Dell Latitude 3310

Service Manual

Regulatory Model: P95G
Regulatory Type: P95G002
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Rev. A01

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.

Contents

1

Working on your computer

Topics:

- Safety instructions

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

1. Ensure that your work surface is flat and clean to prevent the computer cover from being scratched.
2. Turn off your computer.
3. 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.

4. Disconnect your computer and all attached devices from their electrical outlets.
5. Open the display.
6. 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.

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

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 tablet and all attached peripherals.
- Disconnect the tablet 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 tablet to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an antistatic mat.
- Wear shoes with nonconductive rubber soles to reduce the chance of getting electrocuted.

Bonding

Bonding is a method for connecting two or more grounding conductors to the same electrical potential. This is done by using 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 nonmetal 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.

Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

CAUTION: Do not lift greater than 50 pounds. Always obtain additional resources or use a mechanical lifting device.

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
3. Lift with your legs, not your back.
4. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
5. 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.
6. Follow the same techniques in reverse to set the load down.

After working inside your computer

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.

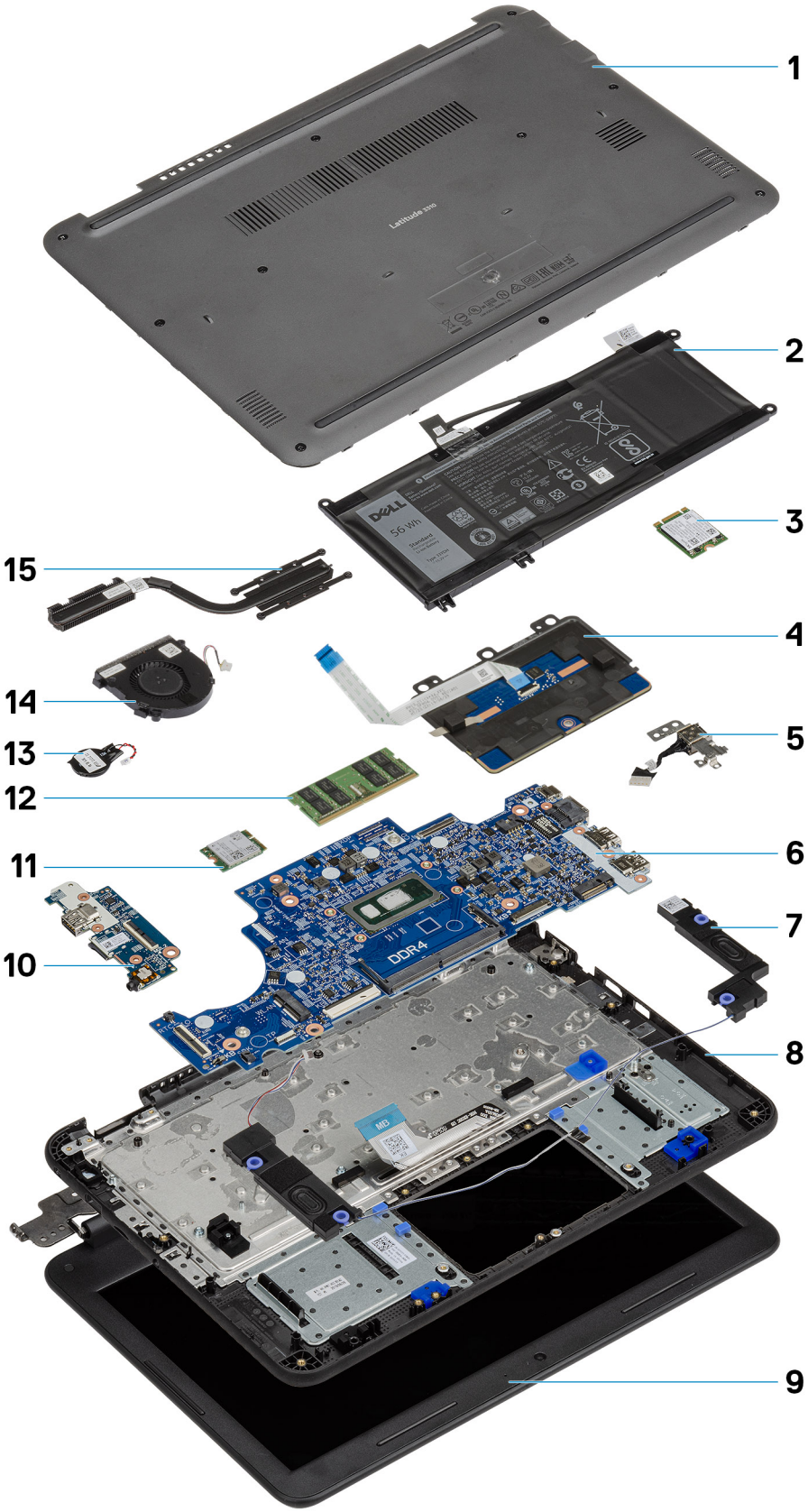
1. Connect any external devices, such as a port replicator or media base, and replace any cards, such as an ExpressCard.
2. Connect any telephone or network cables to your computer.

   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.

2

Major components of your system



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

3

Disassembly and reassembly

Topics:

Screw List

The following table shows the screw list and the images for Latitude 3310, for different components and locations.

Table 1. Screw Size List

Component	Quantity	Screw type	Image
• System board to palmrest • DC-In bracket	• 2 • 1	M2.0 x 2.0	
• LCD Panel to back cover • Touchpad frame to palmrest • SSD bracket to palmrest • Battery retaining bracket • Battery support bracket • I/O Board to palmrest • Fan to palmrest • WLAN bracket	• 4 • 3 • 2 • 2 • 1 • 1 • 2 • 1	M2.0 x 3.0	

Table 1. Screw Size List (continued)

Component	Quantity	Screw type	Image
Hinges to LCD back cover	6	M2.5 x 3.5	
• Touchpad to palmrest • I/O Daughter • I/O Board to palmrest	• 3 • 1 • 1	M2.0 x 3.0 (large head)	
Hinges to palmrest	5	M2.5 x 5.0	
• LCD bezel to back cover • DC-In bracket to MB • I/O board to palmrest • System board to palmrest • SSD to SSD Bracket	• 2 • 1 • 1 • 1 • 1	M2.0 x 4.0	
• Base cover to palmrest • Heatsink to system board	• 10 • 4	M2.5 x 8.0	Captive screws (Part of the base cover)

Recommended tools

The procedures in this document may require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe - Recommended for field technician

microSD card

Removing the microSD card

1. Press in on the microSD card to release it from the computer.

2. Remove the microSD card from the computer.

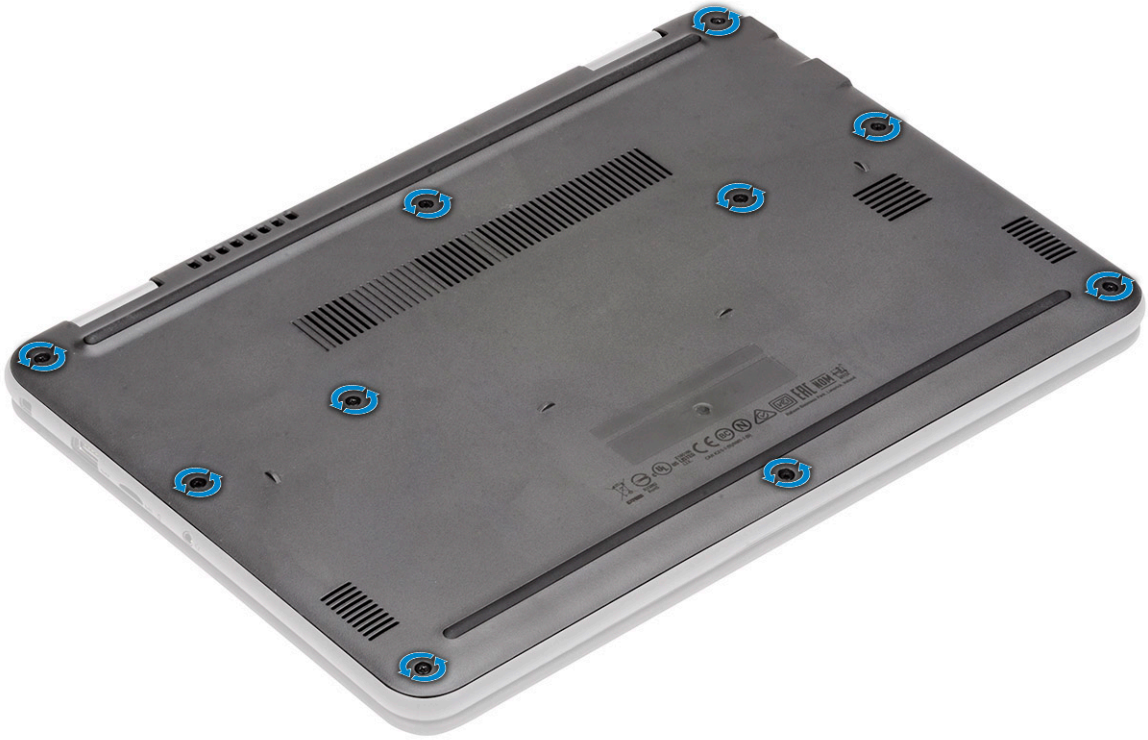
Installing the microSD card

Slide the microSD card into its slot until it clicks into place.

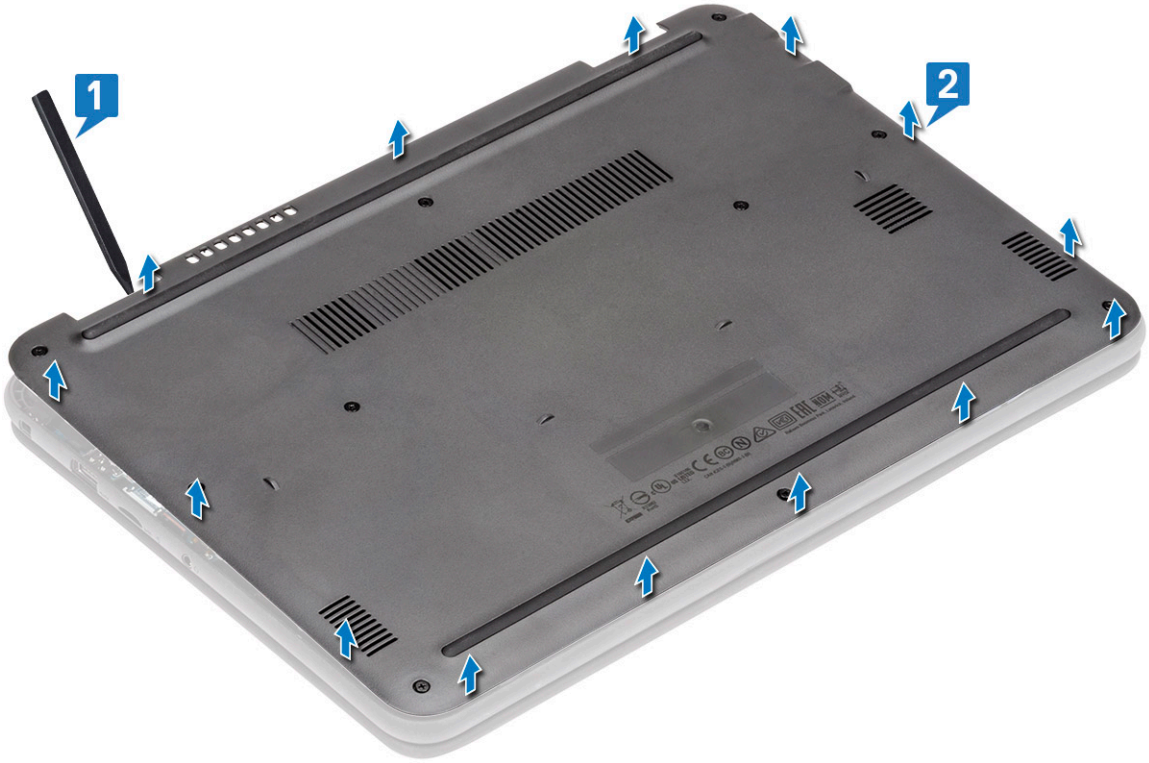
Base Cover

Removing the base cover

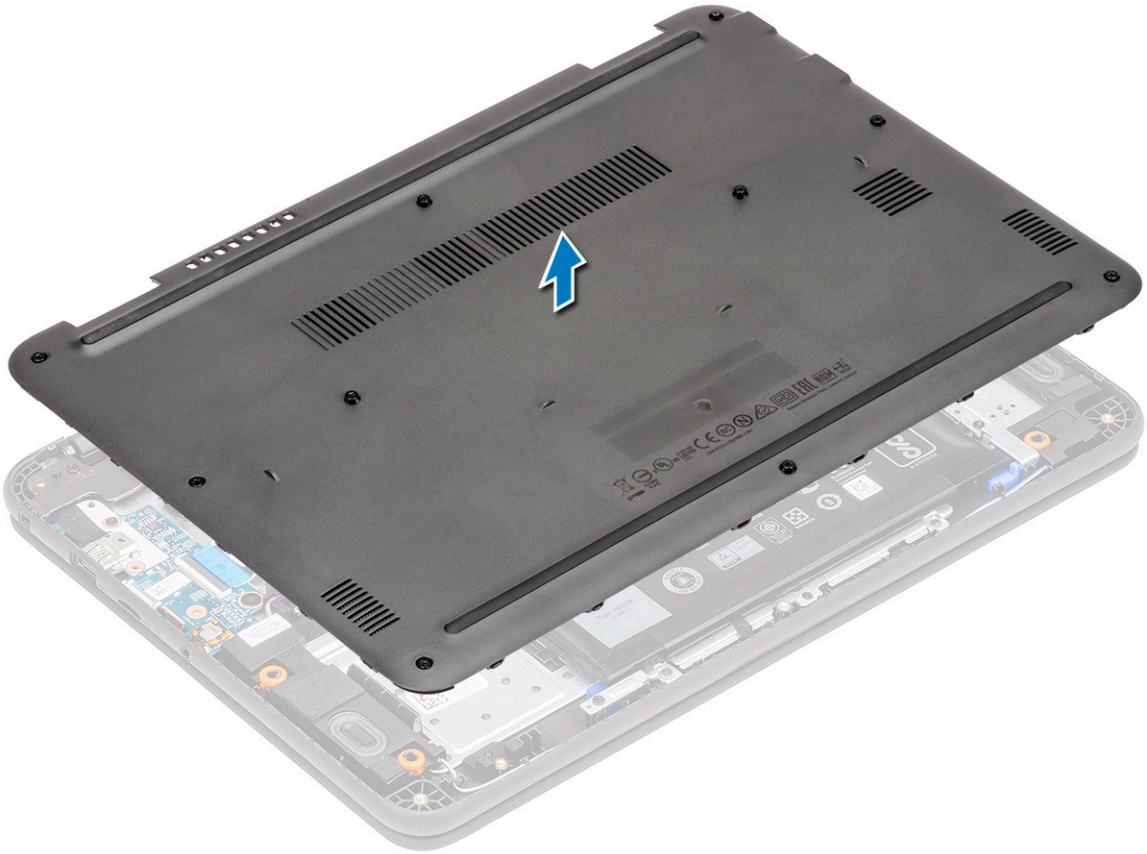
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
3. Loosen the 10 'M2.5xL8.0' captive screws that secure the base cover to the computer.



4. Use a plastic scribe [1] and pry the base cover along the edges [2] to separate the base cover from the computer.

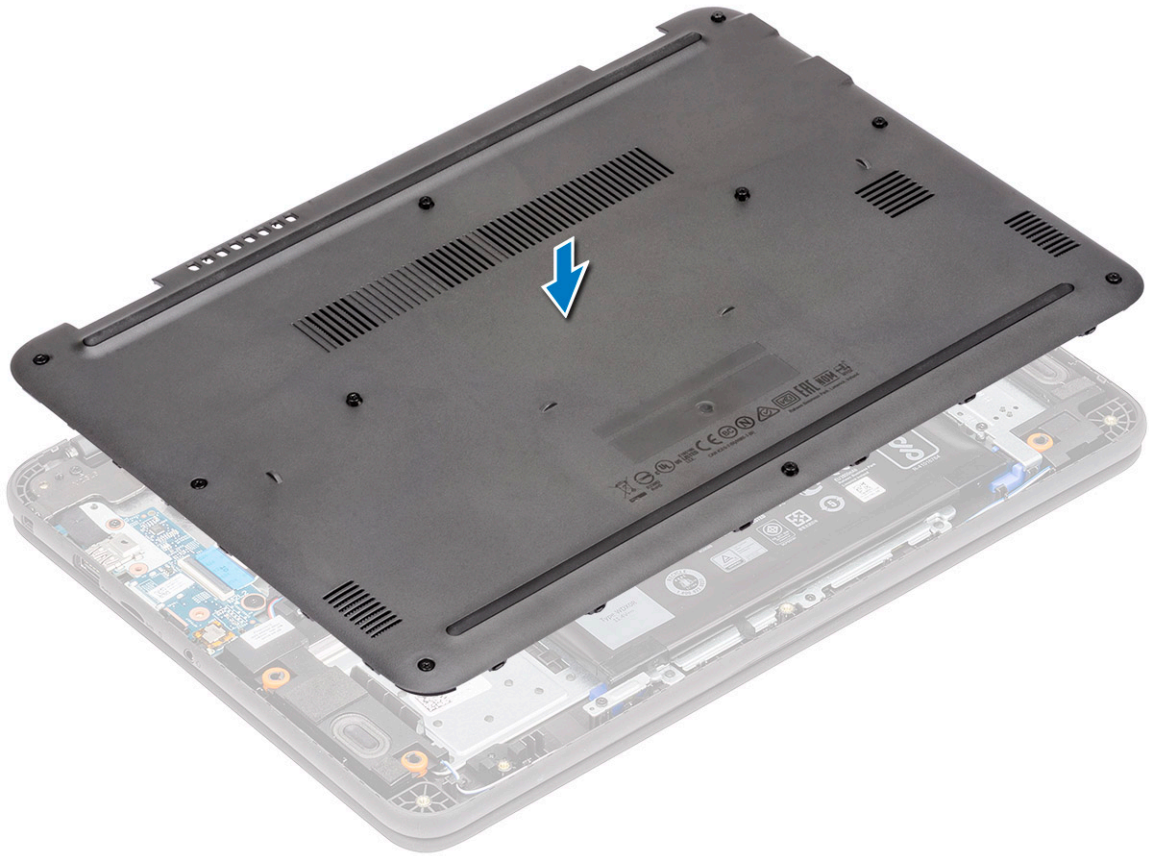


5. Lift the base cover up and away from the computer.

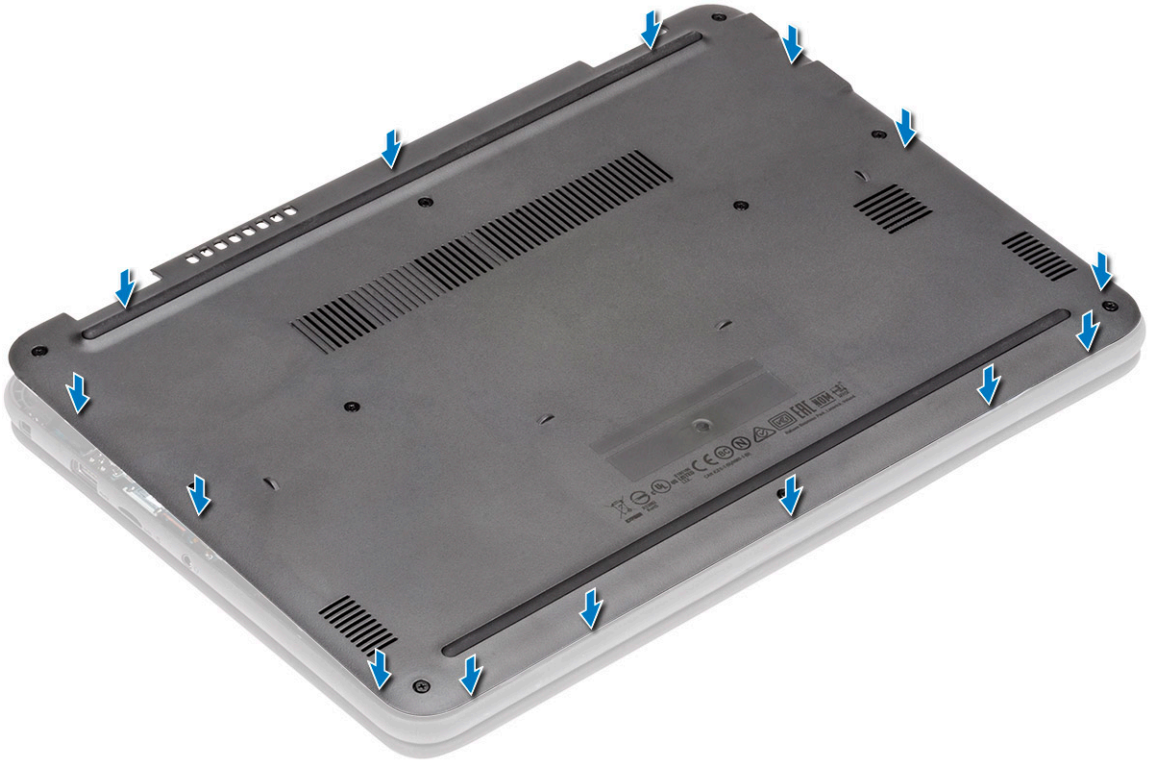


Installing the base cover

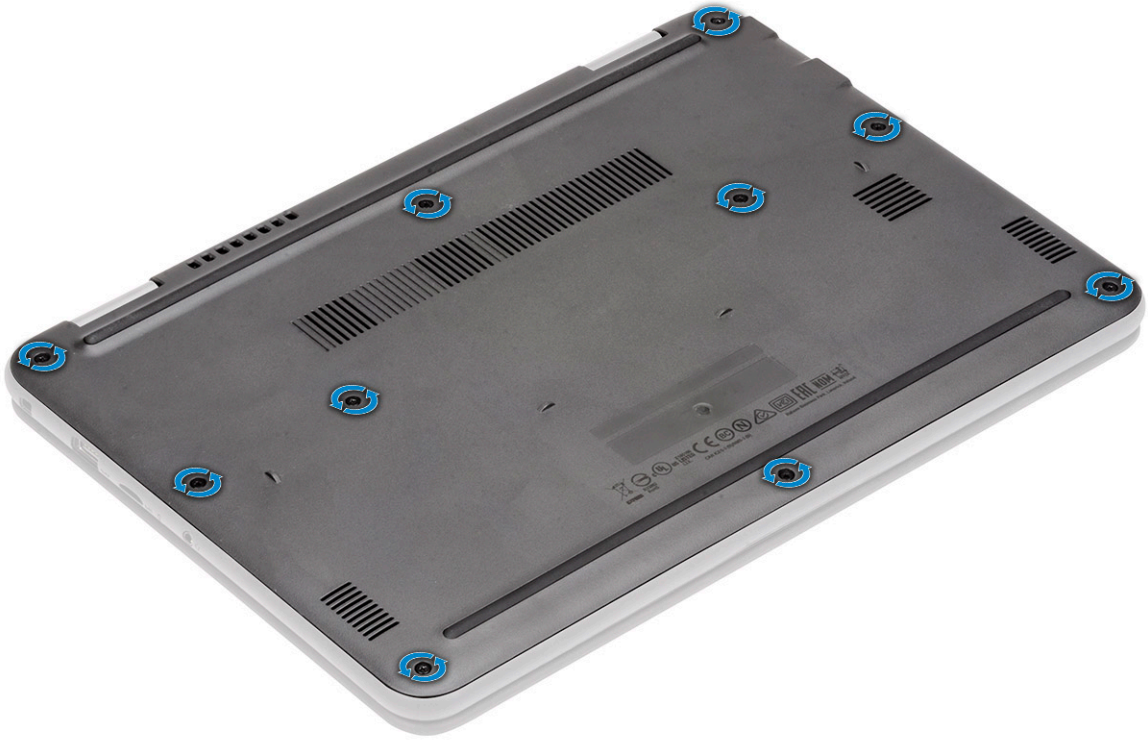
1. Align the base cover and place it on the computer.



2. Press down along the edges of the base cover until it clicks into place.



3. Tighten the 10 'M2.5xL8.0' captive screws to secure the base cover to the computer.



4. Install the:
   a. microSD card
5. Follow the procedure in After working inside your computer.

Battery

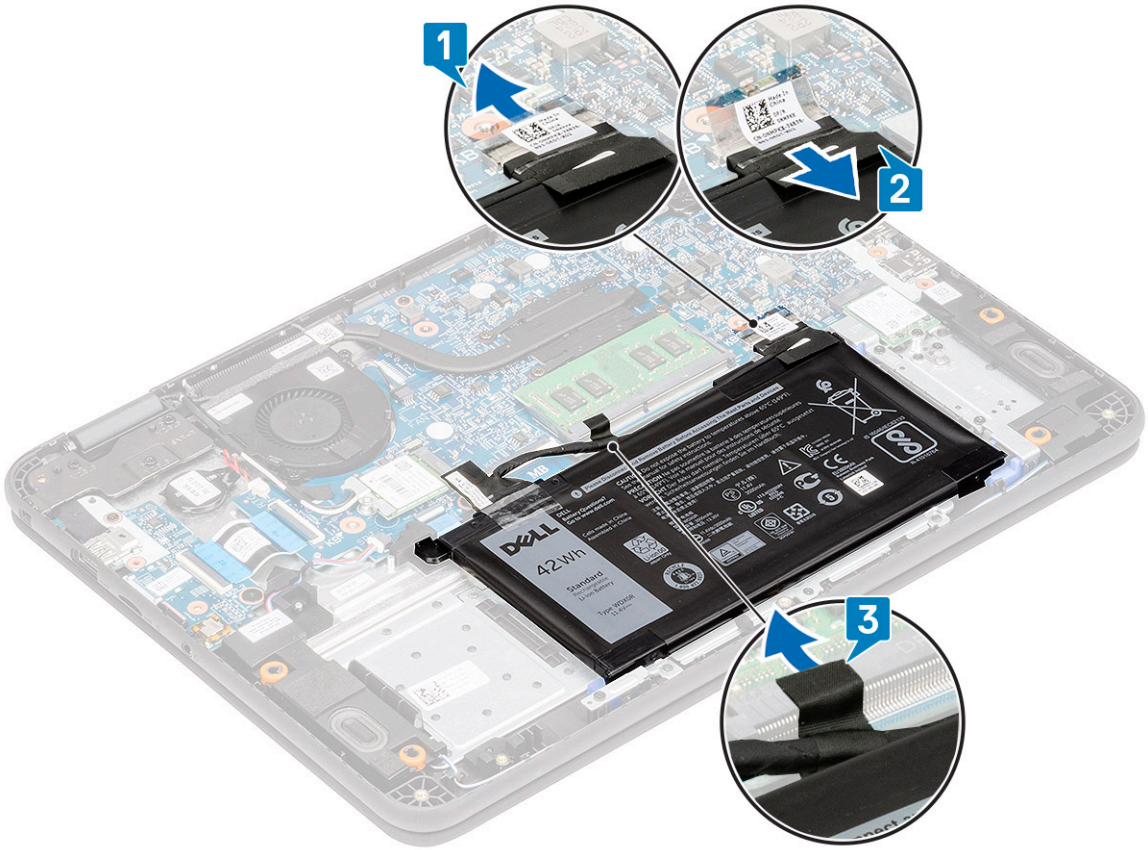
Lithium-ion battery precautions

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 battery

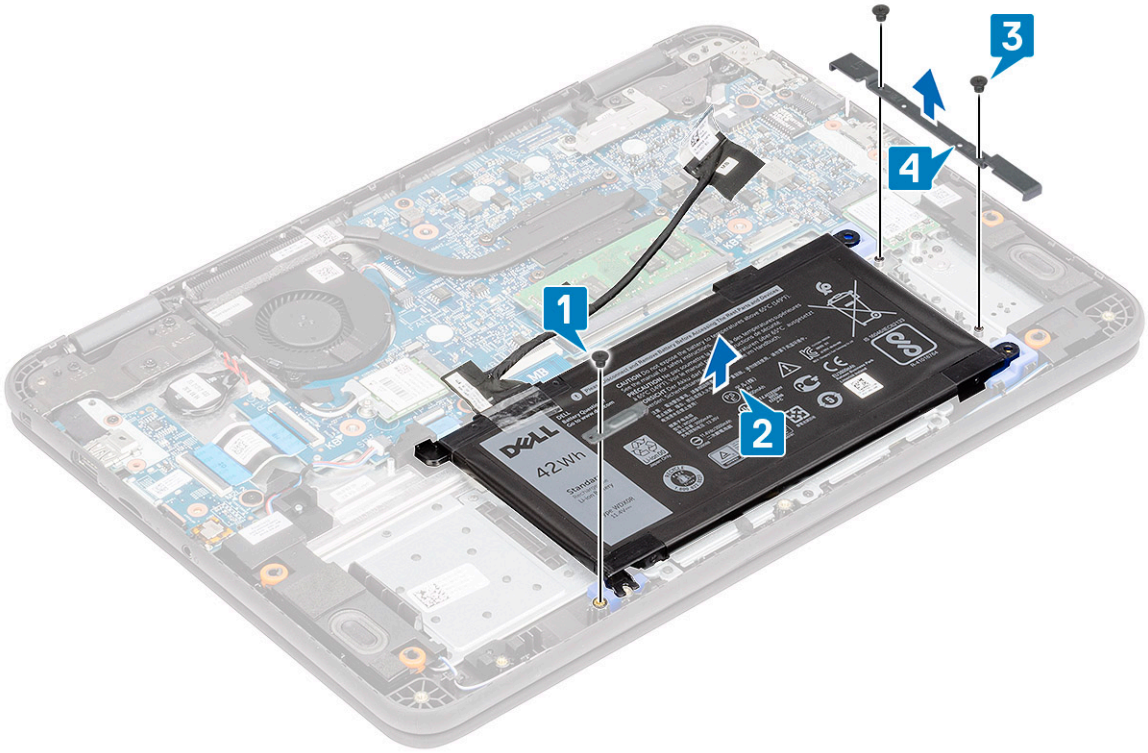
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Peel off the tape [1] and disconnect the battery cable from the system board [2].
4. Peel off the piece of tape [3] on the memory module bracket and unroute the battery cable.



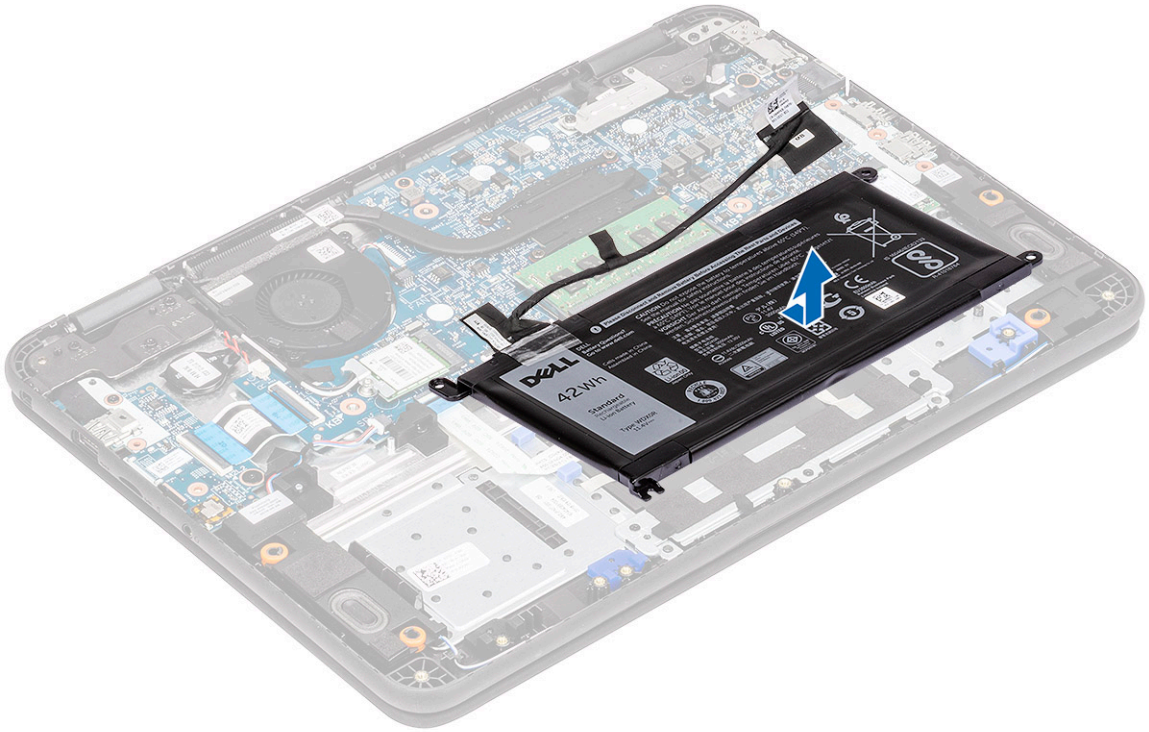
5. Remove the single M2.0x3.0 screw [1] and the two M2.0x3.0 screws [3].

