Latitude 3510

Service Manual

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Regulatory Model: P101F
Regulatory Type: P101F001, P101F001

May 2020
Rev. A00

Notes, cautions, and warnings

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

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

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

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Working on your computer

Safety instructions

Prerequisites

Use the following safety guidelines to protect your computer from potential damage and to ensure your personal safety. Unless otherwise noted, each procedure included in this document assumes that the following conditions exist:

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

About this task

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

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

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

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

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

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

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

Before working inside your computer

About this task

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

Steps

1. Ensure that you follow the Safety Instructions.
2. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
3. Turn off your computer.
4. Disconnect all network cables from the computer.

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

5. Disconnect your computer and all attached devices from their electrical outlets.

6. Press and hold the power button while the computer is unplugged to ground the system board.

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

Safety precautions

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

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

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

Standby power

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

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

Bonding

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

Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

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

- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

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

ESD protection summary

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

After working inside your computer

About this task

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

Steps

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

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

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

2

Technology and components

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

Topics:

- USB features
- USB Type-C
- HDMI 1.4
- Power button LED behavior

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.

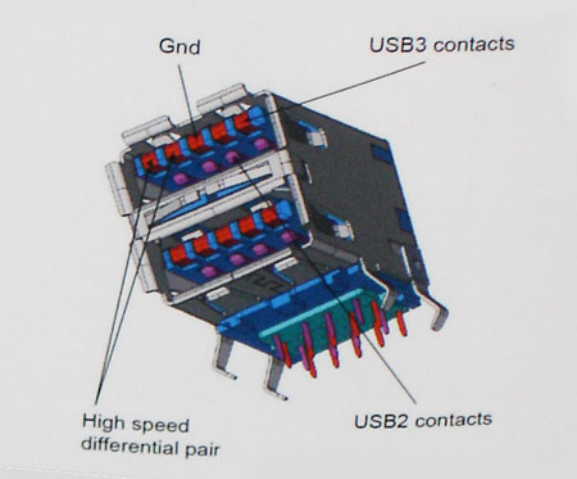
Speed

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 2Gbps throughput. Where 480Mbps was limiting, 5Gbps is more than promising. With its promised 4.8Gbps 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.

USB Type-C

USB Type-C is a new, tiny physical connector. The connector itself can support various exciting new USB standards like USB 3.1 and USB power delivery (USB PD).

Alternate Mode

USB Type-C is a new connector standard that is very small. It is about a third the size of an old USB Type-A plug. This is a single connector standard that every device should be able to use. USB Type-C ports can support a variety of different protocols using “alternate modes,” which allows you to have adapters that can output HDMI, VGA, DisplayPort, or other types of connections from that single USB port

USB Power Delivery

The USB PD specification is also closely intertwined with USB Type-C. Currently, smartphones, tablets, and other mobile devices often use a USB connection to charge. A USB 2.0 connection provides up to 2.5 watts of power — that'll charge your phone, but that's about it. A laptop might require up to 60 watts, for example. The USB Power Delivery specification ups this power delivery to 100 watts. It's bi-directional, so a device can either send or receive power. And this power can be transferred at the same time the device is transmitting data across the connection.

This could spell the end of all those proprietary laptop charging cables, with everything charging via a standard USB connection. You could charge your laptop from one of those portable battery packs you charge your smartphones and other portable devices from today. You could plug your laptop into an external display connected to a power cable, and that external display would charge your laptop as you used it as an external display — all via the one little USB Type-C connection. To use this, the device and the cable have to support USB Power Delivery. Just having a USB Type-C connection doesn't necessarily mean they do.

USB Type-C and USB 3.1

USB 3.1 is a new USB standard. USB 3's theoretical bandwidth is 5 Gbps, while USB 3.1's is 10 Gbps. That's double the bandwidth, as fast as a first-generation Thunderbolt connector. USB Type-C isn't the same thing as USB 3.1. USB Type-C is just a connector shape, and the underlying technology could just be USB 2 or USB 3.0. In fact, Nokia's N1 Android tablet uses a USB Type-C connector, but underneath it's all USB 2.0 — not even USB 3.0. However, these technologies are closely related.

Thunderbolt over USB Type-C

Thunderbolt is a hardware interface that combines data, video, audio, and power in a single connection. Thunderbolt combines PCI Express (PCIe) and DisplayPort (DP) into one serial signal, and additionally provides DC power, all in one cable. Thunderbolt 1 and Thunderbolt 2 use the same connector as miniDP (DisplayPort) to connect to peripherals, while Thunderbolt 3 uses a USB Type-C connector.

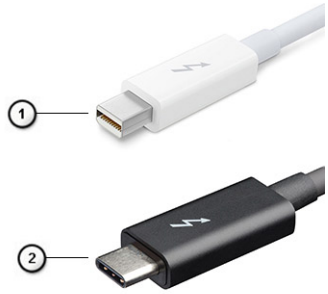


Figure 1. Thunderbolt 1 and Thunderbolt 3

1. Thunderbolt 1 and Thunderbolt 2 (using a miniDP connector)
2. Thunderbolt 3 (using a USB Type-C connector)

Thunderbolt 3 over USB Type-C

Thunderbolt 3 brings Thunderbolt to USB Type-C at speeds up to 40 Gbps, creating one compact port that does it all - delivering the fastest, most versatile connection to any dock, display or data device like an external hard drive. Thunderbolt 3 uses a USB Type-C connector/port to connect to supported peripherals.

1. Thunderbolt 3 uses USB Type-C connector and cables - It is compact and reversible
2. Thunderbolt 3 supports speed up to 40 Gbps

3. DisplayPort 1.4 – compatible with existing DisplayPort monitors, devices and cables
4. USB Power Delivery - Up to 130W on supported computers

Key Features of Thunderbolt 3 over USB Type-C

1. Thunderbolt, USB, DisplayPort and power on USB Type-C on a single cable (features vary between different products)
2. USB Type-C connector and cables which are compact and reversible
3. Supports Thunderbolt Networking (*varies between different products)
4. Supports up to 4K displays
5. Up to 40 Gbps

NOTE: Data transfer speed may vary between different devices.

Thunderbolt Icons

Protocol	USB Type-A	USB Type-C	Notes
Thunderbolt	Not Applicable		Will use industry standard icon regardless of port style (i.e., mDP or USB Type-C)
Thunderbolt w/ Power Delivery	Not Applicable		Up to 130 Watts via USB Type-C

Figure 2. Thunderbolt Iconography Variations

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

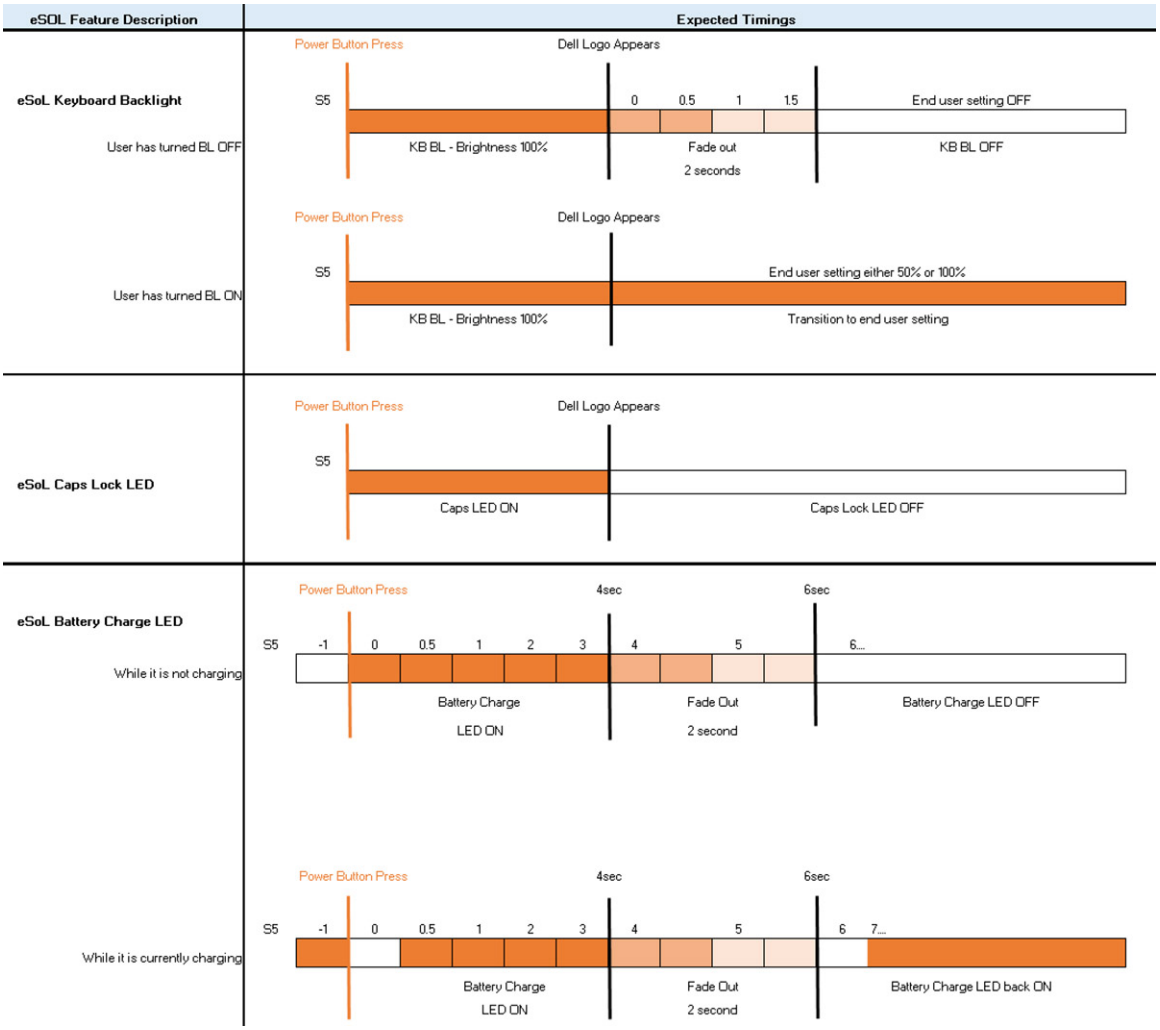
On certain Dell Latitude systems, the power button LED is used to provide an indication of the system status, and as a result the power button illuminates when pressed. The systems with the optional power button/fingerprint reader will have no LED under the power button and hence will apply the available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



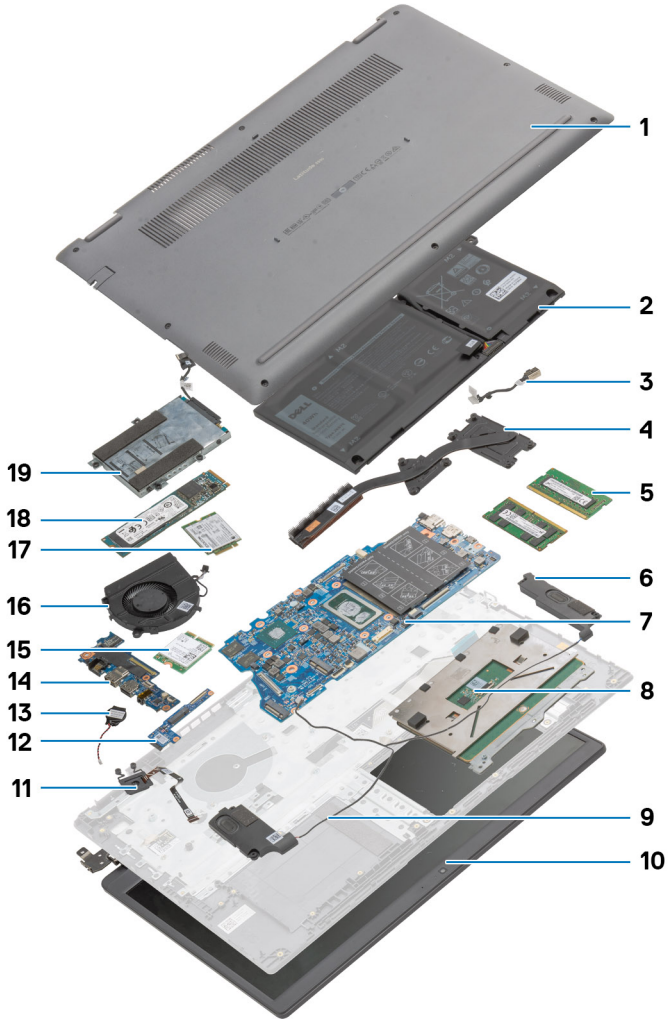
Power button with fingerprint reader will have no LED and will leverage the available LED's in the system to provide indication of the system status

- **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

Major components of your system



1. Base Cover
2. Battery
3. DC-in Port
4. Heatsink
5. Memory Modules
6. Speakers
7. System Board
8. Touchpad
9. Palmrest Assembly
10. Display Assembly
11. Power Button Module
12. Daughterboard Module
13. Coin-cell Battery
14. IO Board
15. WLAN Card
16. Fan Assembly
17. WWAN Card

18. Solid-state Drive
19. Hard Drive 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

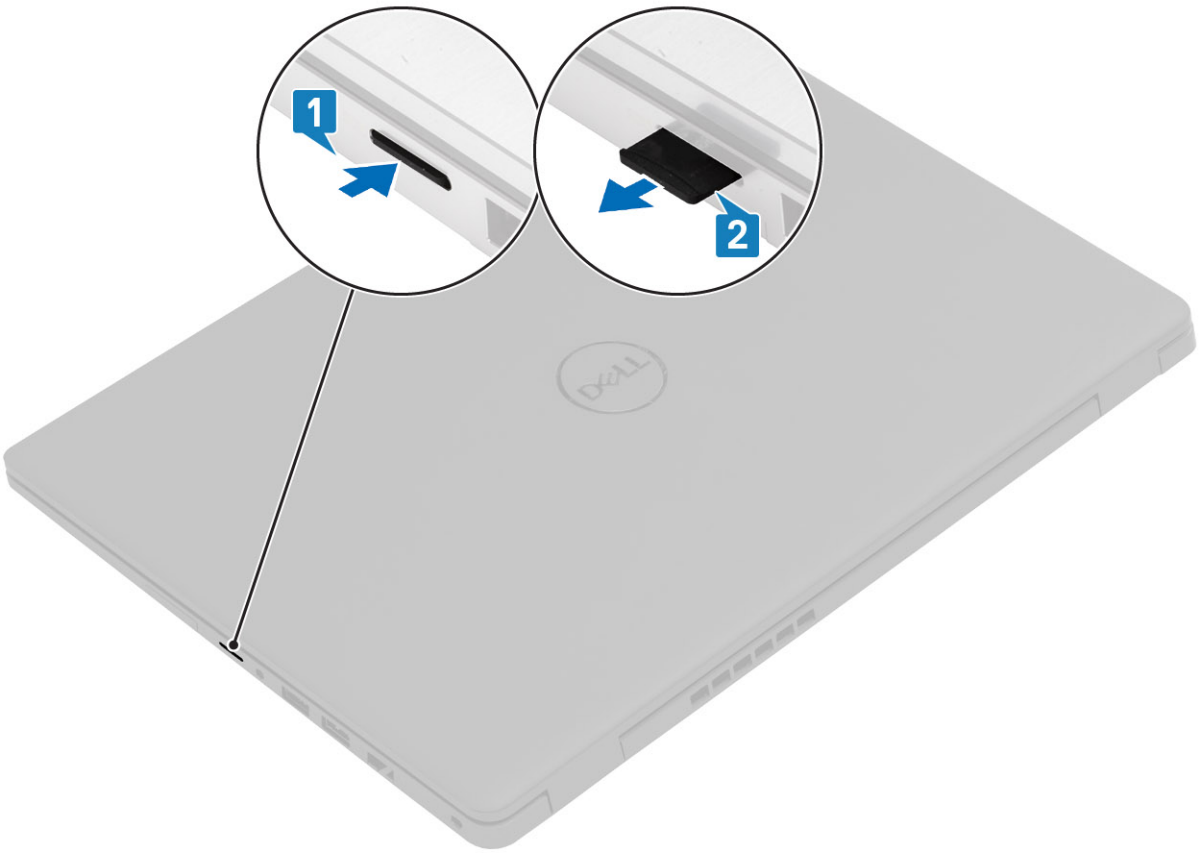
MicroSD card

Removing the microSD card

Prerequisites

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

About this task

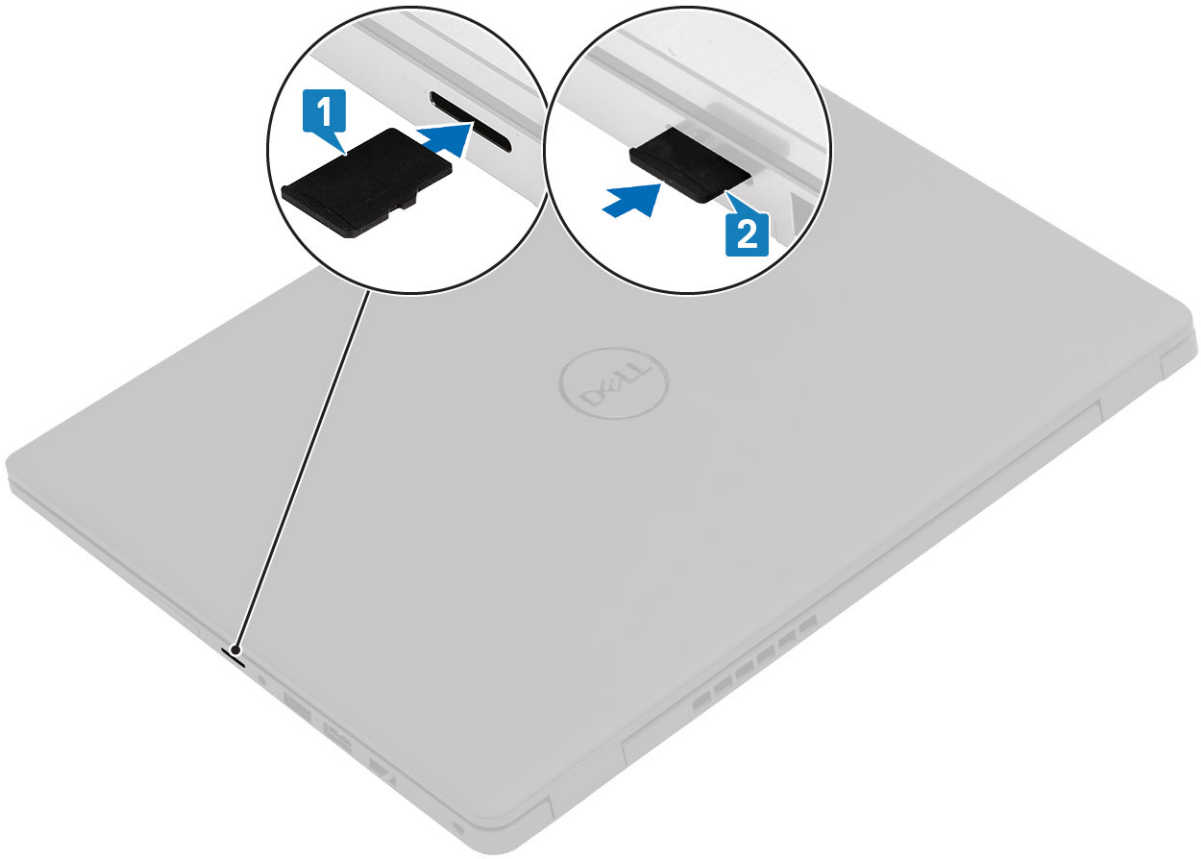


Steps

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

Installing the microSD card

About this task



Steps

1. Align the microSD card to its slot on the computer.
2. Slide the microSD card into the slot until it clicks into place.

Next steps

Follow the procedures in After working inside your computer.

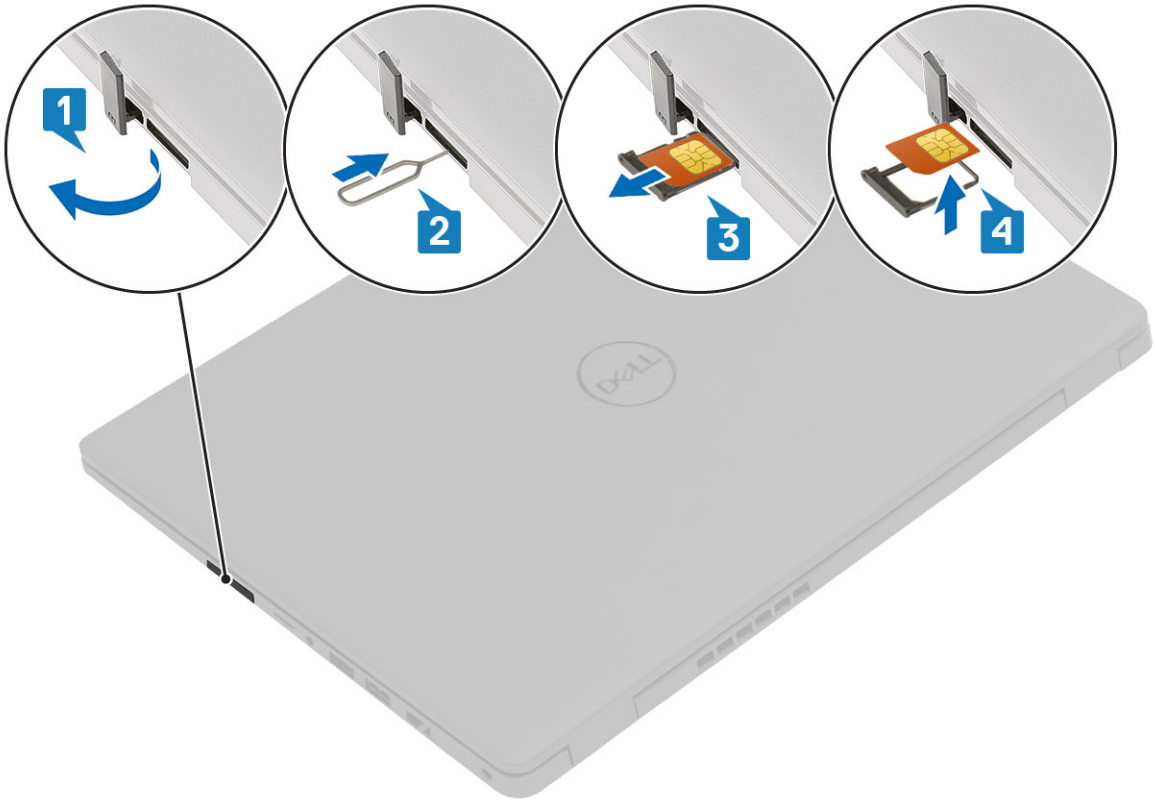
SIM card

Removing the SIM card

Prerequisites

1. Follow the procedure in Before working inside your computer

About this task

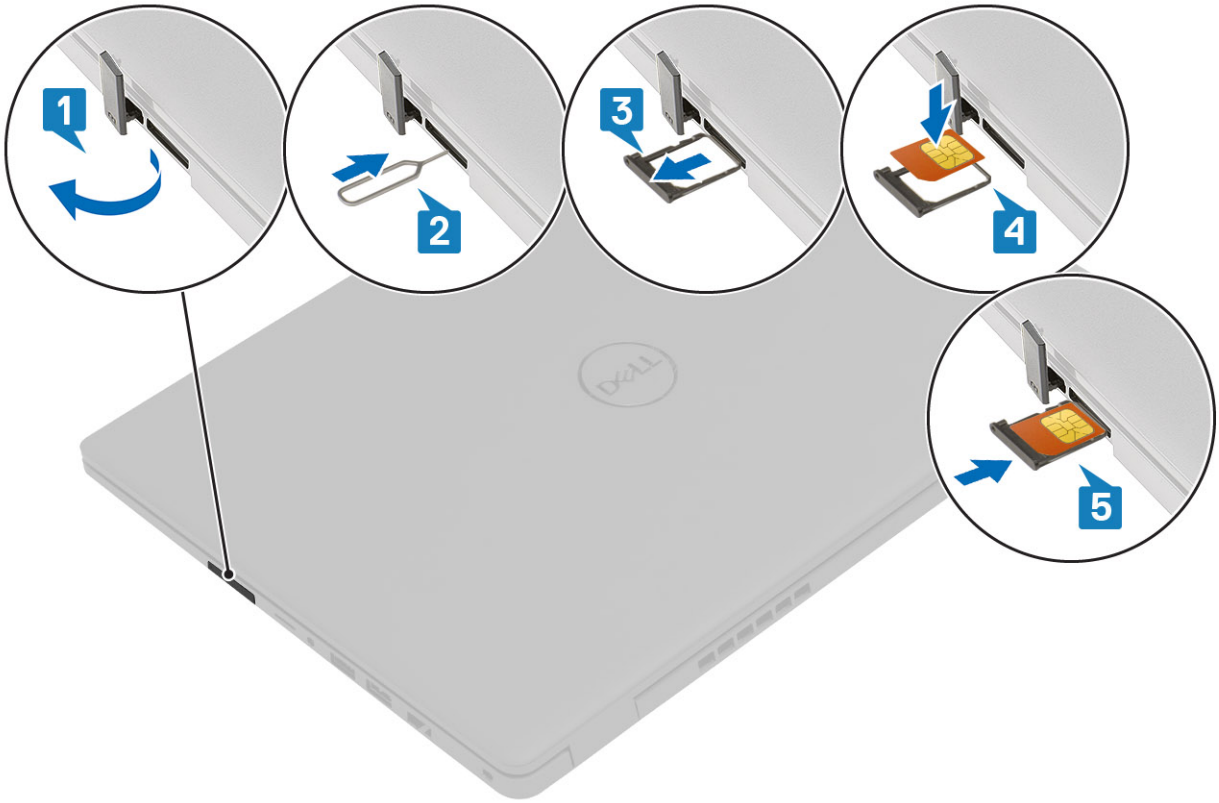


Steps

1. Open the latch that covers the SIM card slot to release it from the system.
2. Insert a SIM card remover tool in the slot and push it to eject the SIM card tray.
3. Pull the SIM card try and remove the SIM card from the SIM card tray.

