Chromebook 3110 2-in-1

Service Manual

Regulatory Model: P30T
Regulatory Type: P30T002
January 2022
Rev. A00

DELL Technologies

Notes, cautions, and warnings

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

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

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

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1

Working inside your computer

Safety instructions

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

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

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

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

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

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

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

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

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

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

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

Before working inside your computer

Steps

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

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

5. Remove any media card and optical disc from your computer, if applicable.
6. After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

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

7. Place the computer face down.

Safety precautions

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

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

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

Standby power

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

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

Bonding

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

Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

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

ESD field service kit

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

Components of an ESD field service kit

The components of an ESD field service kit are:

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

ESD protection summary

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

Transporting sensitive components

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

After working inside your computer

About this task

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

Steps

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

2

Removing and installing components

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

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #1
- Torx 5 screwdriver
- Plastic scribe

Screw list

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

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

NOTE: Screw color may vary with the configuration ordered.

Table 1. Screw list

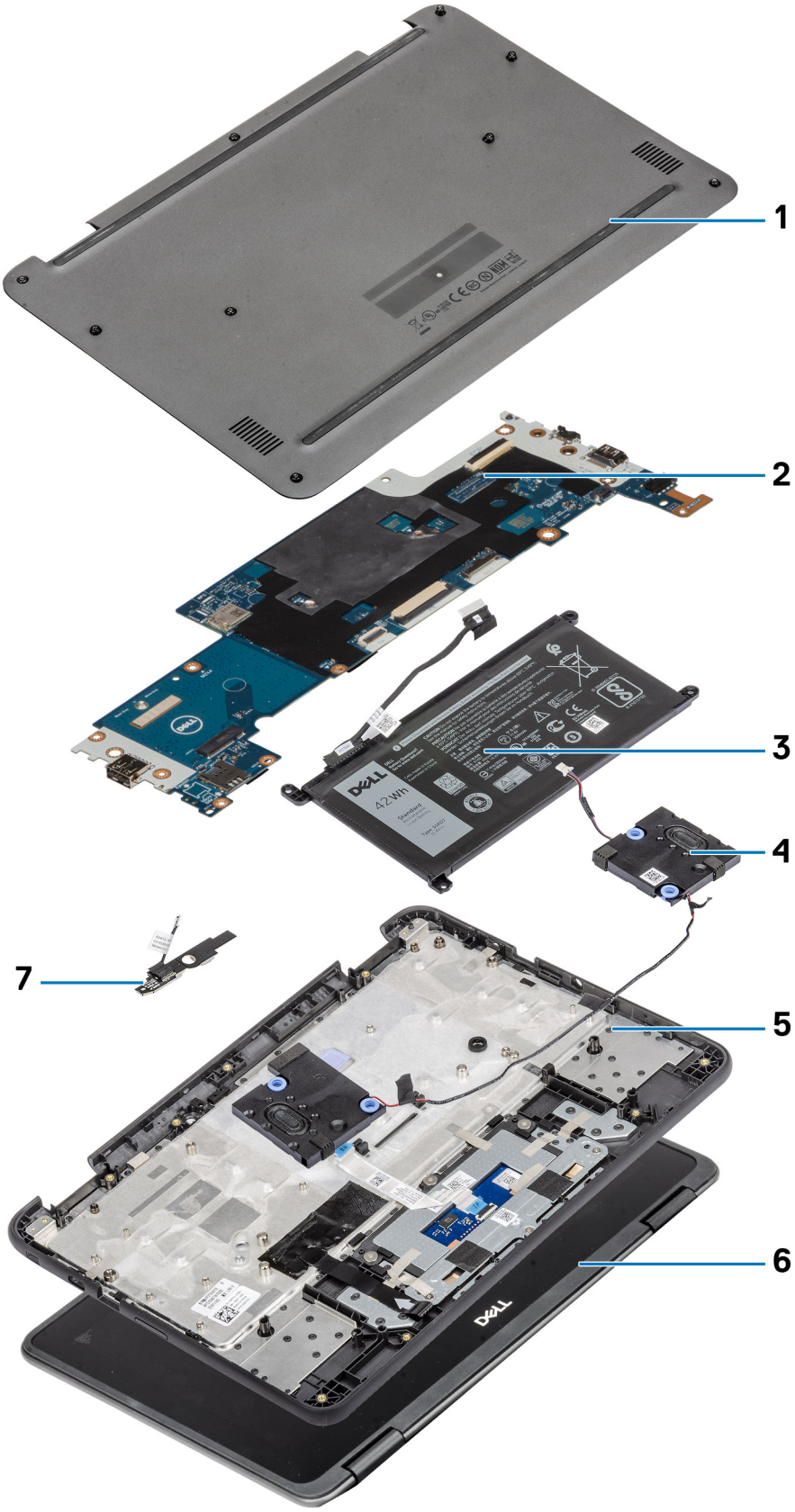
Component	Screw type	Quantity	Screw image
Base cover	Captive screws	9	
3-cell battery	M2x4	3	
WLAN bracket	M2x3	1	
Display-cable bracket	M2x4	1	
Display assembly	M2.5x5	6	
Right I/O bracket	M2x4	2	
Left I/O bracket	M2x4 M2.5x5	1 1	

Table 1. Screw list (continued)

Component	Screw type	Quantity	Screw image
System board	M2x4	7	
World-facing camera	M2.5x2.5	1	
Display hinges	M2x3 M2.5x2.5	4 6	

Major components of Chromebook 3110 2-in-1

The following image shows the major components of Chromebook 3110 2-in-1.



1. Base cover
2. System board
3. Battery
4. Speakers
5. Computer chassis
6. Display assembly
7. World facing camera (optional)

NOTE: Dell provides a list of components and their part numbers for the original system configuration purchased. These parts are available according to warranty coverages purchased by the customer. Contact your Dell sales representative for purchase options.

Base cover

Removing the base cover

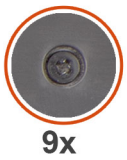
Prerequisites

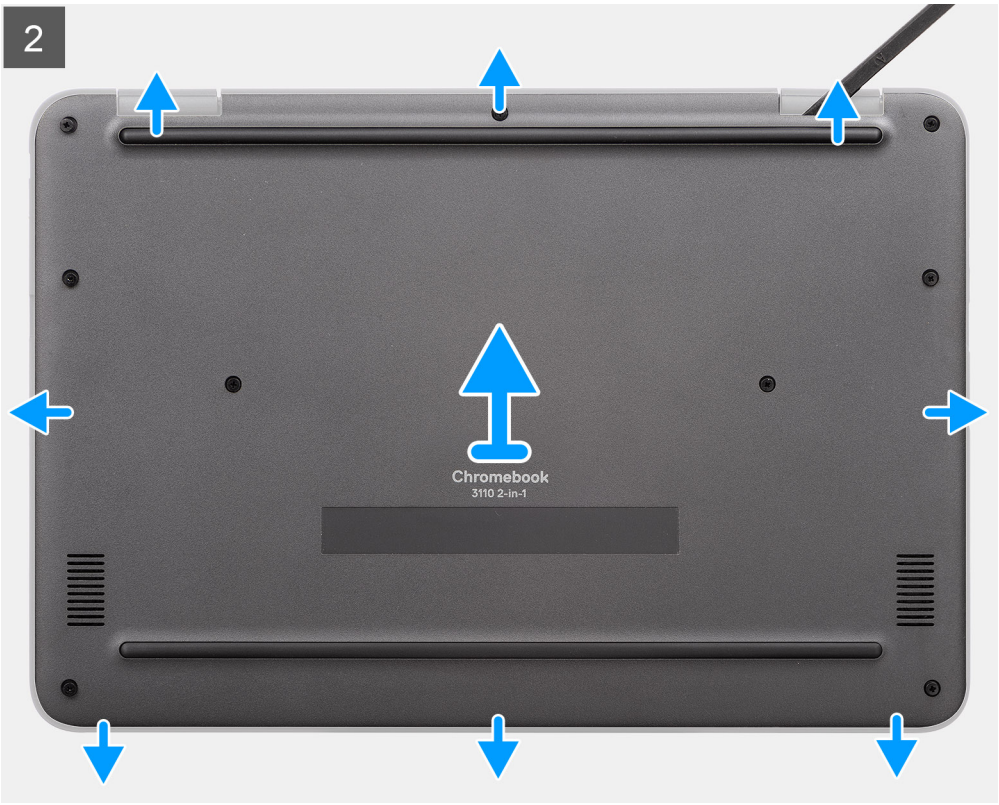
1. Follow the procedure in Before working inside your computer.

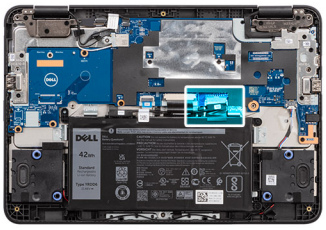
About this task

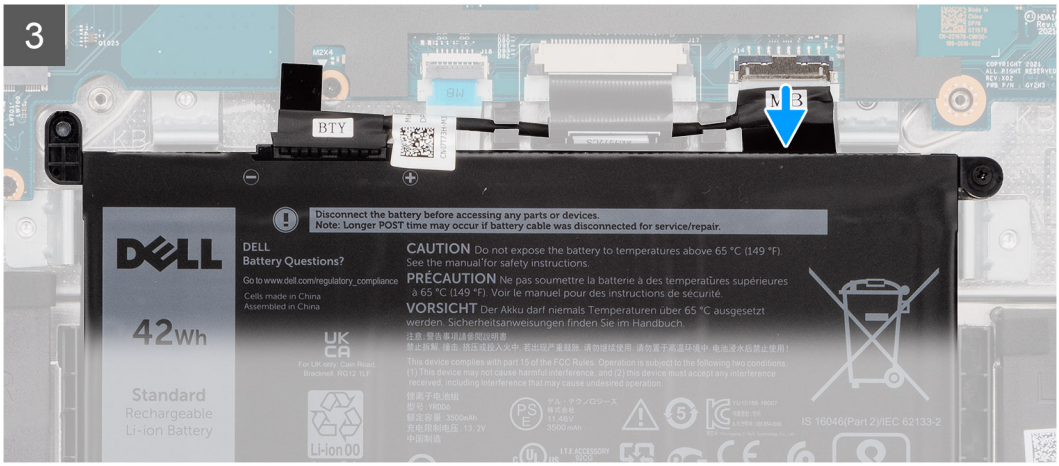
The following images indicate the location of the base cover and provide a visual representation of the removal procedure.

NOTE: For Chromebook 3110 systems shipped with WWAN, the base cover is secured using Torx 5 (not Phillips #0) screws.









Steps

1. Loosen the nine captive screws that secure the base cover to the palm-rest assembly.
2. Using a plastic scribe, pry the base cover from the U-shaped indents at the top and continue working on the sides to open the base cover.
3. Lift and remove the base cover off the palm-rest assembly.
4. Use the pull tab to disconnect the battery cable from the connector system board.

Installing the base cover

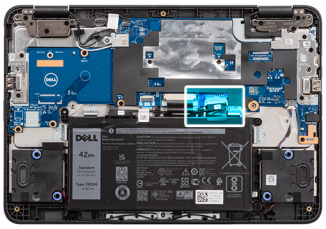
Prerequisites

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

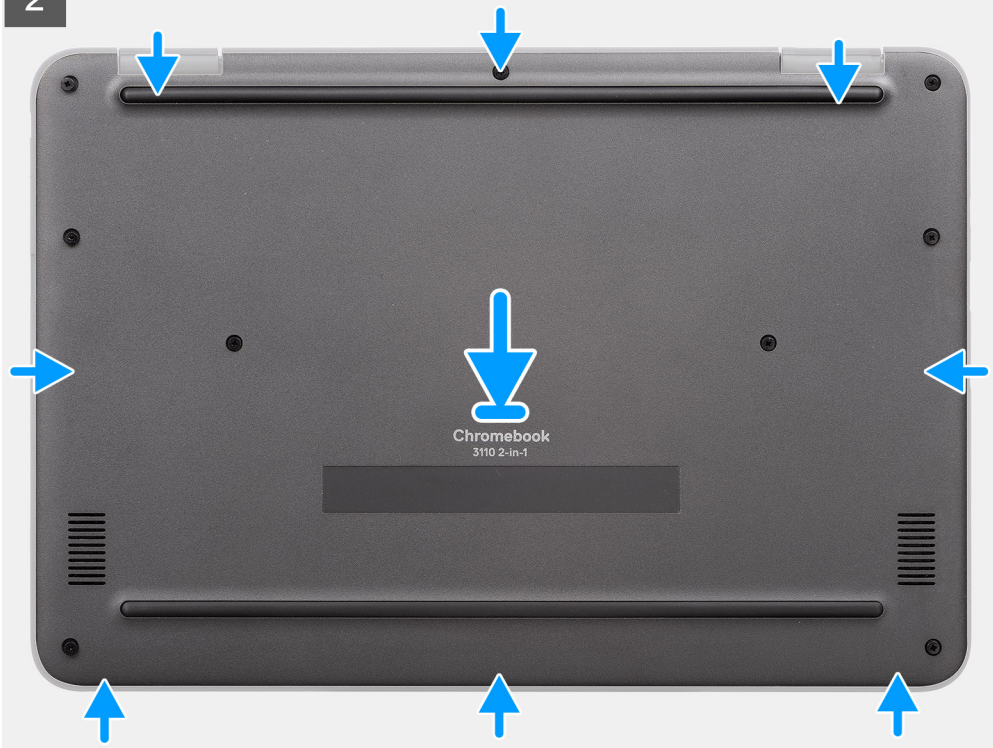
About this task

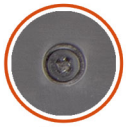
The following images indicate the location of the base cover and provide a visual representation of the installation procedure.

NOTE: For Chromebook 3110 systems shipped with WWAN, the base cover is secured using Torx 5 (not Phillips #0) screws.



2





9x

3

Steps

1. Connect the battery cable to the connector on the system board.
2. Place the base cover on top of the palm-rest assembly.
3. Align the screw holes on the base cover with the screw holes on the palm-rest assembly, and snap the base cover latches into place.
4. Tighten the nine captive screws to secure the base cover to the palm-rest assembly.