   NOTE: This procedure shows a 3-cell 42 WHr battery removal. The 4-cell 56 WHr battery is slightly bigger in size and attaches to the palmrest.

6. Separate the battery support bracket [4] from the palmrest and Lift the battery away from the computer [2].



7. Lift the battery away from the computer.



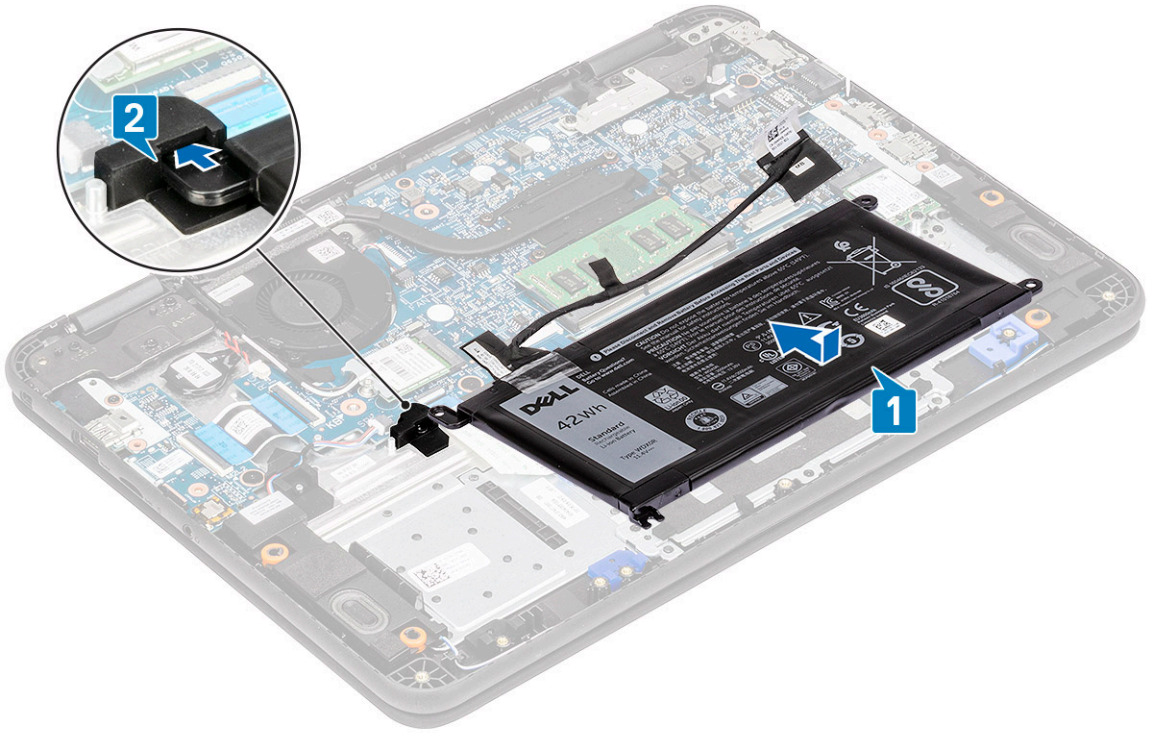
8. Peel off the tape [1] and disconnect the battery cable from the battery [2].

Installing the battery

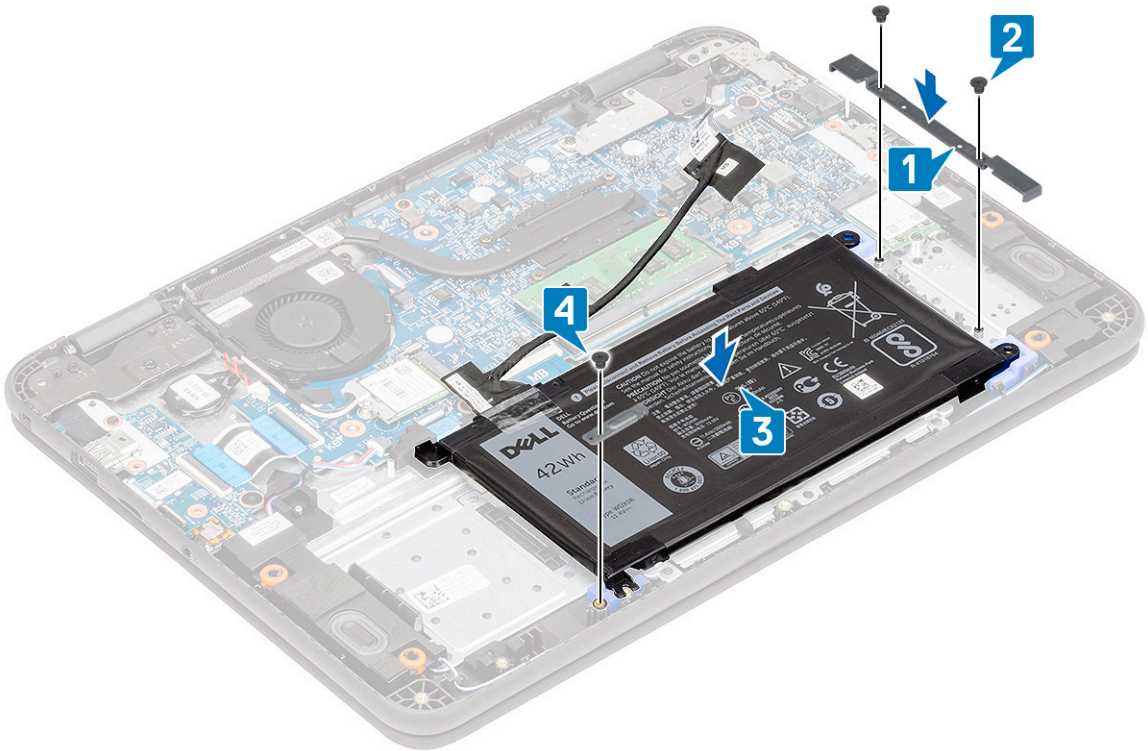
1. Install the battery cable on the battery [1] and secure it using a piece of tape [2].

2. **NOTE:** This procedure illustrates a 3-cell 42 WHr battery, a 4-cell 56 WHr battery mounts is slightly bigger in size and attaches to different mount points on the palmrest.

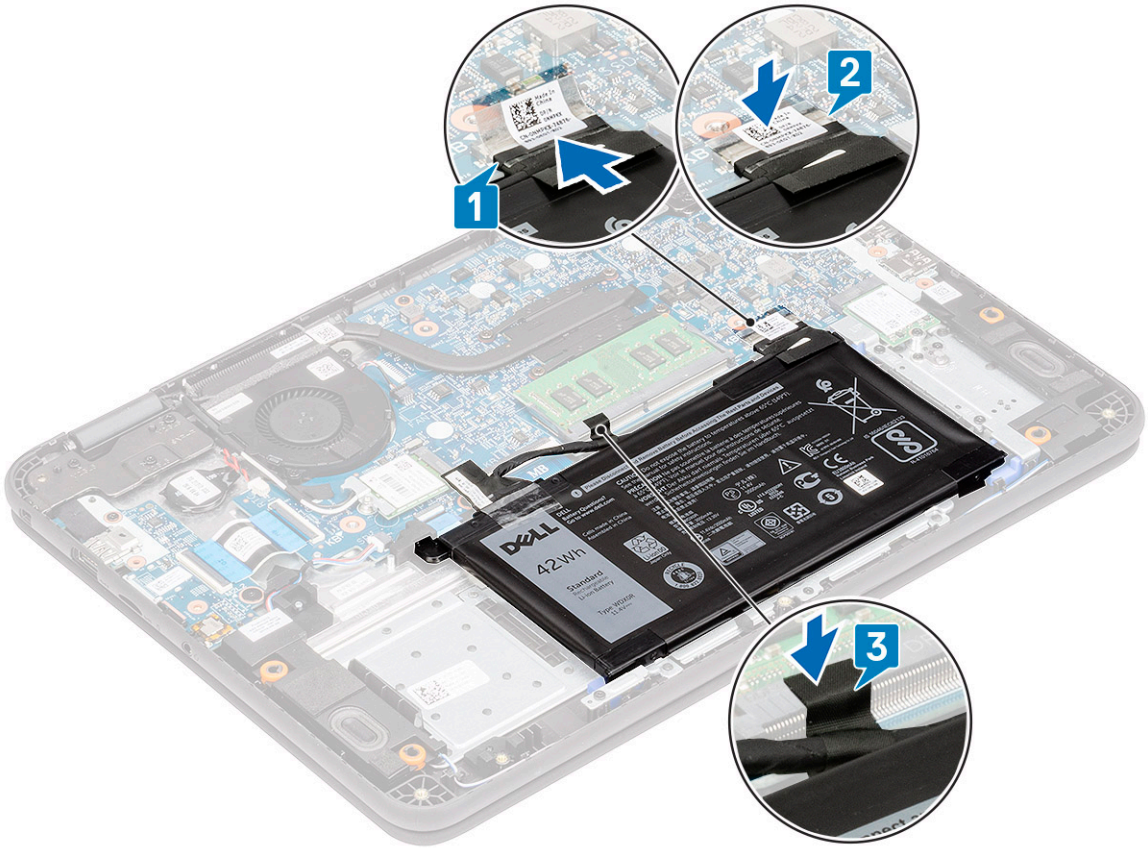
   Insert the battery into the slot on the computer [1] and align the battery and the screw hole on the palmrest [2].



3. Install the battery [3] and the single M2.0x3.0 screw to retain the battery [4] to the palmrest.
4. Install the battery support bracket [1] and install the two M2.0x3.0 screws securing the battery to the palmrest [2].



5. Connect the battery cable to the system board [1] and secure it using a piece of tape [2].
6. Route the battery cable along the memory module bracket and secure it using a piece of tape [3].



7. Install the:
   a. base cover
   b. microSD card
8. Follow the procedure in After working inside your computer.

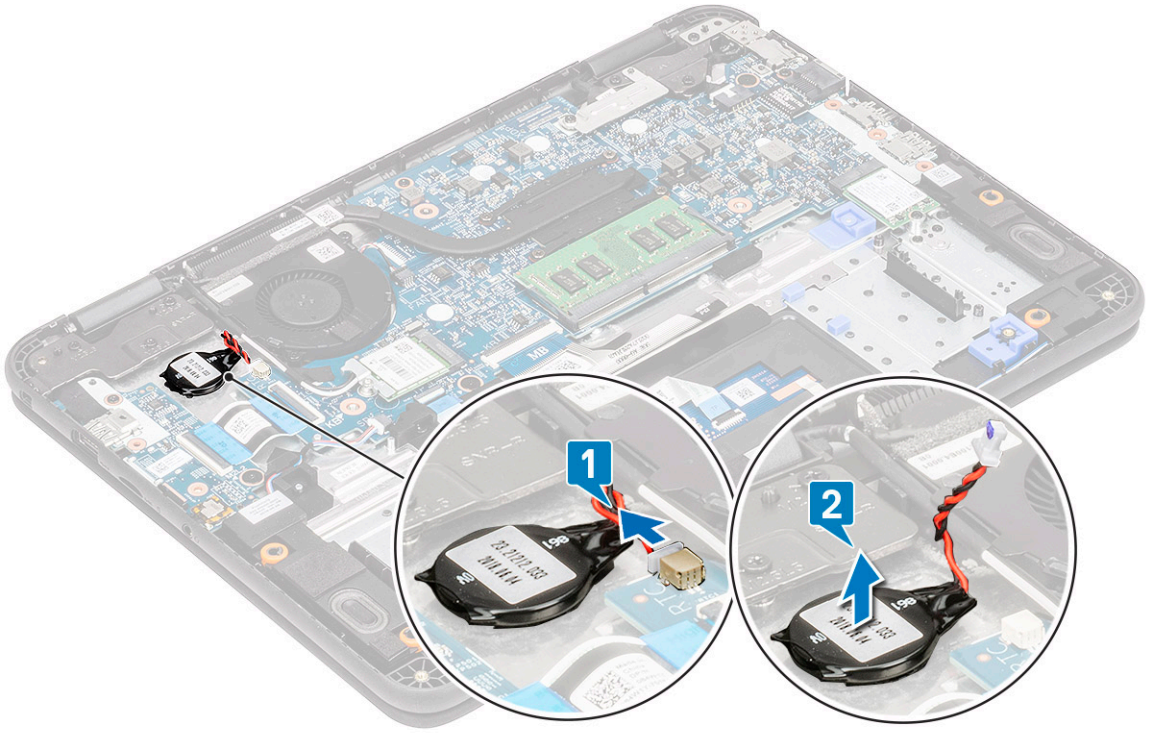
Coin Cell

Removing the coin cell

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. **CAUTION: Back up the data before removing the coin cell. Removal of the coin cell resets the BIOS and may cause No Boot, No POST, or potential loss of data.**

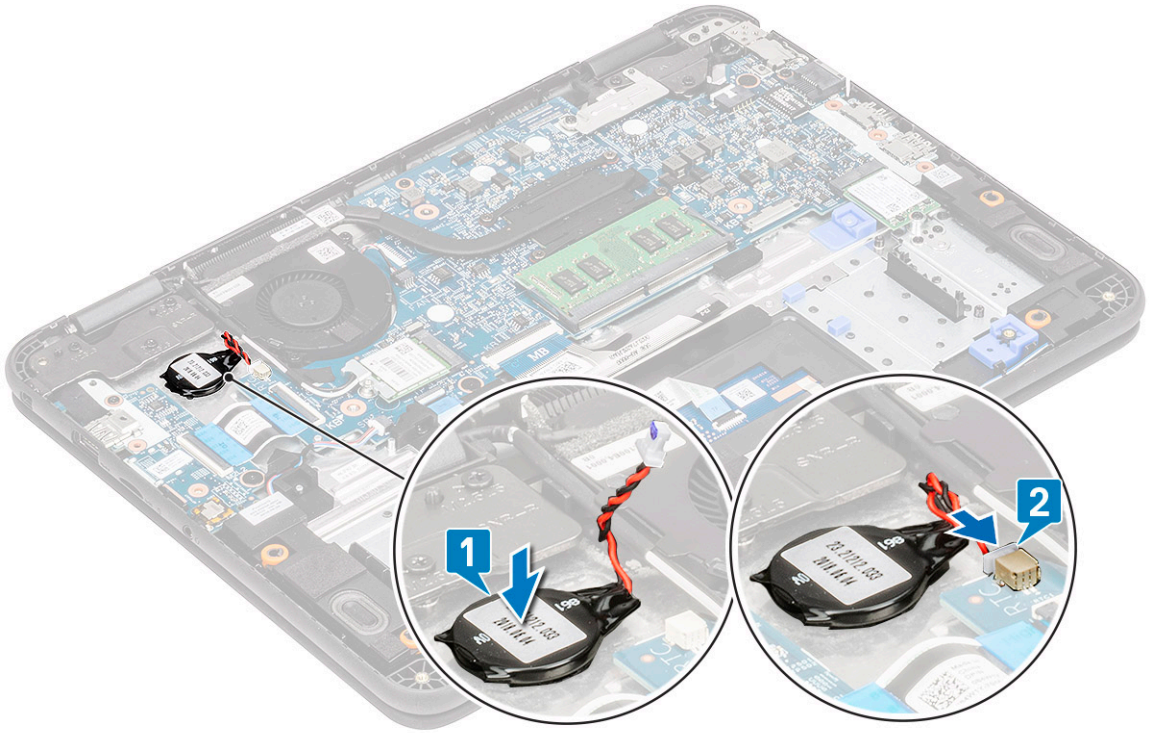
   Disconnect the battery cable from its connector on the system board [1].
5. Lift and remove the coin cell from the system [2].

   NOTE: A strong adhesive is used on the coin cell; a bit of force is needed to peel the battery from the palmrest.



Installing the coin cell

1. Place the coin cell battery into the system [1].
2. Connect the coin cell battery cable to its connector on the system board [2].



3. Reconnect the battery cable to the connector on the system board.
4. Install the:
   a. base cover

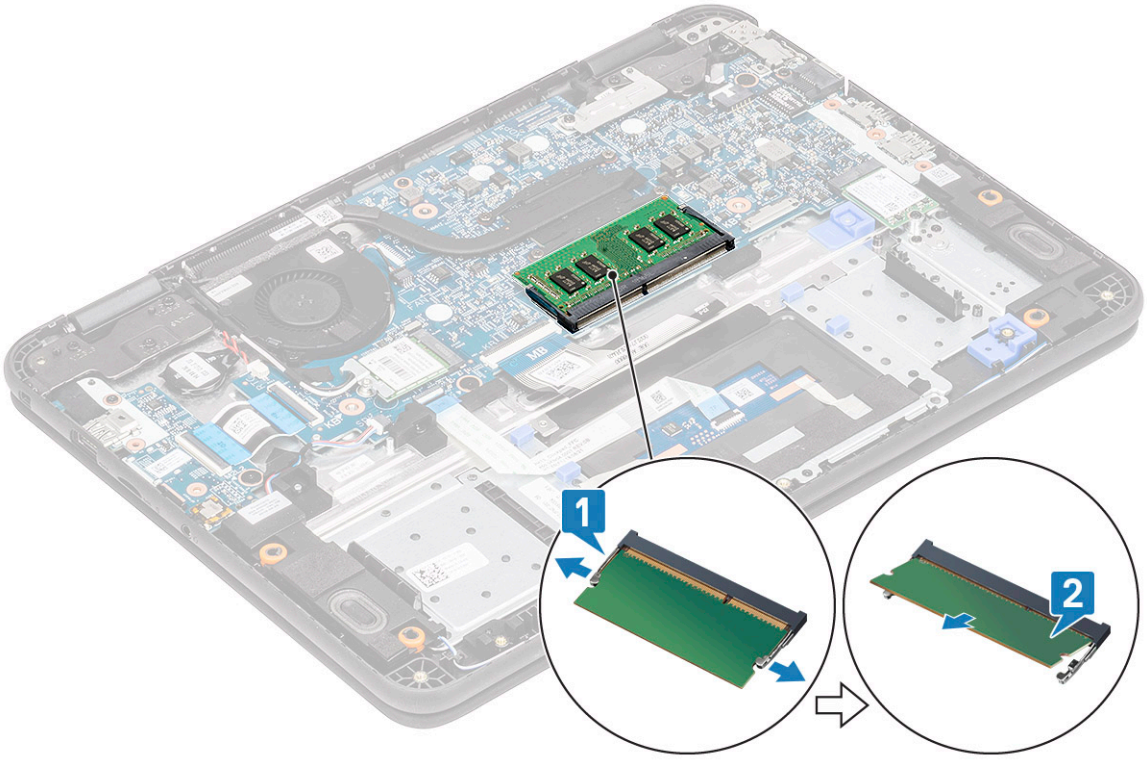
b. microSD card

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

Memory Module

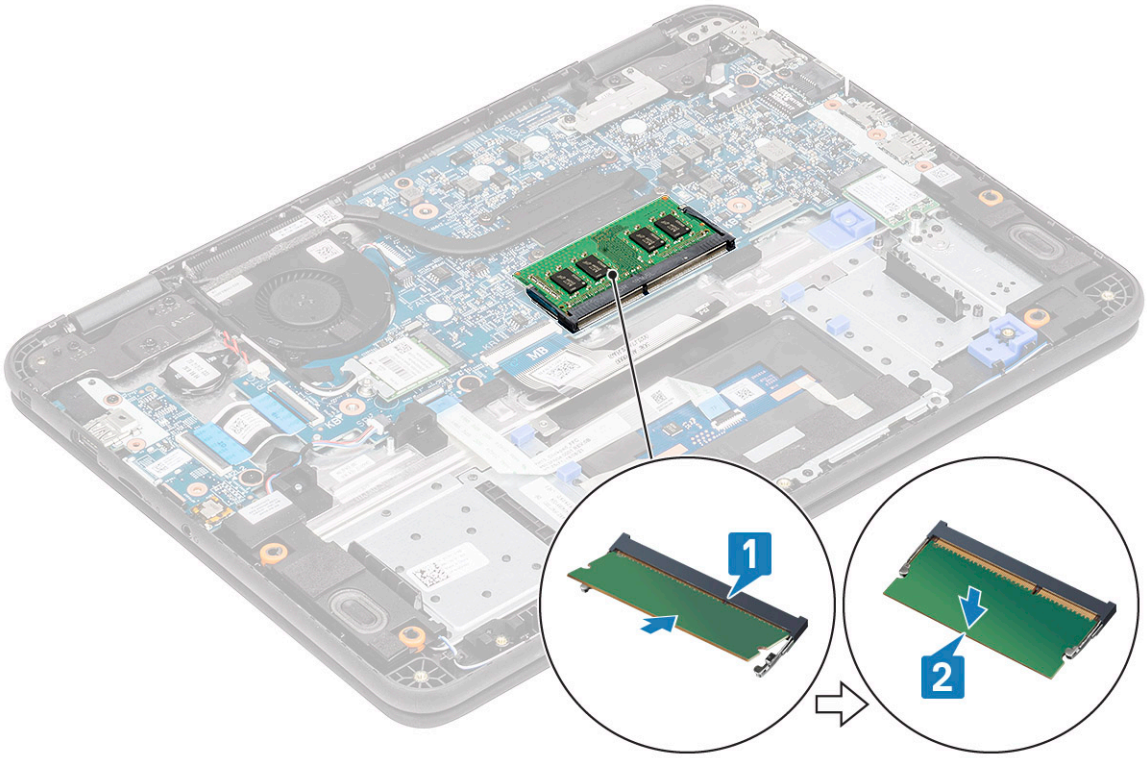
Removing the memory module

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. Pry apart the memory module latches [1].
5. Lift and remove the memory module from the system board [2].



Installing the memory module

1. Insert the memory module at an acute angle into its connector on the system board [1].
2. Gently push the memory module until the latches snap into place [2].



3. Reconnect the battery cable to the connector on the system board.
4. Install the:
   a. base cover
   b. microSD card
5. Follow the procedure in After working inside your computer.

Solid state drive (SSD)

Removing the SSD

1. **NOTE:** This system has the option to fit two form factors (M.2 2242 and M.2 2230) SSD/eMMC cards. This is achieved by removing, inverting, and installing the extender to an alternate location as marked on the palmrest.

   Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. Remove the single M2.0x4.0 screw along with the washer that secures the SSD on the extender [1].
5. Remove the SSD from the M.2 slot on the system board [2].

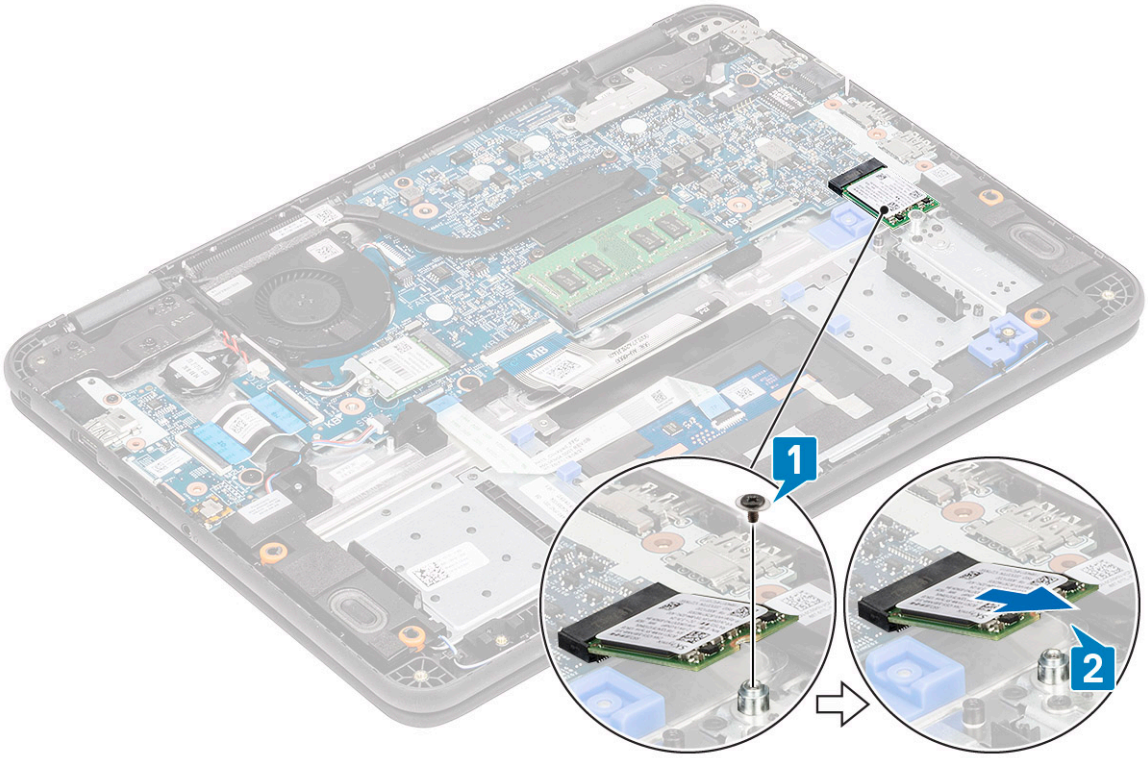


Figure 1. M.2 2230 SSD

Installing the SSD

1. Install the SSD in the M.2 bracket [1] and secure it to the extender using the single M2.0x4.0 screw and washer [2].

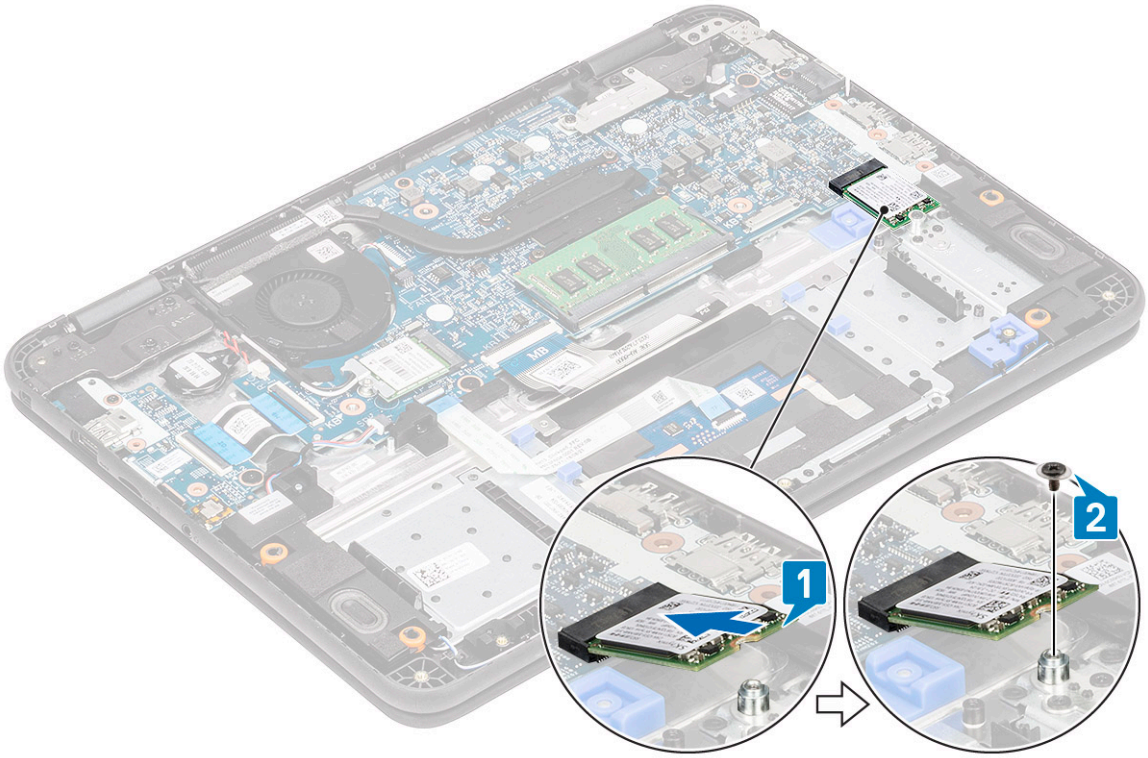


Figure 2. M.2 2230 SSD

2. Reconnect the battery cable to the connector on the system board.
3. Install the:
   a. base cover
   b. microSD card
4. Follow the procedure in After working inside your computer.

SSD bracket

Removing the SSD bracket

1. **NOTE:** This system has the option to fit two form factors (M.2 2242 and M.2 2230) SSD/eMMC cards. This is achieved by removing, inverting, and installing the extender to an alternate location as marked on the palmrest.

   Follow the procedure in Before working inside your computer.
2. Remove the :
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. Remove the SSD
5. Remove the two M2.0x3.0 screws securing the SSD bracket to the palmrest [1].
6. Remove the SSD bracket from the palmrest [2].

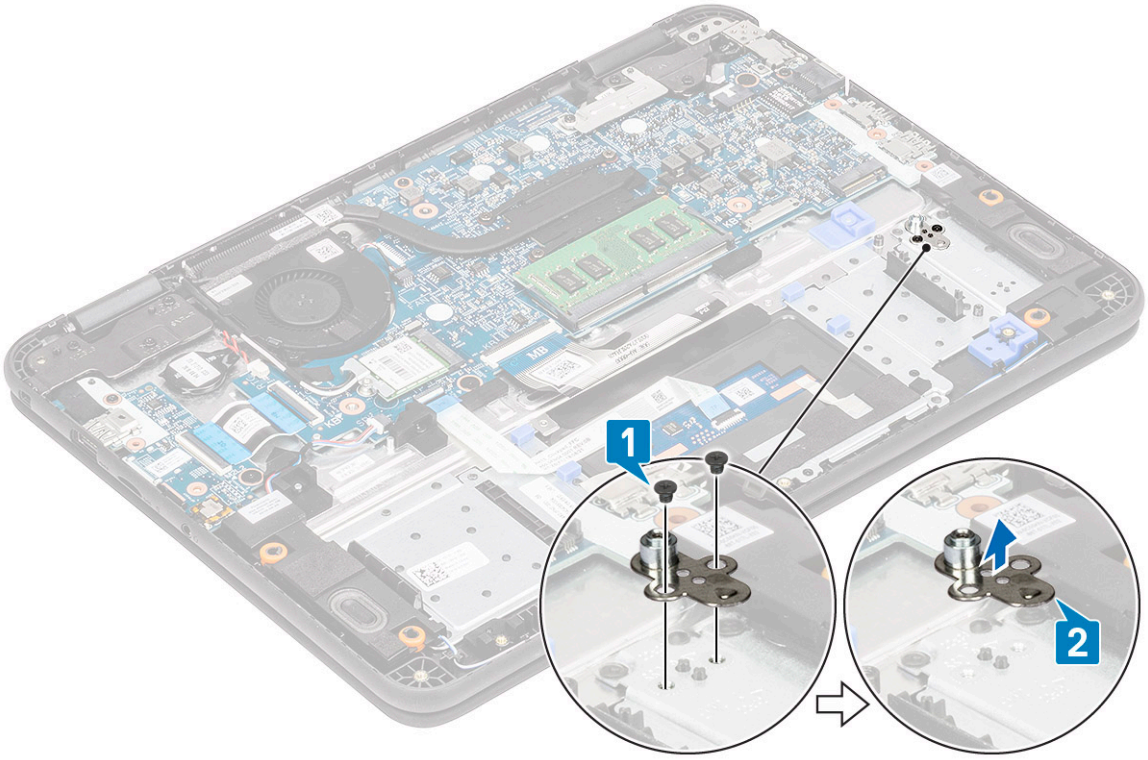


Figure 3. M.2 2230 SSD

Installing the SSD bracket

1. Install the SSD bracket in the palmrest [1].
2. Install the two M2.0x3.0 screws securing the SSD bracket to the palmrest [2].

