

# Alienware Area-51m R2

## Service Manual

Regulatory Model: P38E  
Regulatory Type: P38E002

June 2020  
Rev. A00

A L I E N W A R E 

## Notes, cautions, and warnings

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

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

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

# Contents

<b>1 Working inside your computer.....</b>	<b>6</b>
Before working inside your computer.....	6
Safety instructions.....	6
Electrostatic discharge—ESD protection.....	7
ESD field service kit .....	7
Transporting sensitive components.....	8
After working inside your computer.....	8
<b>2 Removing and installing components.....</b>	<b>9</b>
Recommended tools.....	9
Screw list.....	9
Base cover.....	11
Removing the base cover.....	11
Installing the base cover.....	13
Battery.....	14
Lithium-ion battery precautions.....	14
Removing the battery.....	15
Installing the battery .....	15
Memory modules.....	16
Removing the memory modules.....	16
Installing the memory modules.....	17
Solid-state drive—M.2 slot one.....	18
Removing the M.2 2280 solid-state drive from M.2 slot one.....	18
Installing the M.2 2280 solid-state drive in M.2 slot one.....	19
Removing the M.2 2230 solid-state drive from M.2 slot one.....	20
Installing the M.2 2230 solid-state drive in M.2 slot one.....	21
Solid-state drive—M.2 slot two.....	23
Removing the M.2 2280 solid-state drive from M.2 slot two.....	23
Installing the M.2 2280 solid-state drive in M.2 slot two.....	24
Removing the M.2 2230 solid-state drive from M.2 slot two.....	25
Installing the M.2 2230 solid-state drive in M.2 slot two.....	25
Solid state drive—M.2 slot three.....	27
Removing the M.2 2280 solid-state drive from M.2 slot three.....	27
Installing the M.2 2280 solid-state drive in M.2 slot three.....	27
Solid state drive—M.2 slot four.....	28
Removing the M.2 2280 solid-state drive from M.2 slot four.....	28
Installing the M.2 2280 solid-state drive in M.2 slot four.....	29
Solid-state drive interposer board.....	30
Removing the solid-state drive interposer board.....	30
Installing the solid-state drive interposer board.....	31
Wireless card.....	33
Removing the wireless card.....	33
Installing the wireless card.....	33
Hard drive.....	35
Removing the hard drive.....	35

Installing the hard drive.....	36
Rear-I/O cover.....	37
Removing the rear-I/O cover.....	37
Installing the rear-I/O cover.....	38
Audio daughter-board.....	39
Removing the audio daughter-board.....	39
Installing the audio daughter-board.....	40
Speakers.....	41
Removing the speakers.....	41
Installing the speakers .....	41
Card-reader board.....	42
Removing the card-reader board.....	42
Installing the card-reader board.....	43
Coin-cell battery.....	44
Removing the coin-cell battery.....	44
Installing the coin-cell battery.....	45
Computer base.....	46
Removing the computer base.....	46
Installing the computer base.....	48
Touchpad.....	50
Removing the touchpad.....	50
Installing the touchpad.....	51
Display assembly.....	53
Removing the display assembly.....	53
Installing the display assembly.....	55
Heat-sink assembly.....	58
Removing the heat-sink assembly.....	58
Installing the heat-sink assembly .....	59
Processor.....	60
Removing the processor.....	60
Installing the processor.....	60
Graphics card.....	62
Removing the graphics card.....	62
Installing the graphics card.....	62
Left power-adapter port.....	63
Removing the left power-adapter port.....	63
Installing the left power-adapter port.....	64
System board.....	65
Removing the system board.....	65
Installing the system board .....	68
Right power-adapter port.....	71
Removing the right power-adapter port.....	71
Installing the right power-adapter port.....	72
Keyboard.....	73
Removing the keyboard.....	73
Installing the keyboard.....	75
Palm-rest assembly.....	76
Removing the palm-rest assembly.....	76
Installing the palm-rest assembly.....	77



<b>3 Drivers and downloads.....</b>	<b>79</b>
<b>4 System setup.....</b>	<b>80</b>
Entering BIOS setup program.....	80
Navigation keys.....	80
One time boot menu.....	80
System setup options.....	81
Main.....	81
Advanced.....	82
Security.....	84
Boot.....	86
Exit.....	86
Updating the BIOS in Windows .....	87
Updating your system BIOS using a USB flash drive.....	87
Flashing the BIOS from the F12 One-Time boot menu.....	88
System and setup password.....	89
Assigning a system setup password.....	89
Deleting or changing an existing system setup password.....	89
Clearing CMOS settings.....	90
Clearing BIOS (System Setup) and System passwords.....	90
<b>5 Troubleshooting.....</b>	<b>91</b>
SupportAssist diagnostics.....	91
Recovering the operating system.....	91
System diagnostic lights.....	91
Flea power release.....	92
WiFi power cycle.....	92
Real Time Clock—RTC reset.....	93
<b>6 Getting help and contacting Alienware.....</b>	<b>94</b>




# Working inside your computer

## Before working inside your computer

### About this task










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

### Steps

1. Save and close all open files and exit all open applications.
2. Shut down your computer. Click **Start** >  **Power** > **Shut down**.  
 **NOTE:** If you are using a different operating system, see the documentation of your operating system for shut-down instructions.
3. Disconnect your computer and all attached devices from their electrical outlets.
4. Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.  
 **CAUTION:** To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.
5. Remove any media card and optical disc from your computer, if applicable.

## Safety instructions

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

-  **NOTE:** Before working inside your computer, read the safety information that is shipped with your computer. For more safety best practices, see the Regulatory Compliance home page at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **NOTE:** Disconnect your computer from all power sources before opening the computer cover or panels. After you finish working inside the computer, replace all covers, panels, and screws before connecting your computer to an electrical outlet.
-  **CAUTION:** To avoid damaging the computer, ensure that the work surface is flat, dry and clean.
-  **CAUTION:** To avoid damaging the components and cards, handle them by their edges, and avoid touching the pins and the contacts.
-  **CAUTION:** You should only perform troubleshooting and repairs as authorized or directed by the Dell technical assistance team. Damage due to servicing that is not authorized by Dell is not covered by your warranty. See the safety instructions that is shipped with the product or at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **CAUTION:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity which could harm internal components.
-  **CAUTION:** When you disconnect a cable, pull it by its connector or its pull tab, not the cable itself. Some cables have connectors with locking tabs or thumb-screws that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly-aligned to avoid bending the connector pins. When connecting cables, ensure that the ports and the connectors are correctly oriented and aligned.
-  **CAUTION:** Press and eject any installed card from the media-card reader.
-  **NOTE:** The color of your computer and certain components may appear differently than shown in this document.

# Electrostatic discharge—ESD protection

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

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

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

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

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

Perform the following steps to prevent ESD damage:

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

## ESD field service kit

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

### Components of an ESD field service kit

The components of an ESD field service kit are:

- **Anti-Static Mat** – The anti-static mat is dissipative and parts can be placed on it during service procedures. When using an anti-static mat, your wrist strap should be snug and the bonding wire should be connected to the mat and to any bare metal on the system being worked on. Once deployed properly, service parts can be removed from the ESD bag and placed directly on the mat. ESD-sensitive items are safe in your hand, on the ESD mat, in the system, or inside a bag.
- **Wrist Strap and Bonding Wire** – The wrist strap and bonding wire can be either directly connected between your wrist and bare metal on the hardware if the ESD mat is not required, or connected to the anti-static mat to protect hardware that is temporarily placed on the mat. The physical connection of the wrist strap and bonding wire between your skin, the ESD mat, and the hardware is known as bonding. Use only Field Service kits with a wrist strap, mat, and bonding wire. Never use wireless wrist straps. Always be aware that the internal wires of a wrist strap are prone to damage from normal wear and tear, and must be checked regularly with a wrist strap tester in order to avoid accidental ESD hardware damage. It is recommended to test the wrist strap and bonding wire at least once per week.
- **ESD Wrist Strap Tester** – The wires inside of an ESD strap are prone to damage over time. When using an unmonitored kit, it is a best practice to regularly test the strap prior to each service call, and at a minimum, test once per week. A wrist strap tester is the best method for doing this test. If you do not have your own wrist strap tester, check with your regional office to find out if they have one. To perform the test, plug the wrist-strap's bonding-wire into the tester while it is strapped to your wrist and push the button to test. A green LED is lit if the test is successful; a red LED is lit and an alarm sounds if the test fails.
- **Insulator Elements** – It is critical to keep ESD sensitive devices, such as plastic heat sink casings, away from internal parts that are insulators and often highly charged.
- **Working Environment** – Before deploying the ESD Field Service kit, assess the situation at the customer location. For example, deploying the kit for a server environment is different than for a desktop or portable environment. Servers are typically installed in a rack within a data center; desktops or portables are typically placed on office desks or cubicles. Always look for a large open flat work area that is free of clutter and large enough to deploy the ESD kit with additional space to accommodate the type of

system that is being repaired. The workspace should also be free of insulators that can cause an ESD event. On the work area, insulators such as Styrofoam and other plastics should always be moved at least 12 inches or 30 centimeters away from sensitive parts before physically handling any hardware components

- **ESD Packaging** – All ESD-sensitive devices must be shipped and received in static-safe packaging. Metal, static-shielded bags are preferred. However, you should always return the damaged part using the same ESD bag and packaging that the new part arrived in. The ESD bag should be folded over and taped shut and all the same foam packing material should be used in the original box that the new part arrived in. ESD-sensitive devices should be removed from packaging only at an ESD-protected work surface, and parts should never be placed on top of the ESD bag because only the inside of the bag is shielded. Always place parts in your hand, on the ESD mat, in the system, or inside an anti-static bag.
- **Transporting Sensitive Components** – When transporting ESD sensitive components such as replacement parts or parts to be returned to Dell, it is critical to place these parts in anti-static bags for safe transport.

## ESD protection summary


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

## Transporting sensitive components

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

## Lifting equipment

Adhere to the following guidelines when lifting heavy weight equipment:

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

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

## After working inside your computer

### About this task

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

### Steps

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

# Removing and installing components

## Recommended tools











The procedures in this document may require the following tools:

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





















## Screw list

- i** **NOTE:** When removing screws from a component, it is recommended to note the screw type, the quantity of screws, and then place them in a screw storage box. This is to ensure that the correct number of screws and correct screw type is restored when the component is replaced.
- i** **NOTE:** Some computers have magnetic surfaces. Ensure that the screws are not left attached to such surface when replacing a component.
- i** **NOTE:** Screw color may vary with the configuration ordered.

**Table 1. Screw list**

Component	Secured to	Screw type	Quantity	Screw image
Audio daughter-board	Palm-rest assembly	M2.5x2.5	3	
Battery	Palm-rest assembly	M2.5x5	6	
Computer base	Palm-rest assembly	M2.5x12	1	
Computer base	Palm-rest assembly	M2.5x8	14	
Display-cable bracket	System board	M2x3	1	
Display assembly	Computer base	M2.5x8	2	
Display assembly	Palm-rest assembly	M2.5x2.5	4	
Graphics card	System board	M2x3	3	
Graphics-card cable	Graphics card	M2x3	2	
Graphics-card cable	System board	M2x3	2	

**Table 1. Screw list(continued)**

Component	Secured to	Screw type	Quantity	Screw image
Heat-sink assembly	Palm-rest assembly	M2.5x5	2	
Per key keyboard	Palm-rest assembly	M1.2x2.5	57	
Hard-drive assembly	Palm-rest assembly	M2x3	4	
Hard-drive bracket	Hard drive	M3x3	4	
Power-adaptor port bracket	Palm-rest assembly	M2x3	1	
Rear-I/O cover	Computer base	M2.5x2.5	4	
Rear-I/O cover	Palm-rest assembly	M2.5x7	2	
System board	Palm-rest assembly	M2.5x5	4	
M.2 2280 solid-state drive in M.2 slot one	Palm-rest assembly	M2x3	1	
M.2 2280 solid-state drive in M.2 slot two	Palm-rest assembly	M2x3	1	
M.2 2230 solid-state drive in M.2 slot one	Palm-rest assembly	M2x3	2	
M.2 2230 solid-state drive in M.2 slot two	Palm-rest assembly	M2x3	2	
Solid-state drive mounting bracket	Palm-rest assembly	M2x3	2	
M.2 2280 solid-state drive in M.2 slot three	Solid-state drive interposer board	M2x3	2	
M.2 2280 solid-state drive in M.2 slot four	Solid-state drive interposer board	M2x3	2	
Solid-state drive interposer board	Solid-state drive interposer board bracket	M2x3	3	
Solid-state drive interposer board	Palm-rest assembly	M2x3	4	
Card-reader board	Palm-rest assembly	M2.5x2.5	3	
Touchpad bracket	Palm-rest assembly	M2x3	5	
Wireless-card bracket	System board	M2x3	1	

# Base cover

## Removing the base cover

### Prerequisites

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

### About this task

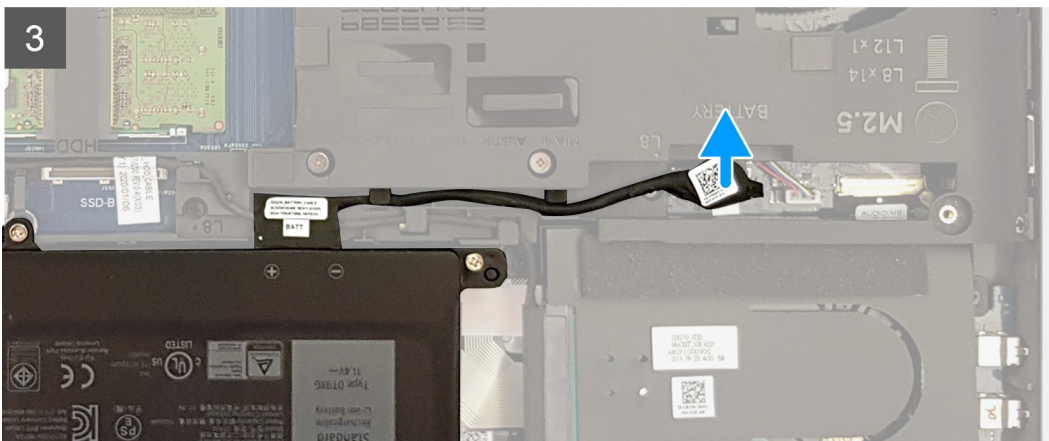
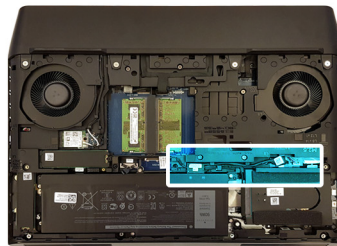
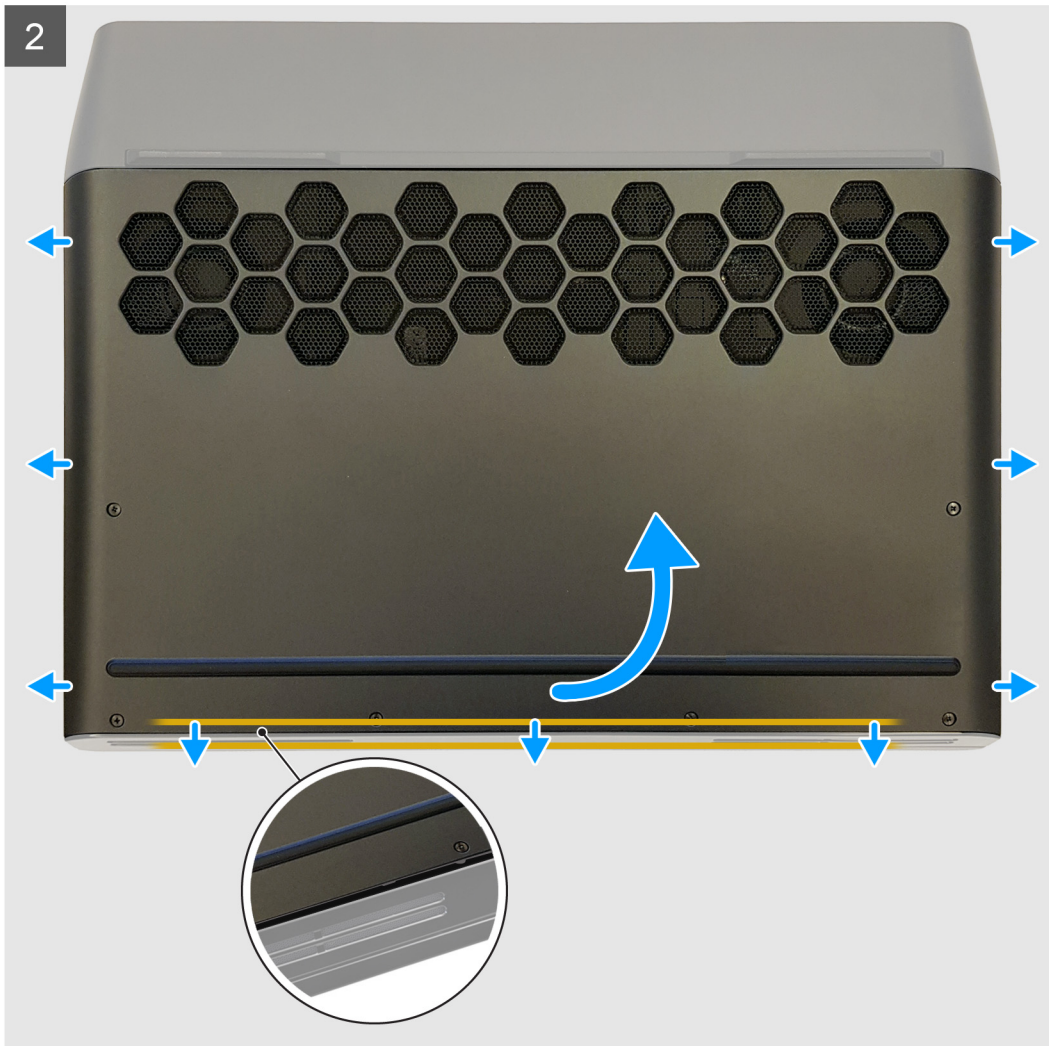
The following image indicates the location of the base cover and provides a visual representation of the removal procedure.



6x









## Steps

1. Loosen the six captive screws that secure the base cover to the computer base to open a gap between the two parts.
2. Starting from the middle of the bottom side, lift open the base cover with your fingertips.
3. Release the tabs on the base cover from the slots on the computer base.
4. Slide the base cover off the computer base.
5. Disconnect the battery cable from the system board.
6. Press and hold the power button for five seconds to ground the system board.

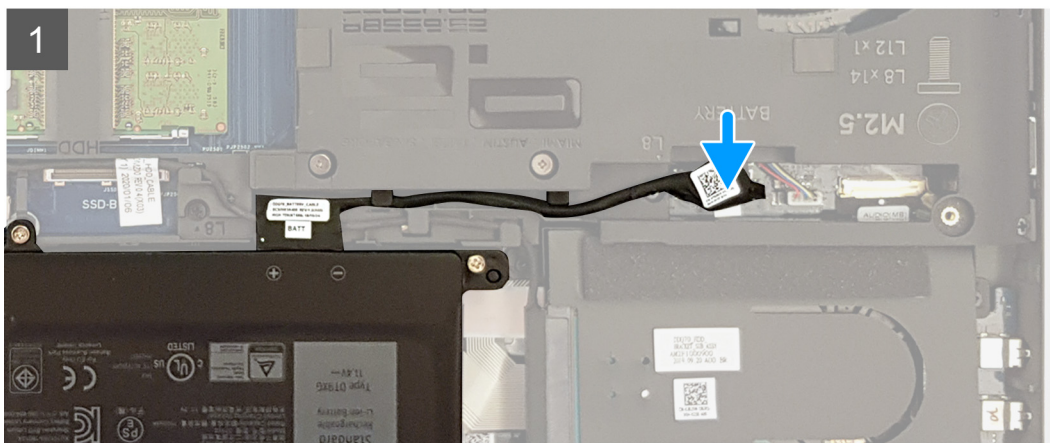
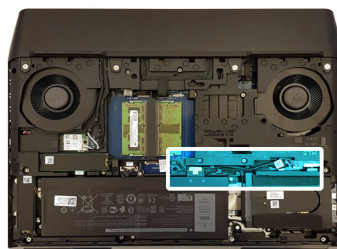
## Installing the base cover

### Prerequisites

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

### About this task

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





### Steps

1. Connect the battery cable to the system board.
2. Slide the tabs on the base cover into the slots on the computer base and snap the base cover into place.
3. Tighten the six captive screws that secure the base cover to the computer base.

### Next steps

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

## Battery

### Lithium-ion battery precautions

#### ⚠ CAUTION:

- Exercise caution when handling Lithium-ion batteries.
- Discharge the battery completely before removing it. Disconnect the AC power adapter from the system and operate the computer solely on battery power—the battery is fully discharged when the computer no longer turns on when the power button is pressed.
- Do not crush, drop, mutilate, or penetrate the battery with foreign objects.
- Do not expose the battery to high temperatures, or disassemble battery packs and cells.
- Do not apply pressure to the surface of the battery.
- Do not bend the battery.
- Do not use tools of any kind to pry on or against the battery.
- Ensure any screws during the servicing of this product are not lost or misplaced, to prevent accidental puncture or damage to the battery and other system components.

- If the battery gets stuck inside your computer as a result of swelling, do not try to release it as puncturing, bending, or crushing a lithium-ion battery can be dangerous. In such an instance, contact Dell technical support for assistance. See [www.dell.com/contactdell](http://www.dell.com/contactdell).
- Always purchase genuine batteries from [www.dell.com](http://www.dell.com) or authorized Dell partners and resellers.

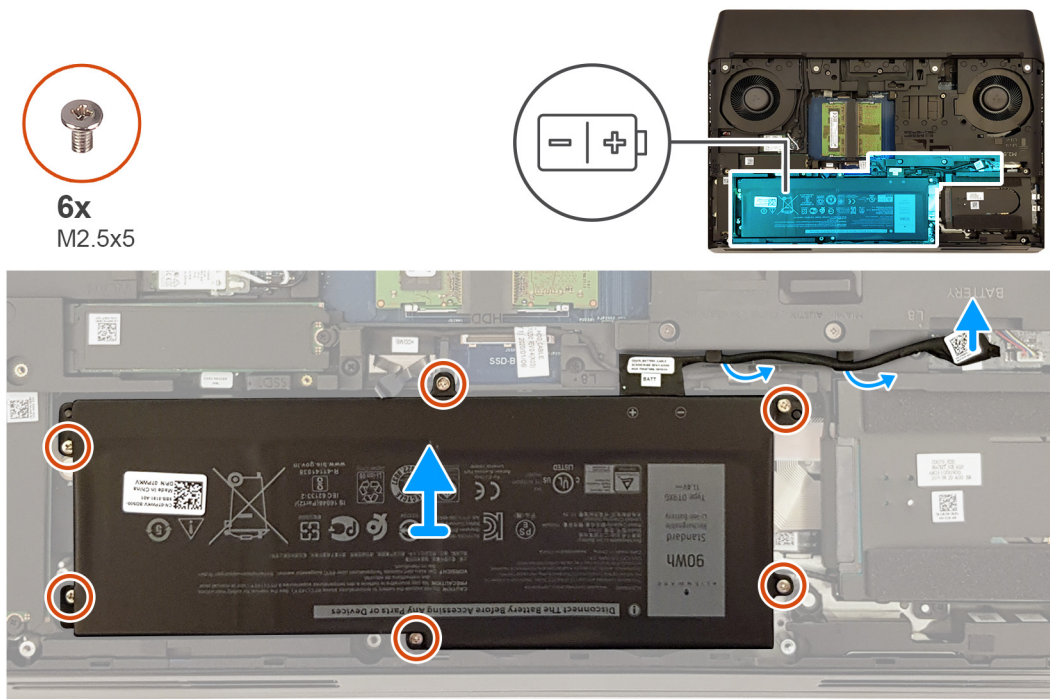
## Removing the battery

### Prerequisites

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

### About this task

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



### Steps

1. Using the pull tab, disconnect the battery cable from the system board and remove it from the routing guides on the computer base, if applicable.
2. Remove the six screws (M2.5x5) that secure the battery to the palm-rest assembly.
3. Lift the battery off the palm-rest assembly.

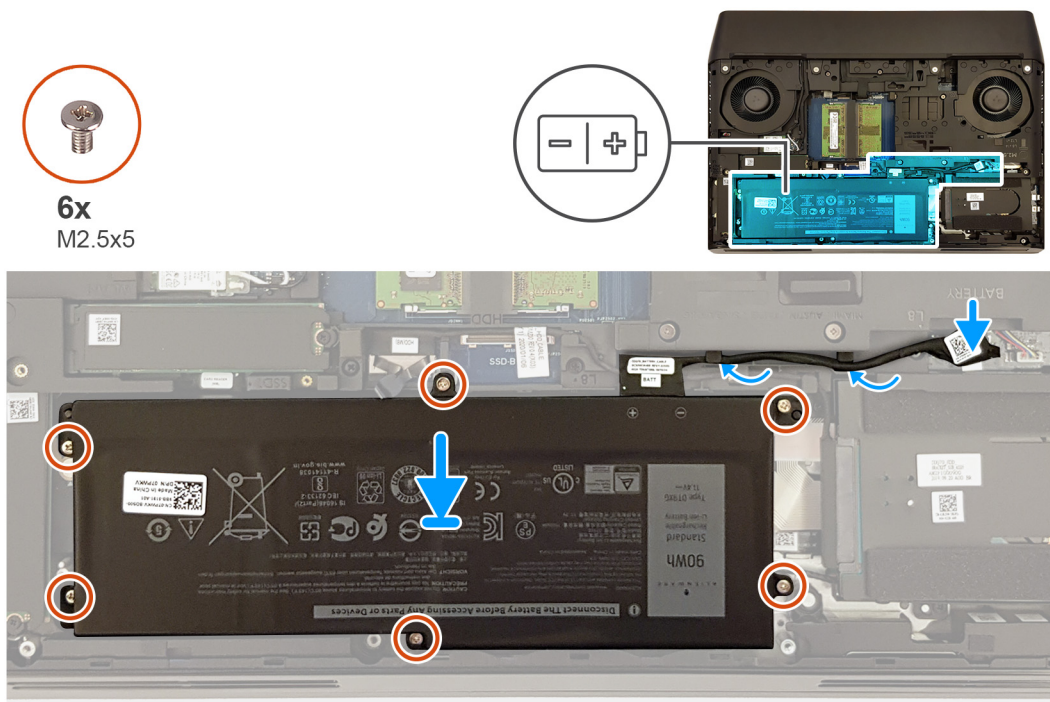
## Installing the battery

### Prerequisites

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

### About this task

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



## Steps

1. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
2. Replace the six screws (M2.5x5) that secure the battery to the palm-rest assembly.
3. Route the battery cable through the routing guides on the computer base and connect the battery cable to the system board.

## Next steps

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

# Memory modules

## Removing the memory modules

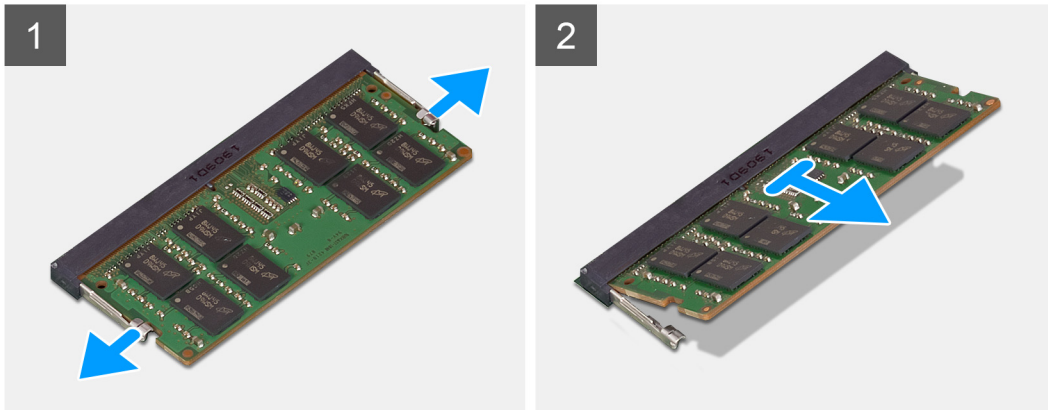
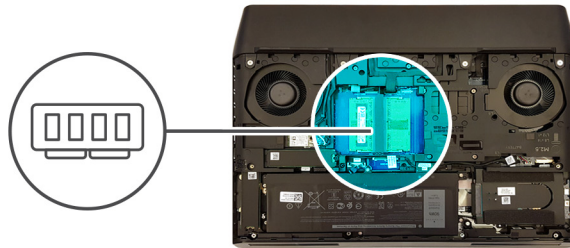
### Prerequisites

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

### About this task

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





### Steps

1. Use your fingertips to carefully spread apart the securing-clips on each end of the memory-module slot until the memory module pops up.
2. Remove the memory module from the memory-module slot.

**NOTE:** Repeat steps 1 and 2 to remove any other memory modules installed in your computer.

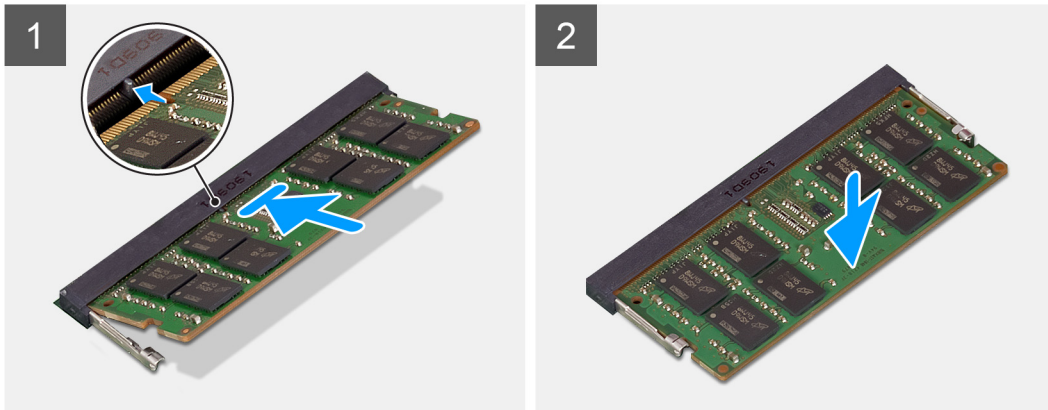
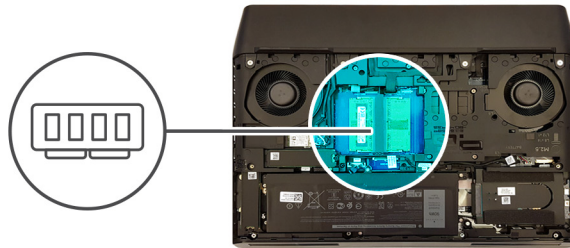
## Installing the memory modules

### Prerequisites

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

### About this task

The following image indicates the location of the memory modules 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.
- i** **NOTE:** If you do not hear the click, remove the memory module and reinstall it.
- i** **NOTE:** Repeat steps 1 to 3 if you are installing two memory modules.