Installing the SIM card

About this task



Steps

1. Open the latch that covers the SIM card slot to release it from the system.
2. Insert the SIM card removal tool in the slot and push it to eject the SIM card tray [2].
3. Pull the SIM card holder out of the slot.
4. Place the SIM card into the SIM card holder.
5. Slide the SIM card tray into the slot until it clicks into place.

Next steps

Follow the procedures 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

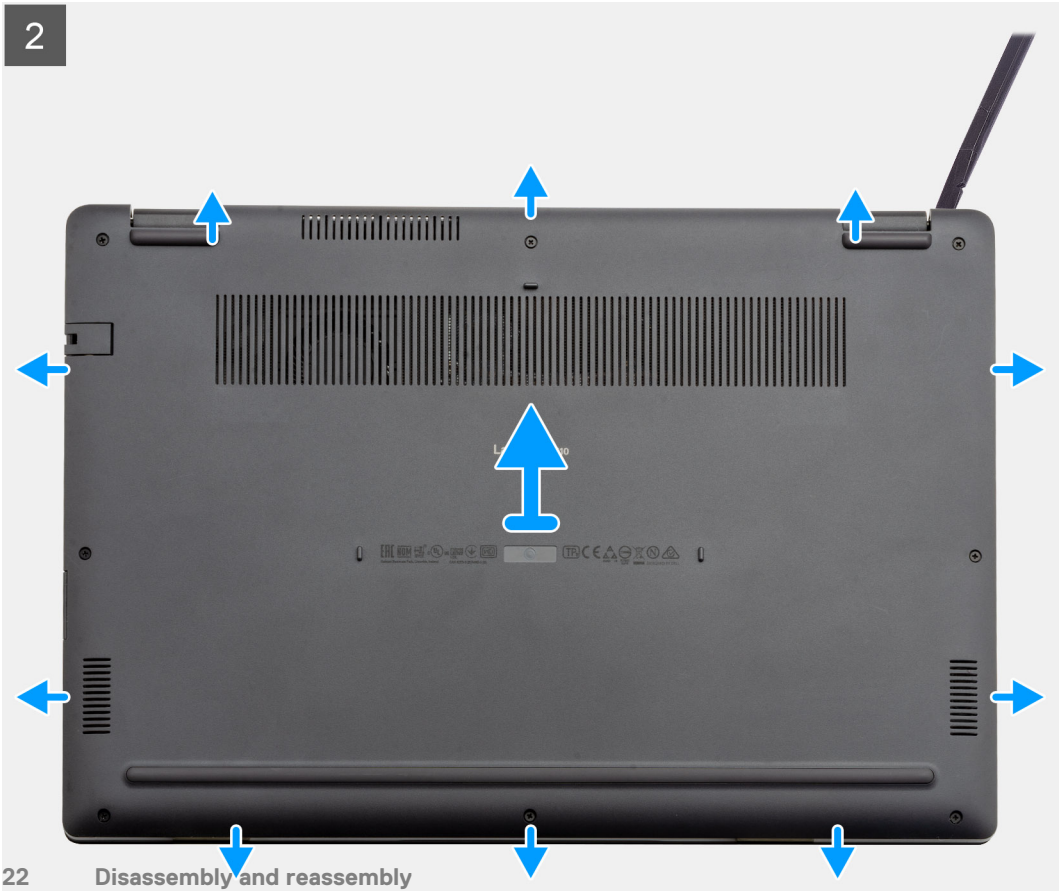


8x
M2.5x2.5

1



2



Steps

1. Loosen the eight (M2.5x2.5) screws that secure the bottom base to the computer.
2. Using a plastic scribe, pry the base cover from the top-right corner and lift the base cover away from the computer.

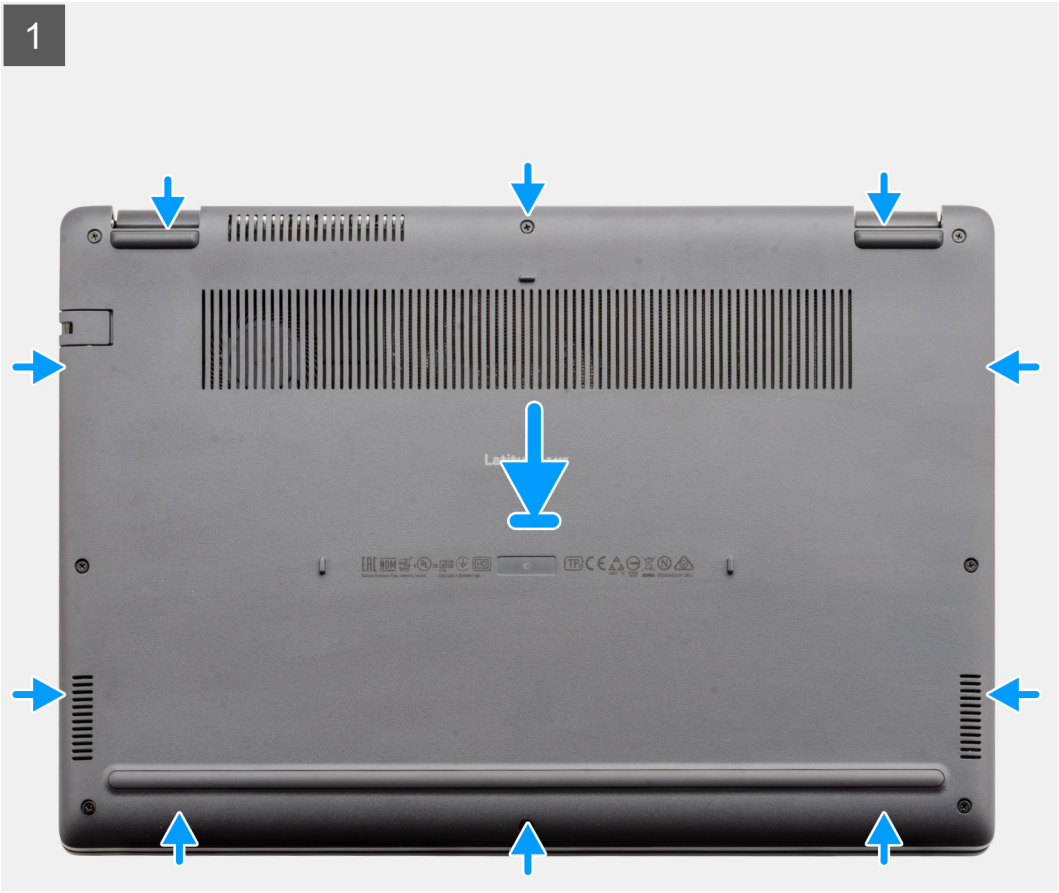
Installing the base cover

Prerequisites

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

About this task

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





8x
M2.5x2.5



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 eight (M2.5x2.5) 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

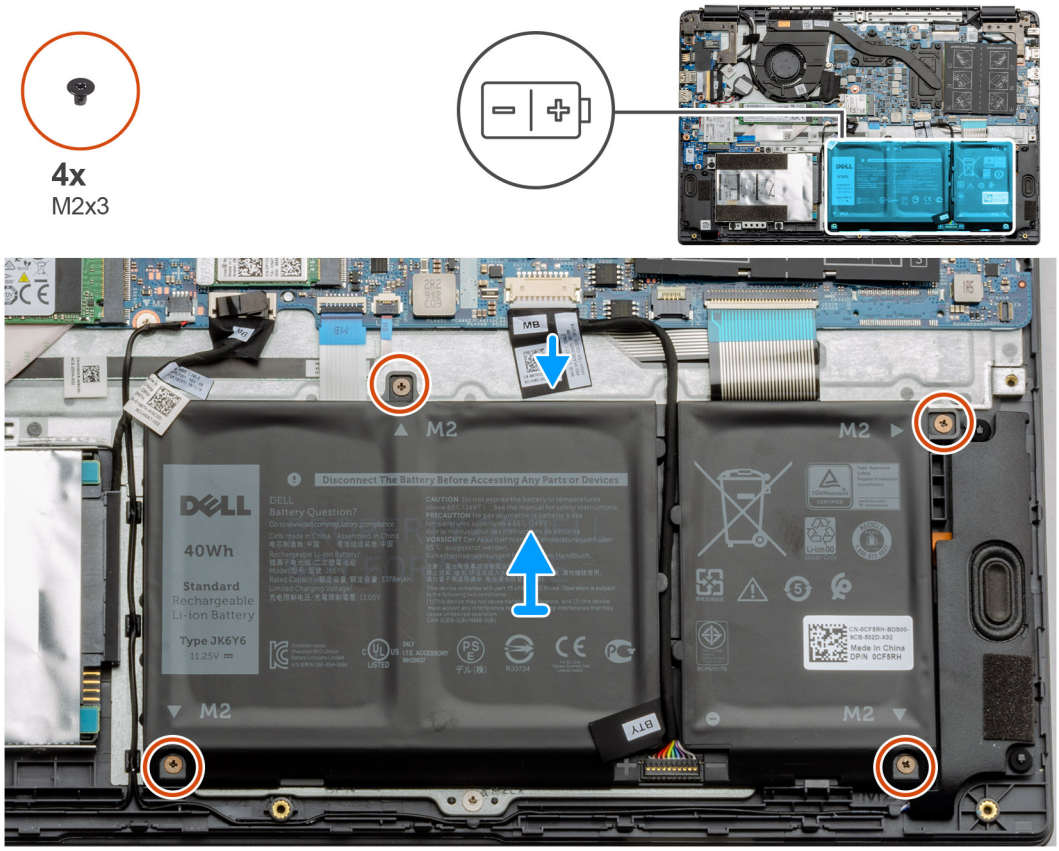
CAUTION:

- **Exercise caution when handling Lithium-ion batteries.**
- **Discharge the battery as much as possible before removing it from the system. This can be done by disconnecting the AC adapter from the system to allow the battery to drain.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**
- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**
- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**
- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.**

Removing the battery

Prerequisites

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



Steps

1. Disconnect the battery cable from the connector on the system board.
2. Remove the four (M2x3) screws that secures the battery to the palm rest assembly.
3. Lift and move the battery away from the computer.

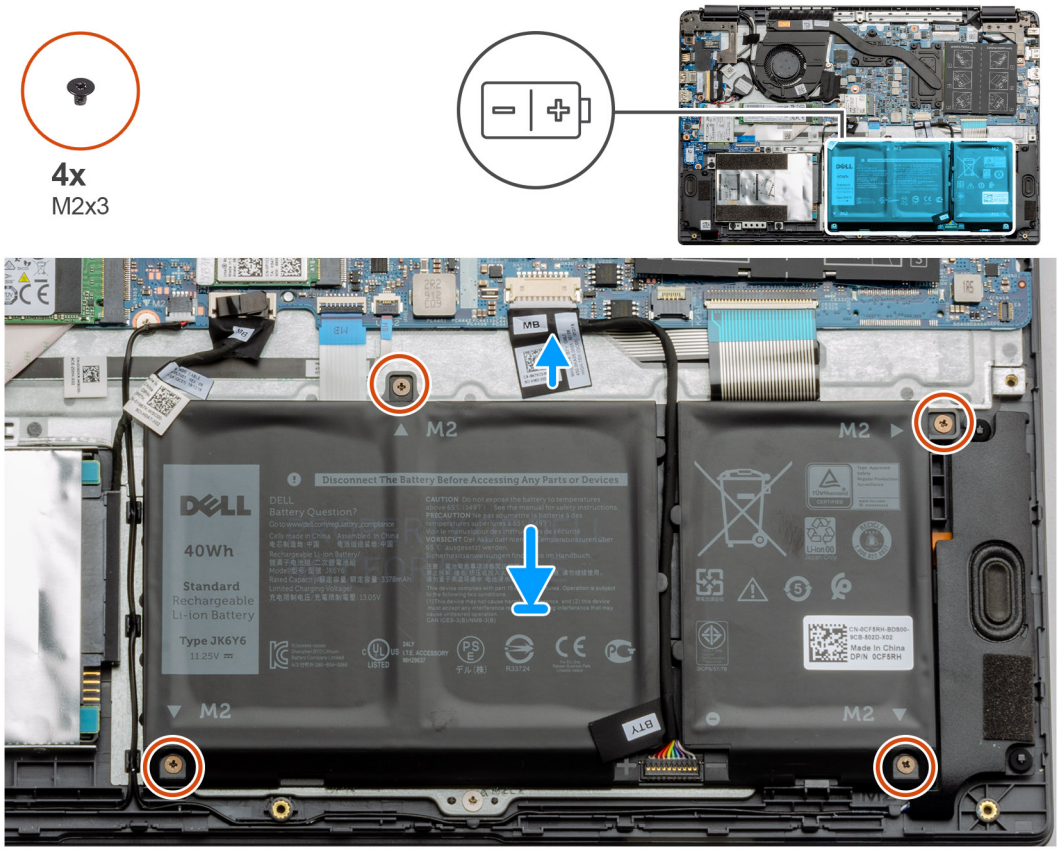
Installing the battery

Prerequisites

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

About this task

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



Steps

1. Align the tabs on the battery with the slots on the palm rest assembly.
2. Place the battery in the battery bay.
3. Tighten the four (M2x3) screws to secure the battery to the palm rest assembly.
4. Connect the battery cable to the connector on the system board.

Next steps

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

Memory modules

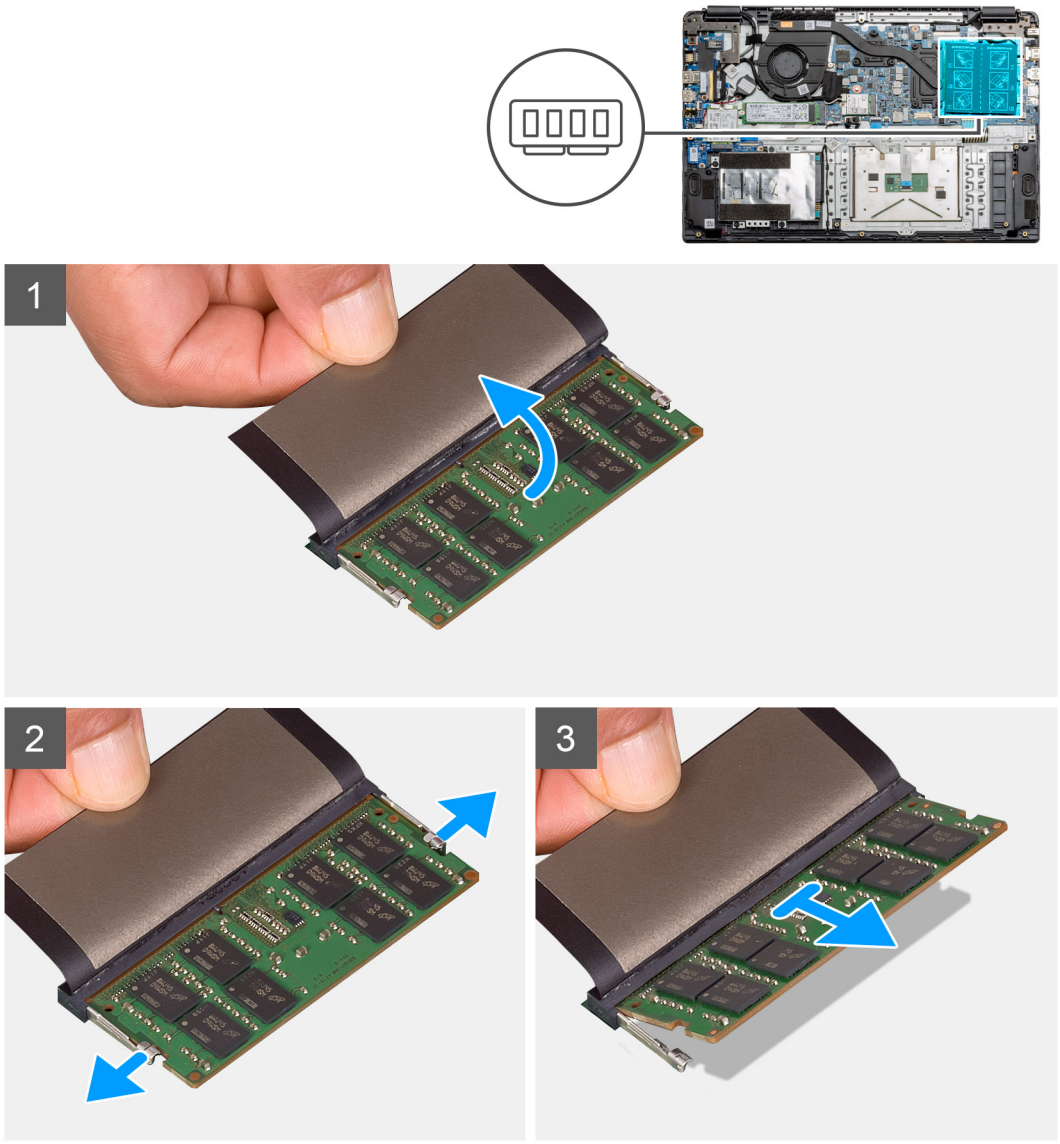
Removing the memory module

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.

About this task

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



Steps

1. Peel the adhesive cover above the memory module.
2. Pry the clips securing the memory module until the memory module pops-up.
3. Remove the memory module from the memory slot.

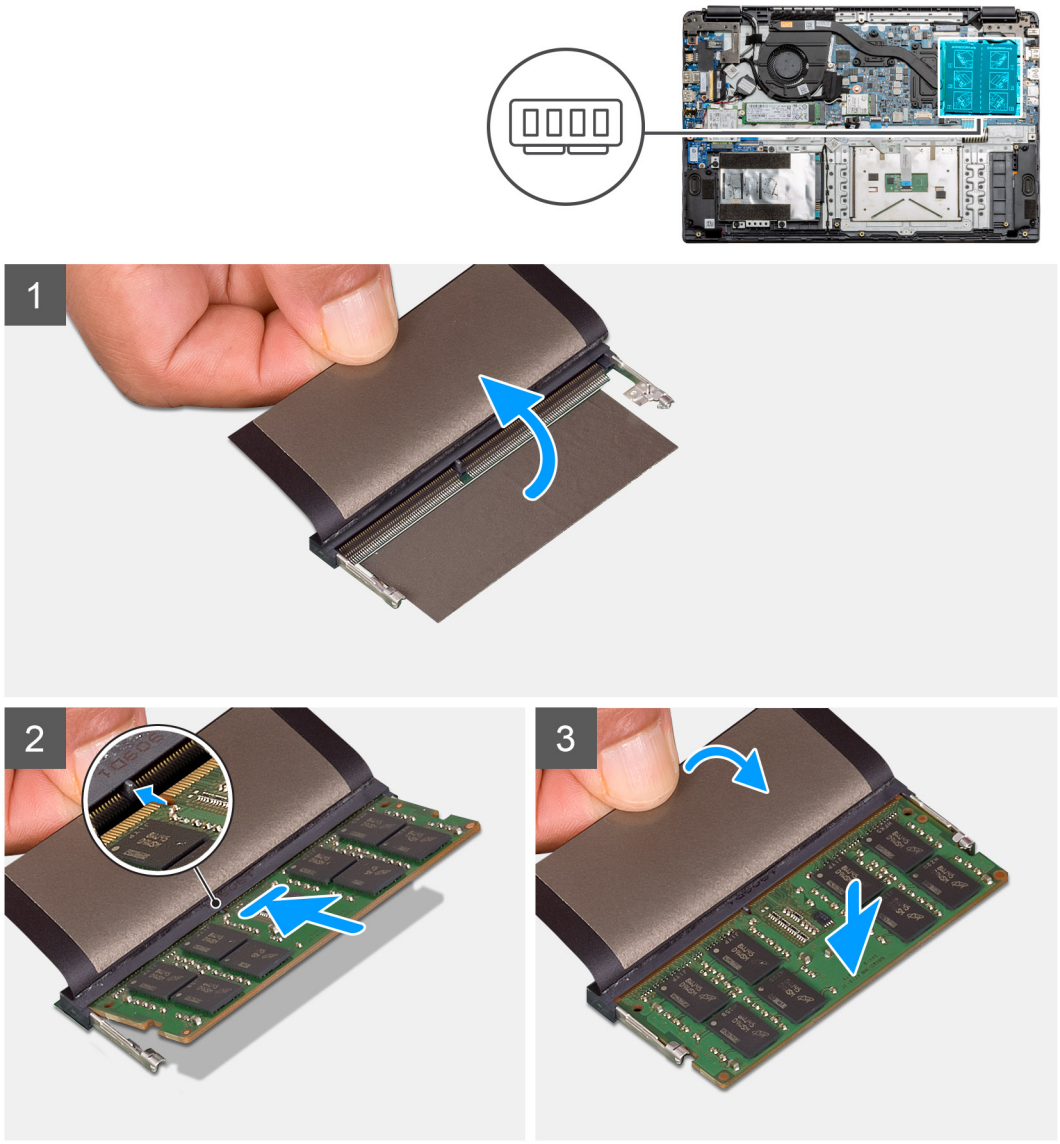
Installing the memory modules

Prerequisites

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

About this task

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



Steps

1. Peel back the adhesive cover from over the memory slot.
2. Align the notch on the memory module with the tab on the memory module slot.
3. Slide the memory module firmly into the slot at an angle.
4. Press the memory module down until it clicks into place.