Next steps

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

Battery

Lithium-ion battery precautions

CAUTION:

- **Exercise caution when handling Lithium-ion batteries.**
- **Discharge the battery completely before removing it. Disconnect the AC power adapter from the system and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.**
- **Do not crush, drop, mutilate, or penetrate the battery with foreign objects.**
- **Do not expose the battery to high temperatures, or disassemble battery packs and cells.**
- **Do not apply pressure to the surface of the battery.**
- **Do not bend the battery.**
- **Do not use tools of any kind to pry on or against the battery.**
- **Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.**
- **If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.**
- **Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.**
- **Swollen batteries should not be used and should be replaced and disposed properly. For guidelines on how to handle and replace swollen Lithium-ion batteries, see Handling swollen Lithium-ion batteries.**

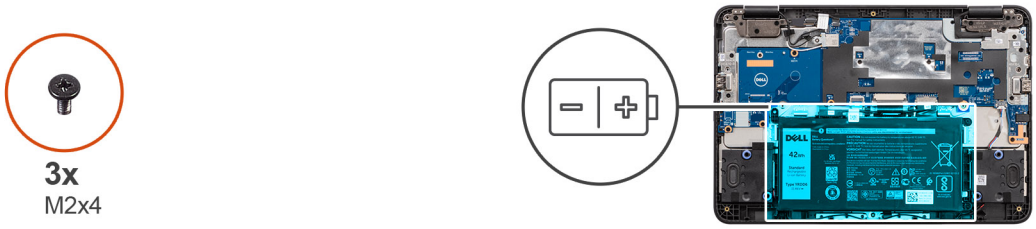
Removing the 3-cell battery

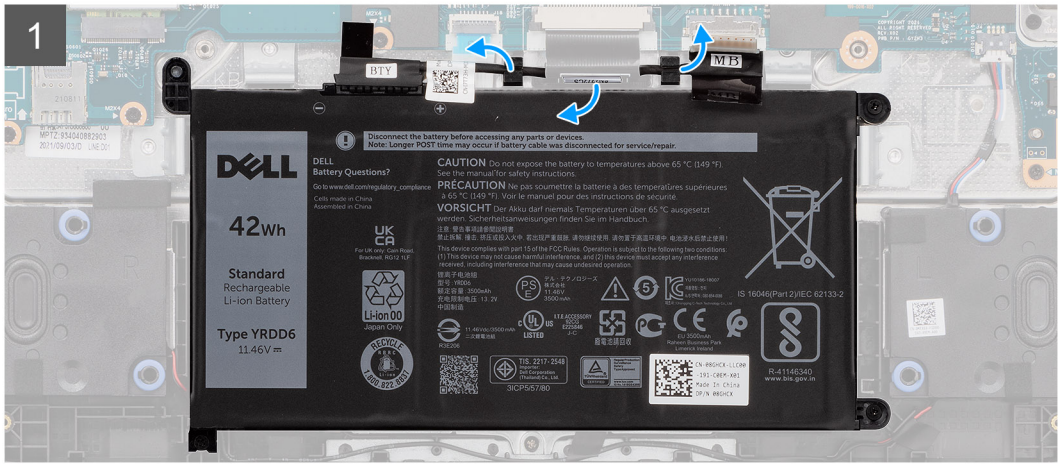
Prerequisites

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

About this task

The following images indicate the location of the 3-cell battery and provide a visual representation of the removal procedure.





Steps

1. Unroute the battery cable from the routing channels between the system board and 3-cell battery.
2. Remove the three screws (M2x4) that secure the 3-cell battery to the palm-rest assembly.
3. Lift the 3-cell battery off the palm-rest assembly.

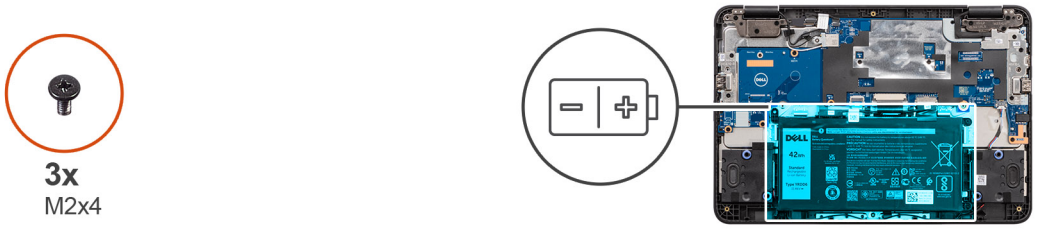
Installing the 3-cell battery

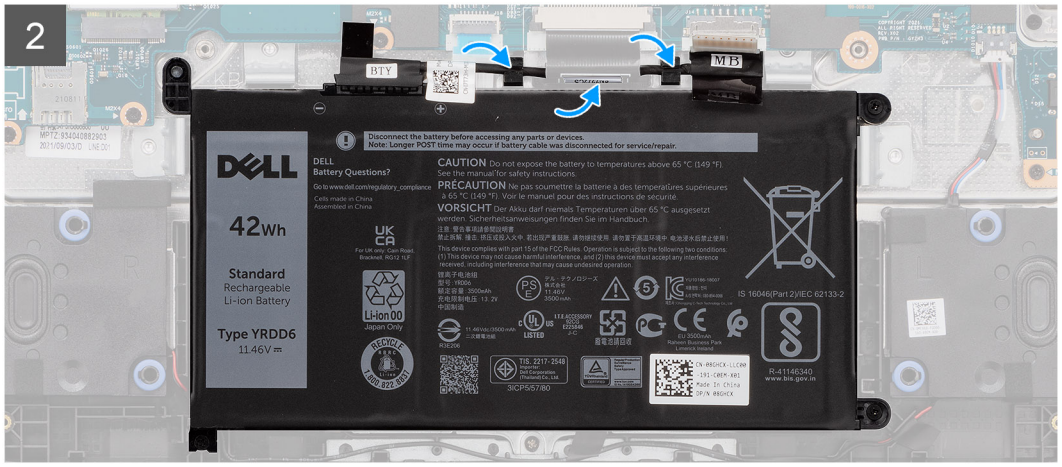
Prerequisites

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

About this task

The following images indicate the location of the 3-cell battery and provide a visual representation of the installation procedure.





Steps

1. Align and place the 3-cell battery in the slot on the palm-rest assembly.
2. Replace the three screws (M2x4) to secure the 3-cell battery to the palm-rest assembly.
3. Route the battery cable through the routing channels between the system board and 3-cell battery.

Next steps

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

Battery cable

Removing the battery cable

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the 3-cell battery

About this task

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

Steps

Disconnect the battery cable from the connector on the battery.

Installing the battery cable

Prerequisites

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

About this task

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

Steps

Connect the battery cable to the connector on the battery.

Next steps

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

Keyboard

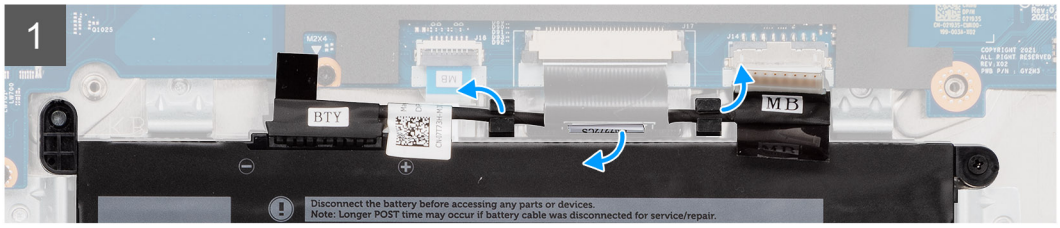
Removing the keyboard

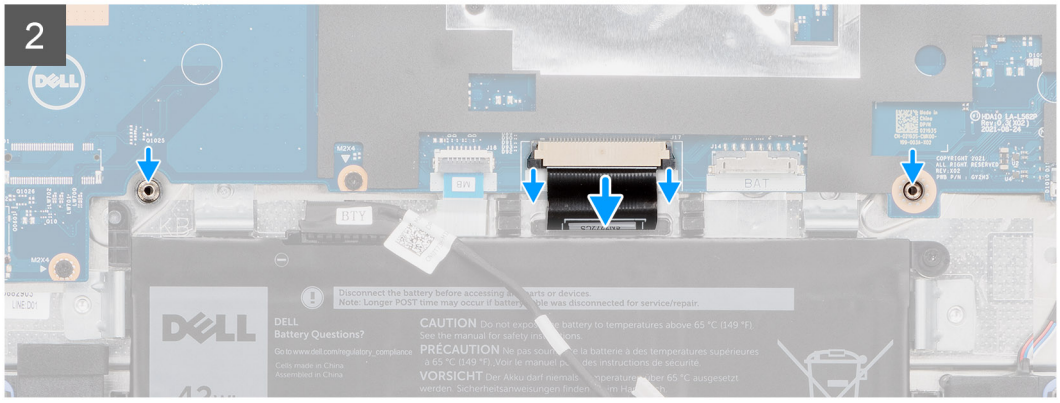
Prerequisites

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

About this task

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


1
BTY
MB
Disconnect the battery before accessing any parts or devices.
Note: Longer POST time may occur if battery cable was disconnected for service/repair.


2
DELL
BTY
BAT
Disconnect the battery before accessing any parts or devices.
Note: Longer POST time may occur if battery cable was disconnected for service/repair.
DELL
Battery Questions?
CAUTION
PRÉCAUTION
VORSICHT

3
esc
backspace
tab
enter
shift
ctrl
alt

4
esc
backspace
tab
enter
shift
ctrl
alt

Steps

1. Unroute the battery cable from the routing channels between the system board and 3-cell battery.
2. Disconnect the keyboard Flexible Printed Circuits (FPC) cable from the connector on the system board.
3. Place the system on a flat surface with the keyboard facing up. Open the system to 180 degrees.
4. Hold the sides of the palm-rest securely while pushing into the two release holes using a plastic scribe.
5. Use a plastic scribe to carefully pry the keyboard from the latches in the palm-rest assembly to release the keyboard from the keyboard bracket in the palm-rest assembly.
6. Lift and remove the keyboard from the palm-rest assembly and carefully pull the keyboard FPC cable through the gap on the palm-rest assembly.

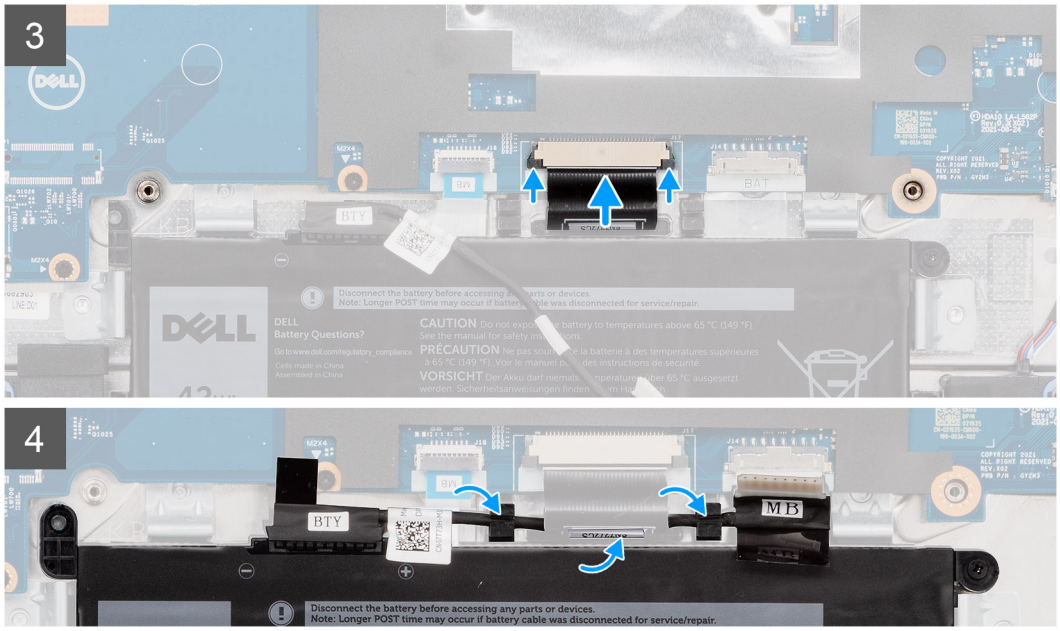
Installing the keyboard

Prerequisites

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

About this task

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



Steps

1. Carefully insert the keyboard Flexible Printed Circuits (FPC) cable through the gap on the palm-rest.
2. Align and place the keyboard on the palm-rest assembly.
3. Gently press the keyboard and snap it into place.
4. Close the display completely and turn the system over.
5. Pull the keyboard FPC cable from the opening in the palm-rest.
6. Connect the keyboard FPC cable to the connector on the system board.
7. Route the battery cable through the routing channels between the system board and 3-cell battery.

Next steps

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

Display assembly

Removing the display assembly

Prerequisites

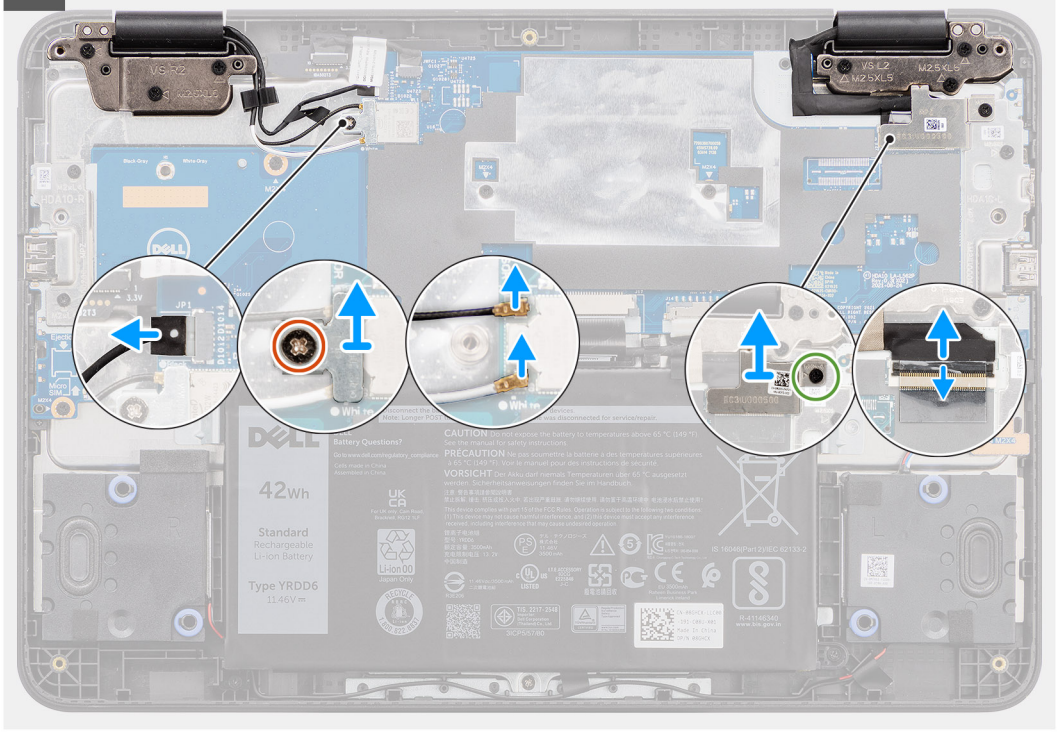
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.