### Next steps

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

## Solid-state drive—M.2 slot one

### Removing the M.2 2280 solid-state drive from M.2 slot one

#### Prerequisites

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

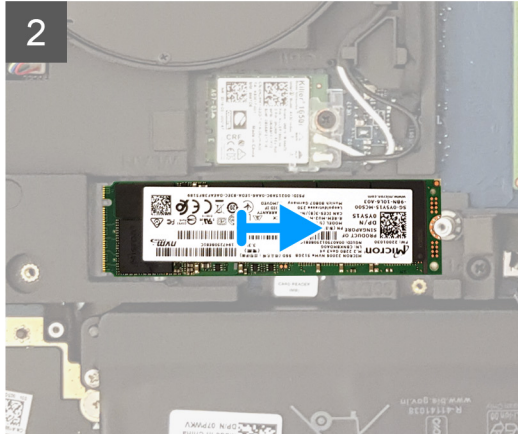
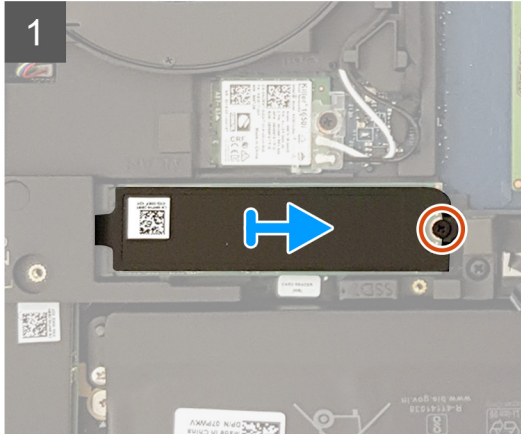
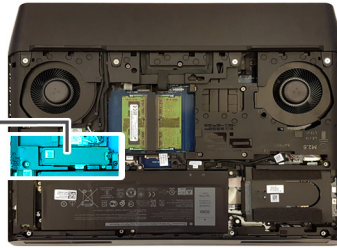
#### About this task

- i** **NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot one.
- i** **NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot one are as follows:
- M.2 2230 solid-state drive
  - M.2 2280 solid-state drive

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot one and provides a visual representation of the removal procedure.



1x  
M2x3



## Steps

1. Remove the screw (M2x3) that secures the thermal shield and the solid-state drive to the computer base.
2. Slide and lift the thermal shield from the computer base.
3. Slide and remove the M.2 2280 solid-state drive from the M.2 solid-state drive slot on the system board.

## Installing the M.2 2280 solid-state drive in M.2 slot one

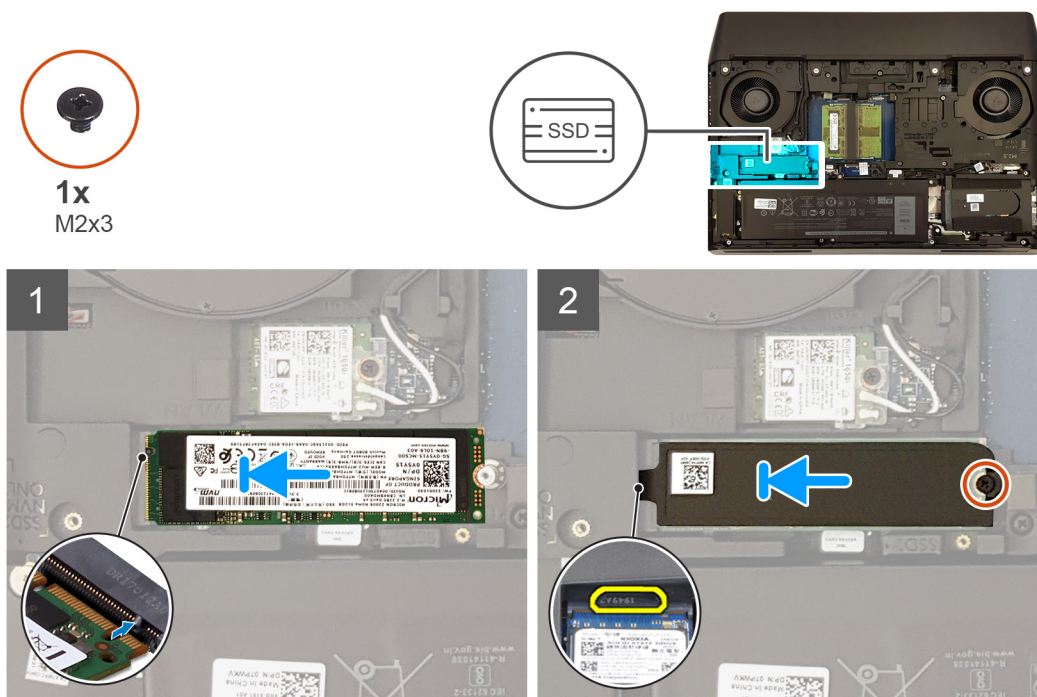
### Prerequisites

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

### About this task

- ① **NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot one.
- ① **NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot one are as follows:
  - M.2 2230 solid-state drive
  - M.2 2280 solid-state drive
- ① **NOTE:** Install the solid-state drive to M.2 slot one before installing the solid-state drive to M.2 slot two on the system board.

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot one and provides a visual representation of the installation procedure.



## Steps

1. Align the notch on the M.2 2280 solid-state drive with the tab on the M.2 solid-state drive slot on the system board.
2. Slide the M.2 2280 solid-state drive into the M.2 solid-state drive slot on the system board.
3. Slide the tab on the thermal shield into the slot on the computer base to secure the thermal shield in place.
4. Align the screw holes on the thermal shield with the screw holes on the computer base.
5. Replace the screw (M2x3) that secures the solid-state drive and the thermal shield to the computer base.

## Next steps

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

## Removing the M.2 2230 solid-state drive from M.2 slot one

### Prerequisites

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

### About this task

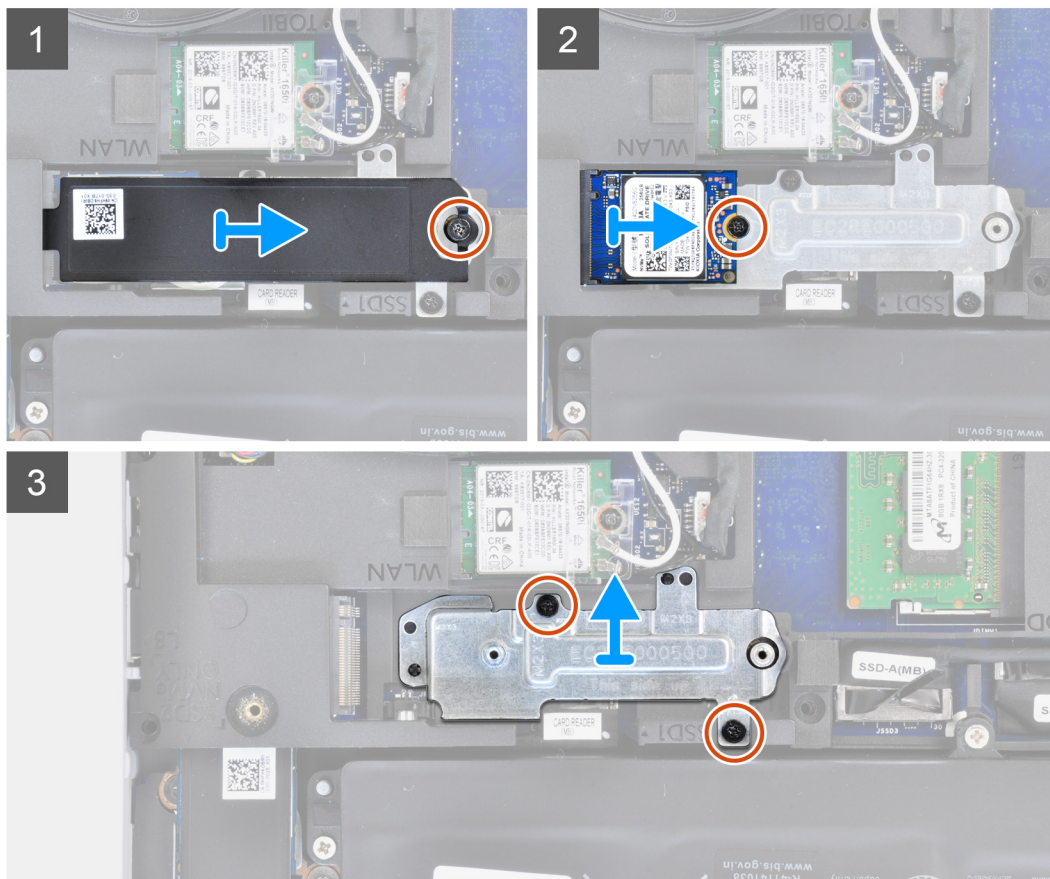
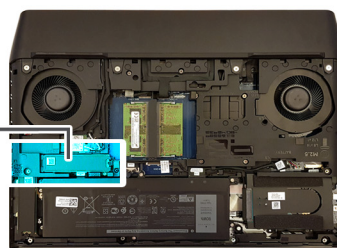
- ⓘ **NOTE:** This procedure applies only to computers shipped with an M.2 2230 solid-state drive installed in M.2 slot one.
- ⓘ **NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot one are as follows:
  - M.2 2230 solid-state drive
  - M.2 2280 solid-state drive

The following image indicates the location of the M.2 2230 solid-state drive in M.2 slot one and provides a visual representation of the removal procedure.





4x  
M2x3



## Steps

1. Remove the screw (M2x3) that secures the M.2 thermal shield to the palm-rest assembly and system board.
2. Lift the M.2 thermal shield from the palm-rest assembly and system board.
3. Remove the screw (M2x3) that secures the M.2 2230 solid-state drive to the palm-rest assembly.
4. Slide and remove the M.2 2230 solid-state drive from the M.2 solid-state drive slot on the system board.
5. Remove the two screws (M2x3) that secure the solid-state drive mounting bracket to the computer base.
6. Lift the solid-state drive mounting bracket off the computer base.

## Installing the M.2 2230 solid-state drive in M.2 slot one

### Prerequisites

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

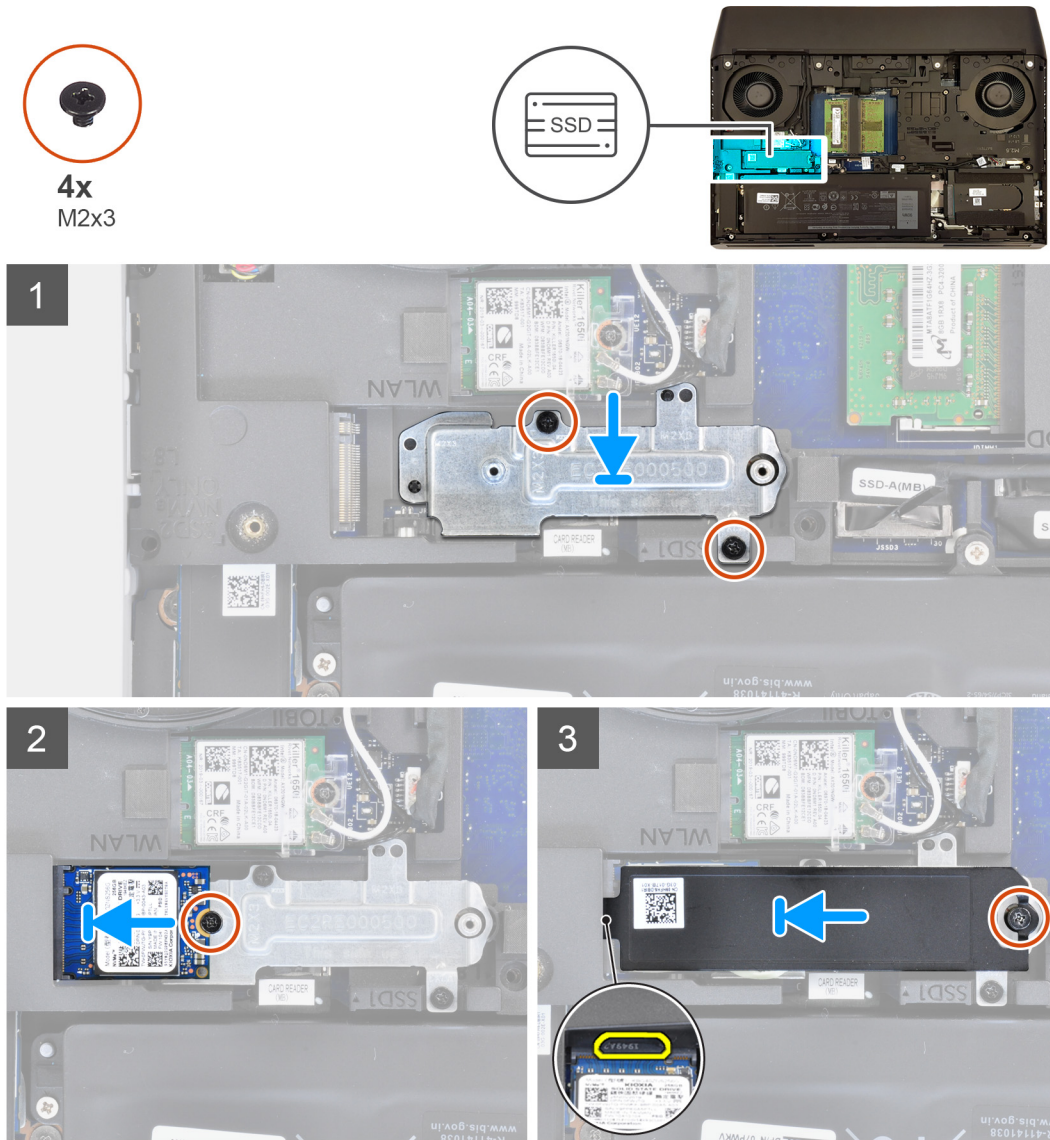
### About this task

- NOTE:** This procedure applies only to computers shipped with an M.2 2230 solid-state drive installed in M.2 slot one.
- NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot one are as follows:

- M.2 2230 solid-state drive
- M.2 2280 solid-state drive

**i NOTE:** Install the solid-state drive to the M.2 slot one before installing the solid-state drive to the M.2 slot two on the system board.

The following image indicates the location of the M.2 2230 solid-state drive in M.2 slot one and provides a visual representation of the installation procedure.



## Steps

1. Using the alignment posts, place the solid-state drive mounting bracket in the slot on the computer base.
2. Align the screw holes on the solid-state drive mounting bracket with the screw holes on the computer base.
3. Replace the two screws (M2x3) that secure the solid-state drive mounting bracket to the computer base.
4. Align the notch on the M.2 2230 solid-state drive with the tab on the M.2 solid-state drive slot on the system board.
5. Slide the M.2 2230 solid-state drive into the M.2 solid-state drive slot on the system board.
6. Replace the screw (M2x3) that secures the M.2 2230 solid-state drive to the palm-rest assembly.
7. Slide the tab on the thermal shield into the slot on the computer base to secure the thermal shield in place.
8. Align the screw holes of the M.2 thermal shield with the screw holes on the palm-rest assembly and system board.
9. Replace the screw (M2x3) that secures the M.2 thermal shield to the palm-rest assembly and system board.

### Next steps

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

## Solid-state drive—M.2 slot two

### Removing the M.2 2280 solid-state drive from M.2 slot two

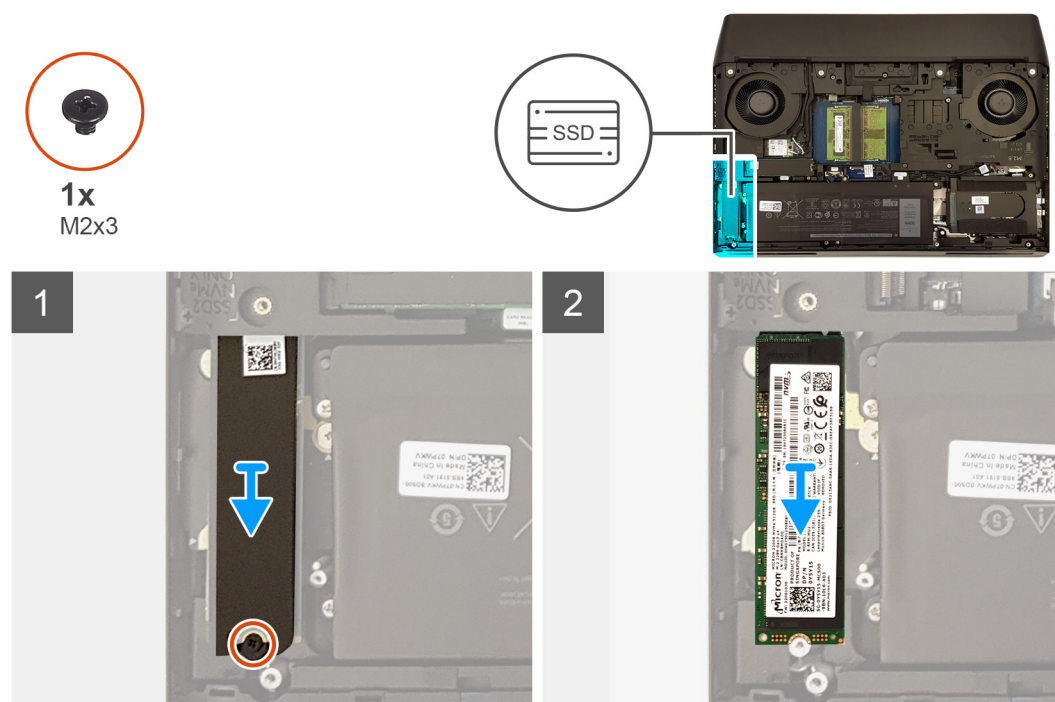
#### Prerequisites

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

#### About this task

- NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot two.
- NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot two are as follows:
- M.2 2230 solid-state drive
  - M.2 2280 solid-state drive

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot two and provides a visual representation of the removal procedure.



#### Steps

1. Remove the screw (M2x3) that secures the thermal shield and the solid-state drive to the computer base.
2. Slide and lift the thermal shield from the computer base.
3. Slide and remove the M.2 2280 solid-state drive from the M.2 solid-state drive slot on the system board.



## Installing the M.2 2280 solid-state drive in M.2 slot two

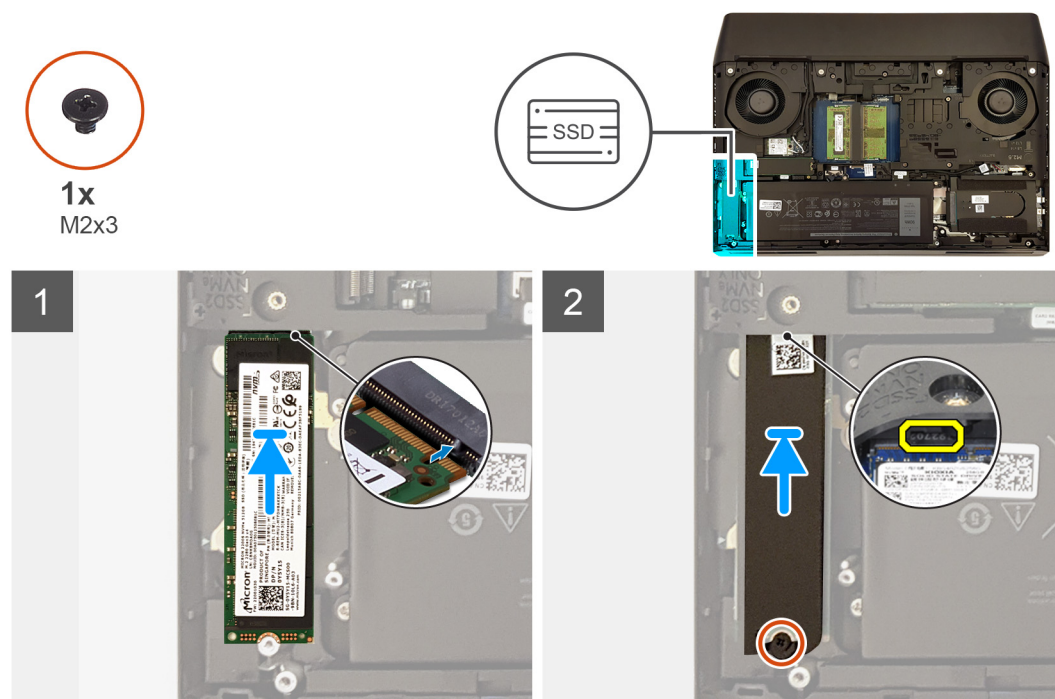
### Prerequisites

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

### About this task

- ① **NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot two.
- ① **NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot two are as follows:
  - M.2 2230 solid-state drive
  - M.2 2280 solid-state drive
- ① **NOTE:** Install the solid-state drive to M.2 slot one before installing the solid-state drive to M.2 slot two on the system board.

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot two and provides a visual representation of the installation procedure.



### Steps

1. Align the notch on the M.2 2280 solid-state drive with the tab on the M.2 solid-state drive slot on the system board.
2. Slide the M.2 2280 solid-state drive into the M.2 solid-state drive slot on the system board.
3. Slide the tab on the thermal shield into the slot on the computer base to secure the thermal shield in place.
4. Align the screw holes on the thermal shield with the screw holes on the computer base.
5. Replace the screw (M2x3) that secures the solid-state drive and the thermal shield to the computer base.

### Next steps

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

## Removing the M.2 2230 solid-state drive from M.2 slot two

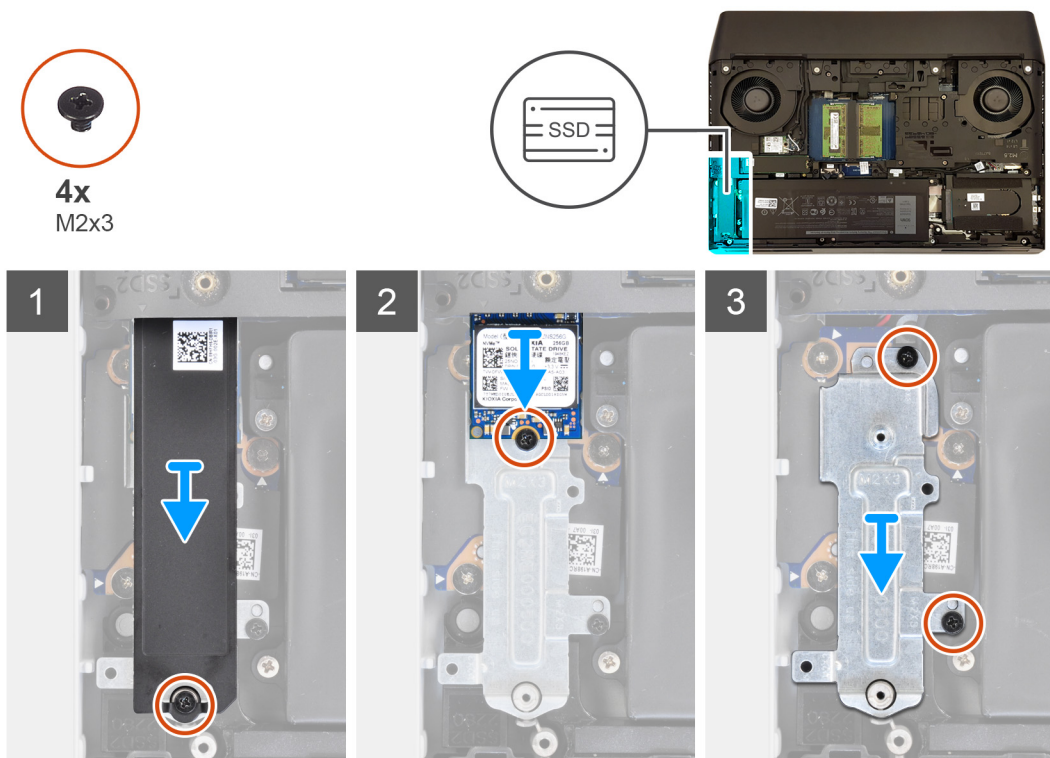
### Prerequisites

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

### About this task

- NOTE:** This procedure applies only to computers shipped with an M.2 2230 solid-state drive installed in M.2 slot two.
- NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot two are as follows:
- M.2 2230 solid-state drive
  - M.2 2280 solid-state drive

The following image indicates the location of the M.2 2230 solid-state drive in M.2 slot two and provides a visual representation of the removal procedure.



### Steps

1. Remove the screw (M2x3) that secures the M.2 thermal shield to the palm-rest assembly and system board.
2. Lift the M.2 thermal shield from the palm-rest assembly and system board.
3. Remove the screw (M2x3) that secures the M.2 2230 solid-state drive to the palm-rest assembly.
4. Slide and remove the M.2 2230 solid-state drive from the M.2 solid-state drive slot on the system board.
5. Remove the two screws (M2x3) that secure the solid-state drive mounting bracket to the computer base.
6. Lift the solid-state drive mounting bracket off the computer base.

## Installing the M.2 2230 solid-state drive in M.2 slot two

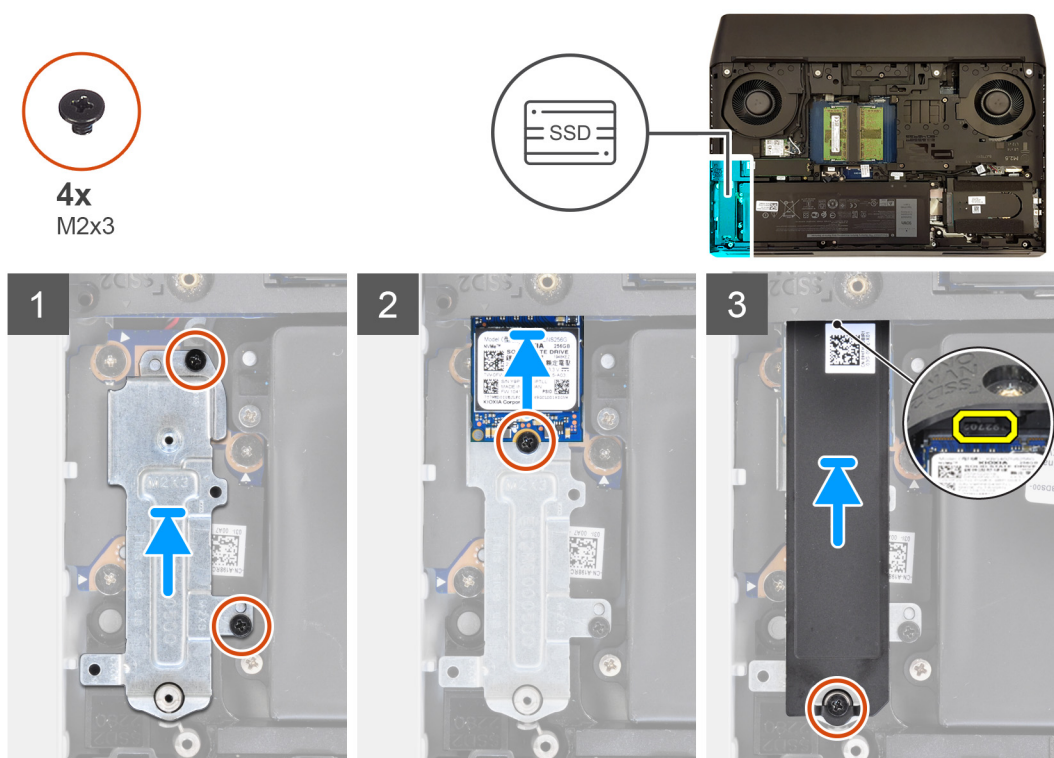
### Prerequisites

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

## About this task

- NOTE:** This procedure applies only to computers shipped with an M.2 2230 solid-state drive installed in M.2 slot two.
- NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drive installed. The solid-state drive configurations that are supported on M.2 slot two are as follows:
  - M.2 2230 solid-state drive
  - M.2 2280 solid-state drive
- NOTE:** Install the solid-state drive to the M.2 slot one before installing the solid-state drive to the M.2 slot two on the system board.

The following image indicates the location of the M.2 2230 solid-state drive in M.2 slot two and provides a visual representation of the installation procedure.



## Steps

1. Using the alignment posts, place the solid-state drive mounting bracket in the slot on the computer base.
2. Align the screw holes on the solid-state drive mounting bracket with the screw holes on the computer base.
3. Replace the two screws (M2x3) that secure the solid-state drive mounting bracket to the computer base.
4. Align the notch on the M.2 2230 solid-state drive with the tab on the M.2 solid-state drive slot on the system board.
5. Slide the M.2 2230 solid-state drive into the M.2 solid-state drive slot on the system board.
6. Replace the screw (M2x3) that secures the M.2 2230 solid-state drive to the palm-rest assembly.
7. Slide the tab on the thermal shield into the slot on the computer base to secure the thermal shield in place.
8. Align the screw holes of the M.2 thermal shield with the screw holes on the palm-rest assembly and system board.
9. Replace the screw (M2x3) that secures the M.2 thermal shield to the palm-rest assembly and system board.

## Next steps

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

# Solid state drive—M.2 slot three

## Removing the M.2 2280 solid-state drive from M.2 slot three

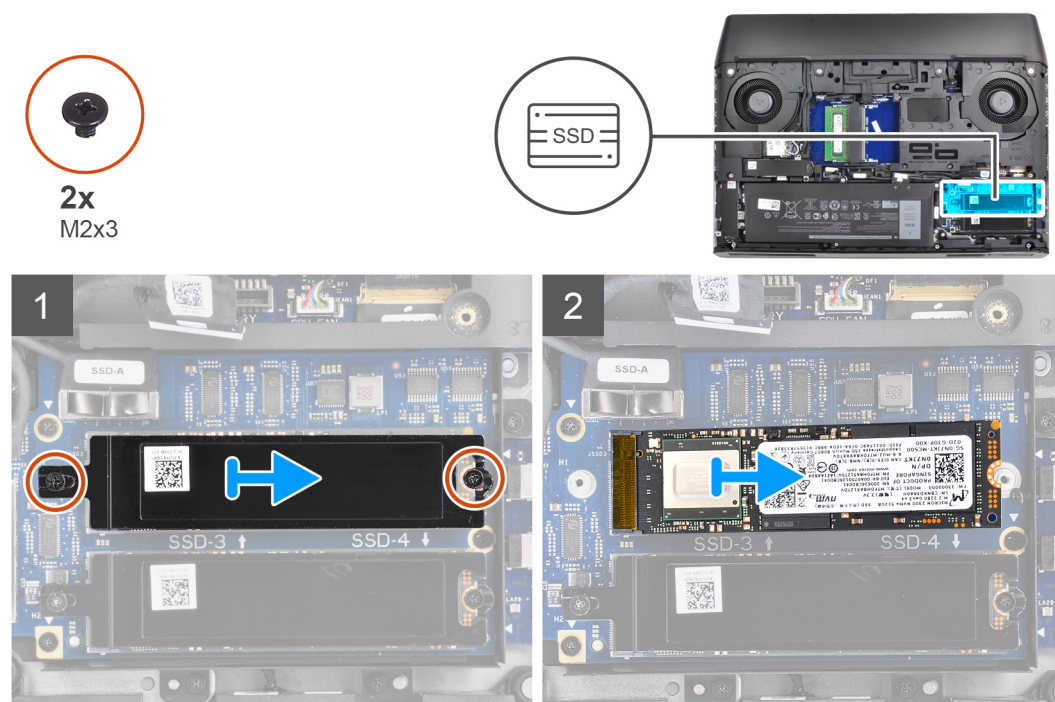
### Prerequisites

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

### About this task

**NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot three.

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot three and provides a visual representation of the removal procedure.



