

XPS 15

Service Manual

Computer Model: XPS 15-9560
Regulatory Model: P56F
Regulatory Type: P56F001



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.
- 6 Close the display and turn the computer over.

Safety instructions

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



WARNING: 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.



WARNING: 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:** To avoid damaging the components and cards, handle them by their edges, and avoid touching pins and 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 shipped with the product or at www.dell.com/regulatory_compliance.
-  **CAUTION:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.
-  **CAUTION:** When you disconnect a cable, pull 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
- 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	

Component	Secured to	Screw type	Quantity	Screw image
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	
Display hinges	Palm-rest assembly	M2.5x5	6	
Power-adaptor 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.

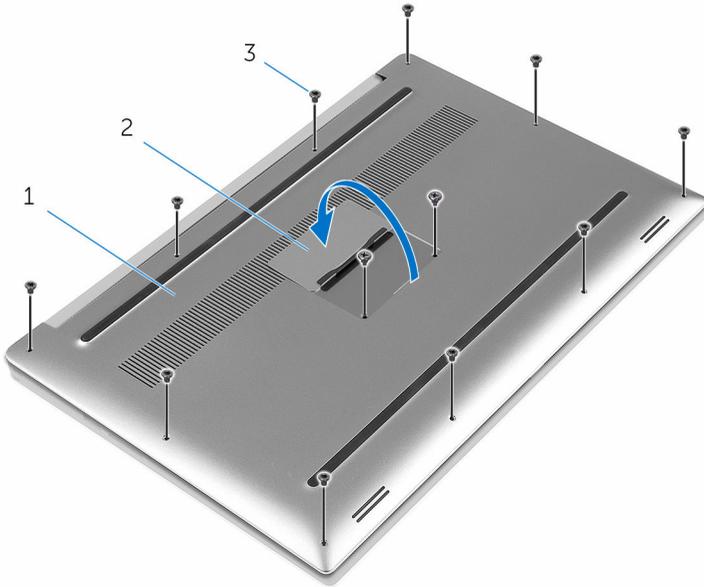


Figure 1. Removing the base cover

- | | | | |
|---|-------------|---|--------------|
| 1 | base cover | 2 | system badge |
| 3 | screws (12) | | |

- Using a plastic scribe, gently pry the base cover off the palm-rest assembly.

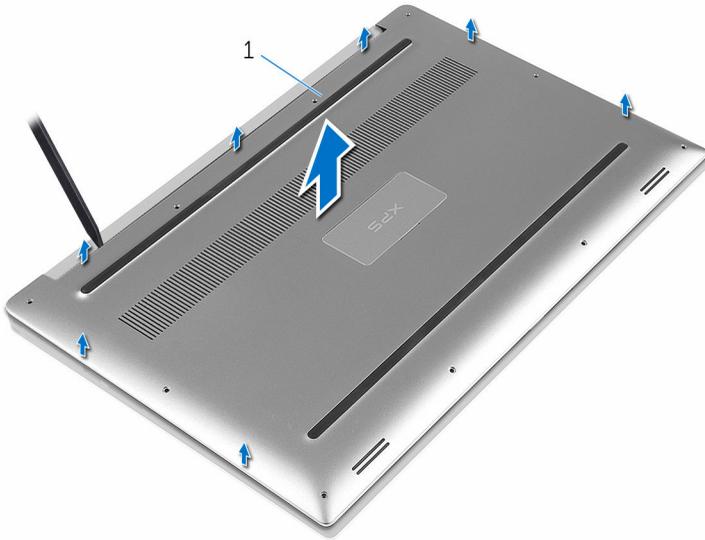


Figure 2. Prying the base cover off the computer base

- 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 base cover 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)



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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.

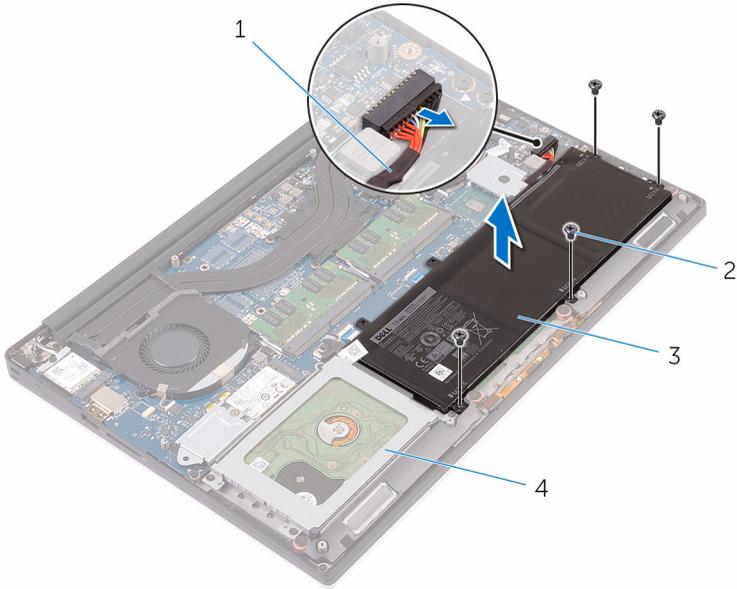


Figure 3. Removing the battery

- | | | | |
|---|---------------|---|--------------------|
| 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.

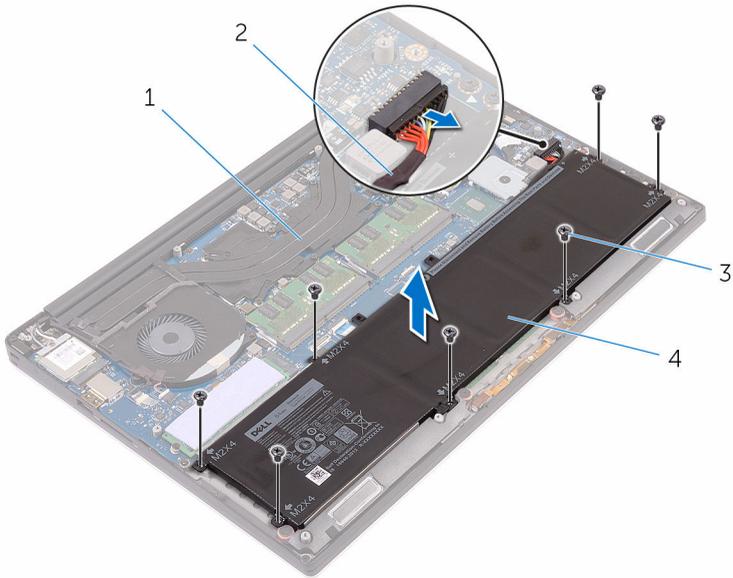


Figure 4. Removing the battery

- | | | | |
|---|--------------------|---|---------------|
| 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 \(half-length\)](#) or the [battery \(full-length\)](#).

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.