About this task

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

1x
M2x3
1x
M2x4
6x
M2.5x5

1


42Wh
Standard
Rechargeable
Li-ion Battery
Type YRDD6
11.46V

Steps

1. Remove the screw (M2x3) that secures the WLAN card bracket to the WLAN card module on the system board.
2. Lift and remove the WLAN card bracket from the WLAN card module that secures the two antenna cables.
3. Disconnect the WLAN antenna cables from the connectors on the WLAN card module.
4. Disconnect the G-sensor cable from the connector on the system board.
5. Peel off and unroute the WLAN antenna cables and G-sensor cable from the routing guides on the palm-rest assembly.
6. Remove the screw (M2x4) that secures the display-cable bracket to the display-cable connector on the system board.
7. Remove the display-cable bracket from the display-cable connector on the system board.
8. Disconnect and peel back the display cable from the system board.
9. Open the display assembly at an angle of 270 degrees and place the system on a flat surface such that the display hinges face upwards.
10. Remove the six screws (M2.5x5) that secure the display assembly in place.

    NOTE: Ensure to hold the display assembly in place while loosening the screws in order to avoid the system from tipping over and damaging the display assembly.

11. Lift the display assembly off the palm-rest assembly.

Installing the display assembly

Prerequisites

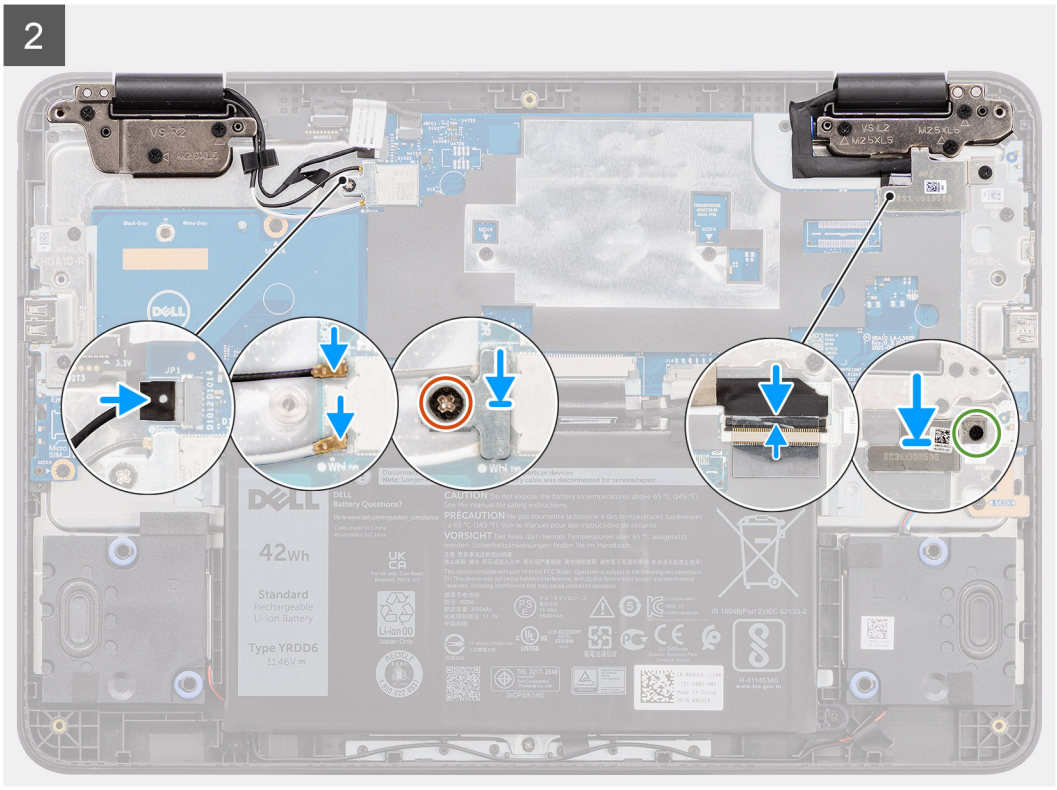
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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

1x
M2x3
1x
M2x4
6x
M2.5x5

1
chromebook



Steps

1. Place the palm-rest assembly on a flat surface.
2. Align the display assembly with the screw holders on the palm-rest assembly.
3. Replace the six screws (M2.5x5) to secure the display assembly to the palm-rest assembly.
4. Adhere the display cable on the system board.
5. Connect the display cable to the connector on system board.
6. Align and place the display-cable bracket on the display-cable connector on the system board.
7. Replace the screw (M2x4) to secure the display-cable bracket to the display-cable connector on the system board.
8. Route and adhere the WLAN antenna cables and G-sensor cable through the routing guides on the palm-rest assembly.
9. Connect the G-sensor cable to the connector on the system board.

   For Chromebook 3110 2-in-1, the G-sensor cable needs to be taped down to the palm-rest and routed underneath the WLAN antennas.
10. Connect the WLAN antenna cables to the connectors on the WLAN card module.

    NOTE: For systems shipped with WLAN capabilities, route both WLAN antenna cables underneath the tab on the right display hinge, then into the rubber cable holder.
11. Replace the WLAN card bracket on the WLAN card module to secure the two antenna cables.
12. Replace the single screw (M2x3) to secure the WLAN card bracket to the WLAN card module on the system board.

Next steps

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

System board

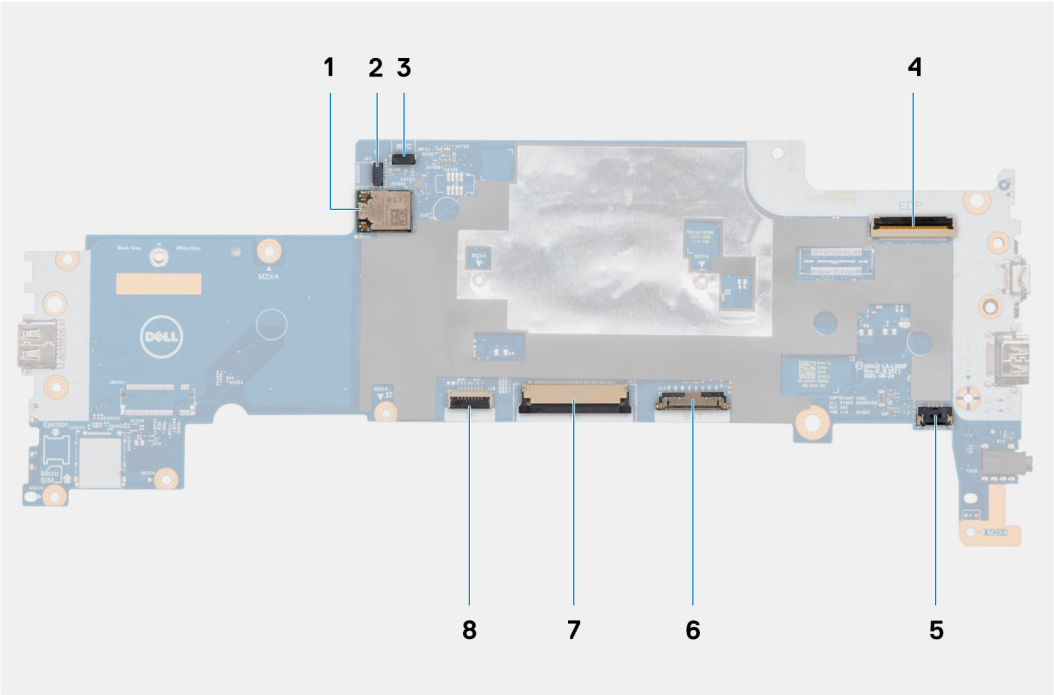
Removing the system board

Prerequisites

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

About this task

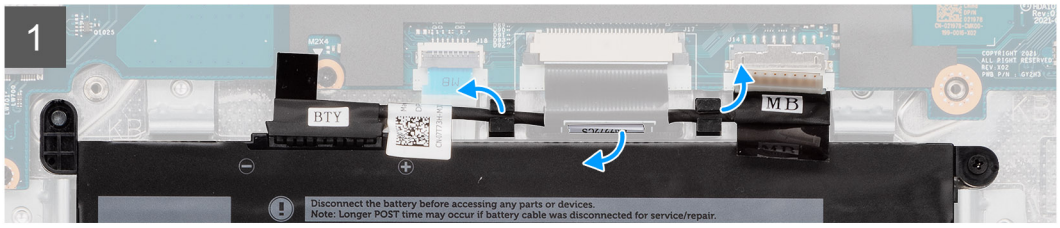
The following images indicate the connectors on your system board.

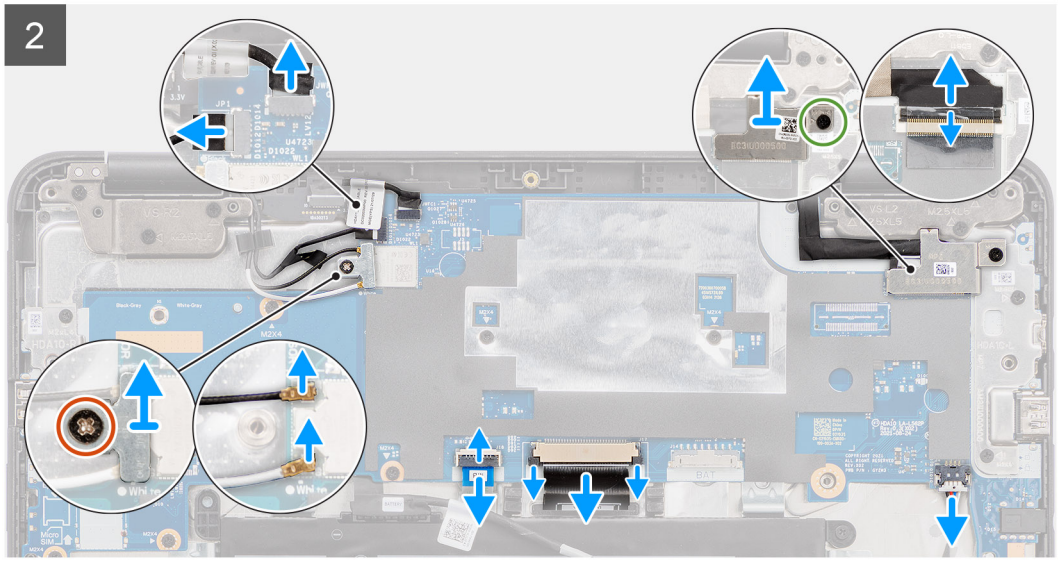


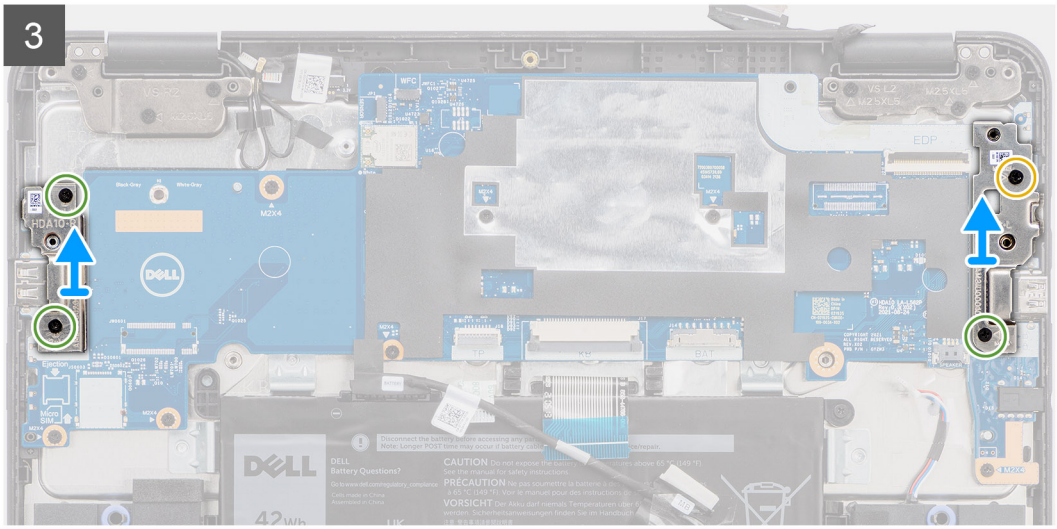
1. WLAN card connector
2. G-sensor cable connector
3. World-facing camera cable connector
4. Display cable connector
5. Speaker cable connector
6. Battery cable connector
7. Keyboard cable connector
8. Touchpad cable connector

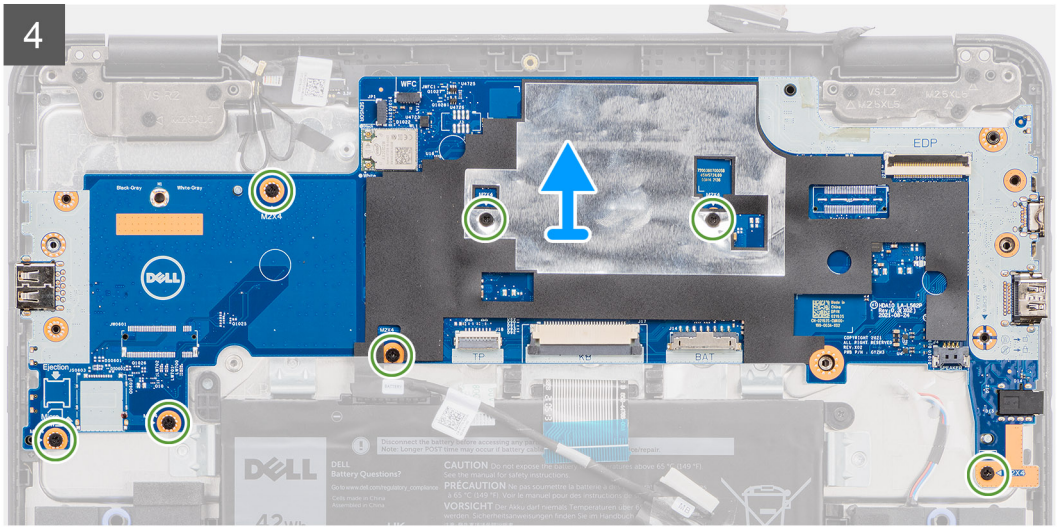
The following images indicate the location of the system board and provide a visual representation of the removal procedure.

