

Dell Latitude 3310 2-in-1

Service Manual

Notes, cautions, and warnings

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

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

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

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Working on your computer


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.


Turning off your computer

Turning off your computertablet tablet— Windows

About this task

 **CAUTION:** To avoid losing data, save and close all open files and exit all open programs before you turn off your computer or remove the side cover.

Steps

1. Click or tap .
2. Click or tap  and then click or tap **Shut down**.

NOTE: Ensure that the computer and all attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for about 6 seconds to turn them off.

Before working inside your computer

Steps

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer.
3. If the computer is connected to a docking device (docked), undock it.
4. Disconnect all network cables from the computer (if available).

CAUTION: If your computer has an RJ45 port, disconnect the network cable by first unplugging the cable from your computer.

5. Disconnect your computer and all attached devices from their electrical outlets.
6. Open the display.
7. Press and hold the power button for a few seconds to ground the system board.

CAUTION: To guard against electrical shock, unplug your computer from the electrical outlet before performing Step # 8.

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.

8. Remove any installed ExpressCards or Smart Cards from their slots.

Safety Precautions

Follow the safety precautions described in the following sections when you perform an installation or a disassembly/reassembly procedure:

- Turn off the system and all attached peripherals.
- Disconnect the system and all attached peripherals from AC power, and then remove the battery.
- Disconnect all network cables, telephone or telecommunications lines from the system.
- Use a wrist grounding strap and mat when working inside any computer system to avoid electrostatic discharge (ESD) damage.
- After removing a system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to help reduce the risk of being shocked or seriously injured in an electrical accident.

Standby Power

Dell products with standby power must be completely unplugged before the case is opened. 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), suspended into a sleep mode, and have other advanced power management features.

After you unplug a system and before you remove components, wait approximately 30 to 45 seconds to allow the charge to drain from the circuits.

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 ESD kit. When connecting a bonding wire, always 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 be sure to always remove all jewelry such as watches, bracelets, or rings prior to bonding yourself and the equipment.

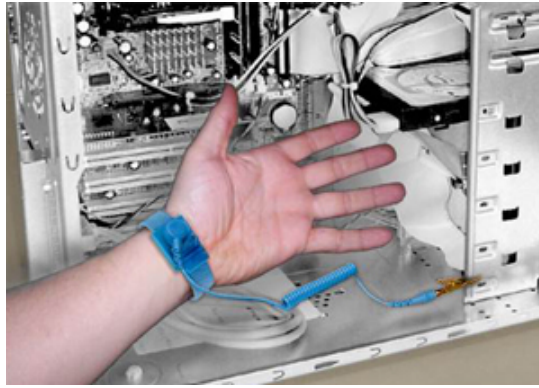


Figure 1. Bonding Properly

Electrostatic Discharge 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 earlier Dell products. For this reason some previously approved methods of handling parts are no longer applicable.

There are two recognized types of ESD damage: catastrophic and intermittent failures.

- **Catastrophic** —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.

i **NOTE: Catastrophic failures represent approximately 20 percent of ESD-related failures.**

- **Intermittent** —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.

i **NOTE: 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 more difficult type of damage to recognize and troubleshoot is the intermittent (also called latent or "walking wounded") failure. The following image shows an example of intermittent damage to a memory DIMM trace. Although the damage is done, the symptoms may not become an issue or cause permanent failure symptoms for some time after the damage occurs.

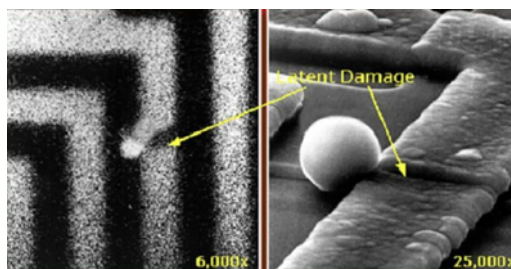


Figure 2. Intermittent (Latent) Damage to a Wiring Trace

Do the following 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.

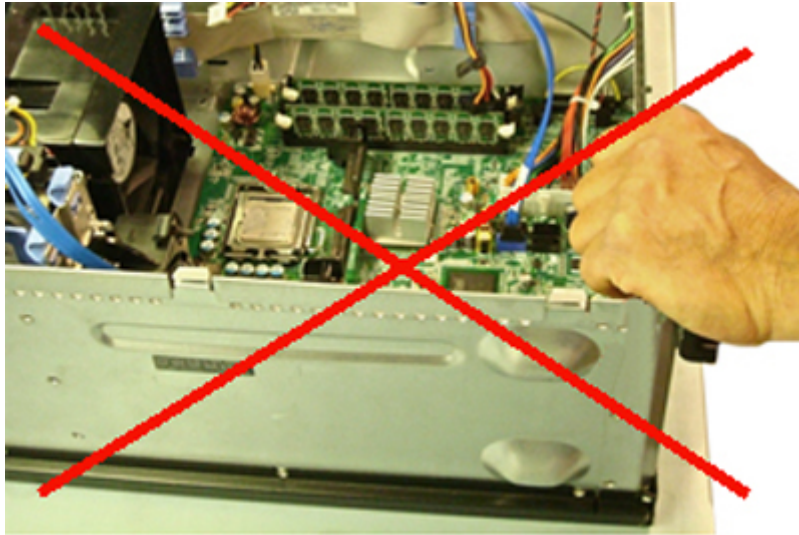


Figure 3. Chassis "Bare Metal" Grounding (Unacceptable)

- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When handling static-sensitive components, grasp them by the sides, not the top. Avoid touching pins and circuit boards.
- 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, be sure to discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

The ESD Field Service Kit

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



Figure 4. ESD Field Service Kit

The anti-static mat is dissipative and should be used to safely place parts on 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 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. Remember, the only safe place for ESD-sensitive items are in your hand, on the ESD mat, in the system, or inside a bag.



Figure 5. Anti-Static Mat

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 a minimum of once per week.

Table 1. Wrist Straps

Wrist Strap and Bonding Wire



Wireless ESD Strap (Unacceptable)



ESD Wrist Strap Tester

The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is 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.



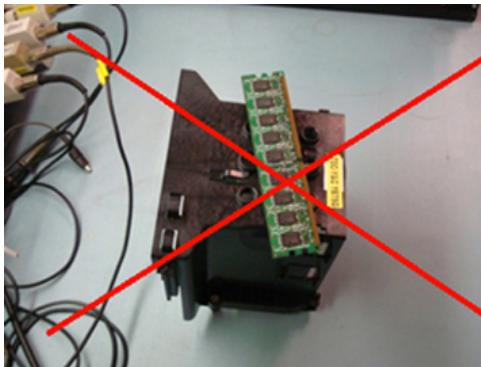
Figure 6. Wrist Strap Tester

Insulator Elements

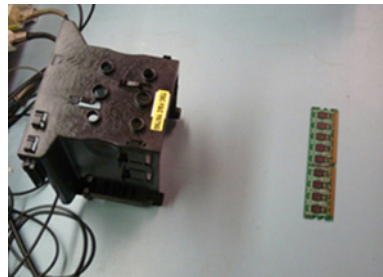
It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.

Table 2. Placement of Insulator Elements

Unacceptable — DIMM lying on an insulator part (plastic heat sink shroud)



Acceptable — DIMM separated from the insulator part



Consider the 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.



Figure 7. ESD Packaging

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 strongly suggested that all field service engineers 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 engineers keep sensitive parts separate from all insulator parts while performing service and that they use anti-static bags for transporting sensitive components.

Lifting Equipment

NOTE: Do not lift greater than 50 pounds. Always obtain assistance from another person or persons, or use a mechanical lifting device.


Adhere to the following guidelines when lifting equipment:

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Bend your knees. Do not bend at the waist.
3. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
4. Lift with your legs, not your back.
5. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
6. Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
7. Follow the same techniques in reverse to set the load down.

After working inside your computer

About this task

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

 **CAUTION: To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.**

Steps

1. Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
2. 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.**

3. Connect your computer and all attached devices to their electrical outlets.
4. Turn on your computer.

Technology and components

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

Topics:

- [UEFI BIOS](#)
- [DDR4](#)
- [Graphics options](#)
- [Storage options](#)
- [HDMI 1.4a](#)
- [Battery specifications](#)
- [USB features](#)
- [USB Type-C](#)
- [Media Card Readers](#)
- [Downloading Windows drivers](#)

UEFI BIOS

UEFI is an acronym for Unified Extensible Firmware Interface. The UEFI specification defines a new model for the interface between personal computer operating systems and platform firmware. The interface consists of data tables that contain platform related information, plus boot and runtime service calls that are available to the operating system and its loader. Together, these provide a standard environment for booting an operating system and running pre-boot applications. One of the main differences between BIOS and UEFI is the way applications are coded. Assembler was used if functions or applications had to be coded for the BIOS while a higher level language code will be used to program the UEFI.

Dell UEFI BIOS implementation will supersede the existing two different sets of BIOS in the portables and desktop products into one single UEFI BIOS moving forward.

Important Information

There is no difference in between the conventional BIOS and the UEFI BIOS unless the UEFI option is checked in the 'Boot List Option' setting in the BIOS page. This will allow the user to create a UEFI boot option list manually without affecting the existing boot priority list. With the implementation of UEFI BIOS, the changes are more related to the manufacturing tools and functionalities with very minimal impact to the customer's usages.

A few things to remember are:

- If customers have a UEFI boot media, and ONLY if they have UEFI boot media (either in the optical media or via USB storage), the one-time boot menu will show an additional section listing the UEFI boot options. Customers can view this option If they have UEFI boot media attached, and the UEFI boot option is specified manually through the 'Boot Sequence' settings.

How to change Service Tag/Owner Tag?

When the service technician replaces a system board, its required to set the service tag when the system restarts. Failure to set a service tag may result in system battery not being able to charge. Therefore, it is very important that the service technician set the correct system service tag. If a wrong service tag is set, then the technician will have to place the order for another system board replacement.

How to change Asset tag information?

To change the Asset tag information, we can use one of the following software utilities:

- Portables Technology Dell Command Configure toolkit-

Customers may also report that after a motherboard replacement, the asset field is already populated in the system BIOS, and needs to be cleared or set. For older systems and all newer systems with the UEFI BIOS platform, customers can download the Dell Command Configure Toolkit (DCC) to customize the BIOS options or even change the ownership or asset tag from within Windows.

DDR4

DDR4 (Double Data Rate fourth generation) memory is a higher-speed successor to the DDR2 and DDR3 technologies and allows up to 512 GB in capacity, compared to the DDR3's maximum of 128 GB per DIMM. DDR4 synchronous dynamic random-access memory is keyed differently from both SDRAM and DDR to prevent the user from installing the wrong type of memory into the system.

DDR4 needs 20 percent less or just 1.2 volts, compared to DDR3 which requires 1.5 volts of electrical power to operate. DDR4 also supports a new, deep power-down mode that allows the host device to go into standby without needing to refresh its memory. Deep power-down mode is expected to reduce standby power consumption by 40 to 50 percent.

DDR4 Details

There are subtle differences between DDR3 and DDR4 memory modules, as listed below:

Key notch difference

The key notch on a DDR4 module is in a different location from the key notch on a DDR3 module. Both notches are on the insertion edge but the notch location on the DDR4 is slightly different, to prevent the module from being installed into an incompatible board or platform.

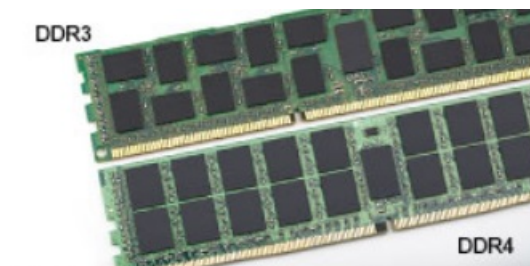


Figure 8. Notch difference

Increased thickness

DDR4 modules are slightly thicker than DDR3, to accommodate more signal layers.

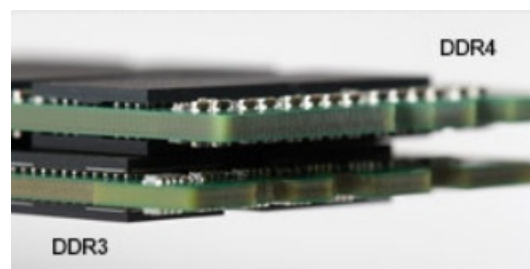


Figure 9. Thickness difference

Curved edge

DDR4 modules feature a curved edge to help with insertion and alleviate stress on the PCB during memory installation.

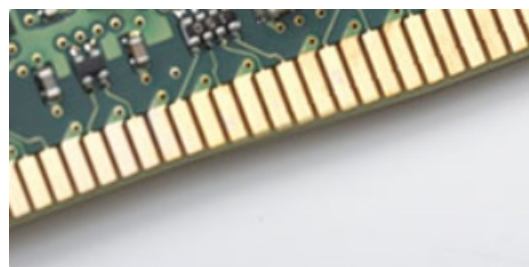


Figure 10. Curved edge

Memory Errors

Memory errors on the system display the new 2 - Amber, 3 - White failure code. If all memory fails, the LCD does not turn on. Troubleshoot for possible memory failure by trying known good memory modules in the memory connectors on the bottom of the system or under the keyboard, as in some portable systems.

Graphics options

This topic lists the graphics specification.

Table 3. Integrated Graphics specification

Parameters	Values
Integrated Graphics Controller	Intel UHD Graphics 610, Intel UHD Graphics 620
Model	Latitude 3310 2 in 1
Bus Type	Internal Interface
Memory Interface	Unified Memory Architecture
Graphics Level	<ul style="list-style-type: none"> Intel Core i3/i5- Intel UHD Graphics 620 Intel Pentium DC- Intel UHD Graphics 610
Estimated Maximum Power Consumption (TDP)	15 W (in the CPU power)
Display Support	On System- eDP (internal), HDMI, DP over USB Type-C
Maximum Vertical Refresh Rate	Up to 85 Hz depending on resolution
Operating Systems Graphics/ Video API Support	DirectX 12, OpenGL 4.5
Supported Resolutions and Max Refresh Rates (Hz), Analog and/or digital	System ports: <ul style="list-style-type: none"> Max Digital- (HDMI) 4096x2304@24 Hz; (DP over TYPE-C) 4096x2304@60 Hz
Numbers of Displays Supported	<ul style="list-style-type: none"> System Ports- Three displays max with LCD plus one display max on each output (HDMI, DisplayPort over USB Type-C). <p>NOTE: A USB Type C Dell dock is optional.</p>

Storage options

This topic lists out the detailed specifications of the supported SSD options.

Table 4. 128 GB SSD

Parameter	Values
Capacity (bytes)	128 GB
Dimensions mm (W x D x H)	22 x 80 x 2.38
Interface type	PCIe
MTBF	800 k hours
Logical blocks	250,069,680
Power Source	
Power consumption (reference only).	Idle 0.5 W, Active 2.5 W

Table 5. 256 GB SSD

Parameter	Values
Capacity (bytes)	256 GB
Dimensions mm (W x D x H)	22 x 80 x 2.38
Interface type	PCIe
MTBF	800 k hours
Logical blocks	500,118,192
Power Source	
Power consumption (reference only).	Idle 0.5 W, Active 2.5 W

Table 6. 512 GB SSD

Parameter	Values
Capacity (bytes)	512 GB
Dimensions mm (W x D x H)	22 x 80 x 2.38
Interface type	PCIe
MTBF	800 k hours
Logical blocks	1,000,215,216
Power Source	
Power consumption (reference only).	Idle 0.5 W, Active 2.5 W

HDMI 1.4a

This topic explains the HDMI 1.4a 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 1.4a 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.

Battery specifications

This topic lists out the detailed battery specifications.

Table 7. Battery specifications

Parameter	Values
Battery Type	Polymer 3C 42 Wh smart battery
Dimension:	
Width	191.85 mm (7.55 in.)
Height	103.25 mm (4.06 in.)
Weight	0.20 kg (0.44 lb)
Depth	5.90 mm (0.23 in.)
Voltage	11.40 VDC
Typical Amp-hour capacity	3.684 Ah
Typical Watt-hour capacity	42 Wh
Operating time	0°C–35°C Charge: 0°C–50°C Discharge: 0°C–70°C
Temperature range: Operating	Charge: 0°C–50°C, 32°F–122°F, Discharge: 0°C–70°C, 32°F–158°F
Temperature range: Non-Operating	-20°C–65°C (-4°F–149°F)
Charging time	0 deg~15 deg C: 4 hours, 16 deg~45 deg C: 2 hours, 46 deg~60 deg C: 3 hours
ExpressCharge Capable	Not supported
BATTMAN Capable	Yes

USB features

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

Table 8. USB evolution

Type	Data Transfer Rate	Category	Introduction Year
USB 2.0	480 Mbps	High Speed	2000
USB 3.0/USB 3.1 Gen 1 Port	5 Gbps	SuperSpeed	2010

USB 3.0/USB 3.1 Gen 1 (SuperSpeed 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 3.0/USB 3.1 Gen 1 finally has the answer to the consumers' demands with a theoretically 10 times faster than its predecessor. In a nutshell, USB 3.1 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 3.0/USB 3.1 Gen 1.

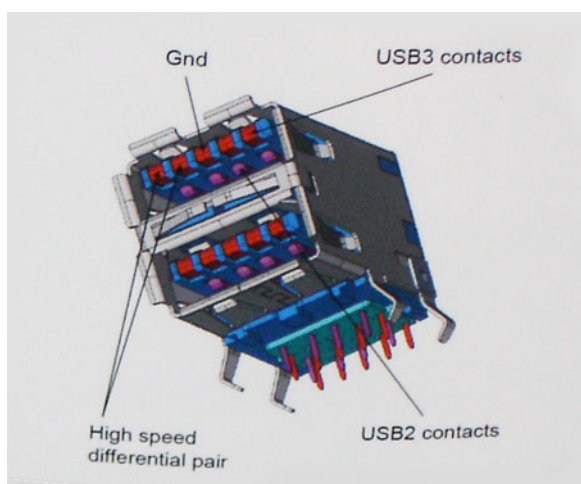


Speed

Currently, there are 3 speed modes defined by the latest USB 3.0/USB 3.1 Gen 1 specification. They are Super-Speed, Hi-Speed and Full-Speed. The new SuperSpeed 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 3.0/USB 3.1 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 (refer to the picture below).
- USB 2.0 previously had four wires (power, ground, and a pair for differential data); USB 3.0/USB 3.1 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 3.0/USB 3.1 Gen 1 utilizes the bidirectional 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 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 3.0/USB 3.1 Gen 1 connections will never achieve 4.8Gbps. We will likely see a real-world maximum rate of 400MB/s with overheads. At this speed, USB 3.0/USB 3.1 Gen 1 is a 10x improvement over USB 2.0.

Applications

USB 3.0/USB 3.1 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 SuperSpeed USB 3.0/USB 3.1 Gen 1 products:

- External Desktop USB 3.0/USB 3.1 Gen 1 Hard Drives
- Portable USB 3.0/USB 3.1 Gen 1 Hard Drives

- USB 3.0/USB 3.1 Gen 1 Drive Docks & Adapters
- USB 3.0/USB 3.1 Gen 1 Flash Drives & Readers
- USB 3.0/USB 3.1 Gen 1 Solid-state Drives
- USB 3.0/USB 3.1 Gen 1 RAIDs
- Optical Media Drives
- Multimedia Devices
- Networking
- USB 3.0/USB 3.1 Gen 1 Adapter Cards & Hubs

Compatibility

The good news is that USB 3.0/USB 3.1 Gen 1 has been carefully planned from the start to peacefully co-exist with USB 2.0. First of all, while USB 3.0/USB 3.1 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 3.0/USB 3.1 Gen 1 cables and only come into contact when connected to a proper SuperSpeed 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.