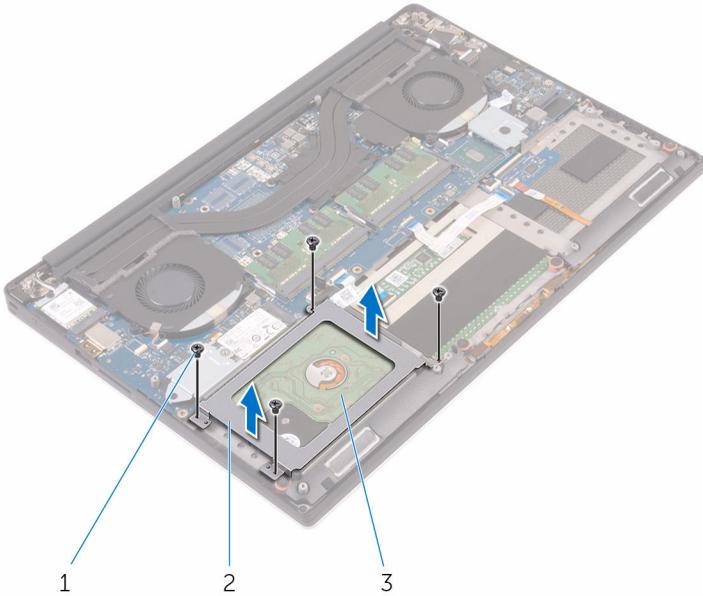


Figure 5. Removing the hard-drive cage

- | | | | |
|---|---------------------|---|-----------------|
| 1 | screws (4) | 2 | hard-drive cage |
| 3 | 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.

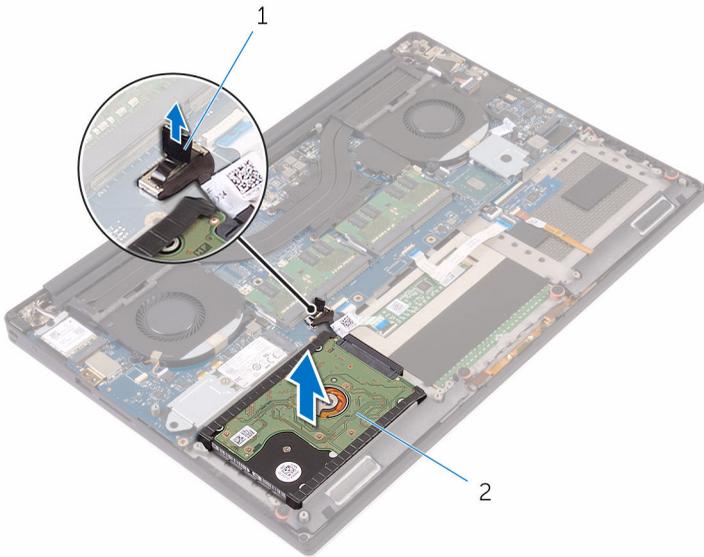


Figure 6. Disconnecting the hard-drive cable from the system board

1 pull tab

2 hard-drive assembly

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

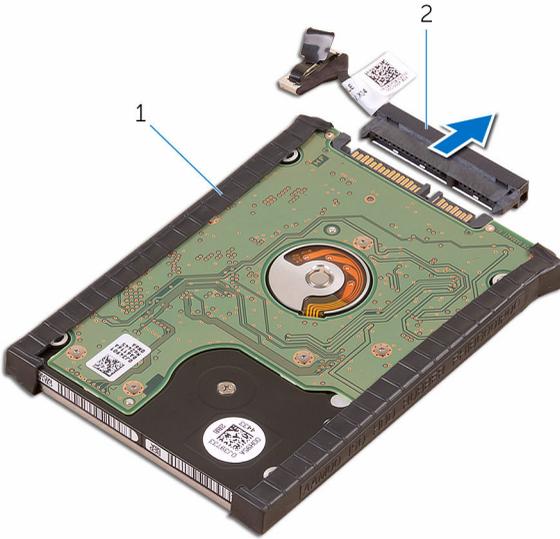


Figure 7. Disconnecting the hard-drive interposer from the hard-drive assembly

1 hard-drive assembly

2 hard-drive interposer

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



Figure 8. Removing the hard-drive cover

1 hard-drive covers (2)

2 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 \(half-length\)](#) or the [battery \(full-length\)](#).
- 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.

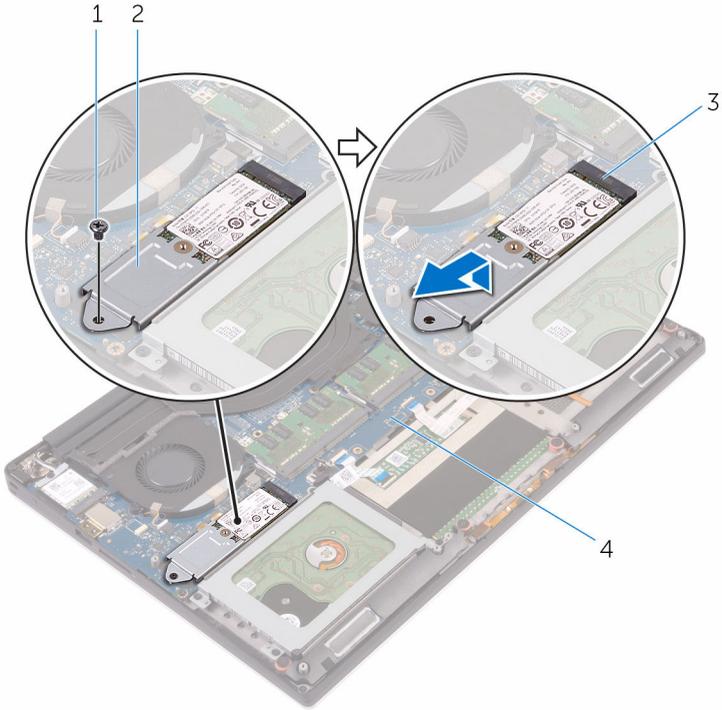


Figure 9. Removing the solid-state drive assembly

- | | | | |
|---|------------------------|---|----------------------------|
| 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.

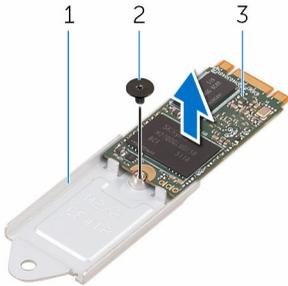


Figure 10. Removing the solid-state drive bracket

- | | | | |
|---|---------------------------|---|-------|
| 1 | solid-state drive bracket | 2 | screw |
| 3 | 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.

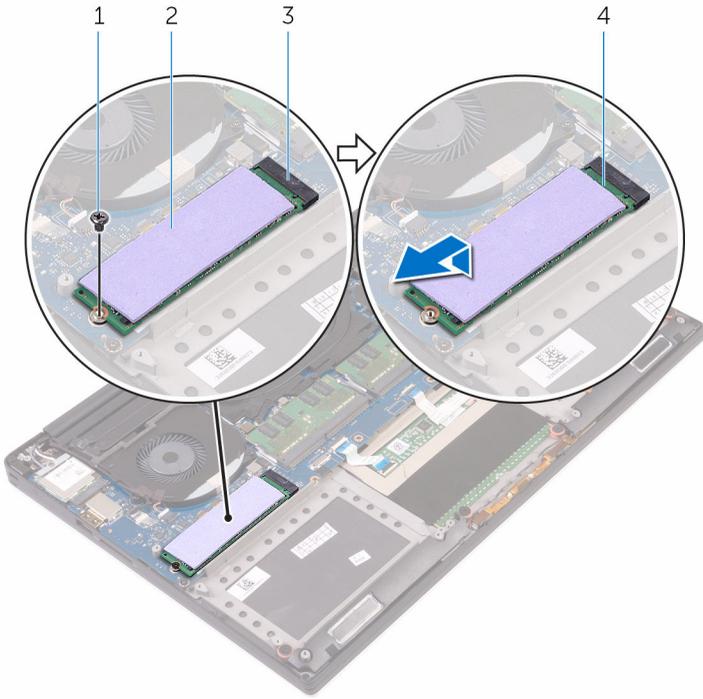


Figure 11. Removing the solid-state drive

- | | | | |
|---|------------------------|---|-------------------|
| 1 | screw | 2 | thermal pad |
| 3 | solid-state drive slot | 4 | solid-state drive |

- 3 Peel the thermal pad off the solid-state drive.

