

XPS 15

Service Manual



Notes, cautions, and warnings

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

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

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

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Before working inside your computer

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

Before you begin

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

Safety instructions

Use the following safety guidelines to protect your computer from potential damage and ensure your personal safety.

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

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

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

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

 **CAUTION:** 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 shipped with the product or at www.dell.com/regulatory_compliance.

 **CAUTION:** Before touching anything inside your computer, ground yourself by using a wrist grounding strap or by periodically 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 on its connector or on its pull tab, not on 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 any connector pins. When connecting cables, ensure that the ports and connectors are correctly oriented and aligned.

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

Recommended tools

The procedures in this document may require the following tools:

- Phillips screwdriver #0
- Phillips screwdriver #1
- Torx #5 (T5) screwdriver
- Plastic scribe

Screw list

The following table provides the list of screws that are used for securing different components to the computer.

Table 1. Screw list

Component	Secured to	Screw type	Quantity	Screw image
Base cover	Palm-rest assembly	M2x3 T5	10	
System badge	Palm-rest assembly	M2x8	2	
Battery (half-length)	Palm-rest assembly	M2x4	4	
Battery (full-length)	Palm-rest assembly	M2x4	7	
Hard-drive cage	Hard-drive assembly	M2x4	4	
Solid-state drive (half-length)	System board	M2x3	1	
Solid-state drive	Solid-state drive bracket	M2x2	1	
Solid-state drive (full-length)	System board	M2x3	1	
Speakers	Palm-rest assembly	M2x2	4	
Fan	System board	M2x4	4	
Heat-sink assembly	System board	M2x3	5/4	
Display-cable bracket	System board	M2x2	1	
System board	Palm-rest assembly	M2x4	5	
Audio daughter-board	System board	M2x3	2	
Keyboard	Palm-rest assembly	M1.6x1.5	31	

Table 1. Screw list (continued)

Component	Secured to	Screw type	Quantity	Screw image
Display hinges	Palm-rest assembly	M2.5x5	6	
Power-adapter port	Palm-rest assembly	M2x3	1	
Antenna module	Display assembly	M2x4	4	

After working inside your computer

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

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 the base cover

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Procedure

1. Close the display, and turn the computer over.
2. Turn the system badge over and remove the two screws (M2x8) that secure the base cover to the palm-rest assembly.
3. Remove the 10 screws (M2x3 T5) that secure the base cover to the palm-rest assembly.

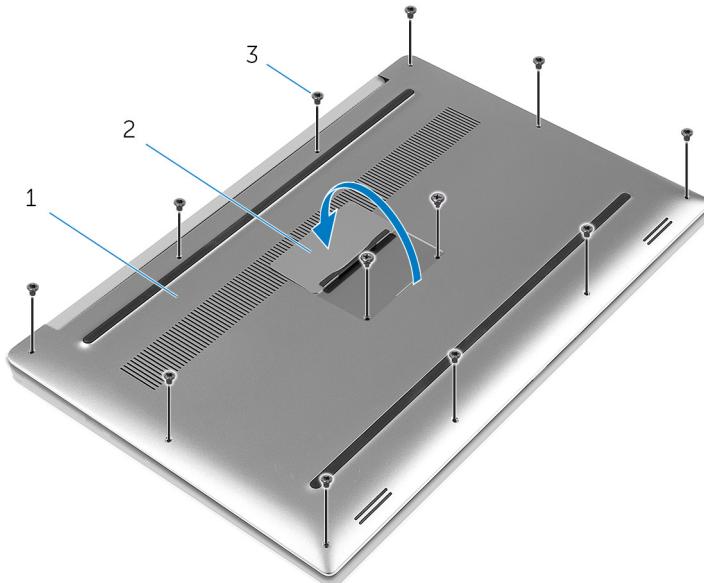


Figure 1. Removing the base cover

- a. base cover
 - b. system badge
 - c. screws (12)
4. Using a plastic scribe, gently pry the base cover off the palm-rest assembly.

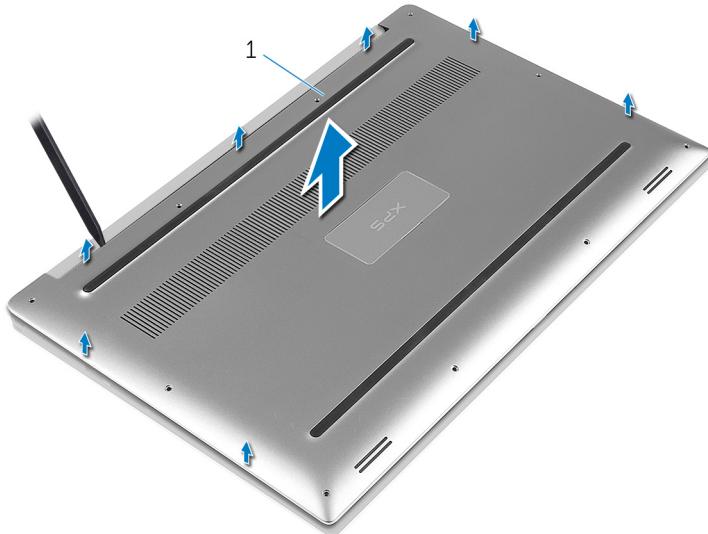


Figure 2. Prying the base cover off the computer base

a. base cover

Replacing the base cover

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Procedure

1. Place the base cover on the palm-rest assembly and snap it into place.
2. Replace the 10 screws (M2x3 T5) that secure the system badge to the palm-rest assembly.
3. Replace the two screws (M2x8) that secure the base cover to the palm-rest assembly.
4. Turn the system badge over, and snap it into place.
5. Turn the computer over.

Removing the battery (half-length)

i | NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

Remove the [base cover](#).

Procedure

1. Remove the four screws (M2x4) that secure the battery to the palm-rest assembly.
2. Disconnect the battery cable from the system board.
3. Lift the battery off the palm-rest assembly.

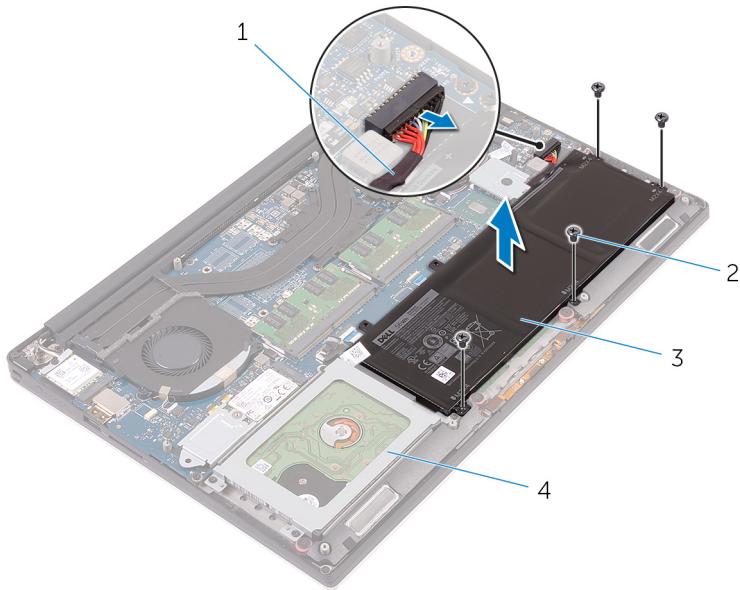


Figure 3. Removing the battery

- | | |
|------------------|-----------------------|
| 1. battery cable | 2. screws (4) |
| 3. battery | 4. palm-rest assembly |
4. Turn the computer over, open the display, and press the power button for five seconds to ground the system board.

Replacing the battery (half-length)

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Procedure

1. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
2. Replace the four screws (M2x4) that secure the battery to the palm-rest assembly.
3. Connect the battery cable to the system board.

Post-requisites

Replace the [base cover](#).

Removing the battery (full-length)

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Prerequisites

Remove the [base cover](#).

Procedure

1. Remove the seven screws (M2x4) that secure the battery to the palm-rest assembly.
2. Disconnect the battery cable from the system board.
3. Lift the battery off the palm-rest assembly.

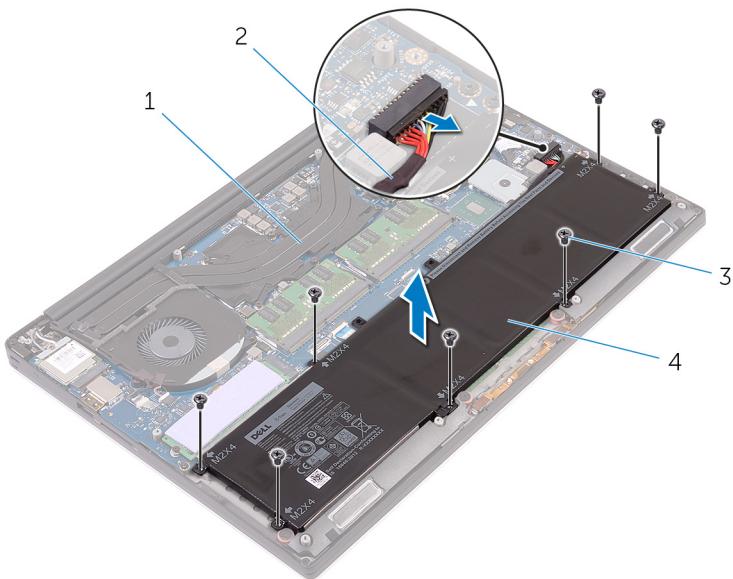


Figure 4. Removing the battery

- | | |
|-----------------------|------------------|
| 1. palm-rest assembly | 2. battery cable |
| 3. screws (7) | 4. battery |
-
4. Turn the computer over, open the display, and press the power button for five seconds to ground the system board.

Replacing the battery (full-length)

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Procedure

1. Align the screw holes on the battery with the screw holes on the palm-rest assembly.
2. Replace the seven screws (M2x4) that secure the battery to the palm-rest assembly.
3. Connect the battery cable to the system board.

Post-requisites

Replace the [base cover](#).

Removing the hard drive

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⚠ CAUTION: Hard drives are fragile. Exercise care when handling the hard drive.

⚠ CAUTION: To avoid data loss, do not remove the hard drive while the computer is in sleep or on state.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#).

Procedure

1. Remove the four screws (M2x4) that secure the hard-drive cage to the palm-rest assembly.
2. Lift the hard-drive cage off the hard-drive assembly.

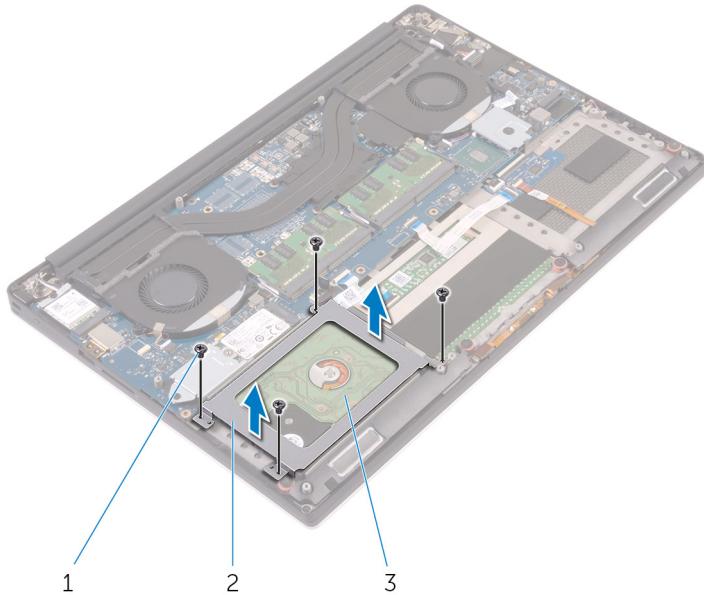


Figure 5. Removing the hard-drive cage

- a. screws (4)
 - b. hard-drive cage
 - c. hard-drive assembly
3. Using the pull tab disconnect the hard-drive cable from the system board.
 4. Lift the hard-drive assembly off the palm-rest assembly.