1x
M2x3
11x
M2x4
1x
M2.5x5


1
BTY
MB
Disconnect the battery before accessing any parts or devices.
Note: Longer POST time may occur if battery cable was disconnected for service/repair.


2





Steps

1. Unroute the battery cable from the routing channels between the system board and 3-cell battery.
2. Remove the screw (M2x3) that secures the WLAN card bracket to the WLAN card module on the system board.
3. Lift and remove the WLAN card bracket from the WLAN card module that secures the two antenna cables.
4. Disconnect the WLAN antenna cables from the connectors on the WLAN card module.
5. Remove the screw (M2x4) that secures the display-cable bracket to the display-cable connector on the system board.
6. Remove the display-cable bracket from the display-cable connector on the system board.
7. For systems shipped with a world-facing camera, disconnect the world-facing camera cable from the connector on the system board.
8. Disconnect the G-sensor cable, display cable, touchpad Flexible Flat Cable (FFC), keyboard Flexible Printed Circuits cable (FPC), and speaker cable from the connectors on the system board.
9. Peel back the display cable from the system board.
10. Remove the two screws (M2x4) that secure the right I/O bracket the palm-rest assembly.
11. Lift and remove the right I/O bracket from the palm-rest assembly.
12. Remove the screw (M2.5x5) and the screw (M2x4) that secure the left I/O bracket to the palm-rest assembly.
13. Remove the left I/O bracket from the palm-rest assembly.
14. Remove the seven screws (M2x4) that secure the system board to the palm-rest assembly.
15. Carefully lift and remove the system board from the left side.

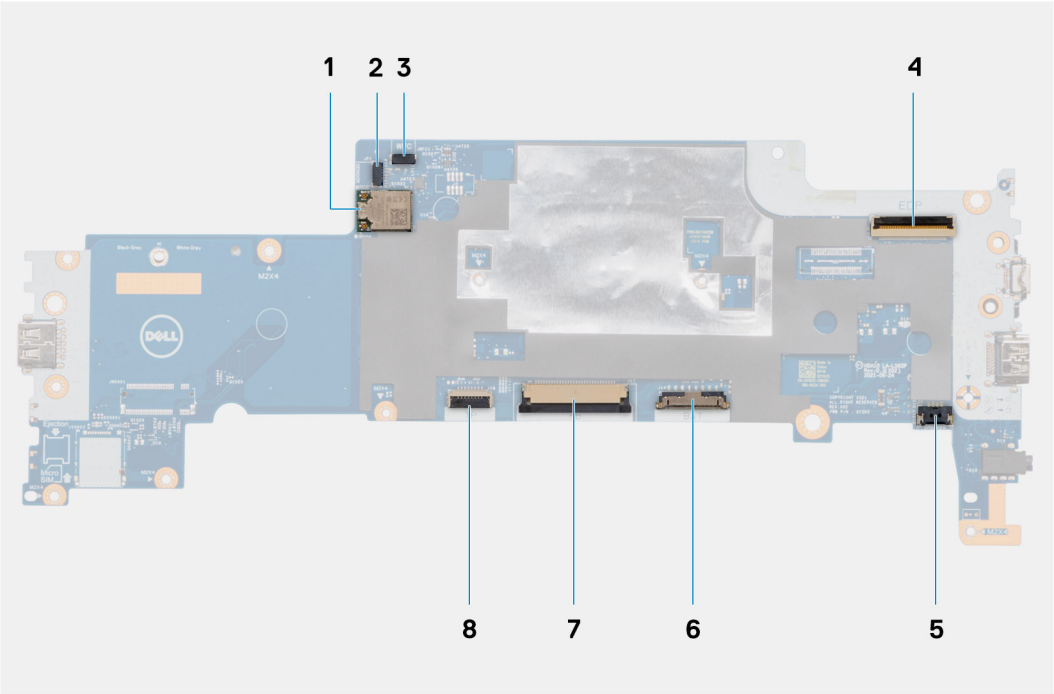
Installing the system board

Prerequisites

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

About this task

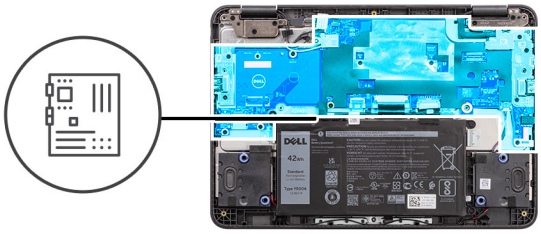
The following image indicates the connectors on your system board.



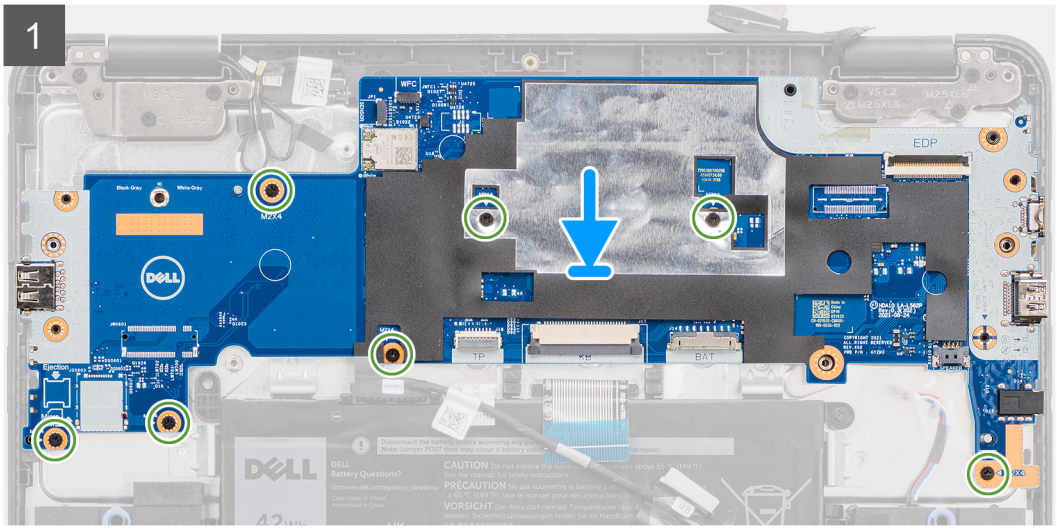
1. WLAN card connector
2. G-sensor cable connector
3. World-facing camera cable connector
4. Display cable connector
5. Speaker cable connector
6. Battery cable connector
7. Keyboard cable connector
8. Touchpad cable connector

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

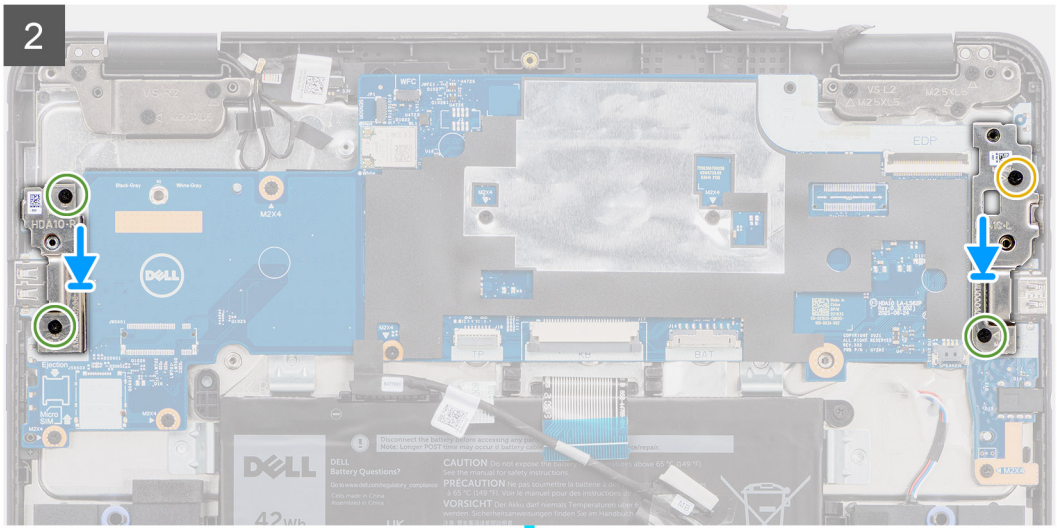
NOTE: If the CPU thermal pad on the palm-rest (underneath the system board) gets detached, adhere it back onto the palm-rest.

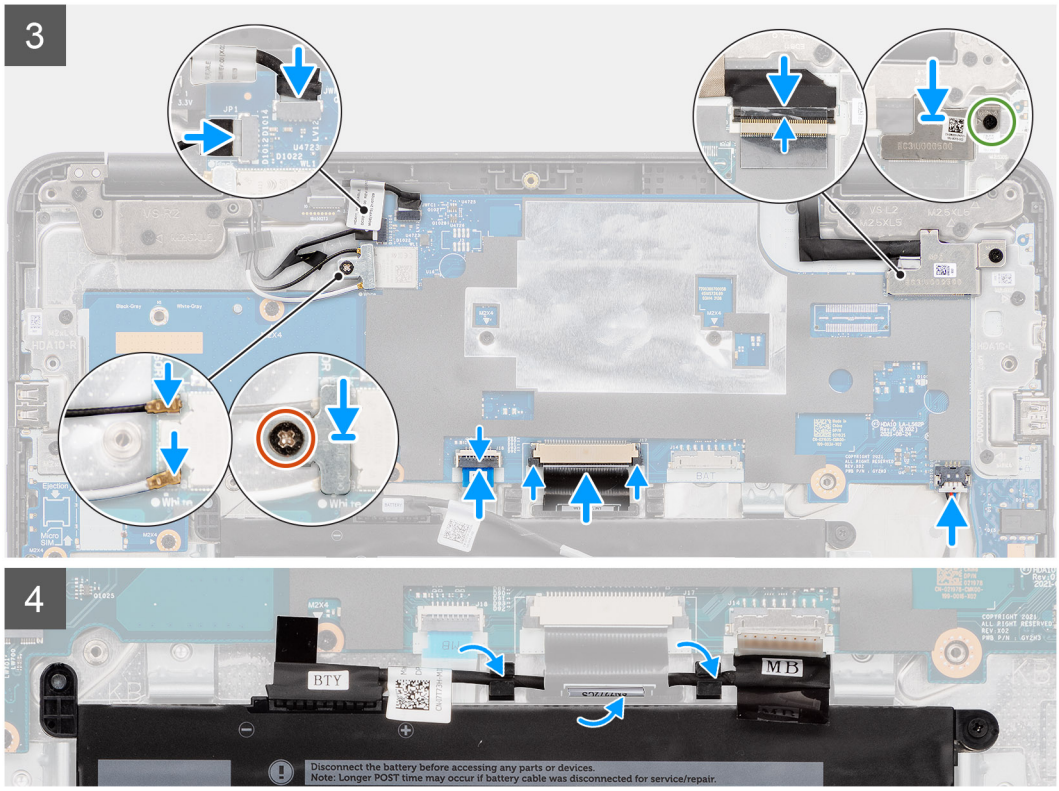


1



2





Steps

1. Place the system board on the palm-rest assembly.
2. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
3. Replace the seven screws (M2x4) to secure the system board to the palm-rest assembly.
4. Align and place the left I/O bracket on the palm-rest assembly.
5. Replace the screw (M2.5x5) and the screw (M2x4) to secure the left I/O bracket to the palm-rest assembly.
6. Align and place the right I/O bracket on the palm-rest assembly.
7. Replace the two screws (M2x4) to secure the right I/O bracket to the palm-rest assembly.
8. Adhere the display cable on system board.
9. Connect the G-sensor cable, display cable, touchpad Flexible Flat Cable (FFC), keyboard Flexible Printed Circuits cable (FPC), and speaker cable to the connectors on the system board.
10. For systems shipped with a world-facing camera, connect the world-facing camera cable to the connector on the system board.
11. Align and place the display-cable bracket on the display-cable connector on the system board.
12. Replace the screw (M2x4) to secure the display-cable bracket to the display-cable connector on the system board.
13. Connect the WLAN antenna cables to the connectors on the WLAN card module.
14. Replace the WLAN card bracket on the WLAN card module to secure the two antenna cables.
15. Replace the screw (M2x3) to secure the WLAN card bracket to the WLAN card module on the system board.
16. Route the battery cable through the routing channels between the system board and 3-cell battery.

