

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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Identifier	GUID-5D3B1051-9384-409A-8D5B-9B53BD496DE8
Status	Released


Before working inside your computer




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

Identifier	GUID-B2521C24-A407-4ABB-8022-6D88B53F0B94
Status	Released

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.

Identifier	GUID-71128823-CE64-4E17-9439-DEE95AF668C4
Status	Released

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.

Identifier	GUID-1DA44488-D101-4AAE-BADD-2C0771F1C35F
Status	Released

Recommended tools

The procedures in this document may require the following tools:











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

Identifier	GUID-328DCC55-D98F-4173-A3DD-26BE2F041BF7
Status	Released











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	



Component	Secured to	Screw type	Quantity	Screw image
Speakers	Palm-rest assembly	M2x2	4	
Fan	System board	M2x4	4	
Heat-sink assembly	System board	M2x3	5/4	
Display-cable bracket	System board	M2x2	1	
System board	Palm-rest assembly	M2x4	5	
Audio daughter-board	System board	M2x3	2	
Keyboard	Palm-rest assembly	M1.6x1.5	31	
Display hinges	Palm-rest assembly	M2.5x5	6	
Power-adaptor port	Palm-rest assembly	M2x3	1	
Antenna module	Display assembly	M2x4	4	

Identifier	GUID-06588814-2678-4667-9FF9-C009F4BCE185
Status	Released

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.

Identifier	GUID-98068FC2-1C1C-46DE-B3FA-DF9D488E9BA1
Status	Released

Removing the base cover



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Identifier	GUID-FE52208C-5EFA-4569-A90D-E459B9E17E37
Status	Released

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.

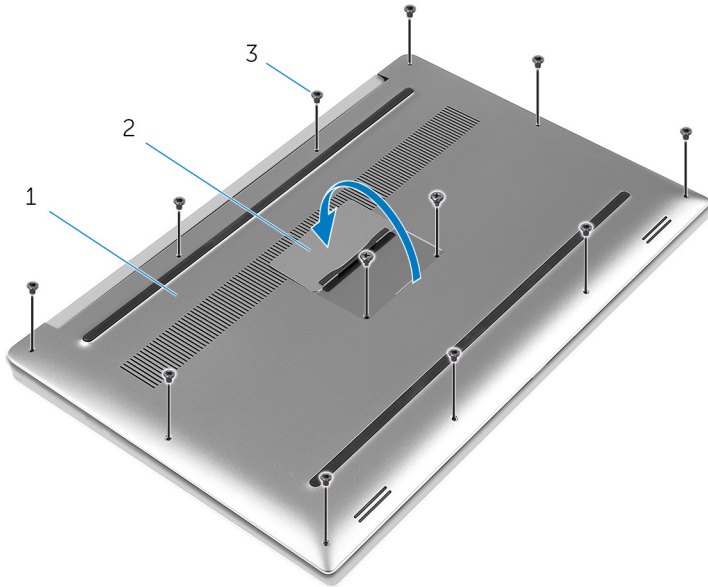


Figure 1. Removing the base cover

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

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

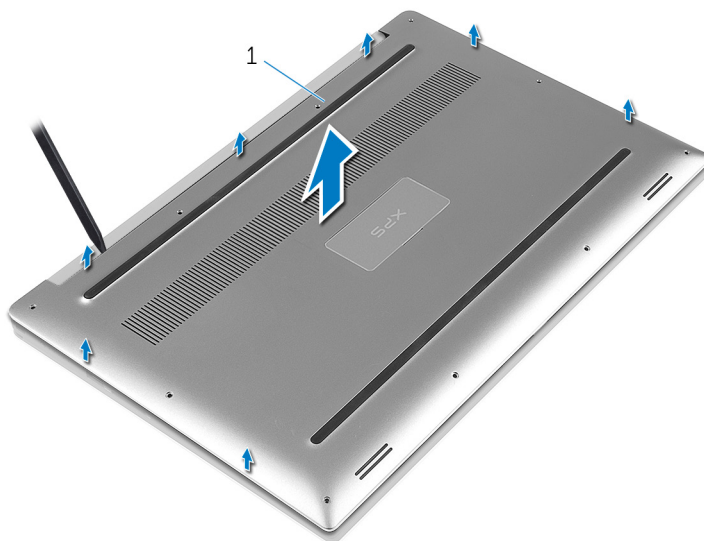


Figure 2. Prying the base cover off the computer base

- 1 base cover

Identifier	GUID-27446428-82D7-4881-9220-9EB090B046EA
Status	Released

Replacing the base cover



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Identifier	GUID-F113D502-95A9-448F-AB1C-F07A96526541
Status	Released

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.

Identifier	GUID-FA3B2FD2-52E7-43FD-8566-AA808CE90E66
Status	Released

Removing the battery (half-length)



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Identifier	GUID-ADE0B0E5-2130-4FC4-8553-96D2D5460E56
Status	Released

Prerequisites

Remove the [base cover](#).

Identifier	GUID-FCDEA56B-004E-44A7-A6A0-7C50399AF6E1
Status	Released

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.

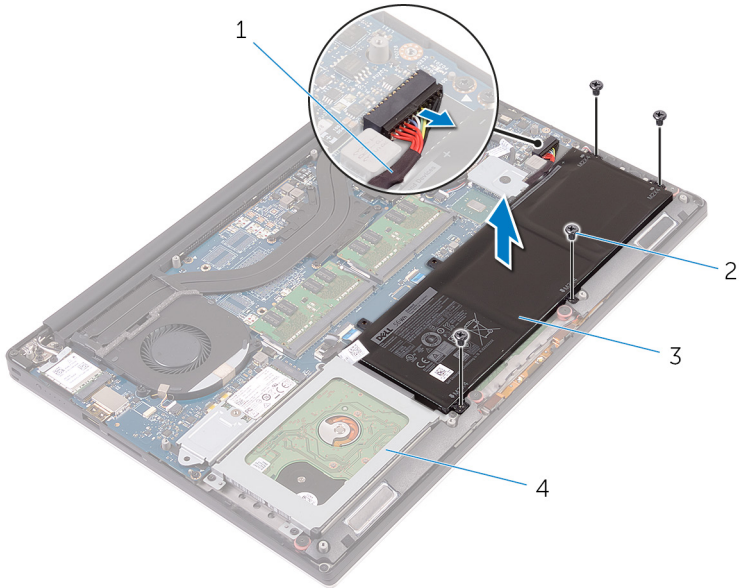


Figure 3. Removing the battery

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

Identifier	GUID-E50A81D7-E412-49DE-BEB1-6B6374245972
Status	Released

Replacing the battery (half-length)



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Identifier	GUID-B0DA0B2B-67A5-4E8B-9FA0-7C2DEB75C5DE
Status	Released

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.

Identifier	GUID-A5E4D6EB-7F3C-40E5-A565-D1CF58021412
Status	Released

Post-requisites

Replace the [base cover](#).



Identifier	GUID-355FFABD-659C-4427-88AA-60E0E3DBB1D9
Status	Released

Removing the battery (full-length)



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Identifier	GUID-ADE0B0E5-2130-4FC4-8553-96D2D5460E56
Status	Released

Prerequisites

Remove the [base cover](#).

Identifier	GUID-CBCA961F-7C16-4C3F-AD46-FA737221CE41
Status	Released

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.

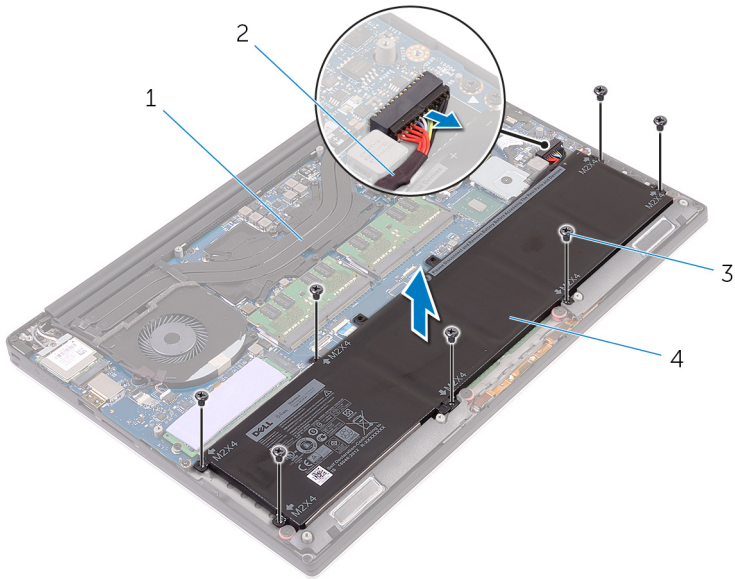


Figure 4. Removing the battery

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

Identifier	GUID-DF0226C1-346A-4344-98C0-0CF1245F11C9
Status	Released

Replacing the battery (full-length)



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Identifier	GUID-4E17BC0B-6366-46F3-8FEE-0F9AD2A039F1
Status	Released

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.

