

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.

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 #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 |  |

| 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.

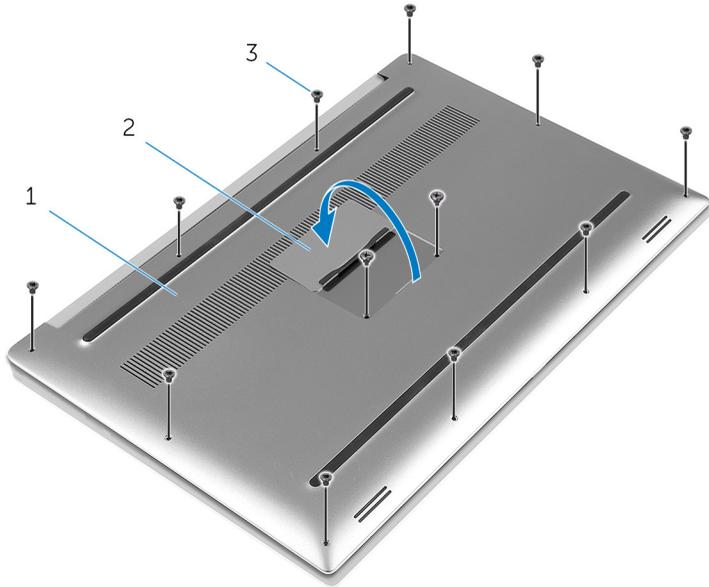


Figure 1. Removing the base cover

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

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

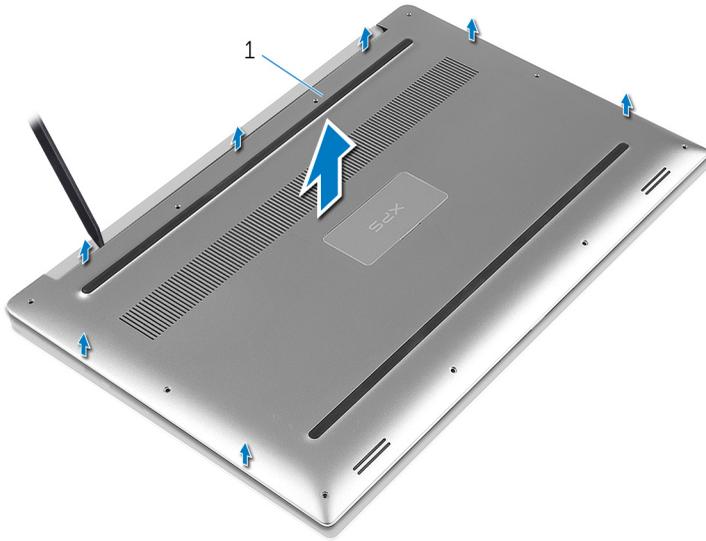


Figure 2. Prying the base cover off the computer base

- 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 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)



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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.

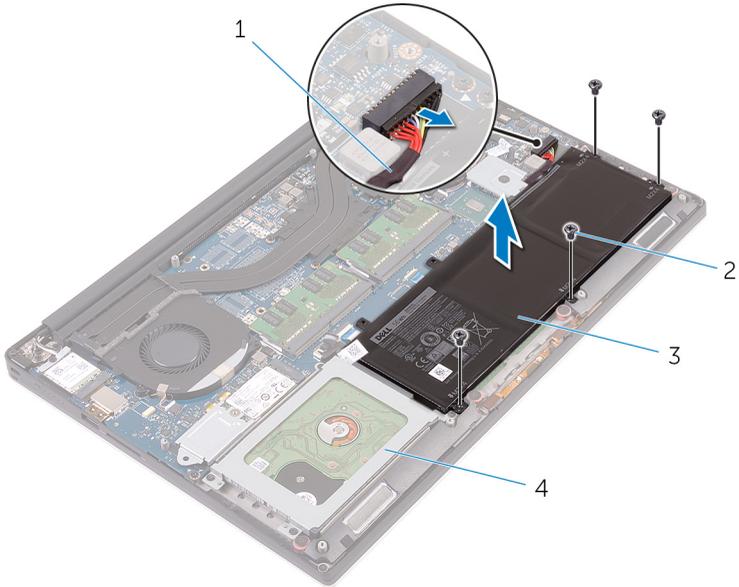


Figure 3. Removing the battery

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

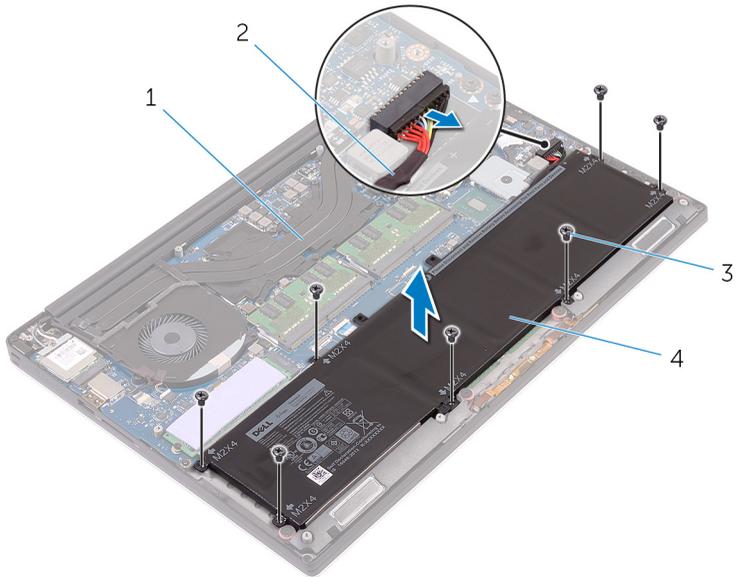


Figure 4. Removing the battery

- | | | | |
|---|--------------------|---|---------------|
| 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 \(half-length\)](#).

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.

