Vostro 3501

Service Manual

Regulatory Model: P90F
Regulatory Type: P90F002
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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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Contents

Chapter 1: Working on your computer 6
Safety instructions 6
Before working inside your computer 6
Safety precautions 7
Electrostatic discharge—ESD protection 7
ESD field service kit 8
Transporting sensitive components 9
After working inside your computer 9

Chapter 2: Technology and components 10
USB features 10
HDMI 1.4 11
Power button LED behavior 12

Chapter 3: Exploded View 14

Chapter 4: Disassembly and reassembly 16
Secure Digital Card 16
Removing the Secure Digital card 16
Installing the Secure Digital card 17
Base cover 18
Removing the base cover 18
Installing the base cover 20
Battery 21
Lithium-ion battery precautions 21
Disconnecting the battery 22
Reconnecting the battery 22
Removing the battery 23
Installing the battery 24
Memory modules 26
Removing the memory module 26
Installing the memory module 26
WLAN card 27
Removing the WLAN card 27
Installing the WLAN card 28
Solid-state drive 29
Removing the M.2 2230 Solid-state drive 29
Installing the M.2 2230 Solid-state drive 30
Removing the M.2 2280 Solid-state drive 31
Installing the M.2 2280 Solid-state drive 32
Hard drive 33
Removing the hard drive assembly 33
Installing the hard drive assembly 34
Coin-cell battery 36

Removing the coin-cell....36
Installing the coin-cell battery....37
System fan....38
Removing the system fan....38
Installing the system fan....38
Heat sink....40
Removing the heatsink....40
Installing the heatsink....40
Speakers....41
Removing the speakers....41
Installing the speakers....42
IO board....43
Removing the IO board....43
Installing the IO board....44
Touchpad....45
Removing the touch pad assembly....45
Installing the touch pad assembly....46
Display assembly....47
Removing the display assembly....47
Installing the display assembly....49
Display bezel....50
Removing the display bezel....50
Installing the display bezel....54
Camera....54
Display panel....56
Display back-cover and antenna assembly....60
Camera....62
Removing the camera....62
Installing the camera....63
Display panel....63
Removing the display panel....63
Installation display panel....66
Display back-cover and antenna assembly....68
Removing the display back-cover....68
Installing the display back-cover....69
Power button....70
Removing the power button....70
Installing the power button....71
System board....72
Removing the system board - Realtek audio....72
Installing the system board - Realtek audio....74
Removing the system board - Cirrus Logic audio....76
Installing the system board - Cirrus Logic audio....78
Power-adapter port....81
Removing the power adapter port....81
Installing the power adapter port....81
Palm-rest and keyboard assembly....82
Removing the palmrest and keyboard assembly....82

Chapter 5: Drivers and downloads....84

Chapter 6: System setup....85
BIOS overview....85
Entering BIOS setup program....85
Navigation keys....85
One time boot menu....86
BIOS setup....86
Overview....86
Boot Options....87
System configuration....88
Video....89
Security....89
Passwords....90
Secure Boot....92
Expert Key Management....92
Performance....92
Power management....93
Wireless....94
POST behavior....94
Maintenance....95
System logs....96
Updating the BIOS....96
Updating the BIOS in Windows....96
Updating the BIOS in Linux and Ubuntu....96
Updating the BIOS using the USB drive in Windows....97
Updating the BIOS from the F12 One-Time boot menu....97
System and setup password....98
Assigning a system setup password....98
Deleting or changing an existing system setup password....98
Clearing BIOS (System Setup) and System passwords....99

Chapter 7: Troubleshooting....100
Handling swollen Lithium-ion batteries....100
Dell SupportAssist Pre-boot System Performance Check diagnostics....100
Running the SupportAssist Pre-Boot System Performance Check....101
System diagnostic lights....101
Recovering the operating system....102
Updating the BIOS in Windows....103
Updating the BIOS using the USB drive in Windows....103
Backup media and recovery options....103
WiFi power cycle....103
Drain residual flea power (perform hard reset)....104

Chapter 8: Getting help and contacting Dell....105

1

Working on your computer

Safety instructions

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

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

WARNING: Disconnect your computer from all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting your computer to an electrical outlet.

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

CAUTION: To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.

CAUTION: You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that is shipped with the product or at www.dell.com/regulatory_compliance.

CAUTION: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity which could harm internal components.

CAUTION: When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumbscrews that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.

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

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

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

Before working inside your computer

Steps

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

   NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.
3. Disconnect your computer and all attached devices from their electrical outlets.

4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
5. Remove any media card and optical disc from your computer, if applicable.
6. After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

   CAUTION: Place the computer on a flat, soft, and clean surface to avoid scratches on the display.

7. Place the computer face down.

Safety precautions

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

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

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

Standby power

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

Unplugging, pressing and holding the power button for 20 seconds should discharge residual power in the system board.

Bonding

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

Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

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

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

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

ESD protection summary

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

Transporting sensitive components

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

After working inside your computer

About this task

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

Steps

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

2

Technology and components

This chapter details the technology and components available in the system.

USB features

Universal Serial Bus, or USB, was introduced in 1996. It dramatically simplified the connection between host computers and peripheral devices like mouses, keyboards, external drivers, and printers.

Table 1. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 2.0	480 Mbps	High Speed	2000
USB 3.2 Gen 1	5 Gbps	Super-Speed	2010
USB 3.2 Gen 2	10 Gbps	Super-Speed	2013

USB 3.2 Gen 1 (Super-Speed USB)

For years, the USB 2.0 has been firmly entrenched as the de facto interface standard in the PC world with about 6 billion devices sold, and yet the need for more speed grows by ever faster computing hardware and ever greater bandwidth demands. The USB 3.2 Gen 1 finally has the answer to the consumer's demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.2 Gen 1 features are as follows:

- Higher transfer rates (up to 5 Gbps)
- Increased maximum bus power and increased device current draw to better accommodate power-hungry devices
- New power management features
- Full-duplex data transfers and support for new transfer types
- Backward USB 2.0 compatibility
- New connectors and cable

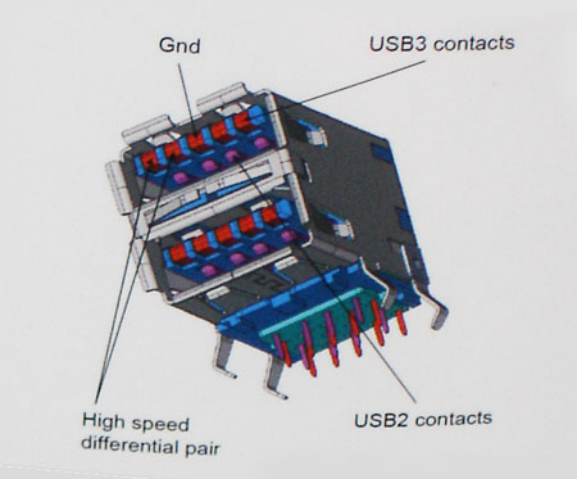
The topics below cover some of the most commonly asked questions regarding USB 3.2 Gen 1.

Speed

Currently, there are 3 speed modes that are defined by the latest USB 3.2 Gen 1 specification. They are Super-Speed, Hi-Speed, and Full-Speed. The new Super-Speed mode has a transfer rate of 4.8 Gbps. While the specification retains Hi-Speed, and Full-Speed USB mode, commonly known as USB 2.0 and 1.1 respectively, the slower modes still operate at 480 Mbps and 12 Mbps respectively and are kept to maintain backward compatibility.

USB 3.2 Gen 1 achieves the much higher performance by the technical changes below:

- An additional physical bus that is added in parallel with the existing USB 2.0 bus (see the figure below).
- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.2 Gen 1 adds four more for two pairs of differential signals (receive and transmit) for a combined total of eight connections in the connectors and cabling.
- USB 3.2 Gen 1 utilizes the bi-directional data interface, rather than USB 2.0's half-duplex arrangement. This gives a 10-fold increase in theoretical bandwidth.



With today's ever increasing demands that are placed on data transfers with high-definition video content, terabyte storage devices, high megapixel count digital cameras etc., USB 2.0 may not be fast enough. Furthermore, no USB 2.0 connection could ever come close to the 480Mbps theoretical maximum throughput, making data transfer at around 320 Mbps (40 MB/s) — the actual real-world maximum. Similarly, USB 3.2 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400 MB/s with overheads. At this speed, USB 3.2 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.2 Gen 1 opens up the laneways and provides more headroom for devices to deliver a better overall experience. Where USB video was barely tolerable previously (both from a maximum resolution, latency, and video compression perspective), it's easy to imagine that with 5-10 times the bandwidth available, USB video solutions should work that much better. Single-link DVI requires almost 2 Gbps throughput. Where 480 Mbps was limiting, 5 Gbps is more than promising. With its promised 4.8 Gbps speed, the standard will find its way into some products that previously weren't USB territory, like external RAID storage systems.

Listed below are some of the available Super-Speed USB 3.2 Gen 1 products:

- External Desktop USB 3.2 Gen 1 Hard Drives
- Portable USB 3.2 Gen 1 Hard Drives
- USB 3.2 Gen 1 Drive Docks & Adapters
- USB 3.2 Gen 1 Flash Drives & Readers
- USB 3.2 Gen 1 Solid-state Drives
- USB 3.2 Gen 1 RAIDs
- Optical Media Drives
- Multimedia Devices
- Networking
- USB 3.2 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.2 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.2 Gen 1 specifies new physical connections and thus new cables to take advantage of the higher speed capability of the new protocol, the connector itself remains the same rectangular shape with the four USB 2.0 contacts in the exact same location as before. Five new connections to carry receive and transmitted data independently are present on USB 3.2 Gen 1 cables and only come into contact when connected to a proper Super-Speed USB connection.

HDMI 1.4

This topic explains the HDMI 1.4 and its features along with the advantages.

HDMI (High-Definition Multimedia Interface) is an industry-supported, uncompressed, all-digital audio/video interface. HDMI provides an interface between any compatible digital audio/video source, such as a DVD player, or A/V receiver and a compatible digital audio and/or video monitor, such as a digital TV (DTV). The primary advantage is cable reduction and content

protection provisions. HDMI supports standard, enhanced, or high-definition video, plus multichannel digital audio on a single cable.

HDMI 1.4 Features

- **HDMI Ethernet Channel** - Adds high-speed networking to an HDMI link, allowing users to take full advantage of their IP-enabled devices without a separate Ethernet cable.
- **Audio Return Channel** - Allows an HDMI-connected TV with a built-in tuner to send audio data "upstream" to a surround audio system, eliminating the need for a separate audio cable.
- **3D** - Defines input/output protocols for major 3D video formats, paving the way for true 3D gaming and 3D home theater applications.
- **Content Type** - Real-time signaling of content types between display and source devices, enabling a TV to optimize picture settings based on content type.
- **Additional Color Spaces** - Adds support for additional color models used in digital photography and computer graphics.
- **4K Support** - Enables video resolutions far beyond 1080p, supporting next-generation displays that will rival the Digital Cinema systems used in many commercial movie theaters.
- **HDMI Micro Connector** - A new, smaller connector for phones and other portable devices, supporting video resolutions up to 1080p.
- **Automotive Connection System** - New cables and connectors for automotive video systems, designed to meet the unique demands of the motoring environment while delivering true HD quality.

Advantages of HDMI

- Quality HDMI transfers uncompressed digital audio and video for the highest, crispest image quality.
- Low-cost HDMI provides the quality and functionality of a digital interface while also supporting uncompressed video formats in a simple, cost-effective manner.
- Audio HDMI supports multiple audio formats from standard stereo to multichannel surround sound.
- HDMI combines video and multichannel audio into a single cable, eliminating the cost, complexity, and confusion of multiple cables currently used in A/V systems.
- HDMI supports communication between the video source (such as a DVD player) and the DTV, enabling new functionality.

Power button LED behavior

On certain Dell Latitude systems, the power button LED is used to provide an indication of the system status, and as a result the power button illuminates when pressed. The systems with the optional power button/fingerprint reader will have no LED under the power button and hence will apply the available LED's in the system to provide an indication of the system status.

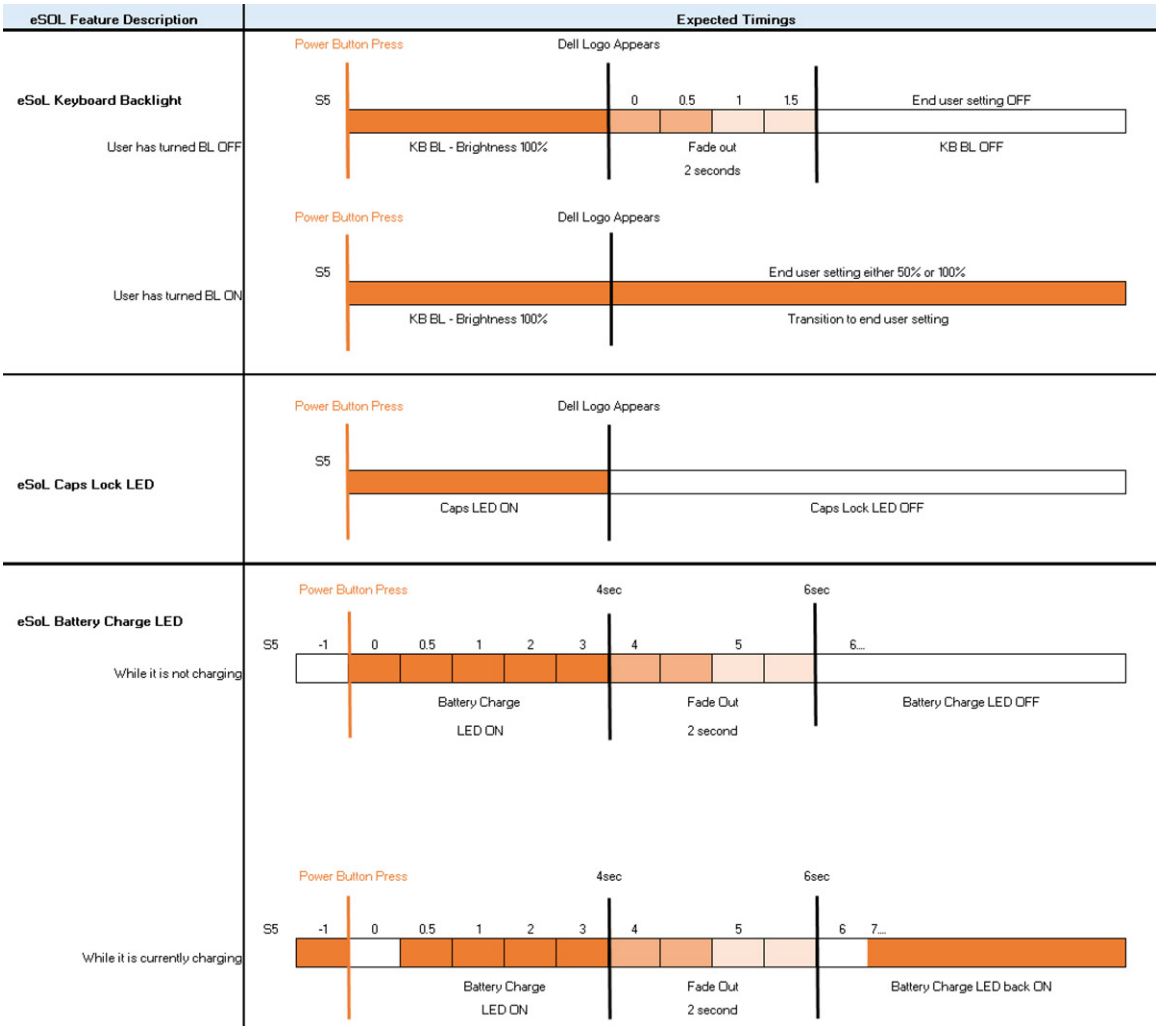
Power button LED behavior without Fingerprint reader

- System is ON (S0) = LED illuminates solid white.
- System in Sleep/Standby (S3, SOix) = LED is off
- System is Off/Hibernating (S4/S5) = LED is off

Power On and LED behavior with Fingerprint reader

- Pressing the power button for a duration between 50 msec to 2 sec turns on the device.
- Power button does not register additional presses until the SOL (Sign-Of-Life) has been provided to the user.
- System LED's illuminates upon pressing the power button.
- All the available LED's (Keyboard backlit/ Keyboard caps lock LED/ Battery Charge LED) illuminates and displays specified behavior.
- The auditory tone is Off by default. It can be enabled in the BIOS setup.
- Safeguards do not time out if the device gets hung during the logon process.
- Dell logo: Turns on within 2 secs after pressing the power button.
- Full boot: Within 22 secs after pressing the power button.

- Below is the example timelines:



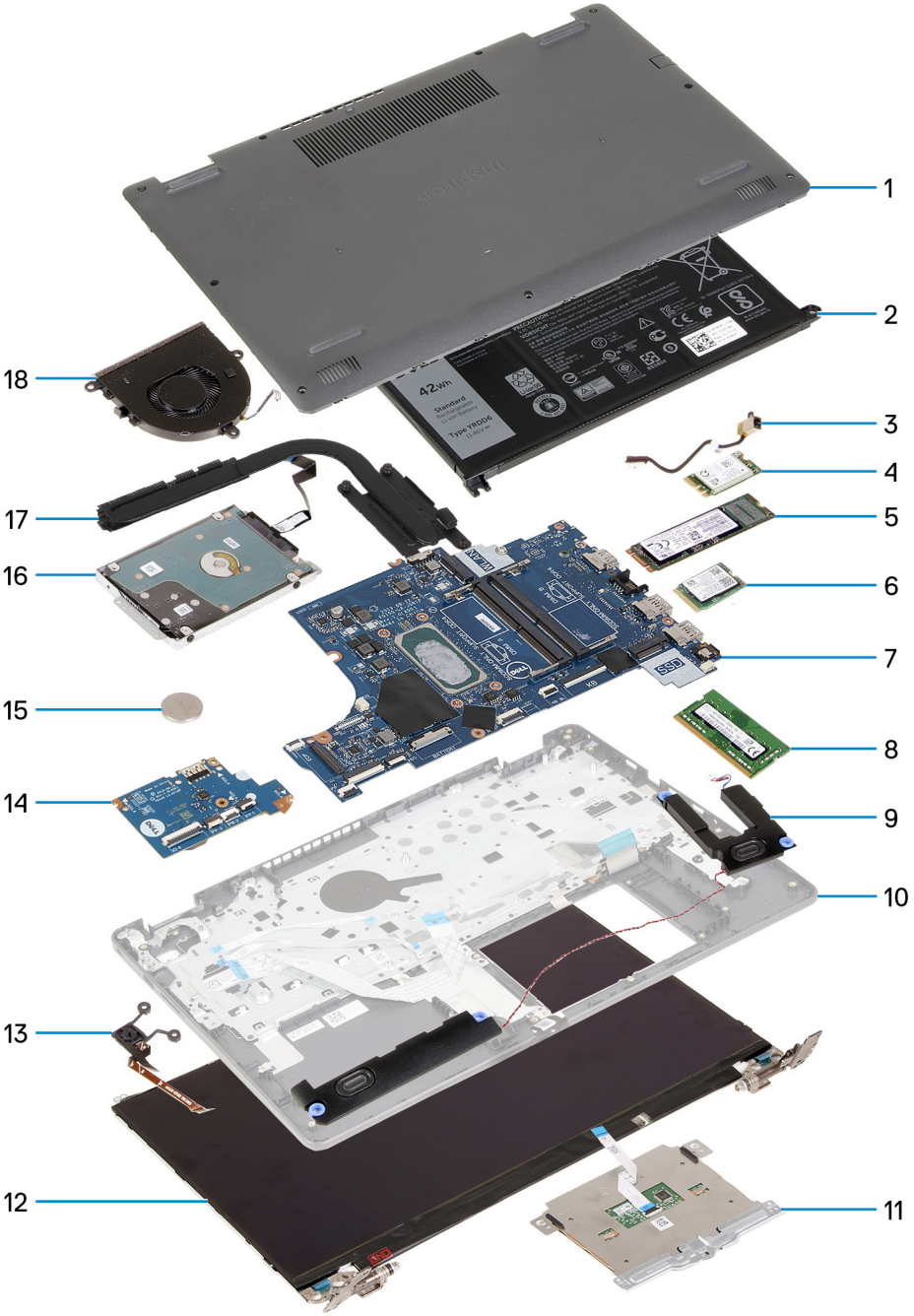
Power button with fingerprint reader will have no LED and will leverage the available LED's in the system to provide indication of the system status

- **Power Adapter LED:**
  - The LED on Power adapter connector illuminates white when power is supplied from electrical outlet.
- **Battery Indicator LED:**
  - If the computer is connected to an electrical outlet, the battery light operates as follows:
    1. Solid white -the battery is charging. When the charge is complete the LED turns off.
  - If the computer is running on a battery, the battery light operates as follows:
    1. Off -the battery is adequately charged (or the computer is turned off).
    2. Solid amber -the battery charge is critically low. A low battery state is approximately 30 minutes or less of battery life remaining.
- **Camera LED**
  - White LED activates when camera is on.
- **Mic Mute LED:**
  - When activated (muted), the mic mute LED on the F4 Key should illuminate WHITE.
- **RJ45 LEDs:**
  - **Table 2. LED on either side of RJ45 port**

Link speed indicator (LHS)	Activity indicator (RHS)
Green	Amber

3

Exploded View



1. Base cover
2. Battery
3. DC-in Port
4. Solid-State Drive bracket
5. Solid-State Drive
6. WLAN Card
7. System Board
8. Memory modules

9. Speakers
10. Palmrest Assembly
11. Touchpad
12. Display Assembly
13. Power Button Module
14. IO Board
15. Coin Cell Battery
16. HDD Assembly
17. Heatsink assembly
18. Fan Assembly

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.

4

Disassembly and reassembly

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

Secure Digital Card

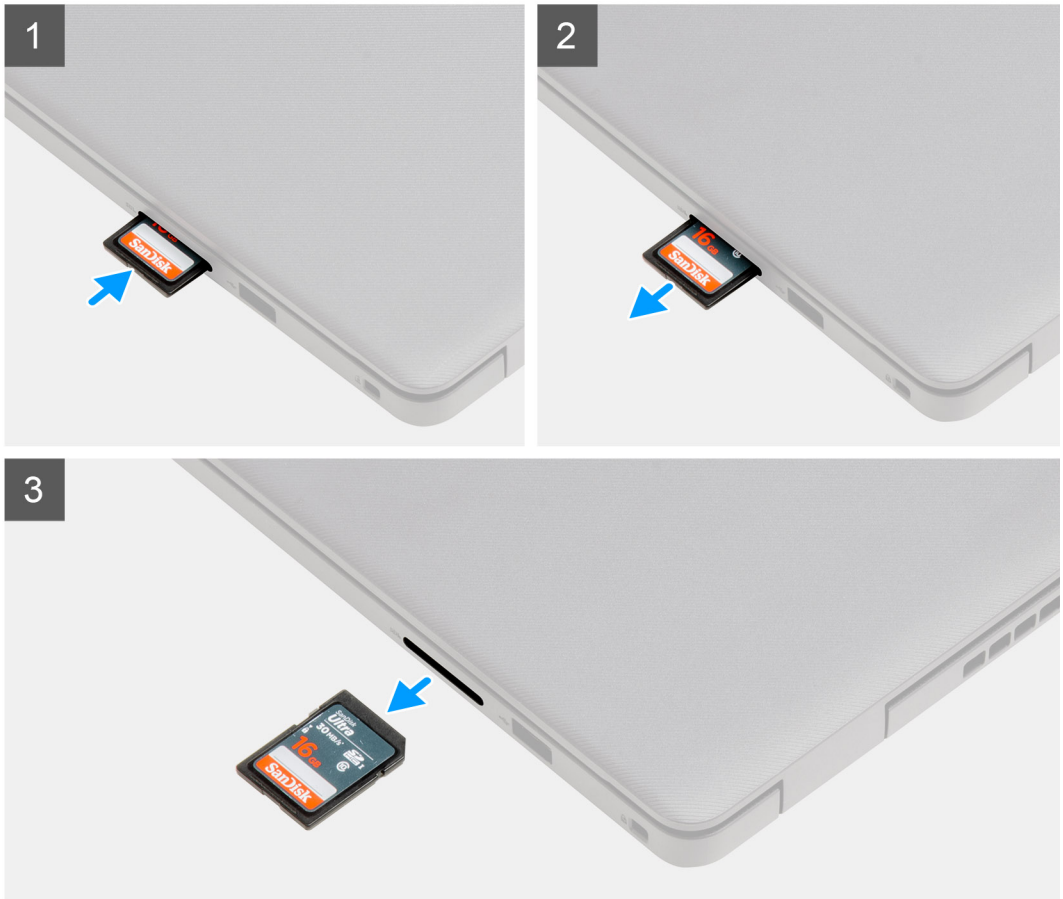
Removing the Secure Digital card

Prerequisites

1. Follow the procedure in Before working inside your computer

About this task





Steps

1. Push the secure digital card to release it from the computer.
2. Slide the secure digital card out of the computer.

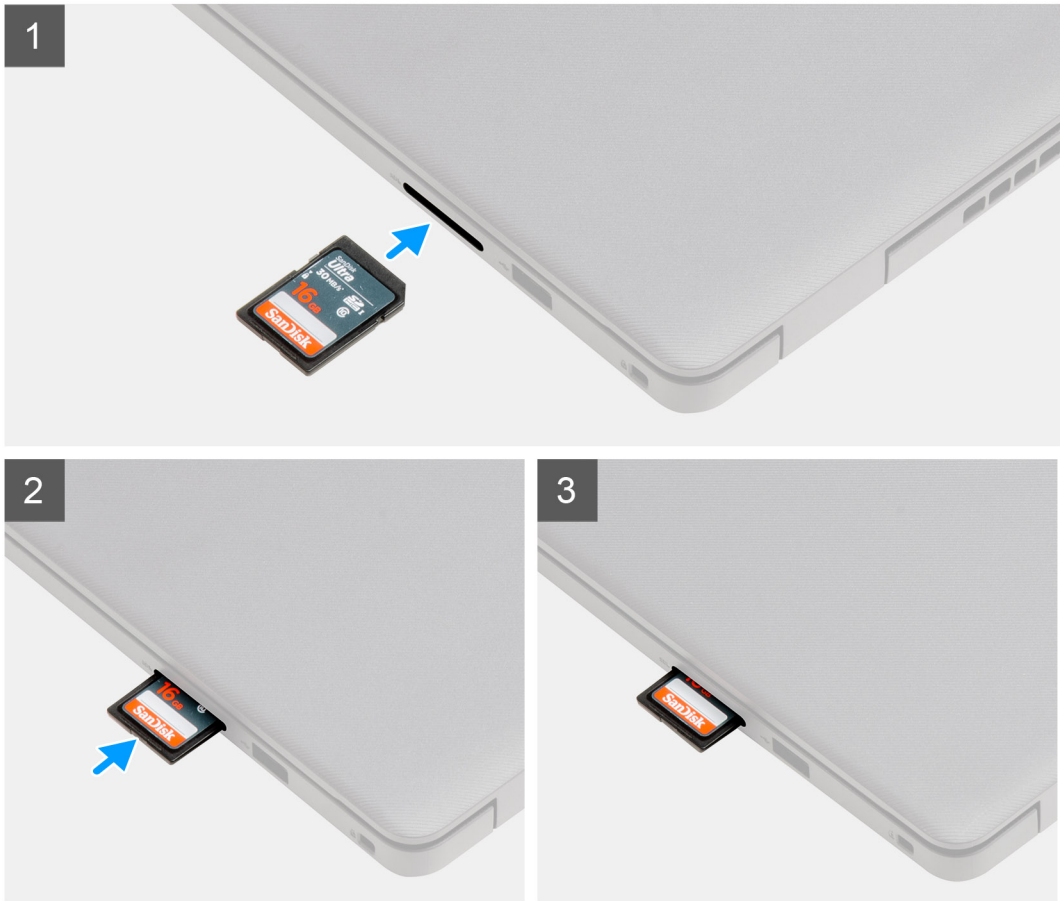
Installing the Secure Digital card

Prerequisites

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

About this task





Steps

Slide the secure digital into the slot until it clicks into place.