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

Next steps

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

WLAN card

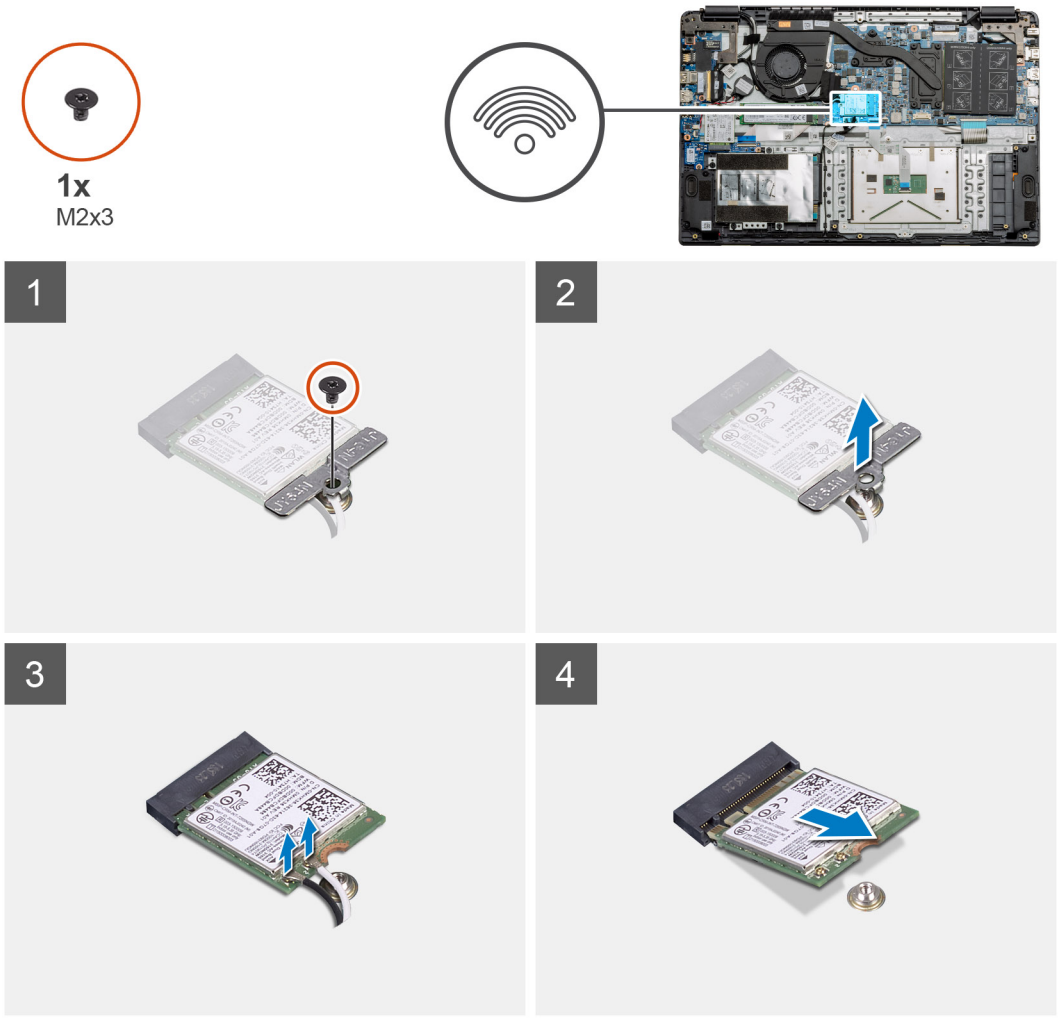
Removing the WLAN card

Prerequisites

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

About this task

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



Steps

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

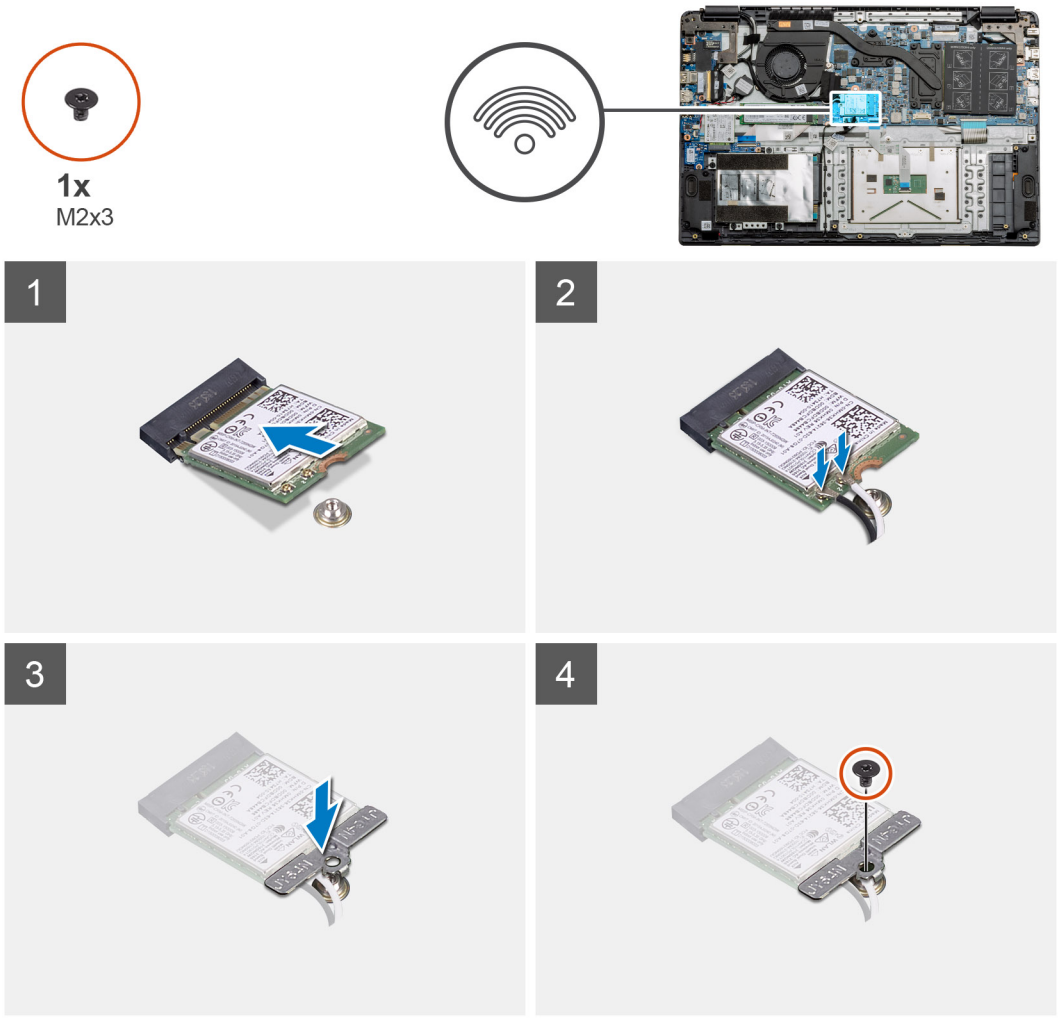
Installing the WLAN card

Prerequisites

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

About this task

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



Steps

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

Next steps

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

WWAN card

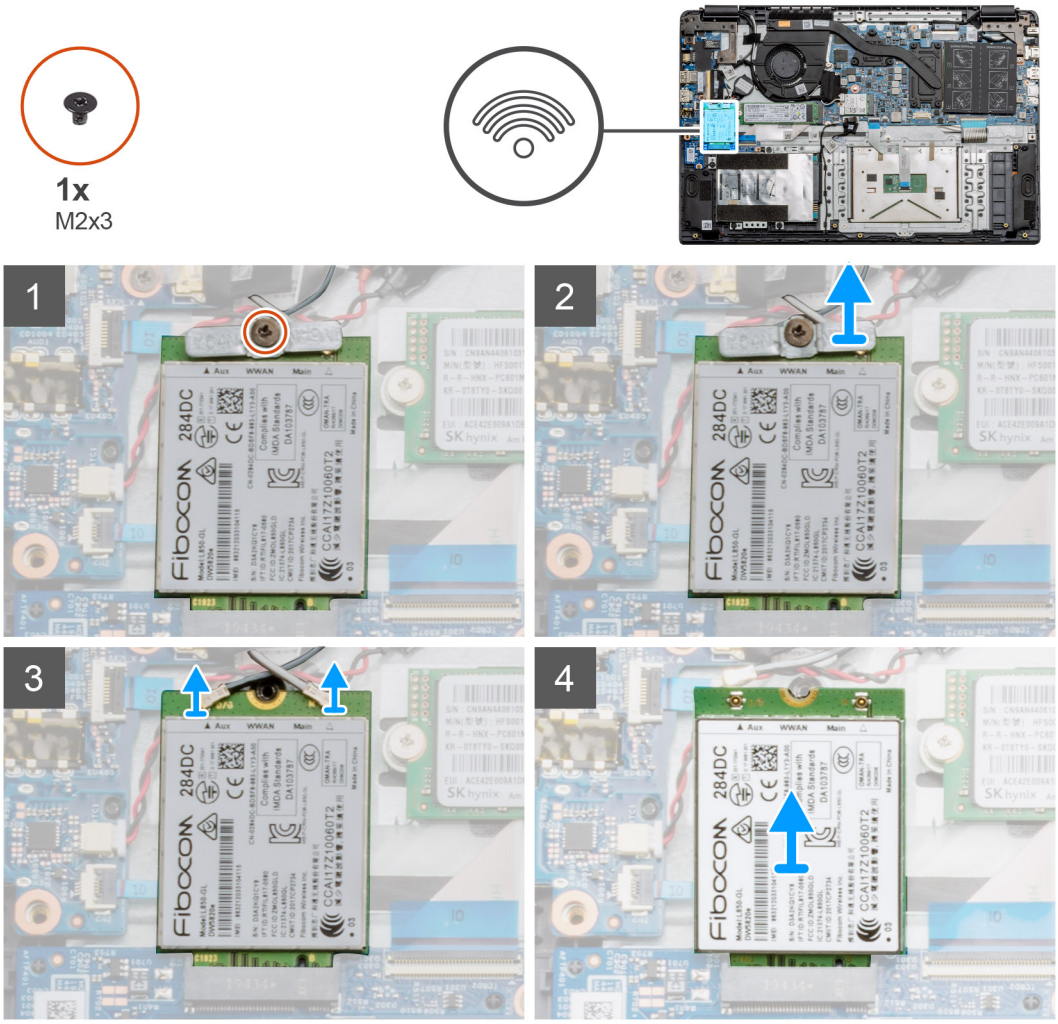
Removing the WWAN card

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

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



Steps

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

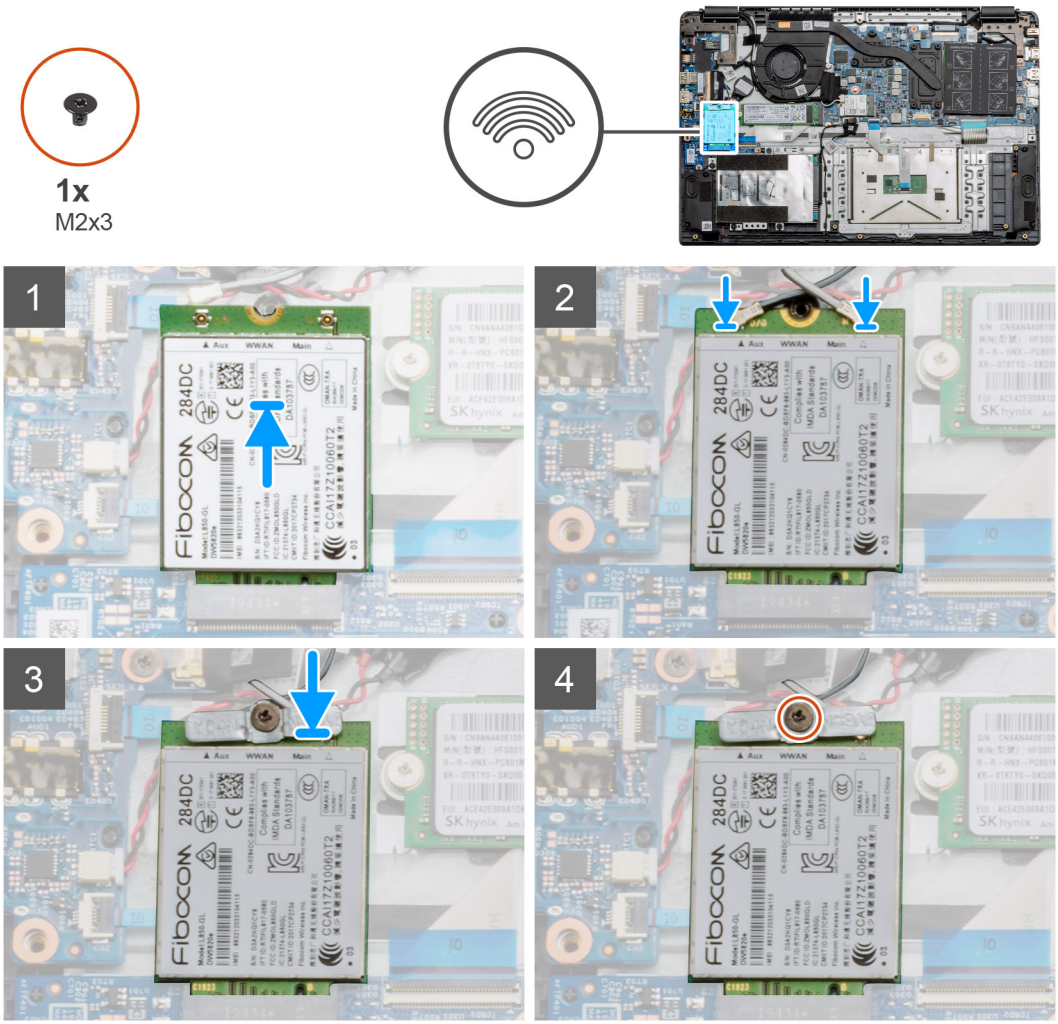
Installing the WWAN card

Prerequisites

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

About this task

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



Steps

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

Next steps

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

Coin-cell battery

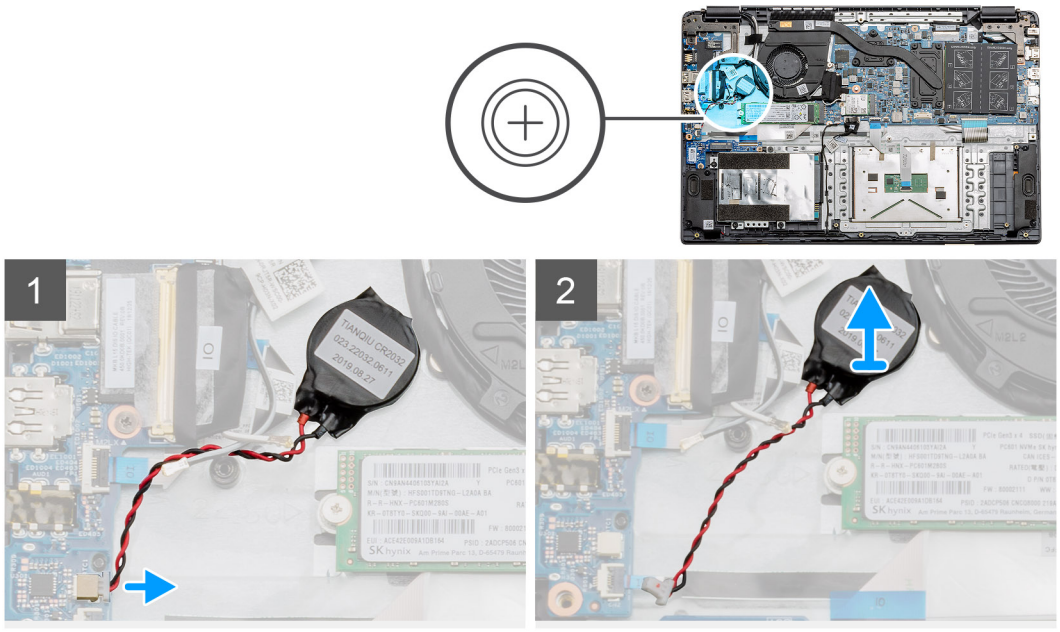
Removing the coin-cell battery

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

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



Steps

1. Disconnect the coin-cell battery cable from the system board.
2. Peel the coin-cell battery off the palmrest assembly as the coin-cell is affixed to the board with an adhesive.

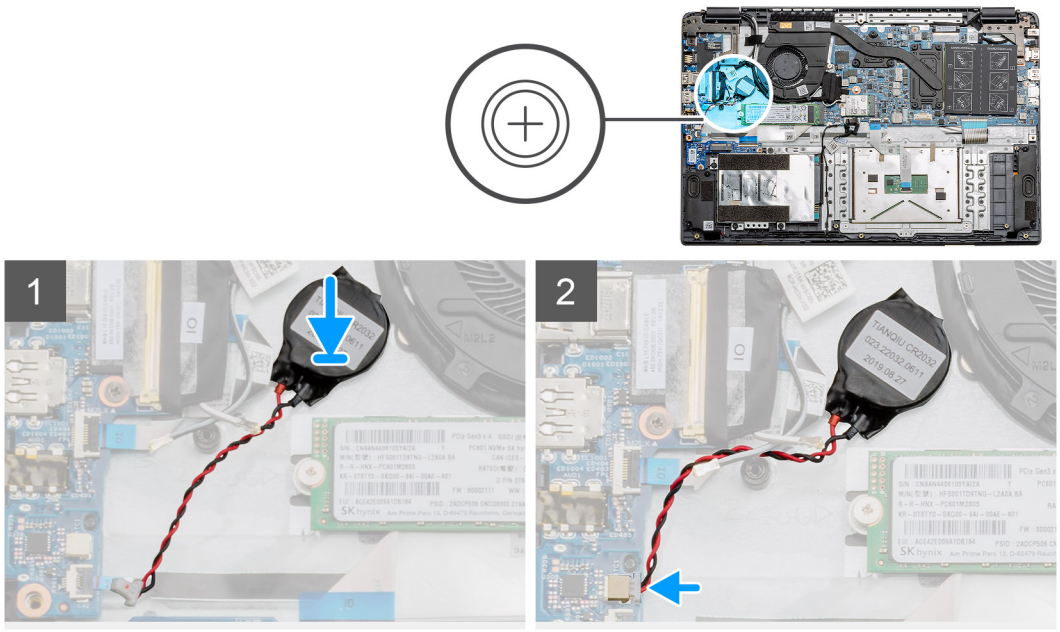
Installing the coin-cell battery

Prerequisites

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

About this task

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



Steps

1. Re-adhere the coin-cell battery to the slot on the palmrest assembly.
2. Connect the coin-cell battery cable 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.

DC-in port

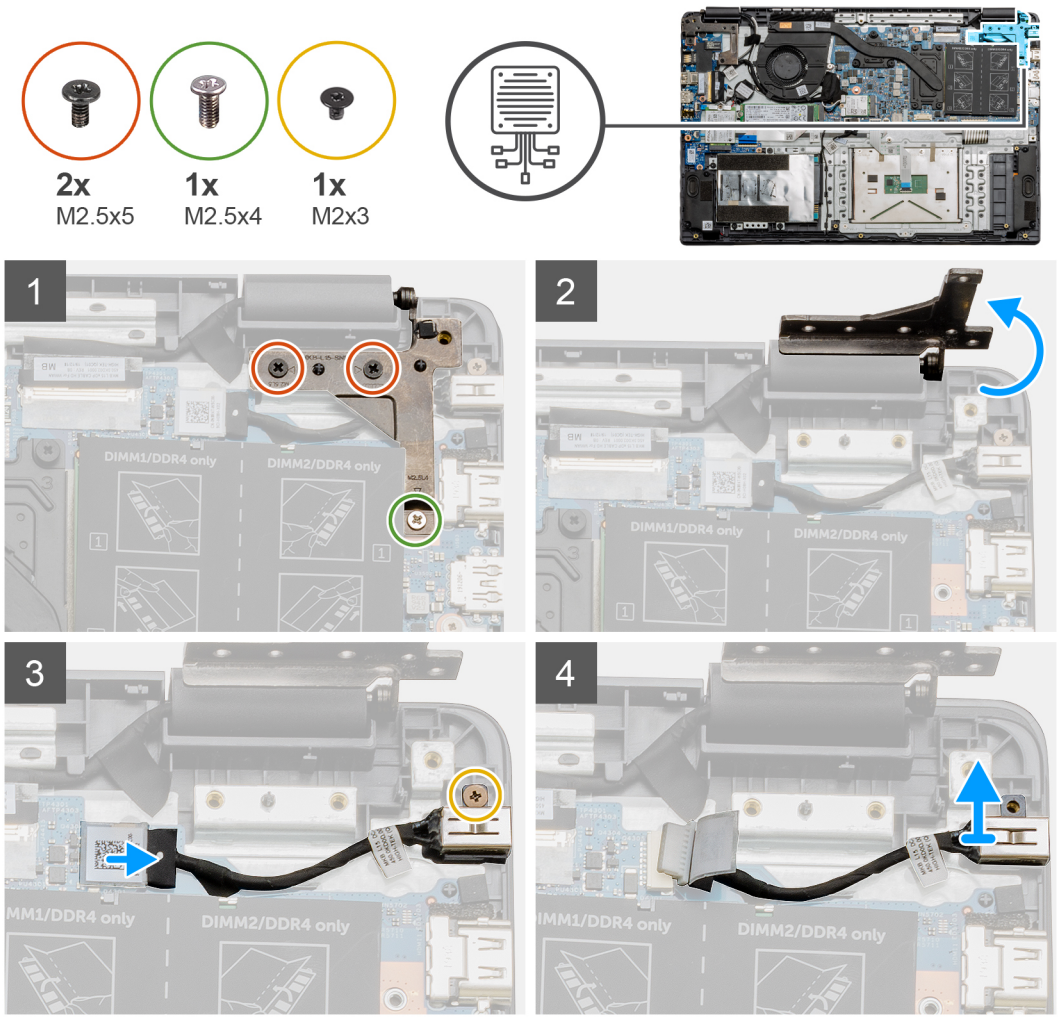
Removing the DC-in

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

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



Steps

1. Locate the DC-in port on your computer, remove the two (M2.5x5) and one (M2.5x4) screws from the hinge covering it.
2. Lift the hinge and fold it away from the chassis.
3. Disconnect the DC-in cable from the computer and remove the single (M2x3) screw.
4. Remove the DC-in port from the computer.