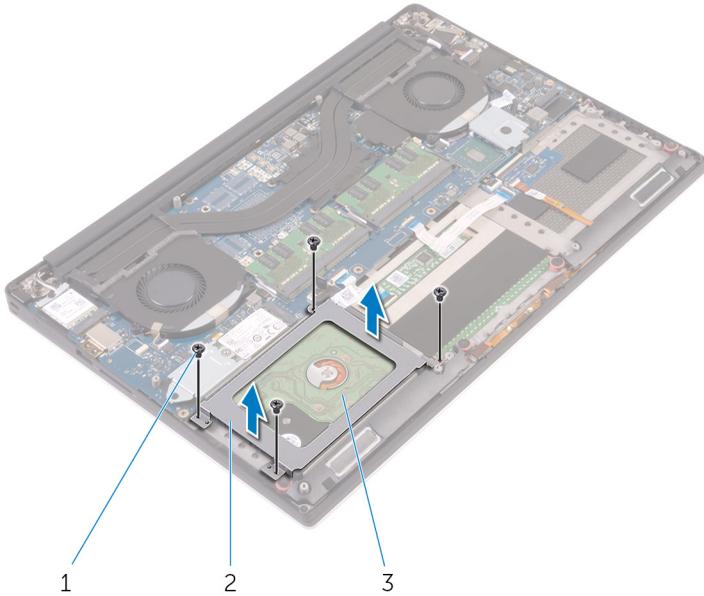


Figure 5. Removing the hard-drive cage

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

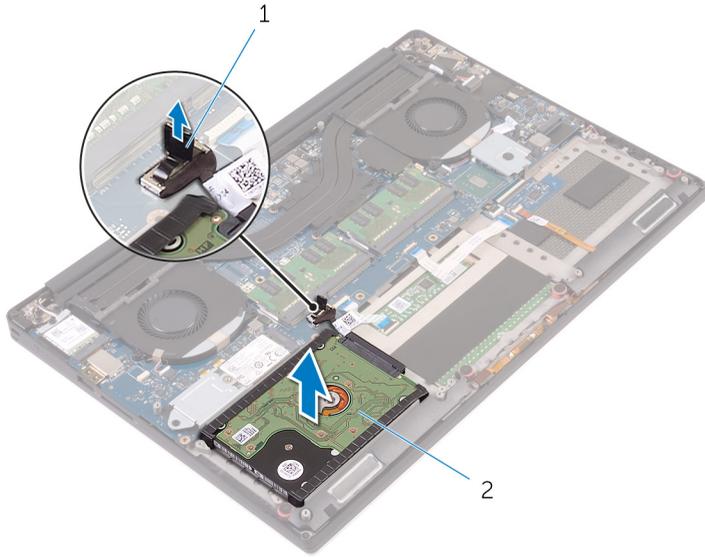


Figure 6. Disconnecting the hard-drive cable from the system board

1 pull tab

2 hard-drive assembly

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

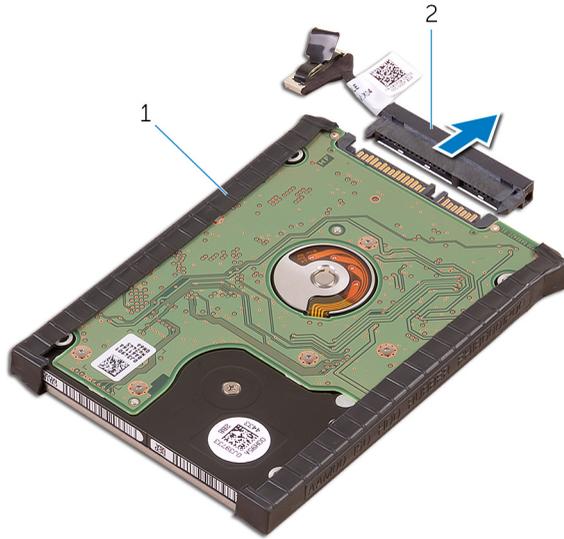


Figure 7. Disconnecting the hard-drive interposer from the hard-drive assembly

1 hard-drive assembly

2 hard-drive interposer

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

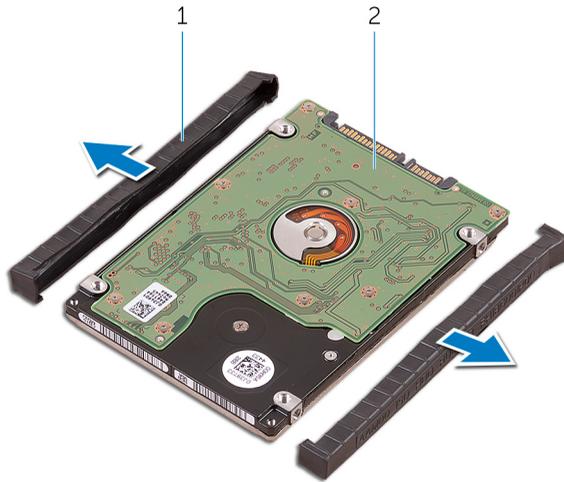


Figure 8. Removing the hard-drive cover

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 \(half-length\)](#).
- 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.

