

Dell Vostro 5590

Service Manual



Notes, cautions, and warnings

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

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

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

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1 Working on your computer	6
Safety instructions.....	6
Turning off your computer — Windows 10.....	6
Before working inside your computer.....	7
After working inside your computer.....	7
2 Removing and installing components	8
Recommended tools.....	8
Screw List.....	8
Base cover.....	9
Removing the base cover.....	9
Installing the base cover.....	11
Battery.....	13
Lithium-ion battery precautions.....	13
Removing the battery.....	14
Installing the battery.....	15
Memory modules.....	15
Removing the secondary memory module.....	15
Installing the secondary memory module.....	16
Hard drive.....	17
Removing the hard drive.....	17
Installing the hard drive.....	18
Solid state drive.....	19
Removing the M.2 2230 solid-state drive.....	19
Removing the M.2 2242 solid-state drive.....	20
Removing the M.2 2280 solid-state drive.....	21
Replacing the SSD support bracket.....	21
Installing M.2 2230 solid-state drive.....	22
Installing M.2 2242 solid-state drive.....	23
Installing M.2 2280 solid-state drive.....	24
WLAN card.....	25
Removing the WLAN card.....	25
Installing the WLAN card.....	26
Coin-cell battery.....	27
Removing the coin-cell battery.....	27
Installing the coin-cell battery.....	28
Speakers.....	29
Removing the speakers.....	29
Installing the speakers.....	30
Input and output board.....	32
Removing the input and output board.....	32
Installing the input and output board.....	33
Heatsink—discrete.....	34
Removing the heatsink assembly-discrete.....	34

Installing the heatsink assembly-discrete.....	35
Heatsink—UMA.....	36
Removing the heatsink assembly-UMA.....	36
Installing the heatsink assembly-UMA.....	37
System fan.....	38
Removing the system fan.....	38
Installing the system fan.....	39
Touchpad.....	41
Removing the touchpad.....	41
Installing the touchpad.....	42
Power-adapter port.....	43
Removing the power-adapter port.....	43
Installing the power-adapter port.....	44
System board.....	45
Removing the system board.....	45
Installing the system board.....	47
Power button.....	50
Removing the power button.....	50
Installing the power button.....	51
Power button with fingerprint reader.....	52
Removing the power button with fingerprint reader.....	52
Installing the power button with fingerprint reader.....	53
Display assembly.....	55
Removing the display assembly.....	55
Installing the display assembly.....	58
Palmrest assembly.....	61
Replacing the palmrest assembly.....	61
3 System setup.....	64
Boot menu.....	64
Navigation keys.....	64
Boot Sequence.....	65
System setup options.....	65
Overview.....	65
Boot options.....	66
System information.....	66
Video.....	68
Security.....	68
Passwords.....	69
Secure boot.....	70
Performance.....	70
Power management.....	71
Wireless.....	72
POST behavior.....	72
Virtualization support.....	72
Maintenance.....	73
System logs.....	73
Updating the BIOS in Windows	73
Updating BIOS on systems with BitLocker enabled.....	74
Updating your system BIOS using a USB flash drive.....	74

System and setup password.....	75
Assigning a system setup password.....	75
Deleting or changing an existing system setup password.....	76
4 Troubleshooting.....	77
Enhanced Pre-Boot System Assessment (ePSA) diagnostics.....	77
Running the ePSA diagnostics.....	77
Diagnostics.....	77
M-BIST.....	78
L-BIST.....	78
System diagnostic lights.....	78
WiFi power cycle.....	79
5 Getting help.....	80
Contacting Dell.....	80

Working on your computer

Safety instructions

Prerequisites

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

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

About this task

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

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

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

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

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

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

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

Turning off your computer — Windows 10

About this task

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

Steps

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

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

Before working inside your computer

About this task

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

Steps

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

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

5. Disconnect your computer and all attached devices from their electrical outlets.
6. Press and hold the power button while the computer is unplugged to ground the system board.

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

After working inside your computer

About this task

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

Steps

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

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

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

Removing and installing components

Recommended tools

The procedures in this document require the following tools:

- Phillips #0 screwdriver
- Phillips #1 screwdriver
- Plastic scribe

NOTE: The #0 screw driver is for screws 0-1 and the #1 screw driver is for screws 2-4

Screw List

The following table shows the screw list and the images for different components.

Table 1. Screw Size List

Component	Screw type	Quantity	Image
Base cover	M2.5x5	7	
	M2X8 (captive screws)	2	
Battery	M2x3	4	
WLAN	M2x3	1	
System fan	M2x3	2	
DC-In	M2x3	1	
SSD	M2x3	1	
Input output board	M2x3	2	
USB Type-C bracket	M2x3	2	
HDD assembly	M2x3	4	
HDD bracket	M3x3	4	
Power button	M2x3	2	

Component	Screw type	Quantity	Image
Touchpad button bracket	M2x2 (Big Head)	3	
Touchpad board	M2x2 (Big Head)	4	
Hinge plate	M2.5x5	4	
	M2x4	2	
Heatsink - UMA	M2x3	4	
Heatsink - Discrete	M2x3	7	
System board	M2x2 (Big head)	5	
Fingerprint board	M2x2 (Big Head)	2	
Power button board	M2x2 (Big Head)	2	
Display Hinges	M2.5x2.5 (Big head)	4	
	M2x3	2	

Base cover

Removing the base cover

Prerequisites

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

About this task

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

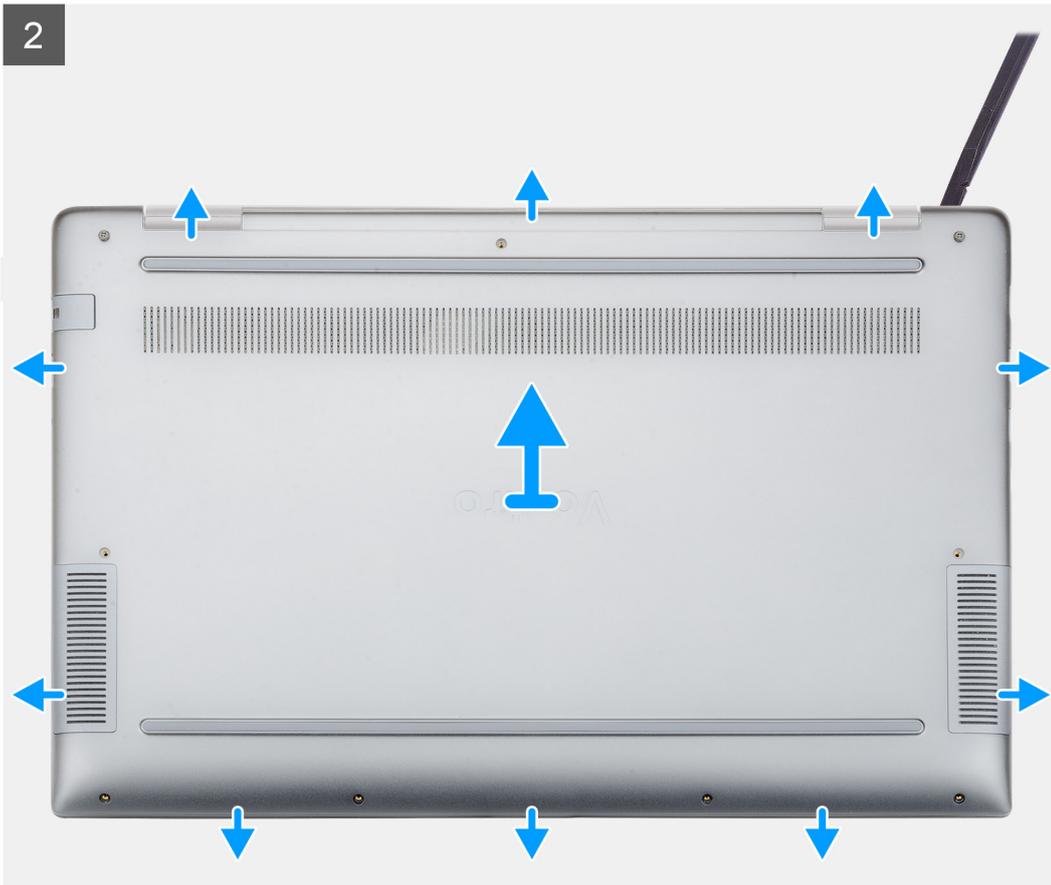


2x
M2x8

7x
M2.5x5

1





Steps

1. Remove the seven (M2.5x5) screws and loosen the two (M2x8) captive screws that secure the base cover to the computer.
2. Pry the base cover starting from the right hinge and work your way around.
3. Lift the base cover away from the computer.

Installing the base cover

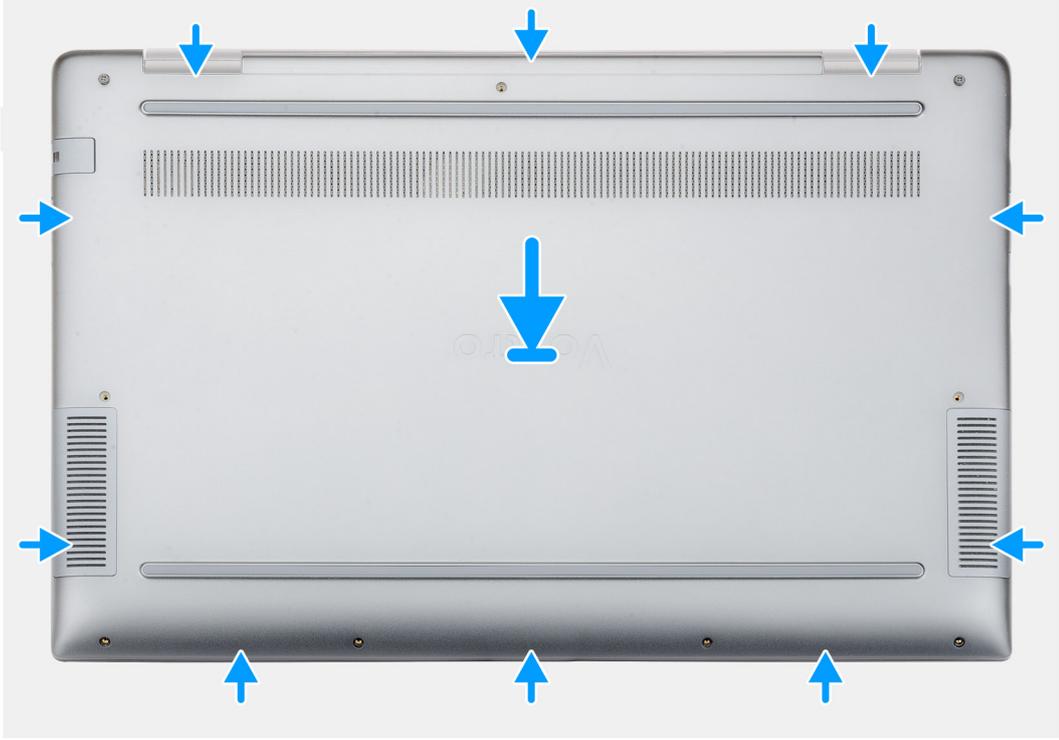
Prerequisites

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

About this task

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

1





2x
M2x8

7x
M2.5x5

2



Steps

1. Place the base cover on the palmrest and keyboard assembly, and snap the base cover into place.
2. Replace the seven (M2.5x5) and tighten the two (M2x8) captive screws to secure the base cover to the computer.

Next steps

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

Battery

Lithium-ion battery precautions

⚠ CAUTION:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery as much as possible before removing it from the system. This can be done by disconnecting the AC adapter from the system to allow the battery to drain.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any kind to pry on or against the battery.

- Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.
- If a battery gets stuck in a device as a result of swelling, do not try to free it as puncturing, bending, or crushing a Lithium-ion battery can be dangerous. In such an instance, contact for assistance and further instructions.
- If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See www.dell.com/contactdell.
- Always purchase genuine batteries from www.dell.com or authorized Dell partners and resellers.

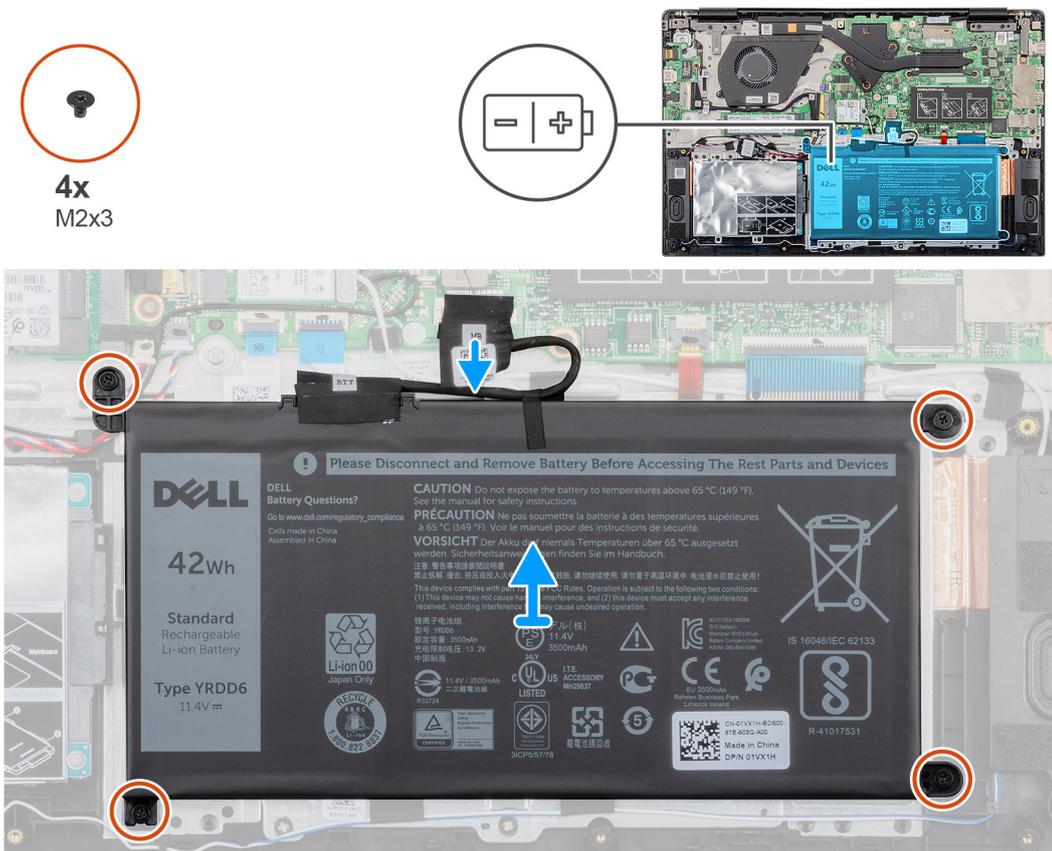
Removing the battery

Prerequisites

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

About this task

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



Steps

1. Disconnect the battery cable from the system board.
2. Remove the four (M2x3) screws that secure the battery to the palmrest.
3. Lift the battery away from the computer.

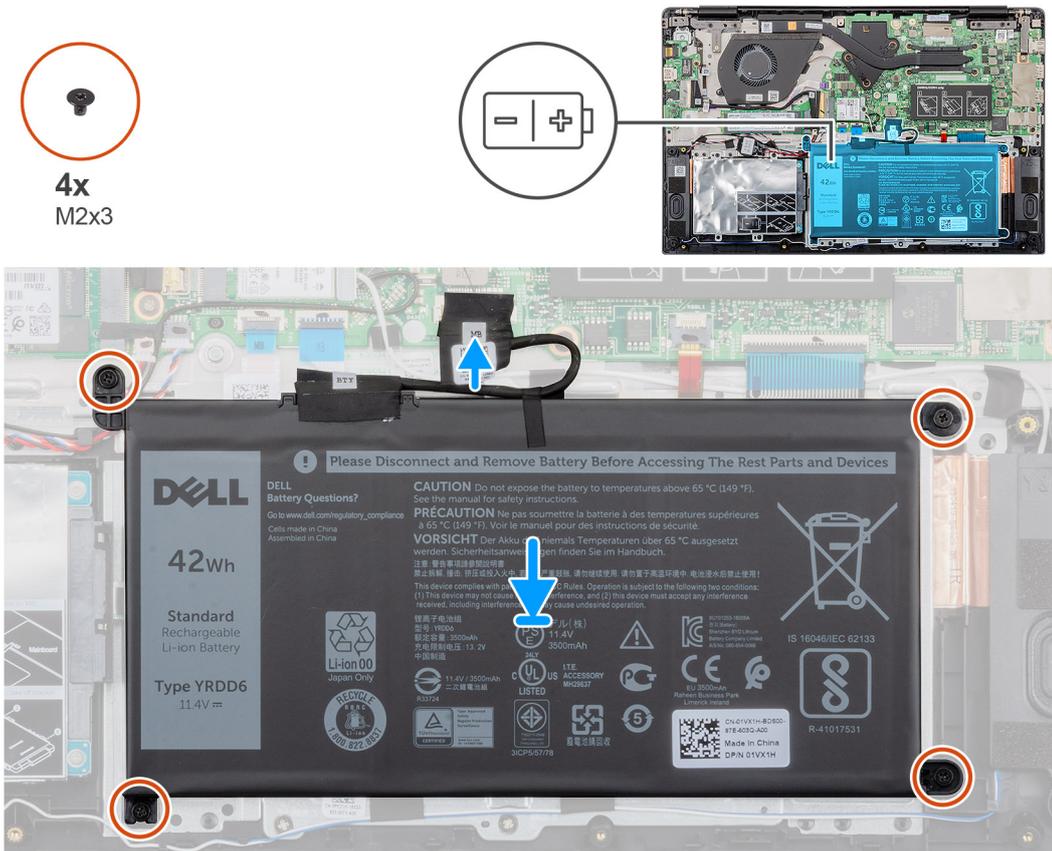
Installing the battery

Prerequisites

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

About this task

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



Steps

1. Place the battery on the palmrest and align the screw holes on the battery with the screw holes on the palmrest.
2. Replace the four (M2x3) screws to secure the battery to the palmrest.
3. Connect the battery cable to the connector on the system board.