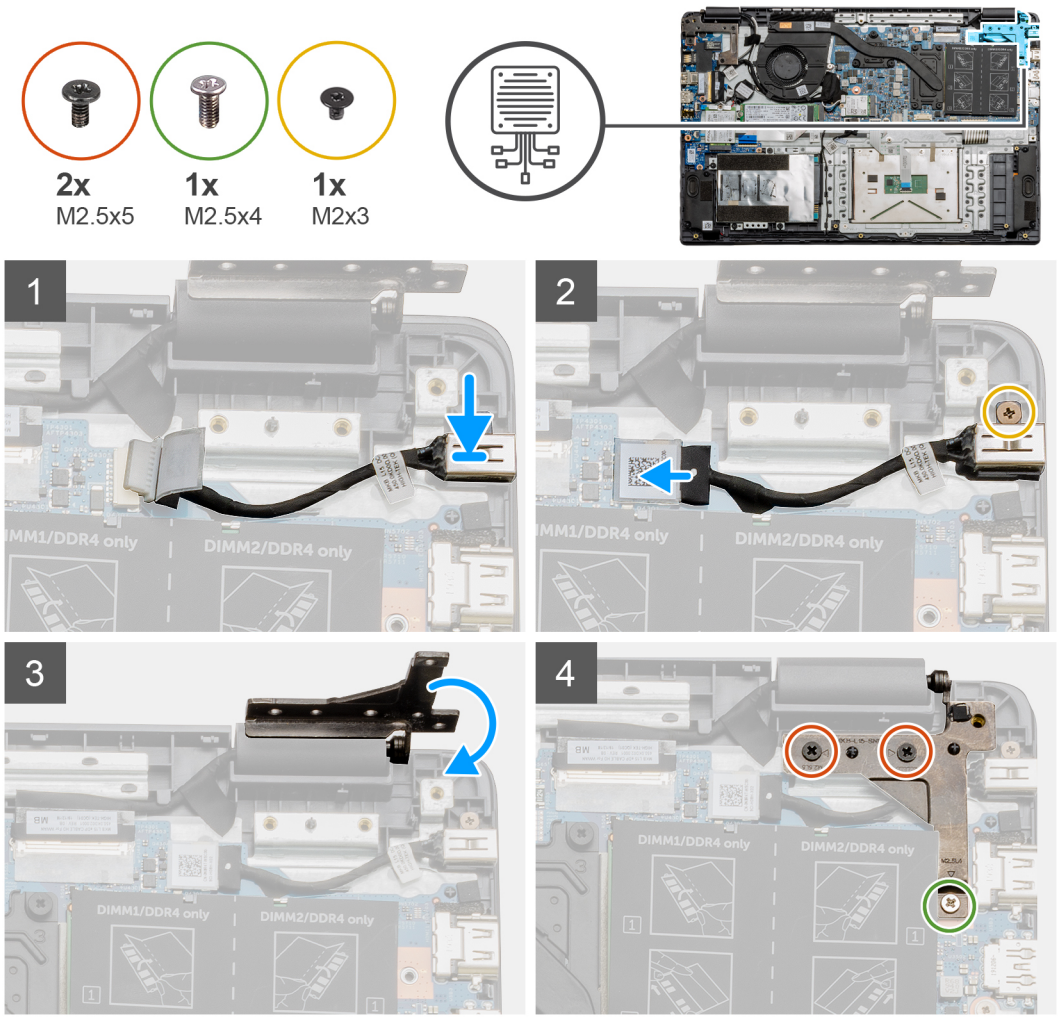
Installing the DC-in

Prerequisites

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

About this task

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



Steps

1. Place the DC-in module into the provided slot.
2. Install the (M2x3) screw and connect the DC-in cable to the system board.
3. Fold and align the hinge to the screw holders on the palmrest.
4. Install the two (M2.5x5) and one (M2.5x4) screws to secure the hinge.

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.

Solid state drive

Solid state drive bracket

Removing the M.2 2280 solid-state drive

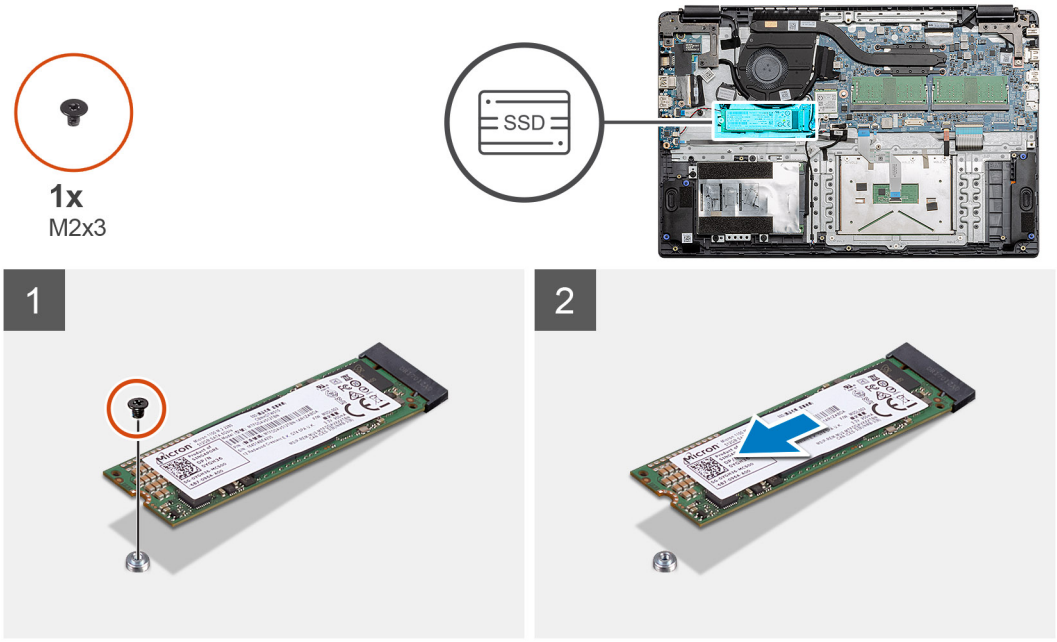
Prerequisites

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

2. Remove the SD Card.
3. Remove the base cover.
4. Disconnect the battery.

About this task

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



Steps

1. Remove the single (M2x3) screw that secures the solid-state module to the palmrest assembly.
2. Slide the solid-state module out from the M.2 slot.

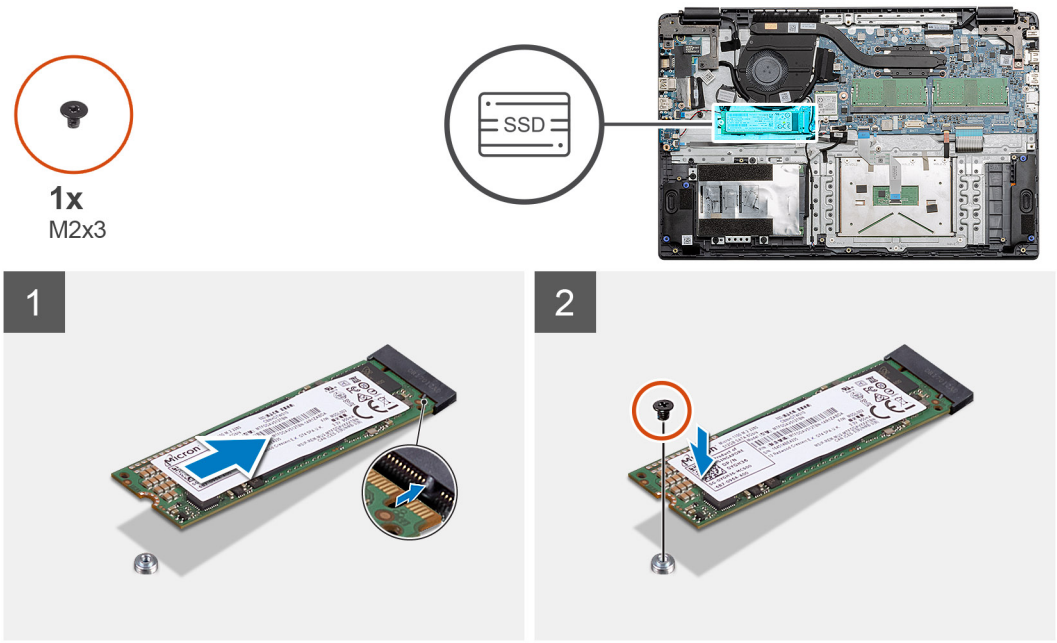
Installing M.2 2280 solid-state drive

Prerequisites

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

About this task

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



Steps

1. Align and slide the solid-state drive into the slot.
2. Replace the single (M2x3) screw to secure the solid-state drive module to the system.

Next steps

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

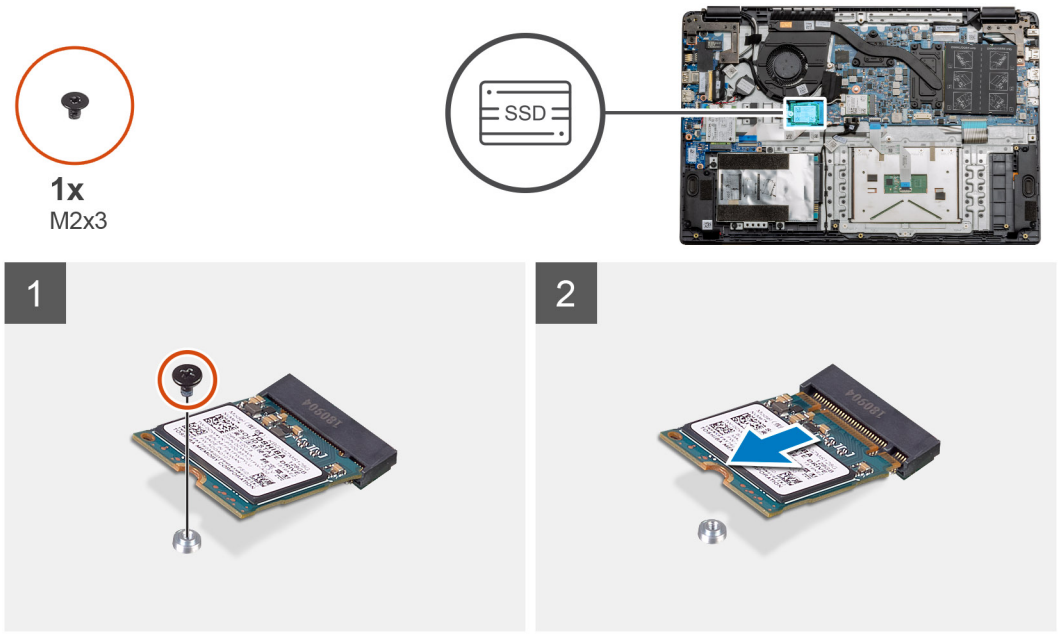
Removing the M.2 2230 solid-state drive

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.

About this task

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



Steps

1. Remove the single (M2x3) screw that secures the solid-state module to the palmrest assembly.
2. Slide the solid-state module out from the M.2 slot.

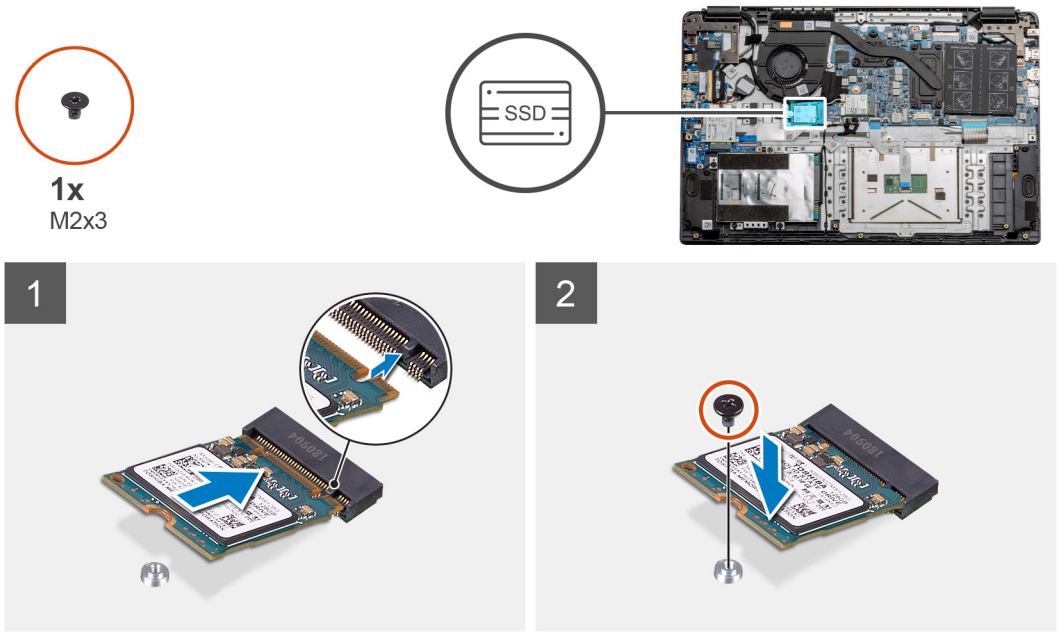
Installing M.2 2230 solid-state drive

Prerequisites

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

About this task

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



Steps

1. Align and slide the solid-state drive into the slot.
2. Replace the single (M2x3) screw to secure the solid-state drive module to the palmrest and keyboard assembly.

Next steps

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

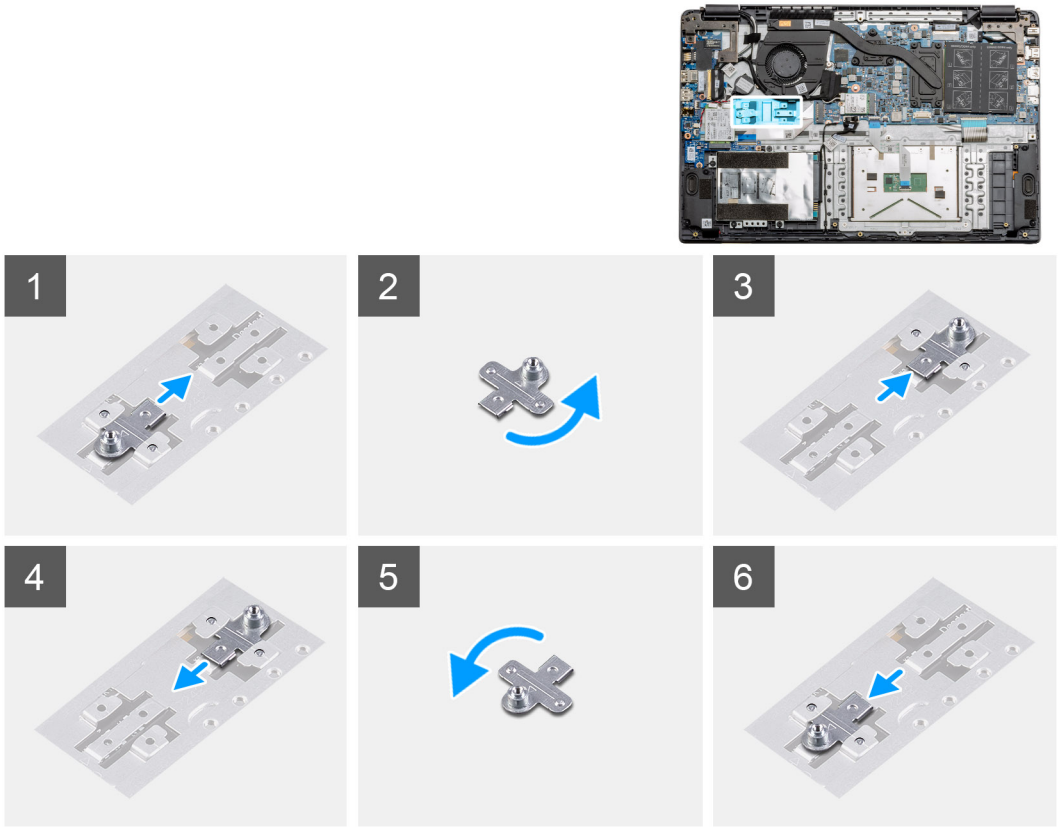
Installing M.2 solid-state drive bracket

Prerequisites

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

About this task

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



Steps

1. Slide the bracket out of the metal holder.
2. Rotate the bracket so that it faces the opposite side from its original mounting position.
3. Slide the bracket into the metal holder on the opposite end.

Next steps

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

Hard Drive

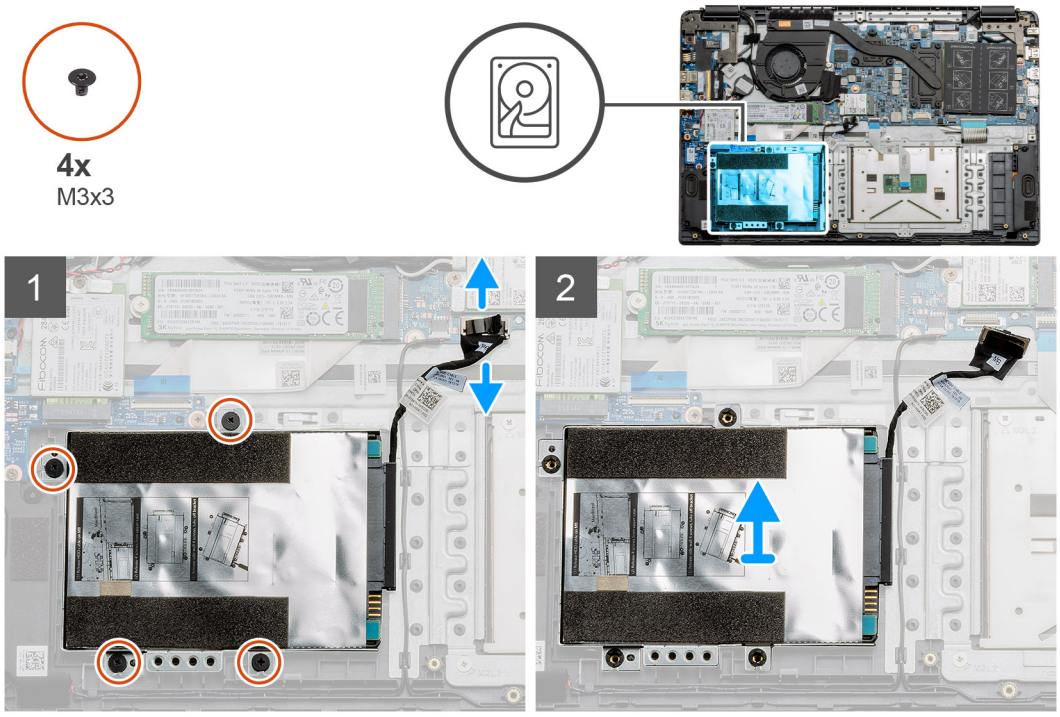
Removing the Hard Drive

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.

About this task

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



Steps

1. Remove the four M3x3 screws and disconnect the hard drive cable from the connector on the system board.
2. Remove the hard drive from the computer.

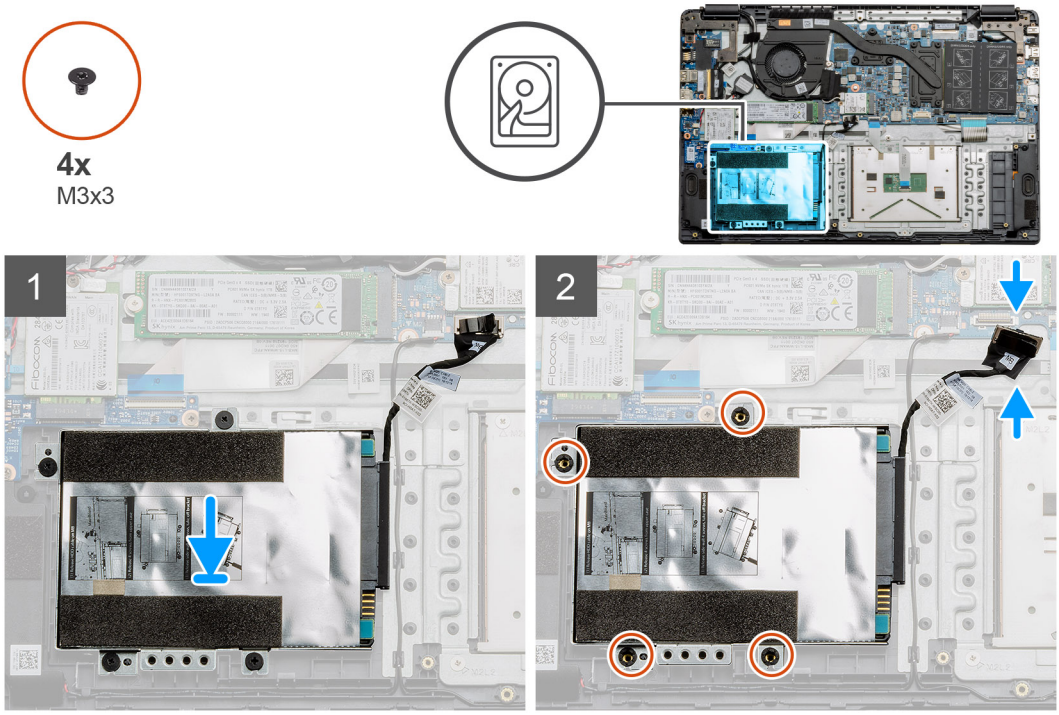
Installing the Hard Drive

Prerequisites

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

About this task

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



Steps

1. Align the screw holes on the hard drive assembly with the mounting points on the palmrest.
2. Replace the four M3x3 screws to secure the hard drive in place and connect the hard drive cable to the connector on 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.

Touchpad

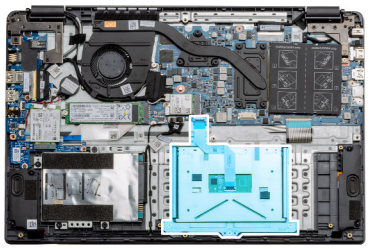
Removing the touchpad button board

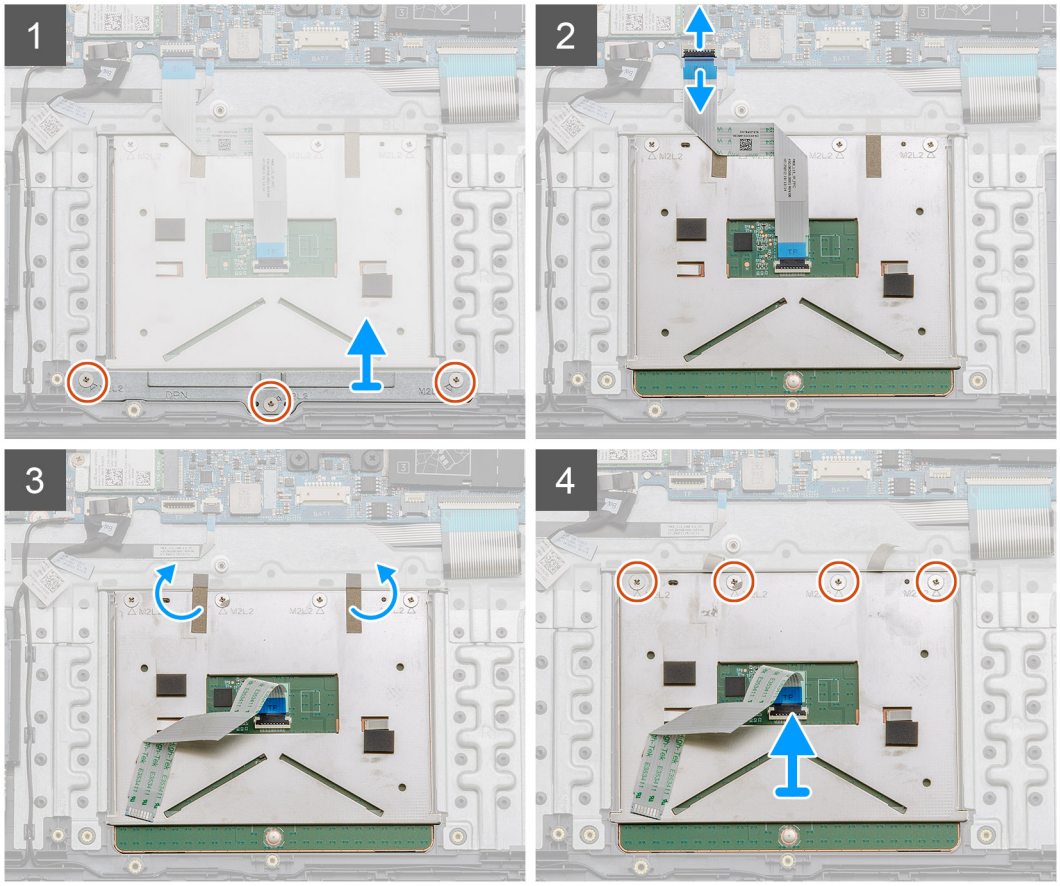
Prerequisites

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

About this task







Steps

1. Remove the three (M2x2) screws from the bottom portion of the touchpad.
2. Disconnect the ribbon cable from the system board.
3. Peel away the adhesive straps holding the top portion of the touchpad.
4. Remove the four (M2x2) screws from the top portion of the touchpad and lift the touchpad away from the computer.