Identifier	GUID-A5E4D6EB-7F3C-40E5-A565-D1CF58021412
Status	Released

Post-requisites

Replace the [base cover](#).

Identifier	GUID-5DE1E07B-4633-4536-ACBF-4A3067007FE0
Status	Released

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.

Identifier	GUID-C7C10D90-ADC9-4C77-887A-AF3EE25E9BDA
Status	Released

Prerequisites

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

Identifier	GUID-D6DE55CD-9F65-40DC-8643-7C6D95509DA6
Status	Released

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.

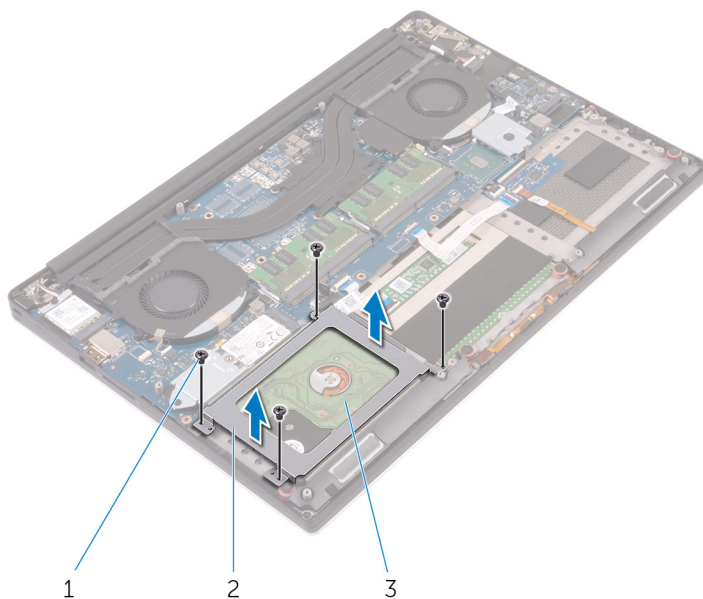


Figure 5. Removing the hard-drive cage

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

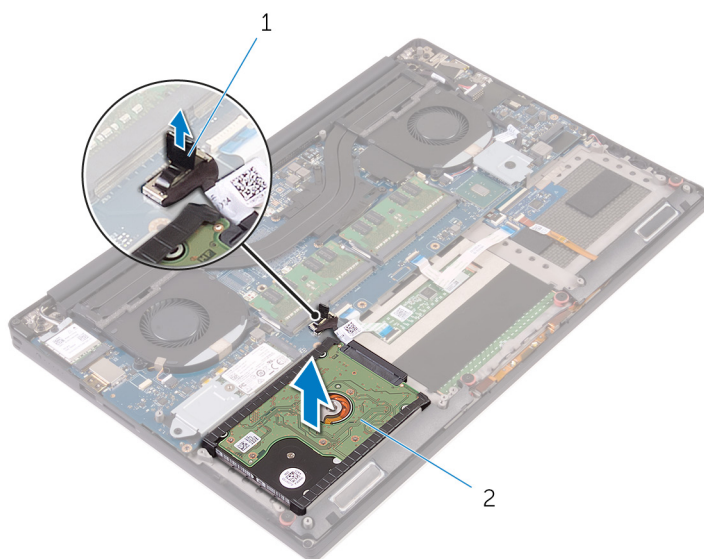


Figure 6. Disconnecting the hard-drive cable from the system board

1 pull tab

2 hard-drive assembly

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

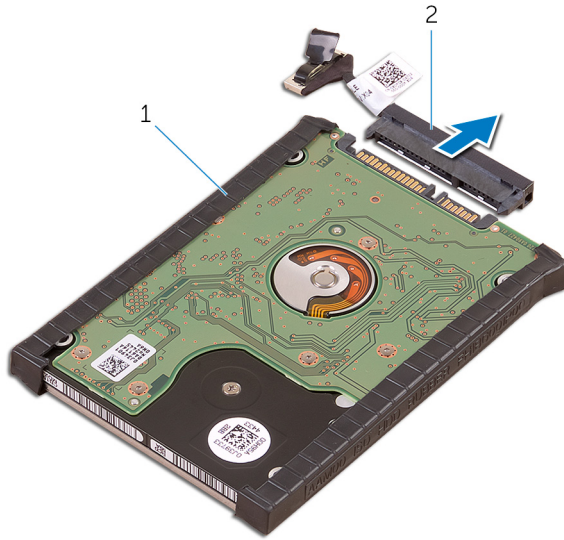


Figure 7. Disconnecting the hard-drive interposer from the hard-drive assembly

- 1 hard-drive assembly 2 hard-drive interposer

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

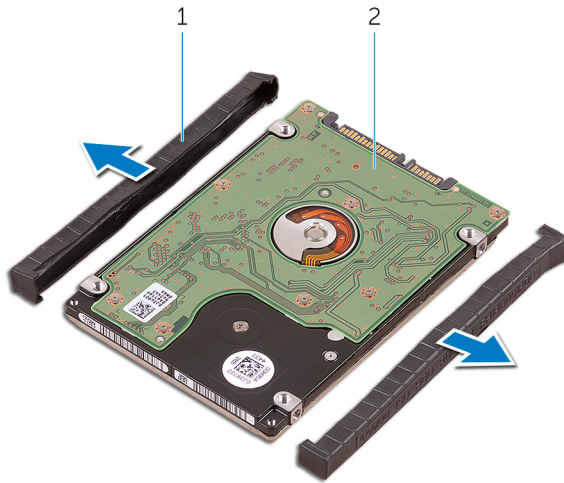


Figure 8. Removing the hard-drive cover

1 hard-drive covers (2)

2 hard drive

Identifier	GUID-8D72BB77-0F8B-428E-A98E-FF7DA2CDA899
Status	Released

Replacing the hard drive



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

Identifier	GUID-84AE5B77-A0DE-461A-BF43-D8853194B570
Status	Released

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.

Identifier	GUID-D58061A8-62F0-4304-AC8D-80A1C0DDF696
Status	Released

Post-requisites

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

- 2 Replace the [base cover](#).



Identifier	GUID-8B732F56-051E-43E5-BD12-F403EA5BE6E8
Status	Released

Removing the solid-state drive (half-length)



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Identifier	GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF
Status	Released

Prerequisites

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

Identifier	GUID-1DE68481-5A48-4382-8E64-7D4508ABEAB0
Status	Released

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.

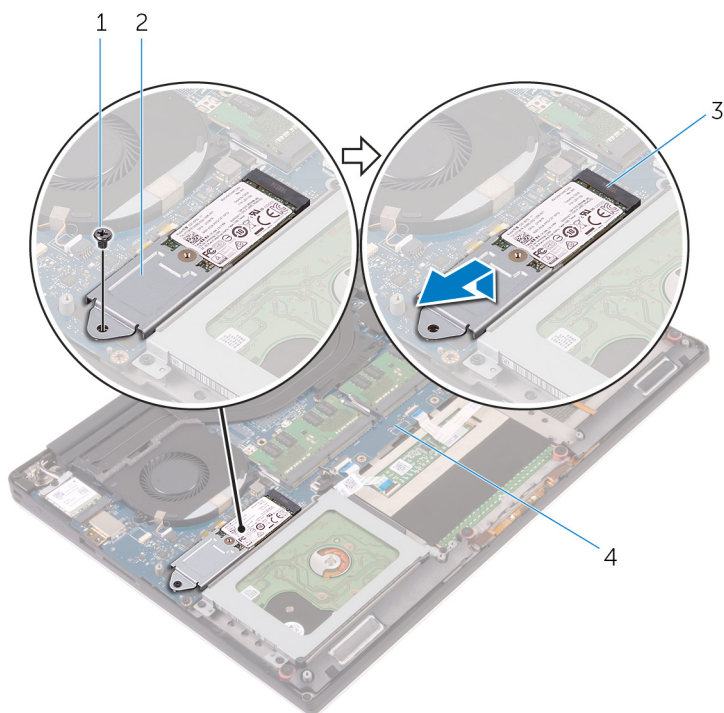


Figure 9. Removing the solid-state drive assembly

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

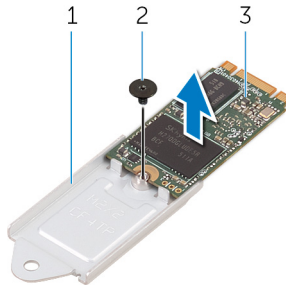


Figure 10. Removing the solid-state drive bracket

- | | | | |
|---|---------------------------|---|-------|
| 1 | solid-state drive bracket | 2 | screw |
| 3 | solid-state drive | | |
- 4 Lift the solid-state drive off the solid-state drive bracket.