Next steps

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

Speakers

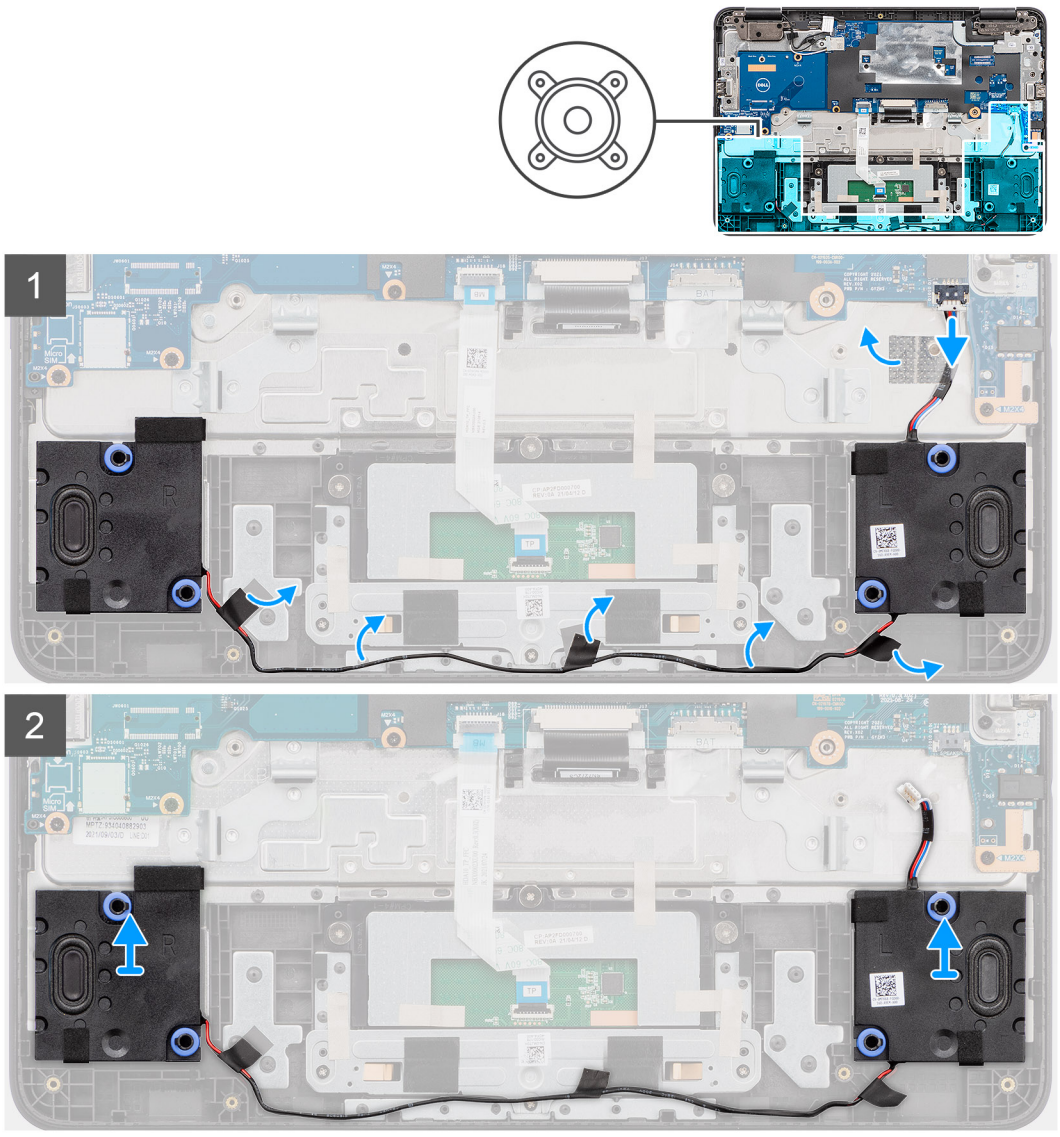
Removing the speakers

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the 3-cell battery.

About this task

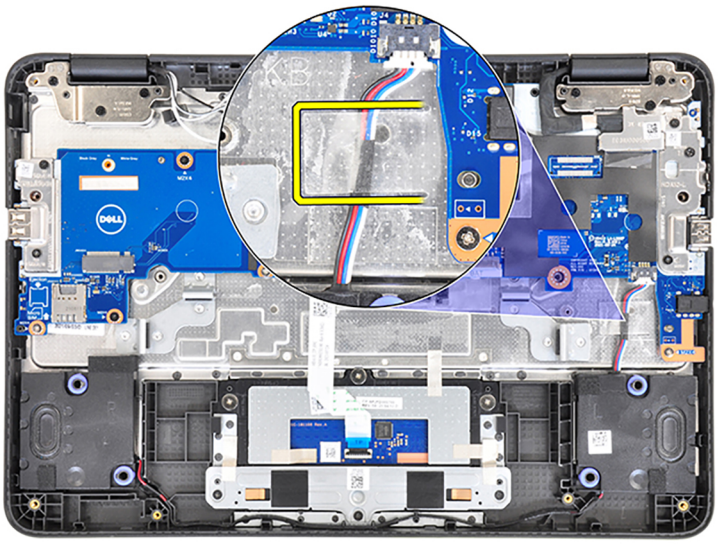
The following image indicates the location of the speakers and provides a visual representation of the removal procedure.



Steps

1. Peel back the clear tape that secures the speaker cable to the palm-rest.

NOTE: To remove the speakers, the piece of transparent tape that secures the speaker cable in place must be peeled



back.

2. Disconnect the speaker cable from the connector on the system board.
3. Peel the three pieces of adhesive tape that secure the speaker cable in place.
4. Unroute the speaker cables from the routing channels in the palm-rest assembly.

   NOTE: When replacing the speakers onto the palm-rest, the speaker cables must be routed through the routing channels in the palm-rest and underneath the tape with an arrow to avoid damaging the speaker cables when installing the base cover.

5. Lift the speakers along with their cables off the palm-rest assembly.

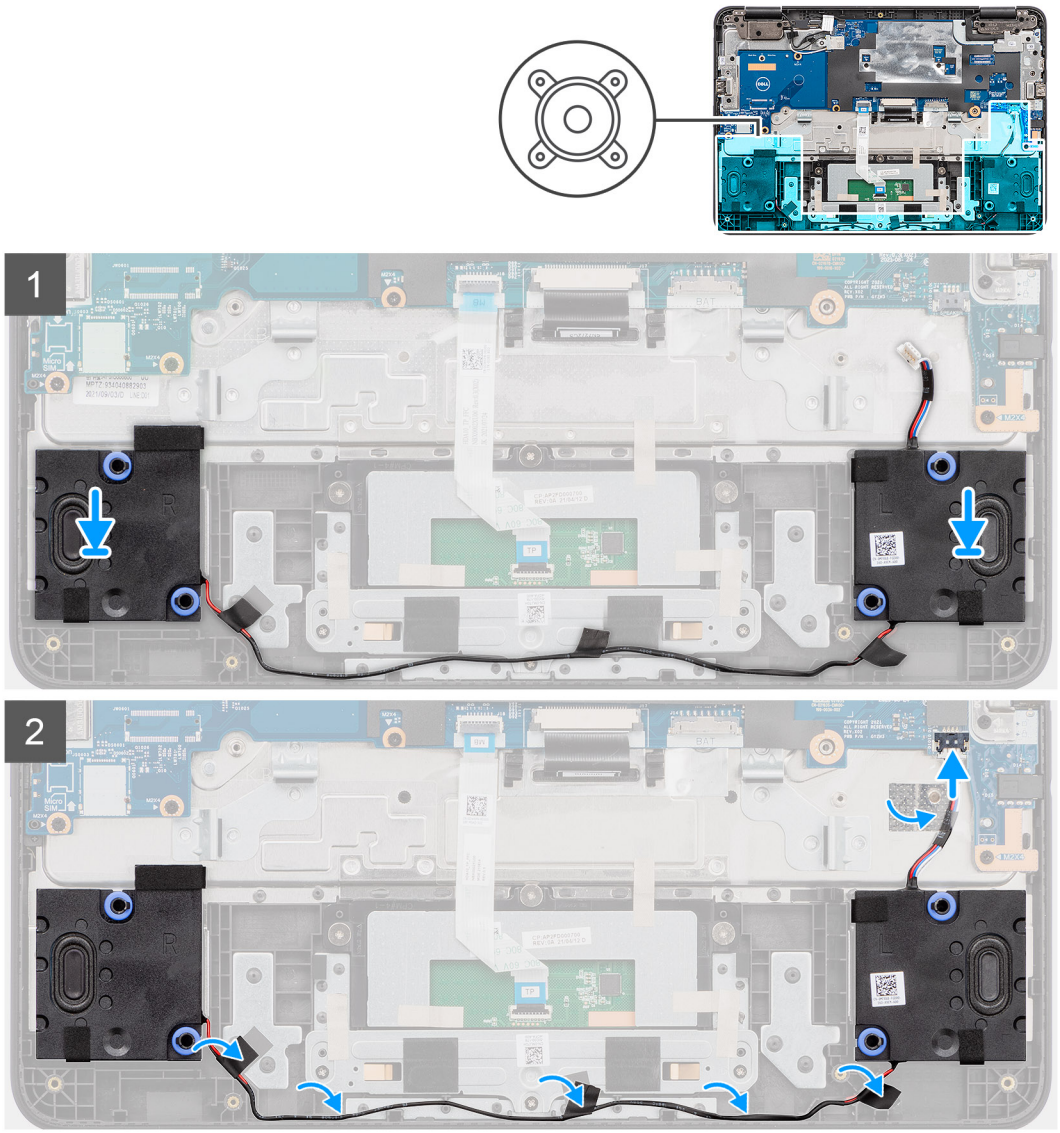
Installing the speakers

Prerequisites

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

About this task

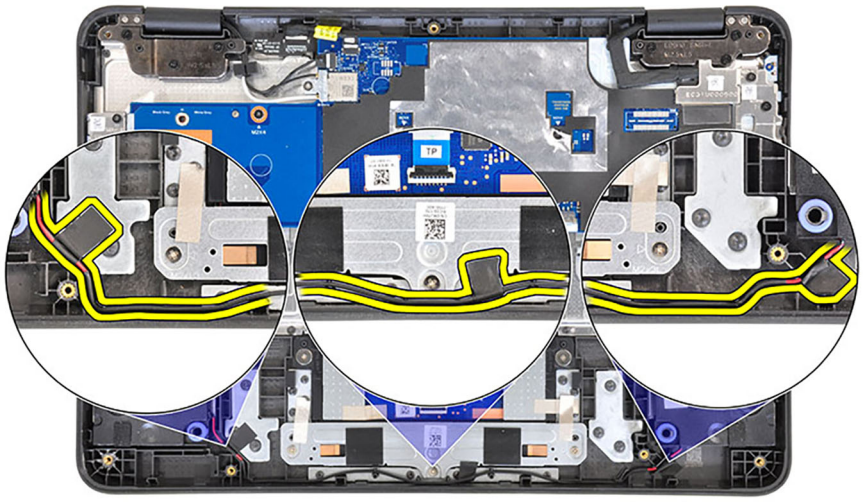
The following image indicates the location of the speakers and provides a visual representation of the installation procedure.



Steps

1. Using the alignment posts, place the speakers into the slots on the palm-rest assembly.
2. Route the speaker cable through the routing channels in the palm-res assembly.

   NOTE: The speaker cables must be routed through the routing channels at the bottom of the palm-rest and underneath the tape with an arrow to avoid damaging the speaker cables when installing the base cover.



3. Affix the three pieces of adhesive tape to secure the speaker cable in place.
4. Connect the speaker cable to the connector on the system board.
5. Affix the clear tape to secure the speaker cable in place.

Next steps

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

World-facing camera cable

Removing the world-facing camera cable

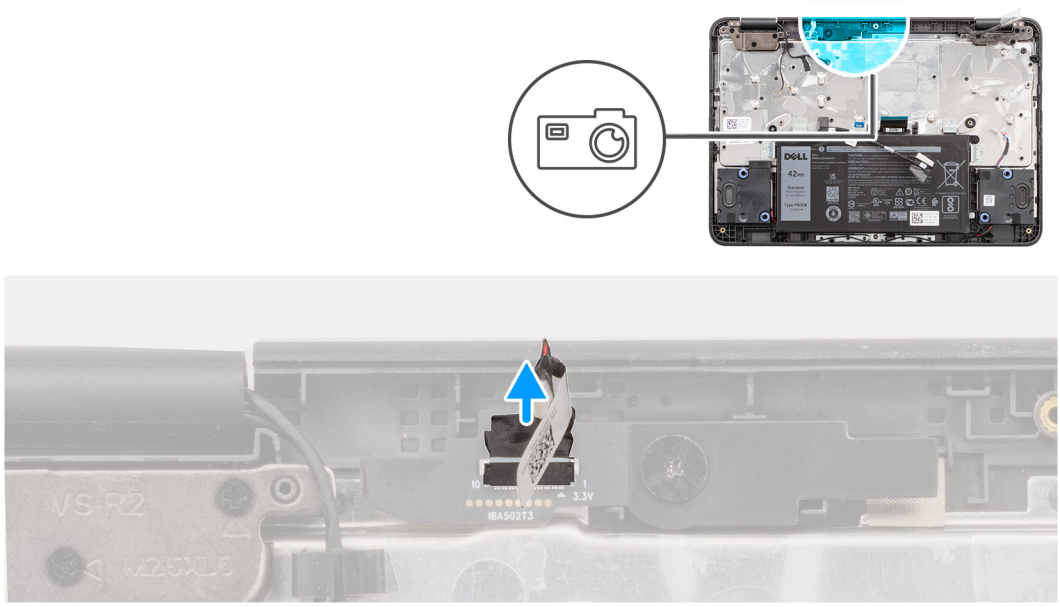
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the system board.

About this task

NOTE: The following procedure is applicable only for systems shipped with a world-facing camera.

The following image indicates the location of the world-facing camera cable and provides a visual representation of the removal procedure.



Steps

1. Disconnect the world-facing camera cable from the connector on the world-facing camera.
2. Lift the world-facing camera cable off the palm-rest assembly.

Installing the world-facing camera cable

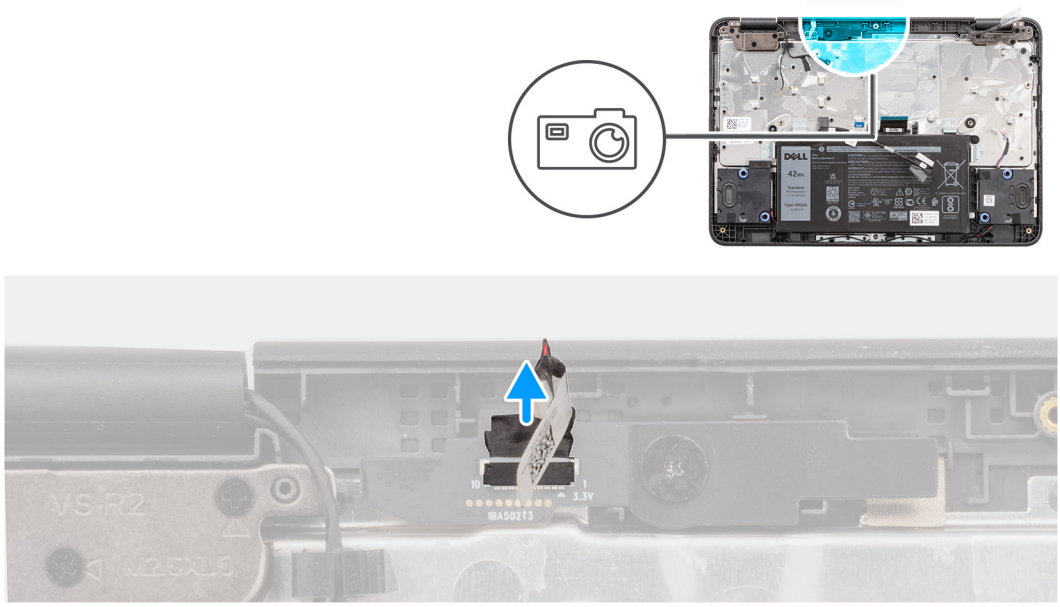
Prerequisites

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

About this task

NOTE: The following procedure is applicable only for systems shipped with a world-facing camera.