Next steps

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

Memory modules

Removing the secondary memory module

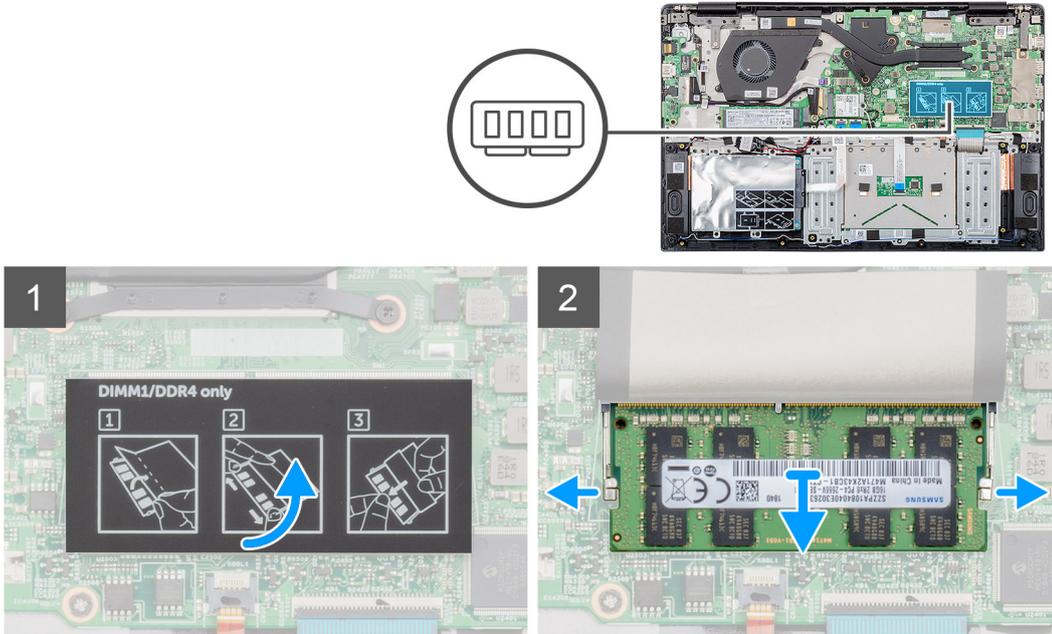
Prerequisites

NOTE: Primary memory module is integrated into the system board.

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

About this task

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



Steps

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

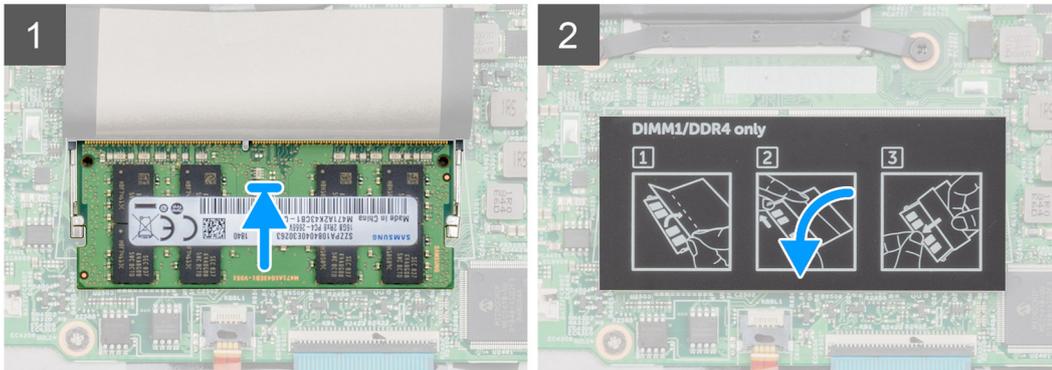
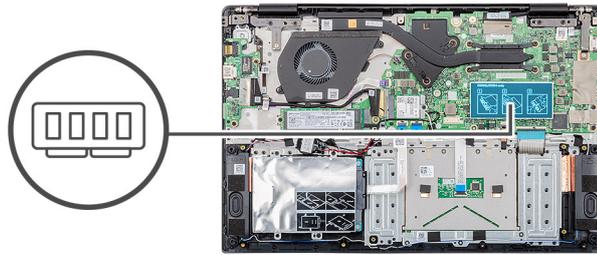
Installing the secondary memory module

Prerequisites

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

About this task

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



Steps

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

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

4. Affix the adhesive tape above the memory module.

Next steps

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

Hard drive

Removing the hard drive

Prerequisites

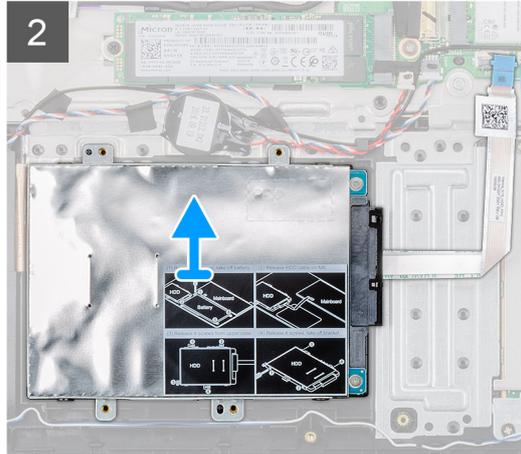
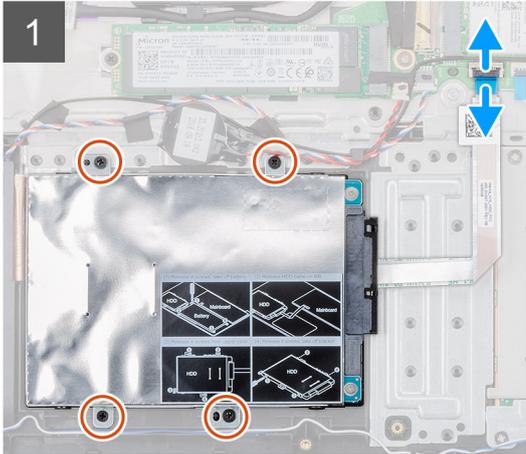
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

The figure indicates the location of the 2.5 in. hard-drive module and provides a visual representation of the removal procedure.



4x
M2x3



Steps

1. Release the latch and disconnect the hard-drive cable from the connector on the system board.
2. Remove the four (M2x3) screws that secure the hard-drive module to the palmrest assembly.
3. Slide the hard-drive module out from the computer.

Installing the hard drive

Prerequisites

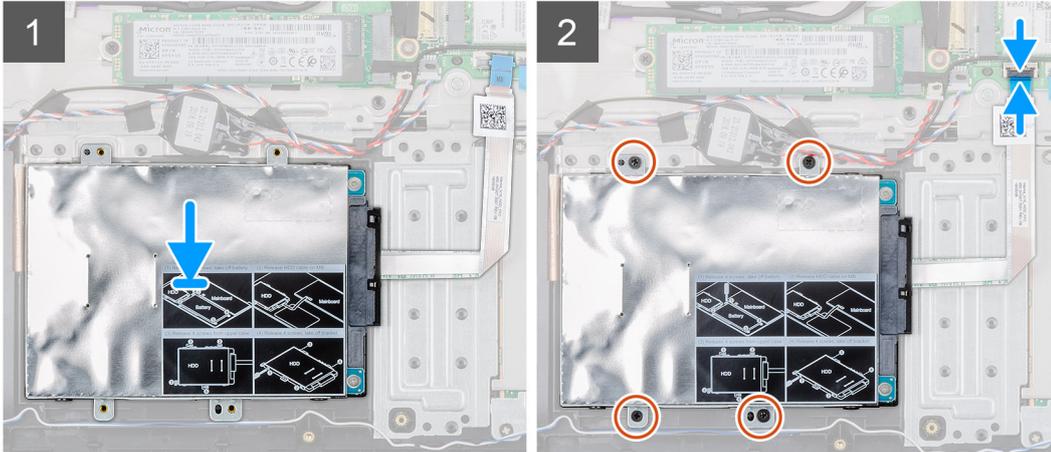
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the 2.5 in. hard-drive module and provides a visual representation of the installation procedure.



4x
M2x3



Steps

1. Place the hard-drive module on the system and align the screw holes on the hard drive module with the screw holes on the palmrest assembly.
2. Replace the four (M2x3) screws to secure the hard-drive module to the palmrest assembly.
3. Connect the hard-drive cable to the connector on the system board and close the latch to secure the cable.

Next steps

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

Solid state drive

Removing the M.2 2230 solid-state drive

Prerequisites

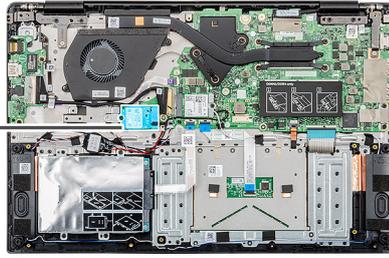
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

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



1x
M2x3



Steps

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

Removing the M.2 2242 solid-state drive

Prerequisites

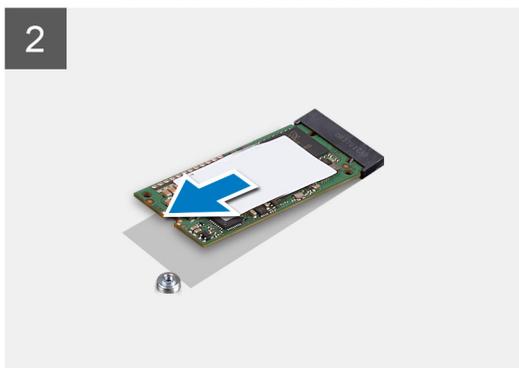
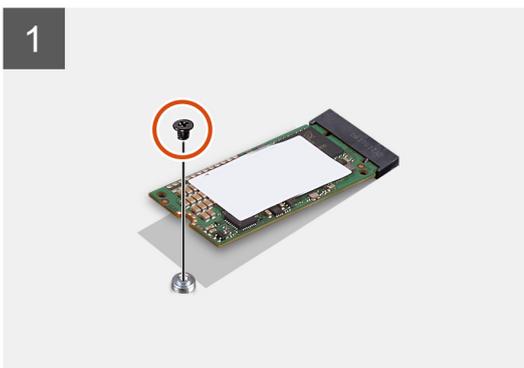
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

The figure indicates the location of the M.2 2242 solid-state drive and provides a visual representation of the removal procedure.



1x
M2x3



Steps

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

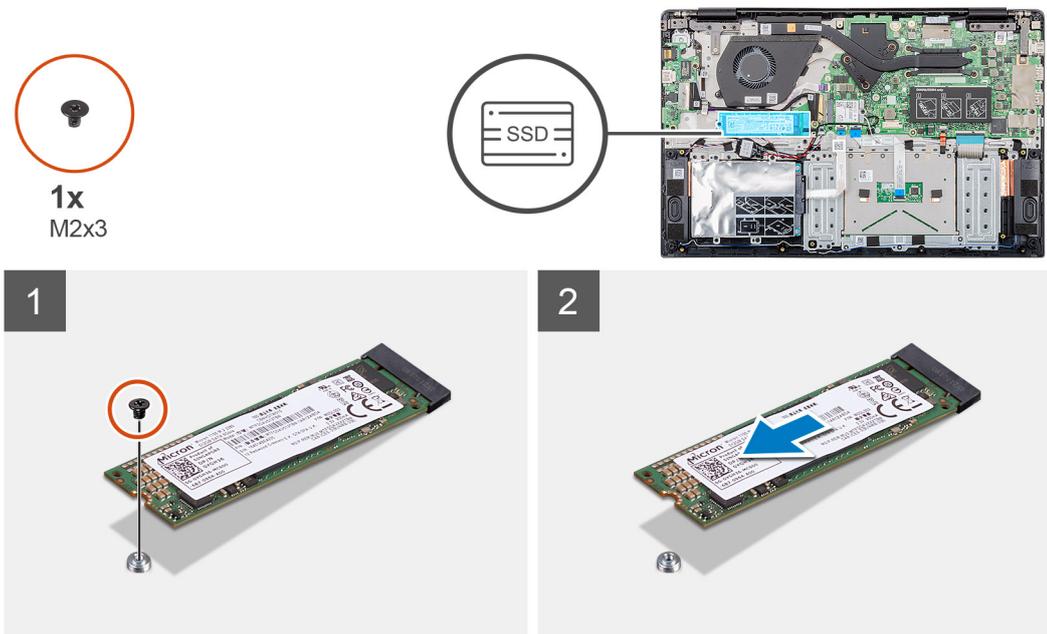
Removing the M.2 2280 solid-state drive

Prerequisites

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

About this task

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



Steps

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

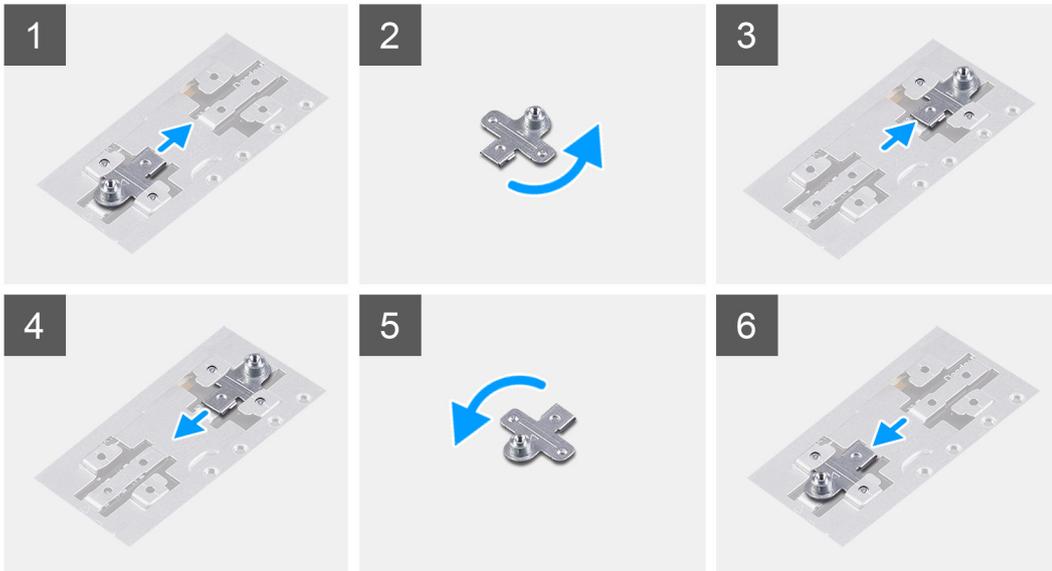
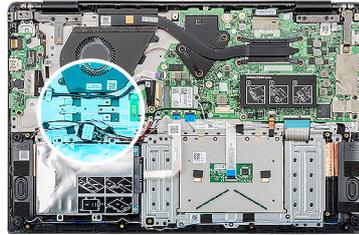
Replacing the SSD support bracket

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [M.2 2230 SSD](#) or [M.2 2242 SSD](#) or [M.2 2280 SSD](#).

About this task

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



Steps

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

Installing M.2 2230 solid-state drive

Prerequisites

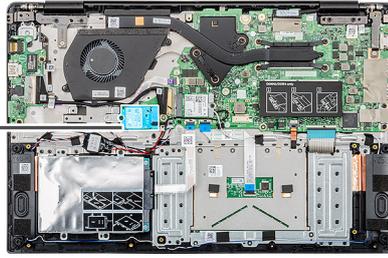
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



1x
M2x3



Steps

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

Next steps

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

Installing M.2 2242 solid-state drive

Prerequisites

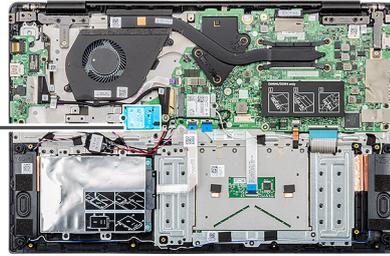
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

The figure indicates the location of the M.2 2242 solid-state drive and provides a visual representation of the installation procedure.



1x
M2x3



Steps

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

Next steps

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

Installing M.2 2280 solid-state drive

Prerequisites

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

About this task

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



1x
M2x3



Steps

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

Next steps

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

WLAN card

Removing the WLAN card

Prerequisites

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

About this task

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



1x
M2x3



Steps

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

Installing the WLAN card

Prerequisites

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

About this task

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



1x
M2x3



Steps

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

Next steps

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

Coin-cell battery

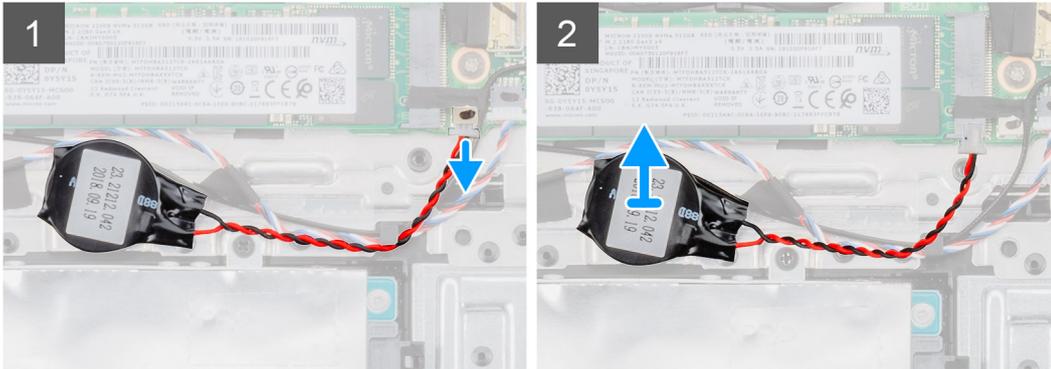
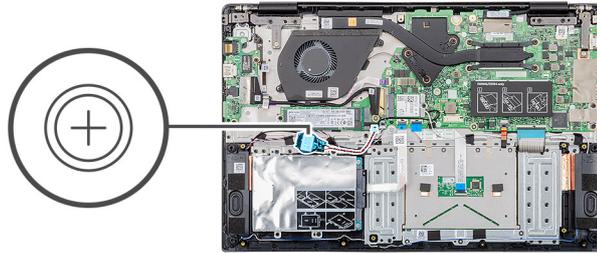
Removing the coin-cell battery

Prerequisites

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

About this task

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



Steps

1. Disconnect the coin-cell battery cable from the system board.
2. Remove the coin-cell battery cable from the routing guide.
3. Peel the coin-cell battery off the palmrest assembly.

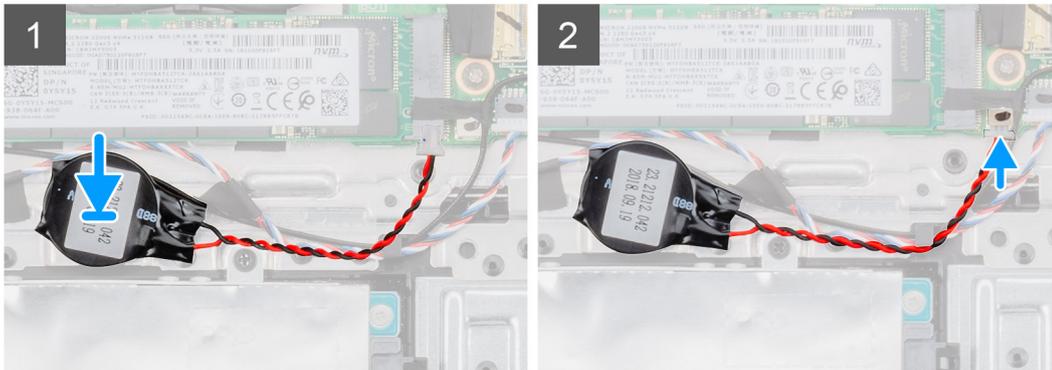
Installing the coin-cell battery

Prerequisites

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

About this task

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



Steps

1. Adhere the coin-cell battery to the slot on the palmrest assembly.
2. Route the coin-cell battery cable through the routing guide.
3. Connect the coin-cell battery cable to the system board.

