

Inspiron 24 5000 All-in-One

Service Manual



Notes, cautions, and warnings

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

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

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

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Before working inside your computer

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

Before you begin

- 1 Save and close all open files and exit all open applications.
- 2 Shut down your computer. Click **Start** >  **Power** > **Shut down**.

 **NOTE:** If you are using a different operating system, see the documentation of your operating system for shut-down instructions.

- 3 Disconnect your computer and all attached devices from their electrical outlets.
- 4 Disconnect all attached network devices and peripherals, such as keyboard, mouse, and monitor from your computer.
- 5 Remove any media card and optical disc from your computer, if applicable.
- 6 After the computer is unplugged, press and hold the power button for 5 seconds to ground the system board.

 **CAUTION:** Place the computer on a flat, soft, and clean surface to avoid scratches on the display.

- 7 Place the computer face down.

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 #1
- 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
Stand (Pedestal)	Back cover	M3x5	2	
System-board shield	Display-assembly base	M3x5	5	
Wireless-card shield	System board	M2x2.5	2	
Wireless card	System board	M2x2.5	1	
Solid-state drive/Intel Optane memory	System board	M2x2.5	1	
Solid-state drive (half-length)	System board	M2x2.5	1	
Fan	Display-assembly base	M3x5	3	
Base panel	Rear-I/O bracket	M3x5	2	
Base panel	Display-assembly base	M3x5	2	
Rear-I/O bracket	Display-assembly base	M3x5	3	
Speakers	Display-assembly base	M3x4+7.1	6	
Power-button board	Middle frame	M3x5	1	
Microphones (4 modules)	Middle frame	M2x2.5	4	
Side-I/O board and headphone-board shield	Display-assembly base	M3x5	2	

Component	Secured to	Screw type	Quantity	Screw image
Side-I/O board	Display-assembly base	M2.5x3.5	2	
Headset port	Display-assembly base	M3x5	1	
Antenna modules	Display-assembly base	M2x2.5	2	
Retractable-camera assembly door	Display-assembly base	M3x5	2	
Retractable-camera bezel	Retractable-camera assembly	M3x5	3	
System board	Display-assembly base	M3x5	9	
Power-adapter port	Display-assembly base	M3x5	2	
Display panel	Display-assembly base	M3x5	11	
Middle frame	Display-assembly base	M3x5	17	

After working inside your computer

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

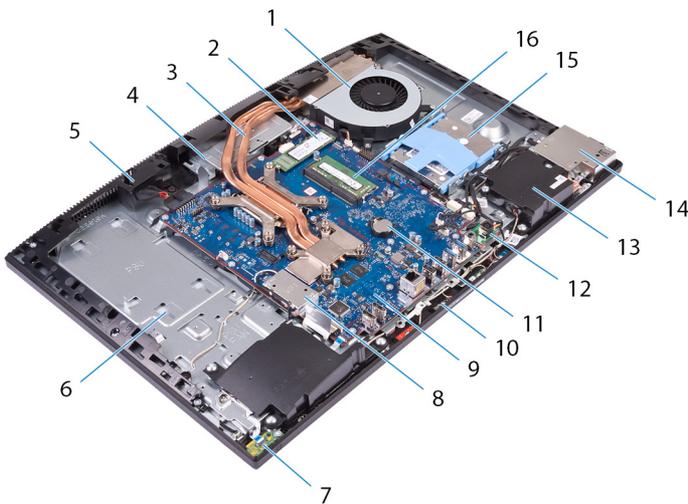
- 1 Replace all screws and ensure that no stray screws remain inside your computer.
- 2 Connect any external devices, peripherals, or cables you removed before working on your computer.
- 3 Replace any media cards, discs, or any other parts that you removed before working on your computer.
- 4 Connect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

Technical overview

⚠ 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.

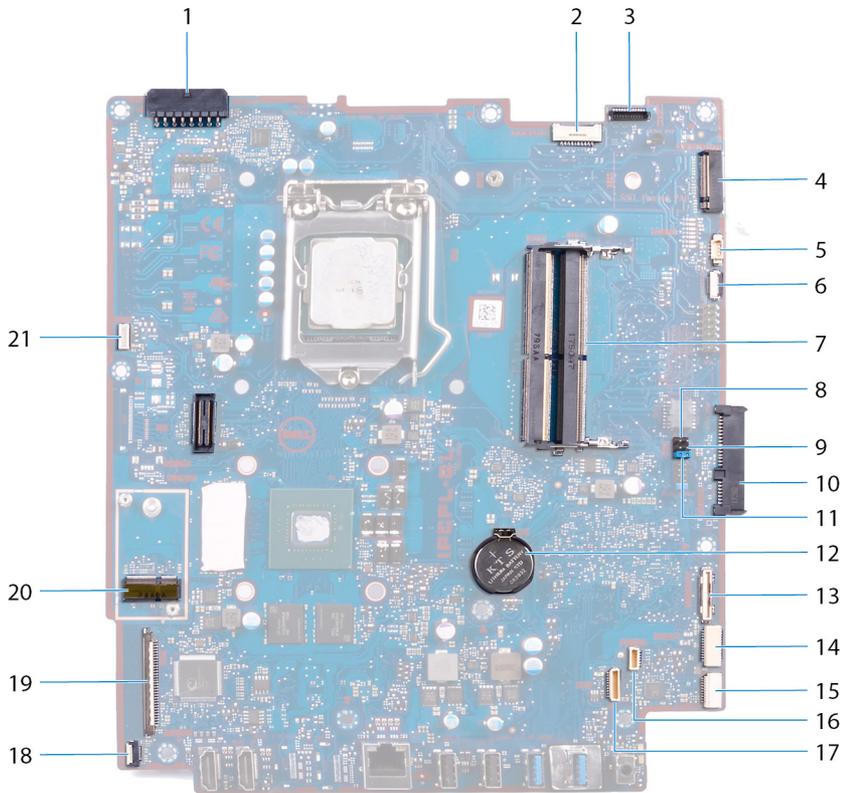
Inside view of your computer

① NOTE: The appearance of heat sink differs depending on the graphics configuration you ordered.



- | | | | |
|----|--------------------|----|---------------------------------------|
| 1 | fan | 2 | solid-state drive/Intel Optane memory |
| 3 | heat sink | 4 | retractable-camera assembly |
| 5 | middle frame | 6 | display-assembly base |
| 7 | power-button board | 8 | wireless-card shield |
| 9 | system board | 10 | microphones (4) |
| 11 | coin-cell battery | 12 | power-adaptor port |
| 13 | speakers (2) | 14 | side I/O-bracket |
| 15 | hard drive | 16 | memory modules |

System-board components



- | | | | |
|----|------------------------------|----|------------------------------------|
| 1 | power-adaptor port connector | 2 | display-backlight cable |
| 3 | camera-cable connector | 4 | M.2 PCIe/SATA slot |
| 5 | fan-cable connector | 6 | low pin count debug header |
| 7 | memory-module slots (2) | 8 | service mode jumper |
| 9 | CMOS clear jumper | 10 | hard-drive connector |
| 11 | password clear jumper | 12 | coin-cell battery |
| 13 | side-I/O board connector | 14 | side-I/O power connector |
| 15 | headset-port board connector | 16 | speaker-cable connector |
| 17 | microphone-cable connector | 18 | power-button board cable connector |
| 19 | display-cable connector | 20 | M.2 wireless-card slot |
| 21 | touchscreen-cable connector | | |

Removing the stand

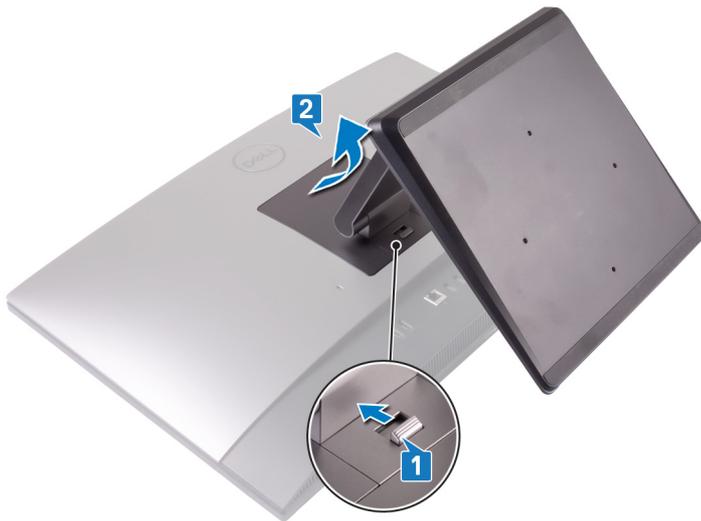
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Procedure

ⓘ NOTE: The following procedure applies only to computers that are shipped with an articulating stand.

⚠ CAUTION: Place the computer on a flat, soft and clean surface to avoid damaging the display.

- 1 Push the release tab.
- 2 Hold the tab in the release position and lift the stand off the back cover.



Procedure

ⓘ NOTE: The following procedure applies only to computers that are shipped with a pedestal stand.

⚠ CAUTION: Place the computer on a flat, clean, and even surface to avoid damaging the display.

- 1 Using a plastic scribe, pry the stand cover away from the back cover.



- 2 Remove the two screws (M3x5) that secure the stand to the back cover.
- 3 Slide and lift the stand off the back cover.



Replacing the stand

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Procedure

① NOTE: The following procedure applies only to computers that are shipped with an articulating stand.

Align the tabs on the stand with the slots on the back cover and snap the stand into place on the back cover.



Procedure

① NOTE: The following procedure applies only to computers that are shipped with a pedestal stand.

- 1 Align the tabs on the stand with the slots on the back cover, slide the stand into the slots, and then snap it into place.
- 2 Replace the two screws (M3x5) that secure the stand to the back cover.



- 3 Snap the tabs on the stand cover into the slots on the back cover.



Removing the back cover

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Prerequisite

Remove the [stand](#).

Procedure

- 1 Press the tab on the back cover and push it in the direction shown to release the back cover from the latch on the system-board shield.
- 2 Lift the back cover from the computer.



Replacing the back cover

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Procedure

- 1 Place the back cover on the middle frame and align the tabs on the back cover with the slots on the middle frame.
- 2 Slide the back cover towards the back panel to push the back cover tab under the latch on the system-board shield.



Post-requisite

Replace the [stand](#).

Removing the hard drive

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

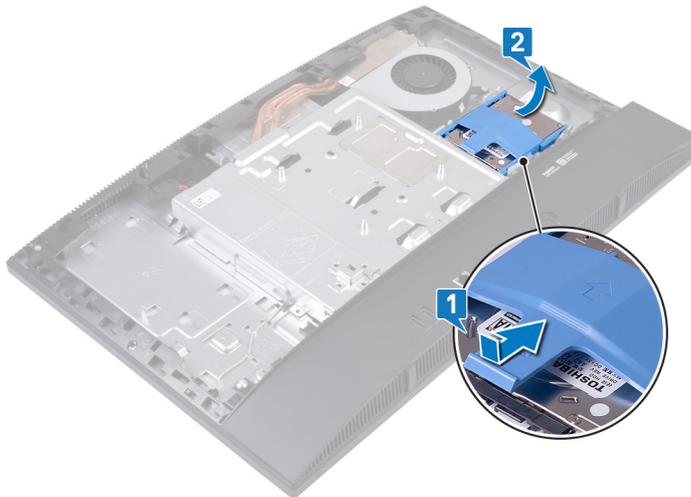
⚠ CAUTION: To avoid data loss, do not remove the hard drive while the computer is in sleep or on state.

Prerequisites

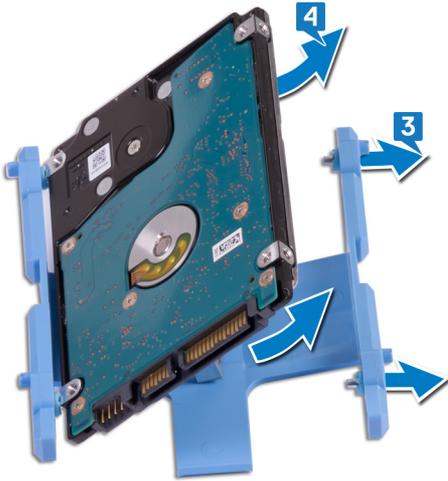
- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).

Procedure

- 1 Press down the tab securing the hard-drive assembly to the system-board shield.
- 2 Slide and lift the hard-drive assembly from its slot to release it from the display-assembly base.



- 3 Pry the tabs on hard-drive bracket from its slots on the hard drive.
- 4 Remove the hard drive off the hard-drive bracket.



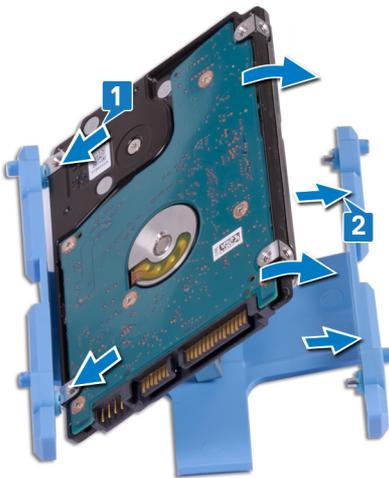
Replacing the hard drive

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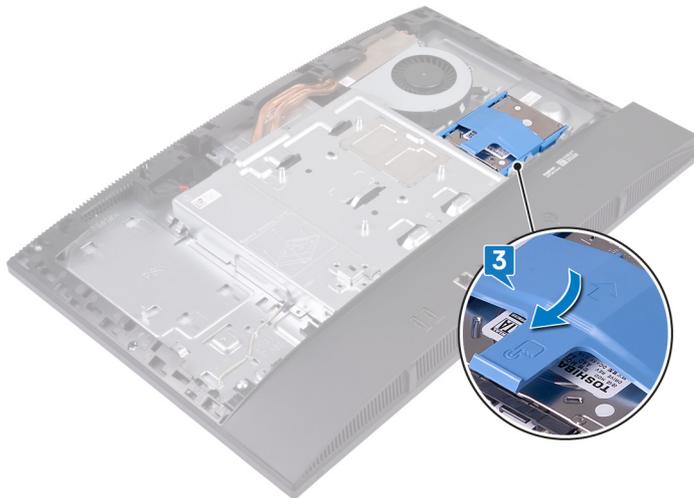
⚠ CAUTION: Hard drives are fragile. Exercise care when handling the hard drive.