Installing the touchpad

Prerequisites

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

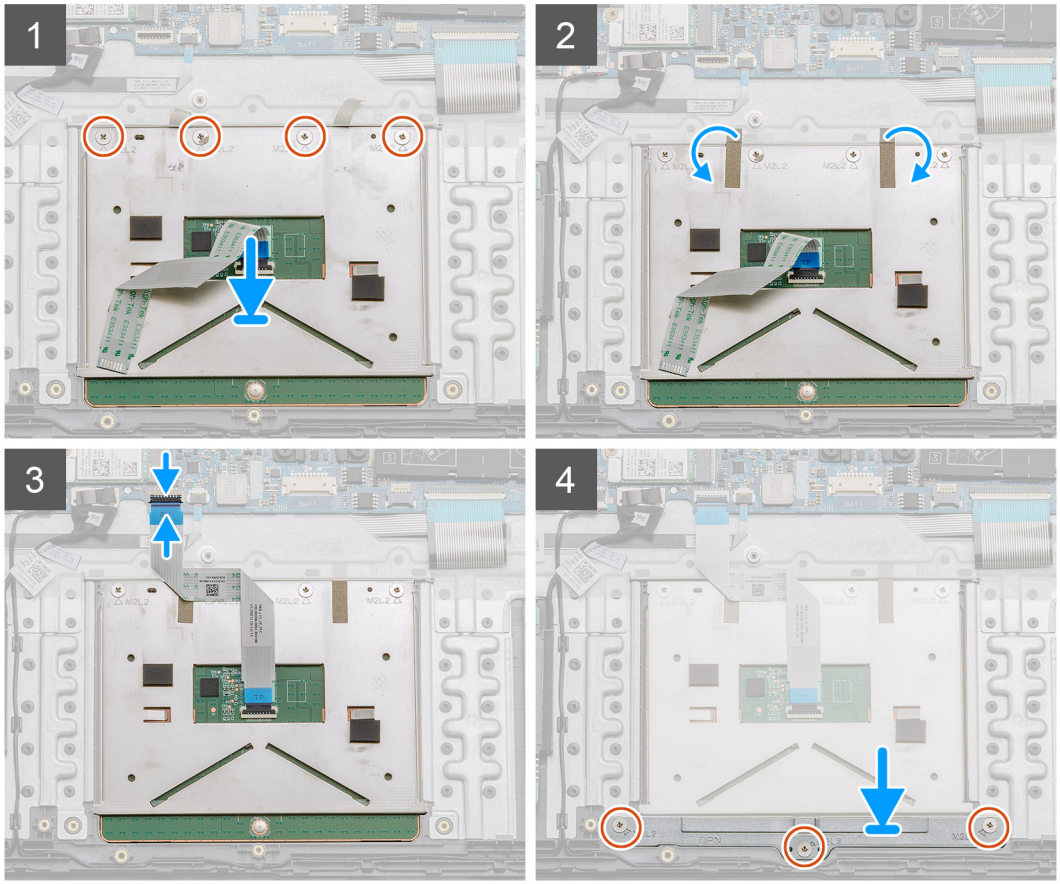
About this task

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



7x
M2x2





Steps

1. Place the touchpad onto the palmrest, ensure the screw posts align with the ones on the palmrest. Install the four (M2x2) screws to the top of touchpad.
2. Fold back the two adhesive tape strips onto the touchpad.
3. Connect the ribbon cable from the touchpad to the system board.
4. Install the three (M2x2) screws into the screw posts at the bottom of the palmrest

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.

Speakers

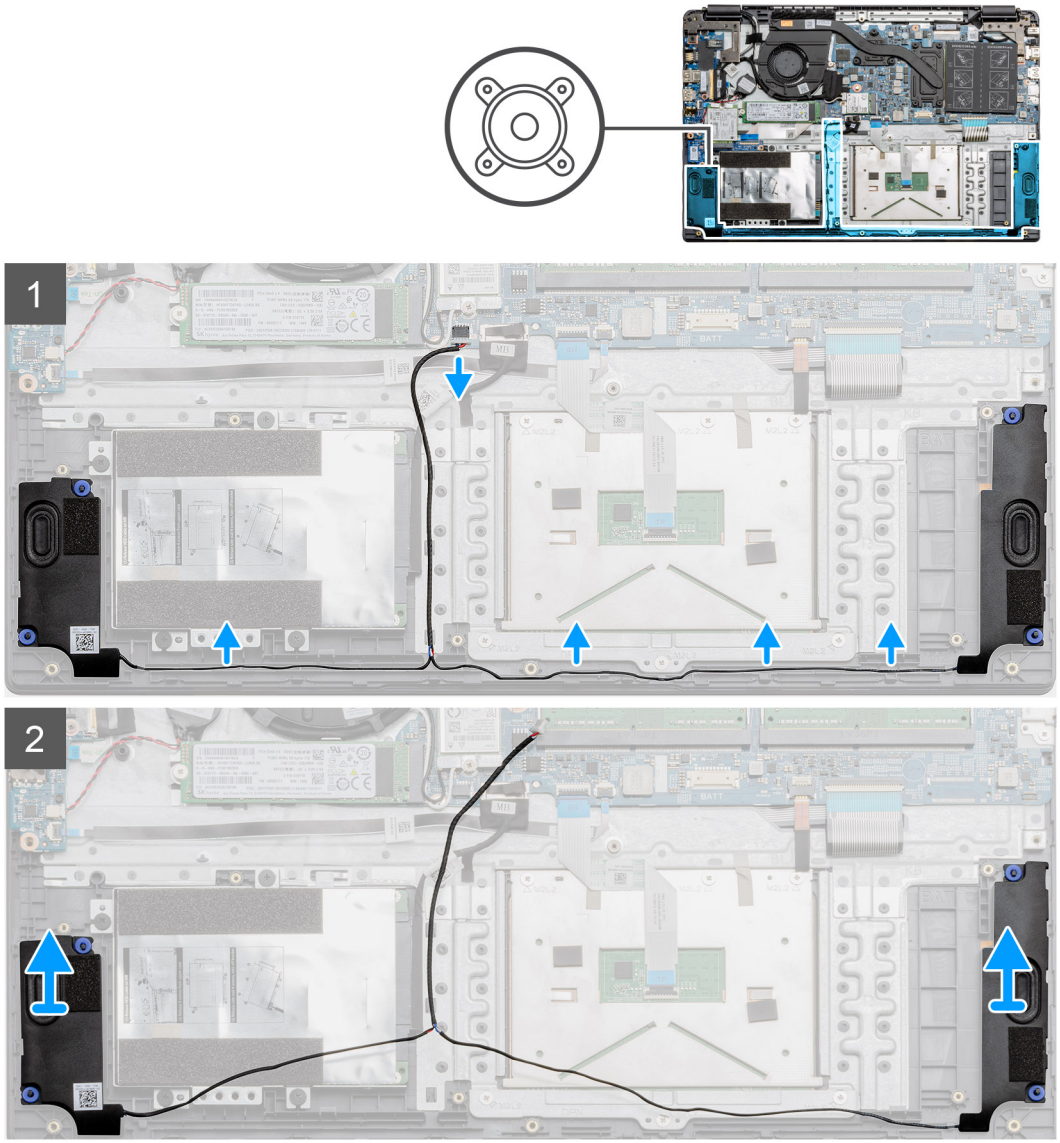
Removing the speakers

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.

About this task

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



Steps

1. Disconnect the Speaker cable from the connector on the system board and lift the connected cables from the routing points on the lower portion of the palmrest.
2. Ensure the cables are free and lift the speaker modules from both ends of the computer.

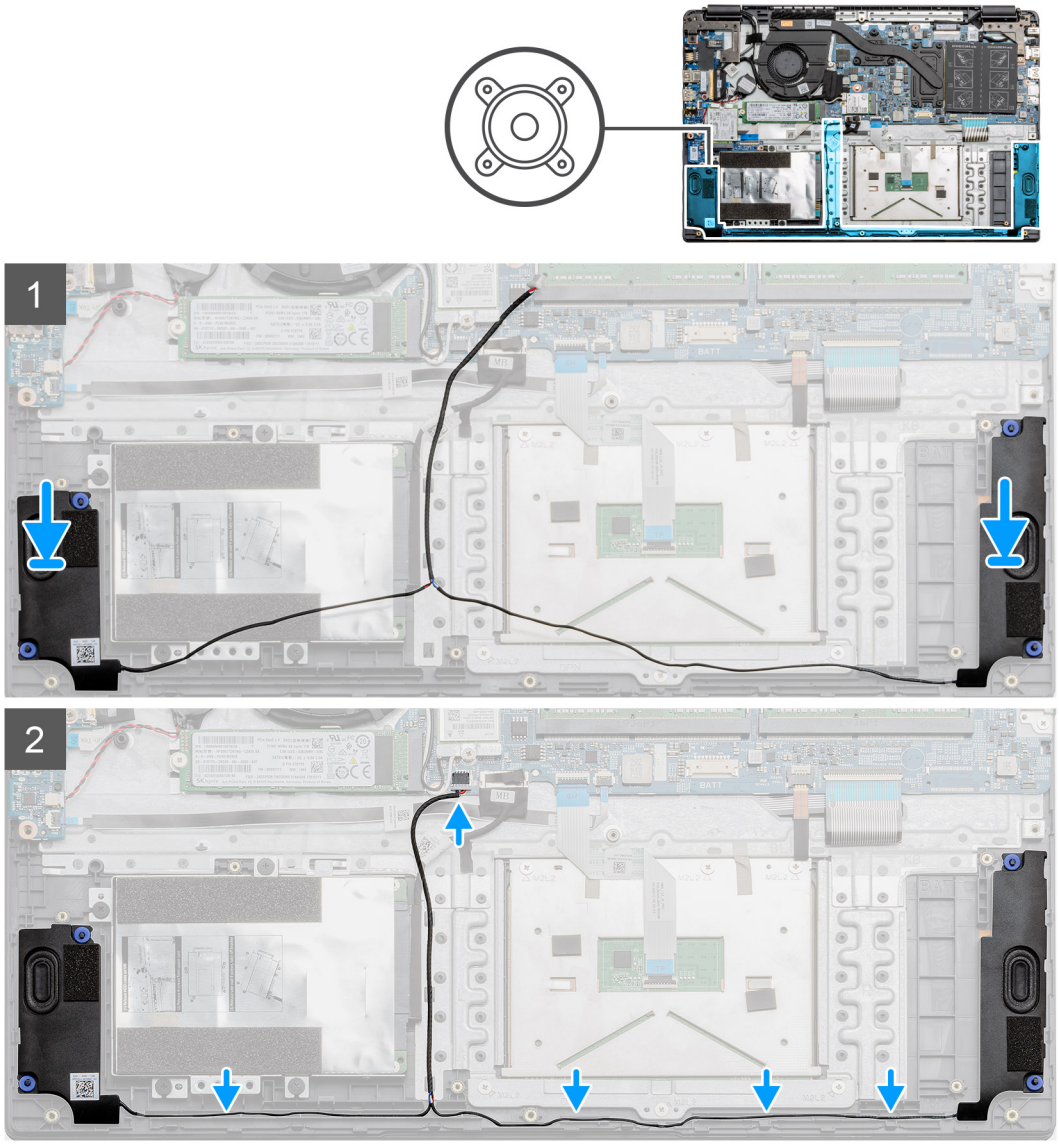
Installing the speakers

Prerequisites

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

About this task

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



Steps

1. Place the speaker assembly onto the mounting points on the bottom base on the computer.
2. Route the cables from both the speaker modules through the routing points at the lower portion of the bottom base. Once secured, connect the speaker's cable connector to the connector on 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.

Fan Assembly

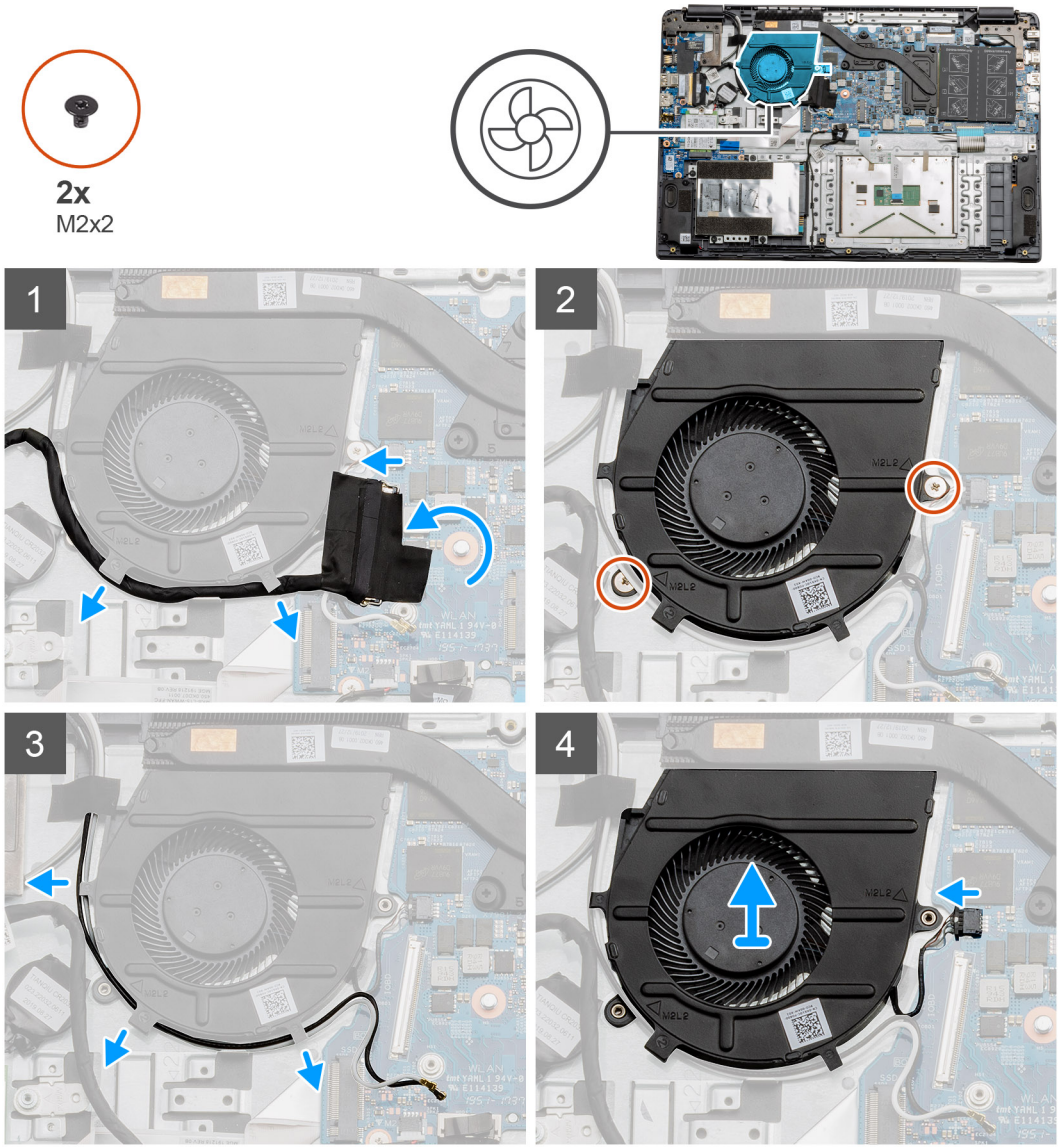
Removing the Fan Assembly

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.

About this task

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



Steps

1. Disconnect the IO board cable from the connector on the system board and remove the cables from the cable management routes along side the fan assembly.
2. Remove the two (M2x2) screws from the fan assembly.

3. Disconnect the WLAN antenna cables, and remove the cables from the cable management routes along side the fan assembly.
4. Disconnect the fan cable from the system board and lift the fan assembly away from the computer.

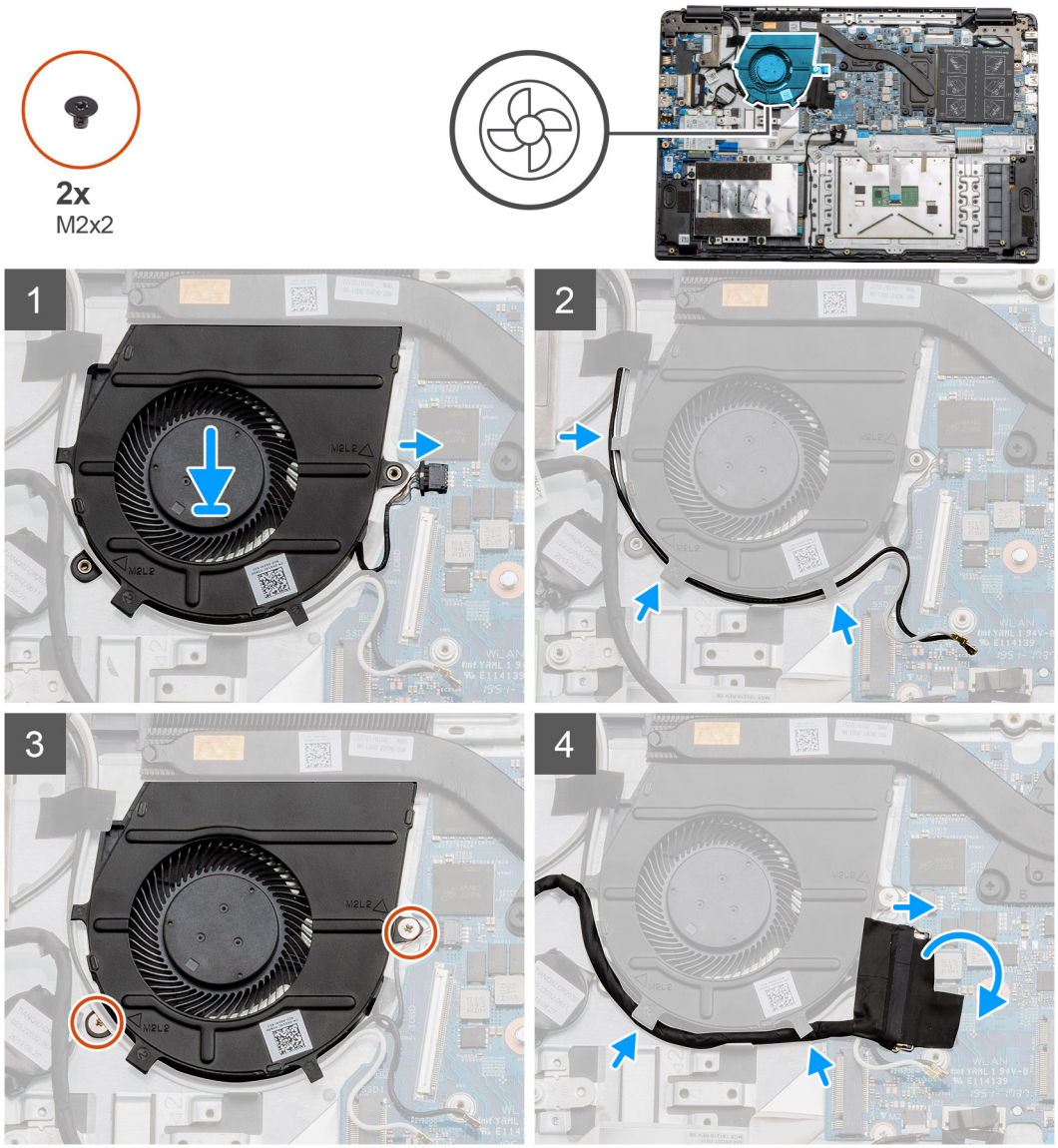
Installing the Fan Assembly

Prerequisites

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

About this task

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



Steps

1. Place the fan assembly onto the mounting points on the palmrest and connect the fan cable to the system board.
2. Route the antenna cables along the cable management routes on the fan assembly and connect the cables to the WLAN card.
3. Connect the fan connector to the system board.
4. Route the IO board cable along the cable management route on the fan assembly and connect it 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.

Heatsink assembly

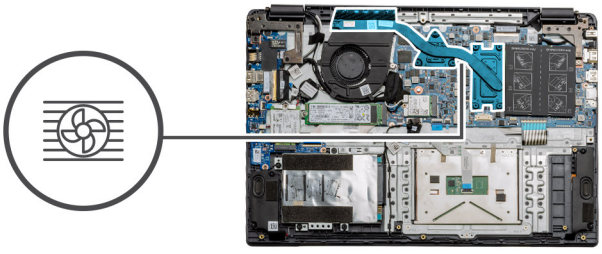
Removing the Heatsink Assembly - UMA

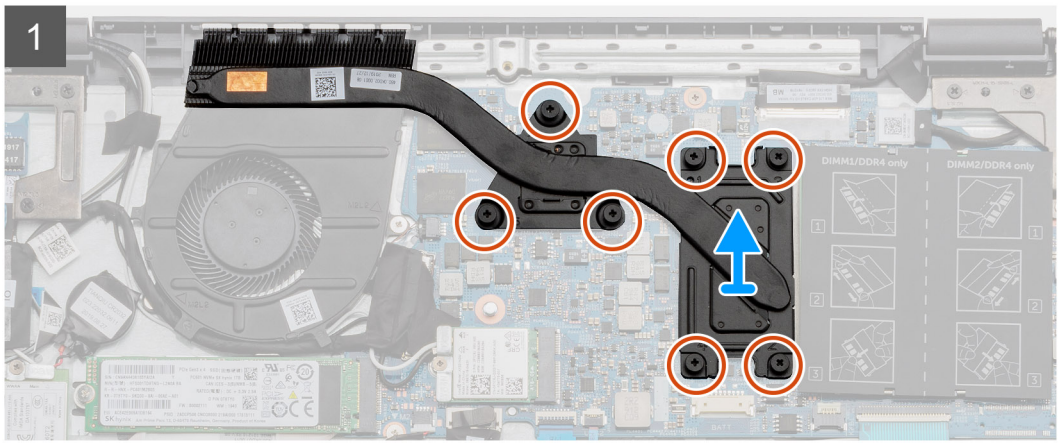
Prerequisites

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

About this task

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





Steps

1. Loosen the seven captive screws that secure the heatsink to the system board.
2. Lift the heatsink assembly away from the computer.