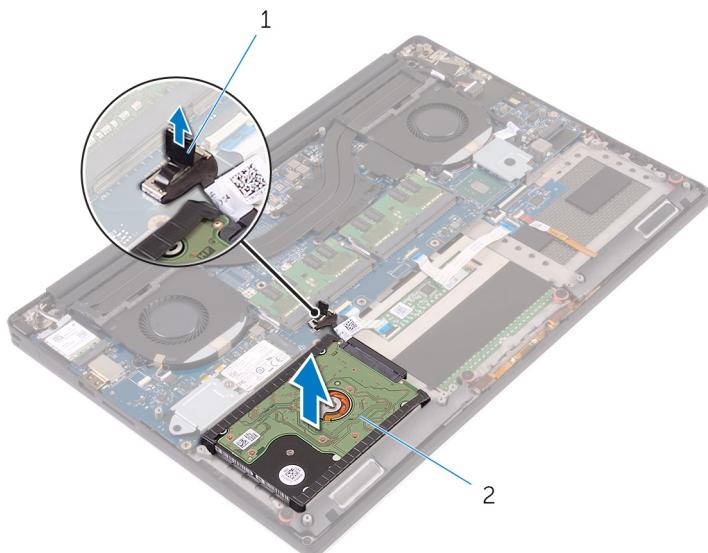


Figure 6. Disconnecting the hard-drive cable from the system board

- a. pull tab
- b. hard-drive assembly

5. Disconnect the hard-drive interposer from the hard-drive assembly.

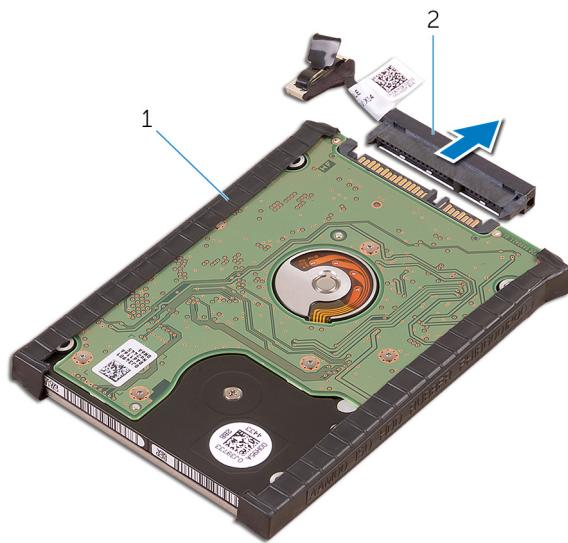


Figure 7. Disconnecting the hard-drive interposer from the hard-drive assembly

- a. hard-drive assembly
- b. hard-drive interposer

6. Remove the hard-drive covers away from the hard drive.

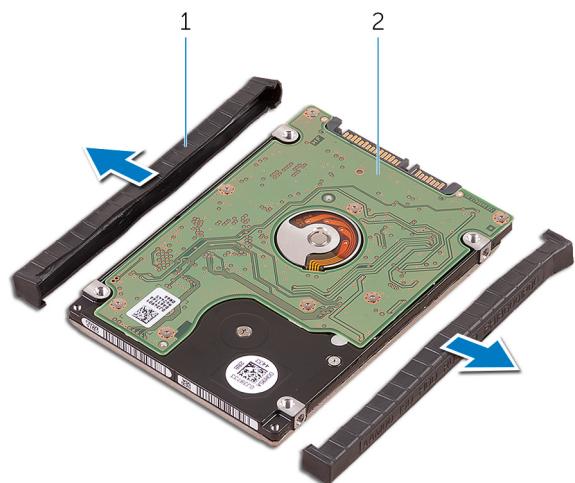


Figure 8. Removing the hard-drive cover

- a. hard-drive covers (2)
- b. hard drive

Replacing the hard drive

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 **CAUTION:** Hard drives are fragile. Exercise care when handling the hard drive.

Procedure

1. Replace the hard-drive covers on the hard drive.
2. Connect the hard-drive interposer to the hard-drive assembly.
3. Place the hard-drive assembly on the palm-rest assembly.
4. Connect the hard-drive cable to the system board.
5. Align the screw holes on the hard-drive cage with the screw holes on the hard-drive assembly.
6. Replace the four screws (M2x4) screws that secure the hard-drive cage to the palm-rest assembly.

Post-requisites

1. Replace the [battery \(half-length\)](#).
2. Replace the [base cover](#).

Removing the solid-state drive (half-length)

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Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Remove the screw (M2x3) that secures the solid-state drive assembly to the system board.
2. Lift and slide the solid-state drive assembly from the system board.

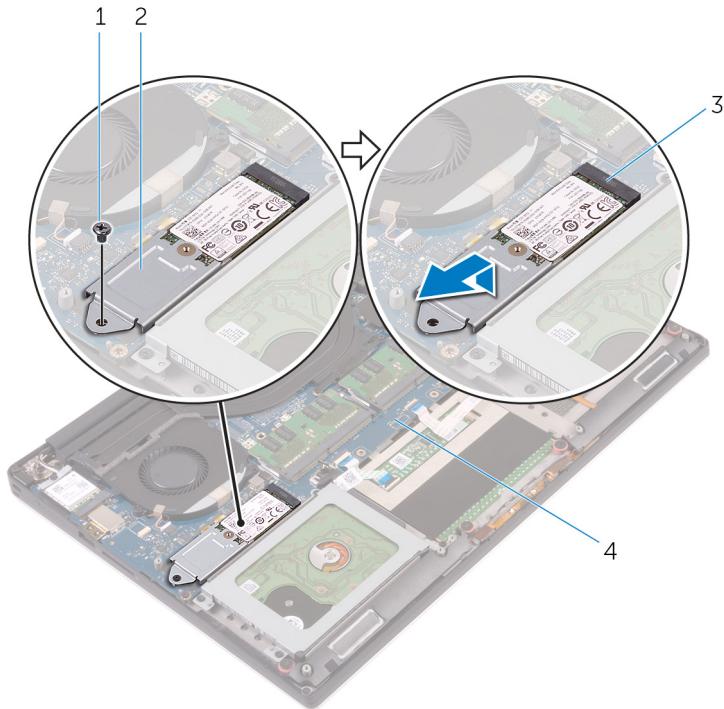


Figure 9. Removing the solid-state drive assembly

- | | |
|---------------------------|-------------------------------|
| 1. screw | 2. solid-state drive assembly |
| 3. solid-state drive slot | 4. system board |
-
3. Turn the solid-state drive assembly over, then remove the screw (M2x2) that secures the solid-state drive to the solid-state drive bracket.

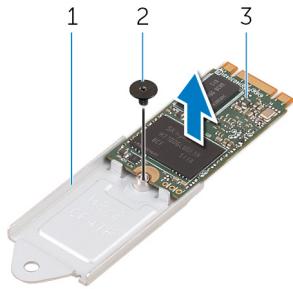


Figure 10. Removing the solid-state drive bracket

- a. solid-state drive bracket
 - b. screw
 - c. solid-state drive
4. Lift the solid-state drive off the solid-state drive bracket.

Replacing the solid-state drive (half-length)

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Procedure

1. Align the screw hole on the solid-state drive bracket with the screw hole on the solid-state drive.
2. Replace the screw (M2x2) that secures the solid-state drive to the solid-state drive bracket.
3. Align the notches on the solid-state drive assembly with the tabs in the solid-state drive slot.
4. Slide the solid-state drive assembly at an angle into the solid-state drive slot.
5. Press the other end of the solid-state drive down and replace the screw (M2x3) that secures the solid-state drive to the system board.

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the solid-state drive (full-length)

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Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Remove the screw (M2x3) that secures the solid-state drive to the system board.
2. Lift and slide the solid-state drive from the system board.

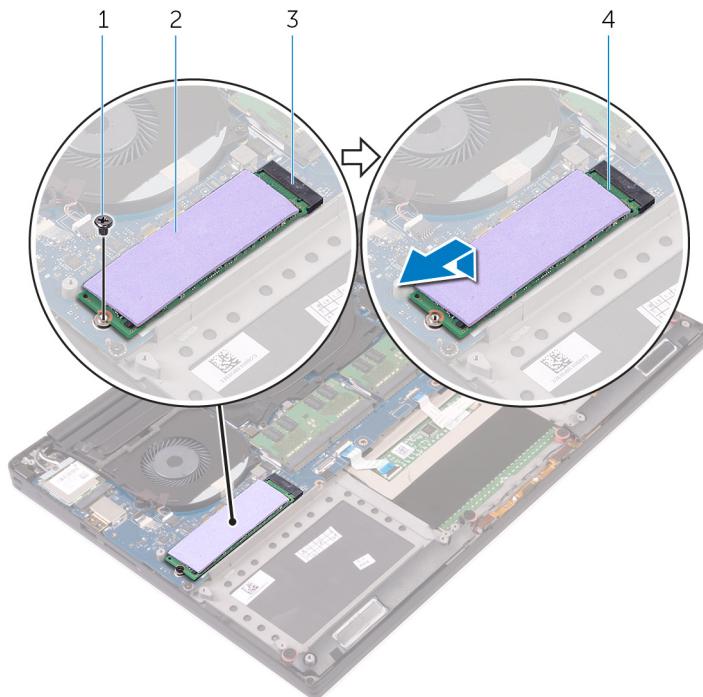


Figure 11. Removing the solid-state drive

1. screw
 2. thermal pad
 3. solid-state drive slot
 4. solid-state drive
3. Peel the thermal pad off the solid-state drive.

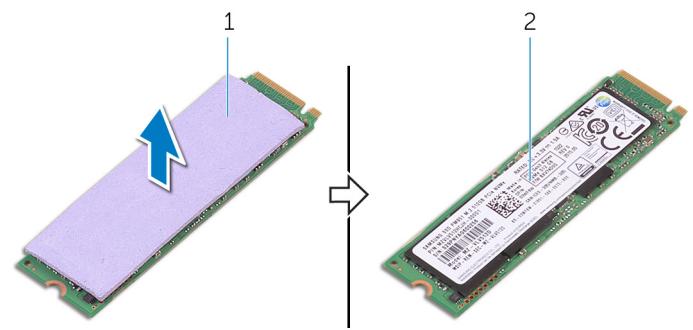


Figure 12. Removing the thermal pad

- a. thermal pad
- b. solid-state drive

Replacing the solid-state drive (full-length)

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Procedure

1. Adhere the thermal pad to the solid-state drive.
2. Slide the solid-state drive at an angle into the solid-state drive slot.
3. Press the other end of the solid-state drive down and replace the screw (M2x3) that secures the solid-state drive to the system board.

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the speakers

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Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Disconnect the speaker cable from the audio daughter-board.
2. Note the speaker-cable routing and remove the cable from the routing guides.
3. Remove the four screws (M2x2) that secure the speakers to the palm-rest assembly.
4. Lift the speakers, along with the speaker cable, off the palm-rest assembly.

