

Alienware M17x-R3 Service Manual

Regulatory model: P11E

Regulatory type: P11E001



Notes, Cautions, and Warnings



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



CAUTION: A CAUTION indicates potential damage to hardware or loss of data if instructions are not followed.



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

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Before You Begin

This manual provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in "Turning Off Your Computer" on page 9 and "Before Working Inside Your Computer" on page 10.
- You have read the safety information that shipped with your computer.
- A component can be replaced or—if purchased separately—installed by performing the removal procedure in reverse order.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Plastic scribe
- BIOS executable update program at support.dell.com

Turning Off Your Computer

 **CAUTION: To avoid losing data, save and close all open files and exit all open programs before you turn off your computer.**

- 1 Save and close all open files and exit all open programs.
- 2 Click **Start** , and then click **Shut Down**.

The computer turns off after the operating system shutdown process finishes.

- 3 Ensure that the computer and any attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for at least 8 to 10 seconds until the computer turns off.

Before Working Inside Your Computer

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

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell™ is not covered by your warranty.
-  **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; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.
-  **CAUTION:** To avoid damaging the computer, perform the following steps before you begin working inside the computer.
 - 1 Ensure that the work surface is flat and clean to prevent the computer cover from being scratched.
 - 2 Turn off your computer (see "Turning Off Your Computer" on page 9).
-  **CAUTION:** To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.
 - 3 Disconnect all telephone or network cables from the computer.
 - 4 Press and eject any installed cards from the 9-in-1 Media Card Reader.
 - 5 Disconnect your computer and all attached devices from their electrical outlets.
 - 6 Disconnect all attached devices from your computer.

 **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

- 7** Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 8** Turn the computer top-side up, open the display, and press the power button to ground the system board.

Battery Pack

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid damage to the computer, use only the battery designed for this particular Alienware computer. Do not use batteries designed for other Alienware computers.

Removing the Battery Pack

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Shut down the computer and turn it over.
- 3 Slide the battery latch to the unlock position as shown.
The battery pack pops up.
- 4 Remove the battery pack.



1 battery pack

2 battery latch

Replacing the Battery Pack



CAUTION: To avoid damage to the computer, use only the battery designed for this particular Alienware computer.

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the tabs on the battery with the slots on the battery bay and snap the battery into place.

Compartment Door

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Compartment Door

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the two screws that secure the compartment door to the computer base.
- 4 Slide and lift the compartment door away from the computer.



1 compartment door

2 screws (2)

Replacing the Compartment Door

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the tabs on the compartment door with the slots on the computer base and slide the compartment door into place.
- 3 Replace the two screws that secure the compartment door to the computer base.
- 4 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



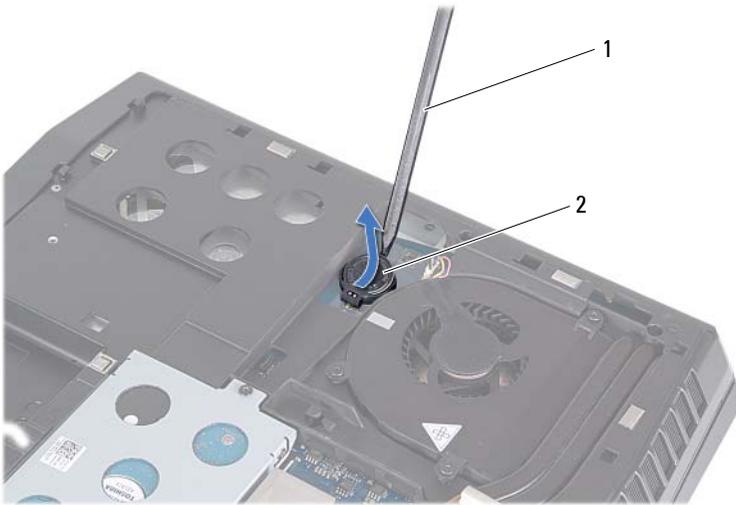
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Coin-Cell Battery

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Coin-Cell Battery

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Use a plastic scribe to pry up the coin-cell battery from the slot on the system board.



1 plastic scribe

2 coin-cell battery

Replacing the Coin-Cell Battery

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Hold the coin-cell battery with the positive side up.
- 3 Slide the coin-cell battery into the slot and gently press until it snaps into place.
- 4 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 5 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Hard Drive(s)

-  **WARNING:** If you remove the hard drive from the computer when the drive is hot, *do not touch* the metal housing of the hard drive.
-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.
-  **CAUTION:** To prevent data loss, turn off your computer (see "Turning Off Your Computer" on page 9) before removing the hard-drive assembly. Do not remove the hard drive while the computer is On or in Sleep state.
-  **CAUTION:** Hard drives are extremely fragile. Exercise care when handling the hard drive.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **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; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.
-  **NOTE:** Dell or Alienware does not guarantee compatibility or provide support for hard drives from sources other than Dell.
-  **NOTE:** If you are installing a hard drive from a source other than Dell or Alienware, you need to install an operating system, drivers, and utilities on the new hard drive.

Removing the Hard Drive(s)

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Loosen the three captive screws that secure the hard-drive assembly to the computer base.
- 5 Using the pull-tab, lift the hard-drive assembly to disconnect it from the connector on the system board.
- 6 Lift the hard-drive assembly out of the computer base.

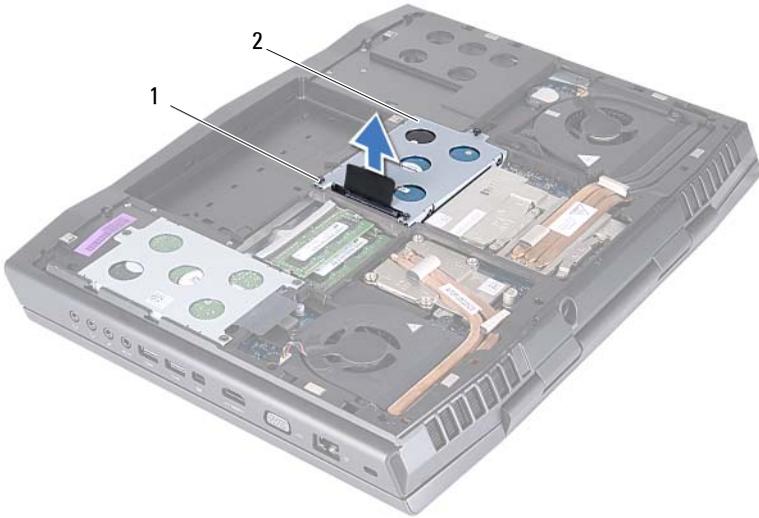
Primary hard-drive assembly



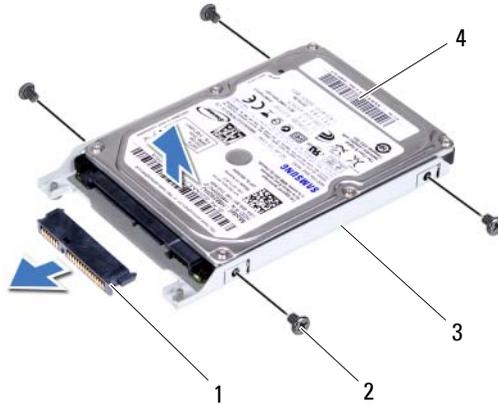
1 captive screws (3)

2 primary hard-drive assembly

Secondary hard-drive assembly



- 1 captive screws (3) 2 secondary hard-drive assembly
- 7** Remove the four screws that secure the hard drive to the hard-drive bracket.
- 8** Lift the hard-drive off the hard-drive bracket.
- 9** Remove the interposer from the hard drive.



- | | | | |
|---|--------------------|---|------------|
| 1 | interposer | 2 | screws (4) |
| 3 | hard-drive bracket | 4 | hard drive |

CAUTION: When the hard drive is not in the computer, store it in protective antistatic packaging (see "Protecting Against Electrostatic Discharge" in the safety instructions that shipped with your computer).

Replacing the Hard Drive(s)

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the new drive from its packaging.
Save the original packaging for storing or shipping the hard drive.
- 3 Connect the interposer to the hard drive.
- 4 Place the hard drive in the hard-drive bracket.
- 5 Replace the four screws that secure the hard drive to the hard-drive bracket.
- 6 Align the connector on the hard drive with the connector on the system board and press the hard drive until it is fully seated.

- 7 Tighten the three captive screws that secure the hard-drive assembly to the computer base.
- 8 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 9 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

- 10 Install the operating system for your computer, as needed.
- 11 Install the drivers and utilities for your computer, as needed.

Memory Module(s)

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

 **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

 **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

 **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

You can increase your computer memory by installing memory modules on the system board. See the "Specifications" section in your *Mobile Manual* for information on the type of memory supported by your computer.