Media Card Readers

NOTE: The media card reader is integrated into the system board on portable systems. If there is a hardware failure or the reader malfunctions, replace the system board.

The media card reader expands the usefulness and functionality of portable systems, especially when used with other devices such as digital cameras, portable MP3 players, and handheld devices. All these devices use a form of media card to store information. Media card readers allows for easy transfer of data between these devices.



Several different types of media or memory cards are available today. Below is a list of the different types of cards that work in the media card reader.

SD Card Reader

1. Memory Stick
2. Secure Digital (SD)
3. Secure Digital High Capacity (SDHC)
4. Secure Digital eXtended Capacity(SDXC)

Downloading Windows drivers

Steps

1. Turn on the laptop.
2. Go to **Dell.com/support**.
3. Click **Product Support**, enter the Service Tag, and then click **Submit**.
i | **NOTE:** If you do not have the Service Tag, use the auto detect feature or manually browse for your laptop model.
4. Click **Drivers and Downloads**.
5. Select the operating system installed on your laptop.
6. Scroll down the page and select the driver to install.
7. Click **Download File** to download the driver.
8. After the download is complete, navigate to the folder where you saved the driver file.
9. Double-click the driver file icon and follow the instructions on the screen.

Command | Configure Graphical User Interface

The **Dell Command | Configure** Graphical User Interface (Command | Configure GUI) displays all Basic Input/Output System (BIOS) configurations supported by Command | Configure. Using the GUI, you can perform the following tasks:

- Create BIOS configuration for client systems
- Validate the BIOS configuration against the BIOS configuration of the host system
- Export the customized BIOS configurations as a configuration file (.ini/.cctk), Self-Contained Executable (SCE), shell script, or report

i | **NOTE:** To apply the configuration using Command Line Interface (CLI), run the required file (.ini , .cctk, or sce).

Accessing Command | Configure From a Windows System

Click **Start > All Programs > Dell > Command | Configure > Command Configure Command Wizard**.

Create Multiplatform Package
Settings for all possible platforms

Create Local System Package
Settings from the current system

Open a Saved Package
Use settings from a previously saved settings

Package History
View history of created packages

Create Multiplatform Package

Configure a generic ini for all systems

View: Basic

Category	Name	Value to Set	Apply Settings	Description
Advanced System...	advsm	Not Specified	<input type="checkbox"/>	Command Configure advsm displays a
Boot Management	adddevice	Not Specified	<input type="checkbox"/>	Adds the specified device to the boot c
Boot Management	forcepxe	Not Specified	<input type="checkbox"/>	Enables or disables PXE as the first boc
Boot Management	wakeonlanbootovrd	Not Specified	<input type="checkbox"/>	Enables or disables the wake on lan bo
Boot Management	bootorder	Not Specified	<input type="checkbox"/>	Command Configure bootorder or Co
Boot Management	bootseqset	Not Specified	<input type="checkbox"/>	Sets the Initial Program Load (IPL) devi
Configuration	adjcacheprefetch	Not Specified	<input type="checkbox"/>	Enables or disables adjacent cache line
Configuration	propowntag	Not Specified	<input type="checkbox"/>	Sets the property ownership tag to the

Accessing Command | Configure From a Linux System

Navigate to the `/opt/Dell/toolkit/bin` directory.

Files And Folders of Command | Configure

The following table displays the files and folders of Command | Configure on a Windows system.

Table 9. Files And Folders configuration

Files/Folders	Description
Command Configure Command Prompt	Allows access to the Command Configure command prompt.
Configuration Wizard	Allows access to the Command Configure GUI.
Command Configure WINPE	Allows access to the Windows PE scripts to create a bootable image. For more details, see the Dell Command Configure Installation Guide.
Uninstall	Uninstalls Command Configure.
User's Guide Online	Provides access to the Command Configure online documentation.

Launching The Command | Configure GUI

NOTE: The Command | Configure GUI is supported only on systems running the Windows operating system.

To launch the GUI, click **Start > All Programs > Dell > Command Configure > Configuration Wizard** or double-click the **Dell Configuration Wizard** on the desktop. The below screen appears:



Create Multiplatform Package

Settings for all possible platforms

Create Local System Package

Settings from the current system

Open a Saved Package

Use settings from a previously saved settings

Package History

View history of created packages

Create Multiplatform Package

Configure a generic ini for all systems

View: Basic ▾

Validate

Edit

Enter Text Here



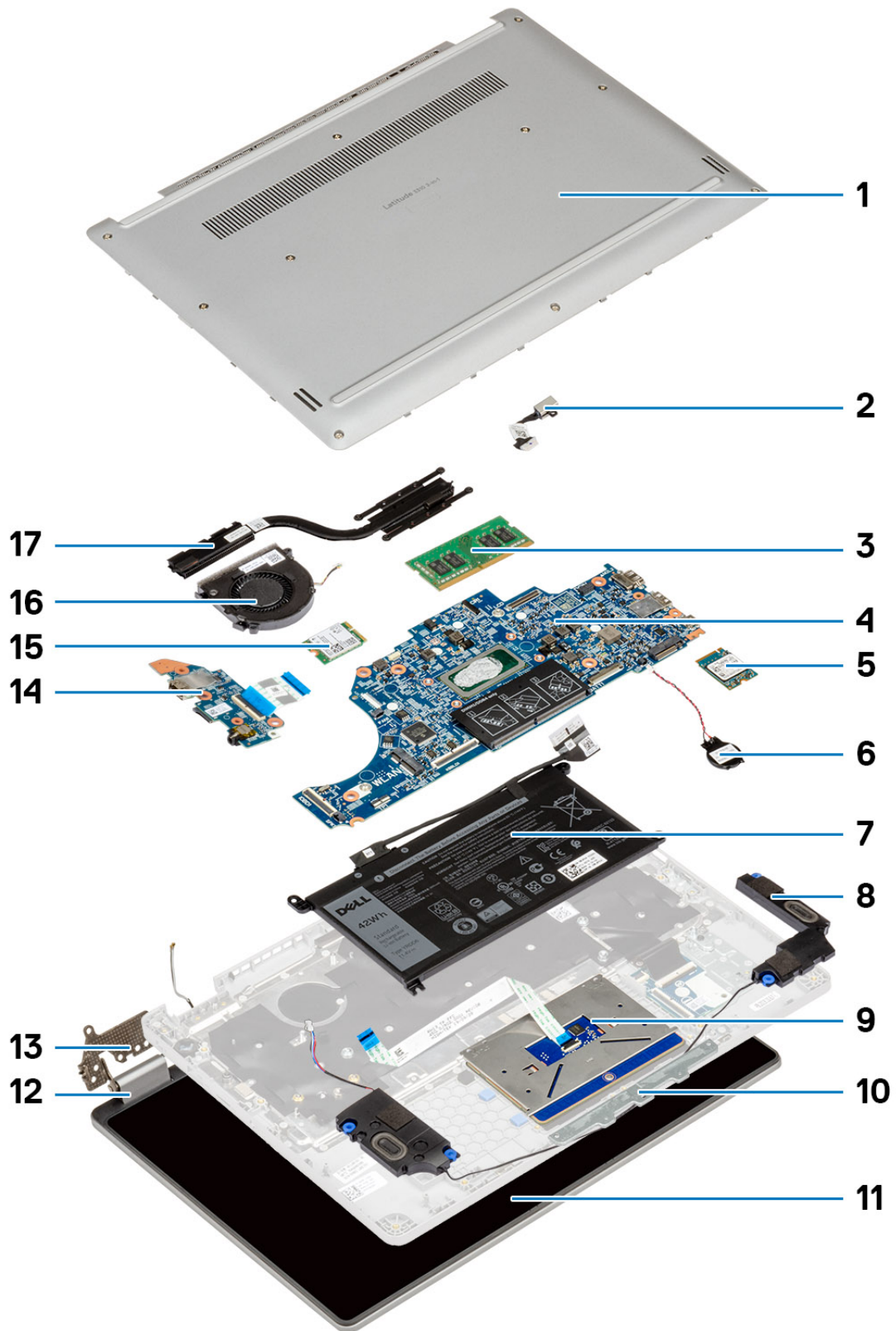
Category ▾	Name	Value to Set	Apply Settings	Description
Advanced System...	advsm	Not Specified	<input type="checkbox"/>	Command Configure advsm displays a
Boot Management	adddevice	Not Specified	<input type="checkbox"/>	Adds the specified device to the boot c
Boot Management	forcepxe	Not Specified	<input type="checkbox"/>	Enables or disables PXE as the first boc
Boot Management	wakeonlanbootovrd	Not Specified	<input type="checkbox"/>	Enables or disables the wake on lan bo
Boot Management	bootorder	Not Specified	<input type="checkbox"/>	Command Configure bootorder or Co
Boot Management	bootseqset	Not Specified	<input type="checkbox"/>	Sets the Initial Program Load (IPL) devi
Configuration	adjcacheprefetch	Not Specified	<input type="checkbox"/>	Enables or disables adjacent cache line
Configuration	propowntag	Not Specified	<input type="checkbox"/>	Sets the property ownership tag to the

REPORT

EXPORT CONFIG

EXPORT .EXE

Major components of your system



1. Back cover
2. Dc-in
3. Memory
4. System board
5. Solid state drive (SSD)
6. Coin cell
7. Battery
8. Speakers
9. Touchpad
10. Touchpad bracket
11. LCD
12. Hinge cover
13. Hinge
14. I/O board
15. WLAN
16. System fan
17. Heatsink

Disassembly and reassembly

Base cover

Removing the base cover

Prerequisites

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

About this task

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

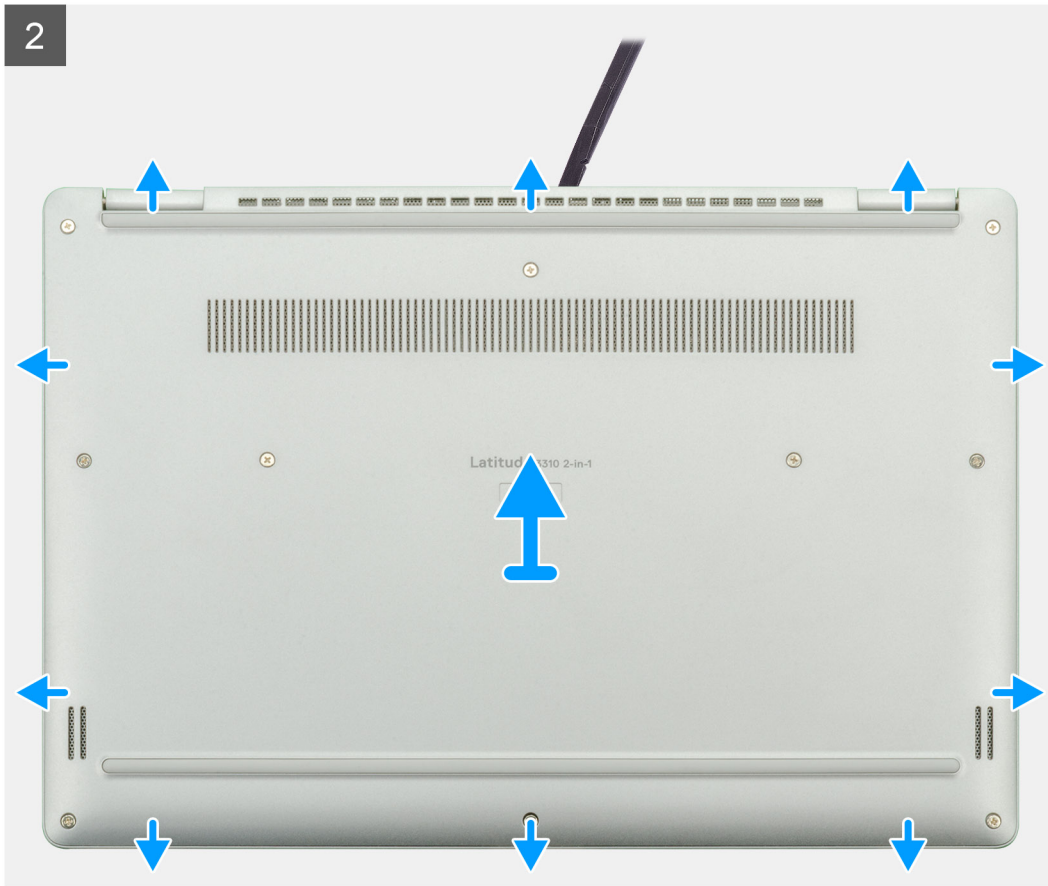


7x
M2.5x5



3x
M2x2





Steps

1. Remove the ten (M2.5x5) captive screws that secure the base cover to the laptop.
2. Pry the base cover starting from the recess at the hinge area and work your way around.
3. Lift the base cover away from the laptop.

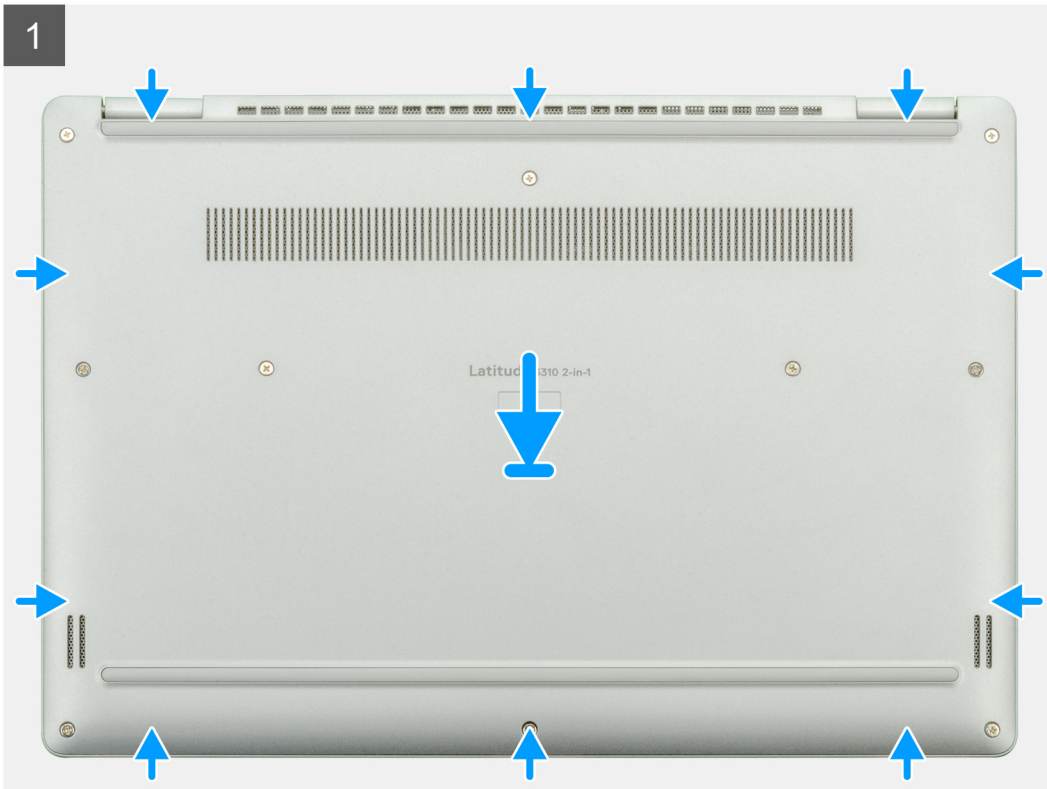
Installing the base cover

Prerequisites

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

About this task

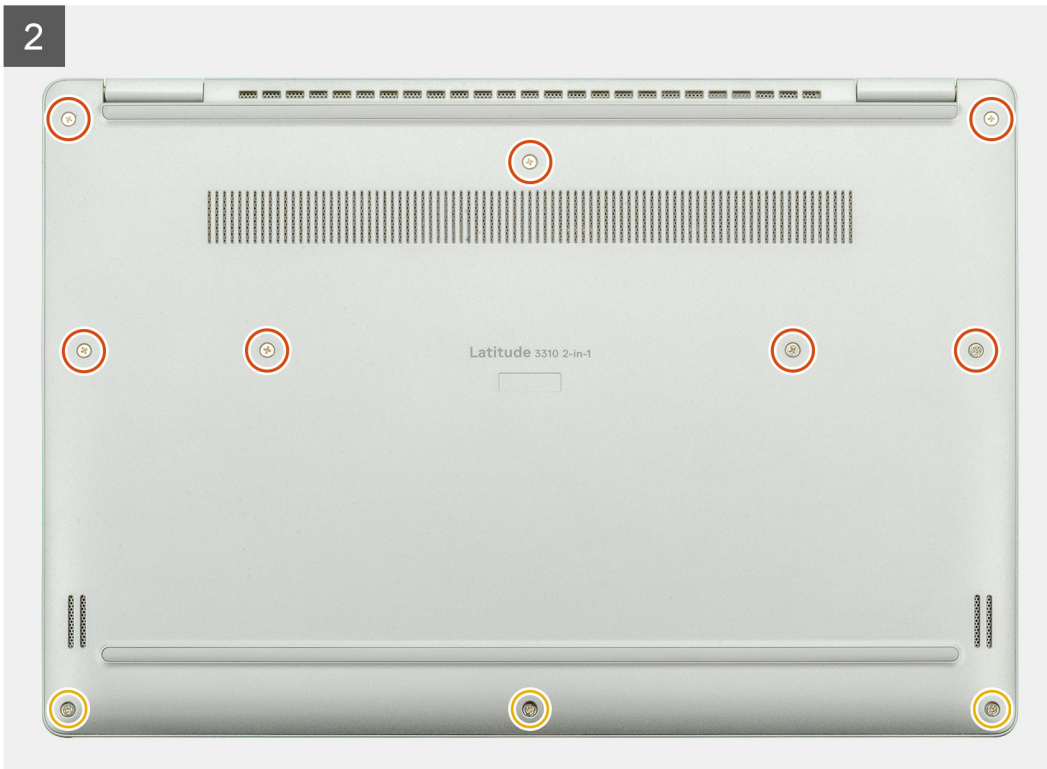
The figure indicates the location of the base cover and provides a visual representation of the installation procedure.



7x
M2.5x5



3x
M2x2



Steps

1. Peel off the adhesive tape and release the battery cable from the latch.
2. Remove the four (M2x3) screws that secure the battery.
3. Lift the battery off the laptop.