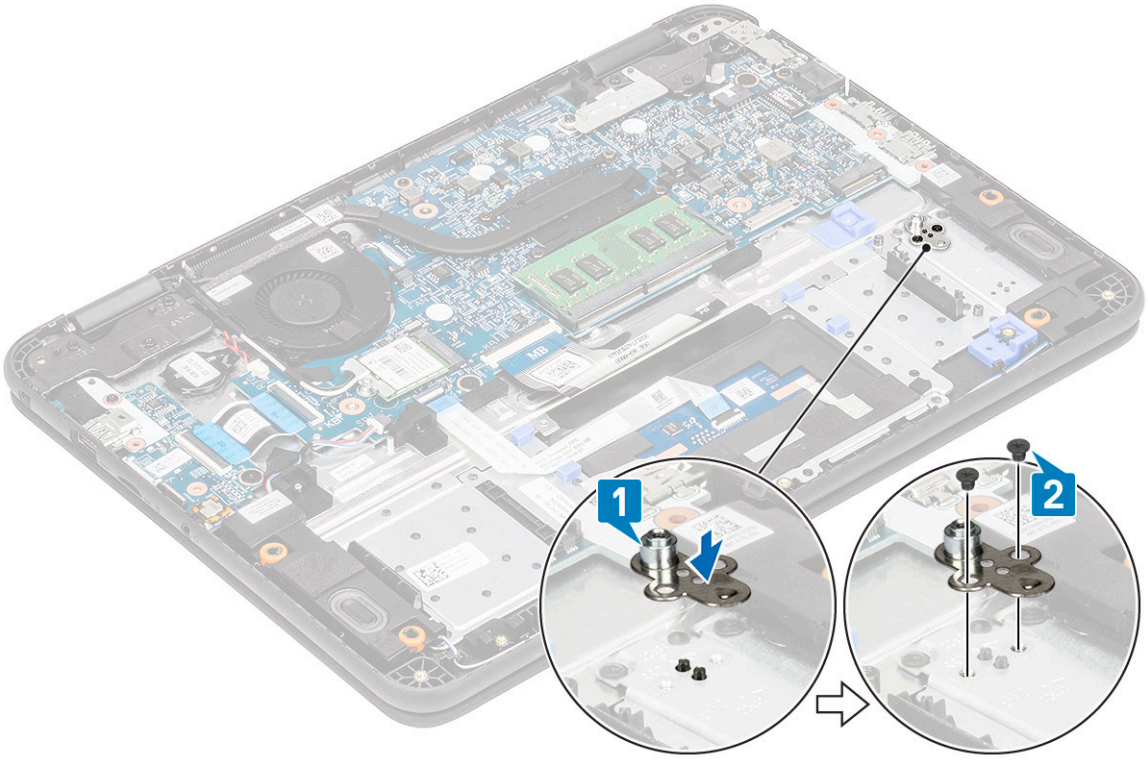


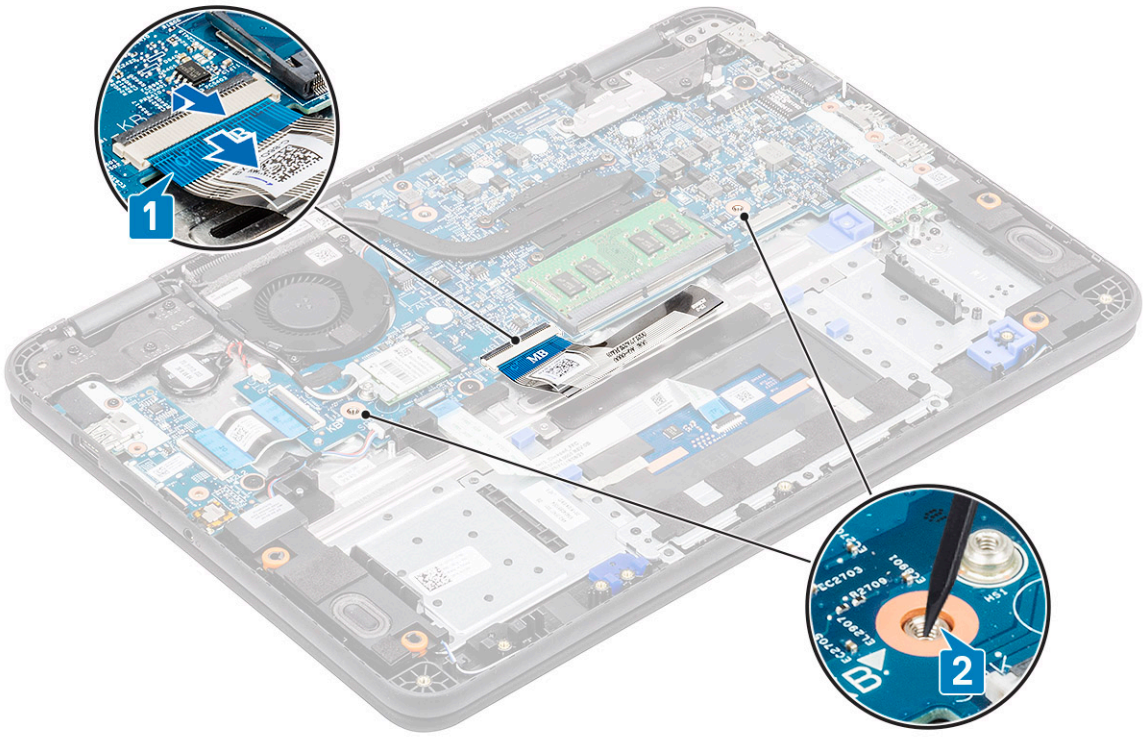
Figure 4. M.2 2230 SSD

3. Install the SSD.
4. Reconnect the battery cable to the connector on the system board.
5. Install the:
   a. base cover
   b. microSD card
6. Follow the procedure in After working inside your computer.

Keyboard

Removing the keyboard

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
3. Disconnect the keyboard cable from the system board [1].
4. Hold the sides of the palmrest securely while pushing into the two release holes using a plastic scribe [2].



NOTE: It takes some force to push out the keyboard through the two release holes. Exercise due caution.

5. Gently pry up the lower edge of the keyboard from the computer.

6. Gently remove the keyboard cable from underneath the keyboard.

NOTE: Unroute the keyboard cable from the touchpad bracket before proceeding.

7. Slide the keyboard towards the touchpad [1] and lift it up [2] to remove it from the computer.

Installing the keyboard

1. Install the keyboard on the computer [1] and slide it into the retention tabs in the holes on the palmrest [2].

   NOTE: Keyboard cable must be inserted parallel to the connector.

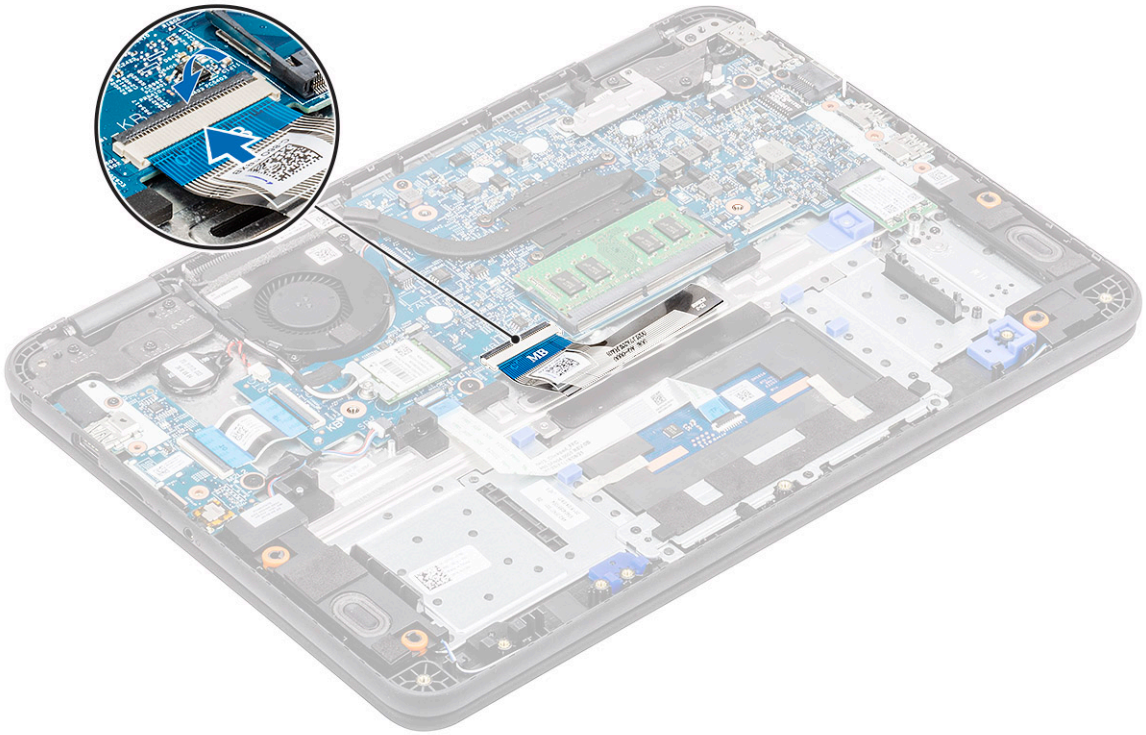
   NOTE: Remove the antiadhesive paper on the keyboard before inserting the cable.

   NOTE: After the cable is inserted, the operator must hold the cable with the left and press the actuator down by the right hand to avoid loosening the cable.

2. Tuck in the keyboard cable and route it along the touchpad bracket.

3. Press the keyboard until it clicks in place.

4. Insert the keyboard cable in its connector on the system board.



5. Install the:
   a. battery

b. base cover
c. microSD card

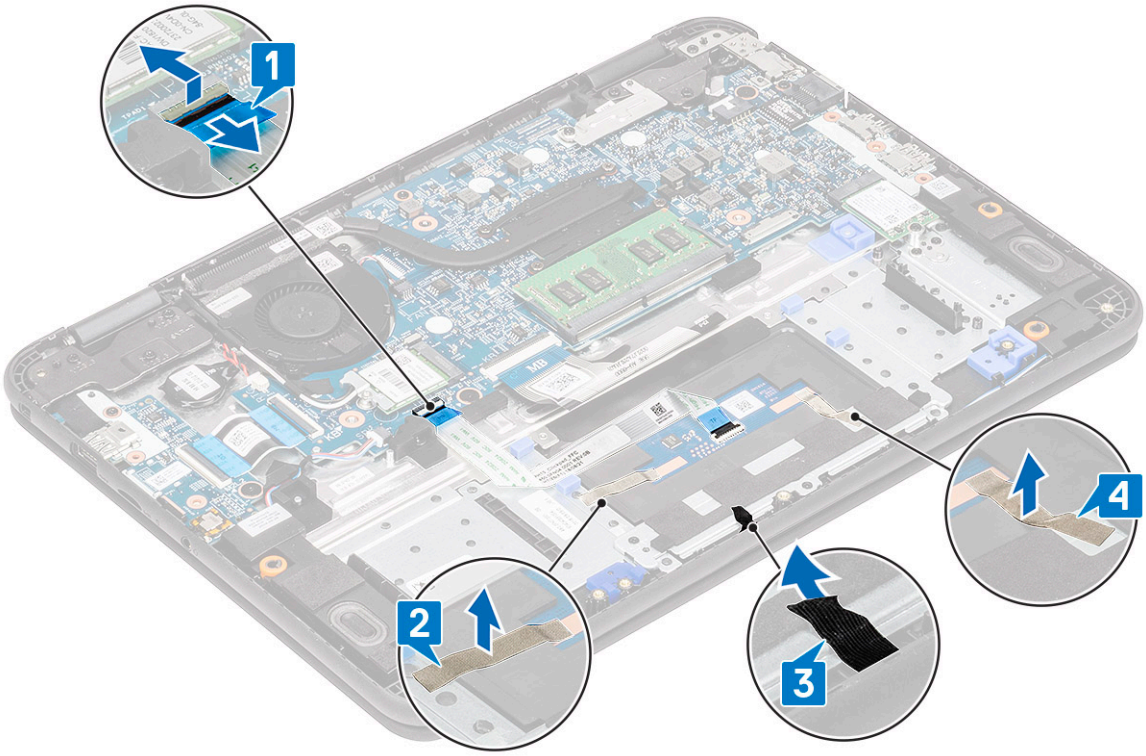
6. Follow the procedure in After working inside your computer.

Touchpad

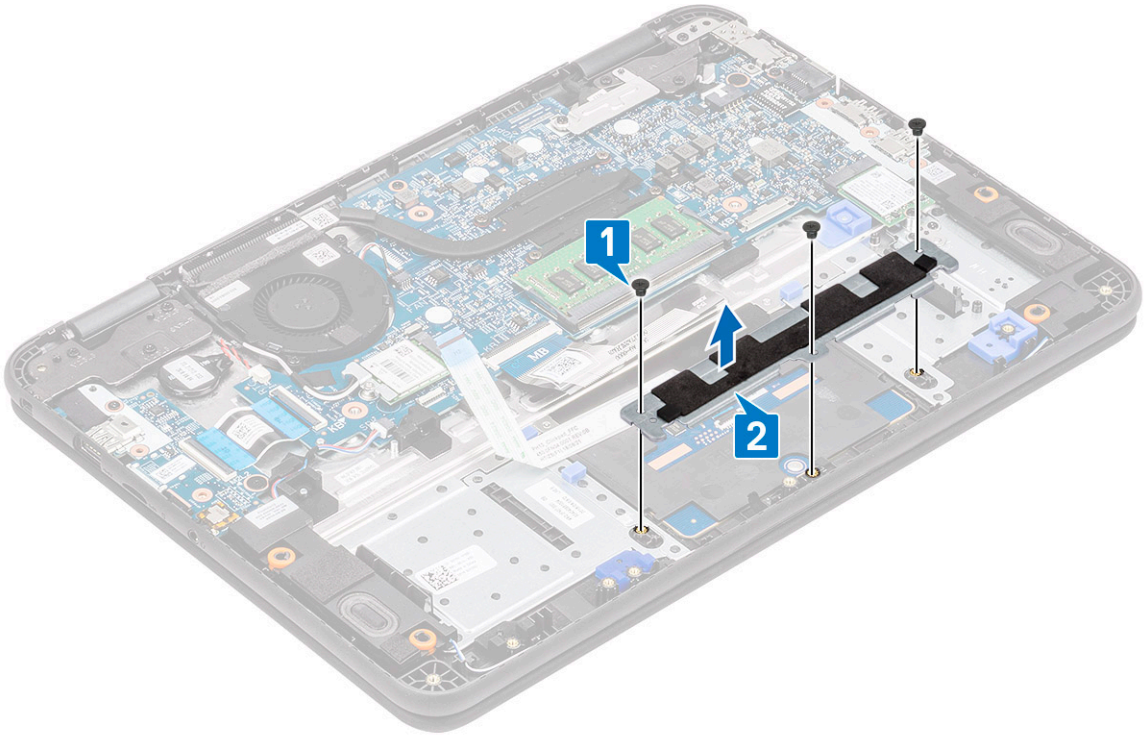
Touchpad is part of the Palmrest assembly. These instructions are for reference only.

Removing the touchpad

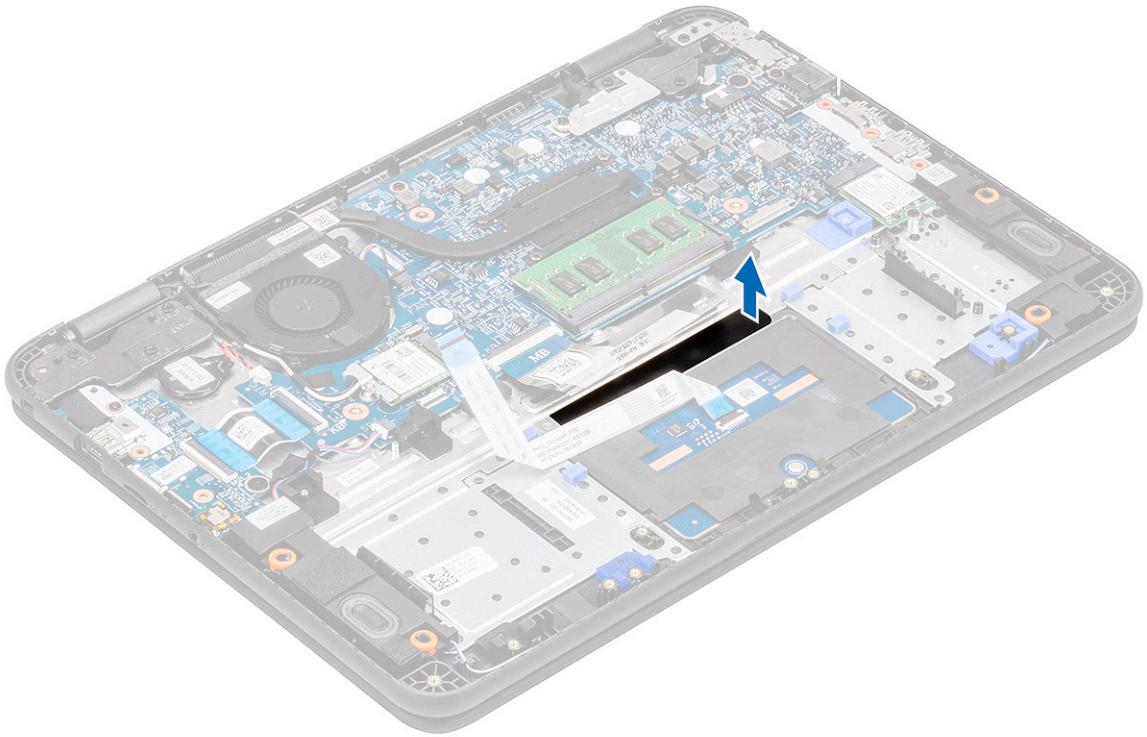
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
3. Lift the actuator and disconnect the touchpad cable from the system board [1].
4. Remove the tape [2,3,4] securing the touchpad to the chassis.



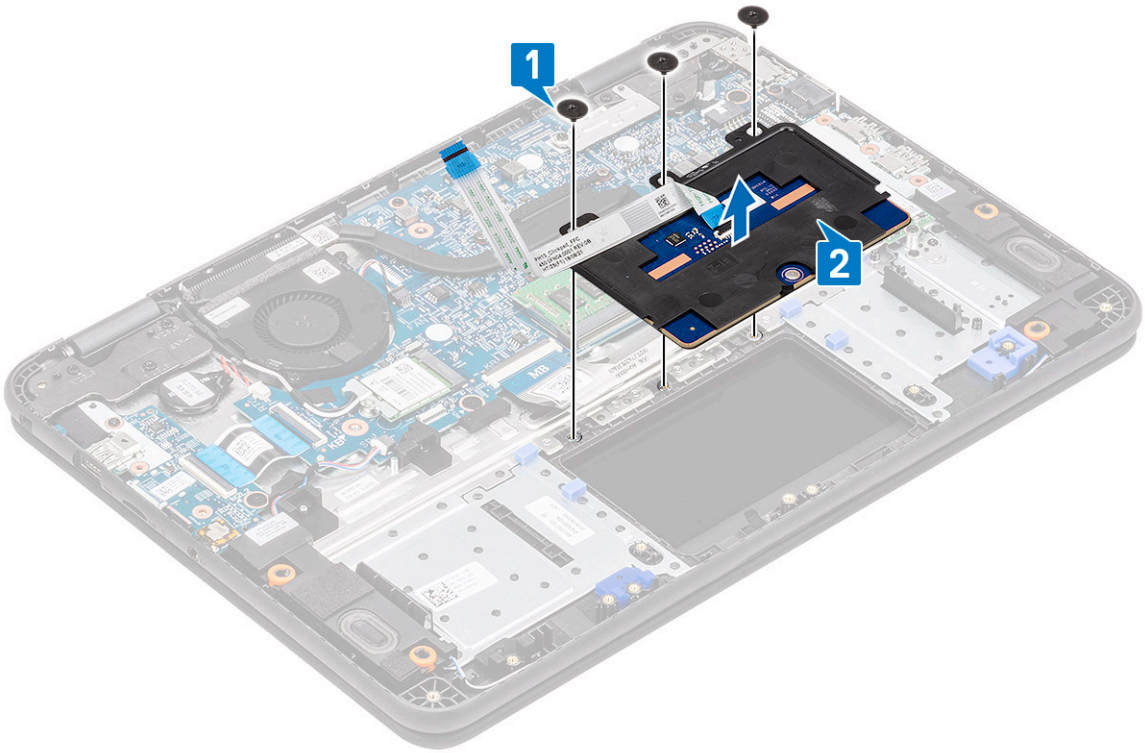
5. Remove the three M2.0x3.0 screws [1] that secure the metal bracket to the touchpad on the computer.



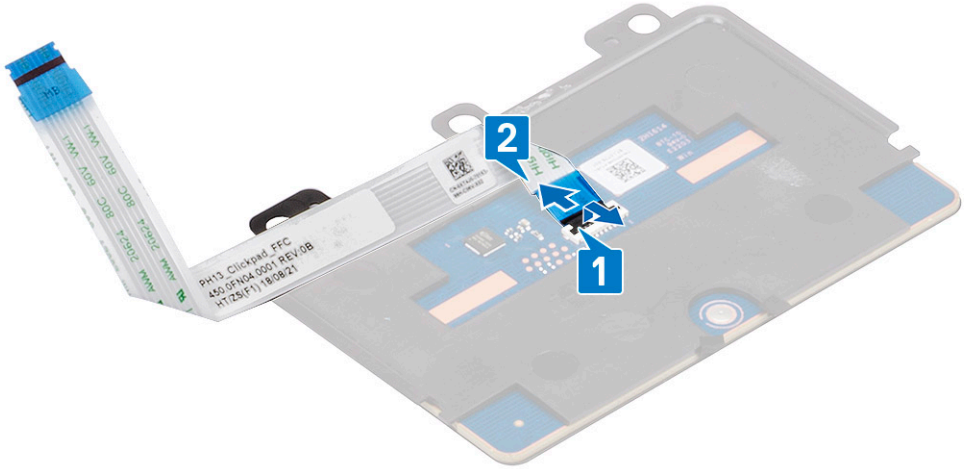
6. Peel off the tape from the touchpad.



7. Remove the M2.0x3.0 screws (large head) [1] that secure the touchpad to the system and then lift the touchpad from the system [2].

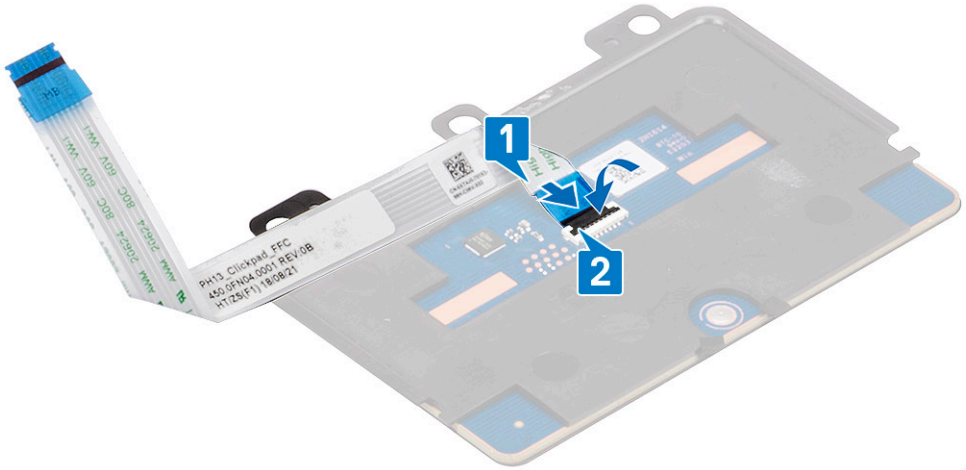


8. Lift the actuator [1] and remove the touchpad FFC cable [2] from the module.

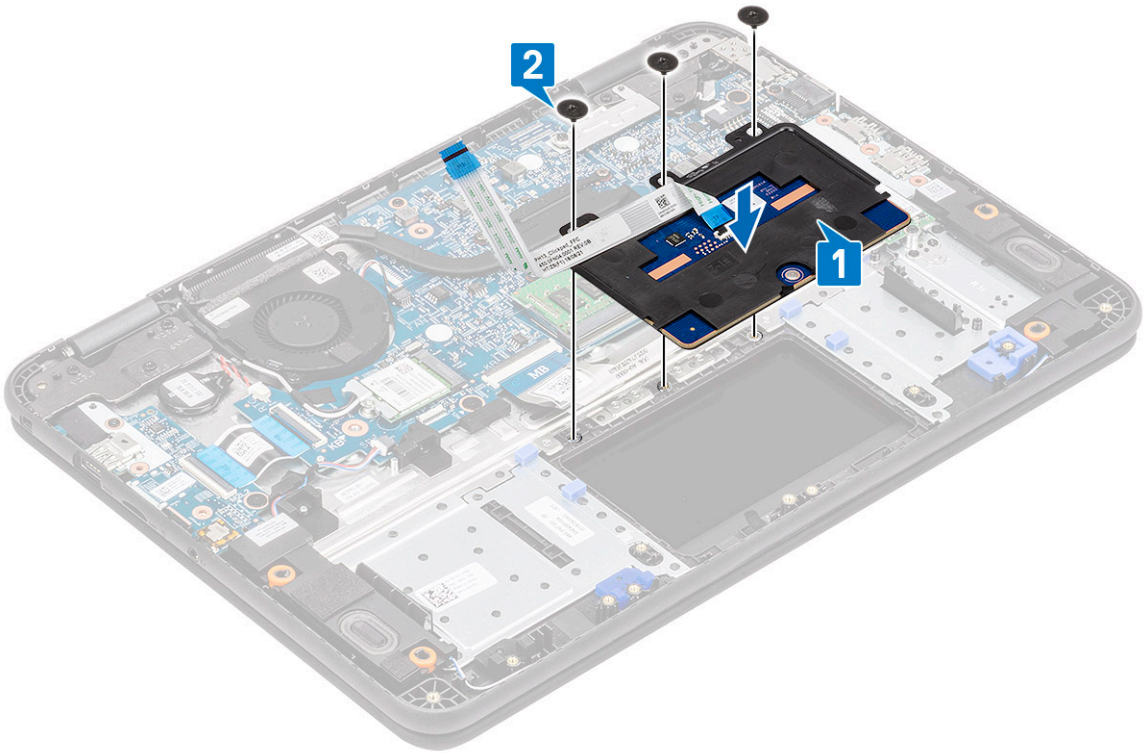


Installing the touchpad

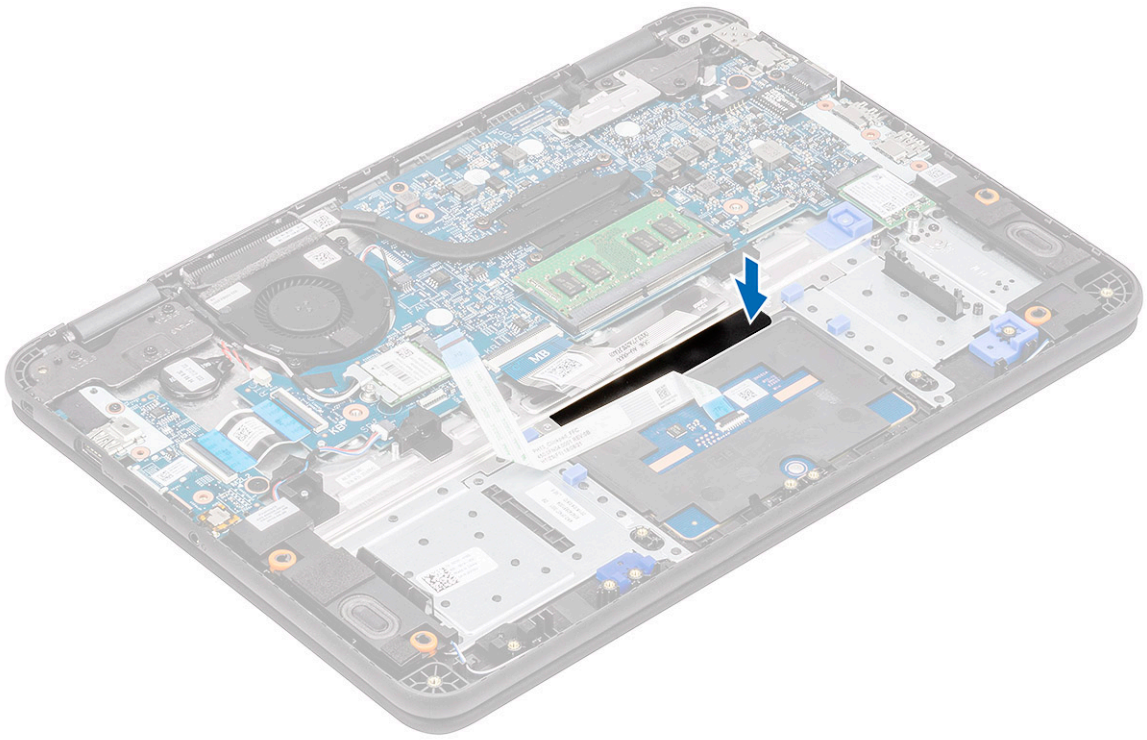
1. Install the touchpad FFC cable into its slot on the touchpad module [1] and close the actuator [2] to secure it.



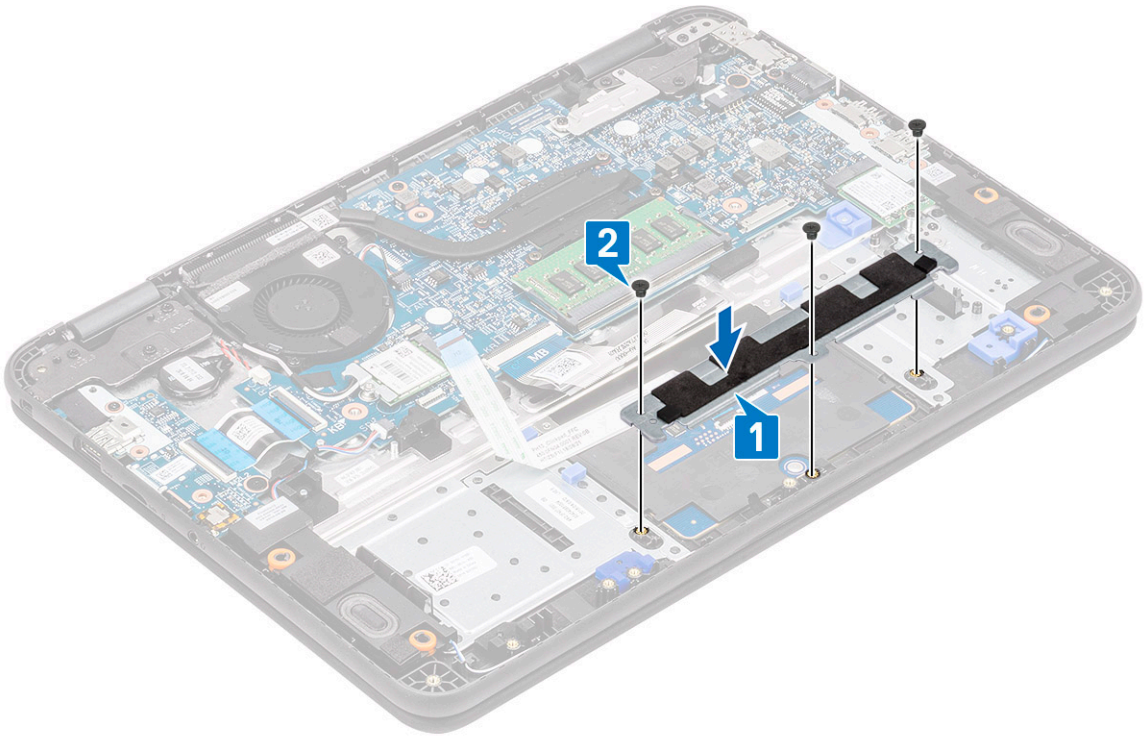
2. Place the touchpad into the slots on the computer [1] and tighten the three M2.0x3.0 screws [2] to secure the touchpad to the system.



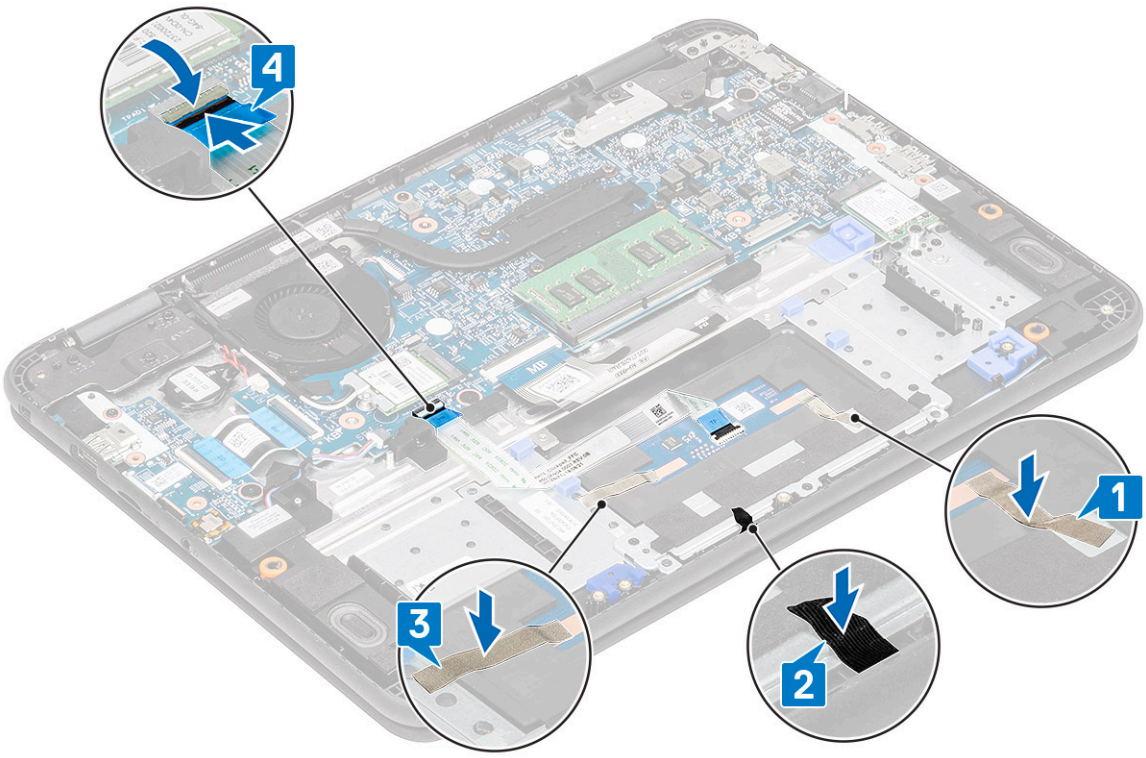
3. Secure the touchpad using a piece of tape.