Procedure

- 1 Align the tabs on the hard-drive bracket with the slots on the hard drive.
- 2 Flex the hard-drive bracket and replace the remaining tabs on the hard-drive bracket with the slots on the hard drive.



- 3 Place the hard-drive assembly into its slot and slide to lock the hard-drive assembly to the display-assembly base.



Post-requisites

- 1 Replace the [back cover](#).
- 2 Replace the [stand](#).

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 [stand](#).
- 2 Remove the [back cover](#).

Procedure

- 1 Pry the DIMM door on the system-board shield.

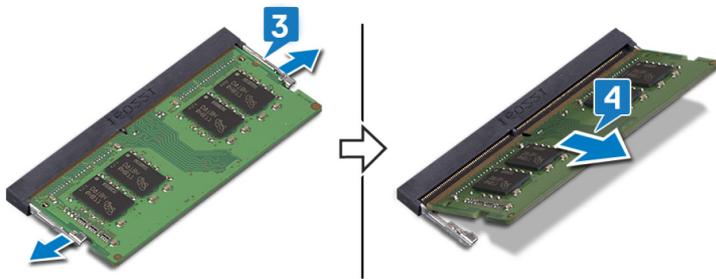


- 2 Locate the memory module on the system board.

ⓘ NOTE: Depending on the configuration ordered, your computer may have up to two memory modules installed on the system board.



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



Replacing the memory modules

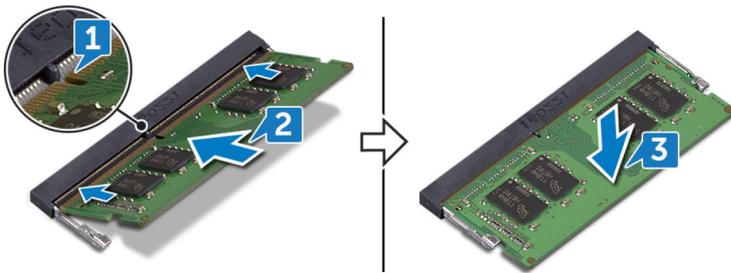
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Procedure

- 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.
- 3 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.

ⓘ NOTE: Repeat this procedure for each memory module shipped with your computer.



- 4 Align the tabs on the DIMM door with the slots on the system-board shield, and then snap the DIMM door until it clicks into place.

ⓘ NOTE: If you do not hear the click, remove the DIMM door and realign it.



Post-requisites

- 1 Replace the [back cover](#).
- 2 Replace the [stand](#).

Removing the system-board shield

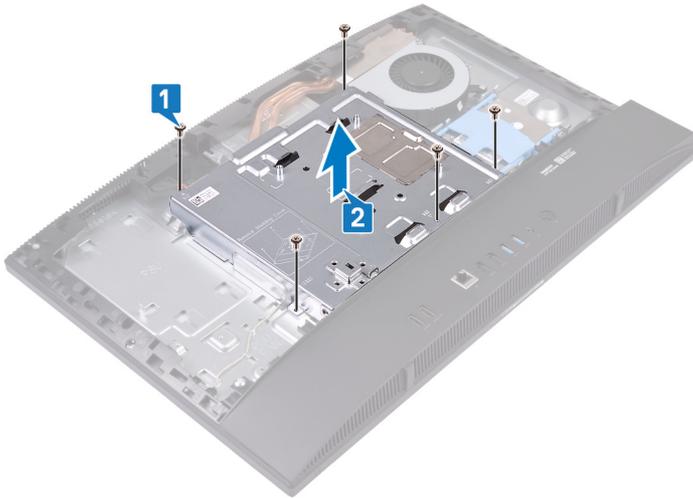
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Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).

Procedure

- 1 Remove the five (M3x5) screws that secure the system-board shield to the display-assembly base.
- 2 Lift the system-board shield off the display-assembly base.



Replacing the system-board shield

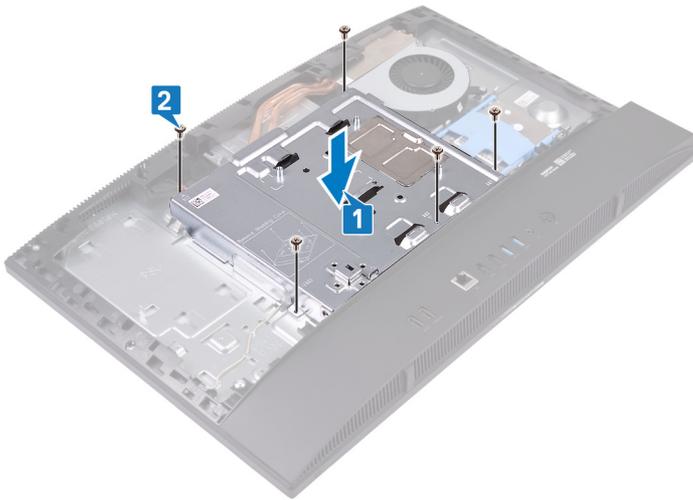
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Procedure

1 Align and place the screw holes on the system-board shield with the screw holes on the display-assembly base.

⚠ CAUTION: Before replacing the screws, ensure that cables connected to the system board are not being pinched.

2 Replace the five screws (M3x5) that secure the system-board shield to the display-assembly base.



Post-requisites

1 Replace the [back cover](#).

2 Replace the [stand](#).

Removing the camera

⚠ 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.

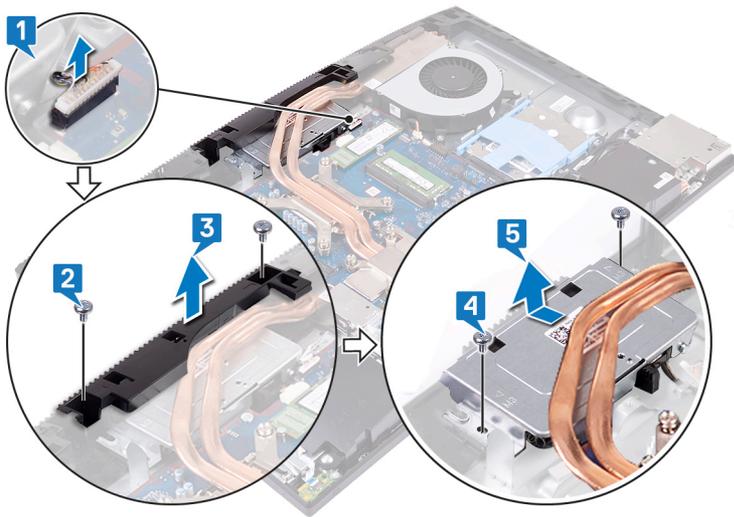
Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

ⓘ NOTE: The size and configuration of the camera module may vary depending on the configuration ordered.

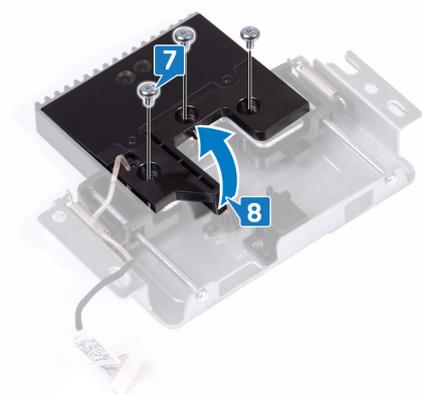
- 1 Disconnect the camera cable from the system board.
- 2 Remove the two screws (M3x5) that secure the retractable-camera assembly door to the middle frame.
- 3 Lift the retractable-camera assembly door out of the middle frame.
- 4 Remove the two screws (M3x5) that secure the retractable-camera assembly bracket to the middle frame.
- 5 Slide and lift the retractable-camera bracket off the middle frame.



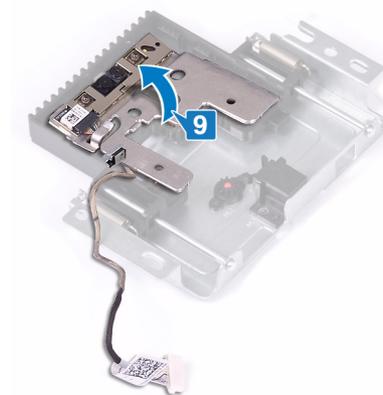
- 6 Press the top of the retractable-camera assembly to extend the retractable camera.



- 7 Remove the three screws (M3x5) that secure the retractable-camera bezel to the retractable-camera bracket.
- 8 Lift the retractable-camera bezel off the retractable-camera assembly.



- 9 Release the camera module from the tab and lift the camera module along with the camera bracket and camera cable, off the retractable-camera assembly.

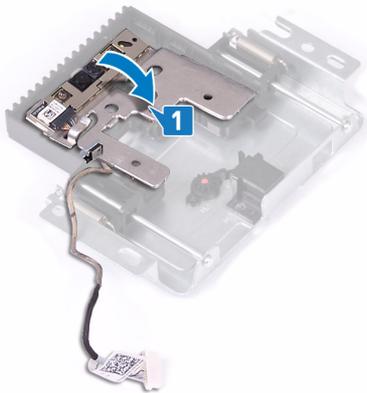


Replacing the camera

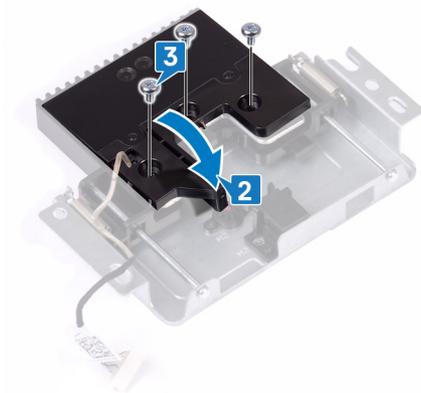
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Procedure

- 1 Place the camera module along with the camera bracket and camera cable in the slot on the retractable-camera assembly and snap it in place.



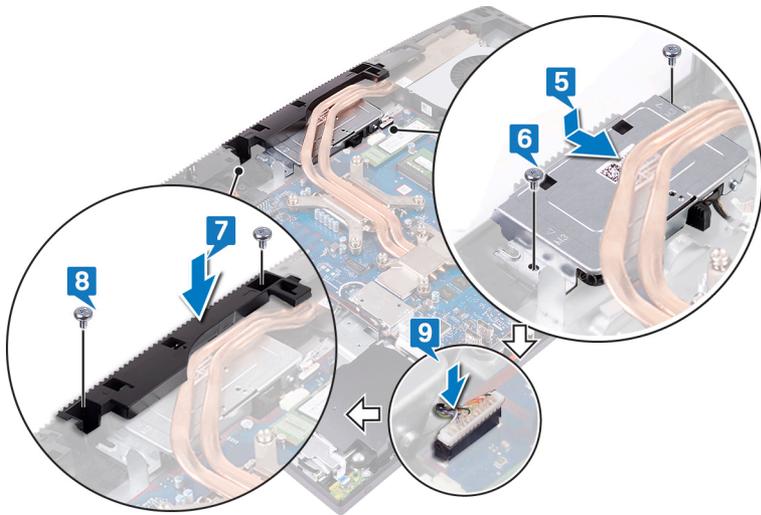
- 2 Align and place the retractable-camera bezel on the retractable-camera assembly.
- 3 Replace the three screws (M3x5) that secure the retractable-camera bezel to the retractable-camera bracket.



- 4 Press the top of the retractable-camera assembly to retract the retractable camera.



- 5 Slide and place the retractable-camera bracket on the middle frame.
- 6 Align the screw holes on the retractable-camera bracket with the screw holes on the middle frame and then replace the two screws (M3x5) that secure the retractable-camera assembly bracket to the middle frame.
- 7 Align and place the retractable-camera assembly door on the middle frame.
- 8 Replace the two screws (M3x5) that secure the retractable-camera assembly door to the middle frame.
- 9 Connect the camera cable to the system board.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).
- 3 Replace the [stand](#).

Removing the base panel

⚠ 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 [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

- 1 Remove the two screws (M3x5) that secure the base panel to the display-assembly base.
- 2 Remove the two screws (M3x5) that secure the base panel to the rear-I/O bracket.



- 3 Lift the base panel off the middle frame.

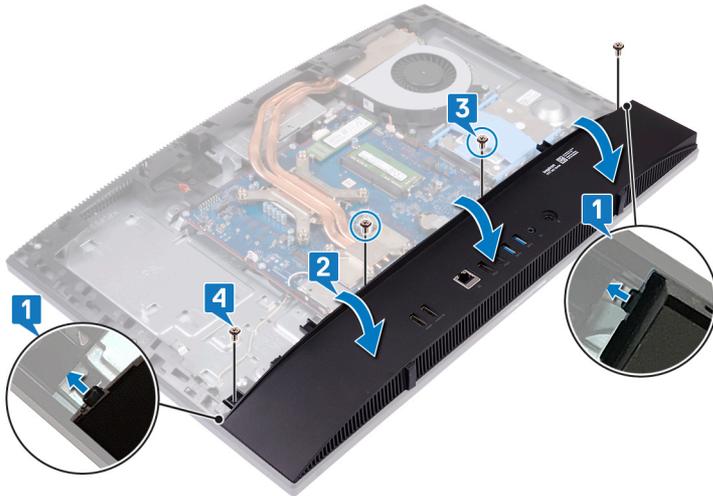


Replacing the base panel

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Procedure

- 1 Align the tabs on the base panel with the slots on the middle frame.
- 2 Align the slots on the base panel with the ports on the rear-I/O bracket, and snap it into place.
- 3 Replace the two screws (M3x5) that secure the base panel to the rear-I/O bracket.
- 4 Replace the two screws (M3x5) that secure the base panel to the display-assembly base.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).
- 3 Replace the [stand](#).

Removing the rear-I/O bracket

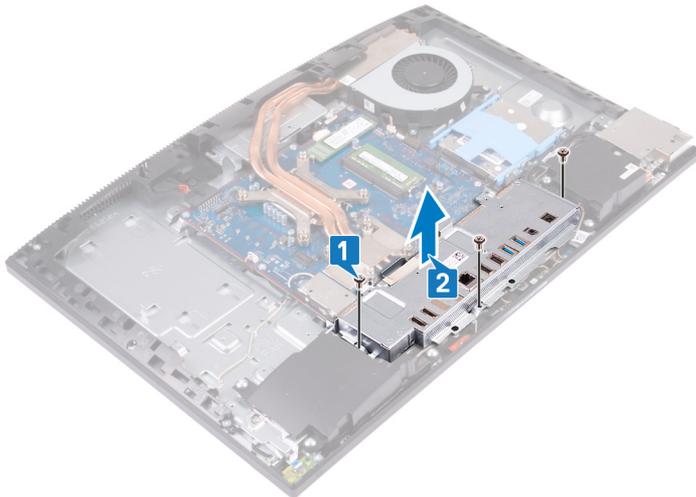
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).