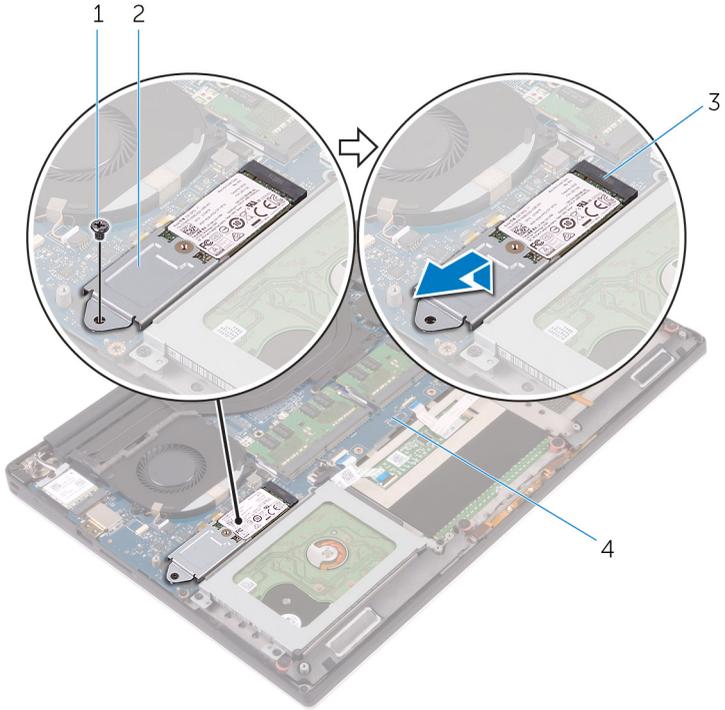


Figure 9. Removing the solid-state drive assembly

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

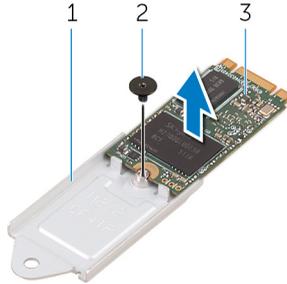


Figure 10. Removing the solid-state drive bracket

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

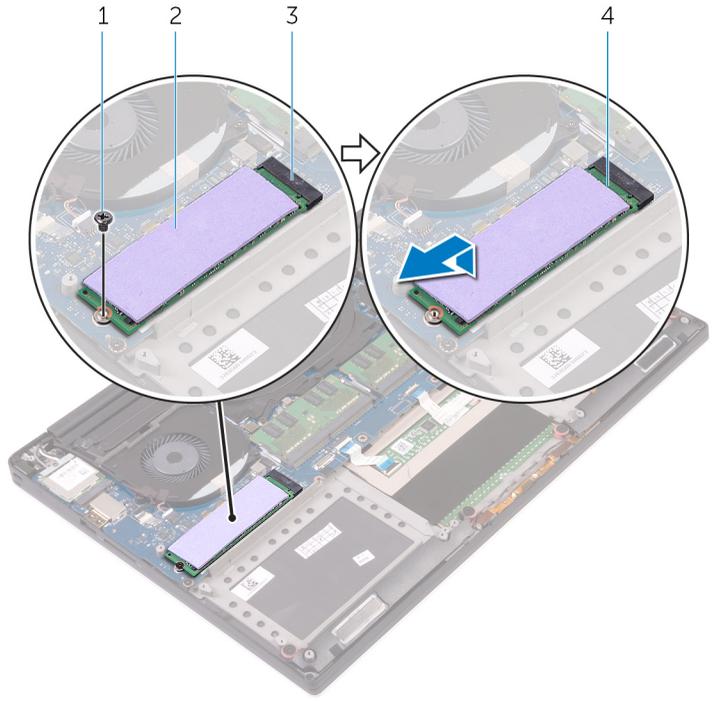


Figure 11. Removing the solid-state drive

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



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

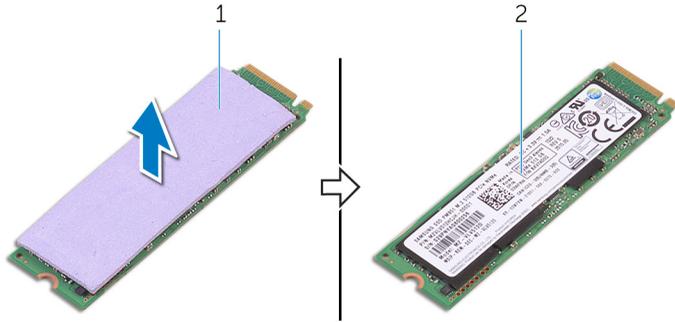


Figure 12. Removing the thermal pad

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 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.