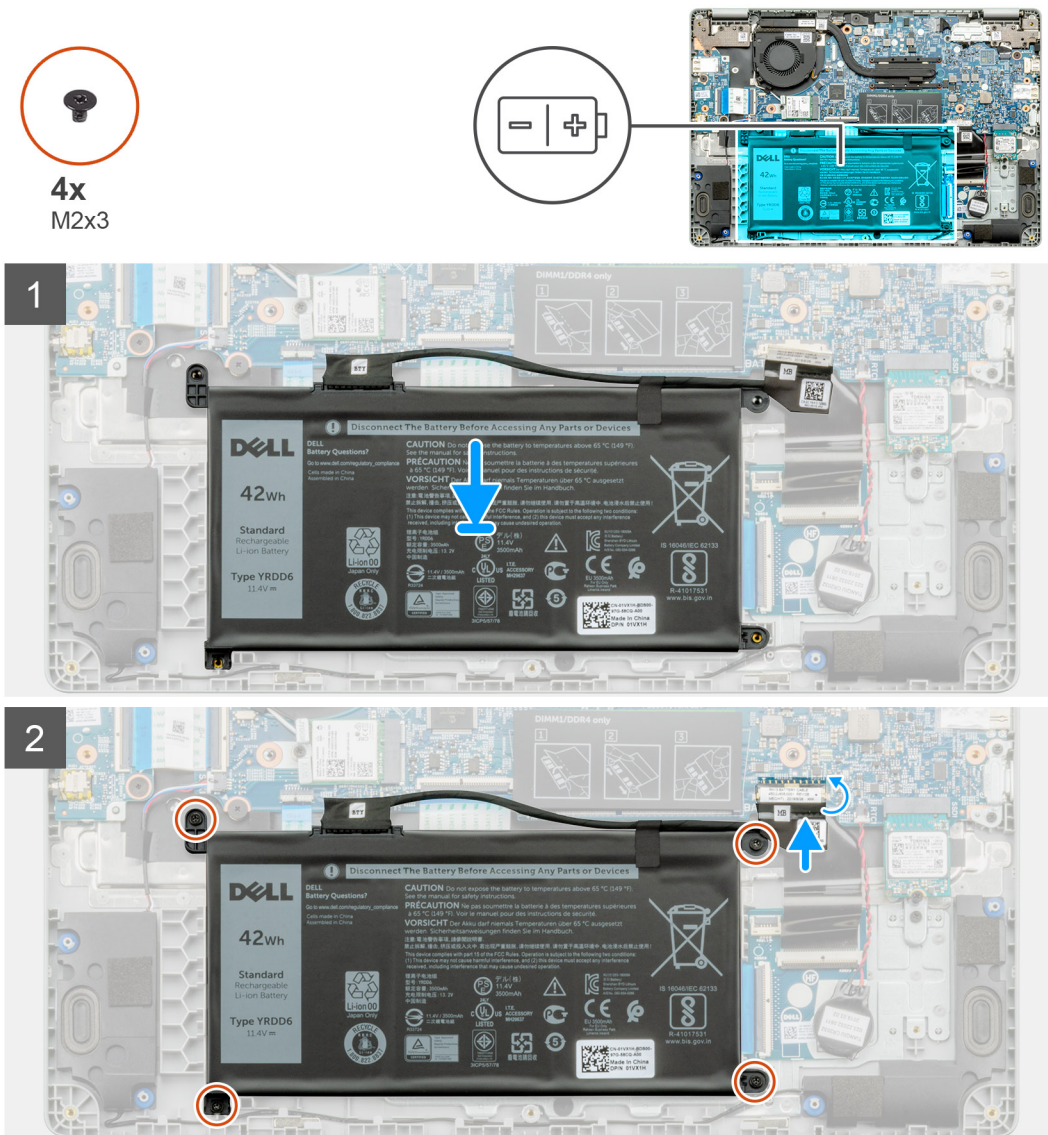
Installing the battery

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. Place the battery on the palmrest and keyboard assembly and align the screw holes on the battery with the screw holes on the palmrest and keyboard assembly.
2. Replace the four (M2x3) captive screws that secure the battery to the laptop.
3. Connect the battery cable to the system board.

Next steps

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

Memory modules

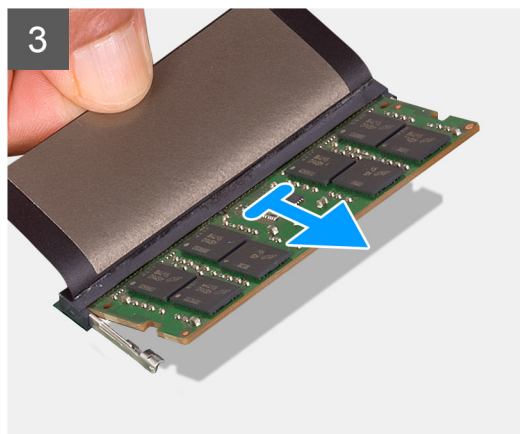
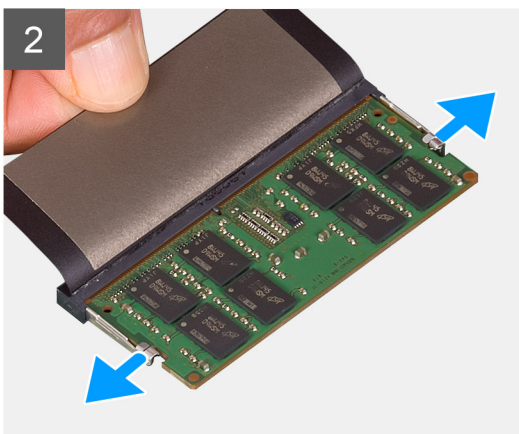
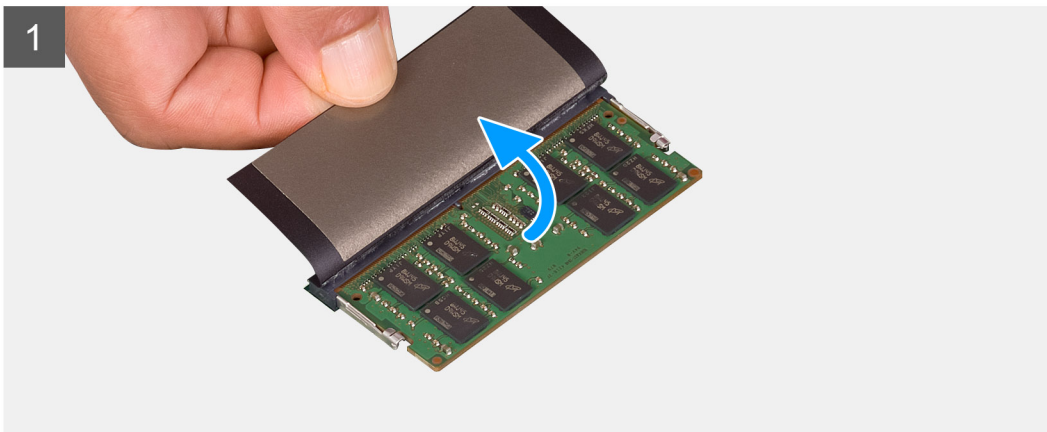
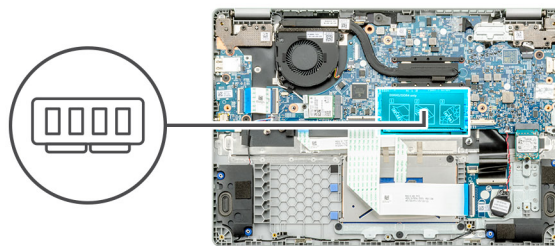
Removing the memory modules

Prerequisites

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

About this task

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



Steps

1. Peel the adhesive tape, above the memory module, to a 90-degree angle.
2. Using your finger tips gently pry the retention clips away from the memory module until the memory module pops up.
3. Slide and remove the memory module from the memory module slot on the system board.

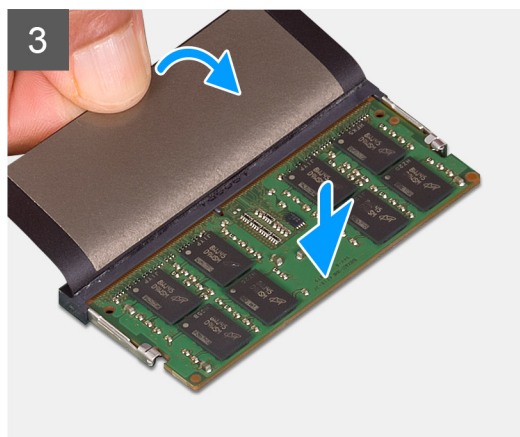
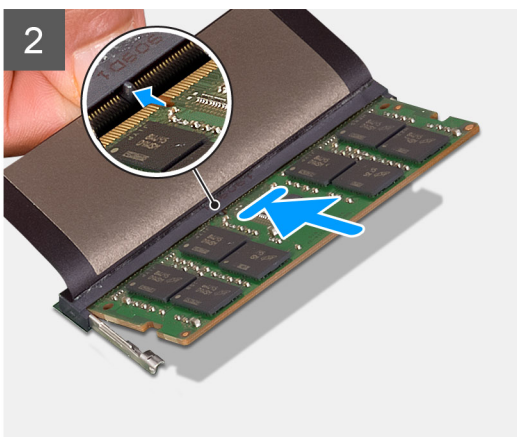
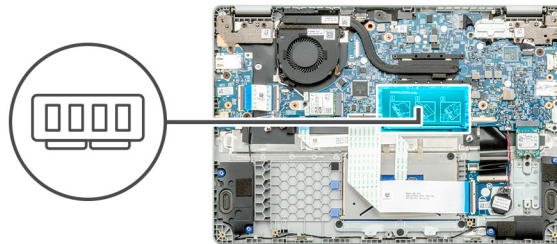
Installing the memory modules

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. Align the notch on the memory module with the tab on the memory module slot.
2. Slide the memory module firmly into the slot at an angle.
3. Press the memory module down until it clicks into place.

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

Next steps

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

Solid state drive

Removing the M.2 2230 solid-state drive

Prerequisites

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

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.



1x
M2x3



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.

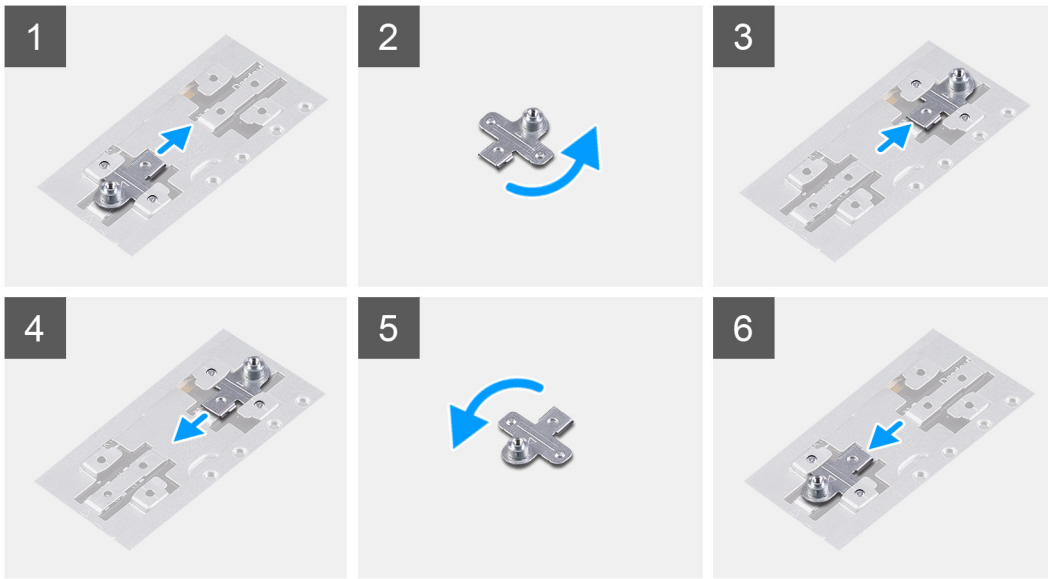
Replacing the SSD support bracket

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery cable](#).
4. Remove the [M.2 2230 SSD](#).

About this task

The figure indicates the location of the SSD support bracket and provides a visual representation of the replace procedure.



Steps

1. Slide and remove the SSD support bracket from the support bracket slot.
2. Depending on the type of solid-state drive (M.2 2230/ M.2 2242/ M.2 2280), align and insert the SSD support bracket into the support bracket slot.
3. Install the solid-state drive.

Installing M.2 2230 solid-state drive

Prerequisites

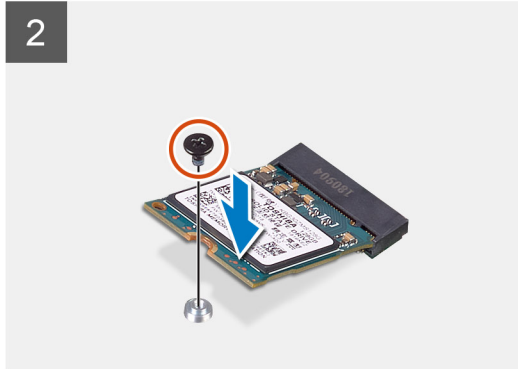
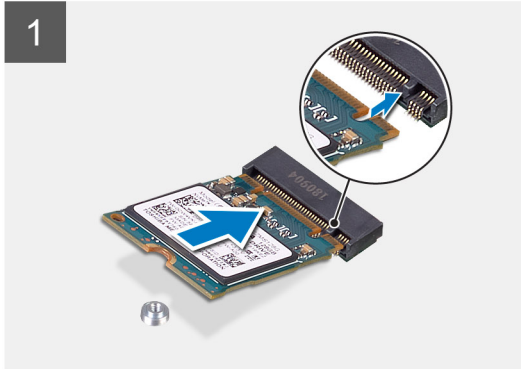
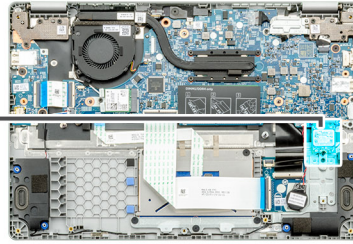
If you are replacing a component, remove the existing component before performing the installation procedure.

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.



1x
M2x3



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

Coin-cell battery

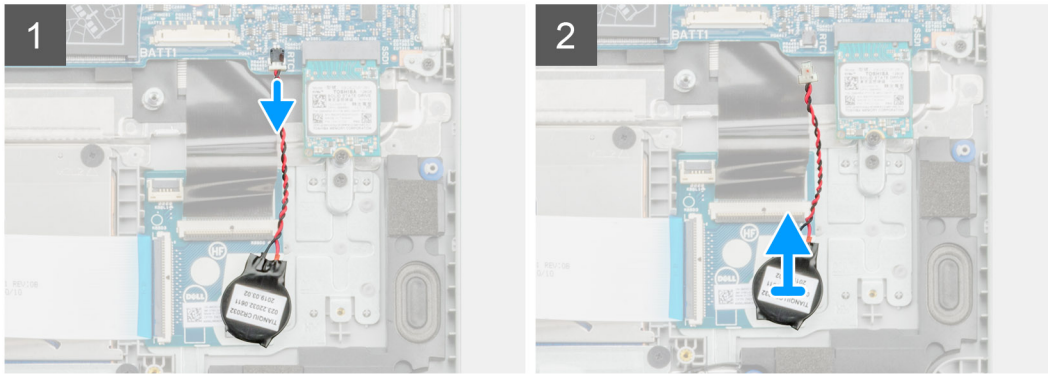
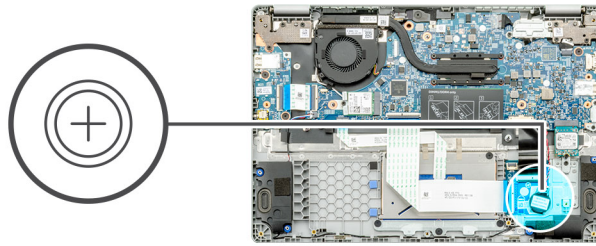
Removing the coin-cell battery

Prerequisites

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

About this task

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



Steps

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

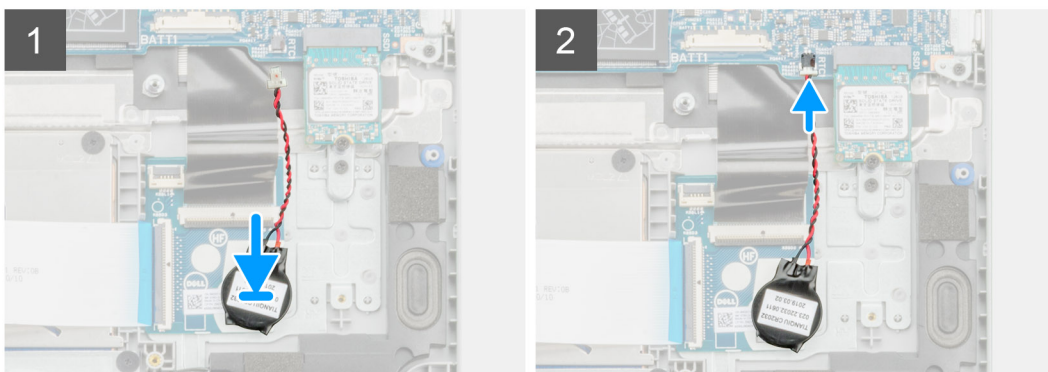
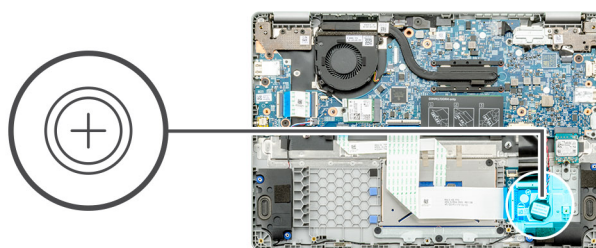
Installing the coin-cell battery

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. Route the coin-cell battery cable through the routing guide.
3. Connect the coin-cell battery cable to the system board.

Next steps

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

WLAN card

Removing the WLAN card

Prerequisites

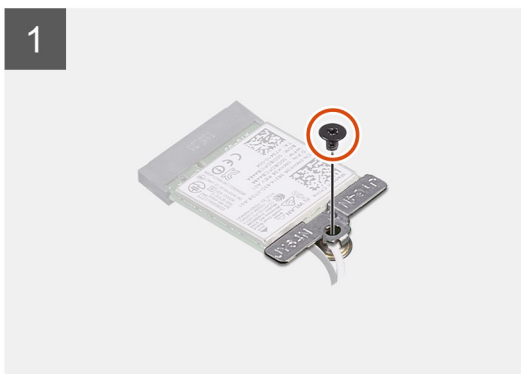
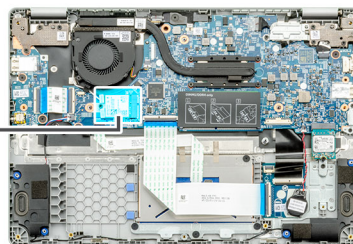
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery cable](#).

About this task

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



1x
M2x3



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

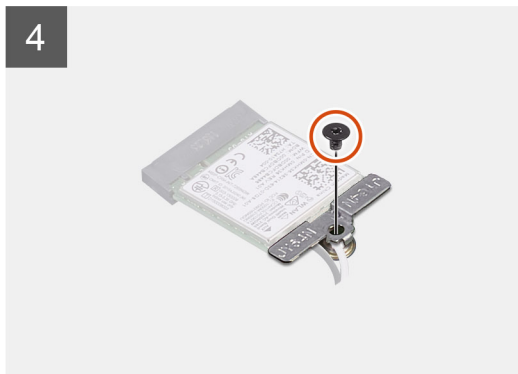
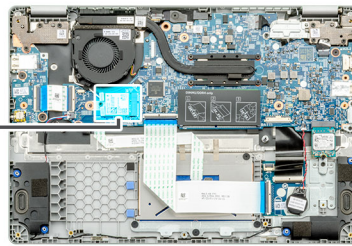
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



1x
M2x3



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

Speakers

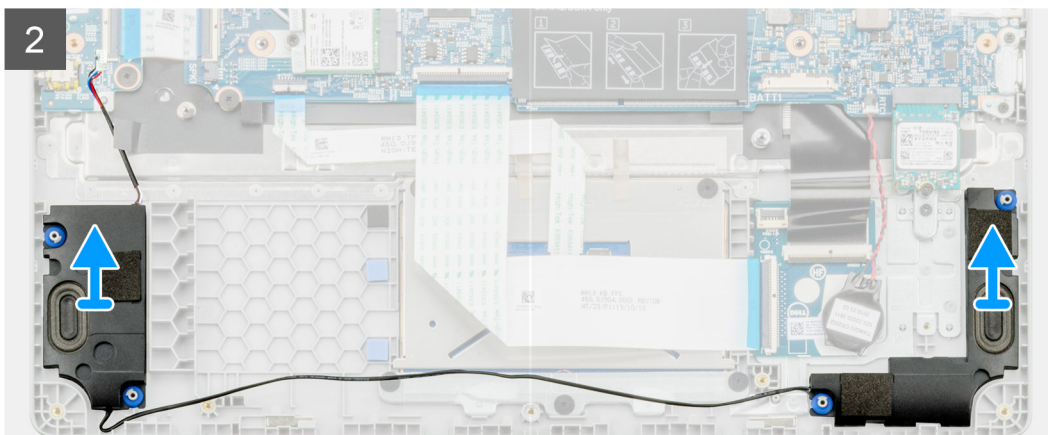
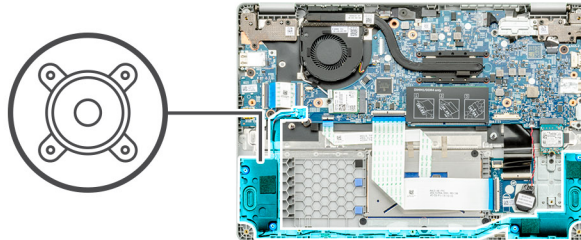
Removing the speakers

Prerequisites

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

About this task

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



Steps

1. Locate the speakers on your computer.
2. Disconnect the speaker cable from the connector on the system board.
3. Peel the adhesive tape that secures the speaker cable.
4. Unroute the speaker cables from the retention clips on the computer.
5. Lift the speakers out of the computer.