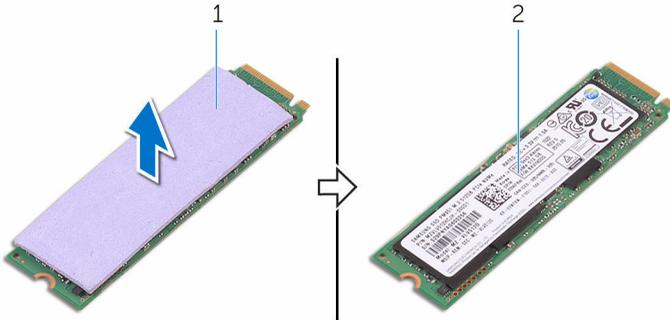


Figure 12. Removing the thermal pad

1 thermal pad

2 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 system 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.

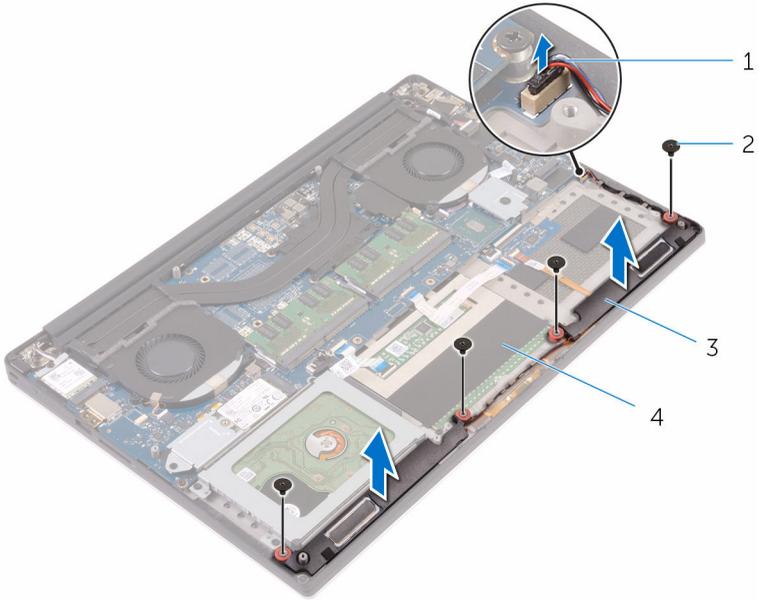


Figure 13. Removing the speakers

- | | | | |
|---|---------------|---|--------------------|
| 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 system 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.

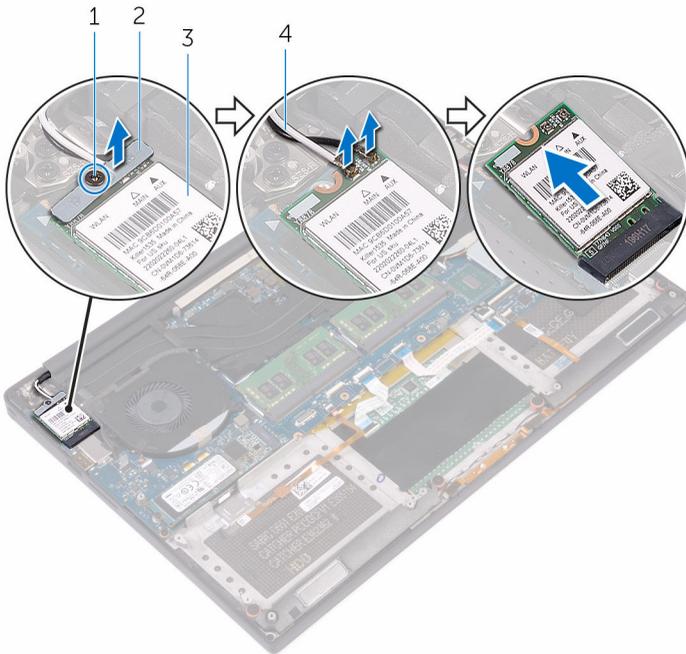


Figure 14. Removing the wireless card

- | | | | |
|---|---------------|---|-----------------------|
| 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.

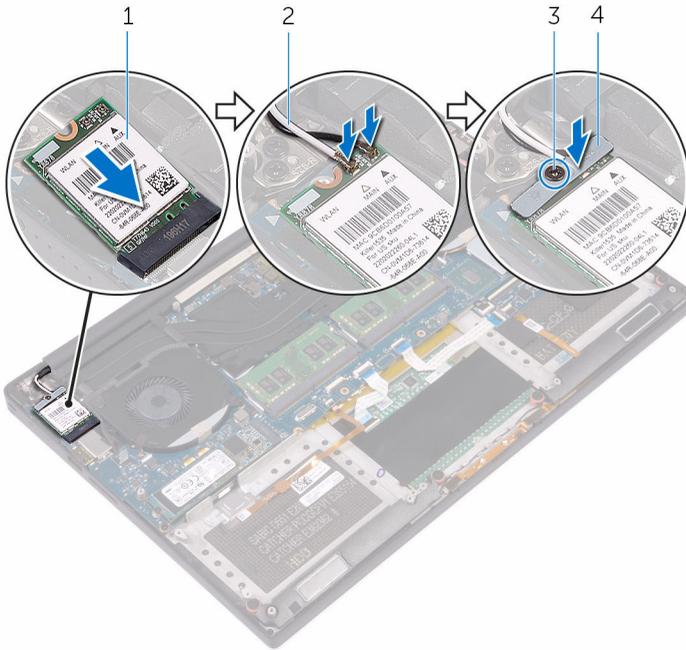


Figure 15. Replacing the wireless card

- | | | | |
|---|---------------|---|-----------------------|
| 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



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Prerequisites

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

Procedure



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

- 1 Remove the two screws (M2x4) that secure the video fan (JFAN_2) to the system board.
- 2 Disconnect the touch-screen cable from the system board.
- 3 Peel off the tape that secures the touch-screen cable 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.

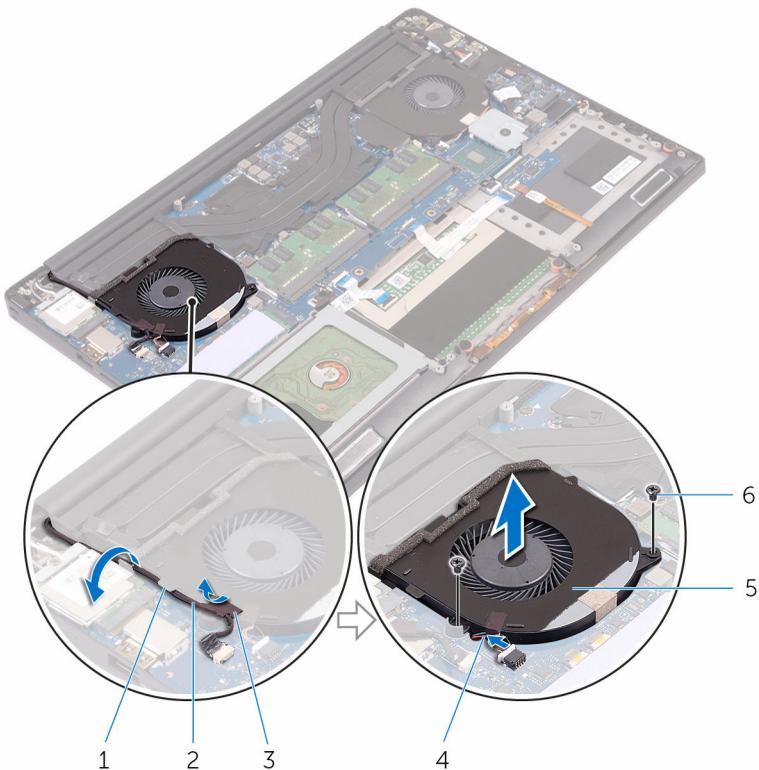


Figure 16. Removing the video fan

- | | | | |
|---|--------------------|---|-------------------------------|
| 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.