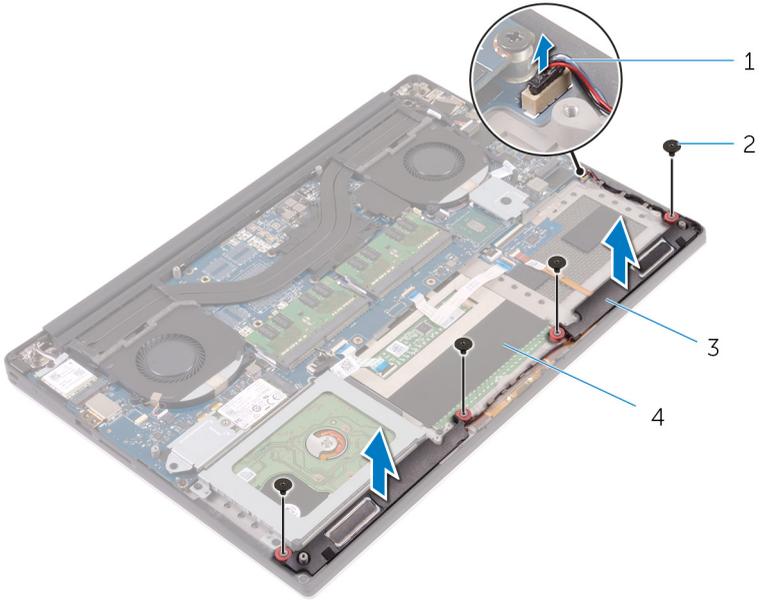


Figure 13. Removing the speakers

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

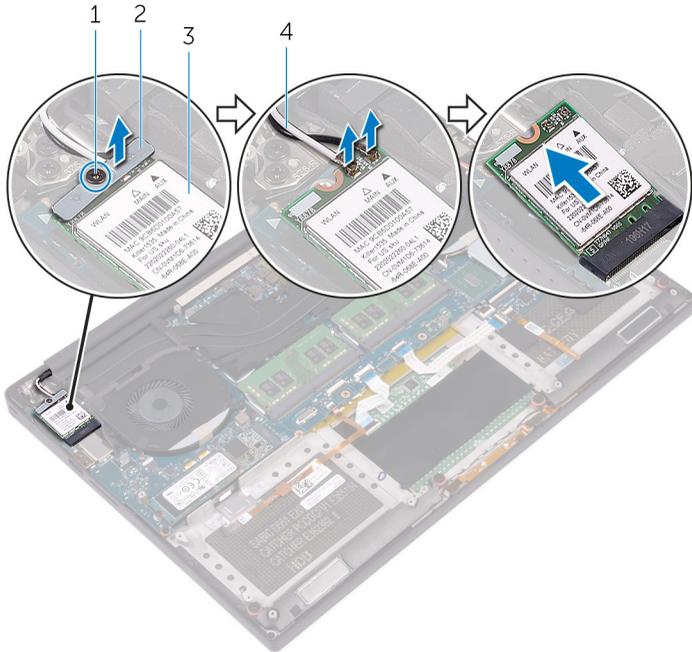


Figure 14. Removing the wireless card

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



Replacing the wireless card

 **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

 **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.

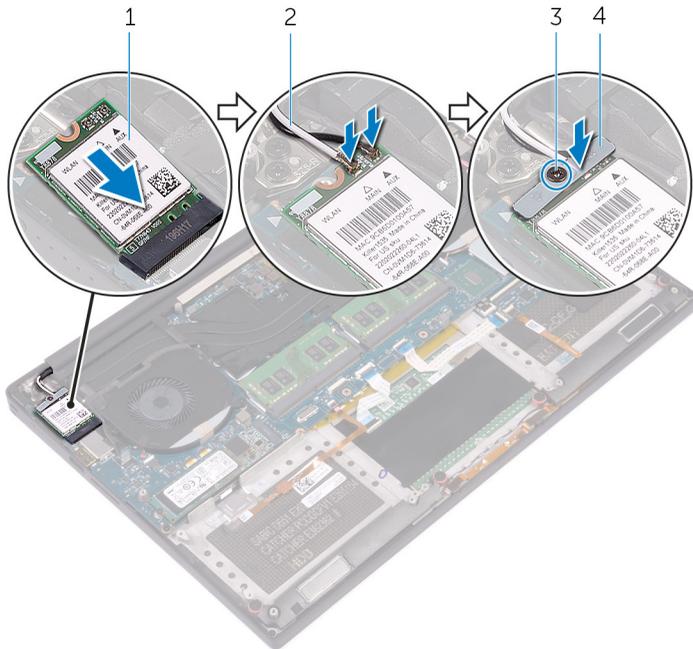


Figure 15. Replacing the wireless card

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



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 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.
 -  **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.

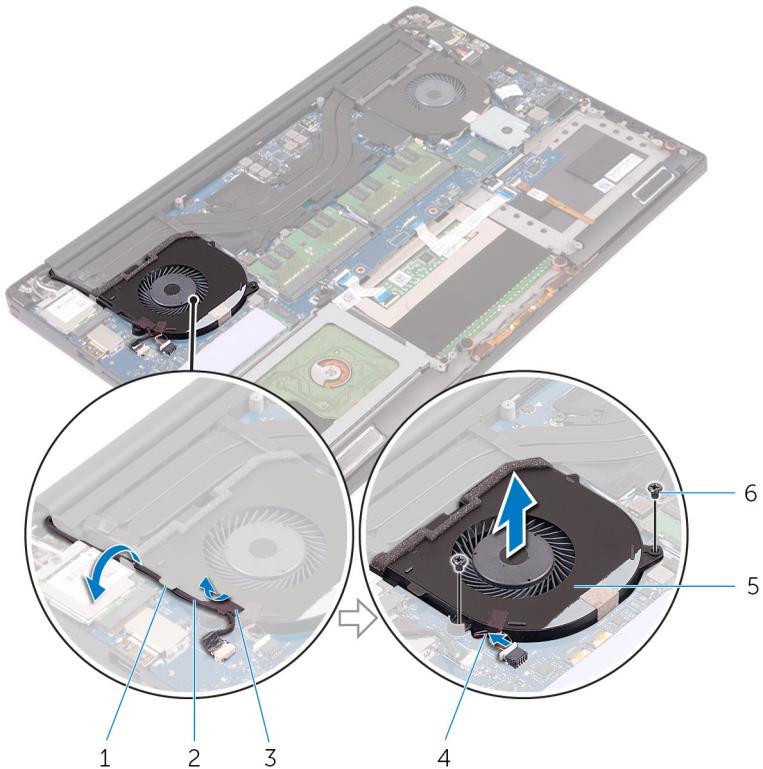


Figure 16. Removing the video fan

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

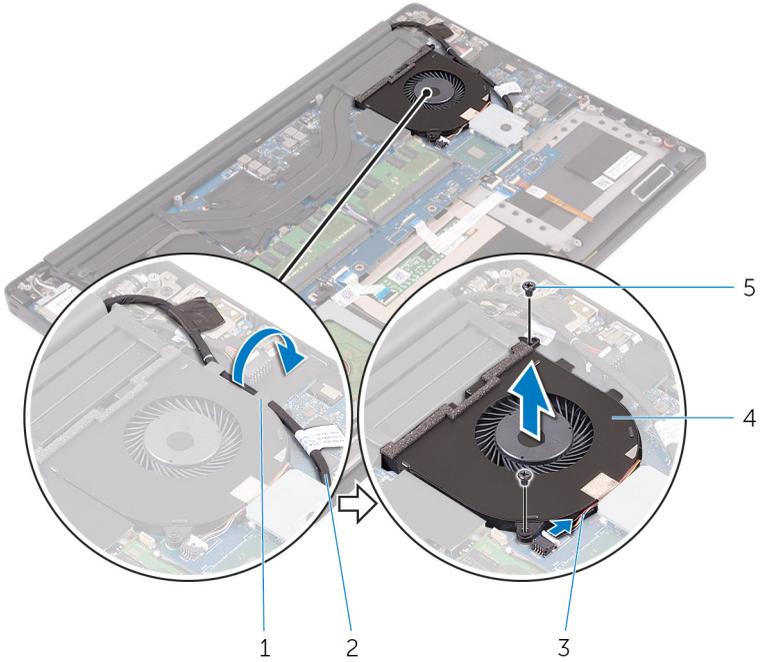


Figure 17. Removing the processor fan

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

Replacing the fans



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 (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

 **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.

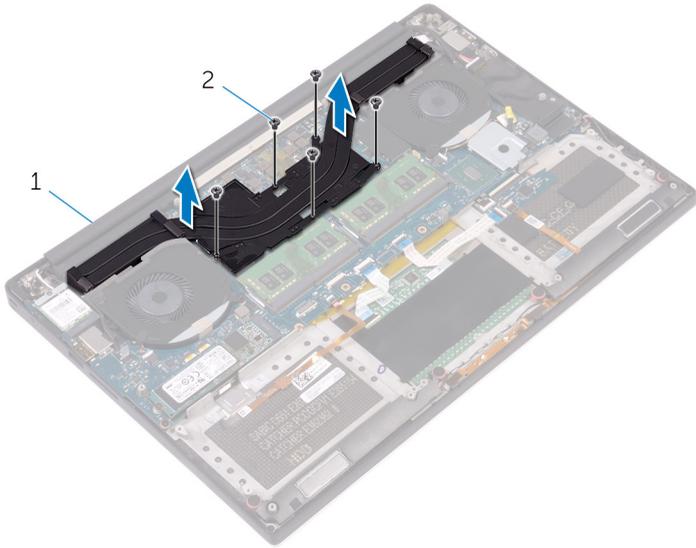


Figure 18. Removing the heat-sink assembly

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.