Identifier

GUID-D3CEABFD-629C-4387-BE70-448237C2381D

Status

Released

Replacing the solid-state drive (half-length)



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Identifier

GUID-0B4DFA25-CDC9-407D-A65A-234FFD38CFA5

Status

Released

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.

Identifier

GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D

Status

Released

Post-requisites

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



- 2 Replace the [base cover](#).



Identifier	GUID-CA63CF9E-83FD-4B12-9A33-5E7A4DBAB972
Status	Released

Removing the solid-state drive (full-length)



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.

Identifier	GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF
Status	Released

Prerequisites

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

Identifier	GUID-7B2E5A47-FAA4-4AA9-B3F5-2284E315C53B
Status	Released

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.

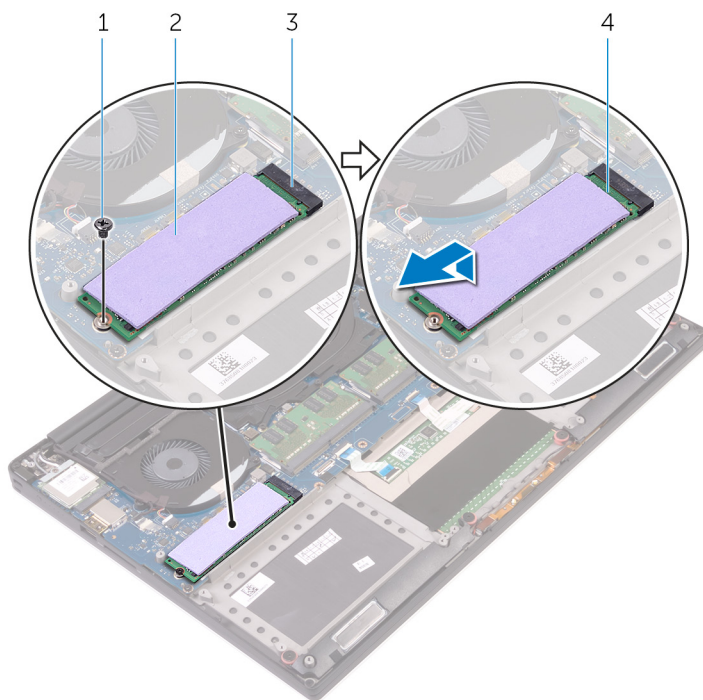


Figure 11. Removing the solid-state drive

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

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

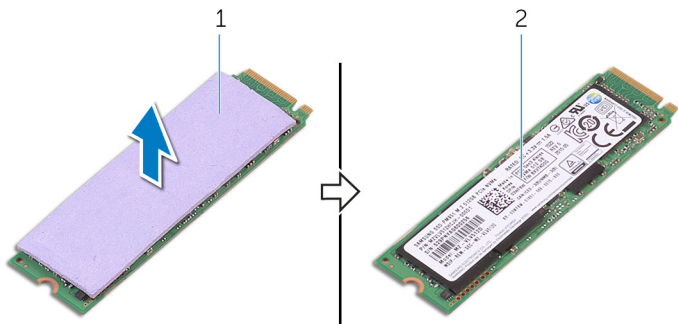


Figure 12. Removing the thermal pad

1 thermal pad

2 solid-state drive

Identifier	GUID-47BC7D1D-16F9-431C-B5A1-81A1759FBE6A
Status	Released

Replacing the solid-state drive (full-length)



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Identifier	GUID-2E45853F-15D0-4E23-99A9-F91D4DCDF447
Status	Released

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.

Identifier	GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D
Status	Released

Post-requisites

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

Identifier	GUID-BF7F1ECA-BC62-4949-B1BE-EC64E351719E
Status	Released

Removing the speakers



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.

Identifier	GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF
Status	Released

Prerequisites

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

Identifier	GUID-5146EAB7-980D-425D-B274-7DB1561C06D3
Status	Released

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.

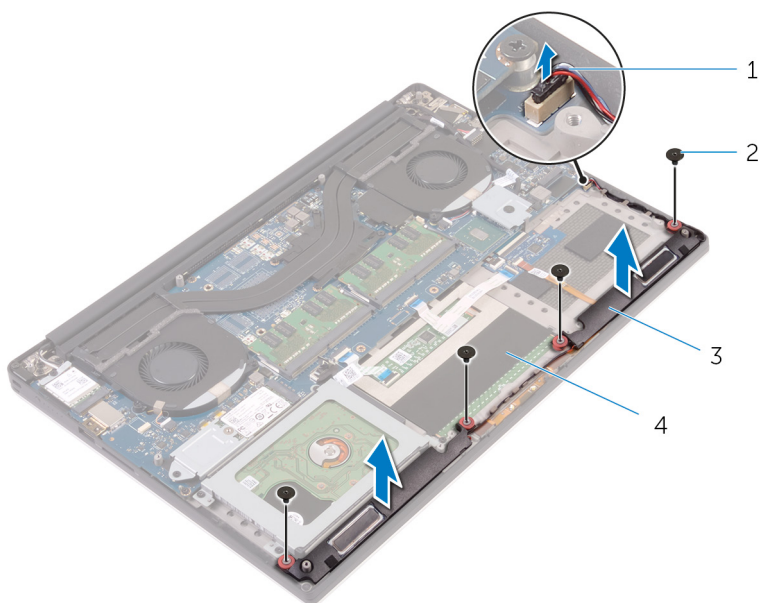


Figure 13. Removing the speakers

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

Identifier	GUID-40DC76F7-B3EC-450A-848E-632D68C352E2
Status	Released

Replacing the speakers



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.

Identifier	GUID-AC4AADA4-AE75-4834-B2D7-49DA6C0A92EC
Status	Released

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.

Identifier	GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D
Status	Released

Post-requisites

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



Identifier	GUID-4AF7A7F4-79DC-43F4-A4DF-63362F890FB6
Status	Released

Removing 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.

Identifier	GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF
Status	Released

Prerequisites

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

Identifier	GUID-6F685E0B-92D5-4CEF-AA20-0A459D7A8E89
Status	Released

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.

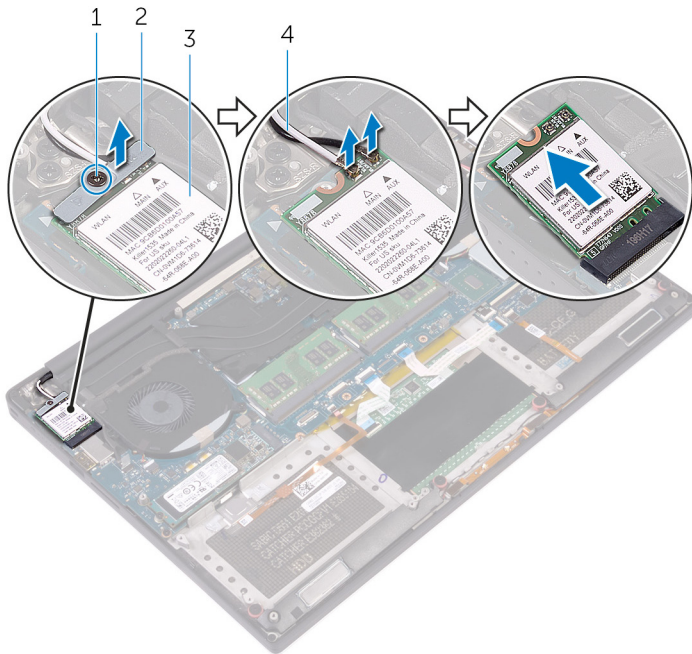



Figure 14. Removing the wireless card

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

Identifier	GUID-94E88AEC-6F12-4B0E-AA6A-B28D8E200225
Status	Released

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.

Identifier	GUID-7D457601-D15C-4126-B9DA-6C9B7B8A871C
Status	Released

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.