 **NOTE:** Memory modules purchased from Dell or Alienware are covered under your computer warranty.

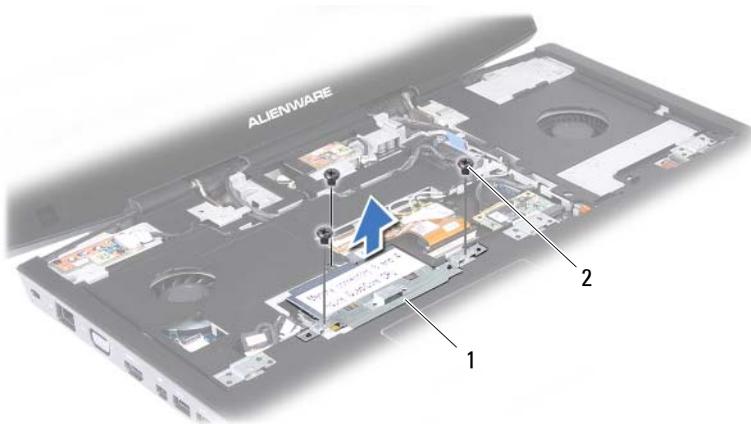
 **NOTE:** If you purchased a dual-core processor, your computer supports only memory module connectors DIMM 1 and DIMM 2.

 **NOTE:** Your computer supports up to four memory module connectors. You can access connectors DIMM 1 and DIMM 2 by removing the compartment door at the bottom of your computer. You can access connectors DIMM 3 and DIMM 4 by removing the memory-module cover on top of the palm rest assembly.

Removing the Memory Module(s)

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).

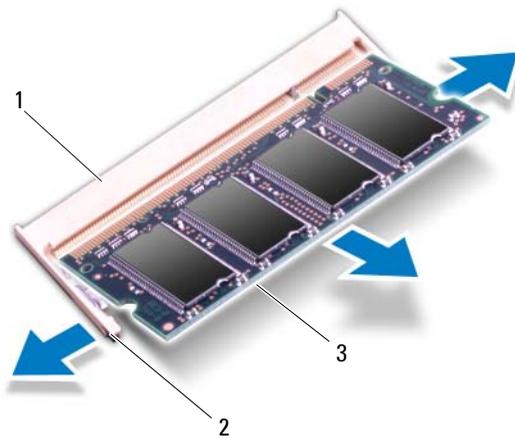
- 4 To remove memory module(s) from connectors DIMM 1 and DIMM 2, go to step 6.
- 5 To remove memory-module(s) from connectors DIMM 3 and DIMM 4:
 - a Remove the center control cover (see "Removing the Center Control Cover" on page 49).
 - b Remove the keyboard (see "Removing the Keyboard" on page 55).
 - c Remove the three screws that secure the memory-module cover to the palm rest assembly.



- 1 memory-module cover 2 screws (3)

CAUTION: To prevent damage to the memory-module connector, do not use tools to spread the memory module securing clips.

- 6 Use your fingertips to carefully spread apart the securing clips on each end of the memory-module connector until the memory module pops up.



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

7 Remove the memory module from the memory-module connector.

Replacing the Memory Module(s)

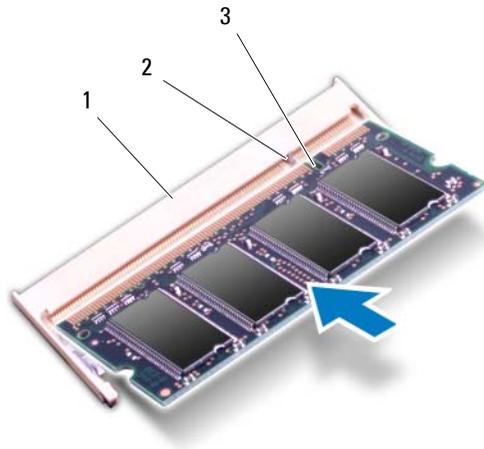
1 Follow the instructions in "Before You Begin" on page 9.

 **NOTE:** If you need to install memory modules in two connectors, install a memory module in the lower connector before you install a memory module in the upper connector.

2 Align the notch in the memory module with the tab in the memory-module connector.

3 Slide the memory module firmly into the connector at a 45-degree angle, and press the memory module down until it clicks into place. If you do not hear the click, remove the memory module and reinstall it.

 **NOTE:** If the memory module is not installed properly, the computer may not boot.



- 1 memory-module connector
- 2 tab
- 3 notch

- 4 If you have replaced memory module(s) in connectors DIMM 1 and DIMM 2, go to step 6.
- 5 If you have replaced memory module(s) in connectors DIMM 3 and DIMM 4:
 - a Align the screw holes on the memory-module cover with the screw holes on the palm rest assembly.
 - b Replace the three screws that secure the memory-module cover to the palm rest assembly.
 - c Replace the keyboard (see "Replacing the Keyboard" on page 57).
 - d Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 6 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 7 Replace the battery pack (see "Replacing the Battery Pack" on page 14).

 **CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.**

8 Turn on the computer.

As the computer boots, it detects the additional memory and automatically updates the system configuration information.

To confirm the amount of memory installed in the computer:

Click **Start**  → **Control Panel** → **System and Security** → **System**.

Graphics-Card Heat Sink Fan

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** The graphics-card assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Graphics-Card Heat Sink Fan

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Disconnect the graphics-card heat sink fan cable from the connector on the system board.
- 5 Loosen the three captive screws that secure the graphics-card heat sink fan to the chassis.
- 6 Lift the graphics-card heat sink fan along with the cable away from the chassis.



- 1 graphics-card heat sink fan cable
- 2 captive screws (3)
- 3 graphics-card heat sink fan

Replacing the Graphics-Card Heat Sink Fan

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the screw holes on the graphics-card heat sink fan with the screw holes on the chassis.
- 3 Tighten the three captive screws that secure the graphics-card heat sink fan to the chassis.
- 4 Connect the graphics-card heat sink fan cable to the connector on the system board.
- 5 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 6 Replace the battery pack (see "Replacing the Battery Pack" on page 14).

△ CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Graphics-Card Assembly

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** The graphics-card assembly may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Graphics-Card Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the graphics-card heat sink fan (see "Removing the Graphics-Card Heat Sink Fan" on page 31).
- 5 Remove the two screws that secure the graphics-card assembly to the system board.
- 6 Lift and slide the graphics-card assembly out to disconnect it from the connector on the system board.



1 graphics-card assembly

2 screws (2)

Replacing the Graphics-Card Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Insert the graphics card connector at a 45-degree angle into the connector on the system board.
- 3 Press the other end of the graphics-card assembly down into the slot on the system board and replace the two screws that secure the graphics-card assembly to the system board.
- 4 Replace the graphics-card heat sink fan (see "Replacing the Graphics-Card Heat Sink Fan" on page 32).
- 5 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 6 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



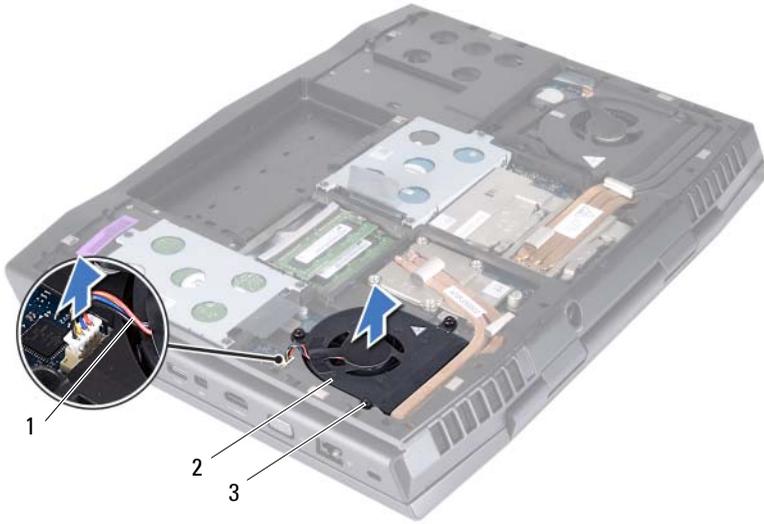
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Processor Heat-Sink Fan

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** The processor heat sink may be very hot during normal operation. Ensure that it has had sufficient time to cool before you touch it.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Processor Heat-Sink Fan

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Disconnect the processor heat-sink fan cable from the connector on the system board.
- 5 Loosen the three captive screws that secure the processor heat-sink fan to the chassis.
- 6 Lift the processor heat-sink fan along with the cable away from the chassis.