### Steps

1. Remove the two screws (M2x3) that secure the thermal shield and the solid-state drive to the solid-state drive interposer board.
2. Slide and lift the thermal shield from the computer base.
3. Slide and remove the M.2 2280 solid-state drive from the M.2 solid-state drive slot on the solid-state drive interposer board.

## Installing the M.2 2280 solid-state drive in M.2 slot three

### Prerequisites

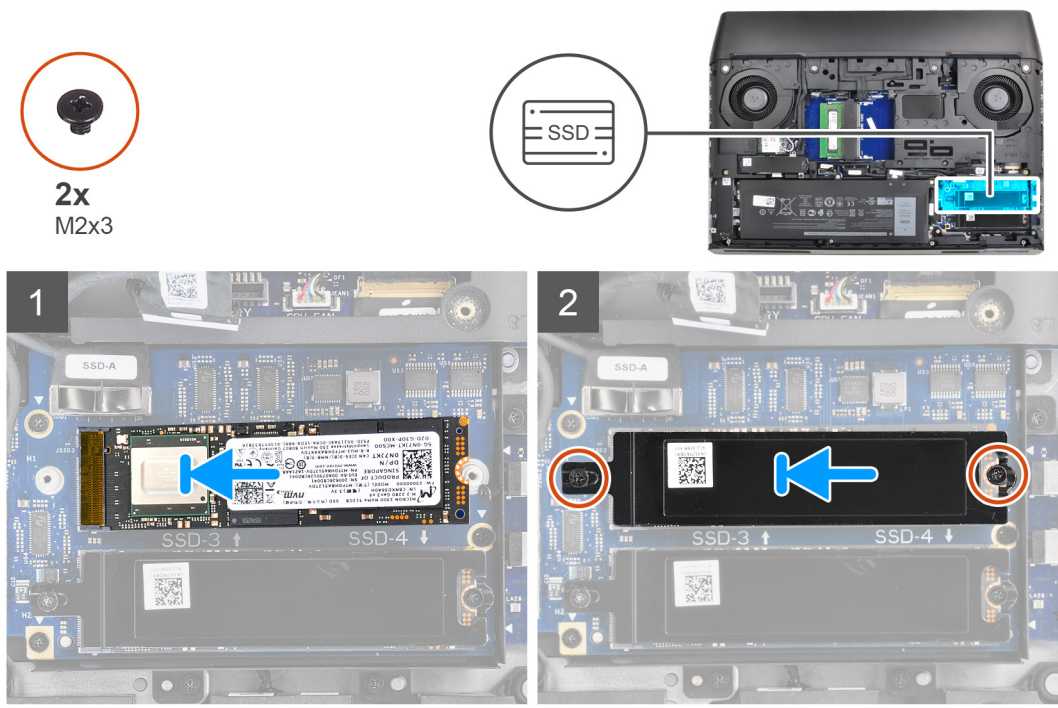
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

**NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot three.

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot three and provides a visual representation of the installation procedure.





**Steps**

- 1. Align the notch on the M.2 2280 solid-state drive with the tab on the M.2 solid-state drive slot on the solid-state drive interposer board.
- 2. Slide the M.2 2280 solid-state drive into the M.2 solid-state drive slot on the solid-state drive interposer board.
- 3. Align the screw holes on the thermal shield with the screw holes on the solid-state drive interposer board.
- 4. Replace the two screws (M2x3) that secure the solid-state drive and the thermal shield to the solid-state drive interposer board.

**Next steps**

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

**Solid state drive—M.2 slot four**

**Removing the M.2 2280 solid-state drive from M.2 slot four**

**Prerequisites**

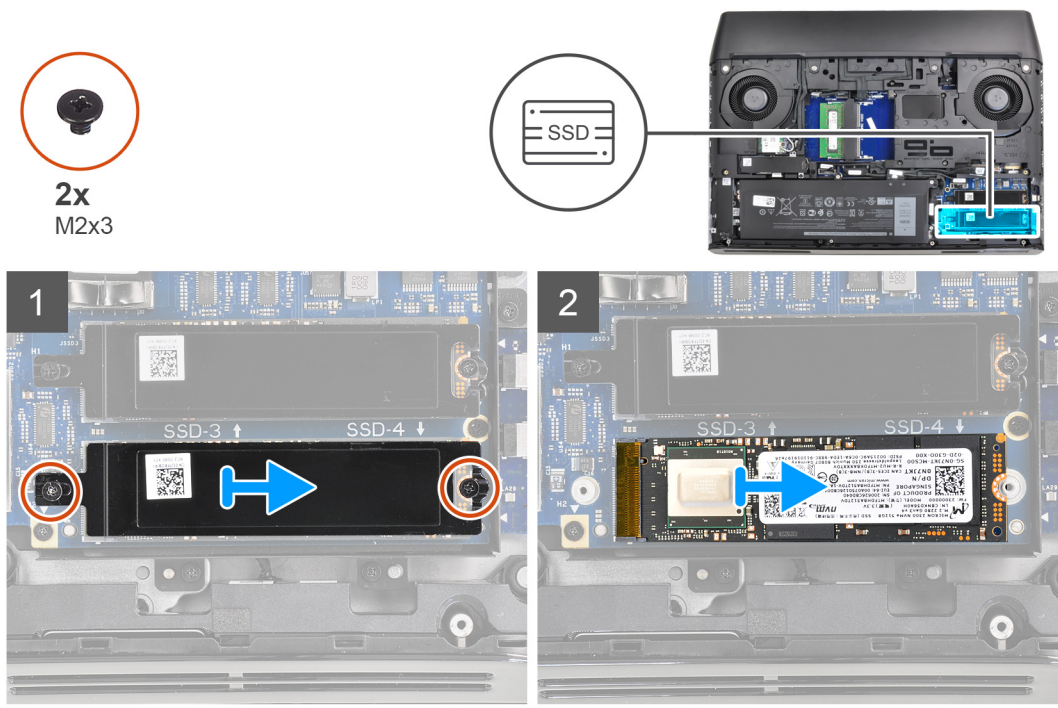
- 1. Follow the procedure in [Before working inside your computer](#).
- 2. Remove the [base cover](#).

**About this task**

**NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot four.

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot four and provides a visual representation of the removal procedure.





**Steps**

- 1. Remove the two screws (M2x3) that secure the thermal shield and the solid-state drive to the solid-state drive interposer board.
- 2. Slide and lift the thermal shield from the computer base.
- 3. Slide and remove the M.2 2280 solid-state drive from the M.2 solid-state drive slot on the solid-state drive interposer board.

**Installing the M.2 2280 solid-state drive in M.2 slot four**

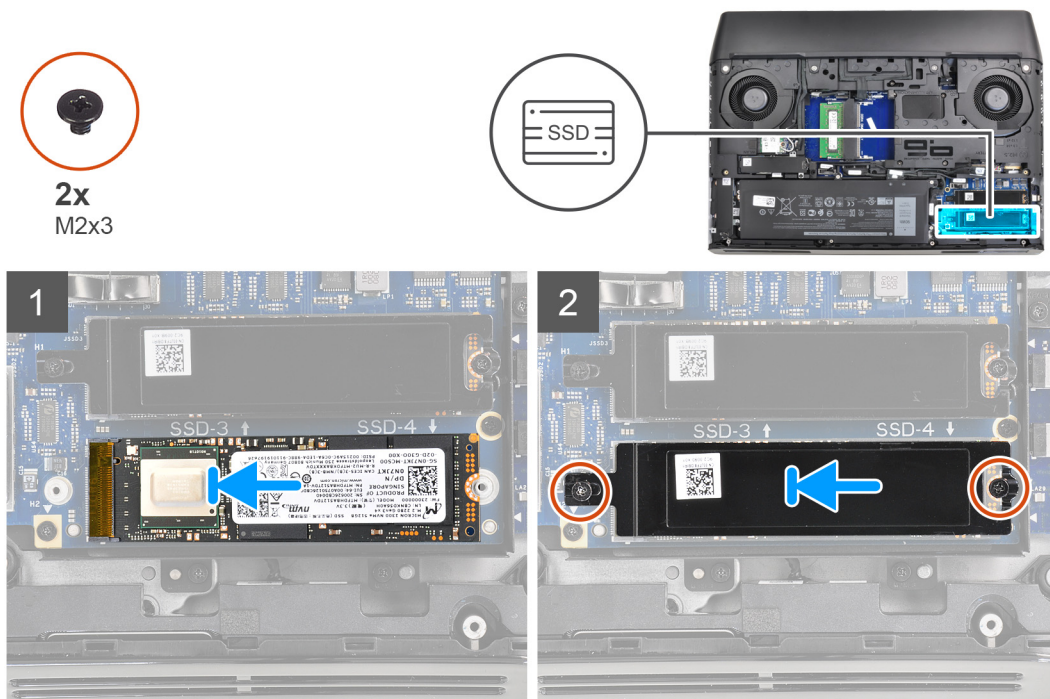
**Prerequisites**

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

**About this task**

**NOTE:** This procedure applies only to computers shipped with an M.2 2280 solid-state drive installed in M.2 slot four.

The following image indicates the location of the M.2 2280 solid-state drive in M.2 slot four and provides a visual representation of the installation procedure.



## Steps

1. Align the notch on the M.2 2280 solid-state drive with the tab on the M.2 solid-state drive slot on the solid-state drive interposer board.
2. Slide the M.2 2280 solid-state drive into the M.2 solid-state drive slot on the solid-state drive interposer board.
3. Align the screw holes on the thermal shield with the screw holes on the solid-state drive interposer board.
4. Replace the two screws (M2x3) that secure the solid-state drive and the thermal shield to the solid-state drive interposer board.

## Next steps

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

# Solid-state drive interposer board

## Removing the solid-state drive interposer board

### Prerequisites

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

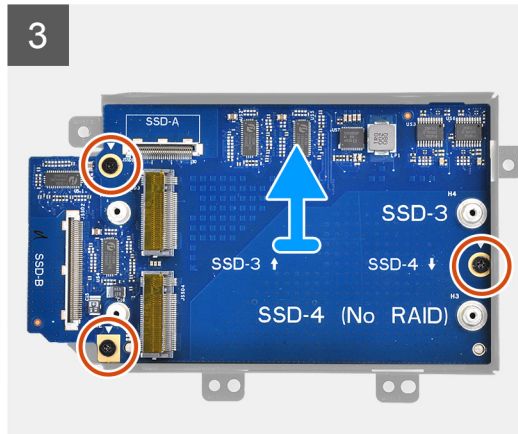
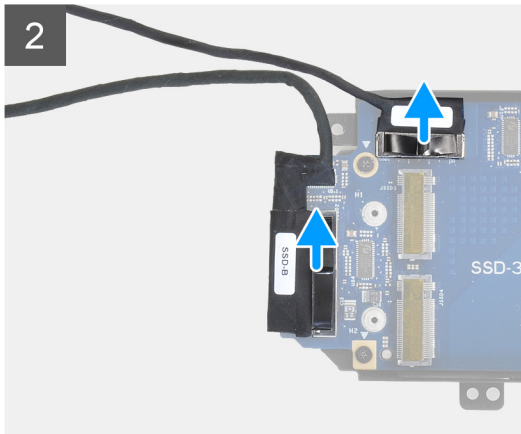
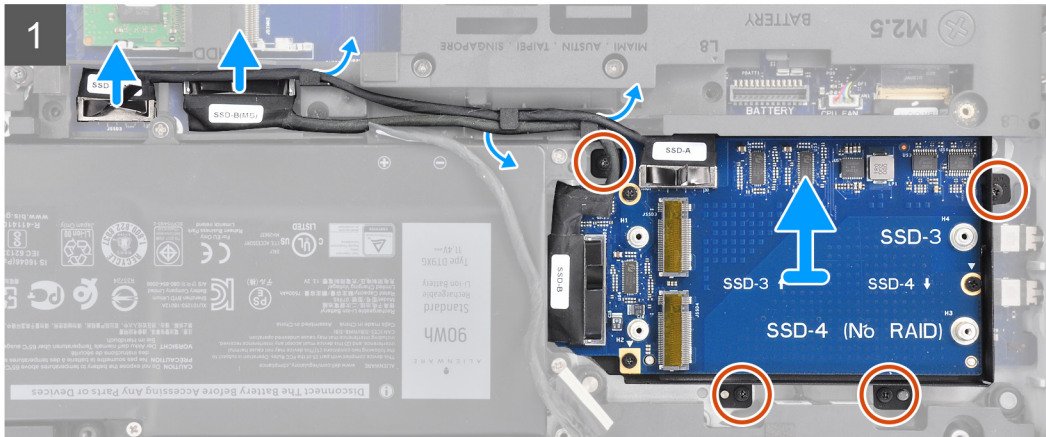
### About this task

**NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drives installed. This procedure applies only to computers shipped with more than two solid-state drives.

The following image indicates the location of the solid-state drive interposer board and provides a visual representation of the removal procedure.



7x  
M2x3



## Steps

1. Disconnect the solid-state drive interposer board cables from the system board.
2. Remove the solid-state drive interposer board cables from the routing guides on the computer base.
3. Remove the four screws (M2x3) that secure the solid-state drive interposer board bracket to the palm-rest assembly.
4. Lift the solid-state drive interposer board assembly off the palm-rest assembly.
5. Disconnect the solid-state drive interposer board cables from the solid-state drive interposer board.
6. Remove the three screws (M2x3) that secure the solid-state drive interposer board to the solid-state drive interposer board bracket.
7. Lift the solid-state drive interposer board off the solid-state drive interposer board bracket.

## Installing the solid-state drive interposer board

### Prerequisites

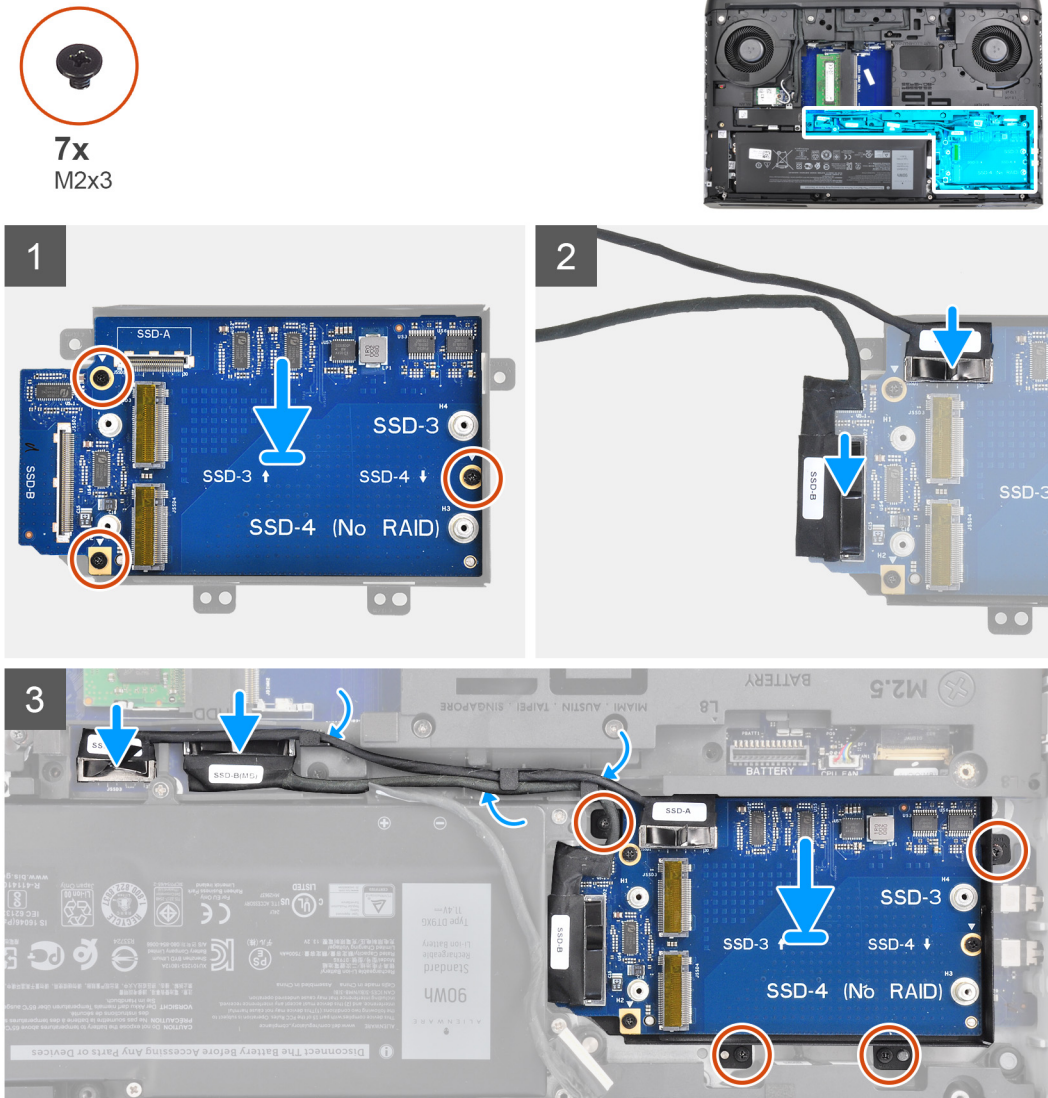
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

- NOTE:** Depending on the configuration ordered, the computer may have up to four M.2 solid-state drives installed. This procedure applies only to computers shipped with more than two solid-state drives.



The following image indicates the location of the solid-state drive interposer board and provides a visual representation of the installation procedure.



## Steps

1. Place the solid-state drive interposer board on the solid-state drive interposer board bracket.
2. Align the screw holes on the solid-state drive interposer board with the screw holes on the solid-state drive interposer board bracket.
3. Replace the three screws (M2x3) that secure the solid-state drive interposer board to the solid-state drive interposer board bracket.
4. Connect the solid-state drive interposer board cable which is marked as SSD-A to the SSD-A connector on the solid-state drive interposer board.
5. Connect the solid-state drive interposer board cable which is marked as SSD-B to the SSD-B connector on the solid-state drive interposer board.
6. Connect the solid-state drive interposer board cable which is marked as SSD-A (MB) to the SSD-A connector on the system board.
7. Connect the solid-state drive interposer board cable which is marked as SSD-A (MB) to the SSD-B connector on the system board.
8. Replace the four screws (M2x3) that secure the solid-state drive interposer board to the palm-rest assembly.

## Next steps

1. Install the [base cover](#).

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

## Wireless card

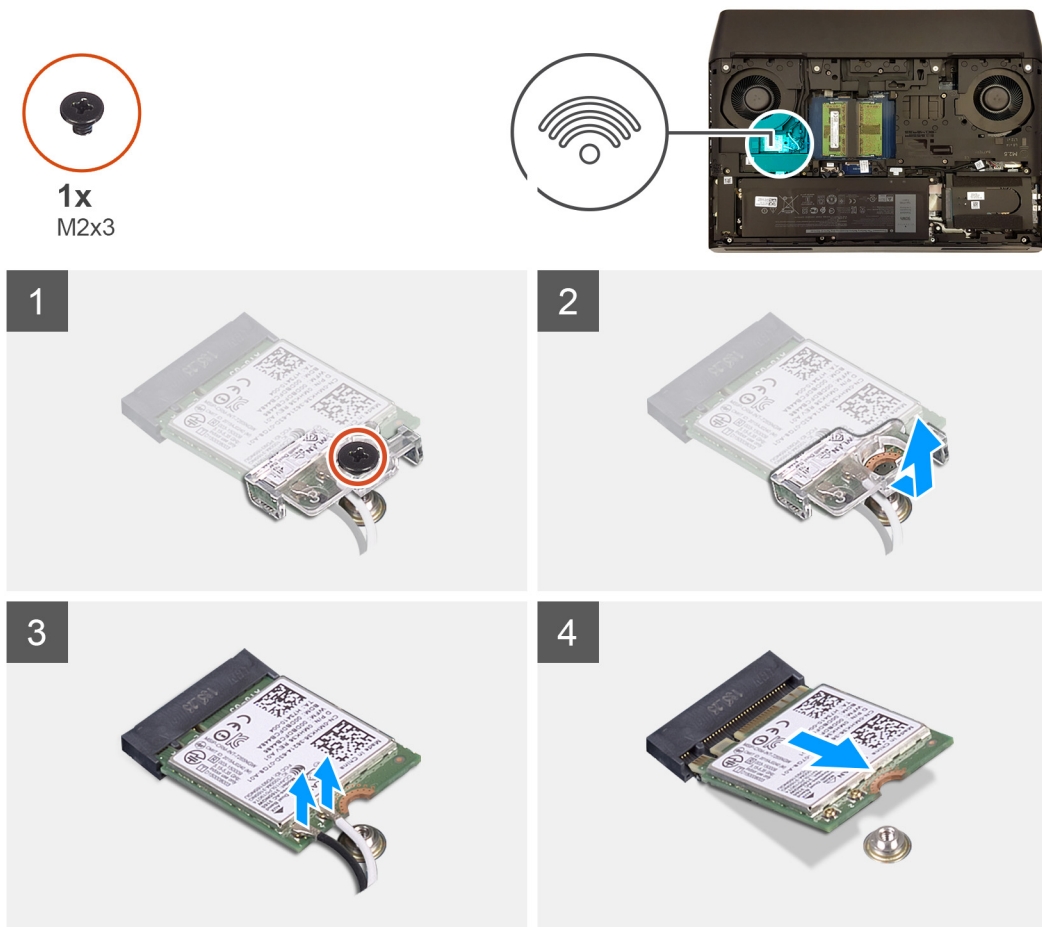
### Removing the wireless card

#### Prerequisites

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

#### About this task

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



#### Steps

1. Remove the screw (M2x3) that secures the wireless-card bracket to the system board.
2. Slide and remove the wireless-card bracket from the wireless card.
3. Disconnect the antenna cables from the wireless card.
4. Slide and remove the wireless card from the wireless-card slot.

### Installing the wireless card

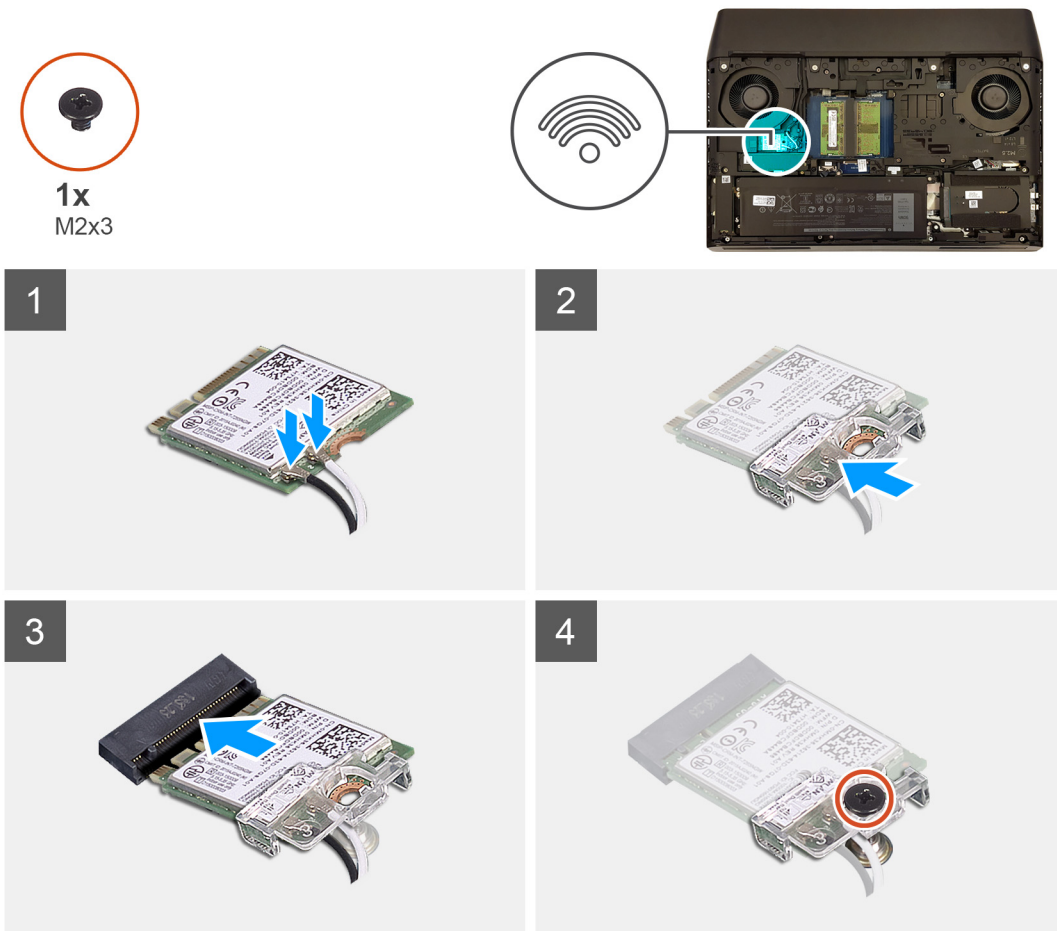
#### Prerequisites

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

About this task

 **CAUTION:** To avoid damage to the wireless card, do not place any cables under it.

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



Steps

- 1. Connect the antenna cables to the wireless card.  
The following table provides the antenna-cable color scheme for the wireless card that is supported by your computer.

Table 2. Antenna-cable color scheme

Connectors on the wireless card	Antenna-cable color
Main (white triangle)	White
Auxiliary (black triangle)	Black

- 2. Slide and replace the wireless-card bracket on the wireless-card.
- 3. Align the notch on the wireless card with the tab on the wireless-card slot and insert the wireless card at an angle into the wireless-card slot.
- 4. Replace the screw (M2x3) that secures the wireless-card bracket to the system board.

Next steps

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

# Hard drive

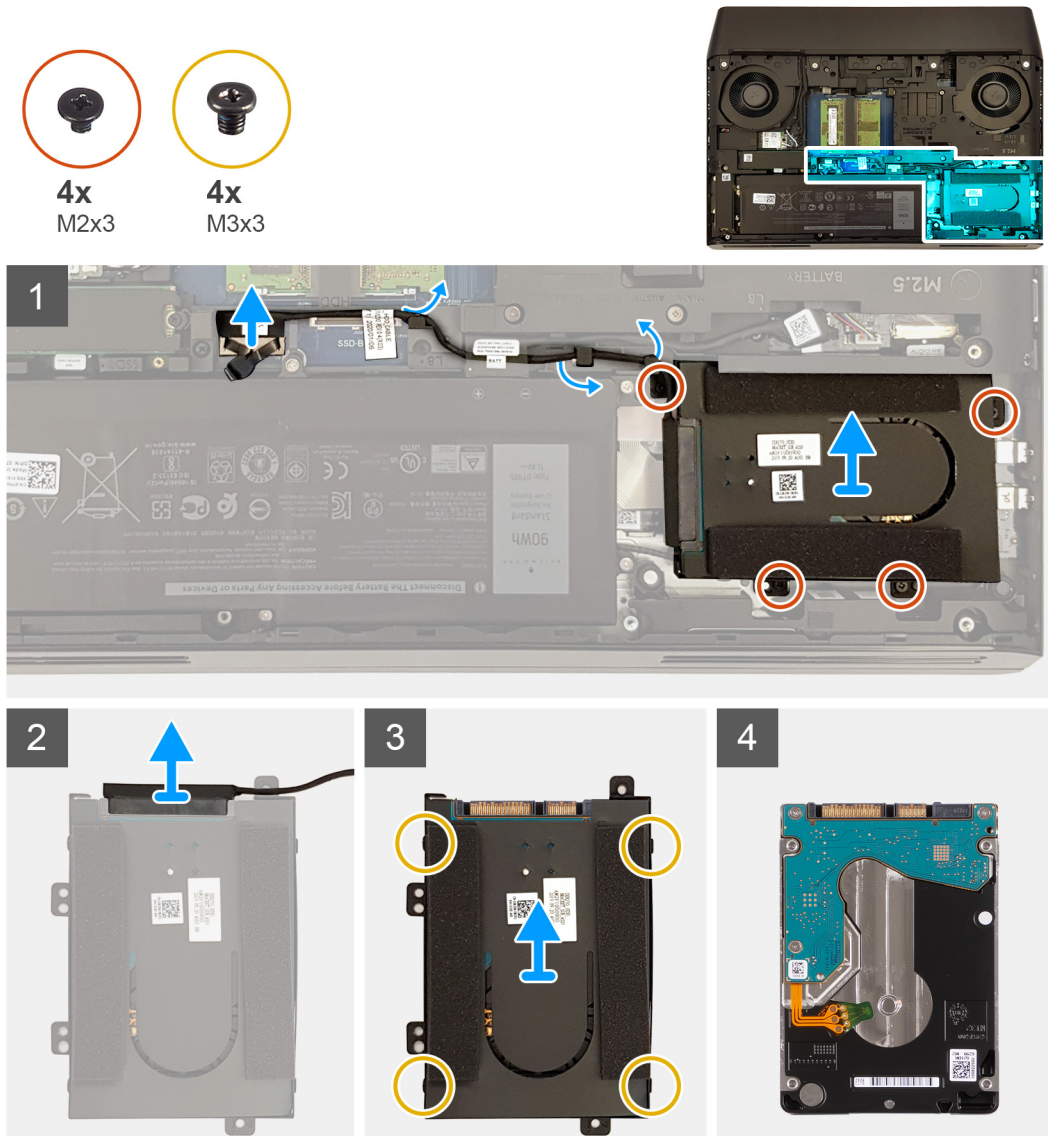
## Removing the hard drive

### Prerequisites

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

### About this task

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



### Steps

1. Using the pull tab, disconnect the hard-drive cable from the system board.
2. Remove the hard-drive cable from the routing guides on the computer base.
3. Remove the four screws (M2x3) that secure the hard-drive assembly to the palm-rest assembly.
4. Lift the hard-drive assembly along with its cable off the palm-rest assembly.
5. Disconnect the interposer from the hard-drive assembly.
6. Remove the four screws (M3x3) that secure the hard-drive bracket to the hard drive.
7. Lift the hard-drive bracket off the hard drive.



