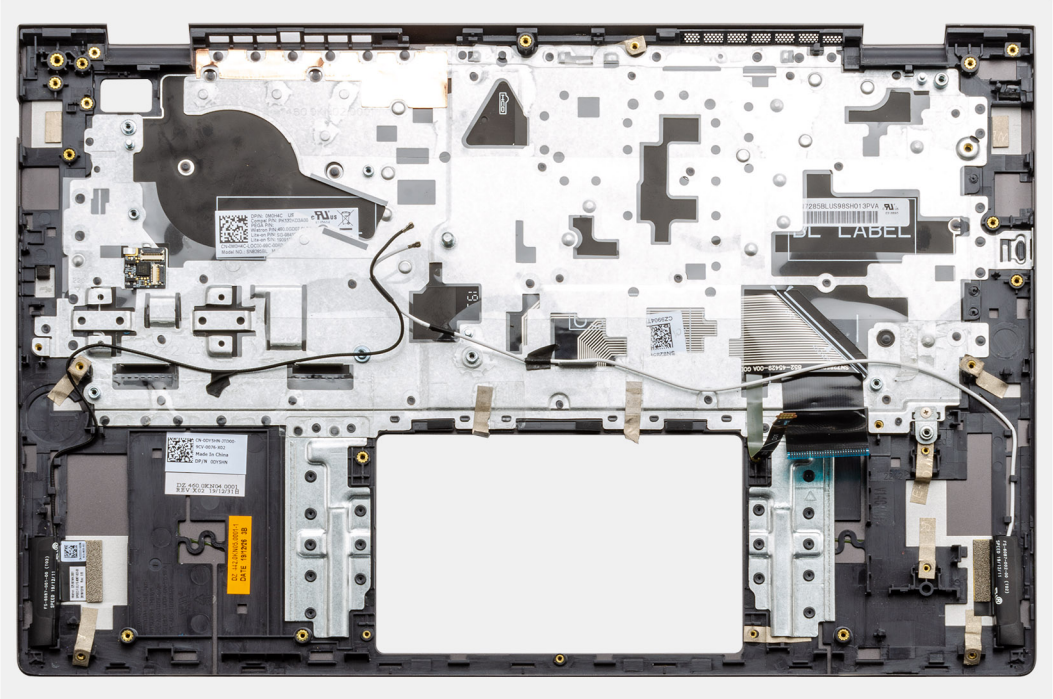
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the WLAN card.
5. Remove the memory module.
6. Remove the M.2 2280 SSD.
7. Remove the M.2 2230 SSD.
8. Remove the system fan.
9. Remove the speaker (3-cell battery configuration or 4-cell battery configuration).
10. Remove the heat sink.
11. Remove the coin-cell battery.
12. Remove the I/O board.
13. Remove the power button with fingerprint reader.
14. Remove the DC-in port.
15. Remove the touchpad.
16. Remove the display assembly.
17. Remove the system board.

NOTE: The system board can be removed along with the heat sink.

About this task

The figure indicates the location of the palm-rest and keyboard assembly and provides a visual representation of the removal procedure.



Steps

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

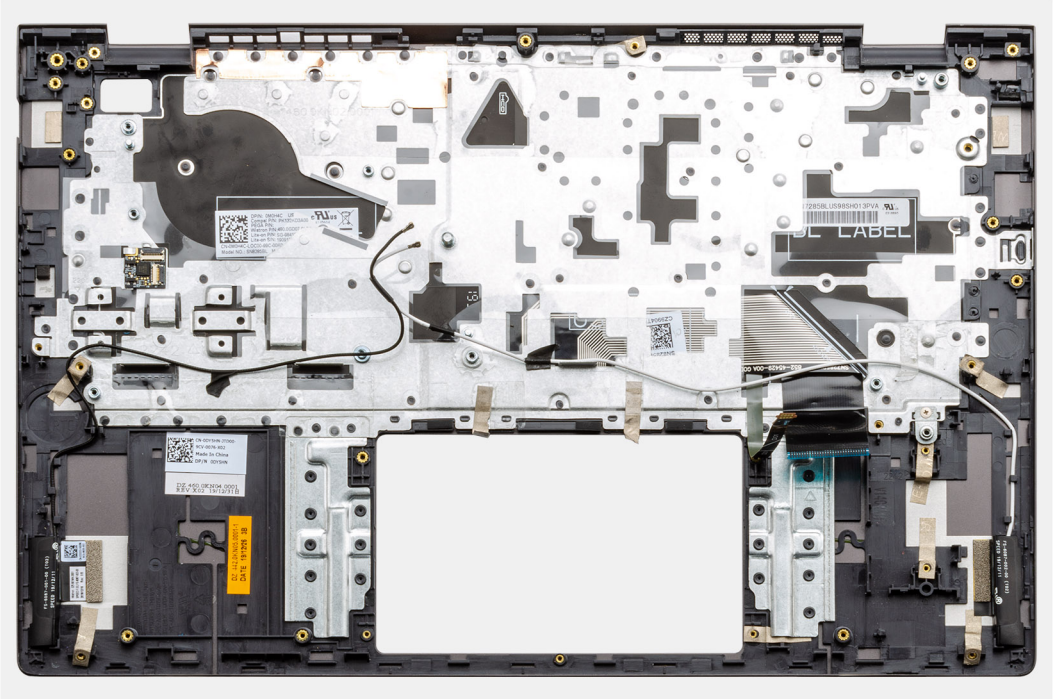
Installing the palm-rest and keyboard assembly - UMA

Prerequisites

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

About this task

The figure indicates the location of the palm-rest and keyboard assembly and provides a visual representation of the installation procedure.



Steps

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

Next steps

1. Install the system board.
2. Install the touchpad.
3. Install the DC-in port.
4. Install the power button with fingerprint reader.
5. Install the coin-cell battery.
6. Install the heat sink.
7. Install the memory module.
8. Install the I/O board.
9. Install the display assembly.
10. Install the speakers (3-cell battery configuration or 4-cell battery configuration).
11. Install the system fan.
12. Install the M.2 2230 SSD card.
13. Install the M.2 2280 SSD card.
14. Install the WLAN card.
15. Install the battery (3-cell or 4-cell) based on the configuration.
16. Install the base cover.
17. Follow the procedure in after working inside your computer.

Removing the palm-rest and keyboard assembly - discrete

Prerequisites

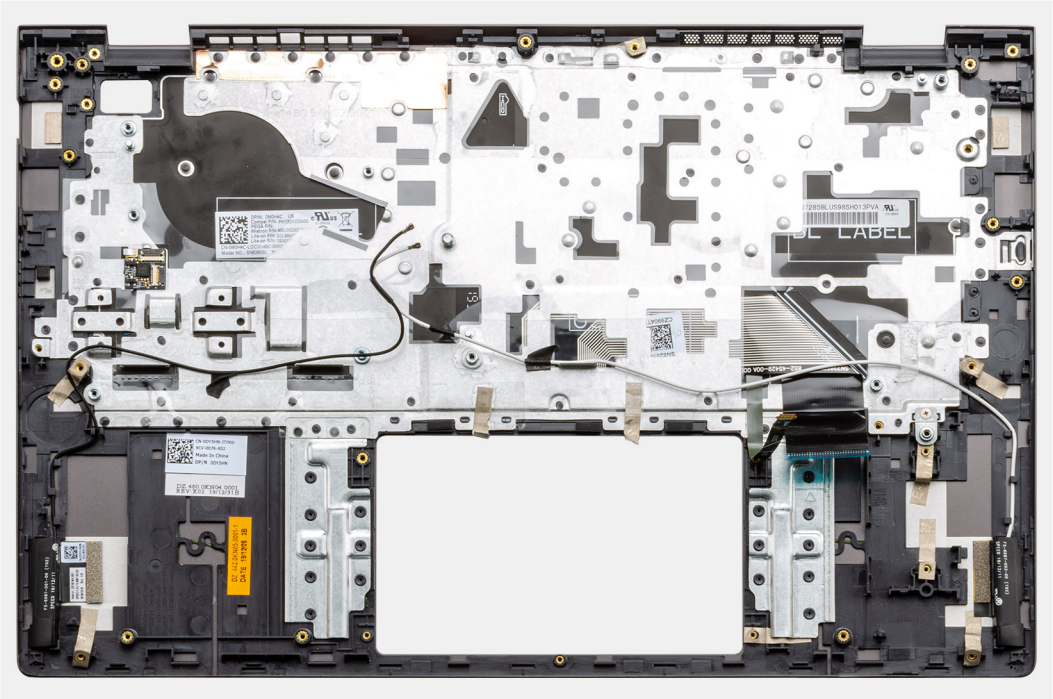
1. Follow the procedure in before working inside your computer.
2. Remove the base cover.
3. Remove the battery (3-cell or 4-cell).
4. Remove the WLAN card.
5. Remove the memory module.
6. Remove the SSD-1 (M.2 2280 SSD or M.2 2230 SSD).
7. Remove the SSD-2.