Next steps

1. Follow the procedure in after working inside your computer

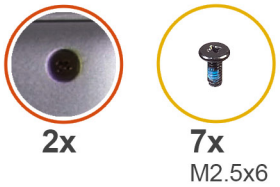
Base cover

Removing the base cover

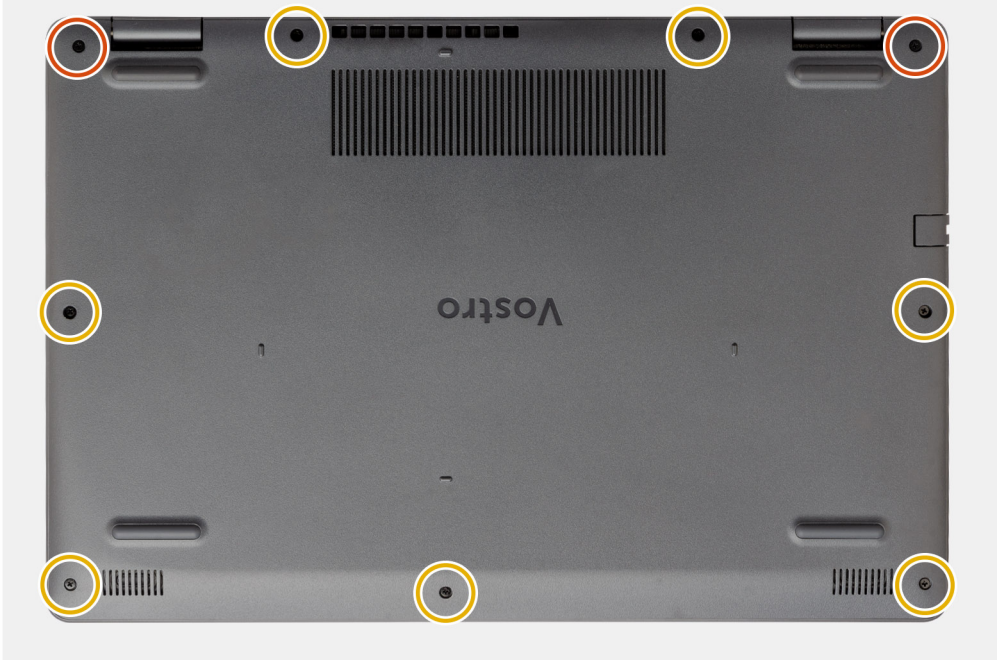
Prerequisites

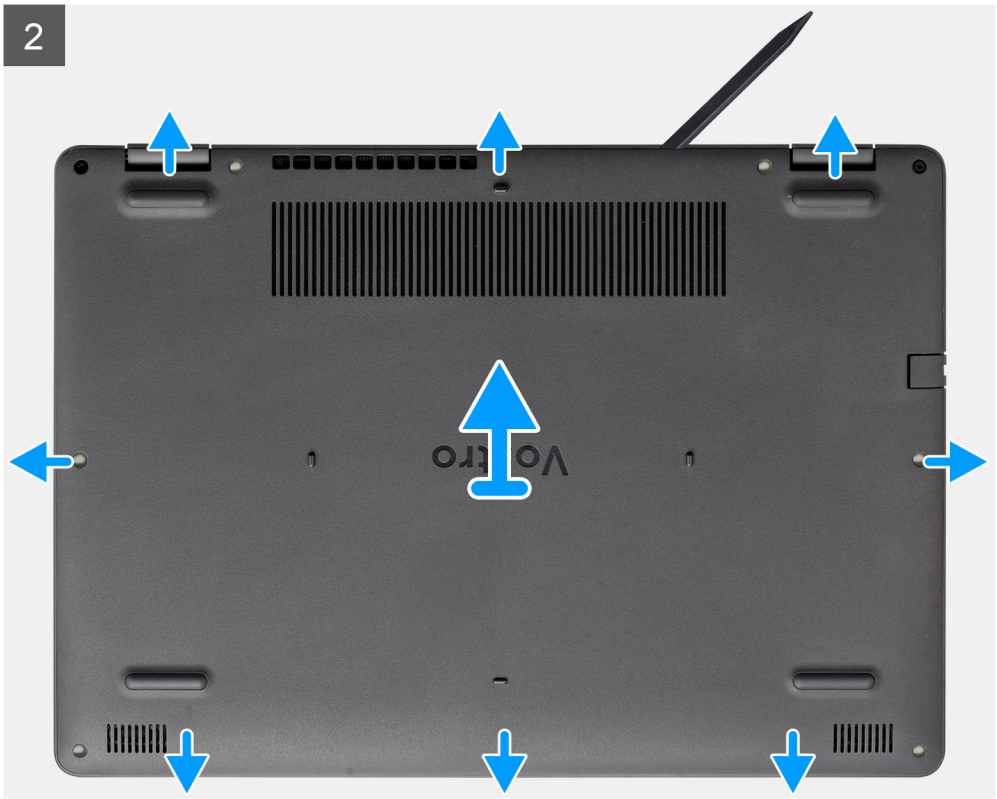
1. Follow the procedure in before working inside your computer.
2. Remove the SD card.

About this task



1





Steps

1. Remove the seven (M2.5x6) screws and loosen the two captive screws from the base cover.
2. Pry open the base cover starting from the recesses located in the U-shaped indents at the top edge of the base cover near the hinges.



NOTE: CAUTION: DO NOT pry up from the edge near the vents at the top side of the base cover as this may damage



the base cover.

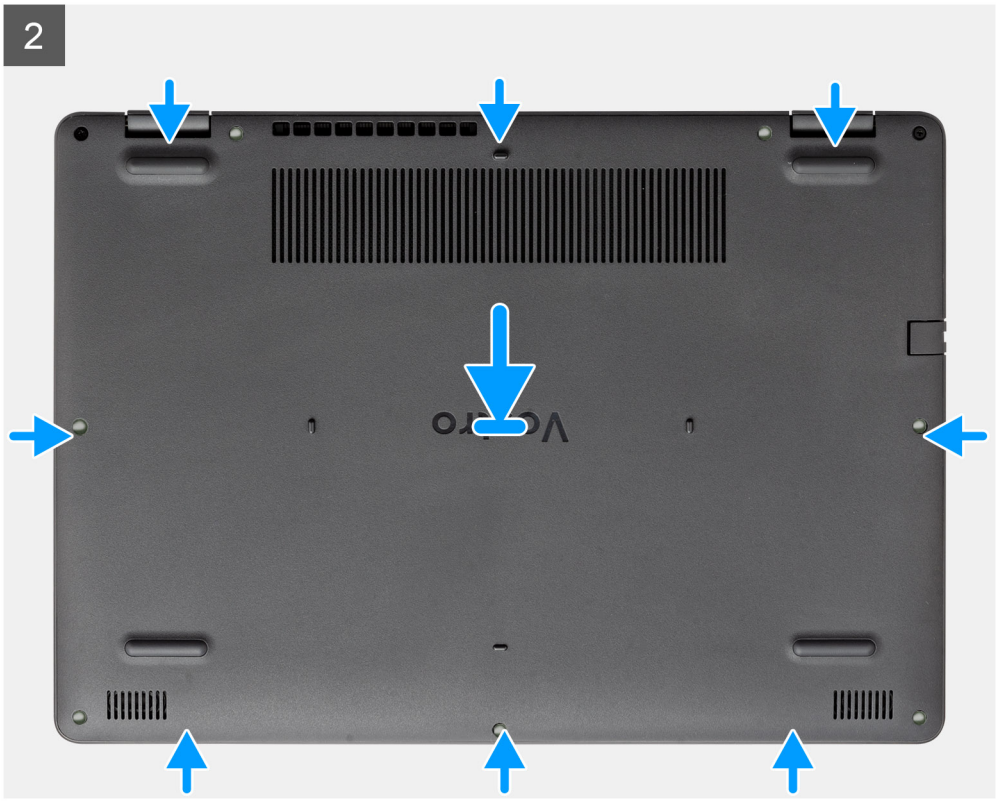
3. Lift up the top side of the base cover and remove it from the system.

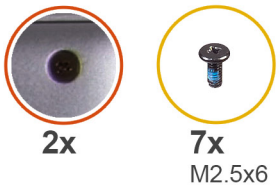
Installing the base cover

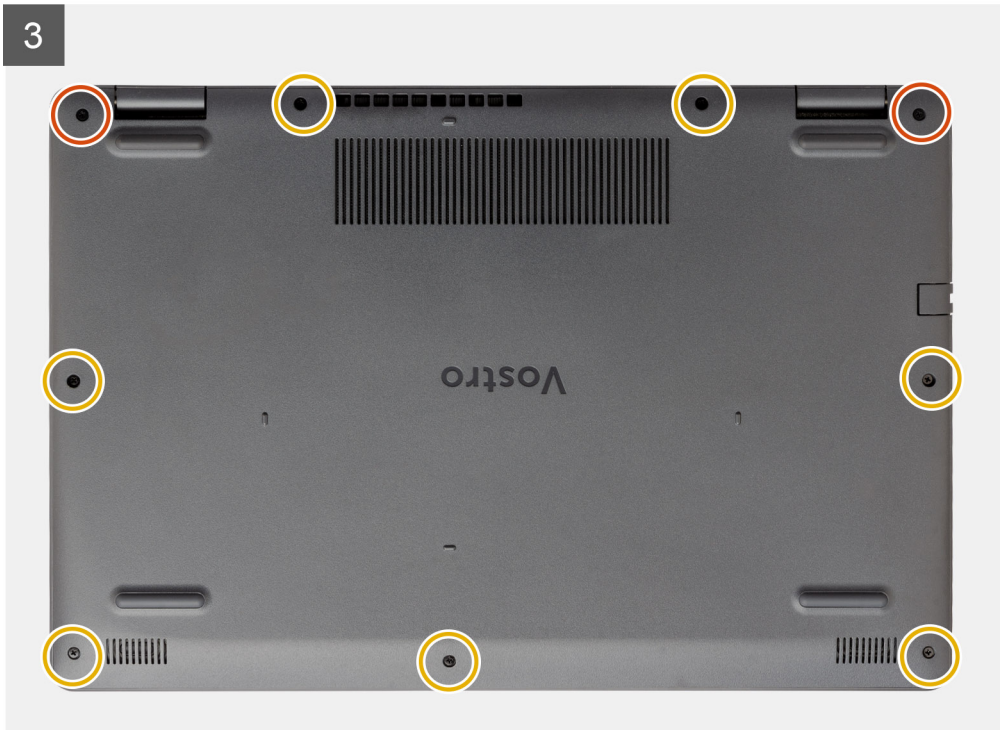
Prerequisites

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

About this task







Steps

1. Align and place the base cover on the computer, press the edges and sides of the base cover until it snaps into place.
2. Tighten the seven (M2.5x6) screws and the two captive screws to secure the base cover to the computer.

Next steps

1. Replace the SD card
2. Follow the procedure in after working inside your computer

Battery

Lithium-ion battery precautions

CAUTION:

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

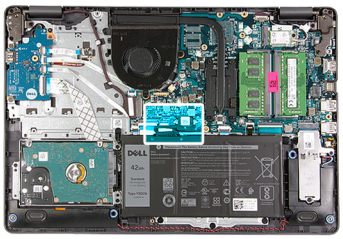
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**
- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.**
- **Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how to handle and replace swollen Lithium-ion batteries, see Handling swollen Lithium-ion batteries.**

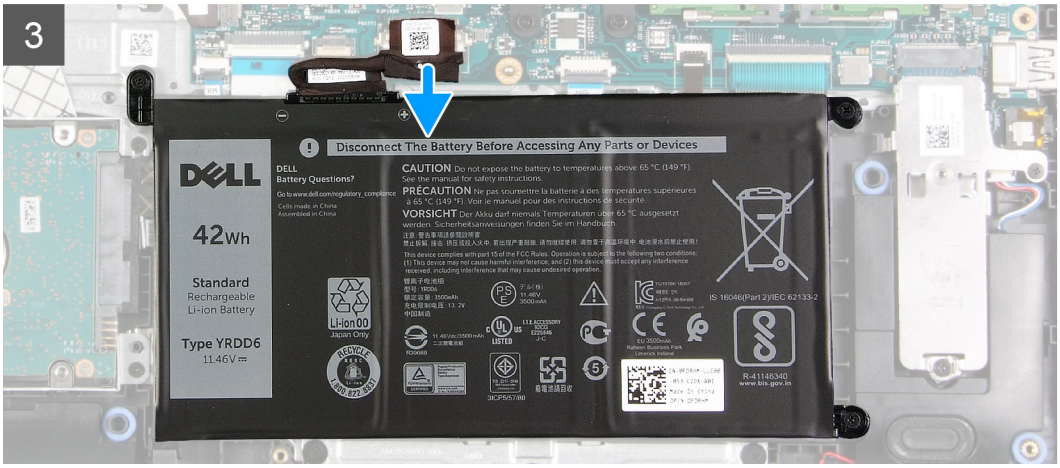
Disconnecting the battery

Prerequisites

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

About this task





Steps

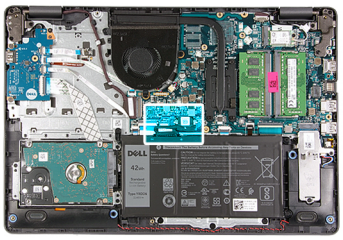
1. Peel back the tape covering the battery connector.
2. Disconnect the battery cable from the connector on the system board.

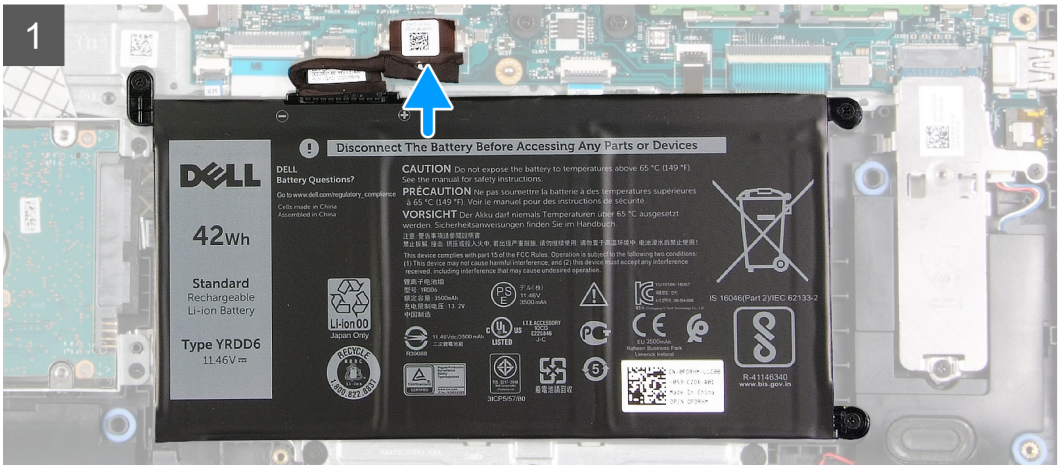
Reconnecting the battery

Prerequisites

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

About this task





Steps

1. Connect the battery cable to the connector on the system board.
2. Replace the tape covering the battery connector.

Next steps

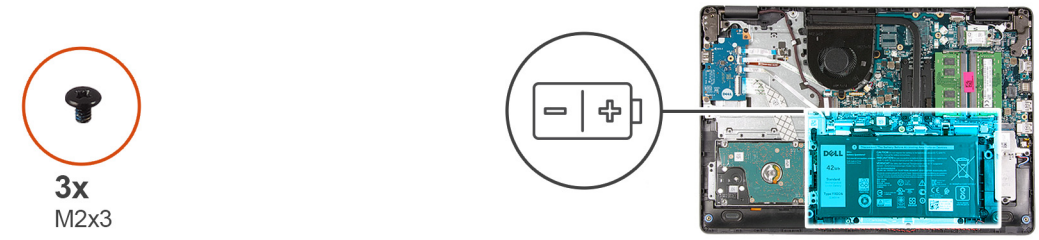
1. Install the base cover.
2. Install the SD card.
3. Follow the procedure in after working inside your computer.

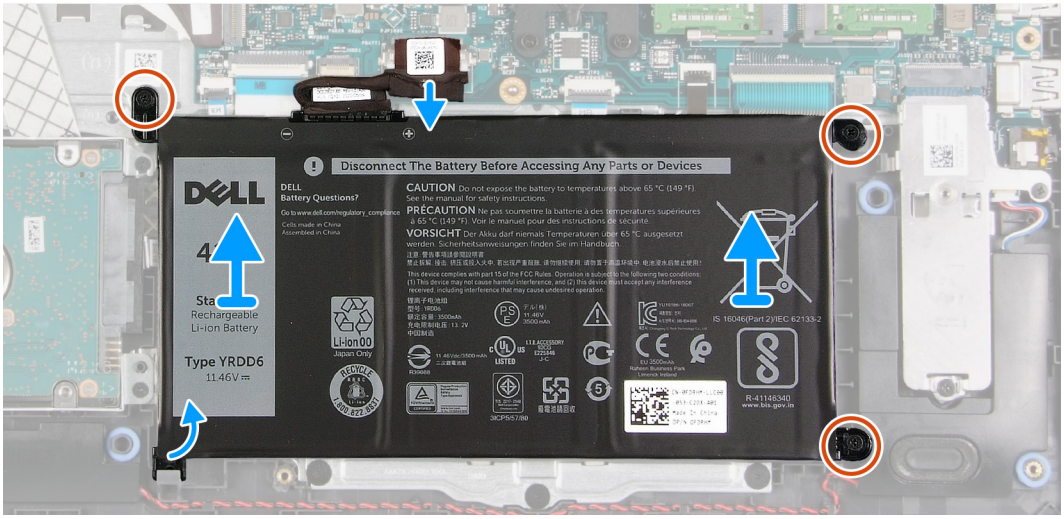
Removing the battery

Prerequisites

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

About this task





Steps

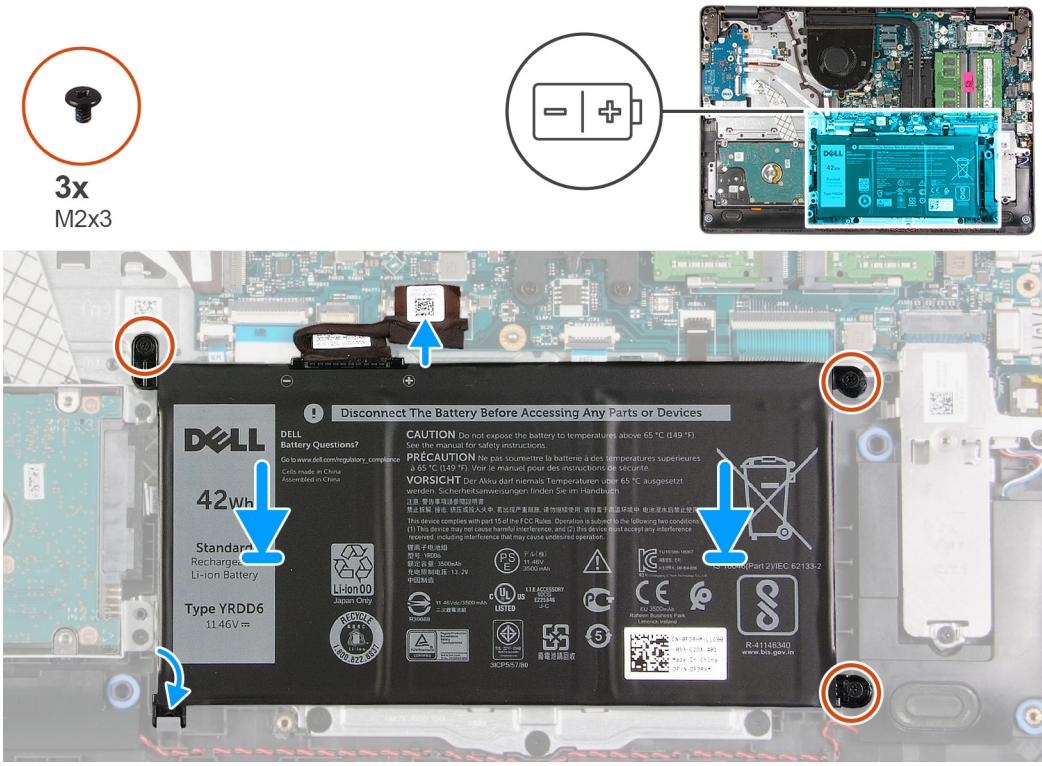
1. Remove the three (M2x3) screws that secure the battery to the palmrest.
2. Lift and move the battery away from the computer.

Installing the battery

Prerequisites

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

About this task



Steps

1. Align the tabs on the battery with the slots on the palm rest assembly.

   NOTE: When installing the battery into the system, insert the tab at the bottom left corner of the battery into the hook on the bottom side of the palm rest.

2. Replace the three (M2x3) screws that secure the battery to the palmrest.
3. Reconnect the battery cable to the connector on the system board.

   NOTE: When installing the battery into the system, insert the tab at the bottom left corner of the battery into the hook



   on the bottom side of the palm rest.

Next steps

1. Install the base cover.
2. Install the SD card.

3. Follow the procedure in after working inside your computer.

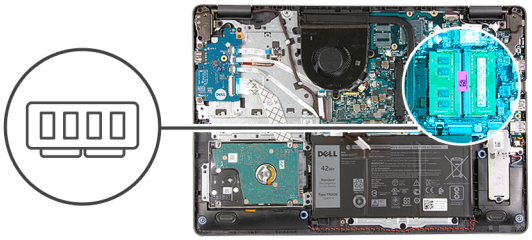
Memory modules

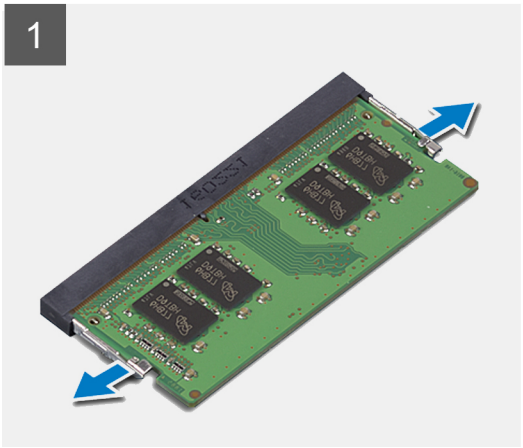
Removing the memory module

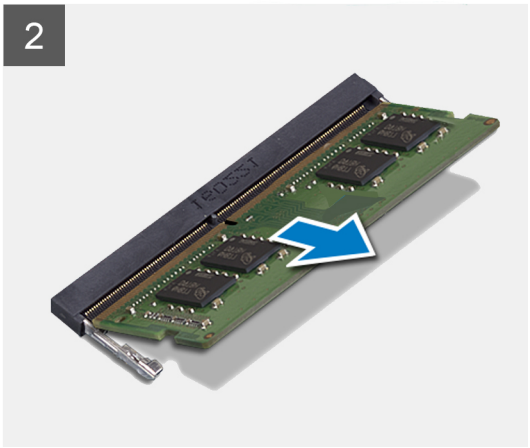
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.

About this task







Steps

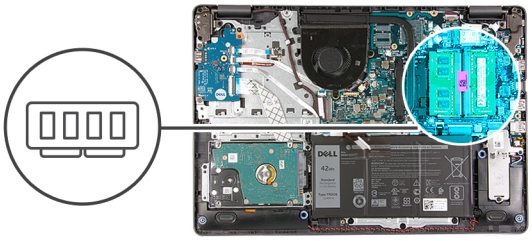
1. Pry the clips securing the memory module until the memory module pops-up.
2. Remove the memory module from the memory module slot.

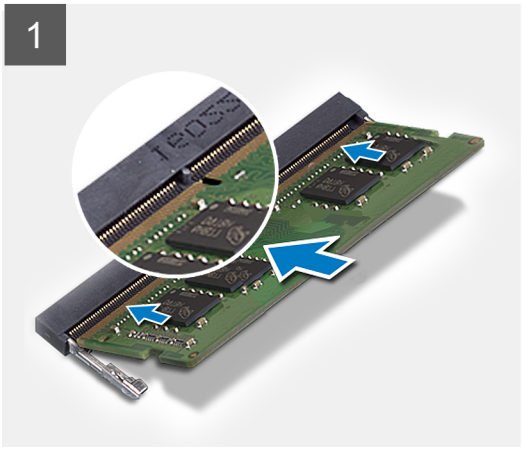
Installing the memory module

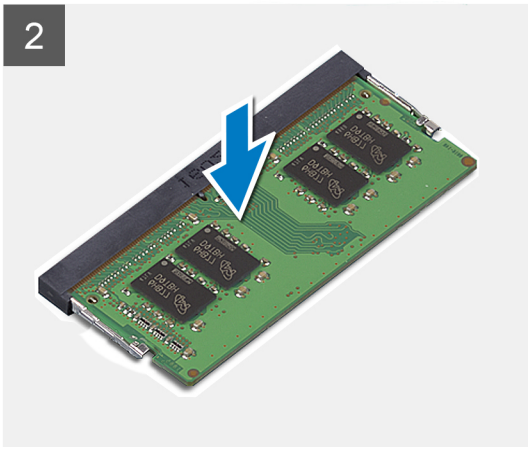
Prerequisites

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

About this task







Steps

1. Align the notch on the memory module with the tab on the memory module slot and slide the memory module firmly into the slot at an angle.
2. Press the memory module down until the clips secure it.

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

Next steps

1. Connect the battery cable.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

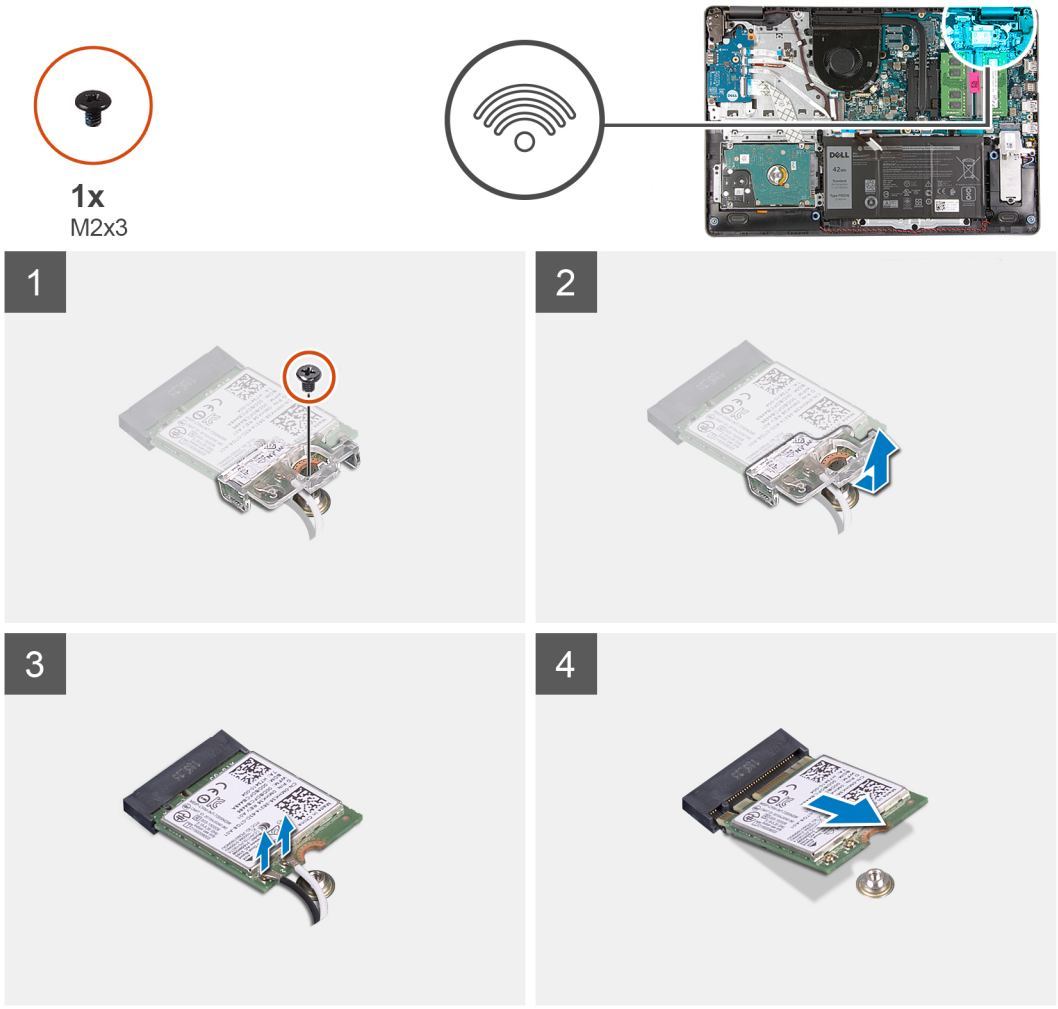
WLAN card

Removing the WLAN card

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.