- 1 processor heat-sink fan cable
- 2 processor heat-sink fan
- 3 captive screws (3)

Replacing the Processor Heat-Sink Fan

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the screw holes on the processor heat-sink fan with the screw holes on the chassis.
- 3 Tighten the three captive screws that secure the processor heat-sink fan to the chassis.
- 4 Connect the processor heat-sink fan cable to the connector on the system board.
- 5 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 6 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



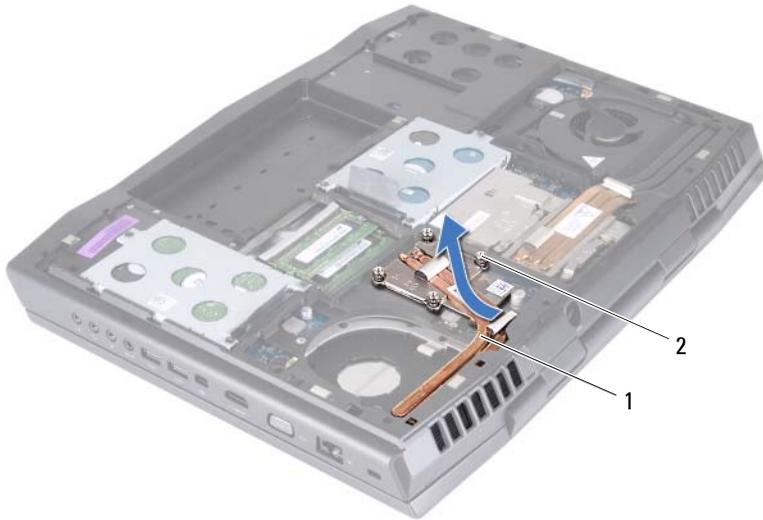
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Processor Heat-Sink

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **WARNING:** If you remove the processor heat-sink from the computer when the heat sink is hot, *do not touch* the metal housing of the processor heat-sink.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Processor Heat-Sink

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the processor heat-sink fan (see "Removing the Processor Heat-Sink Fan" on page 37).
- 5 In sequential order (indicated on the processor heat-sink), loosen the four captive screws that secure the processor heat-sink to the system board.
- 6 Lift the processor heat-sink at an angle towards the front of the computer and out of the computer base.



1 processor heat-sink

2 captive screws (4)

Replacing the Processor Heat-Sink

 **CAUTION:** Incorrect alignment of the processor heat-sink can damage the processor.

 **NOTE:** The original thermal grease can be reused if the original processor heat-sink is reinstalled. If the processor heat-sink is replaced, use the thermal grease provided in the kit to ensure that thermal conductivity is achieved.

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Slide the processor heat-sink in place.
- 3 Align the four captive screws on the processor heat-sink with the screw holes on the system board and tighten the screws in sequential order (indicated on the processor heat-sink).
- 4 Replace the processor heat-sink fan (see "Replacing the Processor Heat-Sink Fan" on page 38).
- 5 Replace the compartment door (see "Replacing the Compartment Door" on page 16).

6 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



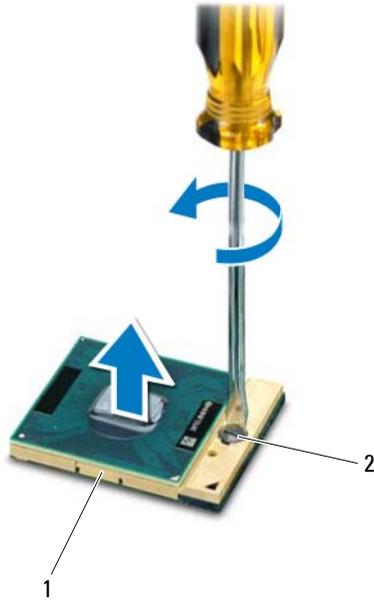
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Processor Module

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To prevent intermittent contact between the ZIF-socket cam screw and the processor module when removing or replacing the processor, press to apply slight pressure to the center of the processor module while turning the cam screw.
-  **CAUTION:** To avoid damage to the processor module, hold the screwdriver so that it is perpendicular to the processor module when turning the cam screw.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Processor Module

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the processor heat-sink fan (see "Removing the Processor Heat-Sink Fan" on page 37).
- 5 Remove the processor heat-sink (see "Removing the Processor Heat-Sink" on page 41).
- 6 To loosen the ZIF socket, use a small, flat-blade screwdriver and rotate the ZIF-socket cam screw counterclockwise until it comes to the cam stop.



1 ZIF socket

2 ZIF-socket cam screw

CAUTION: To ensure maximum cooling for the processor module, do not touch the heat transfer areas on the processor thermal cooling assembly. The oils in your skin can reduce the heat transfer capability of the thermal pads.

CAUTION: When removing the processor module, lift the module straight up. Be careful not to bend the pins on the processor module.

7 Lift the processor module from the ZIF socket.

Replacing the Processor Module

NOTE: If a new processor module is installed, you will receive a new thermal-cooling assembly, which will include an affixed thermal pad, or you will receive a new thermal pad along with documentation to illustrate proper installation.

1 Follow the instructions in "Before You Begin" on page 9.

- 2 Align the pin-1 corner of the processor module with the pin-1 corner of the ZIF socket, then place the processor module.



NOTE: The pin-1 corner of the processor module has a triangle that aligns with the triangle on the pin-1 corner of the ZIF socket.

When the processor module is properly seated, all four corners are aligned at the same height. If one or more corners of the module are higher than the others, the module is not seated properly.



CAUTION: To avoid damage to the processor module, hold the screwdriver perpendicular to the processor module when turning the cam screw.

- 3 Tighten the ZIF socket by turning the cam screw clockwise to secure the processor module to the system board.
- 4 Replace the processor heat-sink (see "Replacing the Processor Heat-Sink" on page 42).
- 5 Replace the processor heat-sink fan (see "Replacing the Processor Heat-Sink Fan" on page 38).
- 6 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 7 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



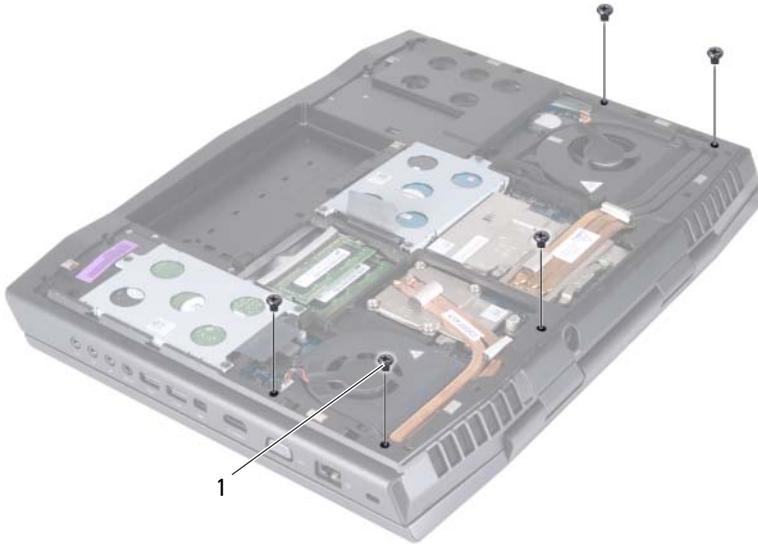
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Center Control Cover

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Center Control Cover

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the five screws that secure the center control cover to the computer base.



- 1 screws (5)

⚠ CAUTION: Be extremely careful when removing the center control cover. The cover along with the cable that attaches to it are fragile.

- 5 Turn the computer over and open the display as far as possible.
- 6 Gently pry the center control cover from the back of the computer and then ease the tabs on the center control cover out of the slots on the palm rest assembly.



1 center control cover

⚠ CAUTION: Be extremely careful when removing and handling the center control cover. Failure to do so could result in scratching the display panel.

- 7** Turn the center control cover towards the display.
- 8** Disconnect the media control keys cable from the connector on the system board.
- 9** Lift the center control cover away from the computer.



- 1 media control keys cable

Replacing the Center Control Cover

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Connect the media control keys cable to the connector on the system board.
- 3 Align the tabs on the center control cover with the slots on the palm rest assembly and snap the cover into place.
- 4 Close the display and turn the computer over.
- 5 Replace the five screws that secure the center control cover to the computer base.
- 6 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 7 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Keyboard

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Keyboard

- 1 Follow the instructions in "Before You Begin" on page 9.
 - 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
 - 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
 - 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
 - 5 Remove the five screws that secure the keyboard to the computer base.
-  **CAUTION:** The keycaps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Be careful when removing and handling the keyboard.
 -  **CAUTION:** Be extremely careful when removing and handling the keyboard. Failure to do so could result in scratching the display panel.
- 6 Carefully lift the keyboard and slide the keyboard tabs out of the slots on the palm rest assembly.
 - 7 Carefully turn the keyboard over and place it on the palm rest assembly.



1 screws (5)

2 keyboard

8 Lift the release latches on the connectors on the system board and disconnect the keyboard cable and backlit keyboard cable.

9 Lift the keyboard off the palm rest assembly.



1 keyboard cable

2 backlit keyboard cable

Replacing the Keyboard

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Slide the keyboard cable and backlit keyboard cable into their connectors on the system board and press down on their connector latches to secure the cables.
- 3 Slide the tabs on the keyboard into the slots on the palm rest assembly and lower the keyboard into place.
- 4 Replace the five screws that secure the keyboard to the computer base.
- 5 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 6 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 7 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Wireless Mini-Card

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.
-  **NOTE:** Dell or Alienware does not guarantee compatibility or provide support for Mini-Cards from sources other than Dell or Alienware.