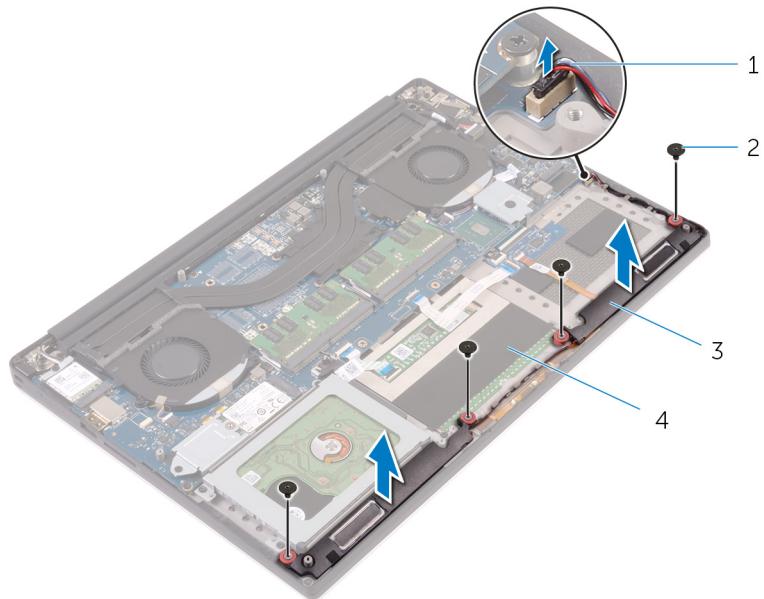


Figure 13. Removing the speakers

- | | |
|------------------|-----------------------|
| 1. speaker cable | 2. screws (4) |
| 3. speakers (2) | 4. palm-rest assembly |

Replacing the speakers

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Procedure

1. Using the alignment posts, place the speakers on the palm-rest assembly.
2. Replace the four screws (M2x2) that secure the speakers to the palm-rest assembly.
3. Route the speaker cables through the routing guides on the palm-rest assembly.
4. Connect the speaker cable to the audio daughter-board.

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the wireless card

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Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Loosen the captive screw that secures the wireless-card bracket to the wireless card.
2. Lift the wireless-card bracket off the wireless card.
3. Disconnect the antenna cables from the wireless card.
4. Slide and remove the wireless card out of the wireless-card slot.

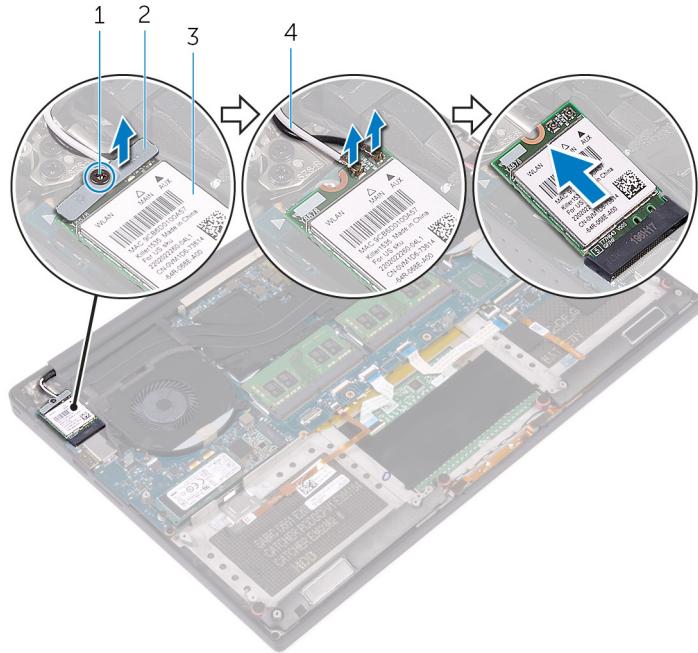


Figure 14. Removing the wireless card

- | | |
|------------------|--------------------------|
| 1. captive screw | 2. wireless-card bracket |
| 3. wireless card | 4. antenna cables (2) |

Replacing the wireless card

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Procedure

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

1. Align the notch on the wireless card with the tab on the wireless-card slot and slide the card into the slot.
2. Connect the antenna cables to the wireless card. The following table provides the antenna-cable color scheme for the wireless card 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

3. Align the screw hole on the wireless-card bracket with the screw-hole on the wireless card.
4. Tighten the captive screw that secures the wireless-card bracket to the wireless card.

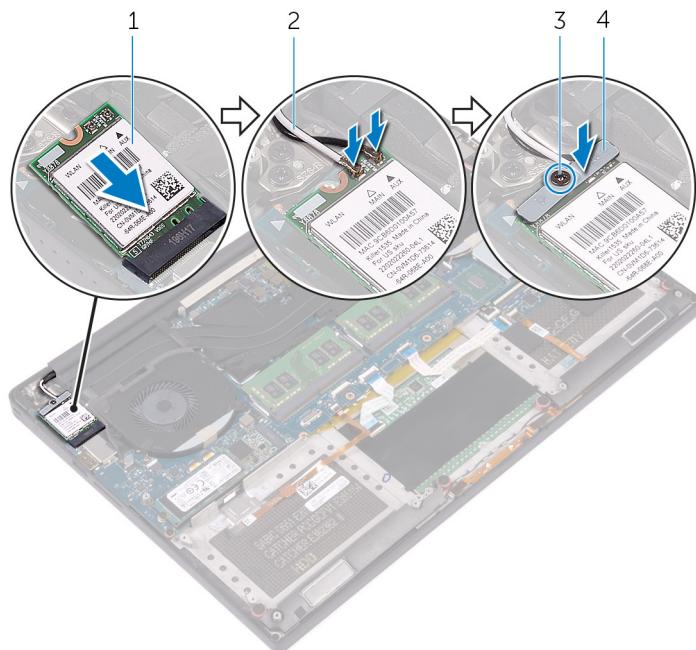


Figure 15. Replacing the wireless card

1. wireless card
2. antenna cables (2)
3. captive screw
4. wireless-card bracket

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the fans

i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Remove the two screws (M2x4) that secure the video fan (JFAN_2) to the system board.
2. Disconnect the touch-screen cable (optional) from the system board.
i **NOTE:** The touch-screen cable is available only on laptop configurations with touch displays.
3. Peel off the tape that secures the touch-screen cable (optional) to the video fan (JFAN_2).
4. Note the routing of the touch-screen cable and remove the cable from the routing guides on the video fan (JFAN_2).
5. Disconnect the video fan (JFAN_2) cable from the system board.
6. Lift the video fan (JFAN_2) away from the palm-rest assembly.

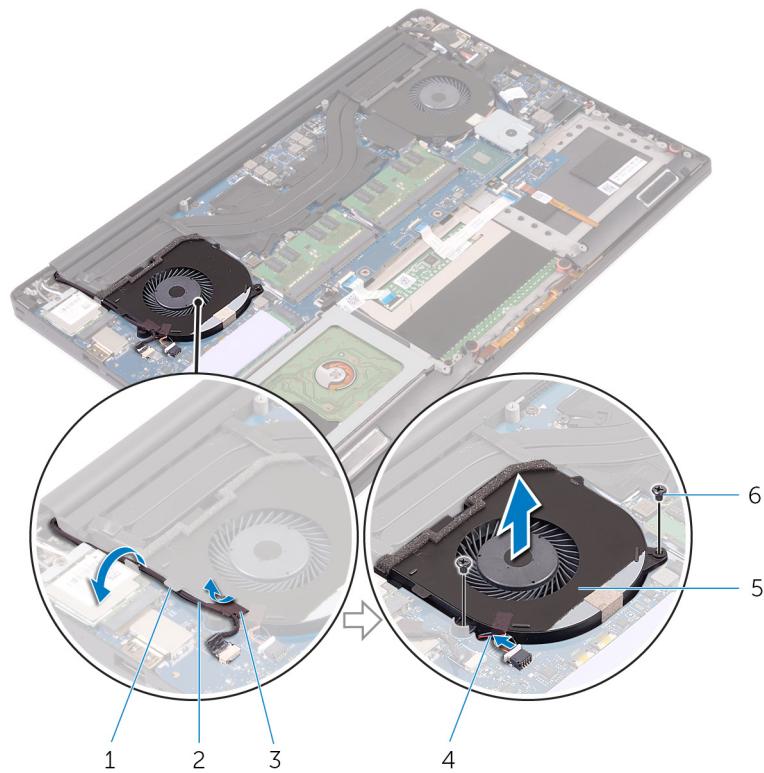


Figure 16. Removing the video fan

- | | |
|-----------------------|----------------------------------|
| 1. routing guide | 2. touch-screen cable (optional) |
| 3. tape | 4. fan cable |
| 5. video fan (JFAN_2) | 6. screws (2) |
7. Remove the two screws (M2x4) that secure the processor fan (JFAN_1) to the system board.
8. Note the routing of the display cable and remove the cable from the processor fan (JFAN_1).
9. Disconnect the processor fan (JFAN_1) cable from the system board.
10. Lift the processor fan (JFAN_1) away from the palm-rest assembly.

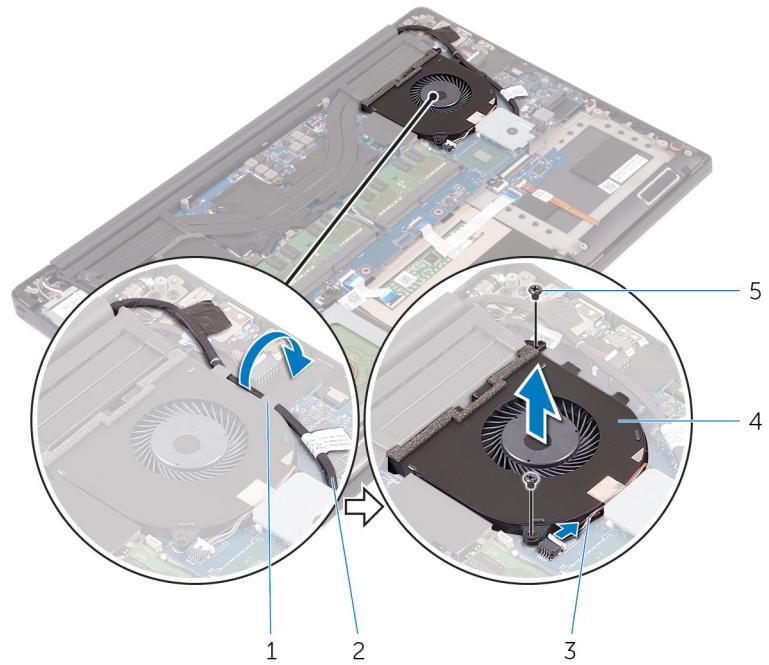


Figure 17. Removing the processor fan

- | | |
|------------------|---------------------------|
| 1. routing guide | 2. display cable |
| 3. fan cable | 4. processor fan (JFAN_1) |
| 5. screws (2) | |

Replacing the fans

i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the processor fan (JFAN_1) with the screw holes on the palm-rest assembly.
2. Connect the processor fan (JFAN_1) cable to the system board.
3. Route the display cable through the routing guides on the processor fan (JFAN_1).
4. Replace the two screws (M2x4) that secure the processor fan (JFAN_1) to the system board.
5. Align the screw holes on the video fan (JFAN_2) with the screw holes on the palm-rest assembly.
6. Connect the video fan (JFAN_2) cable to the system board.
7. Route the touch-screen cable (optional) through the routing guides on the video fan (JFAN_2).
8. Adhere the tape that secures the touch-screen cable (optional) to the video fan (JFAN_2).
9. Connect the display cable to the system board.
10. Replace the two screws (M2x4) that secure the video fan (JFAN_2) to the system board.

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the heat-sink assembly

i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

i **NOTE:** The heat sink may become hot during normal operation. Allow sufficient time for the heat sink to cool before you touch it.

⚠ CAUTION: For maximum cooling of the processor, do not touch the heat transfer areas on the heat sink. The oils in your skin can reduce the heat transfer capability of the thermal grease.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Remove the five screws (M2x3) that secure the heat-sink assembly to the system board.

i **NOTE:** Depending on the configuration ordered, some configurations may have four screws (M2x3).