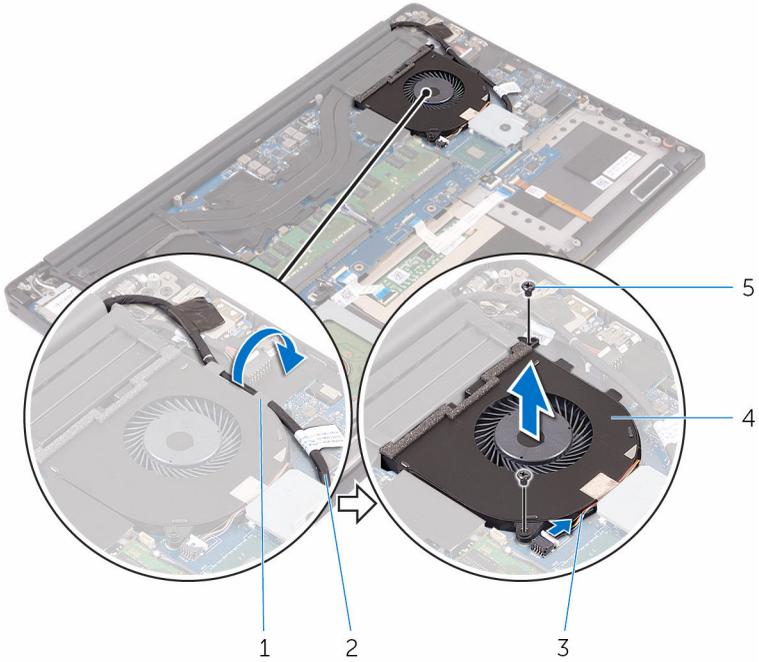


Figure 17. Removing the processor fan

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

Replacing the fans



WARNING: 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 through the routing guides on the video fan (JFAN_2).
- 8 Adhere the tape that secures the touch-screen cable 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

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

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

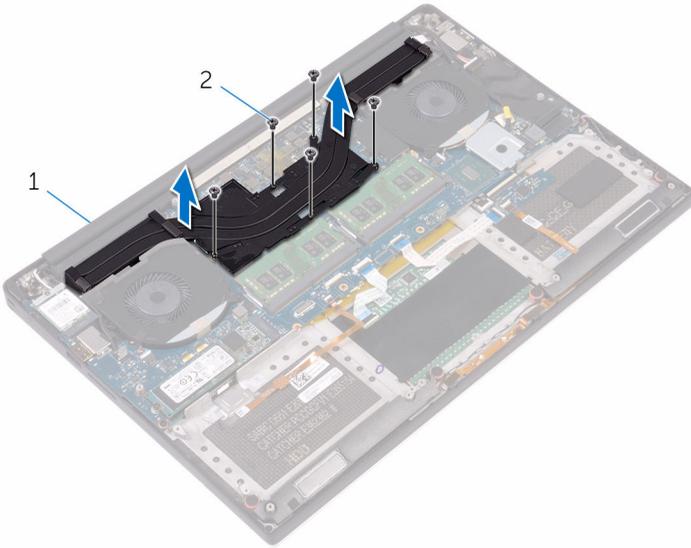


Figure 18. Removing the heat-sink assembly

1 heat-sink assembly

2 screws (5/4)



Replacing the heat-sink assembly

 **WARNING:** 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:** The original thermal grease can be reused if the original system board and fan are reinstalled together. If either the system board or the fan is replaced, use the thermal pad 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



WARNING: 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.

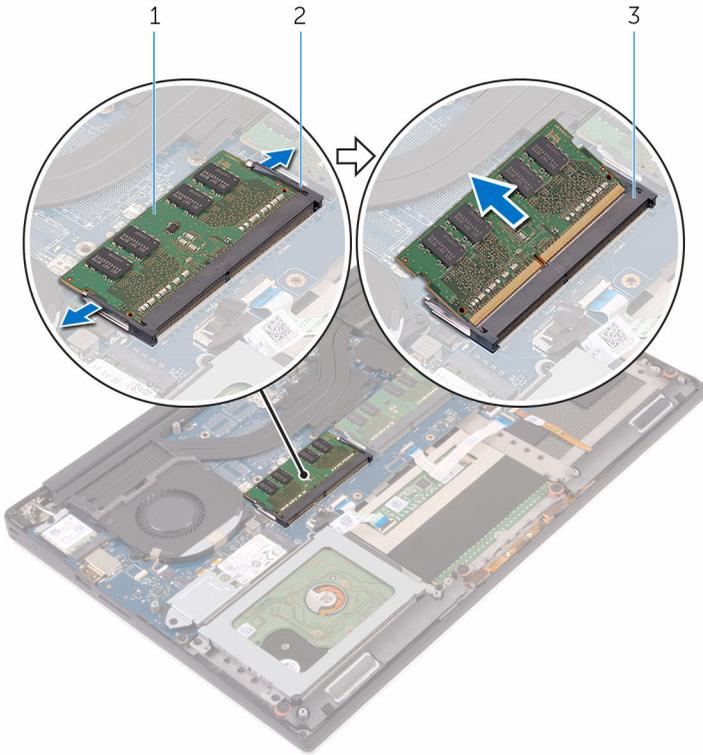


Figure 19. Removing the memory modules

- 1 memory module
- 2 securing clips (2)
- 3 memory-module slot

Replacing the memory modules



WARNING: 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.



- Slide the memory module firmly into the slot at an angle and gently press the memory module down until it clicks into place.

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

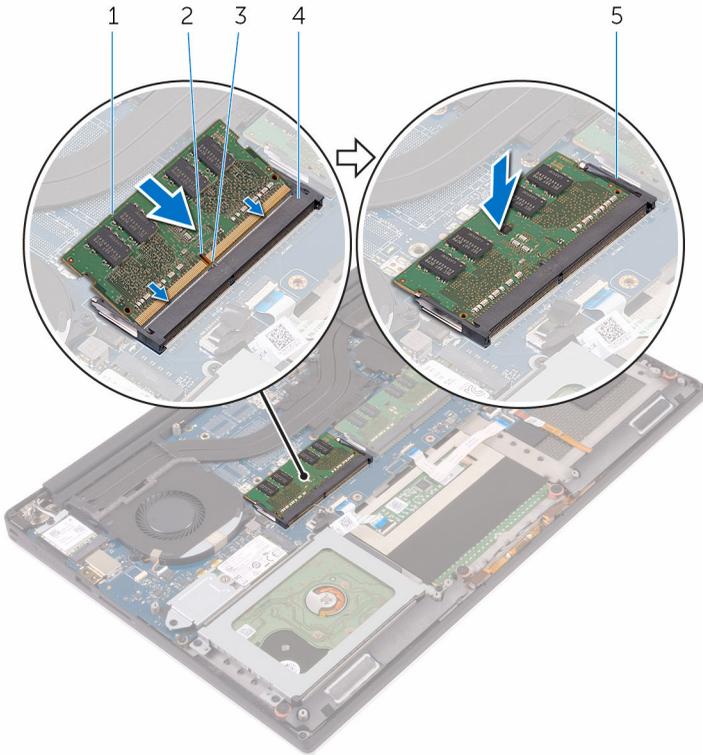


Figure 20. Replacing the memory modules

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

Post-requisites

- Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).