8. Remove the system fan.
9. Remove the heat sink discrete.
10. Remove the speaker (3-cell battery configuration or 4-cell battery configuration).
11. Remove the coin-cell battery.
12. Remove the I/O board.
13. Remove the power button with fingerprint reader.
14. Remove the DC-in port.
15. Remove the touchpad.
16. Remove the display assembly.
17. Remove the system board.

NOTE: The system board can be removed along with the heat sink.

About this task

The figure indicates the location of the palm-rest and keyboard assembly and provides a visual representation of the removal procedure.



Steps

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

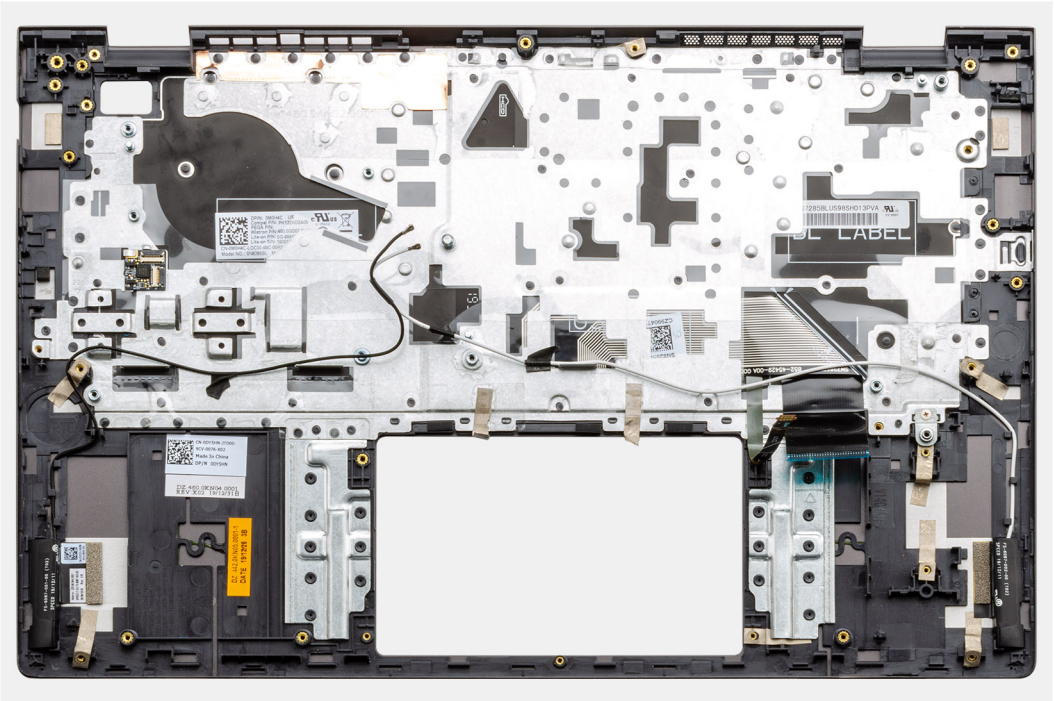
Installing the palm-rest and keyboard assembly - discrete

Prerequisites

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

About this task

The figure indicates the location of the palm-rest and keyboard assembly and provides a visual representation of the installation procedure.



Steps

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

Next steps

1. Install the system board.
2. Install the touchpad.
3. Install the DC-in port.
4. Install the power button with fingerprint reader.
5. Install the I/O board.
6. Install the coin-cell battery.
7. Install the heat sink.
8. Install the display assembly.
9. Install the speakers (3-cell battery configuration or 4-cell battery configuration).
10. Install the system fan.
11. Install the SSD-1 (M.2 2230 SSD card or M.2 2280 SSD card).
12. Install the SSD-2 .
13. Install the memory modules.
14. Install the WLAN card.
15. Install the battery (3-cell or 4-cell) based on the configuration.
16. Install the base cover.
17. Follow the procedure in after working inside your computer.

4

Software

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

Topics:

- Downloading Windows drivers

Downloading Windows drivers

Steps

1. Turn on the notebook.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag of your notebook, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the auto detect feature or manually browse for your notebook model.

4. Click **Drivers and Downloads**.
5. Select the operating system installed on your notebook.
6. Scroll down the page and select the driver to install.
7. Click **Download File** to download the driver for your notebook.
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the driver file icon and follow the instructions on the screen.

5

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:

- Boot menu
- Navigation keys
- Boot Sequence
- BIOS setup
- Updating the BIOS in Windows
- System and setup password

Boot menu

Press <F12> when the Dell logo appears to initiate a one-time boot menu with a list of the valid boot devices for the system. Diagnostics and BIOS Setup options are also included in this menu. The devices that are listed on the boot menu depend on the bootable devices in the system. This menu is useful when you are attempting to boot to a particular device or to bring up the diagnostics for the system. Using the boot menu does not make any changes to the boot order stored in the BIOS.

The options are:

- **UEFI Boot Devices**:
  - Windows Boot Manager
  - UEFI Hard Drive
  - Onboard NIC (IPV4)
  - Onboard NIC (IPV6)
- **Pre-Boot Tasks**:
  - BIOS Setup
  - Diagnostics
  - BIOS Update
  - SupportAssist OS Recovery
  - BIOS Flash Update - Remote
  - Device Configuration

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.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that prompts you to save any unsaved changes and restarts the system.

Boot Sequence

Boot sequence 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:

- Removable Drive (if available)
- STXXXX Drive

  NOTE: XXXX denotes the SATA drive number.
- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

  NOTE: Choosing **Diagnostics**, displays the **SupportAssist diagnostics** screen.

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

BIOS setup

NOTE: Depending on the laptop and its installed devices, the items listed in this section may or may not appear.

Overview

Table 2. Overview

Option	Description

System Information	This section lists the primary hardware features of your computer.
	The options are:
	• **System Information**
	  ○ BIOS version
	  ○ Service Tag
	  ○ Asset Tag
	  ○ Manufacture Date
	  ○ Ownership Date
	  ○ Express Service Code
	  ○ Ownership Tag

Table 2. Overview

Option	Description
	○ Signed Firmware Update ● **Battery** ○ Primary ○ Battery Level ○ Battery State ○ Health ○ AC Adapter ● **Processor Information** ○ Processor Type ○ Maximum Clock Speed ○ Minimum Clock Speed ○ Current Clock Speed ○ Core Count ○ Processor ID ○ Processor L2 Cache ○ Processor L3 Cache ○ Microcode Version ○ Intel Hyper-Threading Capable ○ 64-Bit Technology ● **Memory Configuration** ○ Memory Installed ○ Memory Available ○ Memory Speed ○ Memory Channel Mode ○ Memory Technology ○ DIMM_Slot 1 ○ DIMM_Slot 2 ● **Device Information** ○ Panel Type ○ Video Controller ○ Video Memory ○ Wi-Fi Device ○ Native Resolution ○ Video BIOS Version ○ Audio Controller ○ Bluetooth Device ○ LOM MAC Address ○ dGPU Video Controller

Boot configuration

Table 3. Boot configuration

Option	Description
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. The options are: ● **Windows Boot Manager** ● **UEFI Hard Drive**

Table 3. Boot configuration (continued)