4. Affix the bottom bracket [1] that secures the touchpad to the computer.
5. Install the three M2.0x3.0 screws [2] securing the touchpad to the system.



6. Affix the tapes [1,2,3] on the touchpad and connect the touchpad cable [4] to the connector on the system board.

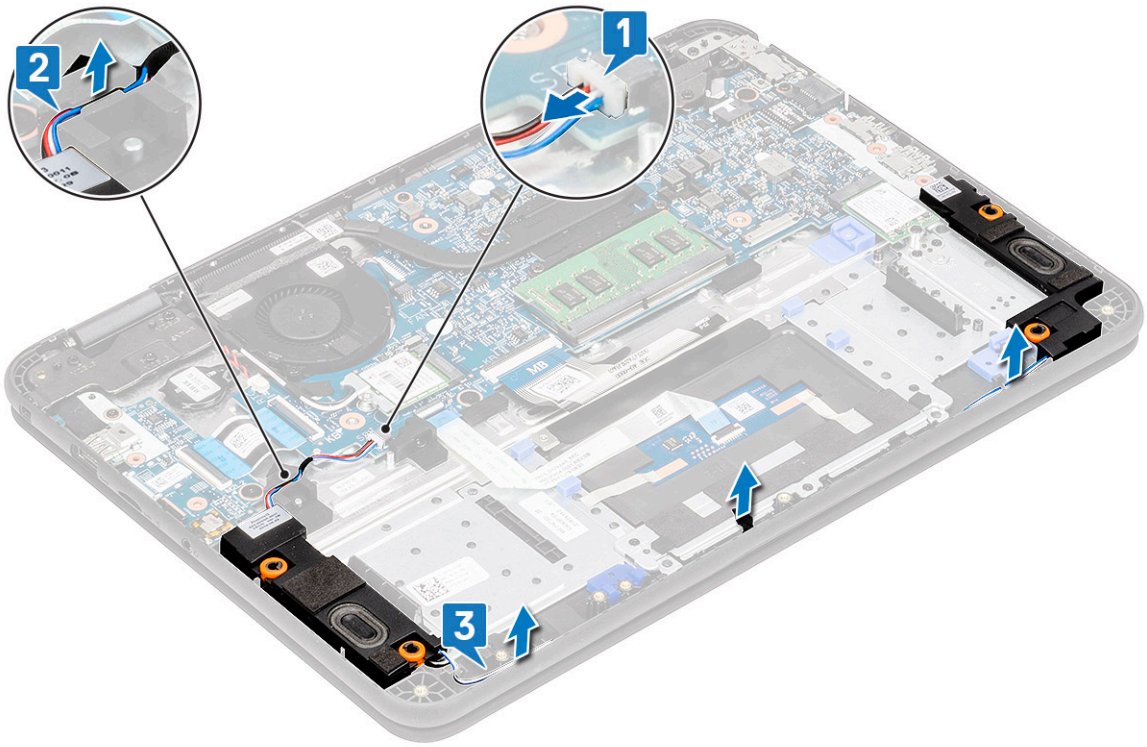


7. Install the:
   a. battery
   b. base cover
   c. microSD card
8. Follow the procedure in After working inside your computer.

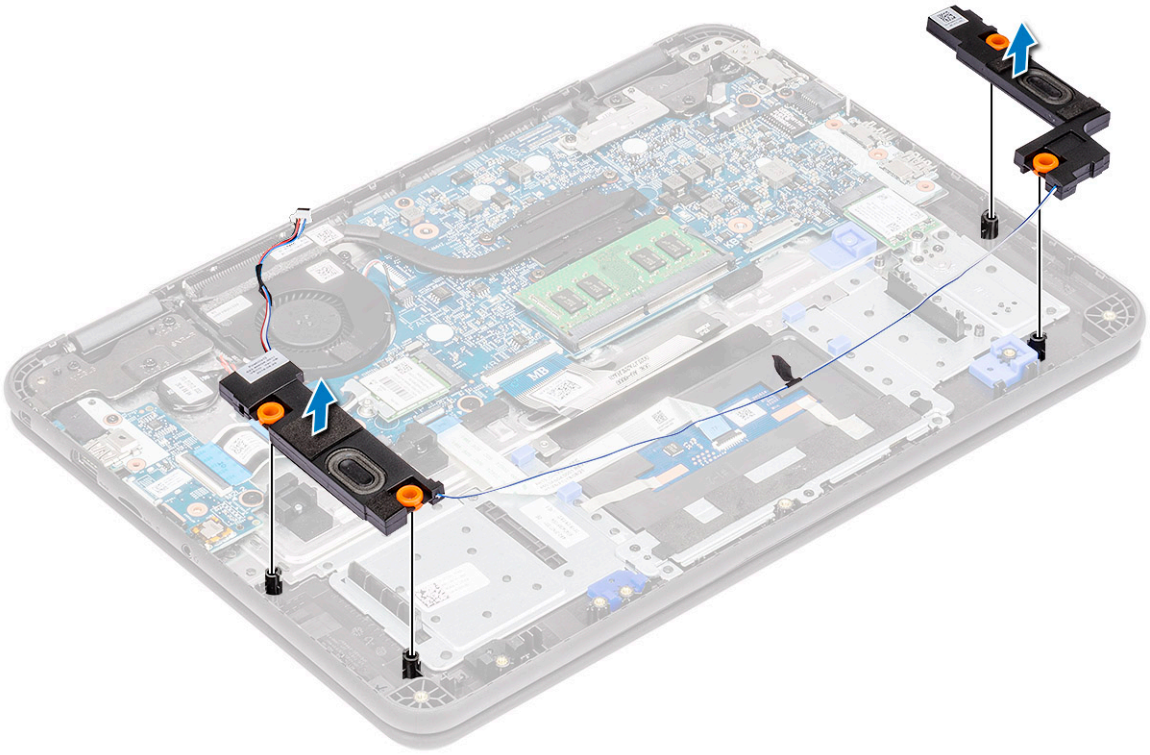
Speakers

Removing the speakers

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. Disconnect the speaker cable from the connector on the system board [1] and lift the speaker cable off from the cable guide [2].
5. Unroute the speaker cable from the routing channel [3] along the bottom of the touchpad on the palmrest.

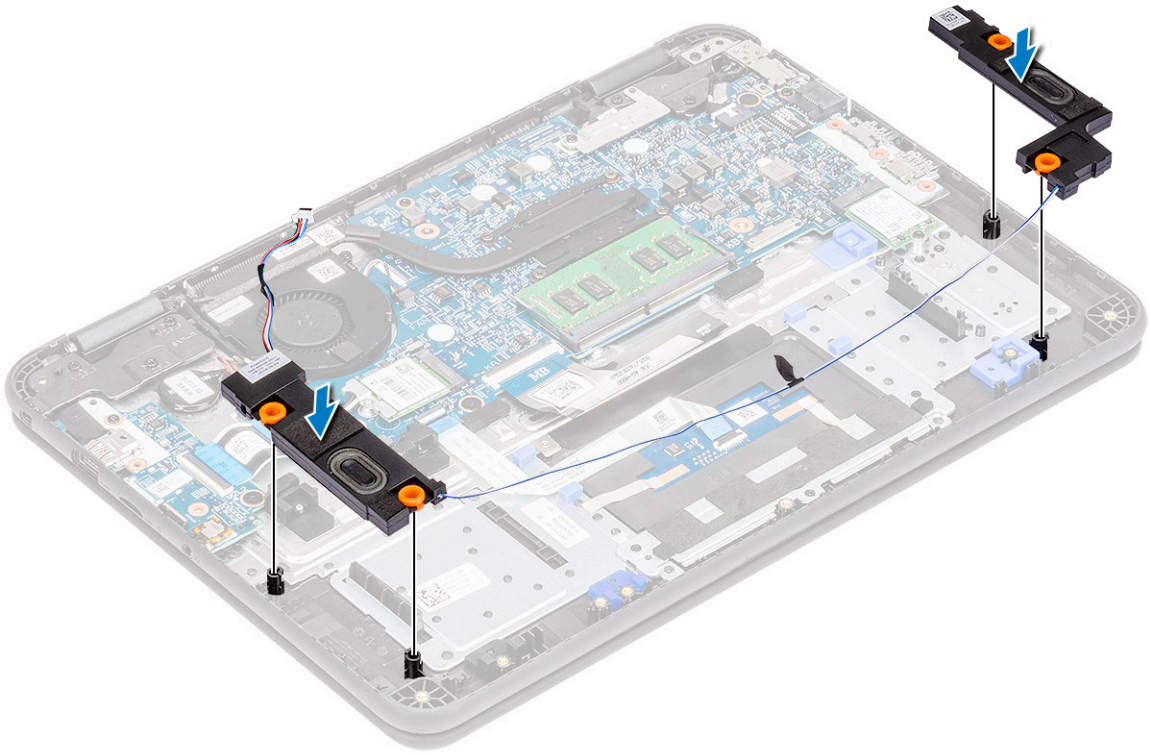


6. Remove the speakers along with the cable from the computer.

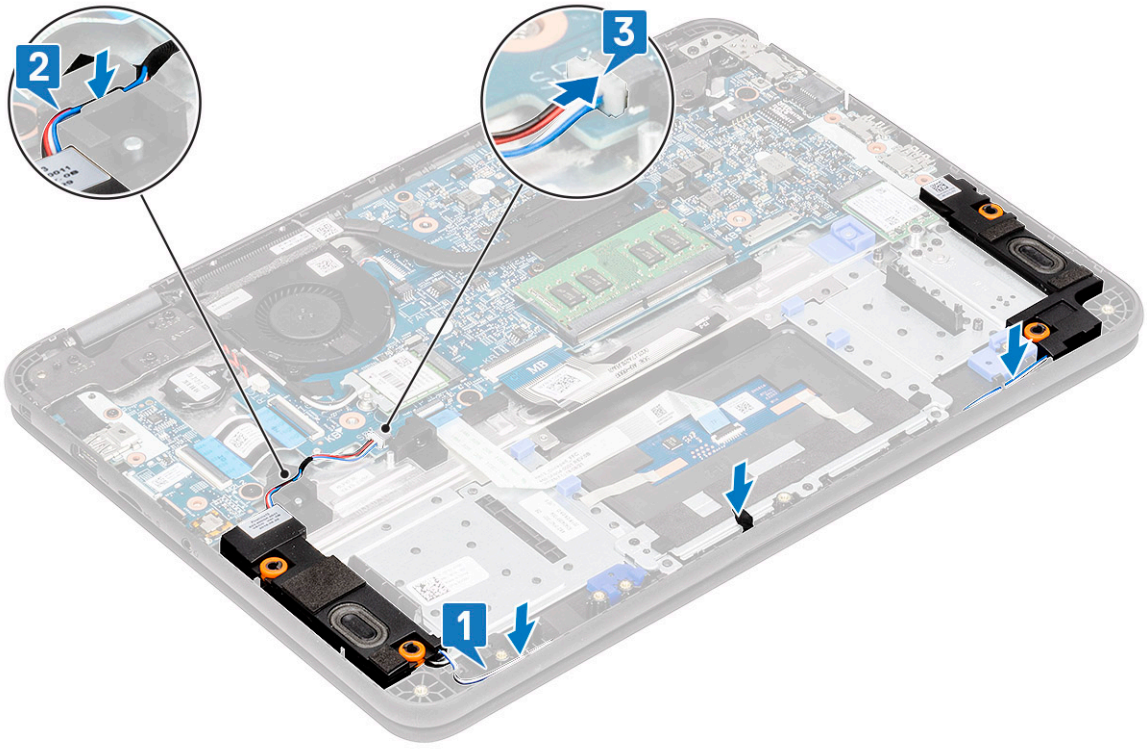


Installing the speakers

1. Place the speakers into the slots on the computer.



2. Route the speaker cable through the routing channel along the bottom of the touchpad on the palmrest [1].
3. Route and secure the speaker cable into the cable guide [2] and connect the cable to the connector on the system board [3].



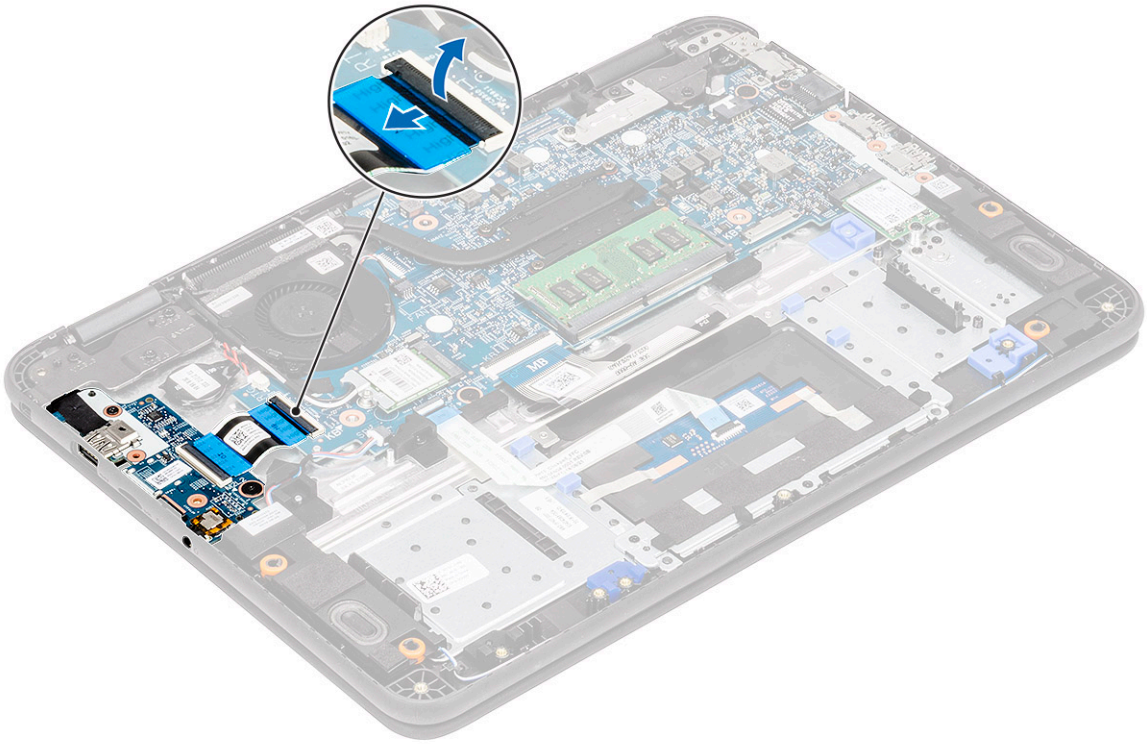
4. Reconnect the battery cable to the connector on the system board.
5. Install the:
   a. base cover
   b. microSD card
6. Follow the procedure in After working inside your computer.

I/O Daughterboard

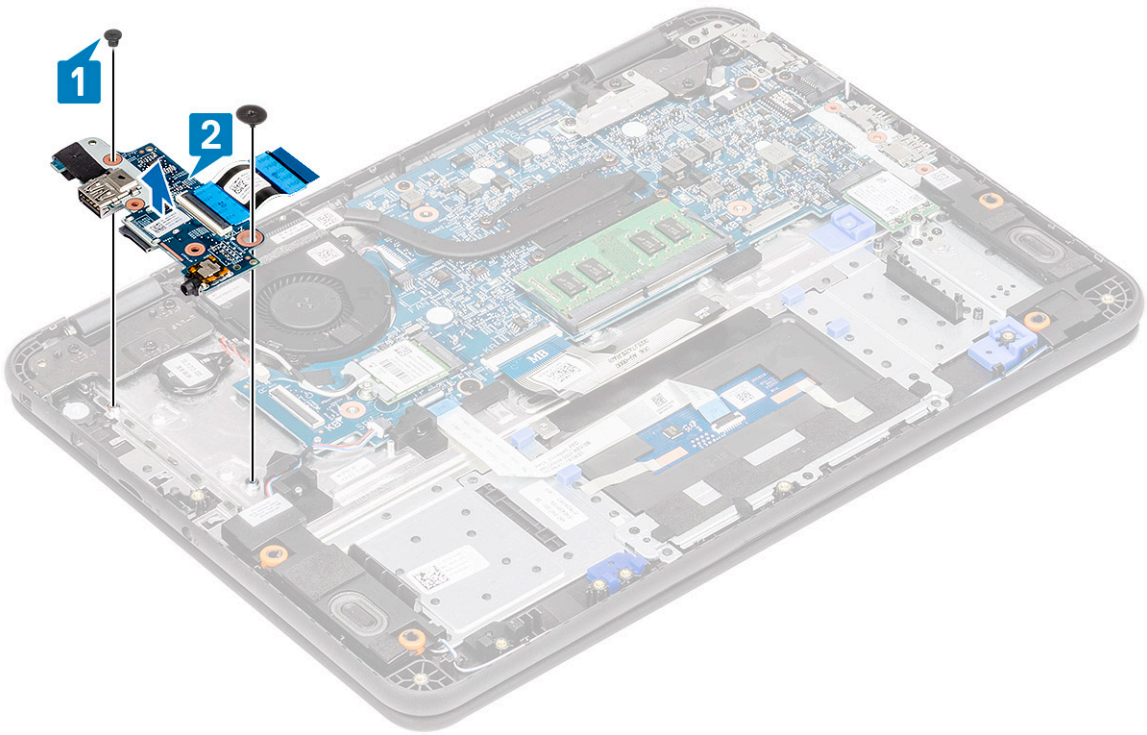
Removing the I-O daughterboard

1. **NOTE:** The power button is located on this PCB.

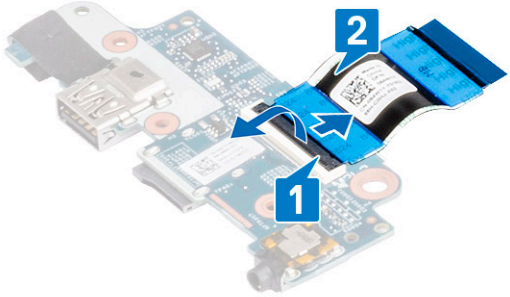
   Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
3. Disconnect the I/O daughterboard cable from its connector on the system board.



4. Remove the two M2.0x3.0 (One standard, 1 large head) screws that secure the I/O daughterboard to the palmrest [1] .
5. Lift and remove the I/O daughterboard from the computer [2].

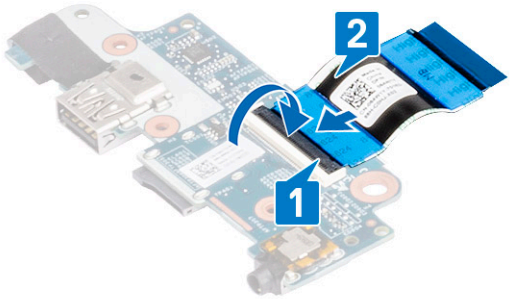


6. Open the actuator [1] and remove the FFC cable from the I/O board [2].

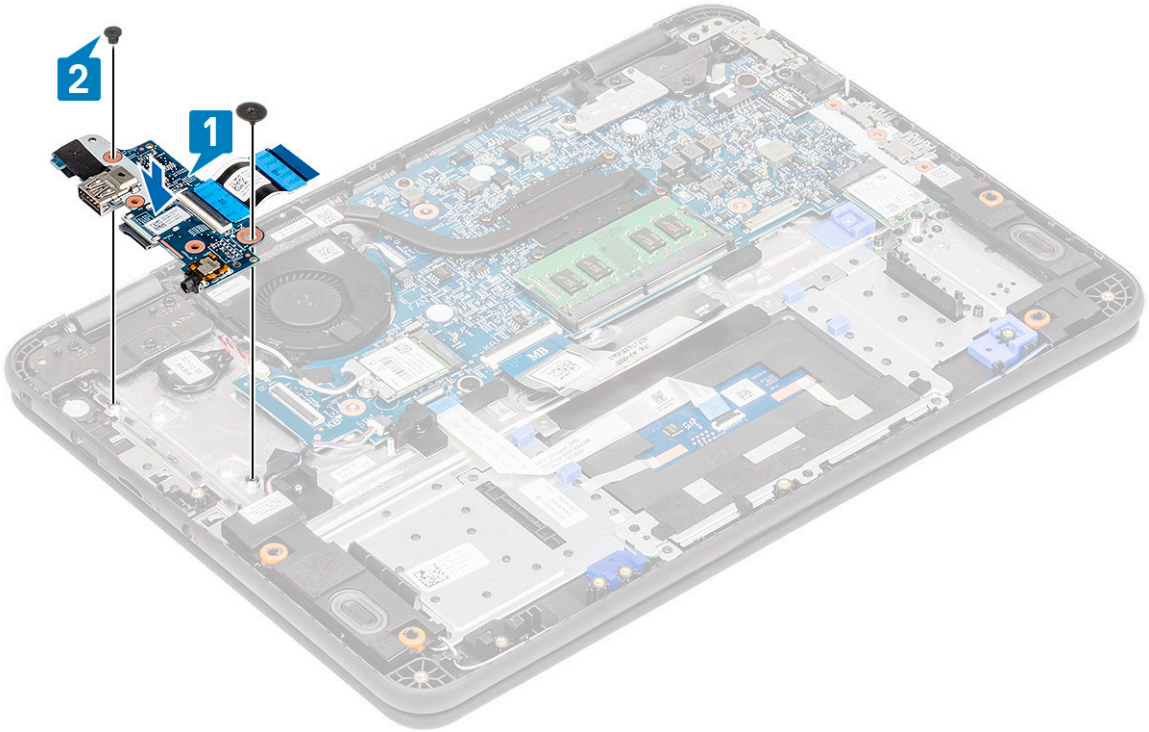


Installing the I/O daughterboard

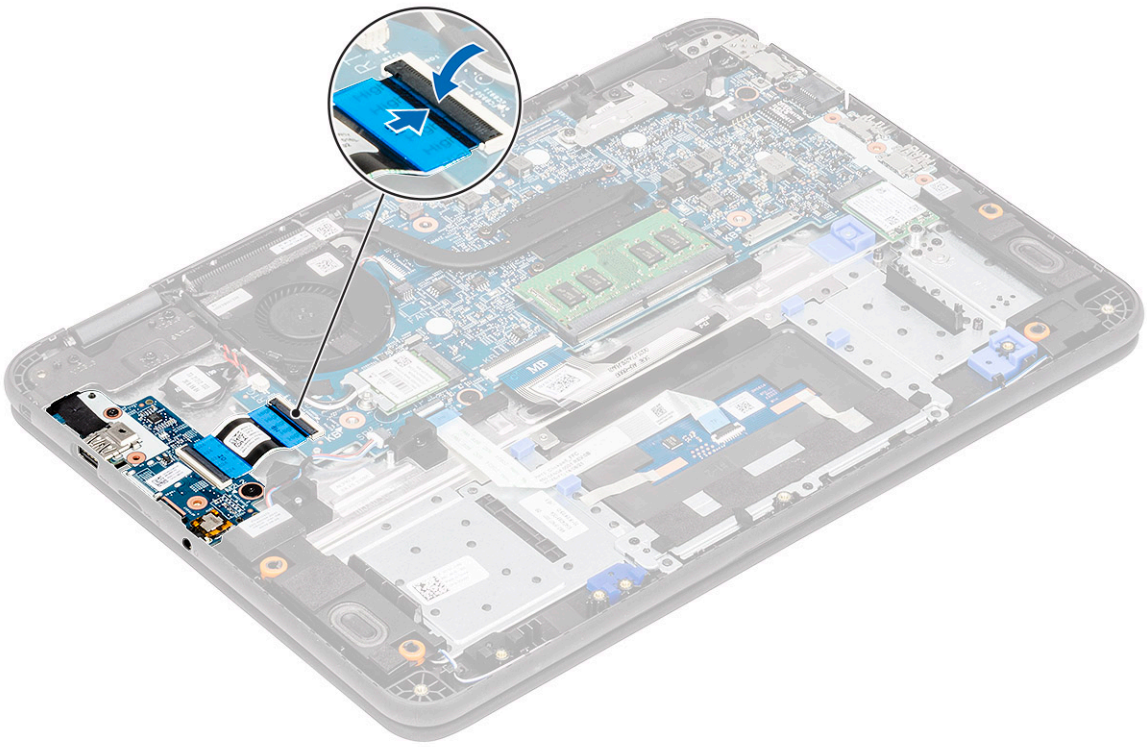
1. Install the FFC cable in the I/O board [1] and close the actuator [2].



2. Place the I/O daughterboard in its place on the computer [1] and tighten the two M2.0x3.0 screws to secure the I/O daughterboard to the system board [2].



3. Connect the I/O daughterboard FFC cable to the system board.

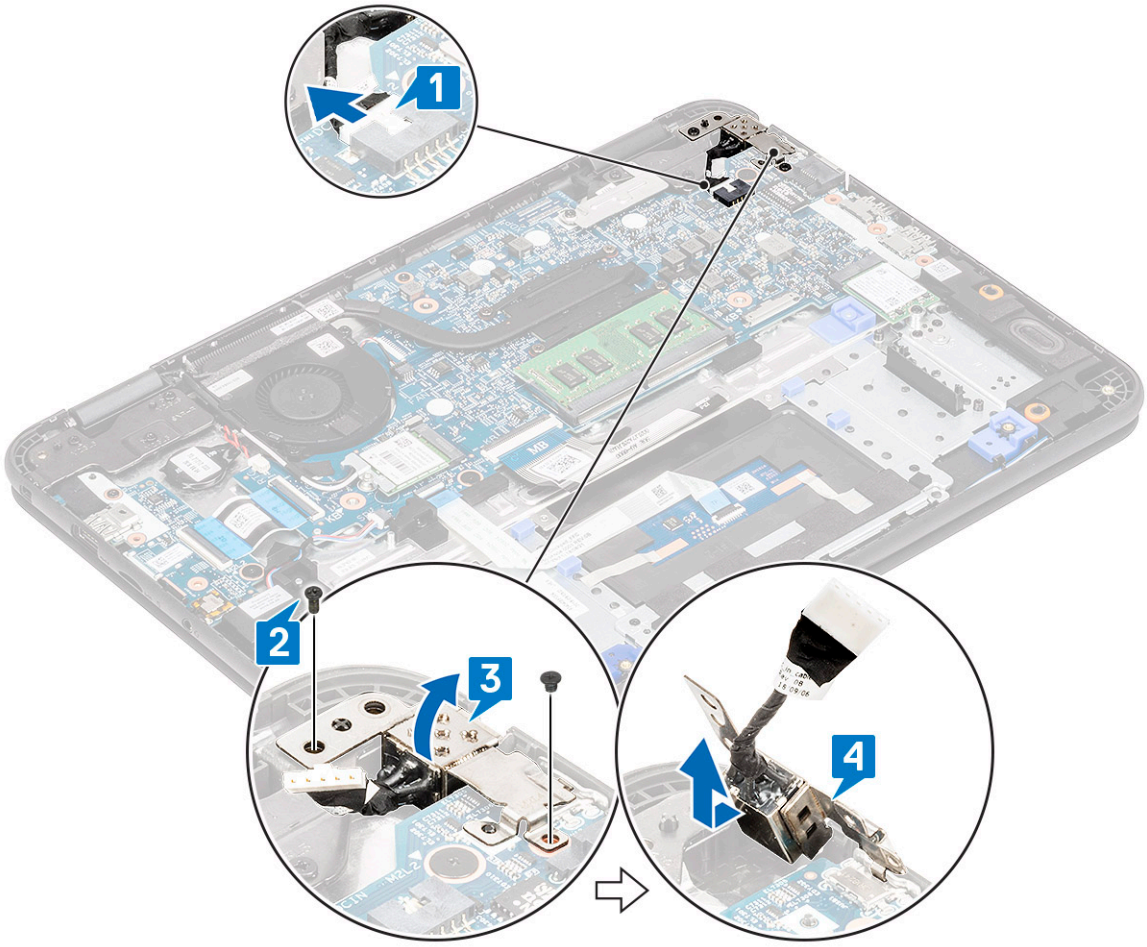


4. Install the:
   a. battery
   b. base cover
   c. microSD card
5. Follow the procedure in After working inside your computer.

Dc-in cable

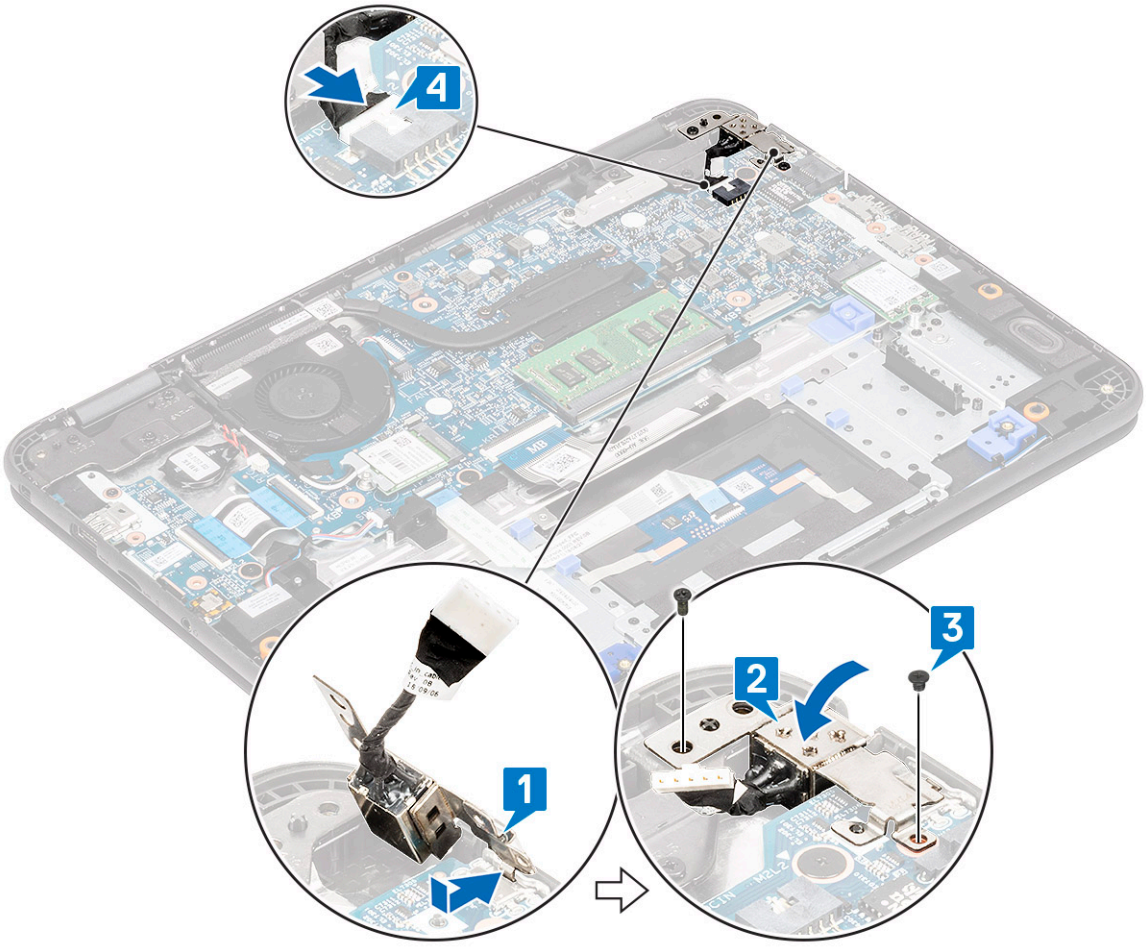
Removing the DC-in cable

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
3. Disconnect the DC-in cable from its connector on the system board [1].
4. Remove the one M2.0x4.0 and one M2.0x2.0 screws securing the DC-in port to the palmrest and the system board [2].
5. Flip over the metal bracket on the USB Type-C port of the system board [3].
6. Lift to remove the DC-in port from the computer [4].