Procedure

- 1 Remove the three (M3x5) screws that secure the rear-I/O bracket to the display-assembly base.
- 2 Lift the rear-I/O bracket off the display-assembly base.



Replacing the rear-I/O bracket

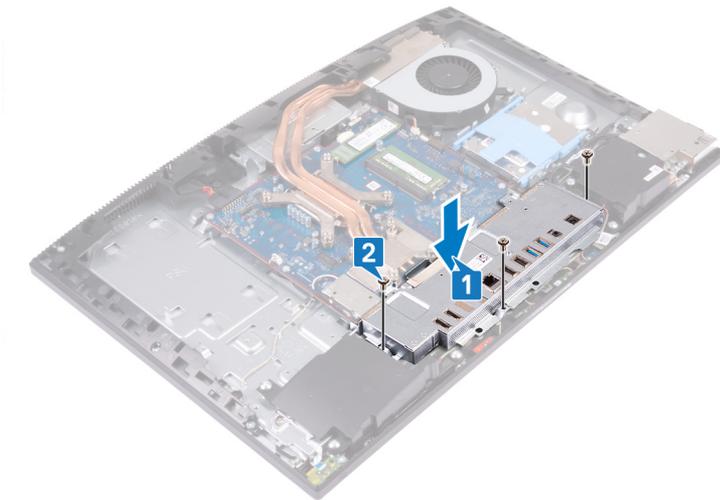
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Procedure

1 Align the slots on the rear-I/O bracket with the ports on the system board.

⚠ CAUTION: Before replacing the screws, ensure that the cables connected to the system board are not being pinched.

2 Replace the three screws (M3x5) that secure the rear-I/O bracket to the display-assembly base.



Post-requisites

- 1 Replace the [base panel](#).
- 2 Replace the [system-board shield](#).
- 3 Replace the [back cover](#).
- 4 Replace the [stand](#).

Removing the microphones

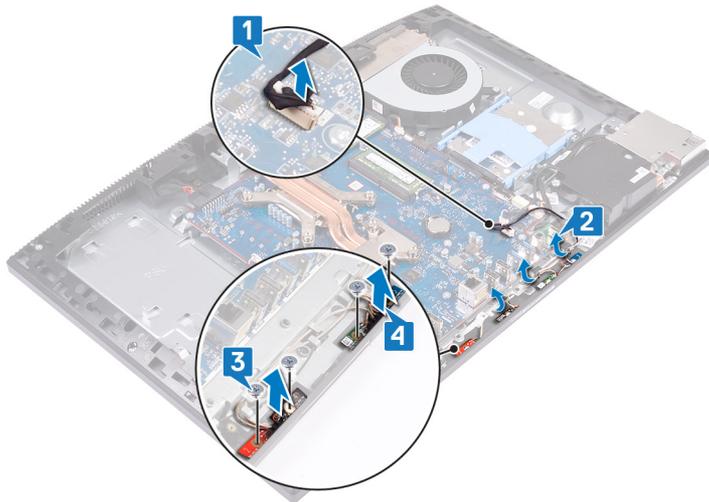
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).

Procedure

- 1 Disconnect the microphone-module cable from the system board.
- 2 Remove the microphone-module cable from the routing guides on the display-assembly base.
- 3 Remove the four screws (M2x2.5) that secure the microphone modules (4) to the middle frame.
- 4 Lift the microphone modules off the slots on the middle frame.

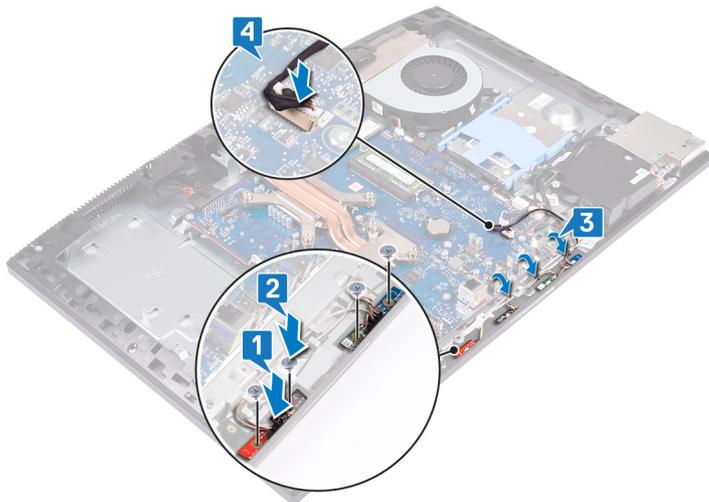


Replacing the microphones

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Procedure

- 1 Align and place the microphone modules (4) to the slots on the middle frame.
- 2 Replace the four screws (M2x2.5) that secure the microphone modules to the middle frame.
- 3 Route the microphone-module cable through the routing guides on the display-assembly base.
- 4 Connect the microphone-module cable to the connector on the system board.



Post-requisites

- 1 Replace the [rear-I/O bracket](#).
- 2 Replace the [base panel](#).
- 3 Replace the [system-board shield](#).
- 4 Replace the [back cover](#).
- 5 Replace the [stand](#).

Removing the speakers

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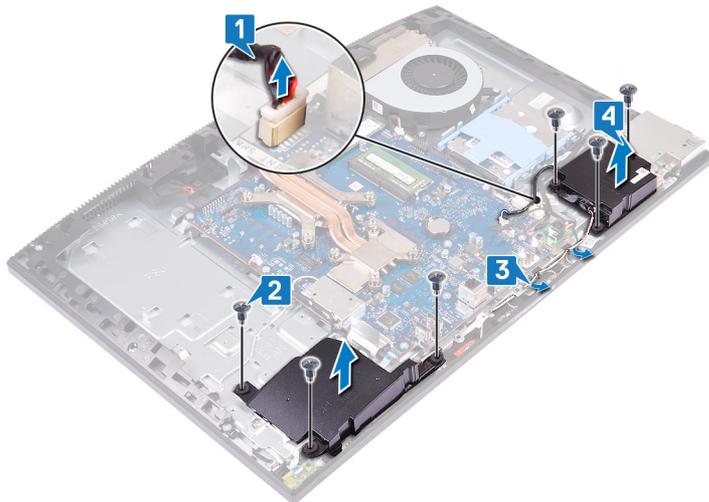
Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).

Procedure

① NOTE: Note the routing guides before the removal of the speaker cable.

- 1 Disconnect the speaker cable from the system board.
- 2 Remove the six screws (M3x4+7.1) that secure the speakers to the display-assembly base.
- 3 Remove the speaker cable from the routing guides on the display-assembly base.
- 4 Lift the speakers along with the cable off the display-assembly base.

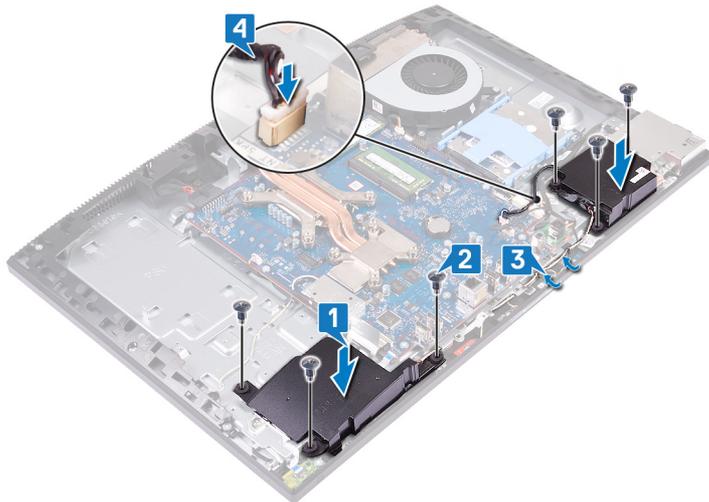


Replacing the speakers

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Procedure

- 1 Place the speakers on the display-assembly base and align the screw holes on the speakers to the screw holes on the display-assembly base.
- 2 Replace the six screws (M3x4+7.1) that secure the speakers to the display-assembly base.
- 3 Route the speaker cable through the routing guides on the display-assembly base.
- 4 Connect the speaker cable to the system board.



Post-requisites

- 1 Replace the [rear-I/O bracket](#).
- 2 Replace the [base panel](#).
- 3 Replace the [system-board shield](#).
- 4 Replace the [back cover](#).
- 5 Replace the [stand](#).

Removing the antennas

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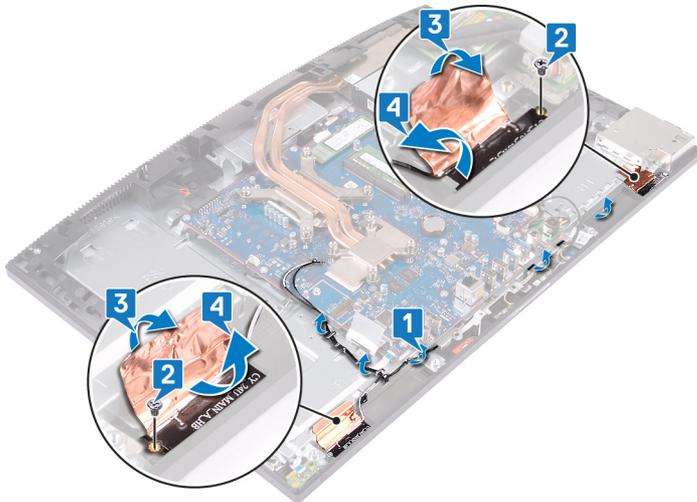
Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [wireless card](#).
- 5 Remove the [base panel](#).
- 6 Remove the [rear-I/O bracket](#).
- 7 Remove the [speakers](#).

Procedure

ⓘ NOTE: Note the routing of the antenna cables, before removing the antenna cables from the routing guides. Also, note the location of the antenna modules printed on the display-assembly base as ANT-B (black) and ANT-W (white).

- 1 Remove the antenna cables from the routing guides on the display-assembly base.
- 2 Remove the two screws (M2x2.5) that secure the antenna modules (2) to the middle frame.
- 3 Carefully peel the tape that secures the antenna cables (2) to the middle frame.
- 4 Release the antenna modules (2) from the tabs and lift the antenna modules off the middle frame.



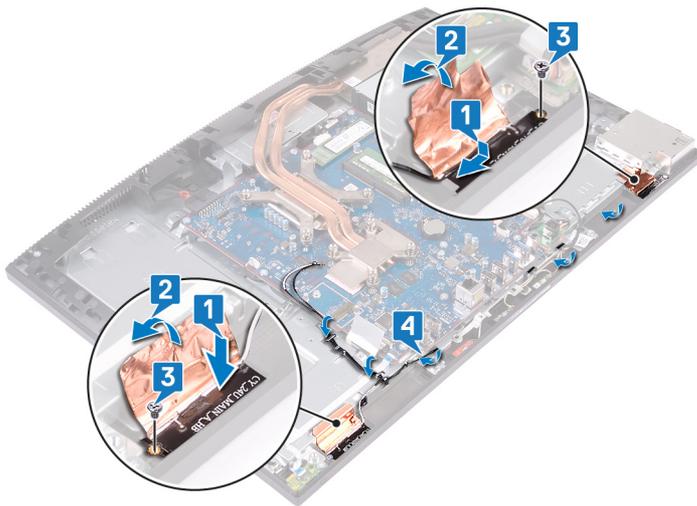
Replacing the antennas

⚠ 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 **NOTE:** Note the location of the antenna modules printed on the display-assembly base as ANT-B (black) and ANT-W (white).

- 1 Align the antenna modules (2) with the slots on the middle frame and adhere it in place.
- 2 Adhere the tape that secures the antenna cables (2) to the middle frame.
- 3 Replace the two screws (M2x2.5) that secure the antenna modules (2) to the middle frame.
- 4 Route the antenna cables through the routing guides on the display-assembly base.



Post-requisites

- 1 Replace the [speakers](#).
- 2 Replace the [rear-I/O bracket](#).
- 3 Replace the [base panel](#).
- 4 Replace the [wireless card](#).
- 5 Replace the [system-board shield](#).
- 6 Replace the [back cover](#).
- 7 Replace the [stand](#).

Removing the side I/O-board

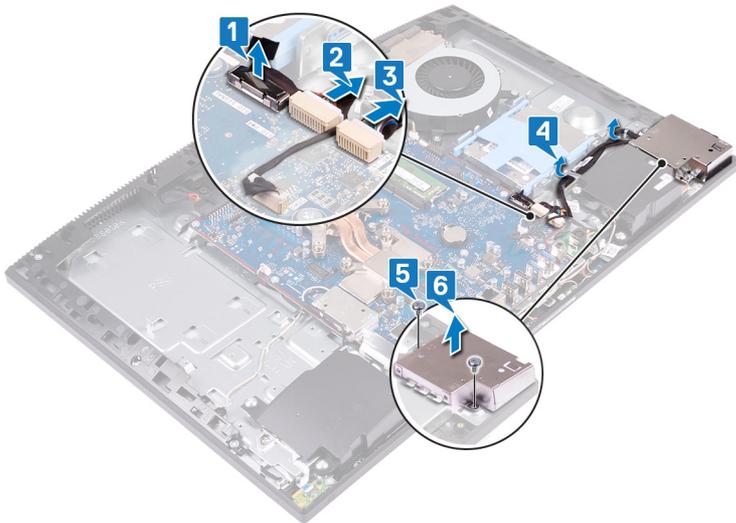
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).

Procedure

- 1 Using the pull tab, disconnect the side-I/O cable from the system board.
- 2 Disconnect the side-I/O power cable from the system board.
- 3 Disconnect the headset-port cable from the system board.
- 4 Remove the side-I/O cable, side-I/O power cable, and headset-port cable from the routing guides on the display-assembly base.
- 5 Remove the two screws (M3x5) securing the side-I/O board shield to the display-assembly base.
- 6 Lift the side-I/O board shield off the display-assembly base.