About this task



Steps

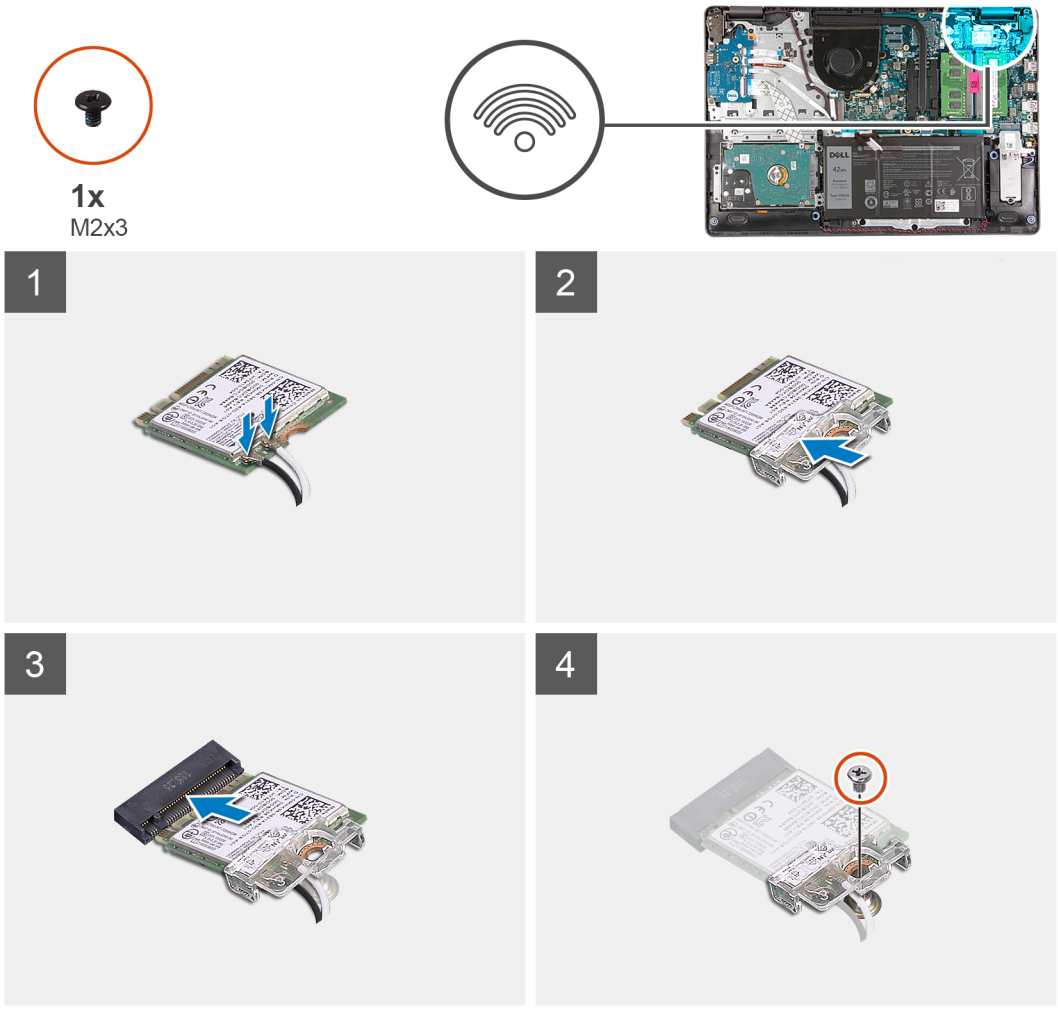
1. Remove the single (M2x3) screw that secures the WLAN card bracket to the system board.
2. Slide and remove the WLAN card bracket that secures the WLAN antenna cables.
3. Disconnect the WLAN antenna cables from the connectors on the WLAN card.
4. Pull out the WLAN card from the M.2 port on the system board.

Installing the WLAN card

Prerequisites

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

About this task



Steps

1. Replace the WLAN card into the M.2 Slot on the system board.
2. Connect the WLAN antenna cables to the connectors on the WLAN card.
3. Place the WLAN card bracket to secure the WLAN antenna cables to the WLAN card.
4. Replace the single (M2x3) screw to secure the WLAN bracket and the WLAN card to the palmrest.

Next steps

1. Connect the battery cable.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

Solid-state drive

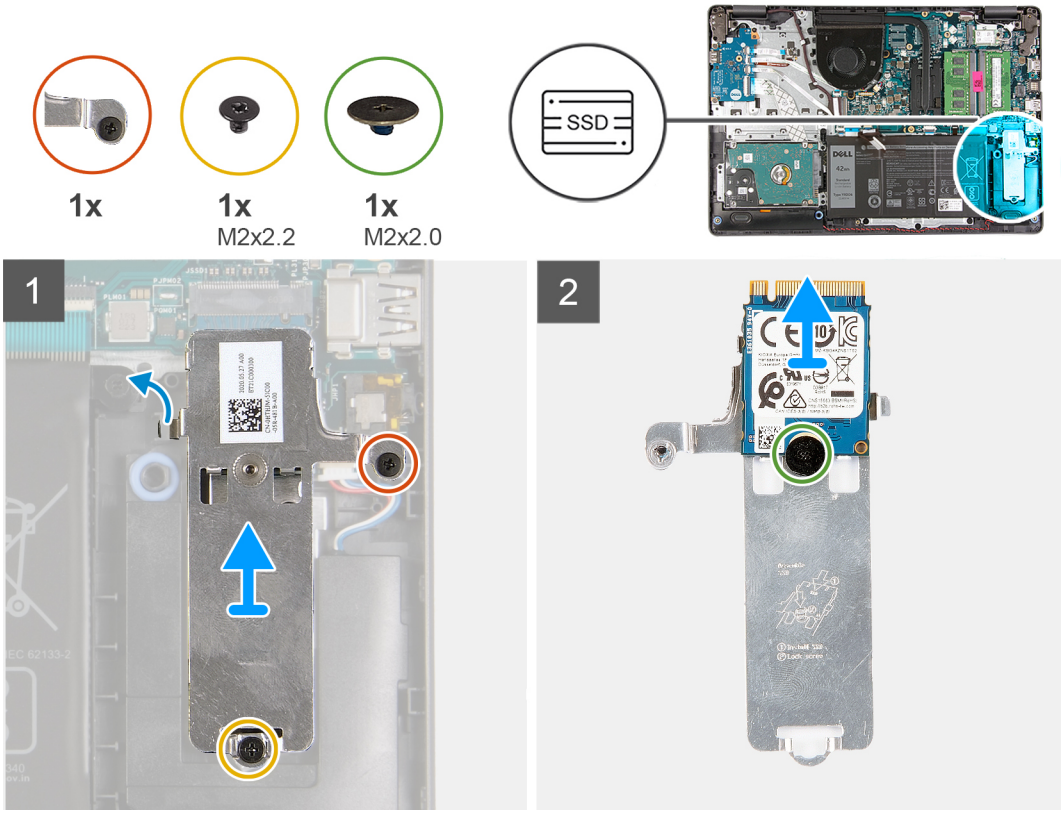
Removing the M.2 2230 Solid-state drive

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.

3. Remove the base cover.
4. Disconnect the battery cable.

About this task



Steps

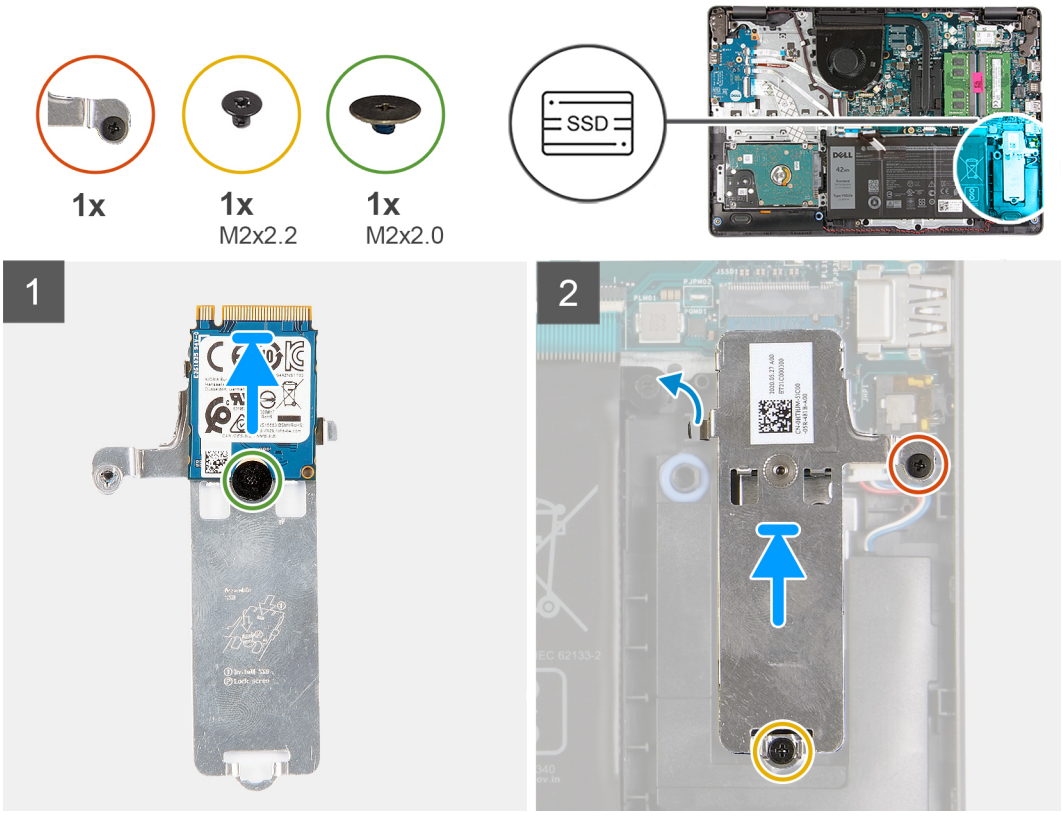
1. Remove the single (M2x2.2) screw and loosen the single captive screw, securing the SSD thermal plate to the palmrest, to lift it out of the system.
2. Turn the thermal plate over and remove the single (M2x2) screw securing the M.2 2230 SSD to the thermal plate.
3. Lift the solid-state drive off the thermal plate.

Installing the M.2 2230 Solid-state drive

Prerequisites

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

About this task



Steps

1. Place the solid-state drive into the thermal plate and install the single (M2x2) screw.
2. Slide and insert the tab of the solid-state drive into the solid-state drive slot.
3. Replace the single (M2x2.2) screw and tighten the single captive screw to secures the thermal plate to the palmrest.

Next steps

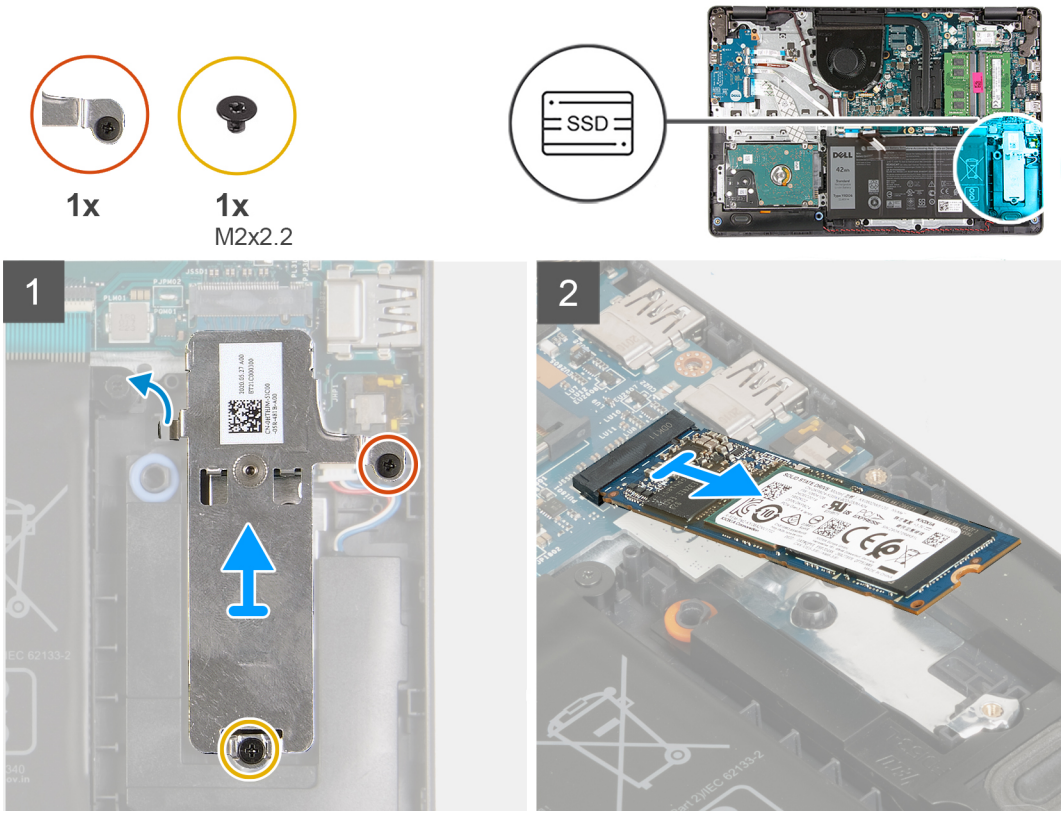
1. Connect the battery cable.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

Removing the M.2 2280 Solid-state drive

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.

About this task



Steps

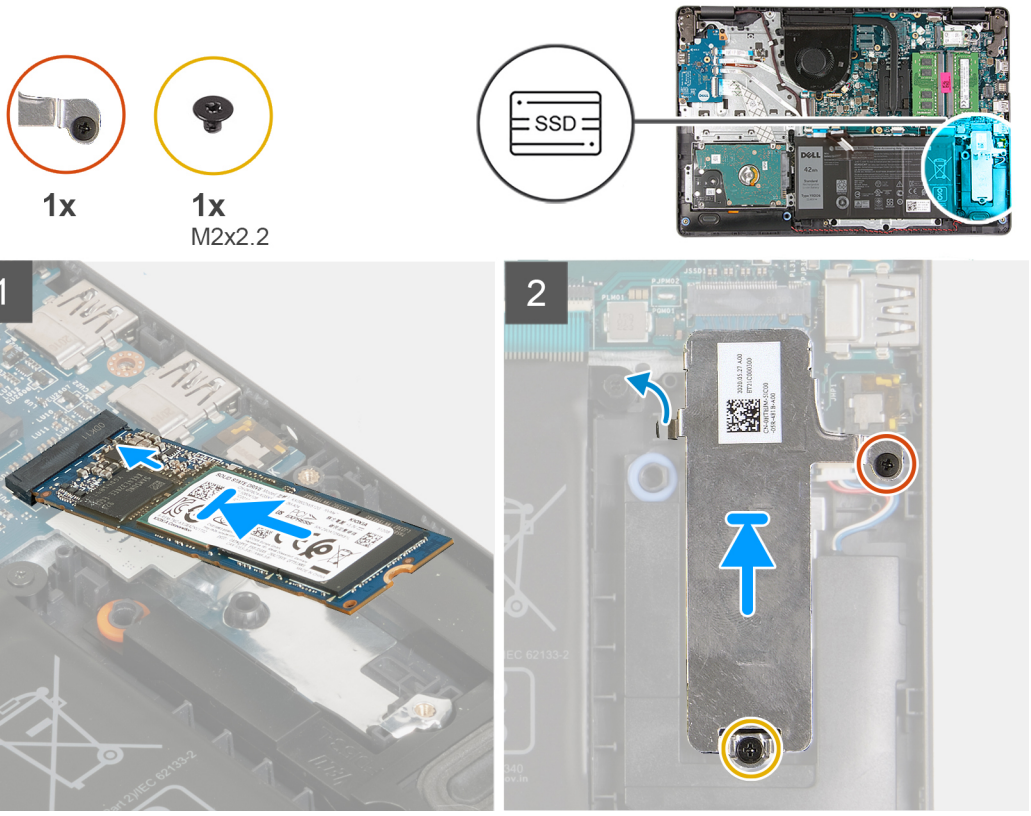
1. Remove the single (M2x2.2) screw and the single captive screw from the thermal bracket and lift the bracket out of the system.
2. Lift the solid-state drive from the M.2 slot on the system board and remove it from the system.

Installing the M.2 2280 Solid-state drive

Prerequisites

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

About this task



Steps

1. Slide and insert the Solid-state drive into the M.2 port on the system board.
2. Place the thermal bracket on the solid-state drive, replace the single (M2x2.2) screw and tighten the captive screw to secure the thermal plate to the palmrest.

Next steps

1. Connect the battery cable.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

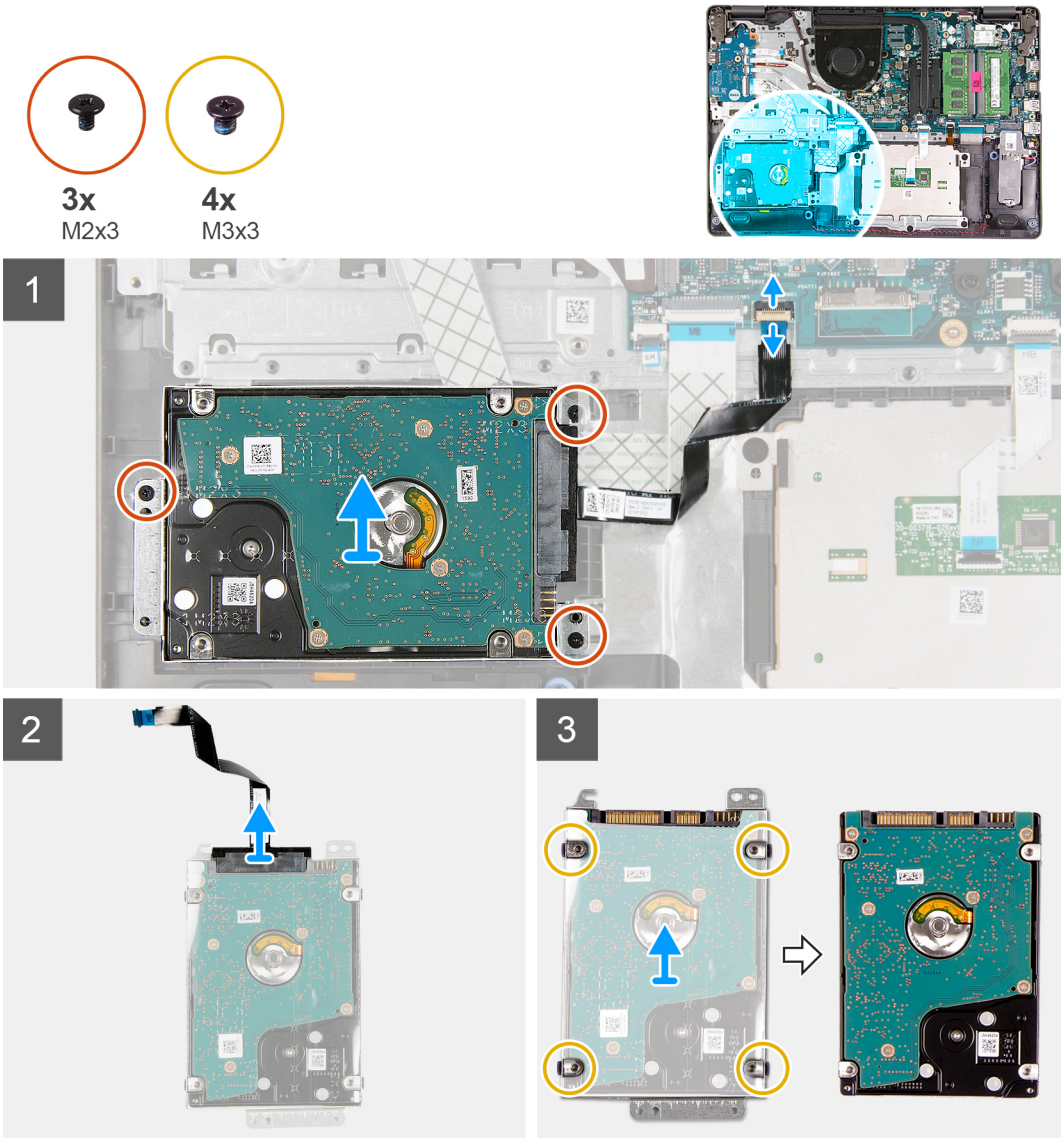
Hard drive

Removing the hard drive assembly

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.

About this task



Steps

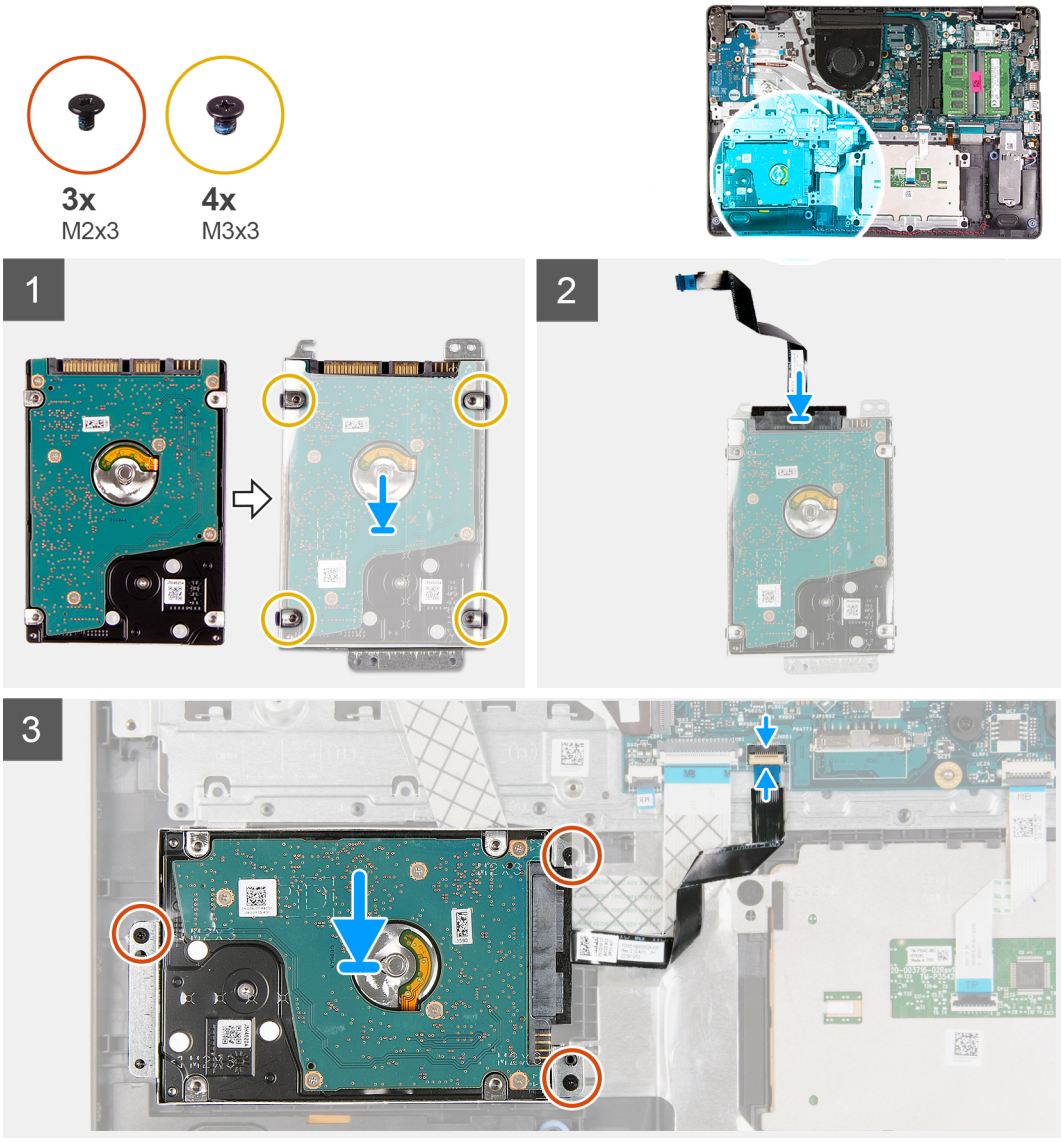
1. Lift the latch and disconnect the hard drive cable from the system board.
2. Remove the three (M2x3) screws that secure the hard drive assembly to the palmrest and lift the hard drive assembly along with its cable from the system.
3. Disconnect the interposer from the hard drive.
4. Remove the four (M3x3) screws from the hard drive bracket to free the hard drive.

Installing the hard drive assembly

Prerequisites

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

About this task



Steps

1. Align the hard drive with the hard drive bracket and replace the four (M3x3) screws.
2. Connect the interposer to the hard drive.
3. Align and place the hard drive assembly on the palmrest, then replace the three (M2x3) screws to secure the hard drive assembly to the palmrest.
4. Connect the hard drive cable to the system board and close the latch to secure the cable.

Next steps

1. Install the battery.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

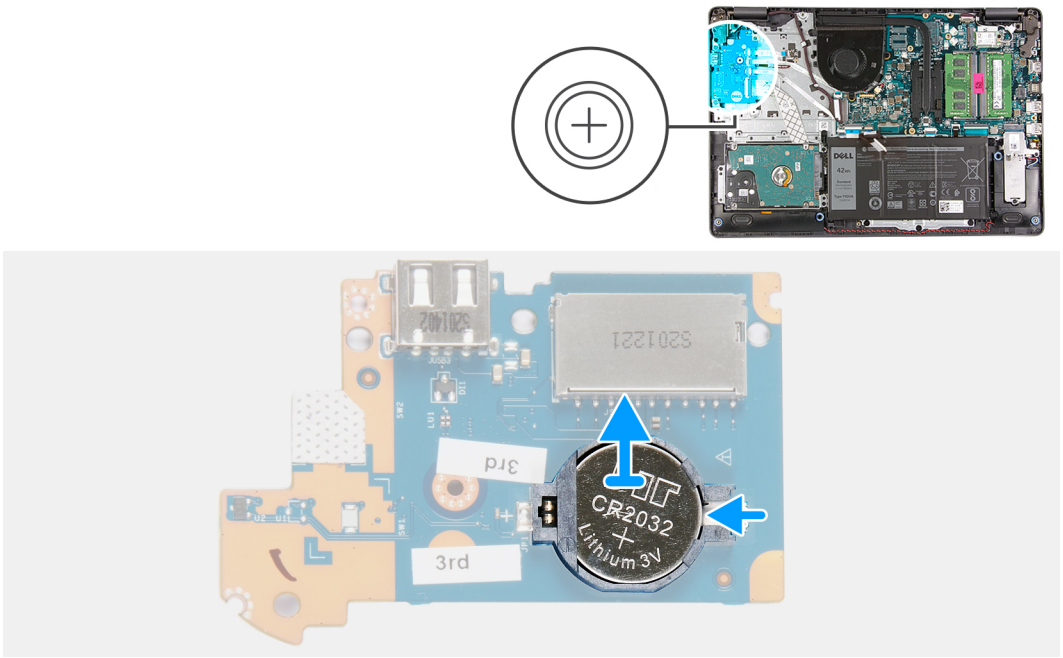
Coin-cell battery

Removing the coin-cell

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the IO board.

About this task

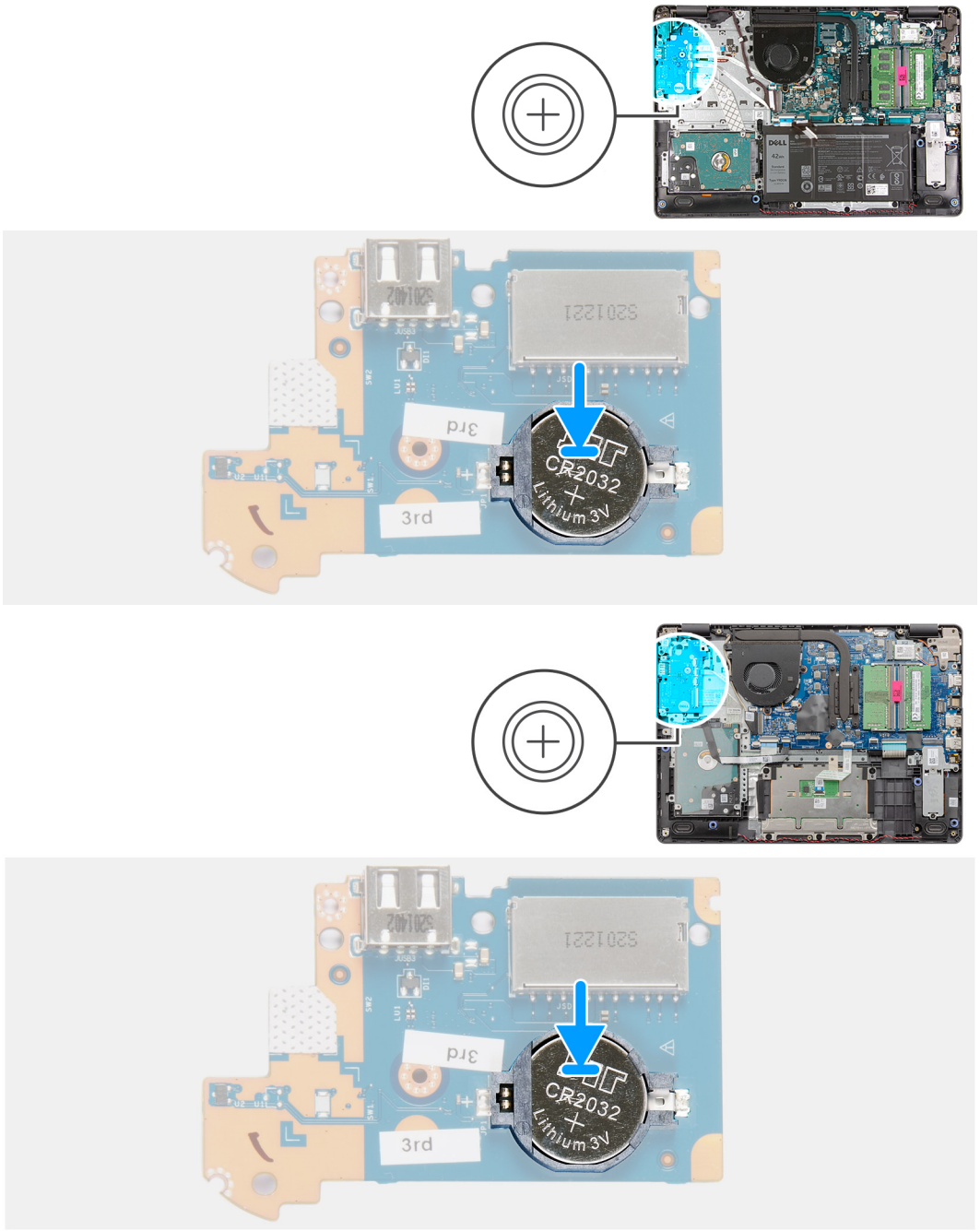


Steps

1. Use a plastic scribe to pry up the coin-cell battery from the slot on the IO daughter board.
2. Remove the coin-cell battery from the IO daughter board.