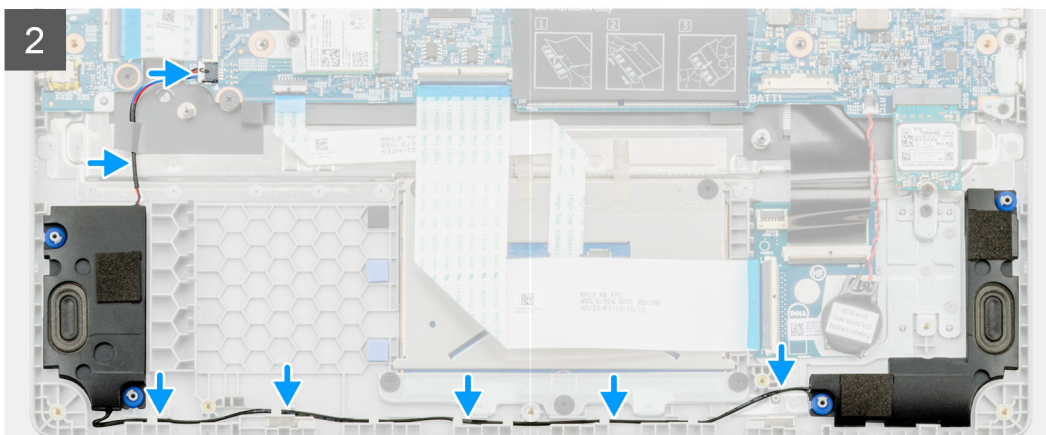
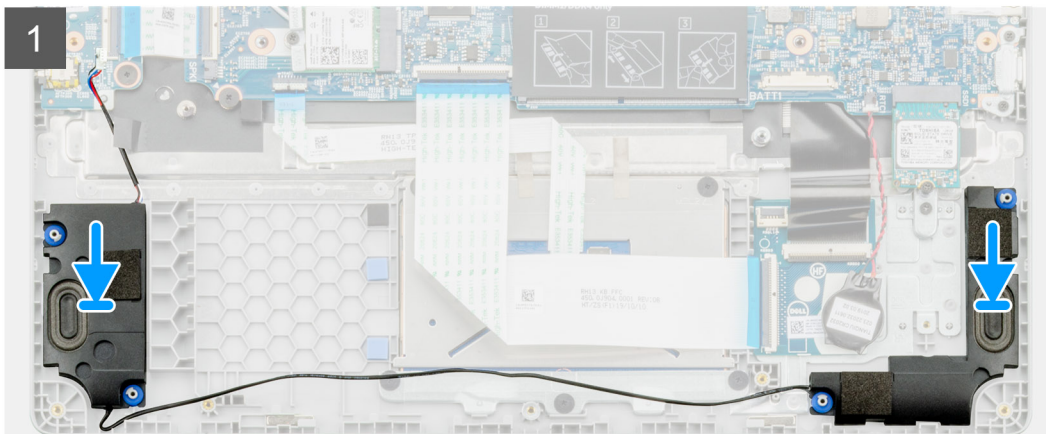
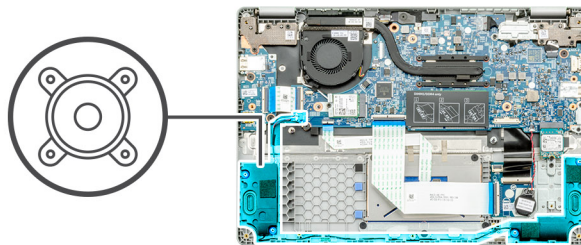
Installing the speakers

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. Locate the speaker slot on your computer.
2. Align and place the speakers in the slot on your computer.

3. Connect the speaker cable to the connector on the system board.
4. Route the speaker cables through the retention clips on your computer.
5. Adhere the adhesive tape to secure the speaker cable.

Next steps

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

Heatsink assembly

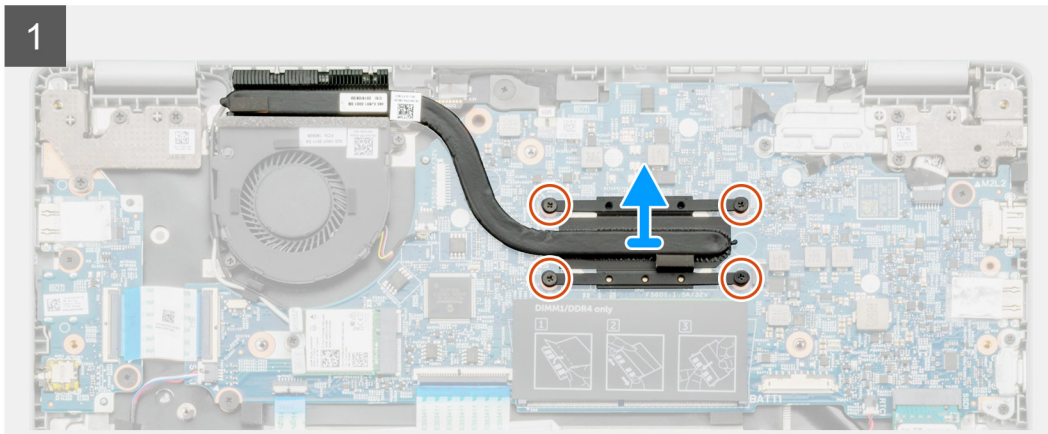
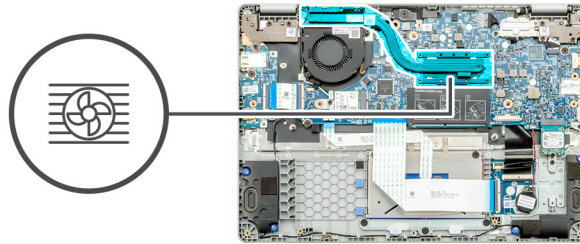
Removing the heatsink assembly

Prerequisites

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

About this task

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



Steps

1. Locate the heatsink assembly on your computer.
2. Remove the four (M2x3) captive screws that secure the heatsink assembly to the computer.
3. Lift the heatsink assembly out of the computer.

NOTE: There will be thermal grease beneath the heatsink.

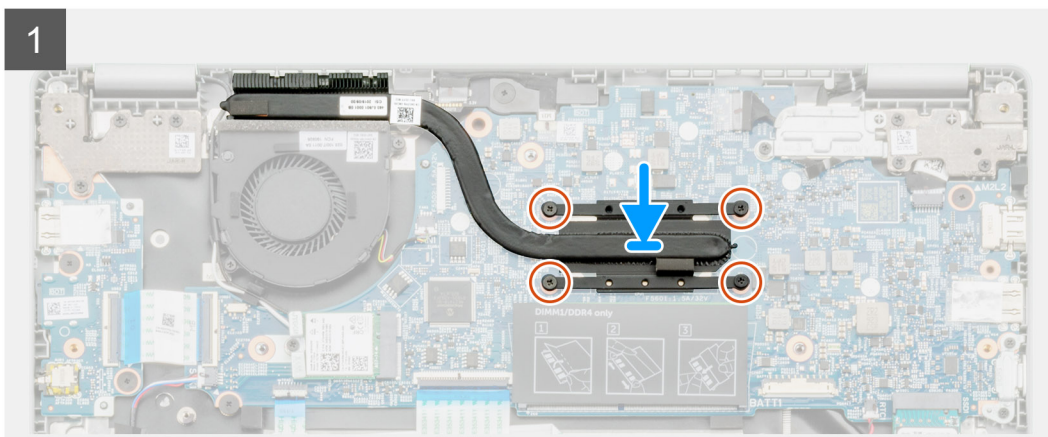
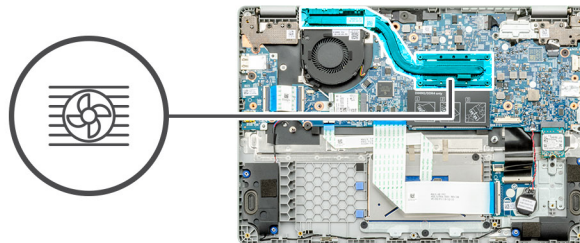
Installing the heatsink assembly

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 heatsink and provides a visual representation of the installation procedure.



Steps

1. Locate the heatsink slot on your computer.
2. Align and place the heatsink assembly into the slot of your computer.
i **NOTE:** Ensure to apply the thermal grease to the heatsink assembly.
3. Install the four (M2x3) screw that secures the heatsink assembly.

Next steps

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

System Fan

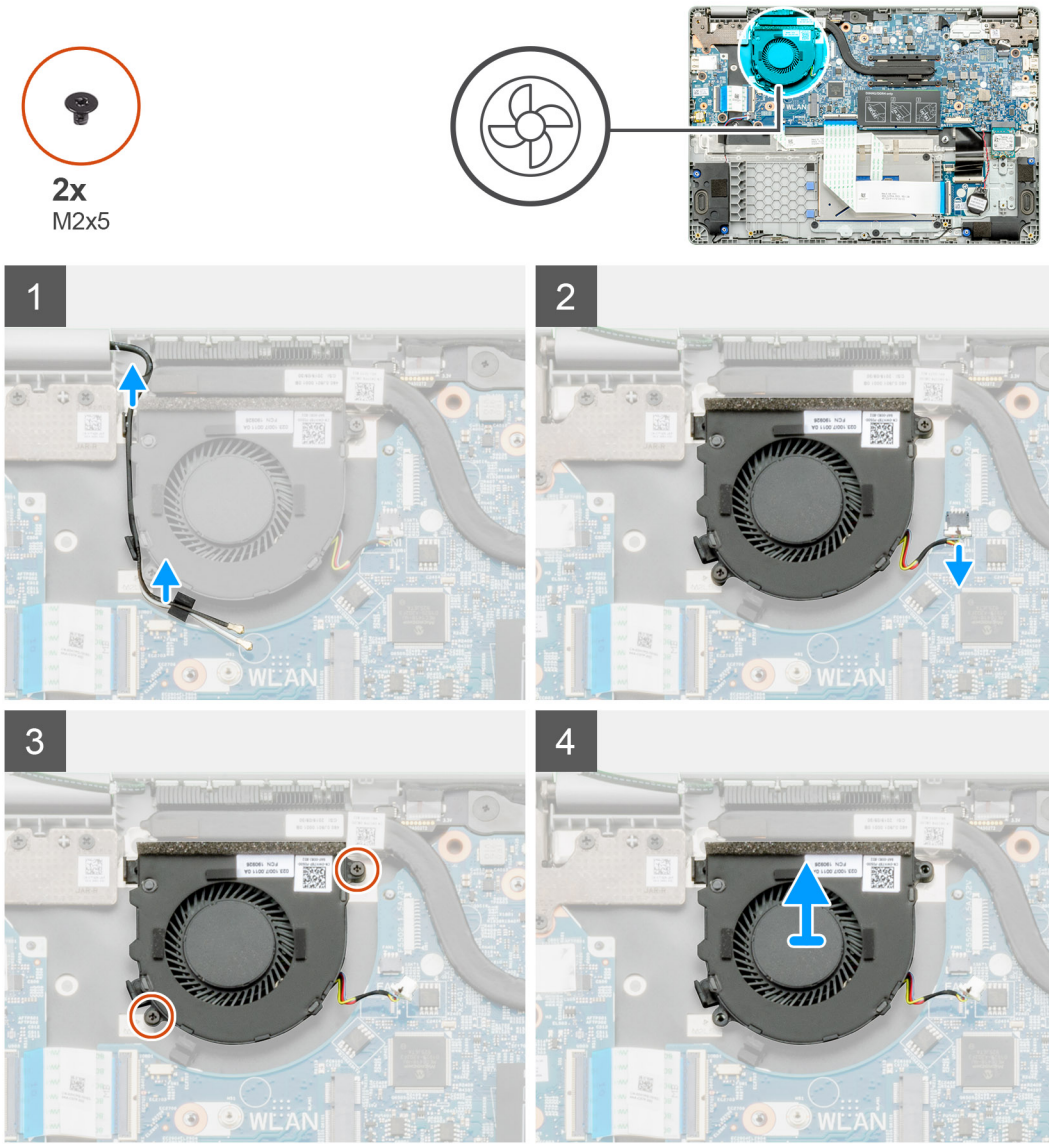
Removing the system fan

Prerequisites

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

About this task

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



Steps

1. Locate the system fan on your computer.
2. Unroute the cable and release the wireless cable.
3. Disconnect the system fan cable from the connector on the system board.
4. Remove the two (M2x3) screws that secure the system fan to the palmrest assembly.
5. Lift the system fan off the palmrest assembly.

Installing the system fan

Prerequisites

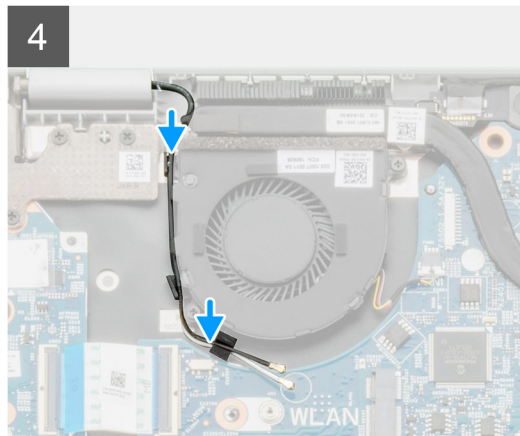
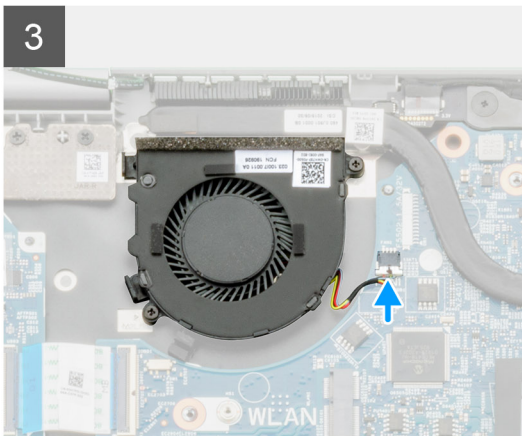
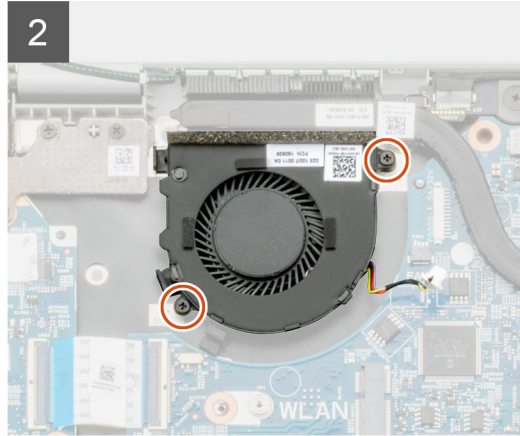
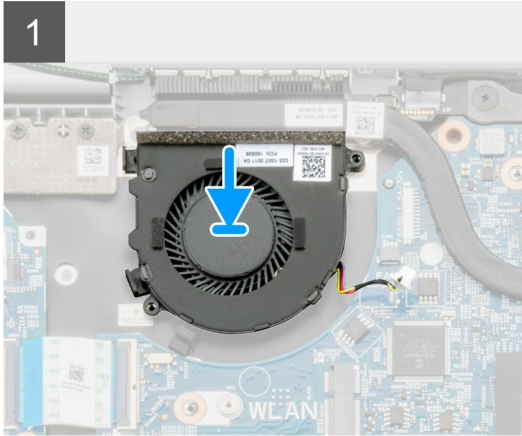
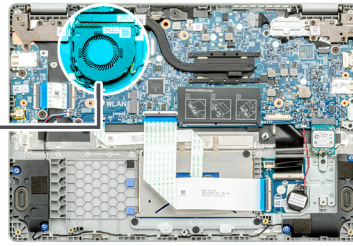
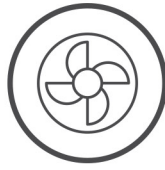
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M2x5



Steps

1. Locate the system fan slot on your computer.
2. Align and place the system fan into the slot on the palmrest assembly.
3. Replace the two (M2x3) screws to secure the system fan to the palmrest assembly.
4. Connect the system fan cable to the connector on the system board.
5. Route the wireless cable and connect it to the connector on the system board.

Next steps

1. Install the [WLAN card](#)
2. Install the [battery cable](#).
3. Install the [base cover](#).
4. Follow the procedure in [After working inside your computer](#).