2 Replace the [base cover](#).



Removing the system board



WARNING: 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.



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.



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.



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

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

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.

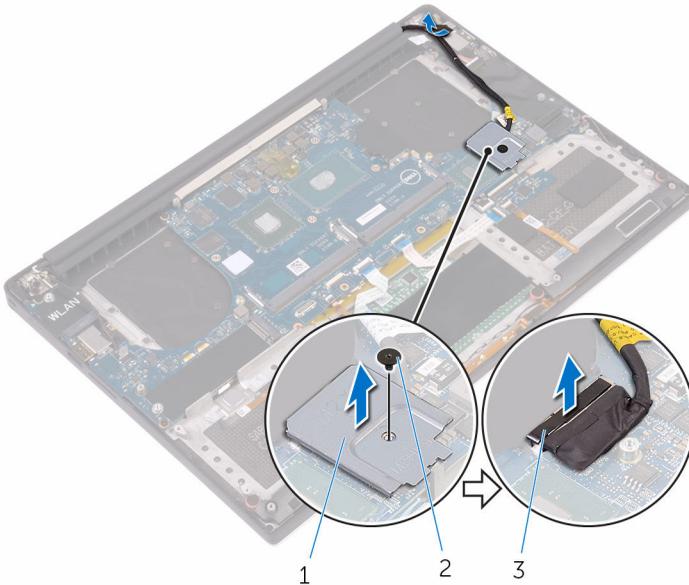


Figure 21. Disconnecting the display cable

- | | | | |
|---|-----------------------|---|-------|
| 1 | display-cable bracket | 2 | screw |
| 3 | 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.

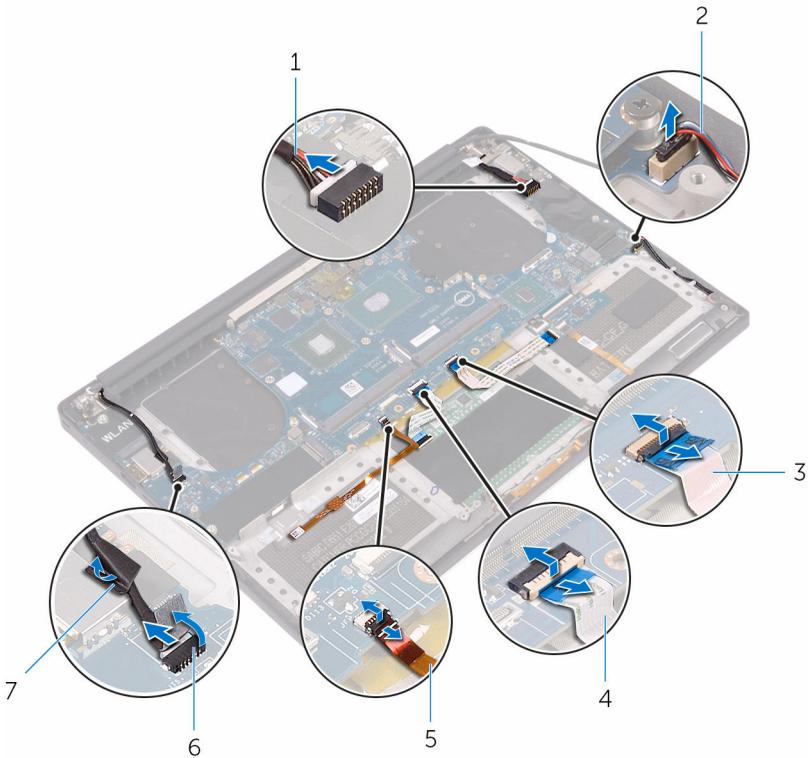


Figure 22. Disconnecting the cables

- | | | | |
|---|------------------------------|---|-------------------------------|
| 1 | power-adaptor 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.

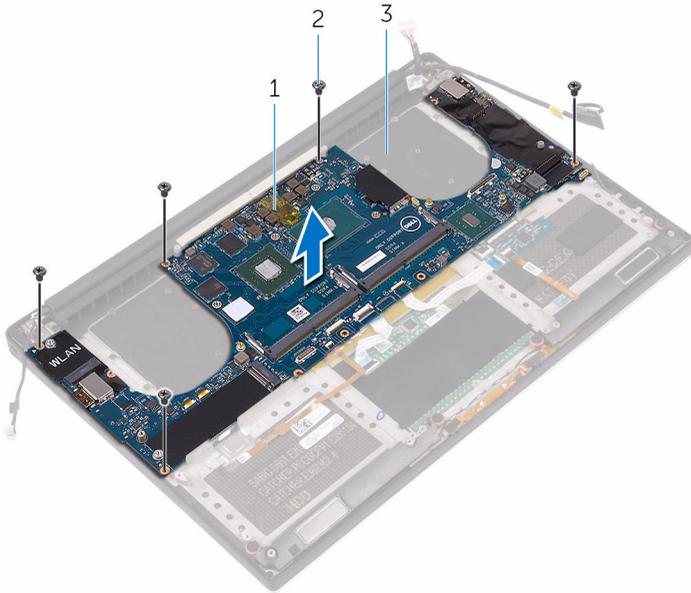


Figure 23. Removing the system board

- | | | | |
|---|--------------------|---|------------|
| 1 | system board | 2 | screws (5) |
| 3 | palm-rest assembly | | |

Replacing the system board



WARNING: 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.



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.



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

- 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-adaptor 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 Replace 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



WARNING: 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 [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.

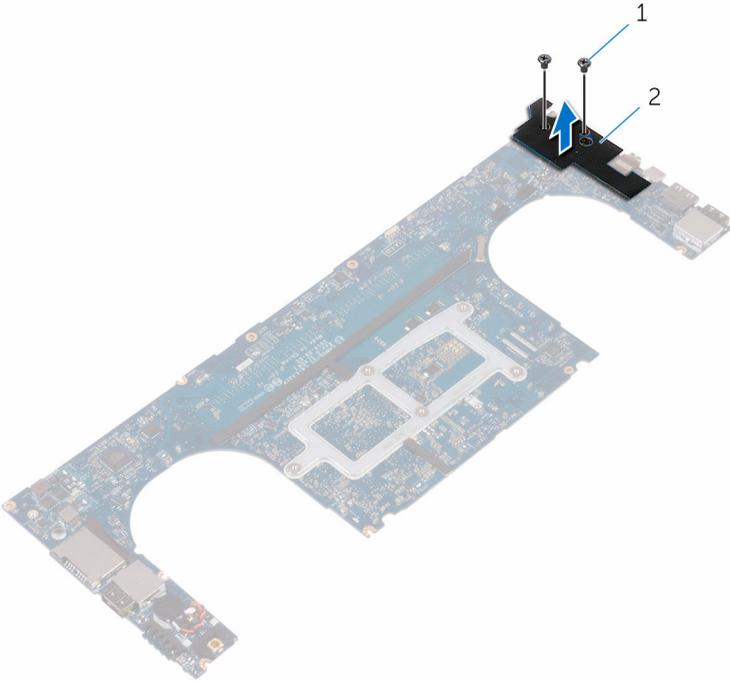


Figure 24. Removing the audio daughter-board

1 screws (2)

2 audio daughter-board



Replacing the audio daughter-board



WARNING: 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 Replace 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

 **WARNING:** 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 Remove 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.