The following image indicates the location of the world-facing camera cable and provides a visual representation of the installation procedure.



Steps

1. Align and place the world-facing camera cable on the palm-rest assembly.
2. Connect the world-facing camera cable to the connector on the world-facing camera module.

Next steps

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

World-facing camera

Removing the world-facing camera

Prerequisites

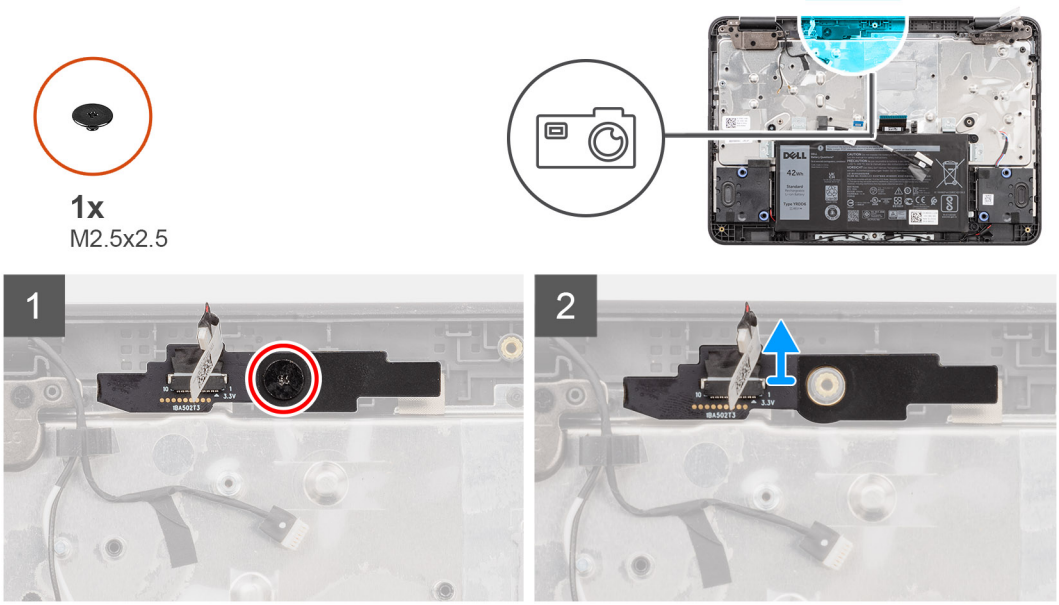
CAUTION: This is a fragile component. Handle with care.

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the system board.
4. Remove the world-facing camera cable.

About this task

NOTE: The following procedure is applicable only for systems that are shipped with a world-facing camera.

The following images indicate the location of the world-facing camera and provide a visual representation of the removal procedure.



Steps

1. Remove the screw (M2.5x2.5) that secures the world-facing camera module to the palm-rest assembly.
2. Lift and remove the world-facing camera module from the palm-rest assembly.

Installing the world-facing camera

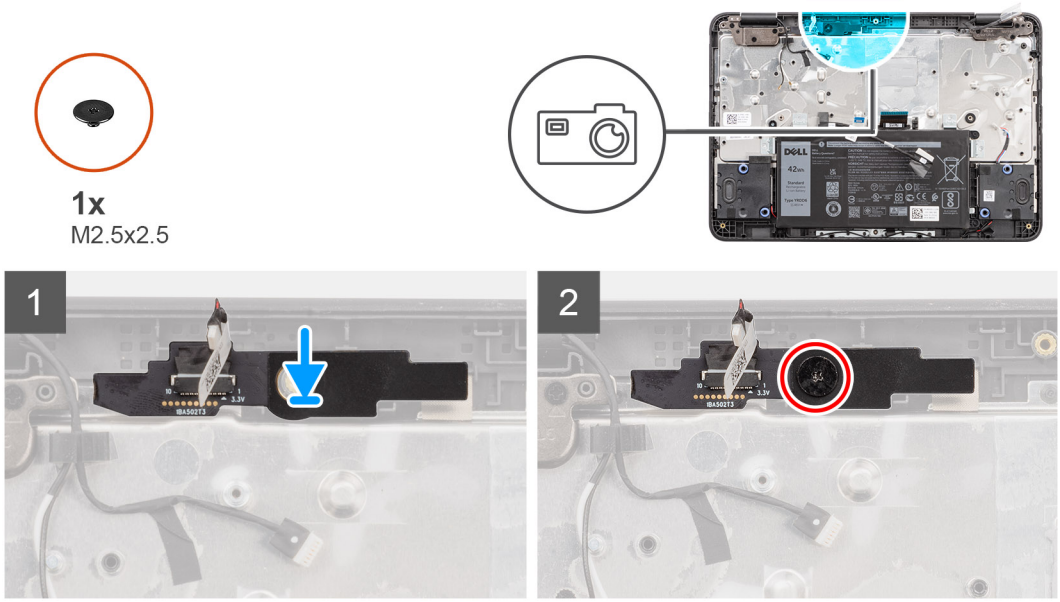
Prerequisites

CAUTION: This is a fragile component. Handle with care.

About this task

NOTE: The following procedure is applicable only for systems that are shipped with a world-facing camera.

The following image indicates the location of the front-facing camera and provides a visual representation of the installation procedure.



Steps

1. Insert the world-facing camera module into the slot on the palm-rest assembly.
2. Replace the screw (M2.5x2.5) to secure the world-facing camera module to the palm-rest assembly.

Next steps

1. Install the world-facing camera cable.
2. Install the system board.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

Display panel

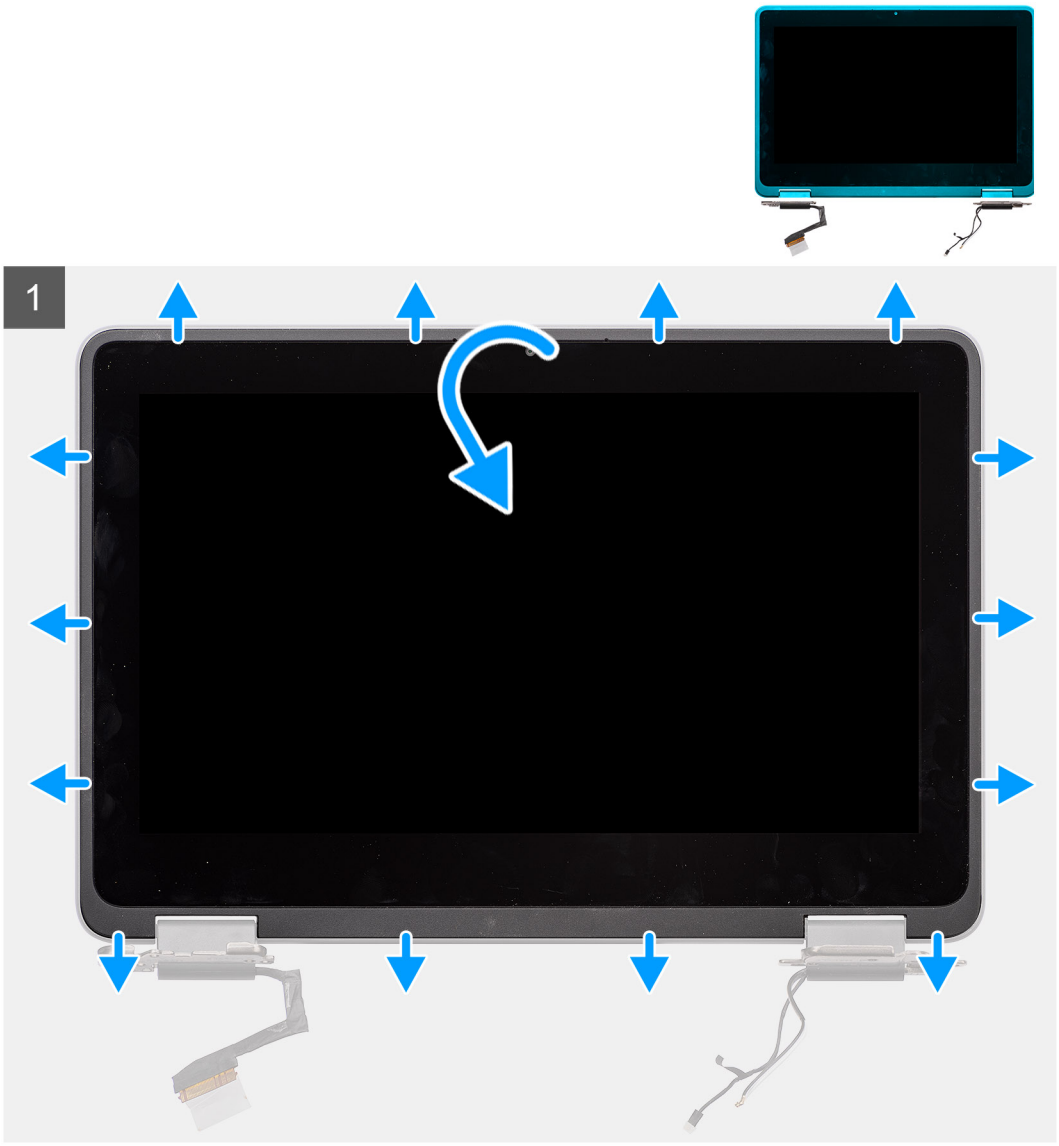
Removing the display panel

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the display assembly.

About this task

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


1

Steps

1. Use a plastic scribe to carefully pry open the display panel from the recesses at the U-shaped indents above the left and right display hinges.

2. Use a plastic scribe to pry open the outside left and right edges of the display panel.

CAUTION: Prying from the bottom edge of the panel may damage components located near the bottom of the display assembly.

3. Carefully flip the display panel to access the display cable.
4. Peel back the conductive tape that secures the display cable to the back of the display panel.
5. Peel and remove the rubber spacer on the display cable.
6. For systems that support USI pen, disconnect the USI pen cable from the connector on the back of the display panel.
7. Disconnect the display cable from the connector on the back of the display panel.
8. Lift and remove the display panel from the display assembly.

Installing the display panel

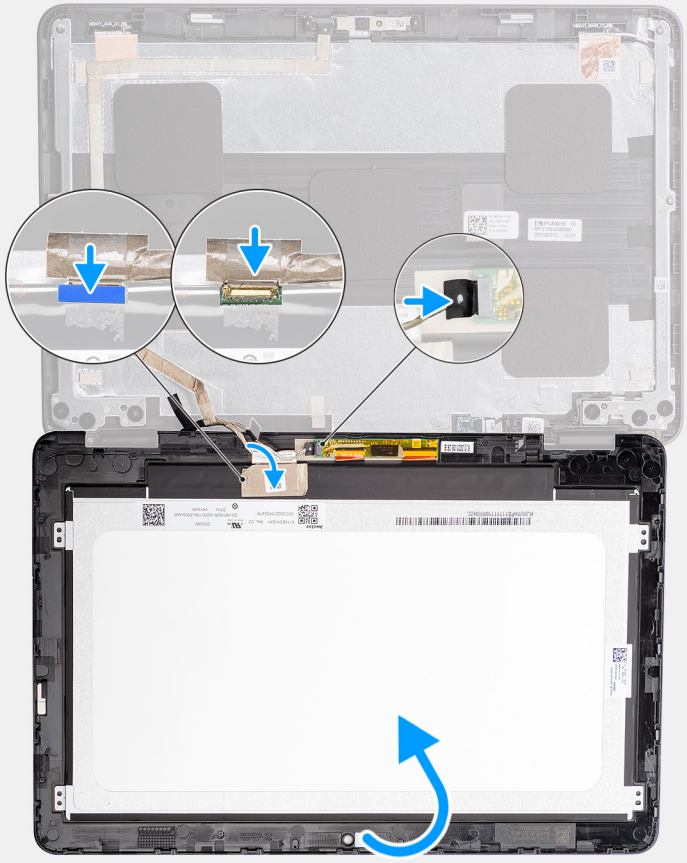
Prerequisites

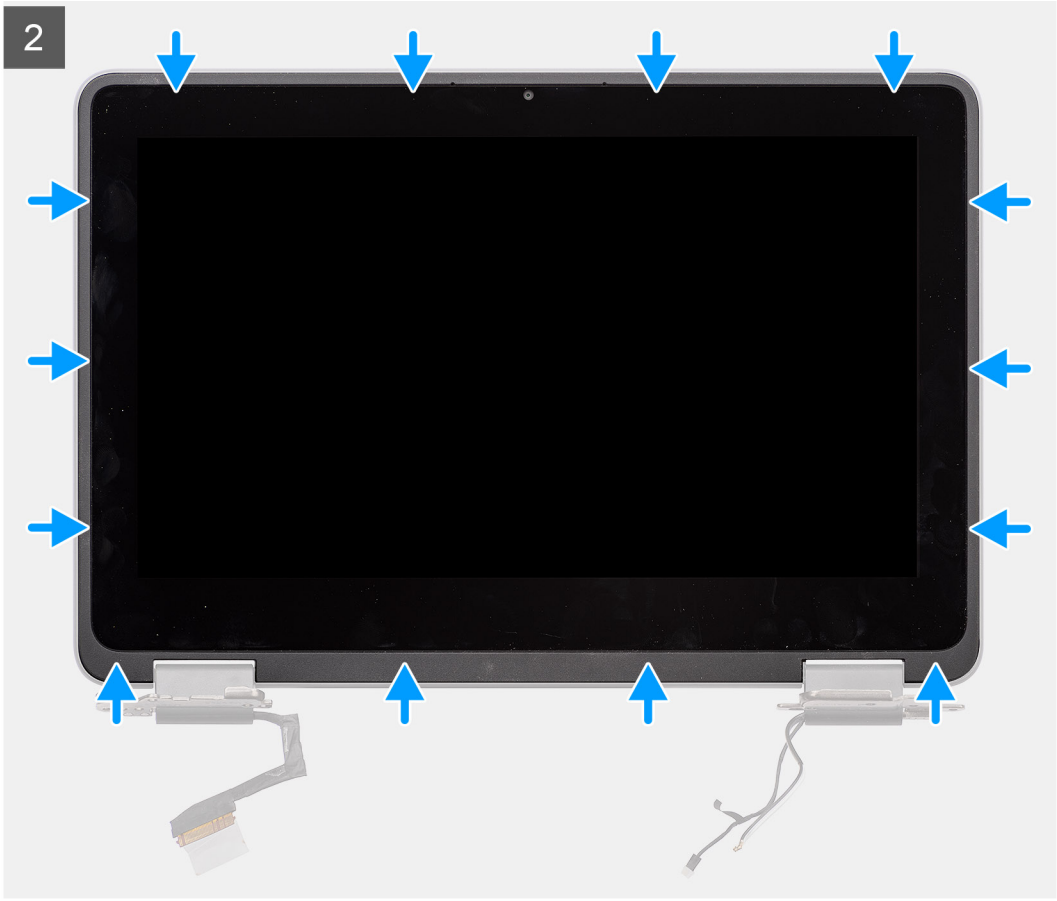
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The following images indicate the location of the display panel and provide a visual representation of the installation procedure.