- 7 Using the pull tab, disconnect the side-I/O cable from the side-I/O board.
- 8 Disconnect the side-I/O power cable from the side-I/O board.
- 9 Remove the headset-port cable from the routing guide on the side-I/O board.
- 10 Remove the two screws (M2.5x3.5) that secure the side-I/O board to the display-assembly base.
- 11 Slide and lift the side-I/O board off the display-assembly base.

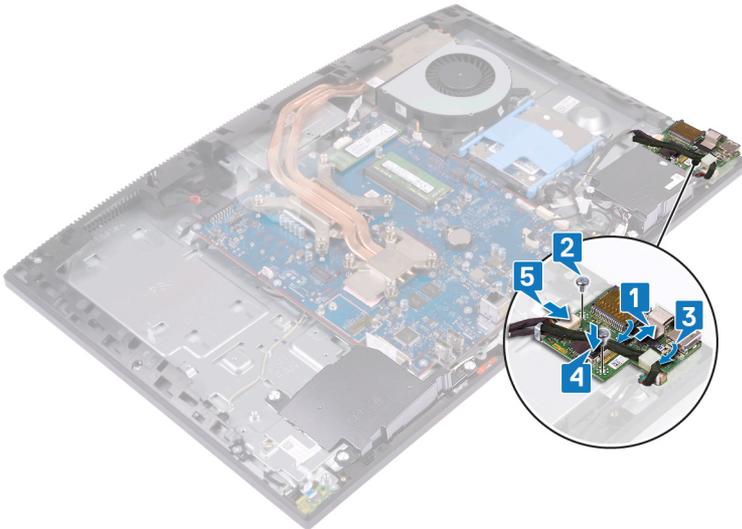


Replacing the side I/O-board

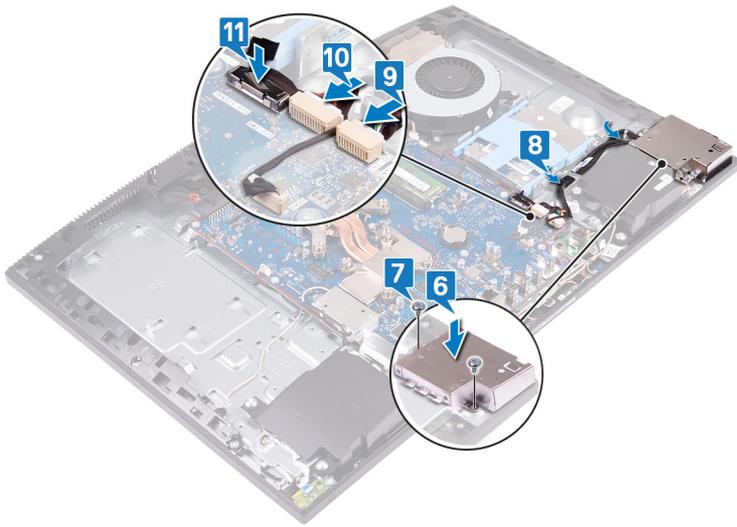
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in **Before working inside your computer**. After working inside your computer, follow the instructions in **After working inside your computer**. For more safety best practices,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

Procedure

- 1 Align and place the side-I/O board onto the display-assembly base.
- 2 Replace the two screws (M2.5x3.5) that secure the side-I/O board to the display-assembly base.
- 3 Route the headset-port cable through the routing guide on the side-I/O board.
- 4 Connect the side-I/O power cable to the side-I/O board.
- 5 Connect the side-I/O cable to the side-I/O board.



- 6 Align the screw holes on the side-I/O board shield to the screw holes on the display-assembly base.
- 7 Replace the two screws (M3x5) that secure the side-I/O board shield to the display-assembly base.
- 8 Route the side-I/O cable, side-I/O power cable, and headset-port cable through the routing guides on the display-assembly base.
- 9 Connect the headset-port cable to the system board.
- 10 Connect the side-I/O power cable to the system board.
- 11 Connect the side-I/O cable to the system board.



Post-requisites

- 1 Replace the [rear-I/O bracket](#).
- 2 Replace the [base panel](#).
- 3 Replace the [system-board shield](#).
- 4 Replace the [back cover](#).
- 5 Replace the [stand](#).

Removing the headset port

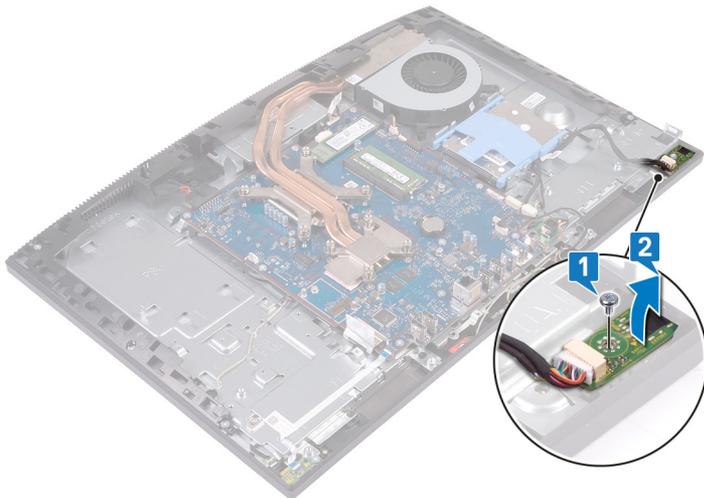
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).
- 6 Remove the [side I/O-board](#).

Procedure

- 1 Remove the screw (M3x5) that secures the headset-port board to the display-assembly base.
- 2 Lift the headset-port board, along with its cable off the display-assembly base.

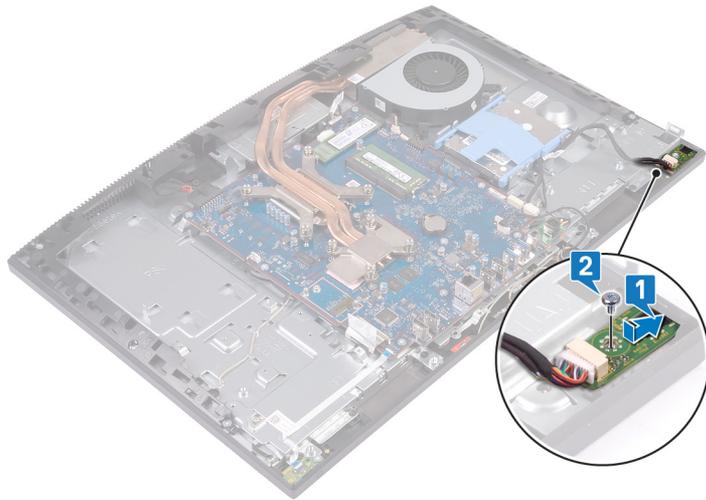


Replacing the headset port

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Procedure

- 1 Slide the headset port into its slot on the middle frame and align the screw hole on the headset port with the screw hole on the display-assembly base.
- 2 Replace the screw (M3x5) that secures the headset-port board to the display-assembly base.



Post-requisites

- 1 Replace the [side I/O-board](#).
- 2 Replace the [rear-I/O bracket](#).
- 3 Replace the [base panel](#).
- 4 Replace the [system-board shield](#).
- 5 Replace the [back cover](#).
- 6 Replace the [stand](#).

Removing the power-button board

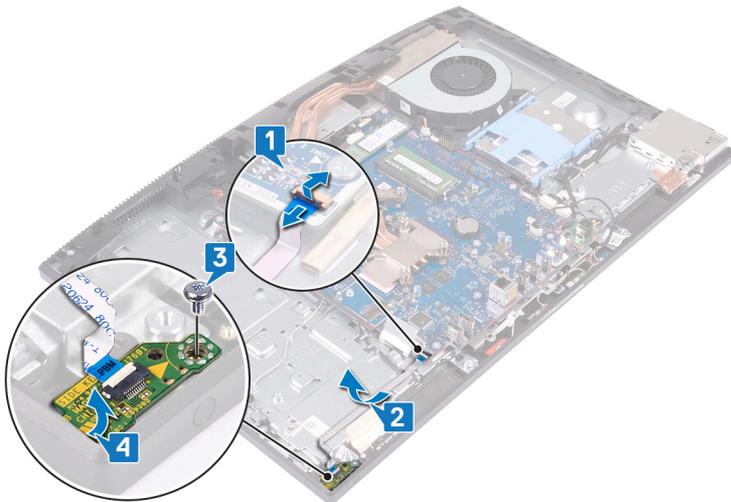
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Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [wireless card](#).
- 5 Remove the [base panel](#).
- 6 Remove the [rear-I/O bracket](#).
- 7 Remove the [speakers](#).

Procedure

- 1 Open the latch, and disconnect the power-button board cable from the system board.
- 2 Peel off the power-button board cable from the display-assembly base.
- 3 Remove the screw (M3x5) that secures the power-button board to the display-assembly base.
- 4 Slide and lift the power-button board, along with its cable, off the display-assembly base.



Replacing the power-button board

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Procedure

- 1 Using the alignment post, place the power-button board into its slot on the middle frame.
- 2 Replace the screw (M3x5) that secures the power-button board to the middle frame.
- 3 Adhere the power-button board cable to the display-assembly base.
- 4 Slide the power-button board cable into the connector on the system board, and then close the latch to secure the cable.



Post-requisites

- 1 Replace the [speakers](#).
- 2 Replace the [rear-I/O bracket](#).
- 3 Replace the [base panel](#).
- 4 Replace the [wireless card](#).
- 5 Replace the [system-board shield](#).
- 6 Replace the [back cover](#).
- 7 Replace the [stand](#).

Removing the coin-cell battery

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⚠ 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

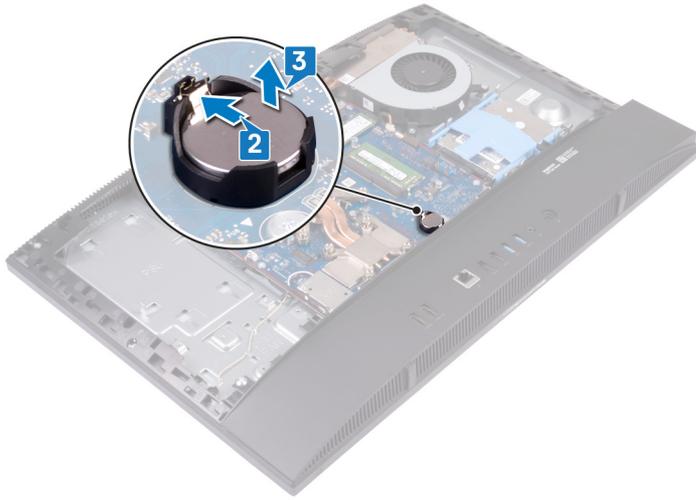
- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

- 1 Locate the coin-cell battery on the system board.



- 2 Using your fingertips, press on the metal clip to release the coin-cell battery from the coin-cell battery holder.
- 3 Lift the coin-cell battery from the coin-cell battery holder.



Replacing the coin-cell battery

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Procedure

With the positive-side facing up, insert the coin-cell battery into the battery socket on the system board and snap the battery into place.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).
- 3 Replace the [stand](#).

Removing the wireless card

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Prerequisites

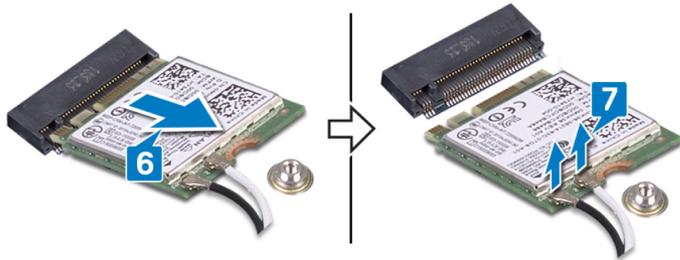
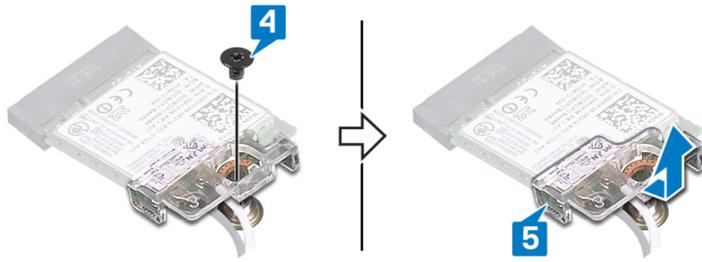
- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

- 1 Remove the two screws (M2x2.5) that secure the wireless-card shield to the system board.
- 2 Remove the antenna cables from the routing guides on the wireless-card shield.
- 3 Remove the wireless-card shield from the system board.



- 4 Remove the screw (M2x2.5) that secures the wireless card to the system board.
- 5 Slide and lift the wireless-card bracket off the wireless card.
- 6 Slide and remove the wireless card out of the wireless-card slot.
- 7 Disconnect the antenna cables from the wireless card.



Replacing the wireless card

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Procedure

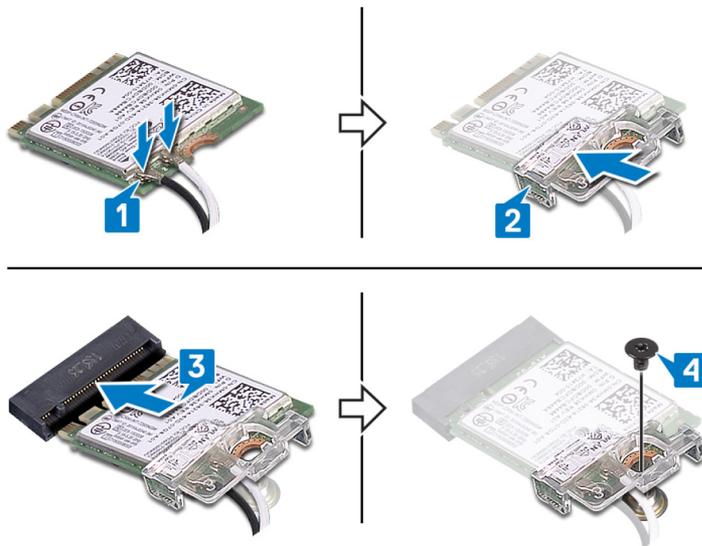
⚠ CAUTION: To avoid damaging the wireless card, do not place any cables under it.

- 1 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. Wireless card color scheme

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

- 2 Align and place the wireless-card bracket on the wireless card.
- 3 Slide the wireless card at an angle into the wireless-card slot.
- 4 Replace the screw (M2x2.5) that secures the wireless-card bracket and the wireless card to the system board.