I/O board

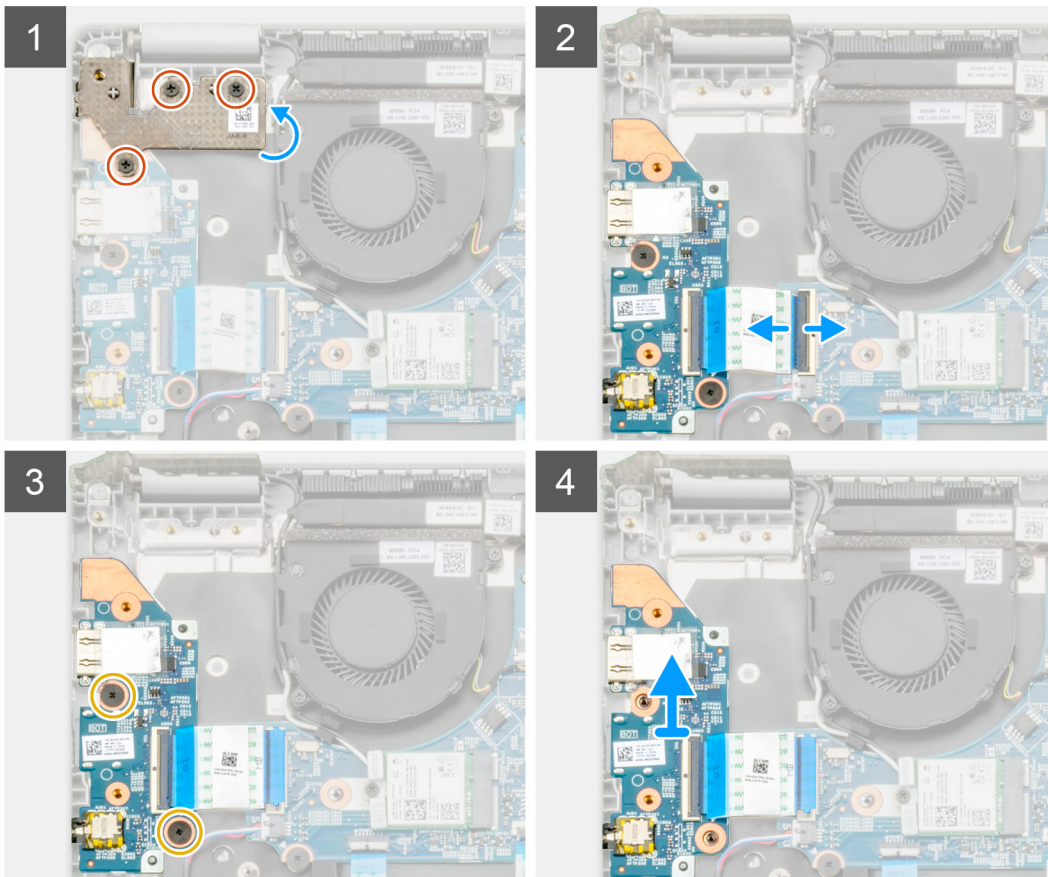
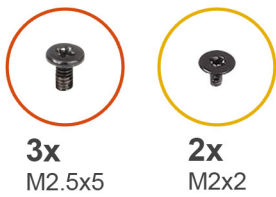
Removing the input and output board

Prerequisites

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

About this task

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



Steps

1. Locate the I/O board on your computer.
2. Remove the three (M2.5x5) screws that secure the hinge to the computer.
3. Lift up the plastic lever and disconnect the cable from the computer.
4. Remove the two (M2x2) screws that secure the I/O board to the computer.

- Lift the I/O board out of the computer.

Installing the input and output board

Prerequisites

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

About this task

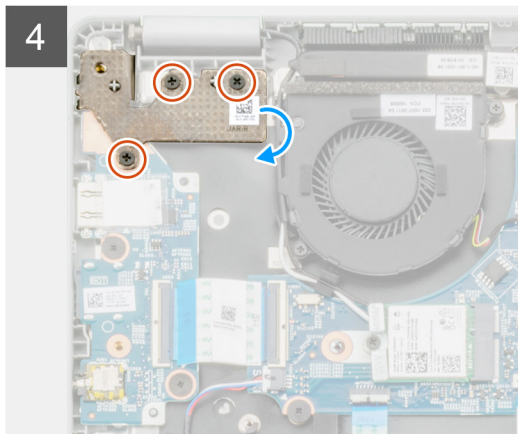
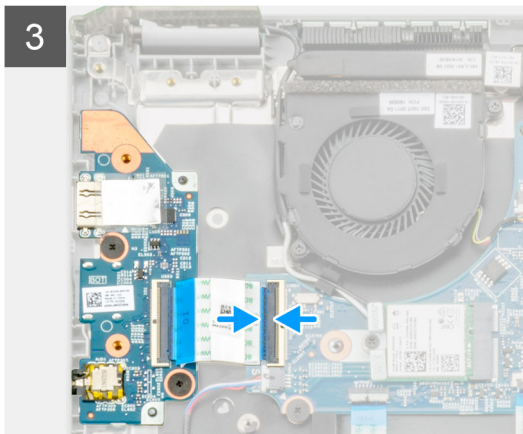
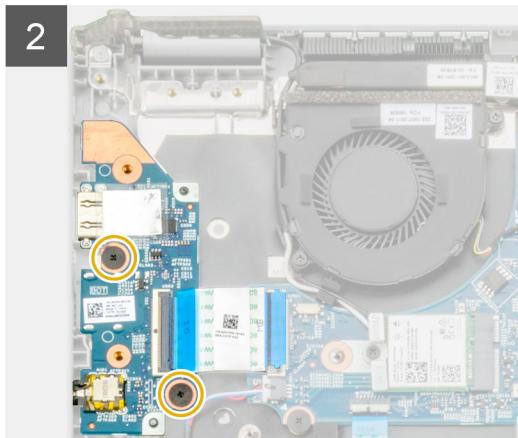
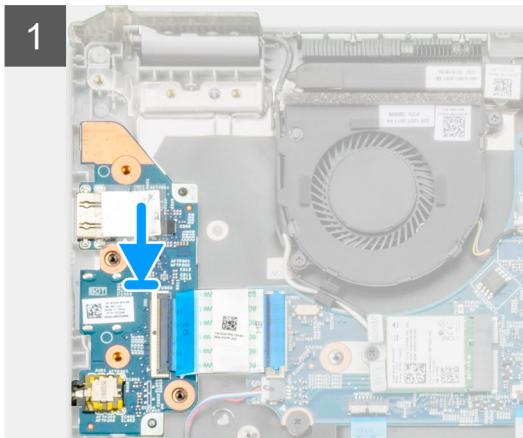
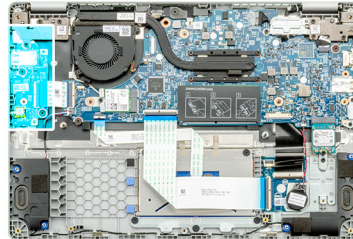
The figure indicates the location of the input and output board and provides a visual representation of the installation procedure.



3x
M2.5x5



2x
M2x2



Steps

- Locate the I/O board on your computer.
- Align and place the I/O board into the computer.
- Install the two (M2x2) screws that secure the I/O board to the computer.
- Connect the cable to the computer.
- Install the three (M2.5x5) screws that secure the hinge to the computer.

Next steps

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

DC-in port

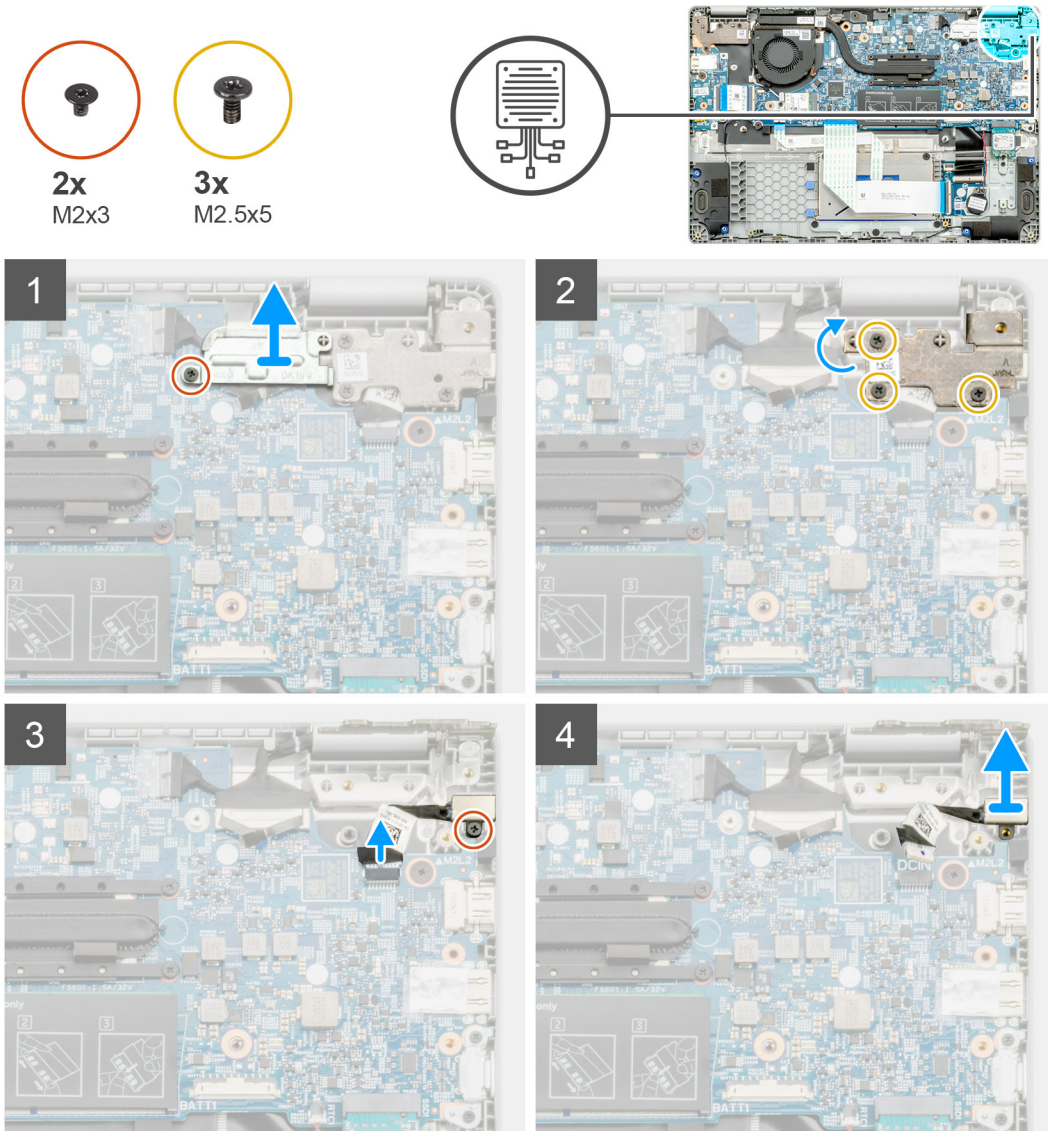
Removing the DC-in

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. 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.
2. Remove the single (M2x3) screw and lift metal bracket covering the display connector.
3. Remove the three (M2.5x5) screws and lift the hinge.
4. Disconnect the DC-in cable from the computer and remove the single (M2x3) screw.
5. Remove the DC-in port from the computer.

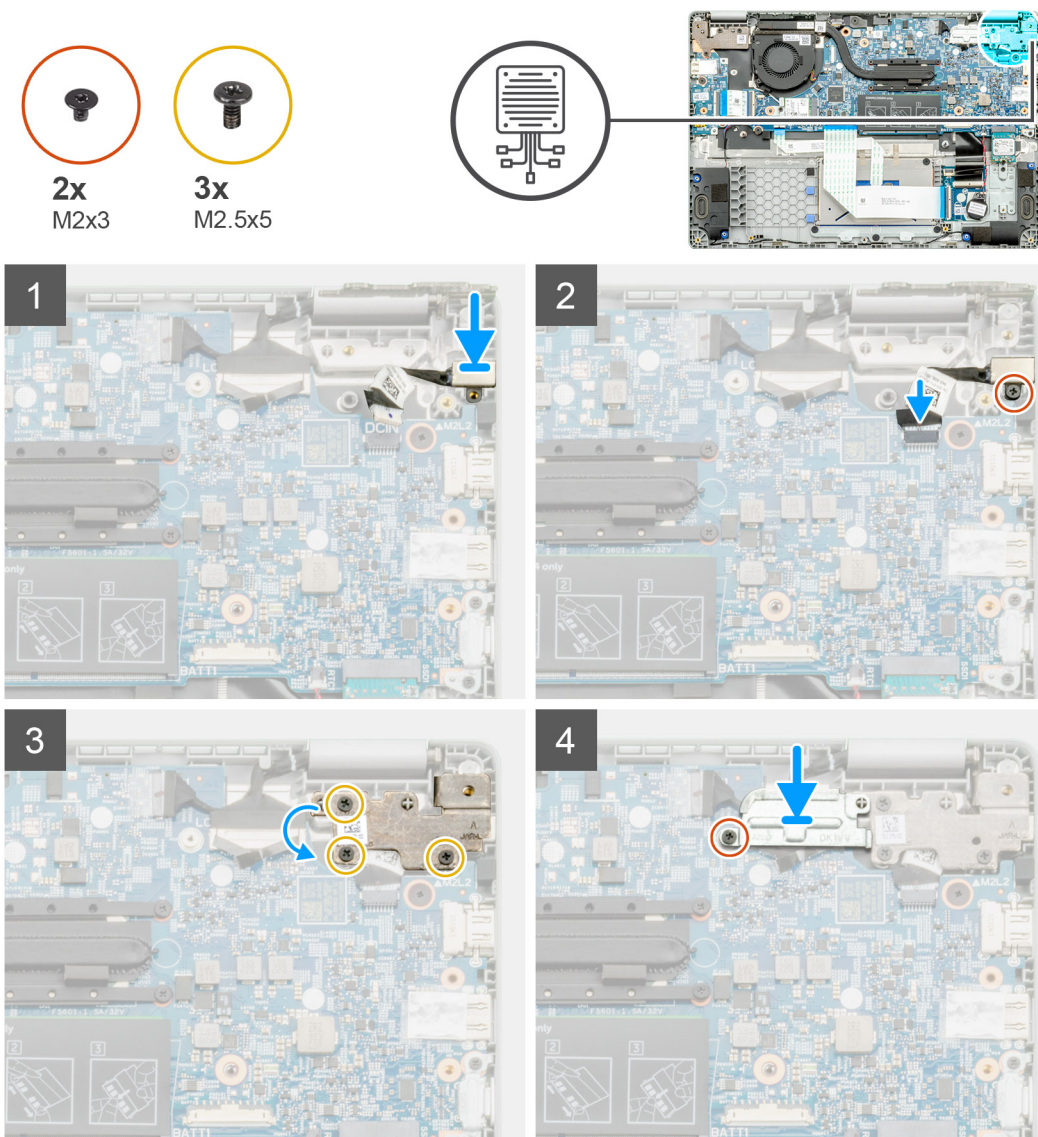
Installing the DC-in

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. Locate the DC-in port on your computer.
2. Install the (M2x3) screw and connect the DC-in cable to the system board.

3. Install the three (M2.5x5) screws and fix the DC-in metal bracket.
4. Install the (M2x3) screw and fix the metal bracket covering the display connector.

Next steps

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

World facing camera

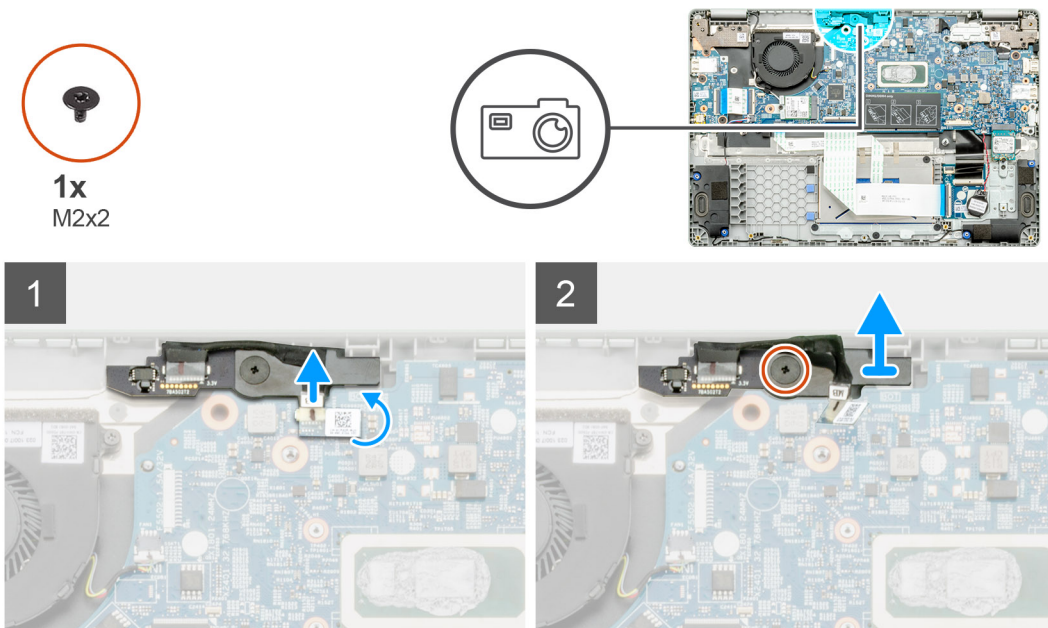
Removing the world-facing camera

Prerequisites

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

About this task

The figure indicates the location of the world facing camera on the plamrest and provides a visual representation of the removal procedure.



Steps

1. Locate the world-facing camera on your computer.
2. Peel back the world-facing camera cable.
i **NOTE: The world facing camera cable is secured to the computer by an adhesive strip.**
3. Remove the single (M2x3) screw that secures the world-facing camera to the computer.
4. Lift the world-facing camera out of the computer.

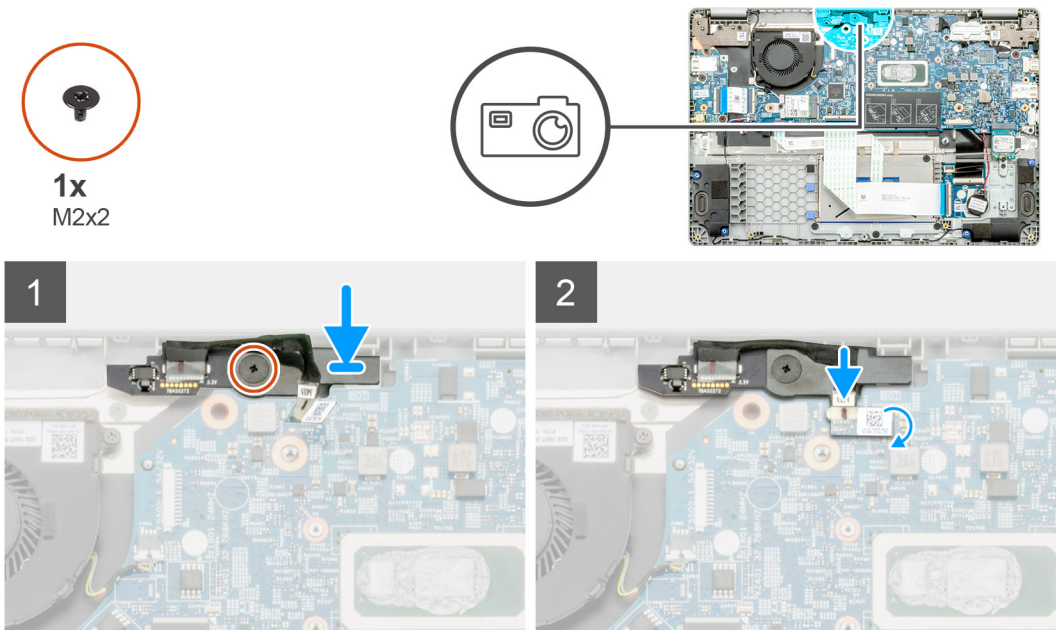
Installing the world-facing camera

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 world-facing camera on the plamrest and provides a visual representation of the removal procedure.



Steps

1. Locate the world-facing camera slot on your computer.
2. Align and place the world-facing camera on the computer.
3. Install the single (M2x3) screw that secures the world-facing camera to the computer.
4. Insert the camera cable to it's slot on the system board

Next steps

1. Install the [Heatsink](#)
2. Install the [battery](#).
3. Install the [base cover](#).
4. Follow the procedure in [After working inside your computer](#).