Option	Description
	• **Onboard NIC (IPV4)** • **Onboard NIC (IPV6)** **NOTE:** Legacy Boot mode is not supported on this platform.
Secure Boot	Secure Boot helps ensure your system boots using only validated boot software. **Enable Secure Boot**—By default, this option is disabled. **NOTE:** The system has to be in UEFI boot mode to enable **Enable Secure Boot**.
Secure Boot Mode	Changes to the Secure Boot operation mode modifies the behavior of Secure Boot to allow evaluation of UEFI driver signatures. The options are: • **Deployed Mode**—By default, this option is enabled. • **Audit Mode**
Expert Key Management	Allows you to enable or disable Expert Key Management. **Enable Custom Mode**—By default, this option is disabled. The Custom Mode Key Management options are: • **PK**—By default, this option is enabled. • **KEK** • **db** • **dbx**

Integrated Devices

Table 4. Integrated device options

Option	Description
Date/Time	Allows you to set the date and time. The change to the system date and time takes effect immediately.
Camera	Allows you to enable or disable camera. **Enable Camera** - This option is enabled by default.
Audio	Allows you to turn off all integrated audio. By default, the **Enable Audio** option is selected. Allows you to enable or disable the integrated audio or microphone and speaker separately. By default, the Enable Audio option is selected. The options are: • **Enable Microphone** • **Enable Internal Speaker**
USB Configuration	Allows you to enable or disable the internal or integrated USB configuration. The options are:

Table 4. Integrated device options (continued)

Option	Description
	• **Enable USB Boot Support** • **Enable External USB Port** By default, all the options are enabled.
Disable USB4 PCIE Tunneling	By default the **Disable USB4 PCIE Tunneling** is disabled.

Storage

Table 5. Storage options

Option	Description
SATA/NVMe Operation	Allows you to set the operating mode of the integrated storage device controller. The options are: • **Disabled** • **AHCI/NVMe** • **RAID On**—By default, the RAID On option is enabled.
Storage Interface	Allows you to enable or disable various drives on board. The options are: • **M.2 PCIe SSD-0** • **M.2 PCIe SSD-1** By default, all the options are enabled.
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during system startup. This technology is part of the Self Monitoring Analysis and Reporting Technology (SMART) specification. By default, the **Enable SMART Reporting** option is disabled .
Drive Information	Provides information about drive type and device.

Display

Table 6. Display options

Option	Description
Display Brightness	Allows you to set the screen brightness when running on battery and AC power. The options are: • **Brightness on battery power** - By default, set to 50. • **Brightness on AC power** - By default, set to 100.
EcoPower	**EcoPower** increases the battery life by reducing the display brightness when appropriate. By default **Enable EcoPower** is enabled.
Full Screen Logo	Displays full screen logo when the image matches screen resolution.

Table 6. Display options (continued)

Option	Description
	By default, all the option is disabled.

Connection options

Table 7. Connection

Option	Description
Integrated NIC	Integrated NIC controls the onboard LAN controller. It allows pre-OS and early operating system networking features to use any enabled NICs when UEFI networking protocols are installed and available. The options are: • **Disabled** • **Enabled** • **Enabled with PXE** - This option is enabled by default.
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. The options are: • **WLAN** • **Bluetooth** Both the options are enabled by default.
Enable UEFI Network Stack	Allows you to control the onboard LAN controller. It allows pre-OS and early operating system networking features to use any enabled NICs when UEFI networking protocols are installed and available. **Enable UEFI Network Stack** - This option is enabled by default.

Power management

Table 8. Power Management

Option	Description
Battery Configuration	Allows the system to run on battery during peak power usage hours. The options are: • **Adaptive**—enabled by default • **Standard** • **ExpressCharge** • **Primarily AC Use** • **Custom** **NOTE:** If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop.
Advanced Configuration	This option enables you to maximize the battery health. By default, the **Enable Advanced Battery Charge Mode** option is disabled. **NOTE:** The user can charge battery using feature **Beginning of Day** and **Work Period**. By default, **Work Period** is disabled.

Table 8. Power Management (continued)

Option	Description
	Use ExpressCharge for accelerated battery charging.
Peak Shift	Allows the system to run on battery during peak power usage hours. **Peak Shift** - By default, this option is disabled. **NOTE:** The user can: • Set **Battery Threshold** Min = 15, Max = 100 • Prevent AC power between certain times of the day using **Peak Shift Start**, **Peak Shift End**, and **Peak Shift Charge Start**.
Thermal Management	Allows cooling of fans and the processor heat management to adjust system performance, noise, and temperature. The options are: • **Optimized**—enabled by default • **Cool** • **Quiet** • **Ultra Performance**
USB Wake Support	**Wake on Dell USB-C Dock** — Allows you to connect a Dell USB-C Dock to wake the system from standby mode. By default, the option **Wake on Dell USB-C Dock** is enabled. **NOTE:** These features are only functional when the AC power adapter is connected. If the AC power adapter is removed before Standby, the BIOS removes power from all USB ports to conserve battery power.
Block Sleep	This option enables you to block entering to sleep (S3) mode in operating system environment. By default, the **Block Sleep** option is disabled. **NOTE:** When Block Sleep is enabled, the system does not go to sleep. Intel Rapid Start gets disabled automatically, and the operating system power option remains blank if it was set to Sleep.
Lid Switch	Allows you to disable the lid switch. The options are: • **Enable Lid Switch**—enabled by default • **Power On Lid Open**—enabled by default
Intel Speed Shift technology	Allows you to enable or disable the Intel Speed Shift Technology support. By default,**Intel Speed Shift technology** is enabled. Enabling this option allows the operating system to select appropriate processor performance.

Security

Table 9. Security

Option	Description
TPM 2.0 Security	Allows you to enable or disable the Trusted Platform Module (TPM). The options are: • **TPM 2.0 Security On**—This option is enabled by default. • **PPI Bypass for Enable Commands**

Table 9. Security (continued)

Option	Description
	• **PPI Bypass for Disable Commands** • **PPI Bypass for Clear Command** • **Attestation Enable**—This option is enabled by default. • **Key Storage Enable**—This option is enabled by default. • **SHA-256**—This option is enabled by default. • **Clear** • **TPM State**—This option is enabled by default.
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protection. **SMM Security Mitigation** - By default, this option is enabled.
Data Wipe on Next Boot	Allows BIOS to queue up data wipe cycle for storage devices connected to the motherboard on the next reboot. **Start Data Wipe** - By default, this option is disabled. **NOTE:** Secure Wipe operation deletes information in a way that it cannot be reconstructed.
Absolute	This field allows you to Enable, Disable, or Permanently Disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute® Software. The options are: • **Enabled**—This option is enabled by default. • **Disabled** • **Permanently Disable Absolute**
UEFI Boot Path Security	Controls whether the system prompts the user to enter the admin password (if set) when booting to a UEFI boot path device from the F12 boot menu. The options are: • **Never** • **Always** • **Always Except Internal HDD**—This option is enabled by default. • **Always Except Internal HDD&PXE**

Password

Table 10. Security

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. The entries to set password are: • **Enter the old password:** • **Enter the new password:** Press **Enter** once you enter the new password and again press **Enter** to confirm the new password. **NOTE:** Deleting the admin password deletes the system password (if set). The admin password can also be used to delete hard drive password. For this reason, you cannot set an admin password if a system password or hard drive password is set. Hence, an admin password has to be set first if the admin password has to be used with system password and/or hard drive password.
System Password	Allows you to set, change, or delete the system password.