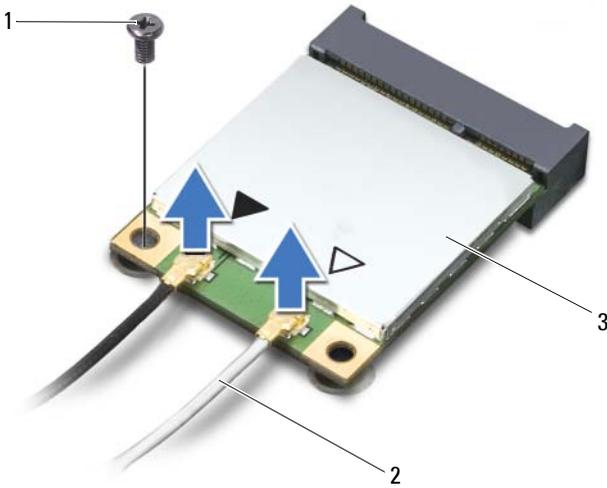
If you ordered a wireless Mini-Card with your computer, the card is already installed.

Your computer supports one half Mini-Card slot for WLAN.

-  **NOTE:** Depending on the configuration of the computer when it was sold, the Mini-Card slot may or may not have a Mini-Card installed.

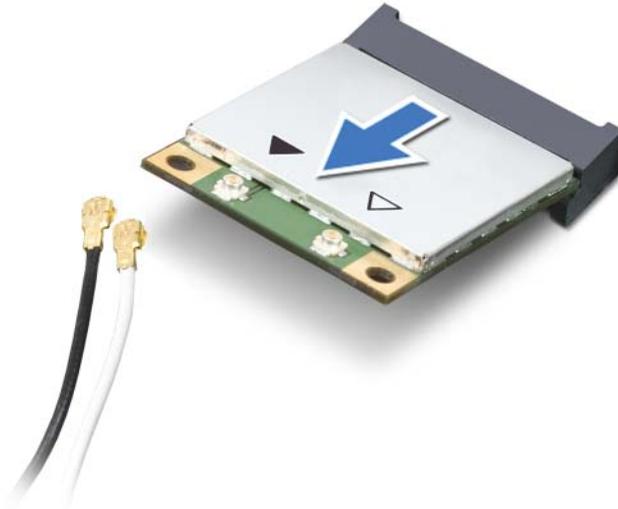
Removing the Mini-Card

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Disconnect the antenna cables from the Mini-Card.



- 1 screw
- 2 antenna cables (2)
- 3 Mini-Card

- 7** Remove the screw that secures the Mini-Card to the system board.
- 8** Lift the Mini-Card out of the connector on the system board.



- △ **CAUTION:** When the Mini-Card is not in the computer, store it in protective antistatic packaging. For more information, see "Protecting Against Electrostatic Discharge" in the safety information that shipped with your computer.

Replacing the Mini-Card

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the new Mini-Card from its packaging.

- △ **CAUTION:** Use firm and even pressure to slide the card into place. If you use excessive force, you may damage the connector.

- △ **CAUTION:** The connectors are keyed to ensure correct insertion. If you feel resistance, check the connectors on the card and on the system board, and realign the card.

- 3 Insert the Mini-Card connector at a 45-degree angle into the connector on the system board.
- 4 Press the other end of the Mini-Card down into the slot on the system board and replace the screw that secures the Mini-Card to the system board.

- 5 Connect the appropriate antenna cables to the Mini-Card you are installing. The following table provides the antenna cable color scheme for each Mini-Card supported by your computer.

Connectors on the Mini-Card	Antenna Cable Color Scheme
WLAN (2 or 3 antenna cables)	
Main WLAN (white triangle)	white
Auxiliary WLAN (black triangle)	black
MIMO WLAN (gray triangle) (optional)	gray

- 6 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 7 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 8 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 9 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

- 10 Install the drivers and utilities for your computer, as required.



NOTE: If you are installing a Mini-card from a source other than Dell or Alienware, you must install the appropriate drivers and utilities.

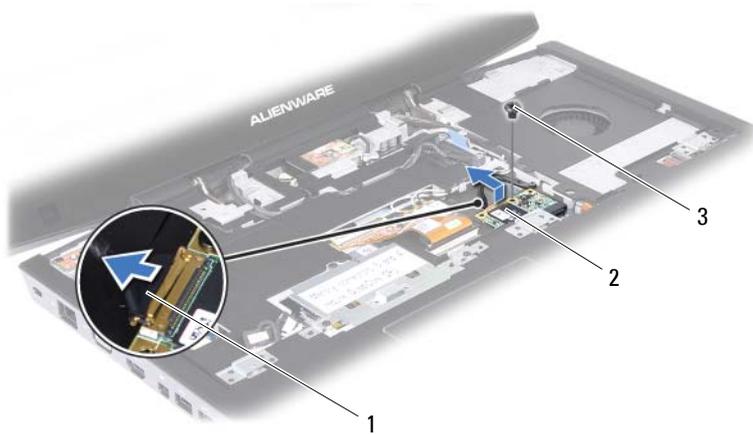
WirelessHD Card (Optional)

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

If you ordered a wirelessHD card with your computer, the card is already installed.

Removing the WirelessHD Card

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Disconnect the wirelessHD card cable from the connector on the wirelessHD card.
- 7 Remove the screw that secures the wirelessHD card to the system board.
- 8 Lift the wirelessHD card out of the connector on the system board.



- 1 wirelessHD card cable 2 wirelessHD card
3 screw

Replacing the WirelessHD Card

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the new wirelessHD card from its packaging.

△ CAUTION: Use firm and even pressure to slide the card into place. If you use excessive force, you may damage the connector.

△ CAUTION: The connectors are keyed to ensure correct insertion. If you feel resistance, check the connectors on the card and on the system board, and realign the card.

- 3 Insert the wirelessHD card connector at a 45-degree angle into the connector on the system board.
- 4 Press the other end of the wirelessHD card down into the slot on the system board and replace the screw that secures the wirelessHD card to the system board.
- 5 Connect the wirelessHD card cable to the connector on the wirelessHD card.
- 6 Replace the keyboard (see "Replacing the Keyboard" on page 57).

- 7 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 8 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 9 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



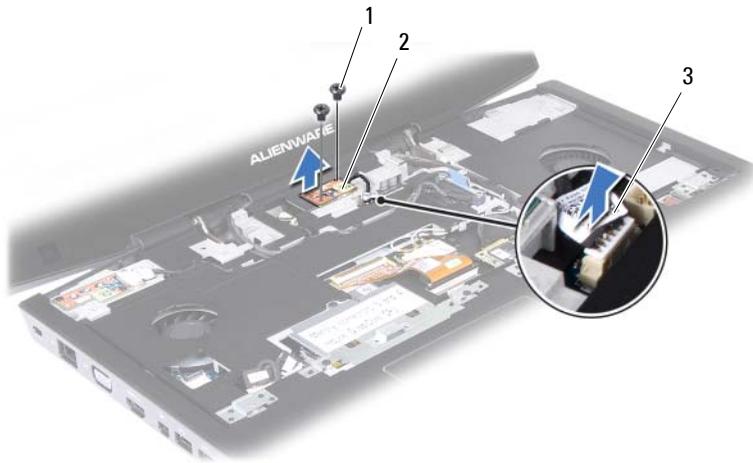
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Power Button Board

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Power Button Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Disconnect the power button board cable from the connector on the system board.
- 7 Remove the two screws that secure the power button board to the palm rest assembly.
- 8 Lift the power button board off the palm rest assembly.