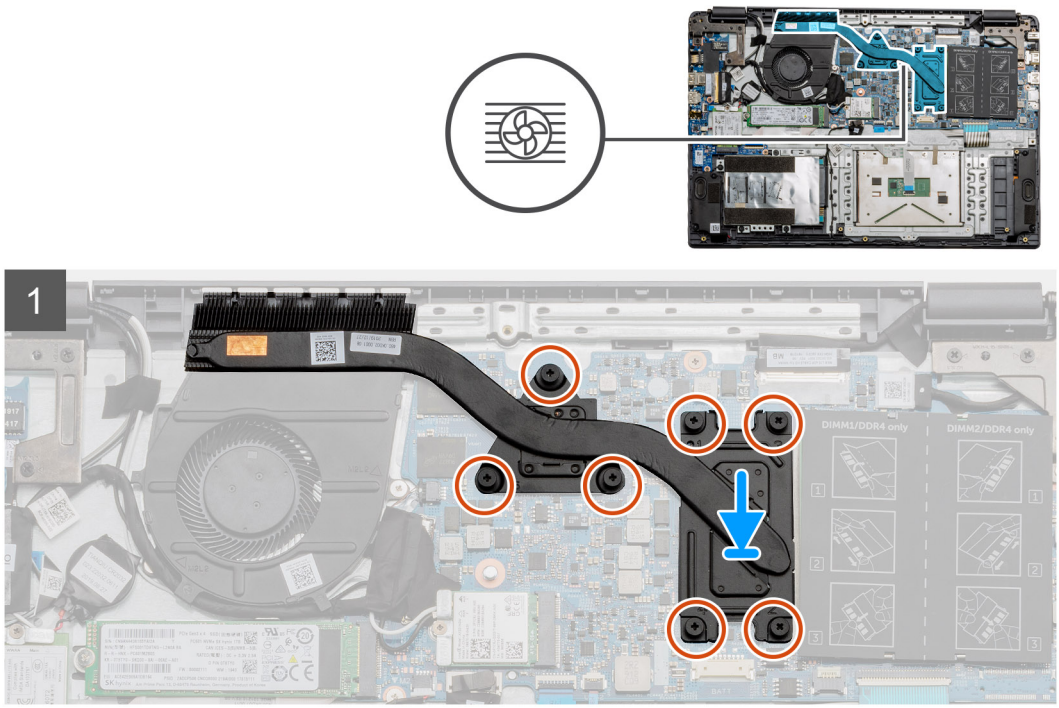
Installing the Heatsink Assembly - Discrete

Prerequisites

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

About this task

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



Steps

1. Place the heatsink onto the system board ensuring the mounting points on heatsink and system board align.
2. Tighten the seven captive screws to secure the heatsink 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.

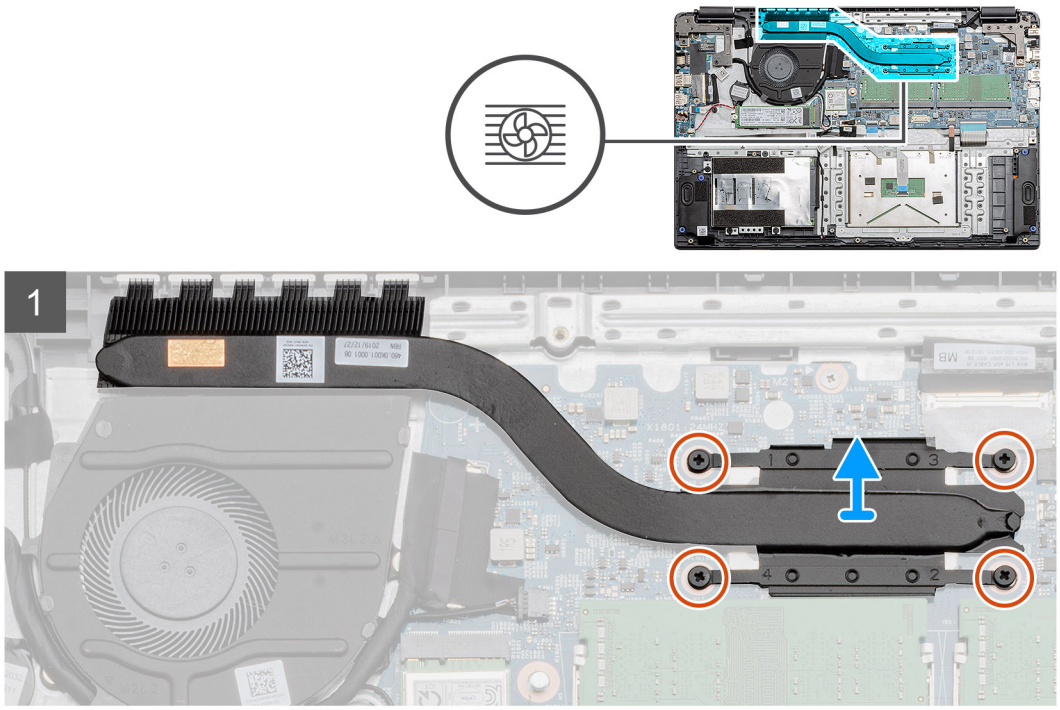
Removing the Heatsink Assembly - UMA

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.

About this task

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



Steps

1. Loosen the four captive screws that secure the heatsink to the system board.
2. Lift the heatsink assembly away from the computer.

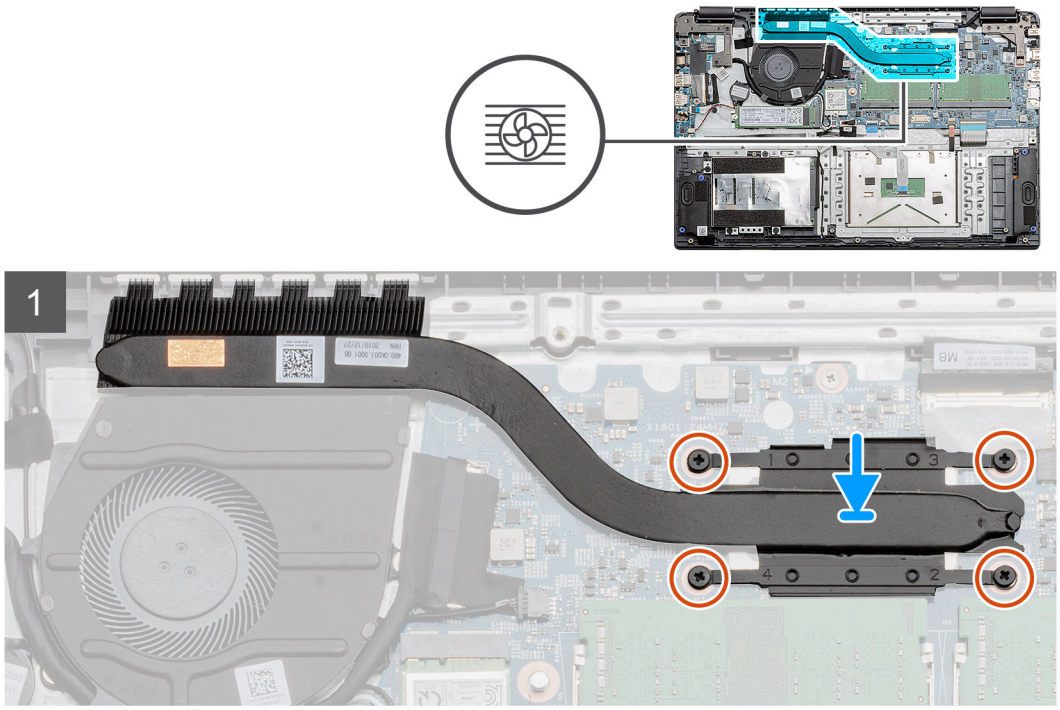
Installing the Heatsink Assembly - UMA

Prerequisites

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

About this task

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



Steps

1. Place the heatsink onto the system board ensuring the mounting points on heatsink and system board align.
2. Tighten the four captive screws to secure the heatsink 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.

System board

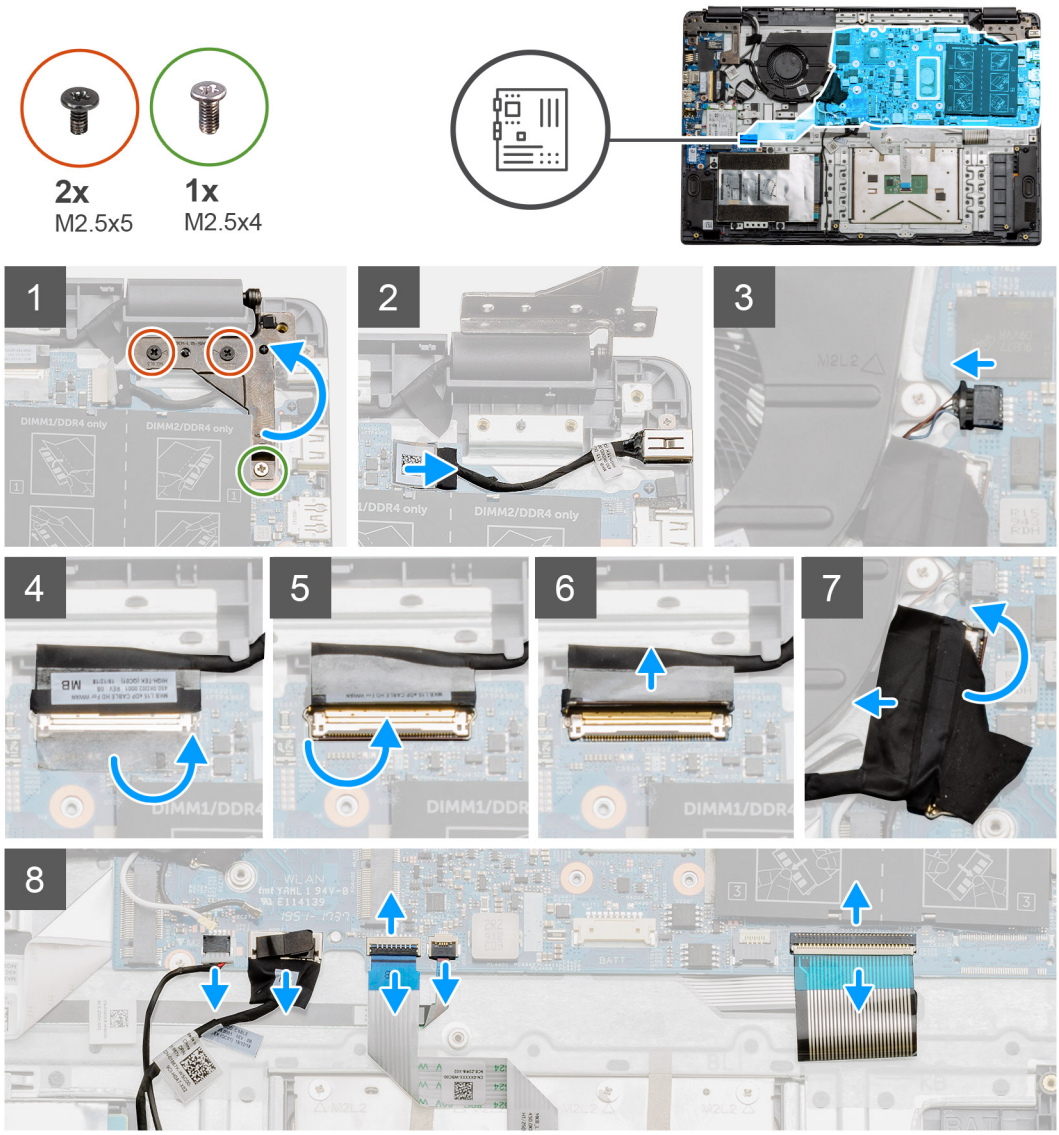
Removing the system board - Discrete

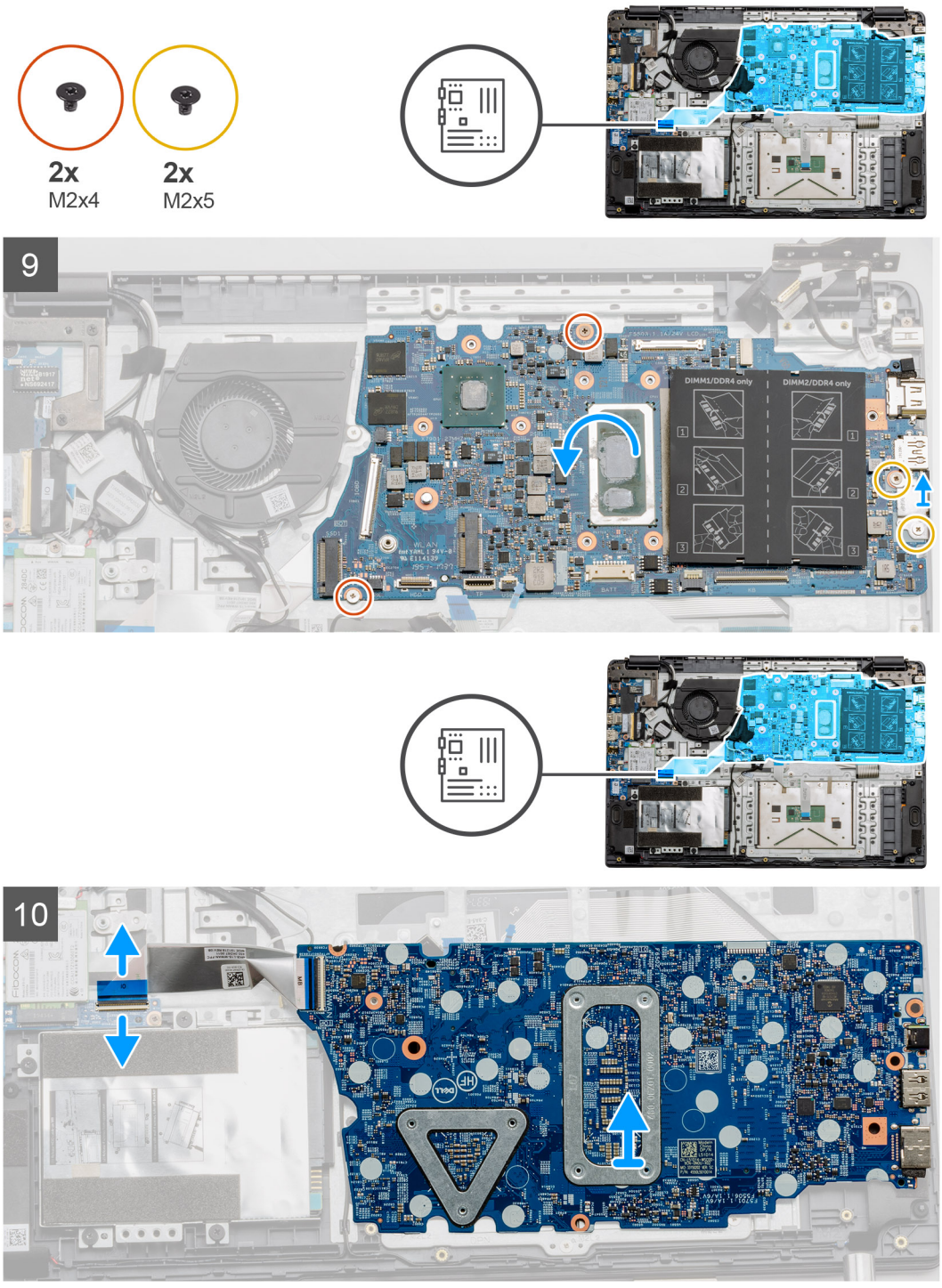
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD Card.
3. Remove the base cover.
4. Disconnect the battery.
5. Remove the memory modules.
6. Remove the WWAN card.
7. Remove the WLAN card.
8. Remove the solid state drive.
9. Remove the heatsink.

About this task

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


2x
M2.5x5
1x
M2.5x4
1
2
3
4
5
6
7
8



Steps

1. Remove the two (M2.5x5) and the single (M2.5x4) screws from the right hinge.
2. Disconnect the DC-in connector cable from the system board.
3. Disconnect the Fan assembly cable from the system board.
4. Peel back the adhesive tape covering the LCD cable.
5. Lift the latch that locks down the LCD cable onto the system board.
6. Disconnect the LCD cable from the system board.
7. Peel back the adhesive tape from over the IO board connector cable and disconnect the IO boards connector cable.
8. Disconnect the connector cables from the system board in the following order (left - right): Speaker, Touchpad, USB, Battery, Keyboard.

9. Remove the two (M2x4) screws from the system board and the two (M2x5) screws holding the metal shield. Then lift and flip the board downward.
10. Disconnect the cable that is connected to the daughterboard and lift and move the system board away from the computer.

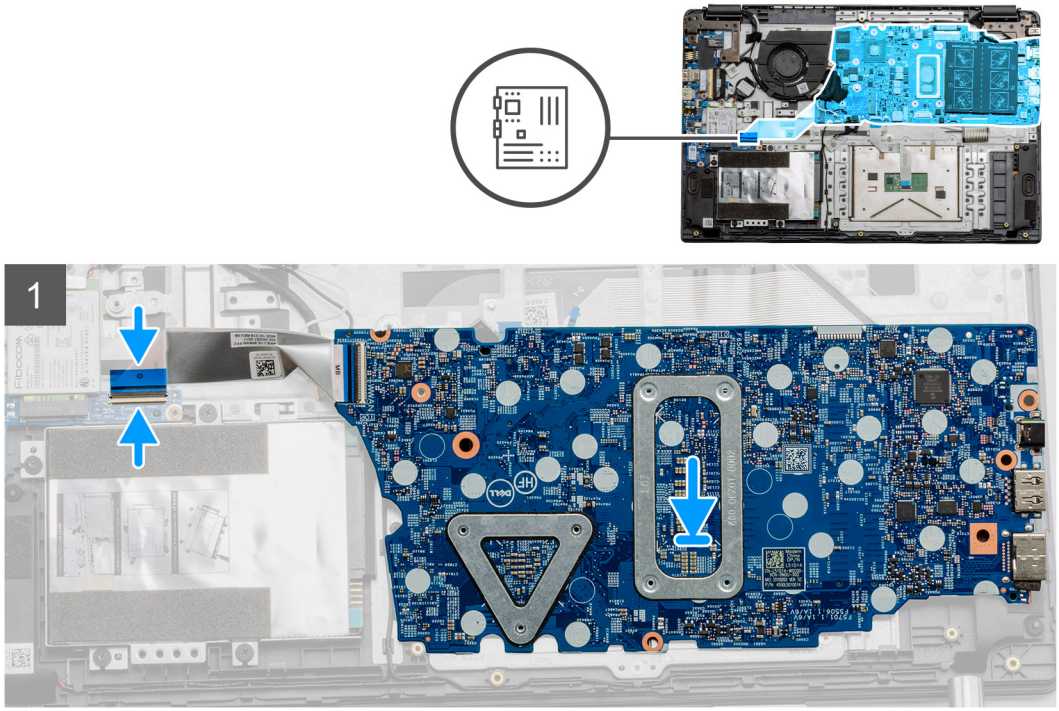
Installing the system board - Discrete

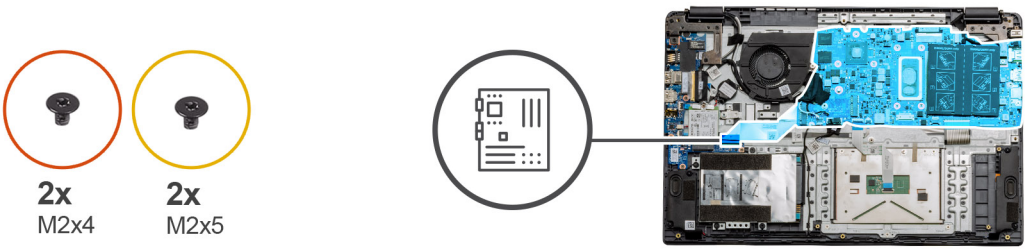
Prerequisites

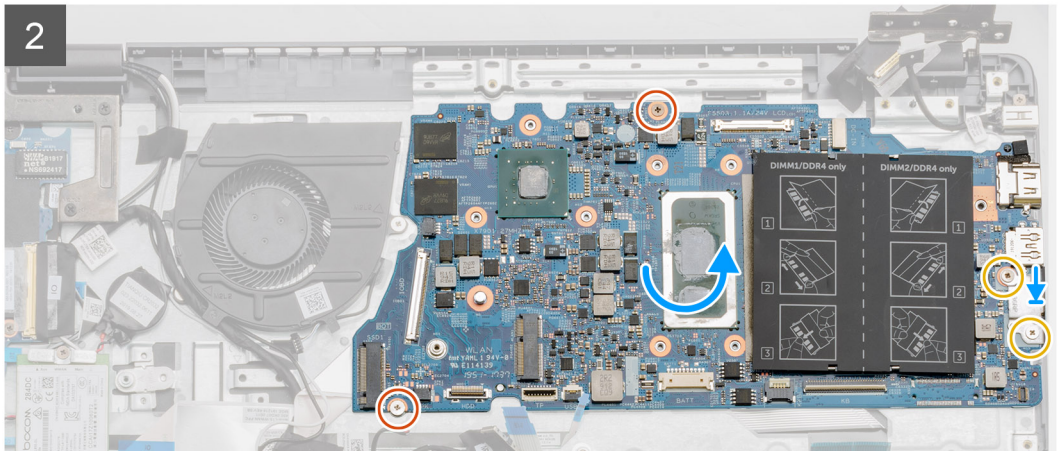
If you are replacing a component, remove the existing component before performing the installation procedure.

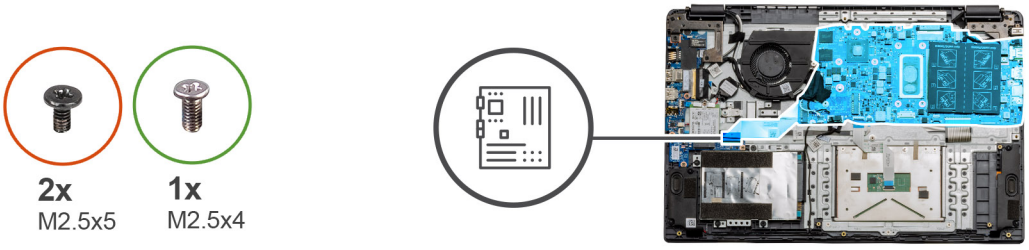
About this task

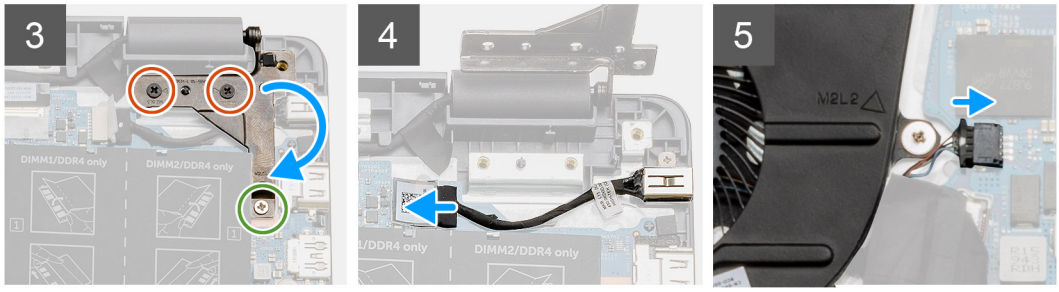
The figure indicates the location of the system board and provides a visual representation of the installation procedure.