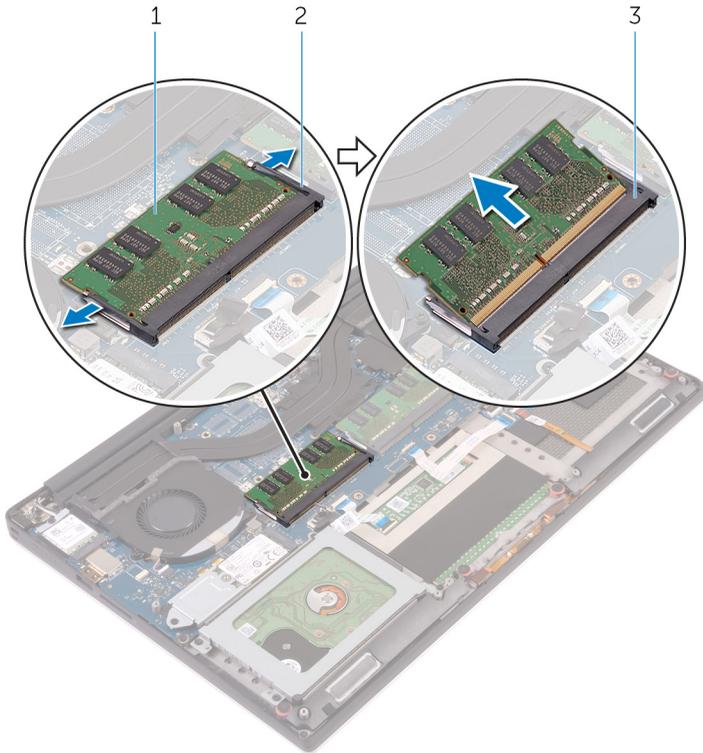


Figure 19. Removing the memory modules

- | | | | |
|---|--------------------|---|--------------------|
| 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.**

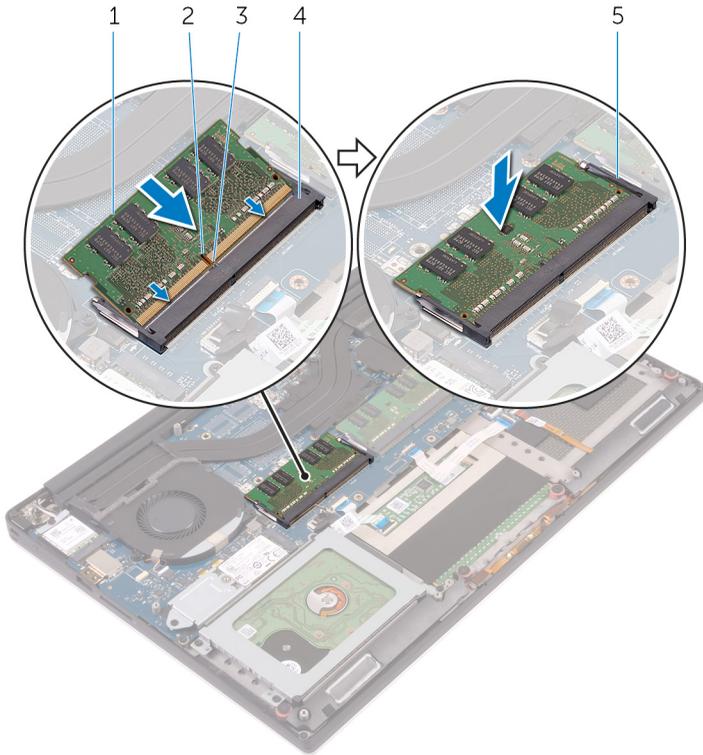


Figure 20. Replacing the memory modules

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

 **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

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.

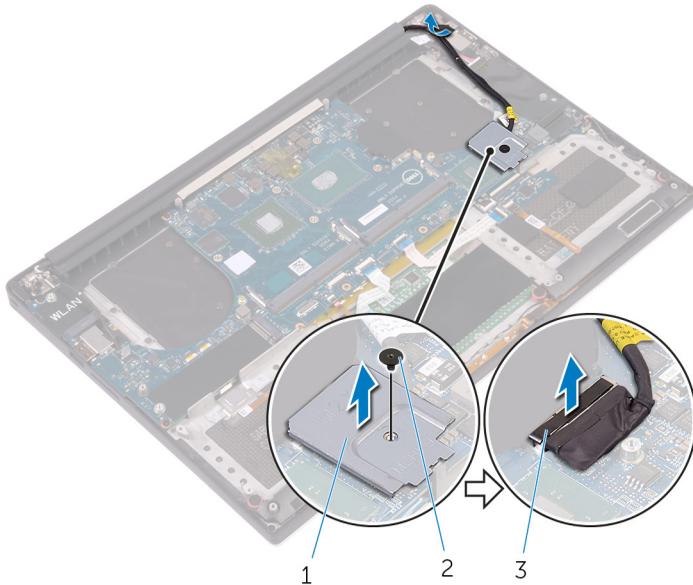


Figure 21. Disconnecting the display cable

- | | | | |
|---|-----------------------|---|-------|
| 1 | display-cable bracket | 2 | screw |
| 3 | display cable | | |
- 4 Disconnect the power-adaptor 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.