Touchpad buttons

Removing the touchpad

Prerequisites

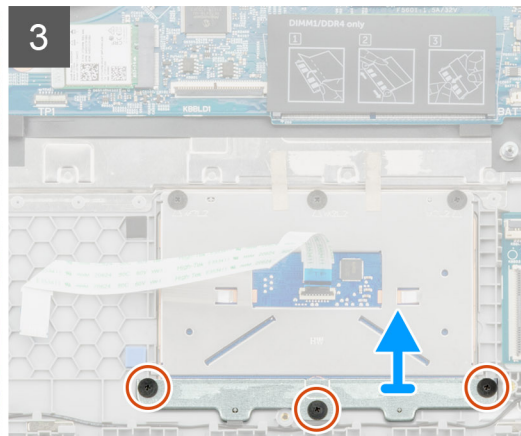
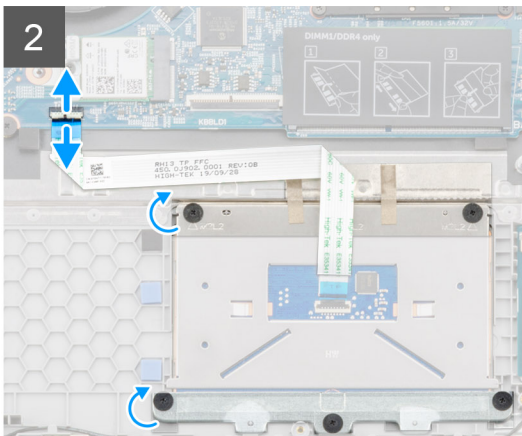
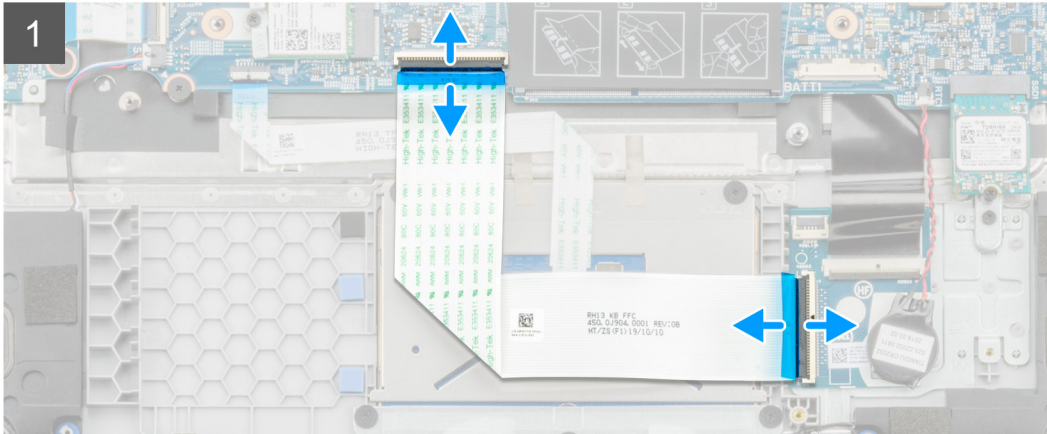
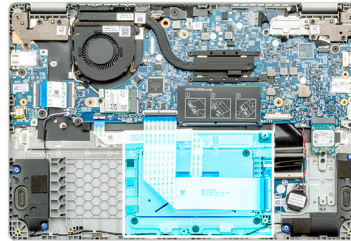
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

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

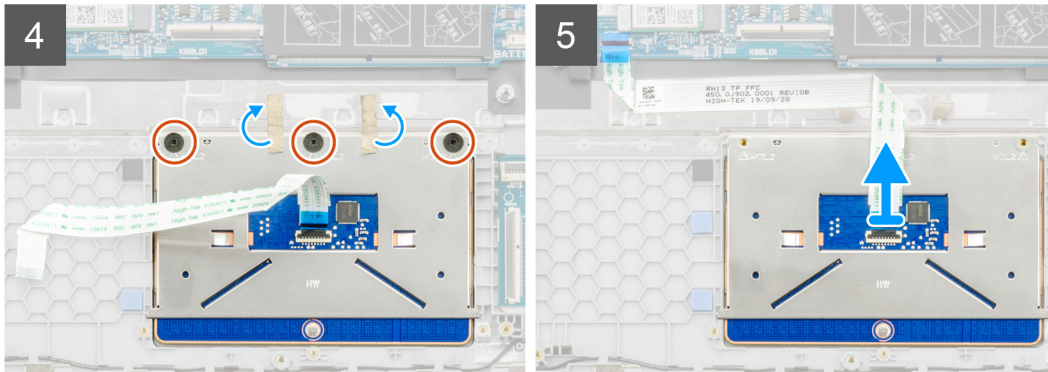


3x
M2x2





3x
M2x2



Steps

1. Locate the touchpad on your computer.
2. Open the latch and disconnect the keyboard transfer cable from the system board.
3. Open the latch and disconnect the touchpad cable from the connector.
4. Peel off the transparent adhesive tapes.
5. Remove the three (M2x2) screws that secure the touchpad bracket and lift the bracket from the palmrest.
6. Peel off the adhesive tapes.
7. Remove the three (M2x2) screws that secure the touchpad.
8. Lift the touchpad from the system board.

Installing the touchpad

Prerequisites

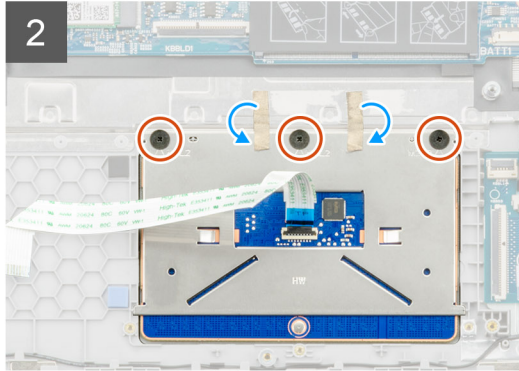
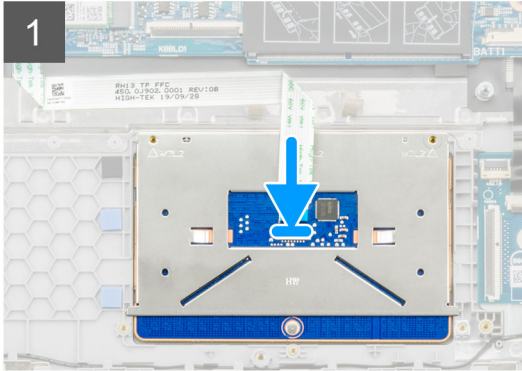
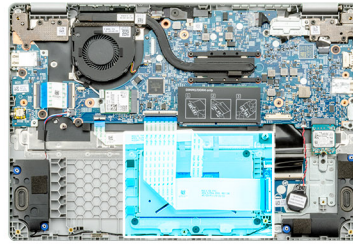
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

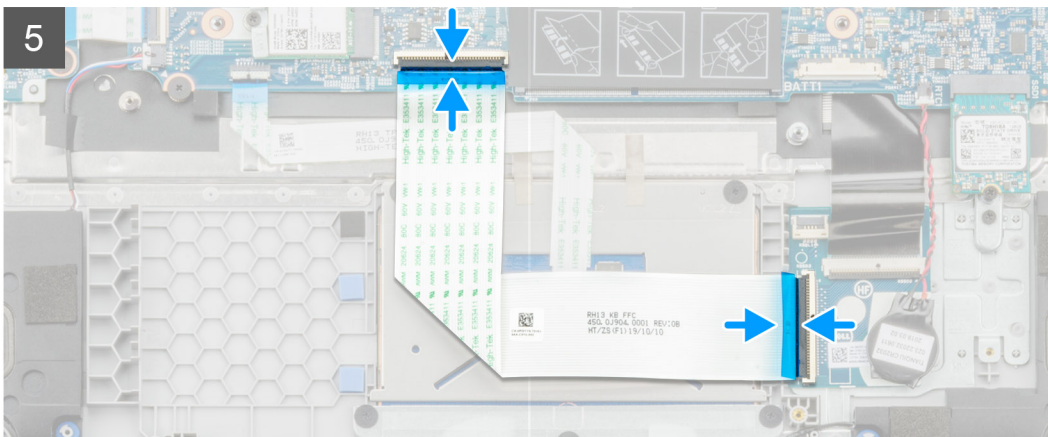
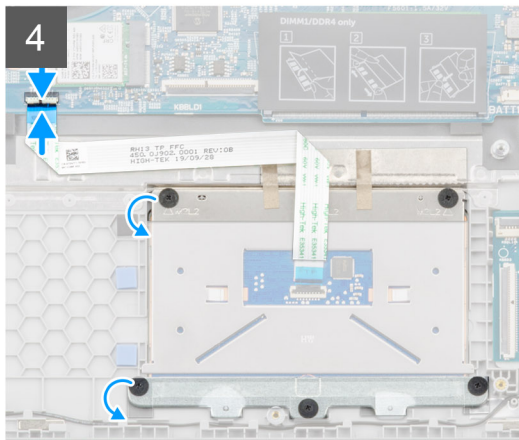
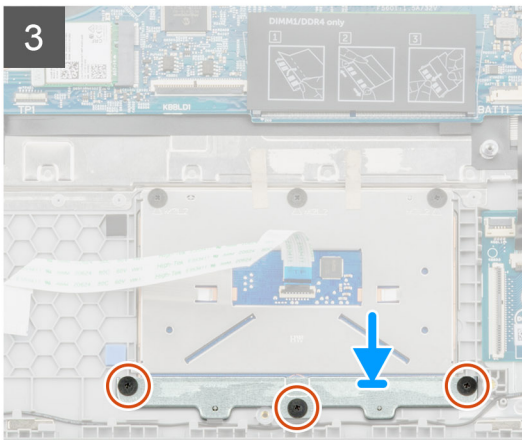
The figure indicates the location of the battery and provides a visual representation of the installation procedure.



3x
M2x2



3x
M2x2



Steps

1. Locate the touchpad on your computer.
2. Open the latch and connect the keyboard transfer cable to the system board.
3. Affix back the adhesive tapes.
4. Install the three (M2x2) screws that secure the touchpad bracket and align the bracket into the palmrest.
5. Open the latch and connect the touchpad cable into the connector.
6. Install the three (M2x2) screws that secure the touchpad.
7. Affix back the transparent adhesive tapes.
8. Open the latch and connect the keyboard transfer cable to the system board.

Next steps

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

System board

Removing the system board

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory](#).
5. Remove the [Solid state drive](#)
6. Remove the [WLAN card](#).
7. Remove the [Heatsink](#).

About this task

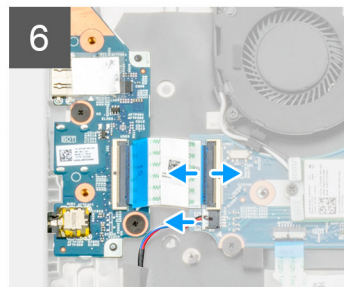
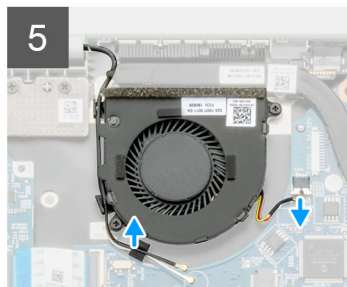
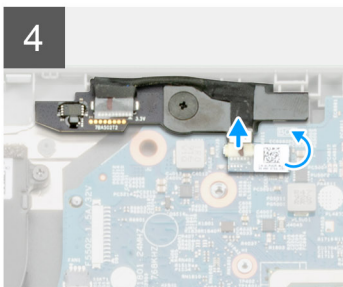
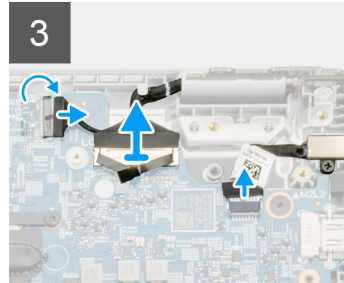
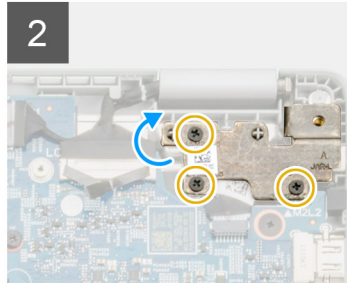
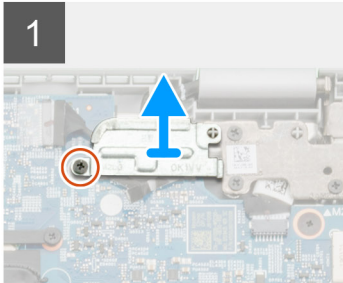
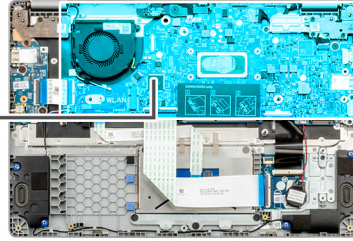
The figure indicates the location of the system board and provides a visual representation of the removal procedure.

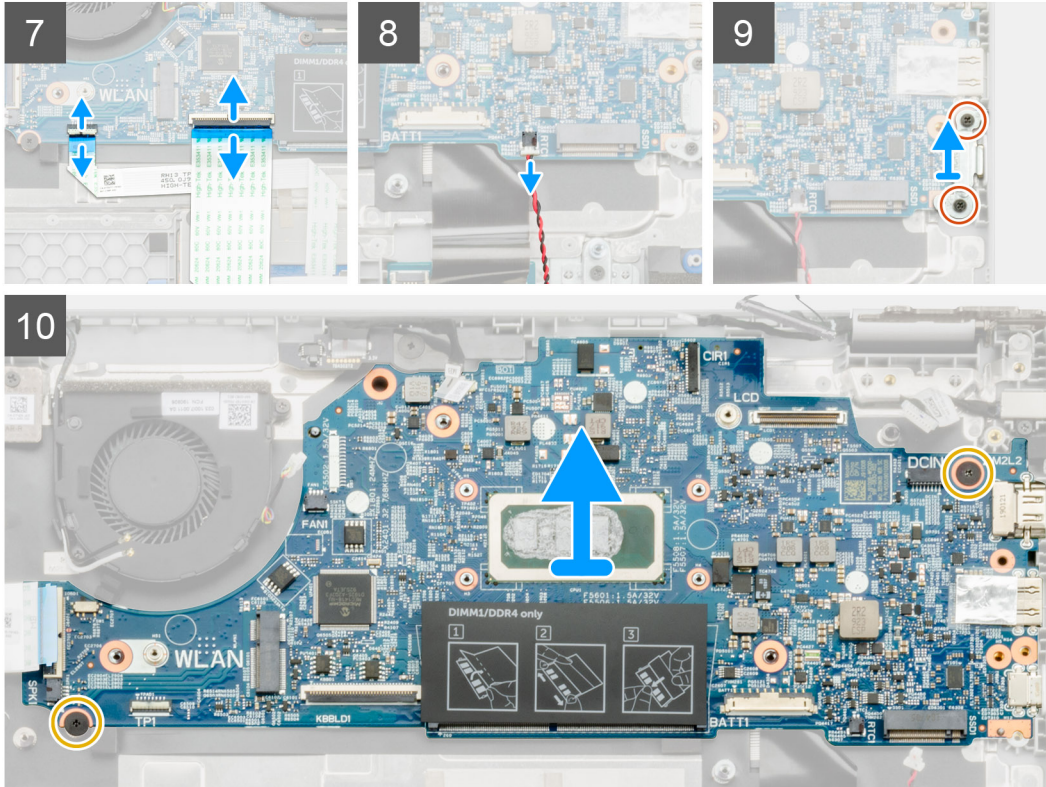
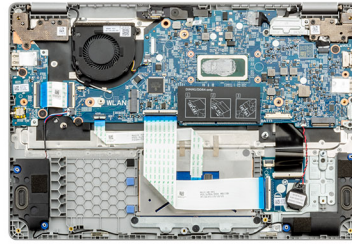
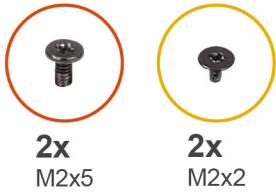


2x
M2x3



3x
M2.5x5





Steps

1. Locate the system board on your computer.
2. Remove the single (M2x3) screw and lift metal bracket covering the display connector.
3. Remove the three (M2.5x5) screws and lift the hinge.
4. Peel off the adhesive tape and remove the touchscreen cable from the latch. Lift the ED cable and remove the display cable from the latch on the system board.
5. Peel off the adhesive tape and remove the world-facing camera cable from the latch.
6. Unroute the cable, release the wireless cable, and disconnect the system fan cable from the connector on the system board.
7. Disconnect the I/O board cable, keyboard transfer cable, and touchpad cable from the latch.
8. Release the coin-cell cable from the latch.
9. Remove the two (M2x5) screws that secure the metal bracket to the computer.
10. Remove the two (M2x2) screws that secure the system board to the palmrest and keyboard assembly.
11. Lift the system board off the palmrest and keyboard assembly.

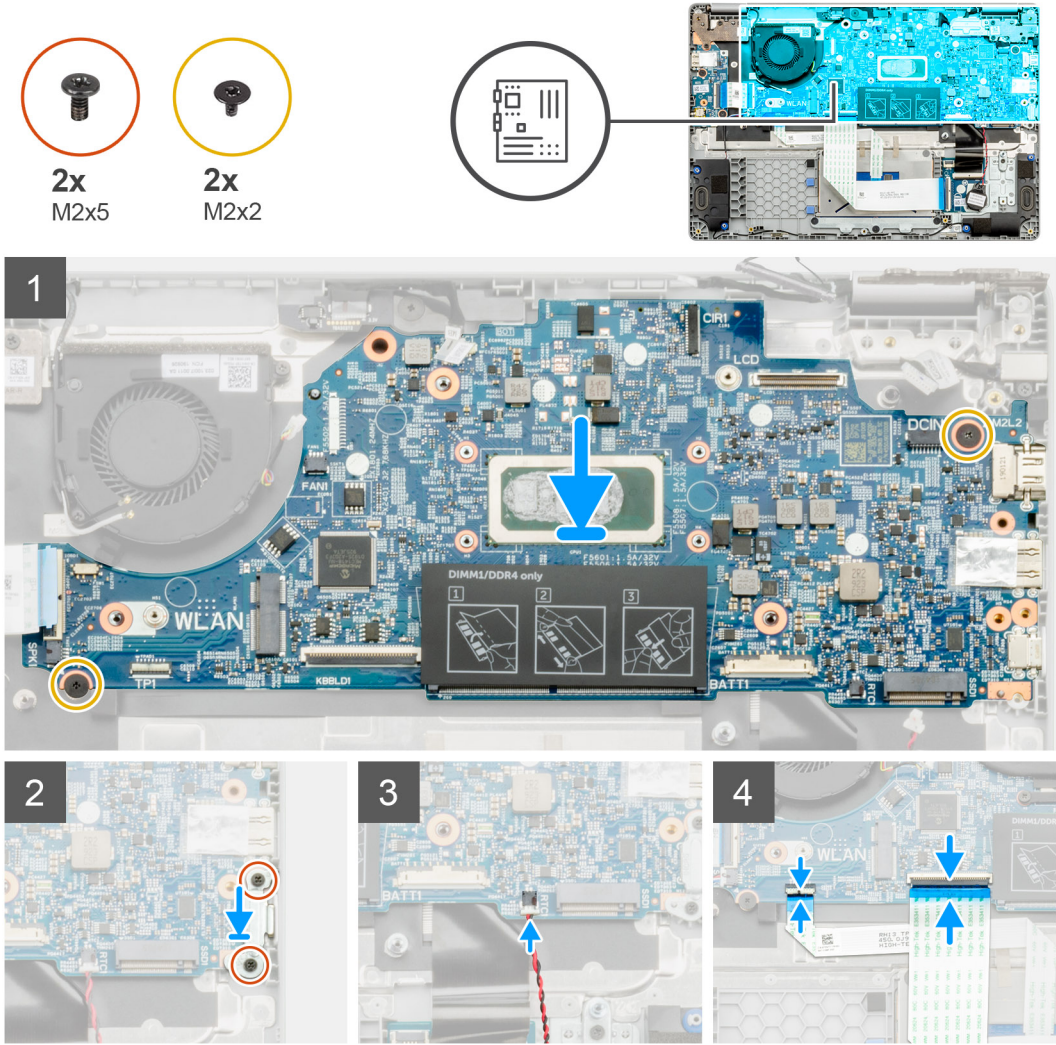
Installing the system board

Prerequisites

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

About this task

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

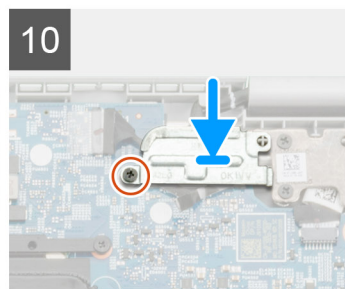
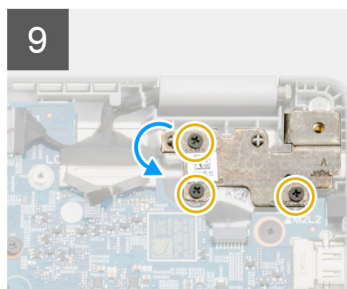
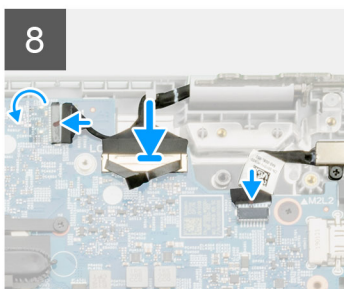
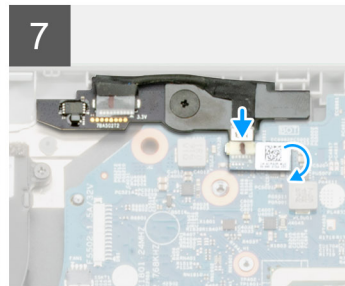
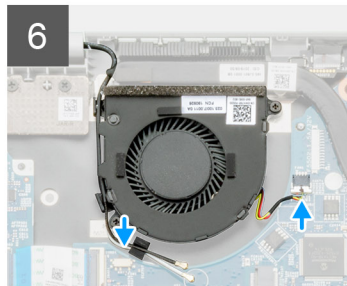
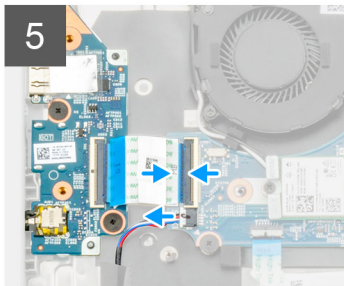