- 1 screws (2)
- 2 power button board
- 3 power button board cable

Replacing the Power Button Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the slots on the power button board with the alignment posts on the chassis and secure the power button board in place.
- 3 Replace the two screws that secure the power button board to the palm rest assembly.
- 4 Connect the power button board cable to the connector on the system board.
- 5 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 6 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 7 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 8 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

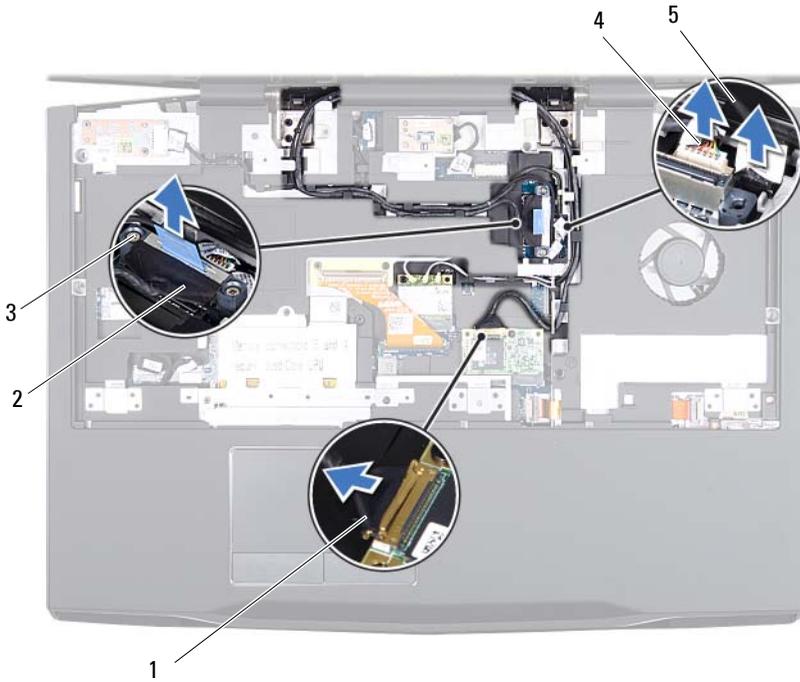
Display Assembly

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Display Assembly

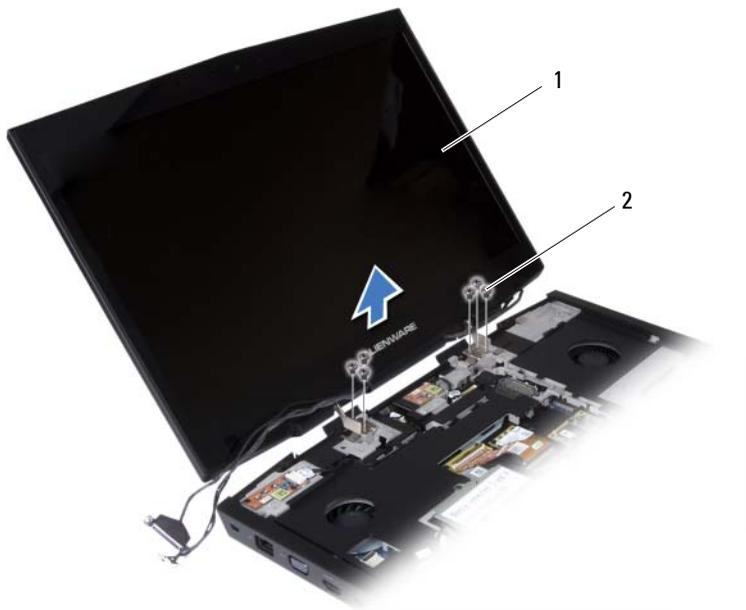
- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Disconnect the antenna cables from the Mini-Card (see "Removing the Mini-Card" on page 59).
- 7 Disconnect the wirelessHD card cable from the connector on the wirelessHD card (see "Removing the WirelessHD Card" on page 63).
- 8 Loosen the two captive screws that secure the display cable to the system board.
- 9 Using the pull-tab, pull the display cable to disconnect the display cable from the connector on the system board.

- 10 Disconnect the camera cable and infrared cable from the respective system board connectors.
- 11 Note the routing of the display cable, camera cable, infrared cable, wirelessHD card cable, Mini-Card antenna cables and remove the cables from the routing guides on the palm rest assembly.



- | | | | |
|---|-----------------------|---|---------------|
| 1 | wirelessHD card cable | 2 | display cable |
| 3 | captive screws (2) | 4 | camera cable |
| 5 | infrared cable | | |

- 12 Remove the six screws that secure the display assembly to the computer base.
- 13 Lift the display assembly off the computer.



1 display assembly

2 screws (6)

Replacing the Display Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Place the display assembly in position and replace the six screws that secure the display assembly to the computer base.
- 3 Route the display cable, camera cable, infrared cable, wirelessHD card cable, and Mini-Card antenna cables through the routing guides on the palm rest assembly.
- 4 Connect the display cable to the connector on the system board.
- 5 Tighten the two captive screws that secure the display cable to the system board.
- 6 Connect the camera cable and infrared cable to the respective system board connectors.

- 7 Connect the wirelessHD card cable to the connector on the wirelessHD card (see "Replacing the WirelessHD Card" on page 64).
- 8 Connect the Mini-Card antenna cables to the Mini-Card (see "Replacing the Mini-Card" on page 61).
- 9 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 10 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 11 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 12 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Status Light Board

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Status Light Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Remove the display assembly (see "Removing the Display Assembly" on page 71).
- 7 Disconnect the status light board cable from the connector on the system board.
- 8 Note the routing of status light board cable and remove the cable from the routing guides.
- 9 Remove the two screws that secure the status light board to the palm rest assembly.

10 Lift the status light board off the palm rest assembly.



1 screws (2)

2 status light board

3 status light board cable

Replacing the Status Light Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the slots on the status light board with the alignment posts on the palm rest assembly and secure the status light board in place.
- 3 Replace the two screws that secure the status light board to the palm rest assembly.
- 4 Route the status light board cable through the routing guides on the palm rest assembly.
- 5 Connect the status light board cable to the connector on the system board.
- 6 Replace the display assembly (see "Replacing the Display Assembly" on page 73).
- 7 Replace the keyboard (see "Replacing the Keyboard" on page 57).

- 8 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 9 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 10 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



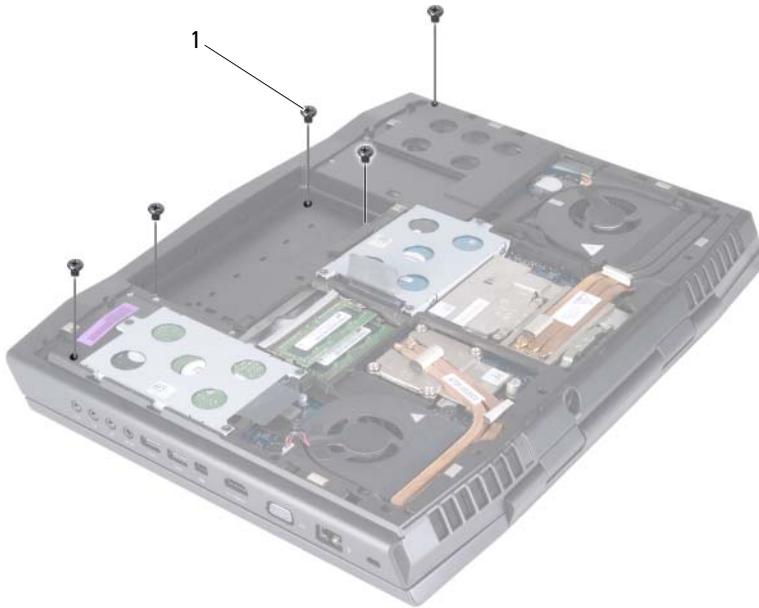
CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Palm Rest Assembly

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Palm Rest Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove any installed card or blank from the 9-in-1 Media Card Reader.
- 3 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 4 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 5 Remove the five screws that secure the palm rest assembly to the computer base.

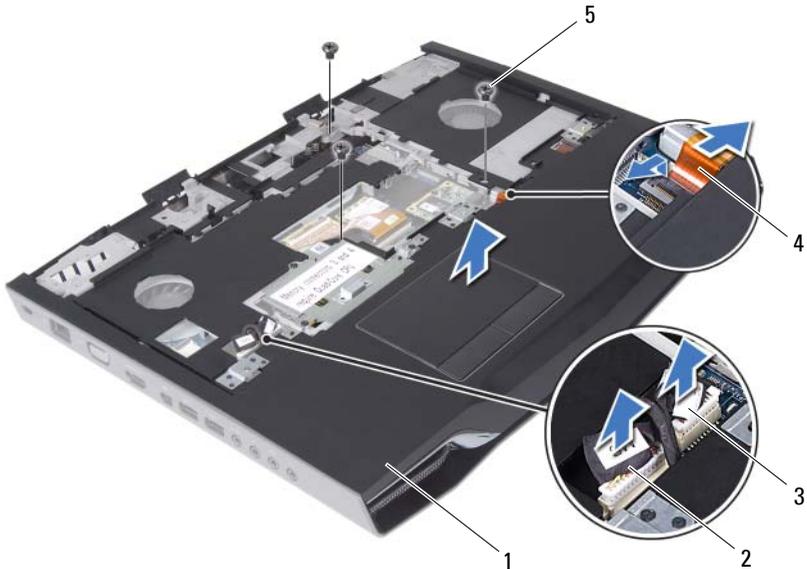


- 1** screws (5)
- 6** Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 7** Remove the keyboard (see "Removing the Keyboard" on page 55).
- 8** Remove the power button board (see "Removing the Power Button Board" on page 67).
- 9** Remove the display assembly (see "Removing the Display Assembly" on page 71).
- 10** Remove the status light board (see "Removing the Status Light Board" on page 75).
- 11** Disconnect the touch pad cable, LVDS cable, and Media Card Reader cable from the connectors on the system board.
- 12** Remove the three screws that secure the palm rest assembly to the computer base.