2. Lift the heat-sink assembly off the system board.

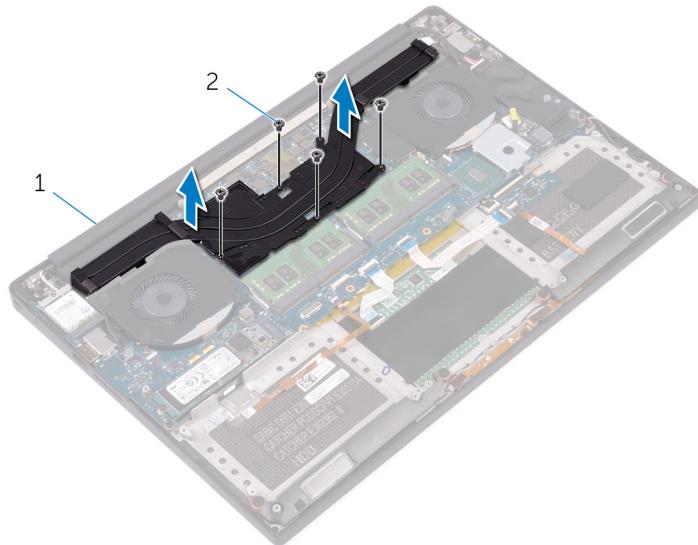


Figure 18. Removing the heat-sink assembly

- a. heat-sink assembly
- b. screws (5/4)

Replacing the heat-sink assembly

 **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

 **CAUTION:** Incorrect alignment of the heat sink can damage the system board and processor.

 **NOTE:** If either the system board or the fan and heat-sink assembly is replaced, use the thermal pad/paste provided in the kit to ensure that thermal conductivity is achieved.

Procedure

1. Align the screw holes on the heat-sink assembly with the screw holes on the system board.
2. Replace the five screws (M2x3) that secure the heat-sink assembly to the system board.

 **NOTE:** Depending on the configuration ordered, some configurations may have four screws (M2x3).

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the memory modules

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

Procedure

1. Using your fingertips, spread apart the securing clips on each end of the memory-module slot until the memory module pops up.
2. Slide and remove the memory module from the memory-module slot.

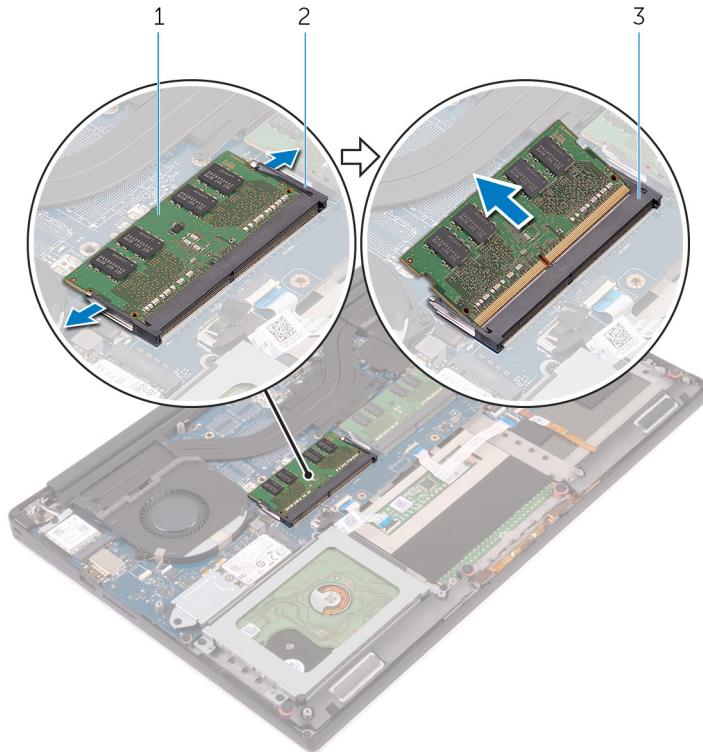


Figure 19. Removing the memory modules

- a. memory module
- b. securing clips (2)
- c. memory-module slot

Replacing the memory modules

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

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 and gently 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.

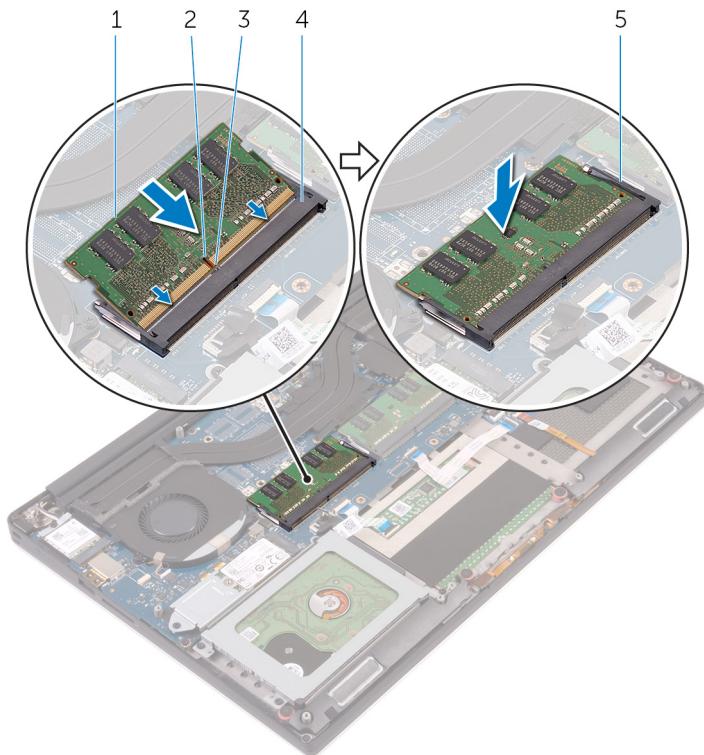


Figure 20. Replacing the memory modules

- | | |
|-------------------|-----------------------|
| 1. memory module | 2. notch |
| 3. tab | 4. memory-module slot |
| 5. securing clips | |

Post-requisites

1. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
2. Replace the [base cover](#).

Removing the system board

i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

i **NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

i **NOTE:** Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

i **NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.

Prerequisites

i **NOTE:** Remove the SD card before removing the system board to avoid damage to the SD card.

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).
4. Follow the procedure from step 1 to step 4 in “[Removing the hard drive](#)”.
5. Remove the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
6. Remove the [fans](#).
7. Remove the [heat-sink assembly](#).
8. Remove the [memory modules](#).

Procedure

i **NOTE:** The touch-screen cable is available only on laptop configurations with touch displays.

1. Remove the screw (M2x2) that secures the display-cable bracket to the system board.
2. Lift the solid-state drive bracket to access the display cable.
3. Disconnect the display cable from the system board.

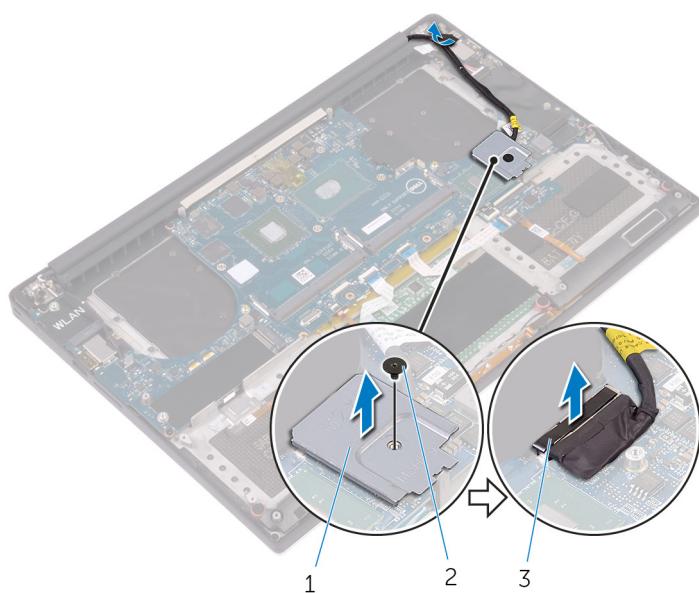


Figure 21. Disconnecting the display cable

- a. display-cable bracket
 - b. screw
 - c. display cable
4. Disconnect the power-adapter port cable, speaker cable, keyboard-control board cable, touch-pad cable and fingerprint reader cable from the system board.
 5. Peel off the tape and disconnect the touch-screen cable from the system board.

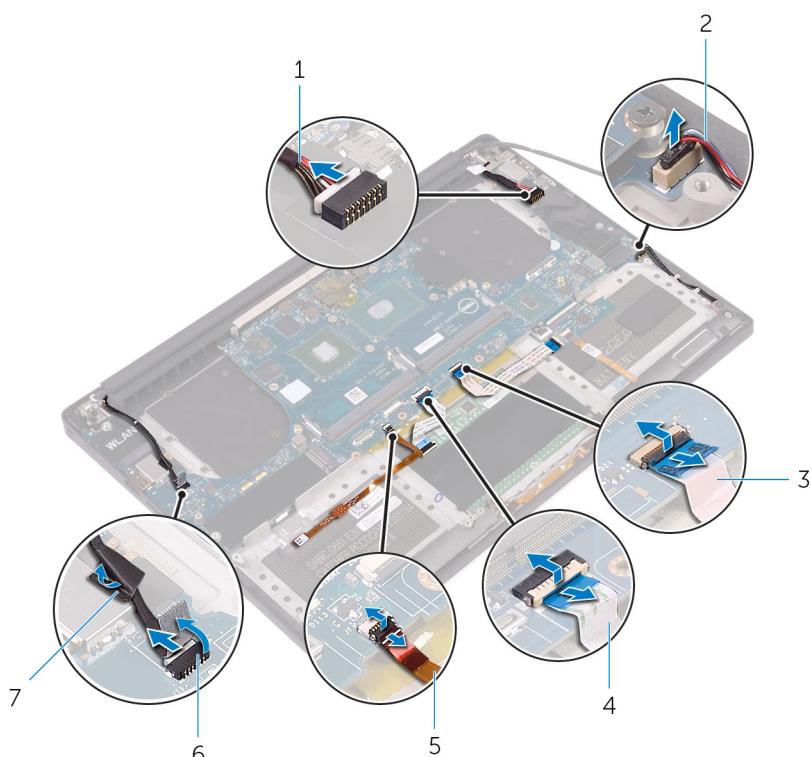


Figure 22. Disconnecting the cables

- | | |
|---------------------------------|----------------------------------|
| 1. power-adapter port cable | 2. speaker cable |
| 3. keyboard-control board cable | 4. touch-pad cable |
| 5. fingerprint reader cable | 6. touch-screen cable (optional) |

7. tape
 6. Remove the five screws (M2x4) that secure the system board to the palm-rest assembly.
 7. Lift the system board off the palm-rest assembly.
- CAUTION:** Hold the system board from the center. The circuitry on the sides is delicate and can be easily damaged if the system board is held in any other way.