2x
M2x3



3x
M2.5x5



Steps

1. Locate the system board slot on your computer.
2. Slide the ports on the system board into the slots on the palm-rest and keyboard assembly and align the screw holes on the system board with the screw holes on the palm-rest and keyboard assembly.
3. Install the two (M2x2) screws that secure the system board to the palmrest and keyboard assembly.
4. Replace the two (M2x5) screw to secure the metal bracket to the computer.
5. Connect the coin-cell cable to the latch.
6. Connect the I/O board cable, keyboard transfer cable, and touchpad cable to the latch.
7. Route the cable, install the wireless cable, and connect the system fan cable to the connector on the system board.
8. Affix back the adhesive tape and connect the touchscreen cable to the latch. Replace the ED cable and connect the display cable to the latch on the system board.
9. Affix back the adhesive tape and connect the world-facing camera cable to the latch.
10. Replace the three (M2.5x5) screws to fix the hinge.
11. Replace the single (M2x3) screw to fix the metal bracket.

Next steps

1. Install the [Heatsink](#).
2. Install the [WLAN card](#).
3. Install the [Solid state drive](#).
4. Install the [memory](#).
5. Install the [battery](#).
6. Install the [base cover](#).
7. Follow the procedure in [After working inside your computer](#).

Display assembly

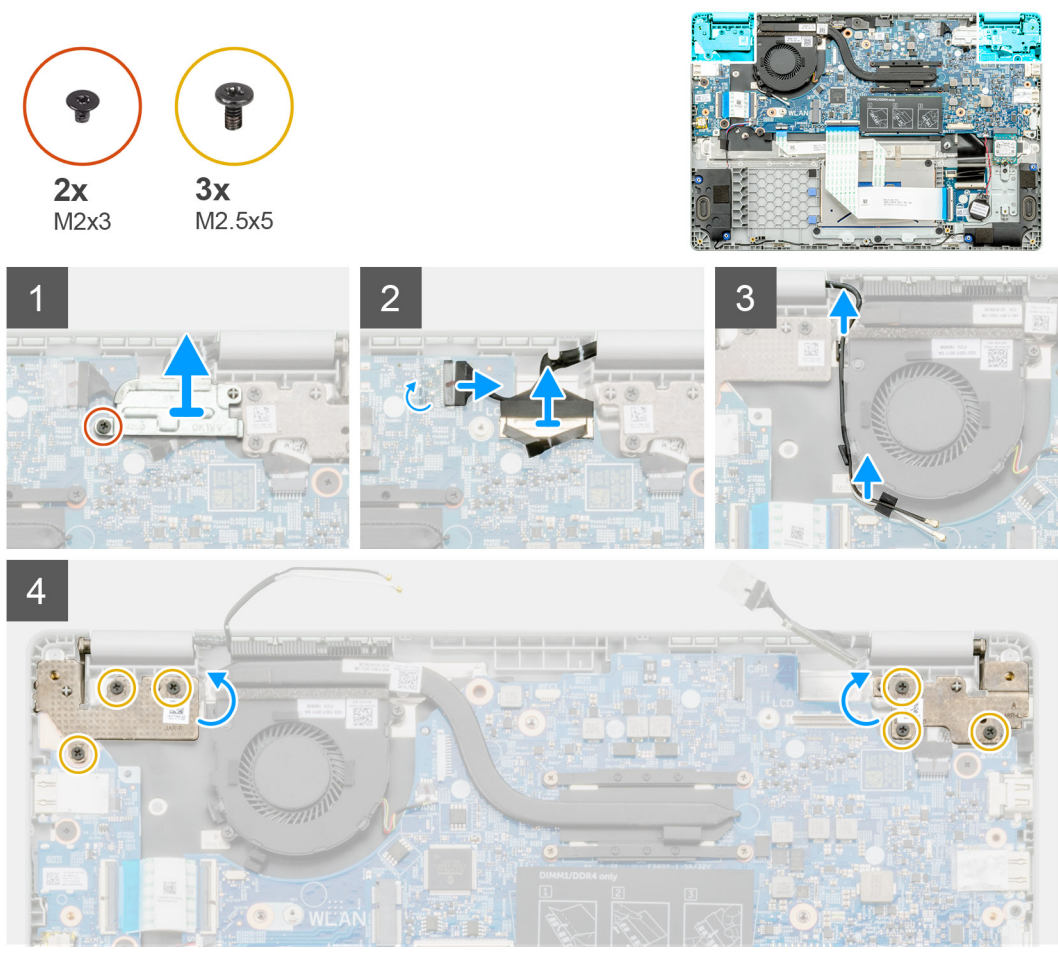
Removing the display assembly

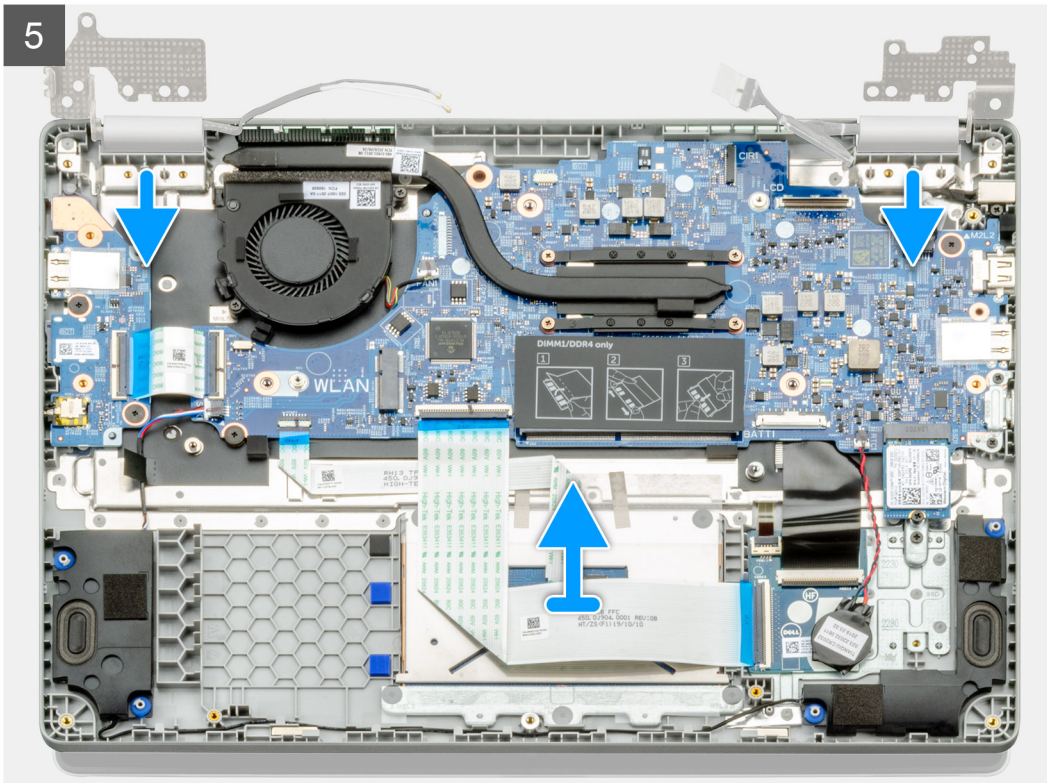
Prerequisites

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

About this task

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





Steps

1. Locate the display hinges on your computer.
2. Remove the six (M2.5x5) screws that secure the display hinges to the chassis of your computer.
3. Open the display hinges at an angle of 90 degrees and slightly open the display.
4. Slide and remove the palm-rest and keyboard assembly off the display assembly.

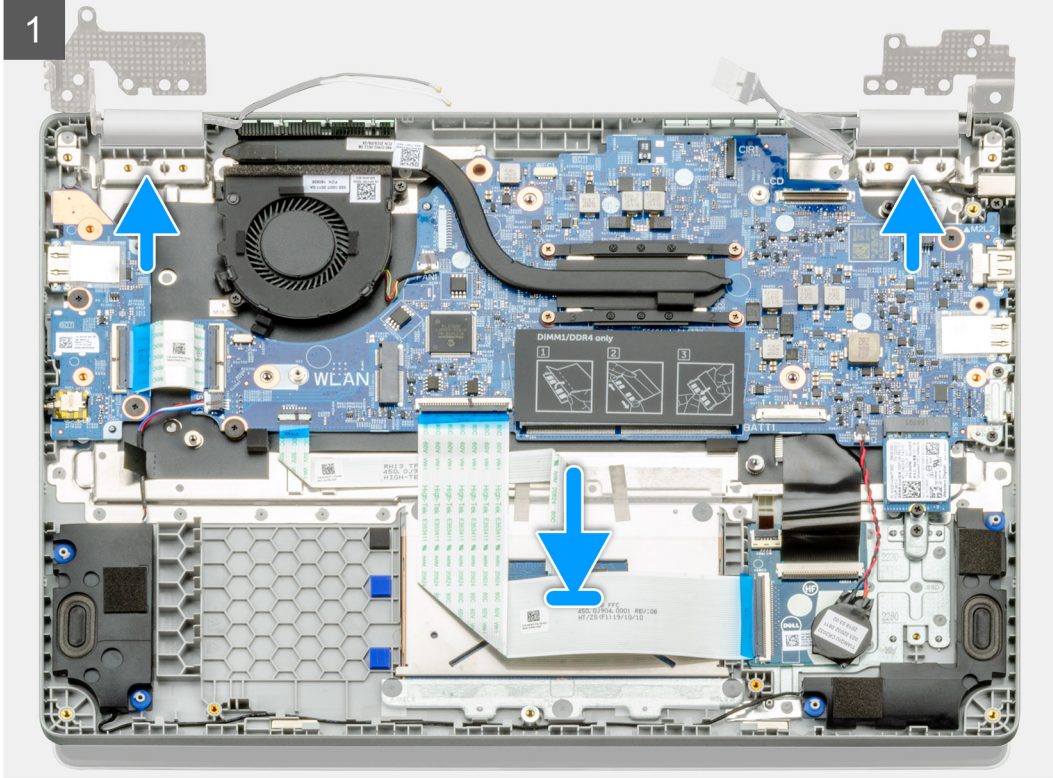
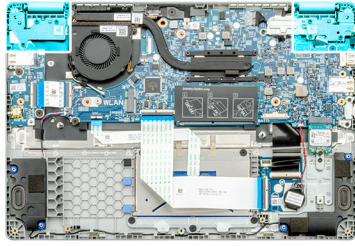
Installing the display assembly

Prerequisites

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

About this task

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

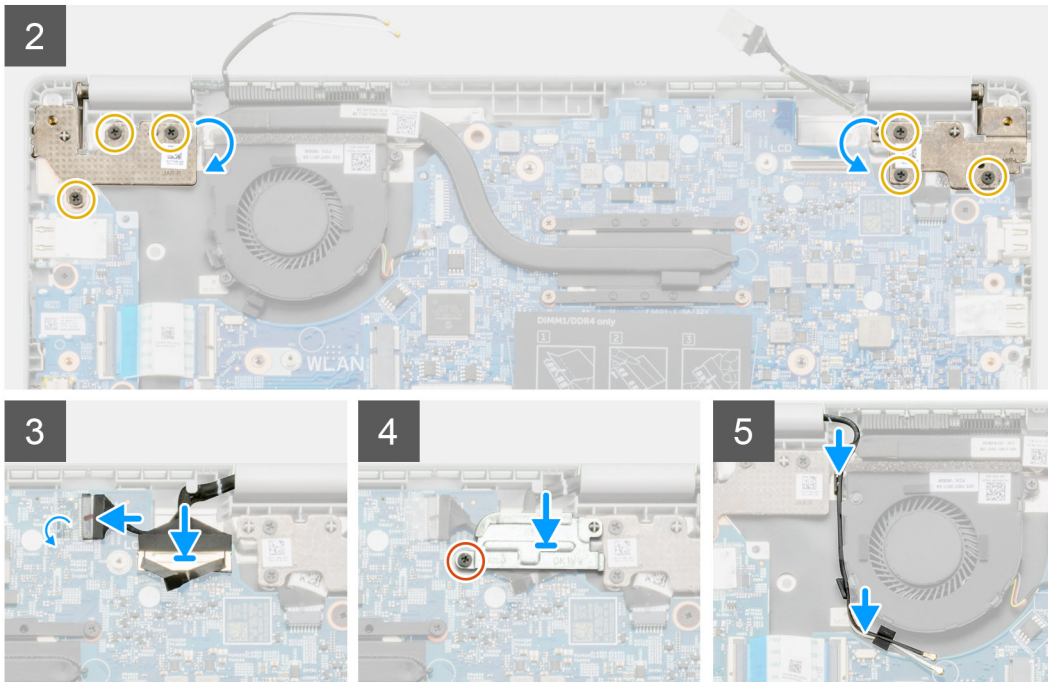




2x
M2x3



3x
M2.5x5



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

LCD panel

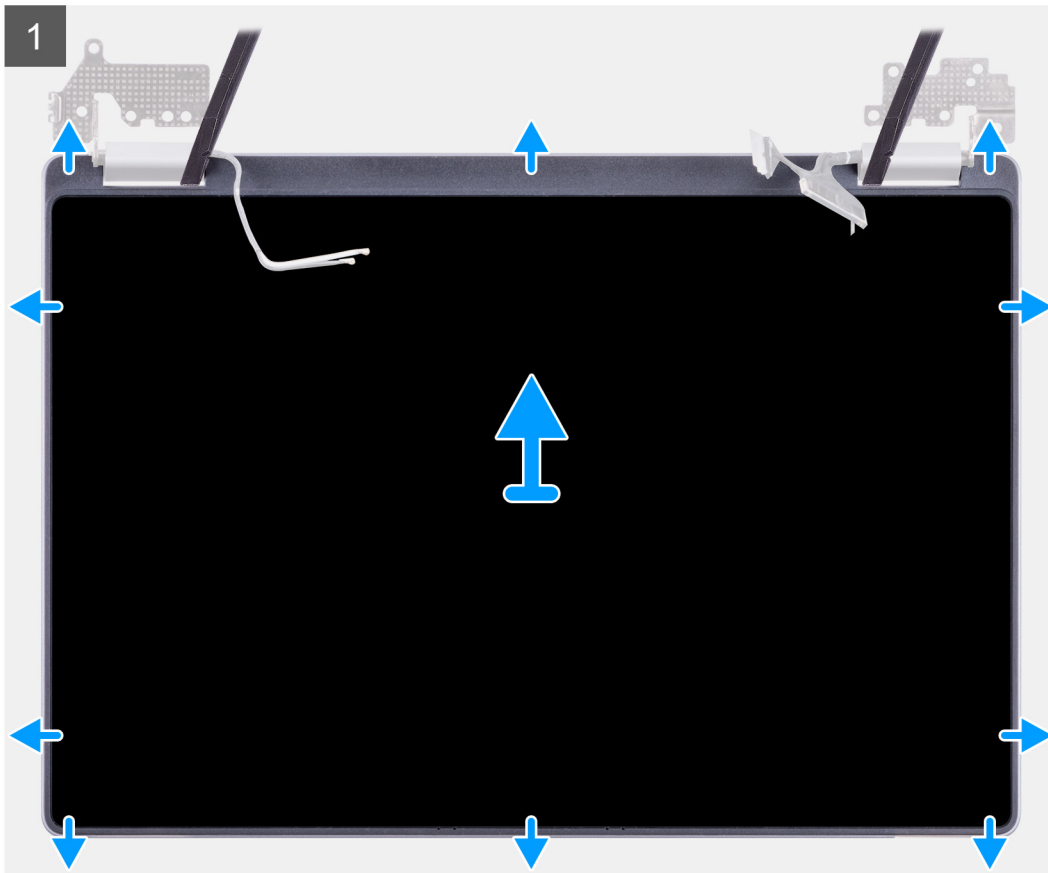
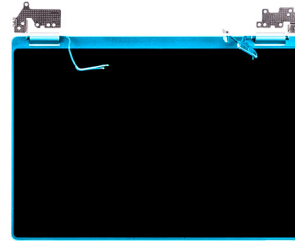
Removing the LCD panel

Prerequisites

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

About this task

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



Steps

1. Use a plastic scribe to pry from the recess at the hinge area.
2. Work your way around pry from all the sides.
3. Lift the LCD panel.