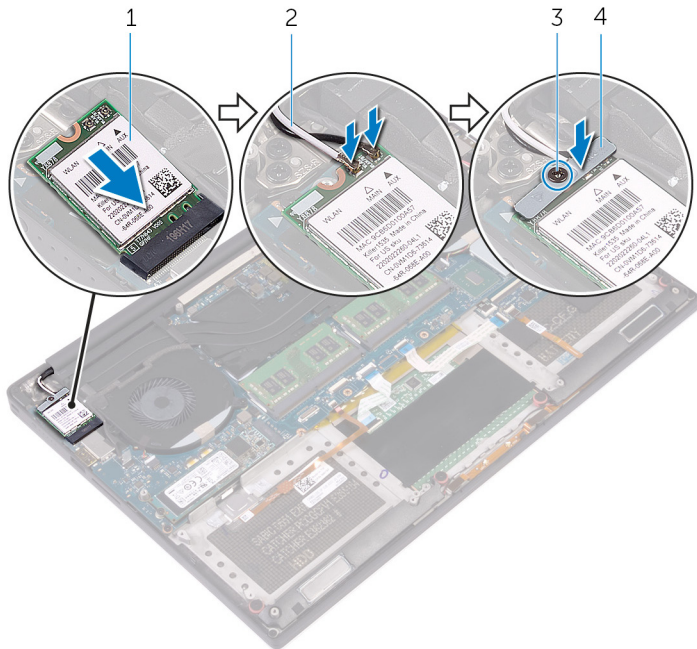


Figure 15. Replacing the wireless card

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

Identifier	GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D
Status	Released

Post-requisites

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



Identifier	GUID-F98150E9-52A3-4FCD-8420-54A9A2A6DA46
Status	Released

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.

Identifier	GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF
Status	Released

Prerequisites

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

Identifier	GUID-25D531B0-2984-47B0-AD3F-D83854B7F4AC
Status	Released

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.

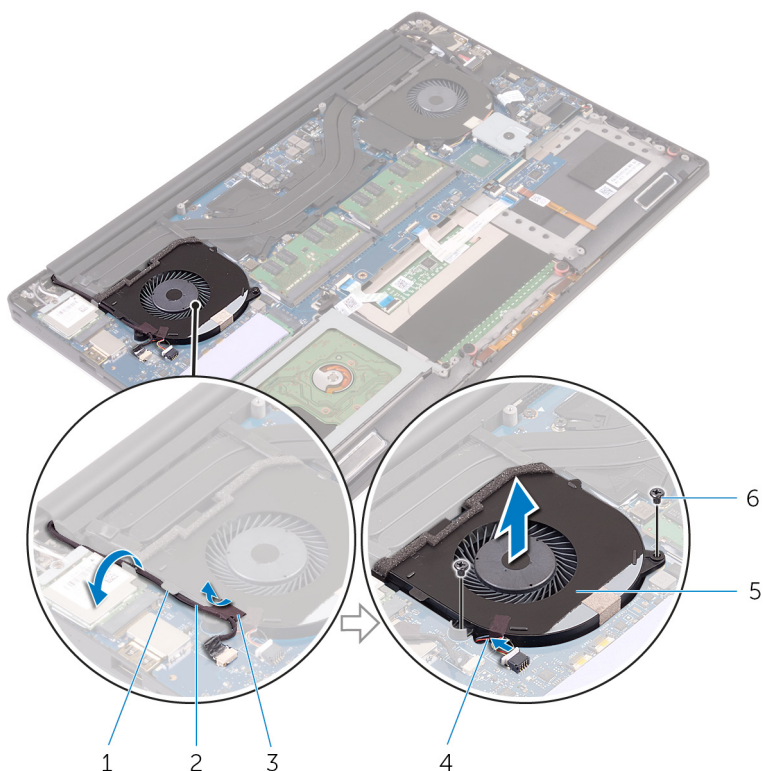


Figure 16. Removing the video fan

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

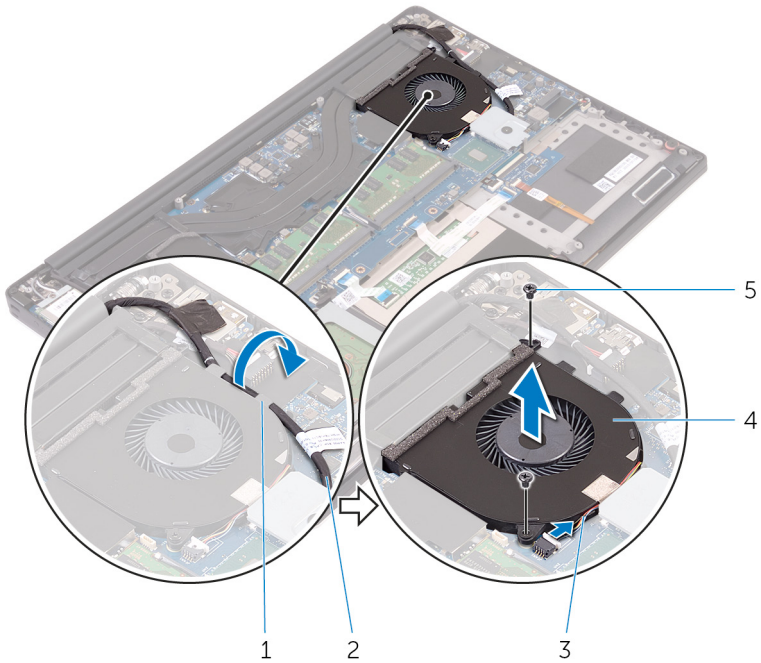


Figure 17. Removing the processor fan

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

Identifier	GUID-C3E89978-1994-4C7D-98C9-E51C8651B0A6
Status	Released

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.

Identifier	GUID-396D4ADD-FAAE-4C35-AEEF-CB3FC39F26B0
Status	Released

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.




Identifier	GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D
Status	Released

Post-requisites


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

Identifier	GUID-A4C65F77-E1D1-4595-B52B-D281E90F786D
Status	Released

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.

Identifier	GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF
Status	Released

Prerequisites

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

Identifier	GUID-2072A66E-E520-4C42-B582-C5A4A2076A92
Status	Released

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.

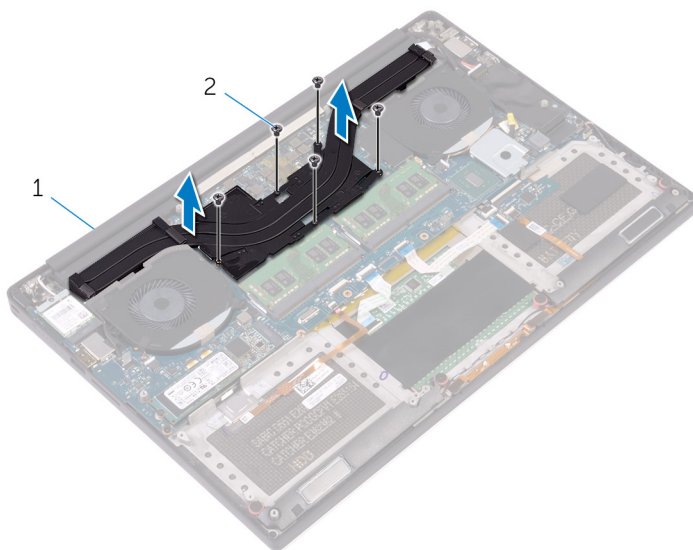


Figure 18. Removing the heat-sink assembly

1 heat-sink assembly

2 screws (5/4)

Identifier	GUID-9847FD24-88EC-4F5A-BCCF-D9D9830B777A
Status	Released

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.

Identifier	GUID-6735D332-2AE0-440D-9A7D-54D6D917B52A
Status	Released

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).



Identifier	GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D
Status	Released

Post-requisites

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

Identifier

GUID-AAC0DC5A-1680-492D-804F-52F812D409C2

Status

Released

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.

Identifier

GUID-28F89DF8-99BB-4B9C-88D1-6DB4494163CF

Status

Released

Prerequisites

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

Identifier

GUID-E7CC2856-2069-4D93-BA85-9326C079A4BB

Status

Released

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.