Next steps

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

Speakers

Removing the speakers

Prerequisites

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

About this task

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



Steps

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

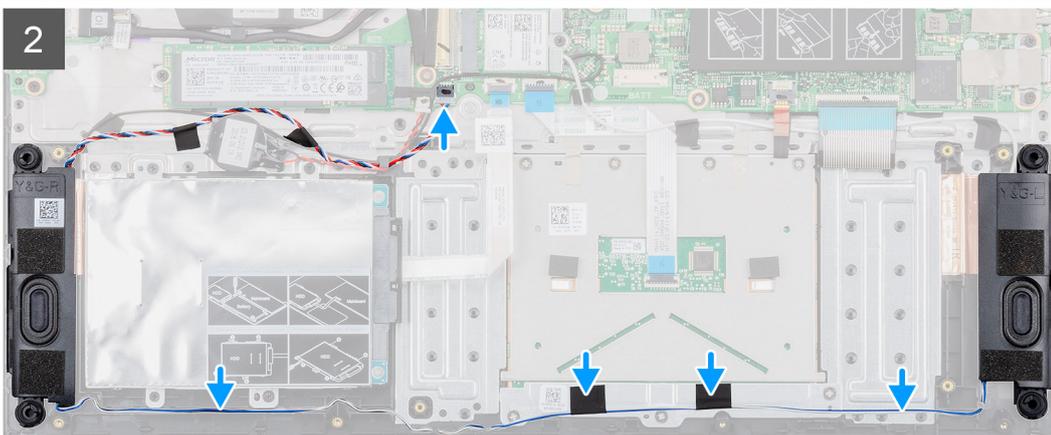
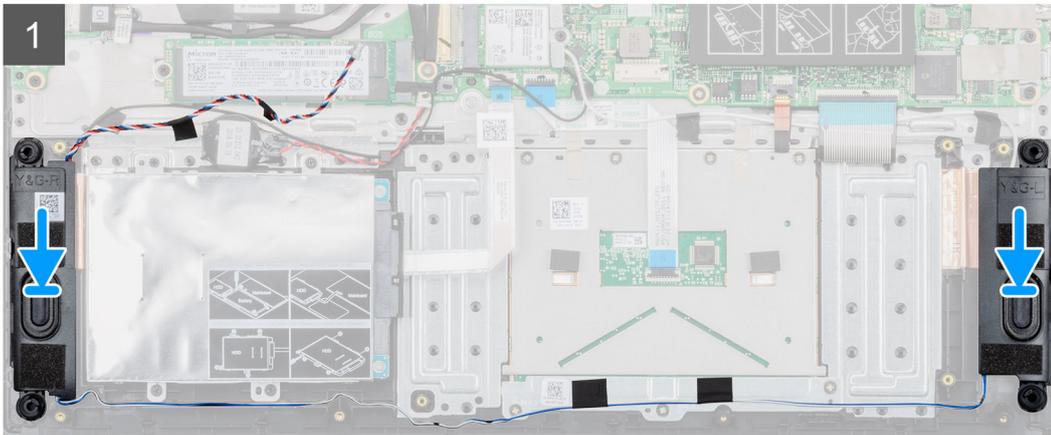
Installing the speakers

Prerequisites

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

About this task

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



Steps

1. Locate the speaker slot on your computer.
2. Align and place the speakers in the slot on your computer.
3. Connect the speaker cable to the connector on the system board.
4. Route the speaker cables through the retention clips on your computer.
5. Adhere the adhesive tape to secure the speaker cable.

Next steps

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

Input and output board

Removing the input and output board

Prerequisites

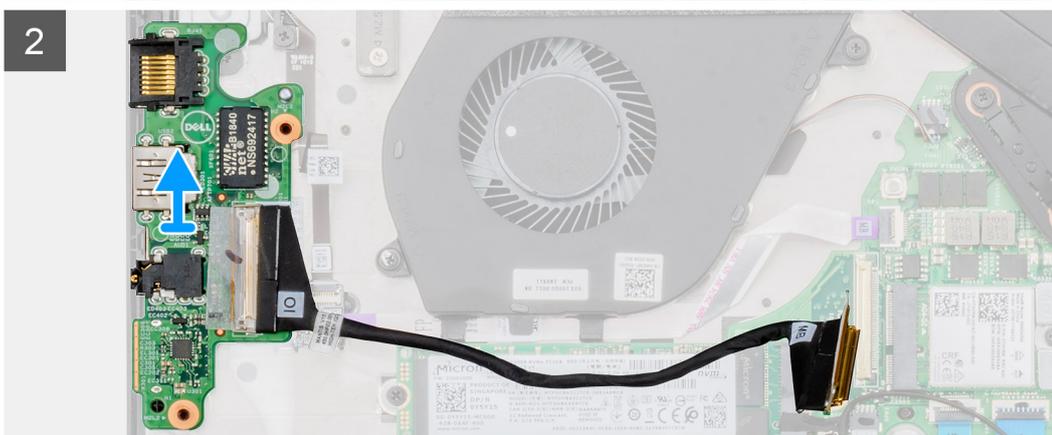
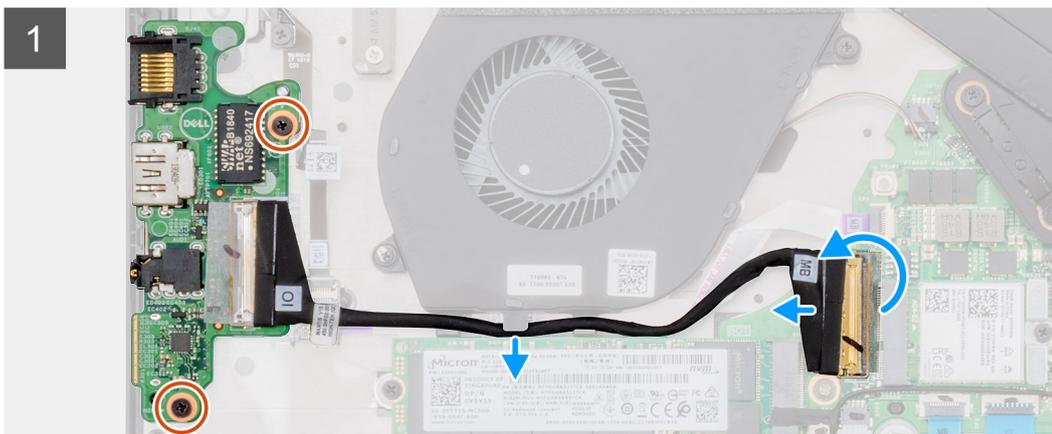
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

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



2x
M2x3



Steps

1. Locate the input and output board on your computer.
2. Lift the latch and disconnect the input and output board cable from the connector on the system board.
3. Unroute the input and output board cables from the retention clips on the computer.
4. Remove the two (M2x3) screws that secure the input and output board to the palmrest assembly.

5. Lift the input and output board out of the computer.

Installing the input and output board

Prerequisites

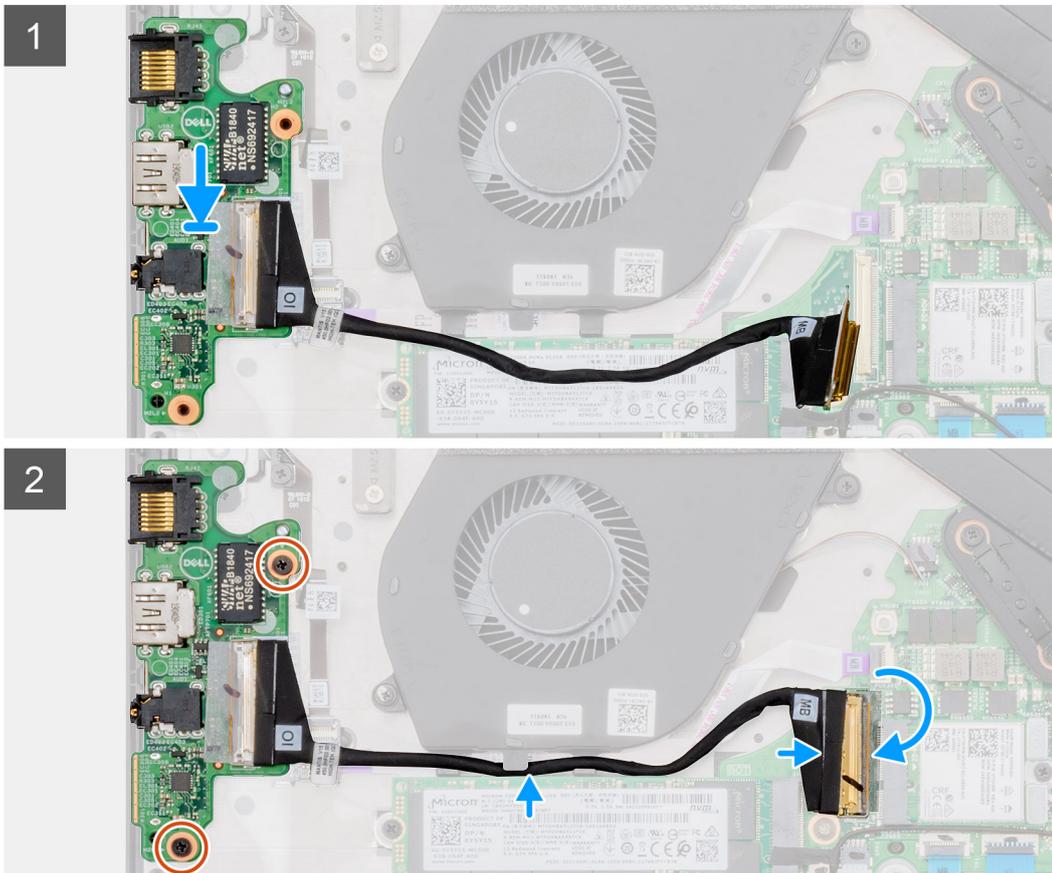
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M2x3



Steps

1. Align and place the input and output board in the slot on your computer.
2. Replace the two (M2x3) screws to secure the input and output board to the palmrest assembly.
3. Connect the input and output board cable to the connector on the system board.
4. Route the input and output board cables through the retention clips on your computer.

Next steps

1. Install the [battery](#).

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

Heatsink—discrete

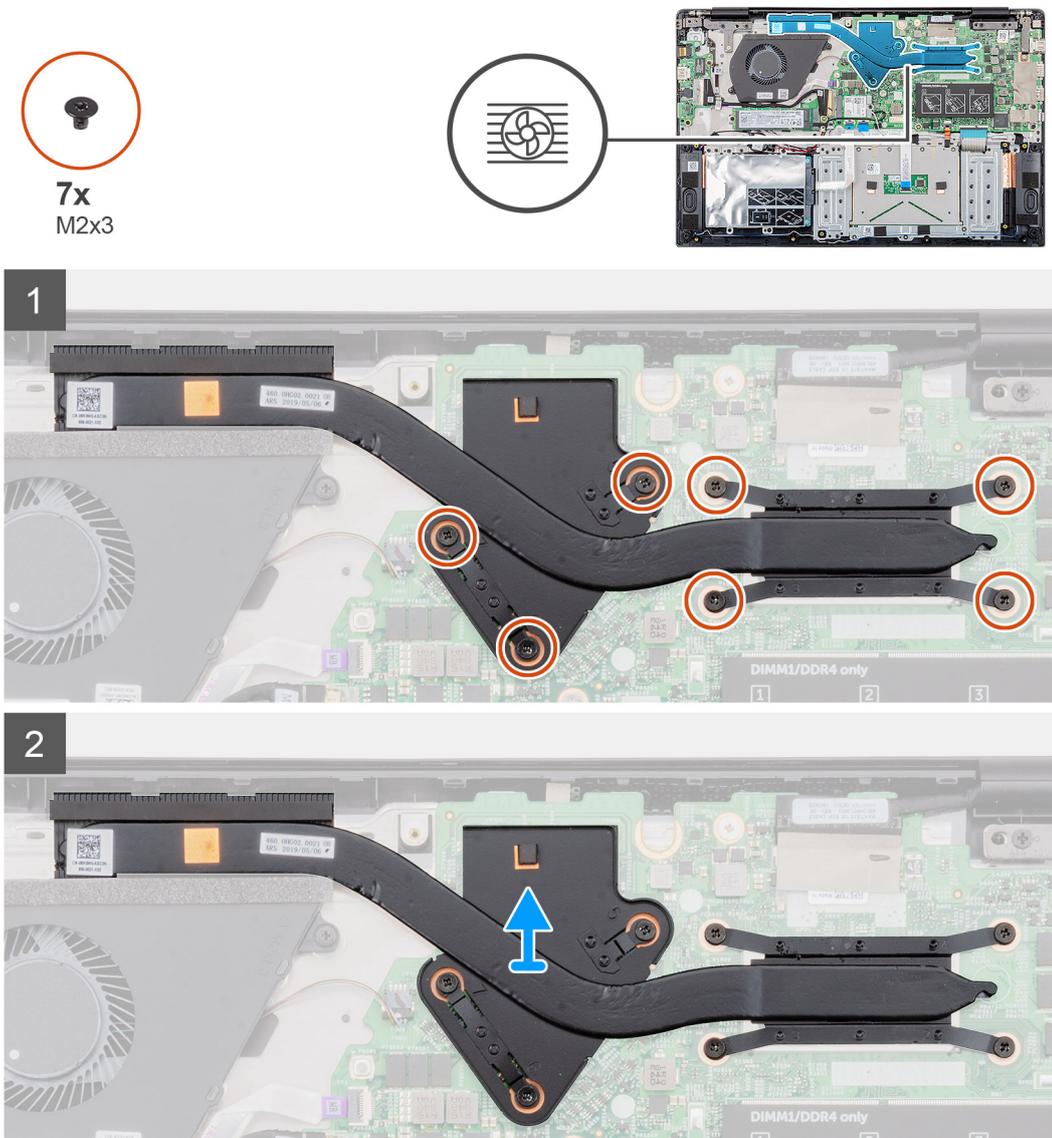
Removing the heatsink assembly-discrete

Prerequisites

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

About this task

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



Steps

1. Locate the heatsink assembly on your computer.

2. Remove the seven (M2x3) screws that secure the heatsink assembly to the system board.

NOTE: Remove the screws in the order of the callout numbers [1, 2, 3, 4, 5, 6, 7] as indicated on the heatsink.

3. Lift the heatsink assembly out of the computer.

Installing the heatsink assembly-discrete

Prerequisites

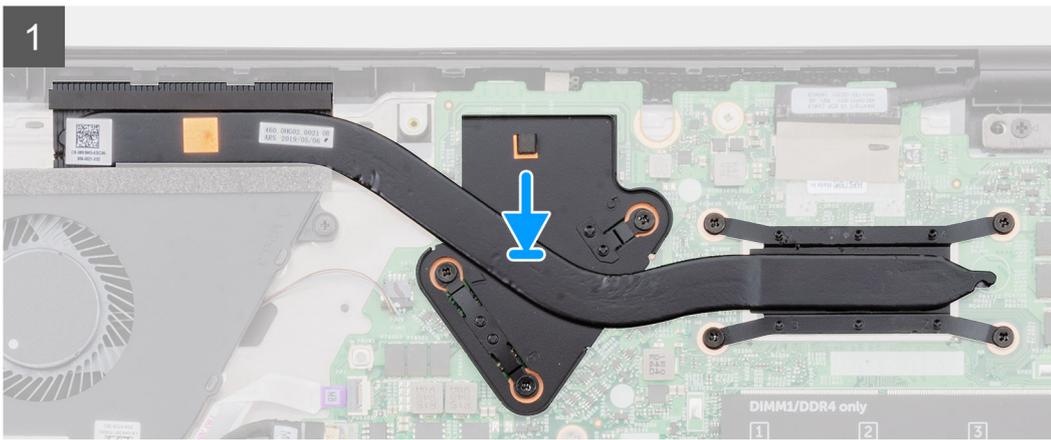
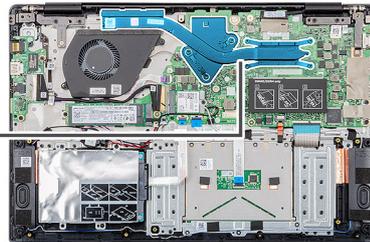
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



7x
M2x3



Steps

1. Locate the heatsink assembly slot on your computer.
2. Align and place the heatsink assembly into the slot.
3. Replace the seven (M2x3) screws to secure the heatsink assembly to the system board.

NOTE: Replace the screws as per the callout on the heatsink.

Next steps

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

Heatsink—UMA

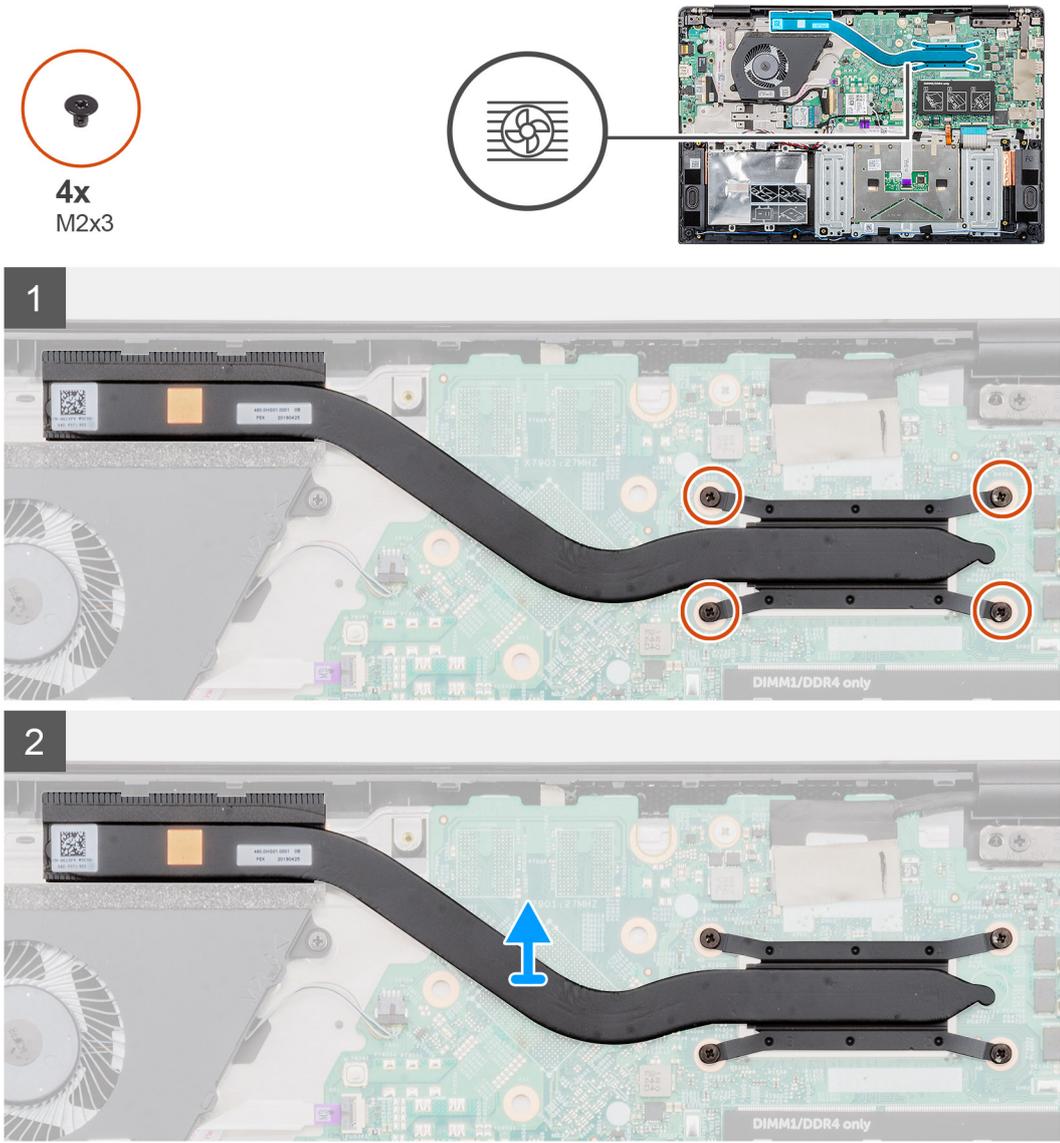
Removing the heatsink assembly-UMA

Prerequisites

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

About this task

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



Steps

1. Locate the heatsink assembly on your computer.
2. Remove the four (M2x3) screws that secure the heatsink assembly to the computer.

i | **NOTE:** Remove the screws as per the callout on the heatsink module.