- 5 Align the screw holes on the wireless-card shield with the screw holes on the system board and place the wireless-card shield on the system board.
- 6 Replace the two screws (M2x2.5) that secure the wireless-card shield to the system board.
- 7 Route the antenna cables through the routing guides on the wireless-card shield.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).
- 3 Replace the [stand](#).

Removing the solid-state drive/Intel Optane

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Prerequisites

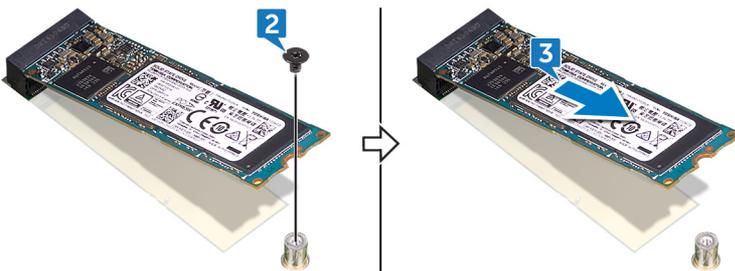
- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

- 1 Locate the solid-state drive/Intel Optane memory on the system board.



- 2 Remove the screw (M2x2.5) that secures the solid-state drive/Intel Optane memory to the system board.
- 3 Slide and remove the solid-state drive/Intel Optane memory from the M.2 card slot on the system board.



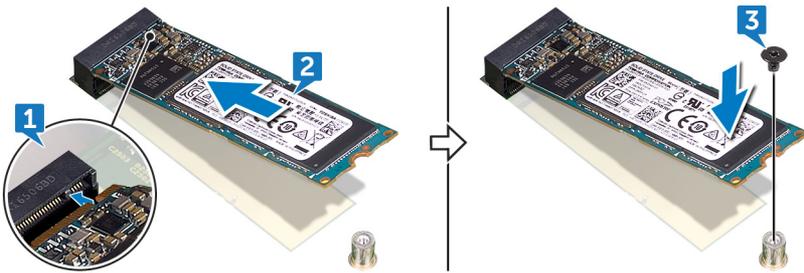
Replacing the solid-state drive/Intel Optane

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⚠ CAUTION: Solid-state drives are fragile. Exercise care when handling the solid-state drive.

Procedure

- 1 Align the notch on the solid-state drive/Intel Optane memory with the tab on the M.2 card slot.
- 2 Slide the solid-state drive/Intel Optane memory into the M.2 card slot on the system board.
- 3 Replace the screw (M2x2.5) that secures the solid-state drive/Intel Optane memory to the system board.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).
- 3 Replace the [stand](#).

Removing the solid-state drive (half-length)

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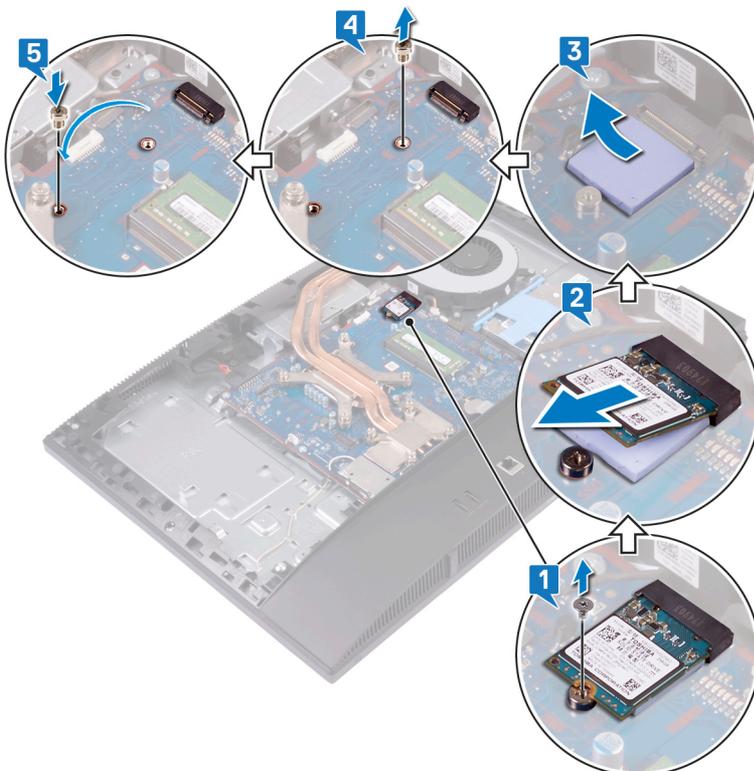
Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

ⓘ NOTE: Follow the procedure in step 4 and step 5, only if you are replacing the half-length solid-state drive with the full-length solid-state drive.

- 1 Remove the screw (M2x2.5) that secures the half-length solid-state drive to the system board.
- 2 Slide and remove the half-length solid-state drive from the M.2 card slot on the system board.
- 3 Peel of the thermal pad from the system board.
- 4 Remove the screw nut from the M.2 2230 screw hole.
- 5 Install the screw nut to the M.2 2280 screw hole.



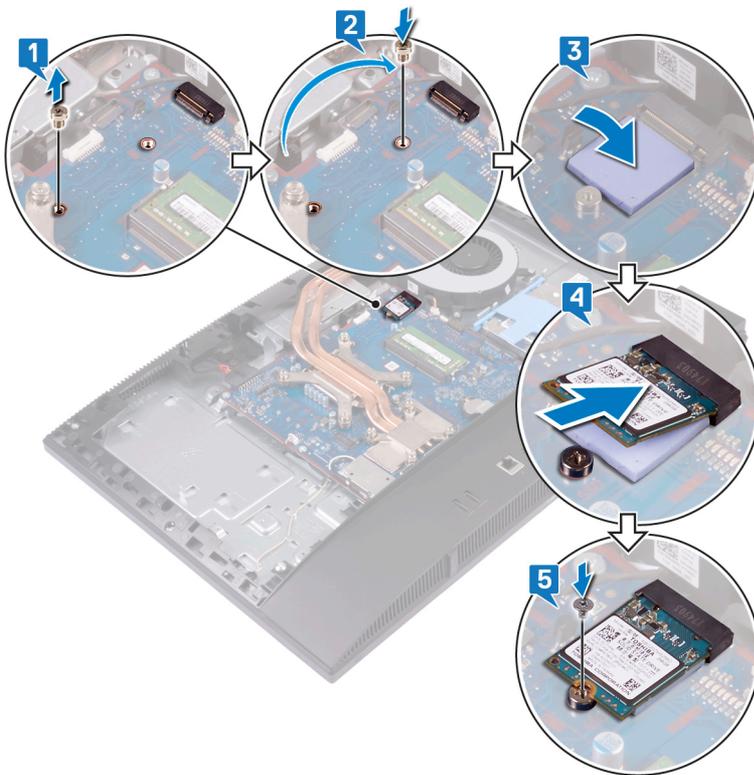
Replacing the solid-state drive (half-length)

⚠ 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.

Procedure

① **NOTE:** Follow the procedure in step 1 and step 2, only if you are replacing the full-length solid-state drive with the half-length solid-state drive.

- 1 Remove the screw nut from the M.2 2280 screw hole.
- 2 Install the screw nut to the M.2 2230 screw hole.
- 3 Adhere the thermal pad to the system board.
- 4 Align the notch on the half-length solid-state drive with the tab on the M.2 card slot and slide the half-length solid-state drive into the M.2 card slot on the system board.
- 5 Replace the screw (M2x2.5) that secures the half-length solid-state drive to the system board.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).

3 Replace the [stand](#).

Removing the fan

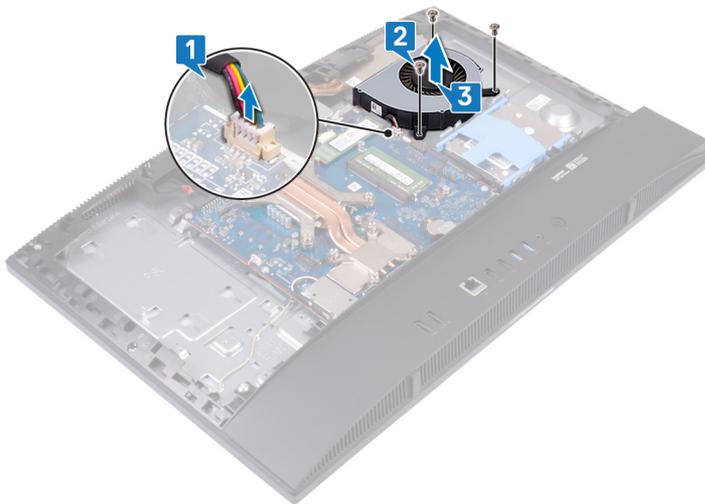
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).

Procedure

- 1 Disconnect the fan cable from its connector on the system board.
- 2 Remove the three screws (M3x5) that secure the fan to the display-assembly base.
- 3 Lift the fan off the display-assembly base.

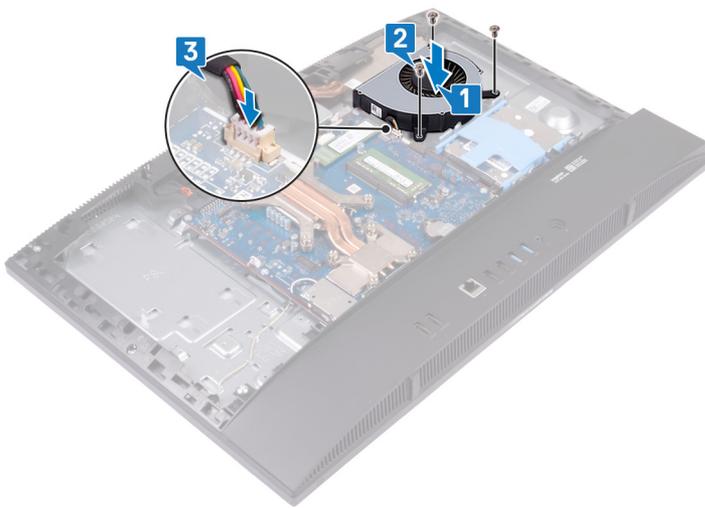


Replacing the fan

⚠ 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 fan with the screw holes on the display-assembly base.
- 2 Replace the three screws (M3x5) that secure the fan to the display-assembly base.
- 3 Connect the fan cable to the system board.



Post-requisites

- 1 Replace the [system-board shield](#).
- 2 Replace the [back cover](#).
- 3 Replace the [stand](#).

Removing the heat sink

- ⚠ 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.

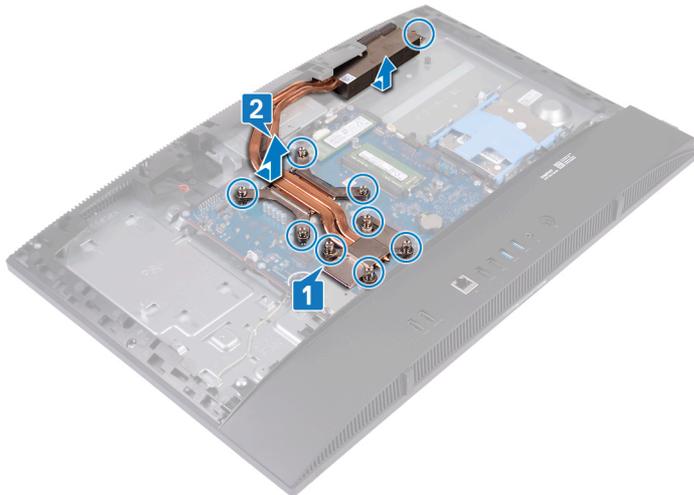
Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [fan](#).

Procedure

① NOTE: The location and number of captive screws on the heat sink may vary depending on the graphics configuration ordered.

- 1 In reverse sequential order (as indicated on the heat sink), loosen the captive screws that secure the heat sink to the system board and the display-assembly base.
- 2 Slide and lift the heat sink off the system board and display-assembly base.



Replacing the heat sink

⚠ 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.

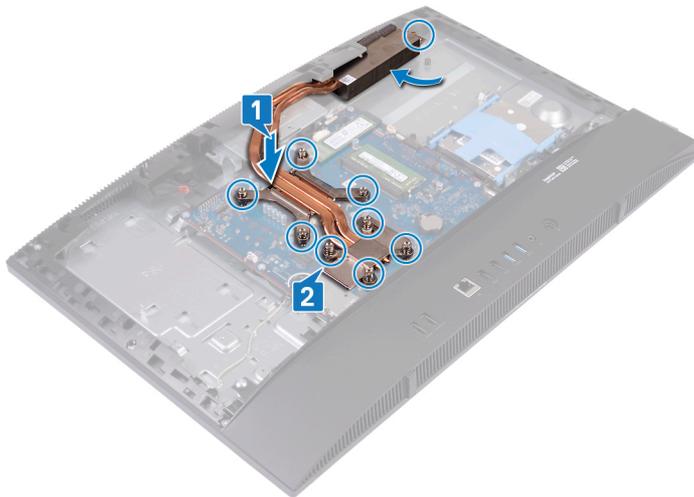
⚠ CAUTION: Incorrect alignment of the heat sink can damage the system board and processor.

ⓘ NOTE: If either the system board or the heat sink is replaced, use the thermal pad provided in the kit to ensure that thermal conductivity is achieved.

Procedure

ⓘ NOTE: The location and number of captive screws on the heat sink may vary depending on the graphics configuration ordered.

- 1 Align the captive screws on the heat sink with the screw holes on the system board and the display assembly base.
- 2 In sequential order (as indicated on the heat sink), tighten the captive screws that secure the heat sink to the system board and display assembly base.



Post-requisites

- 1 Replace the [fan](#).
- 2 Replace the [system-board shield](#).
- 3 Replace the [back cover](#).
- 4 Replace the [stand](#).

Removing the processor

⚠ 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 [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [fan](#).
- 5 Remove the [heat sink](#).

Procedure

- 1 Locate the processor on the system board.



- 2 Press the release-lever down and then pull it outwards to release it from the securing tab.
- 3 Pull up the release-lever completely to unlock the processor.
- 4 Gently lift the processor and remove it from the processor socket.