Installing the DC-in cable

1. Install the DC-in port in the computer, aligning it with the notch in the chassis [1].
2. Ensure that the metal bracket sits flush on the USB Type-C port, aligning with screw holes on the system board [2].
3. Tighten the one M2.0x4.0 and one M2.0x2.0 screws to secure the DC-in to the motherboard and palmrest [3].
4. Connect the DC-in cable to the system board [4].



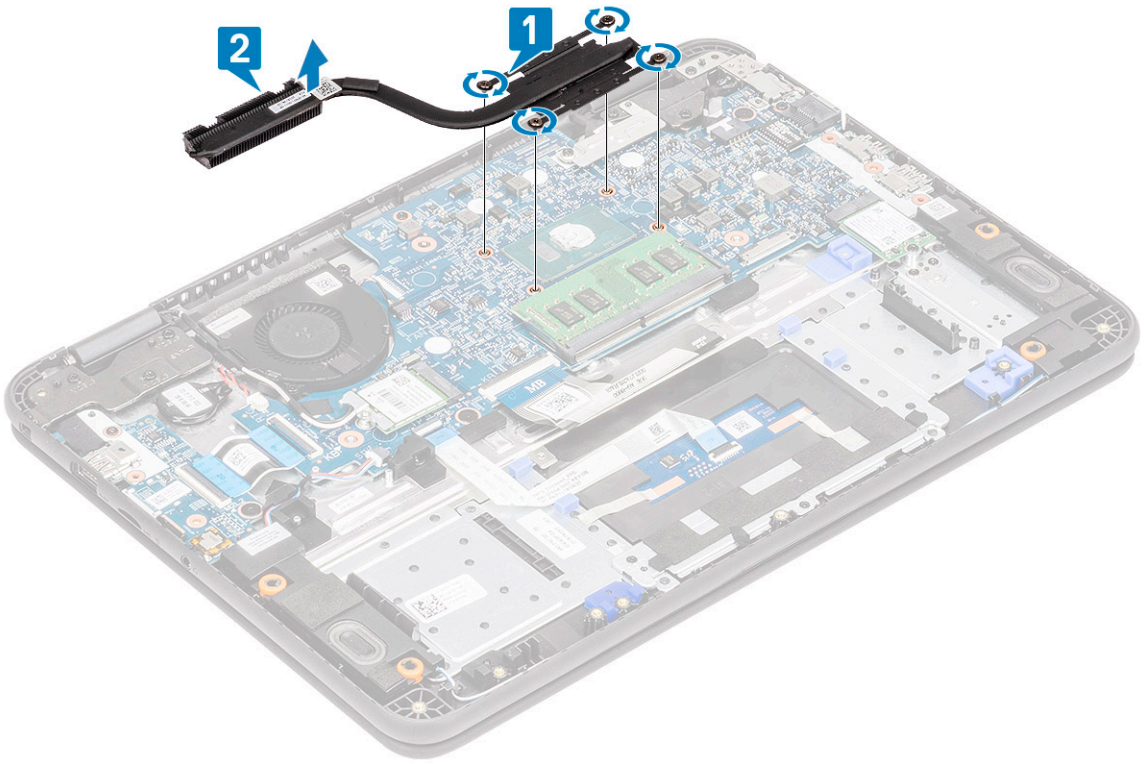
5. Install the:
   a. battery
   b. base cover
   c. microSD card
6. Follow the procedure in After working inside your computer.

Heat sink

Removing the heat sink

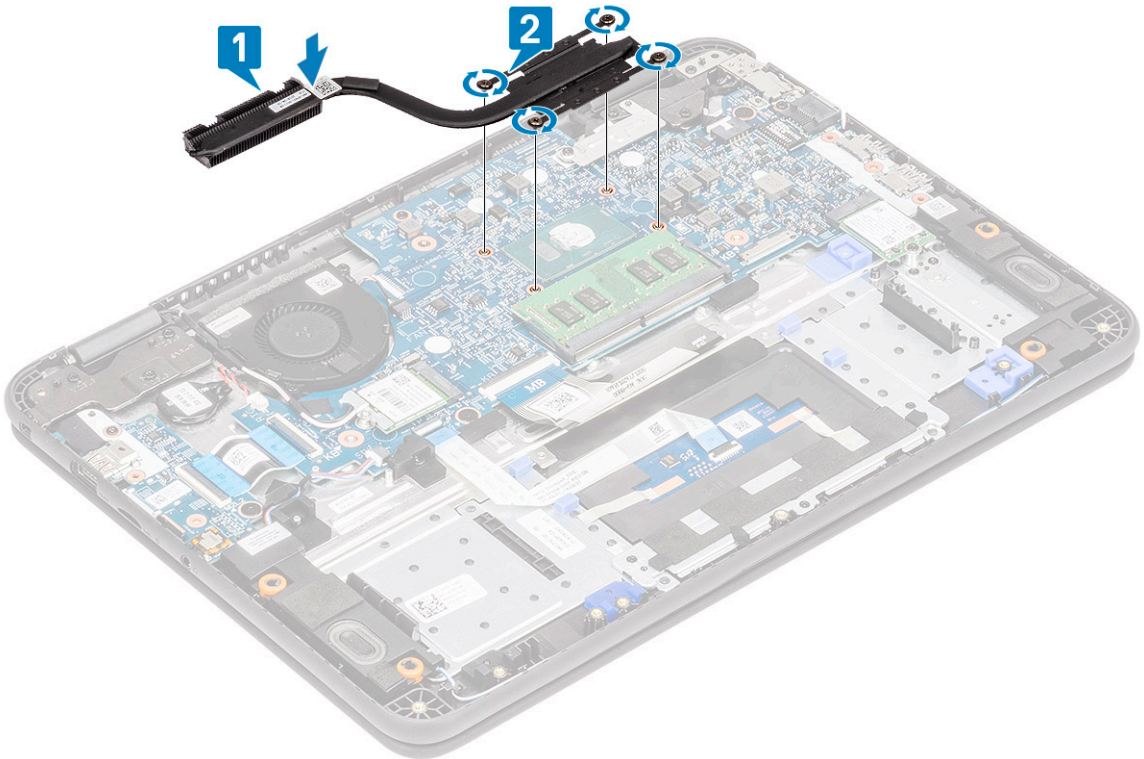
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
3. **NOTE:** Follow the diagonal order to loosen the screws.

   Loosen the four captive M2.5x2.5 screws that secure the heat sink to the computer [1].
4. Lift the heat sink away from the computer [2].



Installing the heat sink

1. Insert the heat sink into the slot on the computer [1].
2. Tightened the four M2.5x2.5 screws [2] to secure the heatsink to the computer.



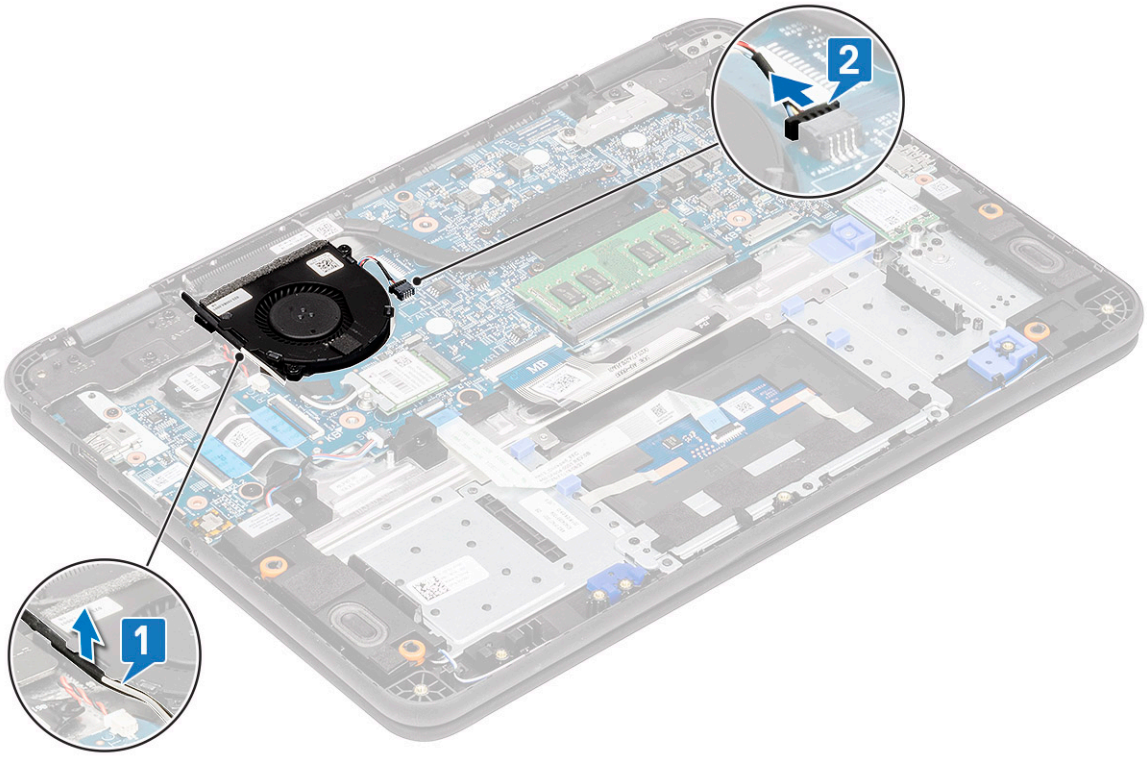
NOTE: Follow the diagonal pattern to tighten the screws, similar to the pattern followed to loosen the screws in "Removing heatsink".

3. Install the:
   a. battery
   b. base cover
   c. microSD card
4. Follow the procedure in After working inside your computer.

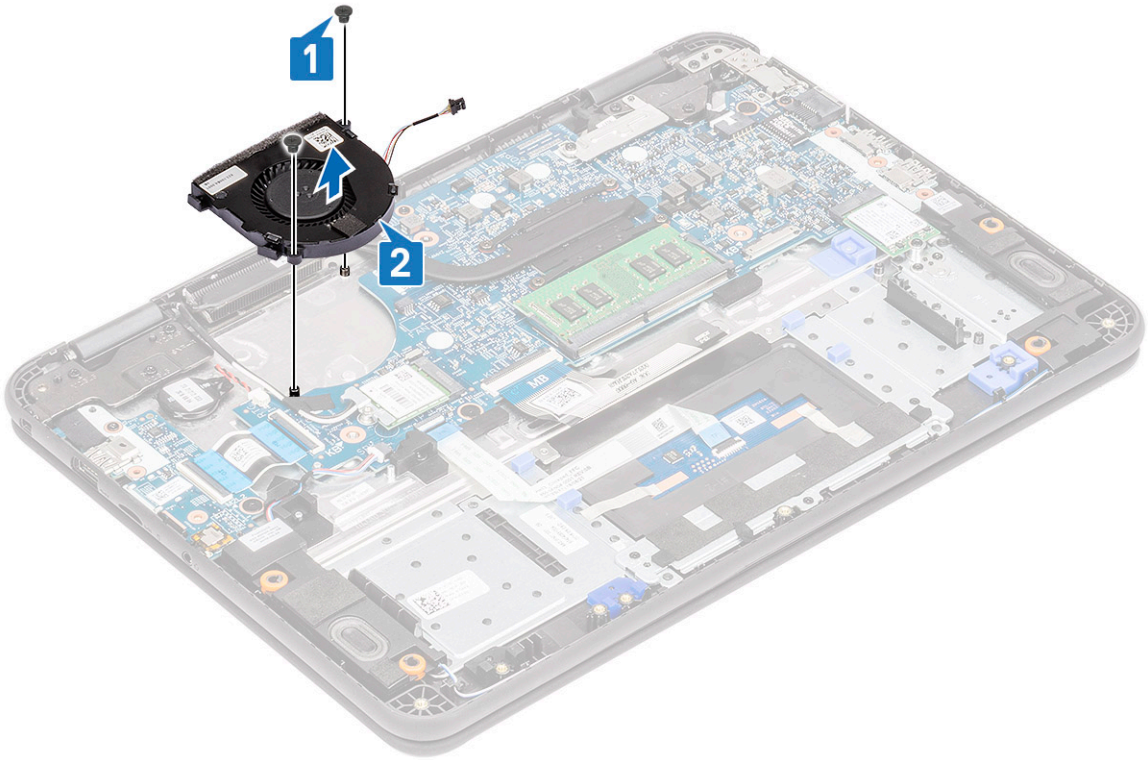
System Fan

Removing the system fan

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. Unroute and pry out the WLAN antennae cable from the hook near the fan case [1].
5. Disconnect the system fan connector from the system board [2].

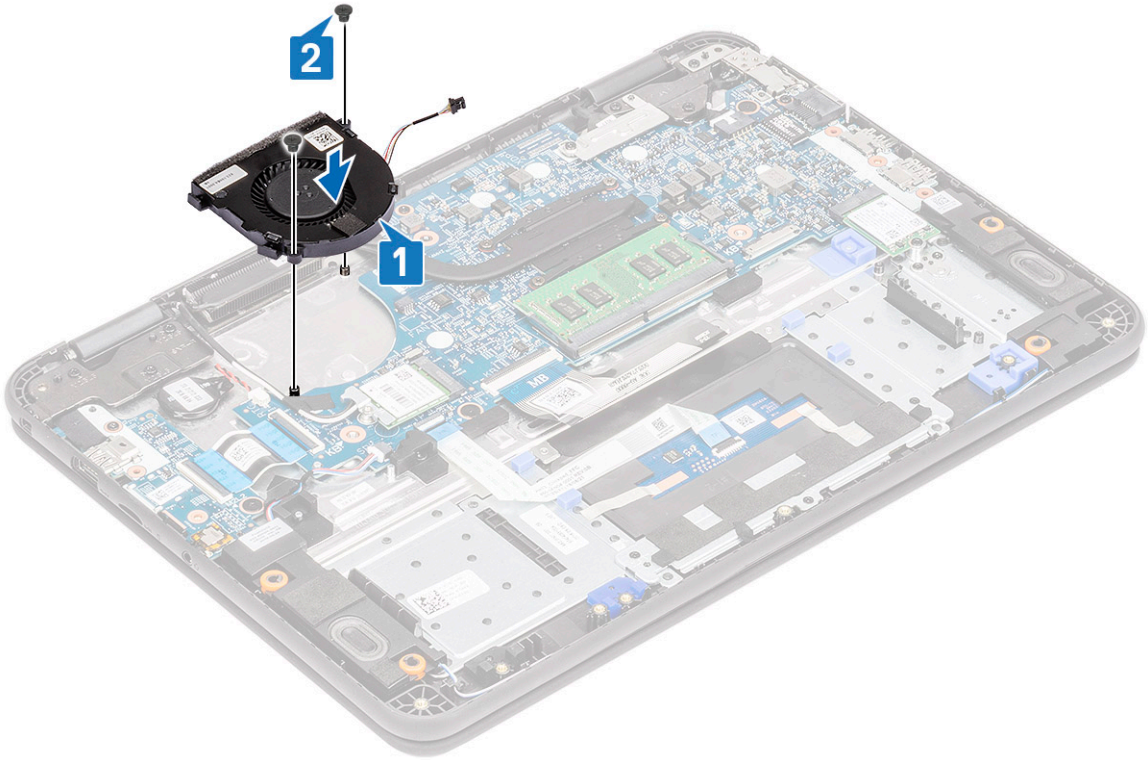


6. Remove the two M2.0x3.0 screws [1] that secure the system fan to the palmrest.
7. Lift the system fan off from the palmrest [2].

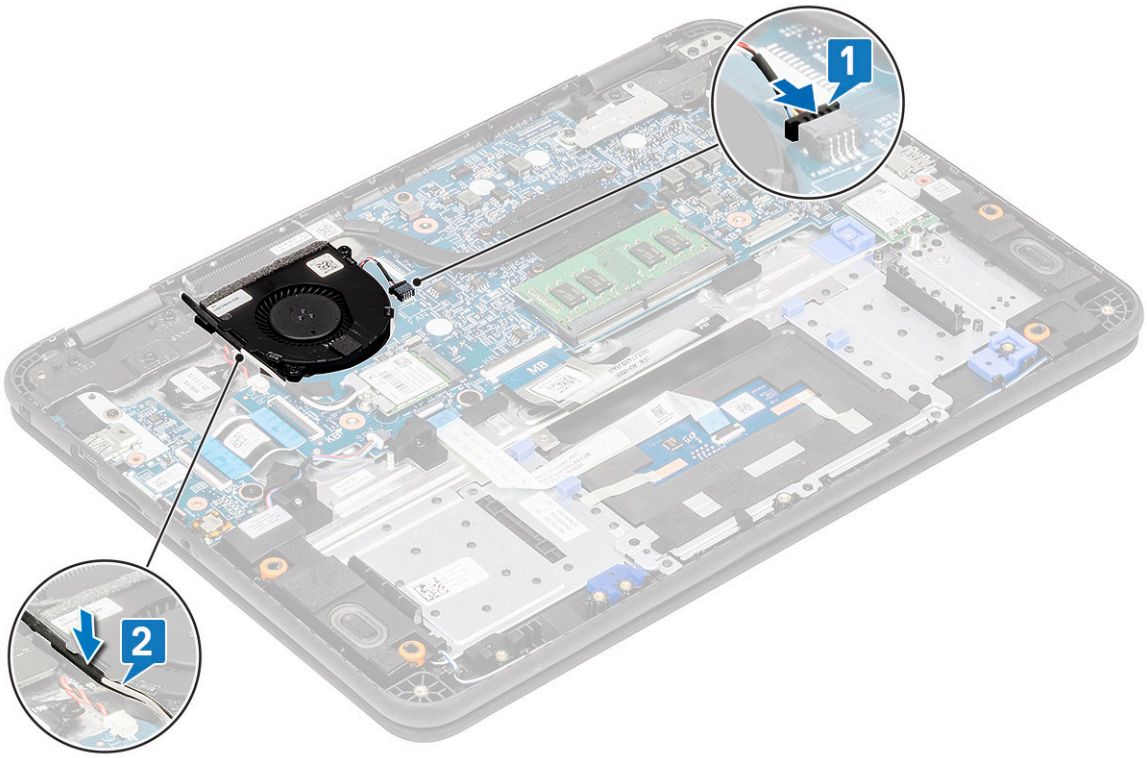


Installing the system fan

1. Place the system fan on the palmrest [1].
2. Install the two M2.0x3.0 screws [2] to secure the system fan to the palmrest.



3. Connect the fan cable to the system board [1].
4. Route the WLAN antennae cable along the fan case onto its hook on the system board [2].

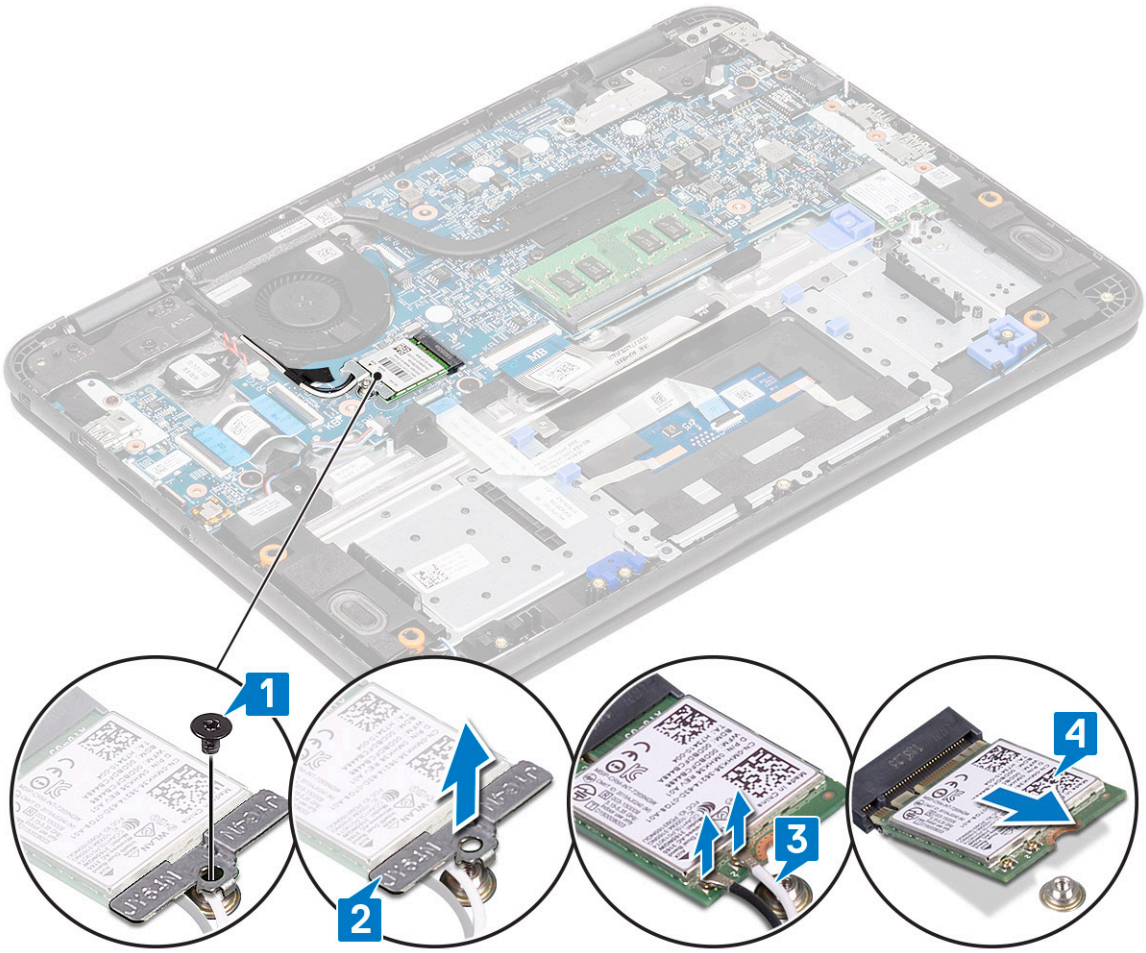


5. Reconnect the battery cable to the connector on the system board.
6. Install the:
   a. base cover
   b. microSD card
7. Follow the procedure in After working inside your computer.

WLAN Card

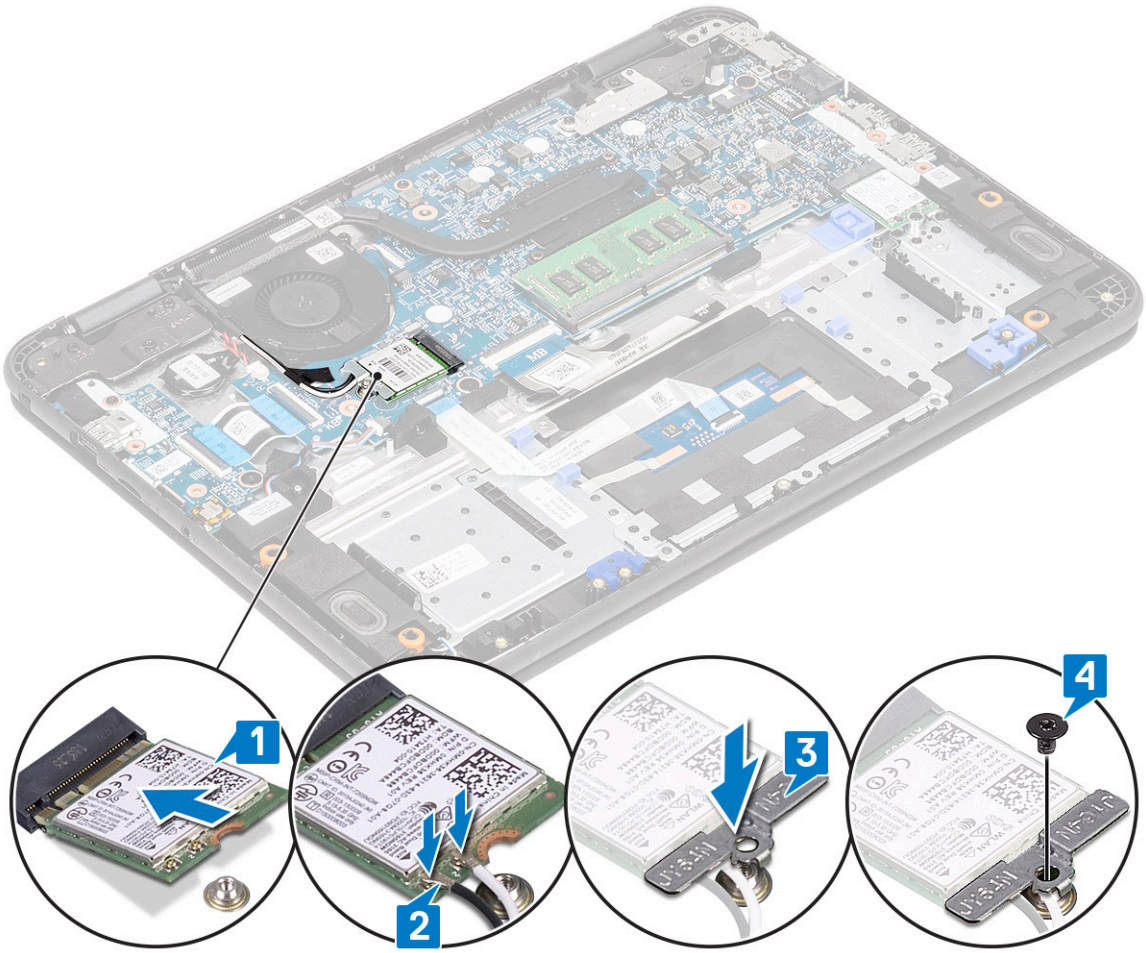
Removing the WLAN card

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
3. Disconnect the battery cable from the connector on the system board.
4. Remove the single M2.0x3.0 screw that secures the WLAN metal bracket to the computer [1] and lift and remove the metal bracket off the WLAN card [2].
5. Disconnect the two antenna cables [3] and remove the WLAN card from the M.2 connector on the system board [4].



Installing the WLAN card

1. Insert the WLAN card into the M.2 connector on the system board [1].
2. Connect the two antenna cables to the WLAN card [2].
3. Replace the metal bracket on the WLAN [3].
4. Tighten the M2.0x3.0 screw to secure the WLAN card and bracket to the system board [4].



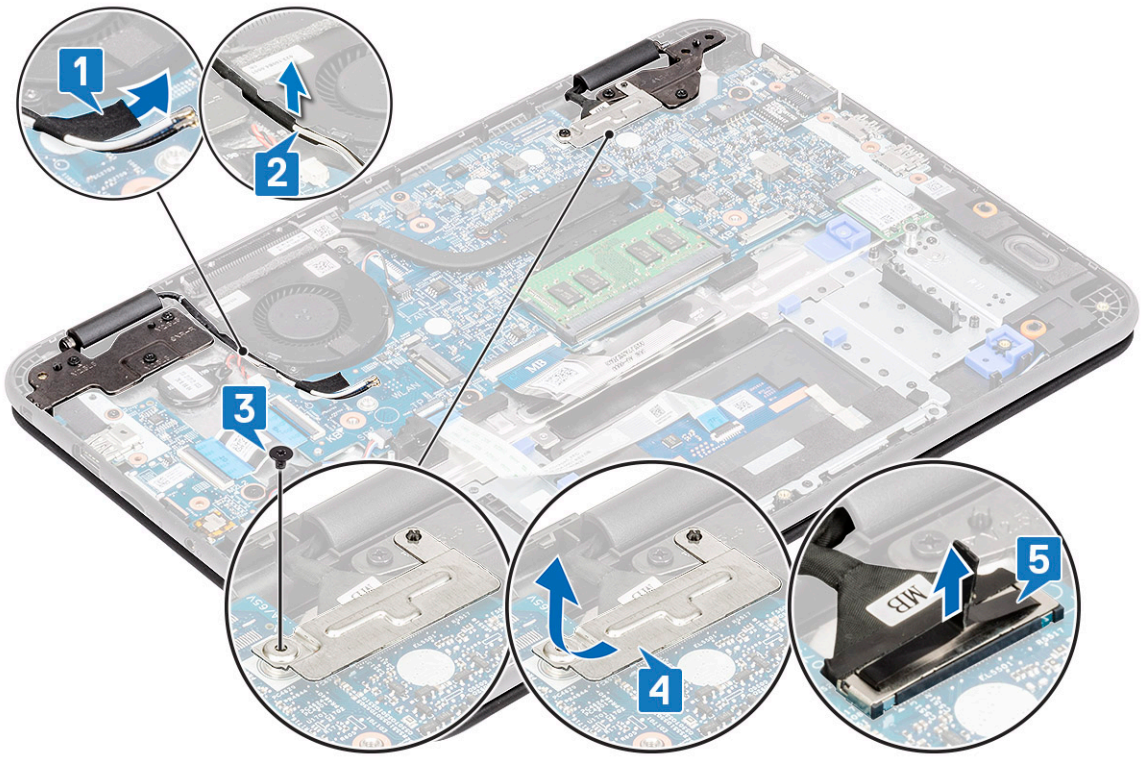
5. Reconnect the battery cable to the connector on the system board.
6. Install the:
   a. base cover
   b. microSD card
7. Follow the procedure in After working inside your computer.

Display assembly

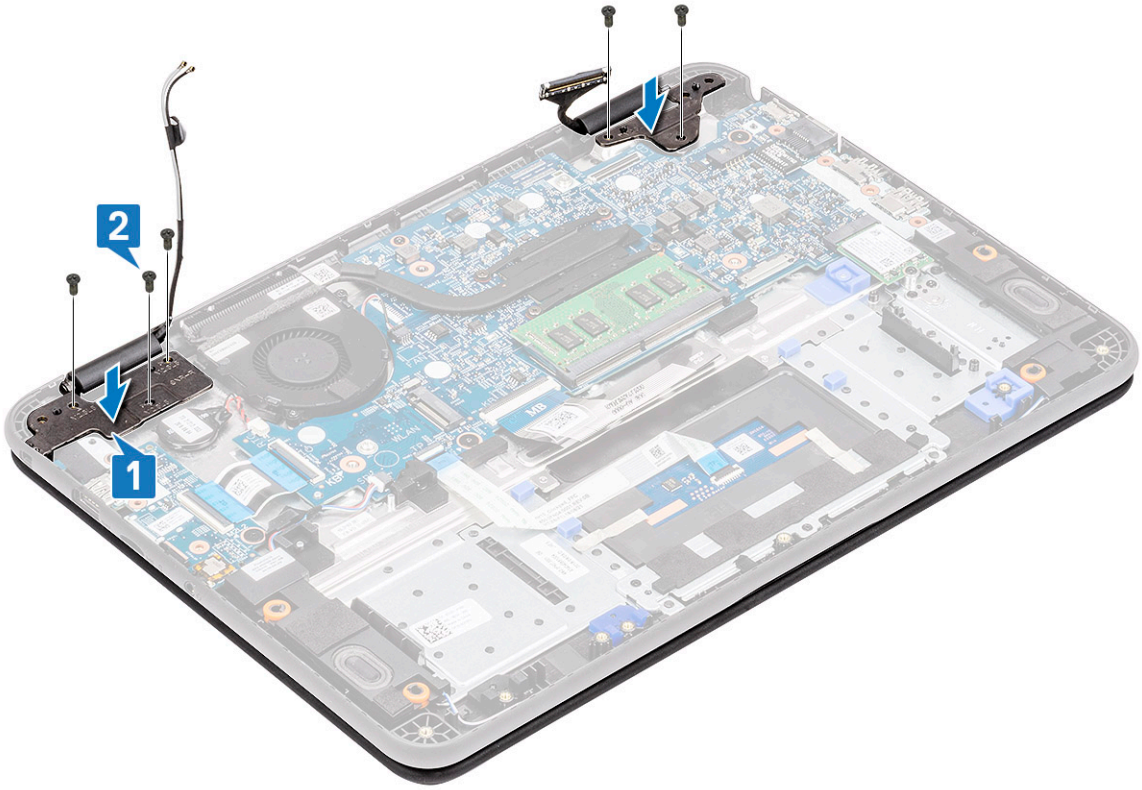
Removing the display assembly

NOTE: This process is for both touch and non-touch LCDs.

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. DC-in cable
3. Remove the tape [1] and unroute the antennae cable [2] near the fan case.
4. Remove the single screw that secures the EDP bracket [3] and remove it off the EDP connector on the system board [4].
5. Disconnect the EDP cable from the system board [5].