1





Steps

1. Connect the display cable to the connector on the back of the display panel.
2. For systems that support USI pen, connect the USI pen cable to the connector on the back of the display panel.
3. Adhere the rubber spacer on the display cable.
4. Adhere the conductive tape to secure the display cable to the back of the display panel.
5. Flip the display panel to align it with the display assembly.
6. Starting from the top corner, press on the display bezel and work around the entire bezel until it clicks onto the display assembly.

Next steps

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

Front-facing camera

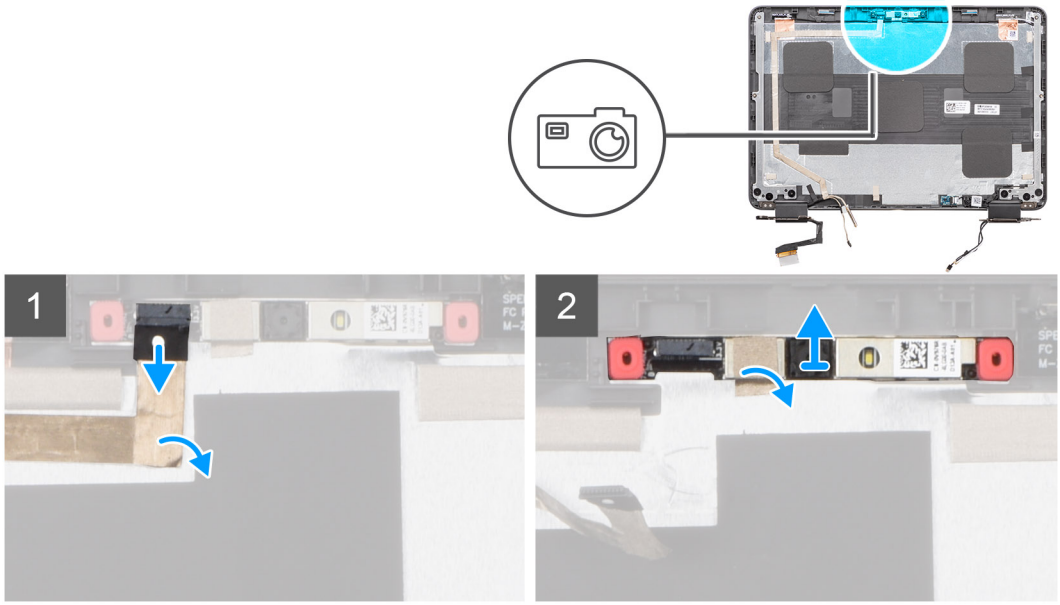
Removing the front-facing camera

Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the display assembly.
4. Remove the display panel.

About this task

The following image indicates the location of the front-facing camera and provides a visual representation of the removal procedure.



Steps

1. Disconnect the camera cable from connector on the camera module.
2. Use a plastic scribe to carefully pry up the camera from the bottom side, starting from the locations marked by the arrows.
3. Lift and remove the camera module from the display assembly.

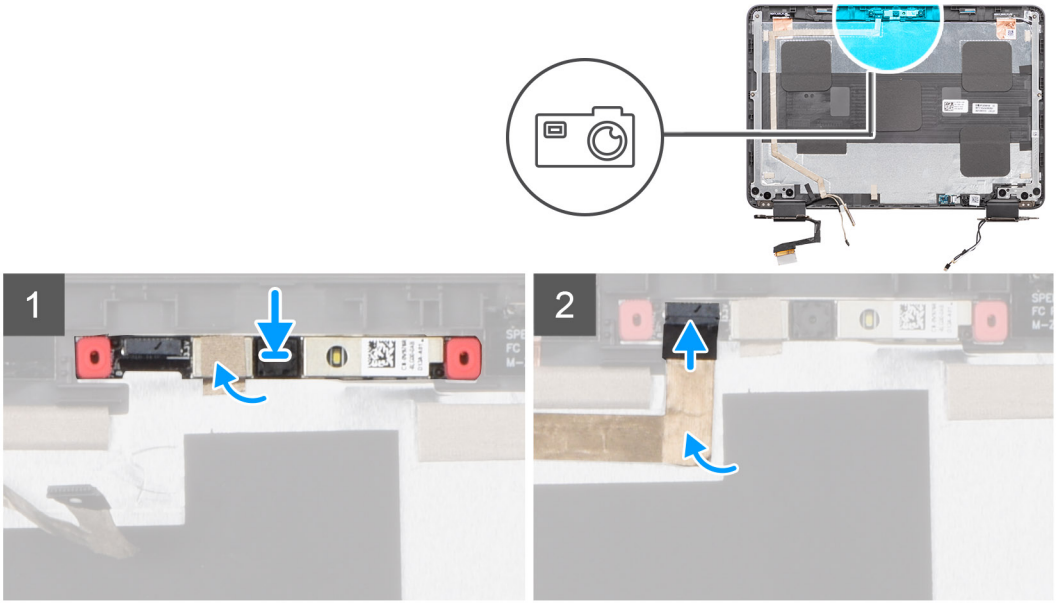
Installing the front-facing camera

Prerequisites

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

About this task

The following image indicates the location of the front-facing camera and provides a visual representation of the installation procedure.



Steps

1. Align and place the camera module into the slot on the display assembly.
2. Gently press the camera module until it clicks into place.
3. Connect the camera cable to the connector on the camera module.

Next steps

1. Install the display panel.
2. Install the display assembly.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

Display hinges

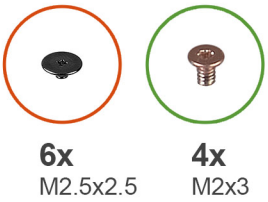
Removing the display hinges

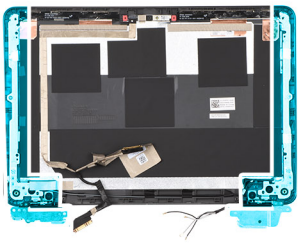
Prerequisites

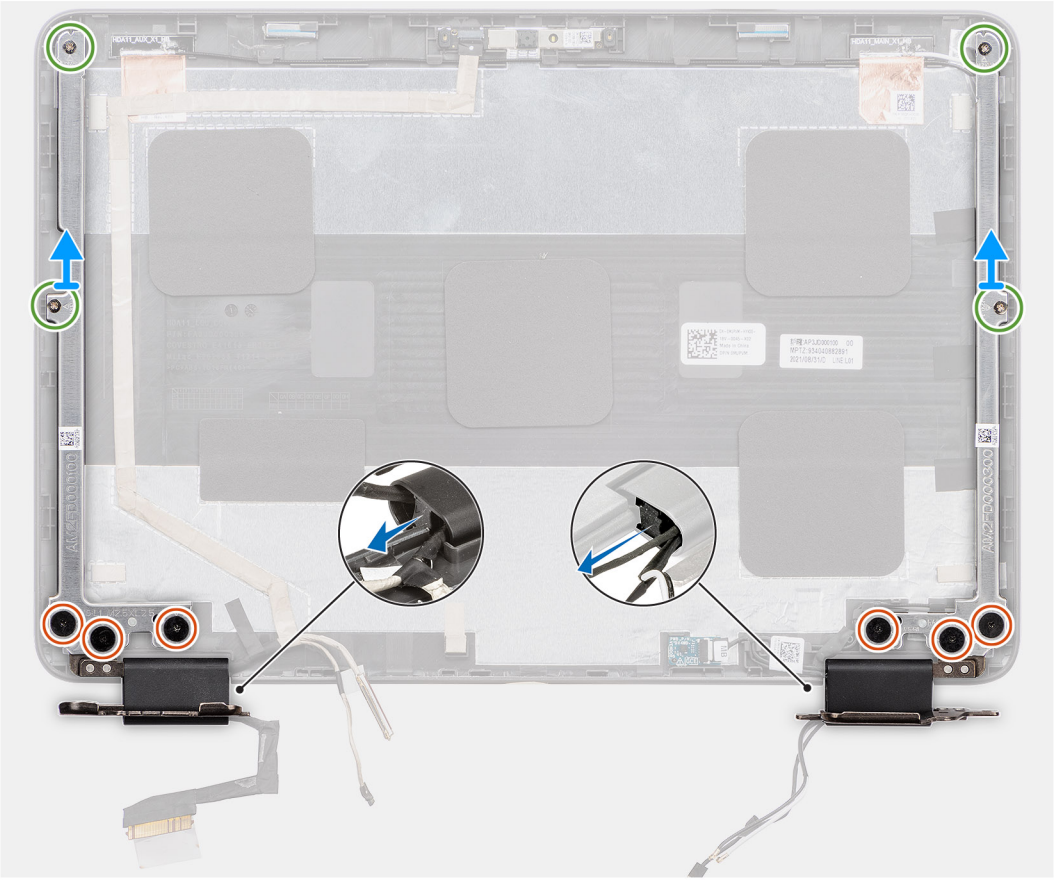
1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the display assembly.
4. Remove the display panel.

About this task

The following image indicates the location of the display hinges and provides a visual representation of the removal procedure.







Steps

1. Rotate the display hinges and the hinge caps upwards toward the display cover.

   NOTE: The display hinges should be at an angle of 0 degrees while the hinge caps should be at an angle of 90 degrees (or of the position of a closed laptop).

   NOTE: Ensure that the display hinges are rotated to the unlock position only, the hinge caps do not rotate until the display hinges are in the unlock position.

2. Remove the hinge rubbers that cover the left and right hinge caps.
3. Gently pull the display cable out of the left hinge cap.
4. Gently pull the G-sensor cable and wireless antennas out of the right hinge cap.
5. Rotate the display hinges open to an angle of 90 degrees.
6. Remove the four screws (M2x3) and the six screws (M2.5x2.5) that secure the display hinges to the display back-cover.
7. Lift and remove the display hinges from the display back-cover.

Installing the display hinges

Prerequisites

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

About this task

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

Steps

1. Align the screw holes on the display hinges with the screw holes on the display back-cover.
2. Replace the four screws (M2.0x3.0) and the six screws (M2.5x2.5) to secure the display hinges to the display back-cover.
3. Rotate the display hinges close to an angle of 90 degrees.
4. Gently push the G-sensor cable and wireless antennas into the right hinge cap.
5. Gently push the display cable into the left hinge cap.
6. Replace the hinge rubbers to secure the left and right hinge caps.
7. Rotate the display hinges and the hinge caps downwards away from the display cover.

NOTE: The display hinges should be at an angle of 0 degrees while the hinge caps should be at an angle of 90 degrees (or of the position of a closed laptop).

NOTE: Ensure that the display hinges are rotated only to the unlock position, the hinge caps do not rotate until the display hinges are in the unlock position.

Next steps

1. Install the display panel.
2. Install the display assembly.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

Display cable

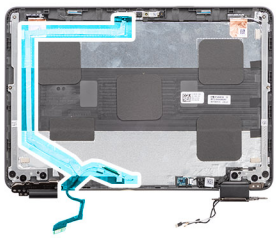
Removing the display cable

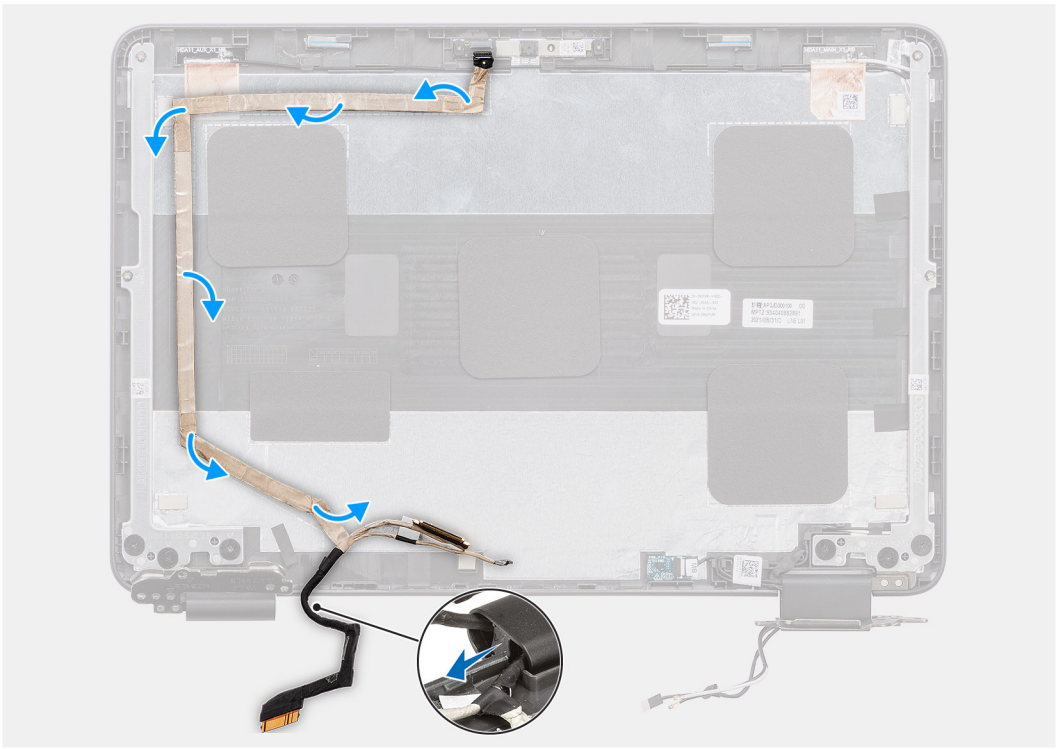
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the display assembly.
4. Remove the display panel.

About this task

The following image indicates the location of the display cable and provides a visual representation of the removal procedure.





Steps

1. Rotate the left display hinge and the left hinge cap upwards toward the display cover. The display hinge should be at an angle of 0 degrees while the hinge cap should be at an angle of 90 degrees (or of the position of a closed laptop).