3. Lift the heatsink assembly out of the computer.

Installing the heatsink assembly-UMA

Prerequisites

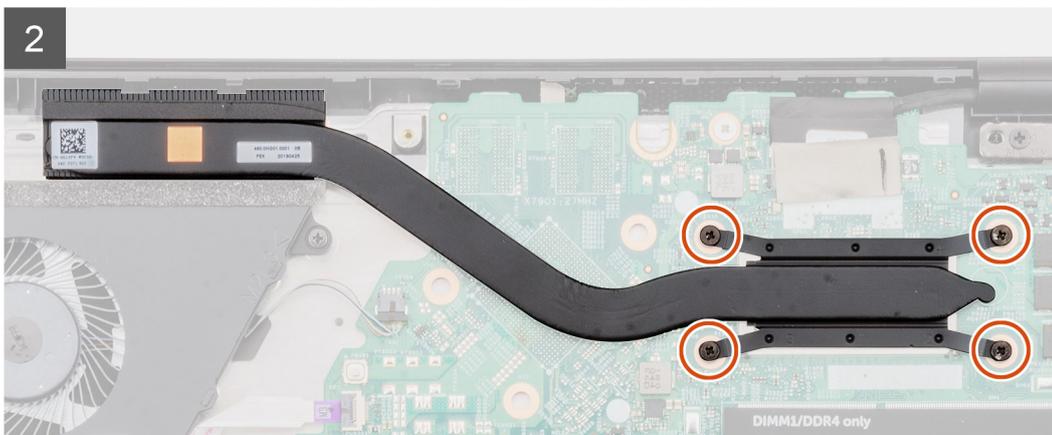
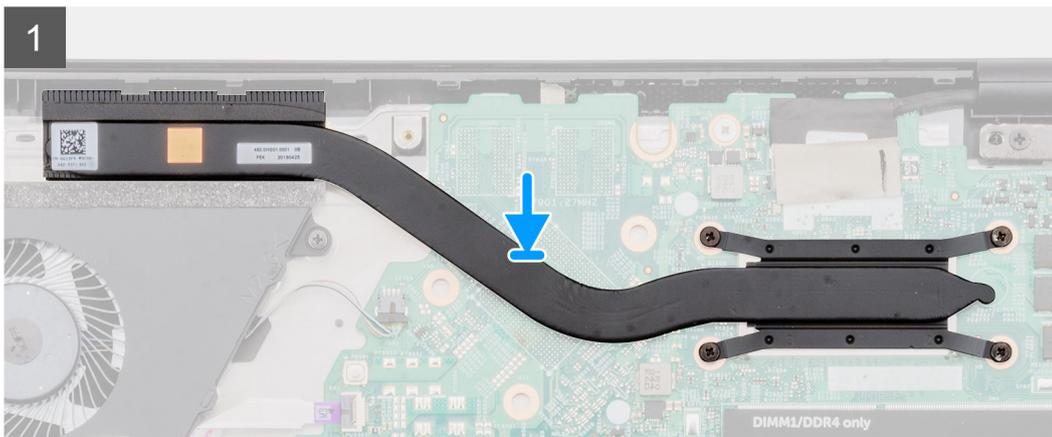
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



4x
M2x3



Steps

1. Locate the heatsink assembly slot on your computer.
2. Align and place the heatsink assembly into the slot of your computer.

3. Replace the four (M2x3) screws to secure the heatsink assembly to the system board.

 **NOTE:** Install the screws as per the callout on the heatsink.

Next steps

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

System fan

Removing the system fan

Prerequisites

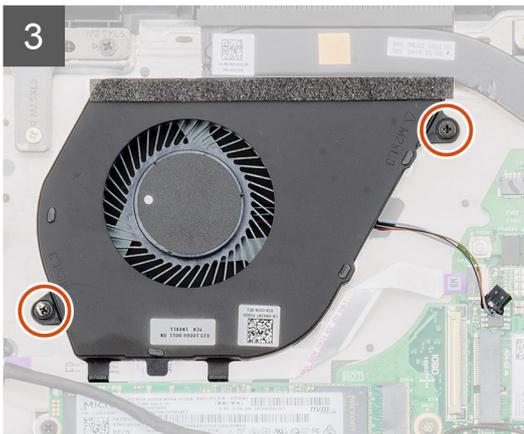
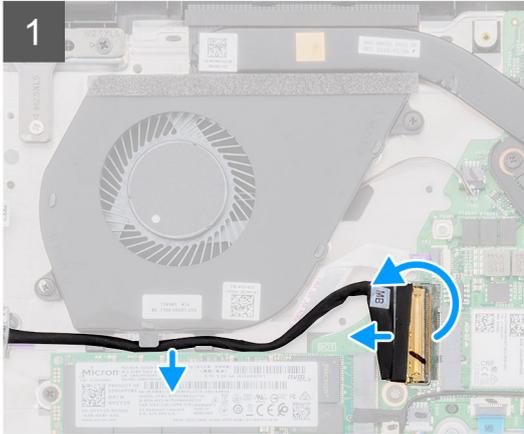
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

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



2x
M2x3



Steps

1. Lift the latch and disconnect the input and output board cable from the connector on the system board.
2. Unroute the input and output board cable from the retention clips.
3. Disconnect the system fan cable from the connector on the system board.
4. Remove the two (M2x3) screws that secure the system fan to the palmrest assembly.
5. Lift the system fan off the palmrest assembly.

Installing the system fan

Prerequisites

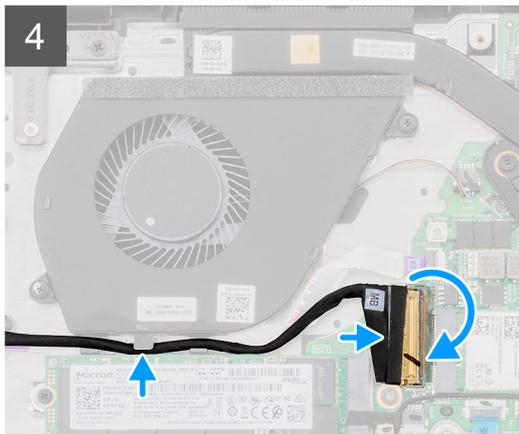
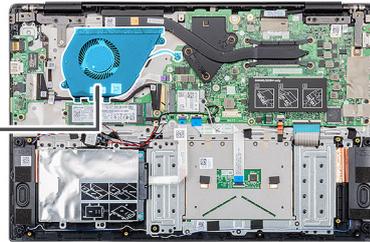
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



2x
M2x3



Steps

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

Next steps

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

Touchpad

Removing the touchpad

Prerequisites

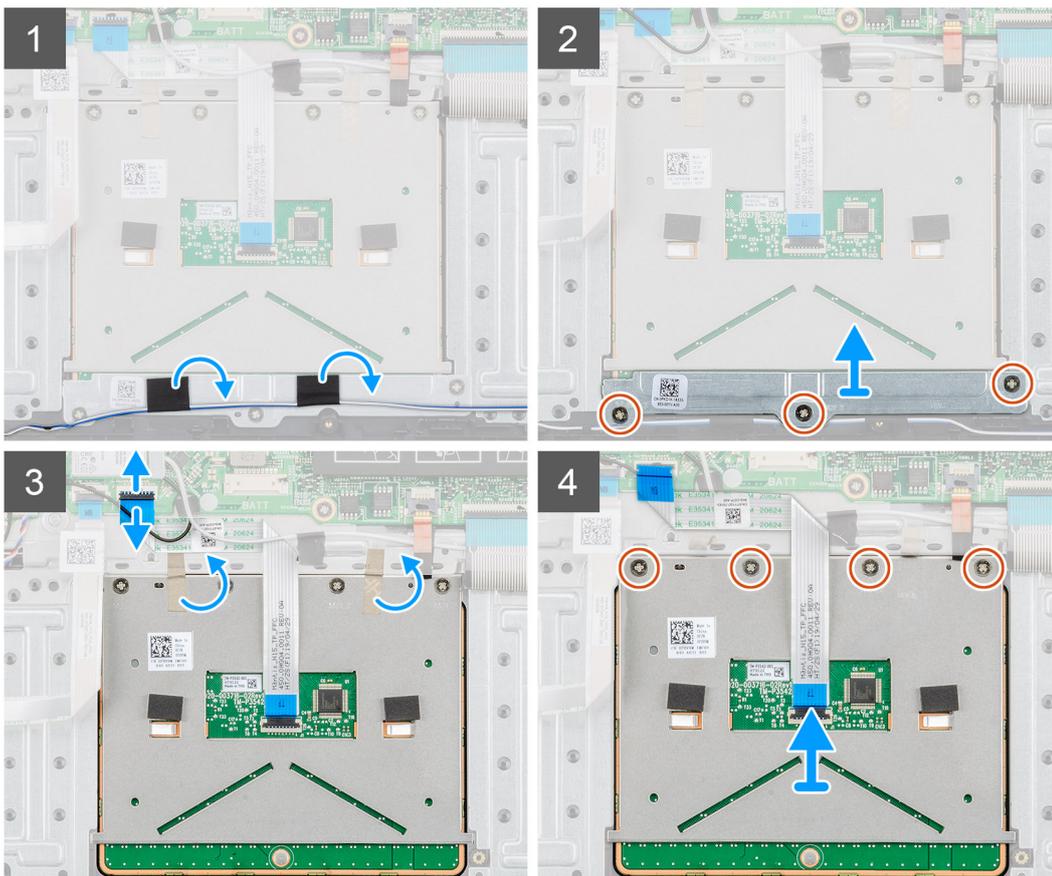
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).

About this task

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



7x
M2x2



Steps

1. Locate the touchpad on your computer.
2. Peel the adhesive that secures the speaker cable to the touchpad bracket.
3. Remove the three (M2x2) screws that secure the touchpad bracket to the touchpad.
4. Remove the touchpad bracket away from the computer.

- Lift the latch and disconnect the touchpad cable from the connector on the system board.
- Peel the adhesive that secures the touchpad to the palmrest and keyboard assembly.
- Remove the four (M2x2) screws that secure the touchpad to the palmrest and keyboard assembly.
- Lift the touchpad out of the computer.

Installing the touchpad

Prerequisites

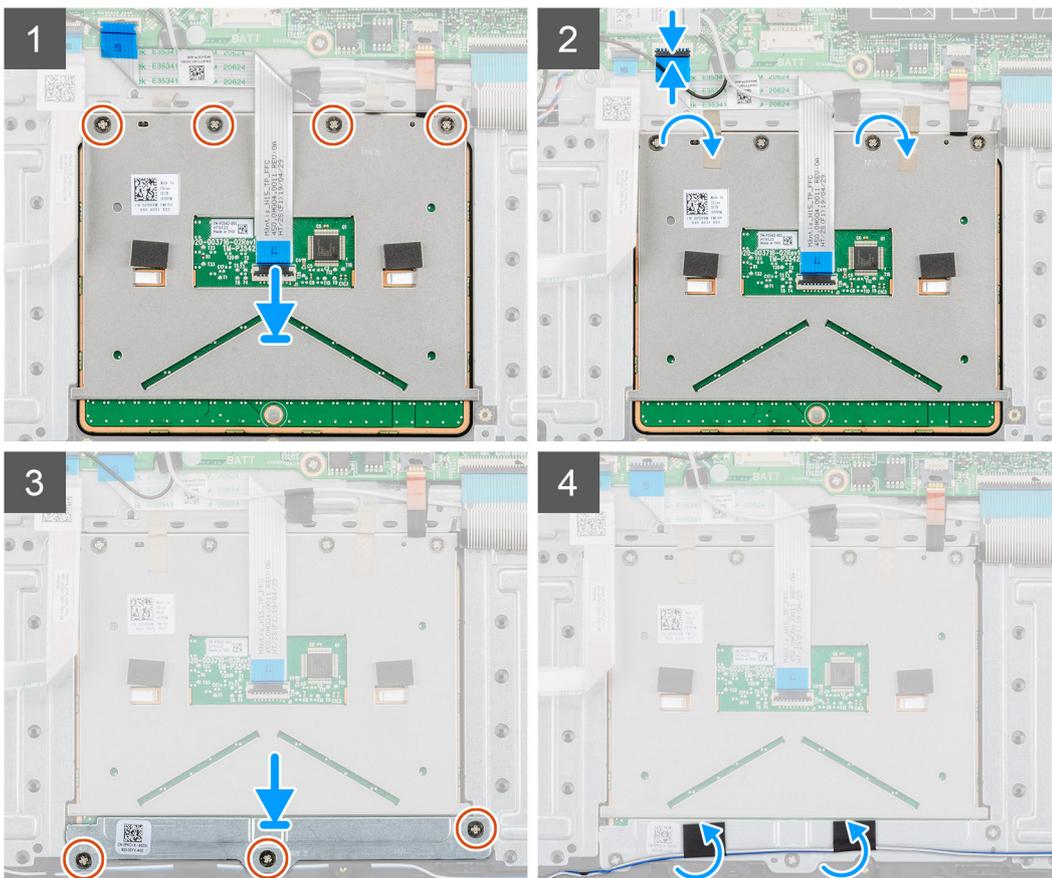
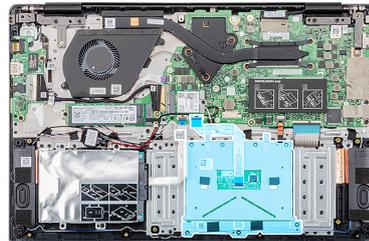
If you are replacing a component, remove the existing component before performing the installation procedure.

About this task

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



7x
M2x2



Steps

- Locate the touchpad slot on your computer.
- Align and place the touchpad into the slot on your computer.
- Replace the four (M2x2) screws to secure the touchpad to the palmrest.
- Connect the touchpad cable to the connector on the system board and secure the latch.

5. Adhere the adhesive to secure the touchpad to the palmrest.
6. Align and place the touchpad bracket.
7. Replace the three (M2x2) screws to secure the touchpad bracket to the touchpad.
8. Adhere the adhesive to route the speaker cable.

Next steps

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

Power-adapter port

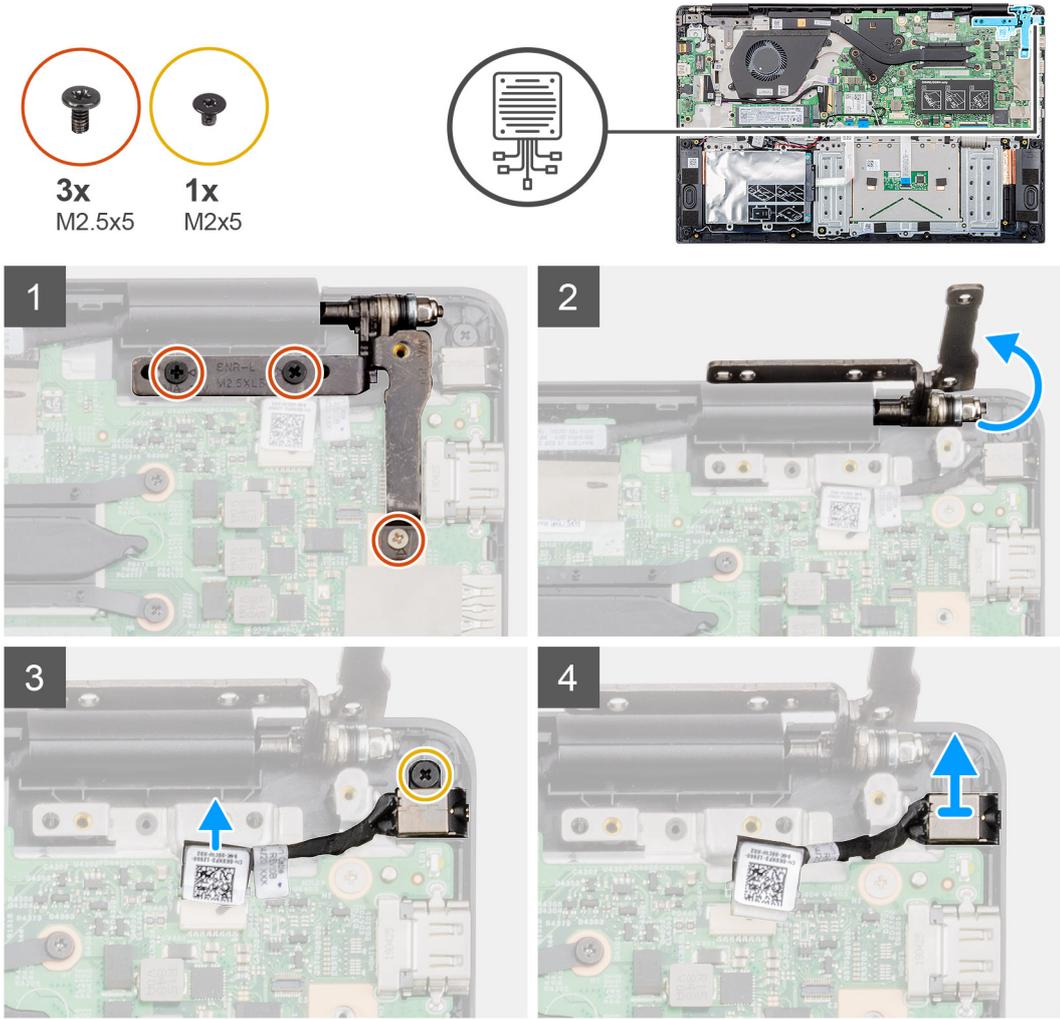
Removing the power-adapter port

Prerequisites

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

About this task

The figure indicates the location of the power-adapter and provides a visual representation of the removal procedure.