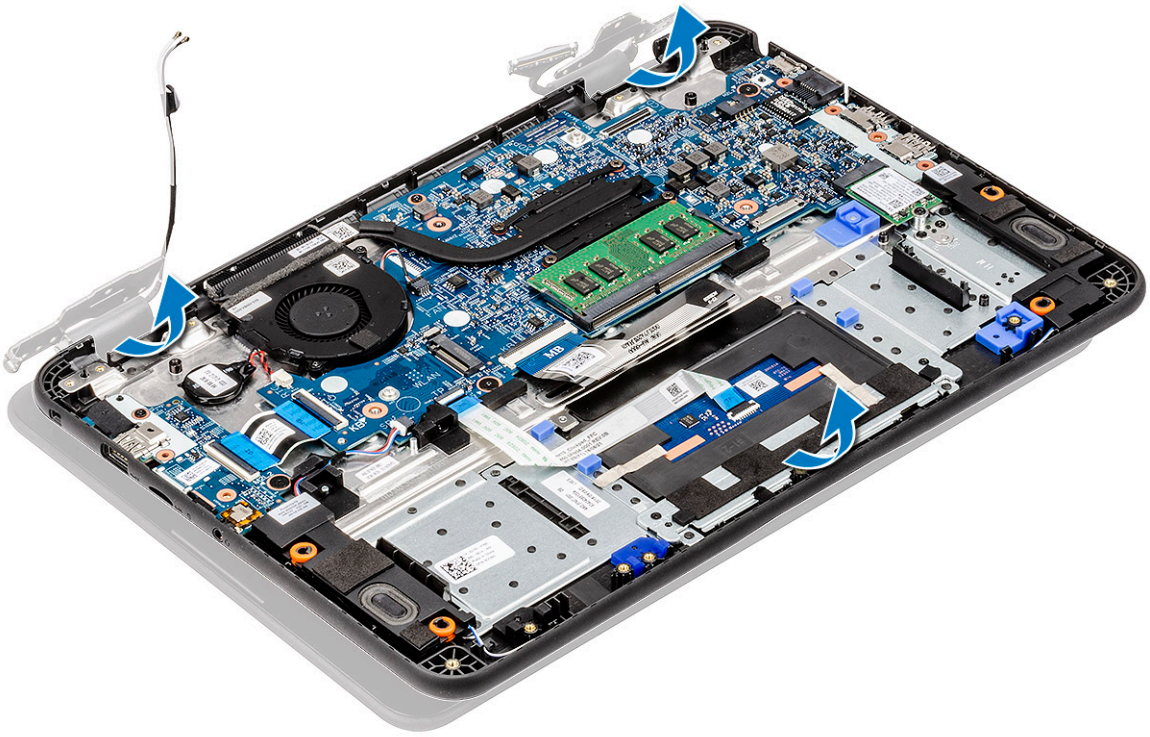


6. Remove the five M2.5x5.0 screws securing the LCD hinges to the computer.



7. Open the lid slightly.

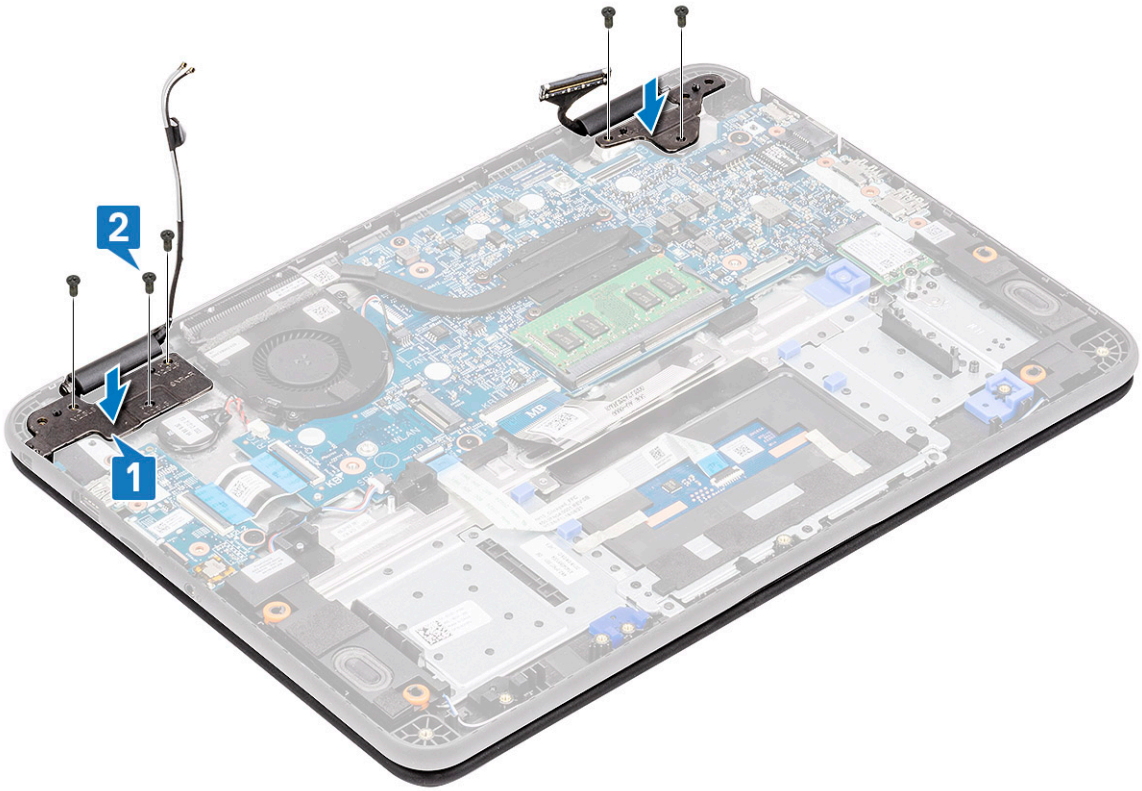
8. Separate the hinges from the palmrest and separate the display assembly from the computer.



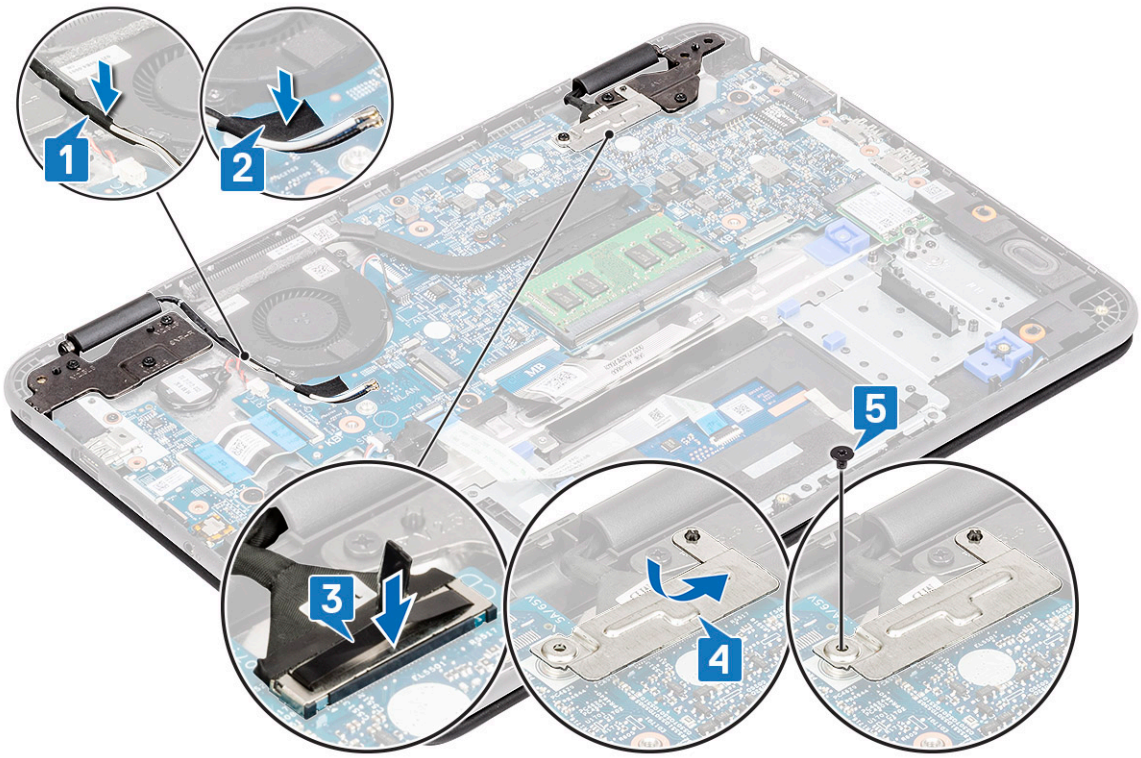
Installing the display assembly

1. Install the display assembly aligning the hinge caps on the palmrest.

2. Align the hinges to the screw holes on the system board [1] and tighten the five M2.5x5.0 screws [2] to secure the display assembly to the computer.



3. Route the antennae cable along the edges of the fan case [1] and stick a piece of tape [2] to secure it to the system board.
4. Connect the EDP cable [3], place the EDP bracket on the connector [4] , and secure it to system board using the single screw [5].



5. Install the:
   a. DC-in cable
   b. WLAN card
   c. battery
   d. base cover
   e. microSD card
6. Follow the procedure in After working inside your computer.

Display bezel

Removing the display bezel

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. DC-in cable
   f. display assembly
3. Remove the screw protector caps [1] and then remove the two M2.0x4.0 screws securing the bezel [2] to the back cover.

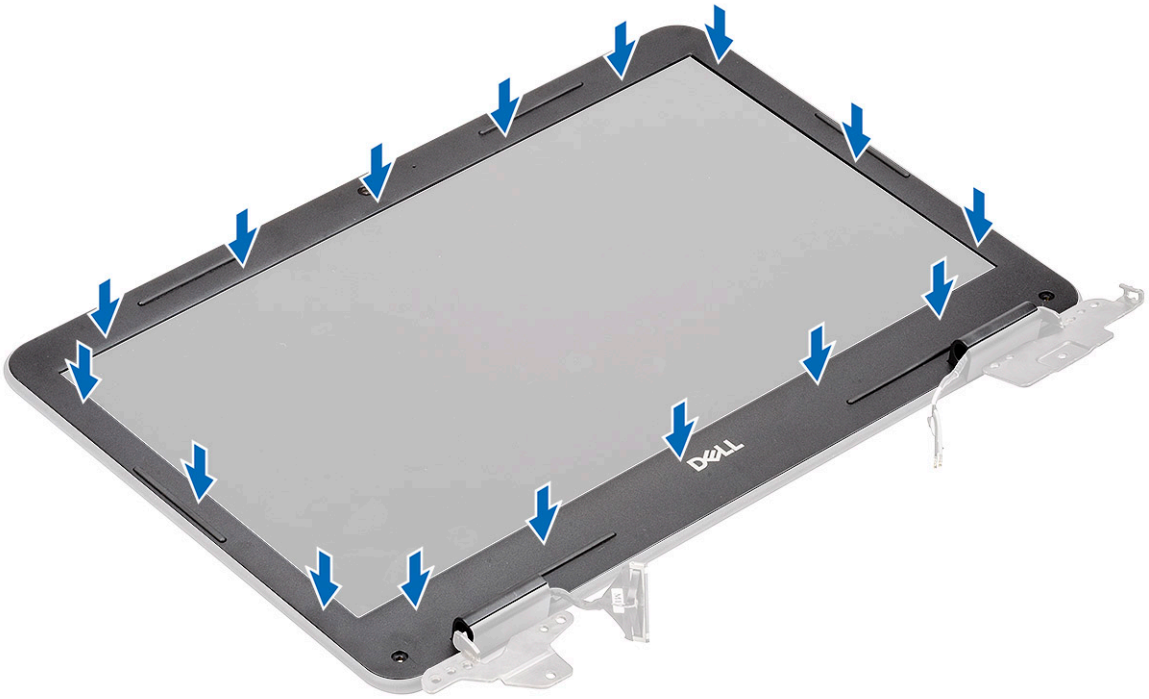
4. Pry from all sides along the inside of the LCD panel to separate the LCD bezel from the back cover.

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

Installing the display bezel

1. Place the bezel on the LCD back cover preassembled with the LCD panel.

2. Press along the edges of the LCD to clip the LCD back cover to the bezel.



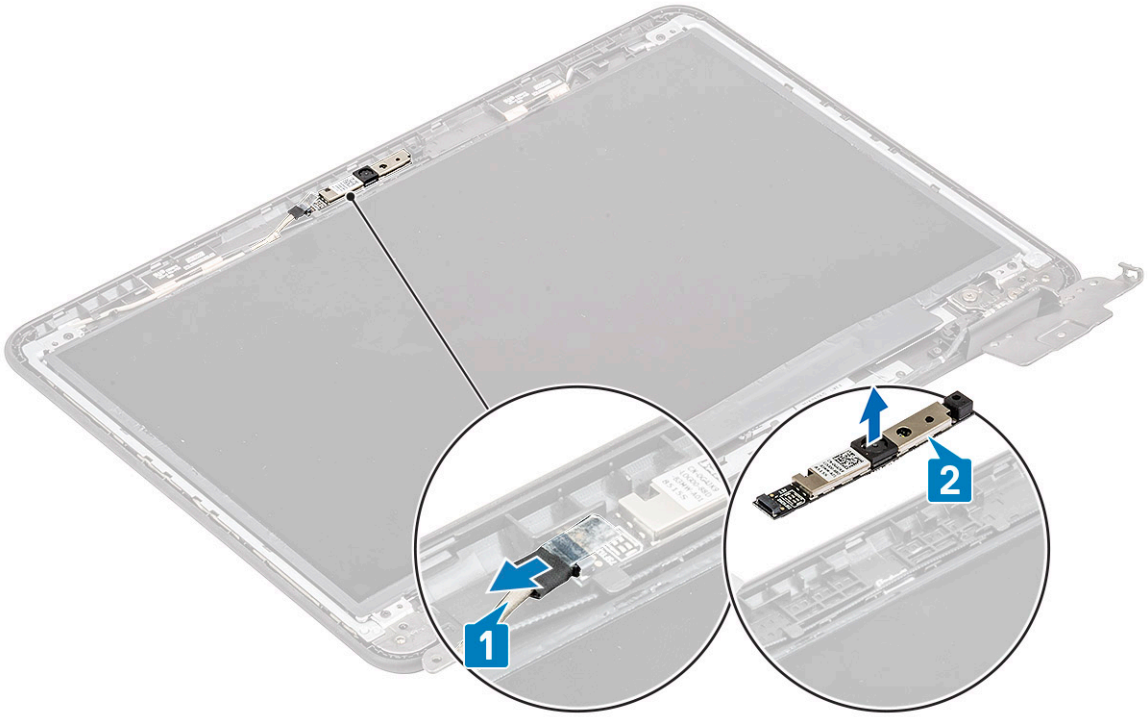
3. Install the two M2.0x4.0 screws [1] to secure the display bezel to the back cover and affix the screw protector caps [2].

4. Install the:
   a. display assembly
   b. DC-in cable
   c. WLAN card
   d. battery
   e. base cover
   f. microSD card
5. Follow the procedure in After working inside your computer.

Camera microphone module

Removing the camera-microphone module

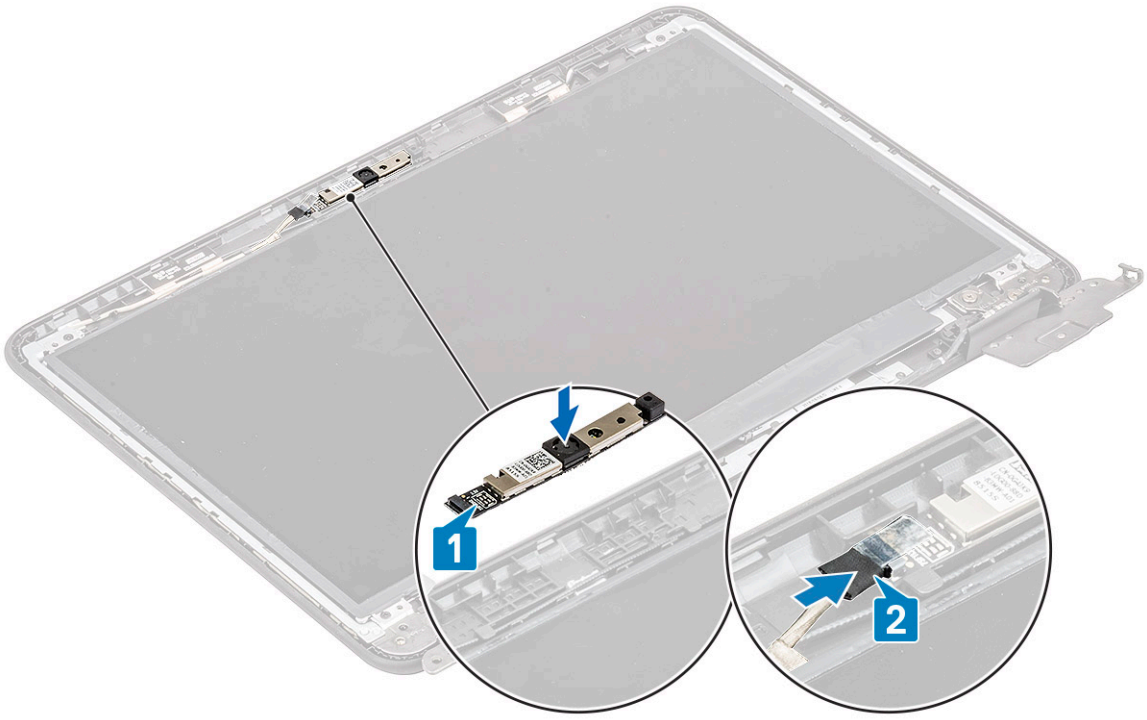
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. DC-in cable
   f. display assembly
   g. display bezel
3. Disconnect the EDP cable from the microphone-camera module [1].
4. Lift the microphone-camera module from the display assembly [2].



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

Installing the camera-microphone module

1. Align and place the camera-microphone module on the LCD back cover assembly [1].
2. Connect the EDP cable to the camera-microphone module [2].

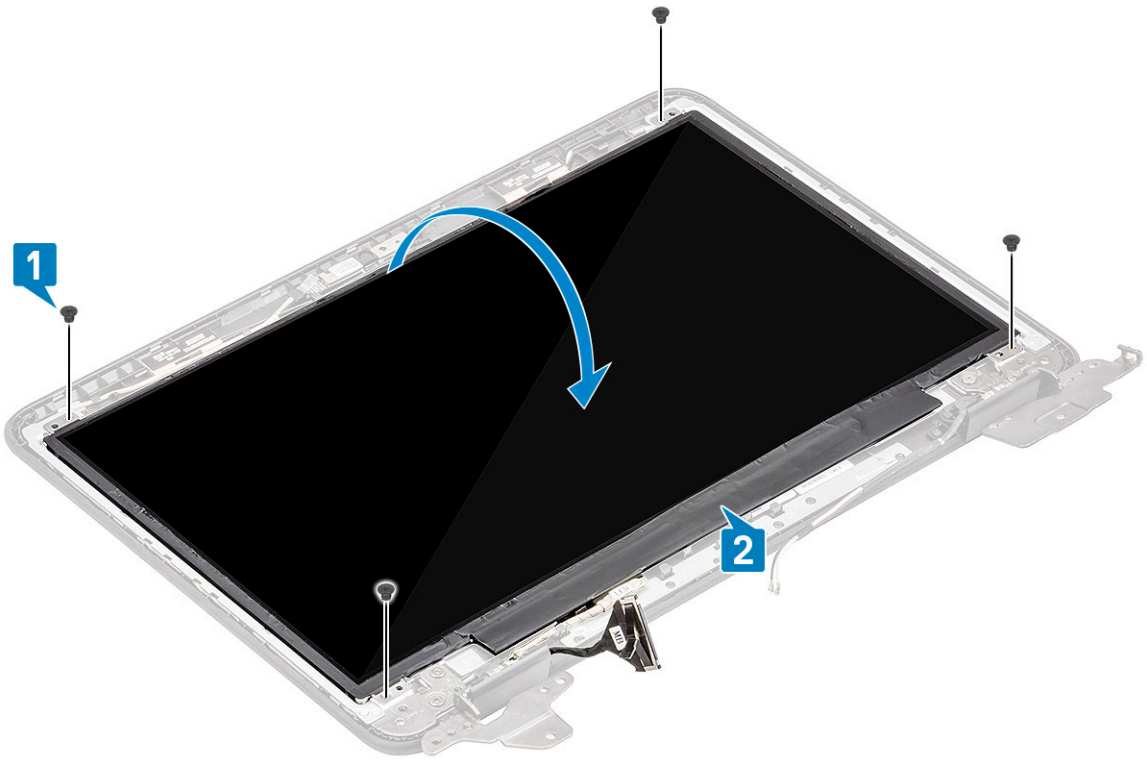


3. Install the:
   a. display bezel
   b. display assembly
   c. DC-in cable
   d. WLAN card
   e. battery
   f. base cover
   g. microSD card
4. Follow the procedure in After working inside your computer.

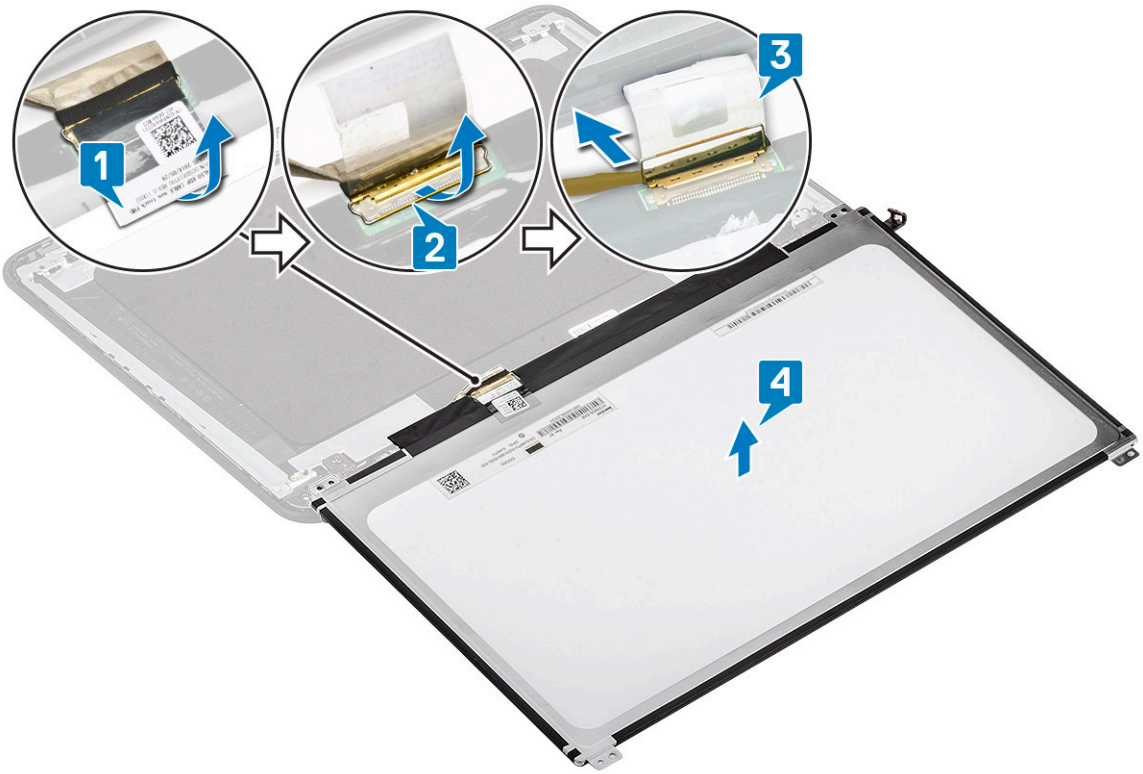
LCD panel

Removing the LCD panel

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. DC-in cable
   f. display assembly
   g. LCD bezel
3. Remove the four M2.0x3.0 screws [1] securing the LCD panel to the LCD back cover and flip it over [2].



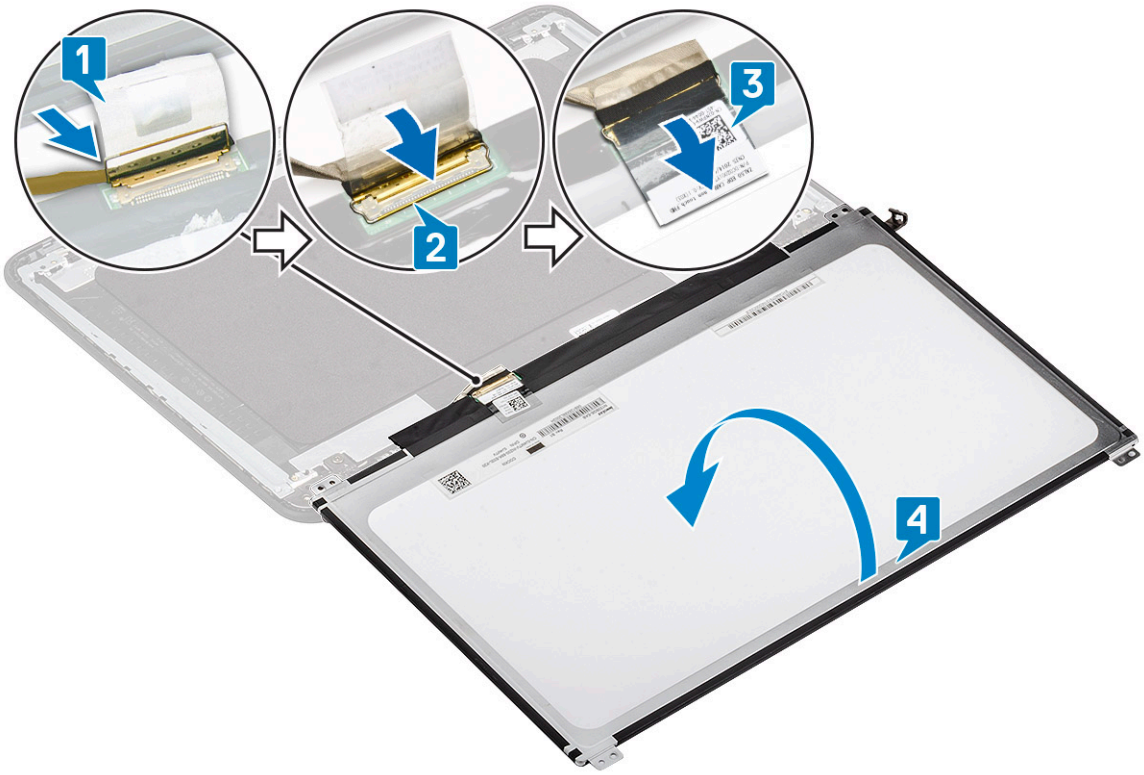
4. Peel off the tape from the EDP connector [1] and open the actuator [2] to disconnect the EDP cable from the system board [3].
5. Lift the LCD panel up and away from the computer [4].



Installing the LCD panel

1. Connect the eDP cable to the system board [1] while holding the cable and close the actuator on the connector [2].

2. Stick the tape on the connector [3] securing the eDP cable to the LCD panel and flip over the LCD panel to rest on the LCD back cover [4].



3. Align the LCD panel to the back cover [1] and install the four M2.0x3.0 screws to secure the LCD panel to the LCD back cover [2].

4. Install the:
   a. display bezel
   b. display assembly
   c. DC-in cable

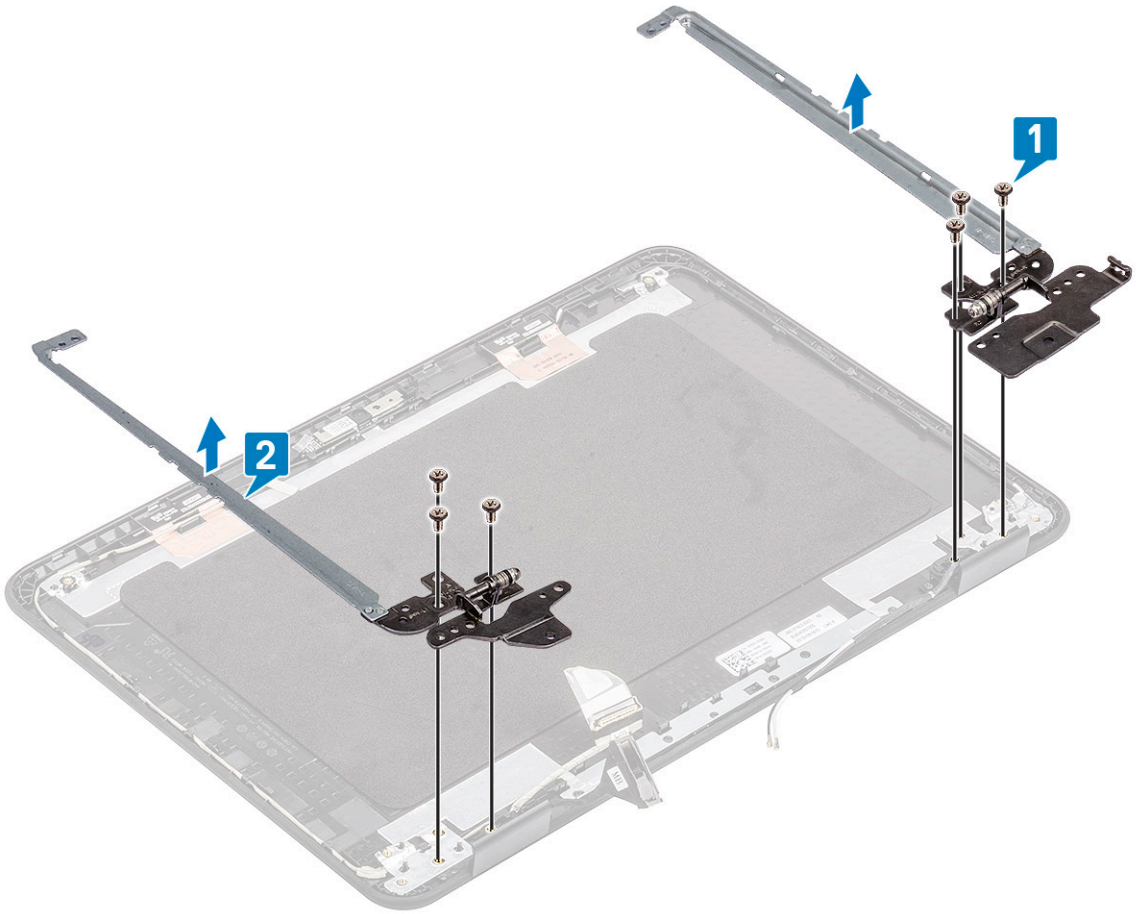
d. WLAN card
e. battery
f. base cover
g. microSD card

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

Display hinges

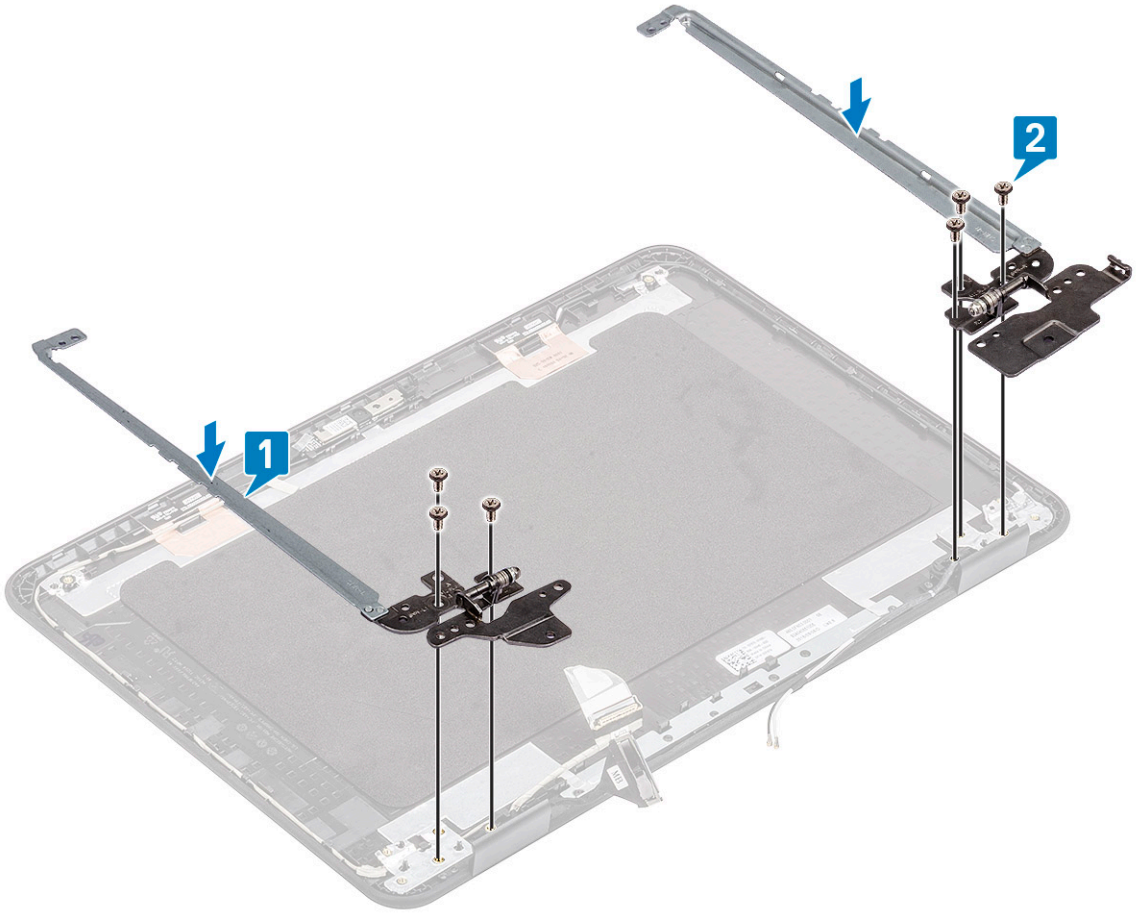
Removing the display hinges

1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. DC-in cable
   f. display assembly
   g. LCD bezel
   h. LCD panel
3. Remove the six M2.5x3.5 screws on either side securing the hinges to the back cover [1].
4. Angle the hinges and lift the hinges up and away from the back cover [2].