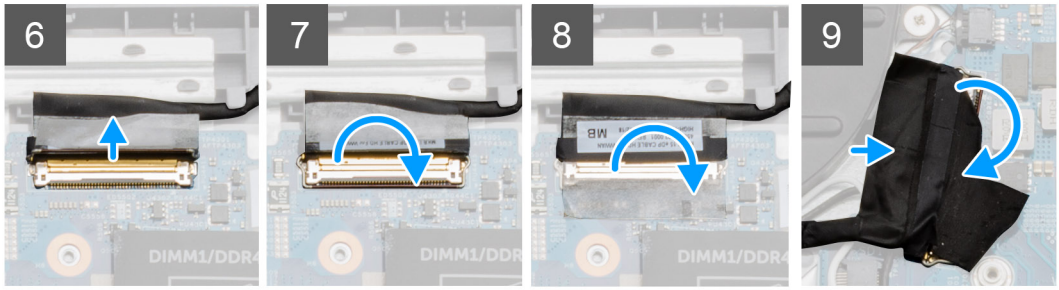


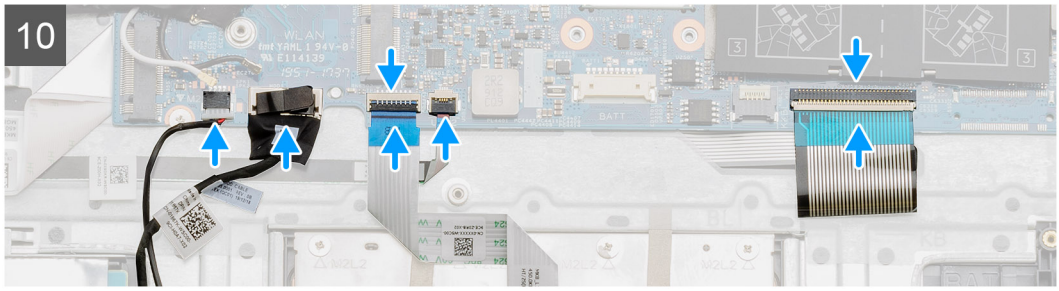

2x
M2x4
2x
M2x5


2
DIMM1/DDR4 only
DIMM2/DDR4 only


2x
M2.5x5
1x
M2.5x4


3
DIMM1/DDR4 only
DIMM2/DDR4 only
4
DIMM2/DDR4 only
5
M2L2


6
DIMM1/DDR
7
DIMM1/DDR
8
DIMM1/DDR
9


10

Steps

1. Hold the system upside down, connect the cable connector from the system board to the daughterboard.
2. Fold the system board upright, and place it onto the system, aligning the screw posts from the palmrest. Place the metal shield onto the USB port module and install the two (M2x5) screws. Install the two (M2x4) screws to secure the system board to the palmrest.
3. Fold the right hinge back, install the two (M2.5x5) and one (M2.5x4) to secure the hinge in place.
4. Connect the DC-in port connector back to the system board.
5. Connect the fan connector back to the system board.
6. Connect the LCD cable back to the system board.
7. Fold the LCD connectors latch to secure it in place.
8. Fold back the adhesive tape into the LCD connector.
9. Connect the IO board cable to the system board.
10. Connect the following cables in the following order (left - right): Speaker, Touchpad, USB, Battery, Keyboard.

Next steps

1. Install the Heatsink.
2. Install the WLAN card.
3. Install the WWAN card.
4. Install the Solid state drive.
5. Install the memory module.
6. Install the battery.
7. Install the base cover.
8. Install the SD Card.
9. Follow the procedure in After working inside your computer.

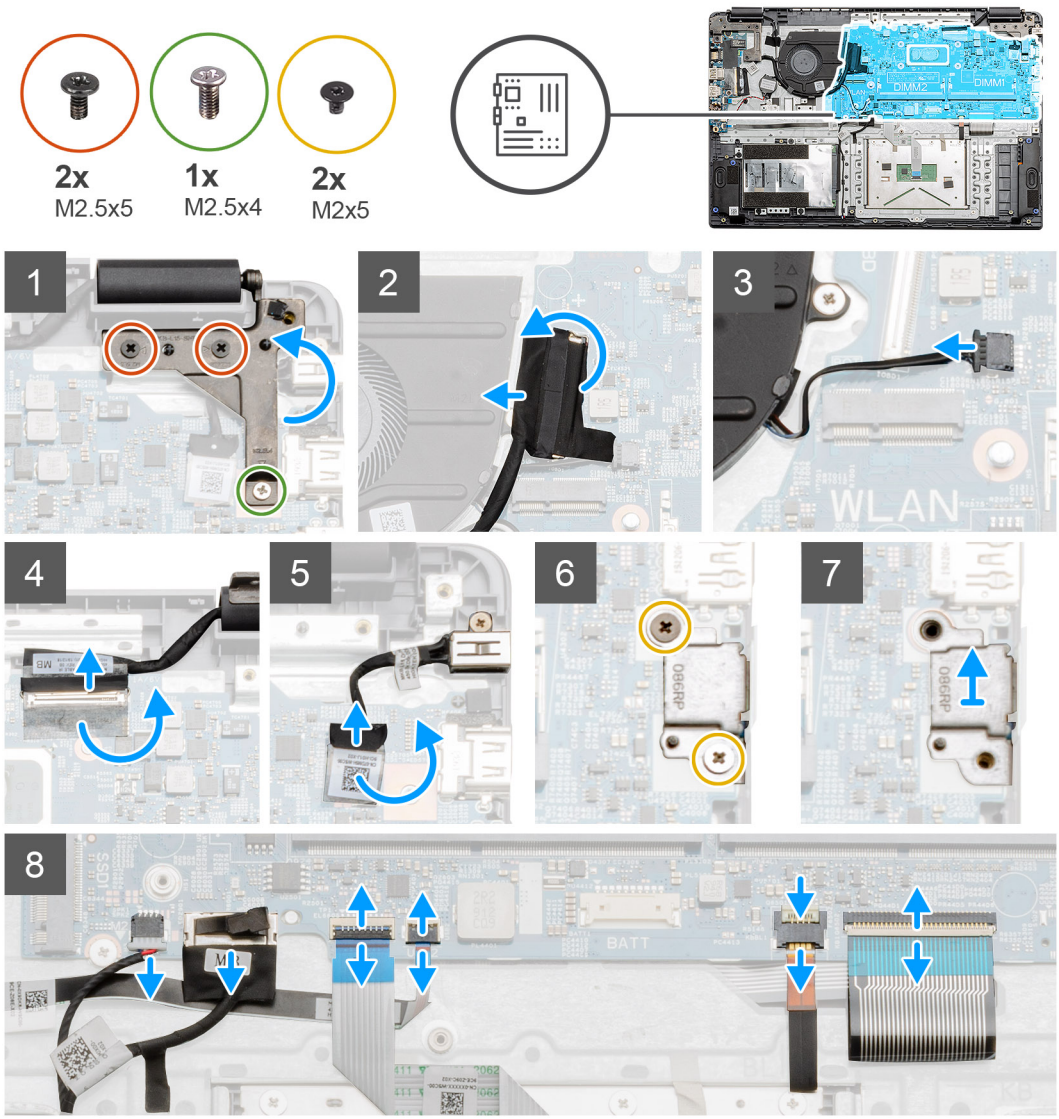
Removing the system board - UMA

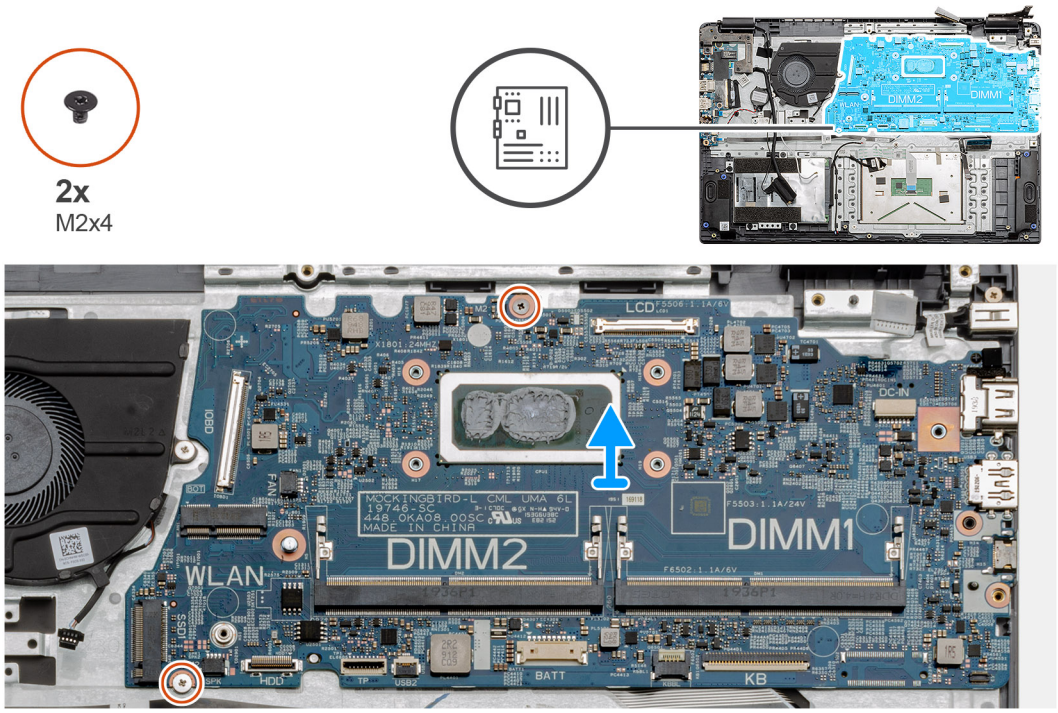
Prerequisites

1. Follow the procedure in before working inside your computer.
2. Remove the SD Card.
3. Remove the base cover.
4. Disconnect the battery.
5. Remove the memory modules.
6. Remove the WLAN card.
7. Remove the WLAN card.
8. Remove the solid state drive.
9. Remove the heatsink.

About this task

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


2x
M2.5x5
1x
M2.5x4
2x
M2x5
DIMM2
DIMM1
1
2
3
WLAN
4
5
6
7
8
BATT



Steps

1. Remove the two (M2.5x5) and the single (M2.5x4) screws from the right hinge.
2. Disconnect the IO board connector cable from the system board.
3. Disconnect the Fan connector cable from the system board.
4. Peel back the adhesive tape from the LCD cable and disconnect the LCD cable from the system board.
5. Peel back the adhesive tape from the DC-in cable connector and disconnect the DC-in cable from the system board.
6. Remove the two (M2x5) screws from the metal shield covering the USB module.
7. Lift and take the metal shield away from the system.
8. Disconnect the connector cables from the system board in the following order (left - right): Speaker, Touchpad, USB, Battery, Keyboard.
9. Remove the two (M2x4) screws from the system board and lift the board away from the computer.

Installing the system board - UMA

Prerequisites

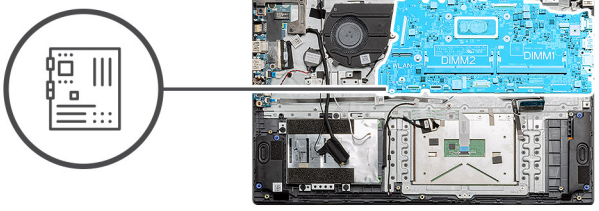
If you are replacing a component, remove the existing component before performing the installation procedure.

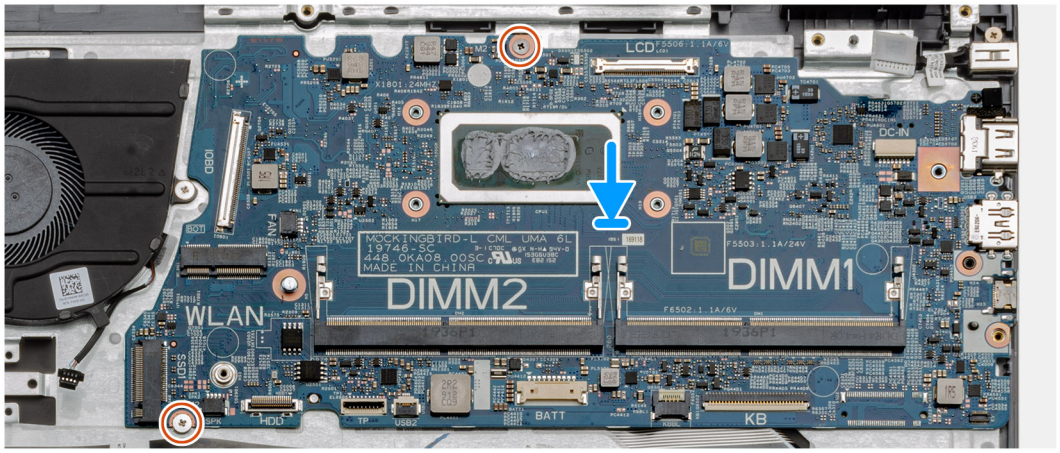
About this task

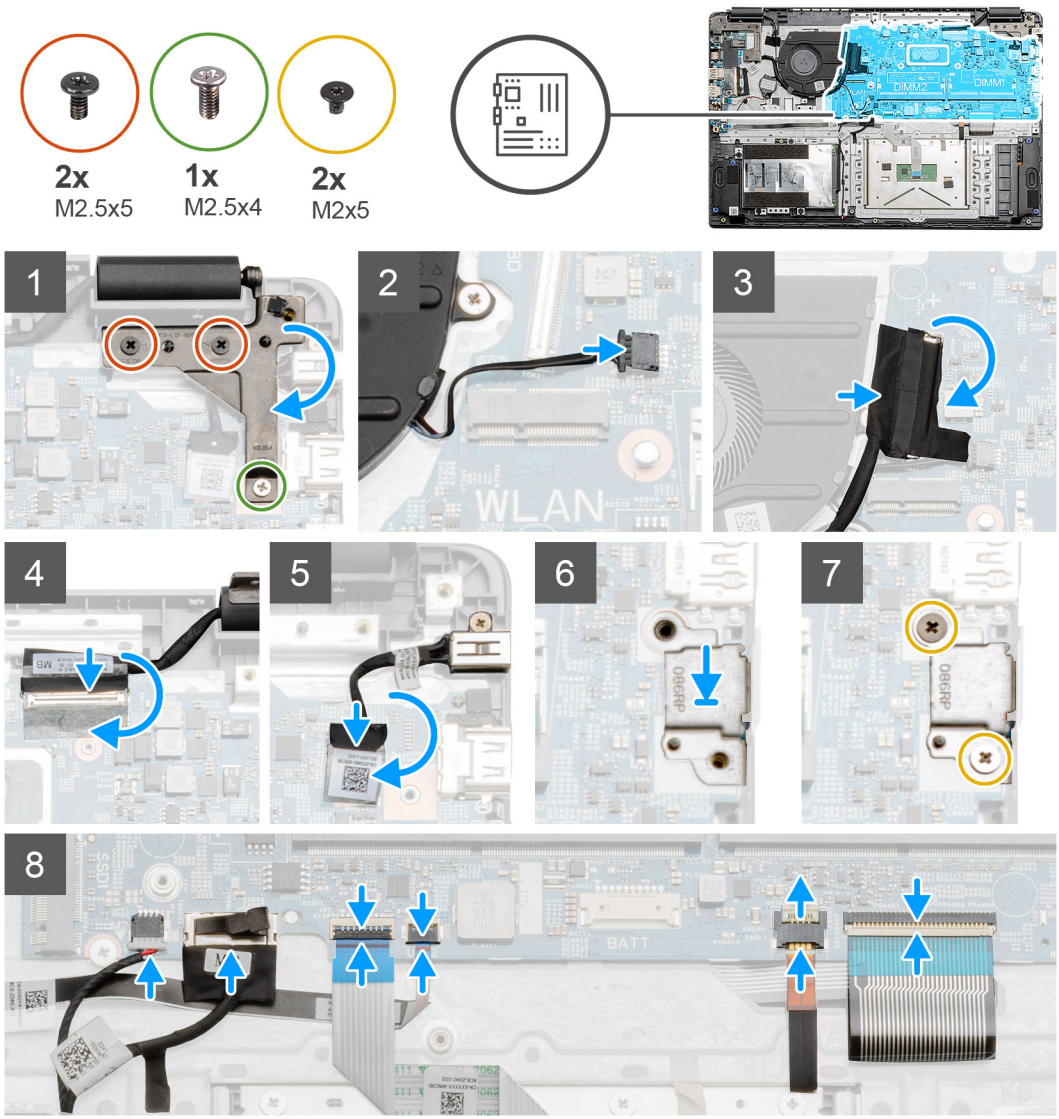
The figure indicates the location of the system board and provides a visual representation of the installation procedure.



2x
M2x4







Steps

1. Place the system board onto the palmrest, aligning the screw posts to the mounting points on the palmrest. Install the two (M2x4) screws to secure the system board to the palmrest.
2. Fold the right hinge back, install the two (M2.5x5) and one (M2.5x4) to secure the hinge in place.
3. Connect the fan connector back to the system board.
4. Connect the IO board cable to the system board.
5. Connect the LCD cable back to the system board and fold the adhesive tape back onto the LCD connector.
6. Connect the DC-in port connector back to the system board and fold the adhesive tape back onto the DC-in connector.
7. Place the metal shield onto the USB port module.
8. Install the two (M2x5) screws to secure the metal shield.
9. Connect the following cables in the following order (left - right): Speaker, Touchpad, USB, Battery, Keyboard.

Next steps

1. Install the Heatsink.
2. Install the WLAN card.
3. Install the WWAN card.
4. Install the Solid state drive.
5. Install the memory module.
6. Install the battery.
7. Install the base cover.

8. Install the SD Card.
9. Follow the procedure in After working inside your computer.

IO Board

Removing the IO Board

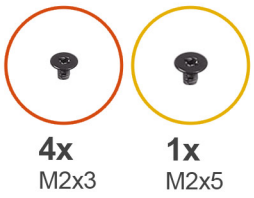
Prerequisites

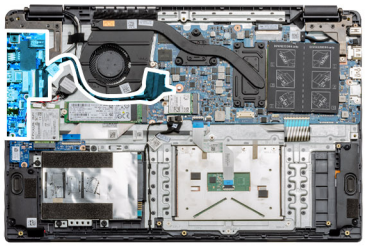
1. Follow the procedure in before working inside your computer.
2. Remove the SD Card.
3. Remove the base cover.
4. Disconnect the battery.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the solid state drive.

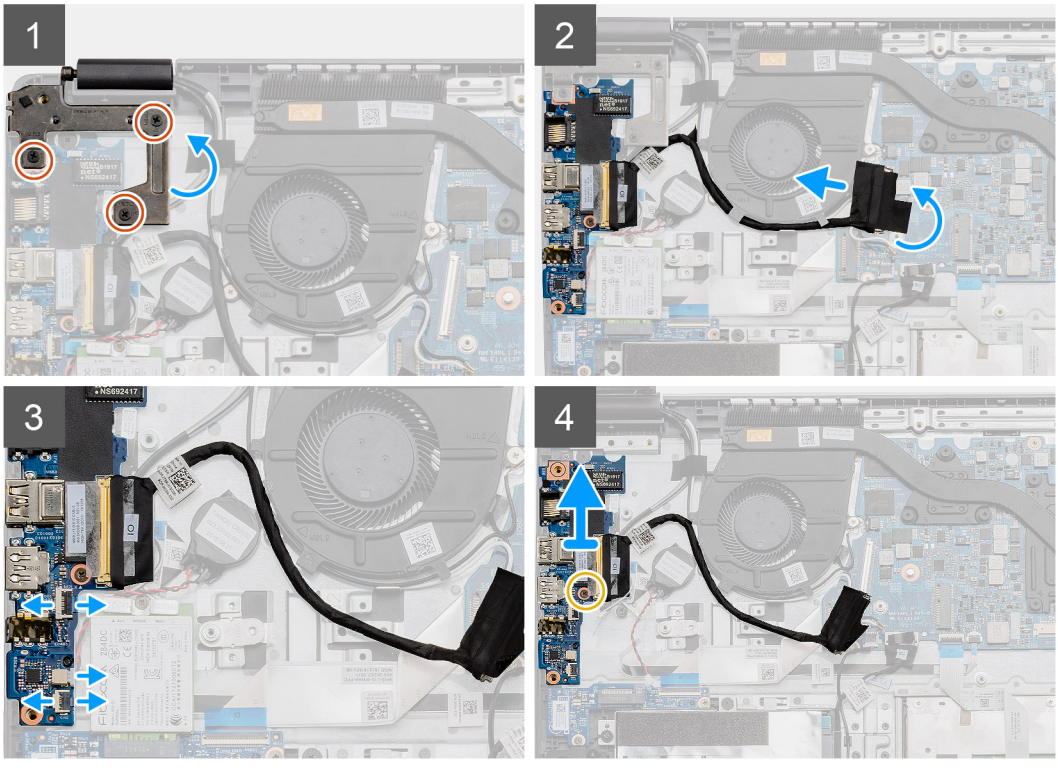
NOTE: Hall Sensor is a part of the IO board and the entire IO board needs to be replaced if the Hall Sensor is faulty.

About this task

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







Steps

1. Remove the three (M2x3) screws from the left hinge and lift the hinge up.
2. Peel back the adhesive tape covering the IO board connector cable and disconnect it from the system board.
3. Disconnect the cable connectors from the IO board in the following order (left - right): USB cable, Coin-cell battery cable, third connector.
4. Remove the single (M2x5) screw that is holding the IO board in place and lift the module away from the computer.

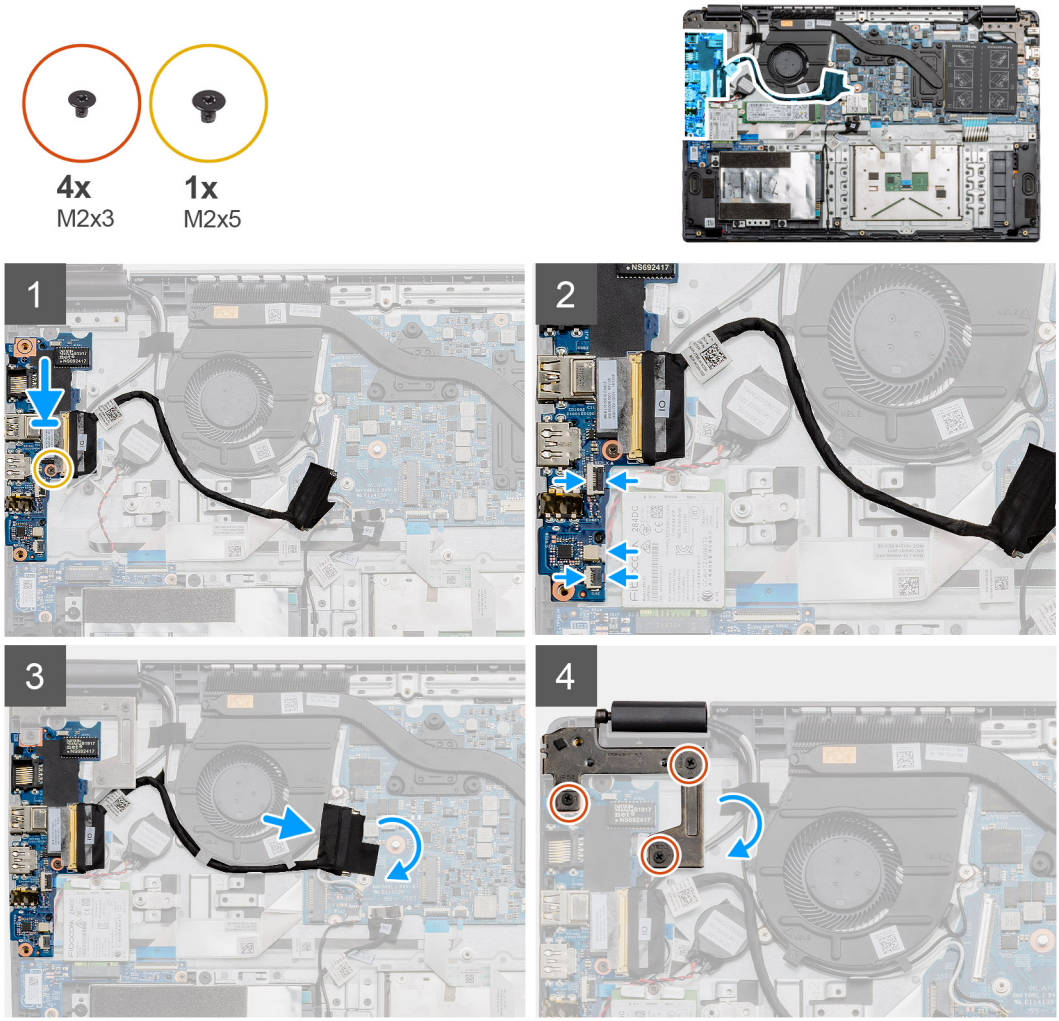
Installing the IO Board

Prerequisites

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

About this task

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



Steps

1. Place the IO board onto the mounting points on the palmrest and secure it using the single (M2x5) screw.
2. Connect the three cable connectors to the connectors on lower right side of the IO board, Using a single (M2x3) screw, install the WWAN card and secure it in place.
3. Route the IO Board connector cable through the routing points under the fan assembly and connect the cable to the connector on the system board. Fold the adhesive tape back onto the IO Board connector on the system board.
4. Using the three (M2x3) screws, close and secure the left hinge to the palmrest.