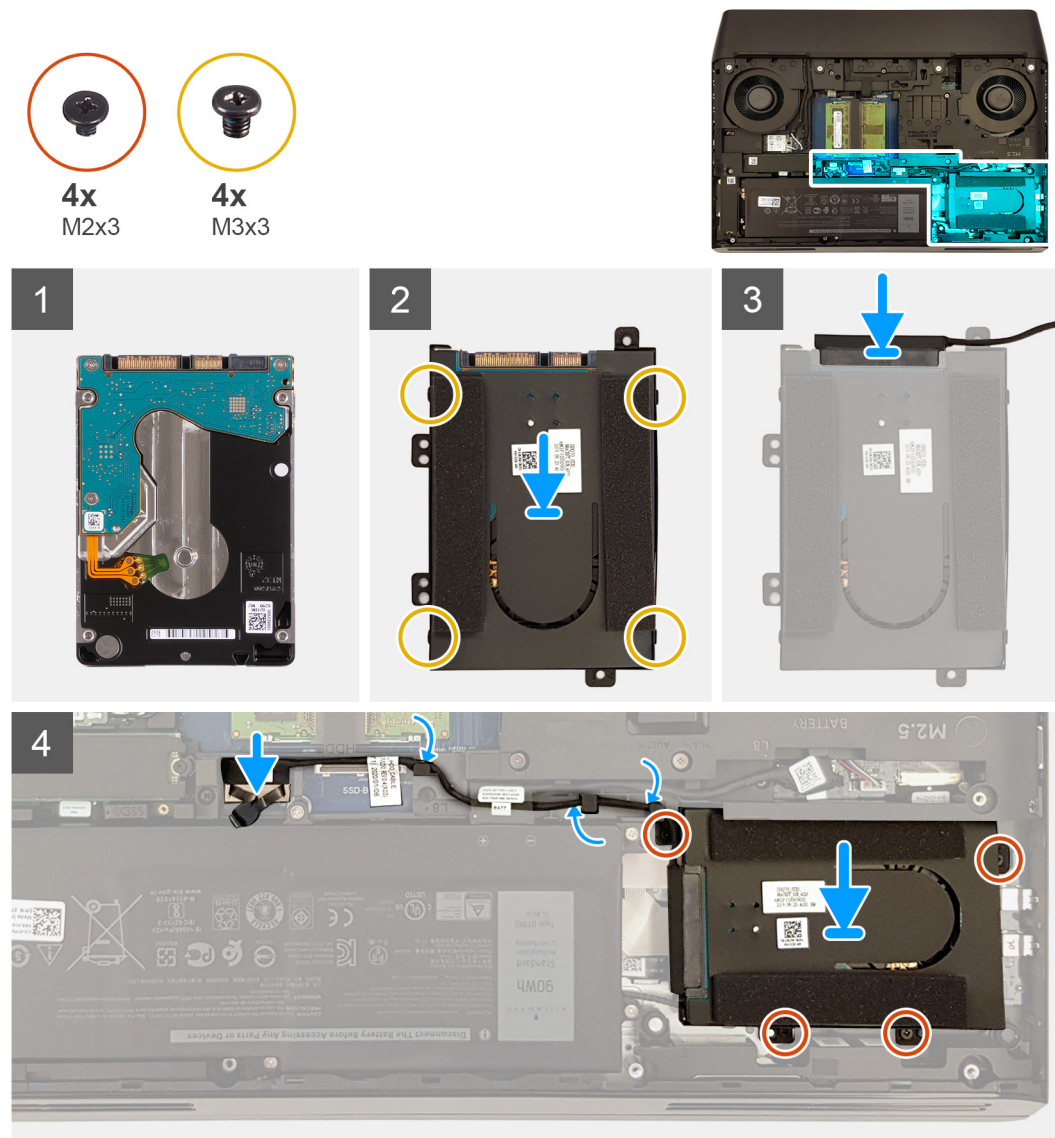
## Installing the hard drive

### Prerequisites

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

### About this task

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



### Steps

1. Place the hard drive on the hard-drive bracket.
2. Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
3. Replace the four screws (M3x3) that secure the hard-drive bracket to the hard drive.
4. Connect the interposer to the hard-drive assembly.
5. Align the screw holes on the hard-drive assembly with the screw holes on the palm-rest assembly.
6. Replace the four screws (M2x3) that secure the hard-drive assembly to the palm-rest assembly.
7. Route the hard-drive cable through the routing guides on the computer base.
8. Connect the hard-drive cable to the system board.



### Next steps

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

## Rear-I/O cover

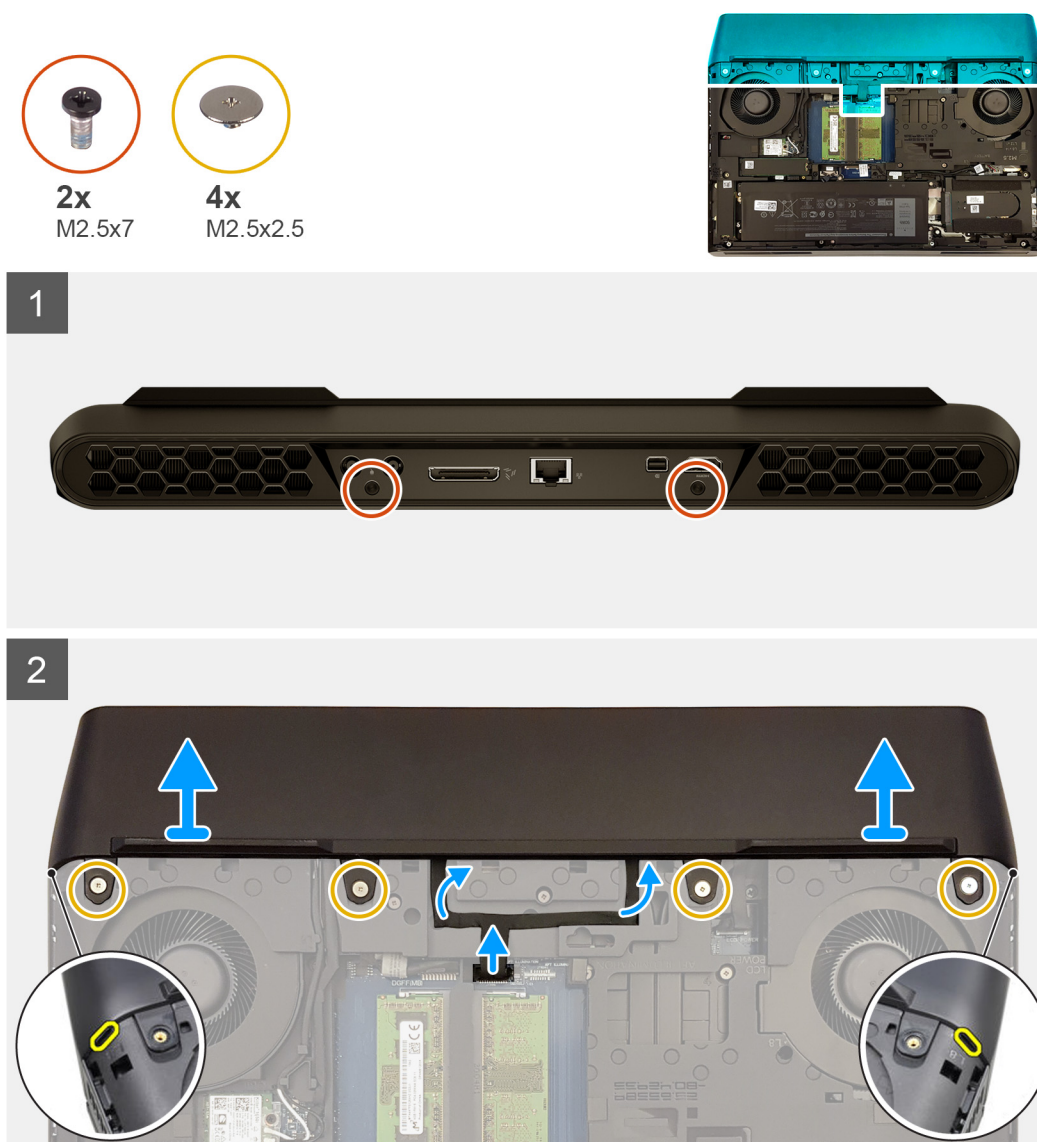
### Removing the rear-I/O cover

#### Prerequisites

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

#### About this task

The following image indicates the location of the rear-I/O cover and provides a visual representation of the removal procedure.



#### Steps

1. Remove the two screws (M2.5x7) that secure the rear-I/O cover to the palm-rest assembly.
2. Disconnect the tron-light cable from the system board and peel it off from the computer base.

3. Remove the four screws (M2.5x2.5) that secure the rear-I/O cover to the computer base.

**NOTE:** Ensure that the tron-light cable is disconnected before removing the rear-I/O cover from palm-rest assembly.

4. Using a plastic scribe, push the side holes on the rear-I/O cover to remove it from the palm-rest assembly.

## Installing the rear-I/O cover

### Prerequisites

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

### About this task

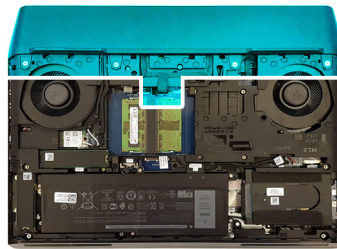
The following image indicates the location of the rear-I/O cover and provides a visual representation of the installation procedure.



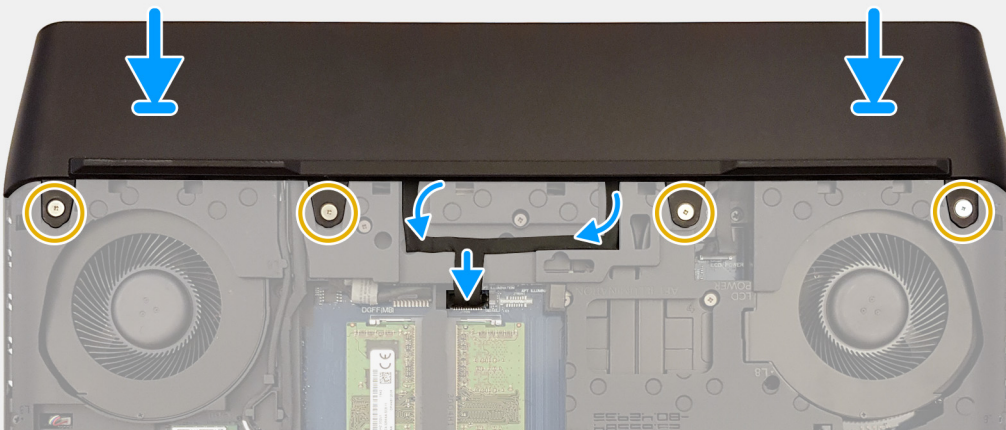
**2x**  
M2.5x7



**4x**  
M2.5x2.5



1



2



### Steps

1. Align the tabs on the rear-I/O cover with the slots on the computer base, and snap the rear-I/O cover into place.
2. Replace the four screws (M2.5x2.5) that secure the rear-I/O cover to the computer base.
3. Replace the two screws (M2.5x7) that secure the rear-I/O cover to the palm-rest assembly.
4. Adhere the tron-light cable to the computer base and connect the tron-light cable to the system board.

### Next steps

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

## Audio daughter-board

### Removing the audio daughter-board

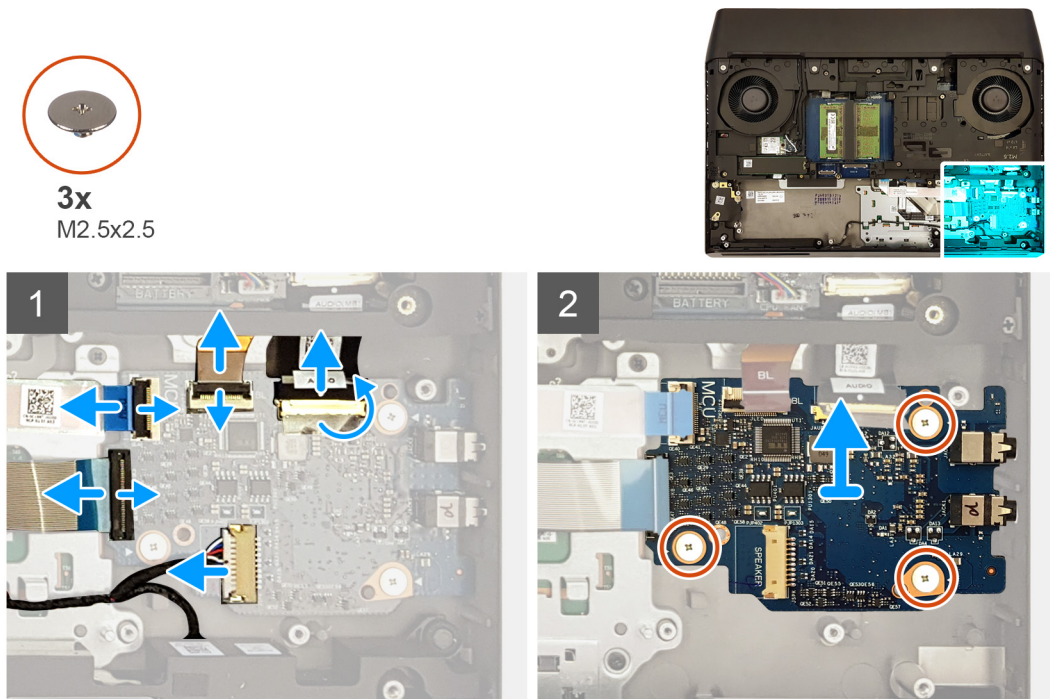
#### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
4. Remove the [solid-state drive from M.2 slot three](#), if applicable.
5. Remove the [solid-state drive from M.2 slot four](#), if applicable.
6. Remove the [solid-state drive interposer board](#), if applicable.

#### About this task

**NOTE:** After replacing the audio daughter-board, you must set up the keyboard language and color.

The following image indicates the location of the audio daughter-board and provides a visual representation of the removal procedure.



#### Steps

1. Open the latch and disconnect the audio daughter-board cable from the audio daughter-board.
2. Open the latch and disconnect the keyboard-backlight cable from the audio daughter-board.
3. Open the latch and disconnect the keyboard-controller cable from the audio daughter-board.
4. Open the latch and disconnect the keyboard cable from the audio daughter-board.
5. Disconnect the speaker cable from the audio daughter-board.
6. Remove the three screws (M2.5x2.5) that secure the audio daughter-board to the palm-rest assembly.
7. Lift the audio daughter-board at an angle off the palm-rest assembly.

## Installing the audio daughter-board

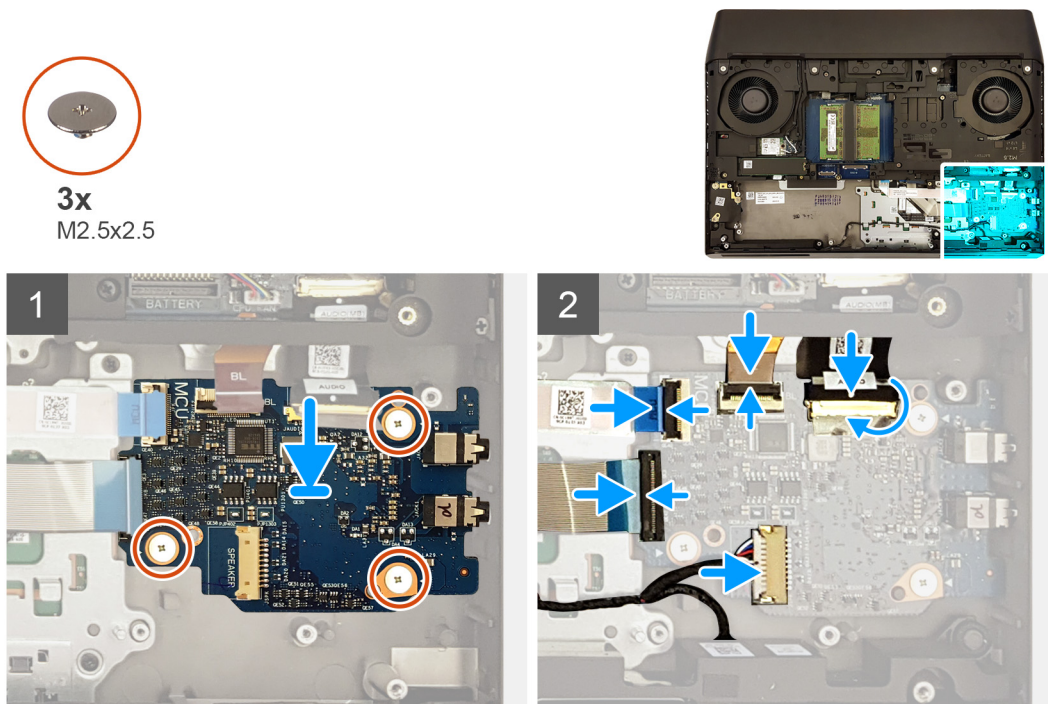
### Prerequisites

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

### About this task

**NOTE:** After replacing the audio daughter-board, you must set up the keyboard language and color.

The following image indicates the location of the audio daughter-board and provides a visual representation of the installation procedure.



### Steps

1. Place the audio daughter-board in the slot on the palm-rest assembly.
2. Replace the three screws (M2.5x2.5) that secure the audio daughter-board to the palm-rest assembly.
3. Connect the speaker cable to the audio daughter-board.
4. Connect the keyboard-controller cable to the audio daughter-board and close the latch to secure the cable.
5. Connect the keyboard-backlight cable to the audio daughter-board and close the latch to secure the cable.
6. Connect the keyboard cable to the audio daughter-board and close the latch to secure the cable.
7. Connect the audio daughter-board cable to the audio daughter-board and close the latch to secure the cable.

### Next steps

1. Install the [solid-state drive interposer board](#), if applicable.
2. Install the [solid-state drive from M.2 slot four](#), if applicable.
3. Install the [solid-state drive from M.2 slot three](#), if applicable.
4. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
5. Install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).



# Speakers

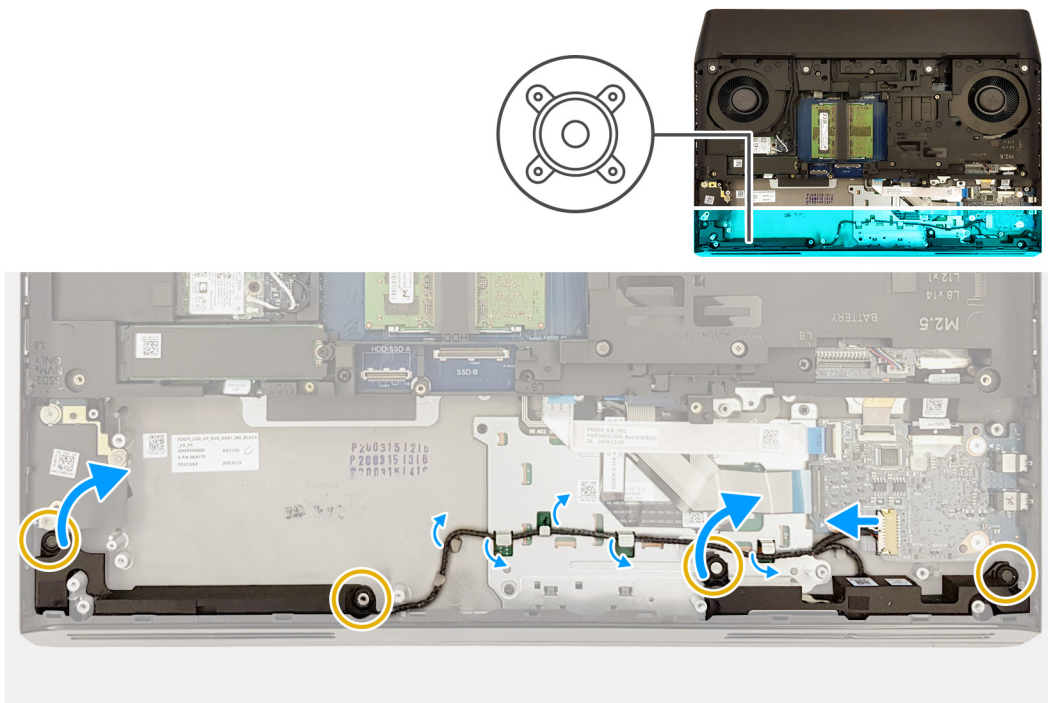
## Removing the speakers

### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [solid-state drive from M.2 slot two](#).
5. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
6. Remove the [solid-state drive from M.2 slot three](#), if applicable.
7. Remove the [solid-state drive from M.2 slot four](#), if applicable.
8. Remove the [solid-state drive interposer board](#), if applicable.

### About this task

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



### Steps

1. Disconnect the speaker cable from the audio daughter-board.
2. Using the tab on the right speaker, slightly pull the speaker upwards to release the speaker from the palm-rest assembly.
3. Slide the right speaker in a clockwise direction to remove the right speaker from the computer.
4. Note the speaker cable routing and remove the speaker cable from the routing guides on the palm-rest assembly and the touchpad bracket.
5. Using the tab on the left speaker, slightly pull the speaker upwards to release the speaker from the palm-rest assembly.
6. Slide the left speaker in a clockwise direction to remove the right speaker from the computer.

## Installing the speakers

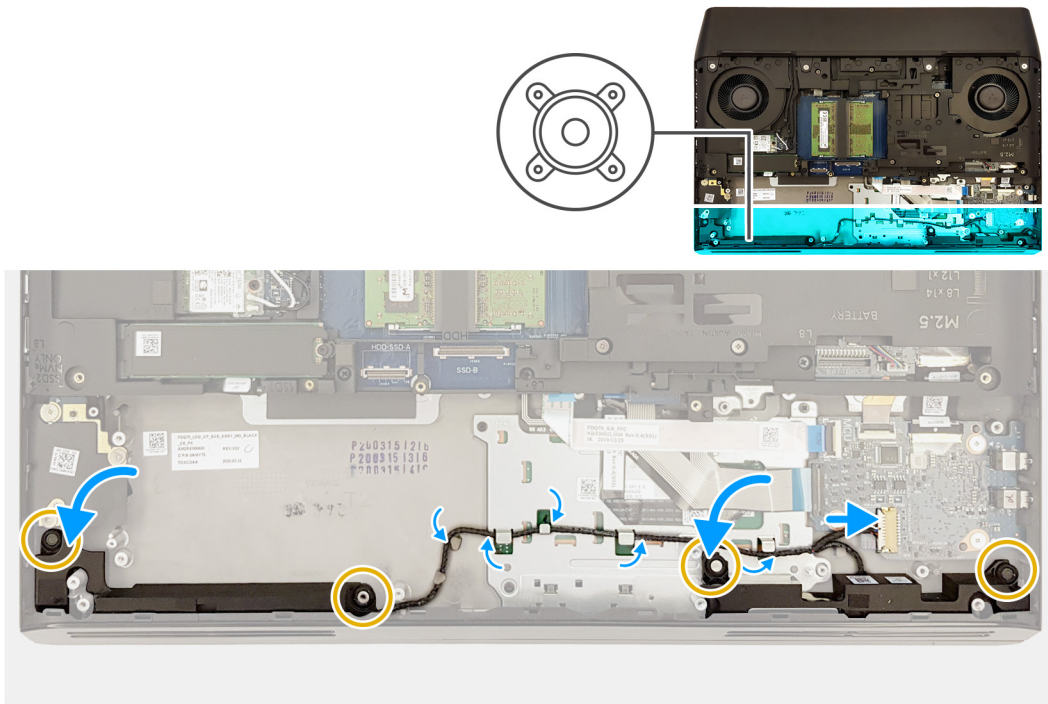
### Prerequisites

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

## About this task

- NOTE:** If the rubber grommets are pushed out of the speakers when removing the speakers, push them back in place before replacing the speakers.

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



## Steps

1. Using the alignment posts and rubber grommets, place the left speaker in the slot on the palm-rest assembly.
2. Holding the tab on the left speaker, rotate the left speaker into place in an anti-clockwise direction and secure it using the alignment posts.
3. Route the speaker cable through the routing guides on the palm-rest assembly and the touchpad bracket.
4. Using the alignment posts and rubber grommets, place the right speaker in the slot on the palm-rest assembly.
5. Holding the tab on the right speaker, rotate the right speaker into place in an anti-clockwise direction and secure it using the alignment posts.
6. Connect the speaker cable to the audio daughter-board.

## Next steps

1. Install the [solid-state drive interposer board](#), if applicable.
2. Install the [solid-state drive from M.2 slot four](#), if applicable.
3. Install the [solid-state drive from M.2 slot three](#), if applicable.
4. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
5. Install the [solid-state drive in M.2 slot two](#).
6. Install the [battery](#).
7. Install the [base cover](#).
8. Follow the procedure in [After working inside your computer](#).

# Card-reader board

## Removing the card-reader board

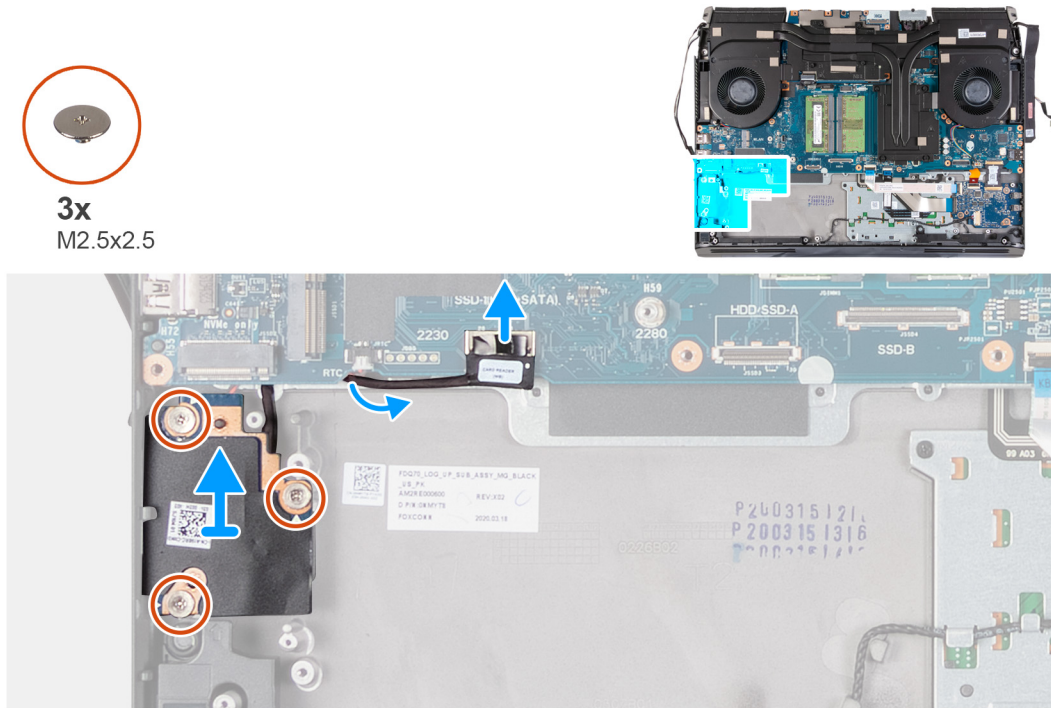
### Prerequisites

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

2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [wireless card](#).
5. Remove the [solid-state drive from M.2 slot two](#).
6. Remove the [rear-I/O cover](#).
7. Remove the [computer base](#).

### About this task

The following image indicates the location of the card-reader board and provides a visual representation of the removal procedure.



### Steps

1. Using the pull tab, disconnect the card-reader board cable from the system board.
2. Remove the three screws (M2.5x2.5) that secure the card-reader board to the palm-rest assembly.
3. Remove the card-reader board cable from the routing guides on the palm-rest assembly.
4. Lift the SD card reader board off the palm-rest assembly.

## Installing the card-reader board

### Prerequisites

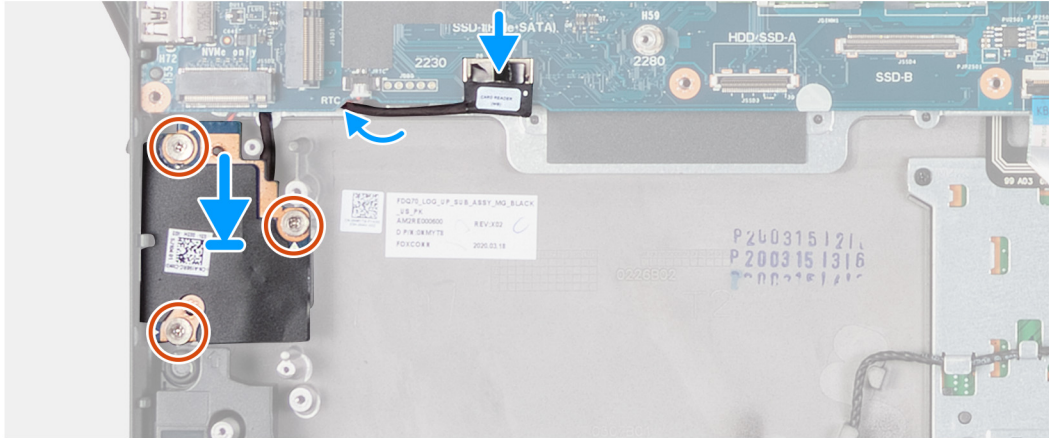
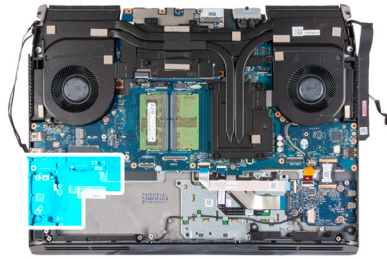
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

The following image indicates the location of the card-reader board and provides a visual representation of the installation procedure.



**3x**  
M2.5x2.5



## Steps

1. Place the card-reader board in the slot on the palm-rest assembly.
2. Align the screw holes on the card-reader board with the screws holes on the palm-rest assembly.
3. Replace the three screws (M2.5x2.5) that secure the card-reader board to the palm-rest assembly.
4. Route the card-reader board cable through the routing guides on the computer base.
5. Connect the card-reader board cable to the system board.

## Next steps

1. Install the [computer base](#).
2. Install the [rear-I/O cover](#).
3. Install the [solid-state drive in M.2 slot two](#).
4. Install the [wireless card](#).
5. Install the [battery](#).
6. Install the [base cover](#).
7. Follow the procedure in [After working inside your computer](#).