13 Carefully pry out the palm rest assembly along the rear edge and then ease the palm rest assembly from the computer base.

△ CAUTION: Carefully separate the palm rest assembly from the computer base to avoid damage to the palm rest assembly.

14 Lift the palm rest assembly off the computer base.



1 palm rest assembly

2 LVDS cable

3 touch pad cable

4 Media Card Reader cable

5 screws (3)

Replacing the Palm Rest Assembly

- 1** Follow the instructions in "Before You Begin" on page 9.
- 2** Align the screw holes on the palm rest assembly with the screw holes on the computer base.
- 3** Replace the three screws that secure the palm rest assembly to the computer base.

- 4 Connect the touch pad cable, LVDS cable, and Media Card Reader cable to the connectors on the system board.
- 5 Replace the status light board (see "Replacing the Status Light Board" on page 76).
- 6 Replace the display assembly (see "Replacing the Display Assembly" on page 73).
- 7 Replace the power button board (see "Replacing the Power Button Board" on page 68).
- 8 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 9 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 10 Replace the five screws that secure the palm rest assembly to the computer base.
- 11 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 12 Replace the battery pack (see "Replacing the Battery Pack" on page 14).
- 13 Replace any cards or blank that you removed from the 9-in-1 Media Card Reader.



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

Internal Card With Bluetooth Wireless Technology

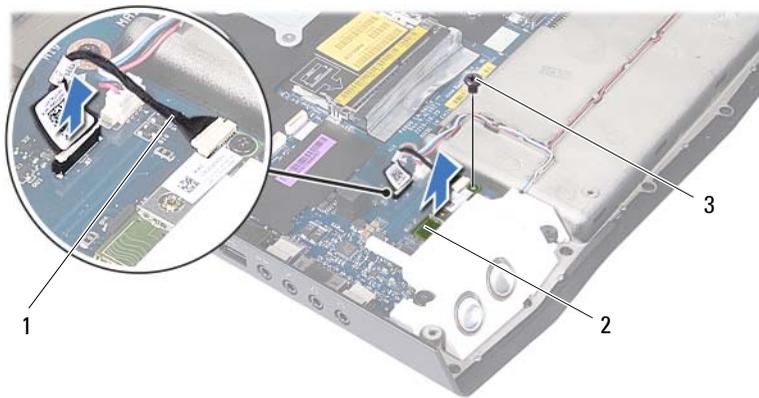
-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

If you ordered a card with Bluetooth wireless technology with your computer, it is already installed.

Removing the Bluetooth Card

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Remove the power button board (see "Removing the Power Button Board" on page 67).
- 7 Remove the display assembly (see "Removing the Display Assembly" on page 71).

- 8** Remove the status light board (see "Removing the Status Light Board" on page 75).
- 9** Remove the palm rest assembly (see "Removing the Palm Rest Assembly" on page 79).
- 10** Disconnect the Bluetooth-card cable from the connector on the system board.
- 11** Remove the screw that secures the Bluetooth card to the system board.
- 12** Lift the Bluetooth card away from the system board.



- | | |
|-------------------------------|-------------------------|
| 1 Bluetooth-card cable | 2 Bluetooth card |
| 3 screw | |

Replacing the Bluetooth Card

- 1** Follow the instructions in "Before You Begin" on page 9
- 2** Align the screw hole on the Bluetooth card with the screw hole on the system board.
- 3** Replace the screw that secures the Bluetooth card to the system board.
- 4** Connect the Bluetooth-card cable to the connector on the system board.
- 5** Replace the palm rest assembly (see "Replacing the Palm Rest Assembly" on page 81).

- 6 Replace the status light board (see "Replacing the Status Light Board" on page 76).
- 7 Replace the display assembly (see "Replacing the Display Assembly" on page 73).
- 8 Replace the power button board (see "Replacing the Power Button Board" on page 68).
- 9 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 10 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 11 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 12 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

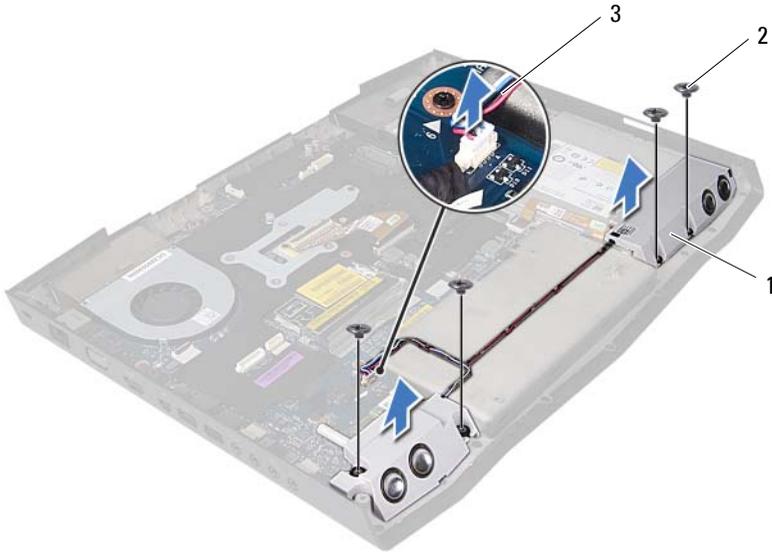
Speakers

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Speakers

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Remove the power button board (see "Removing the Power Button Board" on page 67).
- 7 Remove the display assembly (see "Removing the Display Assembly" on page 71).
- 8 Remove the status light board (see "Removing the Status Light Board" on page 75).
- 9 Remove the palm rest assembly (see "Removing the Palm Rest Assembly" on page 79).

- 10 Disconnect the speakers cable from the connector on the system board.
- 11 Note the speakers cable routing and remove the cable from the routing guides on the computer base.
- 12 Remove the four screws that secure the speakers to the computer base.
- 13 Lift the speakers along with the cable off the computer base.



- | | | | |
|---|----------------|---|------------|
| 1 | speakers (2) | 2 | screws (4) |
| 3 | speakers cable | | |

Replacing the Speakers

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the screw holes on the speakers with the screw holes on the computer base and route the speaker cables in the routing guides.
- 3 Replace the four screws that secure the speakers to the computer base.
- 4 Route the speakers cable through the routing guides on the computer base.

- 5 Connect the speakers cable to the connector on the system board.
- 6 Replace the palm rest assembly (see "Replacing the Palm Rest Assembly" on page 81).
- 7 Replace the status light board (see "Replacing the Status Light Board" on page 76).
- 8 Replace the display assembly (see "Replacing the Display Assembly" on page 73).
- 9 Replace the power button board (see "Replacing the Power Button Board" on page 68).
- 10 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 11 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 12 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 13 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

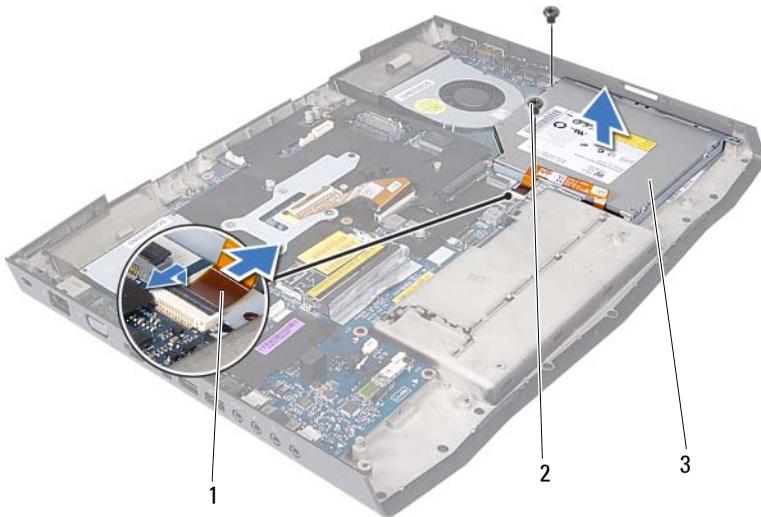
Optical Drive

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.

Removing the Optical Drive

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 3 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 4 Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 5 Remove the keyboard (see "Removing the Keyboard" on page 55).
- 6 Remove the power button board (see "Removing the Power Button Board" on page 67).
- 7 Remove the display assembly (see "Removing the Display Assembly" on page 71).
- 8 Remove the status light board (see "Removing the Status Light Board" on page 75).
- 9 Remove the palm rest assembly (see "Removing the Palm Rest Assembly" on page 79).
- 10 Remove the speakers (see "Removing the Speakers" on page 87).

- 11 Lift the release latch on the connector on the system board and disconnect the optical-drive cable from the connector on the system board.
- 12 Remove the two screws that secure the optical-drive assembly to the computer base.
- 13 Lift the optical-drive assembly off the computer base.