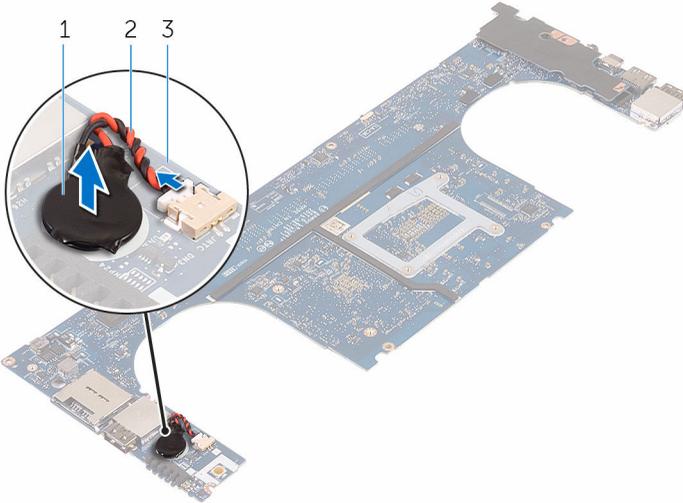


Figure 25. Removing the coin-cell battery

- | | | | |
|---|-------------------|---|-------------------------|
| 1 | coin-cell battery | 2 | coin-cell battery cable |
| 3 | system board | | |

Replacing the coin-cell battery



WARNING: 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 Replace 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



WARNING: 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 [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.

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

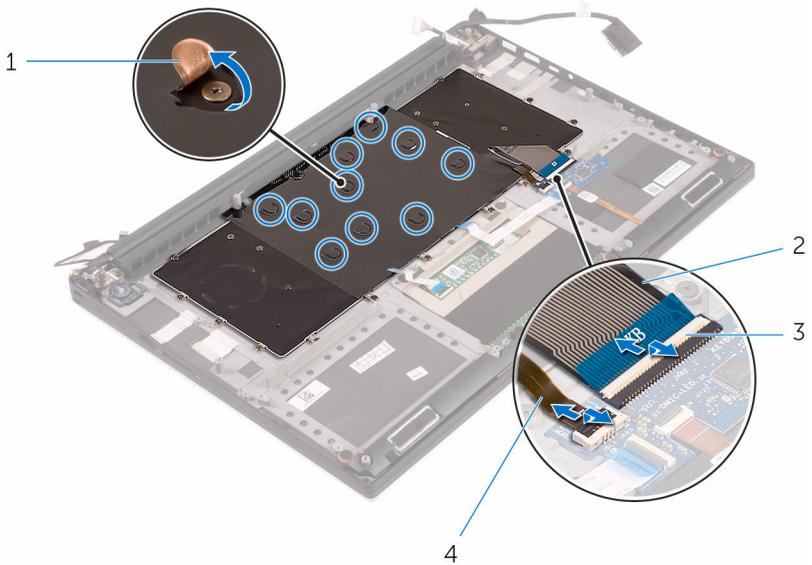


Figure 26. Disconnecting the keyboard and keyboard-backlight cable

- | | | | |
|---|-------------|---|--------------------------|
| 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.

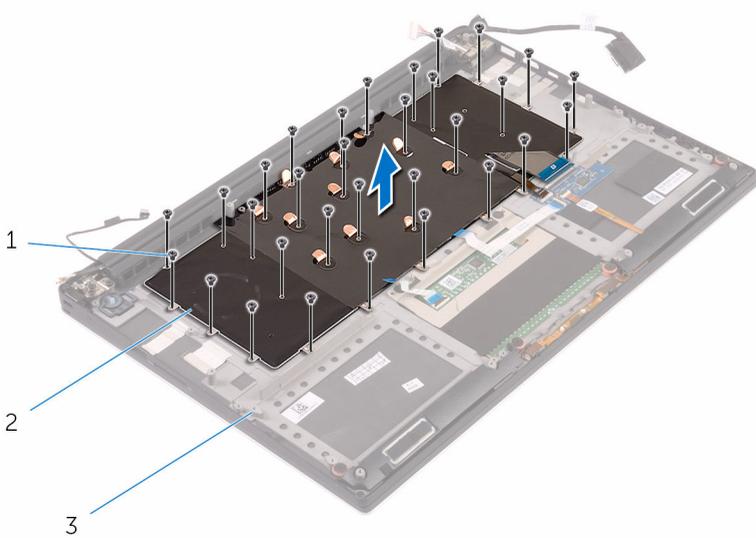


Figure 27. Removing the screws from the keyboard

- | | | | |
|---|--------------------|---|----------|
| 1 | screws (31) | 2 | keyboard |
| 3 | palm-rest assembly | | |

Replacing the keyboard



WARNING: 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 Replace the [hard drive](#).
- 3 Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
- 4 Replace the [base cover](#).



Removing the display assembly



WARNING: 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



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.

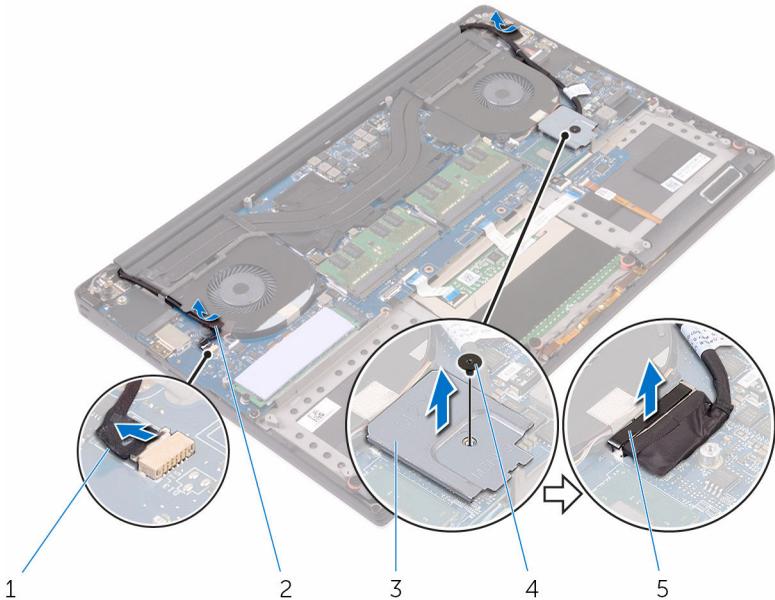


Figure 28. Disconnecting the cables

- | | | | |
|---|-------------------------------|---|-------|
| 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