Table 10. Security (continued)

Option	Description
	The entries to set password are: • **Enter the old password:** • **Enter the new password:** Press **Enter** once you enter the new password and again press **Enter** to confirm the new password.
Password Configuration	Allows you to configure a password. **Upper Case Letter** — When enabled, this field reinforces password must contain at least one upper capital letter. **Lower Case Letter** — When enabled, this field reinforces password must contain at least one lower capital letter. **Digit** — When enabled, this field reinforces password must contain at least one-digit number. **Special Character** — When enabled, this field reinforces password must contain at least one special character. **NOTE:** These options by default are disabled. **Minimum Characters** — Defines the number of characters allowed for a password. Min = 4
Password Bypass	Allows you to bypass the System password and the Internal hard drive password, when it is set, during a system restart. The options are: • **Disabled**—This option is enabled by default. • **Reboot bypass**
Password Changes	Allows you to change the system password and hard drive password without the need of administrator password. **Enable Non-Admin Password Changes** - By default, this option is disabled.
Admin Setup Lockout	Allows the administrator to control how the user can access BIOS setup. **Enable Admin Setup Lockout** - By default, this option is disabled. **NOTE:** • If the admin password is set and **Enable Admin Setup Lockout**is enabled, you cannot view the BIOS setup (using F2 or F12) without the admin password. • If the admin password is set and **Enable Admin Setup Lockout**is disabled, the BIOS setup can be entered and items that are viewed in Locked mode.
Master Password Lockout	Allows you to disable master password support. **Enable Master Password Lockout** - By default, this option is disabled. **NOTE:** The Hard Disk password has to be cleared before the settings can be changed.

Update and Recovery

Table 11. Update and recovery

Option	Description
UEFI Capsule Firmware Updates	Allows you to update the system BIOS through UEFI capsule update packages. **Enable UEFI Capsule Firmware Updates** - By default, this option is enabled.
BIOS Recovery from Hard Drive	Allows you to recover BIOS on the primary hard drive or USB drive in corrupted conditions. **BIOS Recovery from Hard Drive** - By default, this option is enabled. **NOTE:** BIOS Recovery from hard drives is not available for Self-Encrypting Drives (SED).
BIOS Downgrade	Allows you to control flashing of the system firmware to previous versions. **Allow BIOS Downgrade** - By default, this option is enabled.
SupportAssist OS Recovery	Allows you to enable or disable the boot flow for SupportAssist OS Recovery if there are certain system errors. **SupportAssist OS Recovery** - By default, this option is enabled. **NOTE:** If **SupportAssist OS Recovery** setup option is disabled, then all the automatic boot flow for SupportAssist OS Recovery tool is disabled.
BIOSConnect	Allows you to recover cloud service operating system if the main operating system and/or local service operating system fails to boot with the number of failures equal to or greater than the value specified by the Auto operating system Recovery Threshold setup. **BIOSConnect** - By default, this option is enabled.
Dell Auto OS Recovery Threshold	The Auto OS Recovery threshold setup options control the automatic flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool. The options are: • **Off** • **1** • **2** - Default • **3**

System management

Table 12. System management

Option	Description
Service Tag	Displays the service tag of your computer.
Asset Tag	An Asset Tag is a string of 64 characters that are used by IT administrator to uniquely identify a particular system. On an asset tag is set, it cannot be changed.
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. **Wake on AC** By default, this option is disabled.
Auto On Time	This setting allows a system to automatically power on for defined days/time. The options are:

Table 12. System management (continued)

Option	Description
	• **Disabled** - This option is enabled by default. • **Every Day** • **Weekdays** • **Select Days**

Keyboard

Table 13. Keyboard

Option	Description
Numlock Enable	Allows you to enable or disable Numlock function when the system boots. **Enable Numlock** This option is enabled by default.
Fn Lock Options	Allows you to change the function key settings. **Fn Lock Mode** This option is enabled by default. The options are: • **Lock Mode Standard** • **Lock Mode Secondary**- This option is enabled by default.
Keyboard Illumination	Allows you to set keyboard illumination settings using hotkeys <Fn>+<F5> during normal system operation. The options are: • **Disabled** • **Dim** • **Bright**- This option is enabled by default. **NOTE:** The keyboard illumination brightness is set at 100%.
Keyboard Backlight Timeout on AC	This feature defines the timeout value for the keyboard backlight when an AC adapter is plugged in the system. The options are: • **5 seconds** • **10 seconds** - This option is enabled by default. • **15 seconds** • **30 seconds** • **1 minute** • **5 minutes** • **15 minutes** • **Never** **NOTE:** If **Never** is selected, the backlight stays on always when the system has AC adapter plugged in.
Keyboard Backlight Timeout on Battery	This feature defines the timeout value for the keyboard backlight when the system is running only on battery power. The options are: • **5 seconds**

Table 13. Keyboard (continued)

Option	Description
	• **10 seconds** - This option is enabled by default. • **15 seconds** • **30 seconds** • **1 minute** • **5 minutes** • **15 minutes** • **Never** **NOTE:** If **Never** is selected, the backlight stays on always when the system is running on battery power.

Pre-boot behavior

Table 14. Pre-boot behavior

Option	Description
Adapter Warnings	This option displays warning messages during boot when adapters with little power capacity are detected. • **Enable Adapter Warnings**—enabled by default
Warnings and Errors	This option causes the boot process to only pause when warnings and errors are detected rather than stop, prompt, and wait for user input. This feature is useful where the system is being remotely managed. Select one of the following options: • **Prompt on Warnings and Errors**—enabled by default • **Continue on Warnings** • **Continue on Warnings and Errors** **NOTE:** Errors deemed critical to the operation of the system hardware always stop the system.
USB-C Warnings	This option enables or disables dock warning messages. **Enable Dock Warning Messages** — enabled by default.
Fastboot	This option allows you to configure the speed of UEFI boot process. Select one of the following options: • **Minimal** • **Thorough**—enabled by default • **Auto**
Extend BIOS POST Time	This option allows you to configure the BIOS POST load time. Select one of the following options: • **0 seconds**—enabled by default. • **5 seconds** • **10 seconds**
Mouse/Touchpad	This option defines how the system handles mouse and touchpad input. Select one of the following options: • **Serial Mouse** • **PS/2 Mouse** • **Touchpad and PS/2 Mouse**—enabled by default.

Virtualization support

Table 15. Virtualization Support

Option	Description
Intel Virtualization Technology	This option specifies whether the system can run on a Virtual Machine Monitor (VMM). By default, the **Enable Intel Virtualization Technology (VT)** option is enabled.
VT for Direct I/O	This option specifies whether the system can perform Virtualization technology for direct I/O; an Intel method for virtualization for memory map I/O. By default, the **Enable Intel VT for Direct I/O** option is enabled.

Performance

Table 16. Performance

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The default value is set to the maximum number of cores. • **All Cores** — This option is enabled by default. • **1** • **2** • **3**
Intel SpeedStep	This feature allows the system to dynamically adjust processor voltage and core frequency, decreasing average power consumption and heat production. **Enable Intel SpeedStep Technology** This option is enabled by default.
C-States Control	This feature allows you to enable or disable the ability of the CPU to enter and exit low-power states. **Enable C-state control** This option is enabled by default.
Enable Adaptive C-states for Discrete Graphics	This feature allows the system to dynamically detect high usage of discrete graphics and adjust system parameters for higher performance during that time period. **Enable Adaptive C-states for Discrete Graphics** This option is enabled by default.
Intel Turbo Boost Technology	This option allows you to enable or disable the Intel TurboBoost mode of the processor. **Enable Intel Turbo Boost Technology** This option is enabled by default.
Intel Hyper-Threading Technology	This option allows you to enable or disable the HyperThreading in the processor. **Enable Intel Hyper-Threading Technology** This option is enabled by default.

System logs

Table 17. System Logs

Option	Description
BIOS Event Log	Allows you to either keep and clear the BIOS event log. **Clear BIOS Event Log** The options are: • **Keep** - This option is enabled by default. • **Clear**
Thermal Event Log	Allows you to either keep and clear the Thermal event log. **Clear Thermal Event Log** The options are: • **Keep** - This option is enabled by default. • **Clear**
Power Event Log	Allows you to either keep and clear the Power event log. **Clear Power Event Log** The options are: • **Keep** - This option is enabled by default. • **Clear**

Updating the BIOS in Windows

Prerequisites

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

About this task

NOTE: If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re enabled after the BIOS update is completed.

For more information about this subject, see Knowledge Article: How to Enable or Disable BitLocker with TPM in Windows.

Steps

1. Restart the computer.
2. Go to **Dell.com/support**.
   - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
   - Click **Detect Product** and follow the instructions on screen.
3. If you are unable to detect or find the Service Tag, click **Choose from all products**.
4. Choose the **Products** category from the list.