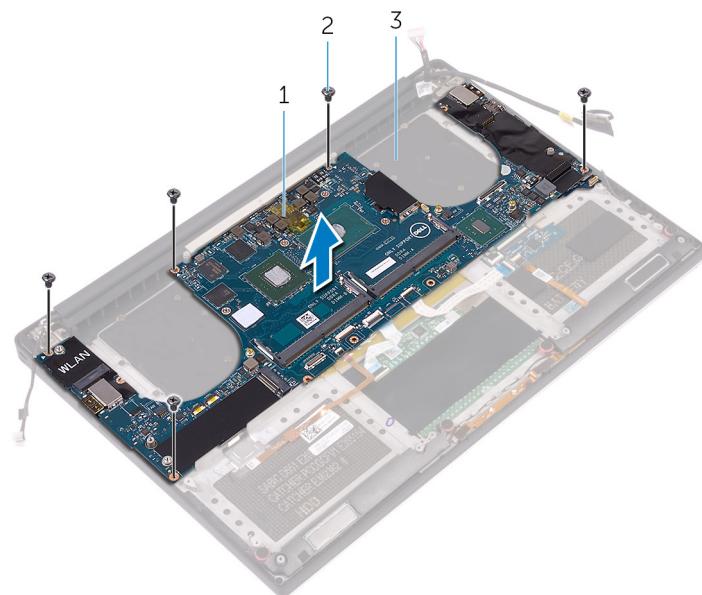


Figure 23. Removing the system board

- a. system board
- b. screws (5)
- c. palm-rest assembly

Replacing the system board

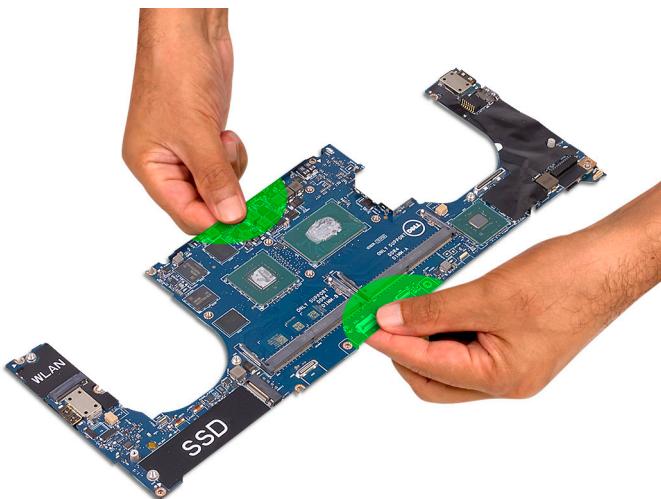
i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

i **NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.

i **NOTE:** Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Procedure

△ CAUTION: When replacing the system board, it is important to hold it at the center of the board as shown in the image. The circuitry on the sides of the board is fragile and can be easily damaged if the system board is held at the sides or neck area.



i **NOTE:** When replacing the system board, angle the system board onto the palm-rest assembly with the SD-card slot side. Angling it this way while mounting the system board gives sufficient clearance as the audio daughter-board is beneath the other side of the system board.



1. Align the screw holes on the system board with the screw holes on the palm-rest assembly.
2. Replace the five screws (M2x4) that secure the system board to the palm-rest assembly.
3. Adhere the tape and connect the touch-screen cable to the system board.
4. Connect the power-adapter port cable, speaker cable, keyboard-control board cable, touch-pad cable and fingerprint reader to the system board.
5. Connect the display cable to the system board.
6. Align the screw hole on the display-cable bracket with the screw hole on the system board.
7. Replace the screw (M2x2) that secures the display-cable bracket to the system board.

Post-requisites

1. Replace the [memory modules](#).
2. Replace the [heat-sink assembly](#).
3. Replace the [fans](#).
4. Replace the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
5. Follow the procedure from step 3 to step 6 in “[Replacing the hard drive](#)”.
6. Replace the [wireless card](#).
7. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
8. Replace the [base cover](#).

Removing the audio daughter-board

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).
4. Follow the procedure from step 1 to step 4 in “[Removing the hard drive](#)”.
5. Remove the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
6. Remove the [fans](#).
7. Remove the [heat-sink assembly](#).
8. Remove the [memory modules](#).
9. Remove the [system board](#).

Procedure

1. Remove the two screws (M2x3) that secures the audio daughter-board to the system board.
2. Lift the audio daughter-board off the system board and turn the audio daughter-board over.

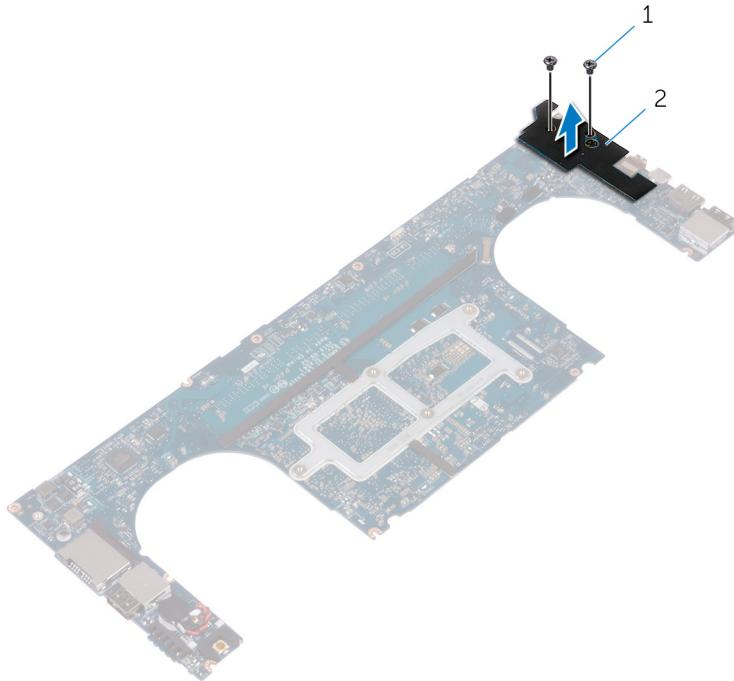


Figure 24. Removing the audio daughter-board

- a. screws (2)

b. audio daughter-board

Replacing the audio daughter-board

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Turn the audio daughter-board over and place the audio daughter-board into the slot on the system board.
2. Replace the screw (M2x3) that secures the audio daughter-board to the system board.

Post-requisites

1. Replace the [system board](#).
2. Replace the [memory modules](#).
3. Replace the [heat-sink assembly](#).
4. Replace the [fans](#).
5. Replace the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
6. Follow the procedure from step 3 to step 6 in “[Replacing the hard drive](#)”.
7. Replace the [wireless card](#).
8. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
9. Replace the [base cover](#).

Removing the coin-cell battery

i **NOTE:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

⚠ CAUTION: Removing the coin-cell battery resets the BIOS setup program's settings to default. It is recommended that you note the BIOS setup program's settings before removing the coin-cell battery.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).
4. Follow the procedure from step 1 to step 4 in “[Removing the hard drive](#)”.
5. Remove the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
6. Remove the [fans](#).
7. Remove the [heat-sink assembly](#).
8. Remove the [memory modules](#).
9. Remove the [system board](#).

Procedure

1. Turn the system board over.
2. Disconnect the coin-cell battery cable from the system board.
3. Note the location of the coin-cell battery and pry it off the system board.

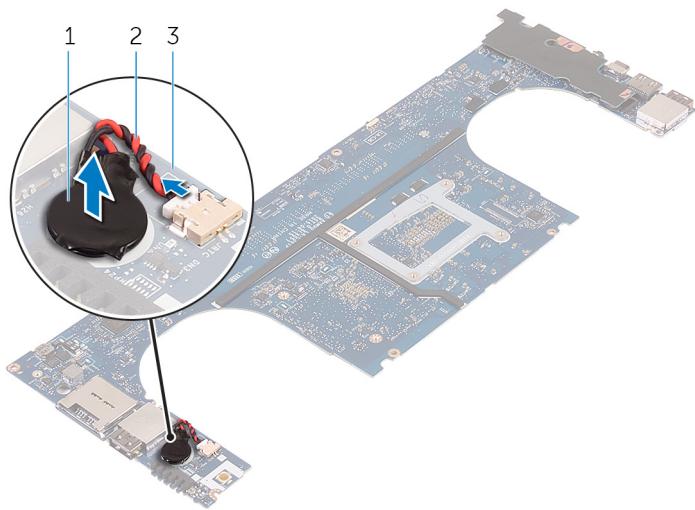


Figure 25. Removing the coin-cell battery

- a. coin-cell battery
- b. coin-cell battery cable

c. system board

Replacing the coin-cell battery

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Adhere the coin-cell battery to the system board.
2. Connect the coin-cell battery cable to the system board.
3. Turn the system board over.

Post-requisites

1. Replace the [system board](#).
2. Replace the [memory modules](#).
3. Replace the [heat-sink assembly](#).
4. Replace the [fans](#).
5. Replace the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
6. Follow the procedure from step 3 to step 6 in “[Replacing the hard drive](#)”.
7. Replace the [wireless card](#).
8. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
9. Replace the [base cover](#).

Removing the keyboard

i | NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Follow the procedure from step 1 to step 4 in “[Removing the hard drive](#)”.
4. Remove the [system board](#).

Procedure

1. Open the latches and disconnect the keyboard cable and keyboard-backlight cable from the keyboard-controls board.
2. Lift up the Mylar to access the screws that secure the keyboard to the palm-rest assembly.

i | NOTE: All new keyboards will be shipped with the Mylar. Do not peel off the Mylar.

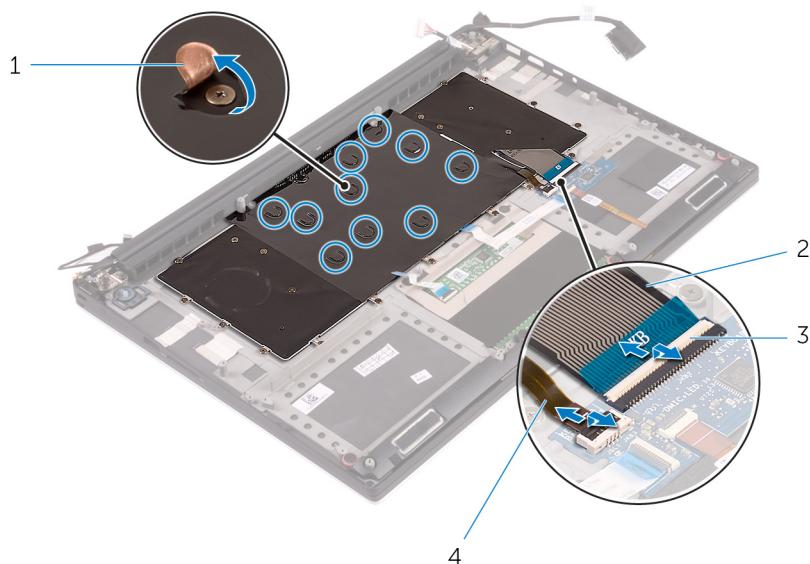


Figure 26. Disconnecting the keyboard and keyboard-backlight cable

- | | |
|----------------|-----------------------------|
| 1. Mylar | 2. keyboard cable |
| 3. latches (2) | 4. keyboard-backlight cable |
3. Remove the 31 screws (M1.6x1.5) that secure the keyboard to the palm-rest assembly.
 4. Lift the keyboard off the palm-rest assembly.

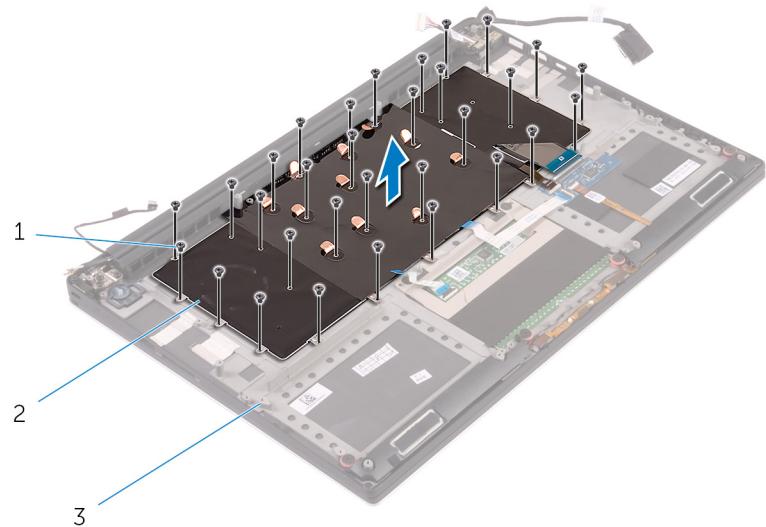


Figure 27. Removing the screws from the keyboard

- a. screws (31)
- b. keyboard
- c. palm-rest assembly

Replacing the keyboard

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the keyboard with the screw holes on the palm-rest assembly.
2. Replace the 31 screws (M1.6x1.5) that secure the keyboard to the palm-rest assembly.
3. Adhere the Mylar to the screws that secure the keyboard to the palm-rest assembly.
4. Connect the keyboard cable and keyboard-backlight cable to the keyboard-controls board.