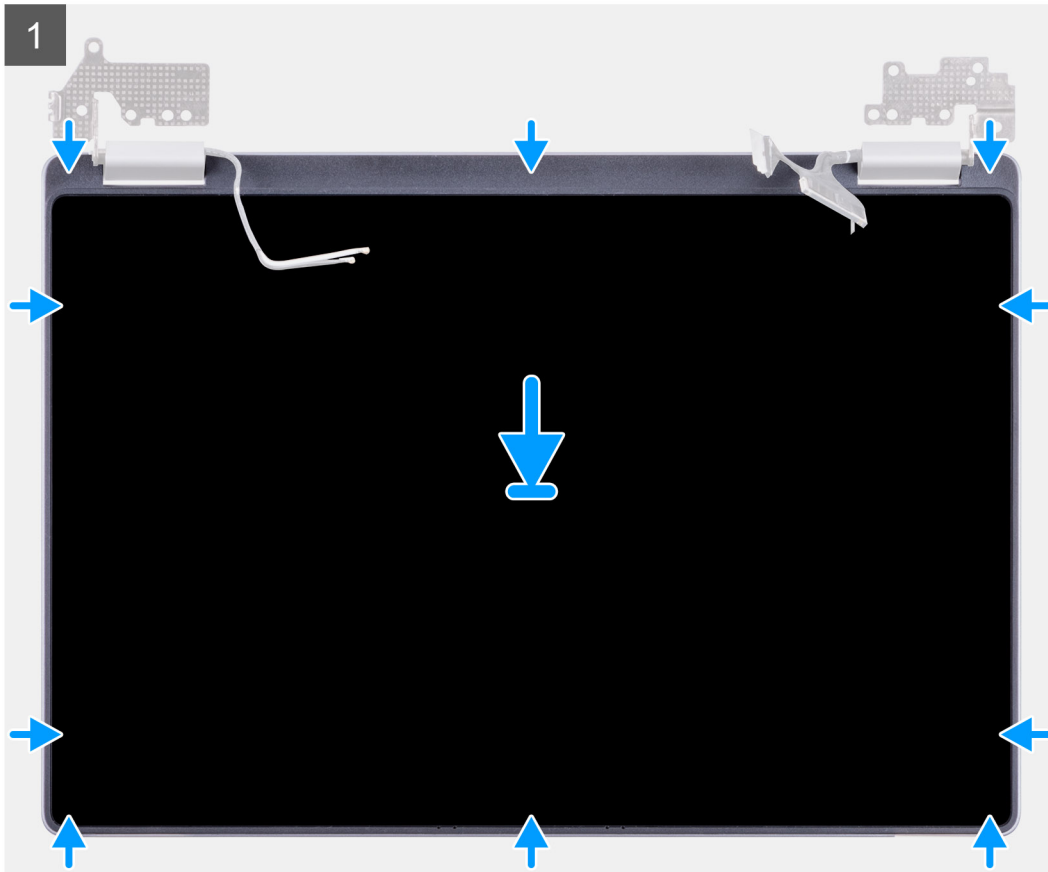
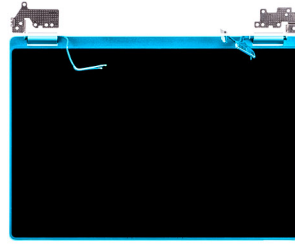
Installing the LCD panel

Prerequisites

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

About this task

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



Steps

1. Align the LCD panel to the back cover.
2. Angle the hinges and install the hinges on the back cover.

NOTE: Ensure that the hooks on the top of the display panel assembly are inserted prior before snapping the sides of the assembly in place.

Next steps

1. Install the [Display assembly](#) .
2. Follow the procedure in [After working inside your computer](#).

Diagnostics

This chapter details the built in troubleshooting features to diagnose the Dell systems. It also lists the invoking instructions along with related information for each diagnostics method.

Topics:

- [ePSA Diagnostics](#)
- [WiFi power cycle](#)
- [Diagnostic LEDs](#)
- [M-BIST](#)
- [Self-Heal](#)
- [BIOS recovery](#)
- [LCD Built-in Self Test](#)

ePSA Diagnostics

The ePSA diagnostics (also known as system diagnostics) performs a complete check of your hardware. The ePSA 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 Enhanced Pre-boot System Assessment window displays, listing all devices detected in the computer. The diagnostics starts running the tests on all the detected devices.

Running ePSA diagnostics

Invoke diagnostics by either of the methods that are suggested below:

- **Tap F12** key on keyboard, as the Dell splash screen appears, until you get the message **Diagnostic Boot Selected**.
 - On the one-time boot menu screen, use the Up/Down arrow key to select the **Diagnostics** option and then press **Enter**.
- Press and Hold **Function (Fn)** key on the keyboard and press the **Power button** to power on the system.

ePSA User Interface

This section contains information on ePSA 3.0's Basic and Advanced Screen.

ePSA opens the basic screen on start. You can switch to the advanced screen using the arrow icon at the bottom of the screen. The advanced screen shows detected devices on the left column. Specific test can be included or excluded only in the interactive mode.

ePSA Basic Screen

The Basic Screen has minimal controls which allows easy navigation for the user to start or stop the diagnostics.

ePSA Advanced Screen

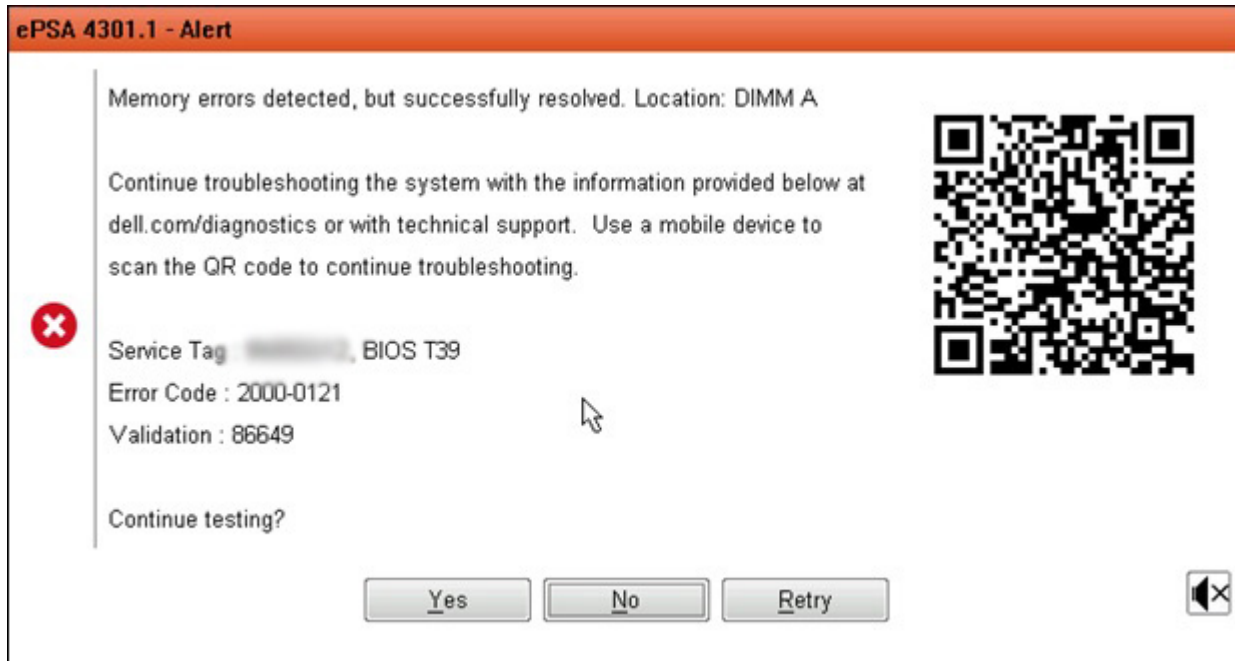
The advanced screen allows more directed testing and contains more detailed information about the overall health of the system. The user can get to this screen by simply swiping a finger to the left on touchscreen systems or clicking the next page button on the lower right hand side of the basic screen.

To run the test on specific device or run a specific test

1. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
2. Select the device from the left pane and click **Run Tests** or use **Advanced Option** to include or exclude any test.

ePSA Error Messages

When the Dell ePSA Diagnostic detects an error while running, it will pause the test and the following window is displayed:



- By responding **Yes**, the diagnostic will continue testing the next device and the error details will be available in the summary report.
- By responding **No**, the diagnostic will stop testing the remaining untested device.
- By responding **Retry**, the diagnostic will ignore the error and rerun the last test.

Capture the error code with Validation code or Scan QR code and Contact Dell.

i **NOTE:** As part of the new feature, user can now mute the beeping sound code when there is an error by clicking on  at the bottom right side of the error window.

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

WiFi power cycle

About this task

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

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

Steps

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

6. Turn on the modem.
7. Turn on your computer.

Diagnostic LEDs

Instead of beep codes, errors are indicated via the bicolor Battery Charge/Status LED. A specific blink pattern is followed by flashing a pattern of flashes in amber, followed by white. The pattern then repeats.

NOTE: The diagnostic pattern will consist of a two-digit number being represented by a first group of LED blinks (1 through 9) in amber, followed by a 1.5 second pause with the LED off, and then a second group of LED blinks (1 through 9) in white. This is then followed by a three second pause, with the LED off, before repeating over again. Each LED blink takes 1.5 seconds.

The system will not shutdown when displaying the Diagnostic Error Codes.

Diagnostic Error Codes will always supersede any other use of the LED. For instance, on laptops, battery codes for Low Battery or Battery Failure situations will not be displayed when Diagnostic Error Codes are being displayed.

Table 10. Diagnostic LEDs

Blinking Pattern		Problem Description	Suggested Resolution
Amber	White		
2	1	CPU failure	Replace the system board.
2	2	System board failure (included BIOS corruption or ROM error)	Flash latest BIOS version. If problem persists, replace the system board.
2	3	No memory/RAM detected	Confirm that the memory module is installed properly. If problem persists, replace the memory module.
2	4	Memory/RAM failure	Replace the memory module.
2	5	Invalid memory installed	Replace the memory module.
2	6	System board/Chipset error	Replace the system board.
2	7	LCD failure	Replace the LCD module.
2	8	LCD Power rail failure	Replace the system board.
3	1	CMOS battery failure	Replace the RTS battery.
3	2	PCI or Video card/chip failure	Replace the system board.
3	3	BIOS Recovery Image not found	Flash latest BIOS version. If problem persists, replace the system board.
3	4	BIOS Recovery Image found but invalid	Flash latest BIOS version. If problem persists, replace the system board.

NOTE: For diagnostics pattern 2-amber, 8-white connect an external monitor to isolate between system board or graphics controller failure.

M-BIST

M-BIST (Built In Self-Test) diagnostics tool, featuring improved accuracy in system board failures.

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

How to run M-BIST

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

1. Press and hold both the **M** key on the keyboard and the **power button** to initiate M-BIST.
2. With both the **M** key and the **power button** that is held down, the battery indicator LED may exhibit two states:
 - a. OFF: No fault detected with the system board
 - b. AMBER: Indicates a problem with the system board

Self-Heal

Course Introduction

About this task

Self-Heal is an option that helps recover a Dell Latitude system from a No Post, No Power, No Video situation.

Self-Heal Instruction

Steps

1. Remove the primary battery and the AC adapter.
2. Disconnect the CMOS battery.
3. Release the flea power. Press and hold the power button down for 10 seconds or leave the system idle for 45 seconds.
4. Make sure the CMOS and primary battery are not plugged into the system.
5. Plug in the AC adapter. The system will auto power-on when the AC adapter is inserted.
6. The system will start with a blank screen for a while and will shut down automatically. Watch for the LED lights (power, WiFi, and HDD). It will turn on.
7. The system will try to restart twice and will boot on the third attempt.
8. Place the CMOS battery and the AC adapter back in the system.
9. If self-heal recovers the failure, update the system with the latest BIOS, and perform ePSA to ensure proper functionality of the system.

Example

NOTE:

- During installation or removal of any hardware, always ensure all data is backed up properly.
- For instructions on how to remove or replace parts, visit the [Assembly Disassembly](#).
- Before beginning to work on the computer, follow the [Safety Instruction](#).

Supported Latitude Models

About this task

NOTE:

- Before replacing the system board, perform Self-Heal as a mandatory step.
- Latitude Self-Heal can be avoided when complete system tear-down is required to access the coin-cell battery.
- For the Latitude E7 Series (XX70), BIOS Recovery 2.0 should be performed as the primary step.
- In order to reduce troubleshooting time associated with Self-Heal, there is no mandatory requirement to reassemble the system. Technicians can initiate Self-Heal even with the system board exposed.
- Do not touch any of the exposed components or the system board to avoid shorting and static discharge.
- If Self-Heal is unable to recover the failure, proceed with replacing the system board.

NOTE:

Front-line Agent Action: Front-line agents must encourage the customer to perform this step before isolating the issue as a motherboard failure. If the customer is not comfortable performing the Self-Heal procedure, then please document

the dispatch being created in 5GL. Advise the onsite engineers to perform the Self-Heal procedure as one of the mandatory initial steps. Advise them that if the Self-Heal procedure is unsuccessful, to continue with the regular troubleshooting before part replacement.

Onsite Engineer Action: The Latitude Self-Heal procedure has to be a mandatory initial step. If the Self-Heal procedure is unsuccessful, continue with the regular troubleshooting before part replacement. Document Self-Heal results in the call closure log (Self-Heal Pass or Fail).

BIOS recovery

The BIOS recovery is designed to fix the main BIOS, and cannot work if the boot is damaged. The BIOS recovery will not work in the event of EC corruption, ME corruption, or a hardware related issue. The BIOS recovery image should be available on the unencrypted partition on the drive for BIOS recovery feature.

Rollback BIOS feature

Two versions of the BIOS recovery image are saved on the hard drive:

- Current running BIOS (old)
- To-be-updated BIOS (new)

The old version is already stored on the hard drive. The BIOS adds new version to the hard drive, maintains the old version, and deletes other existing versions. For example, A00 and A02 versions are already on the hard drive, A02 is the running BIOS. The BIOS adds A04, maintains A02, and deletes A00. Having two BIOS version enables the Rollback BIOS feature.

If the recovery file cannot be stored (hard drive is out of space), the BIOS sets a flag to indicate this condition. The flag is reset in the event it later becomes possible to store the recovery file. The BIOS notifies the user during POST and in BIOS Setup, the BIOS recovery is degraded. BIOS recovery through hard drive may not be possible, however BIOS recovery through USB flash drive is still possible.

For USB key: root directory or "\"

BIOS_IMG.rcv: the recovery image stored on the USB key.

BIOS recovery using hard drive

About this task

 **NOTE:** Ensure that you have the previous version and the latest version of the BIOS from the Dell support site available to use.

 **NOTE:** Ensure that you have the file type extensions visible in the operating system (OS).

Steps

1. Browse to the location of the BIOS update executable (.exe) files.
2. Rename the BIOS executable files to **BIOS_PRE.rcv** for the earlier version of the BIOS and **BIOS_CUR.rcv** for the latest version of the BIOS.

For example, if the latest version's file name is **PowerEdge_T30_1.0.0.exe**, rename it to **BIOS_CUR.rcv** and if the previous version's file name is **PowerEdge_T30_0.0.9.exe**, rename it to **BIOS_PRE.rcv**

 **NOTE:**

- a. **If the hard drive is new, there will be no operating system installed.**
 - b. **If the hard drive has been partitioned at the Dell factory, there will be a Recovery Partition available.**
3. Disconnect the hard drive and install the hard drive into another system that has a full operational operating system.
 4. Start up the system and in the Windows operating system environment follow these steps to copy the BIOS recovery file to the **Recovery Partition**.
 - a) Open a Windows Command Prompt window.
 - b) At the prompt, type **diskpart** to start the **Microsoft DiskPart**.
 - c) At the prompt, type **list disk** to list out the available hard drives.
Select the hard drive that was installed in Step 3.

- d) At the prompt, type **list partition** to view the available partitions on this hard drive.
- e) Select **Partition 1** which is the **Recovery Partition**. The size of the partition will be 39 MB.
- f) At the prompt, type **set id=07** to set the partition ID.

NOTE: The partition will be visible to the operating system as **Local Disk (E)** to read and write data.

- g) Create the following folders in **Local Disk (E)**, **E:\EFI\Del\BIOS\Recovery**.
- h) Copy both the BIOS files **BIOS_CUR.rcv** and **BIOS_PRE.rcv** to the recovery folder on **Local Disk (E)**.
- i) In the **Command Prompt** window, at the **DISKPART** prompt, type **set id=DE**.

After the executing this command, the partition **Local Disk (E)** will not be accessible by the OS.

5. Shut the system down, remove the hard drive, and install the hard drive into the original system.
6. Start the system up and boot to System Setup, in the **Maintenance** section ensure that **BIOS Recovery from Hard Drive** is enabled in the **BIOS Recovery** section of the setup.
7. Press the power button to shut the system down.
8. Holding the **Ctrl and Esc** keys, press the power button to start the system up. Keep holding the **Ctrl and Esc** keys until the **BIOS Recovery Menu** page is displayed.
Ensure that the **Recover BIOS** radio button is selected and click **Continue** to start the BIOS recovery.

BIOS recovery using USB drive

About this task

NOTE: Ensure that you have the file type extensions visible in the operating system.

NOTE: Ensure that you have downloaded the latest BIOS from the Dell support site and save it on your system.

Steps

1. Browse to the location of the downloaded BIOS update executable (.exe) file.
2. Rename the file to BIOS_IMG.rcv.
For example, if the file name is PowerEdge_T30_0.0.5.exe, rename it to BIOS_IMG.rcv
3. Copy the BIOS_IMG.rcv file to the root directory of the USB key.
4. If not plugged in, plug in the USB drive, restart the system, press F2 to enter the System Setup, and then press power button to shut down the system.
5. Start the system.
6. While the system is starting up, press the **Ctrl+Esc** keys while holding the power button until the **BIOS Recovery Menu** dialog box is displayed.
7. Click **Continue** to start the BIOS recovery process.
NOTE: Ensure that the **Recovery BIOS** option is selected in the **BIOS Recovery Menu** dialog box.
8. Select the path on the USB drive where BIOS recovery file is stored(root directory or "\") and follow the on-screen instructions.

LCD Built-in Self Test

Overview : LCD Built-in Self Test (BIST)


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

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

How to invoke LCD BIST Test

1. Power off the Dell laptop.
2. Disconnect any peripherals connected to the laptop. Connect only the AC adapter (charger) to the laptop.

3. Make sure that the LCD (screen) is clean (no dust particles on the surface of the screen).
4. Press and hold **D** key and **Power on** the laptop to enter LCD built-in self test (BIST) mode. Continue to hold the D key, until you see color bars on the LCD (screen).
5. The screen will display multiple color bars and change colors on the entire screen to red, green, and blue.
6. Carefully inspect the screen for abnormalities.
7. Press **Esc** key to exit.


 **NOTE: Dell ePSA upon launch, initiates a LCD BIST first, expecting a user intervention confirm functionality of the LCD.**

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 11. Self-help resources

Self-help resources	Resource location
Information about Dell products and services	www.dell.com
Dell Help and Support app	
Accessing help	In Windows search, type <code>Help</code> and <code>Support</code> , and press <code>Enter</code> .
Online help for operating system	www.dell.com/support/windows
Troubleshooting information, user manuals, set up instructions, product specifications, technical help blogs, drivers, software updates, and so on.	www.dell.com/support
Dell knowledge base articles for various computer concerns	<ol style="list-style-type: none"> 1. Go to www.dell.com/support. 2. Type the subject or keyword in the Search box. 3. Click Search to retrieve the related articles.
Learn and know the following information about your product:	See <i>Me and My Dell</i> at www.dell.com/support/manuals .
<ul style="list-style-type: none"> • Product specifications • Operating system • Setting up and using your product • Data backup • Troubleshooting and diagnostics • Factory and system restore • BIOS information 	<p>To locate the <i>Me and My Dell</i> relevant to your product, identify your product through one of the following:</p> <ul style="list-style-type: none"> • Select Detect Product. • Locate your product through the drop-down menu under View Products. • Enter the Service Tag number or Product ID in the search bar.

Contacting Dell

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

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

 **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.