   NOTE: Choose the appropriate category to reach the product page.

5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.
   The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.

10. Select your preferred download method in the **Please select your download method below** window, click **Download File**. The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.
    Follow the instructions on the screen.

Updating BIOS on systems with BitLocker enabled

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known, this can result in data loss or an unnecessary operating system reinstall. For more information about this subject, see Knowledge Article: Updating the BIOS on Dell Systems With BitLocker Enabled

Updating the Dell BIOS in Linux and Ubuntu environments

If you want to update the system BIOS in a Linux environment, such as Ubuntu, see Update the Dell BIOS in a Linux or Ubuntu environment.

Flashing the BIOS from the F12 One-Time boot menu

Updating your system BIOS using a 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 system.

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

NOTE: Only systems 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:

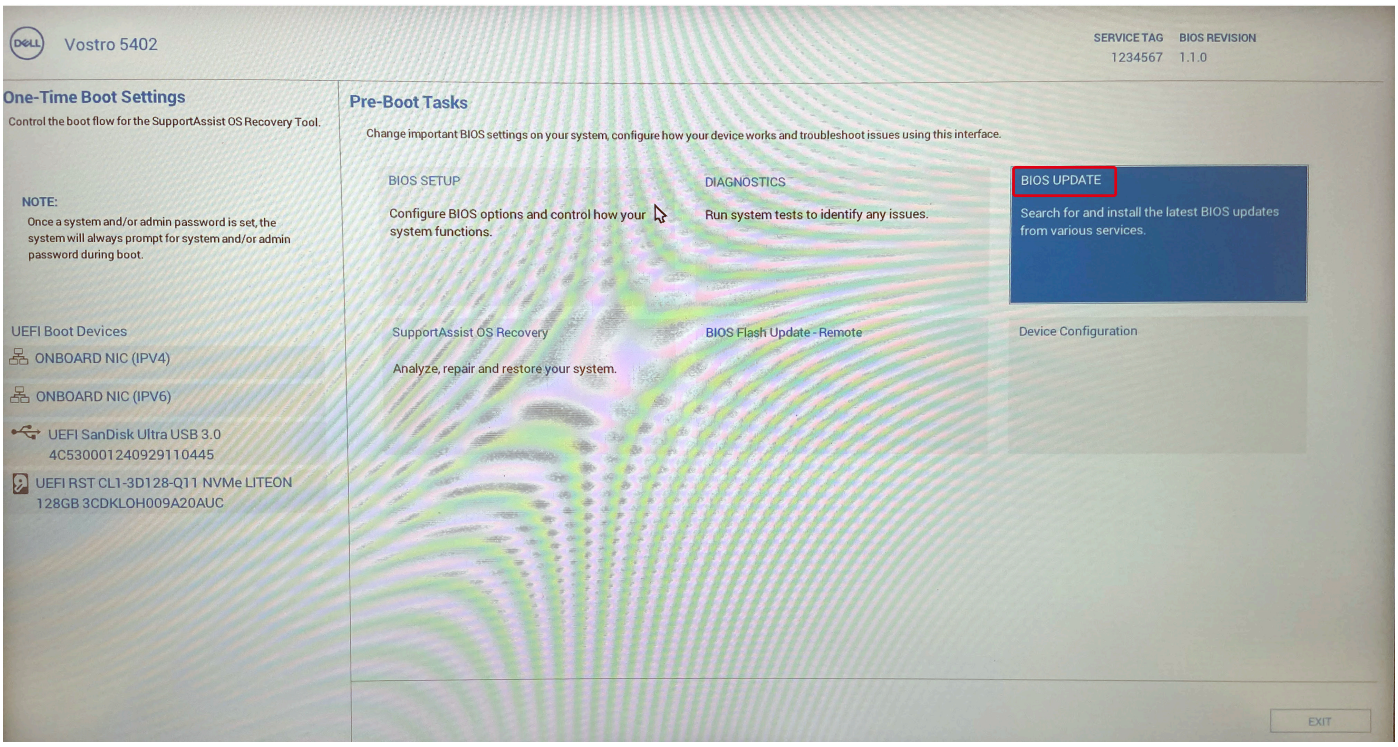
- USB drive formatted to the FAT32 file system (key does not have to be bootable).
- BIOS executable file that you downloaded from the Dell Support website and copied to the root of the USB drive.
- AC power adapter that is connected to the system.
- Functional system battery to flash the BIOS.

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

CAUTION: Do not power off the system during the BIOS update process. Powering off the system could make the system fail to boot.

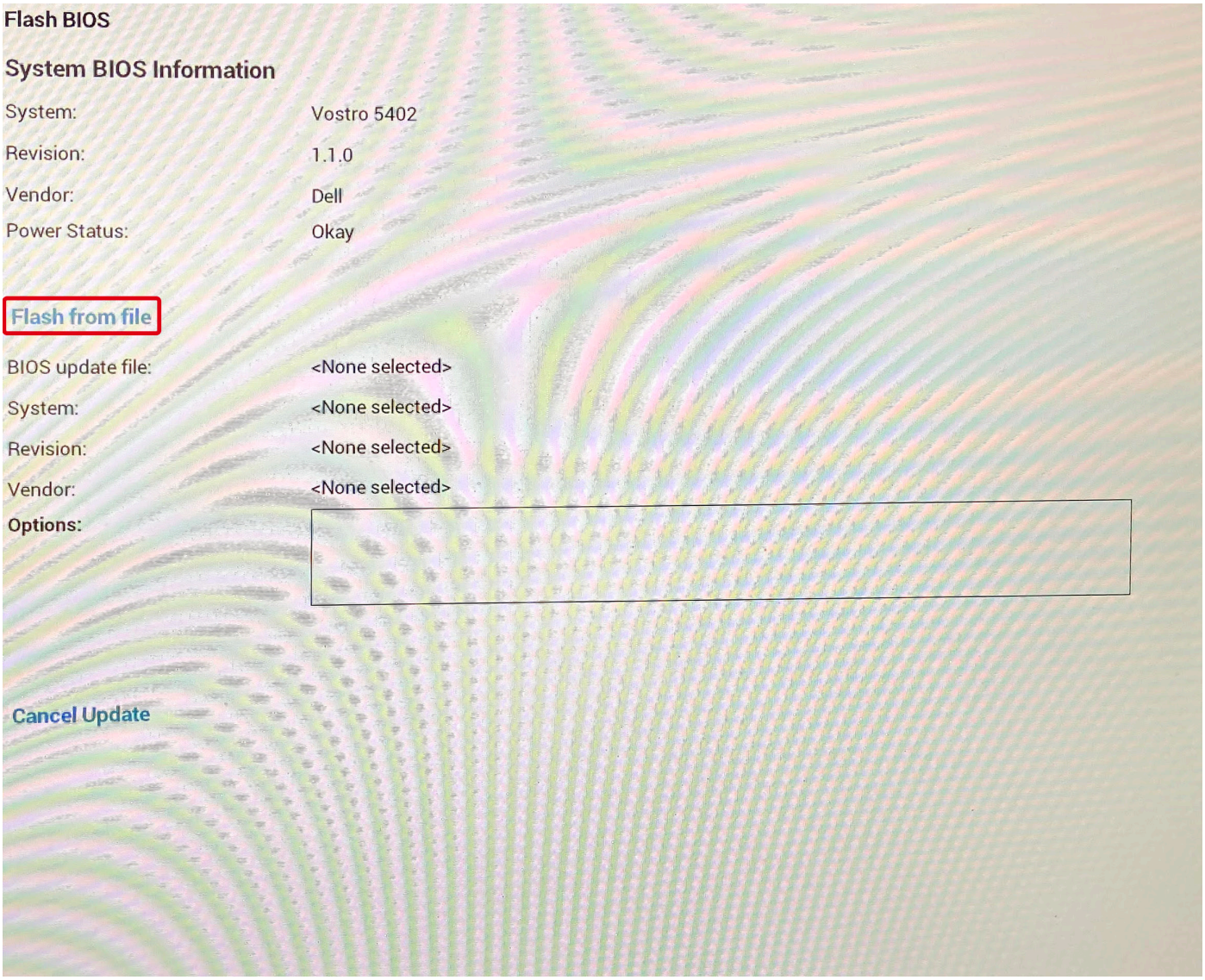
Steps

1. From a power off state, insert the USB drive where you copied the flash into a USB port of the system .
2. Power on the system and press the **F12** key to access the One-Time Boot Menu.
3. Select **BIOS Update** using the mouse or arrow keys then press **Enter**.