Installing the coin-cell battery

About this task



Steps

1. With the positive-side facing up, insert the coin-cell battery into the battery socket on the I/O board.
2. Press the battery until it clicks into place.

Next steps

1. Install the IO board.
2. Connect the battery cable.
3. Install the base cover.
4. Install the SD card.

5. Follow the procedure in after working inside your computer.

System fan

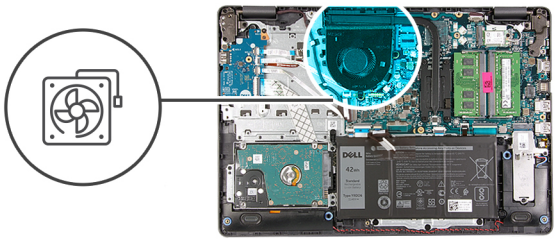
Removing the system fan

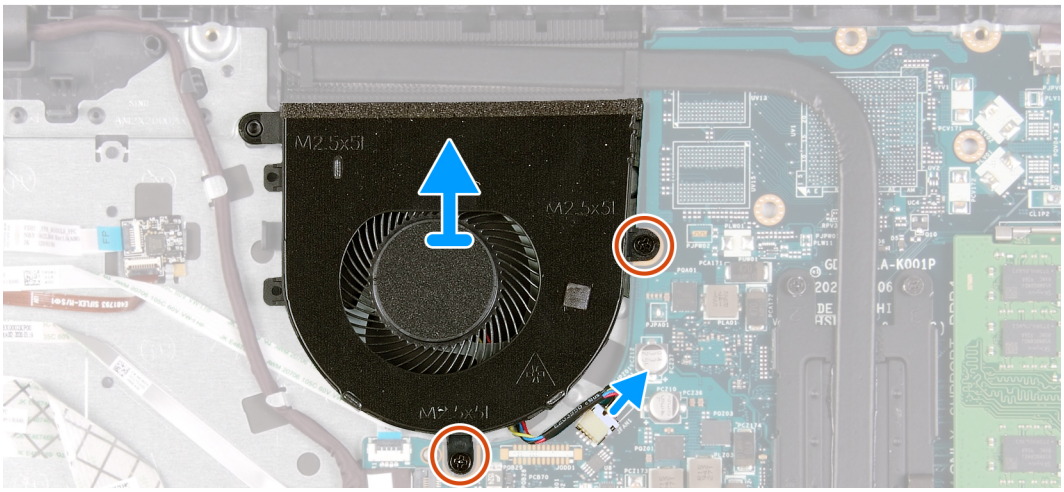
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.

About this task







Steps

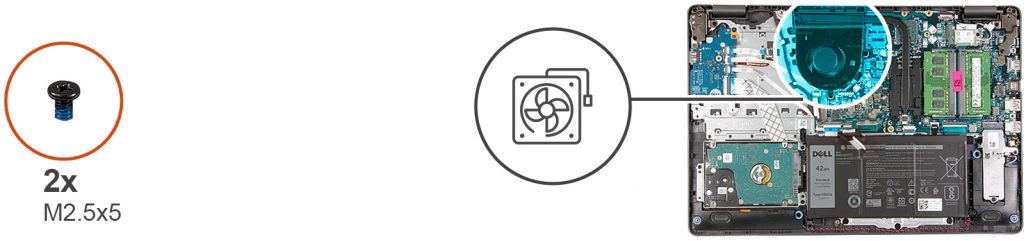
1. Disconnect the fan cable from the connector on the system board.
2. Remove the two screws (M2.5x5) that secures the fan to the palmrest.

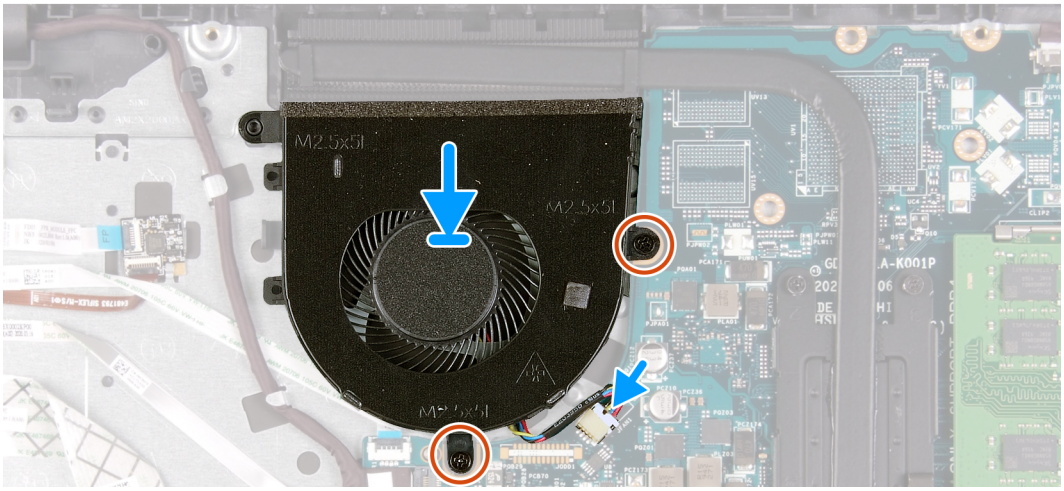
Installing the system fan

Prerequisites

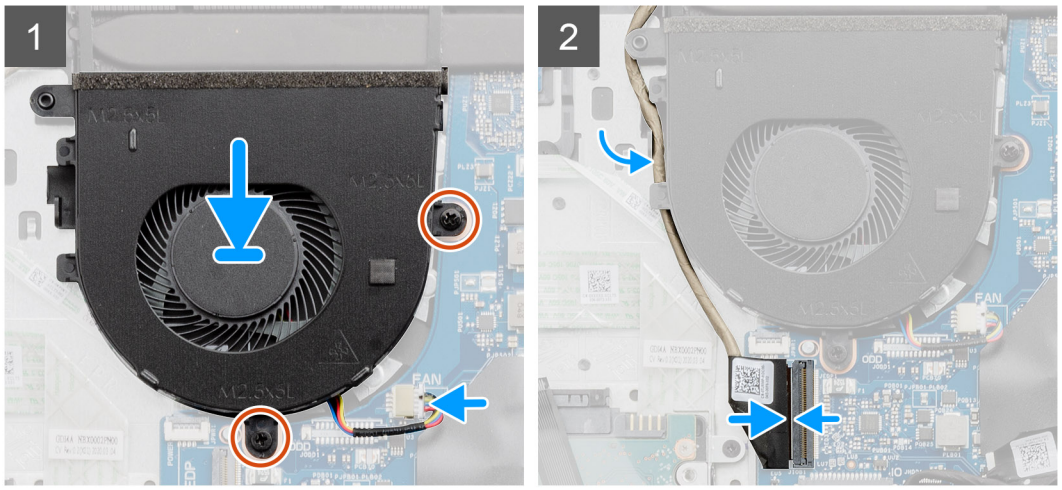
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task









Steps

1. Align and place the fan on the palm rest.
2. Replace the two screws (M2.5x5) that secure the fan to the palmrest.
3. Connect the fan cable to the connector on the system board .

Next steps

1. Reconnect the battery cable.

2. Replace the base cover.
3. Replace the SD card.
4. Follow the procedure in after working inside your computer.

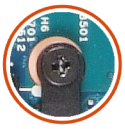
Heat sink

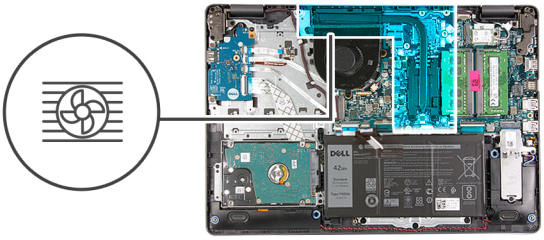
Removing the heatsink

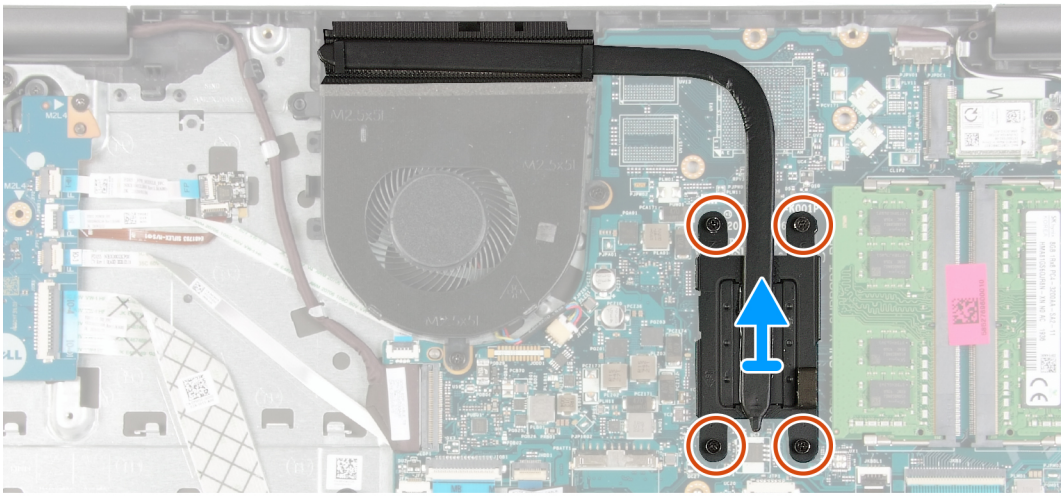
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.

About this task







Steps

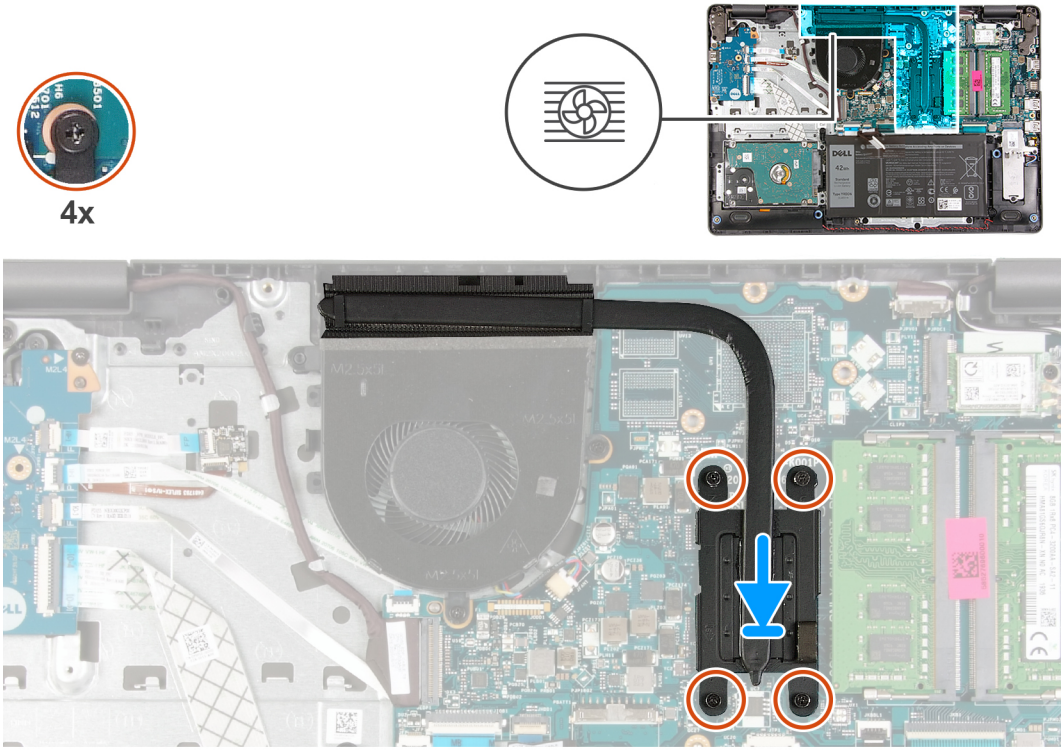
1. Loosen the four captive screws that secure the heatsink to the system board.
2. Lift the heatsink off the system board.

Installing the heatsink

Prerequisites

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

About this task



Steps

1. Place the heatsink on the system board and align the captive screws on the heatsink with the screw holes on the system board.
2. Tiighten the four captive screws to secure the heatsink to the system board.

Next steps

1. Reconnect the battery cable.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

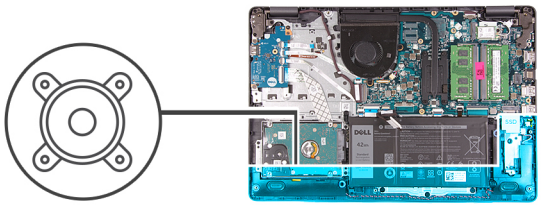
Speakers

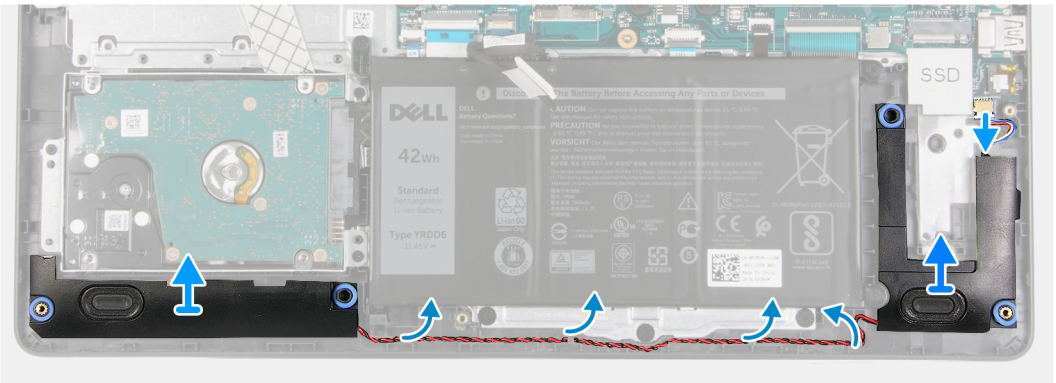
Removing the speakers

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the SSD.

About this task





Steps

1. Disconnect the speaker cable from the system board.
2. Unroute and remove the speaker cable from the routing guides on palmrest.
3. Lift the speakers, along with the cable, off the system.

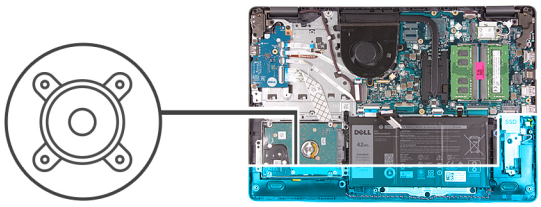
Installing the speakers

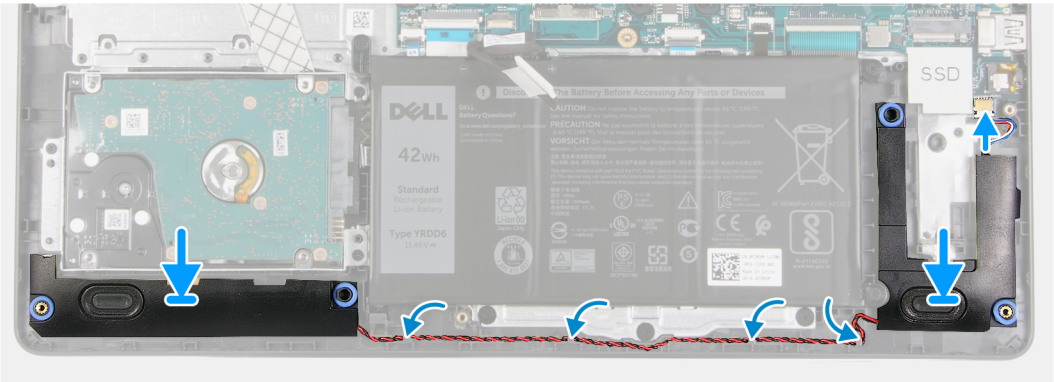
Prerequisites

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

About this task

NOTE: If the rubber grommets are pushed out when removing the speakers, push them back in before replacing the speakers.





Steps

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

Next steps

1. Install the SSD.
2. Reconnect the battery cable.
3. Install the base cover.
4. Install the SD card.
5. Follow the procedure in after working inside your computer.

IO board

Removing the IO board

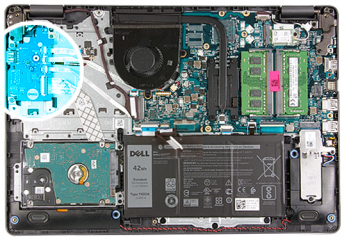
Prerequisites

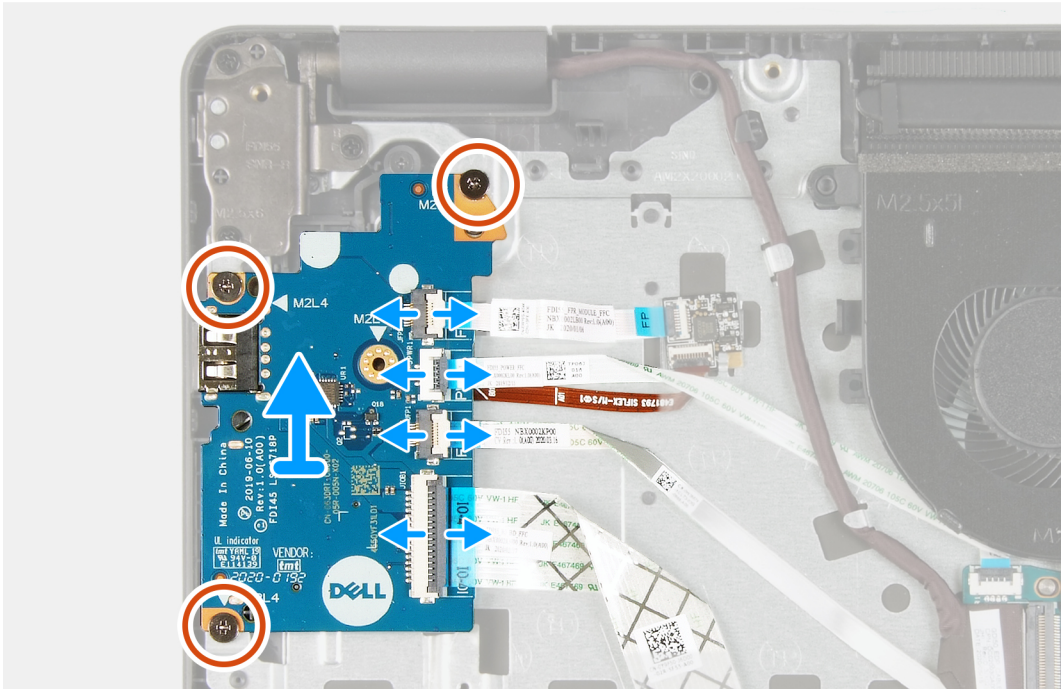
1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.

About this task



3x
M2x4





Steps

1. [For models shipped with a fingerprint reader] : Disconnect the fingerprint reader to IO daughter board FFC and IO daughter board to system board FFC from the IO daughter board.
2. [For models shipped without a fingerprint reader] : Disconnect the power button FFC, IO daughter board FFC, and display cable from the system board.
3. Peel back the power button FFC and IO daughter board FFC from the palm rest.
4. Remove the three (M2x4) screws that secure the IO board to the palmrest, and remove the IO board from the system.
5. Disconnect and remove the power button FFC and IO daughter board FFC from the IO daughter board.

Installing the IO board

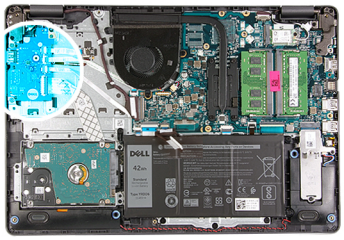
Prerequisites

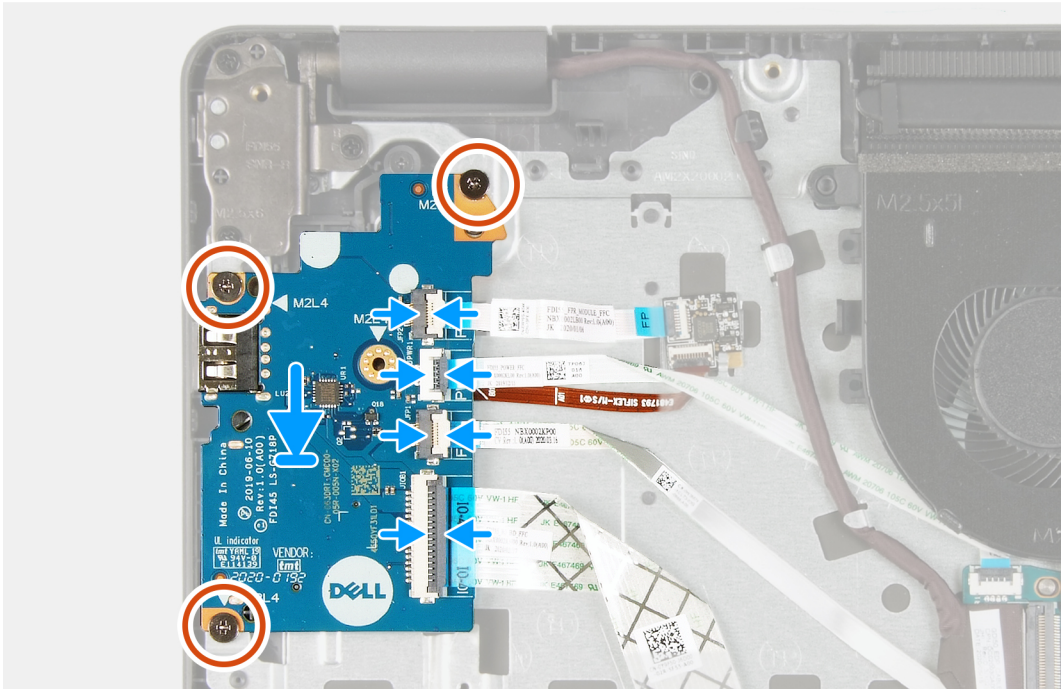
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task



3x
M2x4





Steps

1. Reconnect the power button FFC and IO daughter board FFC to the IO daughter board.
2. Place the IO daughter board onto the from the system.
3. Replace the three (M2x4) screws to secure the IO daughter board to the palmrest.
4. [For models shipped without a fingerprint reader] : Reconnect the power button FFC, IO daughter board FFC, and display cable to the connectors on the system board.
5. [For models shipped with a fingerprint reader] : Reconnect the fingerprint reader to IO daughter FFC and IO daughter board to system board FFC from the IO daughter board.

Next steps

1. Connect the battery cable.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

Touchpad

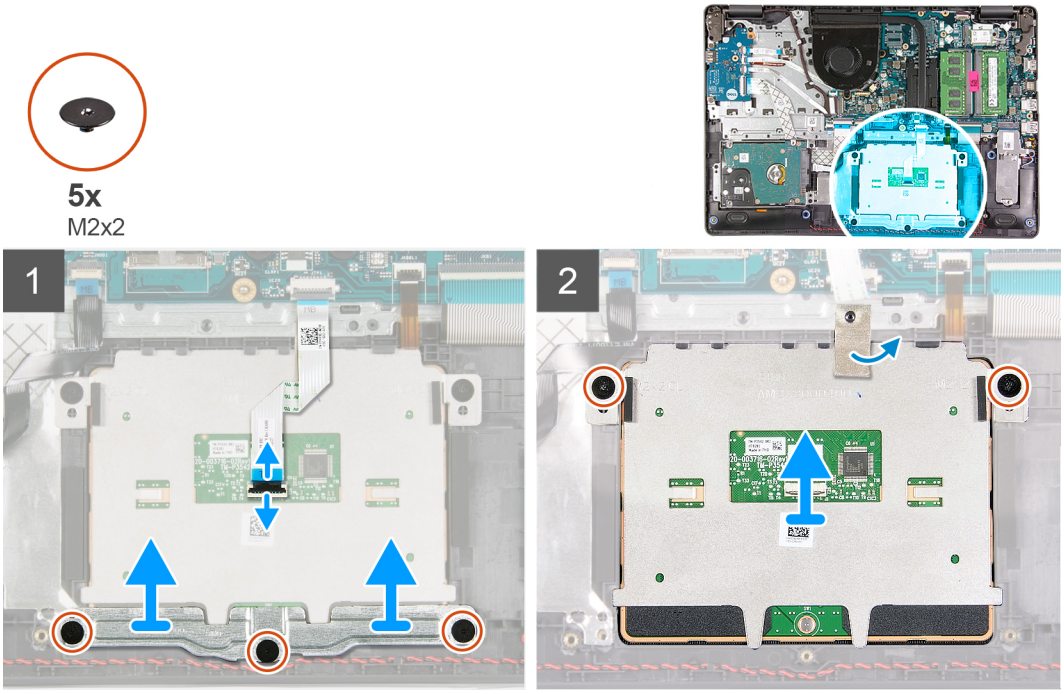
Removing the touch pad assembly

Prerequisites

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

2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.

About this task



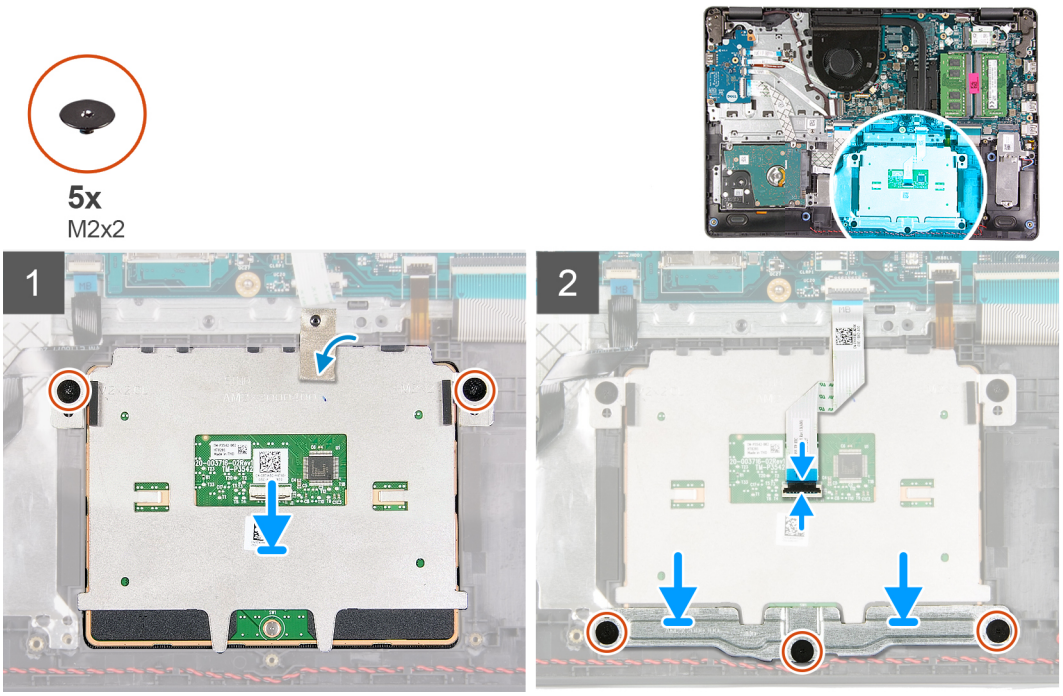
Steps

1. Disconnect the touchpad FFC from the system board.
2. Peel back the conductive tape from the touchpad module.
3. Remove the three (M2x2) screws securing the touchpad bracket in place.
4. Remove the touchpad bracket from the system.
5. Remove the two (M2x2) screws securing the touchpad module in place.
6. Remove the touchpad module with touchpad FFC from the system.
7. Disconnect the touchpad FFC from the touchpad module.

Installing the touch pad assembly

About this task

NOTE: Ensure that the touch pad is aligned with the guides available on the palm-rest and keyboard assembly, and the gap on either sides of the touch pad is equal.



Steps

1. Reconnect the touchpad FFC to the touchpad module.
2. Align and place the touchpad module onto the system.
3. Install the two (M2x2) screws to secure the touchpad module to the palmrest.
4. Install the touchpad bracket on the touchpad and secure it using the three (M2x2) screws.
5. Peel back the conductive tape over the touchpad module.
6. Reconnect the touchpad FFC to the system board.