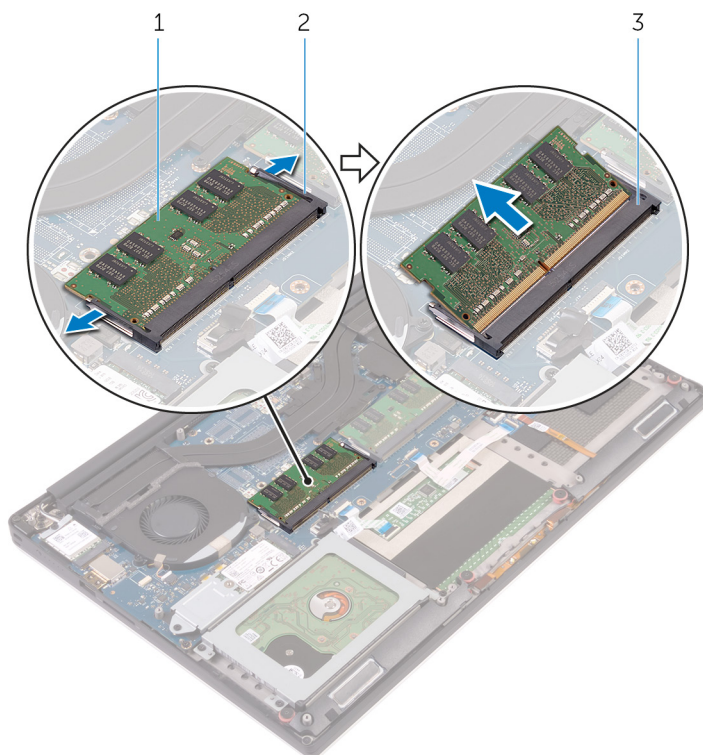


Figure 19. Removing the memory modules

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

Identifier	GUID-1F5023F5-9868-4AAF-A9F5-BFB400CD890A
Status	Released

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.

Identifier	GUID-01D31343-9248-4391-A6FC-1C2FE832C508
Status	Released

Procedure

- 1 Align the notch on the memory module with the tab on the memory-module slot.



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



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

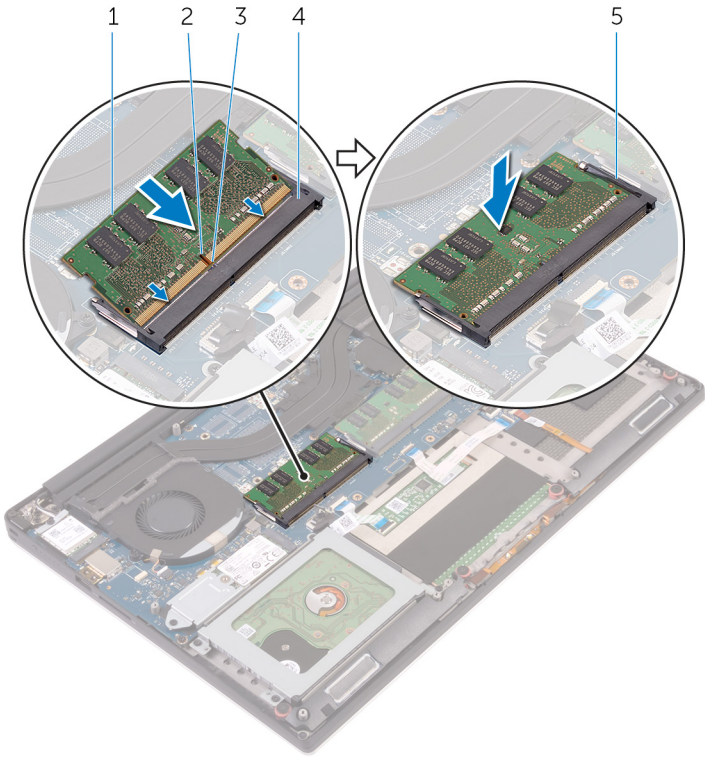


Figure 20. Replacing the memory modules

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

Identifier	GUID-D6D9C7FD-F5F2-4841-BED9-C4F8672A8F1D
Status	Released

Post-requisites

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



Identifier	GUID-B54497E8-5AD5-4FF9-AD4A-F32FDBEDE1E8
Status	Released

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.

Identifier	GUID-3CDEC4BE-A292-4A1F-BC04-BF305C3B75C9
Status	Released

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](#).



Identifier	GUID-8F688CA0-8CD9-4D38-9D34-81544EC60A32
Status	Released

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.

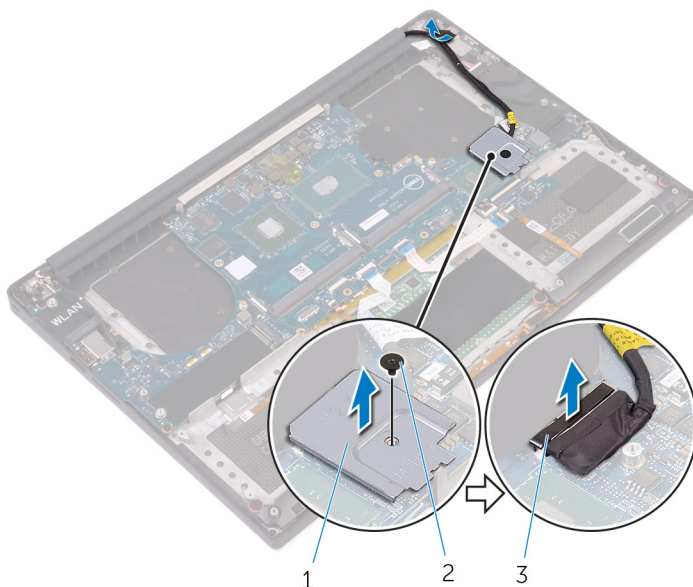


Figure 21. Disconnecting the display cable

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

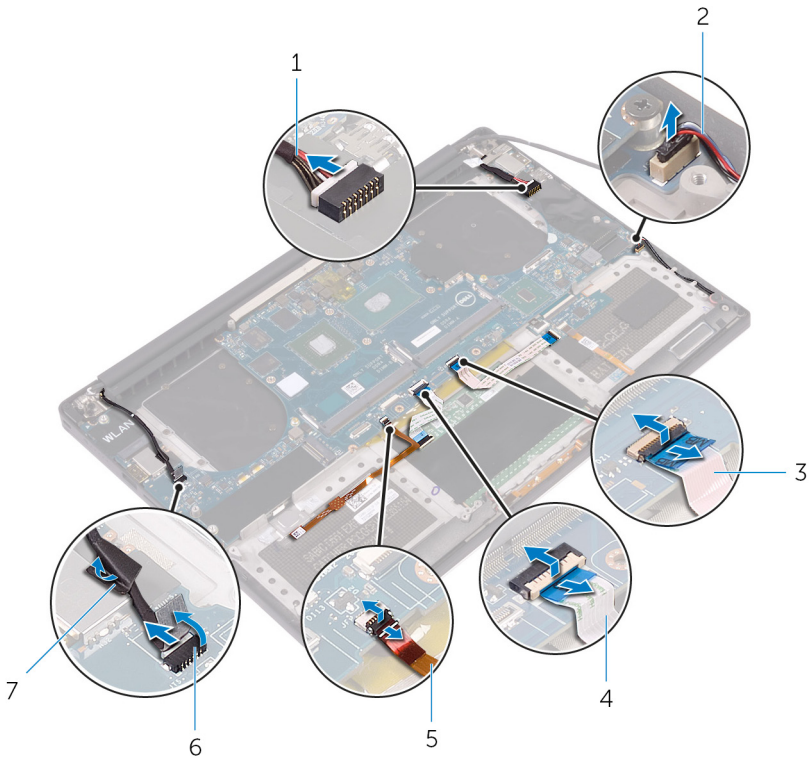


Figure 22. Disconnecting the cables

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

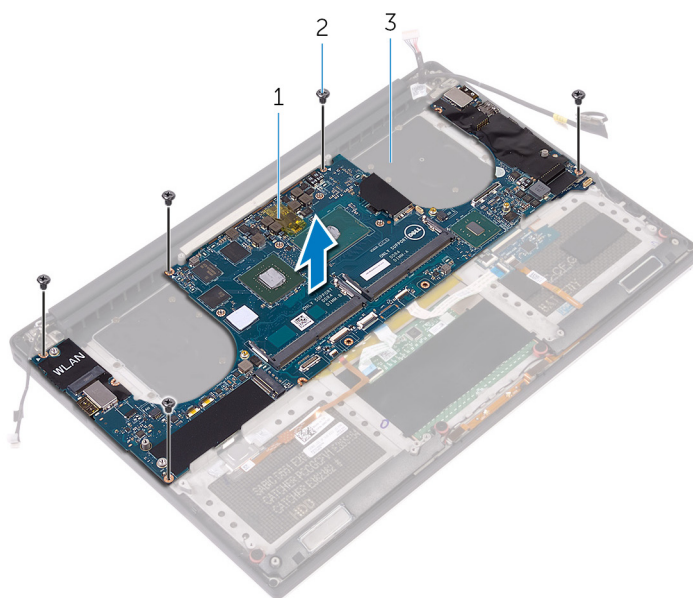


Figure 23. Removing the system board

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

Identifier	GUID-67274E98-E2F1-4B7B-A903-F38BA6B62028
Status	Released

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.