Post-requisites

1. Replace the [system board](#).
2. Follow the procedure from step 3 to step 6 in “[Replacing the hard drive](#)”.
3. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
4. Replace the [base cover](#).

Removing the display assembly

i | NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).

Procedure

i | NOTE: The touch-screen cable is available only on laptop configurations with touch displays.

1. Remove the screw (M2x2) that secures the display-cable bracket to the system board.
2. Disconnect the touch-screen cable and display cable from the system board.
3. Peel off the tape and remove the touch-screen cable from the routing guides on the fan.

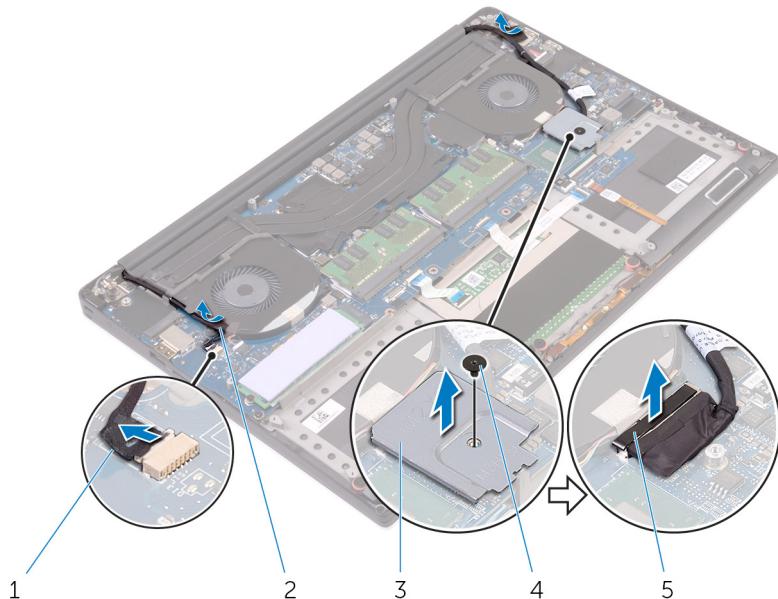


Figure 28. Disconnecting the cables

1. touch-screen cable (optional)
 2. tape
 3. display-cable bracket
 4. screw
 5. display cable
-
4. Turn the computer over and open the display at an angle of 90 degrees.
 5. Rotate the computer and place it on the edge of the table in a position that allows access to the screws on the display hinges.

6. Remove the six screws (M2.5x5) that secure the display hinges to the palm-rest assembly.
7. Carefully lift the display assembly from the palm-rest assembly

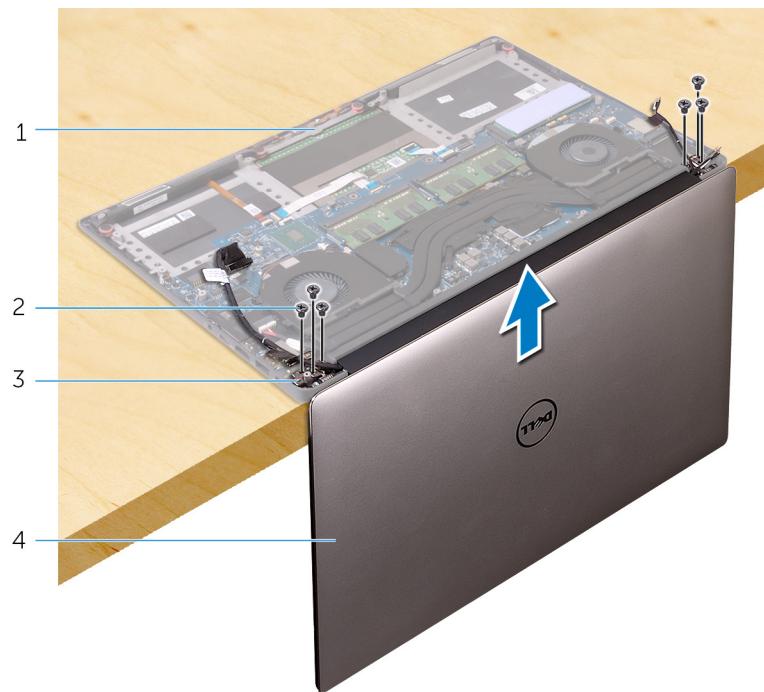


Figure 29. Removing the screws that secure the display hinges to palm-rest assembly

- | | |
|-----------------------|---------------------|
| 1. palm-rest assembly | 2. screws (6) |
| 3. display hinges (2) | 4. display assembly |
8. Carefully place the display assembly on a clean, flat surface.



Figure 30. Display assembly

- a. display assembly

Replacing the display assembly

i | NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Place the palm-rest assembly at the edge of the table with the speakers facing away from the edge.
2. Align the screw holes on the palm-rest assembly with the screw holes on the display hinges.
3. Replace the six screws (M2.5x5) that secure the display hinges to the palm-rest assembly.
4. Adhere the tape and route the touch-screen cable (optional) through the routing guides on the fan.
5. Connect the touch-screen cable and display cable to the system board.

i | NOTE: The touch-screen cable is available only on laptop configurations with touch displays.

6. Replace the screw (M2x2) that secures the display-cable bracket to the system board.

Post-requisites

1. Replace the [wireless card](#).
2. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Replace the [base cover](#).

Removing the power-adapter port

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [display assembly](#).

Procedure

1. Disconnect the power-adapter port cable from the system board.
2. Remove the screw (M2x3) that secures the power-adapter port to the palm-rest assembly.
3. Lift the power-adapter port along with its cable, off the palm-rest assembly.

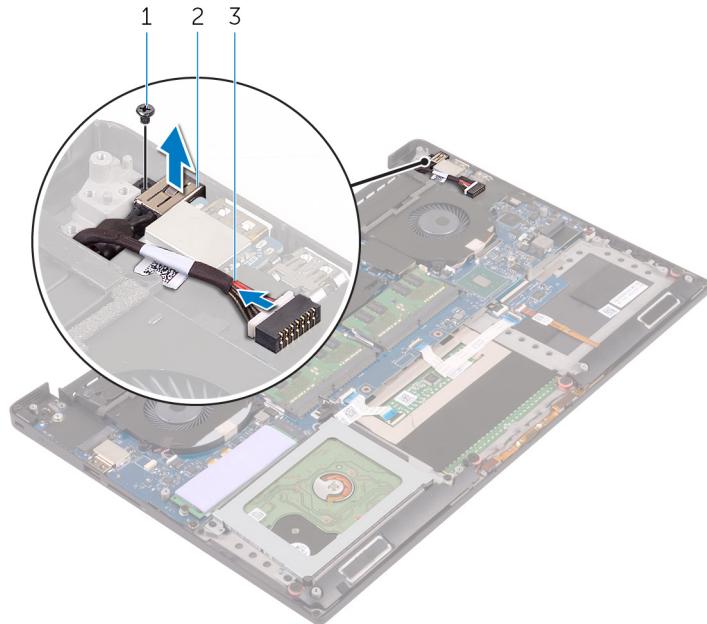


Figure 31. Removing the power-adapter port

- a. screw
- b. power-adapter port
- c. power-adapter port cable

Replacing the power-adapter port

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Place the power-adapter port into the slot on the palm-rest assembly.
2. Route the power-adapter port cable through its routing guides on the palm-rest assembly.
3. Replace the screw (M2x3) that secures the power-adapter port to the palm-rest assembly.
4. Connect the power-adapter port cable to the system board.

Post-requisites

1. Replace the [display assembly](#).
2. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Replace the [base cover](#).

Removing the antenna cover

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).

Procedure

1. Carefully turn the display hinges at an angle.

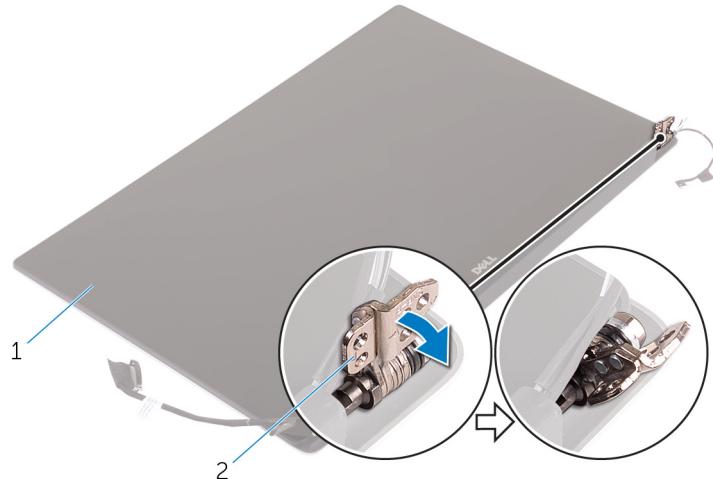


Figure 32. Turning the display hinge

- a. display assembly
- b. display hinges (2)

2. Slide and lift the antenna cover away from the display assembly.

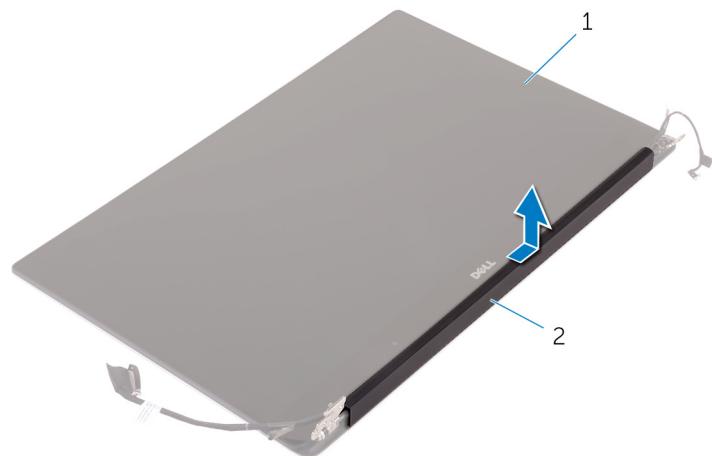


Figure 33. Removing the antenna cover

- a. display assembly
- b. antenna cover

Replacing the antenna cover

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Replace the antenna cover on the display assembly.
2. Turn the display hinges to the normal position.

Post-requisites

1. Replace the [display assembly](#).
2. Replace the [wireless card](#).
3. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
4. Replace the [base cover](#).

Removing the display hinges

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

(i) NOTE: These instructions are applicable only for laptops with a non-touchscreen display.

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).
5. Remove the [antenna cover](#).