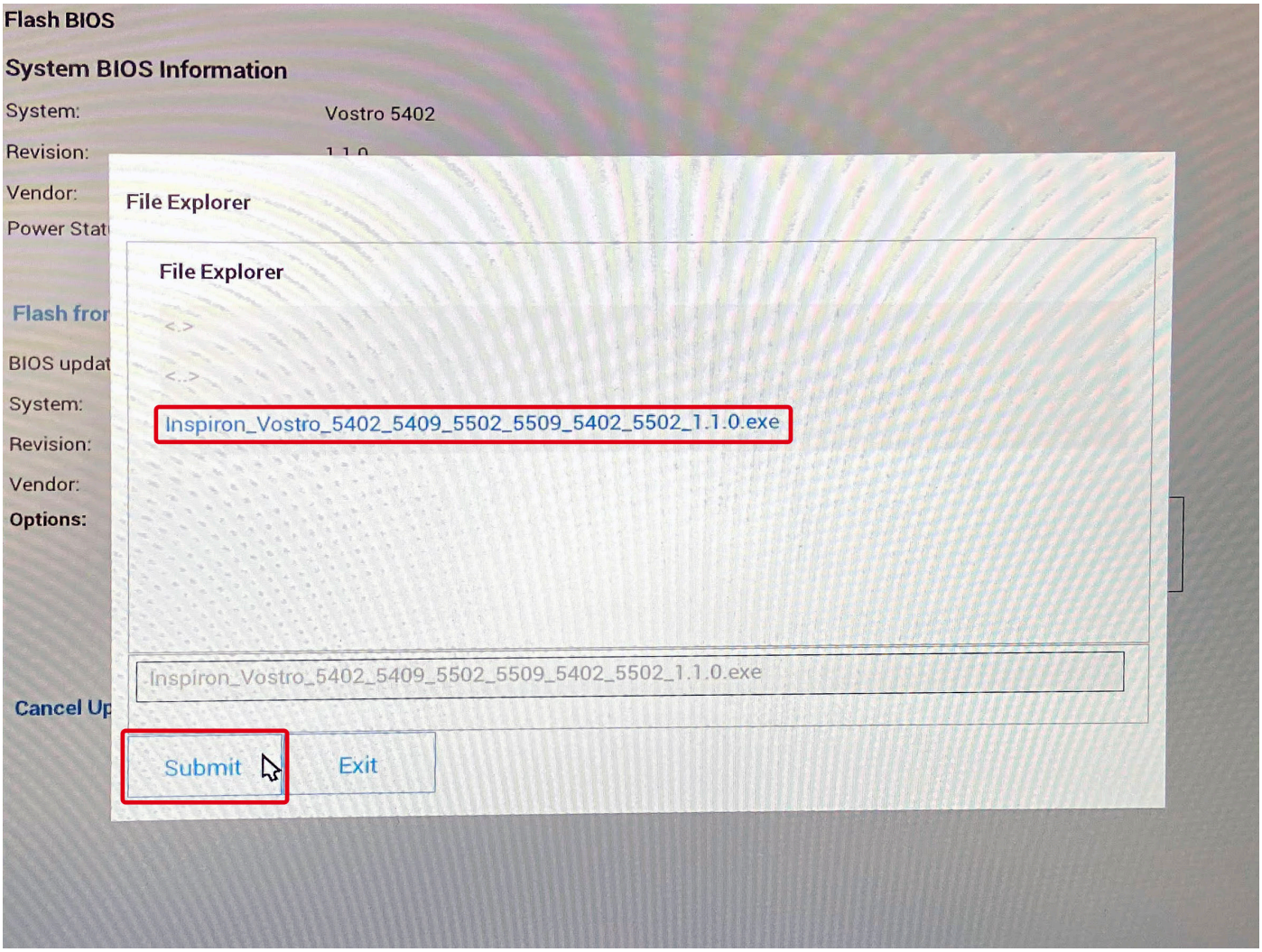


The **Flash BIOS** opens.

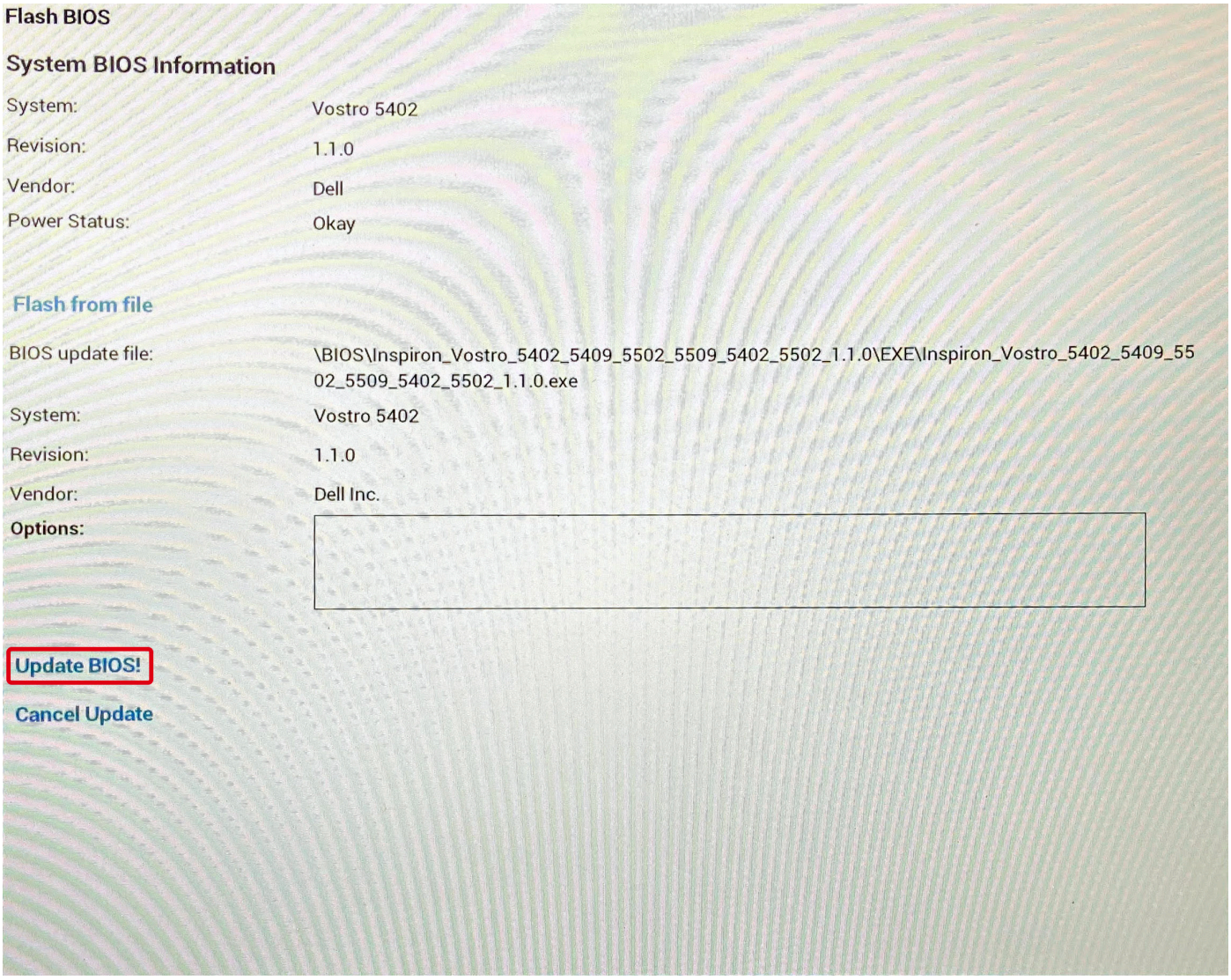
4. Click **Flash from file**.