Next steps

1. Install the battery.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

Display assembly

Removing the display assembly

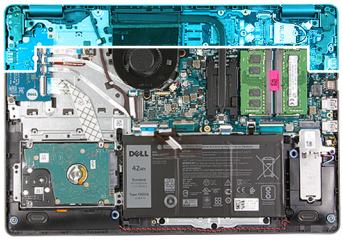
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the WLAN.

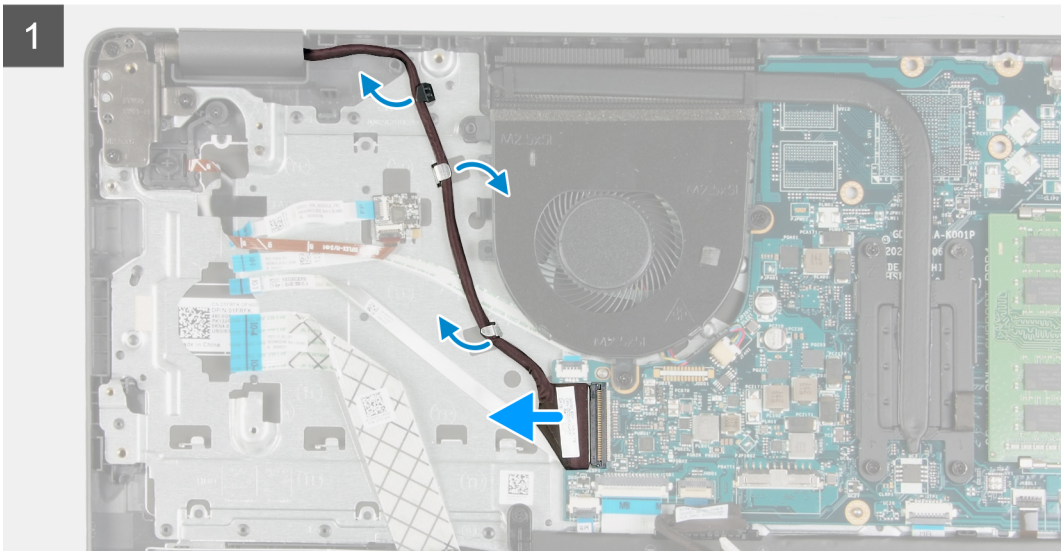
About this task



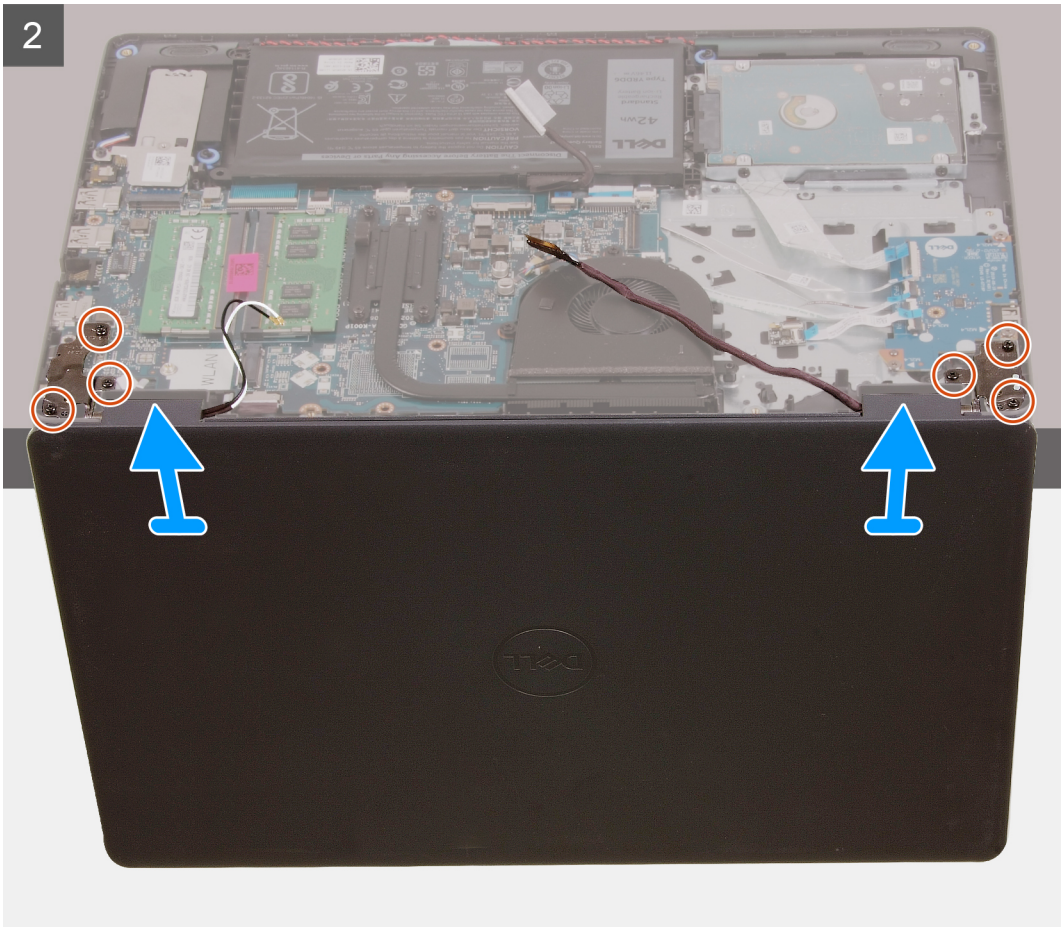
6x
M2.5x6



1



2



Steps

1. Disconnect the display cable from the connector on the system board.
2. Unthread the display cable and WLAN antenna cables from the routing channels.
3. Open the system to at least 90-degrees and place the system on the edge of a table so that the palm rest is laying flat on the table and the display assembly is over the edge.
4. Remove the six (M2.5x6) screws securing the display assembly in place.
5. Remove the display assembly from the system.

Installing the display assembly

Prerequisites

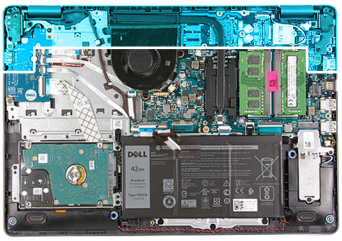
If you are replacing a component, remove the existing component before performing the installation procedure.

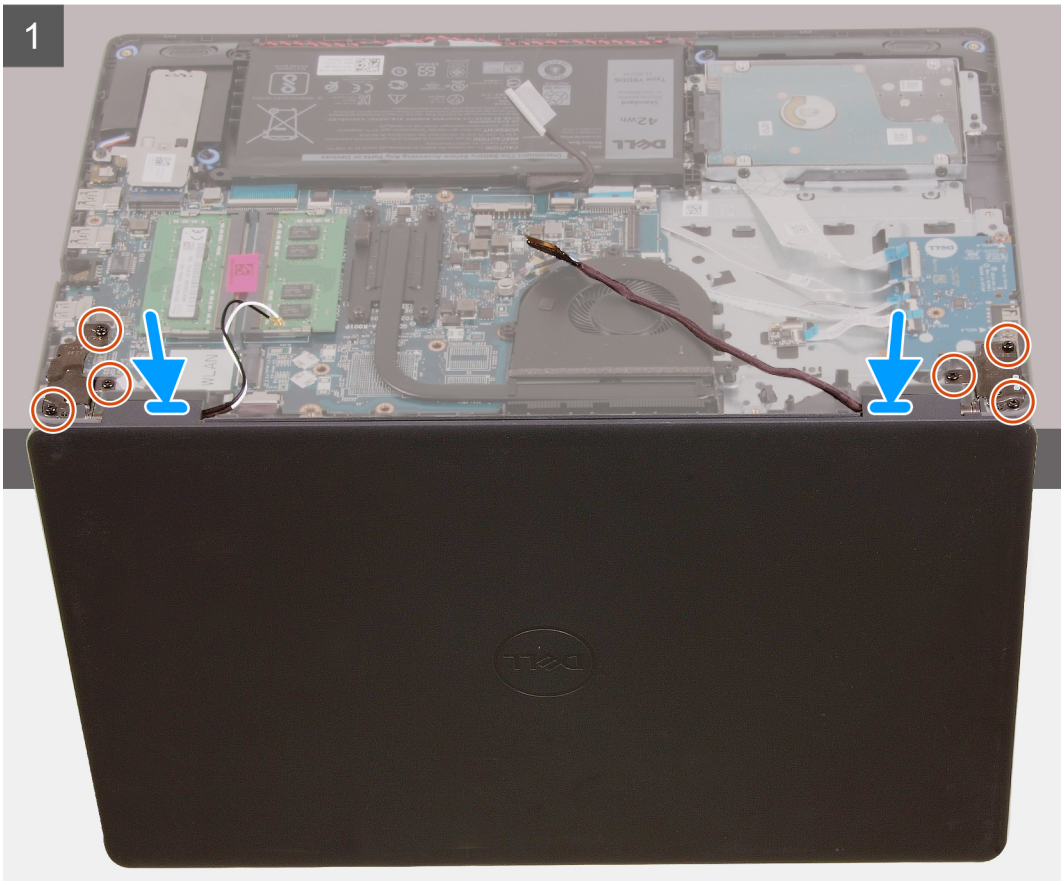
About this task

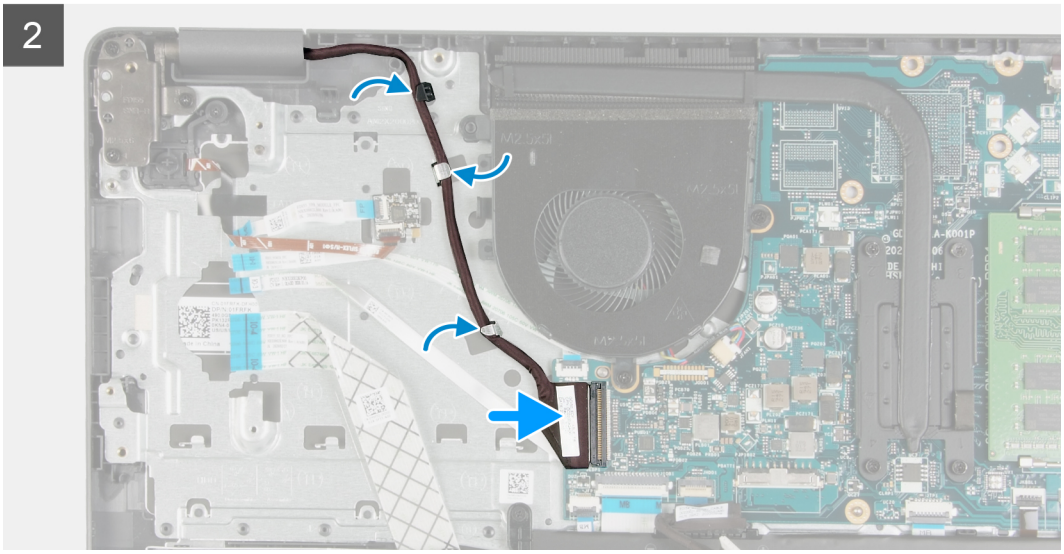
NOTE: Ensure that the hinges are opened to the maximum before replacing the display assembly on the palmrest and keyboard assembly.



6x
M2.5x6







Steps

1. Align and place the system under the hinges on the display assembly.
2. Install the six (M2.5x6) screws onto te hinges to secure the display to the system chassis.
3. Re-route the display cable and WLAN antenna cables through the routing channels on the palmrest.
4. Reconnect the display cable to the connector on the system board.

Next steps

1. Install the WLAN.
2. Install the base cover.
3. Install the SD card.
4. Follow the procedure in after working inside your computer.

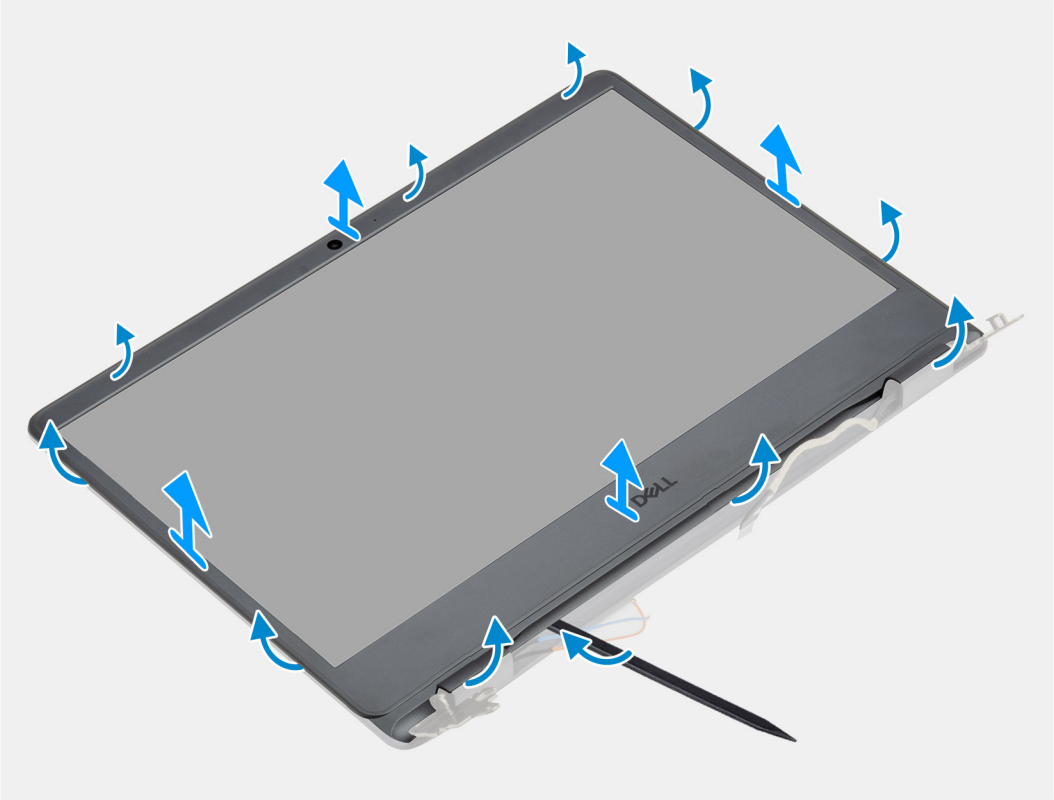
Display bezel

Removing the display bezel

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery cable.
5. Remove the display assembly.

About this task



Steps

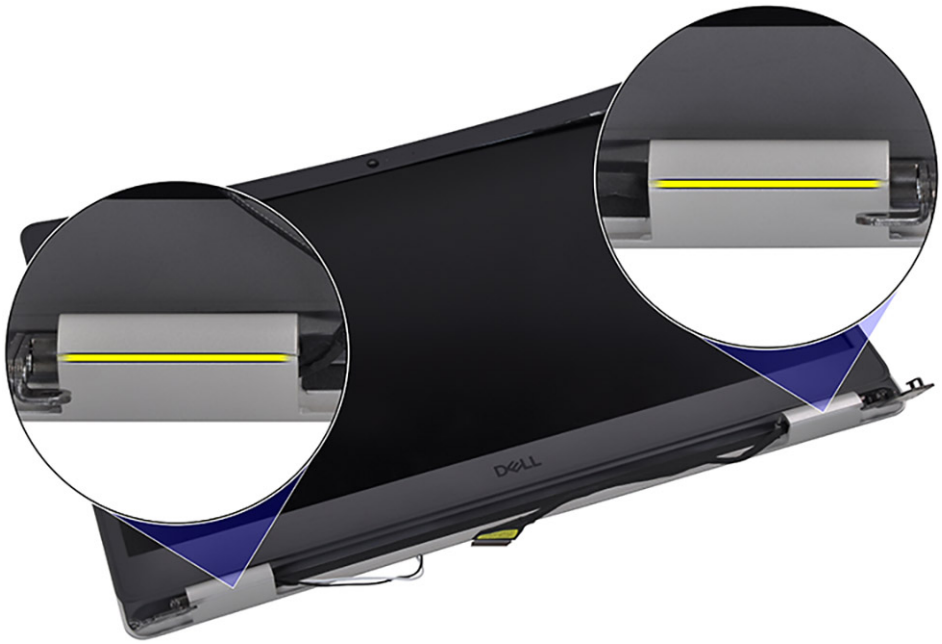
1. Pry open the display bezel from the inner edge at the left and right sides of the display assembly.



2. Pry open the display bezel from the inner edge at the top side of the display assembly.



3. Pry open the hinge caps at the bottom side of the display assembly.

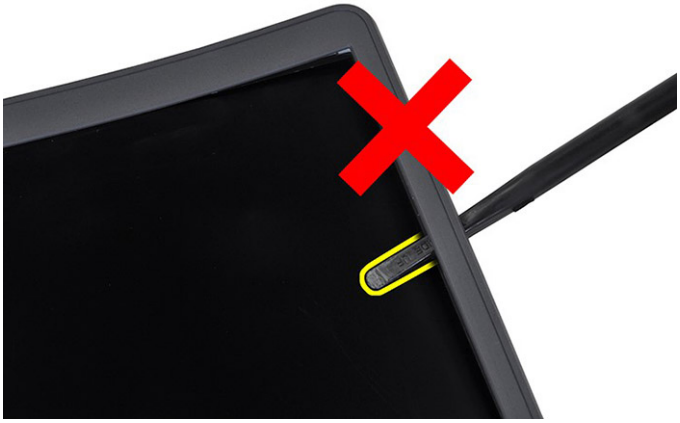


4. Pry open the display bezel from the inner edge at the bottom side of the display assembly.



5. Lift and remove the display bezel from the display assembly

NOTE: CAUTION: DO NOT use a scribe or any other objects to pry up the display bezel in the manners shown in the images below as the pressure applied on the display panel by the scribe will damage the display panel.



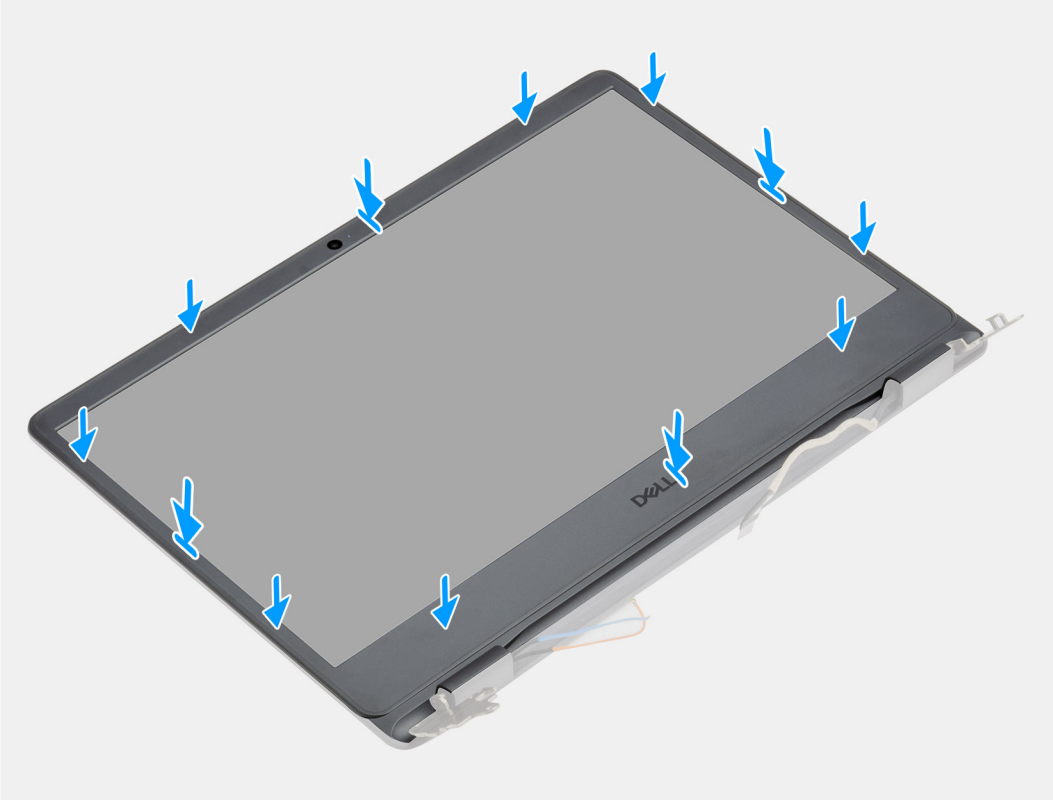


Installing the display bezel

Prerequisites

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

About this task



Steps

Align the display bezel with the display back-cover and antenna assembly, and then gently snap the display bezel into place.

Next steps

1. Install the display assembly.
2. Reconnect the battery cable.
3. Install the base cover.
4. Install the SD card.
5. Follow the procedure in after working inside your computer.

Camera

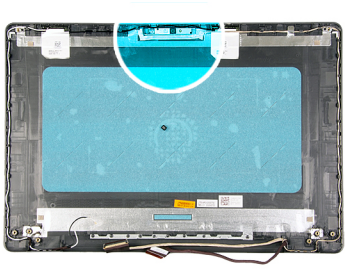
Removing the camera

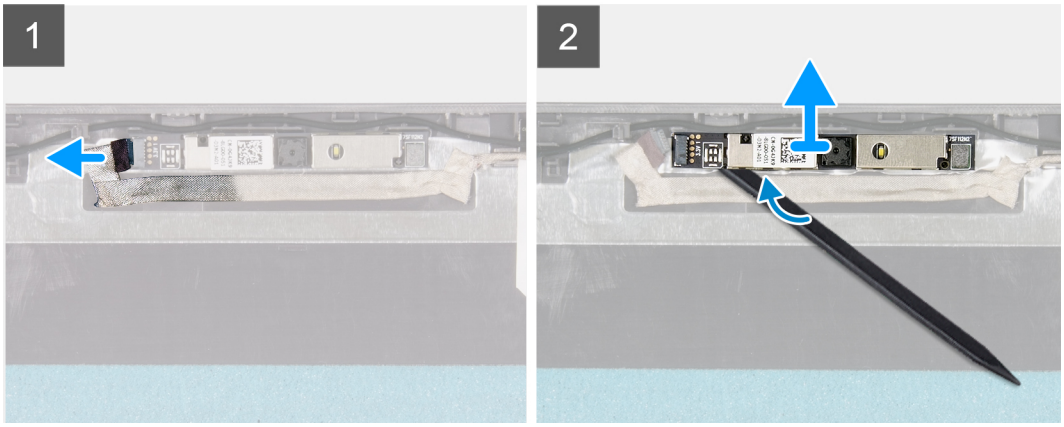
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the WLAN.

6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

About this task





Steps

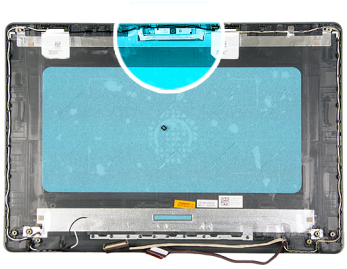
1. Disconnect the camera cable from the camera module.
2. Using a plastic scribe, gently pry the camera off the display back-cover and antenna assembly.

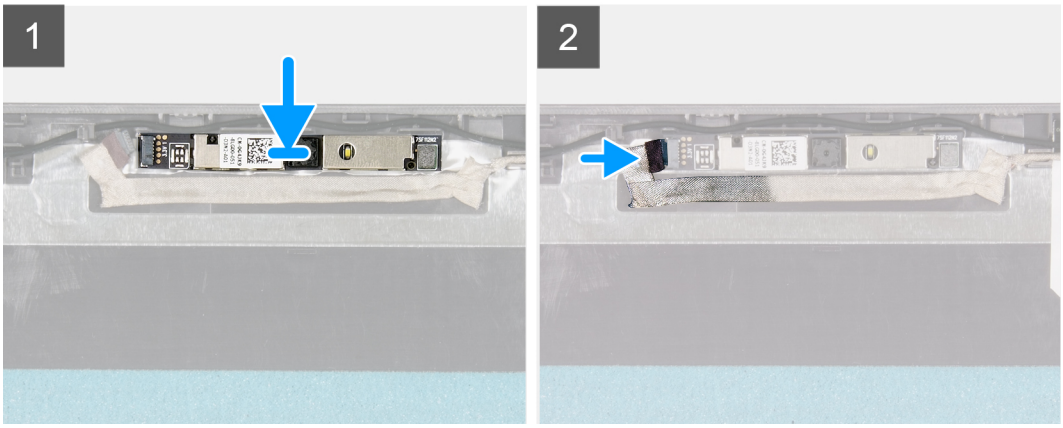
Installing the camera

Prerequisites

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

About this task





Steps

1. Using the alignment post, adhere the camera module on the display back-cover and antenna assembly.
2. Connect the camera cable to the camera module.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN.
5. Connect the battery cable.
6. Install the base cover.
7. Install the SD card.
8. Follow the procedure in after working inside your computer.

Display panel

Removing the display panel

Prerequisites

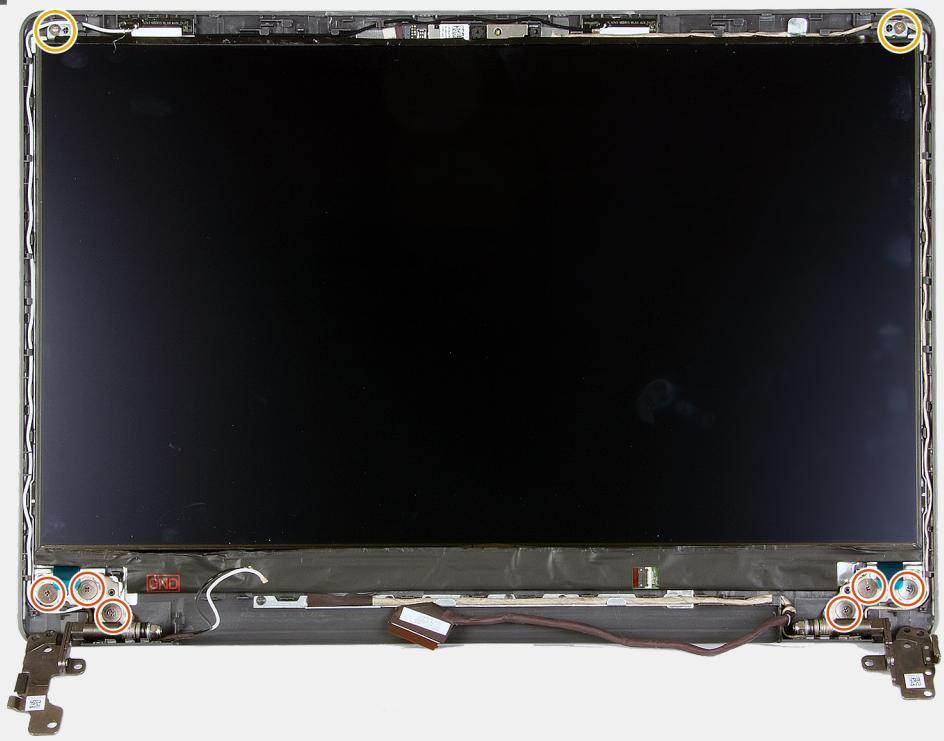
1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the WLAN.
6. Remove the display assembly.
7. Remove the display bezel.

About this task

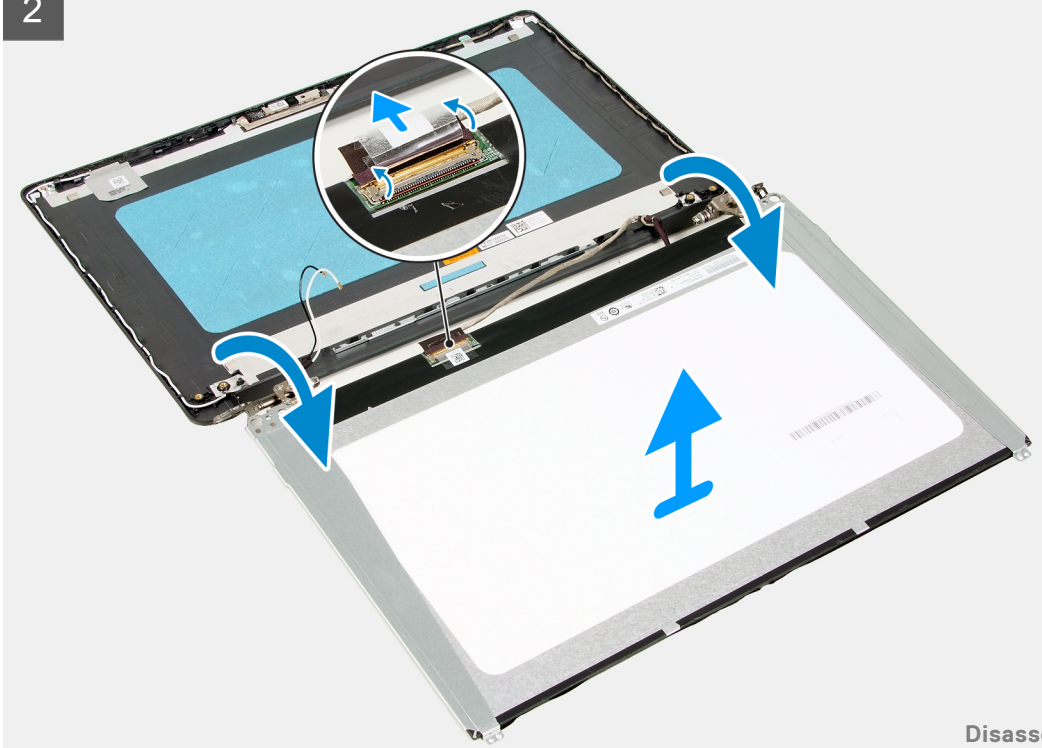




1



2



Steps

1. Remove the six (M2.5x2.5) and two (M2x2.5) screws securing the display panel to the hinges.
2. Gently flip the display panel assembly forward, peel back the mylar tape securing the display cable on the rear of the display panel.