Identifier	GUID-B880E805-E813-45FF-8885-0945022F24DF
Status	Released

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.

Identifier	GUID-089EE999-93A9-452E-8B02-09D8FCFB7C90
Status	Released

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](#).



Identifier	GUID-3C23730D-19FE-4A80-8998-9A85C2DCE934
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Status	Released
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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.

Identifier	GUID-44D35805-8B60-4013-B93B-9D1ACACD3E33
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Status	Released
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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](#).

Identifier	GUID-97008DC4-67C0-4190-A77A-32D3C0432069
Status	Released

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.

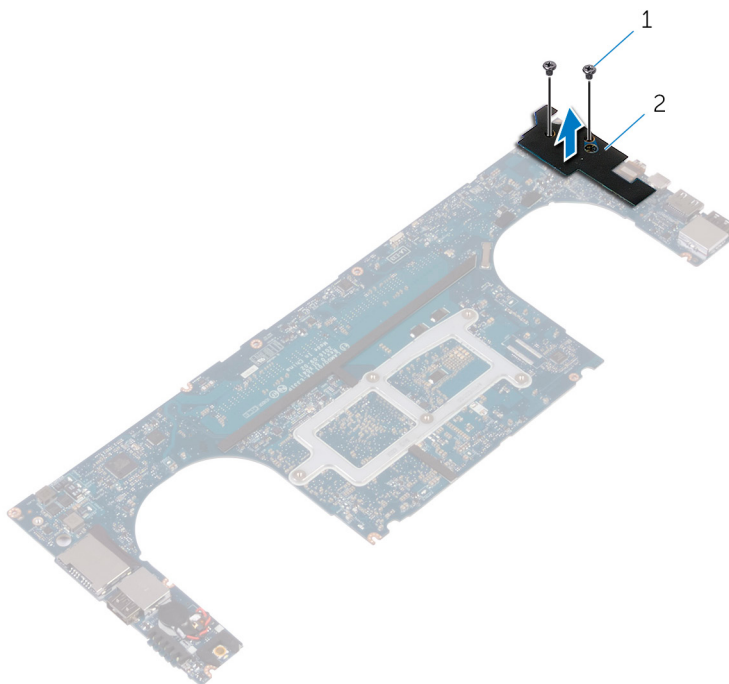


Figure 24. Removing the audio daughter-board

1 screws (2)

2 audio daughter-board



Identifier	GUID-14B28E08-E8D1-4B67-83F3-85BFE7AA7937
Status	Released

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.

Identifier	GUID-C9A47377-4CCF-4494-8D1D-338EF8D7B50C
Status	Released

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.

Identifier	GUID-918C0499-50D7-49AB-8F43-B72724B368FF
Status	Released

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](#).



Identifier	GUID-30EEBC49-DE3E-4C3F-8226-86CE5F32F388
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Status	Released
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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.

Identifier	GUID-6634F686-747A-4FB1-8FEB-7271331E5E56
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Status	Released
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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](#).

Identifier	GUID-215EAD74-5DCE-4E4C-B00B-4E8FE78889E1
Status	Released

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.

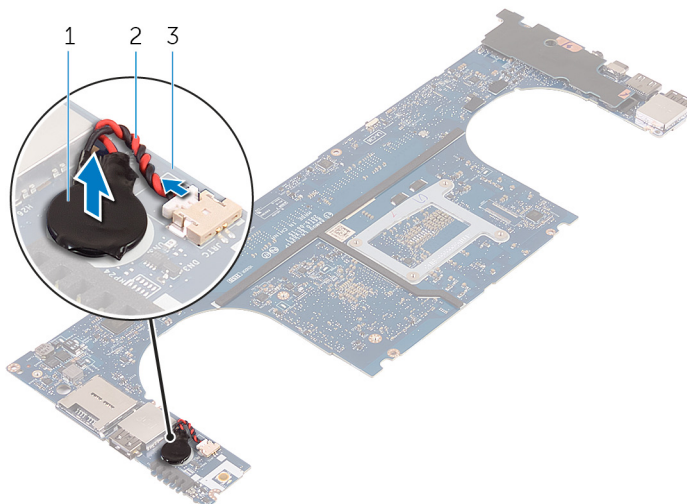


Figure 25. Removing the coin-cell battery

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

Identifier	GUID-5E22F4A0-F01F-4522-8155-BE22A8CA6E5F
Status	Released

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.

Identifier	GUID-A26355E1-1177-48A1-86DE-85C0637849C0
Status	Released

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.

Identifier	GUID-4EB5EDC2-D30F-4CBF-A7C9-99B10F18D946
Status	Released

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](#).



Identifier	GUID-5AE964CF-7958-4D31-BBA8-155C933167E8
Status	Released

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.

Identifier	GUID-BE0AEDCA-F3D2-47B1-8A55-2367CF360BD7
Status	Released

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](#).

Identifier	GUID-86E18A8C-01FE-40F5-9FF2-853A93FEB0BB
Status	Released

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.

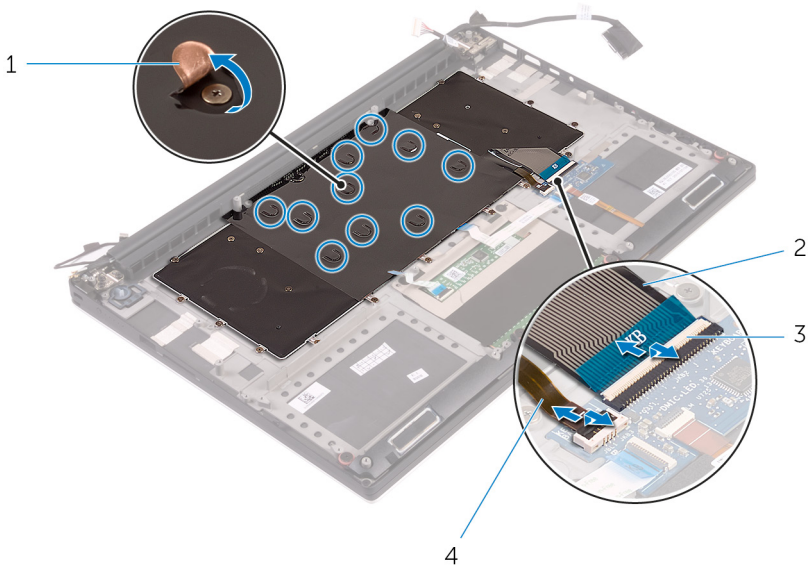


Figure 26. Disconnecting the keyboard and keyboard-backlight cable

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

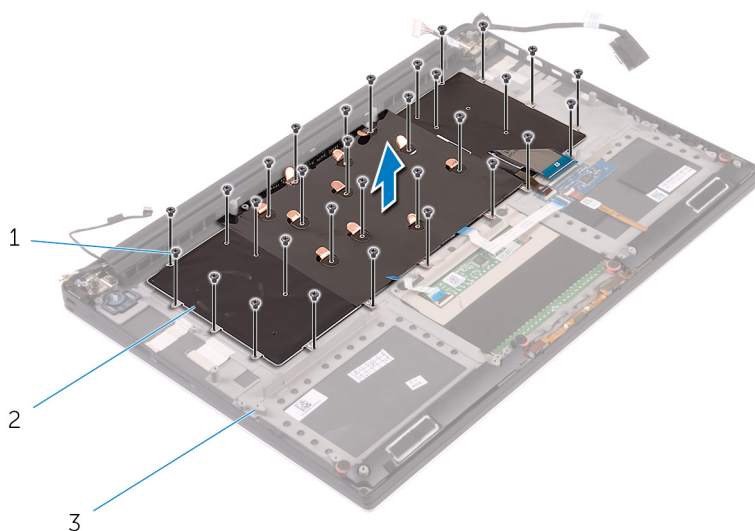


Figure 27. Removing the screws from the keyboard

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

Identifier	GUID-18204C76-DF75-4DB8-BD6F-EFA74576AAD7
Status	Released

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.

Identifier	GUID-491E066B-A879-4DD1-AFD0-80C3D978E1EE
Status	Released

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.

Identifier	GUID-9DB0941C-C68E-41AA-921E-F226F8F0F3E5
Status	Released

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](#).



Identifier	GUID-AB1F153B-621B-42FC-89BE-0E1105FF1786
Status	Released

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.

Identifier	GUID-B56E2301-3ABA-48D9-BC76-A2962E57BC12
Status	Released

Prerequisites

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

Identifier	GUID-074C95E5-EC9E-47A6-9E61-EECF4480ECF1
Status	Released

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.