Procedure

1. Peel off the tape to access the screws on the display hinges.

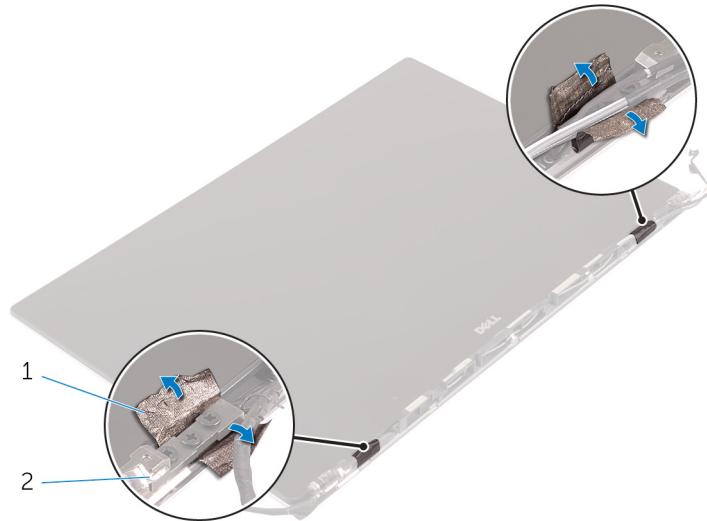


Figure 34. Peeling the tape

- a. tape
 - b. display hinges (2)
2. Remove the six screws (M2.5x5) that secure the display hinges to the display assembly.
 3. Carefully lift the display hinges off the display assembly.



Figure 35. Removing the display hinges

- a. screws (6)
- b. display hinges (2)

Replacing the display hinges

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the display hinges with the screw holes on the display assembly.
2. Replace the six screws (M2.5x5) that secure the display hinges to the display assembly.
3. Adhere the tape to the display hinges.

Post-requisites

1. Replace the [antenna cover](#).
2. Replace the [display assembly](#).
3. Replace the [wireless card](#).
4. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
5. Replace the [base cover](#).

Removing the antenna module

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

(i) NOTE: These instructions are applicable only for laptops with a non-touchscreen display.

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [wireless card](#).
4. Remove the [display assembly](#).
5. Remove the [antenna cover](#).

Procedure

1. Peel the tape that covers the antenna cables.
2. Remove the four screws (M2x4) that secure the antenna module to the display assembly.
3. Lift the antenna module away from the display assembly.

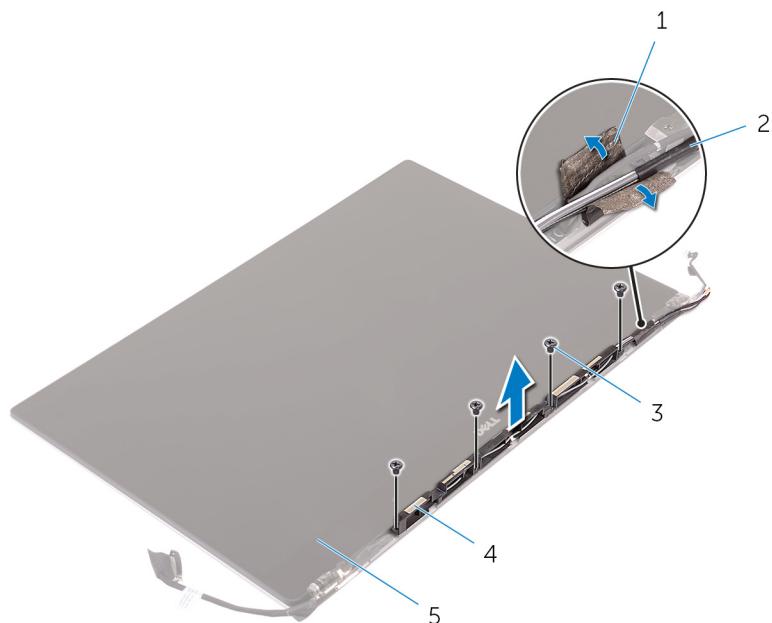


Figure 36. Removing the antenna module

- | | |
|---------------------|-------------------|
| 1. tape | 2. antenna cable |
| 3. screws (4) | 4. antenna module |
| 5. display assembly | |

Replacing the antenna module

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the antenna module with the screw holes on the display assembly.
2. Replace the four screws (M2x4) that secure the antenna module to the display assembly.
3. Adhere the tape that covers the antenna cable.

Post-requisites

1. Replace the [antenna cover](#).
2. Replace the [display assembly](#).
3. Replace the [wireless card](#).
4. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
5. Replace the [base cover](#).

Removing the palm-rest assembly

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Prerequisites

(i) NOTE: Remove the SD card before removing the palm-rest assembly to avoid damage to the SD card.

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [memory modules](#).
4. Follow the procedure from step 1 to step 4 in “[Removing the hard drive](#)”.
5. Remove the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
6. Remove the [wireless card](#).
7. Remove the [speakers](#).
8. Remove the [heat-sink assembly](#).
9. Remove the [fans](#).
10. Remove the [display assembly](#).
11. Remove the [power-adapter port](#).
12. Remove the [system board](#).
13. Remove the [keyboard](#).

Procedure

After performing the steps in the prerequisites we are left with the palm-rest assembly.



Figure 37. Removing the palm-rest assembly

1. palm-rest assembly

Replacing the palm-rest assembly

(i) NOTE: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices, see the Regulatory Compliance home page at www.dell.com/regulatory_compliance.

Procedure

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

Post-requisites

1. Replace the [keyboard](#).
2. Replace the [system board](#).
3. Replace the [power-adapter port](#).
4. Replace the [display assembly](#).
5. Replace the [fans](#).
6. Replace the [heat-sink assembly](#).
7. Replace the [speakers](#).
8. Replace the [wireless card](#).
9. Replace the [solid-state drive \(half-length\)](#) or the [solid-state drive \(full-length\)](#).
10. Follow the procedure from step 3 to step 6 in “[Replacing the hard drive](#)”.
11. Replace the [memory modules](#).
12. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
13. Replace the [base cover](#).

Downloading drivers

Downloading the audio driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & Downloads > Find it myself**.
5. Scroll down the page and expand **Audio**.
6. Click **Download** to download the audio driver for your computer.
7. After the download is complete, navigate to the folder where you saved the audio driver file.
8. Double-click the audio driver file icon and follow the instructions on the screen to install the driver.

Downloading the graphics driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & downloads > Find it myself**.
5. Scroll down the page and expand **Video**.
6. Click **Download** to download the graphics driver for your computer.
7. After the download is complete, navigate to the folder where you saved the graphics driver file.
8. Double-click the graphics driver file icon and follow the instructions on the screen to install the driver.

Downloading the USB 3.0 driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & Downloads > Find it myself**.
5. Scroll down the page and expand **Chipset**.
6. Click **Download** to download the USB 3.0 driver for your computer.
7. After the download is complete, navigate to the folder where you saved USB 3.0 driver file.
8. Double-click the USB 3.0 driver file icon and follow the instructions on screen to install the driver.

Downloading the Wi-Fi driver

1. Turn on the computer.
2. Go to www.dell.com/support.
3. Click **Product support**, enter the Service Tag of your computer, and then click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & downloads > Find it myself**.
5. Scroll down the page and expand **Network**.
6. Click **Download** to download the Wi-Fi driver for your computer.
7. After the download is complete, navigate to the folder where you saved the Wi-Fi driver file.
8. Double-click the driver file icon and follow the instructions on the screen.

Downloading the media-card reader driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support**, enter the Service Tag of your computer, and then click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & downloads > Find it myself**.
5. Scroll down the page and expand **Chipset**.
6. Click **Download** to download the media-card reader driver for your computer.
7. After the download is complete, navigate to the folder where you saved the card reader driver file.
8. Double-click the card reader driver file icon and follow the instructions on the screen.

Downloading the chipset driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product Support**, enter the Service Tag of your computer, and then click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & downloads > Find it myself**.
5. Scroll down the page and expand **Chipset**.
6. Click **Download** to download the appropriate chipset driver for your computer.
7. After the download is complete, navigate to the folder where you saved the chipset driver file.
8. Double-click the chipset driver file icon and follow the instructions on the screen to install the driver.

Downloading the network driver

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support** enter the Service Tag of your computer and click **Submit**.
(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
4. Click **Drivers & downloads > Find it myself**.
5. Scroll down the page and expand **Network**.

6. Click **Download** to download the network driver for your computer.
7. Save the file, and after the download is complete, navigate to the folder where you saved the network driver file.
8. Double-click the network driver file icon and follow the instructions on screen.

System setup

i | NOTE: Depending on the computer and its installed devices, the items listed in this section may or may not be displayed.

Boot Sequence

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

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

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

- Removable Drive (if available)
 - STXXXX Drive
- i | NOTE:** XXX denotes the SATA drive number.
- Optical Drive (if available)
 - SATA Hard Drive (if available)
 - Diagnostics

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

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

Navigation keys

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

Keys	Navigation
Up arrow	Moves to the previous field.
Down arrow	Moves to the next field.
Enter	Selects a value in the selected field (if applicable) or follow the link in the field.
Spacebar	Expands or collapses a drop-down list, if applicable.
Tab	Moves to the next focus area.
	i NOTE: For the standard graphics browser only.
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.

BIOS overview

⚠ | 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.

i | 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

1. Turn on (or restart) your computer.
2. During POST, when the DELL logo is displayed, watch for the F2 prompt to appear, and then press F2 immediately.

i | NOTE: The F2 prompt indicates that the keyboard is initialized. This prompt can appear very quickly, so you must watch for it, and then press F2. If you press F2 before the F2 prompt, this keystroke is lost. 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.

System setup options

i | NOTE: Depending on this computer and its installed devices, the items listed in this section may or may not be displayed.

Table 3. System setup options—System information menu

General-System Information	
System Information	
BIOS Version	Displays the BIOS version number.
Service Tag	Displays the Service Tag of the computer.
Asset Tag	Displays the Asset Tag of the computer.
Ownership Tag	Displays the ownership tag of the computer.
Manufacture Date	Displays the manufacture date of the computer.
Ownership Date	Displays the ownership date of the computer.
Express Service Code	Displays the express service code of the computer.
Memory Information	
Memory Installed	Displays the total computer memory installed.
Memory Available	Displays the total computer memory available.
Memory Speed	Displays the memory speed.
Memory Channel Mode	Displays single or dual channel mode.
Memory Technology	Displays the technology used for the memory.
DIMM A Size	Displays the DIMM A memory size.
DIMM B Size	Displays the DIMM B memory size.
Processor Information	
Processor Type	Displays the processor type.
Core Count	Displays the number of cores on the processor.
Processor ID	Displays the processor identification code.
Current Clock Speed	Displays the current processor clock speed.
Minimum Clock Speed	Displays the minimum processor clock speed.
Maximum Clock Speed	Displays the maximum processor clock speed.

Table 3. System setup options—System information menu (continued)

General-System Information	
Processor L2 Cache	Displays the processor L2 Cache size.
Processor L3 Cache	Displays the processor L3 Cache size.
HT Capable	Displays whether the processor is hyper-threading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.
Device Information	
M.2 SATA	Displays the M.2 SATA device information.
Primary Hard Drive	Displays the primary hard drive.
M.2 PCIe SSD-0	Displays the M.2 PCIe solid state drive.
Passthrough MAC Address	Displays the pass-through MAC address.
Video Controller	Displays the video controller.
Video BIOS Version	Displays the video BIOS version.
Video Memory	Displays the video memory.
Panel Type	Displays the display panel type.
Native Resolution	Displays the display resolution.
Audio Controller	Displays the audio controller.
Wi-Fi Device	Displays the wireless device.
Bluetooth Device	Displays the Bluetooth device.
Battery Information	
Boot Sequence	
Boot Sequence	Displays the boot sequence.
Boot List Option	Displays the available boot options.
Advanced Boot Options	
Enable Legacy Option ROMs	Enable or disable legacy option ROMs.
Enable Attempt Legacy Boot	Enable or disable attempts to legacy boot when the computer fails to boot in UEFI boot mode.
Enable UEFI Network Stack	Enable or disable the UEFI network stack.
UEFI Boot Path Security	
Date/Time	
	Displays the current date in MM/DD/YY format and current time in HH:MM:SS AM/PM format.