   NOTE: Ensure the panel has a clean and smooth surface to rest on to prevent damage.

3. Disconnect the display cable from the display panel assembly and lift the display panel away from the system.

   NOTE: Do not remove the metal brackets from the panel.

Installation display panel

Prerequisites

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

About this task

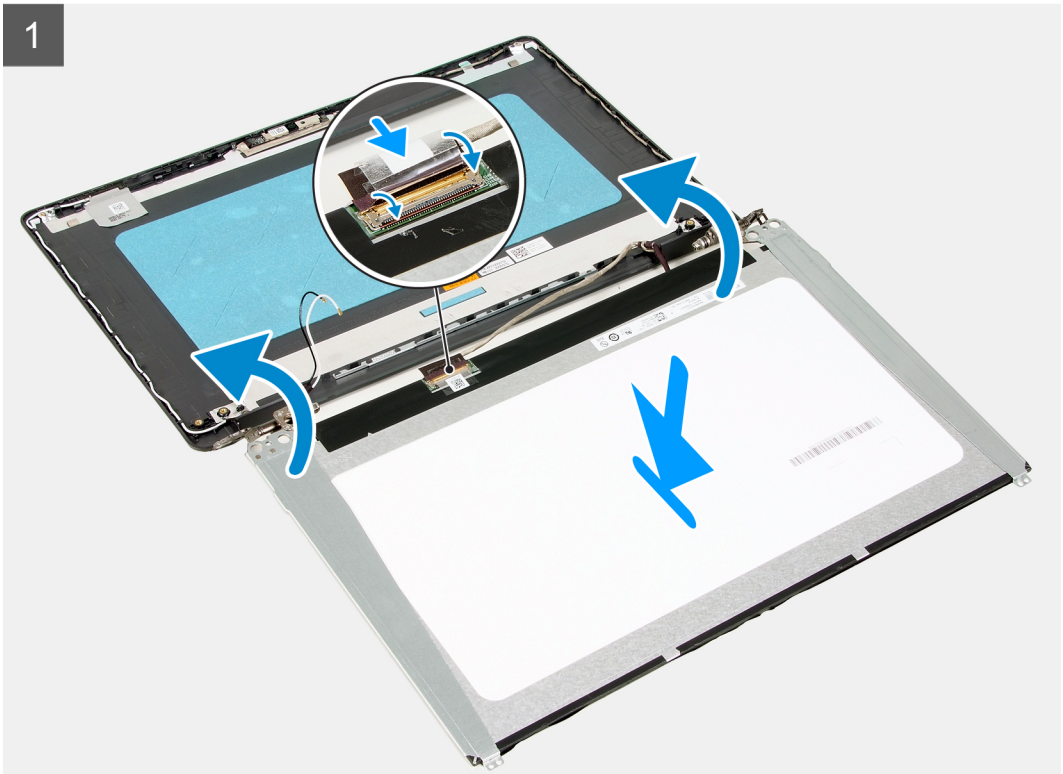


6x
M2.5x2.5

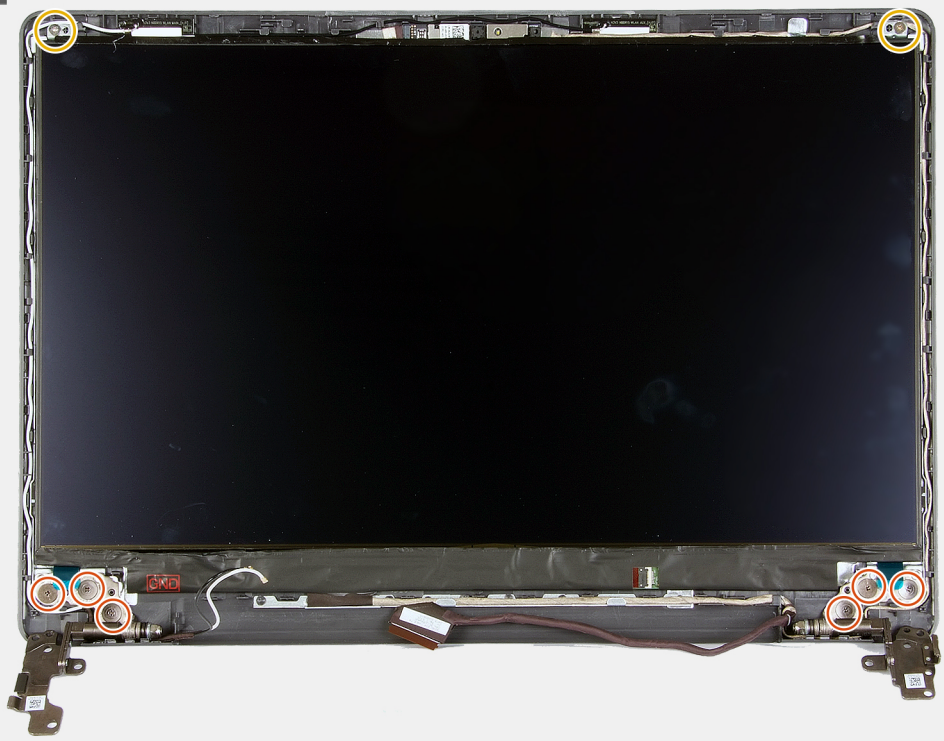
2x
M2x2.5



1



2



Steps

1. Place the display panel on a flat and clean surface .
2. Connect the display cable to the connector at the back of the display panel and close the latch to secure the cable .
3. Adhere the tape that secures the display cable to the back of the display panel .
4. Turn the display panel over and place it on the display back-cover .
5. Replace the six (M2x2.5) and two (M2.5x2.5) screws that secure the display panel to the display back-cover.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN.
5. Install the battery.
6. Install the base cover.
7. Install the SD card.
8. Follow the procedure in after working inside your computer.

Display back-cover and antenna assembly

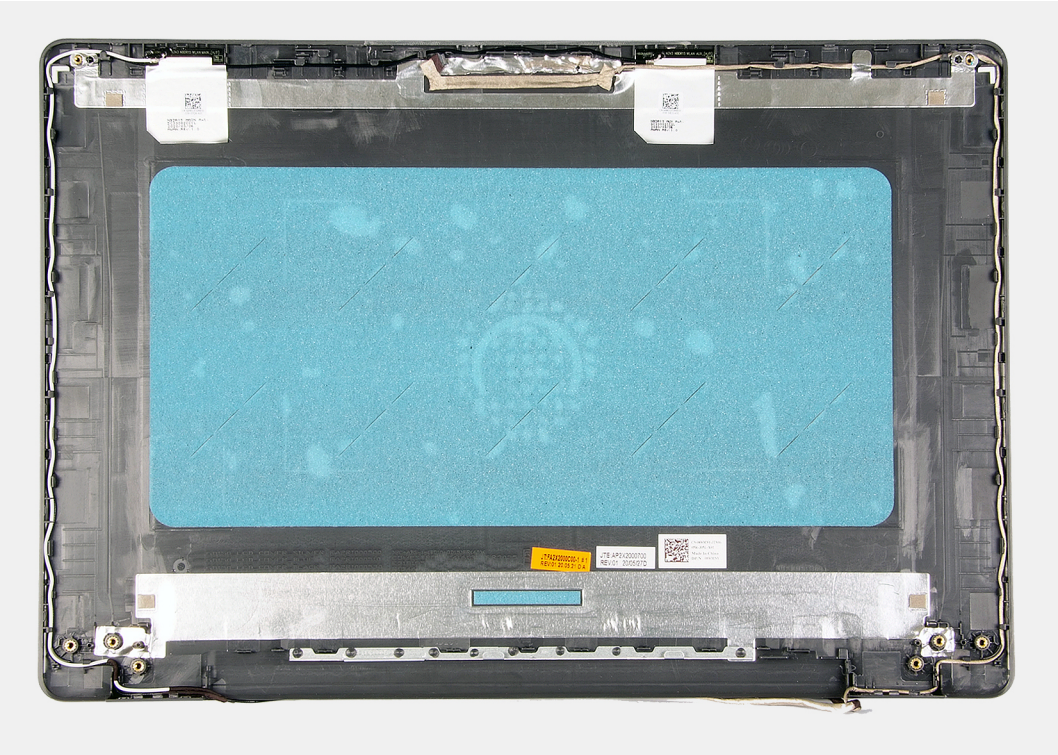
Removing the display back-cover

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the WLAN.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

About this task

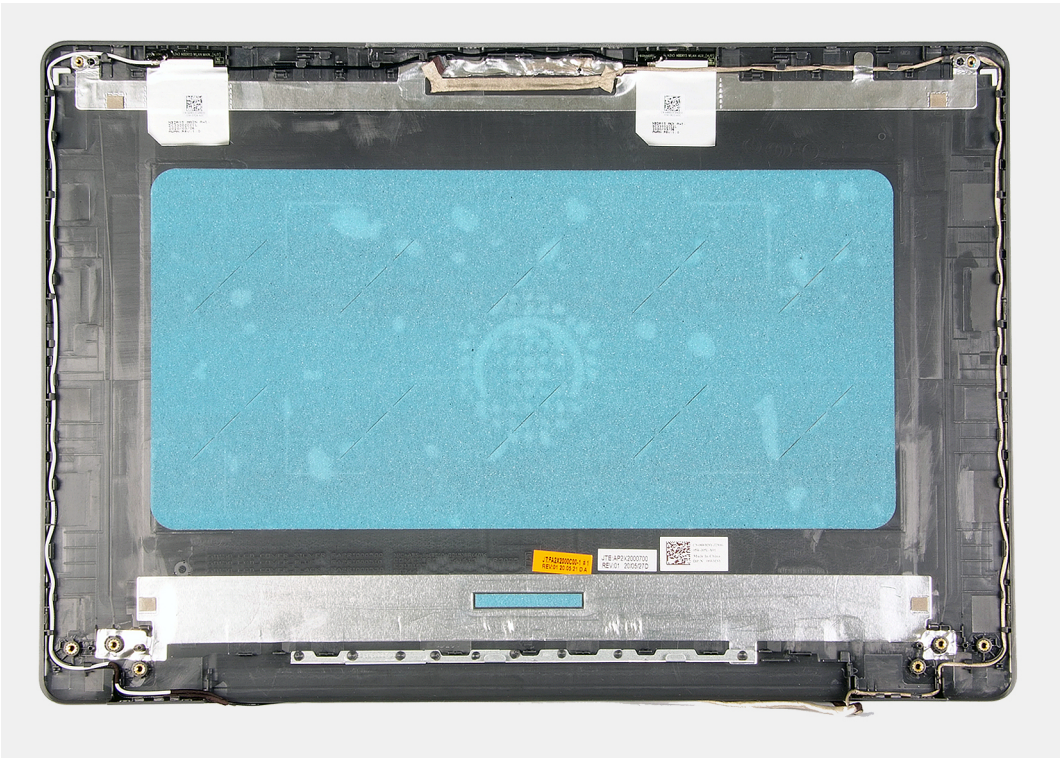
After performing all the preceding steps, you are left with the display back-cover.



Installing the display back-cover

About this task

Place the display back-cover on a clean and flat



surface.

Next steps

1. Install the display panel.
2. Install the display bezel.

3. Install the display assembly.
4. Install the WLAN.
5. Connect the battery cable.
6. Install the base cover.
7. Install the SD card.
8. Follow the procedure in after working inside your computer.

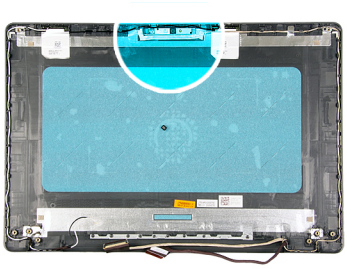
Camera

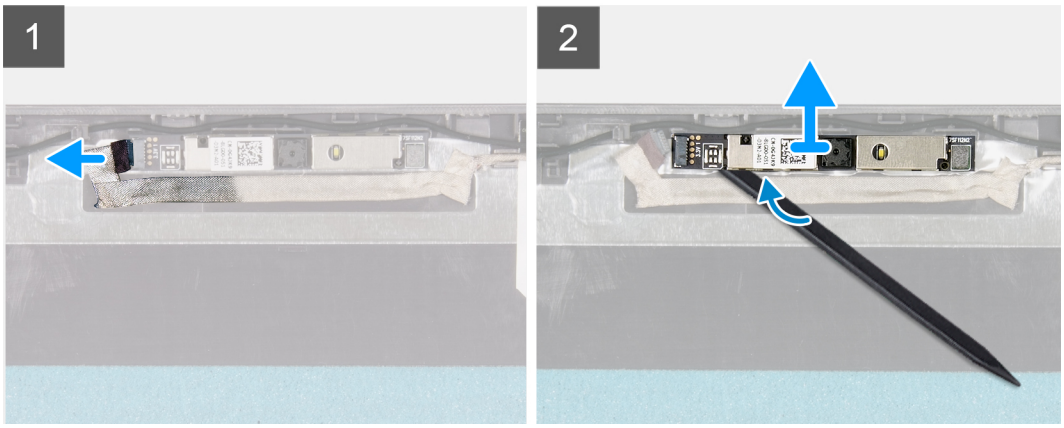
Removing the camera

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the WLAN.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

About this task





Steps

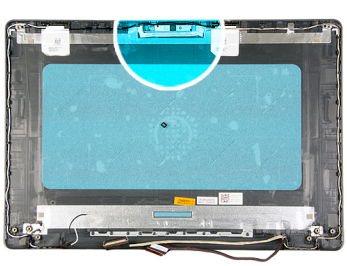
1. Disconnect the camera cable from the camera module.
2. Using a plastic scribe, gently pry the camera off the display back-cover and antenna assembly.

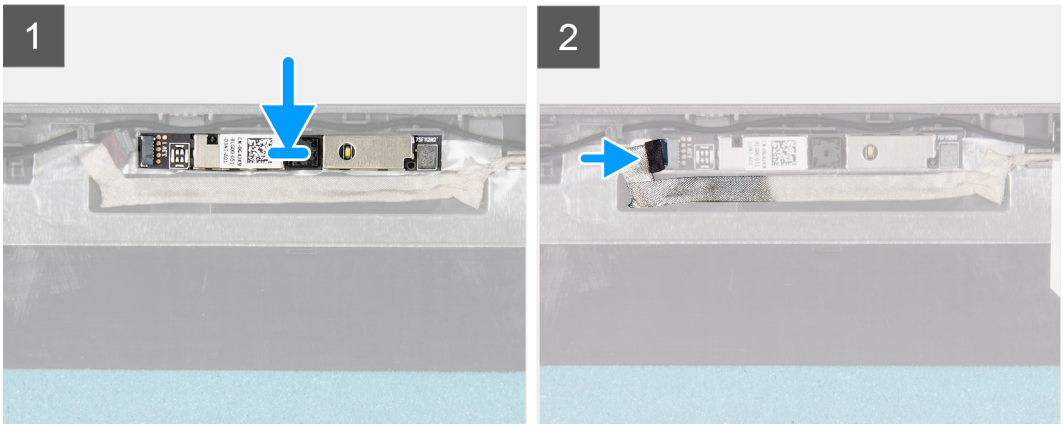
Installing the camera

Prerequisites

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

About this task





Steps

1. Using the alignment post, adhere the camera module on the display back-cover and antenna assembly.
2. Connect the camera cable to the camera module.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN.
5. Connect the battery cable.
6. Install the base cover.
7. Install the SD card.
8. Follow the procedure in after working inside your computer.

Display panel

Removing the display panel

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.

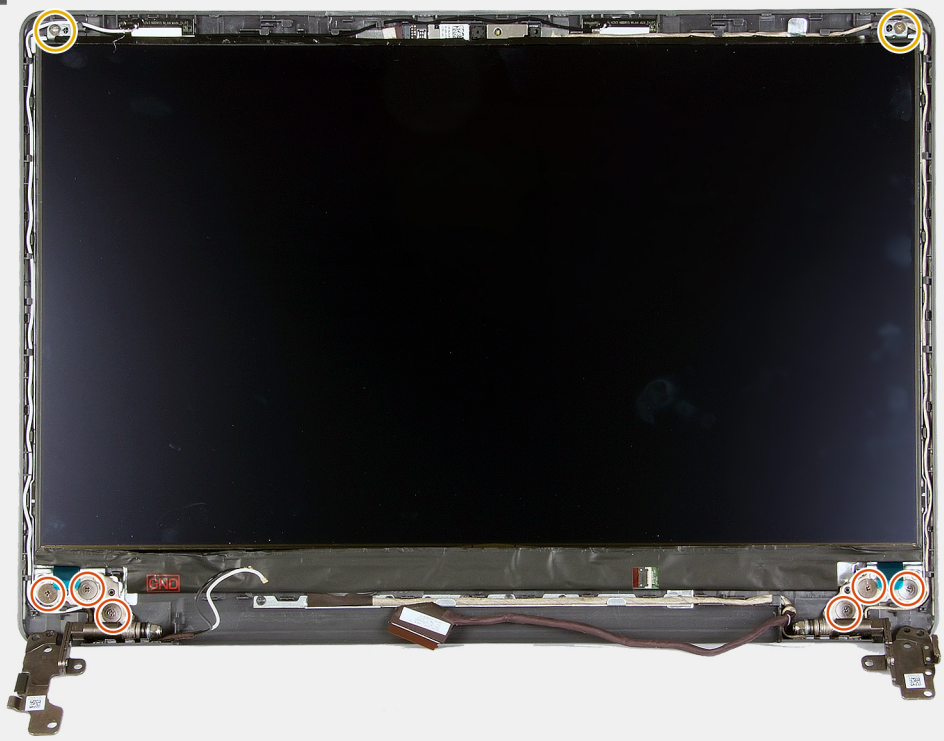
5. Remove the WLAN.
6. Remove the display assembly.
7. Remove the display bezel.

About this task

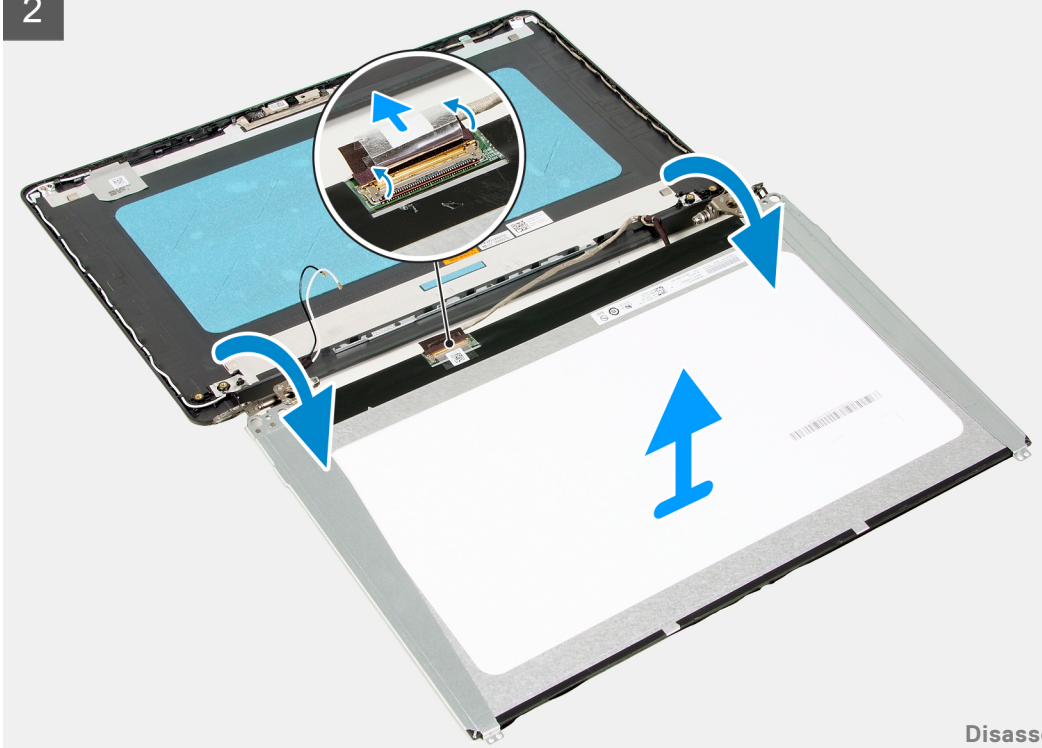




1



2



Steps

1. Remove the six (M2.5x2.5) and two (M2x2.5) screws securing the display panel to the hinges.
2. Gently flip the display panel assembly forward, peel back the mylar tape securing the display cable on the rear of the display panel.

   NOTE: Ensure the panel has a clean and smooth surface to rest on to prevent damage.

3. Disconnect the display cable from the display panel assembly and lift the display panel away from the system.

   NOTE: Do not remove the metal brackets from the panel.

Installation display panel

Prerequisites

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

About this task

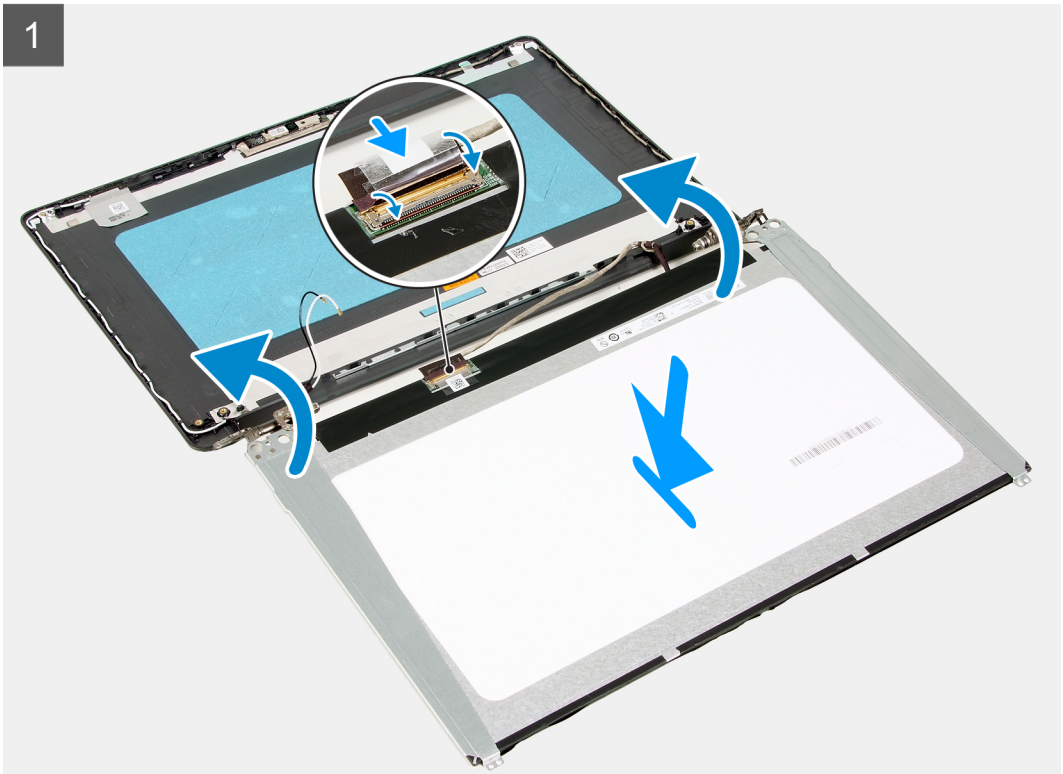


6x
M2.5x2.5

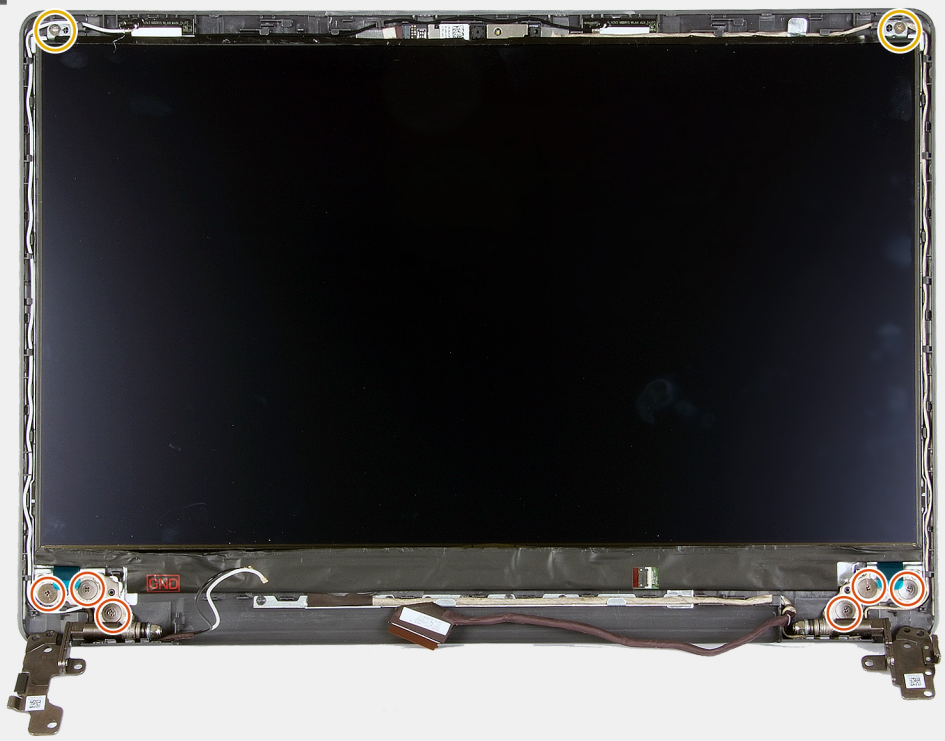
2x
M2x2.5



1



2



Steps

1. Place the display panel on a flat and clean surface .
2. Connect the display cable to the connector at the back of the display panel and close the latch to secure the cable .
3. Adhere the tape that secures the display cable to the back of the display panel .
4. Turn the display panel over and place it on the display back-cover .
5. Replace the six (M2x2.5) and two (M2.5x2.5) screws that secure the display panel to the display back-cover.

Next steps

1. Install the display panel.
2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN.
5. Install the battery.
6. Install the base cover.
7. Install the SD card.
8. Follow the procedure in after working inside your computer.

Display back-cover and antenna assembly

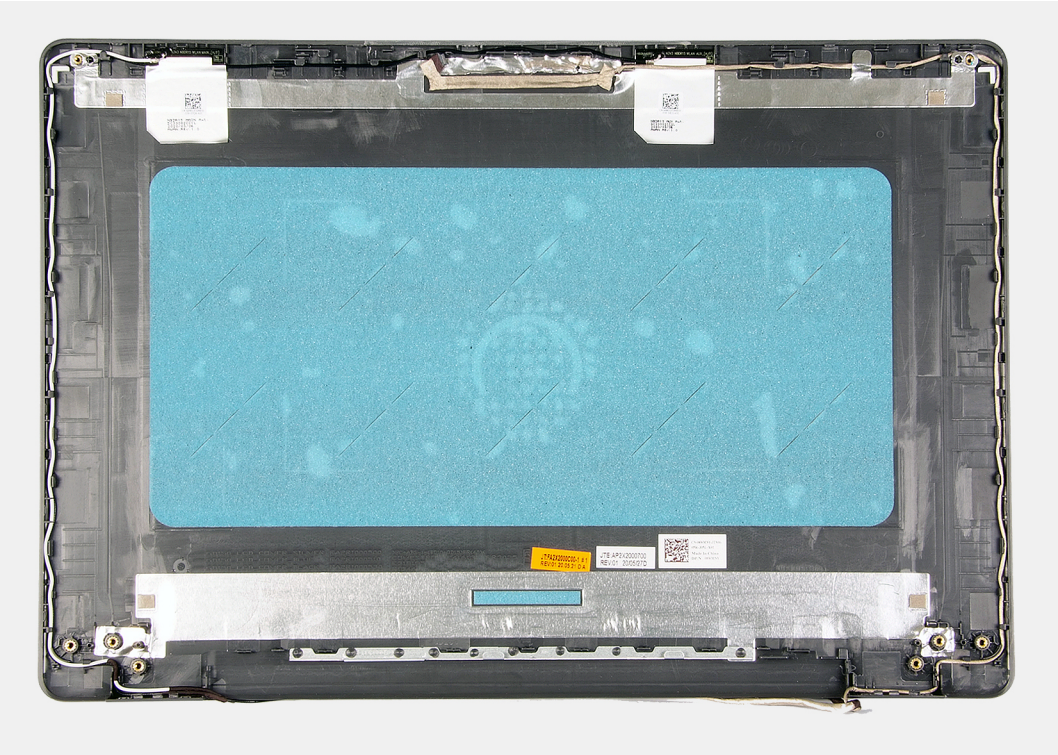
Removing the display back-cover

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the WLAN.
6. Remove the display assembly.
7. Remove the display bezel.
8. Remove the display panel.