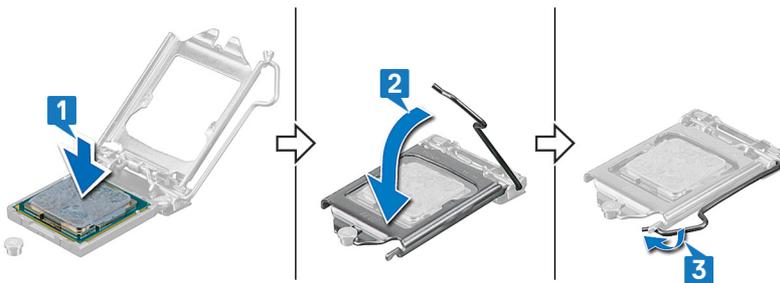


Replacing the processor

- ⚠ **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:** If either the processor or the heat sink is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.
- 📌 **NOTE:** A new processor ships with a thermal pad in the package. In some cases, the processor may ship with the thermal pad attached to it.

Procedure

- 1 Ensure that the release lever on the processor socket is fully extended in the open position. Then align the notches on the processor with the tabs on the processor socket and place the processor in the processor socket.
 - ⚠ **CAUTION:** The pin-1 corner of the processor has a triangle that aligns with the triangle on the pin-1 corner on the processor socket. When the processor is properly seated, all four corners are aligned at the same height. If one or more corners of the processor are higher than the others, the processor is not seated properly.
 - ⚠ **CAUTION:** Ensure that the processor-cover notch is positioned underneath the alignment post.
- 2 When the processor is fully seated in the socket, close the processor cover.
- 3 Pivot the release-lever down and place it under the tab on the processor cover.



Post-requisites

- 1 Replace the [heat sink](#).
- 2 Replace the [fan](#).
- 3 Replace the [system-board shield](#).
- 4 Replace the [back cover](#).
- 5 Replace the [stand](#).

Removing the system board

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

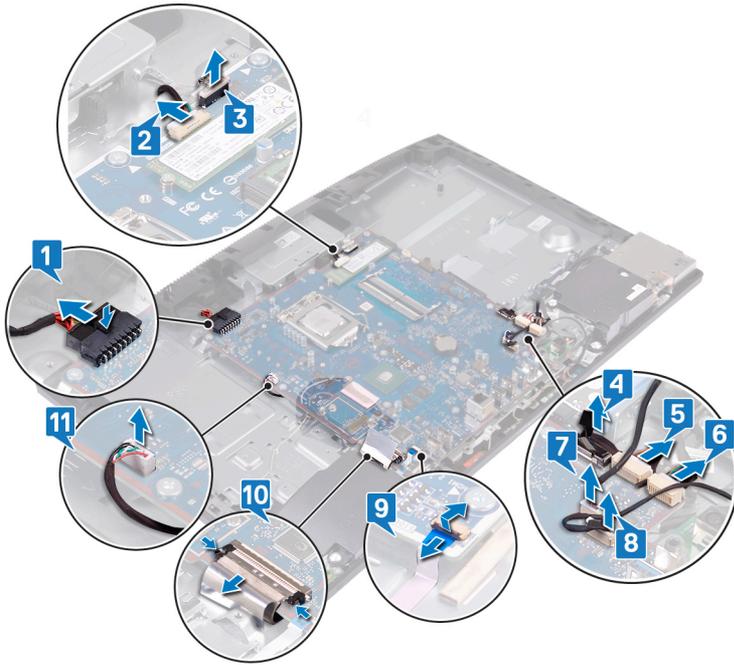
- ⓘ NOTE:** Your computer's Service Tag is stored in the system board. You must enter the Service Tag in the BIOS setup program after you replace the system board.
- ⓘ NOTE:** Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.
- ⓘ NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect the cables correctly after you replace the system board.

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).
- 6 Remove the [hard drive](#).
- 7 Remove the [memory modules](#).
- 8 Remove the [wireless card](#).
- 9 Remove the [solid-state drive/Intel Optane memory](#) or [solid-state drive \(half-length\)](#), whichever applicable.
- 10 Remove the [fan](#).
- 11 Remove the [heat sink](#).
- 12 Remove the [processor](#).

Procedure

- 1 Disconnect the power-adapter port cable from the system board.
- 2 Disconnect the display-backlit cable from the system board.
- 3 Disconnect the camera cable from the system board.
- 4 Using the pull tab, disconnect the side-I/O cable from the system board.
- 5 Disconnect the side-I/O power cable from the system board.
- 6 Disconnect the headset-port board cable from the system board.
- 7 Disconnect the speaker cable from the system board.
- 8 Disconnect the microphones cable from the system board.
- 9 Open the latch, and disconnect the power-button board cable from the system board.
- 10 Peel the tape and press the securing clip to disconnect the display cable from the system board.
- 11 Disconnect the touchscreen cable from the system board.



- 12 Remove the nine screws (M3x5) that secure the system board to the display-assembly base.
- 13 Lift the system board off the display-assembly base.



Replacing the system board

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

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

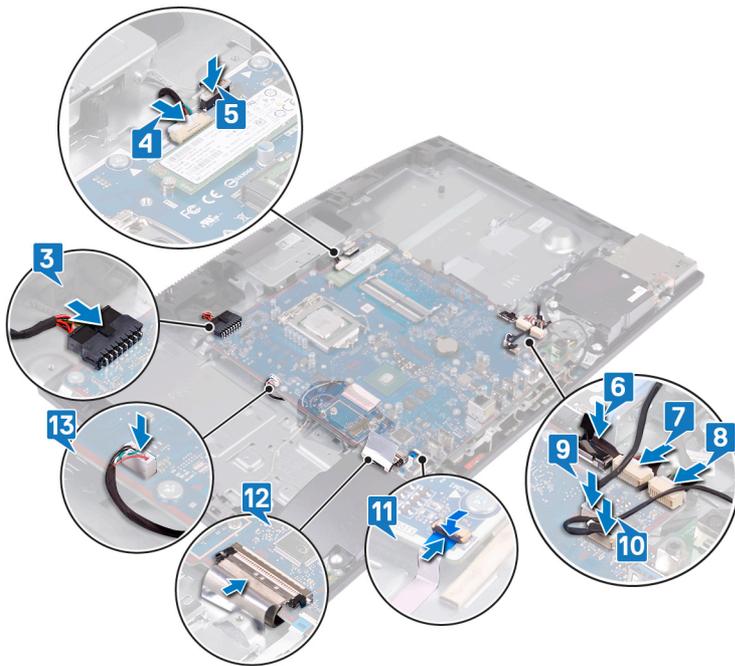
ⓘ NOTE: Replacing the system board removes any changes you have made to the BIOS using the BIOS setup program. You must make the appropriate changes again after you replace the system board.

Procedure

- 1 Align the screw holes on the system board with the screw holes on the display-assembly base.
- 2 Replace the nine screws (M3x5) that secure the system board to the display-assembly base.



- 3 Connect the power-adapter cable to the system board.
- 4 Connect the display-backlit cable to the system board.
- 5 Connect the camera cable to the system board.
- 6 Connect the side-I/O cable to the system board.
- 7 Connect the side-I/O power cable to the system board.
- 8 Connect the headset-port board cable to the system board.
- 9 Connect the speaker cable to the system board.
- 10 Connect the microphones cable to the system board.
- 11 Connect the power-button board cable to the system board and close the latch to secure the cable.
- 12 Connect the display cable to the system board and adhere the tape that secures the display cable to the system board.
- 13 Connect the touchscreen cable to the system board.



Post-requisites

- 1 Replace the [processor](#).
- 2 Replace the [heat sink](#).
- 3 Replace the [fan](#).
- 4 Replace the [solid-state drive/Intel Optane memory](#) or [solid-state drive \(half-length\)](#), whichever applicable.
- 5 Replace the [wireless card](#).
- 6 Replace the [memory modules](#).
- 7 Replace the [hard drive](#).
- 8 Replace the [rear-I/O bracket](#).
- 9 Replace the [base panel](#).
- 10 Replace the [system-board shield](#).
- 11 Replace the [back cover](#).
- 12 Replace the [stand](#).

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.

Removing the power-adapter port

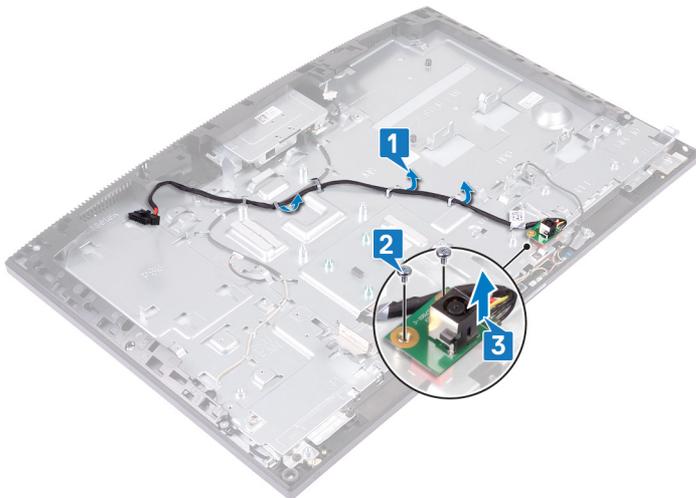
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).
- 6 Remove the [hard drive](#).
- 7 Remove the [wireless card](#).
- 8 Remove the [fan](#).
- 9 Remove the [heat sink](#).
- 10 Remove the [system board](#).

Procedure

- 1 Remove the power-adapter port cable through the routing guides on the display-assembly base.
- 2 Remove the two screws (M3x5) that secure the power-adapter port to the display-assembly base.
- 3 Lift the power-adapter port, along with its cable, off the display-assembly base.

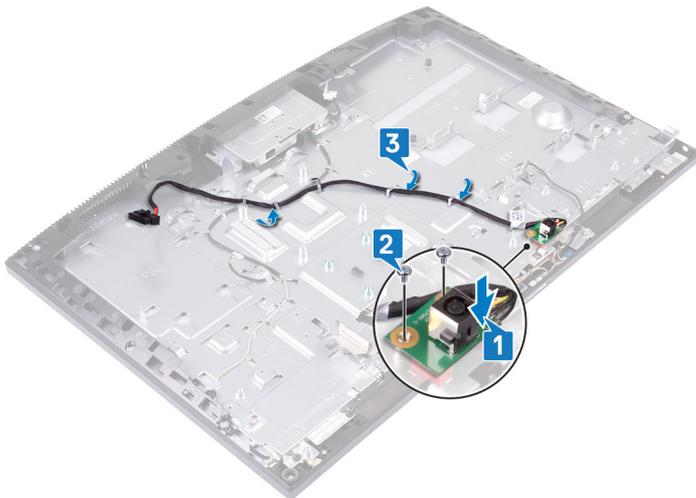


Replacing the power-adapter port

⚠ 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 Align the screw hole on the power-adapter port with the screw hole on the display-assembly base and place the power-adapter port on the display-assembly base.
- 2 Replace the two screws (M3x5) that secures the power-adapter port to the display-assembly base.
- 3 Route the power-adapter cable through the routing guides on the display-assembly base.



Post-requisites

- 1 Replace the [system board](#).
- 2 Replace the [heat sink](#).
- 3 Replace the [fan](#).
- 4 Replace the [wireless card](#).
- 5 Replace the [hard drive](#).
- 6 Replace the [rear-I/O bracket](#).
- 7 Replace the [base panel](#).
- 8 Replace the [system-board shield](#).
- 9 Replace the [back cover](#).
- 10 Replace the [stand](#).

Removing the display panel

⚠ 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 [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).
- 6 Remove the [hard drive](#).
- 7 Remove the [wireless card](#).
- 8 Remove the [fan](#).
- 9 Remove the [heat sink](#).
- 10 Remove the [system board](#).
- 11 Remove the [camera](#).

Procedure

- 1 Remove the display-backlit cable from the routing guides on the display-assembly base.
- 2 Remove the 11 screws (M3x5) that secure the middle frame and display-assembly base to the display panel.

i **NOTE:** The screws that secure the middle frame and display-assembly base to the display panel are silver in color and etched with "LCD" around the screw holes.



3 Place the computer in upright position, holding the display panel and display-assembly base, carefully release the display panel from middle frame and display-assembly base.

NOTE: To prevent damage to the display panel and the middle frame, hold the display panel as shown in the image when it is released from the display-assembly base.

- 4 Remove the touchscreen cable from the routing guide on the display-assembly base.
- 5 Slide the display-backlit cable through the slot on the display-assembly base.
- 6 Slide the display cable through the slot on the display-assembly base.
- 7 Lift the display panel off the middle frame and display-assembly base.



8 After performing the above steps, you are left with the display panel.



Replacing the display panel

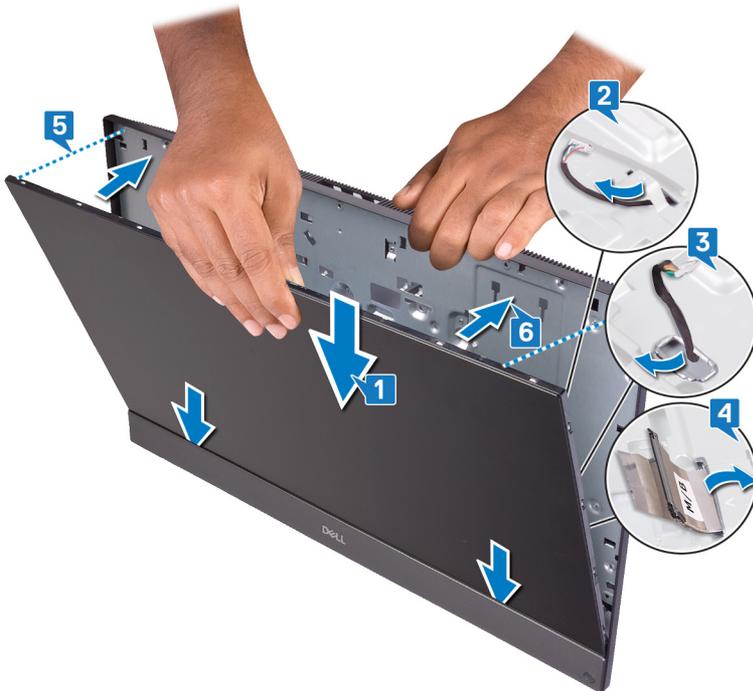
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Procedure

- 1 Place the display panel on the middle frame and display-assembly base.