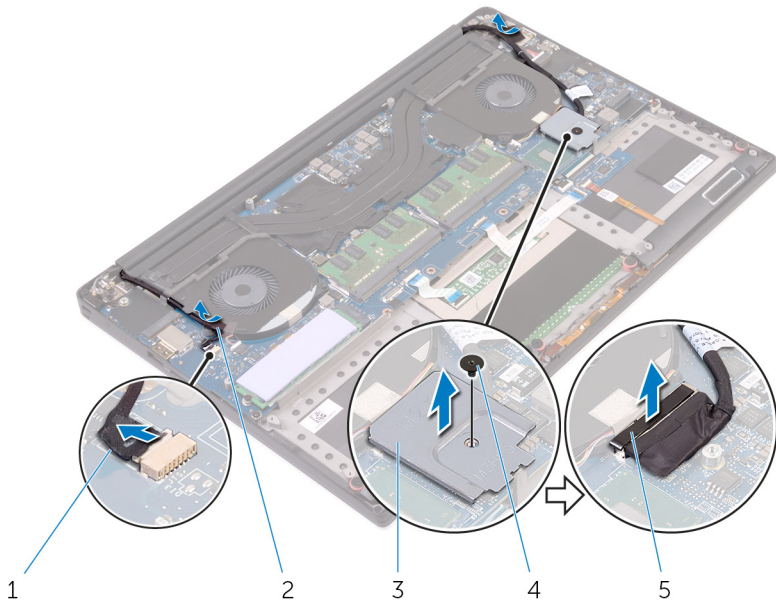


Figure 28. Disconnecting the cables

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

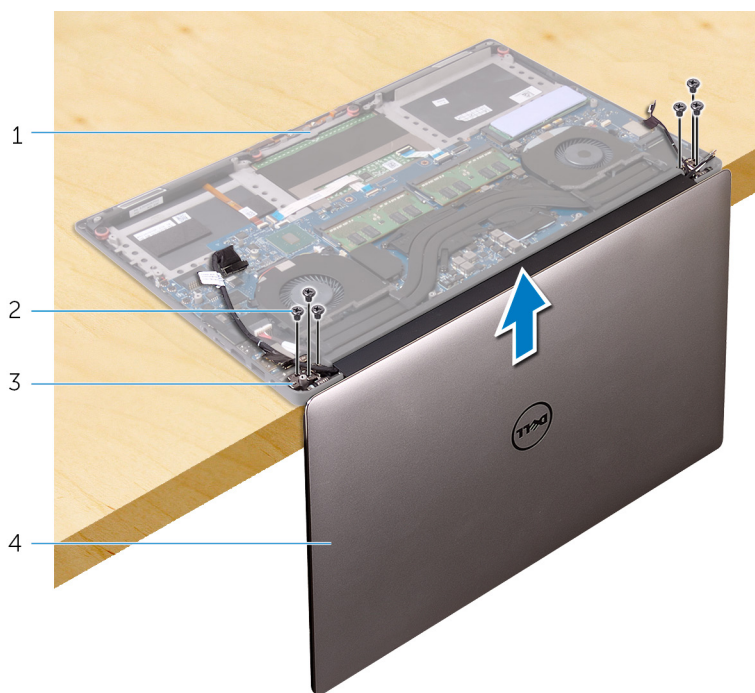


Figure 29. Removing the screws that secure the display hinges to palm-rest assembly

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

Identifier

GUID-2DF70EB1-9D26-4051-8B7C-FB14A89925D8

Status

Released

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.

Identifier

GUID-DA82B76C-0EE3-4263-9033-54BF36A6B5B6

Status

Released

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.

Identifier	GUID-96465A79-3284-4285-B73F-150E1B213336
Status	Released

Post-requisites

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



Identifier	GUID-35D5032D-9652-403C-9A8A-F98FFABA8776
Status	Released

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.

Identifier	GUID-2FF28833-B61C-40FB-888B-254BA7578BCB
Status	Released

Prerequisites

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

Identifier	GUID-A6D5FBD8-01B6-4CA4-987A-80FE336B8AF5
Status	Released

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-adaptor port along with its cable, off the palm-rest assembly.

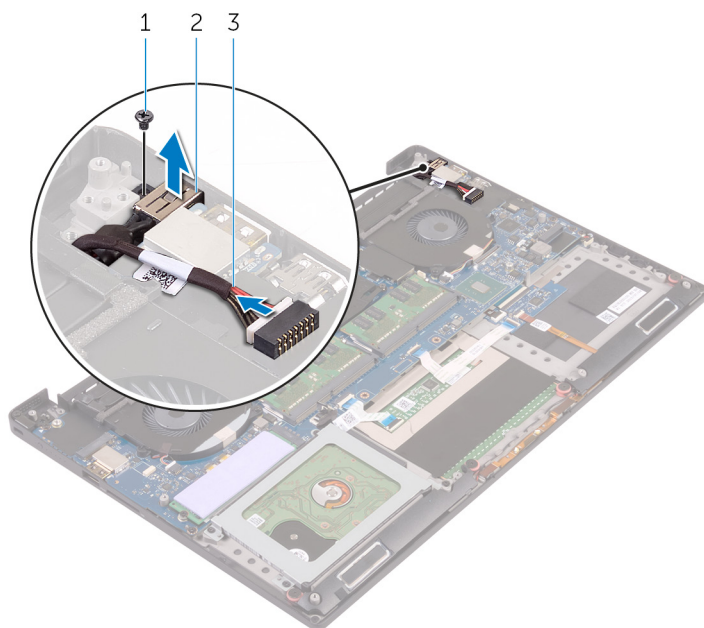


Figure 31. Removing the power-adaptor port

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

Identifier	GUID-A99140DB-7AF3-4218-B305-532FF94DF51D
Status	Released

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.

Identifier	GUID-6573CEC9-6601-4D86-B746-449414FF1856
Status	Released

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.

Identifier	GUID-F0710676-729E-43A4-BC18-2F7005354246
Status	Released

Post-requisites

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

Identifier	GUID-2D298405-DB18-4207-B981-B7135F293956
Status	Released

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.

Identifier	GUID-80BA3639-45CF-469B-A62E-647326B941AC
Status	Released

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](#).



Identifier	GUID-A8377F5B-D34E-4898-A4F8-FC8C47A285BF
Status	Released

Procedure

- 1 Carefully turn the display hinges at an angle.

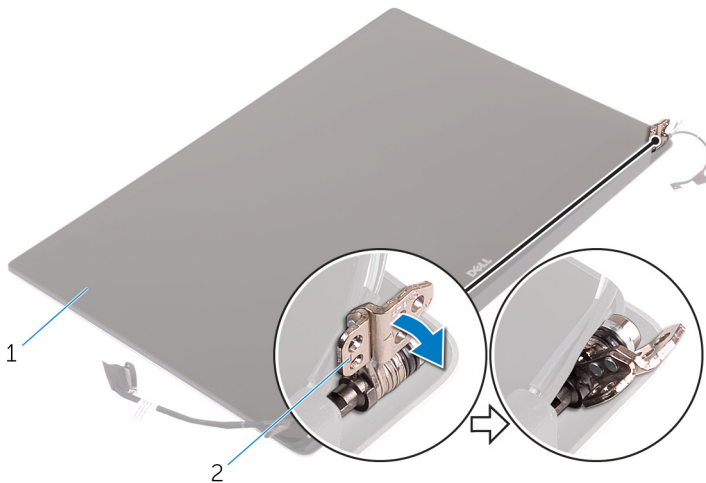


Figure 32. Turning the display hinge

- 1 display assembly
- 2 display hinges (2)

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

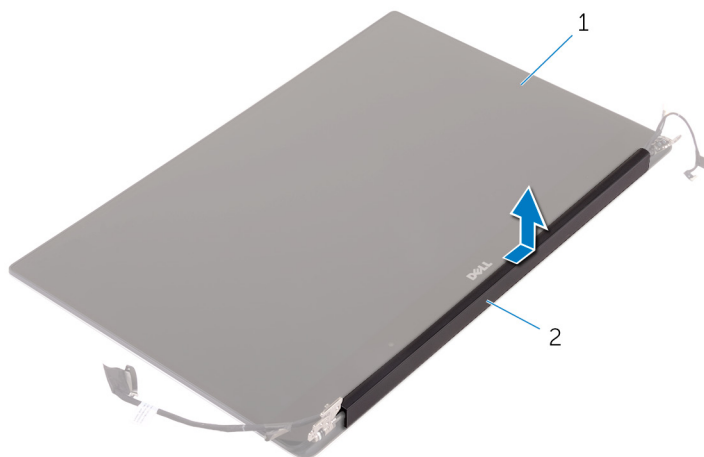


Figure 33. Removing the antenna cover

1 display assembly

2 antenna cover

Identifier	GUID-CDC36DAD-8593-48BA-A3B1-D9401C9DFE1D
Status	Released

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.