Steps

1. Locate the power-adapter port on your computer.
2. Remove the three (M2.5x5) screws that secure the left display hinge to the palmrest assembly.
3. Partially lift the left hinge.
4. Disconnect the power-adapter cable from the connector on the system board.
5. Remove the single (M2x5) screw that secures the power-adapter port to the palmrest.
6. Lift the power-adapter port from the computer.

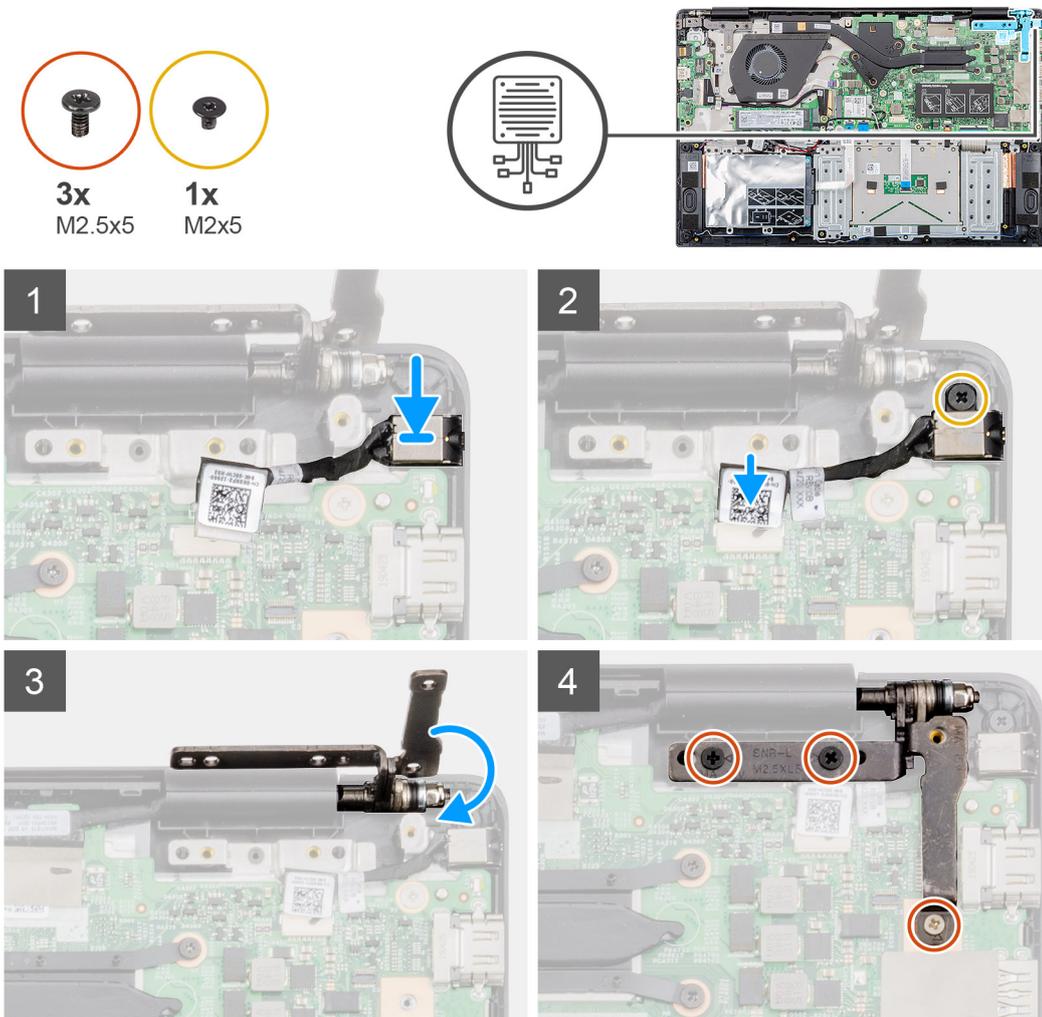
Installing the power-adapter port

Prerequisites

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

About this task

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



Steps

1. Locate the power-adapter slot on your computer.
2. Insert the power-adapter port into the slot on the system board.
3. Replace the single (M2x5) screw to secure the power-adapter port to the palmrest assembly.
4. Connect the power-adapter cable to the connector on the system board.

5. Close the left hinge.
6. Replace the three (M2.5x5) screws that secure the left hinge to the system board.

Next steps

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

System board

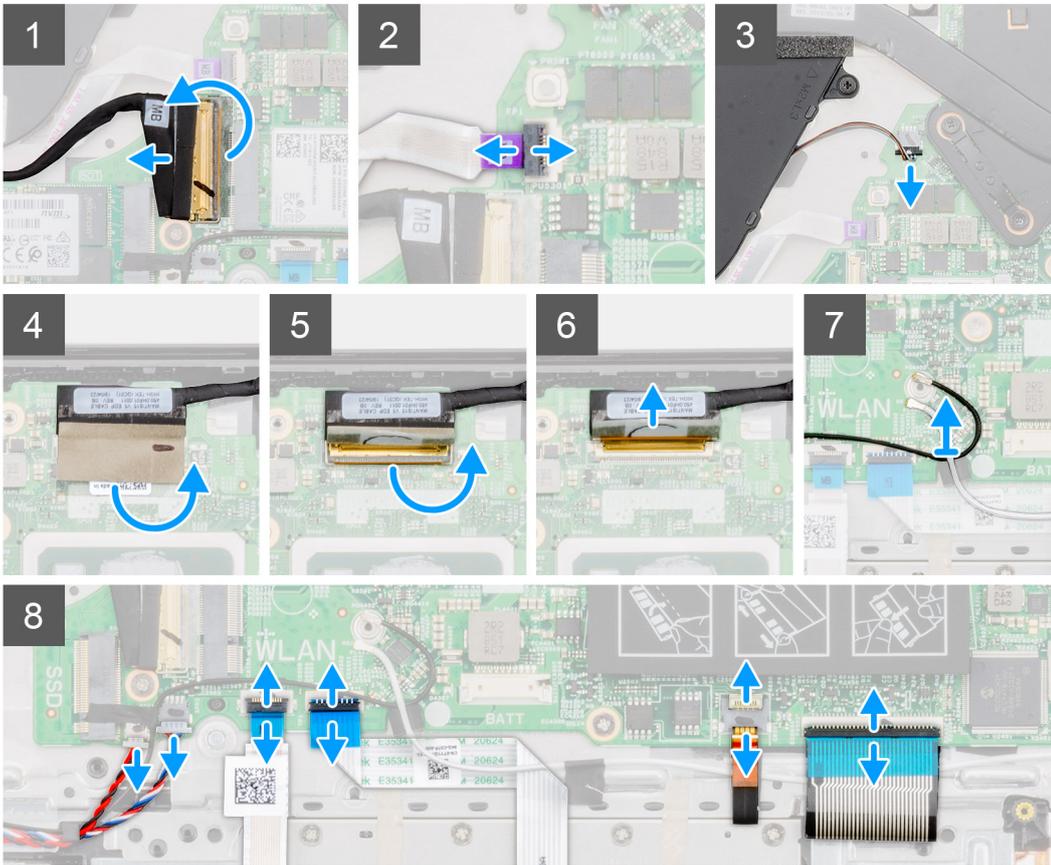
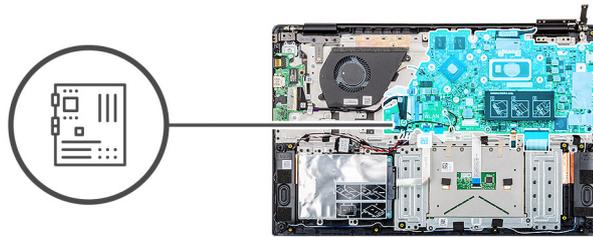
Removing the system board

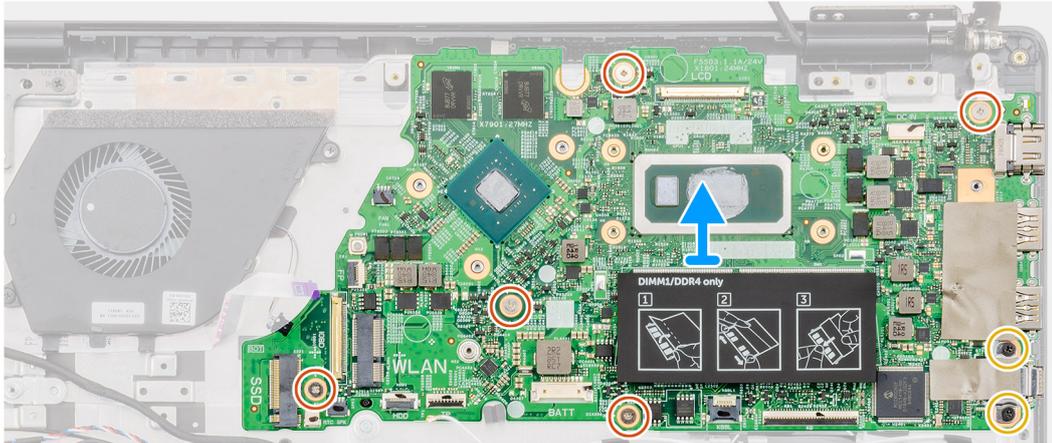
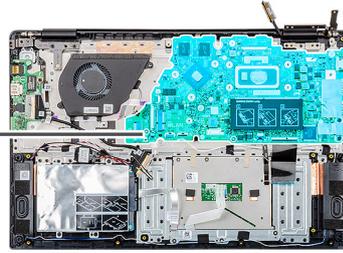
Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [M.2 2230 SSD](#) or [M.2 2242 SSD](#) or [M.2 2280 SSD](#).
5. Remove the [memory](#).
6. Remove the [WLAN](#).
7. Remove the [heatsink-discrete](#) or [heatsink- UMA](#).
8. Remove the [power-adapter port](#).

About this task

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





Steps

1. Locate the system board on your computer.
2. Lift the latch and disconnect the input and output board cable from the connector on the system board.
3. Lift the latch and disconnect the power button cable from the connector on the system board.
4. Peel the adhesive tape above the display cable connector.
5. Lift the latch and disconnect the display cable from the connector on the system board.
6. Remove the WLAN antenna cables.
7. Disconnect the coin-cell battery cable and the speaker cable from the connectors on the system board.
8. Lift the latch and disconnect the hard drive cable, touchpad cable, keyboard backlit cable and the keyboard cable from the connectors on the system board.
9. Remove the five (M2x4) and two (M2x5) screws that secure the system board to the palmrest assembly.
10. Lift the system board off the palmrest and keyboard assembly.

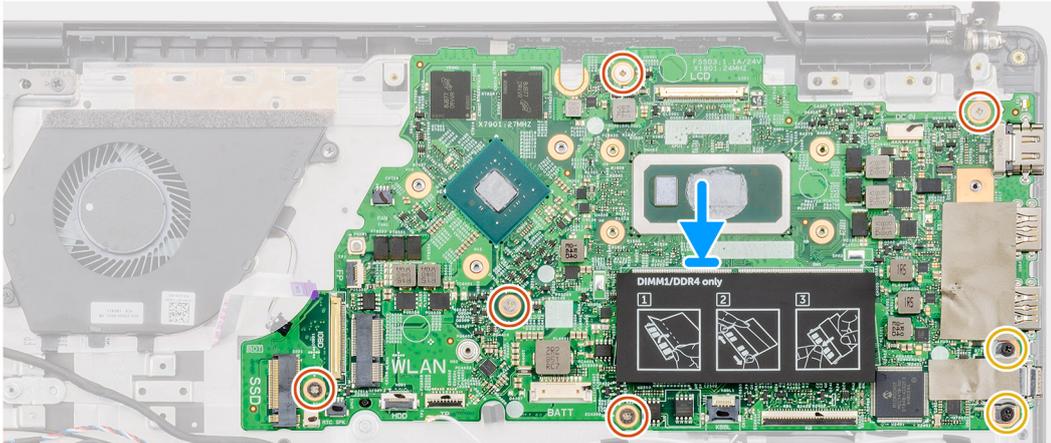
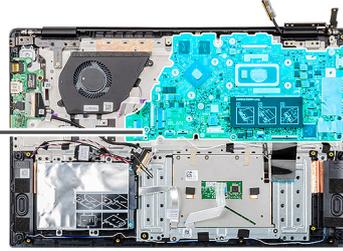
Installing the system board

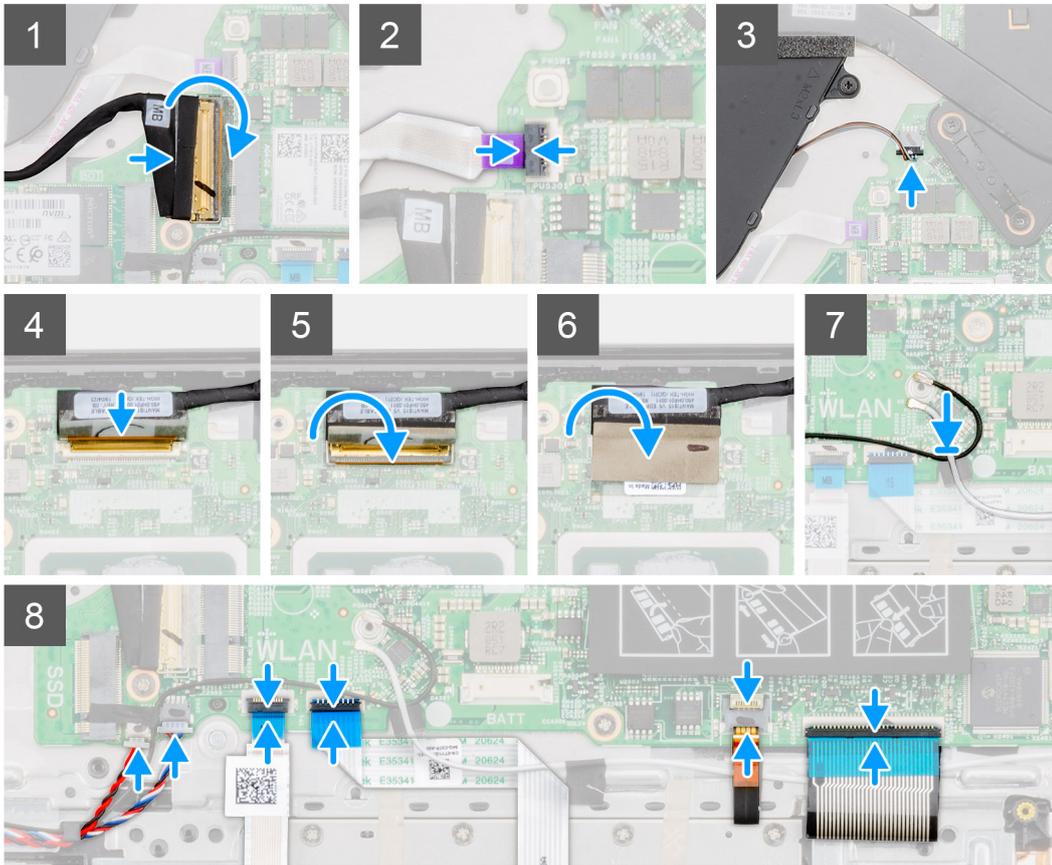
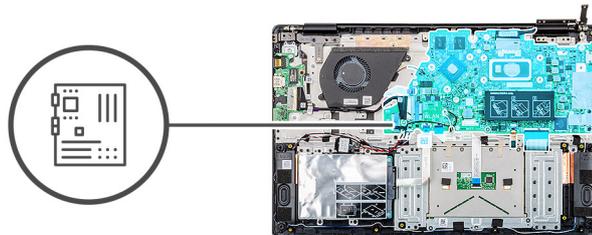
Prerequisites

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

About this task

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





Steps

1. Locate the system board slot on your computer.
2. Align the screw holes on the system board with the screw holes on the palmrest assembly.
3. Replace the five (M2x4) and two (M2x5) screws to secure the system board to the palmrest assembly.
4. Connect the input and output board cable to the connector on the system board and close the latch.
5. Connect the power button cable to the connector on the system board and close the latch.
6. Connect the display cable to the connector on the system board and close the latch.
7. Adhere the adhesive tape above the display cable connector.
8. Connect the coin-cell battery cable and the speaker cable to the connectors on the system board.
9. Connect the hard drive cable, touchpad cable, keyboard backlit cable and the keyboard cable to the connectors on the system board and close the latch.

Next steps

1. Install the [power-adaptor port](#).
2. Install the [heatsink-discrete](#) or [heatsink-UMA](#).
3. Install the [WLAN card](#).
4. Install the [memory](#).
5. Install the [M.2 2230 SSD](#) or [M.2 2242 SSD](#) or [M.2 2280 SSD](#).
6. Install the [battery](#).