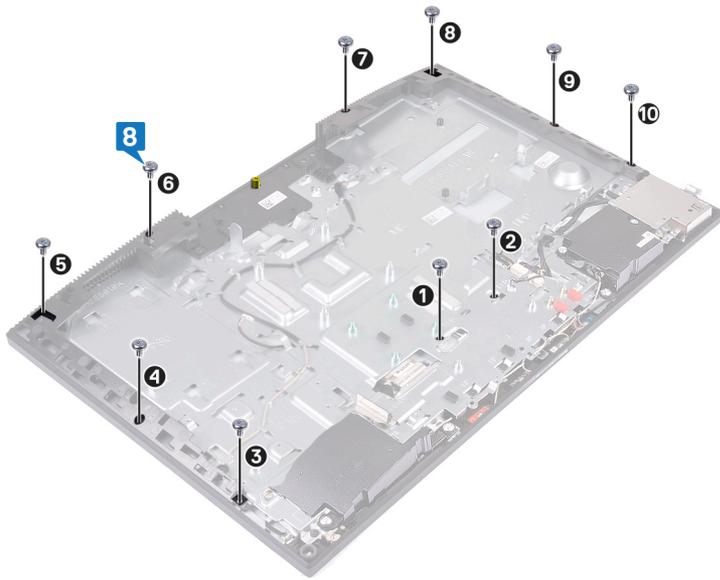
ⓘ NOTE: Ensure the display cable has been fully threaded to the slot on the display-assembly base.

- 2 Route the touchscreen cable through the routing guide on the display-assembly base.
- 3 Slide the display-backlit cable through the slot on the display-assembly base.
- 4 Slide the display cable through the slot on the display-assembly base.
- 5 Push the display panel towards the display-assembly base.
- 6 Close the gap between the display panel and the middle frame.



- 7 Place the display-assembly base on a clean and flat surface with the display panel facing down.
- 8 Replace the ten screws (M3x5) in the sequence as shown in the image, that secure the display panel to the middle frame and display-assembly base.

ⓘ NOTE: The screws that secure the middle frame and display panel to the display-assembly base are silver in color and etched with "LCD" around the screw holes.



9 Remove the jig screw from the display panel.



10 Replace the screw (M3x5) that secure the display panel to the middle frame and display-assembly base.

11 Route the display-backlit cable through the routing guides on the display-assembly base.



Post-requisites

- 1 Replace the [camera](#).
- 2 Replace the [system board](#).
- 3 Replace the [heat sink](#).
- 4 Replace the [fan](#).
- 5 Replace the [wireless card](#).
- 6 Replace the [hard drive](#).
- 7 Replace the [rear-I/O bracket](#).
- 8 Replace the [base panel](#).
- 9 Replace the [system-board shield](#).
- 10 Replace the [back cover](#).
- 11 Replace the [stand](#).

Removing the middle frame

⚠ 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

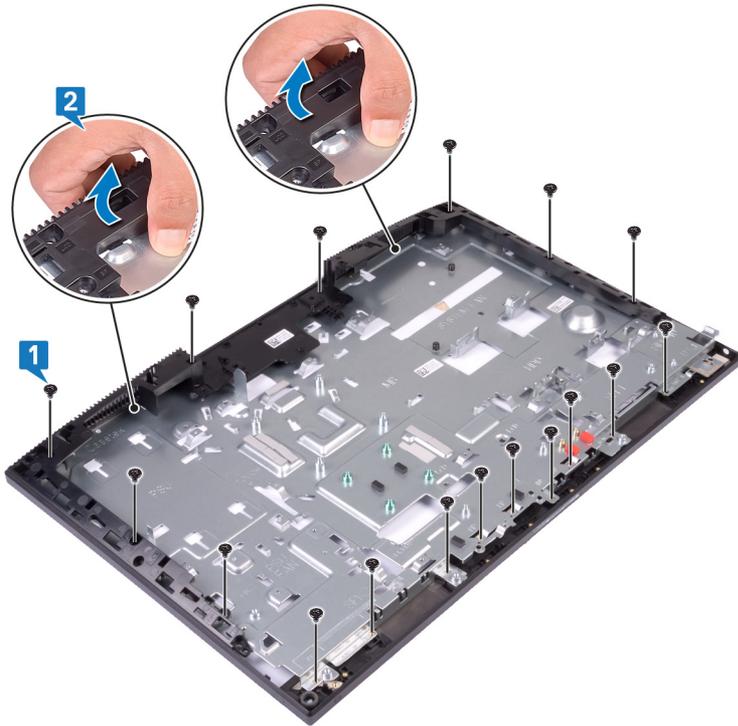
- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).
- 6 Remove the [hard drive](#).
- 7 Remove the [coin-cell battery](#).
- 8 Remove the [memory modules](#).
- 9 Remove the [wireless card](#).
- 10 Remove the [solid-state drive/Intel Optane memory](#) or [solid-state drive \(half-length\)](#), whichever applicable.
- 11 Remove the [fan](#).
- 12 Remove the [heat sink](#).
- 13 Remove the [speakers](#).
- 14 Remove the [power-button board](#).
- 15 Remove the [microphones](#).
- 16 Remove the [side-I/O board](#).
- 17 Remove the [headset port](#).
- 18 Remove the [antennas](#).
- 19 Remove the [camera](#).
- 20 Remove the [processor](#).
- 21 Remove the [system board](#).
- 22 Remove the [display panel](#).

Procedure

- 1 Remove the 17 screws (M3x5) that secure the middle frame to the display-assembly base.

i NOTE: The screws that secure the middle frame to the display-assembly base are black in color and etched with "BP" around the screw holes.

- 2 Slide and lift to release the tabs on the middle frame from the slots on the display-assembly base and lift the middle frame off the display-assembly base.



3 After performing the above steps, you are left with the middle frame.



Replacing the middle frame

⚠ 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.

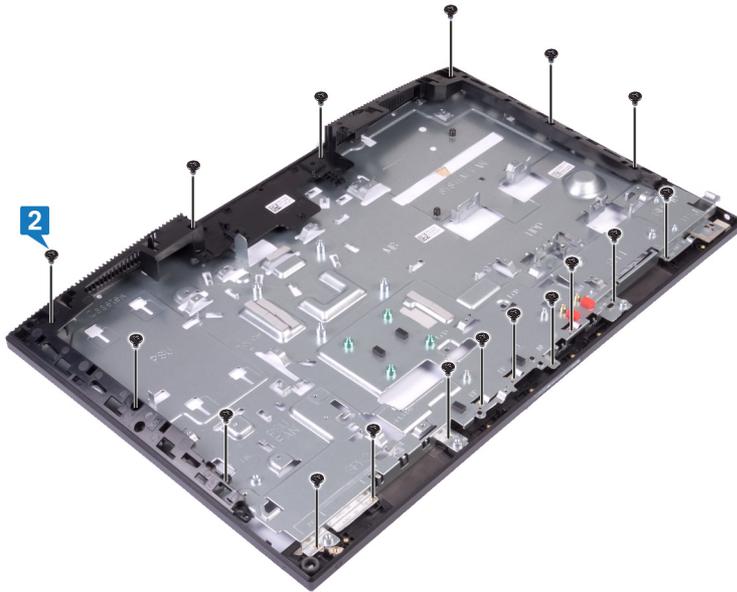
Procedure

- 1 Starting from the location shown, slide and align the middle frame to the slots on the display-assembly base, and then snap the middle frame into place on the display-assembly base.



- 2 Replace the 17 screws (M3x5) that secure the middle frame to the display-assembly base.

i NOTE: The screws that secure the middle frame to the display-assembly base are black in color and etched with "BP" around the screw holes.



Post-requisites

- 1 Replace the [display panel](#).
- 2 Replace the [system board](#).
- 3 Replace the [processor](#).
- 4 Replace the [camera](#).
- 5 Replace the [antennas](#).
- 6 Replace the [headset port](#).
- 7 Replace the [side-I/O board](#).
- 8 Replace the [microphones](#).
- 9 Replace the [power-button board](#).
- 10 Replace the [speakers](#).
- 11 Replace the [heat sink](#).
- 12 Replace the [fan](#).
- 13 Replace the [solid-state drive/Intel Optane memory](#) or [solid-state drive \(half-length\)](#), whichever applicable.
- 14 Replace the [wireless card](#).
- 15 Replace the [memory modules](#).
- 16 Replace the [coin-cell battery](#).
- 17 Replace the [hard drive](#).
- 18 Replace the [rear-I/O bracket](#).
- 19 Replace the [base panel](#).
- 20 Replace the [system-board shield](#).
- 21 Replace the [back cover](#).
- 22 Replace the [stand](#).

Removing the display-assembly base

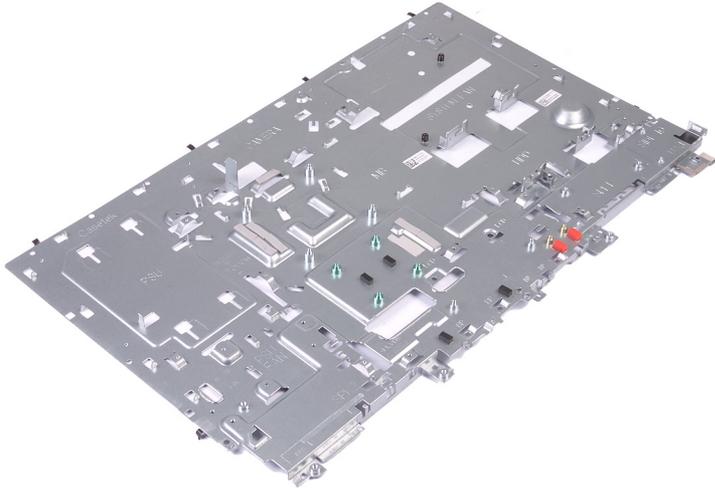
⚠ WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in [Before working inside your computer](#). After working inside your computer, follow the instructions in [After working inside your computer](#). For more safety best practices,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

Prerequisites

- 1 Remove the [stand](#).
- 2 Remove the [back cover](#).
- 3 Remove the [system-board shield](#).
- 4 Remove the [base panel](#).
- 5 Remove the [rear-I/O bracket](#).
- 6 Remove the [hard drive](#).
- 7 Remove the [coin-cell battery](#).
- 8 Remove the [memory modules](#).
- 9 Remove the [wireless card](#).
- 10 Remove the [solid-state drive/Intel Optane memory](#) or [solid-state drive \(half-length\)](#), whichever applicable.
- 11 Remove the [fan](#).
- 12 Remove the [heat sink](#).
- 13 Remove the [speakers](#).
- 14 Remove the [power-button board](#).
- 15 Remove the [microphones](#).
- 16 Remove the [side-I/O board](#).
- 17 Remove the [headset port](#).
- 18 Remove the [antennas](#).
- 19 Remove the [camera](#).
- 20 Remove the [processor](#).
- 21 Remove the [system board](#).
- 22 Remove the [display panel](#).
- 23 Remove the [middle frame](#).

Procedure

After performing all the pre-requisites, you are left with the display-assembly base.

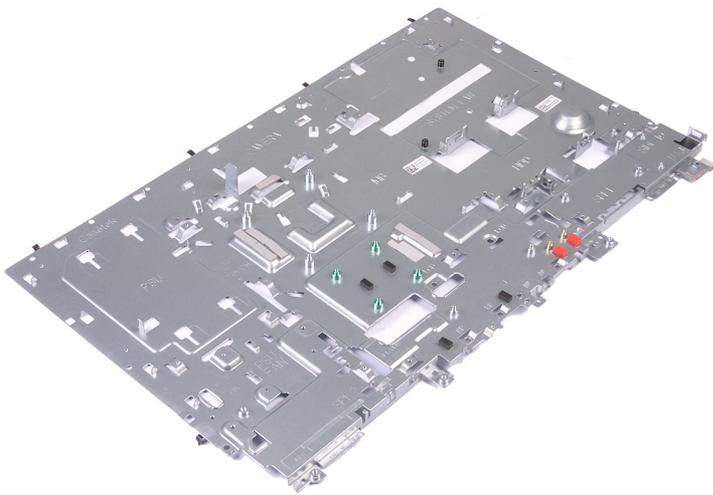


Replacing the display-assembly base

⚠ 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 display-assembly base on a clean and flat surface.



Post-requisites

- 1 Replace the [middle frame](#).
- 2 Replace the [display panel](#).
- 3 Replace the [system board](#).
- 4 Replace the [processor](#).
- 5 Replace the [camera](#).
- 6 Replace the [antennas](#).
- 7 Replace the [headset port](#).
- 8 Replace the [side-I/O board](#).
- 9 Replace the [microphones](#).
- 10 Replace the [power-button board](#).
- 11 Replace the [speakers](#).
- 12 Replace the [heat sink](#).
- 13 Replace the [fan](#).
- 14 Replace the [solid-state drive/Intel Optane memory](#) or [solid-state drive \(half-length\)](#), whichever applicable.
- 15 Replace the [wireless card](#).
- 16 Replace the [memory modules](#).

- 17 Replace the [coin-cell battery](#).
- 18 Replace the [hard drive](#).
- 19 Replace the [rear-I/O bracket](#).
- 20 Replace the [base panel](#).
- 21 Replace the [system-board shield](#).
- 22 Replace the [back cover](#).
- 23 Replace the [stand](#).

Downloading drivers

Downloading the audio driver

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

NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.

- 4 Click **Drivers & downloads**.
- 5 Click the **Detect Drivers** button.
- 6 Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
- 7 If necessary, your computer starts to download and install **SupportAssist**.

NOTE: Review on-screen instructions for browser-specific instructions.

- 8 Click **View Drivers for My System**.
- 9 Click **Download and Install** to download and install all driver updates detected for your computer.
- 10 Select a location to save the files.
- 11 If prompted, approve requests from **User Account Control** to make changes on the system.
- 12 The application installs all drivers and updates identified.

NOTE: Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.

- 13 For manual download and installation, click **Category**.
- 14 Click **Audio** in the drop-down list.
- 15 Click **Download** to download the audio driver for your computer.
- 16 After the download is complete, navigate to the folder where you saved the audio driver file.
- 17 Double-click the audio driver file icon and follow the instructions on the screen to install the driver.

Table 3. Audio controller before and after installation

Before installation

- ▼  Sound, video and game controllers
 -  Intel(R) Display Audio
 -  NVIDIA Virtual Audio Device (Wave Extensible) (WDM)
 -  Realtek Audio

After installation

- ▼  Sound, video and game controllers
 -  Intel(R) Display Audio
 -  NVIDIA High Definition Audio
 -  NVIDIA Virtual Audio Device (Wave Extensible) (WDM)
 -  Realtek Audio

Downloading the graphics driver

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

NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.