# Coin-cell battery

## Removing the coin-cell battery

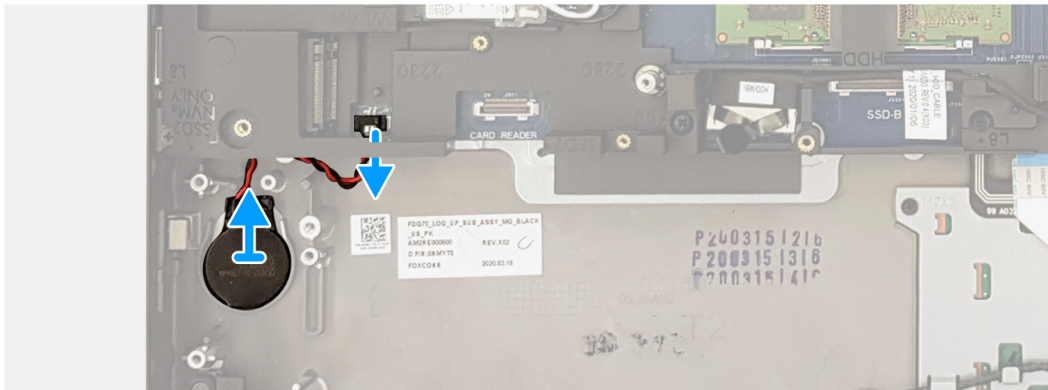
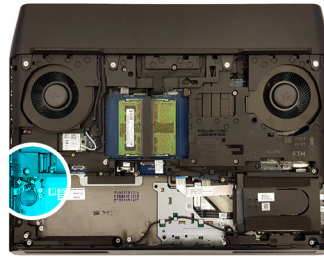
### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [solid-state drive from M.2 slot two](#).
5. Remove the [card-reader board](#).

### About this task

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





## Steps

1. Disconnect the coin-cell battery cable from the system board.
2. Peel off the coin-cell battery from the palm-rest assembly.

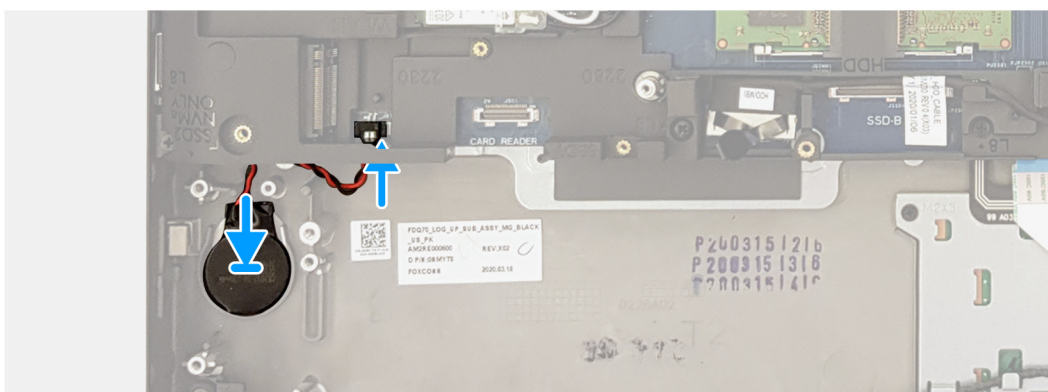
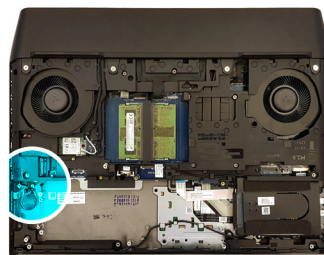
## Installing the coin-cell battery

### Prerequisites

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

### About this task

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



### Steps

1. Adhere the coin-cell battery to the slot on the palm-rest assembly.
2. Connect the coin-cell battery to the system board.

### Next steps

1. Install the [card-reader board](#).
2. Install the [solid-state drive in M.2 slot two](#).
3. Install the [battery](#).
4. Install the [base cover](#).
5. Follow the procedure in [After working inside your computer](#).

## Computer base

### Removing the computer base

#### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [wireless card](#).
5. Remove the [solid-state drive from M.2 slot one](#).
6. Remove the [rear-I/O cover](#).

#### About this task

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



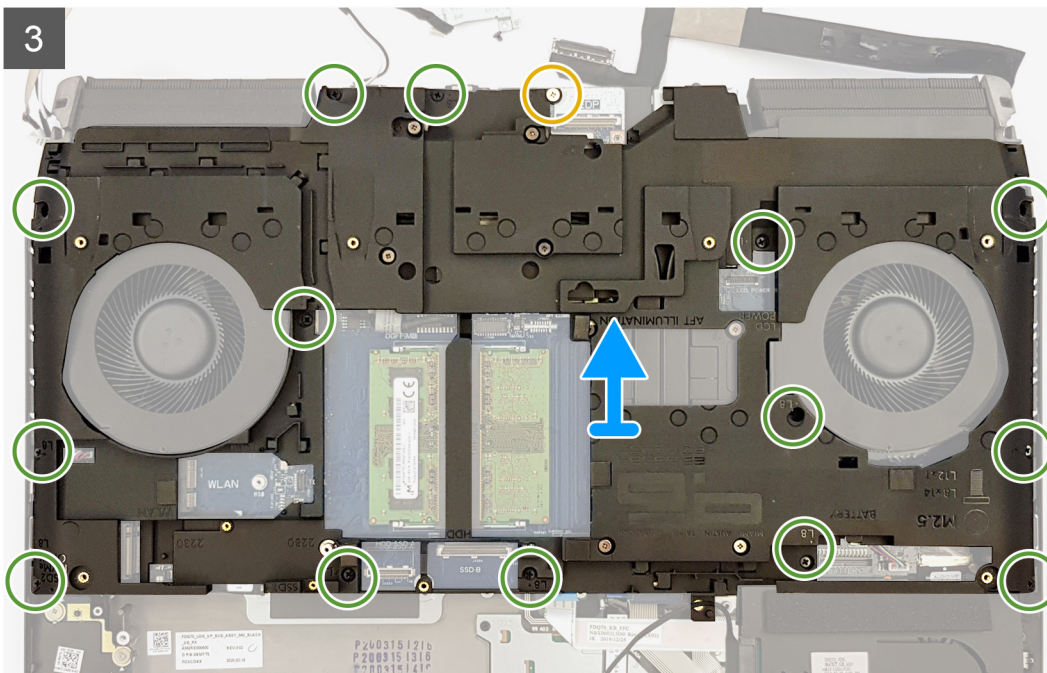
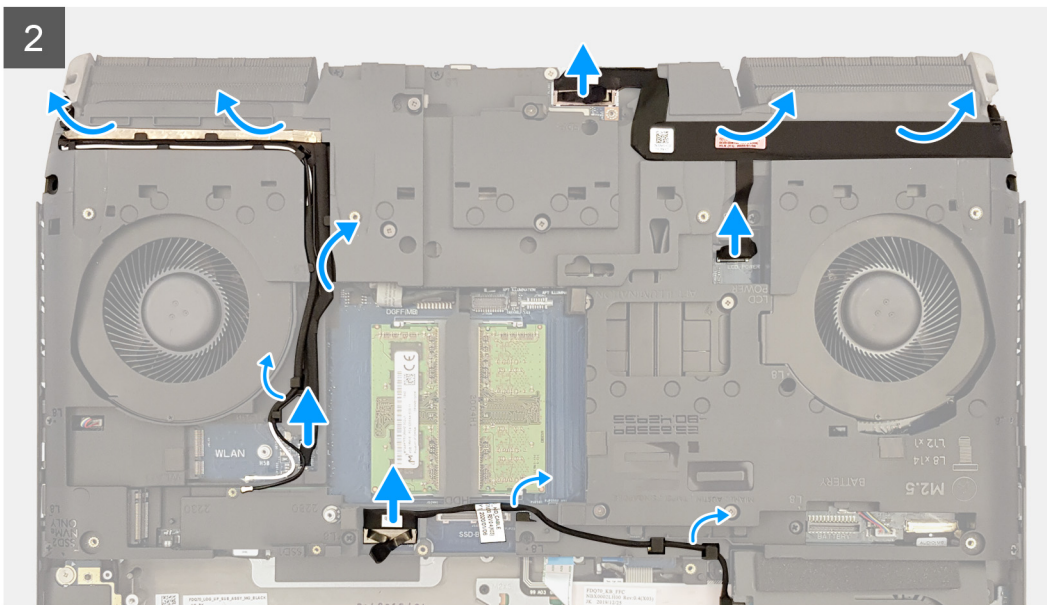
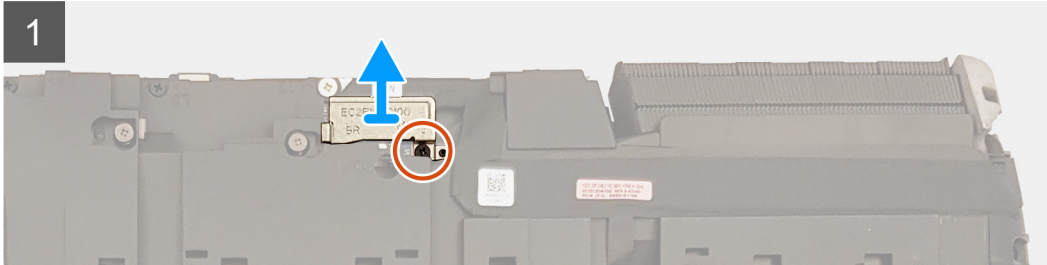
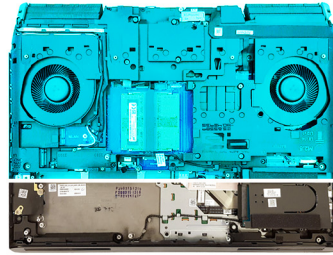
1x  
M2x3



1x  
M2.5x12



14x  
M2.5x8





## Steps

1. Remove the screw (M2x3) that secures the display-cable bracket on the system board.
2. Lift the display-cable bracket off the system board.
3. Using the pull tab, disconnect the hard-drive cable.
4. Remove the hard-drive cable from the routing guides on the computer base.
5. Disconnect the Tobii cable from the system board.
6. Peel off the Tobii cable from the computer base.
7. Remove the antenna cables from the routing guides on the computer base.
8. Using the pull tab, disconnect the display cable from the system board.
9. Disconnect the camera cable from the system board.
10. Peel off the display cable and the camera cable from the computer base.
11. Remove the screw (M2.5x12) that secures the computer base to the palm-rest assembly.
12. Remove the 14 screws (M2.5x8) that secure the computer base to the palm-rest assembly.
13. Lift the computer base off the palm-rest assembly.

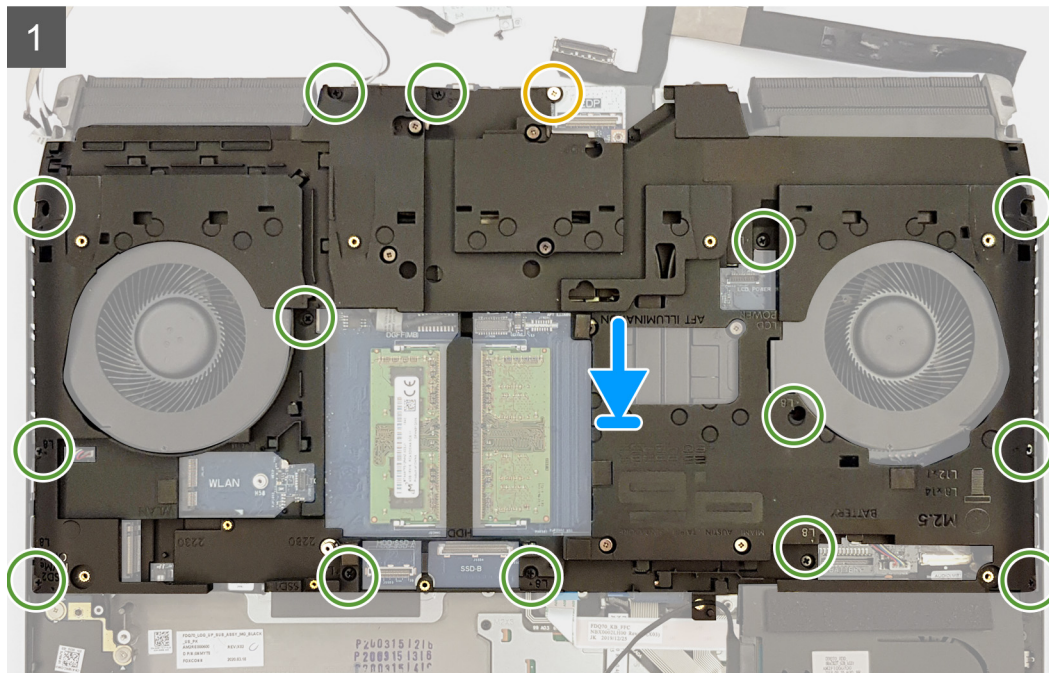
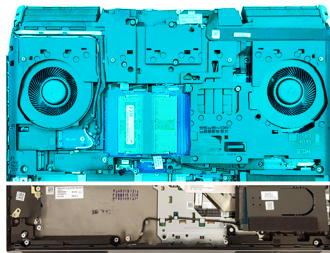
## Installing the computer base

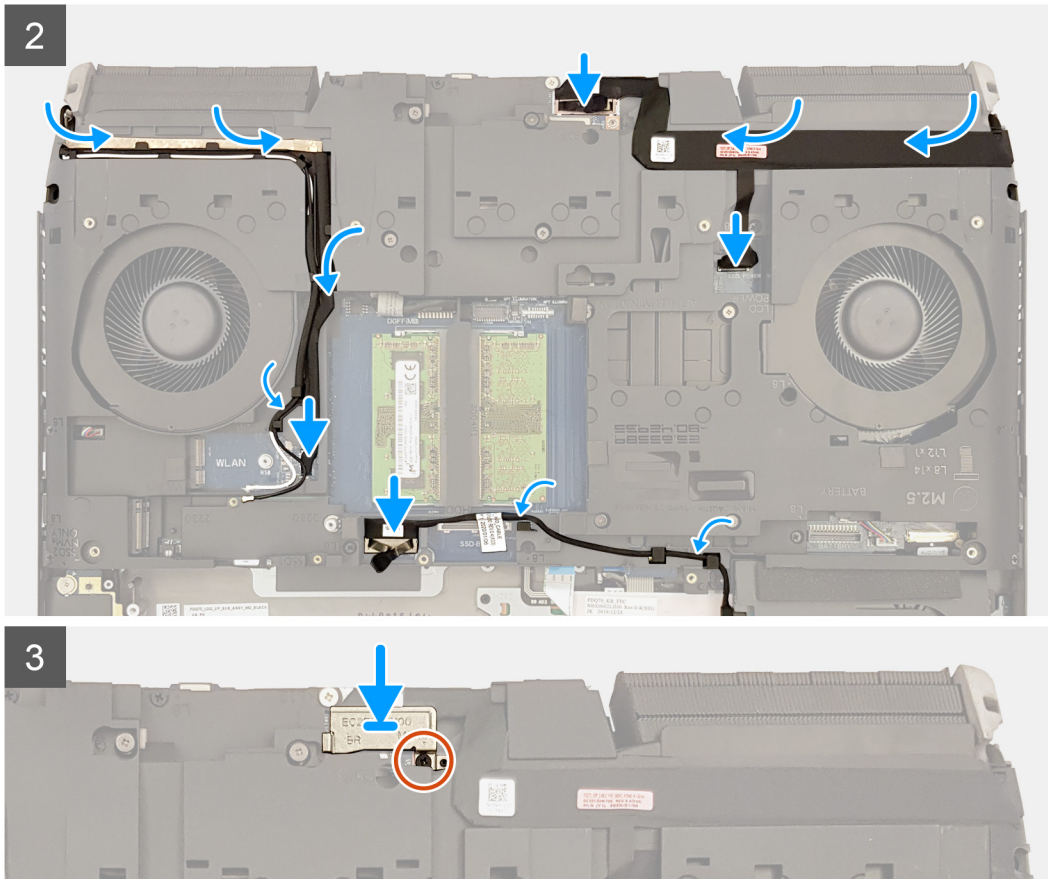
### Prerequisites

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

### About this task

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





### Steps

1. Align the screw holes on the computer base with the screw holes on the palm-rest assembly.
2. Replace the 14 screws (M2.5x8) that secure the computer base to the palm-rest assembly.
3. Replace the screw (M2.5x12) that secures the computer base to the palm-rest assembly.
4. Adhere the display cable and camera cable to the computer base.
5. Connect the camera cable to the system board.
6. Connect the display cable to the system board.
7. Route the antennas cable through the routing guides on the computer base.
8. Adhere the Tobii cable to the computer base.
9. Connect the Tobii cable to the system board.
10. Route the hard-drive cable through routing guides on the computer base.
11. Connect the hard-drive cable to the system board.
12. Align the screw hole on the display-cable bracket with the screw hole on the system board.
13. Replace the screw (M2x3) that secures the display-cable bracket to the system board.

### Next steps

1. Install the [rear-I/O cover](#).
2. Install the [solid-state drive in M.2 slot one](#).
3. Install the [wireless card](#).
4. Install the [battery](#).
5. Install the [base cover](#).
6. Follow the procedure in [After working inside your computer](#).



# Touchpad

## Removing the touchpad

### Prerequisites

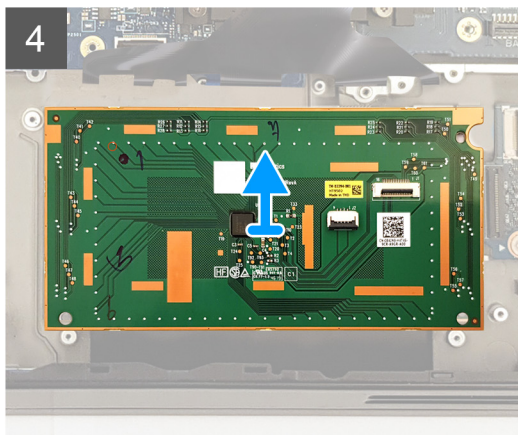
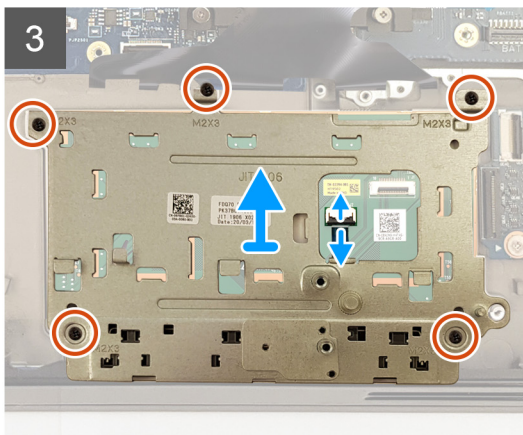
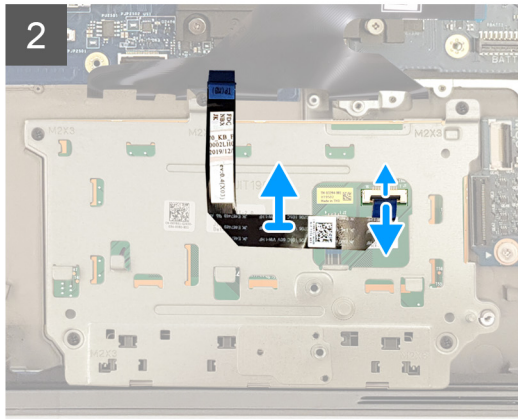
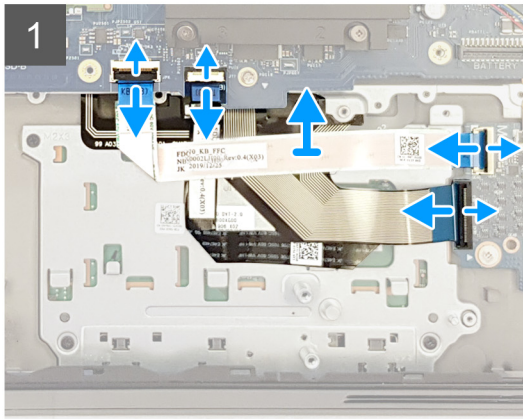
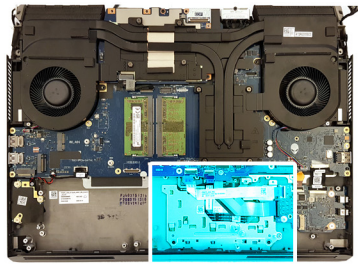
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [solid-state drive from M.2 slot one](#).
5. Remove the [solid-state drive from M.2 slot two](#).
6. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
7. Remove the [solid-state drive from M.2 slot three](#), if applicable.
8. Remove the [solid-state drive from M.2 slot four](#), if applicable.
9. Remove the [solid-state drive interposer board](#), if applicable.
10. Remove the [rear-I/O cover](#).
11. Remove the [speakers](#).
12. Remove the [computer base](#).

### About this task

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



5x  
M2x3



## Steps

1. Open the latch and disconnect the keyboard-controller cable from the system board.
2. Open the latch and disconnect the keyboard-controller cable from the audio daughter-board.
3. Open the latch and disconnect the keyboard cable from the audio daughter-board.
4. Open the latch and disconnect the touchpad cable from the system board.
5. Open the latch and disconnect the touchpad cable from the touchpad.
6. Peel off the touchpad cable from the touchpad bracket.
7. Open the latch and disconnect the touchpad-button cable from the touchpad.
8. Remove the five screws (M2x3) that secure the touchpad bracket to the palm-rest assembly.
9. Slide the touchpad bracket at an angle and lift it off the palm-rest assembly.
10. Lift the touchpad off the palm-rest assembly.

## Installing the touchpad

### Prerequisites

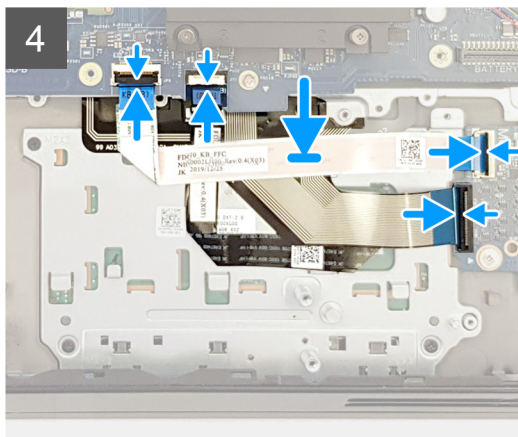
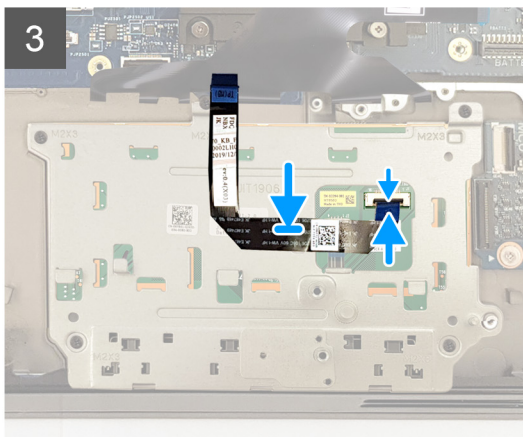
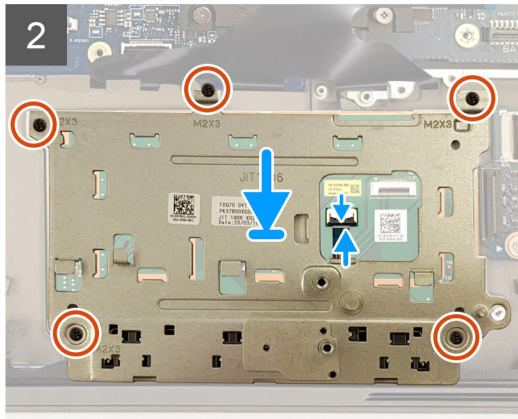
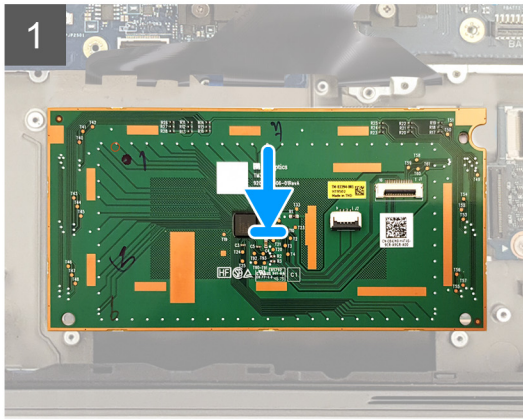
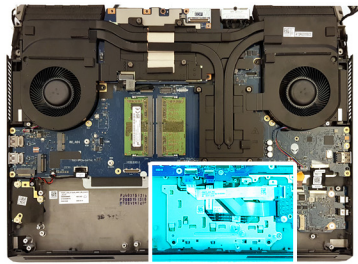
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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



5x  
M2x3



## Steps

1. Place the touchpad into the slot on the palm-rest assembly. Ensure to align the touchpad using the alignment pins on the palm-rest assembly.
2. Place the touchpad bracket into the slot on the palm-rest assembly.
3. Replace the five screws (M2x3) that secure the touchpad bracket to the palm-rest assembly.
4. Connect the touchpad-button cable to the touchpad and close the latch to secure the cable.
5. Adhere the touchpad cable to the touchpad bracket.
6. Connect the touchpad cable to the touchpad and close the latch to secure the cable.
7. Connect the touchpad cable to the system board and close the latch to secure the cable.
8. Connect the keyboard cable to the audio daughter-board and close the latch to secure the cable.
9. Connect the keyboard-controller cable to the audio daughter-board and close the latch to secure the cable.
10. Connect the keyboard-controller cable to the system board and close the latch to secure the cable.

## Next steps

1. Install the [computer base](#).
2. Install the [speakers](#).
3. Install the [rear-I/O cover](#).
4. Install the [solid-state drive interposer board](#), if applicable.
5. Install the [solid-state drive in M.2 slot four](#), if applicable.

6. Install the [solid-state drive in M.2 slot three](#), if applicable.
7. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
8. Install the [solid-state drive in M.2 slot two](#).
9. Install the [solid-state drive in M.2 slot one](#).
10. Install the [battery](#).
11. Install the [base cover](#).
12. 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 [wireless card](#).
4. Remove the [rear-I/O cover](#).

#### About this task

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





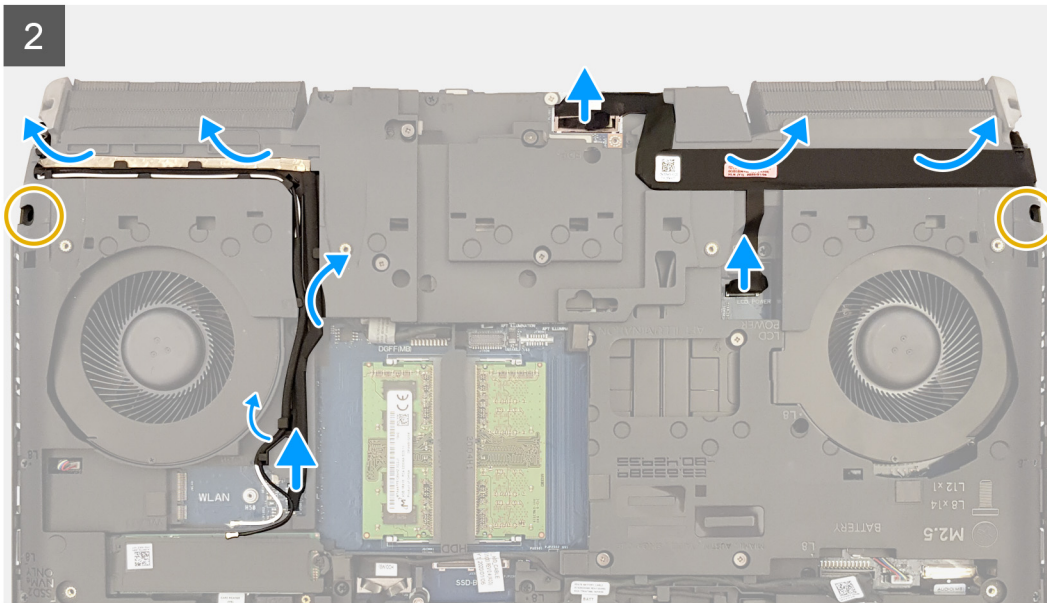
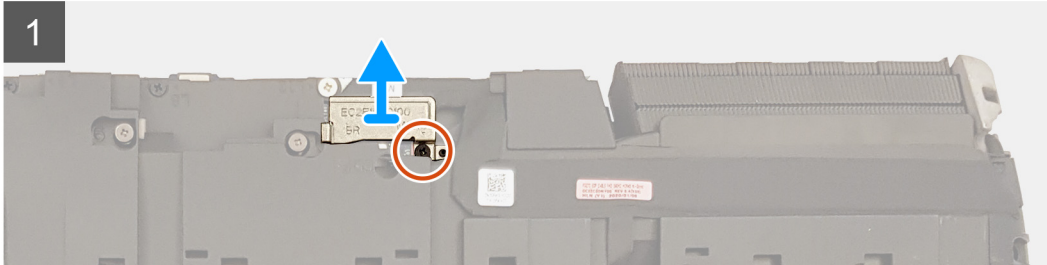
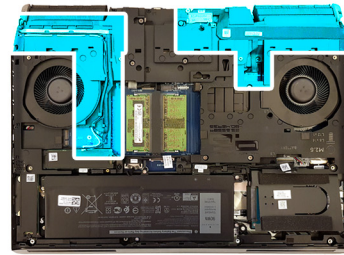
1x  
M2x3



2x  
M2.5x8



4x  
M2.5x2.5







### Steps

1. Remove the screw (M2x3) that secures the display-cable bracket to the system board.
2. Lift the display-cable bracket off the system board.
3. Using the pull tab, disconnect the display cable from the system board.
4. Disconnect the camera cable from the system board.
5. Peel off the display cable and the camera cable from the computer base.
6. Disconnect the Tobii cable from the system board.
7. Remove the antenna cables from the routing guides on the computer base.
8. Peel off the Tobii cable from the computer base.
9. Remove the two screws (M2.5x8) that secures the computer base to the display assembly.
10. Turn the computer over.
11. Remove the four screws (M2.5x2.5) that secure the display hinges to the palm-rest assembly.
12. Lift the display assembly off the palm-rest assembly.