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

Power button

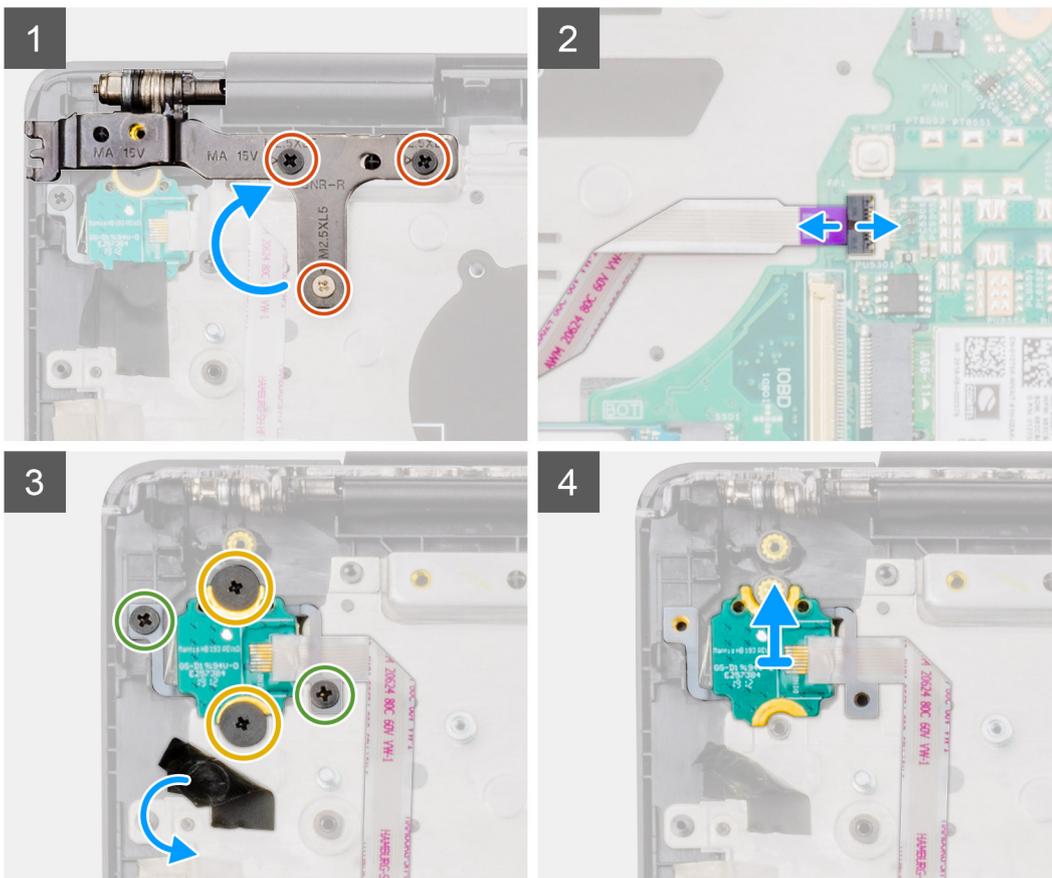
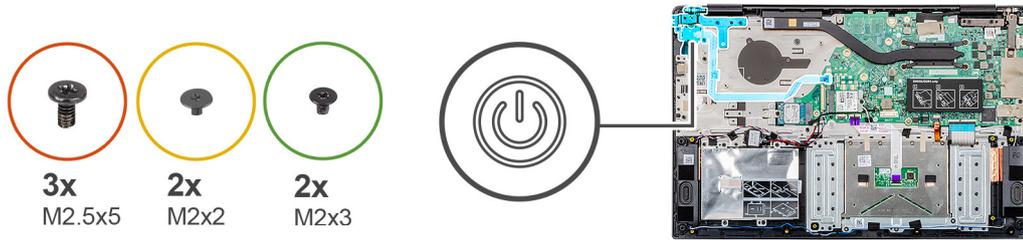
Removing the power button

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [system fan](#).
5. Remove the [input and output board](#).

About this task

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



Steps

1. Locate the power button on your computer.
2. Remove the three (M2.5x5) screws that secure the right display hinge to the palmrest assembly.
3. Lift the right display hinge.
4. Lift the latch and disconnect the power button cable from the connector on the system board.
5. Peel the adhesive tape above the power button.
6. Remove the two (M2x2) screws and the two (M2x3) screws that secure the power button to the palmrest assembly.
7. Lift the power button out of the computer.

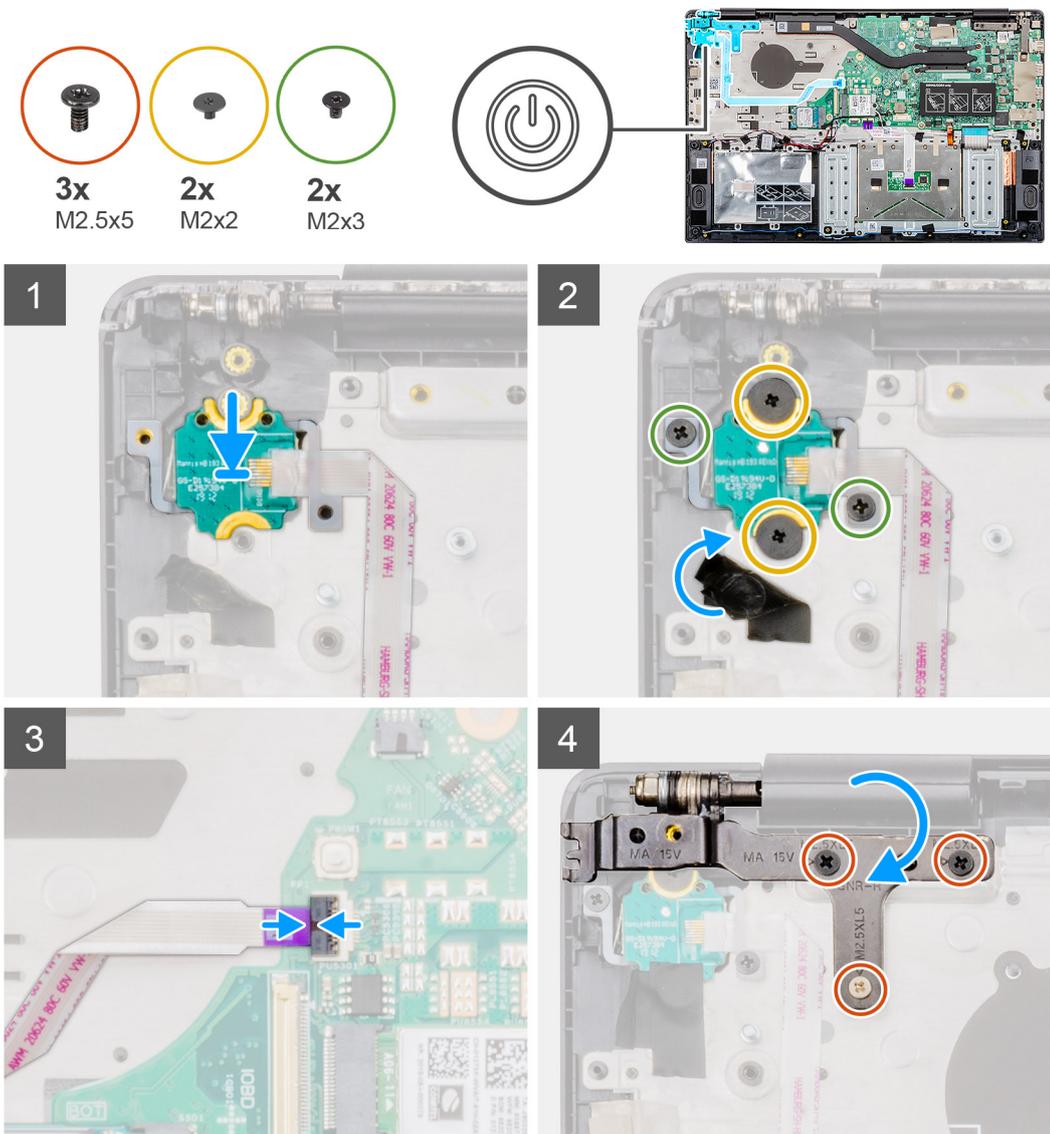
Installing the power button

Prerequisites

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

About this task

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



Steps

1. Locate the power button slot on your computer.
2. Align and place the power button into the slot on your computer.
3. Replace the two (M2x2) screws and the two (M2x3) screws to secure the power button to the palmrest assembly.
4. Adhere the adhesive tape above the power button.
5. Connect the power button cable to the connector on the system board and close the latch.
6. Close the right display hinge and replace the three (M2.5x5) screws to secure the right display hinge to the palmrest assembly.

Next steps

1. Install the [Input and output board](#).
2. Install the [system fan](#).
3. Install the [battery](#).
4. Install the [base cover](#).
5. Follow the procedure in [After working inside your computer](#).

Power button with fingerprint reader

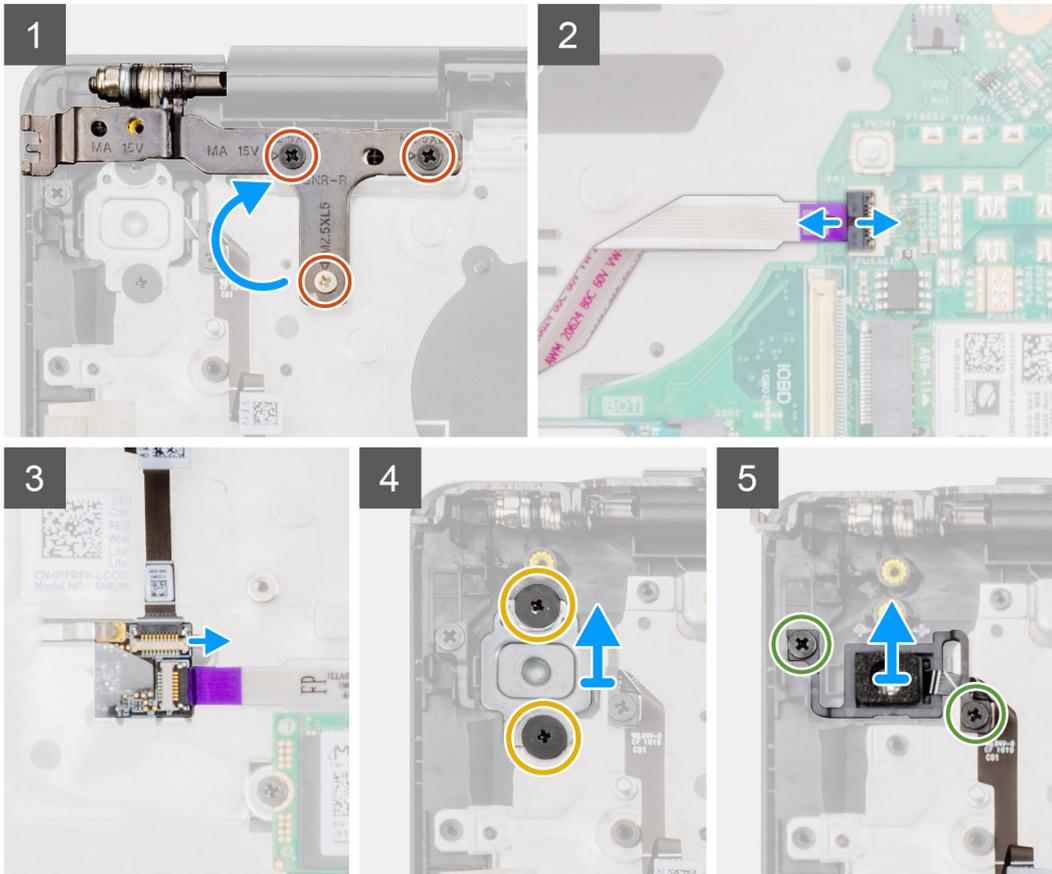
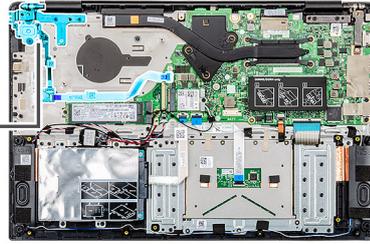
Removing the power button with fingerprint reader

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [system fan](#).
5. Remove the [input and output board](#).

About this task

The figure indicates the location of the power button with fingerprint reader and provides a visual representation of the removal procedure.



Steps

1. Locate the power button with fingerprint reader on your computer.
2. Remove the three (M2.5x5) screws that secure the right display hinge to the palmrest assembly.
3. Lift the right display hinge.
4. Lift the latch and disconnect the power button cable from the connector on the system board.
5. Disconnect the fingerprint reader cable from the connector on the power button cable.
6. Remove the two (M2x2) screws that secure the power button bracket to the palmrest assembly.
7. Remove the two (M2x3) screws that secure the power button to the palmrest assembly
8. Lift the power button with fingerprint reader off the palmrest assembly.

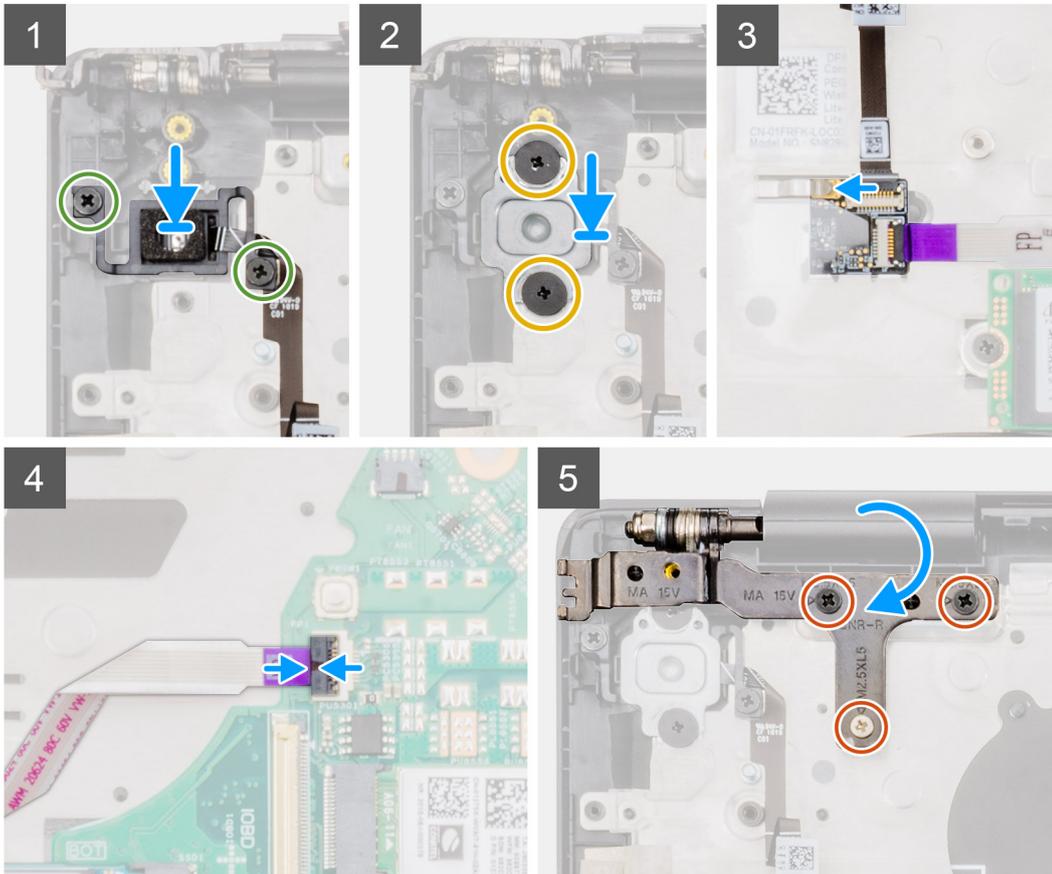
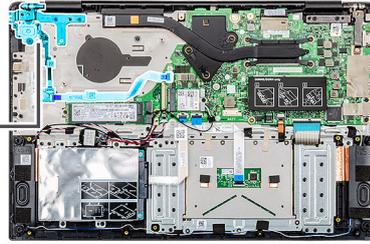
Installing the power button with fingerprint reader

Prerequisites

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

About this task

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



Steps

1. Locate the power button with fingerprint slot on your computer.
2. Align and place the power button with fingerprint into the slot on your computer.
3. Replace the two (M2x3) screws to secure the power button with fingerprint to the palmrest assembly.
4. Replace the two (M2x2) screws to secure the power button bracket to the palmrest assembly.
5. Connect the fingerprint reader cable to the connector on the power button cable.
6. Connect the power button cable to the connector on the system board.
7. Close the right display hinge and replace the three (M2.5x5) screws to secure the right display hinge to the palmrest assembly.

Next steps

1. Install the [Input and output board](#).
2. Install the [system fan](#).
3. Install the [battery](#).
4. Install the [base cover](#).
5. Follow the procedure in [After working inside your computer](#).