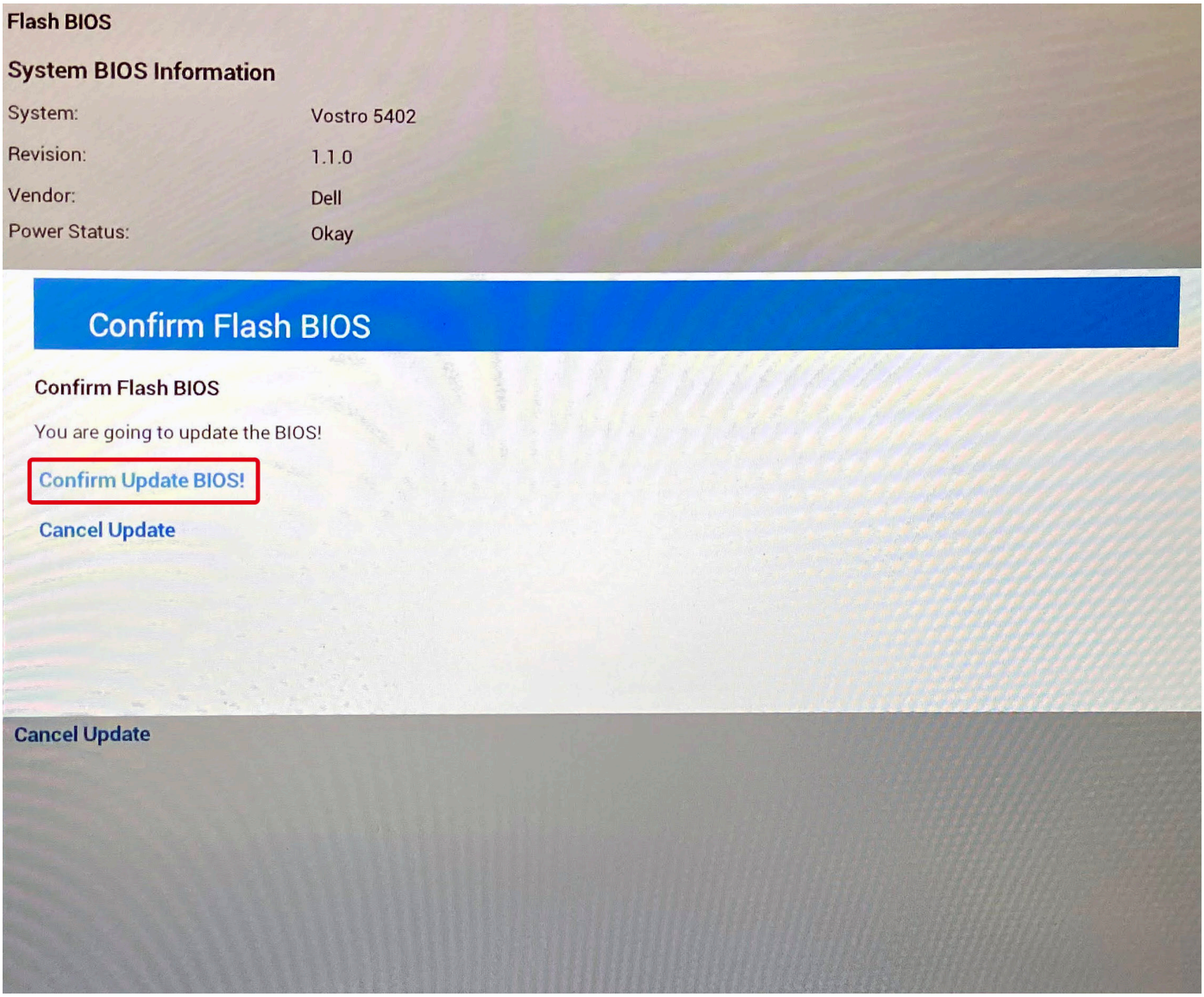
5. Select external USB device.
6. Once the file is selected, double-click the flash target file and click **Submit**.



7. Click **Update BIOS** for the system to reboot and flash the BIOS.



8. Click **Confirm Update BIOS**.



Once complete, the system reboots and the BIOS update process is completed.

System and setup password

Table 18. System and setup password

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

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

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

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

About this task

To enter the system setup, press F2 immediately after a power-on or reboot.

Steps

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

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 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 **F2** 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**, alter or delete the existing system password and press **Enter** or **Tab**.
4. Select **Setup Password**, alter or delete the existing setup password and press **Enter** or **Tab**.

   NOTE: If you change the System and/or Setup password, re enter the new password when prompted. If you delete the System and 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.

6

Troubleshooting

Topics:

- Built-in self-test (BIST)
- System board built-in self-test (M-BIST)
- Display panel power rail built-in self-test (L-BIST)
- Display panel built-in self-test (LCD-BIST)
- Outcome
- SupportAssist diagnostics
- Running the SupportAssist diagnostics
- System diagnostic lights
- Recovering the operating system
- Flashing the BIOS
- Flashing BIOS (USB key)
- Backup media and recovery options
- WiFi power cycle
- Releasing Ethernet (RJ-45) cable

Built-in self-test (BIST)

About this task

There are three different types of BIST to check the performance of display, power rail, and system board. These tests are important to evaluate if an LCD or System board needs a replacement.

1. M-BIST: M-BIST is the system board built-in self-test diagnostics tool that improves the diagnostics accuracy of system board embedded controller (EC) failures. M-BIST must be manually initiated before POST and can also run on a dead system .
2. L-BIST: L-BIST is an enhancement to the single LED error code diagnostics and is automatically initiated during POST.
3. LCD-BIST: LCD BIST is an enhanced diagnostic test that is introduced through Preboot System Assessment (PSA) on legacy systems.

Table 19. Functions

	M-Bist	L-Bist
Purpose	Evaluates the health condition of the system board.	Checks if the system board is supplying power to the LCD by performing an LCD Power Rail test.
Trigger	Press the <M> key and power button.	Integrated into the single LED error code diagnostics. Automatically initiated during POST.
Indicator of fault	Battery LED light with **Solid Amber**.	Battery LED error code of [2,8] blinks Amber x2, then pause, then blinks White x8.
Repair instruction	Indicates a problem with the system board.	Indicates a problem with the system board.

System board built-in self-test (M-BIST)

About this task

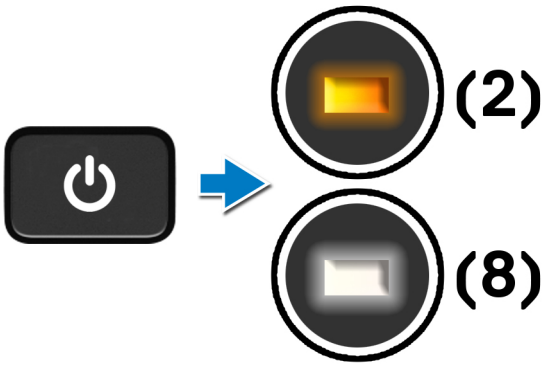
Steps

1. Press and hold both the **M** key and the **power** button to initiate M-BIST.
2. The battery-status light illuminates in amber when there is a system board failure.
3. Replace the system board to fix the issue.

NOTE: The battery status LED does not illuminate if the system board is functioning properly.