About this task

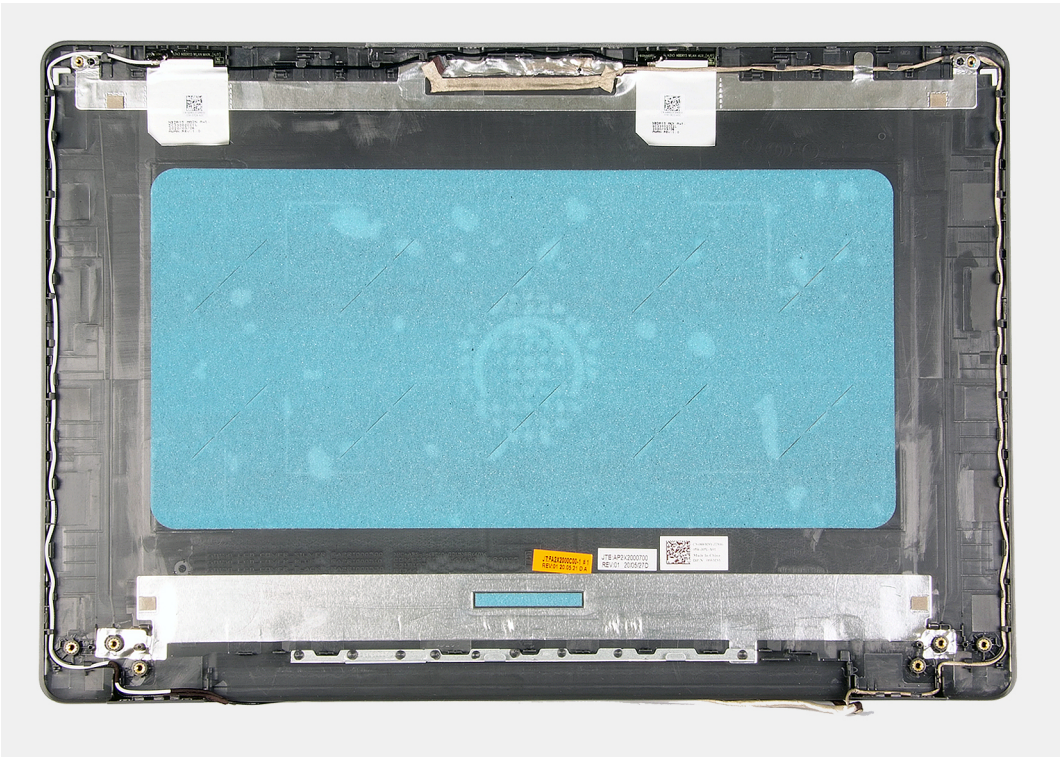
After performing all the preceding steps, you are left with the display back-cover.



Installing the display back-cover

About this task

Place the display back-cover on a clean and flat



surface.

Next steps

1. Install the display panel.

2. Install the display bezel.
3. Install the display assembly.
4. Install the WLAN.
5. Connect the battery cable.
6. Install the base cover.
7. Install the SD card.
8. Follow the procedure in after working inside your computer.

Power button

Removing the power button

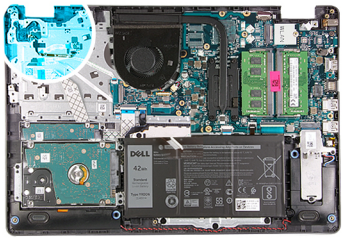
Prerequisites

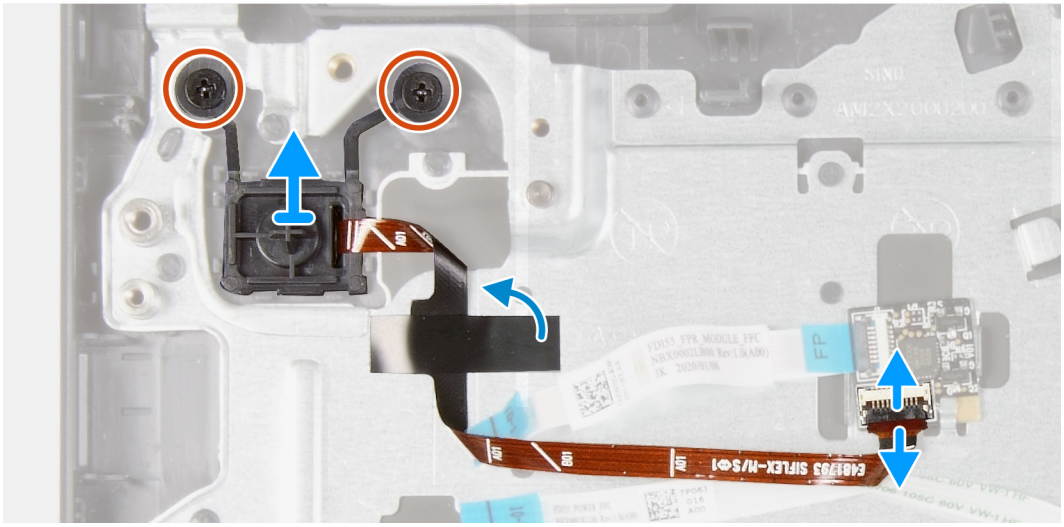
1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Disconnect the battery cable.
5. Remove the IO board.

About this task



2x
M2x3





Steps

1. Remove the two (M2x3) screws securing the power button to the palmrest.
2. Disconnect the power button cable and remove the power button from the system.

Installing the power button

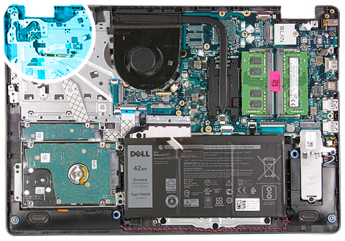
Prerequisites

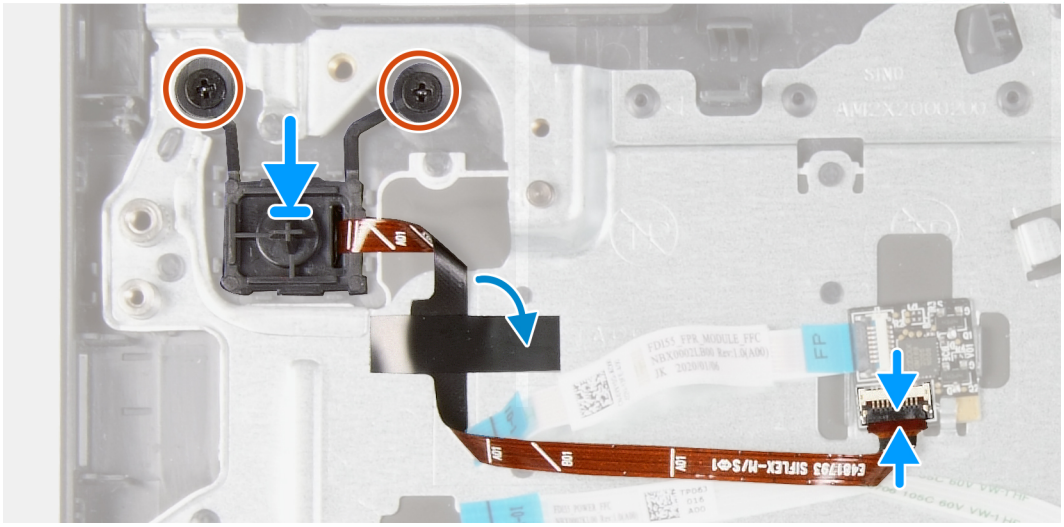
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task



2x
M2x3





NOTE: When replacing/re-installing the power button with fingerprint reader assembly on the Vostro 3501, a mylar sticker must be adhered to the fingerprint reader FPC to ensure that it is properly grounded to the palm rest. The mylar sticker is packaged together with new replacement power button with fingerprint reader assemblies

Steps

1. Place the power-button board into the slot on the palmrest.
2. Install the two (M2x3) screws to secure the power button to the palmrest.
3. Connect the power button cable to the connector on the system board.

Next steps

1. Install the IO board.
2. Connect the battery cable.
3. Install the base cover.
4. Install the SD card.
5. Follow the procedure in after working inside your computer.

System board

Removing the system board - Realtek audio

Prerequisites

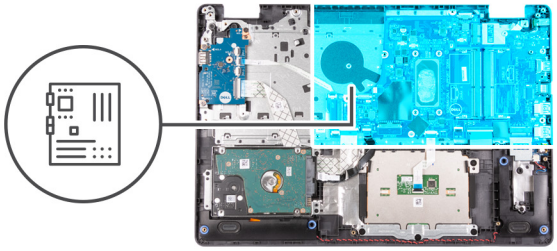
1. Follow the procedure in before working inside your computer
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the WLAN.
6. Remove the SSD.
7. Remove the memory.
8. Remove the system fan.
9. Remove the heatsink.

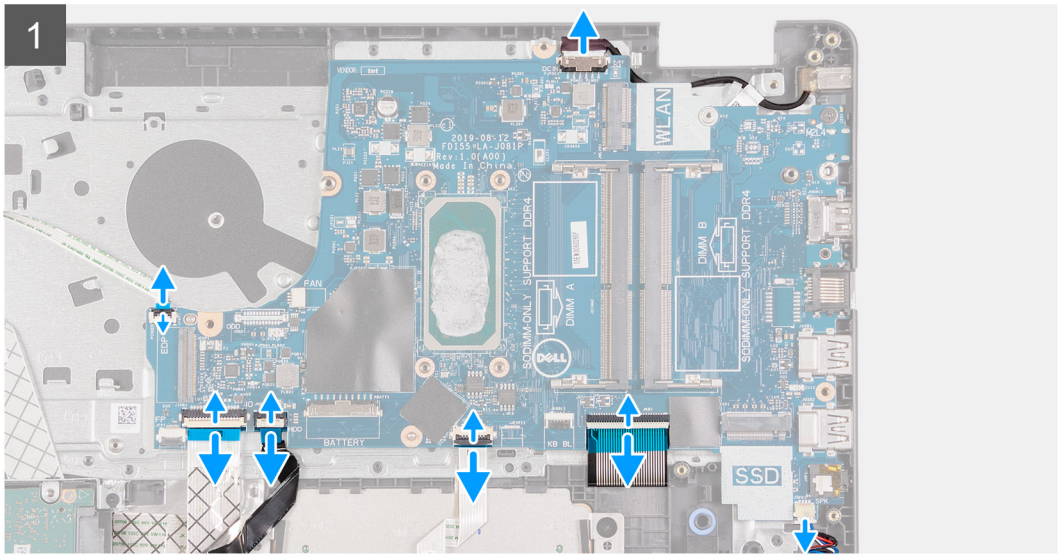
   NOTE: The system board can be removed along with the heat sink.
10. Remove the display assembly.

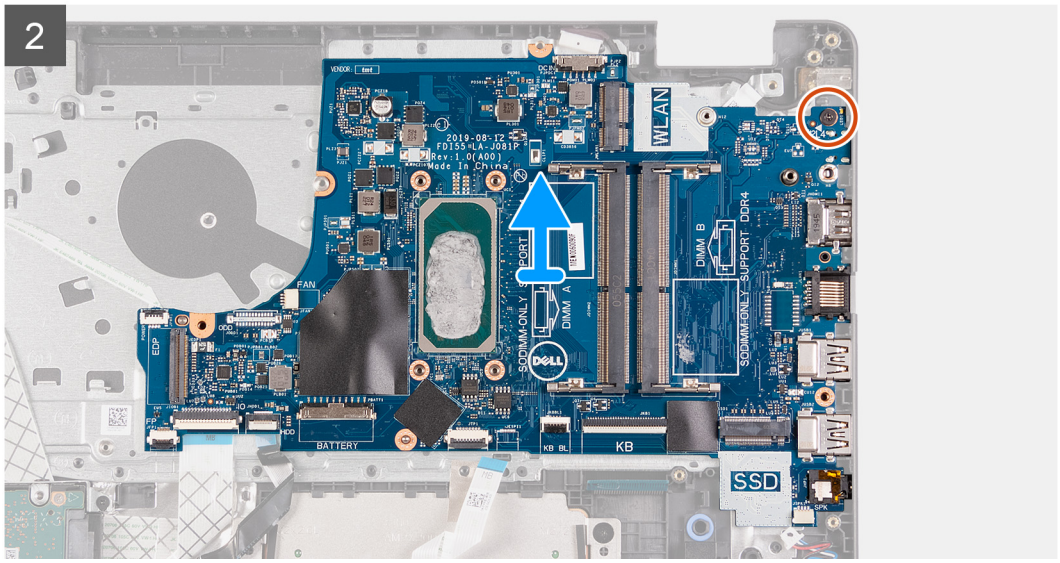
About this task

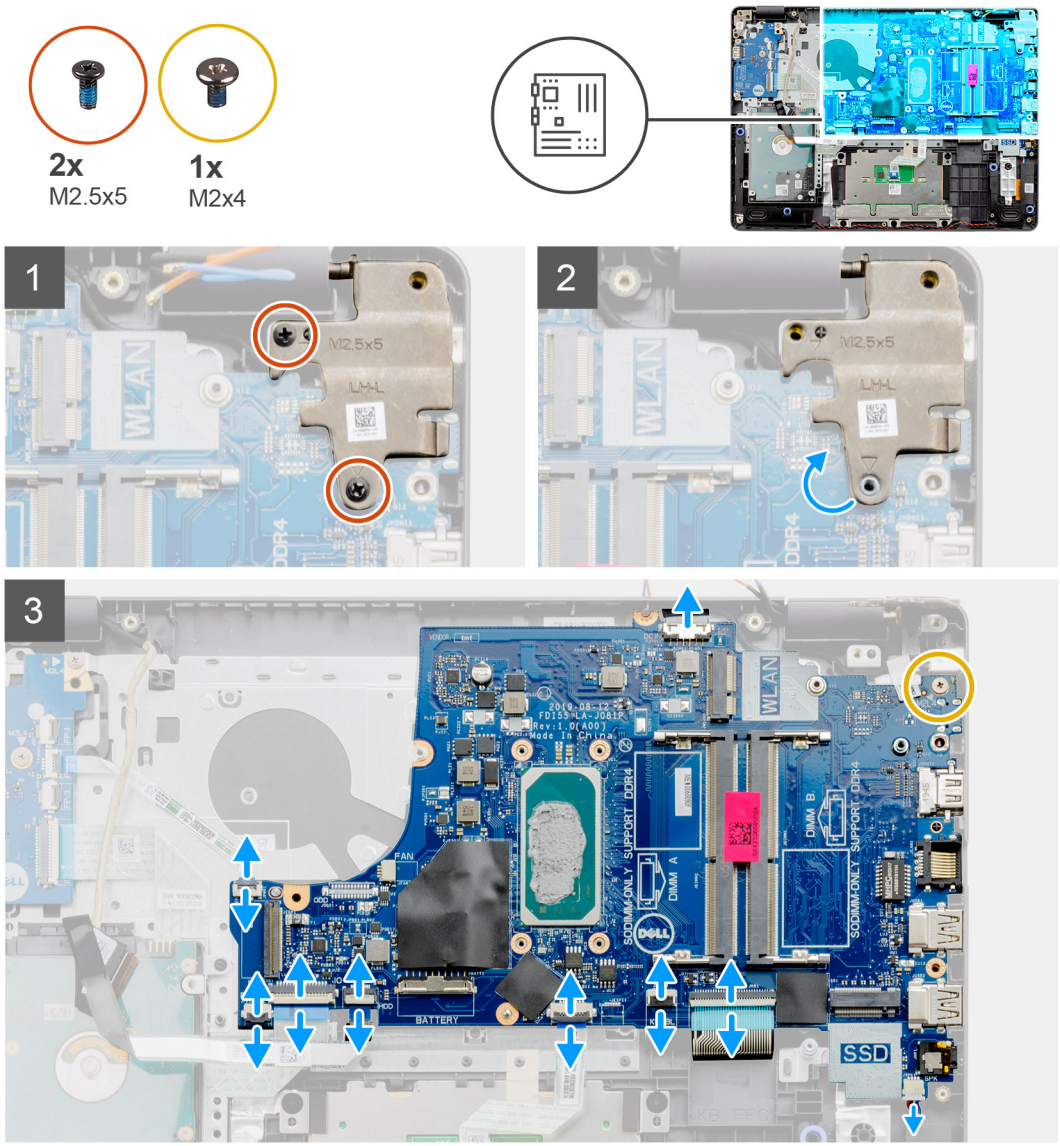


1x
M2x4









Steps

1. Disconnect the following cables from the system board:
   a. Speaker cable
   b. Keyboard FFC
   c. Power adapter port cable
   d. Keyboard backlight FFC
   e. Touchpad FFC
   f. Hard drive FFC
   g. IO board FFC
   h. Fingerprint reader FFC
   i. Power button FFC from the system board
2. Remove the single (M2x4) screw that secures the system board to the palmrest.
3. Carefully lift the system board away from the chassis.

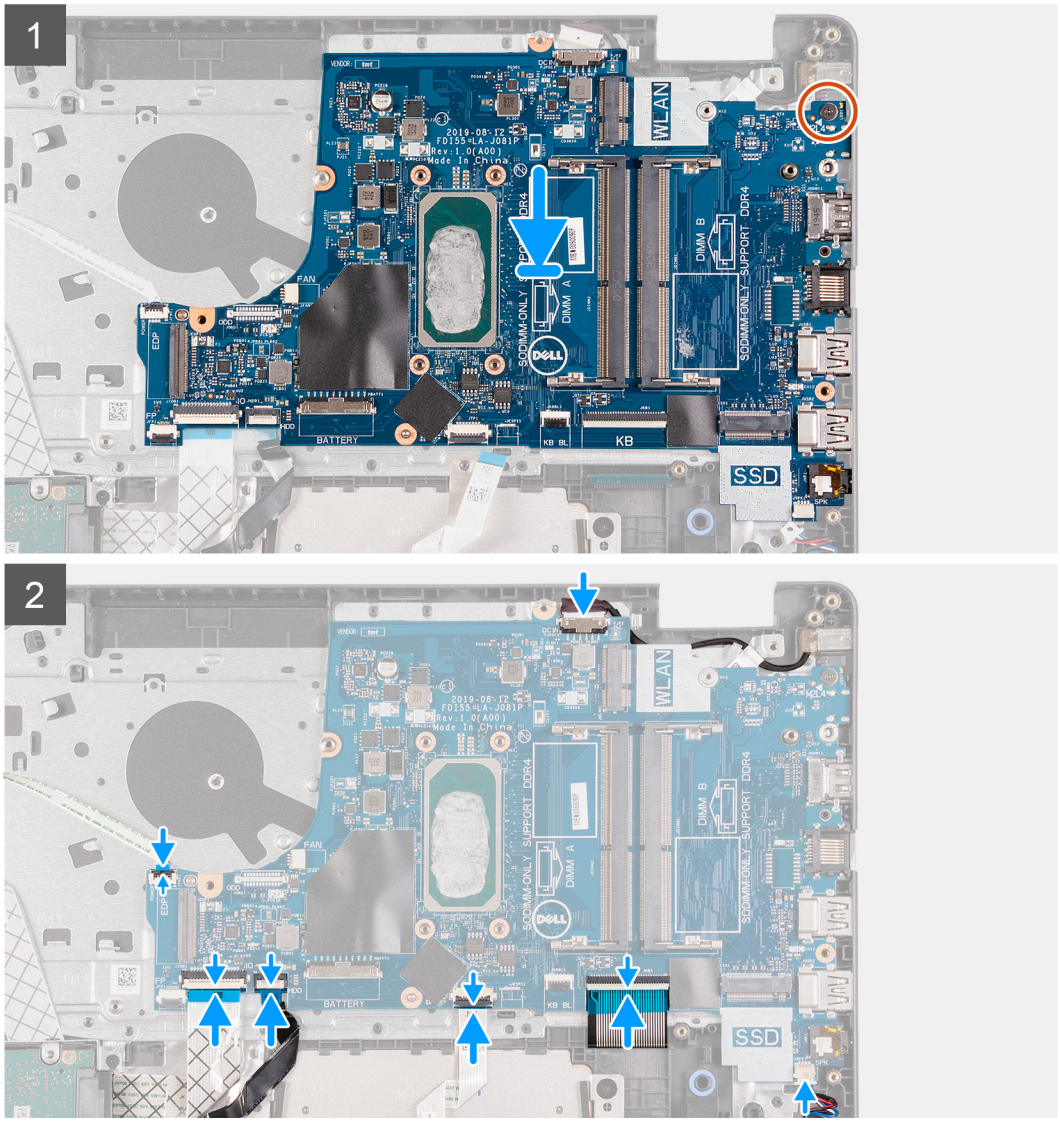
Installing the system board - Realtek audio

Prerequisites

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

About this task





Steps

1. Align and place the system board on the palmrest.
2. Replace the single (M2x4) screw that secures the system board to the palmrest.
3. Connect the following cables to the system board:
   a. Speaker cable
   b. Keyboard FFC
   c. Keyboard backlight FFC
   d. Touchpad FFC
   e. Hard drive FFC
   f. IO board FFC
   g. Power adapter port cable

h. Fingerprint reader FFC
i. Power button FFC from the system board

Next steps

1. Install the display assembly.
2. Install the heatsink.
3. Install the system fan.
4. Install the memory.
5. Install the SSD.
6. Install the WLAN.
7. Install the battery.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in after working inside your computer.

Removing the system board - Cirrus Logic audio

Prerequisites

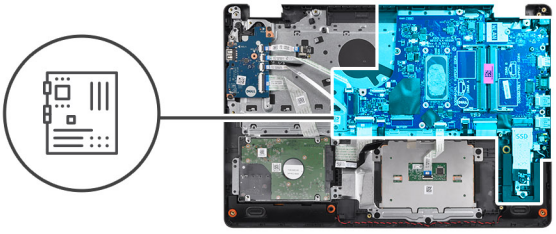
1. Follow the procedure in before working inside your computer
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the WLAN.
6. Remove the SSD.
7. Remove the memory.
8. Remove the system fan.
9. Remove the heatsink.

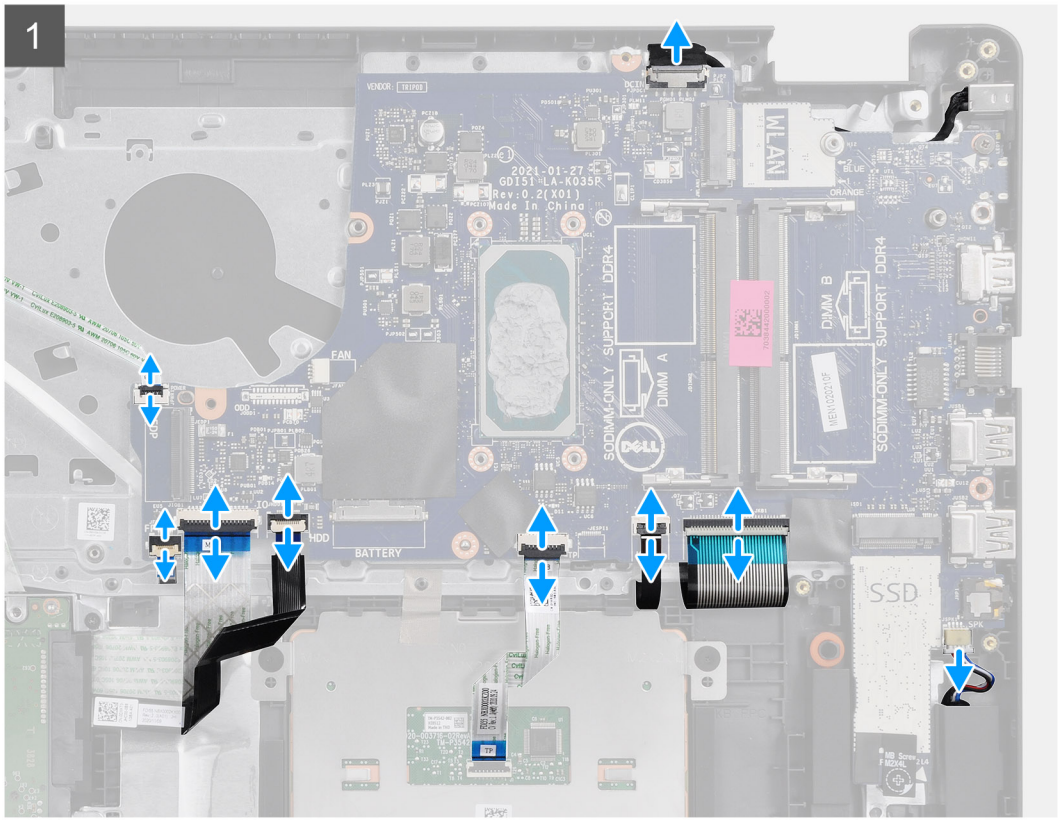
   NOTE: The system board can be removed along with the heat sink.
10. Remove the display assembly.

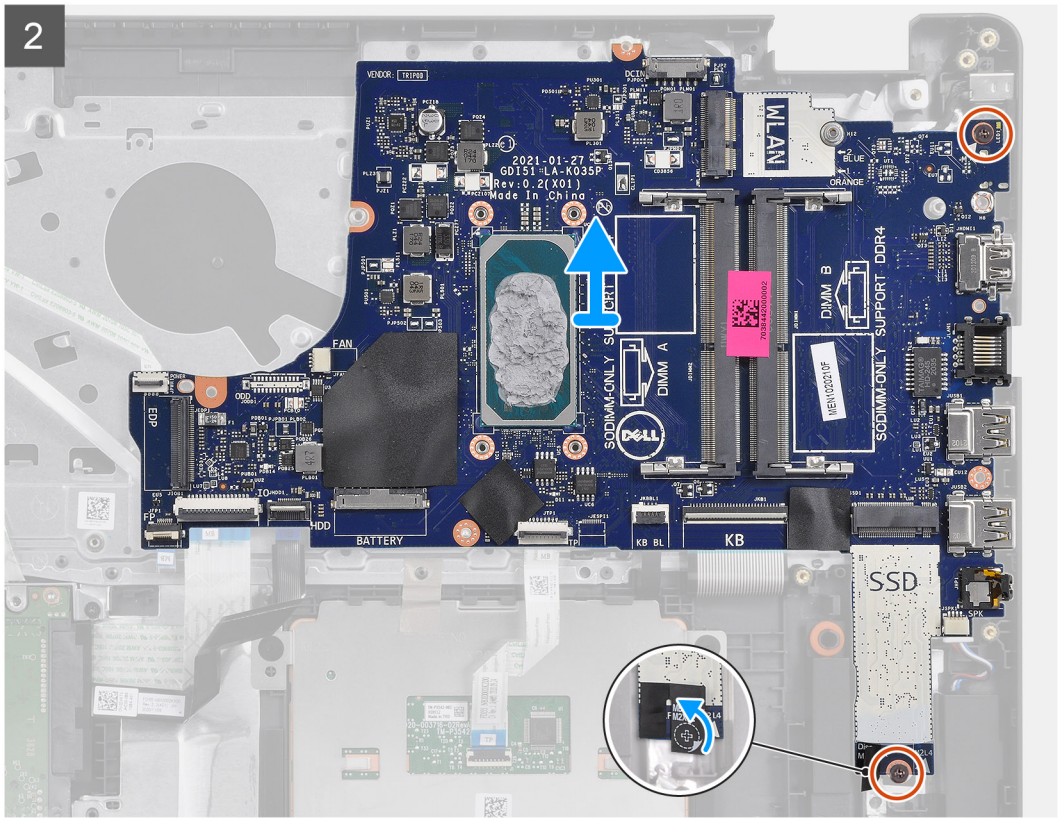
About this task



2x
M2x4







Steps

1. Disconnect the following cables from the system board:
   a. Speaker cable
   b. Keyboard FFC
   c. Power adapter port cable
   d. Keyboard backlight FFC
   e. Touchpad FFC
   f. Hard drive FFC
   g. IO board FFC
   h. Fingerprint reader FFC
   i. Power button FFC from the system board
2. Peel back the Mylar tape from over the screw hole
3. Remove the two (M2x4) screws that secures the system board to the palmrest.
4. Carefully lift the system board away from the chassis.