Installing the display hinges

1. Angle the hinges and install the hinges on the LCD back cover [1].
2. Install the six M2.5x3.5 screws to secure the hinges to the LCD back cover [2].



3. Install the:
   a. LCD panel
   b. display bezel
   c. display assembly
   d. DC-in cable
   e. WLAN card
   f. battery
   g. base cover
   h. microSD card
4. Follow the procedure in After working inside your computer.

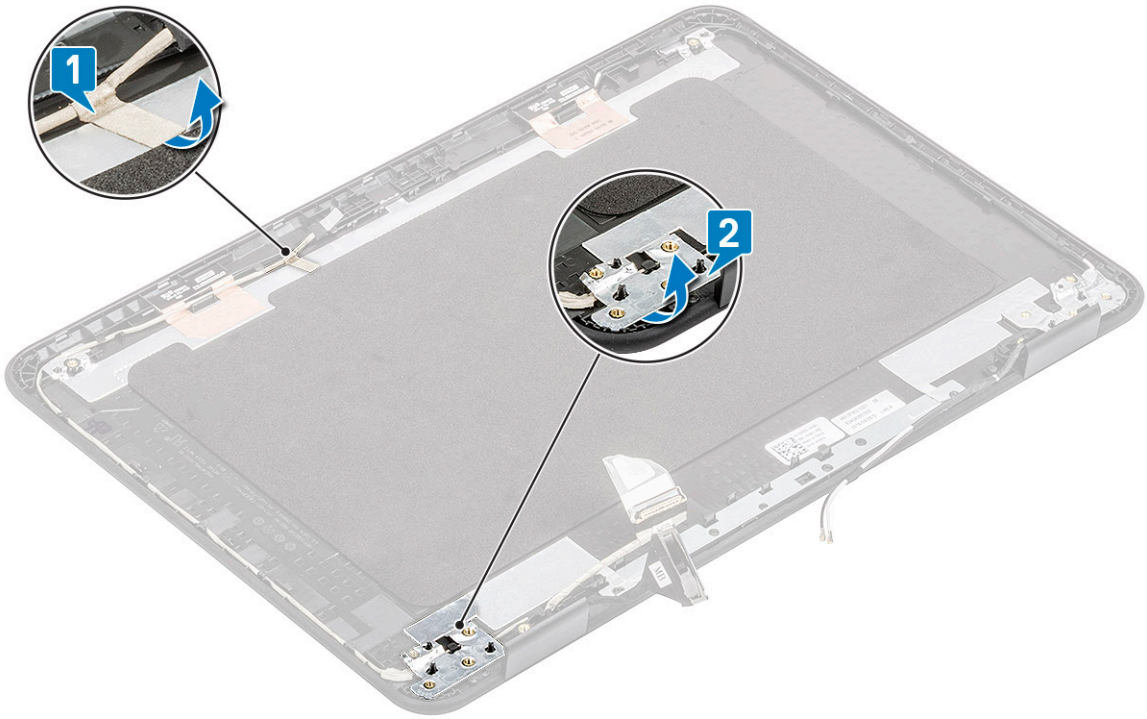
eDP cable

Removing the eDP cable

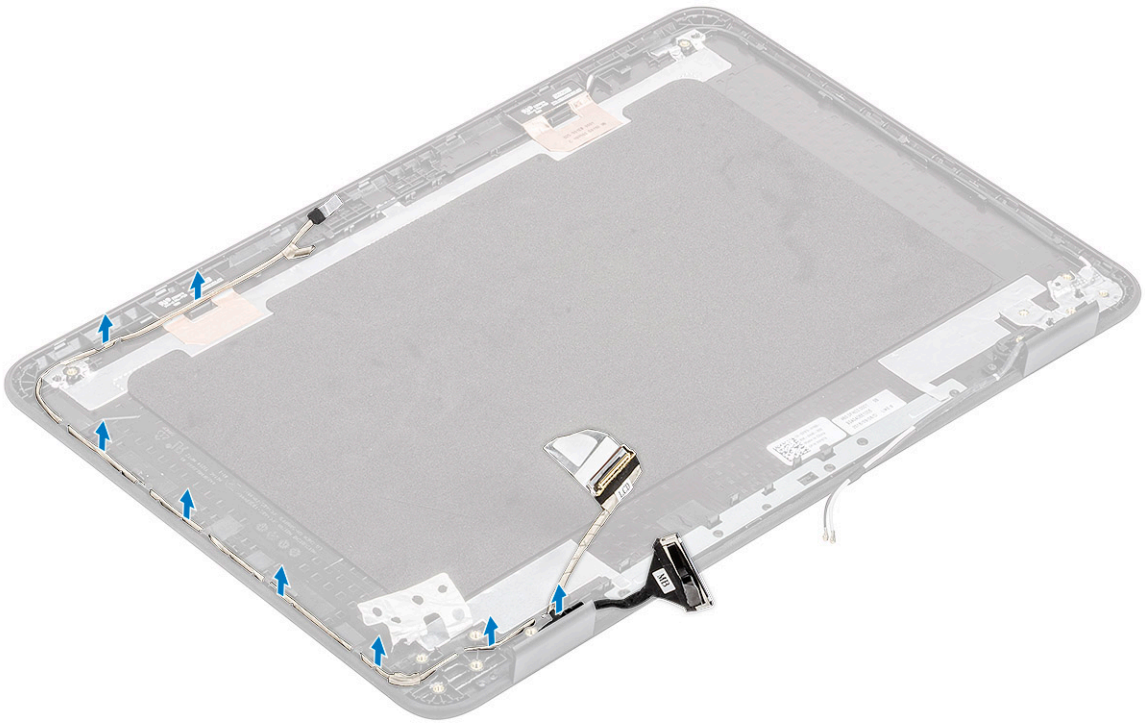
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card

e. DC-in cable
f. display assembly
g. LCD bezel
h. LCD panel
i. Display hinges

3. Peel off the tape securing the eDP cable to the back cover [1] and remove the metal foil [2].

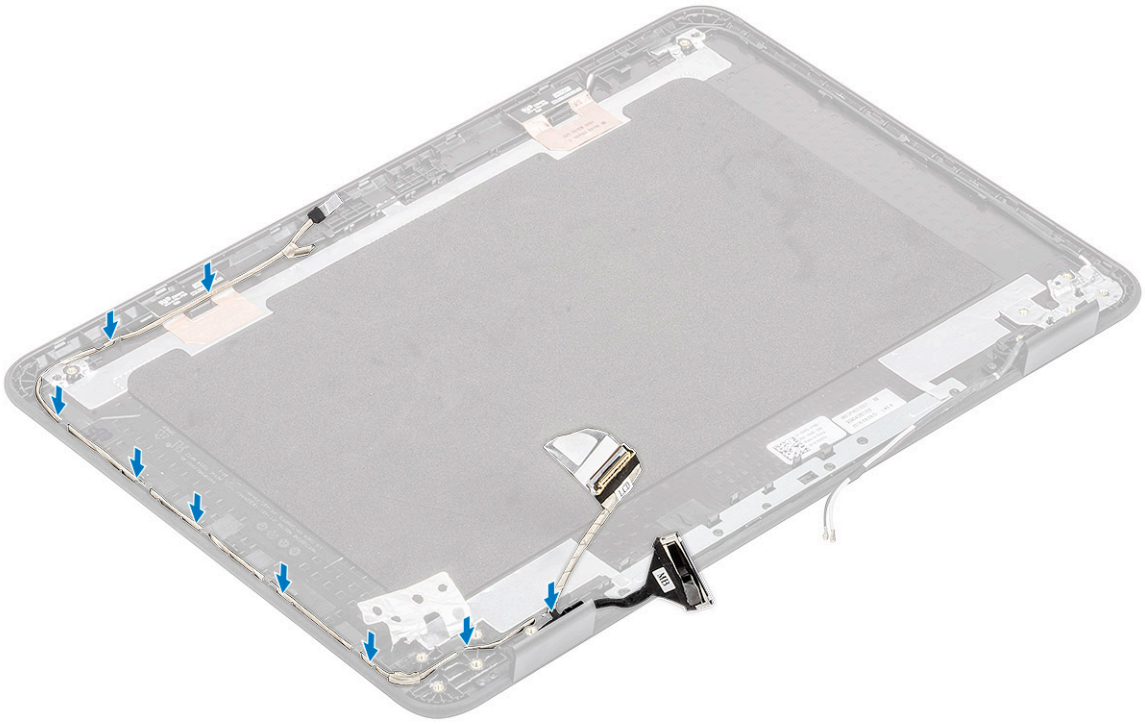


4. Un-route the eDP cable tucked along the back cover and remove the eDP cable from the computer.

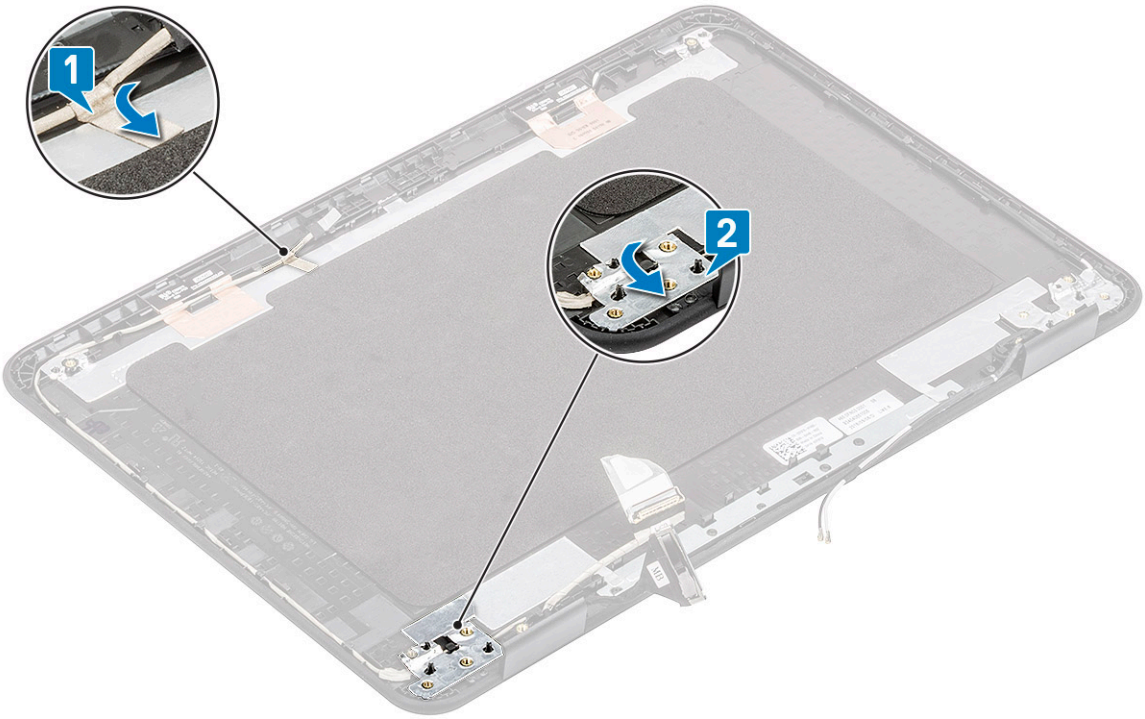


Installing the eDP cable

1. Route the eDP cable along the edges of the LCD back cover.



2. Stick the tape securing the eDP cable to the back cover [1] and install the metal foil to secure the eDP cable to the LCD back cover [2].



3. Install the:
   a. Display hinges
   b. LCD panel

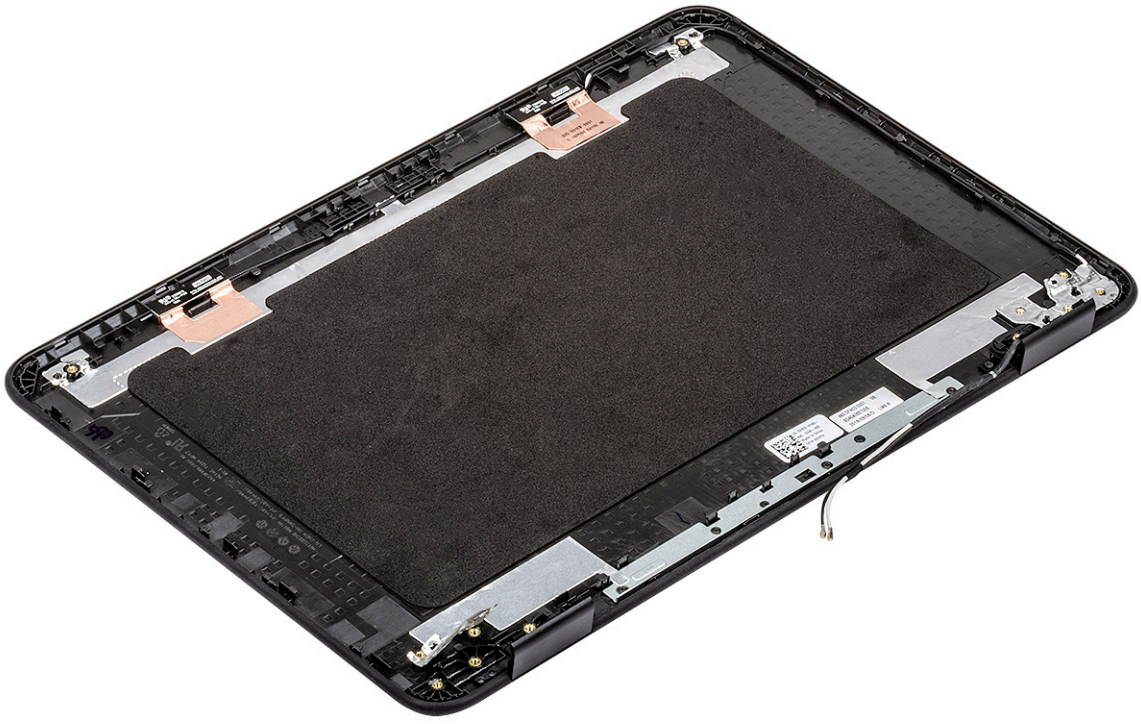
c. display bezel
d. display assembly
e. DC-in cable
f. WLAN card
g. battery
h. base cover
i. microSD card

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

Display back cover

1. **NOTE:** After disassembling the hinges, you are left with the display back cover which is one complete unit along with antennae cables.

   Follow the procedure in Before working inside your computer.
2. Remove the :
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. DC-in cable
   f. display assembly
   g. LCD bezel
   h. LCD panel
   i. Display hinges
   j. eDP cable



3. Install the display back cover assembly.
4. Install the:
   a. eDP cable
   b. Display hinges
   c. LCD panel

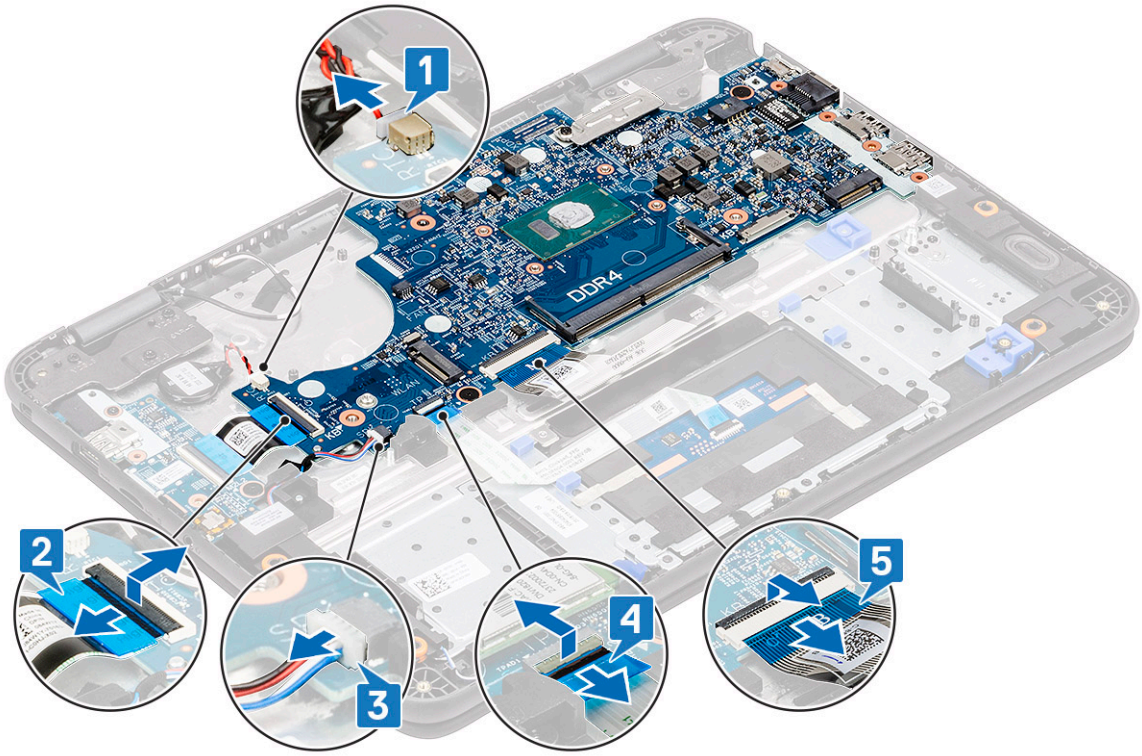
d. display bezel
e. display assembly
f. DC-in cable
g. WLAN card
h. battery
i. base cover
j. microSD card

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

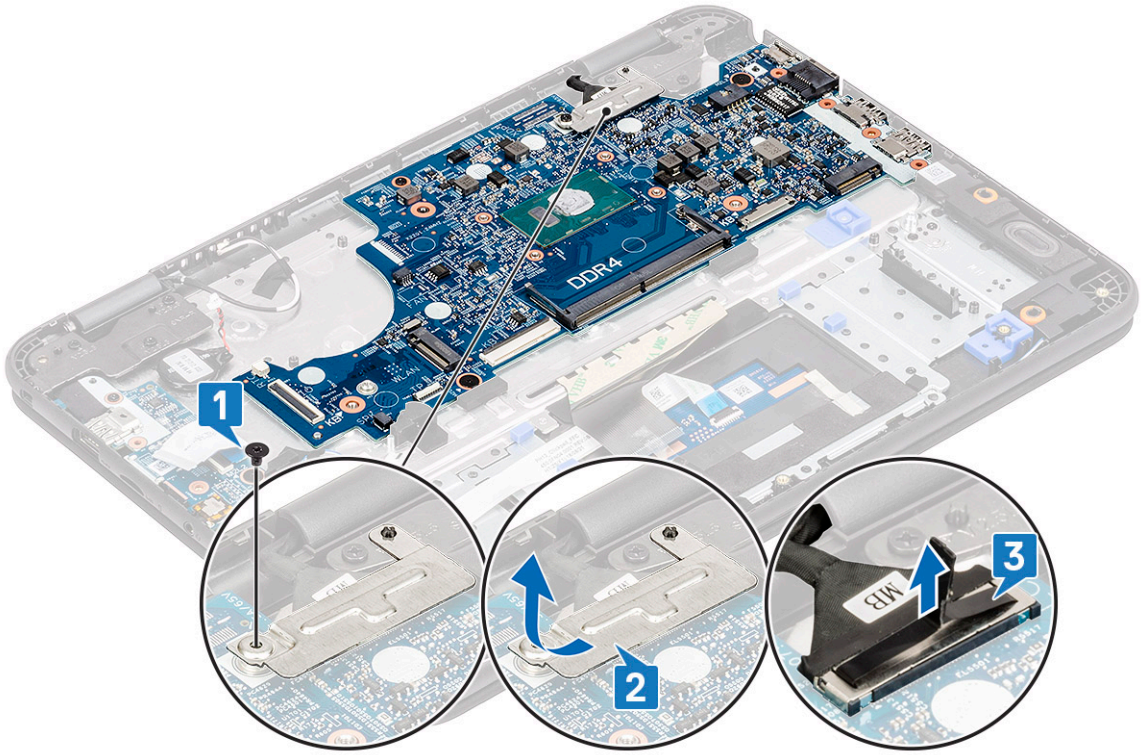
System board

Removing the system board

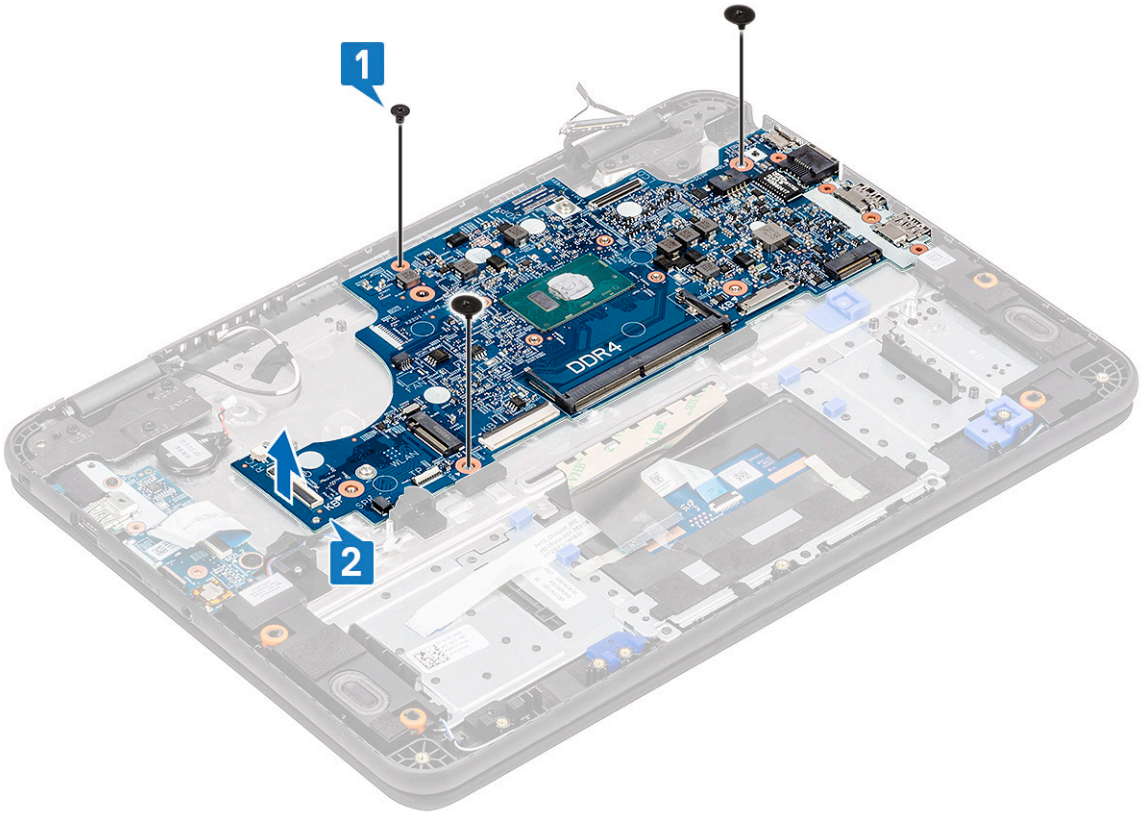
1. Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. WLAN card
   e. SSD
   f. memory module
   g. heat sink
   h. fan
   i. DC-in
3. Disconnect the following cables and connectors:
   a. Coin cell connector [1]
   b. I/O board cable [2]
   c. Speaker cable connector [3]
   d. Touchpad cable connector [4]
   e. Keyboard cable connector [5]



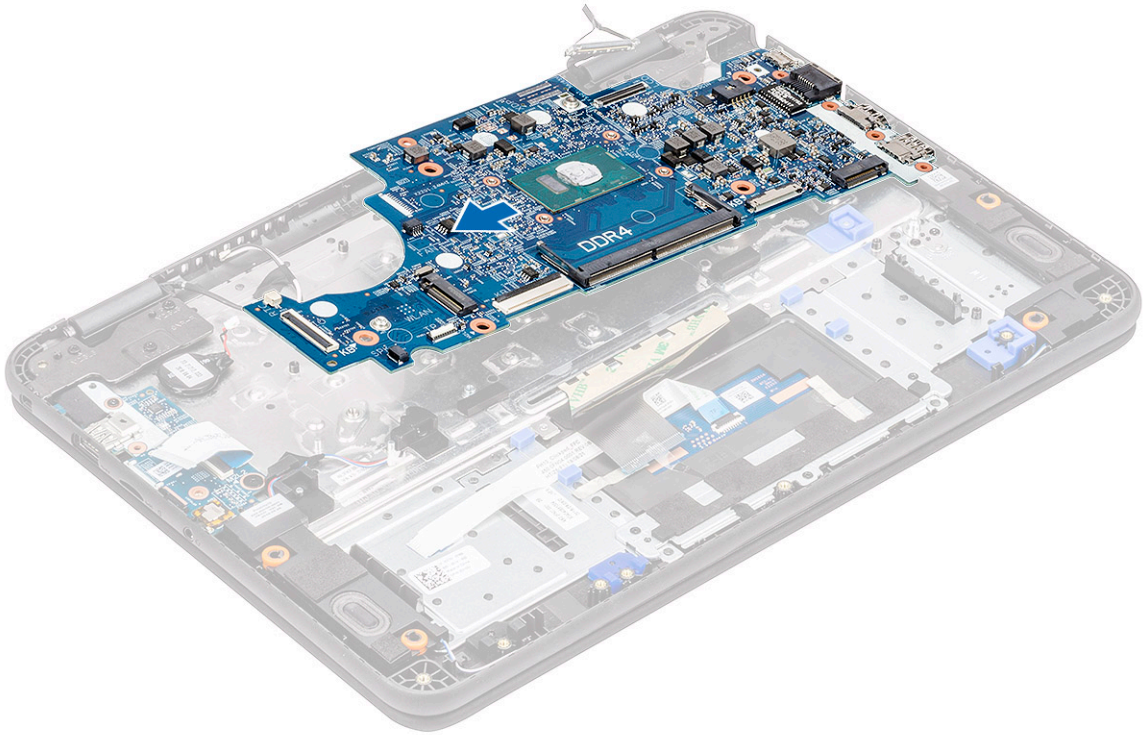
4. Remove the single screw [1] securing the EDP bracket on the system board.
5. Remove the EDP bracket [2] and disconnect the EDP cable [3] from the system board.



6. Remove the single M2.0x4.0 screw and two M2.0x2.0 (Large Head) screws [1] and lift the system board slightly [2].

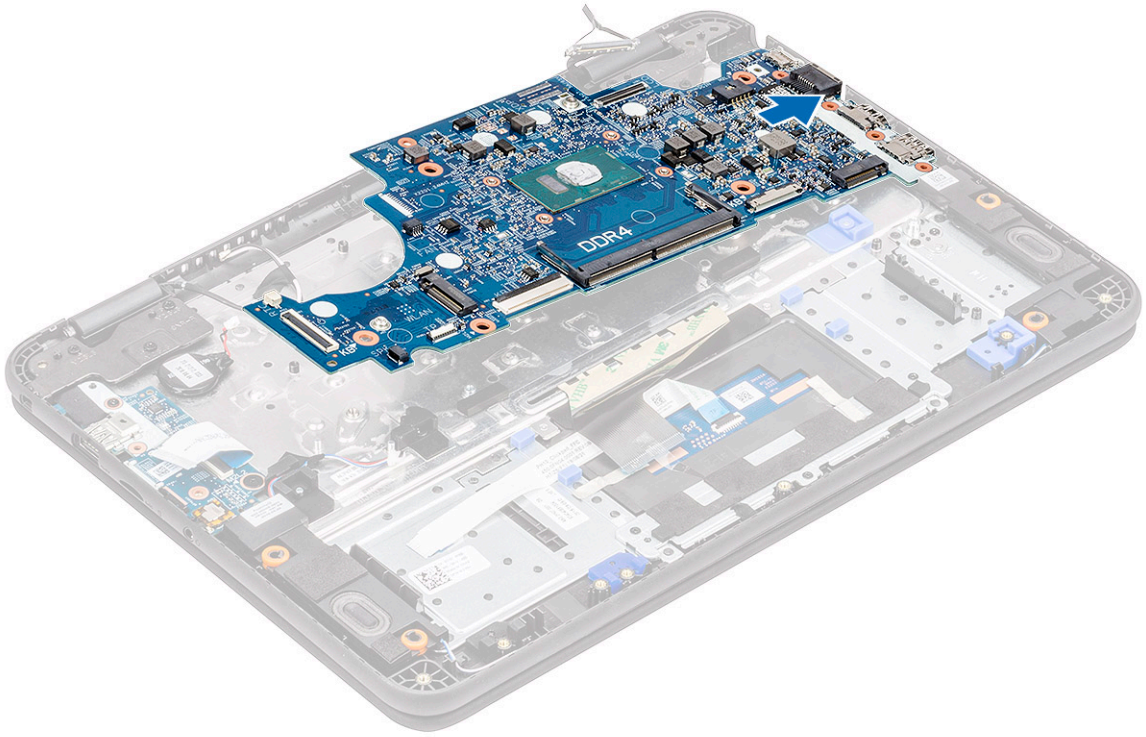


7. Incline the system board and remove the system board from the computer.

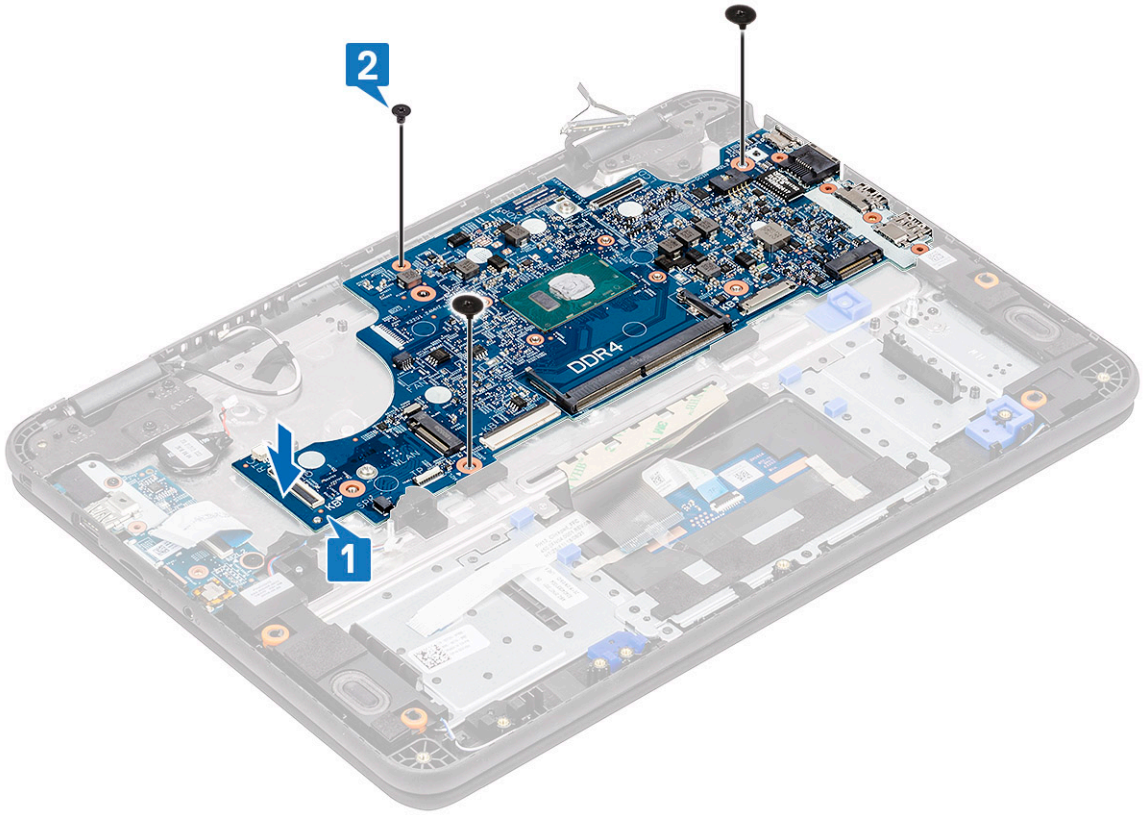


Installing the system board

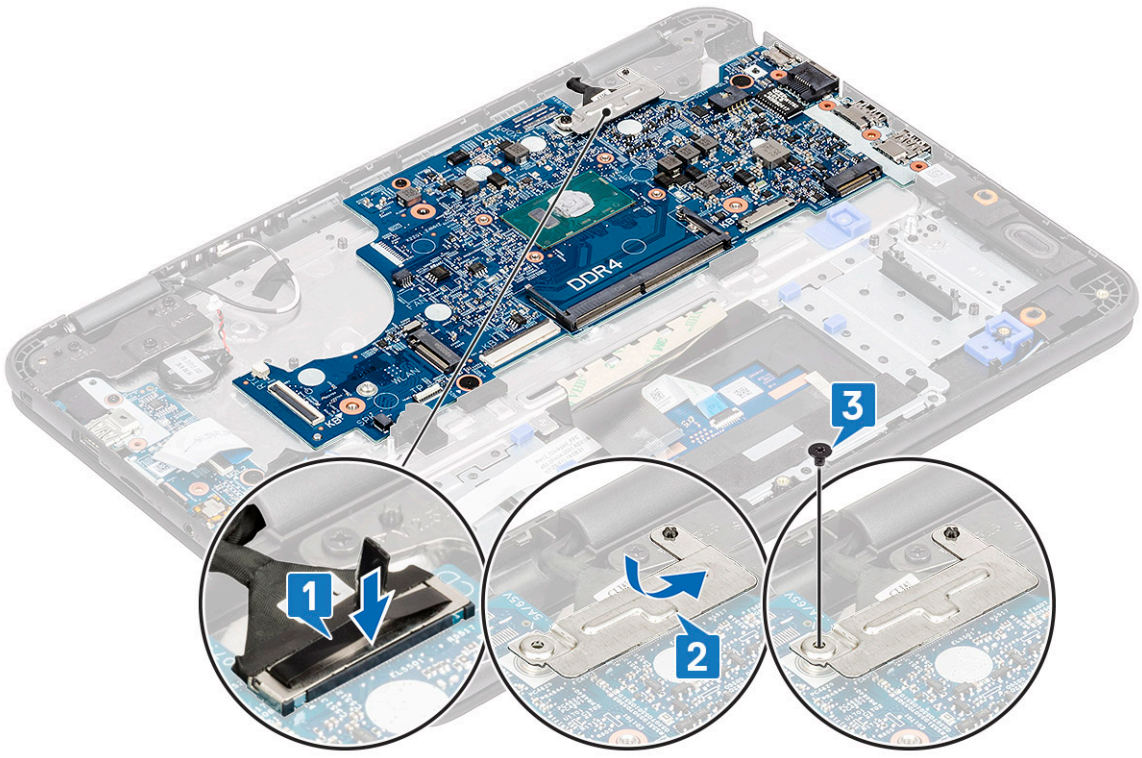
1. Incline the system board slightly and install it on the computer.