Display assembly

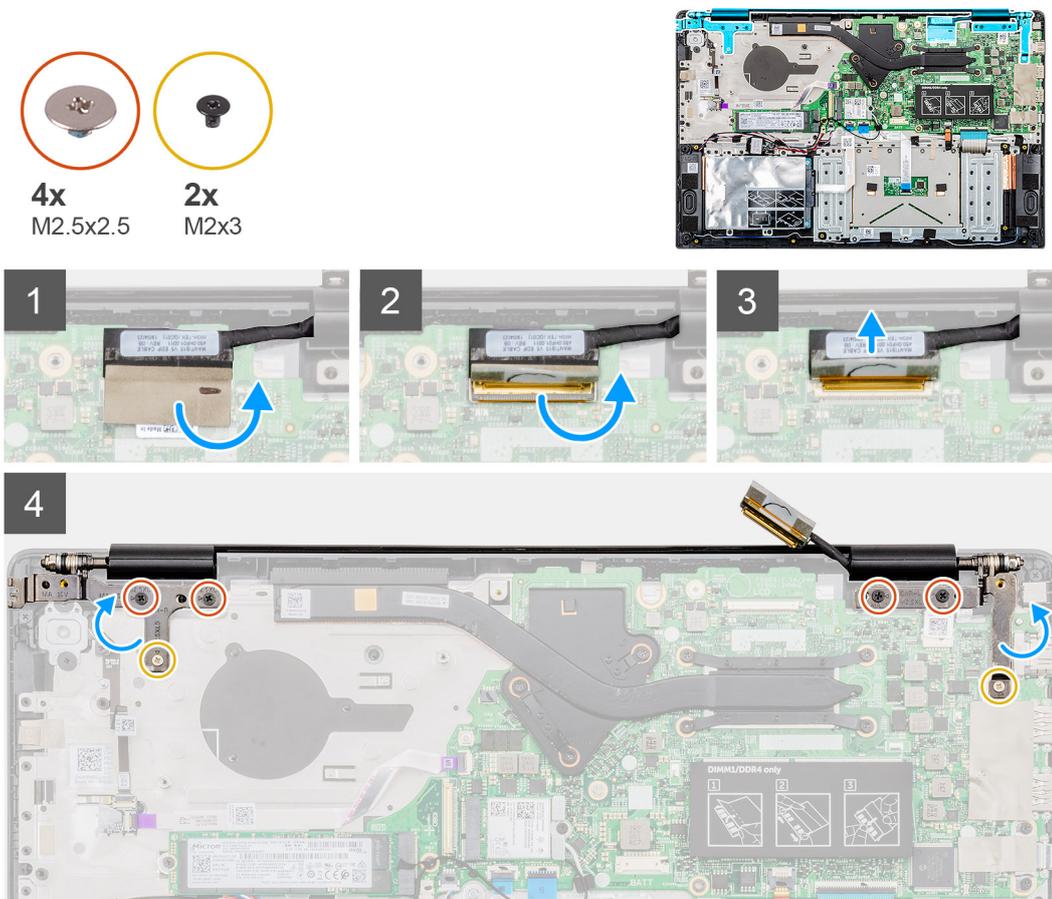
Removing the display assembly

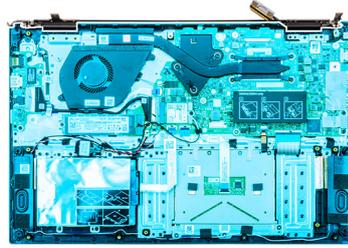
Prerequisites

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

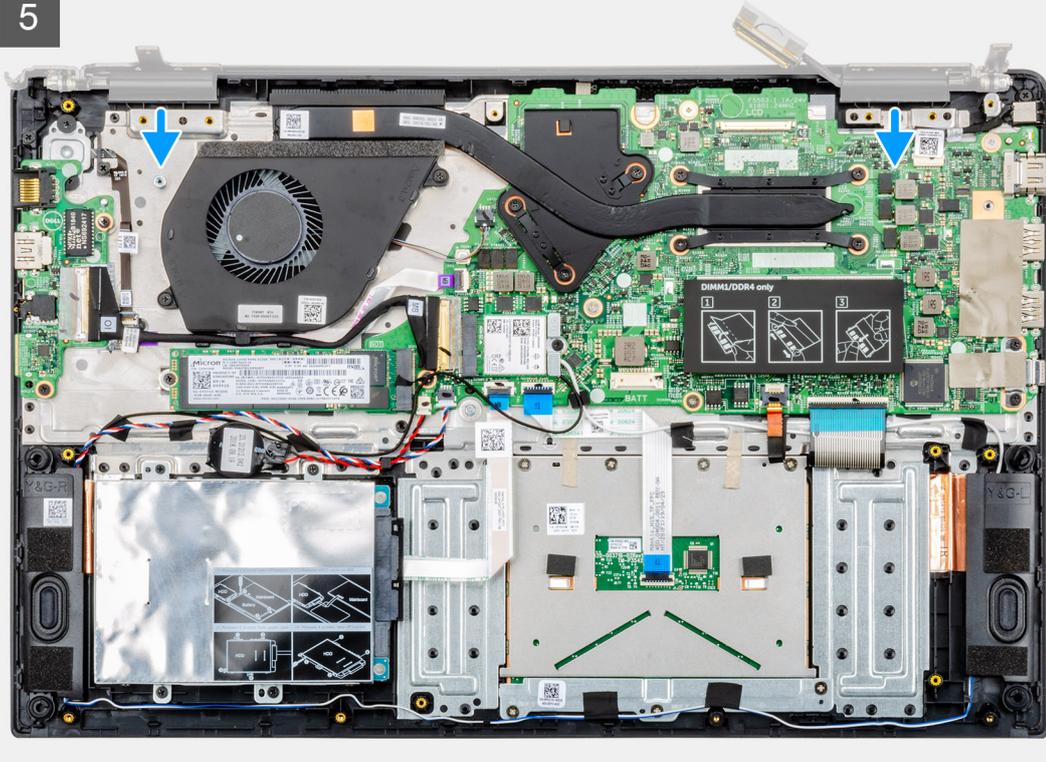
About this task

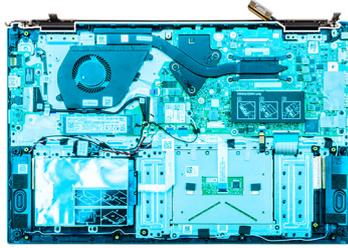
The figure indicates the location of the display assembly and provides a visual representation of the removal procedure.



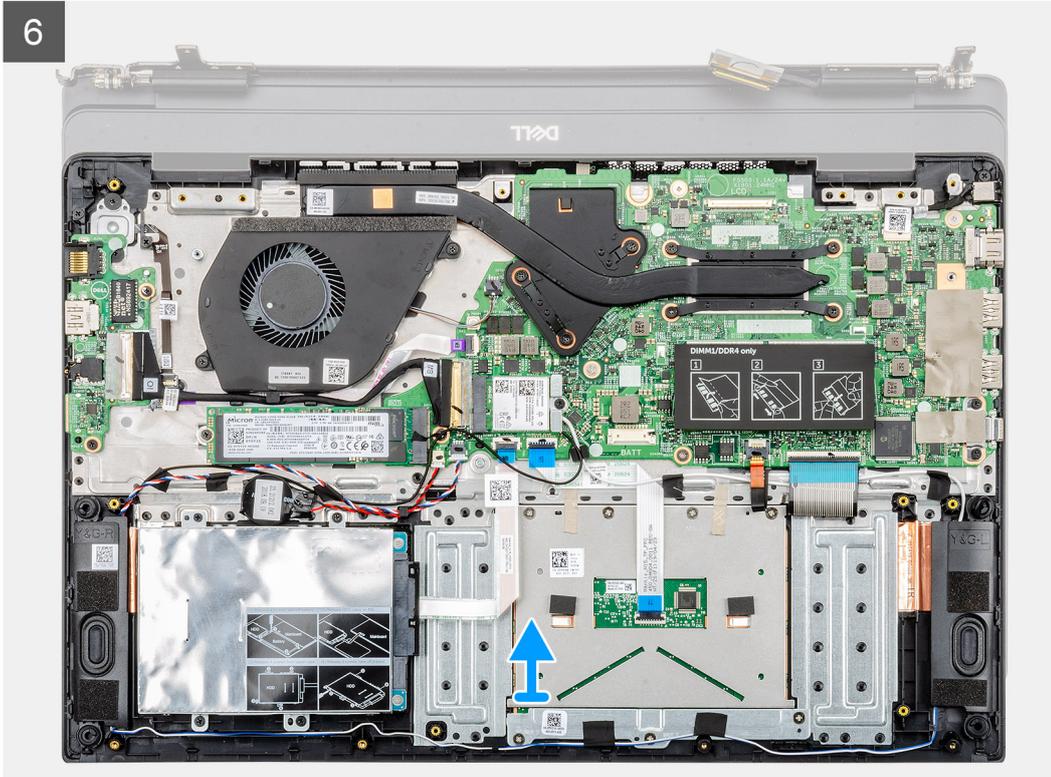


5





6





7



Steps

1. Peel the tape that secures the display cable connector to the system board.
2. Open the latch and disconnect the display cable from the system board.
3. Remove the four (M2.5x2.5 (Big head)) screws and two (M2x3) screws that secure the left and right display hinges to the chassis of your computer.
4. Open the display hinges at an angle of 90 degrees.
5. Gently slide and lift the palmrest assembly off the display assembly.

Installing the display assembly

Prerequisites

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

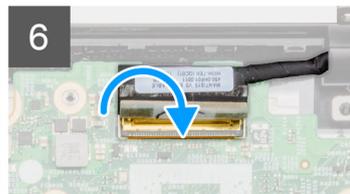
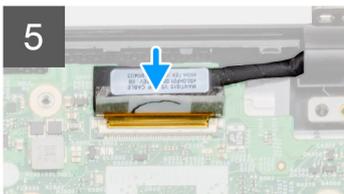
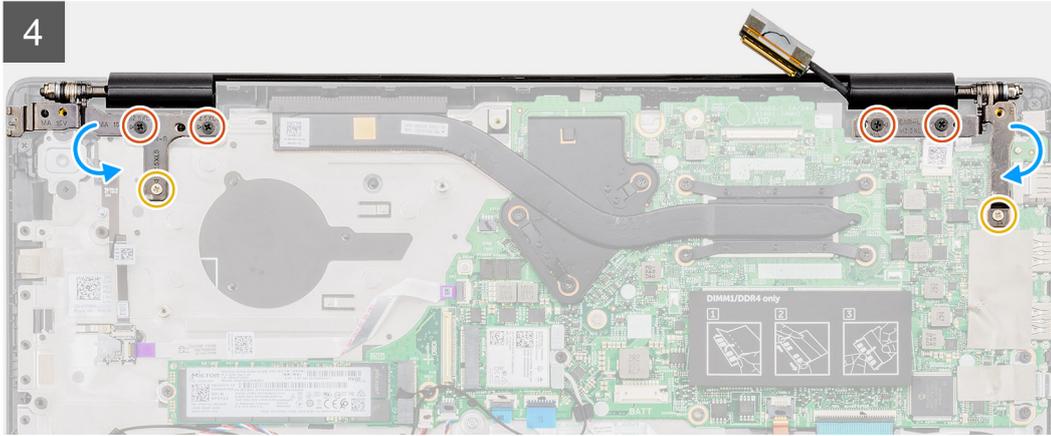
About this task

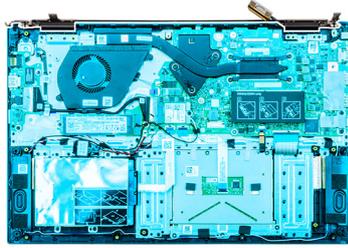
The figure indicates the location of the component and provides a visual representation of the installation procedure.



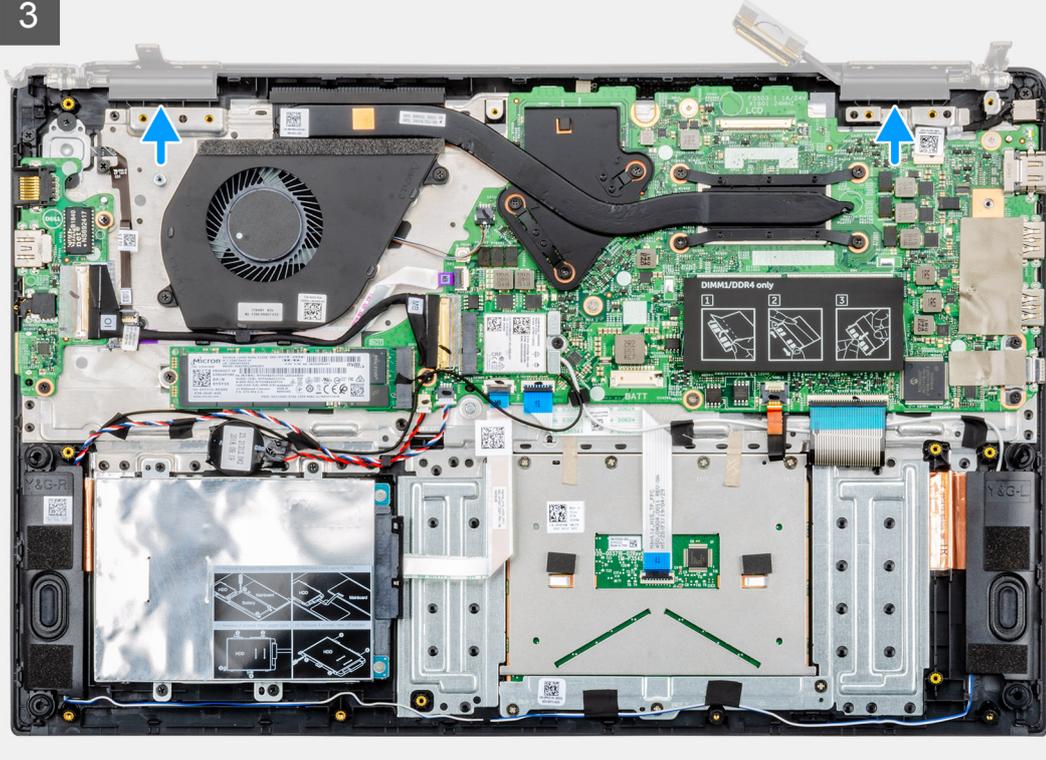
4x
M2.5x2.5

2x
M2x3



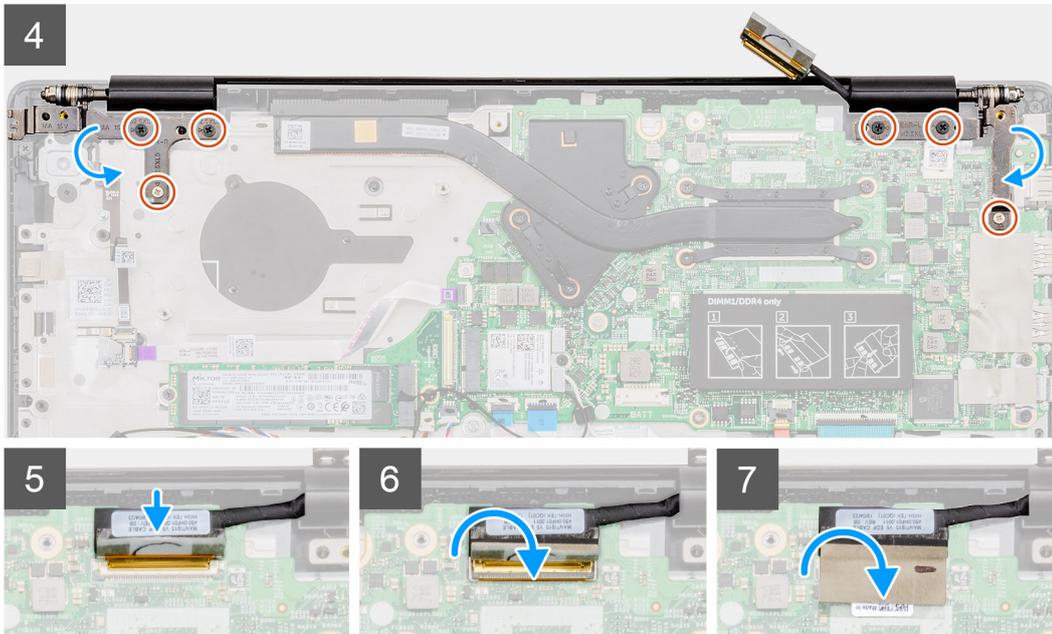
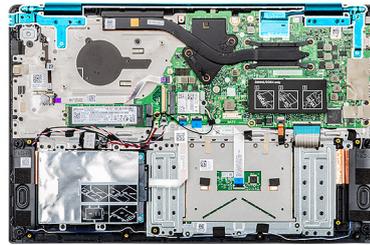


3





6x
M2.5x5



Steps

1. Place the display assembly on a clean and flat surface.
2. Align and place the palmrest and keyboard assembly on the display assembly.
3. Using the alignment posts, close the left and right display hinges.
4. Replace the four (M2.5x2.5 (Big head)) screws and two (M2x3) screws to secure the left and right display hinges to the chassis of the computer.
5. Connect the display cable to the system board and adhere the tape to secure the display cable.

Next steps

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

Palmrest assembly

Replacing the palmrest assembly

Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [hard drive](#).
5. Remove the [coin-cell battery](#).

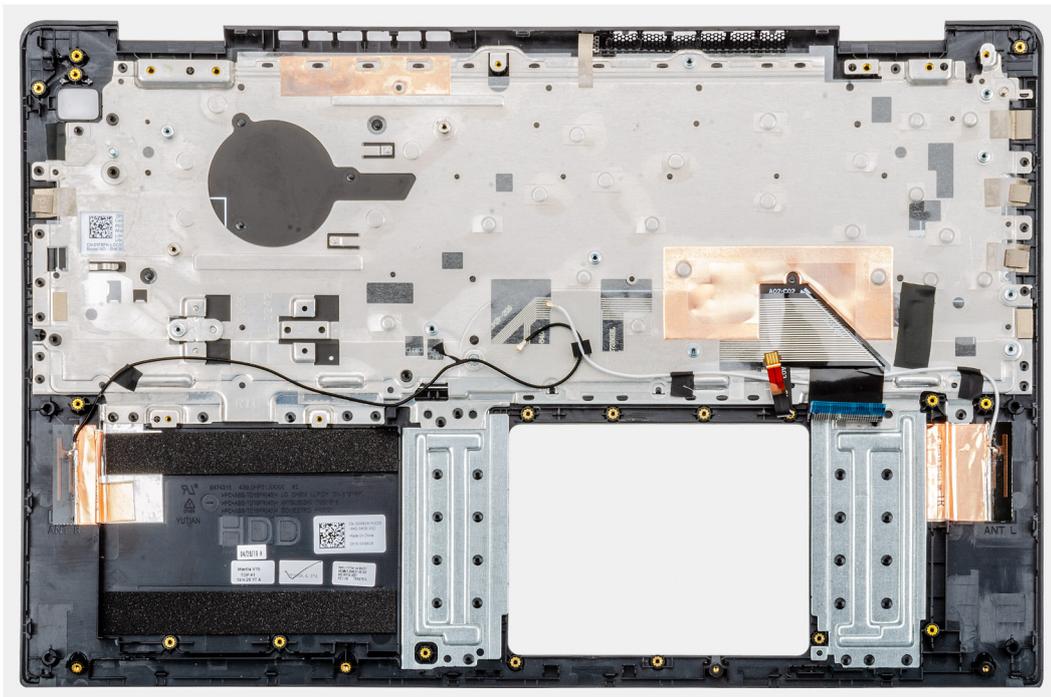
6. Remove the [speakers](#)
7. Remove the [M.2 2230 SSD](#) or [M.2 2242 SSD](#) or [M.2 2280 SSD](#).
8. Remove the [memory](#).
9. Remove the [WLAN](#).
10. Remove the [input and output board](#).
11. Remove the [system fan](#).
12. Remove the [power-adapter port](#).
13. Remove the [touchpad](#).
14. Remove the [system board](#).

i NOTE: The system board can be removed and installed together with the heat sink attached, when replacing the palm-rest assembly. This simplifies the procedure and avoids breaking the thermal bond between system board and heat sink.

15. Remove the [power button](#) or [power button with fingerprint reader](#).
16. Remove the [display assembly](#).

About this task

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



Next steps

1. Install the [display assembly](#).
2. Install the [power button](#) or [power button with fingerprint reader](#).
3. Install the [system board](#).
4. Install the [touchpad](#).
5. Install the [power-adapter port](#).
6. Install the [system fan](#).
7. Install the [input and output board](#).
8. Install the [WLAN card](#).
9. Install the [memory](#).
10. Install the [M.2 2230 SSD](#) or [M.2 2242 SSD](#) or [M.2 2280 SSD](#).
11. Install the [speakers](#)
12. Install the [coin-cell battery](#).
13. Install the [hard drive](#).
14. Install the [battery](#).
15. Install the [base cover](#).

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

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](#)
- [Navigation keys](#)
- [Boot Sequence](#)
- [System setup options](#)
- [Updating the BIOS in Windows](#)
- [System and setup password](#)

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.

Boot Sequence

Boot Sequence allows 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: XXX denotes the SATA drive number.

- Optical Drive (if available)
- SATA Hard Drive (if available)
- Diagnostics

NOTE: Choosing Diagnostics, will display the ePSA diagnostics screen.

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

System setup options

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

Overview

Table 2. Overview

Option	Description
Vostro 5590	Displays the following information: <ul style="list-style-type: none"> • BIOS Version, Service Tag, Asset Tag, Ownership Tag, Manufacture Date, Ownership Date, Express Service Code, and the Signed Firmware Update.
Battery	Displays the battery status, Level, State, health and whether the AC adapter is installed.
Processor	Displays the Processor Type, Core Count, Microcode Version, Maximum Clock Speed, Intel Hyper-Threading capable, Minimum Clock Speed, Processor ID, Current Clock Speed, Minimum Clock Speed, Processor L2 Cache, 64-Bit Technology, Current Clock Speed, and the Processor L3 Cache.
Memory	Displays the Memory Installed, Memory Available, Memory Speed, Memory Channel Mode, Memory Technology, DIMM_SLOT 1, and DIMM_SLOT 2
Devices	Displays the Panel type, Video Controller, Video Memory, Wi-Fi Device, Native Resolution, Video BIOS Version, Audio Controller, Bluetooth Device, LOM MAC Address, and the dGPU Video controller.