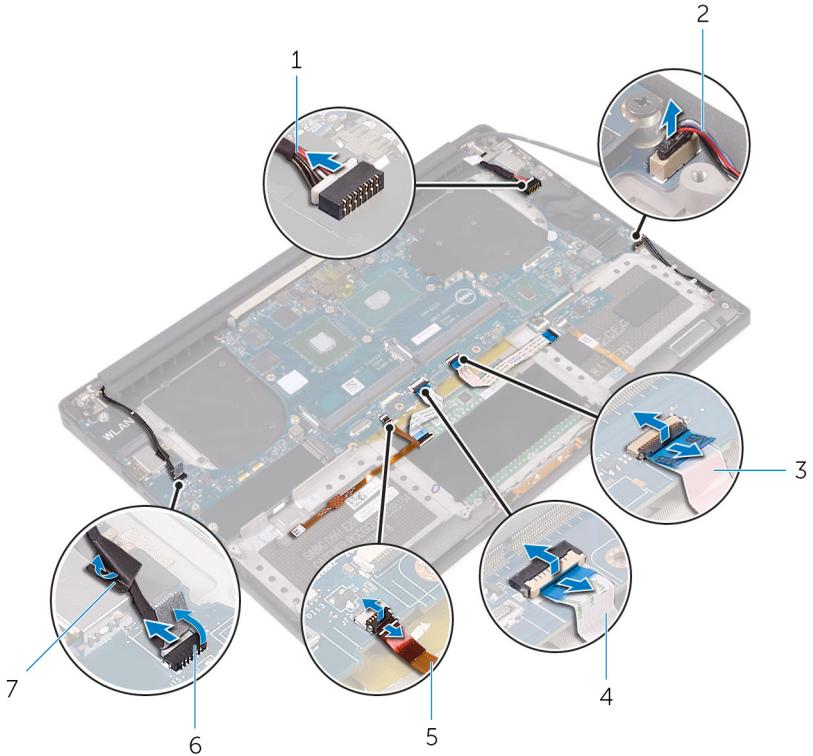


Figure 22. Disconnecting the cables

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

- 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.

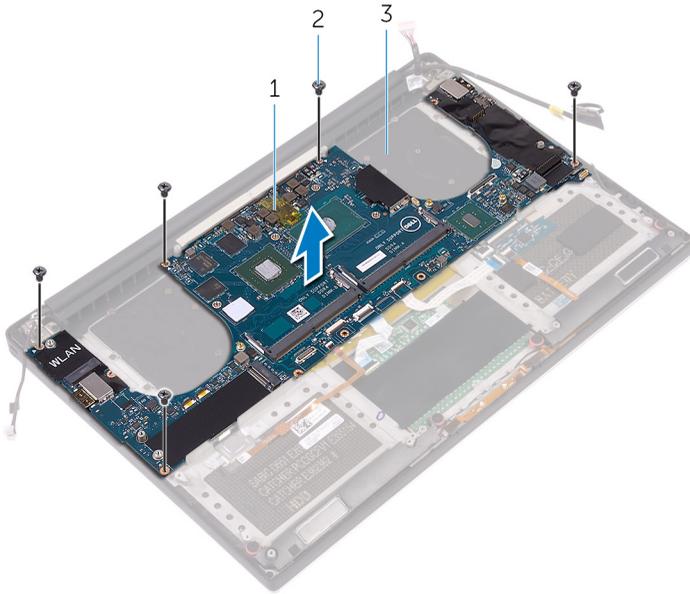


Figure 23. Removing the system board

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



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.

- 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



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 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.

- Lift the audio daughter-board off the system board and turn the audio daughter-board over.

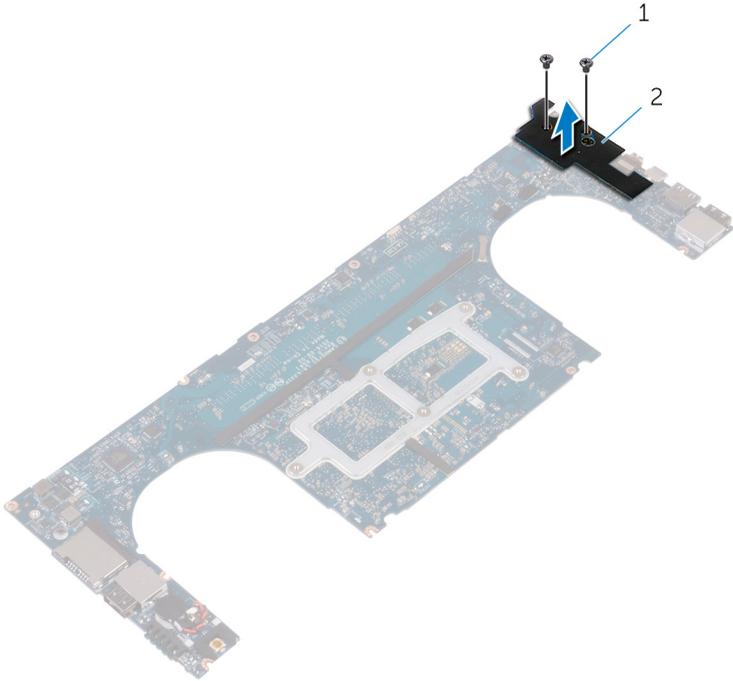


Figure 24. Removing the audio daughter-board

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 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

 **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 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.

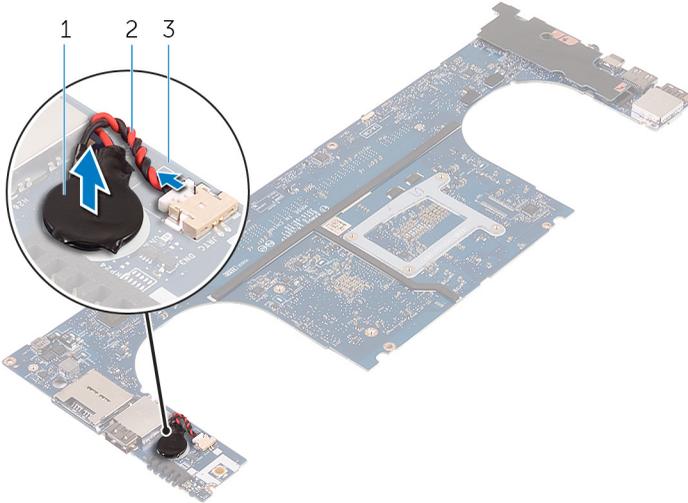


Figure 25. Removing the coin-cell battery

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



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 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.