Identifier	GUID-7ACABB91-5AEC-4E93-9AA6-74128A6B65CF
Status	Released

Procedure

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

Identifier	GUID-6A25475D-B8FF-473F-BDD0-52E3BAD02710
Status	Released

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](#).

Identifier	GUID-6C4E9746-B780-409D-B703-9A43273C227D
Status	Released

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.

Identifier	GUID-7EF5D017-411E-45BA-994D-1B929DB8C05E
Status	Released

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](#).



Identifier	GUID-3E0B3C8E-472C-4076-8F3B-B1CD03501C85
Status	Released

Procedure

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

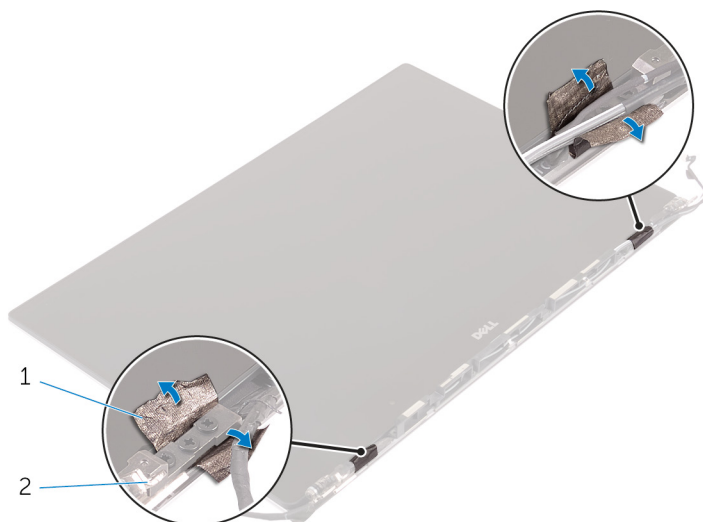


Figure 34. Peeling the tape

- 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.

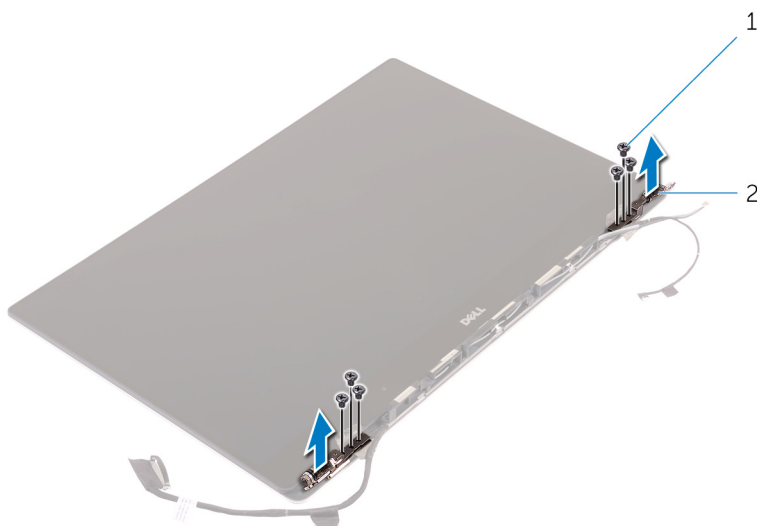


Figure 35. Removing the display hinges

1 screws (6)

2 display hinges (2)

Identifier	GUID-E3D5A4DB-BAB5-4F6F-B7B6-8BC4EF0CC57D
Status	Released

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.

Identifier	GUID-7E4B92E1-B7DB-474B-8E6E-6DE5811E88E7
Status	Released

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.

Identifier	GUID-596D1D1C-5598-4B51-A19E-E26E5C6F7EA5
Status	Released

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](#).

Identifier	GUID-A84F666A-38B4-4C77-A8DE-7910F5831300
Status	Released

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.

Identifier	GUID-892244E2-6E72-43F7-B7E4-E161D5995363
Status	Released

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](#).

Identifier	GUID-941A9399-CB90-4058-A802-7987DC7ECD57
Status	Released

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.

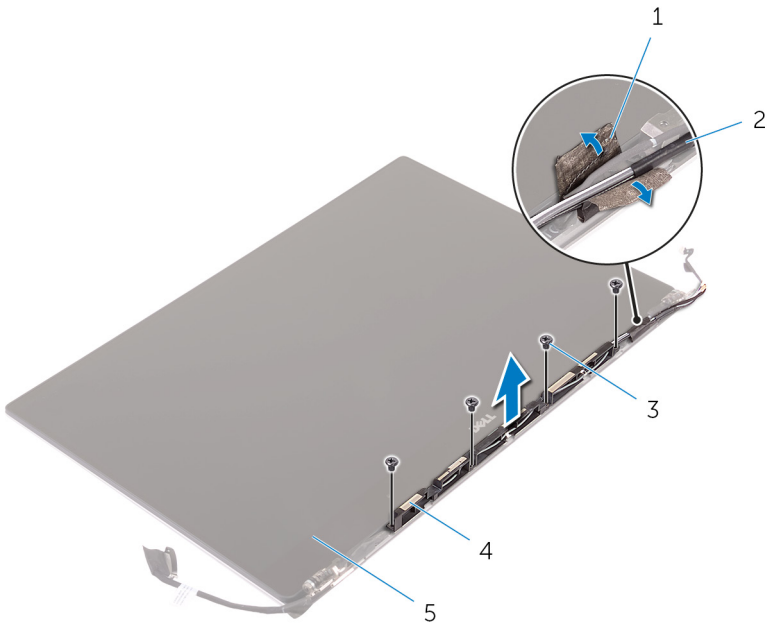


Figure 36. Removing the antenna module

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

Identifier	GUID-29CD5413-5042-412F-825D-11E3CCAAFC74
Status	Released

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.

Identifier	GUID-56FF35CE-C58B-4DD9-B304-DEF3C5645827
Status	Released

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.

Identifier	GUID-0F926196-E7CA-4FE1-8FCC-80AA3AE6AD93
Status	Released

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](#).



Identifier	GUID-740BADE7-E98C-41E6-A2C7-D807C0482F9A
Status	Released

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.

Identifier	GUID-620F59E5-AC3A-4A36-A959-1FAEBA6F2CE9
Status	Released

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 [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-adaptor port](#).
- 12 Remove the [system board](#).
- 13 Remove the [keyboard](#).

Identifier	GUID-3B869ECB-F569-4CFF-978E-EC66F0E4F9E4
Status	Released

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

Identifier	GUID-C338CD8A-D6B9-47AE-9629-3FBE505948D9
Status	Released

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.

Identifier	GUID-EBACC18B-687C-46E5-8818-DE3A7576F360
Status	Released

Procedure

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

Identifier	GUID-83B0C574-2A66-4062-B5E0-1B55FF6B8DEA
Status	Released

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** 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](#).



Identifier	GUID-6F264EA1-964F-41BB-959D-3363BEC8A330
Status	Released

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.

Identifier	GUID-B870F65A-C552-4505-BD6B-19C17853D4CE
Status	Released

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.

Identifier	GUID-4D657279-3C0F-4906-97E5-34F43B3950EF
Status	Released

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.

Identifier	GUID-4FF6787D-08D0-47C4-8A0D-BA3F0C405F50
Status	Released

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.
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.



General-System Information

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.

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	



System 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.
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.



Security

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.
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.
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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 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.



Intel Software Guard Extensions

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.
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.
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.



System Logs	
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.

Identifier	GUID-647C1E15-AF1F-4815-95E2-06A934E73944
Status	Released

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](#).

Identifier	GUID-F5899359-C2E1-41C0-9663-4C79969506EB
Status	Released

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.

Identifier	GUID-B870EAA8-5DDE-49C9-A0FC-161163061517
Status	Released

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.

Identifier	GUID-60C02594-2543-40E4-A549-30028A0A973A
Status	Released

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.



Identifier	GUID-80DC43D6-1463-45B2-A696-31AA152DE5AE
Status	Released

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

Light Pattern	Problem description
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.





Identifier	GUID-8B6ECA9D-83CA-45F7-BD6B-BB1F8EFAF446
Status	Released

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 <i>Me and My Dell</i> 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.