Table 4. System setup options—System configuration menu

System Configuration	
SATA Operation	Configure operating mode of the integrated SATA hard drive controller.
Drives	Enable or disable various drives on board.
SMART Reporting	Enable or disable SMART reporting during system startup.
USB Configuration	
Enable Boot Support	Enable or disable booting from USB mass storage devices such as external hard drive, optical drive, and USB drive.
Enable External USB Port	Enable or disable the external USB port.
Enable Thunderbolt ports	Enable or disable the thunderbolt ports.

Table 4. System setup options—System configuration menu (continued)

System Configuration	
Enable Thunderbolt Boot Support	Enable or disable booting from USB mass storage devices connected to the thunderbolt ports.
Always Allow Dell Docks	Enable or disable the computer to always allow the Dell docking stations.
Enable Thunderbolt (and PCIe behind TBT) Pre-boot	Enable or disable the Thunderbolt (and PCIe behind Thunderbolt) preboot.
USB PowerShare	Enable or disable charging external devices through the USB PowerShare port.
Audio	Enable or disable the integrated audio controller.
Keyboard illumination	Configure the operating mode of the keyboard illumination feature.
Touchscreen	Enables or disables the touch screen.
Miscellaneous Devices	Enable or disable various onboard devices.
Enable Camera	Enable or disable the camera.
Enable Secure Digital (SD) Card	Enable or disable the SD card.
Enable Secure Digital (SD) Card Boot	Enable or disable booting from the SD card.
Secure Digital (SD) Card Read-Only Mode	Enable or disable the SD card read-only mode.

Table 5. System setup options—Video menu

Video	
LCD Brightness	Set the panel brightness independently for battery and AC power.

Table 6. System setup options—Security menu

Security	
Admin Password	Set, change, or delete the administrator password.
System Password	Set, change, or delete the system password.
Strong Password	Enable or disable strong passwords.
Password Configuration	Control the minimum and maximum number of characters allowed for administrator and system passwords.
Password Bypass	Bypass system (boot) password and internal hard disk password prompts during a system restart.
Password Change	Enable or disable changes to the system and hard disk passwords when an administrator password is set.
Non-Admin Setup Changes	Determines whether changes to the setup option are permitted when an administrator password is set.
UEFI Capsule Firmware Updates	Enable or disable BIOS updates through UEFI capsule update packages.
TPM 1.2 Security	Enable or disable Trusted Platform Module (TPM) visibility to the operating system.
Computrace(R)	Enable or disable the BIOS module interface of the optional Computrace service.
CPU XD Support	Enable or disable the execute disable mode of the processor.
OROM Keyboard Access	Enable or disable access to Option ROM (OROM) configuration screens during boot.
Admin Setup Lockout	Enable to prevent users from entering the BIOS setup when an administrator password is set.
Master Password Lockout	Enable or disable master password support.

Table 7. System setup options—Secure boot menu

Secure Boot	
Secure Boot Enable	Enable or disable the secure boot feature.
Expert Key Management	
Expert Key Management	Enable or disable expert key management.
Custom Mode Key Management	Select custom values for expert key management.

Table 8. System setup options—Intel Software Guard Extensions menu

Intel Software Guard Extensions	
Intel SGX Enable	Enable or disable Intel Software Guard Extensions (SGX).
Enclave Memory Size	Set the Intel SGX enclave reserve memory size.
Performance	
Multi Core Support	Enable multiple cores. Default: Enabled.
Intel SpeedStep	Enable or disable the Intel SpeedStep technology. Default: Enabled. (i) NOTE: If enabled, the processor clock speed and core voltage are adjusted dynamically based on the processor load.
C-States Control	Enable or disable additional processor sleep states. Default: Enabled.
Intel TurboBoost	Enable or disable Intel TurboBoost mode in the processor. Default: Enabled.
HyperThread control	Enable or disable hyper-threading in the processor. Default: Enabled.
Power Management	
AC Behavior	Enables the system to power-on automatically, when an AC power adaptor is connected.
Auto on Time	Enable to set the computer to turn on automatically every day or on a pre-selected date and time. This option can be configured only if the Auto On Time is set to everyday, weekdays, or selected days. Default: Disabled.
USB Wake Support	Enable the USB devices to wake the computer from standby mode.
Wake on LAN	Enable the LAN signal to wake the computer from standby mode. (i) NOTE: This feature only works when the computer is connected to an AC power adaptor.
Block Sleep	Enable or disable the sleep state.
Peak Shift	Configure the AC power usage.
Advanced Battery Charge Configuration	Enable from the beginning of the day to a specified work period.
Primary Battery Charge Configuration	Set the primary battery charge setting with a pre-selected custom charge start and stop. Default: Adaptive.
POST Behavior	
Adapter Warnings	Enable adapter warnings.

Table 8. System setup options—Intel Software Guard Extensions menu (continued)**Intel Software Guard Extensions**

	Default: Enabled.
Keypad (Embedded)	Enable or disable the keypad that is embedded in the internal keyboard.
Num lock Enable	Enable or disable the numeric lock—numlock.
	Default: Enabled.
Fn Key Emulation	Enable or disable the function (fn) key emulation.
Fn Lock Options	Enable or disable the function (fn) lock mode.
Fast-boot	Enable to set the speed of the boot process.
	Default: Thorough.
Extend BIOS POST Time	Configure the additional preboot delay.
Full Screen logo	Enable or disable the full screen logo.
Warnings and Errors	Configure the boot process behavior when warnings or errors are detected.

Table 9. System setup options—Manageability

MEBx Hotkey	Enable or disable the Intel Management Engine BIOS Extension (Intel MEBX) hot key when the system boots.
-------------	--

Table 10. System setup options—Virtualization support menu

Virtualization Support	
Virtualization	Specify whether a Virtual Machine Monitor can utilize the additional hardware capabilities provided by Intel Virtualization Technology.
VT for Direct I/O	Specify whether a Virtual Machine Monitor can utilize the additional hardware capabilities provided by Intel Virtualization Technology for Direct I/O.

Table 11. System setup options—Wireless menu

Wireless	
Wireless Switch	Determine which wireless devices can be controlled by the wireless switch.
Wireless Device Enable	Enable or disable internal wireless devices.

Table 12. System setup options—Maintenance menu

Maintenance	
Service Tag	Display the system's Service Tag.
Asset Tag	Create a system asset tag.
BIOS Downgrade	Control flashing of the system firmware to previous revisions.
Data Wipe	Enable to securely erase data from all internal storage devices.
BIOS Recovery	Enable to recover corrupted BIOS using a recovery file on the primary hard drive or from an external USB storage device.

Table 13. System setup options—System Logs menu

System Logs	
BIOS Events	Display BIOS-related events in system logs.
Thermal Events	Display thermal-related events in system logs.
Power Events	Display power-related events in system logs.

Table 14. System setup options—SupportAssist System Resolution

SupportAssist System Resolution	
Auto OS Recovery Threshold	Control the automatic boot flow for the SupportAssist System Resolution console and for the Dell OS Recovery tool.
SupportAssist OS Recovery	Enable or disable the boot flow for the SupportAssist OS Recovery tool in the event of certain system errors.

System and setup password

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

Password type	Description
---------------	-------------

System password Password that you must enter to log on to your system.

Setup password Password that you must enter to access and make changes to the BIOS settings of your computer.

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

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

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

Assigning a system password and setup password

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

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

1. In the **System BIOS** or **System Setup** screen, select **Security** and press Enter.
The **Security** screen is displayed.
2. Select **System Password** and create a password in the **Enter the new password** field.

Use the following guidelines to assign the system password:

- A password can have up to 32 characters.
- The password can contain the numbers 0 through 9.
- Only lower case letters are valid, upper case letters are not allowed.
- Only the following special characters are allowed: space, ("), (+), (,), (-), (.), (/), (:) , ([), (\), (]), (^).

3. Type the system password that you entered earlier in the **Confirm new password** field and click **OK**.
4. Press Esc and a message prompts you to save the changes.
5. Press Y to save the changes.
The computer reboots.

Deleting or changing an existing system and/or setup password

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

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

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

(i) NOTE: If you change the System and/or Setup password, re-enter the new password when prompted. If you delete the System and/or Setup password, confirm the deletion when prompted.

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

Clearing forgotten passwords

Contact Dell technical support to clear the forgotten passwords, see www.dell.com/contactdell.

Clearing CMOS settings

1. Remove the [base cover](#).
2. Remove the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
3. Remove the [coin-cell battery](#).
4. Wait for one minute.
5. Replace the [coin-cell battery](#).
6. Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
7. Replace the [base cover](#).

Real Time Clock (RTC) battery reset

Press and hold the power button for 25 seconds to force Real Time Clock (RTC) battery reset.

Flashing BIOS (USB key)

1. Follow the procedure from step 1 to step 7 in "[Flashing the BIOS](#)" to download the latest BIOS setup program file.
2. Create a bootable USB drive. For more information see the knowledge base article [SLN143196](#) at www.dell.com/support.
3. Copy the BIOS setup program file to the bootable USB drive.
4. Connect the bootable USB drive to the computer that needs the BIOS update.
5. Restart the computer and press **F12** when the Dell logo is displayed on the screen.
6. Boot to the USB drive from the **One Time Boot Menu**.
7. Type the BIOS setup program filename and press **Enter**.
8. The **BIOS Update Utility** appears. Follow the instructions on the screen to complete the BIOS update.

Troubleshooting

Drain residual flea power (perform hard reset)

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

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

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

To drain residual flea power (perform a hard reset)

1. Turn off your computer.
2. Disconnect the power adapter from your computer.
3. Remove the [base cover](#).
4. Disconnect the battery cable from the system board.



5. Press and hold the power button for 20 seconds to drain the flea power.

(i) NOTE: Performing the above steps releases the flea power from your computer.

6. Connect the battery cable to the system board.
7. Replace the [base cover](#).
8. Connect the power adapter to your computer.
9. Turn on your computer.

(i) NOTE: For more information about performing a hard reset, see the knowledge base article [SLN85632](#) at www.dell.com/support.

Flashing the BIOS

You may need to flash (update) the BIOS when an update is available or when you replace the system board.

Follow these steps to flash the BIOS:

1. Turn on your computer.
2. Go to www.dell.com/support.
3. Click **Product support**, enter the Service Tag of your computer, and then click **Submit**.

(i) NOTE: If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.

4. Click **Drivers & downloads > Find it myself**.
5. Select the operating system installed on your computer.
6. Scroll down the page and expand **BIOS**.
7. Click **Download** to download the latest version of the BIOS for your computer.
8. After the download is complete, navigate to the folder where you saved the BIOS update file.
9. Double-click the BIOS update file icon and follow the instructions on the screen.

SupportAssist diagnostics

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

(i) 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.

For more information, see [SupportAssist Pre-Boot System Performance Check](#).

Diagnostics

Power and battery-status light

Indicates the power and battery-charge status.

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

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

Off

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

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

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

The following table shows different light patterns and what they indicate.

Table 15. Diagnostics

Light Pattern	Problem description
2,1	CPU failure
2,2	System board: BIOS and ROM failure
2,3	No memory or RAM detected
2,4	Memory or RAM failure
2,5	Invalid memory installed
2,6	System board or chipset error
2,7	LCD failure
3,1	CMOS battery failure
3,2	PCI/video card failure
3,3	Recovery image not found
3,4	Recovery image found but invalid

The computer may emit a series of beeps during start-up if the errors or problems cannot be displayed. The repetitive beep codes help the user troubleshoot problems with the computer.

Wi-Fi power cycle

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

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

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

Getting help and contacting Dell

Self-help resources

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

Table 16. Self-help resources

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

Contacting Dell

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

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

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