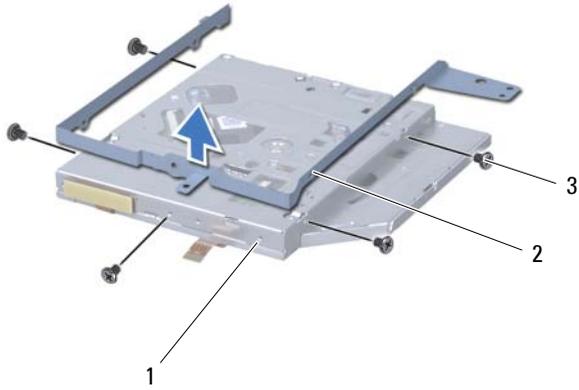


1 optical-drive cable

2 screws (2)

3 optical drive

- 14 Remove the five screws that secure the optical-drive bracket to the optical drive.

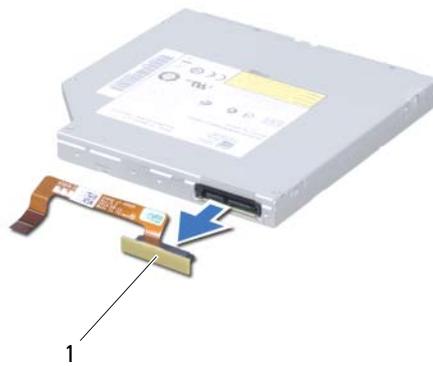


1 optical drive

2 optical-drive bracket

3 screws (5)

15 Remove the interposer from the optical drive.



1 interposer

Replacing the Optical Drive

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Replace the interposer to the optical drive.
- 3 Align the screw holes on the optical-drive bracket with the screw holes on the optical drive and replace the five screws.
- 4 Align the slot on the optical-drive bracket with the alignment posts on computer chassis and secure the optical-drive assembly in place.
- 5 Replace the two screws that secure the optical-drive assembly to the computer base.
- 6 Slide the optical drive cable into the connector on the system board and press down on the connector latch to secure the cable.
- 7 Replace the speakers (see "Replacing the Speakers" on page 88).
- 8 Replace the palm rest assembly (see "Replacing the Palm Rest Assembly" on page 81).
- 9 Replace the status light board (see "Replacing the Status Light Board" on page 76).
- 10 Replace the display assembly (see "Replacing the Display Assembly" on page 73).
- 11 Replace the power button board (see "Replacing the Power Button Board" on page 68).
- 12 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 13 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 14 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 15 Replace the battery pack (see "Replacing the Battery Pack" on page 14).



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

System Board

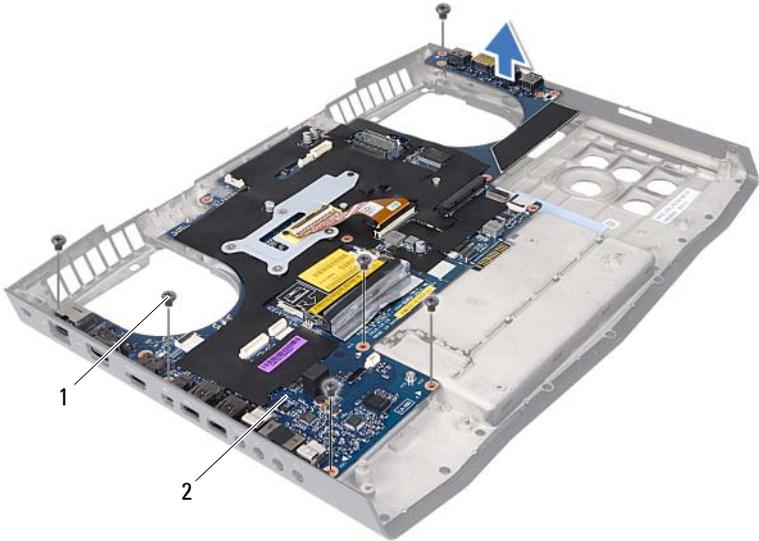
-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at www.dell.com/regulatory_compliance.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery Pack" on page 13) before working inside the computer.
-  **CAUTION:** Handle components by their edges, and avoid touching pins and contacts.

The system board's BIOS chip contains the Service Tag, which is also visible on a barcode label at the bottom of the computer.

Removing the System Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove any installed card or blank from the 9-in-1 Media Card Reader.
- 3 Remove the battery pack (see "Removing the Battery Pack" on page 13).
- 4 Remove the compartment door (see "Removing the Compartment Door" on page 15).
- 5 Remove the hard drive(s) (see "Removing the Hard Drive(s)" on page 20).
- 6 Remove the coin-cell battery (see "Removing the Coin-Cell Battery" on page 17).
- 7 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 25).

- 8** Remove the graphics-card heat sink fan (see "Removing the Graphics-Card Heat Sink Fan" on page 31).
- 9** Remove the graphics-card assembly (see "Removing the Graphics-Card Assembly" on page 35).
- 10** Remove the processor heat-sink fan (see "Removing the Processor Heat-Sink Fan" on page 37).
- 11** Remove the processor heat-sink (see "Removing the Processor Heat-Sink" on page 41).
- 12** Remove the processor module (see "Removing the Processor Module" on page 45).
- 13** Remove the center control cover (see "Removing the Center Control Cover" on page 49).
- 14** Remove the keyboard (see "Removing the Keyboard" on page 55).
- 15** Remove the Mini-Card (see "Removing the Mini-Card" on page 59).
- 16** Remove the power button board (see "Removing the Power Button Board" on page 67).
- 17** Remove the display assembly (see "Removing the Display Assembly" on page 71).
- 18** Remove the wirelessHD card (see "Removing the WirelessHD Card" on page 63).
- 19** Remove the status light board (see "Removing the Status Light Board" on page 75).
- 20** Remove the palm rest assembly (see "Removing the Palm Rest Assembly" on page 79).
- 21** Remove the Bluetooth card (see "Removing the Bluetooth Card" on page 83).
- 22** Remove the speakers (see "Removing the Speakers" on page 87).
- 23** Follow the instructions from step 11 to step 13 in "Removing the Optical Drive" on page 91.
- 24** Remove the six screws that secure the system board to the computer base.
- 25** Carefully ease the connectors on the system board out of the slots in the computer, and lift the system board off the computer base.



1 screws (6)

2 system board

Replacing the System Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the connectors on the system board with the slots on the computer base and place it on the computer base.
- 3 Replace the six screws that secure the system board to the computer base.
- 4 Follow the instructions from step 4 to step 6 in "Replacing the Optical Drive" on page 94.
- 5 Replace the speakers (see "Replacing the Speakers" on page 88).
- 6 Replace the Bluetooth card (see "Replacing the Bluetooth Card" on page 84).
- 7 Replace the palm rest assembly (see "Replacing the Palm Rest Assembly" on page 81).
- 8 Replace the status light board (see "Replacing the Status Light Board" on page 76).

- 9 Replace the wirelessHD card (see "Replacing the WirelessHD Card" on page 64).
- 10 Replace the display assembly (see "Replacing the Display Assembly" on page 73).
- 11 Replace the power button board (see "Replacing the Power Button Board" on page 68).
- 12 Replace the Mini-Card (see "Replacing the Mini-Card" on page 61).
- 13 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 27).
- 14 Replace the keyboard (see "Replacing the Keyboard" on page 57).
- 15 Replace the center control cover (see "Replacing the Center Control Cover" on page 52).
- 16 Replace the processor module (see "Replacing the Processor Module" on page 46).
- 17 Replace the processor heat-sink (see "Replacing the Processor Heat-Sink" on page 42).
- 18 Replace the processor heat-sink fan (see "Replacing the Processor Heat-Sink Fan" on page 38).
- 19 Replace the graphics-card assembly (see "Replacing the Graphics-Card Assembly" on page 36).
- 20 Replace the graphics-card heat sink fan (see "Replacing the Graphics-Card Heat Sink Fan" on page 32).
- 21 Replace the coin-cell battery (see "Replacing the Coin-Cell Battery" on page 18).
- 22 Replace the hard drive(s) (see "Replacing the Hard Drive(s)" on page 22).
- 23 Replace the compartment door (see "Replacing the Compartment Door" on page 16).
- 24 Replace the battery pack (see "Replacing the Battery Pack" on page 14).
- 25 Replace any cards or blank that you removed from the 9-in-1 Media Card Reader.



CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

26 Turn on the computer.



NOTE: After you have replaced the system board, enter the computer Service Tag into the BIOS of the replacement system board.

27 Enter the service tag (see "Entering the Service Tag in the BIOS" on page 99).

Entering the Service Tag in the BIOS

- 1** Ensure that the AC adapter is plugged in and that the main battery is installed properly.
- 2** Turn on the computer.
- 3** Press <F2> during POST to enter the system setup program.
- 4** Navigate to the security tab and enter the service tag in the **Set Service Tag** field.

System Setup

Configuring the System Setup

The System Setup options allow you to:

- Change the system configuration information after you add, change or remove any hardware in your laptop.
- Set or change a user-selectable option.
- View the installed amount of memory or set the type of hard drive installed.