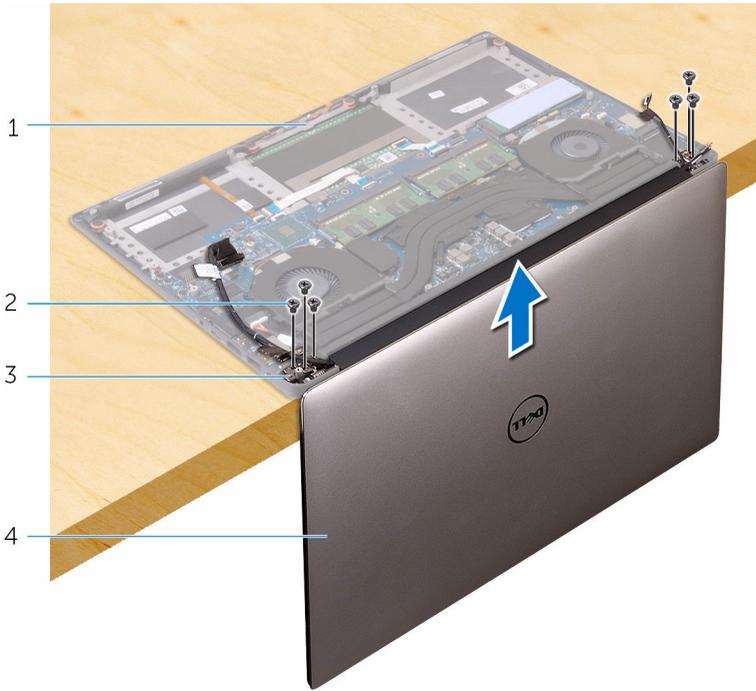


Figure 29. Removing the screws that secure the display hinges to palm-rest assembly

- | | | | |
|---|--------------------|---|------------------|
| 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

- 1 display assembly

Replacing the display assembly



WARNING: 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.



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



WARNING: 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.

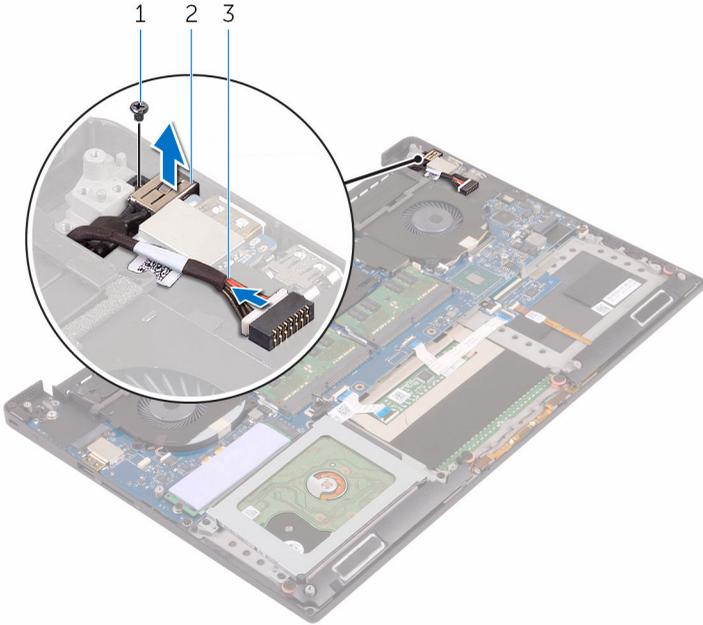


Figure 31. Removing the power-adapter port

- | | | | |
|---|--------------------------|---|--------------------|
| 1 | screw | 2 | power-adapter port |
| 3 | power-adapter port cable | | |

Replacing the power-adapter port



WARNING: 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



WARNING: 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.

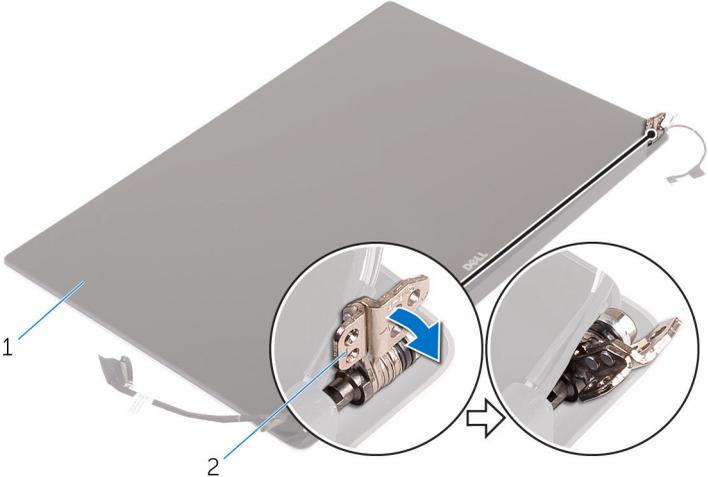


Figure 32. Turning the display hinge

1 display assembly

2 display hinges (2)

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

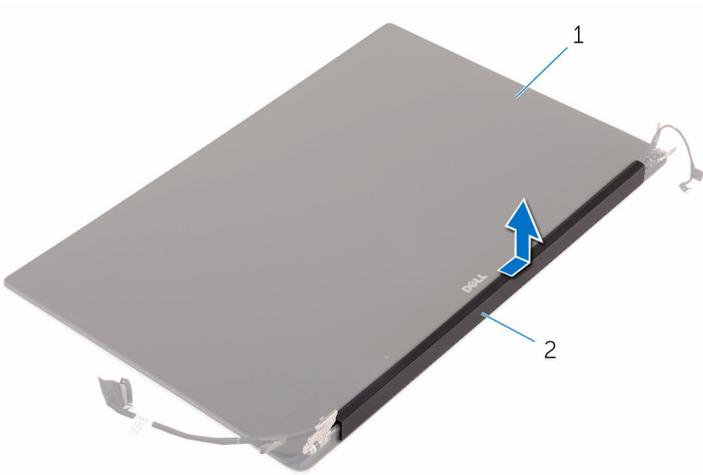


Figure 33. Removing the antenna cover

1 display assembly

2 antenna cover

Replacing the antenna cover



WARNING: 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



WARNING: 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



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.

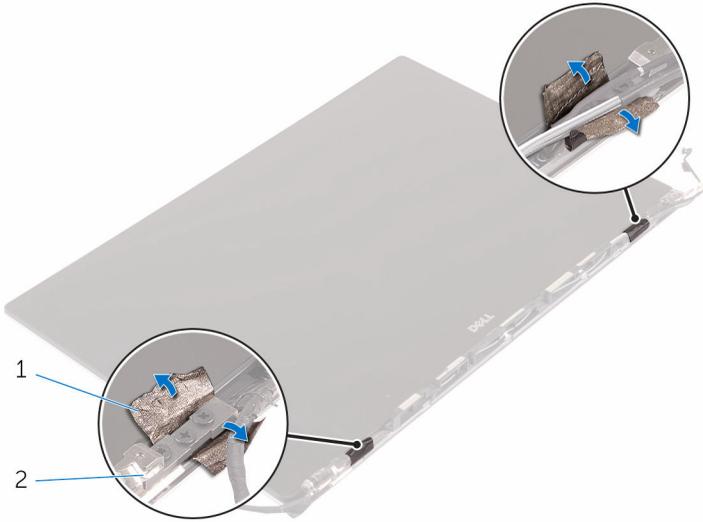


Figure 34. Peeling the tape

1 tape

2 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

1 screws (6)

2 display hinges (2)

Replacing the display hinges



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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



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Prerequisites



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](#).
- 6 Remove the [display hinges](#).

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.