## Installing the display assembly

### Prerequisites

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

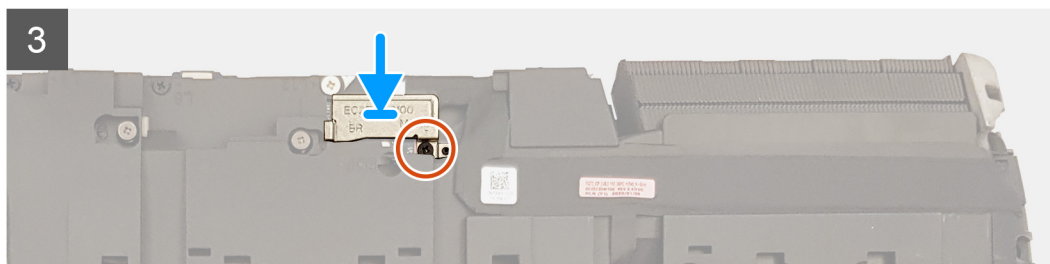
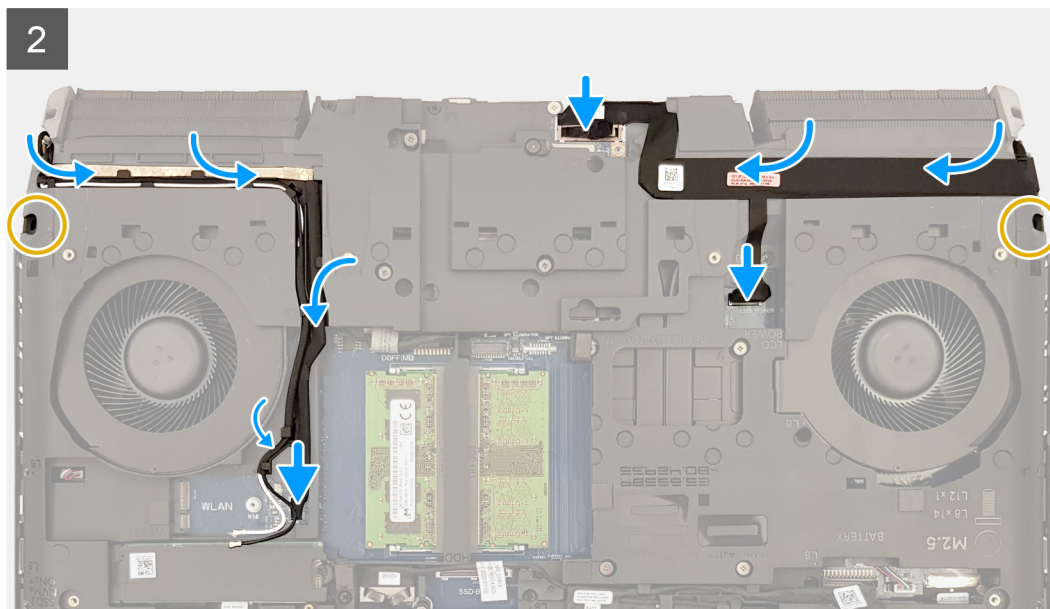
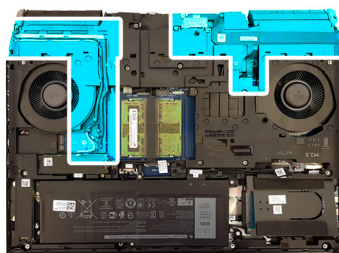
### About this task

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



**4x**  
M2.5x2.5





## Steps

1. Align the screw holes on the display hinges with the screw holes on the palm-rest assembly.
2. Replace the four screws (M2.5x2.5) that secure the display assembly to the palm-rest assembly.
3. Turn the computer over.
4. Replace the two screws (M2.5x8) that secure the computer base to the display assembly.
5. Adhere the Tobii cable to the computer base.
6. Route the antennas cable through the routing guides on the computer base.
7. Connect the Tobii cable to the system board.
8. Adhere the display cable and the camera cable to the computer base.
9. Connect the camera cable to the system board.
10. Connect the display cable to the system board.
11. Align the screw hole on the display-cable bracket with the screw hole on the system board.
12. Replace the screw (M2x3) that secures the display-cable bracket to the system board.

## Next steps

1. Install the [rear-I/O cover](#).
2. Install the [wireless card](#).
3. Install the [base cover](#).
4. Follow the procedure in [After working inside your computer](#).

# Heat-sink assembly

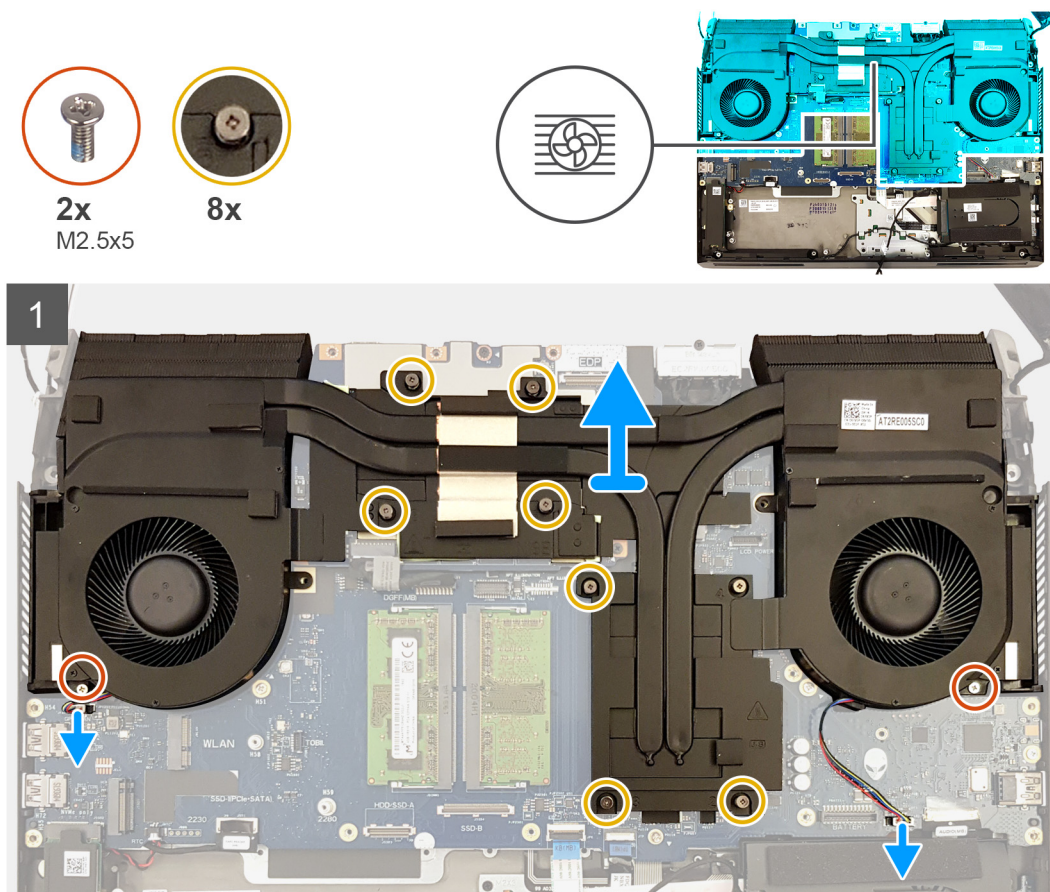
## Removing the heat-sink assembly

### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [wireless card](#).
5. Remove the [solid-state drive from M.2 slot one](#).
6. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
7. Remove the [solid-state drive from M.2 slot three](#), if applicable.
8. Remove the [solid-state drive from M.2 slot four](#), if applicable.
9. Remove the [solid-state drive interposer board](#), if applicable.
10. Remove the [rear I/O cover](#).
11. Remove the [computer base](#).

### About this task

The following image indicates the location of the heat-sink assembly and provides a visual representation of the removal procedure.



### Steps

1. Disconnect the fan cables from the system board.
2. Remove the two screws (M2.5x5) that secure the heat-sink assembly to the palm-rest assembly.
3. In the reverse sequential order (8>7>6>5>4>3>2>1), loosen the eight captive screws that secure the heat-sink assembly to the system board and palm-rest assembly.
4. Lift the heat-sink assembly off the system board.



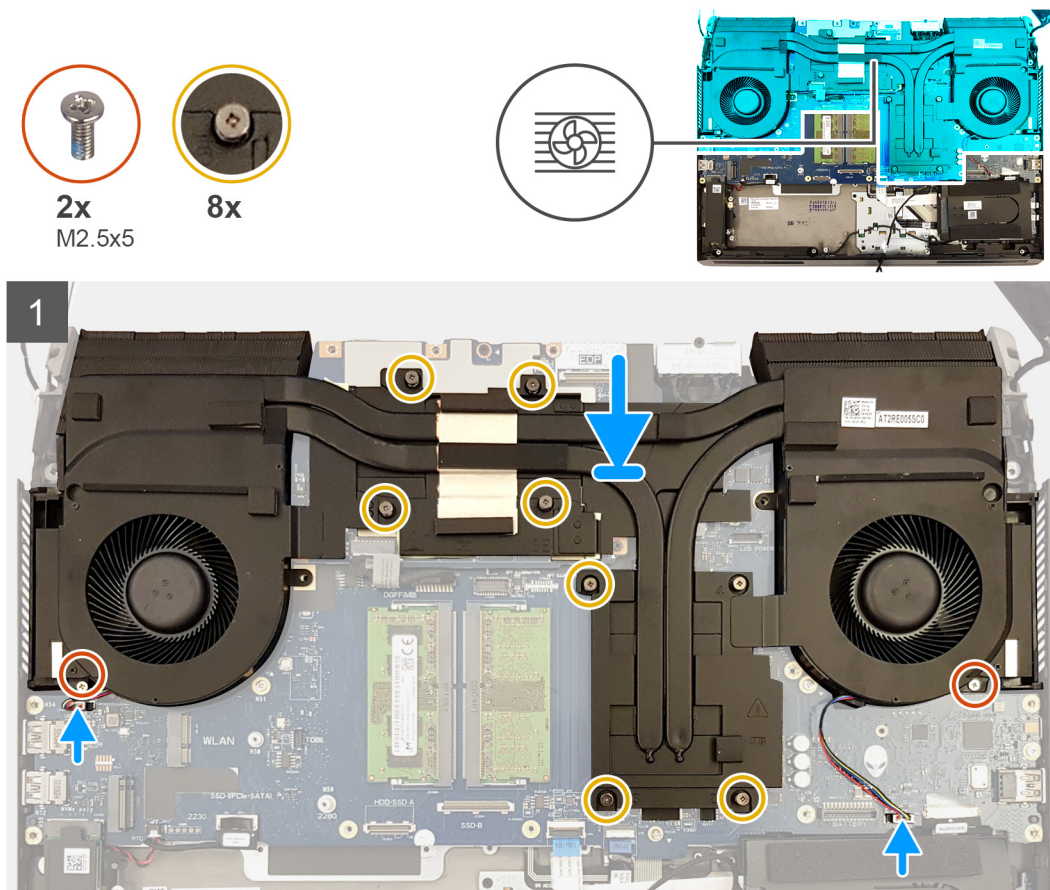
## Installing the heat-sink assembly

### Prerequisites

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

### About this task

The following image indicates the location of the heat-sink assembly and provides a visual representation of the installation procedure.



### Steps

1. Place the heat-sink assembly on the palm-rest assembly and align the screw holes on the heat-sink assembly with the screw holes on the system board and the palm-rest assembly.
2. Tighten the captive screws in the sequential order (1>2>3>4>5>6>7>8) to secure the heat-sink assembly to the system board.
3. Replace the two screws (M2.5x5) that secure the heat-sink assembly to the palm-rest assembly.
4. Connect the fan cables to the system board.

### Next steps

1. Install the [computer base](#).
2. Install the [rear-I/O cover](#).
3. Install the [solid-state drive interposer board](#), if applicable.
4. Install the [solid-state drive from M.2 slot four](#), if applicable.
5. Install the [solid-state drive from M.2 slot three](#), if applicable.
6. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
7. Install the [solid-state drive in M.2 slot one](#).
8. Install the [wireless card](#).
9. Install the [battery](#).
10. Install the [base cover](#).



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

## Processor

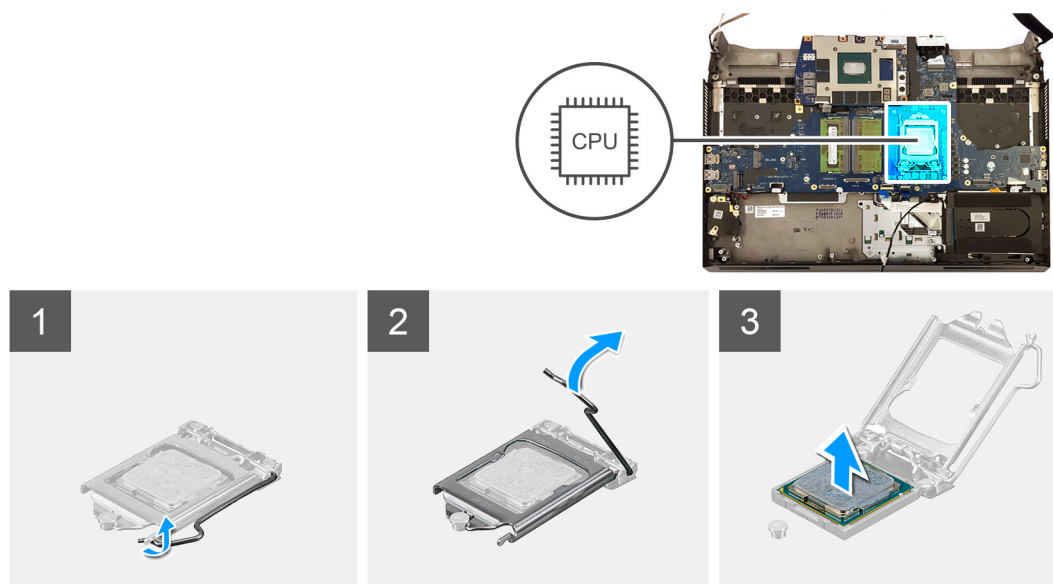
### Removing the processor

#### Prerequisites

1. Follow the procedure in [Before working inside your computer.](#)
2. Remove the [base cover.](#)
3. Remove the [battery.](#)
4. Remove the [wireless card.](#)
5. Remove the [solid-state drive from M.2 slot one.](#)
6. Remove the [rear-I/O cover.](#)
7. Remove the [computer base.](#)
8. Remove the [heat-sink assembly.](#)

#### About this task

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



#### Steps

1. Push down on the lever on the processor cover and move it away from the processor.
2. Pull the lever back to open the processor cover.
3. Lift the processor straight up to remove it from the system board.

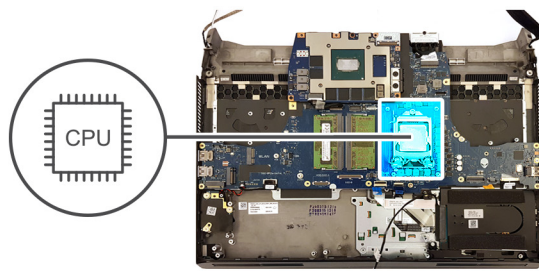
### Installing the processor

#### Prerequisites

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

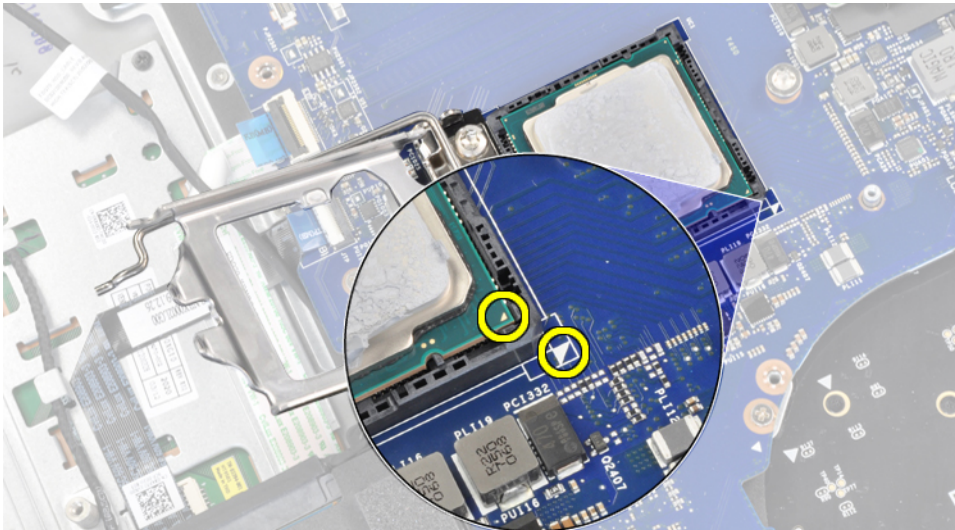
#### About this task

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



## Steps

1. Align the triangle on the processor with the triangle on the processor socket.



2. Place the processor in the processor socket on the system board.
3. Close the processor cover.
4. Push the lever on the processor cover and lock it in place to secure the processor.

## Next steps

1. Install the [heat-sink assembly](#).
2. Install the [computer base](#).
3. Install the [rear-I/O cover](#).
4. Install the [solid-state drive in M.2 slot one](#).
5. Install the [wireless card](#).
6. Install the [memory modules](#).
7. Install the [battery](#).
8. Install the [base cover](#).
9. Follow the procedure in [After working inside your computer](#).

# Graphics card

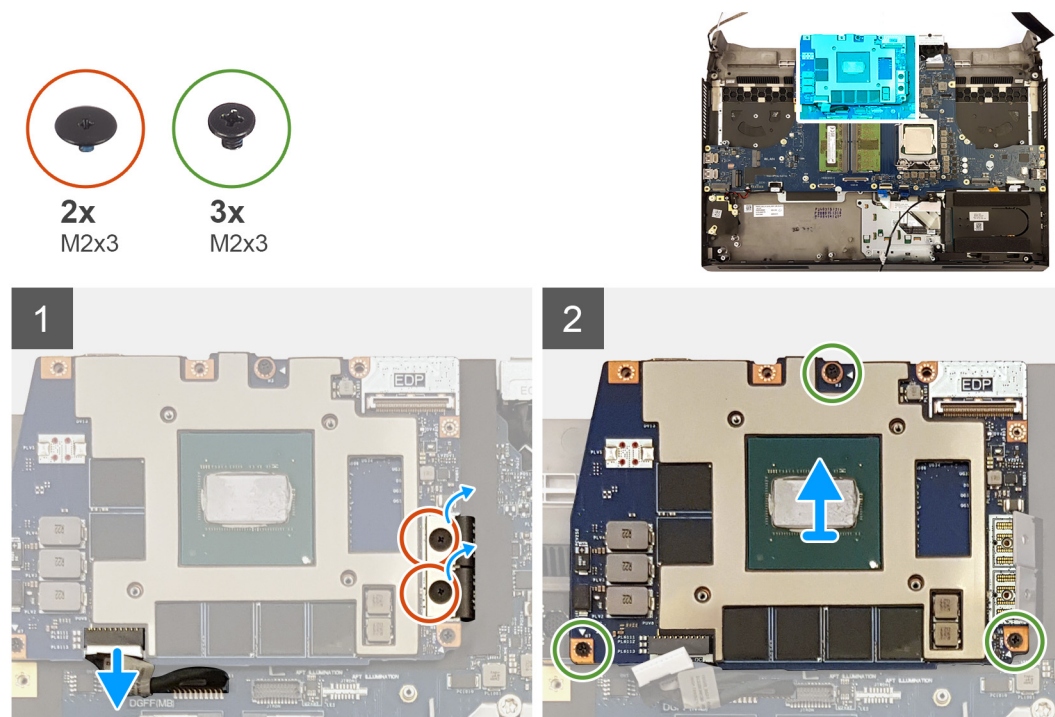
## Removing the graphics card

### Prerequisites

1. Follow the procedure in [Before working inside your computer.](#)
2. Remove the [base cover.](#)
3. Remove the [battery.](#)
4. Remove the [wireless card.](#)
5. Remove the [solid-state drive from M.2 slot one.](#)
6. Follow the procedure from step 1 to step 4 in [Removing the hard drive,](#) if applicable.
7. Remove the [solid-state drive from M.2 slot three,](#) if applicable.
8. Remove the [solid-state drive from M.2 slot four,](#) if applicable.
9. Remove the [rear-I/O cover.](#)
10. Remove the [computer base.](#)
11. Remove the [heat-sink assembly.](#)

### About this task

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



### Steps

1. Disconnect the graphics-card power cable from the graphics card.
2. Remove the two screws (M2x3) that secure the two graphics-card cable to the graphics card.
3. Remove the three screws (M2x3) that secure the graphics card to the system board.
4. Lift the graphics card off the system board.

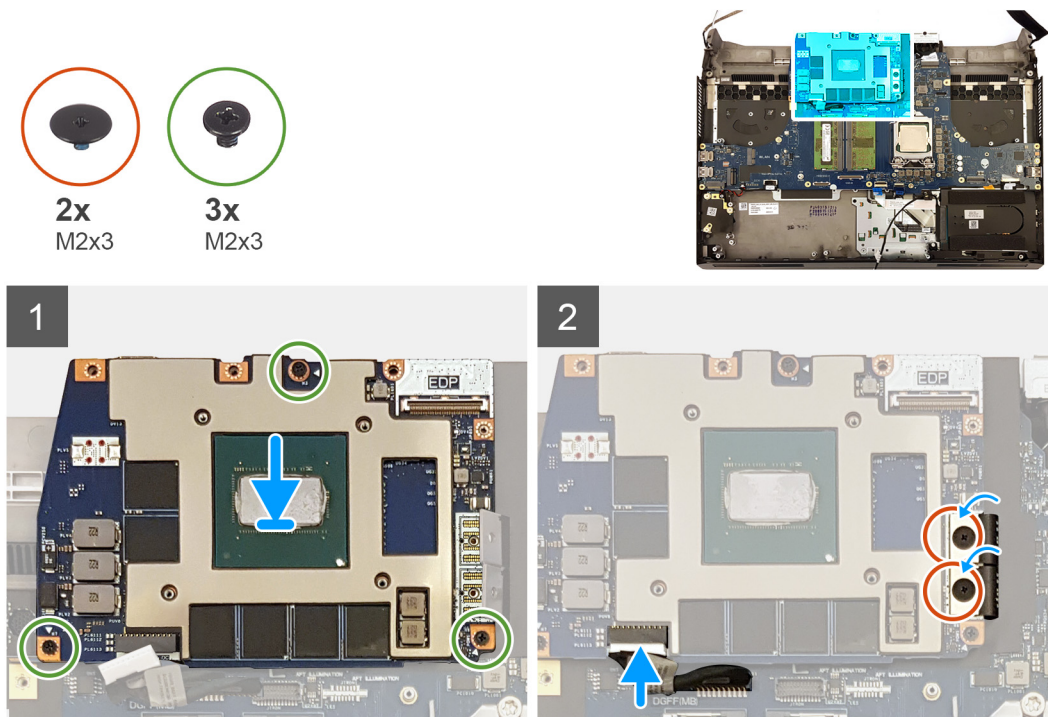
## Installing the graphics card

### Prerequisites

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

### About this task

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



### Steps

1. Place the graphics card on the system board and align the screw holes on the graphics card with the screw holes on the system board.
2. Replace the three screws (M2x3) that secure the graphics card to the system board.
3. Replace the two screws (M2x3) that secure the two graphics-card cables to the graphics card.
4. Connect the graphics-card power cable to the graphics card.

### Next steps

1. Install the [heat-sink assembly](#).
2. Install the [computer base](#).
3. Install the [rear-I/O cover](#).
4. Install the [solid-state drive from M.2 slot four](#), if applicable.
5. Install the [solid-state drive from M.2 slot three](#), if applicable.
6. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
7. Install the [solid-state drive in M.2 slot one](#).
8. Install the [wireless card](#).
9. Install the [memory modules](#).
10. Install the [battery](#).
11. Install the [base cover](#).
12. Follow the procedure in [After working inside your computer](#).

## Left power-adapter port

### Removing the left power-adapter port

#### Prerequisites

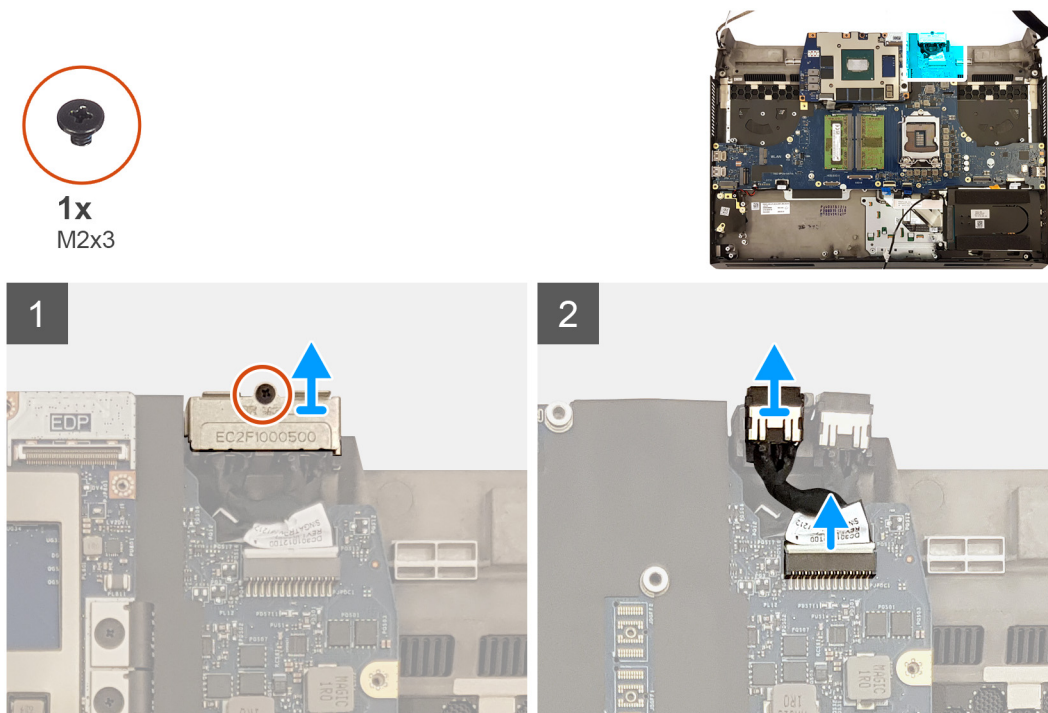
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).



4. Remove the [wireless card](#).
5. Remove the [solid-state drive from M.2 slot one](#).
6. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
7. Remove the [solid-state drive from M.2 slot three](#), if applicable.
8. Remove the [solid-state drive from M.2 slot four](#), if applicable.
9. Remove the [solid-state drive interposer board](#), if applicable.
10. Remove the [rear-I/O cover](#).
11. Remove the [computer base](#).
12. Remove the [heat-sink assembly](#).

### About this task

The following image indicates the location of the left power-adapter port and provides a visual representation of the removal procedure.



### Steps

1. Remove the screw (M2x3) that secures the power-adapter port bracket to the palm-rest assembly.
2. Slide the power-adapter port bracket off the palm-rest assembly.
3. Disconnect the left power-adapter port cable from the system board.

## Installing the left power-adapter port

### Prerequisites

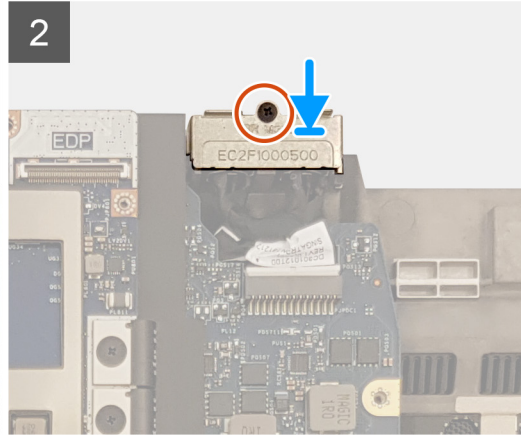
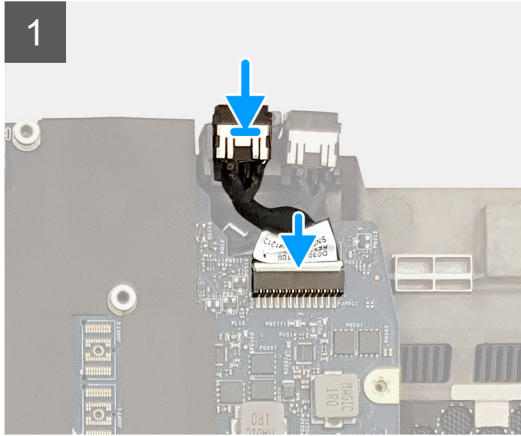
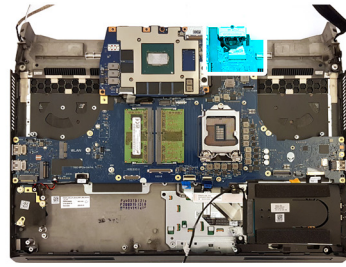
If you are replacing a component, remove the existing component before performing the installation procedure.

### About this task

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



1x  
M2x3



## Steps

1. Connect the left power-adaptor port cable to the system board.
2. Place the left power-adaptor port in the slot on the palm-rest assembly.
3. Slide and place the power-adaptor board bracket on the palm-rest assembly.
4. Replace the screw (M2x3) that secures the power-adaptor port bracket to the palm-rest assembly.

## Next steps

1. Install the [heat-sink assembly](#).
2. Install the [computer base](#).
3. Install the [rear-I/O cover](#).
4. Install the [solid-state drive interposer board](#), if applicable.
5. Install the [solid-state drive in M.2 slot four](#), if applicable.
6. Install the [solid-state drive in M.2 slot three](#), if applicable.
7. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
8. Install the [solid-state drive in M.2 slot one](#).
9. Install the [wireless card](#).
10. Install the [memory modules](#).
11. Install the [battery](#).
12. Install the [base cover](#).
13. Follow the procedure in [After working inside your computer](#).

# System board

## Removing the system board

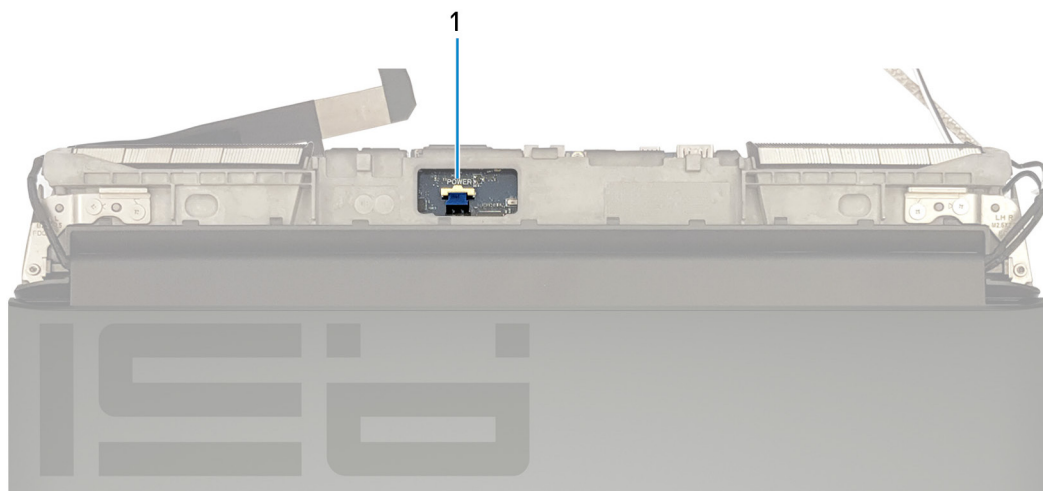
### Prerequisites

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

6. Remove the [solid-state drive from M.2 slot one](#).
7. Remove the [solid-state drive from M.2 slot two](#).
8. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
9. Remove the [solid-state drive from M.2 slot three](#), if applicable.
10. Remove the [solid-state drive from M.2 slot four](#), if applicable.
11. Remove the [solid-state drive interposer board](#), if applicable.
12. Remove the [rear-I/O cover](#).
13. Remove the [computer base](#).
14. Remove the [heat-sink assembly](#).
15. Remove the [left power-adaptor port](#).
16. Remove the [graphics card](#).
17. Remove the [processor](#).