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

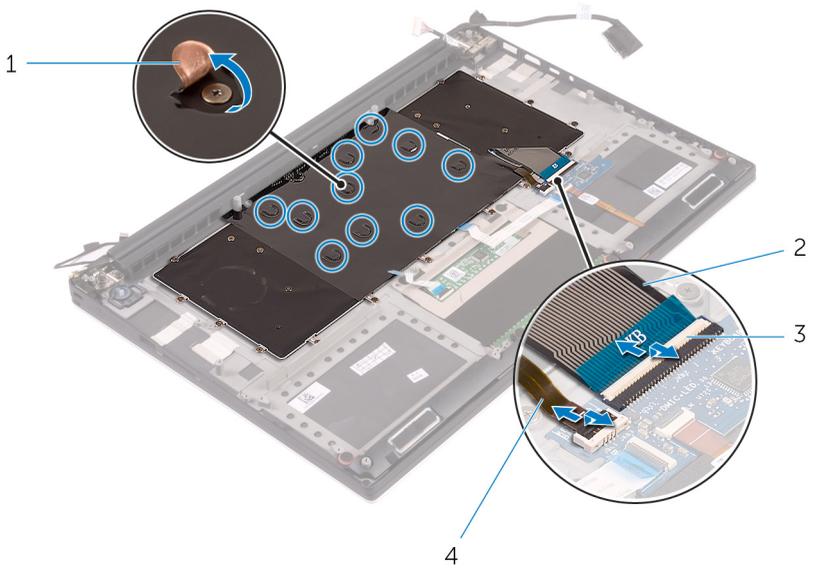


Figure 26. Disconnecting the keyboard and keyboard-backlight cable

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

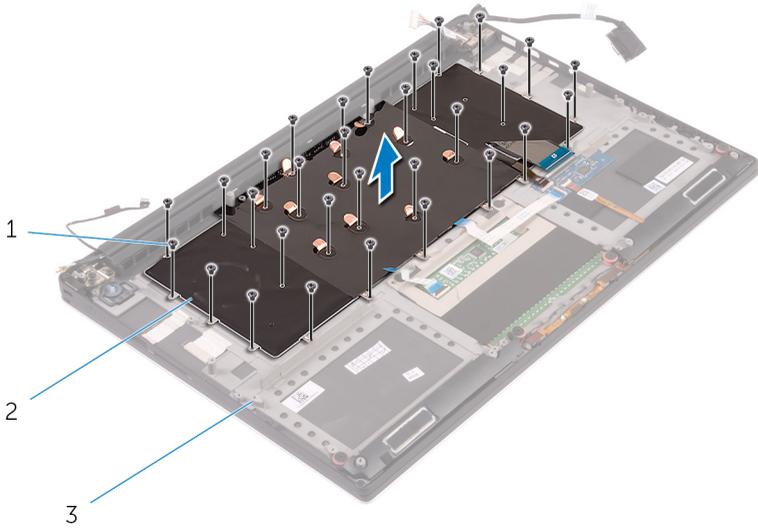


Figure 27. Removing the screws from the keyboard

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



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.

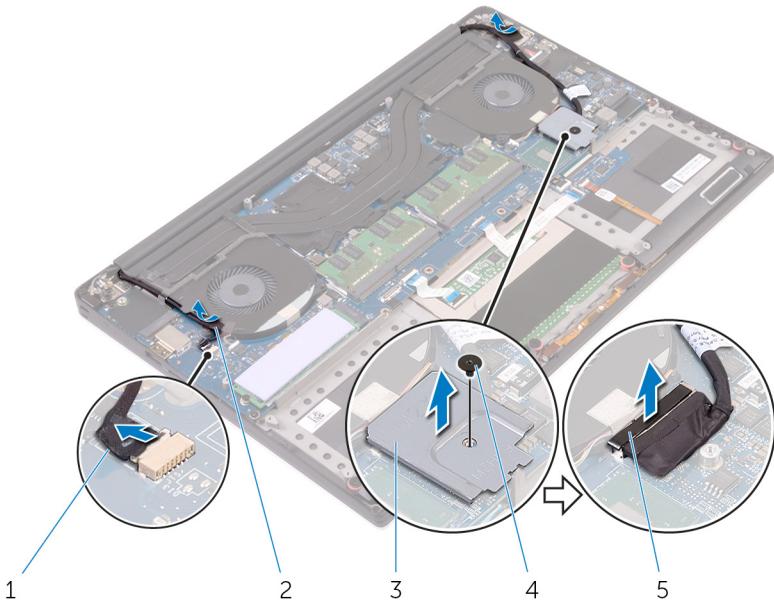


Figure 28. Disconnecting the cables

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

- Carefully place the display assembly on a clean, flat surface.



Figure 30. Display assembly

- 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.

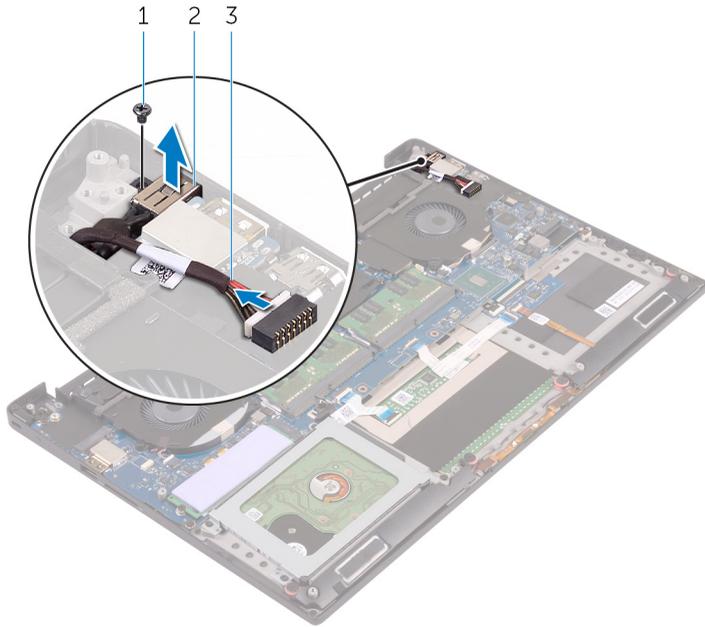


Figure 31. Removing the power-adapter port

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

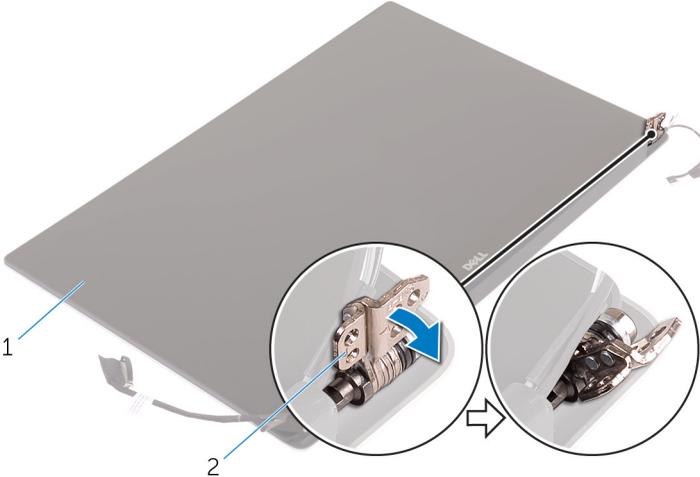


Figure 32. Turning the display hinge

1 display assembly

2 display hinges (2)