Before you use System Setup, it is recommended that you write down the current System Setup information for future reference.



CAUTION: Do not change the settings in System Setup unless you are an expert computer user. Certain changes can cause your computer to work incorrectly.

Entering System Setup

- 1 Turn on (or restart) your laptop.



NOTE: Keyboard failure may result when a key on the keyboard is held down for extended periods of time. To avoid possible keyboard failure, press and release <F2> in even intervals until the System Setup screen appears.

- 2 While the laptop is booting, press <F2> immediately before the operating system logo appears to access the **BIOS Setup Utility**. If an error occurs during POST (Power On Self Test), you may also enter the **BIOS Setup Utility** by pressing <F2> when prompted.



NOTE: If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop, then shut down your laptop and try again.

System Setup Screens

The **BIOS Setup Utility** window displays current or changeable configuration information for your laptop. Information is divided into five menus: **Main**, **Advanced**, **Security**, **Boot**, and **Exit**.

Key functions appear at the bottom of the **BIOS Setup Utility** window and lists keys and their functions within the active field.

System Setup Options



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

Main Menu

System Time (hh:mm:ss)	Displays the system time.
System Date (mm/dd/yyyy)	Displays the system date.
Alienware	Displays the model number of your computer.
Service Tag	Displays the service tag of your computer.
BIOS Version	Displays the BIOS version.
EC Version	Displays the EC firmware version.
ME version	Displays the Intel ME firmware version.
CPU	Displays the type of processor installed.
CPU Frequency	Displays the speed of the processor.
CPU L3 Cache	Displays the processor cache size.
CPUID	Displays the ID of the processor.
Integrated Graphics	Displays the integrated graphics.
Discrete Graphics	Displays the discrete graphics.
Total Memory	Displays the total memory available in your computer.
Memory Bank 0	Displays the memory size installed in DIMM 0.
Memory Bank 1	Displays the memory size installed in DIMM 1.
Memory Bank 2	Displays the memory size installed in DIMM 2.
Memory Bank 3	Displays the memory size installed in DIMM 3.

Advanced Menu

Intel SpeedStep	Allows you to enable or disable the Intel SpeedStep technology. Disabling this feature may improve performance, but will greatly reduce battery life.
Virtualization	Allows you to enable or disable the Intel Virtualization technology.
USB Emulation	<p>Allows you to enable or disable the USB emulation feature. This feature defines how the BIOS, in the absence of a USB-aware operating system, handles USB devices. USB emulation is always enabled during POST.</p> <p>NOTE: You cannot boot any type of USB device (floppy, hard drive, or memory key) when this option is off.</p>
USB Wake Support	<p>Allows you to enable USB devices to wake the computer from standby or to disable the USB wake support feature.</p> <p>NOTE: If USB Powershare is enabled, a device connected to the USB Powershare connector may not wake the computer.</p>
USB Power Share	<p>Allows you to charge USB devices when the computer is turned off or in standby mode.</p> <ul style="list-style-type: none">• AC Only: Charge USB devices when connected to AC adapter only.• AC and Battery: Charge USB devices when connected to AC adapter and when the computer is running on battery.• Disabled: Disables USB PowerShare.

Integrated Network	<p>Allows you to enable or disable the on-board LAN controller.</p> <ul style="list-style-type: none"> • Disabled: Internal LAN is disabled and is not visible to the operating system. • Enabled: Internal LAN is enabled.
High Definition Audio	<p>Allows you to enable or disable the internal high definition audio device.</p> <ul style="list-style-type: none"> • Disabled: The internal audio device is disabled and is not visible to the operating system. • Enabled: The internal audio device is enabled.
SD Card Reader	<p>Allows you to enable or disable the internal SD card reader.</p>
CPU Turbo Mode	<p>Allows you to enable or disable the Intel CPU turbo mode performance option.</p>
Performance Options	<p>Allows you to configure fields in the Performance Options sub-menu (for more information, see "Advanced Menu—Performance Options" on page 105).</p>
SATA Operation	<p>Allows you to configure the operating mode of the integrated SATA hard drive controller.</p> <ul style="list-style-type: none"> • AHCI: SATA is configured for AHCI mode. • RAID: STAT is configured for RAID mode.
SATA HARD DRIVE 1	<p>Displays the installed primary SATA hard drive model.</p>
SATA HARD DRIVE 2	<p>Displays the installed secondary SATA hard drive model.</p>

Adapter Warnings	<ul style="list-style-type: none"> Allows you to choose if the computer should display warning messages when you use AC adapters that are not supported by your computer. Enabled: BIOS will detect unsupported AC adapters and display an error on the screen.
Charger Behavior	Allows you to enable or disable battery charging.

Advanced Menu—Performance Options

Overclocking Feature	<p>Allows you to enable or disable the global overclocking feature.</p> <ul style="list-style-type: none"> Disabled: The overclocking feature is disabled. Enabled: Displays additional overclocking options.
Override Turbo settings	Allows you to override CPU turbo mode settings.
Long Duration PWR Limit	Allows you to set the turbo mode power limit 1 value in watts.
Long Duration Time Window	Allows you to set the turbo mode time 1 value in seconds.
Set Short Duration PWR Limit	Allows you to enable or disable short duration power limit.
Set Short Duration PWR Limit	Allows you to set the turbo mode power limit 2 value in watts.
Bus Clock	
Current Frequency	Displays the current bus clock frequency.
New Frequency in 10KHz increments	Allows you to set the bus clock frequency in increments of 10KHz.
Apply New Bus Clock Frequency	Applies the new bus clock frequency immediately, temporarily, or permanently.
Memory Overclocking	

Memory Override Support	Allows you to enable or disable the memory override option support. <ul style="list-style-type: none"> • Disabled: The memory override support is disabled. • Enabled: Displays additional memory override support options.
Memory Voltage	Allows you to increase memory voltage.
Memory Frequency	Allows you to set memory frequency.
DIMM Profile (XMP)	Allows you to configure different XMP options.

Wireless Menu

Bluetooth	Allows you to enable or disable the internal Bluetooth device. <ul style="list-style-type: none"> • Disabled: The internal Bluetooth device is disabled and is not visible to the operating system. • Enabled: The internal Bluetooth device is enabled.
Wireless Network	Allows you to enable or disable the internal wireless device. <ul style="list-style-type: none"> • Disabled: The internal wireless device is disabled and is not visible to the operating system. • Enabled: The internal wireless device is enabled.
DMC	Allows you to enable or disable the internal DMC device.
Wireless Switch/Hotkey	Allows you to disable all internal wireless devices.

Security Menu

Supervisor Password	Displays if the supervisor password is clear or set.
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User Password	Displays if the user password is clear or set.
Set Service Tag	Displays the service tag of the computer when the service tag is present. Displays a field to input the service tag manually when the service tag is absent.
Set Supervisor Password	Allows you to set the supervisor password. The supervisor password controls access to the system setup utility.
Set User Password	Allows you to set the user password. The user password controls access to the computer at boot.
Computrace	Allows you to enable or disable Computrace security feature.

Boot Menu

Use the up or down arrow keys to change the boot device priority. You can choose from:

- Hard Drive
- USB Storage
- CD/DVD/BD
- Removal Devices
- Network

Exit Menu

Exit Saving Changes	Allows you to exit System Setup and save your changes to CMOS.
Save Change Without Exit	Allows you to remain in System Setup and save your changes to CMOS.
Exit Discarding Changes	Allows you to exit System Setup and load previous values from CMOS for all Setup items.
Load Optimal Defaults	Allows you to load default values for all Setup items.

Discard Changes

Allows you to load previous values from CMOS for all Setup items.

Flashing the BIOS

The BIOS may require flashing when an update is available or when replacing the system board.

To flash the BIOS:

- 1 Turn on the computer.
- 2 Go to support.dell.com/support/downloads.
- 3 Locate the BIOS update file for your computer:



NOTE: The Service Tag for your computer is located on a label at the bottom of the computer.

If you have your computer's Service Tag:

- a Click **Enter a Tag**.
- b Enter your computer's Service Tag in the **Enter a service tag:** field, click **Go**, and proceed to step 4.

If you do not have your computer's Service Tag:

- a Click **Select Model**.
- b Select the type of product in the **Select Your Product Family** list.
- c Select the product brand in the **Select Your Product Line** list.
- d Select the product model number in the **Select Your Product Model** list.



NOTE: If you have selected a different model and want to start over again, click **Start Over** on the top right of the menu.

- e Click **Confirm**.
- 4 A list of results appear on the screen. Click **BIOS**.
- 5 Click **Download Now** to download the latest BIOS file. The **File Download** window appears.
- 6 Click **Save** to save the file on your desktop. The file downloads to your desktop.

- 7** Click **Close** if the **Download Complete** window appears.
The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.
- 8** Double-click the file icon on the desktop and follow the instructions on the screen.