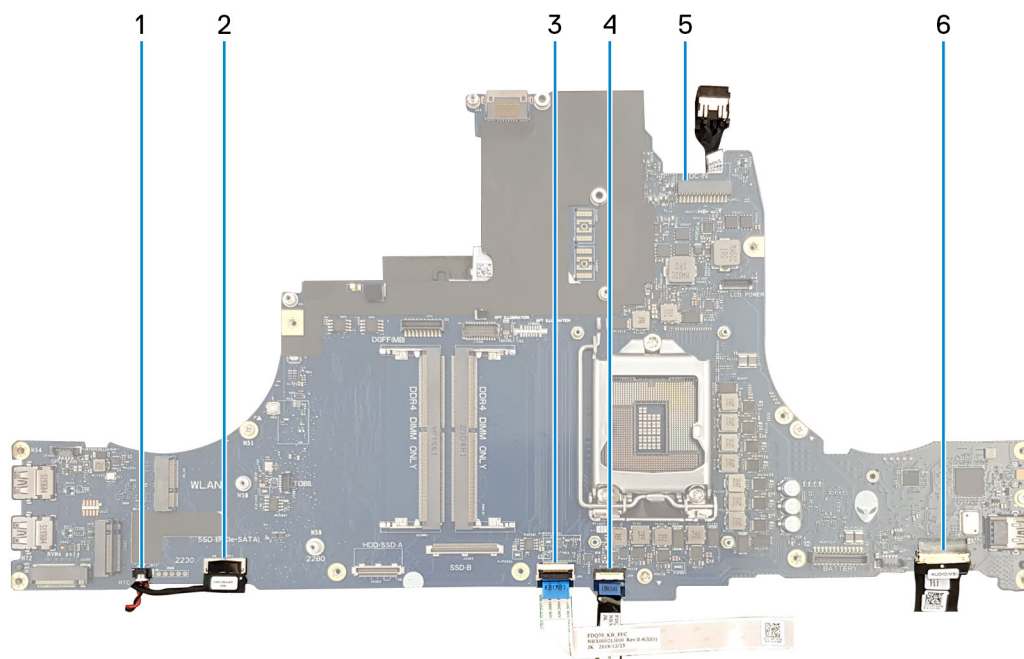
### About this task

The following image indicates the connectors on the bottom side of your system board.



### 1. Power-button board cable

The following image indicates the connectors on the top side of your system board.



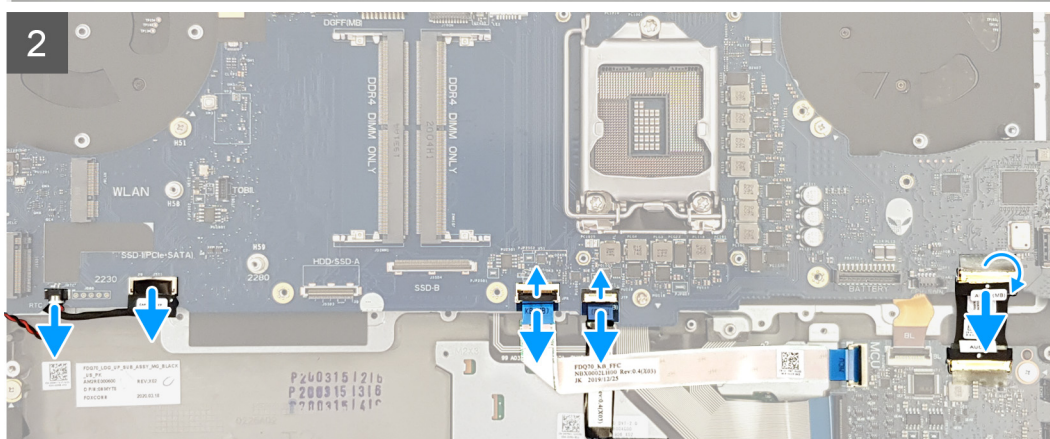
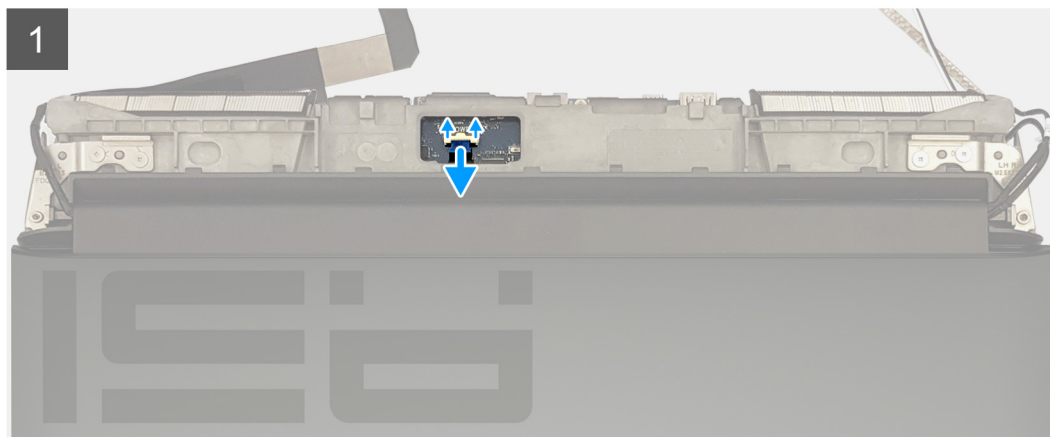
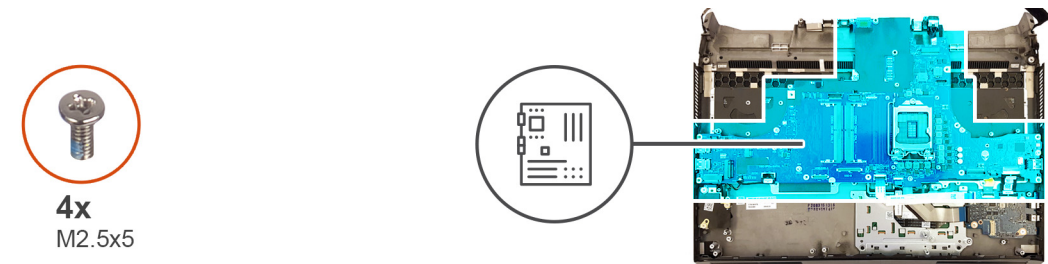
### 1. Coin-cell battery cable

### 2. Card-reader board cable

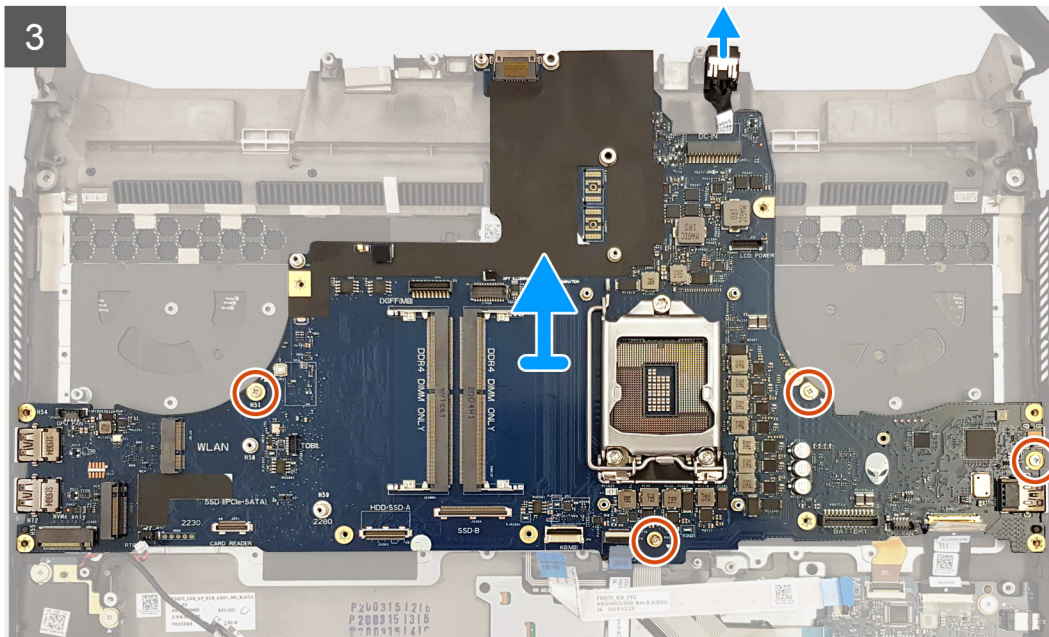
- 3. Keyboard-controller cable
- 5. Left power-adaptor port cable

- 4. Touchpad cable
- 6. Audio daughter-board cable

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







### Steps

1. Place the palm-rest assembly on a clean and flat surface with keyboard facing up, disconnect the power-button board cable.
2. Turn the palm-rest assembly over.

**i NOTE: Ensure that the power-button board cable is disconnected before removing the system board.**

3. Open the latch and disconnect the audio daughter-board cable from the system board.
4. Open the latch and disconnect the touchpad cable from the system board.
5. Open the latch and disconnect the keyboard-controller cable from the system board.
6. Using the pull tab, disconnect the card-reader board cable from the system board.
7. Disconnect the coin-cell battery cable from the system board.
8. Remove the four screws (M2.5x5) that secure the system board to the palm-rest assembly.
9. Lift the system board off the palm-rest assembly along with the right power-adapter port.
10. Remove the [right power-adapter port](#).
11. After performing all the above steps, you are left with the system board.

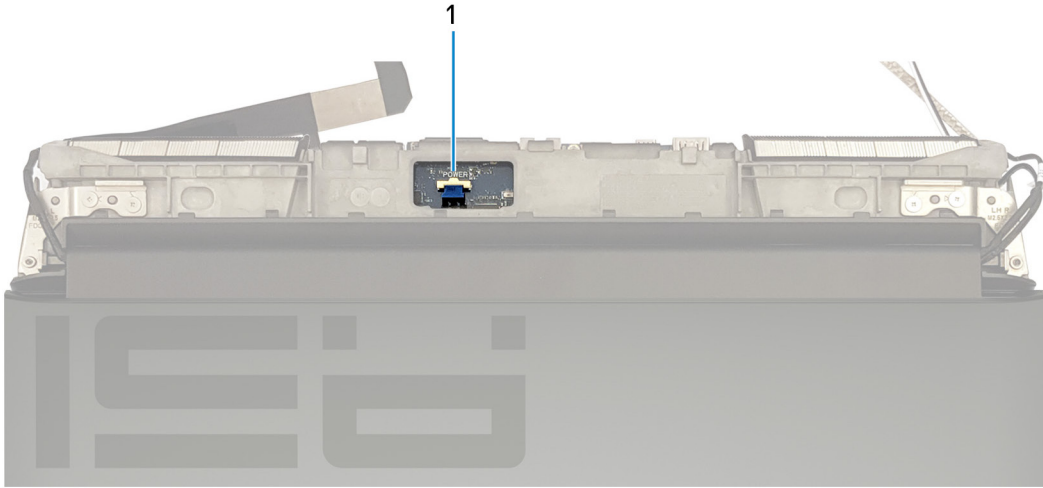
### Installing the system board

#### Prerequisites

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

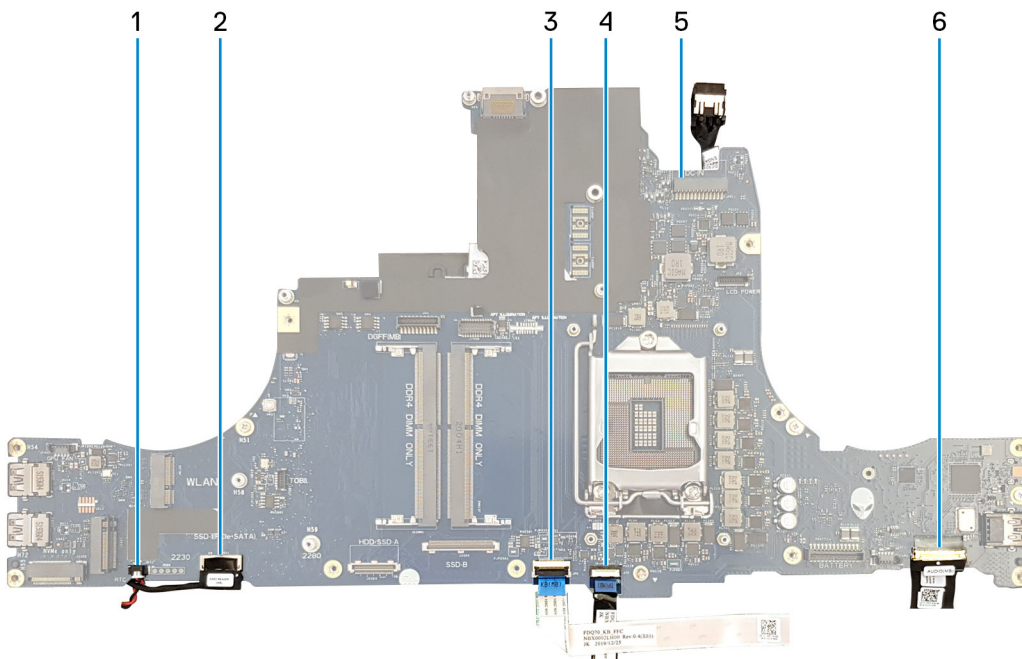
#### About this task

The following image indicates the connectors on the bottom side of your system board.



#### 1. Power-button board cable

The following image indicates the connectors on the top side of your system board.

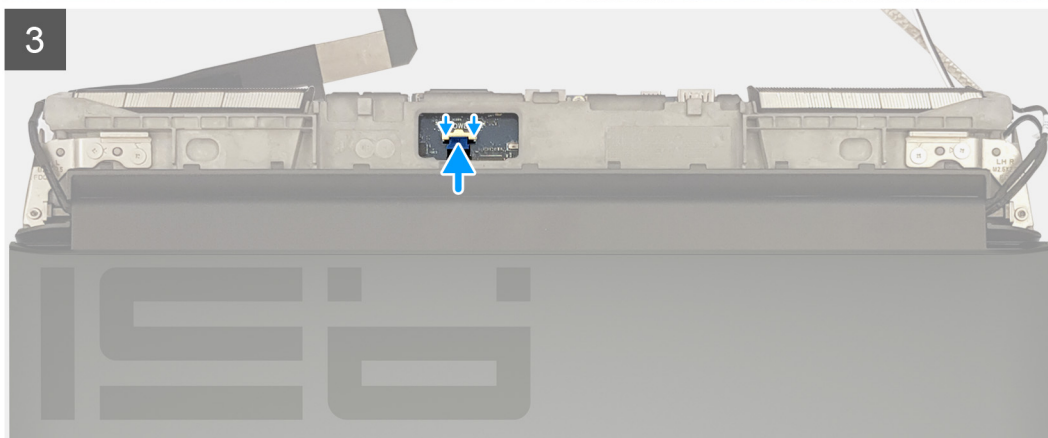
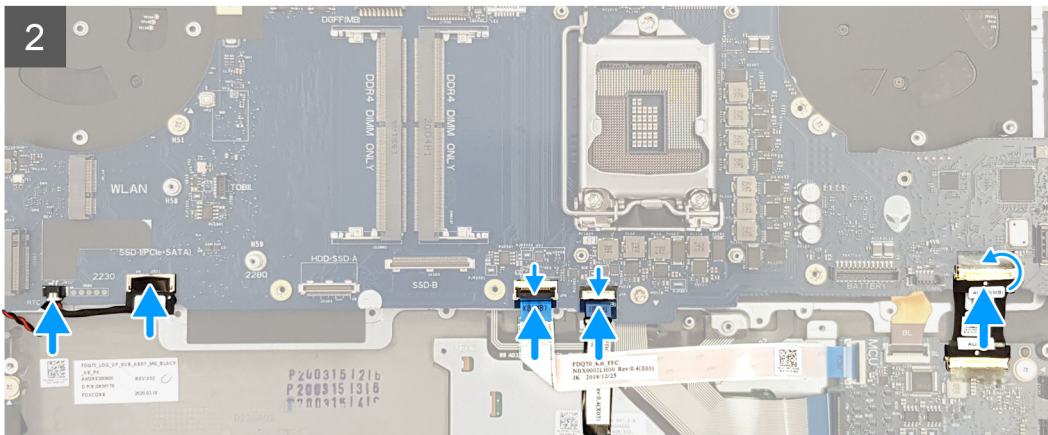
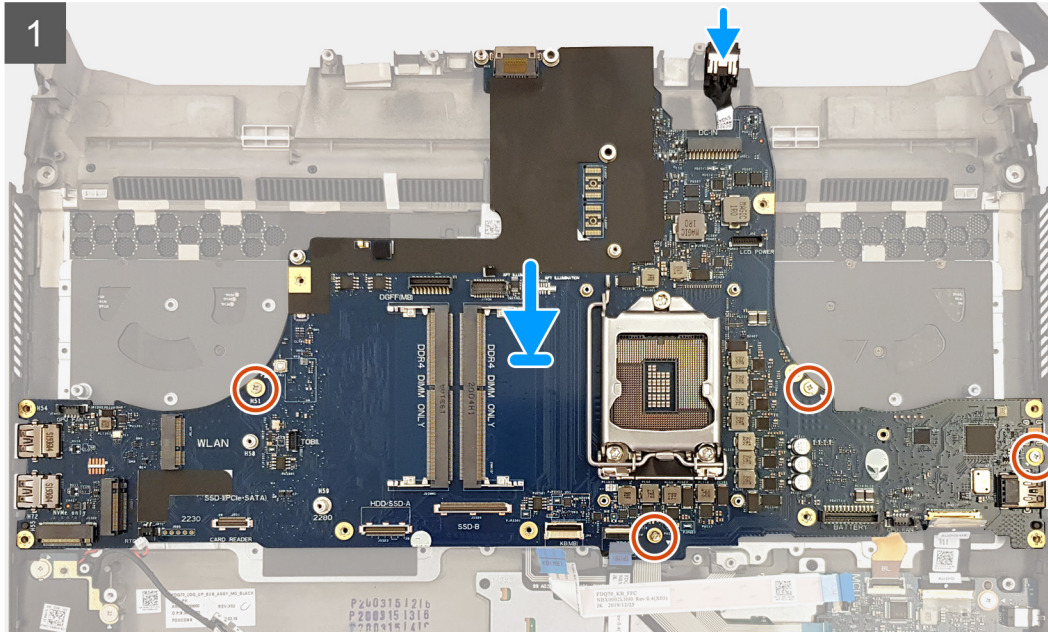
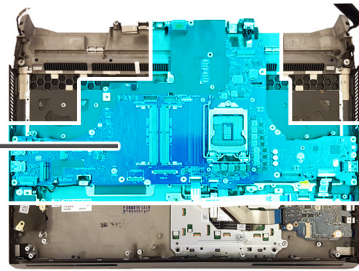


- |                                  |                               |
|----------------------------------|-------------------------------|
| 1. Coin-cell battery cable       | 2. Card-reader board cable    |
| 3. Keyboard-controller cable     | 4. Touchpad cable             |
| 5. Left power-adaptor port cable | 6. Audio daughter-board cable |

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



4x  
M2.5x5





## Steps

1. Replace the [right power-adapter port](#).

**i** **NOTE:** Ensure that the right power-adapter port is already installed to the system board. The right power-adapter port is located underneath the system board, and no longer accessible once system board has been installed to the palm-rest assembly.

2. Turn the system board over and place it into the slot on the palm-rest assembly.

**i** **NOTE:** Do not keep the power-button board cable under the system board.

3. Replace the four screws (M2.5x5) that secure the system board to the palm-rest assembly.
4. Connect the coin-cell battery cable to the system board.
5. Connect the SD card reader cable to the system board.
6. Connect the keyboard-controller cable to the system board and close the latch to secure the cable.
7. Connect the touchpad cable to the system board and close the latch to secure the cable.
8. Connect the audio daughter-board cable to the system board and close the latch to secure the cable.
9. Turn the palm-rest assembly over.
10. Connect the power-button board cable to the system board.

## Next steps

1. Install the [processor](#).
2. Install the [graphics card](#).
3. Install the [left power-adapter port](#).
4. Install the [heat-sink assembly](#).
5. Install the [computer base](#).
6. Install the [rear-I/O cover](#).
7. Install the [solid-state drive interposer board](#), if applicable.
8. Install the [solid-state drive in M.2 slot four](#), if applicable.
9. Install the [solid-state drive in M.2 slot three](#), if applicable.
10. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
11. Install the [solid-state drive in M.2 slot two](#).
12. Install the [solid-state drive in M.2 slot one](#).
13. Install the [wireless card](#).
14. Install the [memory modules](#).
15. Install the [battery](#).
16. Install the [base cover](#).
17. Follow the procedure in [After working inside your computer](#).

# Right power-adapter port

## Removing the right power-adapter port

### Prerequisites

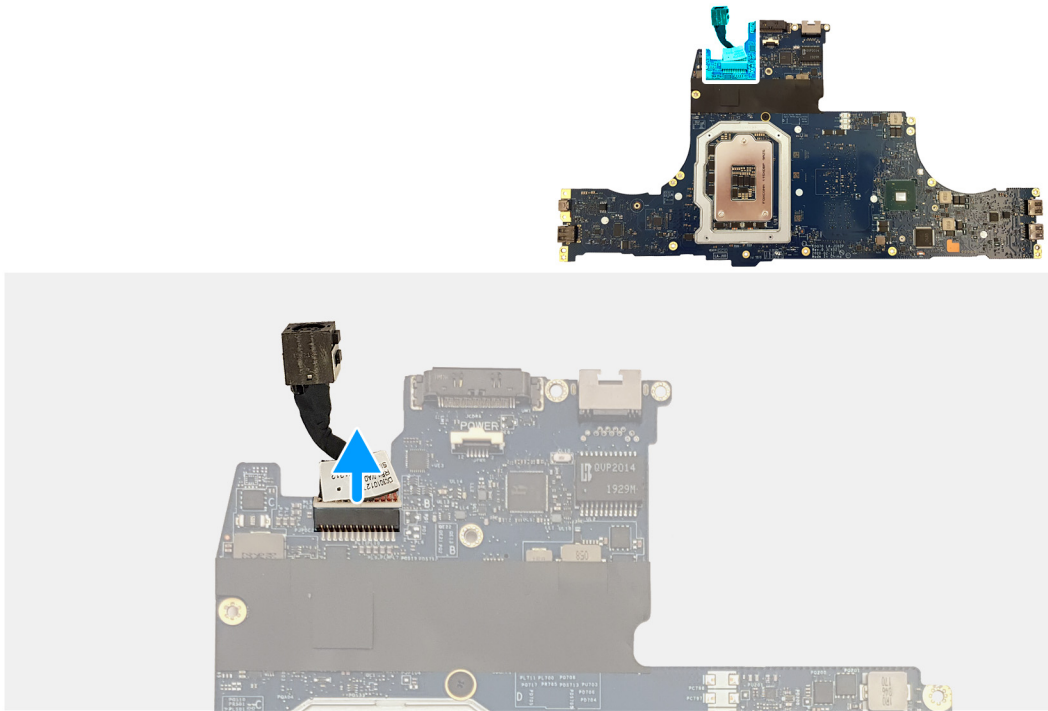
1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory modules](#).
5. Remove the [wireless card](#).
6. Remove the [solid-state drive from M.2 slot one](#).
7. Remove the [solid-state drive from M.2 slot two](#).
8. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
9. Remove the [solid-state drive from M.2 slot three](#), if applicable.
10. Remove the [solid-state drive from M.2 slot four](#), if applicable.
11. Remove the [solid-state drive interposer board](#), if applicable.
12. Remove the [rear-I/O cover](#).



13. Remove the [computer base](#).
14. Remove the [heat-sink assembly](#).
15. Remove the [left power-adapter port](#).
16. Remove the [system board](#).

#### About this task

The following image indicates the location of the right power-adapter port and provides a visual representation of the removal procedure.



Disconnect the right power-adapter port cable from the connector on bottom side of the system board.

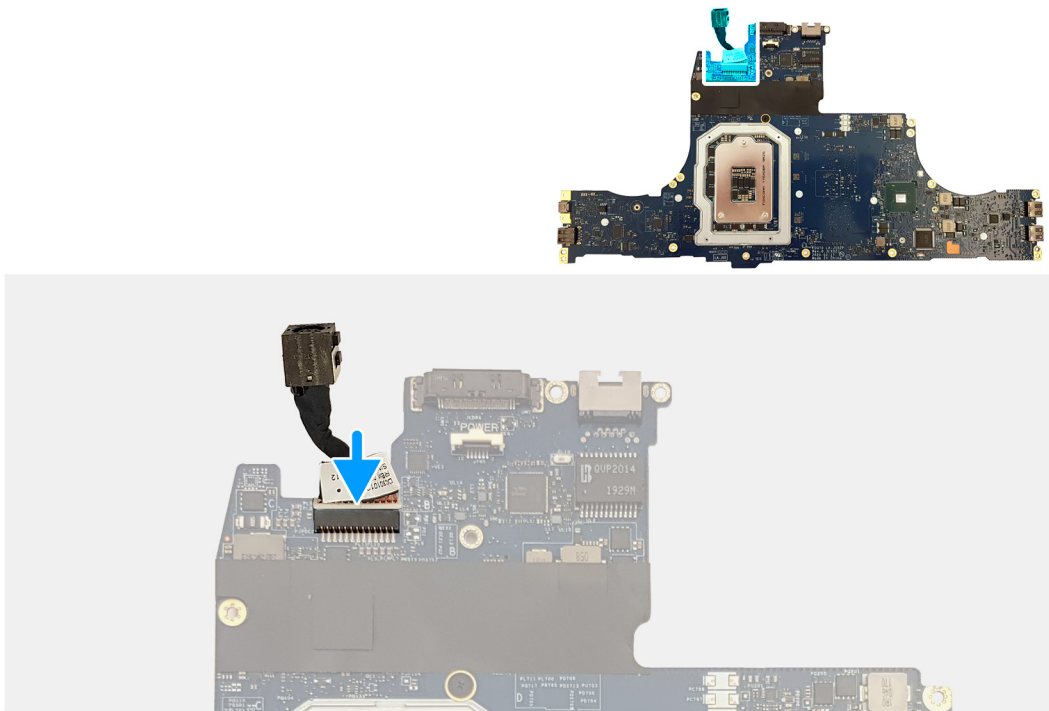
## Installing the right power-adapter port

#### Prerequisites

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

#### About this task

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



Connect the right power-adaptor port cable to the connector at the bottom of the system board.

### Next steps

1. Install the [system board](#).
2. Install the [left power-adaptor port](#).
3. Install the [heat-sink assembly](#).
4. Install the [computer base](#).
5. Install the [rear-I/O cover](#).
6. Install the [solid-state drive interposer board](#), if applicable.
7. Install the [solid-state drive in M.2 slot four](#), if applicable.
8. Install the [solid-state drive in M.2 slot three](#), if applicable.
9. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
10. Install the [solid-state drive in M.2 slot two](#).
11. Install the [solid-state drive in M.2 slot one](#).
12. Install the [wireless card](#).
13. Install the [memory modules](#).
14. Install the [battery](#).
15. Install the [base cover](#).
16. Follow the procedure in [After working inside your computer](#).

## Keyboard

### Removing the keyboard

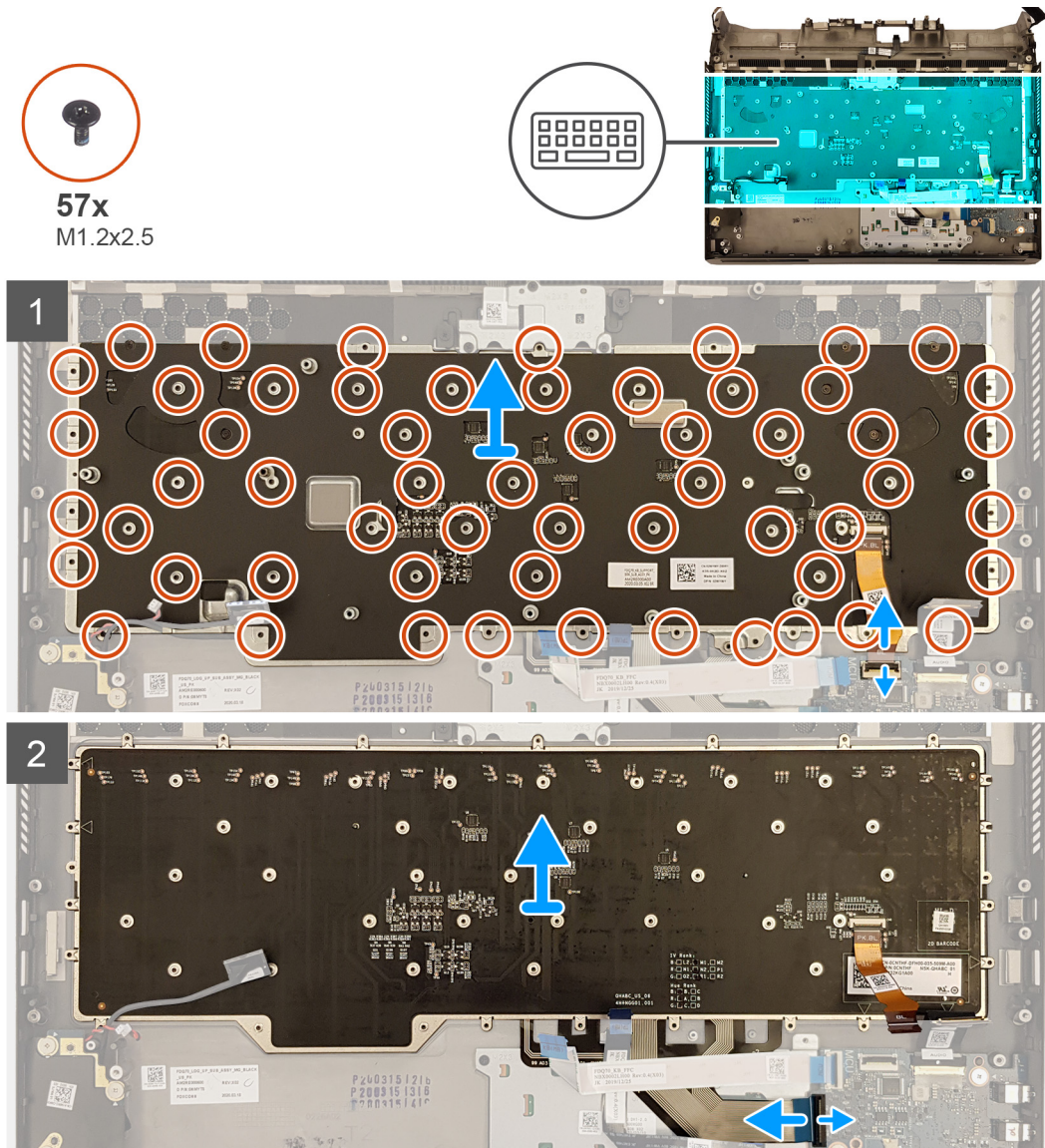
#### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory modules](#).
5. Remove the [wireless card](#).
6. Remove the [solid-state drive from M.2 slot one](#).
7. Remove the [solid-state drive from M.2 slot two](#).

8. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
9. Remove the [solid-state drive from M.2 slot three](#), if applicable.
10. Remove the [solid-state drive from M.2 slot four](#), if applicable.
11. Remove the [solid-state drive interposer board](#), if applicable.
12. Remove the [rear-I/O cover](#).
13. Remove the [computer base](#).
14. Remove the [heat-sink assembly](#).
15. Remove the [left power-adapter port](#).
16. Remove the [system board](#).

### About this task

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



### Steps

1. Open the latch and disconnect the keyboard backlight cable from the audio daughter-board.
2. Open the latch and disconnect the keyboard cable from the audio daughter-board.
3. Remove the 57 screws (M1.2x2.5) that secure the keyboard to the palm-rest assembly.
4. Lift the keyboard off the palm-rest assembly.



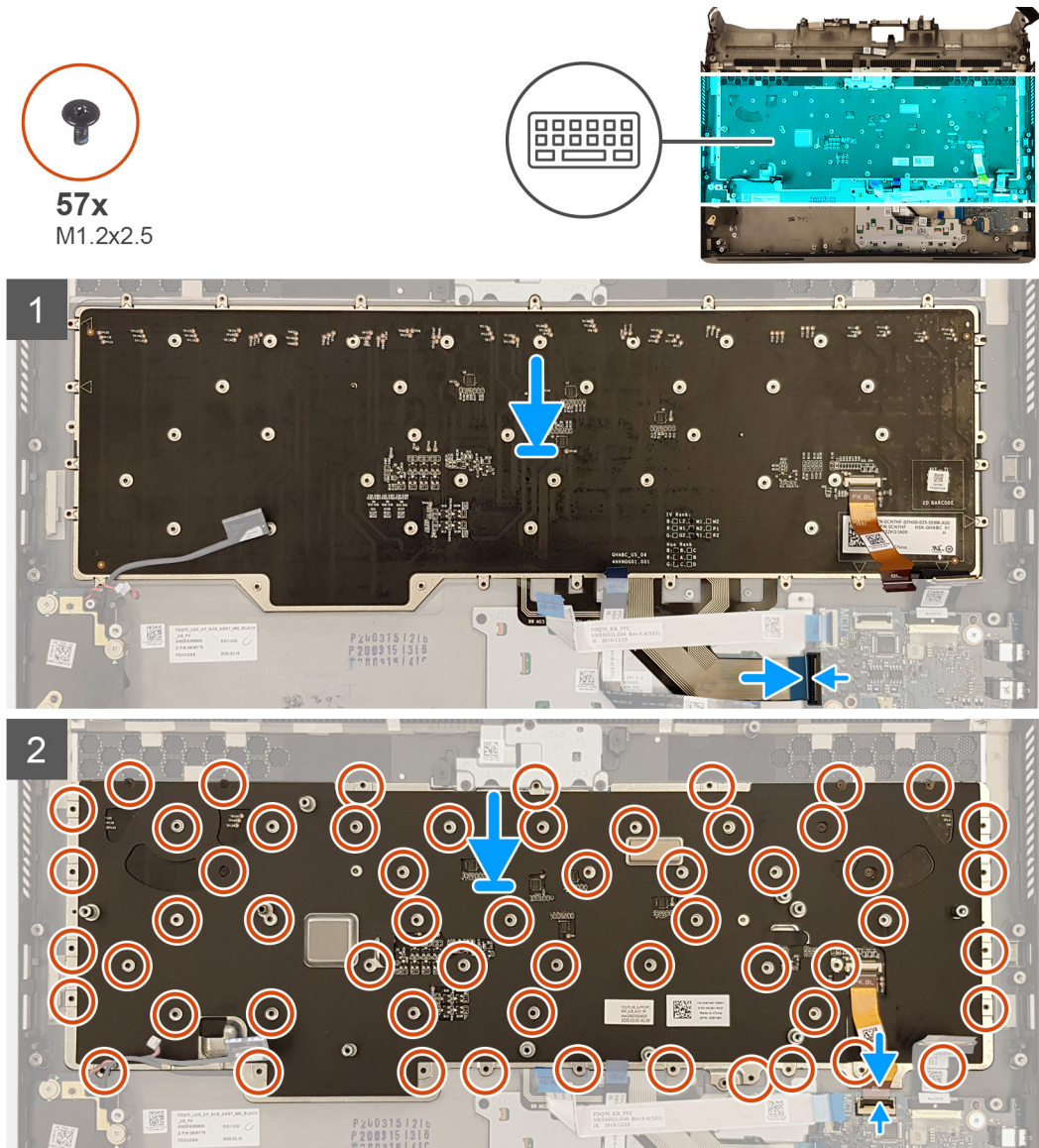
## Installing the keyboard

### Prerequisites

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

### About this task

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



### Steps

1. Place the keyboard in the slots on the palm-rest assembly.
2. Replace the 57 screws (M1.2x2.5) that secure the keyboard bracket to the palm-rest assembly.
3. Connect the keyboard cable to the audio daughter-board and close the latch to secure the cable.
4. Connect the keyboard backlight cable to the audio daughter-board and close the latch to secure the cable.

### Next steps

1. Install the [system board](#).
2. Install the [left power-adaptor port](#).
3. Install the [heat-sink assembly](#).
4. Install the [computer base](#).



5. Install the [display assembly](#).
6. Install the [rear-I/O cover](#).
7. Install the [solid-state drive interposer board](#), if applicable.
8. Install the [solid-state drive in M.2 slot four](#), if applicable.
9. Install the [solid-state drive in M.2 slot three](#), if applicable.
10. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
11. Install the [solid-state drive in M.2 slot two](#).
12. Install the [solid-state drive in M.2 slot one](#).
13. Install the [wireless card](#).
14. Install the [memory modules](#).
15. Install the [battery](#).
16. Install the [base cover](#).
17. Follow the procedure in [After working inside your computer](#).

## Palm-rest assembly

### Removing the palm-rest assembly

#### Prerequisites

1. Follow the procedure in [Before working inside your computer](#).
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Remove the [memory modules](#).
5. Remove the [wireless card](#).
6. Remove the [solid-state drive from M.2 slot one](#).
7. Remove the [solid-state drive from M.2 slot two](#).
8. Follow the procedure from step 1 to step 4 in [Removing the hard drive](#), if applicable.
9. Remove the [solid-state drive from M.2 slot three](#), if applicable.
10. Remove the [solid-state drive from M.2 slot four](#), if applicable.
11. Remove the [solid-state drive interposer board](#), if applicable.
12. Remove the [card-reader board](#).
13. Remove the [audio daughter-board](#).
14. Remove the [speakers](#).
15. Remove the [coin-cell battery](#).
16. Remove the [touchpad](#).
17. Remove the [rear-I/O cover](#).
18. Remove the [display assembly](#).
19. Remove the [computer base](#).
20. Remove the [heat-sink assembly](#).
21. Remove the [left power-adapter port](#).
22. Remove the [system board](#).
23. Remove the [right power-adapter port](#).
24. Remove the [keyboard](#).

#### About this task

The following image indicates the location of the palm-rest assembly and provides a visual representation of the removal procedure.



After performing the steps in the pre-requisites, we are left with the palm-rest assembly.

## Installing the palm-rest assembly

### Prerequisites

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

### About this task

The following image indicates the location of the palm-rest assembly and provides a visual representation of the installation procedure.



Place the palm-rest assembly on a clean and flat surface.

### Next steps

1. Install the [keyboard](#).




2. Install the [right power-adapter port](#).
3. Install the [system board](#).
4. Install the [left power-adapter port](#).
5. Install the [heat-sink assembly](#).
6. Install the [computer base](#).
7. Install the [display assembly](#).
8. Install the [rear-I/O cover](#).
9. Install the [touchpad](#).
10. Install the [coin-cell battery](#).
11. Install the [speakers](#).
12. Install the [audio daughter-board](#).
13. Install the [card-reader board](#).
14. Install the [solid-state drive interposer board](#), if applicable.
15. Install the [solid-state drive in M.2 slot four](#), if applicable.
16. Install the [solid-state drive in M.2 slot three](#), if applicable.
17. Follow the procedure from step 5 to step 8 in [Installing the hard drive](#), if applicable.
18. Install the [solid-state drive in M.2 slot two](#).
19. Install the [solid-state drive in M.2 slot one](#).
20. Install the [wireless card](#).
21. Install the [memory modules](#).
22. Install the [battery](#).
23. Install the [base cover](#).
24. Follow the procedure in [After working inside your computer](#).

# Drivers and downloads

When troubleshooting, downloading or installing drivers it is recommended that you read the Dell Knowledge Based article, Drivers and Downloads FAQ [SLN128938](#).



# 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:** Depending on the computer and its installed devices, the items listed in this section may or may not be displayed.
-  **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.

## Entering BIOS setup program

### Steps

1. Turn on your computer.
  2. Press F2 immediately to enter the BIOS setup program.
-  **NOTE:** If you wait too long and the operating system logo appears, continue to wait until you see the desktop. Then, turn off your computer and try again.

## 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.

Table 3. Navigation keys

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.
Tab	Moves to the next focus area. <div> <b>NOTE:</b> For the standard graphics browser only.</div>
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.

## One time boot menu

To enter **one time boot menu**, turn on your computer, and then press F2 immediately.

-  **NOTE:** It is recommended to shutdown the computer if it is on.

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 (if available)

**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

### Main

**Table 4. Main**

Option	Description
System Time	Displays the current time in hh:mm:ss format.
System Date	Displays the current date in mm/dd/yyyy format.
BIOS Version	Displays the BIOS version.
Product Name	Displays the model number of your computer.
Service Tag	Displays the service tag of your computer.
Asset Tag	Displays the asset tag of your computer.
CPU Type	Displays the processor type.
CPU Speed	Displays the processor speed.
CPU ID	Displays the processor identification code.
CPU L1 Cache	Displays the processor L1 cache size.
CPU L2 Cache	Displays the processor L2 cache size.
CPU L3 Cache	Displays the processor L3 cache size.
Integrated Graphics	Displays the integrated graphics.
Discrete Graphics 1	Displays the first discrete graphics that are installed on your computer.
Discrete Graphics 2	Displays the second discrete graphics that are installed on your computer.
First HDD	Displays the first HDD installed on your computer.
Third HDD	Displays the second HDD installed on your computer.
Fourth HDD	Displays the fourth HDD installed on your computer.
M.2 PCIe SSD-1	Displays the primary SSD installed on your computer.
M.2 PCIe SSD-2	Displays the second SSD installed on your computer.
M.2 PCIe SSD-3	Displays the third SSD installed on your computer.
M.2 PCIe SSD-4	Displays the fourth SSD installed on your computer.
AC Adapter Type	Displays the AC adapter type.
System Memory	Displays the system memory information.
Memory Speed	Displays the memory speed information.

## Advanced

**Table 5. Advanced**

Option	Description
Intel SpeedStep	<p>Enables or disables the Intel SpeedStep mode of processor.</p> <ul style="list-style-type: none"> <li>• <b>Enable Intel SpeedStep</b></li> </ul> <p>Default: Enabled</p>
Intel Speed Shift Technology	<p>Enables or disables the Intel Speed Shift Technology. This option enables the operating system to select the appropriate processor performance automatically.</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b></li> </ul> <p>Default: Enabled</p>
Hyper-Thread Control	<p>Allows you to enable or disable the HyperThreading in the processor.</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b></li> <li>• <b>Enabled</b></li> </ul> <p>Default: Enabled</p>
Integrated NIC	<p>Enables you to configure the onboard LAN controller.</p> <p>Choose one of the following options:</p> <ul style="list-style-type: none"> <li>• <b>Disabled:</b> The internal LAN is off and not visible to the operating system</li> <li>• <b>Enabled:</b> The internal LAN is enabled</li> </ul> <p>Default: Enabled</p>
USB Emulation	<p>Enables or disables the USB emulation feature. This feature defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST.</p> <p>Default: Enabled</p> <p><b>i</b> <b>NOTE: You cannot boot any type of USB device (floppy, hard drive, or memory key) when this option is off.</b></p>
USB Powershare	<p>Enables or disables the USB PowerShare feature. This option enables you to charge external devices using the stored system battery power through the USB PowerShare port when the computer is turned off or in standby mode.</p> <ul style="list-style-type: none"> <li>• <b>Enable USB PowerShare</b></li> </ul> <p>Default: Enabled</p>
USB Wake Support	<p>Enables or disables the USB devices to wake the computer from Standby.</p> <ul style="list-style-type: none"> <li>• <b>Enable USB Wake Support</b></li> </ul> <p>Default: Disabled</p> <p><b>i</b> <b>NOTE: If USB PowerShare is enabled, a device that is connected to the USB PowerShare connector may not wake the computer.</b></p>
SATA Operation	<p>Enables you to configure the operating mode of the integrated SATA drive controller.</p> <p>Choose one of the following options:</p>

**Table 5. Advanced(continued)**

Option	Description
	<ul style="list-style-type: none"> <li>▪ <b>ATA:</b> SATA is configured for ATA mode.</li> <li>▪ <b>AHCI:</b> SATA is configured for AHCI mode.</li> <li>▪ <b>RAID:</b> SATA is configured for RAID mode.</li> <li>▪ <b>RAID On:</b> SATA is configured for RAID mode</li> <li>▪ <b>Intel Smart Response Technology:</b> SATA is configured for RAID mode</li> </ul> <p>Default: RAID On</p>
Adapter Warnings	<p>Enables or disables the system setup (BIOS) warning messages when you use certain power adapters.</p> <ul style="list-style-type: none"> <li>▪ <b>Enable Adapter Warnings</b></li> </ul> <p>Default: Disabled</p>
Function Key Behavior	<p>Enables you to set function key or multimedia key as the default function key behavior.</p> <p>Default: Function Key</p>
Touchpad Backlight	<p>Enables you to choose the operating mode of the touchpad backlight feature.</p> <p>Default: Auto</p>
Battery Health	Displays the battery health.
Camera	<p>Enables or disables the integrated camera. When enabled, the camera functions normally. When disabled, the camera is hidden from the OS (example: not seen in the Device Manager).</p> <p>Default: Enabled</p>
Thunderbolt	<p>Enables or disables Thunderbolt technology support.</p> <p>The options are:</p> <ul style="list-style-type: none"> <li>▪ <b>Enabled</b></li> <li>▪ <b>Disabled</b></li> </ul> <p>Default: Enabled</p>
Thunderbolt Boot Support	<p>Enables or disables booting from storage devices connected to Thunderbolt port.</p> <p>Default: Disabled</p>
Enable Thunderbolt (and PCIe behind TBT) Pre-boot Modules	Default: Disabled
Thunderbolt Adapter Configuration	Default: No Security
<b>Performance Options</b>	
Overclocking Feature	<p>Enables or disables the global overclocking functions.</p> <p>Default: Enabled</p>
Core Overclocking Level#	<p>Enables the CPU to adjust the Flex Ratio and Voltage in a Turbo Mode environment can be modified.</p> <p>Default: Customization</p>
XMP Memory	<p>Enables the XMP mode.</p> <p>Default: Disabled</p>



**Table 5. Advanced(continued)**

Option	Description
Fan Performance Mode	Enables or disables Fan to full speed for CPU cooling. Default: Enabled
<b>Maintenance</b>	
Data Wipe on next boot	If enabled, the BIOS will queue up a data wipe cycle for storage devices that are connected to the motherboard on the next reboot. Default: Enabled
Start This Device Sanitization	
Start All Media Sanitization	
BIOS Recovery from Hard Drive	Enables the computer to recover from a bad BIOS image, as long as the Boot Block portion is intact and functioning. Default: Enabled
BIOS Auto-Recovery	Enables the computer to automatically recover the BIOS without user actions. This feature requires BIOS Recovery from Hard Drive to be set to Enabled. Default: Disabled
<b>SupportAssist System Resolution</b>	
Auto OS Recovery Threshold	Controls the automatic boot flow for SupportAssist System Resolution Console and for Dell operating system Recovery tool. Default: 2
SupportAssist OS Recovery	Enables or disables the boot flow for SupportAssist operating system Recovery tool in the even of certain system errors. Default: Enabled
Battery Charge Configuration	Enables the computer to run on battery during power usage hours. Use the below options to prevent AC power usage between certain times of each day. Default: Adaptive
Advanced Battery Charge Configuration	Enables Advanced Battery Charge Configuration from the beginning of the day to a specified work period. Advanced Battery Charged maximizes battery health while still supporting heavy use during the work day. Default: Disabled
Intel Rapid Storage Technology	Displays the RAID information.

## Security

**Table 6. Security**

Option	Description
Unlock Setup Status	Displays if the setup status is unlocked.
Admin Password Status	Displays if the administrator password is clear or set. Default: Not Set

**Table 6. Security(continued)**

Option	Description
System Password Status	Displays if the system password is clear or set. Default: Not Set
Admin Password	Allows you to set, change, or delete the administrator(admin) password. The entries to set password are: <ul style="list-style-type: none"> <li>▪ <b>Enter the old password:</b></li> <li>▪ <b>Enter the new password:</b></li> <li>▪ <b>Confirm new password:</b></li> </ul> Click <b>OK</b> once you set the password. <i>i</i> <b>NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.</b>
System Password	Allows you to set, change, or delete the System password. The entries to set password are: <ul style="list-style-type: none"> <li>▪ <b>Enter the old password:</b></li> <li>▪ <b>Enter the new password:</b></li> <li>▪ <b>Confirm new password:</b></li> </ul> Click <b>OK</b> once you set the password. <i>i</i> <b>NOTE: For the first time login, "Enter the old password:" field is marked to "Not set". Hence, password has to be set for the first time you login and then you can change or delete the password.</b>
Password Change	Allows you to change the System password when the administrator password is set. <ul style="list-style-type: none"> <li>▪ <b>Allow Non-Admin Password Changes</b></li> </ul> This option is enabled by default.
Absolute	Enables, disables, or permanently disables the BIOS module interface of the optional Absolute Persistence Module service from Absolute Software. <ul style="list-style-type: none"> <li>▪ <b>Enabled:</b> Enable the Absolute Persistence and load the firmware Persistence Module.</li> <li>▪ <b>Disable:</b> Disable Absolute Persistence. The firmware Persistence Module is not installed.</li> <li>▪ <b>Permanently Disabled:</b> Permanently disables Absolute Persistence module interface from farther use.</li> </ul> Default: Enabled
Absolute Status	Displays Absolute status.
Firmware TPM	Enables the Firmware TPM function. Default: Enabled
PPI Bypass for Clear Command	Enables you to control the TPM Physical Presence Interface (PPI). When enabled, this setting allows the OS to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately.
UEFI Firmware Capsule Updates	Allows you to update the system BIOS via UEFI capsule update packages. <ul style="list-style-type: none"> <li>▪ <b>Enable UEFI Capsule Firmware Updates</b></li> </ul> This option is enabled by default.
WINDOWS SMM SECURITY MITIGATIONS TABLE (WSMT)	Enables or disables SMM Security Mitigation.

**Table 6. Security(continued)**

Option	Description
<b>Secure Boot</b>	
Secure Boot	Enables or disables the Secure Boot Feature. Choose one of the options: <ul style="list-style-type: none"> <li>▪ <b>Secure Boot Enable</b></li> <li>▪ <b>Secure Boot Disable</b></li> </ul> Default: Enabled
Secure Boot Mode	Displays the secure boot mode. Default: Deployed Mode.
Expert Key Management	Enables or disables Expert Key Management. Default: Enabled

## Boot

**Table 7. Boot**

Option	Description
Boot List Option	Displays the available boot options. <ul style="list-style-type: none"> <li>▪ Legacy</li> <li>▪ UEFI</li> </ul> Default: UEFI
File Browser Add Boot Option	Enables you to add the boot options.
File Browser Del Boot Option	Enables you to delete the boot options.
Boot Option Priorities	Displays the boot sequence.
Boot Option #1	Displays the available first boot option.
Boot Option #2	Displays the available second boot option.
Boot Option #3	Displays the available third boot option.

## Exit

**Table 8. Exit**

Option	Description
Save Changes and Reset	Enables you to exit system setup and save your changes.
Discard Changes and Reset	Enables you to exit system setup and load previous values for all system setup options.
Restore Defaults	Enables you to restore default values for all system setup options.
Discard Changes	Enables you to load previous values for all system setup options.
Save Changes	Enables you to save the changes for all system setup options.

# 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. For laptops, ensure that your computer battery is fully charged and connected to a power outlet.

## About this task

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

## Steps

1. Restart the computer.
2. Go to [www.dell.com/support](http://www.dell.com/support).
  - Enter the **Service Tag** or **Express Service Code** and click **Submit**.
  - Click **Detect Product** and follow the on-screen instructions.
3. 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 then click **Drivers and Downloads**.  
The Drivers and Downloads section is displayed.
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, and then 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 on-screen instructions.

## Updating your system BIOS using a USB flash drive

### About this task

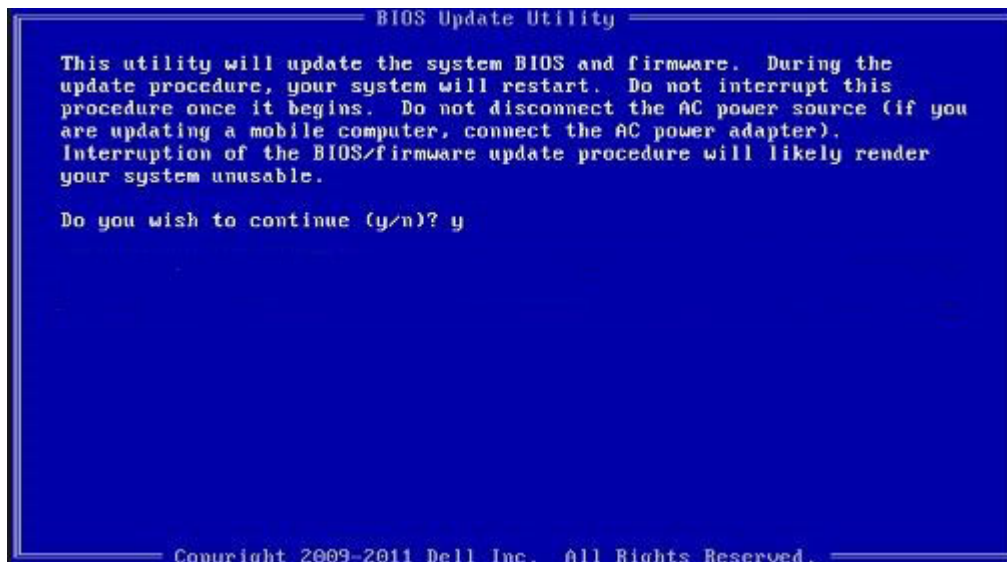
If the computer cannot load into Windows but there is still a need to update the BIOS, download the BIOS file using another computer and save it to a bootable USB flash drive.

 **NOTE: You must use a bootable USB flash drive. For more information, see the knowledge base article [SLN143196](#).**

## Steps

1. Download the BIOS update .exe file to another computer.
2. Copy the .exe file onto the bootable USB flash drive.
3. Insert the USB flash drive into the computer that requires the BIOS update.
4. Restart the computer and press F12 when the Dell logo appears to display the One Time Boot Menu.
5. Using arrow keys, select **USB Storage Device** and press Enter.
6. The computer restarts to a Diag C:\> prompt.
7. Run the file by typing the complete filename and press Enter.
8. The BIOS Update Utility is displayed. Follow the on-screen instructions.





## Flashing the BIOS from the F12 One-Time boot menu

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

### About this task

#### BIOS Update

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

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

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

#### Updating from the One-Time boot menu

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

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

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

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

#### Steps

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

# System and setup password

Table 9. System and setup password

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

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

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

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

 **NOTE:** System and setup password feature is disabled.

## Assigning a system setup password

### 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 F12 immediately after a power-on or reboot.

### 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 valid.
  - Only the following special characters are valid: 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 prompt's you to save the changes.
5. Press Y to save the changes.  
The computer restarts.

## 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 F12 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**, update, or delete the existing system password, and press Enter or Tab.

4. Select **Setup Password**, update, or delete the existing setup password, and press Enter or Tab.

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

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

## Clearing CMOS settings

### About this task

 **CAUTION:** Clearing CMOS settings will reset the BIOS settings on your computer.

### Steps

1. Remove the [base cover](#).
2. Remove the [coin-cell battery](#).
3. Wait for one minute.
4. Replace the [coin-cell battery](#).
5. Replace the [base cover](#).

## Clearing BIOS (System Setup) and System passwords

### About this task

To clear the system or BIOS passwords, contact Dell technical support as described at [www.dell.com/contactdell](http://www.dell.com/contactdell).

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

# Troubleshooting

## SupportAssist diagnostics

### About this task

The SupportAssist diagnostics (previously known as ePSA diagnostics) performs a complete check of your hardware. The SupportAssist diagnostics is embedded in the BIOS and is launched by it internally. The SupportAssist diagnostics provides a set of options for particular devices or device groups. It allows 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 and provide extra information about the failed device(s)
- View status messages that indicate if the tests are completed successfully
- View error messages that indicate if problems were encountered during the test

**NOTE:** Some tests are meant for specific devices and require user interaction. Ensure that you are present in front of the computer when the diagnostic tests are performed.

## Recovering the operating system

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

Dell SupportAssist OS Recovery is a standalone tool that is preinstalled in all Dell computers installed with Windows 10 operating system. It consists of tools to diagnose and troubleshoot issues that may occur before your computer boots to the operating system. It enables you to diagnose hardware issues, repair your computer, back up your files, or restore your computer to its factory state.

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

For more information about the Dell SupportAssist OS Recovery, see *Dell SupportAssist OS Recovery User's Guide* at [www.dell.com/support](http://www.dell.com/support).

## System diagnostic lights

**NOTE:** The system diagnostic lights and the power-status light are at the power button (Alienhead).

**NOTE:** The color of the status lights depends on the configuration set in the Alienware Control Center (AWCC).

**Power-status light:** Indicates the power status.

Solid

- Computer is turned on.
- Power adapter is connected, and the battery has less than ten percent charge.

Breathe—Computer is in sleep state.

Off—Computer is in hibernation or turned off.

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

For example, the power light blinks red two times followed by a pause, and then blinks blue 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 light patterns and associated problems.

**Table 10. LED codes**

Diagnostic light codes	Problem description
2,1	Processor failure
2,2	System board: BIOS or Read-Only Memory (ROM) failure

**Table 10. LED codes(continued)**

Diagnostic light codes	Problem description
2,3	No memory or Random-Access Memory (RAM) detected
2,4	Memory or Random-Access Memory (RAM) failure
2,5	Invalid memory installed
2,6	System board or chipset error
2,7	Display failure
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—Camera is in use.
- Off—Camera is not in use.

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

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

## Flea power release

### About this task

Flea power is the residual static electricity that remains on the computer even after it has been powered off and the battery has been removed. The following procedure provides the instructions on how to conduct flea power release:


### Steps

1. Turn off your computer.
2. Remove the [base cover](#).
3. Remove the [battery](#).
4. Press and hold the power button for 15 seconds to drain the flea power.
5. Replace the [battery](#).
6. Replace the [base cover](#).
7. Turn on your computer.

## 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.

## Real Time Clock—RTC reset

The Real Time Clock (RTC) reset function allows you or the service technician to recover the recently launched model Dell Latitude and Precision systems from **No POST/No Boot/No Power** situations. You can initiate the RTC reset on the system from a power-off state only if it is connected to AC power. Press and hold the power button for 25 seconds. The system RTC reset occurs after you release the power button.

**NOTE:** If AC power is disconnected from the system during the process or the power button is held longer than 40 seconds, the RTC reset process gets aborted.

The RTC reset will reset the BIOS to Defaults, un-provision Intel vPro and reset the system date and time. The following items are unaffected by the RTC reset:

- Service Tag
- Asset Tag
- Ownership Tag
- Admin Password
- System Password
- HDD Password
- Key Databases
- System Logs

**NOTE:** The IT administrator's vPro account and password on the system will be un-provisioned. The system needs to go through the setup and configuration process again to reconnect it to the vPro server.

The below items may or may not reset based on your custom BIOS setting selections:



- Boot List
- Enable Legacy Option ROMs
- Secure Boot Enable
- Allow BIOS Downgrade

# Getting help and contacting Alienware

## Self-help resources

You can get information and help on Alienware products and services using these online self-help resources:

**Table 11. Alienware products and online self-help resources**

Self-help resources	Resource location
Information about Alienware products and services	<a href="http://www.alienware.com">www.alienware.com</a>
My Dell	
Tips	
Contact Support	In Windows search, type <b>Contact Support</b> , and press <b>Enter</b> .
Online help for operating system	<a href="http://www.dell.com/support/windows">www.dell.com/support/windows</a> <a href="http://www.dell.com/support/linux">www.dell.com/support/linux</a>
Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on	<a href="http://www.alienware.com/gamingservices">www.alienware.com/gamingservices</a>
VR Support	<a href="http://www.dell.com/VRsupport">www.dell.com/VRsupport</a>
Videos providing step-by-step instructions to service your computer	<a href="http://www.youtube.com/alienwareservices">www.youtube.com/alienwareservices</a>

## Contacting Alienware

To contact Alienware for sales, technical support, or customer service issues, see [www.alienware.com](http://www.alienware.com).

① **NOTE:** Availability varies by country/region and product, and some services may not be available in your country/region.

① **NOTE:** If you do not have an active Internet connection, you can find contact information about your purchase invoice, packing slip, bill, or Dell product catalog.