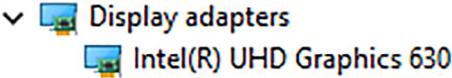
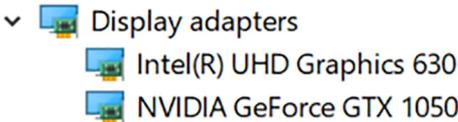
- 4 Click **Drivers & downloads**.
- 5 Click the **Detect Drivers** button.

- 6 Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
- 7 If necessary, your computer starts to download and install **SupportAssist**.
- 8 Click **View Drivers for My System**.
- 9 Click **Download and Install** to download and install all driver updates detected for your computer.
- 10 Select a location to save the files.
- 11 If prompted, approve requests from **User Account Control** to make changes on the system.
- 12 The application installs all drivers and updates identified.

NOTE: Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.

- 13 For manual download and installation, click **Category**.
- 14 Click **Video** in the drop-down list.
- 15 Click **Download** to download the graphics driver for your computer.
- 16 After the download is complete, navigate to the folder where you saved the graphics driver file.
- 17 Double-click the graphics driver file icon and follow the instructions on the screen to install the driver.

Table 4. Display adapters before and after installation

Before installation	After installation
	

Downloading the USB driver

- 1 Turn on your computer.
- 2 Go to www.dell.com/support.
- 3 Enter the Service Tag of your computer, and then click **Submit**.
- 4 Click **Drivers & downloads**.
- 5 Click the **Detect Drivers** button.
- 6 Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
- 7 If necessary, your computer starts to download and install **SupportAssist**.

NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.

- 8 Click **View Drivers for My System**.
- 9 Click **Download and Install** to download and install all driver updates detected for your computer.
- 10 Select a location to save the files.
- 11 If prompted, approve requests from **User Account Control** to make changes on the system.
- 12 The application installs all drivers and updates identified.

NOTE: Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.

- 13 For manual download and installation, click **Category**.
- 14 Click **Chipset** in the drop-down list.
- 15 Click **Download** to download the USB driver for your computer.
- 16 After the download is complete, navigate to the folder where you saved USB driver file.
- 17 Double-click the USB driver file icon and follow the instructions on screen to install the driver.

Downloading the chipset driver

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

 **NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.**

- 4 Click **Drivers & downloads**.
- 5 Click the **Detect Drivers** button.
- 6 Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
- 7 If necessary, your computer starts to download and install **SupportAssist**.

 **NOTE: Review on-screen instructions for browser-specific instructions.**

- 8 Click **View Drivers for My System**.
- 9 Click **Download and Install** to download and install all driver updates detected for your computer.
- 10 Select a location to save the files.
- 11 If prompted, approve requests from **User Account Control** to make changes on the system.
- 12 The application installs all drivers and updates identified.

 **NOTE: Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.**

- 13 For manual download and installation, click **Category**.
- 14 Click **Chipset** in the drop-down list.
- 15 Click **Download** to download the appropriate chipset driver for your computer.
- 16 After the download is complete, navigate to the folder where you saved the chipset driver file.
- 17 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 Enter the Service Tag of your computer, and then click **Submit**.

 **NOTE: If you do not have the Service Tag, use the autodetect feature or manually browse for your computer model.**

- 4 Click **Drivers & downloads**.
- 5 Click the **Detect Drivers** button.
- 6 Review and agree to the Terms and Conditions to use **SupportAssist**, then click **Continue**.
- 7 If necessary, your computer starts to download and install **SupportAssist**.

 **NOTE: Review on-screen instructions for browser-specific instructions.**

- 8 Click **View Drivers for My System**.
- 9 Click **Download and Install** to download and install all driver updates detected for your computer.
- 10 Select a location to save the files.
- 11 If prompted, approve requests from **User Account Control** to make changes on the system.
- 12 The application installs all drivers and updates identified.

 **NOTE: Not all files can be installed automatically. Review the installation summary to identify if manual installation is necessary.**

- 13 For manual download and installation, click **Category**.
- 14 Click **Network** in the drop-down list.
- 15 Click **Download** to download the network driver for your computer.
- 16 Save the file, and after the download is complete, navigate to the folder where you saved the network driver file.

17 Double-click the network driver file icon and follow the instructions on screen.

Table 5. Network driver before and after installation

Before installation

- Network adapters
 - Bluetooth Device (Personal Area Network)
 - Bluetooth Device (RFCOMM Protocol TDI)
 - Intel(R) Ethernet Connection (7) I219-V
 - WAN Miniport (IKEv2)
 - WAN Miniport (IP)
 - WAN Miniport (IPv6)
 - WAN Miniport (L2TP)
 - WAN Miniport (Network Monitor)
 - WAN Miniport (PPPOE)
 - WAN Miniport (PPTP)
 - WAN Miniport (SSTP)

After installation

- Network adapters
 - Bluetooth Device (Personal Area Network)
 - Bluetooth Device (RFCOMM Protocol TDI)
 - Intel(R) Ethernet Connection (7) I219-V
 - Intel(R) Wireless-AC 9560
 - WAN Miniport (IKEv2)
 - WAN Miniport (IP)
 - WAN Miniport (IPv6)
 - WAN Miniport (L2TP)
 - WAN Miniport (Network Monitor)
 - WAN Miniport (PPPOE)
 - WAN Miniport (PPTP)
 - WAN Miniport (SSTP)

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.

Enabling or disabling the USB in 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.
The BIOS setup program is displayed.
- 3 On the **Advanced** tab, select **USB configuration**.
- 4 Select the **Front USB Ports** or **Rear USB Ports** to enable or disable it, respectively.
- 5 Save the settings and exit.

Identifying the hard drive in 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.
A list of hard drives is displayed on the **Main** tab.

Checking the system memory in BIOS setup program

- 1 Turn on or restart your computer.
- 2 Press F2 when the Dell logo is displayed to enter the BIOS setup program.
The memory information is displayed on the **Main** tab.

System setup options

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

Table 6. System setup options—Main menu**Main**

System Time	Displays the current time in hh:mm:ss format.
System Date	Displays the current date in mm/dd/yyyy format.
BIOS Version	Displays the BIOS version number.
Product Name	Displays the product name.
Service Tag	Allows you to enter the service tag of your computer.
Asset Tag	Displays the asset tag of your computer.
CPU Type	Displays the CPU type.
CPU Speed	Displays the speed of the CPU.
CPU ID	Displays the CPU identification code.
Cache L1	Displays the processor L1 cache size.
Cache L2	Displays the processor L2 cache size.
Cache L3	Displays the processor L3 cache size.
First HDD	Displays the primary hard disk.
AC Adapter Type	Displays the power adapter type.
System Memory	Displays the total computer memory installed.
Memory Speed	Displays the memory speed.

Table 7. System setup options—Advanced menu**Advanced****Advanced BIOS Features**

Intel(R)SpeedStep(TM)	Enable or disable the Intel SpeedStep feature. Default: Enabled.
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.
Integrated NIC	Controls the on-board LAN controller.
SATA Operation	This option configures the operating mode of the integrated SATA hard drive controller. Default: AHCI
Adapter Warnings	Enables or disables the power adapter warnings. Default: Enabled
Intel Software Guard Extensions	Enable/Disable/Software Controlled Intel® Software Guard Extensions (SGX). Default: Software controlled

Advanced

BIOS Recovery from Hard Drive	Enable or disable BIOS recovery from hard drive. Default: Enabled
BIOS Auto-Recovery	Enable or disable BIOS Auto-Recovery. Default: Disabled
Always Perform Integrity Check	When enabled, BIOS checks the BIOS image integrity on every boot. When Disabled, BIOS checks the image integrity only if the previous boot did not complete. Default: Disabled

USB Configuration

Rear USB Ports	Allows you to enable or disable the rear USB ports.
Sides USB ports	Allows you to enable or disable the side USB ports.

Power Options

Wake Up by Integrated LAN	Enable or disable the computer to be powered on by special LAN signals. Default: Disabled
AC Recovery	Sets what action the computer takes when power is restored.
Deep Sleep Control	Enable or disable the Deep Sleep mode support. Default: Enabled
USB Wake support (S3)	Enable or disable USB devices to wake the system from Standby. Default: Enabled
USB Powershare Support State	Enable or disable charging USB devices. Default: Disabled
Auto Power On	This option sets the time of day when you would like the system to turn on automatically.
Auto Power On Mode	System turns on automatically.
Auto Power On Date	Auto power on date.
Auto Power On Time	Auto power on time.
Numlock Key	Allows you to set the status of the Numlock key during boot to On or Off.

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	The SupportAssist OS Recovery option will enable or disable the boot flow for SupportAssist OS Recovery tool in the event of certain system errors. If the SupportAssist OS Recovery setup option is set to disabled then all automatic boot flow for SupportAssist OS Recovery tool will be disabled. Default: Disabled

Table 8. System setup options—Security menu**Security**

Unlock Setup Status	Displays the Unlock Setup status.
Admin Password Status	Displays the administrative password status.
System Password Status	Displays the system password status.
HDD Password Status	Displays the hard-drive password status.
Asset Tag	Displays the asset tag of your computer.
Admin Password	Allows you to set the admin password.
System Password	Allows you to set the system password.
HDD Password	Allows you to set the hard drive password.
Password change	Allows you determine whether changes to the System and Hard Disk passwords are permitted when an administrator password is set.
Computrance	Allows you to help track assets and provide recovery services in the event the computer is lost or stolen.
Firmware TPM	Allows you to enable or disable the firmware TPM function.
PPI Bypass for Clear Command	Allows you to control the TPM Physical Presence Interface (PPI). When enabled, this setting will allow the OS to skip BIOS PPI user prompts when issuing the Clear command. Changes to this setting take effect immediately..
UEFI Firmware Capsule Updates	Allows you to enable or disable the UEFI Firmware Capsule Updates function. Default: Enabled

Table 9. System setup options—Boot menu**Boot**

Boot List Option	Allows you to select system boot from Legacy or UEFI.
File Browser Add Boot Option	Allows you to browse into the file system of devices to select the bootloader.
File Browser Del Boot Option	Allows you to delete the boot menu.
Secure Boot	Allows you to enable or disable the secure boot control. Default: Disabled
Legacy option ROMs	Enable or disable the Legacy Option ROMs.
Attempt Legacy Boot	Allows the system to immediately boot the Legacy Boot List if system fails to boot the UEFI Boot List.
Boot Option Priorities	Displays the boot option priorities.
Boot Option #1	Displays the first boot option.
Boot Option #2	Displays the second boot option.
Boot Option #3	Displays the third boot option.

Table 10. System setup options—Exit menu

Exit	
Save Changes and Reset	Allows you to reset the system after saving the changes.
Discard Changes and Reset	Allows you to reset the system without saving any changes.
Restore defaults	Allows you to restore defaults.
Discard Changes	Allows you to discard your changes.
Save Changes	Allows you to save your changes.

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.

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**.
i **NOTE:** If you do not have the Service Tag, use the auto-detect feature or manually browse for your computer model.
- 4 Click **Drivers & downloads > Find it myself**.
- 5 Select the operating system installed on your computer.
- 6 Scroll down the page and expand **BIOS**.
- 7 Click **Download** to download the latest version of the BIOS for your computer.
- 8 After the download is complete, navigate to the folder where you saved the BIOS update file.
- 9 Double-click the BIOS update file icon and follow the instructions on the screen.

Reinstall Windows using a USB recovery drive

⚠ CAUTION: This process formats the hard drive and removes all data on your computer. Ensure that you back up data on your computer before beginning this task.

i **NOTE:** Before reinstalling Windows, ensure your computer has more than 2 GB of memory and more than 32 GB of storage space.

i **NOTE:** This process may take up to an hour to complete and your computer will restart during the recovery process.

- 1 Connect the USB recovery drive to your computer.
- 2 Restart your computer.
- 3 Press F12 after the Dell logo is displayed on the screen to access the boot menu.
A **Preparing one-time boot menu** message appears.
- 4 After the boot menu loads, select the USB recovery device under **UEFI BOOT**.
The system reboots and a screen to **Choose the keyboard layout** is displayed.
- 5 Choose your keyboard layout.
- 6 In the **Choose an option** screen, click **Troubleshoot**.
- 7 Click **Recover from a drive**.
- 8 Choose one of the following options:
 - **Just remove my files** to do a quick format.
 - **Fully clean the drive** to do a complete format.
- 9 Click **Recover** to start the recovery process.

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

ℹ 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.

Display built-in self test

The following procedure provides the instructions on how to run the built-in self test for the display:

- 1 Turn off your computer.
- 2 Press and hold the display built-in self test button.
- 3 Press and hold the power button.
- 4 Release the power button.
- 5 Hold the display built-in self test button until the test starts.

Diagnostics

Power status light: Indicates the power status.

Solid Amber – The computer is unable to boot to the operating system. This indicates that the power supply or another device in the computer is failing.

Blinking Amber – The computer is unable to boot to the operating system. This indicates that the power supply is normal but another device in the computer is failing or not installed properly.

NOTE: See the light patterns to determine the device that is failing.

Off – Computer is in hibernation or turned off.

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

For example, the power 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 the Recovery image is not found.

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

Table 11. System diagnostic lights

Light pattern	Problem description
1	System board, BIOS corruption, or ROM error
2	Memory not found
3	System board, chipset failure
4	Memory or RAM failure
5	Coin-cell battery failure
6	GPU failure
7	CPU failure
8	Display failure
3,6	BIOS recovery image not found
3,7	BIOS recovery image found but invalid
Solid Amber > 2,1	CPU failure

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.

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.

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 Disconnect the power adapter from your computer.
- 3 Press and hold the power button for 15 seconds to drain the flea power.
- 4 Connect the power adapter to your computer.
- 5 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 12. Self-help resources

Information about Dell products and services

www.dell.com

Dell Help & Support app



Tips



Contact Support

In Windows search, type `Contact Support`, and press Enter.

Online help for operating system

www.dell.com/support/windows

www.dell.com/support/linux

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

www.dell.com/support

Dell knowledge base articles for a variety of computer concerns.

- 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
- Factory and system restore
- BIOS information

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

- Select **Detect Product**.
- Locate your product through the drop-down menu under **View Products**.
- Enter the **Service Tag number** or **Product ID** in the search bar.

Contacting Dell

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

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.