2. Press down the system board [1] to install the single M2xL4 screw and two M2xL2 (large head) screws [2] to secure it to the palmrest.

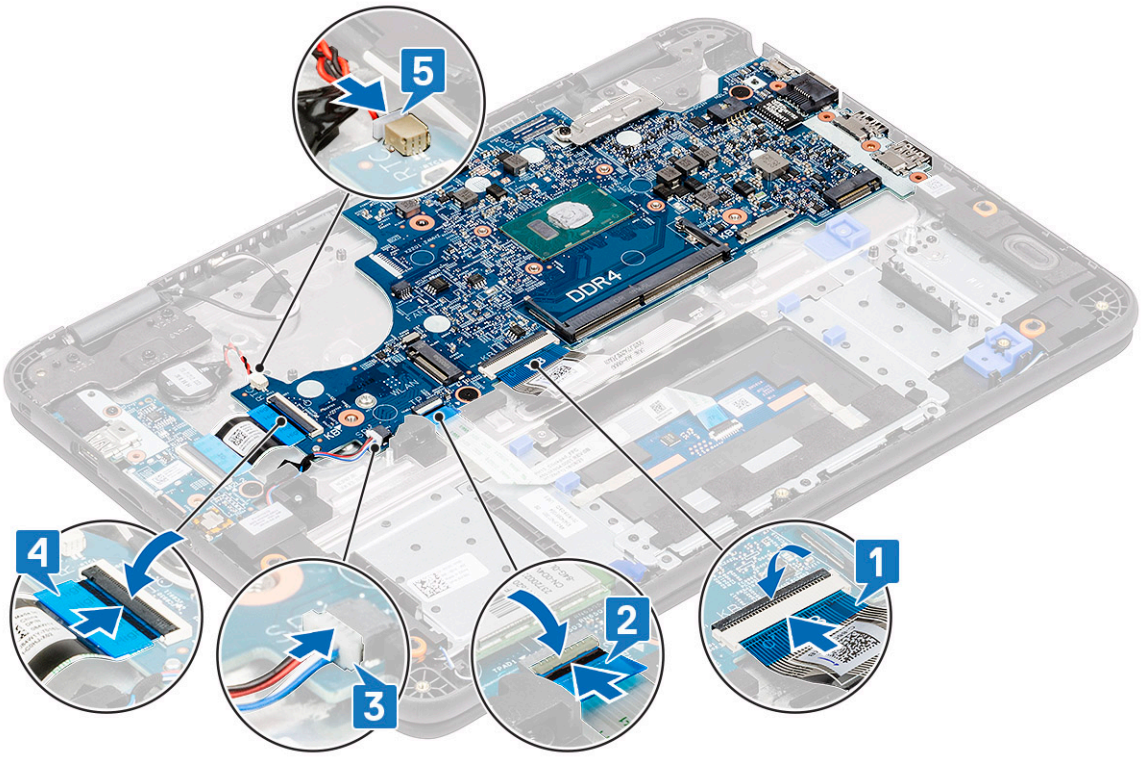


3. Connect the EDP cable to the connector on the system board [1].
4. Align and place the EDP bracket on the connector [2] and tighten the single screw [3] to secure the system board to the computer.



5. Connect the following cables and connectors:
   a. Keyboard cable connector [1]
   b. Touchpad cable connector [2]
   c. Speaker cable connector [3]

d. I/O board cable [4]
e. Coin cell connector [5]



6. Install the:
   a. DC-in cable
   b. fan
   c. heat sink
   d. memory module
   e. SSD
   f. WLAN card
   g. battery
   h. base cover
   i. microSD card
7. Follow the procedure in After working inside your computer.

Palmrest

1. **NOTE:** After disassembling the system board, you are left with the palmrest along with the touchpad which is one complete unit.

   Follow the procedure in Before working inside your computer.
2. Remove the:
   a. microSD card
   b. base cover
   c. battery
   d. coin cell
   e. WLAN card
   f. SSD
   g. speakers
   h. i-o daughterboard
   i. keyboard
   j. display assembly

k. memory module
l. heat sink
m. fan
n. DC-in
o. system board

3. Install the palmrest.

4. Install the:
   a. system board
   b. DC-in cable
   c. fan
   d. heat sink
   e. memory module
   f. display assembly
   g. keyboard
   h. i-o daughterboard
   i. speakers
   j. SSD
   k. WLAN card
   l. coin cell
   m. battery
   n. base cover
   o. microSD card
5. Follow the procedure in After working inside your computer.

4

Technology and components

NOTE: Instructions provided in this section are applicable on computers shipped with Windows operating system. Windows is factory-installed with this computer.

Topics:

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.

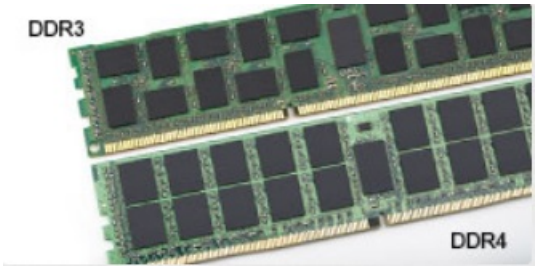


Figure 5. Notch difference

Increased thickness

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

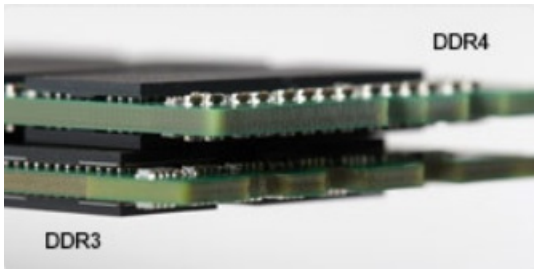


Figure 6. Thickness difference

Curved edge

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

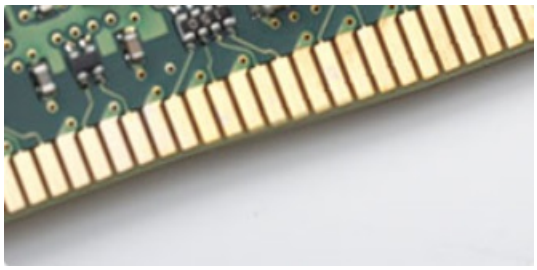


Figure 7. Curved edge

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

Integrated graphics controller

Table 2. Graphics specification

Integrated graphics controller specifications	
Integrated Graphics Controller	Intel UHD Graphics
Model	Dell Latitude 3310
Bus Type	Internal Interface
Memory Interface	Unified Memory Architecture
Basic Graphic frequency	Pentium 5405 U: 300 Mhz Celeron 4205 U: 300 Mhz i3-8145 U: 300 Mhz i5-8265 U: 300 Mhz
Max Graphics dynamic frequency	Pentium 5405 U: 950 Mhz Celeron 4205 U: 900 Mhz i3-8145 U: 1.00 GHz

Table 2. Graphics specification (continued)

Integrated graphics controller specifications	
	i5-8265 U: 1.1 GHz
Graphics Level	Intel Celeron 4205 U: Intel UHD Graphic 610 Intel Pentium 5405 U: Intel UHD Graphic 610 i3-8145 U: Intel UHD Graphic 620 i5-8265 U: Intel UHD Graphic 620
Estimated Maximum Power Consumption (TDP)	15 W (Total SOC power consumption)
Display Support	eDP (internal), HDMI, DisplayPort through Type-C port
Maximum Color Depth	32 bit
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) (Note: Analog and/or digital)	eDP: Panel 1366 x 768 @ 60 Hz HDMI: V1.4 @1.65 Gbps DisplayPort (via Type-C): V1.2 (Except Celeron sku)
Numbers of Displays Supported	3 max

Supported hard drives

128/256 GB M.2 2230 PCIe SSD (Class 35)

Table 3. 128/256 GB M.2 2230 PCIe SSD (Class 35)

Specifications	
Capacity (GB)	128 GB/256 GB
Dimensions (W x D x H)	22 x 30 x 2.38 (mm)
Interface type and maximum speed	PCIe Gen 3 8 Gbps (up to 2 lanes)
MTBF	1.4 Mil hours
Logical blocks	250,069,680
Power source	
Power consumption (reference only)	Idle 0.05 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0 °C to 70 °C
Relative humidity range	10% to 90%
Op shock (@ 2ms)	1,500 G

Table 3. 128/256 GB M.2 2230 PCIe SSD (Class 35) (continued)

Specifications	
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	- 40 °C to 70 °C
Relative humidity range	5% to 95%

64 GB eMMC 5.1 SSD

Table 4. 64 GB eMMC 5.0 SSD specifications

Specifications	
Capacity (GB)	64 GB
Dimensions (W x D x H)	0.86 x 1.65 x 0.05 (inch)
Interface type and maximum speed	Upto eMMC 5.1, HS200, 200 Mbps
MTBF	1.4 Mil hours
Logical blocks	500,118,192
Power source	
Power consumption (reference only)	Idle 0.05 W, Active 4.5 W
Environmental Operating Conditions (Non-Condensing)	
Temperature range	0 °C to 70 °C
Relative humidity range	5% to 95%
Environmental Non-Operating Conditions (Non-Condensing)	
Temperature range	- 40 °C to 70 °C
Relative humidity range	5% to 95%

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

What is ExpressCharge ?

For a system advertised as having the ExpressCharge feature, the battery typically will have greater than 80% charge after about an hour of charging with the system off and fully charged in about 2 hours with the system off.

Enabling Expresscharge requires that both the system and the battery that is used on the system be ExpressCharge capable. If any of the above requirements is missing, ExpressCharge will not be enabled.

What is BATTMAN?

BATTMAN is a computer controlled battery manager intended for typical rechargeable batteries. It has the following capabilities:

- Monitors self-discharge
- Measures internal resistance
- Automatically performs repeated discharge/charge cycles to break in new batteries
- Keeps a log of all operations performed, which can be imported
- Connects via parallel port to any PC running Microsoft Windows
- Operating software, complete with source code, is available to download

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 5. 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	5 Gbps	SuperSpeed	2010
USB 3.1 Gen 2	10 Gbps	SuperSpeed	2013

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

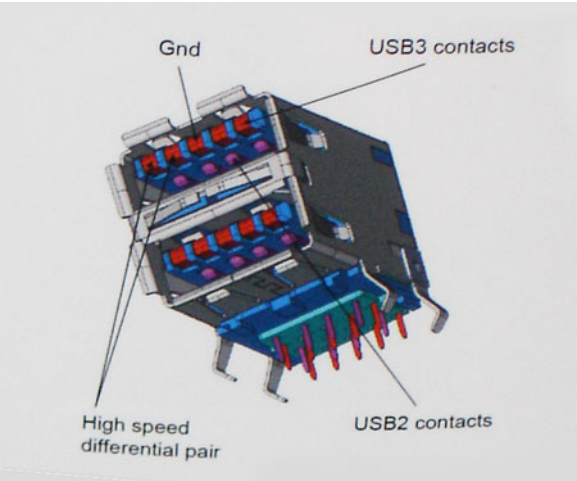
The topics below cover some of the most commonly asked questions regarding USB 3.0/USB 3.1 Gen 1.

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)

5

System setup

CAUTION: Unless you are an expert computer user, do not change the settings in the BIOS Setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change BIOS Setup program, it is recommended that you write down the BIOS Setup program screen information for future reference.

Use the BIOS Setup program for the following purposes:

- Get information about the hardware installed in your computer, such as the amount of RAM and the size of the hard drive.
- Change the system configuration information.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, and enabling or disabling base devices.

Topics:

Boot menu

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

The options are:

- UEFI Boot:
  - Windows Boot Manager
- Other Options:
  - BIOS Setup
  - BIOS Flash Update
  - Diagnostics
  - Change Boot Mode Settings

Navigation keys

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

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.

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

System setup options

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

General options

Table 6. General

Option	Description

System Information	This section lists the primary hardware features of your computer.
	The options are:
	• **System Information**
	  ○ BIOS version
	  ○ Service Tag
	  ○ Asset Tag
	  ○ Ownership Tag
	  ○ Manufacture Date
	  ○ Express Service Code
	• **Memory Configuration**
	  ○ Memory Installed
	  ○ Memory Available
	  ○ Memory Speed
	  ○ Memory Channel Mode
	  ○ Memory Technology
	  ○ DIMM A Size
	NOTE: Due to an amount of memory being assigned for system use, "Memory Available" is less than "Memory Installed". Note that certain operating systems may not be able to use all the available memory.
	• **Processor Information**
	  ○ Processor Type
	  ○ Core Count
	  ○ Processor ID
	  ○ Current Clock Speed
	  ○ Maximum Clock Speed
	  ○ Processor L2 Cache
	  ○ Processor L3 Cache
	  ○ HT Capable
	  ○ 64-Bit Technology
	• **Device Information**
	  ○ SATA-0
	  ○ M.2 PCIe SSD-0
	  ○ LOM MAC Address
	  ○ Passthrough MAC Address

Table 6. General (continued)

Option	Description
	○ Video Controller ○ Video BIOS Version ○ Video Memory ○ Panel Type ○ Native Resolution ○ Audio Controller ○ WiFi Device ○ Bluetooth Device
Battery Information	Displays the battery status, health, and the type of AC adapter connected to the computer.
Boot Sequence	Allows you to change the order in which the computer attempts to find an operating system. The options are: ● **Windows Boot Manager** ● **Onboard NIC (IPV4)** ● **Onboard NIC (IPV6)** Allows you to change the boot list options. Click one of the following options: ○ **Legacy External Devices** ○ **UEFI**—Default
Advanced Boot Options	Allows you to Enable Legacy Option ROMs. The options are: ● **Enable Legacy Option ROMs** ● **Enable Attempt Legacy Boot**
UEFI Boot Path Security	Allows you to control whether the system prompts the user to enter the Admin password when booting to a UEFI boot path. Click one of the following options: ● **Always, Except Internal HDD**—Default ● **Always** ● **Never**
Date/Time	Allows you to set the date and time. The change to the system date and time takes effect immediately.

System configuration

Table 7. System Configuration

Option	Description
Integrated NIC	Allows you to configure the integrated network controller. **Enable UEFI Network Stack** : Enabled by Default. Click one of the following options: ● **Disabled**: The internal LAN is off and not visible to the operating system. ● **Enabled** : The internal LAN is enabled. ● **Enabled w/PXE**: The internal LAN is enabled (with PXE boot)—Default

Table 7. System Configuration (continued)

Option	Description
SATA Operation	Allows you to configure the operating mode of the integrated SATA hard-drive controller. Click one of the following options: • **Disabled** • **AHCI** • **RAID On**—Default **NOTE:** SATA is configured to support RAID mode.
Drives	These fields let you enable or disable various drives on board. The options are: • **SATA-0** • **M.2 PCIe SSD-0**
SMART Reporting	This field controls whether hard drive errors for integrated drives are reported during startup. The option is disabled by default.
USB Configuration	Allows you to enable or disable the internal/integrated USB configuration. The options are: • **Enable USB Boot Support** • **Enable External USB Ports** All the options are set by default. **NOTE:** USB keyboard and mouse always work in the BIOS setup irrespective of these settings.
Dell Type-C Dock Configuration	Allows you to connect to Dell WD and TB family of docks (Type-C Docks) independent of USB and Thunderbolt adapter configuration. This option is enabled by default.
Audio	Allows you to enable or disable the integrated audio controller. By default, the **Enable Audio** option is selected. The options are: • **Enable Microphone** • **Enable Internal Speaker** This option is set by default.
Touchscreen	This option controls whether the touchscreen is enabled or disabled This option is enabled by default.
Miscellaneous devices	Allows you to enable or disable various on board devices. • **Enable Camera**—Default • **Enable Secure Digital (SD) Card** — Enabled Default • **Secure Digital (SD) Card Boot** - Disabled • **Secure Digital Card (SD) Read-Only Mode** - Disabled

Video screen options

Table 8. Video

Option	Description
LCD Brightness	Allows you to set the display brightness depending upon the power source. On Battery (50% is default) and On AC (100% default).
Switchable Graphics	This option enables or disables switchable graphics technologies such as NVIDIA Optimus and SMD PowerExpress. It should only be enabled for Windows 7 and later versions of Windows or the Ubuntu OS. This feature is not applicable to other operating systems.

Security

Table 9. Security

Option	Description
Admin Password	Allows you to set, change, or delete the administrator (admin) password. The entries to set the password are: • **Enter the old password** • **Enter the new password** • **Confirm new password** Click **OK** once you set the password. **NOTE:** For the first time login, "Enter the old password:" field is marked to "Not set". Set the password for the first time and later you can change or delete the password
System Password	Allows you to set, change, or delete the System password. The entries to set the password are: • **Enter the old password** • **Enter the new password** • **Confirm new password** Click **OK** once you set the password. **NOTE:** For the first time login, "Enter the old password:" field is marked to "Not set". Set the password for the first time and later you can change or delete the password
Strong Password	Allows you to enforce the option to always set the strong password. • **Enable Strong Password** This option is not set by default.
Password Configuration	You can define the length of your password. Min = 4, Max = 32
Password Bypass	Allows you to bypass the System password and the Internal HDD password, when it is set, during a system restart. Click one of the options: • **Disabled**—Default • **Reboot bypass**
Password Change	Allows you to change the System password when the administrator password is set.

Table 9. Security (continued)

Option	Description
	• **Allow Non-Admin Password Changes** This option is set by default.
Non-Admin Setup Changes	Allows you to determine whether changes to the setup options are allowed when an Administrator Password is set. If disabled, the setup options are locked by the admin password. • **Allow Wireless Switch Changes** This option is not set by default.
UEFI Capsule Firmware Updates	Allows you to update the system BIOS via UEFI capsule update packages. • **Enable UEFI Capsule Firmware Updates** This option is set by default.
PTT Security	This option lets you control whether the Platform Trust Technology feature (PTT) is visible to the operating system. The options are : • **PTT On** — Enabled by Default • **Clear** • **PPI ByPass for Clear Command**
Computrace (R)	Allows you to activate or disable the optional Computrace software. The options are: • **Deactivate** • **Disable** • **Activate**—Default
CPU XD Support	Allows you to enable or disable the Execute Disable mode of the Processor, operating system uses this feature to hinder malicious programs that exploits buffer overflow. • **Enable CPU XD Support**—Default
Admin Setup Lockout	Allows you to prevent users from entering Setup when an administrator password is set. • **Enable Admin Setup Lockout** This option is not set by default.
Master Password Lockout	Allows you to disable master password support. • **Enable Master Password Lockout** This option is not set by default. **NOTE:** Hard disk password should be cleared before the settings can be changed.
SMM Security Mitigation	Allows you to enable or disable additional UEFI SMM Security Mitigation protection. • **SMM Security Mitigation** This option is not set by default.

Secure Boot

Table 10. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable the Secure Boot Feature.

Table 10. Secure Boot (continued)

Option	Description
	• **Secure Boot Enable** Not enabled by default
Secure Boot Mode	Changes to the Secure Boot operation mode modifies the behavior to allow evaluation of UEFI driver signatures. Choose one of the these options: • **Deployed Mode**—Default • **Audit Mode**
Expert Key Management	Allows you to enable or disable Expert Key Management. • **Enable Custom Mode** This option is not set by default. The Custom Mode Key Management options are: • **PK**—Default • **KEK** • **db** • **dbx**

Intel Software Guard Extensions options

Table 11. Intel Software Guard Extensions

Option	Description
Intel SGX Enable	This field allows you to provide a secured environment for running code/storing sensitive information in the context of the main operating systems. Click one of the following options: • **Disabled** • **Enabled** • **Software controlled**—Default
Enclave Memory Size	This option sets **SGX Enclave Reserve Memory Size** Click one of the following options: • **32 MB** • **64 MB** • **128 MB**—Default

Performance

Table 12. Performance

Option	Description
Multi Core Support	This field specifies whether the process has one or all cores enabled. The performance of some applications improves with the additional cores. • **All**—Default • **1** • **2** • **3**

Table 12. Performance (continued)

Option	Description
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of processor. • **Enable Intel SpeedStep** This option is set by default.
C-States Control	Allows you to enable or disable the additional processor sleep states. • **C states** This option is set by default.
Hyper-Thread Control	Allows you to enable or disable the HyperThreading in the processor. • **Disabled** • **Enabled**—Default

Power management

Table 13. Power Management

Option	Description
AC Behavior	Allows you to enable or disable the computer from turning on automatically when an AC adapter is connected. • **Wake on AC** This option is not set by default.
Enable Intel Speed Shift technology	This option is used to enable/disable Intel Speed Shift Technology. This option is not enabled by default.
Auto On Time	Allows you to set the time at which the computer must turn on automatically. The options are: • **Disabled**—Default • **Every Day** • **Weekdays** • **Select Days** This option is not set by default.
USB Wake Support	Allows you to enable USB devices to wake the system from standby. • **Enable USB Wake Support** • **Wake on Dell USB-C Dock**—Default
Wireless Radio Control	This option if enabled, will sense the connection of the system to a wired network and subsequently disable the selected wireless radios (WLAN and WWAN). Upon disconnection from the wired network the selected wireless radio will be enabled. • **Control WLAN radio** This option is not set by default.
Wake on LAN /WLAN	This option allows the computer to power up from the off state when triggered by a special LAN signal. Wake-up from the Standby state is unaffected by this setting and must be enabled in the operating system. This feature only works when the computer is connected to AC power supply.

Table 13. Power Management (continued)

Option	Description
	• **Disabled**—Default - Does not allow the system to power on by special LAN signals when it receives a wake-up signal from the LAN or wireless LAN. • **LAN or WLAN** - Allows the system to be powered on by special LAN or WLAN signals. • **LAN Only** - Allows the system to be powered on by special LAN signals. • **WLAN Only** - Allows the system to be powered on by special WLAN signals. • **LAN with PXE Boot A wake up packet is sent to the system in either the S4 or S5**
Block Sleep	This option lets you to block entering to sleep in operating system environment. This option is not set by default.
Peak Shift	Allows you enable of disable the Peak shift feature. This feature, when enabled, minimizes the AC power usage at times of peak demand. Battery does not charge between the Peak Shift start and end time. Peak Shift Start and End Time can be configured for all weekdays. This option sets the battery threshold value (15% to 100%)
Advanced Battery Charge Configuration	This option enables you to maximize the battery health. By enabling this option, your system uses the standard charging algorithm and other techniques, during the non-work hours, to improve the battery health. Advanced Battery Charge Mode can be configured for all weekdays.
Primary Battery Charge Configuration	Allows you to select the charging mode for the battery. The options are: • **Adaptive**—Default • **Standard** - Fully charges your battery at a standard rate. • **ExpressCharge**- The battery charges over a shorter period of time using Dell's fast charging technology. • **Primarily AC use** • **Custom** If Custom Charge is selected, you can also configure Custom Charge Start and Custom Charge Stop. **NOTE:** All charging modes may not be available for all the batteries.

Post behavior

Table 14. POST Behavior

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. • **Enable Adapter Warnings**—Default
Numlock Enable	Allows you to enable or disable the Numlock function when the system boots. • **Enable Numlock**—Default
Fn Lock Options	Allows you to let hot key combinations Fn + Esc toggle the primary behavior of F1–F12, between their standard and secondary functions. If you disable this option, you cannot dynamically toggle the primary behavior of these keys. • **Fn Lock**—Default Click one of the following options:

Table 14. POST Behavior (continued)

Option	Description
	• **Lock Mode Disable/Standard**—Default • **Lock Mode Enable/Secondary**
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. Click one of the following options: • **Minimal**—Default • **Thorough** • **Auto**
Extended BIOS POST Time	Allows you to create an additional preboot delay. Click one of the following options: • **0 seconds**—Default • **5 seconds** • **10 seconds**
Full Screen Logo	Allows you to display full screen logo, if your image matches screen resolution. • **Enable Full Screen Logo** This option is not set by default.
Warnings and Errors	Allows you to select different options to either stop, prompt and wait for user input, continue when warnings are detected but pause on errors, or continue when either warnings or errors are detected during the POST process. Click one of the following options: • **Prompt on Warnings and Errors**—Default • **Continue on Warnings** • **Continue on Warnings and Errors**
MAC Address Pass-Through	This feature replaces the external NIC MAC address (in a supported dock or dongle) with selected MAC address from the system. Click one of the following options: • **Passthrough MAC Address**—Default • **Integrated NIC 1 MAC Address** • **Disabled**

Virtualization support

Table 15. Virtualization Support

Option	Description
Virtualization	This option specifies whether a Virtual Machine Monitor (VMM) can utilize the additional hardware capabilities provided by the Intel Virtualization technology. • **Enable Intel Virtualization Technology** This option is set by default.
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by the Intel Virtualization technology for direct I/O. • **Enable VT for Direct I/O** This option is set by default.

Wireless options

Table 16. Wireless

Option	Description
Wireless Switch	Allows to set the wireless devices that can be controlled by the wireless switch. The options are: • **WLAN** • **Bluetooth** All the options are enabled by default.
Wireless Device Enable	Allows you to enable or disable the internal wireless devices. The options are: • **WLAN** • **Bluetooth** All the options are enabled by default.

Maintenance

Table 17. Maintenance

Option	Description
Service Tag	Displays the service tag of your computer.
Asset Tag	Allows you to create a system asset tag if an asset tag is not already set. This option is not set by default.
BIOS Downgrade	Allows you to flash previous revisions of the system firmware. • **Allow BIOS Downgrade** This option is set by default.
Data Wipe	Allows you to securely erase data from all internal storage devices. • **Wipe on Next Boot** This option is not set by default.
BIOS Recovery	**BIOS Recovery from Hard Drive**—This option is set by default. Allows you to recover the corrupted BIOS from a recovery file on the HDD or an external USB drive. **BIOS Auto-Recovery**— Allows you to recover the BIOS automatically. **NOTE: BIOS Recovery from Hard Drive** field should be enabled. **Always Perform Integrity Check**—Performs integrity check on every boot.

System logs

Table 18. System Logs

Option	Description
BIOS events	Allows you to view and clear the System Setup (BIOS) POST events.

Table 18. System Logs (continued)

Option	Description
Thermal Events	Allows you to view and clear the System Setup (Thermal) events.
Power Events	Allows you to view and clear the System Setup (Power) events.

SupportAssist System Resolution

Table 19. SupportAssist System Resolution

Option	Description
Auto OS Recovery Threshold	The Auto OS Recovery threshold setup options controls the automatic flow for SupportAssist System Resolution Console and for Dell OS Recovery Tool. The options are: • **0** • **1** • **2**—Default • **3**
SupportAssist OS Recovery	The SupportAssist OS Recovery option will enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors. This option is not set by default.

Boot Sequence

Boot sequence enables you to bypass the System Setup–defined boot device order and boot directly to a specific device (for example: optical drive or hard drive). During the Power-on Self-Test (POST), when the Dell logo appears, you can:

- Access System Setup by pressing F2 key
- Bring up the one-time boot menu by pressing F12 key.

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

- Removable Drive (if available)
- STXXXX Drive

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

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

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

Updating the BIOS

Updating the BIOS in Windows

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an

unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

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

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

3. Click **Drivers & Downloads**. Expand **Find drivers**.
4. Select the operating system installed on your computer.
5. In the **Category** drop-down list, select **BIOS**.
6. Select the latest version of BIOS, and click **Download** to download the BIOS file for your computer.
7. After the download is complete, browse the folder where you saved the BIOS update file.
8. Double-click the BIOS update file icon and follow the on-screen instructions.
   For more information, see knowledge base article 000124211 at www.dell.com/support.

Updating the BIOS using the USB drive in Windows

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

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

Updating the BIOS from the F12 One-Time boot menu

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

CAUTION: If BitLocker is not suspended before updating the BIOS, the next time you reboot the system it will not recognize the BitLocker key. You will then be prompted to enter the recovery key to progress and the system will ask for this on each reboot. If the recovery key is not known this can result in data loss or an unnecessary operating system re-install. For more information on this subject, see Knowledge Article: https://www.dell.com/support/article/sln153694

BIOS Update

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

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

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

Updating from the One-Time boot menu

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

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

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

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

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

System and setup password

Table 20. System and setup password

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

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

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

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

NOTE: System and setup password feature is disabled.

Assigning a system setup password

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

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

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
   The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field.
   Use the following guidelines to assign the system password:
   - A password can have up to 32 characters.
   - At least one special character: ! " # $ % & ' ( ) * + , - . / : ; < = > ? @ [\ ] ^ _ ` { | }
   - Numbers 0 through 9.
   - Upper case letters from A to Z.
   - Lower case letters from a to z.
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and save the changes as prompted by the pop-up message.
5. Press Y to save the changes.
   The computer restarts.

Deleting or changing an existing system setup password

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

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

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

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

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

Clearing BIOS (System Setup) and System passwords

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

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

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Troubleshooting

Topics:

Handling swollen Lithium-ion batteries

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

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

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

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

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

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

Dell SupportAssist Pre-boot System Performance Check diagnostics

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

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

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

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

Running the ePSA diagnostics

NOTE: A keyboard must be connected to the tablet using USB port or docking port to perform the following tasks:

1. Turn on your computer.
2. As the computer boots, press the F12 key as the Dell logo appears.
3. If no keyboard attached, Press and hold the volume up key to access the one time boot menu.
4. On the boot menu screen, select the **Diagnostics** option.
5. Click the arrow at the bottom left corner.
   Diagnostics front page is displayed.
6. Click the arrow in the lower-right corner to go to the page listing.
   The items that are detected are listed.
7. To run a diagnostic test on a specific device, press Esc and click **Yes** to stop the diagnostic test.
8. Select the device from the left pane and click **Run Tests**.
9. If there are any issues, error codes are displayed.
   Note the error code and validation number and contact Dell.

Self-Heal

Course Introduction

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

Self-Heal Instruction

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 primary battery 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.

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

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).

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** 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

LCD Built-in Self Test (BIST)

Dell laptops 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 that are connected to the laptop. Connect only the AC adapter (charger) to the laptop.
3. Ensure 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 SupportAssist Pre-boot diagnostics upon launch, initiates an LCD BIST first, expecting a user intervention confirm functionality of the LCD.

Backup media and recovery options

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

Recovering the operating system

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

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

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

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

WiFi power cycle

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.

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.

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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 21. Self-help resources

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

Contacting Dell

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

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

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