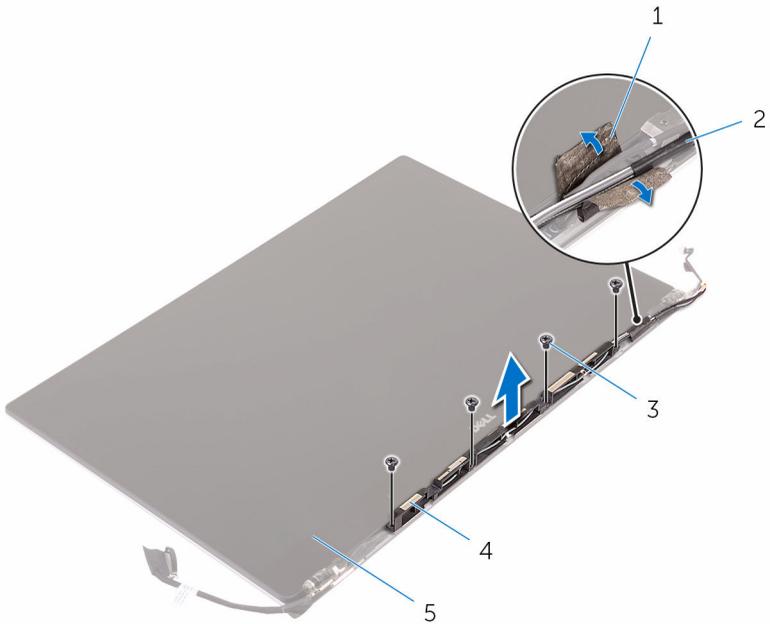


Figure 36. Removing the antenna module

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

Replacing the antenna module



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

Removing the palm-rest assembly



WARNING: 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 [memory modules](#).
- 4 Follow the procedure from step 1 to step 4 in "[Removing the hard drive](#)".
- 5 Remove the [wireless card](#).
- 6 Remove the [speakers](#).
- 7 Remove the [heat-sink assembly](#).
- 8 Remove the [fans](#).
- 9 Remove the [display assembly](#).
- 10 Remove the [power-adapter port](#).
- 11 Remove the [system board](#).
- 12 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



WARNING: 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-adaptor 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 Follow the procedure from step 3 to step 6 in "[Replacing the hard drive](#)".
- 10 Replace the [memory modules](#).
- 11 Replace the [battery \(half-length\)](#) or the [battery \(full-length\)](#).
- 12 Replace the [base cover](#).



BIOS overview

The BIOS manages data flow between the computer's operating system and attached devices such as hard disk, video adapter, keyboard, mouse, and printer.

Entering the BIOS setup program

- 1 Turn on or restart your computer.
- 2 Press F2 when the Dell logo is displayed on the screen to enter the BIOS setup program.

You can change the user-definable settings in BIOS setup program.

Timing key sequences

The keyboard is not the first device initialized by Setup. As a result, if you press a keystroke too early, the keyboard is locked out. In such case, a keyboard error message is displayed on the screen, and you cannot restart your computer with the Ctrl+Alt+Del key combination.

To prevent the keyboard from locking, wait until the keyboard is initialized completely. The keyboard is initialized if one of the following occurs:

- The keyboard lights flash.
- The F2=Setup prompt appears at the top-right corner of the screen during boot.

System setup options

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

Table 3. System setup options—System information menu

General-System Information

System Information

BIOS Version	Displays the BIOS version number.
--------------	-----------------------------------

General-System Information

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.
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 HyperThreading (HT) capable.
64-Bit Technology	Displays whether 64-bit technology is used.

Battery Information

Displays the battery health information.



General-System 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 the Legacy Option ROMs.
---------------------------	---

UEFI Boot Path Security	Enables or disables the user to set the prompt for Admin password when booting from UEFI.
--------------------------------	---

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 booting from USB mass storage devices connected to external USB port.
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 touchscreen.
Miscellaneous Devices	Enable or disable various onboard devices.

System Configuration

Enable Camera	Enable or disable the camera.
Enable Secure Digital (SD) Card	Enable or disable the SD card.

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 Admin and System passwords.
Password Bypass	Bypass the System (Boot) Password and the internal HDD 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(R) Service from Absolute Software.



Security

CPU XD Support	Enable or disable the Execute Disable mode of the Processor.
OROM Keyboard Access	Enable or disable the user to enter Option ROM Configuration screens via hotkeys during boot.
Admin Setup Lockout	Enable to prevent users from entering Setup when an Admin Password is set.
Master Password Lockout	Enable or disable the 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 the 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.
Enclave Memory Size	Set the Intel Software Guard Extensions Enclave Reserve Memory Size.

Performance

Multi Core Support	Enable multiple cores. Default: Enabled.
Intel SpeedStep	Enable or disable Intel Speedstep Technology. Default: Enabled.



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 Software Guard Extensions

Intel TurboBoost	Enable or disable Intel TurboBoost mode of the processor. Default: Enabled.
HyperThread control	Enable or disable HyperThreading in the processor. Default: Enabled.

Power Management

AC Behavior	Enables the system to power-on automatically, when AC is inserted.
Auto on Time	Enable to set the computer to turn on automatically every day or on a preselected 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.
Block Sleep	Enable or disable the sleep state.
Peak Shift	Configure the AC power usage.
Advanced Battery Charge Configuration	Enable Advanced Battery Charge Configuration from the beginning of the day to a specified work period.
Primary Battery Charge Configuration	Set the primary battery charge settings with a preselected custom charge start and stop. Default: Adaptive.

POST Behavior

Adapter Warnings	Enable adapter warnings. Default: Enabled.
Keypad (Embedded)	Enable or disable the keypad that is embedded in the internal keyboard.
Numlock Enable	Enable or disable Numlock. Default: Enable Numlock.
Fn Key Emulation	Enable or disable the Fn key emulation.
Fn Lock Options	Enable or disable the Fn lock mode.



Intel Software Guard Extensions

Fastboot	Enable to set the speed of the boot process. Default: Thorough.
Extend BIOS POST Time	Configure the additional pre-boot delay.
Full Screen logo	Enable or disable the full screen logo.
Warnings and Errors	Configures the boot process behavior when warnings or errors are detected.

Table 9. System setup options—Manageability

MEBx Hotkey	Enable or disable the MEBx Hotkey function when the system boots.
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Table 10. System setup options—Virtualization Support menu

Virtualization Support

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

Maintenance

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 the user to recover from certain corrupted BIOS conditions from a recovery file on the user primary hard drive or an external USB key.

Table 13. System setup options—System Logs menu

System Logs

BIOS Events	Display BIOS events.
Thermal Events	Display Thermal events.
Power Events	Display Power events.

Table 14. System setup options—SupportAssist System Resolution

SupportAssist System Resolution

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

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](#).



Flashing the BIOS

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

Boot menu

This computer includes a one-time boot menu. By using this feature, you can change the sequence of devices that your computer attempts to boot from, for example, floppy, CD-ROM, or hard drive.

Boot menu enhancements

The boot menu enhancements are as follows:

- **Easier Access** – Press F12 to access the boot selection menu.
- **User Prompting** – The user is prompted to use the keystroke on the BIOS screen.
- **Diagnostics Options** – The boot menu includes the ePSA diagnostic options.

Diagnosics

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. Diagnosics

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



Light Pattern	Problem description
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.

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

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

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

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

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

Information about Dell products and services

www.dell.com

Dell Help & Support app



Get started app



Accessing help

In Windows search, type **Help** and **Support**, and press **Enter**.

Online help for operating system

www.dell.com/support/windows

Troubleshooting information, user manuals, setup instructions, product specifications, technical help blogs, drivers, software updates, and so on.

www.dell.com/support

Learn about your operating system, setting up and using your computer, data backup, diagnostics, and so on.

See *Me and My Dell* at www.dell.com/support/manuals.

Contacting Dell

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

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





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.