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

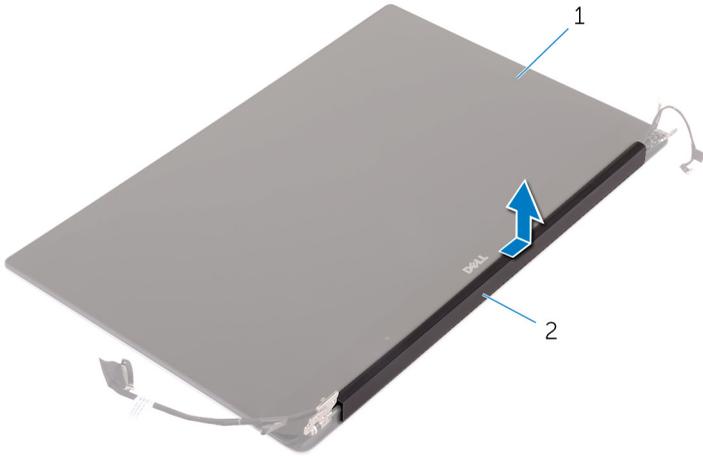


Figure 33. Removing the antenna cover

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.

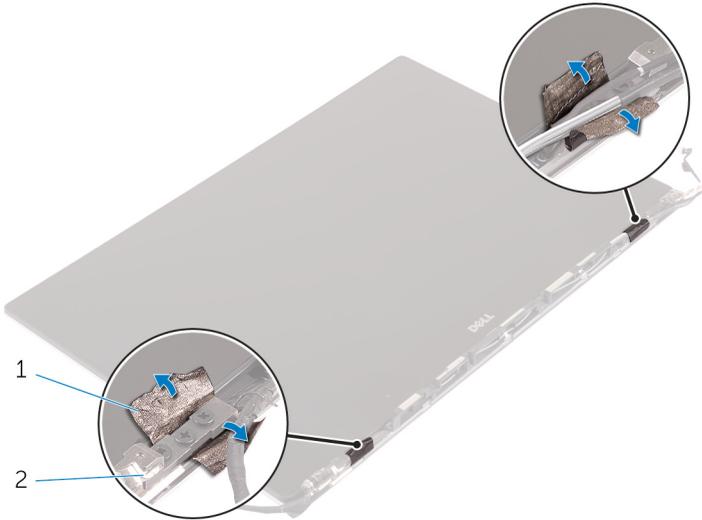


Figure 34. Peeling the tape

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



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 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



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 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.

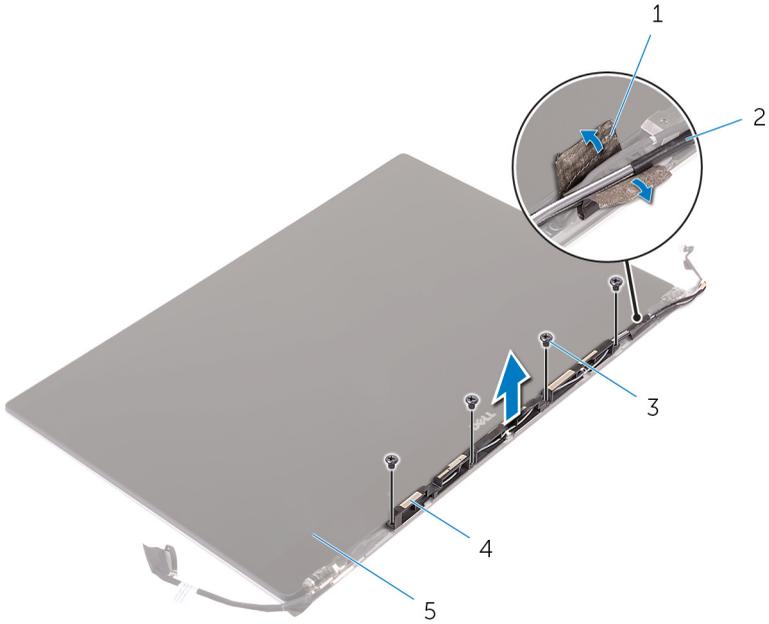


Figure 36. Removing the antenna module

- | | | | |
|---|------------------|---|----------------|
| 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 [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



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: 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



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-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**.



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**.



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**.



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**.



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**.
 **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**.
 **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**.



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

 **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

 **NOTE: XXX denotes the SATA drive number.**

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

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

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

Navigation keys

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

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



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.

 **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

 **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. |

General-System Information

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 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

Displays the battery health information.

Boot Sequence



General-System Information

| | |
|------------------|--------------------------------------|
| 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 | Enables or disables prompts for the administrator 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 the external USB port. |
| Enable Thunderbolt ports | Enable or disable the thunderbolt ports. |
| 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. |



System Configuration

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



Security

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



Intel Software Guard Extensions



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. 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.



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

- 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

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**.



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.

Enhanced Pre-Boot System Assessment (ePSA) diagnostics



CAUTION: Use the ePSA diagnostics to test only your computer. Using this program with other computers may cause invalid results or error messages.

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

- Run tests automatically or in an interactive mode
- Repeat tests
- Display or save test results



- Run thorough tests to introduce additional test options to provide extra information about the failed device(s)
- View status messages that inform you if tests are completed successfully
- View error messages that inform you of problems encountered during testing



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

For more information, see [Dell EPSA Diagnostic 3.0](#).

Running the ePSA diagnostics

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

Diagnostics

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.

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.

Flea power release

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

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

 **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

Information about Dell products and services

www.dell.com

Dell Help & Support app



Accessing help

In Windows search, type **Help** and **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.

- 1 Go to www.dell.com/support.
- 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:

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

- Product specifications
- Operating system
- Setting up and using your product
- Data backup
- Troubleshooting and diagnostics

To locate the *Me and My Dell* relevant to your product, identify your product through one of the following:

- Select **Detect Product**.



- Factory and system restore
- BIOS information
- 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.



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.