Display panel power rail built-in self-test (L-BIST)

About this task

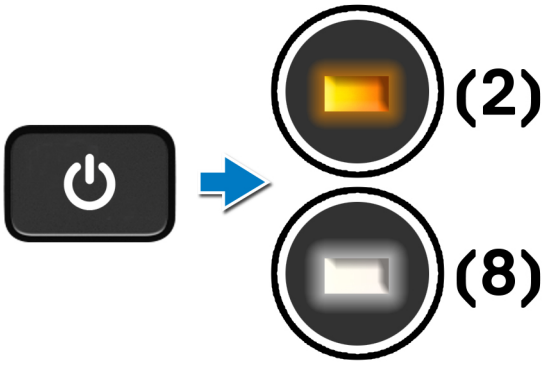


Next steps

L-BIST (LCD Power Rail Test) is an enhancement to the single LED error code diagnostics and is **automatically initiated** during **POST**. L-BIST isolates if the LCD is receiving power from the system board. L-BIST checks if the system board is supplying power to the LCD by performing an LCD Power Rail test. If there is no power going to the LCD, the battery status LED flashes a **[2,8] LED error code.**

Display panel power rail built-in self-test (L-BIST)

About this task

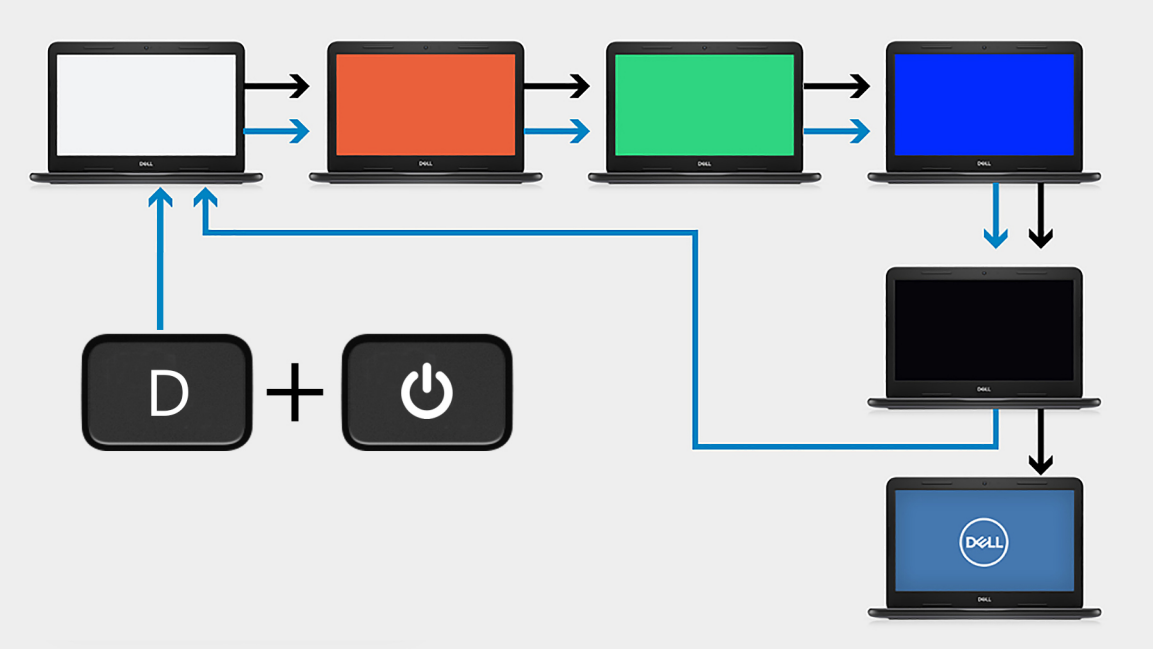


Next steps

L-BIST (LCD Power Rail Test) is an enhancement to the single LED error code diagnostics and is **automatically initiated** during **POST**. L-BIST isolates if the LCD is receiving power from the system board. L-BIST checks if the system board is supplying power to the LCD by performing an LCD Power Rail test. If there is no power going to the LCD, the battery status LED flashes a **[2,8] LED error code.**

Display panel built-in self-test (LCD-BIST)

About this task



Steps

1. Press and hold the **D** key, and then press the **power** button.
2. Release both the **D** key and the **power** button when the computer begins POST.
3. The display panel begins to display a solid color, or cycling through different colors.

NOTE: The sequence of colors may vary depending on the different display panel vendors. The user only must ensure that the colors are being displayed correctly without distortion or graphical anomalies.

4. The computer reboots at the end of the last solid color.

Outcome

About this task

The following table shows the outcome of running different types of BIST.

Table 20. BIST outcome

M-BIST	
Off	No fault detected with system board.
Solid amber	Indicates a problem with the system board.

SupportAssist diagnostics

About this task

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

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

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

Running the SupportAssist diagnostics

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 in the lower-right corner to go to the page listing.
   The items that are detected are listed.
5. Select the device from the left cluster to run tests to run a diagnostic test on a specific device.
6. 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.

Table 21. LED codes

Diagnostic light codes	Problem description
1,1	TPM Detection Failure
1,2	Unrecoverable SPI Flash Failure
1,3	Short in hinge cable tripped OCP1
1,4	Short in hinge cable tripped OCP2
1, 5	EC unable to program i-Fuse
1, 6	Generic catch-all for ungraceful EC code flow errors
1, 7	-
1, 8	-
1, 9	-
2,1	CPU failure
2,2	Motherboard covers BIOS corruption or ROM error
2,3	No Memory/RAM detected
2,4	Memory/RAM Failure
2,5	Invalid memory installed
2,6	Motherboard/Chipset Error
2,7	LCD failure - SBIOS message
2,8	LCD failure - EC detection of power rail failure
2,9	-
3,1	CMOS battery failure
3,2	PCI of Video card/chip failure
3,4	Recovery Image found but invalid
3,5	EC ran into power sequencing failure
3,6	Flash corruption detected by SBIOS
3,7	Timeout waiting on ME to reply to HECI message
3,8	-
3,9	-

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

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

Caps Lock status indicator: 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 10 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/support.

Flashing the BIOS

About this task

It is recommended to flash the BIOS when an update is available or when you replace the system board. To flash the BIOS:

Steps

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support**, enter the Service Tag of your computer, and then click **Submit**.

   NOTE: If you do not have the Service Tag, use the Autodefect feature or manually browse for your computer model.

4. Click **Drivers & downloads** > **Find it myself**.
5. Select the operating system installed on your computer.
6. Scroll down the page, and expand **BIOS**.
7. Click **Download** to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon, and follow the instructions on the screen.

Flashing BIOS (USB key)

Steps

1. Follow the procedure from step 1 to step 7 in "Flashing the BIOS" to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article SLN143196 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
8. The **BIOS Update Utility** appears. Follow the instructions on the screen to complete the BIOS update.

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 personal computer. For more information, see Dell Windows Backup Media and Recovery Options.

WiFi power cycle

About this task

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

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

Steps

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

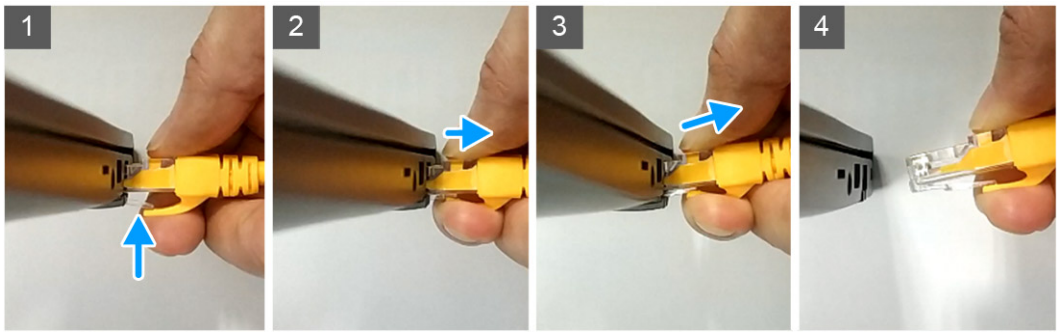
Releasing Ethernet (RJ-45) cable

Prerequisites

Follow this procedure when disconnecting the ethernet (RJ-45) cable from the RJ-45 port to avoid damaging your computer.

Steps

1. Press down on the securing clip to release it from the port and pull the plug backward [1, 2].



2. Lift at an angle when disconnecting the ethernet cable from the RJ-45 port (Ethernet port) [3,4].

7

Getting help

Topics:

- Contacting Dell

Contacting Dell

Prerequisites

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

About this task

Dell provides several online and telephone-based support and service options. Availability varies by country and product, and some services may not be available in your area. To contact Dell for sales, technical support, or customer service issues:

Steps

1. Go to **Dell.com/support.**
2. Select your support category.
3. Verify your country or region in the **Choose a Country/Region** drop-down list at the bottom of the page.
4. Select the appropriate service or support link based on your need.