Installing the system board - Cirrus Logic audio

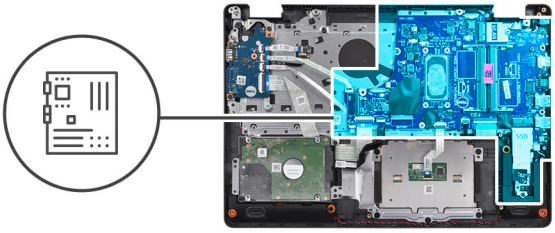
Prerequisites

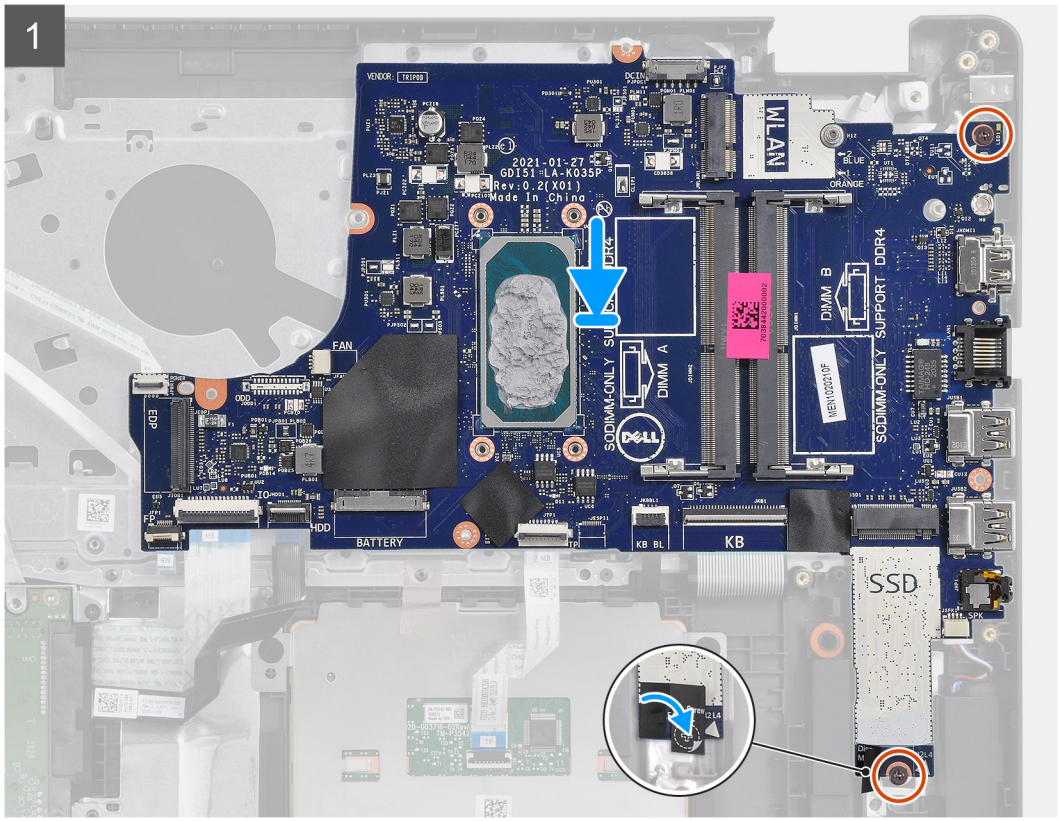
If you are replacing a component, remove the existing component before performing the installation procedure.

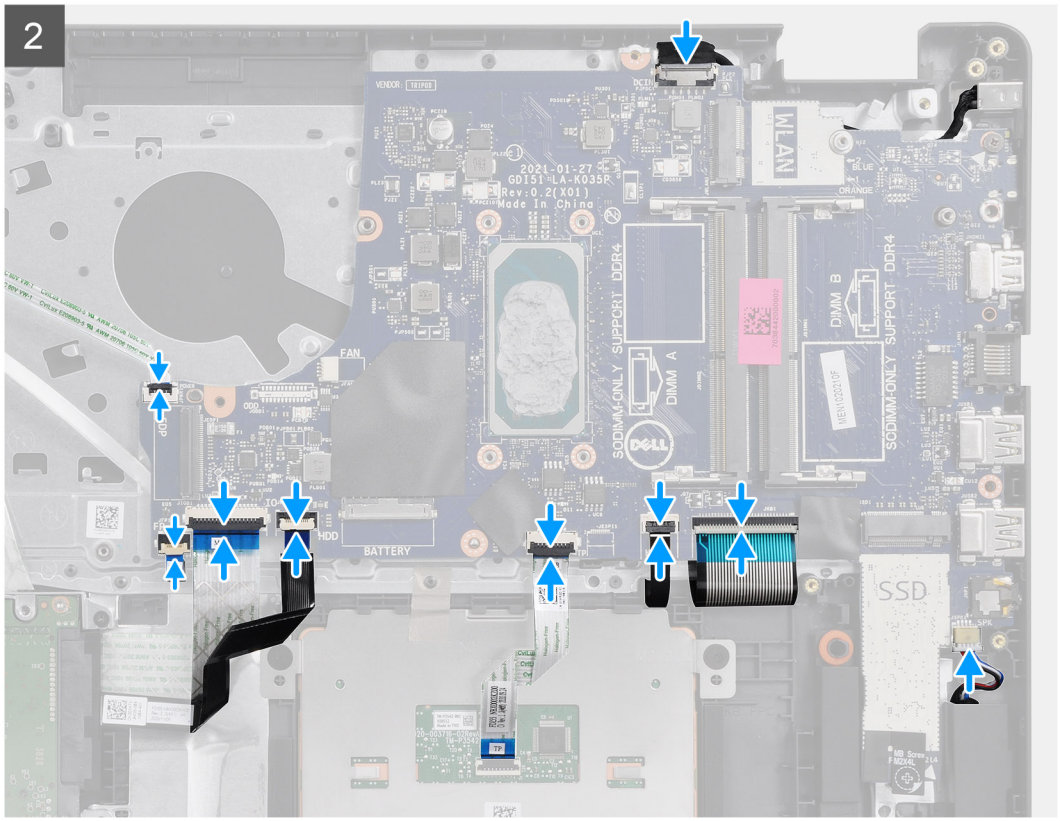
About this task



2x
M2x4







Steps

1. Align and place the system board on the palmrest.
2. Peel back the Mylar tape from over the screw hole.
3. Replace the two screws (M2x4) that secures the system board to the palmrest.
4. Connect the following cables to the system board:
   a. Speaker cable
   b. Keyboard FFC
   c. Keyboard backlight FFC
   d. Touchpad FFC
   e. Hard drive FFC
   f. IO board FFC
   g. Power adapter port cable
   h. Fingerprint reader FFC
   i. Power button FFC from the system board

Next steps

1. Install the display assembly.
2. Install the heatsink.
3. Install the system fan.
4. Install the memory.
5. Install the SSD.
6. Install the WLAN.
7. Install the battery.
8. Install the base cover.
9. Install the SD card.
10. Follow the procedure in after working inside your computer.

Power-adapter port

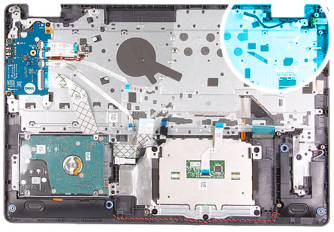
Removing the power adapter port

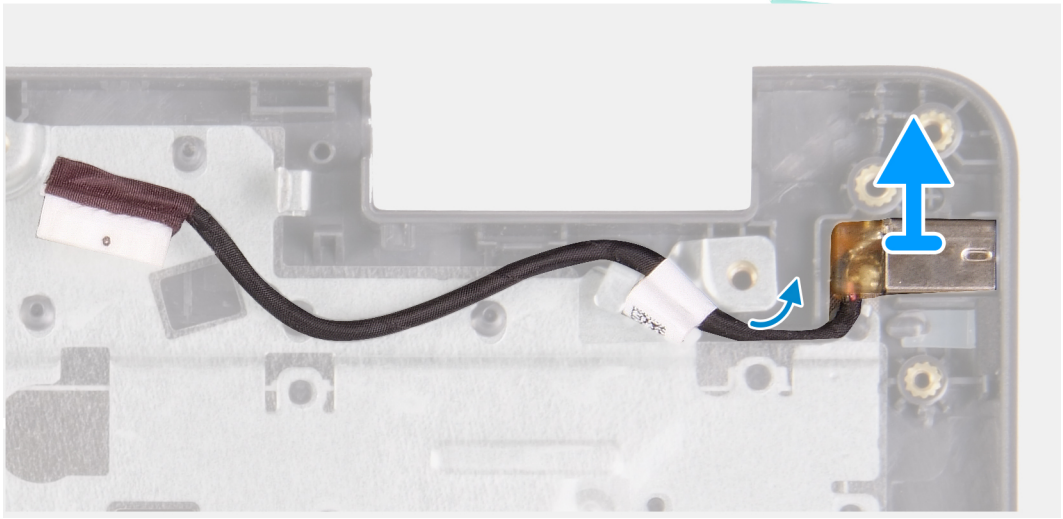
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery cable.
5. Remove the WLAN.
6. Remove the SSD.
7. Remove the system fan.
8. Remove the display assembly
9. Remove the system board

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

About this task





Steps

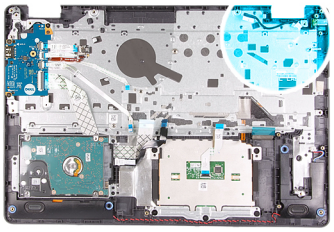
1. Disconnect and un-route the power adapter port module from the system board.
2. Remove the power adapter port module from the system.

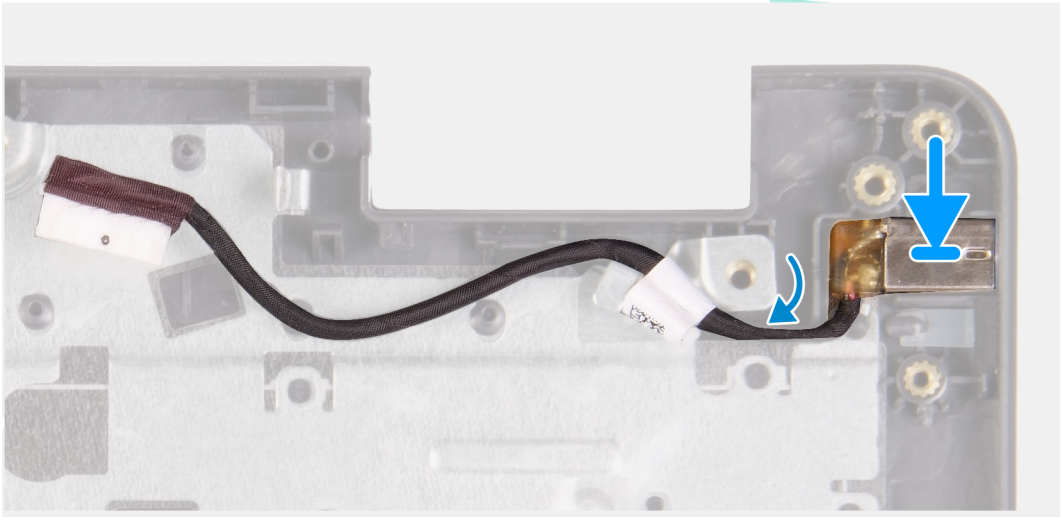
Installing the power adapter port

Prerequisites

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

About this task





Steps

Place the power adapter port module into the slot provided on the palmrest.

Next steps

1. Install the system board.
2. Install the display assembly.
3. Install the system fan.
4. Install the SSD.
5. Install the WLAN.
6. Connect the battery cable.
7. Install the base cover.
8. Install the SD card.
9. Follow the procedure in after working inside your computer.

Palm-rest and keyboard assembly

Removing the palmrest and keyboard assembly

Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the WLAN.
6. Remove the memory
7. Remove the display assembly.
8. Remove the SSD.

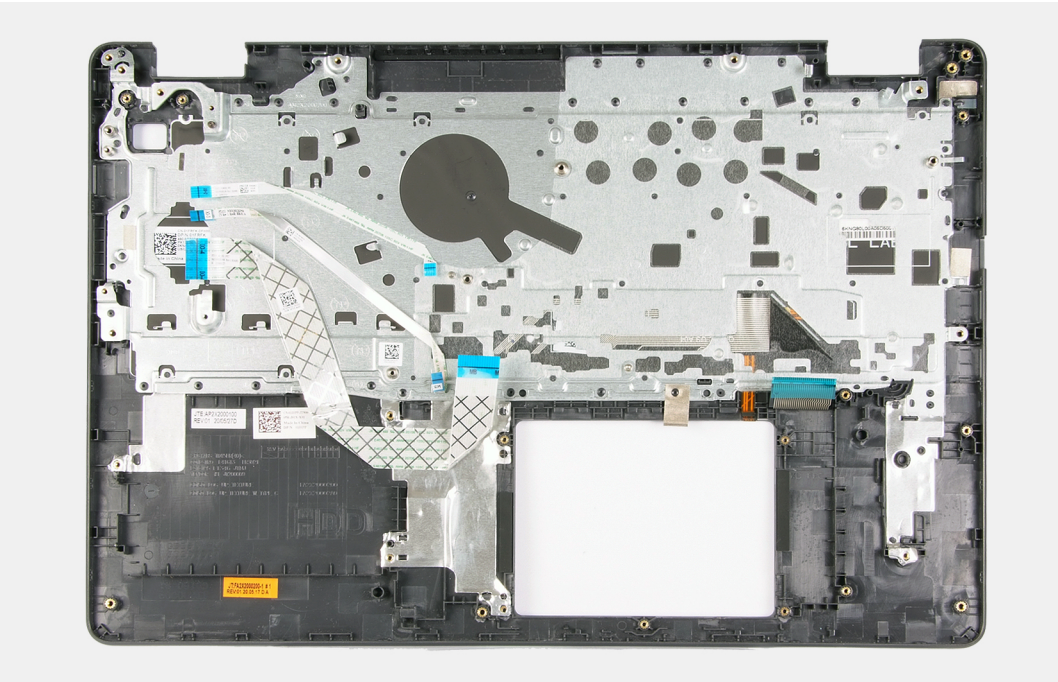
9. Remove the hard drive assembly.
10. Remove the speakers.
11. Remove the coin-cell battery.
12. Remove the system fan.
13. Remove the heatsink.

    NOTE: The system board can be removed along with the heat sink.
14. Remove the IO board.
15. Remove the touchpad.
16. Remove the power adapter port.
17. Remove the system board.

About this task

NOTE: The system board can be removed and installed together with the heatsink still attached.

After performing the preceding steps, you are left with the palmrest and keyboard assembly.



Next steps

1. Install the system board.
2. Install the power adapter port.
3. Install the touchpad.
4. Install the IO board.
5. Install the heatsink.
6. Install the system fan.
7. Install the coin-cell battery.
8. Install the speakers.
9. Install the hard drive assembly.
10. Install the SSD.
11. Install the display assembly.
12. Install the memory
13. Install the WLAN.
14. Install the battery.
15. Install the base cover.
16. Install the SD card.
17. Follow the procedure in before working inside your computer.

5

Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ 000123347.

6

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.

BIOS overview

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

Entering BIOS setup program

Steps

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

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

Navigation keys

NOTE: For most of the System Setup options, changes that you make are recorded but do not take effect until you restart the system.

Table 3. Navigation keys

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area. **NOTE:** For the standard graphics browser only.
Esc	Moves to the previous page until you view the main screen. Pressing Esc in the main screen displays a message that

Table 3. Navigation keys (continued)

Keys	Navigation
	prompts you to save any unsaved changes and restarts the system.

One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F12 immediately.

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

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

- Removable Drive (if available)
- STXXXX Drive (if available)

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

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

BIOS setup

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

Overview

Table 4. 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 ○ Signed Firmware Update ● **Battery** ○ Primary ○ Battery Level ○ Battery State ○ Health ○ AC Adapter ● **Processor Information** ○ Processor Type ○ Maximum Clock Speed

Table 4. Overview

Option	Description
	○ 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 Options

Table 5. Boot Options

Option	Description
Enable Boot Devices	UEFI Hard Drive - Allows the user to select Enable boot devices detected by the system. 1. Windows Boot Manager 2. UEFI Hard Drive **NOTE:** Legacy Boot mode is not supported on this platform.
Add / Remove / View Boot Devices	Allows the user to add or remove boot devices listed above. The controls available are as follows: ● Add Boot Options ● Remove Boot Options ● View
UEFI Boot Path Security	Allows the user to control if the system should ask for admin password. The controls available are as follows: ● Never ● Always ● Always Except Internal HDD

System configuration

Table 6. System configuration

Option	Description
Date/Time	The options are: • **Date** • **Time** **NOTE:** Legacy Boot mode is not supported on this platform.
Network Controller Configurator	**Integrated NIC**: 1. Disabled 2. Enabled 3. Enabled with PXE **Enable UEFI Network Stack**: 1. On 2. Off
Storage Interface	**Port Enablement** - Allows the user to enable/disable onboard drives. The user can toggle on/off for the following drives: • **SATA-0** • **M.2 PCIe SSD-0/SATA-2**
SATA Operation	Allows the user to set the SATA operation mode for the storage devices available. The options available are as follows: • **Disabled** • **AHCI** • **RAID On**
Drive Information	This section displays the driver configuration and specification for all storage devices available.
Enable Audio	Allows the user to enable internal audio devices. The options available are as follows: • **Enable Microphone** • **Enable Internal Speaker**
USB Configuration	Allows the user to enable USB Boot devices. The options available are as follows: • **Enable USB Boot Support** • **Enable External USB Ports**
Miscellaneous Devices	Allows the user to enable internal Camera. The options available are as follows: • **Enable Camera**
Keyboard Illumination	Allows the user to configure the keyboard brightness levels. The options available are as follows: • **Disabled** • **Dim** • **Bright**

Video

Table 7. Video

Option	Description
LCD Brightness	Set the screen brightness when running on battery power. • 0 - 100
Brightness on AC power	Set the screen brightness when running on AC power. • 0 - 100
EcoPower	**Enable EcoPower** - Enable to increase battery life and reduce the display brightness when appropriate. The options are: • **On** • **Off**

Security

Table 8. Security

Option	Description
Enable Admin Setup Lockout	Allows the admin to allow/block users from accessing the BIOS menu • **On** • **Off** **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.
Password Bypass	Allows the user to control if the systems prompts for the system and hard drive passwords when powered on from off state: • **Disabled** • **Reboot Bypass**
Enable Non-Admin Password Changes	When enabled, the user can change system and hard drive password without admin password. • **On** • **Off**
Enable UEFI Capsule Firmware Updates	Allows the user to configure BIOS updates via UEFI capsule update packages • **On** • **Off**
Absolute	Allows the user to enable, disable or permanently disable the BIOS module interface of the optional Absolute Persistence Module service. The controls are as follows: • **Enabled** • **Disabled** • **Permanently Disabled**
TPM 2.0 Security On	Allows the user to enable or disable TPM security. The controls are as follows: • **On** • **Off**

Table 8. Security (continued)

Option	Description
PPI Bypass for Enable Commands	Allows the user to enable or disable TPM Physical Presence Interface (PPI). The controls are as follows: • **On** • **Off**
PPI Bypass for Disabled Commands	Allows the user to enable or disable TPM Physical Presence Interface (PPI). The controls are as follows: • **On** • **Off**
PPI Bypass for Clear Commands	Allows the user to enable or disable TPM Physical Presence Interface (PPI). The controls are as follows: • **On** • **Off**
Attestation Enable	Allows the user to enable or disable TPM endorsement Hierarchy for the operating system. The controls are as follows: • **On** • **Off**
Key Storage Enable	Allows the user to enable or disable TPM endorsement Hierarchy for the operating system. The controls are as follows: • **On** • **Off**
SHA-256	Allows the user to enable SHA-256 hash algorithm to extend the measurements into the TPM PCRs during BIOS boot. The controls are as follows: • **On** • **Off**
Clear	Allows the user to clear TPM owner information and returns TPM to default state. The controls are as follows: • **On** • **Off**
TPM State	Allows the user to enable/disable TPM. The controls are as follows: • **On** • **Off**
SMM Security Mitigation	Allows the user to enable/disable UEFI SMM Security Mitigation. The controls are as follows: • **On** • **Off**

Passwords

Table 9. Passwords

Option	Description
Enable Strong Passwords	Allows the user to enable complex admin and system passwords: • **On** • **Off** **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

Table 9. Passwords (continued)

Option	Description
	password has to be set first if the admin password has to be used with system password and/or hard drive password.
Password Configuration	Allows the user to set the maximum number of characters for Admin and System oasswords: • **Admin Password Min (04)** • **Admin Password Max (32)** • **System Password Min (04)** • **System Password Max (32)**
Admin Password	Allows you to configure an admin 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. **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.

Secure Boot

Table 10. Secure Boot

Option	Description
Secure Boot	Secure Boot helps ensure the 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

Table 11. Expert Key Management

Option	Description
Enable Custom Mode	Aloows the user to manipulate security key databases • **On** • **Off** — By default, this option is enabled.
Expert Key Management	The Custom Mode Key Management options are: • **PK**—By default, this option is enabled. • **KEK** • **db** • **dbx**

Performance

Table 12. 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** This option is enabled by default.

Table 12. Performance (continued)

Option	Description
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.
	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.

Power management

Table 13. Power Management

Option	Description
Wake on AC	Allows the system to wake up to perform basic checks when the adapter is connected. • **On** • **Off** — enabled by default
Enable USB Wake Support	Allows you to enable USB devices to wake the system from standby mode. • **On** • **Off** — enabled by default **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.
Auto On Time	Allows the user to set a defined day/time when they want the system to automatically power on The options are: • **Disable**—enabled by default • **Every Day** • **Weekdays** • **Select Days**

Table 13. Power Management (continued)

Option	Description
	The user will see the days of the week listed with fields to select the time.
Battery Charge Configuration	Allows the user to set the preferred battery charging plan for the system: The options are: • **Adaptive**—enabled by default • **Standard** • **Primarily AC Use** • **CUstom** - Allows the user to set a Start/Stop percentage for battery
Enable Advanced Battery Charge Configuration	Allows the user to enable advanced configuration to maximize battery health while supporting heavy usage. The controls are as follows: • **On** • **Off** The UI below allows the user to set the day and time to further configure battery charging behaviour.
Peak Shift	Allows the system to run on battery during peak power usage hours. The controls are as follows: • **On** • **Off** The UI below allows the user to set the peak day and time to further configure battery usage behavior.

Wireless

Table 14. Wireless options

Option	Description
Wireless Device Enable	The options are: • **WLAN** - Enable / Disable the WLAN device • **Bluetooth** - Enable / Disable the Bluetooth device

POST behavior

Table 15. POST behavior

Option	Description
Numlock Enable	Allows the user to enable/disable numlock **Enable numlock** • **ON** - Enabled by default • **OFF**
FN Lock	Allows the user to enable/disable Function keys • **ON** - Enabled by default • **OFF** Lock Mode: • **Lock Mode Standard** - When selected, the F1 - F12 keys will hold their traditional functions. • **Lock Mode Secondary** - When selected, the F1 - F12 keys will switch to secondary functions with media and system controls.

Table 15. POST behavior (continued)

Option	Description
Warnings and Errors	Allows the user to configure in what circumstances would the system stop the boot process upon encountering errors: • **Prompt on Warning Errors** — System will wait for user input when errors or warnings are detected. • **Continue on Warning** — System will wait for user input only when errors are detected. • **Continue on Warning and Errors** — System will not ask for user input even when errors or warnings are detected.
Enable Adapter Warnings	Allows the user to configure the system to give an error message when lower power adapter is detected. The controls are as follows: • **On** • **Off**
Fastboot	Allows the user to configure the speed of UEFI boot process: • **Minimal** • **Thorough** • **Auto**
Extend BIOS POST Time	Allows the user to configure the BIOS POST load time • **0 seconds** • **5 seconds** • **10 seconds**

Maintenance

Table 16. Maintenance

Option	Description
Service Tag	Displays the service tag of your computer.
Asset Tag	Allows the admin to add an Asset Tag. It is a string of 64 characters that are used by IT administrator to uniquely identify a particular system. Once an asset tag is set, it cannot be changed.
BIOS Recovery from Hard Drive	Allows you to enable or disable recovery from a corrupt BIOS from a copy stored on the hard drive. • **ON** - Enabled by default. • **OFF** The user also gets a check box that allows enabling automatic recovery of the BIOS without user input.
Start Data Wipe	Allows the user to setup an autowipe on the storage devices on the system upon a reboot. The options are: • **ON** • **OFF** - 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

Updating the BIOS in Windows

Steps

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

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

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.

   For more information, see knowledge base article 000124211 at www.dell.com/support.

Updating the BIOS in Linux and Ubuntu

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

Updating the BIOS using the USB drive in Windows

Steps

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article 000145519 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Updating the BIOS from the F12 One-Time boot menu

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

About this task

BIOS Update

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

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

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

Updating from the One-Time boot menu

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

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

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

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

Steps

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

System and setup password

Table 18. System and setup password

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

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

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

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

About this task

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

Steps

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

Deleting or changing an existing system setup password

Prerequisites

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

About this task

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

Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
   The **System Security** screen is displayed.

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

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

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

Clearing BIOS (System Setup) and System passwords

About this task

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

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

7

Troubleshooting

Handling swollen Lithium-ion batteries

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

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

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

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

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

Lithium-ion batteries can swell for various reasons such as age, number of charge cycles, or exposure to high heat. For more information on how to improve the performance and lifespan of the laptop battery and to minimize the possibility of occurrence of the issue, see Dell Laptop Battery - Frequently Asked Questions.

Dell SupportAssist Pre-boot System Performance Check diagnostics

About this task

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

- Run tests automatically or in an interactive mode
- Repeat tests

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

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

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

Running the SupportAssist Pre-Boot System Performance Check

Steps

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

System diagnostic lights

Power and battery-status light

Indicates the power and battery-charge status.

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

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

Off

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

The power and battery-status light 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 19. LED codes

Diagnostic light codes	Problem description	Recommended solutions
1,1	TPM detection failure	Replace the system board.
1,2	Unrecoverable SPI Flash failure	Replace the system board.
1,3	Short in hinge cable tripped OCP1	Check if the display cable (EDP) is seated properly or pinched at the hinges. If problem persists, replace either display cable (EDP) or display assembly (LCD).
1,4	Short in hinge cable tripped OCP2	Check if the display cable (EDP) is seated properly or pinched at the hinges. If problem persists, replace either display cable (EDP) or display assembly (LCD).

Table 19. LED codes (continued)

Diagnostic light codes	Problem description	Recommended solutions
1,5	EC unable to program i-Fuse	Replace the system board.
1,6	Generic catch-all for ungraceful EC code flow errors	Disconnect all power source (AC, battery, coin cell) and drain flea power by pressing & holding down power button.
2,1	Processor failure	Run the Intel CPU diagnostics tools. If problem persists, replace the system board.
2,2	System board: BIOS or ROM (Read-Only Memory) failure	Flash latest BIOS version. If problem persists, replace the system board.
2,3	No memory or RAM (Random-Access Memory) detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2,4	Memory or RAM (Random-Access Memory) failure	Reset and swap memory modules amongst the slots. If problem persists, replace the memory module.
2,5	Invalid memory installed	Reset and swap memory modules among the slots. If problem persists, replace the memory module.
2,6	System-board or chipset error	Flash latest BIOS version. If problem persists, replace the system board.
2,7	LCD failure - SBIOS message	Replace display vable (EDP) if possible, otherwise replace the display assembly (LCD).
2,8	LCD failure - EC detection of power rail failure	Replace the system board.
3,1	Coin-cell battery failure	Reset the CMOS battery connection. If problem persists, replace the RTC battery.
3,2	PCI, video card/chip failure	Replace the system board.
3,3	Recovery image not found	Flash latest BIOS version. If problem persists, replace the system board.
3,4	Recovery image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.
3,5	Power-rail failure	EC ran into power sequencing failure. If problem persists, replace the system board.
3,6	System BIOS Flash incomplete	Flash corruption detected by SBIOS. If problem persists, replace the system board.
3,7	Management Engine (ME) error	Timeout waiting on ME to reply to HECI message. If problem persists, replace the system board.

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

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

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

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

Recovering the operating system

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

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

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

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

Updating the BIOS in Windows

Steps

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

   NOTE: If you do not have the Service Tag, use the SupportAssist feature to automatically identify your computer. You can also use the product ID or manually browse for your computer model.
3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.

   For more information, see knowledge base article 000124211 at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

Steps

1. Follow the procedure from step 1 to step 6 in Updating the BIOS in Windows to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information, see the knowledge base article 000145519 at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** .
6. Select the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
   The **BIOS Update Utility** appears.
8. Follow the on-screen instructions to complete the BIOS update.

Backup media and recovery options

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

WiFi power cycle

About this task

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

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

Steps

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

Drain residual flea power (perform hard reset)

About this task

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

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

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

To drain residual flea power (perform a hard reset)

Steps

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

NOTE: For more information about performing a hard reset, see the knowledge base article 000130881 at www.dell.com/support.

8

Getting help and contacting Dell

Self-help resources

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

Table 20. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
My Dell app	
Tips	
Contact Support	In Windows search, type `Contact Support`, and press Enter.
Online help for operating system	www.dell.com/support/windows
Access top solutions, diagnostics, drivers and downloads, and learn more about your computer through videos, manuals and documents.	Your Dell computer is uniquely identified by a Service Tag or Express Service Code. To view relevant support resources for your Dell computer, enter the Service Tag or Express Service Code at www.dell.com/support. For more information on how to find the Service Tag for your computer, see Locate the Service Tag on your computer.
Dell knowledge base articles for a variety of computer concerns	1. Go to www.dell.com/support. 2. On the menu bar at the top of the Support page, select **Support** > **Knowledge Base**. 3. In the Search field on the Knowledge Base page, type the keyword, topic, or model number, and then click or tap the search icon to view the related articles.

Contacting Dell

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

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

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