   NOTE: Ensure that the display hinge is rotated only to the unlock position, the hinge cap does not rotate until the display hinge is in the unlock position.

2. Remove the hinge rubber that secures the left hinge cap.
3. Gently pull the display cable out of the left hinge cap.
4. Disconnect the camera cable from the camera module.
5. Peel back the tape, close to the left hinge cap, that secures the display cable in place.
6. Peel and unroute the display cable from the routing channels on the display back-cover.

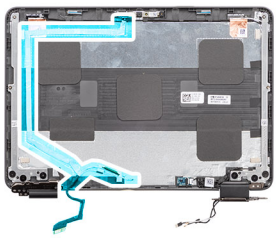
Installing the display cable

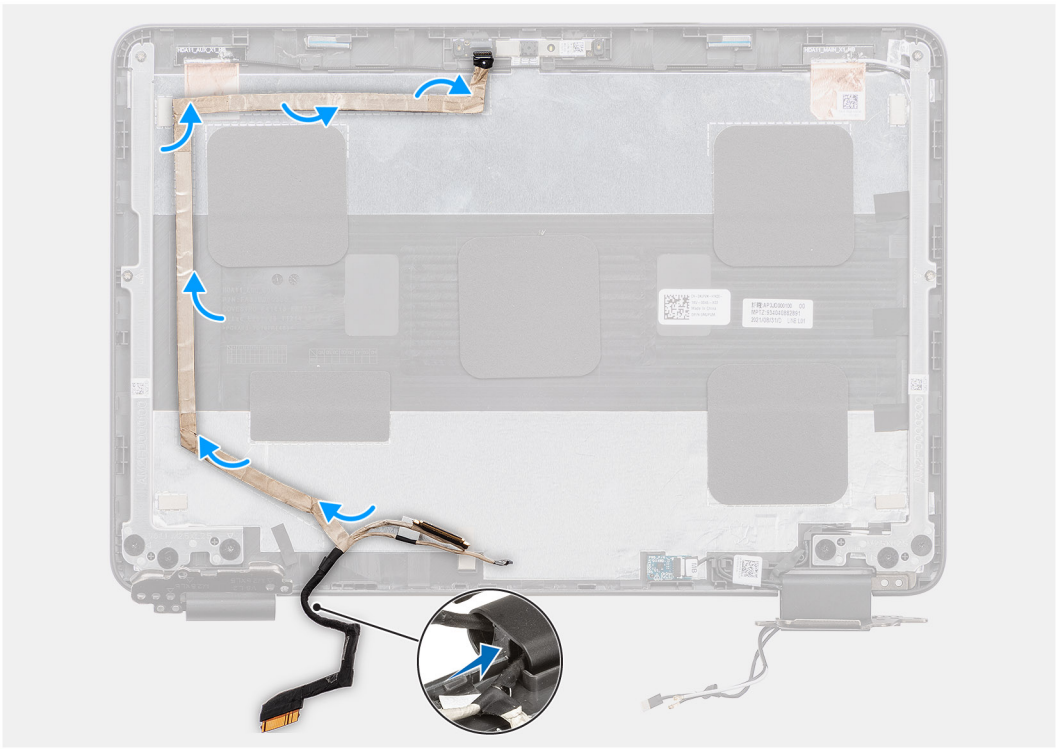
Prerequisites

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

About this task

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





Steps

1. Adhere and routethe display cable through the routing channels on the display back-cover.
2. Affix the tape, close to the left hinge cap, that secures the display cable in place.
3. Connect the camera cable to the camera module.
4. Gently push the display cable in the left hinge cap.
5. Replace the hinge rubber that secures the left hinge cap.
6. Rotate the left display hinge and the left hinge cap downwards away from the display cover. The display hinge should be at an angle of 0 degrees while the hinge cap should be at an angle of 90 degrees (or of the position of a closed laptop).

   NOTE: Ensure that the display hinge is rotated only to the unlock position, the hinge cap does not rotate until the display hinge is in the unlock position.

Next steps

1. Install the display panel.
2. Install the display assembly.
3. Install the base cover.
4. Follow the procedure in After working inside your computer.

Display back-cover and antenna assembly

Removing the display back-cover and antenna assembly

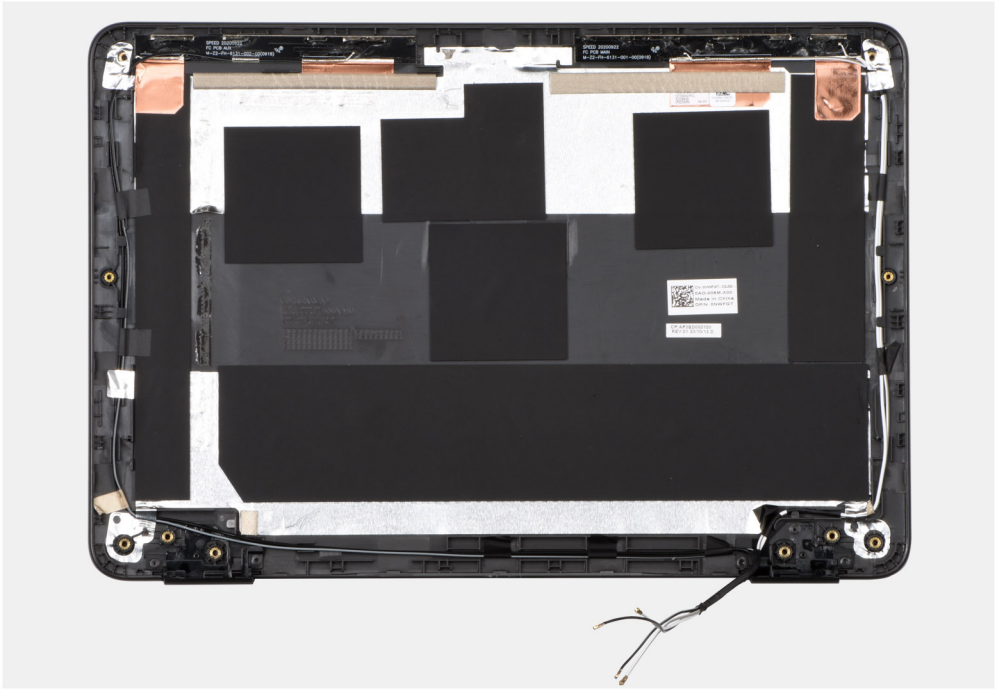
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the display assembly.
4. Remove the display panel.
5. Remove the camera.
6. Remove the display hinges.
7. Remove the display cable.

About this task

NOTE: The display back cover and antenna assembly cannot be further disassembled once all the pre-removal parts procedures are completed. If the wireless antennas or G-sensor module are malfunctioning and are required to be replaced, replace the entire display back cover and antenna assembly.

The image below shows the display back-cover and antenna assembly after the pre-removal parts procedures have been performed for any display back-cover and antenna assembly replacement.



Steps

After performing the pre-requisites you are left with the display back-cover and antenna assembly.

Installing the display back-cover and antenna assembly

Prerequisites

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

About this task

The following image indicates the location of the display back-cover and antenna assembly.

Steps

Place the display back-cover and antenna assembly on a flat surface and perform the postrequisites to install the display back-cover and antenna assembly.

Next steps

1. Install the display cable.
2. Install the display hinges.
3. Install the camera.
4. Install the display panel.
5. Install the display assembly.
6. Install the base cover.
7. Follow the procedure in After working inside your computer.

Palm-rest assembly

Removing the palm-rest assembly

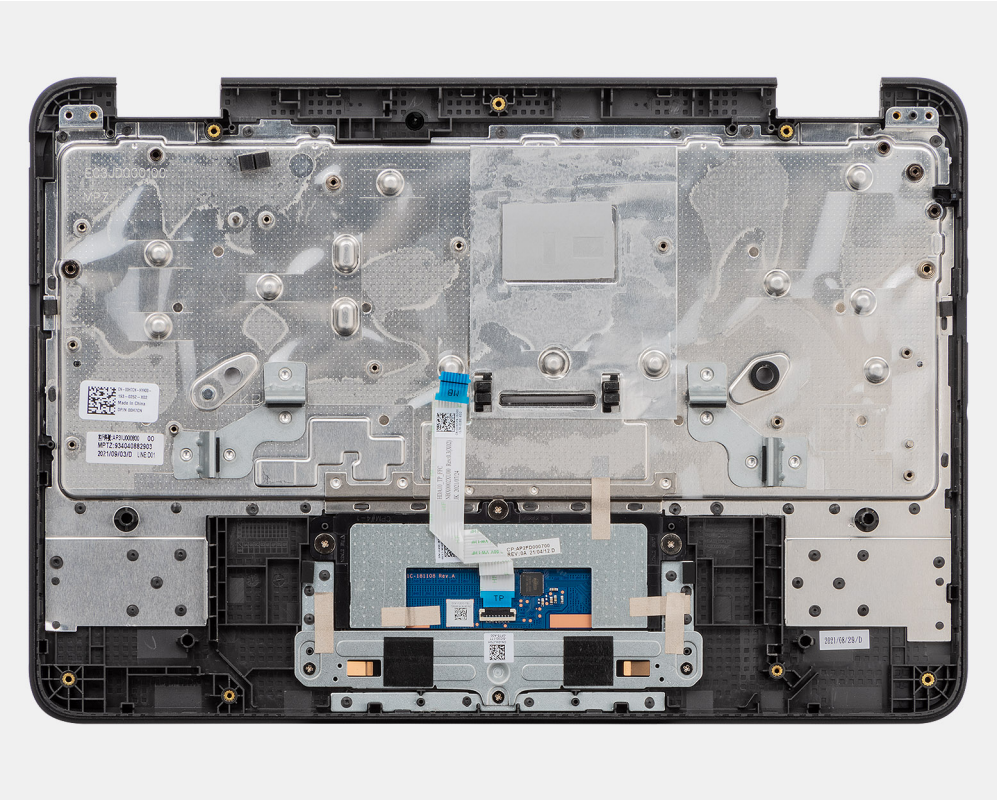
Prerequisites

1. Follow the procedure in Before working inside your computer.
2. Remove the base cover.
3. Remove the 3-cell battery.
4. Remove the keyboard.
5. Remove the display assembly.
6. Remove the system board.
7. Remove the speakers.
8. Remove the world-facing camera for systems shipped with a world-facing camera.

About this task

NOTE: The palm-rest assembly cannot be further disassembled once all of the pre-removal parts procedures are completed. If the touchpad frame, touchpad support bracket, touchpad mylar, touchpad module, touchpad FFC, conductive tape or thermal pad are malfunctioning and need to be replaced, replace the entire palm-rest assembly.

The following image shows the palm-rest assembly after performing the pre-removal parts procedures for any palm-rest assembly replacement.



Steps

After performing the pre-requisites you are left with the palm-rest assembly.

Installing the palm-rest assembly

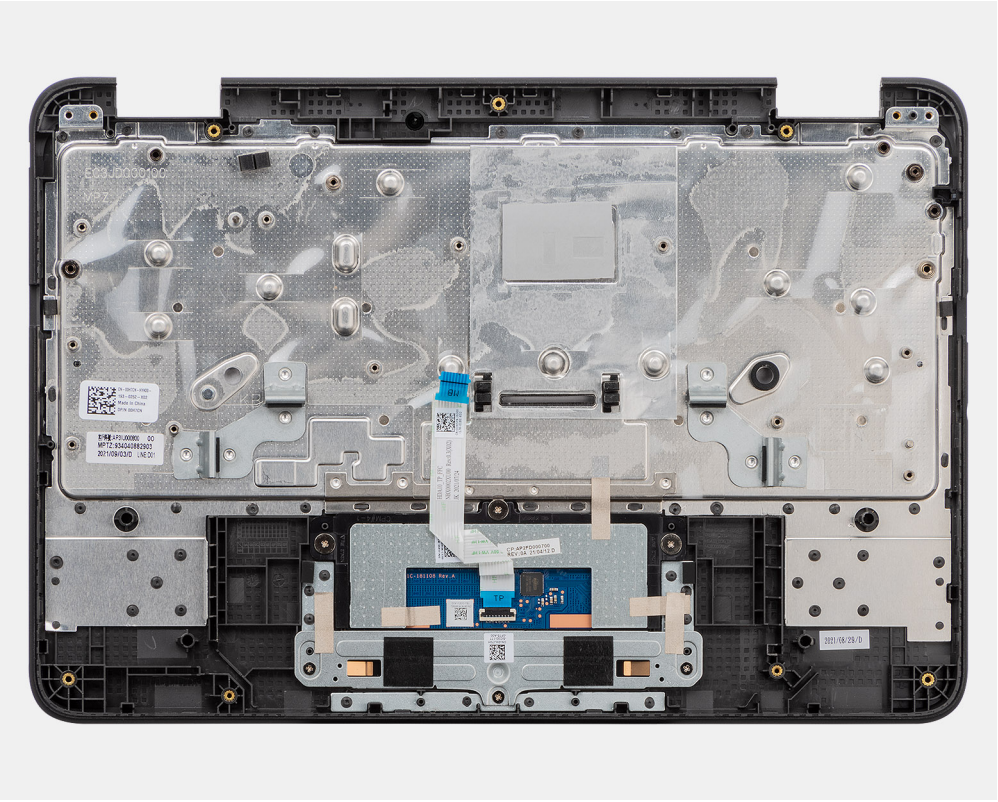
Prerequisites

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

About this task

The following image indicates the location of the palm-rest assembly.

NOTE: If the CPU thermal pad on the palm-rest (underneath the system board) gets detached, adhere it back onto the palm-rest.



Steps

Place the palm-rest assembly on a flat surface and perform the postrequisites to install the palm-rest assembly.

Next steps

1. Install the world-facing camera for systems shipped with a world-facing camera.
2. Install the speakers.
3. Install the system board.
4. Install the display assembly.
5. Install the keyboard.
6. Install the 3-cell battery.
7. Install the base cover.
8. Follow the procedure in After working inside your computer.

3

Troubleshooting

Handling swollen Lithium-ion batteries

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

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

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

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

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

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

Recovering the operating system

When your Chromebook's operating system (OS) isn't working properly, you can recover it. Recovery is removing and reinstalling the OS.

To know how to recover your Chromebook's operating system, see Recover your Chromebook at ttps://support.google.com/chromebook

WiFi power cycle

About this task

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

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

Steps

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

Drain residual flea power (perform hard reset)

About this task

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

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

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

To drain residual flea power (perform a hard reset)

Steps

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

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

4

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 2. Self-help resources

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

Contacting Dell

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

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

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