Next steps

1. Install the WLAN card.
2. Install the WWAN card.
3. Install the Solid state drive.
4. Install the battery.
5. Install the base cover.
6. Install the SD Card.
7. Follow the procedure in After working inside your computer.

Power button

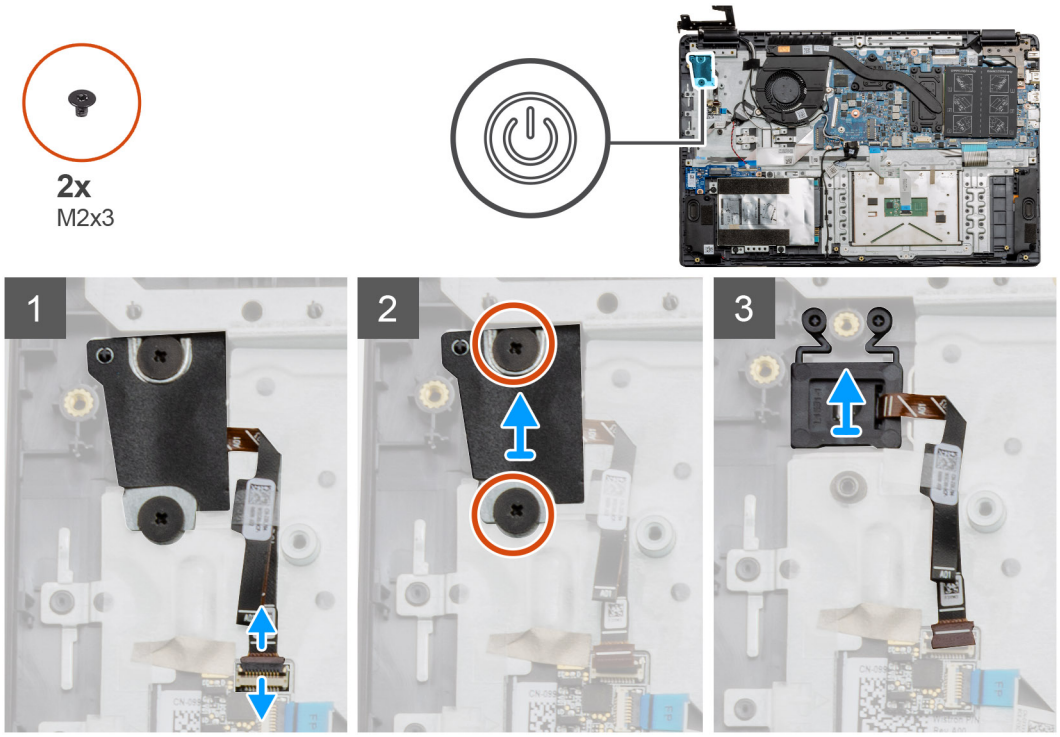
Removing the Power Button

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.
5. Remove the WLAN card.
6. Remove the WWAN card.
7. Remove the IO board.
8. Remove the solid state drive.

About this task

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



Steps

1. Disconnect the power button connector cable from the daughterboard module.
2. Remove the two (M2x3) screws that secure the shield over the power button module.
3. Lift the Power Button module away from the computer.

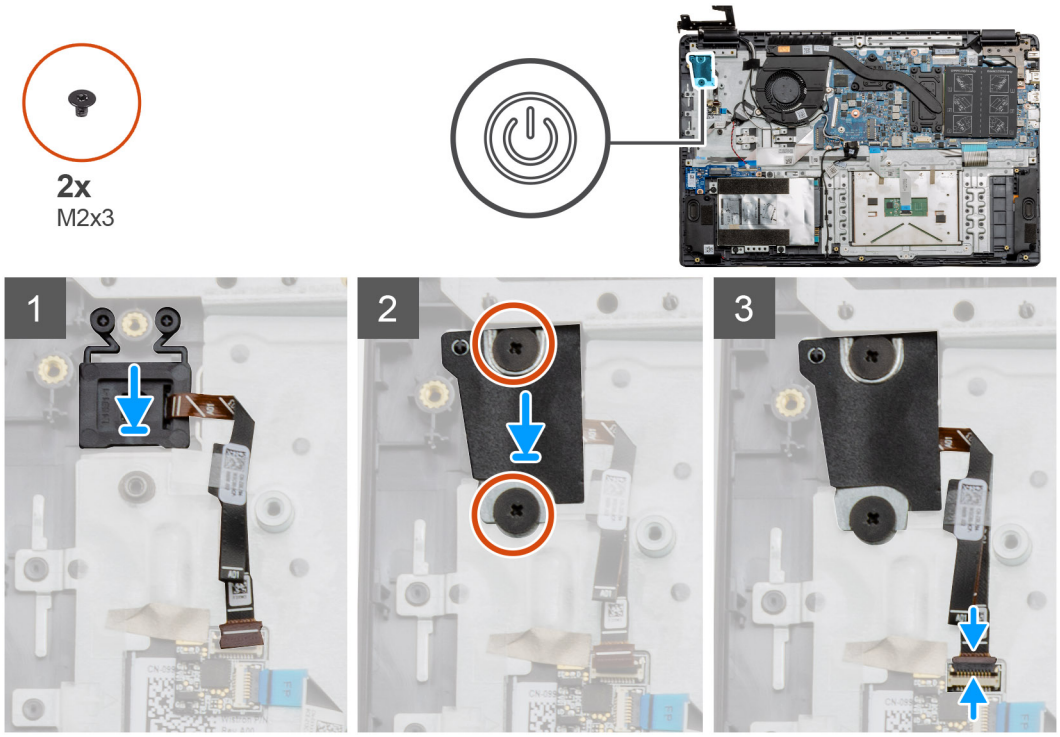
Installing the Power Button

Prerequisites

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

About this task

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



Steps

1. Place the Power Button module onto the mounting points on the palmrest and connect the cable to the connector on the system board.
2. Place the plastic cover on top of the power button module.
3. Place the shield on top of the power button module and install the two (M2x3) screws to secure the shield onto the power button.
4. Connect the cable connector to the daughterboard module.

Next steps

1. Install the WLAN card.
2. Install the WWAN card.
3. Install the Solid state drive.
4. Install the battery.
5. Install the base cover.
6. Install the SD Card.
7. Follow the procedure in After working inside your computer.

Display assembly

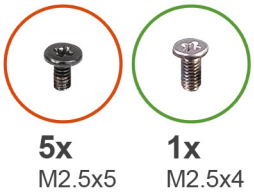
Removing the LCD Assembly

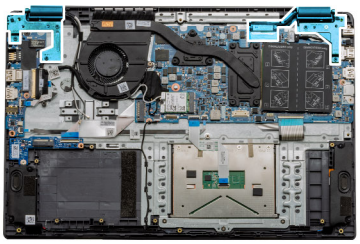
Prerequisites

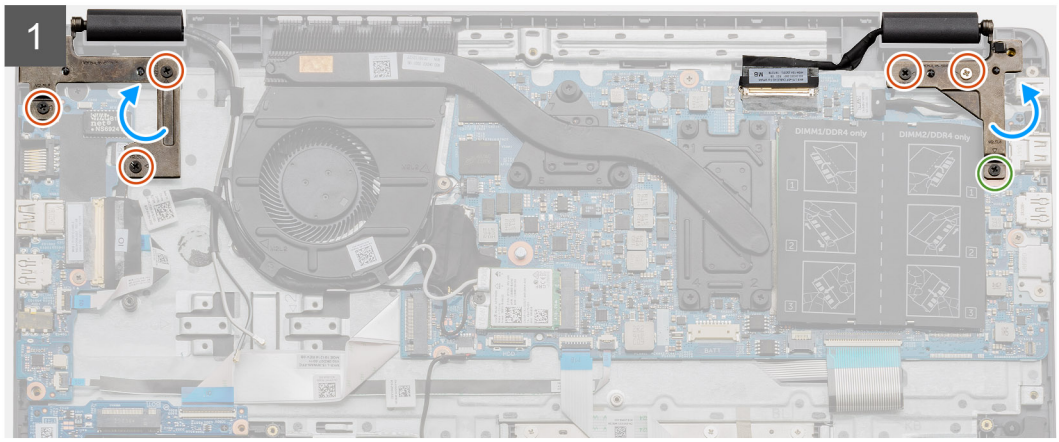
1. Follow the procedure in before working inside your computer.
2. Remove the SD Card.
3. Remove the base cover.
4. Disconnect the battery.

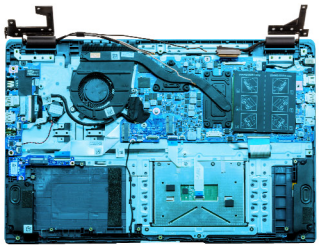
About this task

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

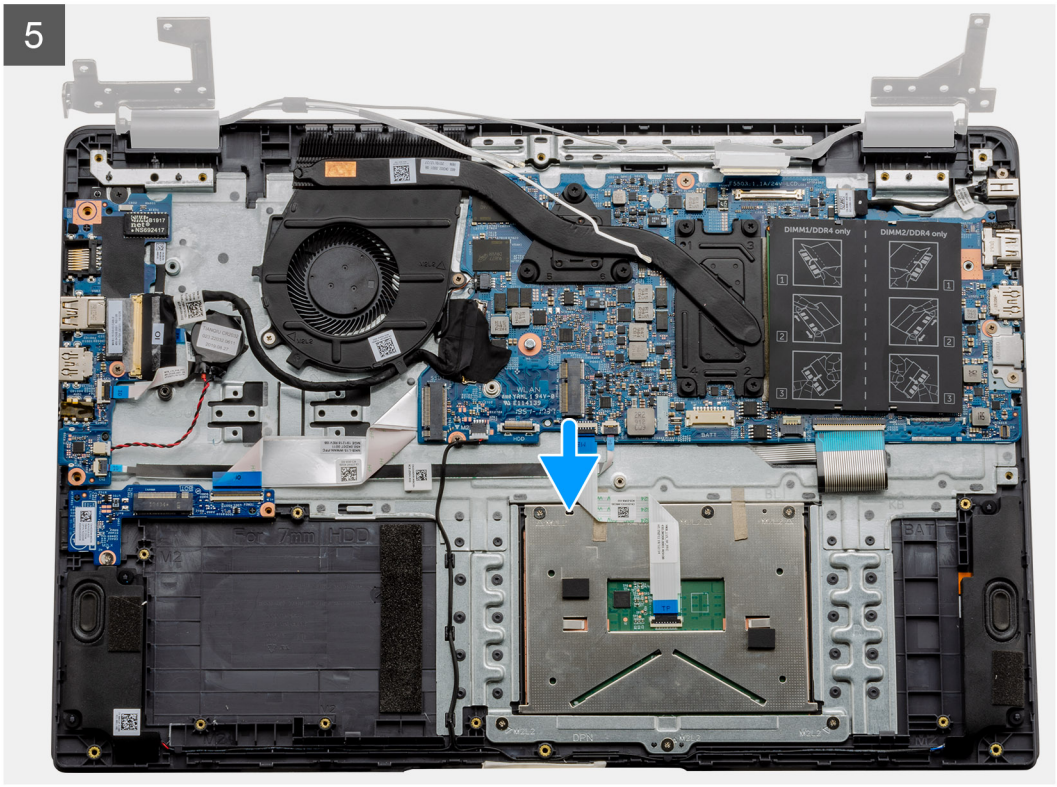








5







Steps

1. Remove the five M2.5x5 screws from both the hinges followed by the single M2.5x4 from the right hinge. Lift and fold the hinges backwards.
2. Peel back the adhesive tape covering the LCD cable.
3. Fold the adhesive tape away from the LCD cable.
4. Remove the LCD cable and lift it away from the computer.
5. Move the system away from the LCD assembly.

Installing the LCD Assembly

Prerequisites

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

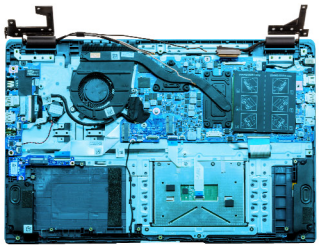
About this task

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

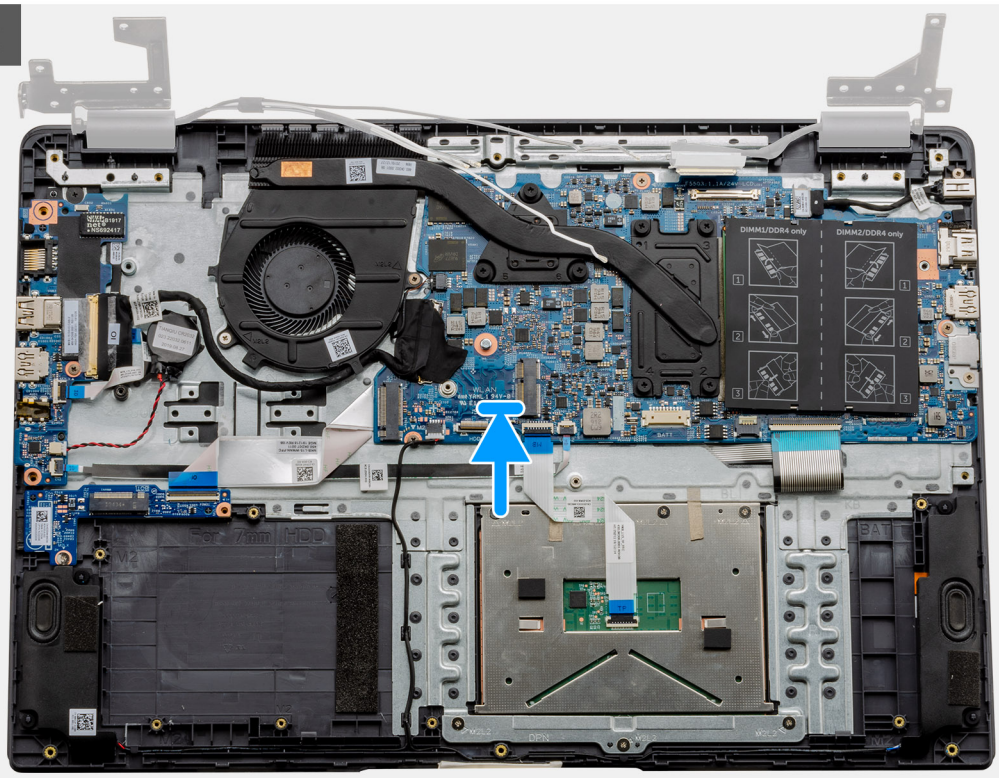


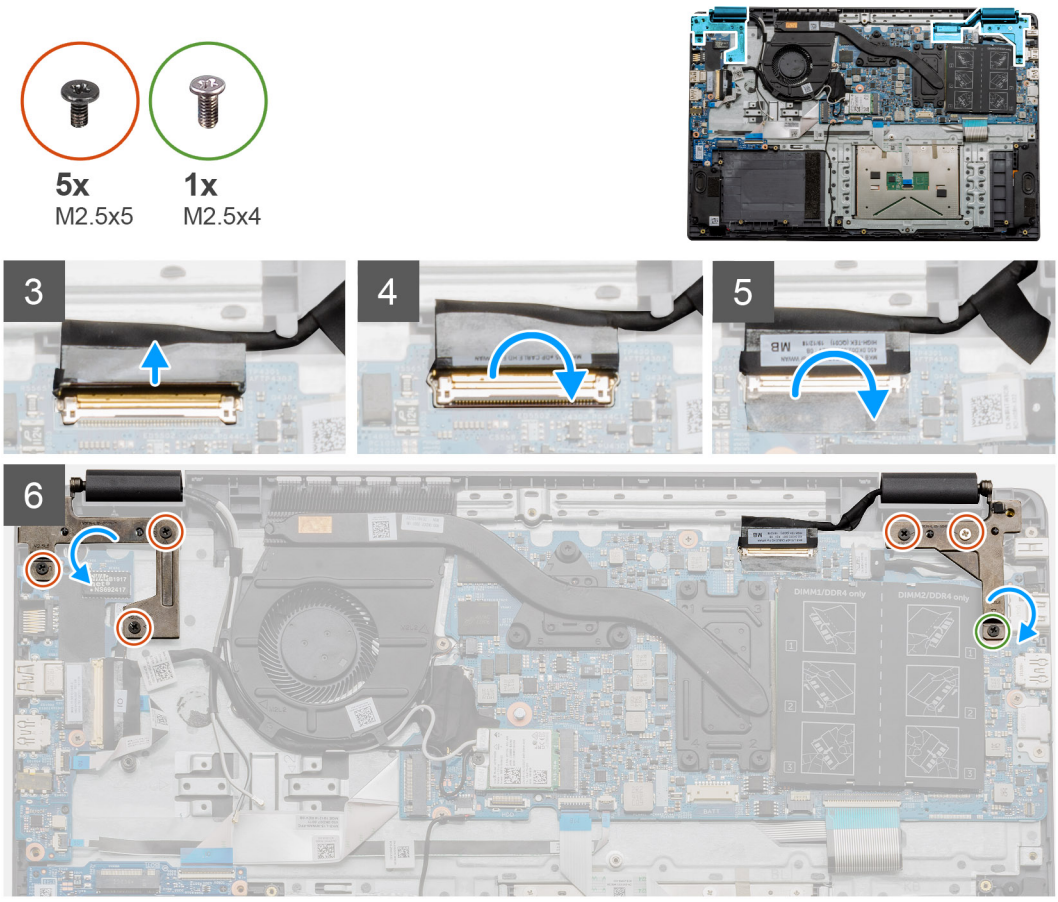
1





2





Steps

1. Place the display assembly on a clean and flat surface.
2. Align and place the palmrest and keyboard assembly on the display assembly.
3. Using the alignment posts, close the display hinges.
4. Connect the display cable to the system board and adhere the tape to secure the display cable.
5. Place the EDP metal bracket on the display cable connector.
6. Install the six (M2.5x5) screws that secure the display hinges to the chassis of your computer.

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.

Palmrest assembly

Removing the Palmrest Assembly

Prerequisites

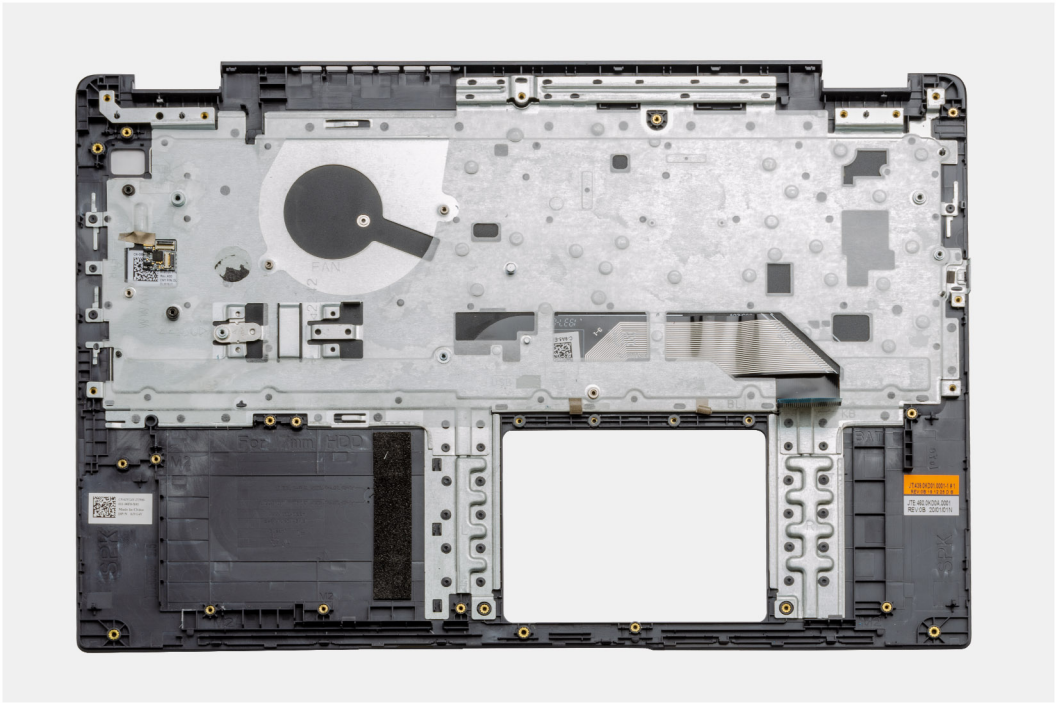
1. Follow the procedure in before working inside your computer.
2. Remove the SD card.
3. Remove the base cover.
4. Remove the battery.
5. Remove the WLAN card.

6. Remove the WWAN card.
7. Remove the coin-cell battery.
8. Remove the memory modules.
9. Remove the DC-in.
10. Remove the solid state drive.
11. Remove the hard drive.
12. Remove the touchpad.
13. Remove the speakers.
14. Remove the heatsink.
15. Remove the system board.

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

About this task

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



Steps

Once the required parts are removed, the bare palmrest assembly can be accessed and removed.

Next steps

1. Install the system board
2. Install the heatsink.
3. Install the speakers.
4. Install the touchpad.
5. Install the hard drive.
6. Install the solid state drive.
7. Install the DC-in.
8. Install the memory modules.
9. Install the coin-cell battery.
10. Install the WWAN card.
11. Install the WLAN card.
12. Install the battery.
13. Install the base cover.

14. Install the SD card SD card.

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

5

Troubleshooting

Enhanced Pre-Boot System Assessment (ePSA) diagnostics

About this task

The SupportAssist diagnostics (also known as system diagnostics) performs a complete check of your hardware. The SupportAssist 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: The SupportAssist window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.

Running SupportAssist diagnostics

Steps

1. Turn on your computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. On the boot menu screen, select the **Diagnostics** option.
4. Click the arrow 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.

SupportAssist diagnostic User Interface

SupportAssist diagnostic User Interface

About this task

This section contains information on Support Assist Basic and Advanced Screen.

SupportAssist opens the basic screen on start. You can switch to the advanced screen using the icon at the bottom left of the screen. The advanced screen shows detected devices in a tiled format. Specific tests can be included or excluded only in the advanced mode. The Basic Screen has minimal controls which allows easy navigation for the user to start or stop the diagnostics.

System diagnostic lights

Battery-status light

Indicates the power and battery-charge status.

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

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

Off

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

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

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

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

Table 3. LED codes

Diagnostic light codes	Problem description
2,1	Processor failure
2,2	System board: BIOS or ROM (Read-Only Memory) failure
2,3	No memory or RAM (Random-Access Memory) detected
2,4	Memory or RAM (Random-Access Memory) failure
2,5	Invalid memory installed
2,6	System-board or chipset error
2,7	Display failure
2,8	LCD power rail failure. Replace system board
3,1	Coin-cell battery failure
3,2	PCI, video card/chip failure
3,3	Recovery image not found
3,4	Recovery image found but invalid
3,5	Power-rail failure
3,6	System BIOS Flash incomplete
3,7	Management Engine (ME) error

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

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

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

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

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.

6

Getting help

Topics:

- Contacting Dell

Contacting Dell

Prerequisites

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

About this task

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

Steps

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