Boot options

Table 3. Boot options

Option	Description
Boot sequence	Displays the following information: <ul style="list-style-type: none">· Windows Boot Manager· UEFI Hard Drive· ONBOARD NIC (IPV4)· ONBOARD NIC (IPV6)
Add/Remove/View Boot Devices	Allows you to: <ul style="list-style-type: none">· Add Boot Option· Remove Boot Option· View
UEFI Boot Path Security	Controls whether or not the system will prompt the user to enter the admin password (if set) when booting to a UEFI boot path device from the F12 boot menu. <ul style="list-style-type: none">· Never· Always· Always Except Internal HDD

System information

Table 4. System Configuration

Option	Description
Date/Time	This option controls the system date and time. Changes to the date/time take effect immediately. <ul style="list-style-type: none">· Date format: MM/DD/YYYY· Time format: HH/MM/SS 24 hour format. You can switch between 12 hr and 24 hr clock.
Network controller configuration	Displays the following information: <ul style="list-style-type: none">· Integrated NIC: If enabled, UEFI networking protocols are installed and available, allowing pre-OS and early OS networking features to use any enabled NICs. This option controls:<ul style="list-style-type: none">· Disabled· Enabled· Enabled with PXE· Enable UEFI Network Stack: (enabled by default)
Storage Interface	Displays the following: <ul style="list-style-type: none">· Port Enablement: This page allows you to select the onboard drives you would like to enable.<ul style="list-style-type: none">· SATA-0 (enabled by default)· M.2 PCIe SSD-0/SATA-2 (enabled by default)
SATA operatoin	Allows you to set the operating mode of the integrated SATA hard drive controller. <ul style="list-style-type: none">· Disabled· AHCI· RAID on (enabled by default)

Option	Description
Drive information	<p>Displays the following information:</p> <ul style="list-style-type: none"> · SATA-0 <ul style="list-style-type: none"> · Type · Device · M.2 PCIe SSD-0/SATA-2 <ul style="list-style-type: none"> · Type · Device
Enable SMART Reporting	<p>If SMART Reporting is enabled, hard drive errors for integrated drives will be reported during system startup.</p>
Enable Audio	<p>Allows you to enable or disable the integrated audio controller. The option Enable Audio is selected by default.</p> <ul style="list-style-type: none"> · Enable Microphone · Enable Internal Speaker <p>Both the options are selected by default.</p>
USB Configuration	<p>When USB Boot Support is enabled, bootable USB mass storage devices can boot through the boot sequence or boot menu. If disabled, the bootable USB mass storage devices are prevented from booting through the boot sequence and boot menu, but USB ports are functional in an OS environment:</p> <ul style="list-style-type: none"> · Enable USB Boot Support · Enable External USB Ports
Miscellaneous Devices	<p>Allows you to enable or disable the following devices:</p> <ul style="list-style-type: none"> · Enable Camera (enabled by default)
Keyboard illumination	<p>Sets the keyboard illumination settings. To change these settings during normal use, press <Fn> +<F5>. The brightness level can be set from 0% to 100%:</p> <ul style="list-style-type: none"> · Disabled · Dim · Bright
Keyboard Backlit Timeout on AC	<p>This feature defines the timeout value for the keyboard backlight when an AC adapter is plugged into the system.</p> <ul style="list-style-type: none"> · 5 sec · 10 sec-enabled by default · 15 sec · 30 sec · 1 min · 5 min · 15 min · Never
Keyboard Backlight Timeout on Battery	<p>This feature defines the timeout value for the keyboard backlight when the system is running only on battery power.</p> <ul style="list-style-type: none"> · 5 sec · 10 sec-enabled by default · 15 sec · 30 sec · 1 min · 5 min · 15 min · Never

Video

Allows you to set the display brightness depending up on the power source—On Battery and On AC. The LCD brightness is independent for battery and AC adapter. It can be set using the slider.

Table 5. Video

Option	Description
Brightness on battery power	Set the screen brightness when running on battery power
Brightness on AC power	Set the screen brightness when running on AC power

Security

Table 6. Security

Option	Description
Enable Admin Setup Lockout	This feature gives administrators control over how their users can or cannot access BIOS Setup. With an admin password set and this option On, BIOS Setup cannot be seen without the admin password. With an admin password set and this option Off, BIOS Setup can be entered and items viewed in the locked mode.
Password Bypass	When enabled, this always prompts for system and internal hard drive passwords when powered on from the Off state. <ul style="list-style-type: none">• Disabled (enabled by default)• Reboot Bypass
Enable Non-Admin Password Changes	Allow Wireless Switch Changes: This option lets you change the system and hard drive password without the need for admin password (Disabled by default).
Non-Admin Setup Changes	This option lets you determine whether changes to the setup option are permitted when an Administrator password is set.
UEFI Capsule Firmware Updates	This option controls whether this system allows BIOS updates via UEFI capsule update packages. This option is selected by default. Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS)
Password Bypass	This option lets you bypass the System (Boot) Password and the internal HDD password prompts during a system restart. <ul style="list-style-type: none">• Disabled — Always prompt for the system and internal HDD password when they are set. This option is enabled by default.• Reboot Bypass — Bypass the password prompts on Restarts (warm boots). <p>NOTE: The system will always prompt for the system and internal HDD passwords when powered on from the off state (a cold boot). Also, the system will always prompt for passwords on any module bay HDDs that may be present.</p>
Password Change	This option lets you determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set. Allow Non-Admin Password Changes - This option is enabled by default.
UEFI Capsule Firmware Updates	This option controls whether this system allows BIOS updates via UEFI capsule update packages. This option is selected by default. Disabling this option will block BIOS updates from services such as Microsoft Windows Update and Linux Vendor Firmware Service (LVFS)

Option	Description
TPM 2.0 Security On	<p>Allows you to control whether the Trusted Platform Module (TPM) is visible to the operating system.</p> <ul style="list-style-type: none"> • TPM On (default) • Clear • PPI Bypass for Enable Commands • PPI Bypass for Disable Commands • PPI Bypass for Clear Commands • Attestation Enable (default) • Key Storage Enable (default) • SHA-256 (default) <p>Choose any one option:</p> <ul style="list-style-type: none"> • Disabled • Enabled (default)
Absolute	<p>This field lets you Enable, Disable or Permanently Disable the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software.</p> <ul style="list-style-type: none"> • Enabled - This option is selected by default. • Disabled • Permanently Disabled
Intel SGX	<p>Allows you to provide a secured environment for running code/storing sensitive information in the context of the main OS. This option is not set by default.</p> <ul style="list-style-type: none"> • Disabled • Enabled • Software Control - This option is selected by default.
SMM Security Mitigation	<p>Allows you to enable or disable additional UEFI SMM Security Mitigation protections. This option is not set by default.</p>

Passwords

Table 7. Passwords

Option	Description
Enable Strong Passords	Allows stricter rules for admin and system passwords.
SPassword configuration	<ul style="list-style-type: none"> • Admin Password Min • Admin Password max • System Password Min • System Password Max
Admin Password	This field lets you set, change, or delete the administrator (admin) password. The admin password enables several security features.
System Password	This fields allows you to set the System password.
Enable master password lockout	This field disables the master password support. Hard disk passwords need to be cleared before the setting can be changed. This option is disabled by default.

Secure boot

Table 8. Secure Boot

Option	Description
Secure Boot Enable	Allows you to enable or disable Secure Boot feature <ul style="list-style-type: none">Secure Boot Enable Option is not selected. For Secure Boot to be enabled, the system needs to be in UEFI boot mode.
Secure Boot Mode	Allows you to modify the behavior of Secure Boot to allow evaluation or enforcement of UEFI driver signatures. <ul style="list-style-type: none">Deployed Mode (default)Audit Mode
Expert key Management	Allows you to manipulate the security key databases only if the system is in Custom Mode. The Enable Custom Mode option is disabled by default. The options are: <ul style="list-style-type: none">PK (default)KEKdbdbx If you enable the Custom Mode , the relevant options for PK, KEK, db, and dbx appear. The options are: <ul style="list-style-type: none">Save to File- Saves the key to a user-selected fileReplace from File- Replaces the current key with a key from a user-selected fileAppend from File- Adds a key to the current database from a user-selected fileDelete- Deletes the selected keyReset All Keys- Resets to default settingDelete All Keys- Deletes all the keys <p> NOTE: If you disable the Custom Mode, all the changes made will be erased and the keys will restore to default settings.</p>

Performance

Table 9. Performance

Option	Description
Multi Core Support	This field allows you to change the number of CPU cores available to the OS. <ul style="list-style-type: none">All Cores—Default
Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep mode of processor. <ul style="list-style-type: none">Enable Intel SpeedStep This option is set by default.
Enable C-States Control	Allows you to enable or disable the CPU's ability to enter and exit low power states. <ul style="list-style-type: none">C states This option is set by default.

Option	Description
Intel TurboBoost	<p>Allows you to enable or disable the Intel TurboBoost mode of the processor.</p> <ul style="list-style-type: none"> • Enable Intel TurboBoost Technology <p>This option is set by default.</p>
Intel Hyper-Threading Technology	<p>Allows you to enable or disable the multiple threads to run on each core.</p> <ul style="list-style-type: none"> • ON

Power management

Table 10. Power management

Options	Descriptions
Auto On Time	<p>Allows you to set the time at which the computer must turn on automatically. The options are:</p> <ul style="list-style-type: none"> • Disabled • Every Day • Weekdays • Select Days
Block Sleep	<p>This options lets you to block entering Sleep (S3) mode in the operating system . Disabled by default.</p>
Battery Charge Configuration	<p>Allows you to select the charging mode for the battery. This functionality allows the system to run on battery during peak power usage hours. The options are:</p> <ul style="list-style-type: none"> • Adaptive—enabled by default • Standard—Fully charges your battery at a standard rate. • ExpressCharge—The battery charges over a shorter time using Dell’s fast charging technology. • Primarily AC use • Custom
Enable Advanced Battery Charge Configuration	<p>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.</p> <p>Enable Advanced Battery Charge Mode- is disabled</p>
Peak Shift	<p>This option enables you to minimize the AC power consumption during the peak power times of day. After you enable this option, your system runs only in battery even if the AC is attached.</p> <ul style="list-style-type: none"> • Enable peak shift—is disabled
Intel Speed Shift Technology	<p>This option is used to enable Intel Speed Shift Technology support.</p> <p>Default setting: Enabled</p>
Lid Behaviour	<ul style="list-style-type: none"> • System input while lid closed: This setting allows system to maintain functionality of keyboard and touchpad. Disabled by default. • Power on Lid open: This setting allows the system to power up from the off state whenever the lid is open or closed. Enabled by default.

Wireless

Allows you to enable or disable the internal wireless devices. All the options are enabled by default.

Table 11. Wireless

Options	Descriptions
WLAN	Allows enabling/disabling of internal WLAN device
Bluetooth	Allows enabling/disabling of internal Bluetooth device

POST behavior

Option	Description
Adapter Warnings	Allows you to enable or disable the system setup (BIOS) warning messages when you use certain power adapters. Default setting: Enable Adapter Warnings
Numlock Enable	Allows you to enable the Numlock option when the computer boots. Enable Network. This option is enabled by 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 toggle dynamically the primary behavior of these keys. The available options are: <ul style="list-style-type: none">· Fn Lock—enabled by default· Lock Mode Disable/Standard—enabled by default· Lock Mode Enable/Secondary
Fastboot	Allows you to speed up the boot process by bypassing some of the compatibility steps. The options are: <ul style="list-style-type: none">· Minimal· Thorough—enabled by default· Auto
Extended BIOS POST Time	Allows you to create an extra preboot delay. The options are: <ul style="list-style-type: none">· 0 seconds—enabled by default.· 5 seconds· 10 seconds
Full Screen Log	<ul style="list-style-type: none">· Enable Full Screen Logo—not enabled
Warnings and errors	<ul style="list-style-type: none">· Prompt on warnings and errors—enabled by default· Continue on warnings· Continue on warnings and errors

Virtualization support

Table 12. Virtualization support

Options	Descriptions
Intel Virtualization Technology	This field specifies whether a virtual Machine Monitor (VMM) can utilize the conditional hardware capabilities provided by Intel Virtualization Technology. Enable Intel Virtualization Technology—enabled by default.

Options	Descriptions
VT for Direct I/O	Enables or disables the Virtual Machine Monitor (VMM) from utilizing the additional hardware capabilities provided by Intel® Virtualization technology for direct I/O. Enable VT for Direct I/O - enabled by default.

Maintenance

Table 13. Maintenance

Options	Descriptions
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.
Service Tag	Displays the Service Tag of your computer.
BIOS Recovery from Hard Drive	This feature allows the system to recover from a bad BIOS image, as long as the Boot Block portion is intact and functioning. This is enabled by default. <ul style="list-style-type: none"> BIOS Auto-recovery: BIOS Auto-recovery automatically recovers BIOS without user action. The default option is disabled.
Start Data Wipe	If enabled, BIOS will queue up a data wipe cycle for storage devices connected to the system board on the next reboot. This is disabled by default.
Allow BIOS Downgrade	This field controls flashing of the system firmware to a previous revision. This is enabled by default.

System logs

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

Updating the BIOS in Windows

Prerequisites

It is recommended to update your BIOS (System Setup), when you replace the system board or if an update is available.

About this task

NOTE: If BitLocker is enabled, it must be suspended prior to updating the system BIOS, and then re-enabled after the BIOS update is completed.

Steps

- Restart the computer.
- Go to **Dell.com/support**.
 - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
 - Click **Detect Product** and follow the instructions on screen.
- If you are unable to detect or find the Service Tag, click **Choose from all products**.

4. Choose the **Products** category from the list.

 **NOTE: Choose the appropriate category to reach the product page**

5. Select your computer model and the **Product Support** page of your computer appears.
6. Click **Get drivers** and click **Drivers and Downloads**.
The Drivers and Downloads section opens.
7. Click **Find it myself**.
8. Click **BIOS** to view the BIOS versions.
9. Identify the latest BIOS file and click **Download**.
10. Select your preferred download method in the **Please select your download method below** window, click **Download File**.
The **File Download** window appears.
11. Click **Save** to save the file on your computer.
12. Click **Run** to install the updated BIOS settings on your computer.
Follow the instructions on the screen.

Updating BIOS on systems with BitLocker enabled

 **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>**

Updating your system BIOS using a USB flash drive

About this task

If the system cannot load into Windows but there is still a need to update the BIOS, download the BIOS file using another system and save it to a bootable USB Flash Drive.

 **NOTE: You will need to use a bootable USB Flash drive. Please refer to the following article for further details: <https://www.dell.com/support/article/sln143196/>**

Steps

1. Download the BIOS update .EXE file to another system.
2. Copy the file e.g. O9010A12.EXE onto the bootable USB Flash drive.
3. Insert the USB Flash drive into the system that requires the BIOS update.
4. Restart the system and press F12 when the Dell Splash logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and click Return.
6. The system will boot to a Diag C:\> prompt.
7. Run the file by typing the full filename e.g. O9010A12.exe and press Return.
8. The BIOS Update Utility will load, follow the instructions on screen.



Figure 1. DOS BIOS Update Screen

System and setup password

Table 14. System and setup password

Password type	Description
System password	Password that you must enter to log on 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 stored on your computer if it is not locked and left unattended.

NOTE: System and setup password feature is disabled.

Assigning a system setup password

Prerequisites

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

About this task

To enter the system setup, press F2 immediately after a power-on or re-boot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter. The **Security** screen is displayed.
2. Select **System/Admin Password** and create a password in the **Enter the new password** field. Use the following guidelines to assign the system password:
 - A password can have up to 32 characters.
 - The password can contain the numbers 0 through 9.
 - Only lower case letters are valid, upper case letters are not allowed.

- Only the following special characters are allowed: space, ("), (+), (,), (-), (.), (/), (:), ([), (\), (]), (').
3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
 4. Press Esc and a message prompts you to save the changes.
 5. Press Y to save the changes.
The computer reboots.

Deleting or changing an existing system setup password

Prerequisites

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

About this task

To enter the System Setup, press F2 immediately after a power-on or reboot.

Steps

1. In the **System BIOS** or **System Setup** screen, select **System Security** and press Enter.
The **System Security** screen is displayed.
2. In the **System Security** screen, verify that **Password Status** is **Unlocked**.
3. Select **System Password**, alter or delete the existing system password and press Enter or Tab.
4. Select **Setup Password**, alter or delete the existing setup password and press Enter or Tab.
 **NOTE: If you change the System and/or Setup password, re-enter 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 reboot.

Troubleshooting

Enhanced Pre-Boot System Assessment (ePSA) diagnostics

About this task

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

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

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

Running the ePSA diagnostics

Steps

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

Diagnostics

Table 15. Diagnostics

	M-BIST	L-BIST
Purpose of diagnostic tool	Evaluates the health condition of the system board to have further resolution on "No Power", "No Post", and "No Video" symptom and reduce repeated dispatches.	Checks if the system board is supplying power to the LCD display by performing an LCD Power Rail test, which allows for isolation of "No Video" symptom to Mainboard, LCD or Cable.
Trigger	Pressing M key and Power button	Integrated into the single LED error code diagnostic. Automatically initiated during POST.

	M-BIST	L-BIST
Indicator of fault	Battery LED light with "Solid Amber"	Battery indicator LED blink error code [Amber, White] = [2,8]
Repair instruction	Indicates a problem with the system board.	Indicates a problem with the system board.

M-BIST

M-BIST is the system board's built-in self-test diagnostics tool that improves the diagnostics accuracy of system board embedded controller (EC) failures. M-BIST can be manually initiated before POST.

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

How to run M-BIST?

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

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

L-BIST

L-BIST (LCD Power Rail Test) is an enhancement to the single LED error code diagnostics and is automatically initiated during POST. L-BIST will check the LCD power rail. If there is no power being supplied to the LCD (i.e., the L-BIST circuit fails), the battery status LED will flash an error code [2,8].

NOTE: If L-BIST fails, LCD-BIST cannot function as there is no power being supplied to the LCD.

Running the L-BIST

1. Press the power button to start up the system.
2. If the system does not start up normally, look at the battery status LED. If the battery status LED flashes an error code [2,8], there is a failure on the LCD power rail of the system board, hence there is no power supplied to the LCD.
3. Replace the system board in this case.

System diagnostic lights

Battery-status light

Indicates the power and battery-charge status.

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

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

Off

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

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

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

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

Table 16. LED codes

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

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

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

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

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

WiFi power cycle

About this task

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

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

Steps

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

Getting help

Topics:

- [Contacting Dell](#)

Contacting Dell

Prerequisites

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

About this task

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

Steps

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