Alienware 17

Owner's Manual

Computer model: Alienware 17 R1
Regulatory model: P18E
Regulatory type: P18E001

ALIENWARE

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 Working Inside Your Computer

Before You Begin

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, exit all open programs, and turn off your computer.
   - Microsoft Windows 8: Point to the lower/upper-right corner of the screen to open the Charms sidebar and click **Settings**→ **Power**→ **Shut down**.
   - Microsoft Windows 7: Click **Start** → **Shut down**.

   NOTE: If you are using a different operating system, see the documentation of your operating system for shut-down instructions.
2. After the computer shuts down, disconnect it from the electrical outlet.
3. Disconnect all cables — such as power and USB cables — from your computer.
4. Disconnect all peripherals from your computer.

Recommended Tools

The procedures in this document require the following tools:

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

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 additional safety best practices information, see the Regulatory Compliance Homepage at 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 power source.

CAUTION: Only a certified service technician is authorized to remove the computer cover and access any of the components inside the computer.

CAUTION: To avoid damaging the computer, ensure that the work surface is flat and clean.

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 connectors and ports are correctly oriented and aligned.

CAUTION: To disconnect a network cable, first unplug the cable from your computer and then unplug the cable from the network device.

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: To avoid damaging the components and cards, handle them by their edges and avoid touching pins and contacts.

After Working Inside Your Computer

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

1. Replace all screws and make sure that no stray screws remain inside your computer.
2. Connect any cables, peripherals, and other parts you removed before working on your computer.
3. Connect your computer to the electrical outlet.
4. Turn on your computer.

Removing the Base Cover

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Close the display and turn the computer over.
2. Remove the screws that secure the base cover to the computer base.
3. Slide the base cover toward the front of the computer.
4. Lift the base cover off.

1	base cover	2	screws (2)

Replacing the Base Cover

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Procedure

1. Align the tabs on the base cover with the slots on the computer base
2. Slide the base cover toward the back of the computer and align the screws holes on the base cover with the screw holes on the computer base.
3. Replace the screws that secure the base cover to the computer base.

Removing the Battery

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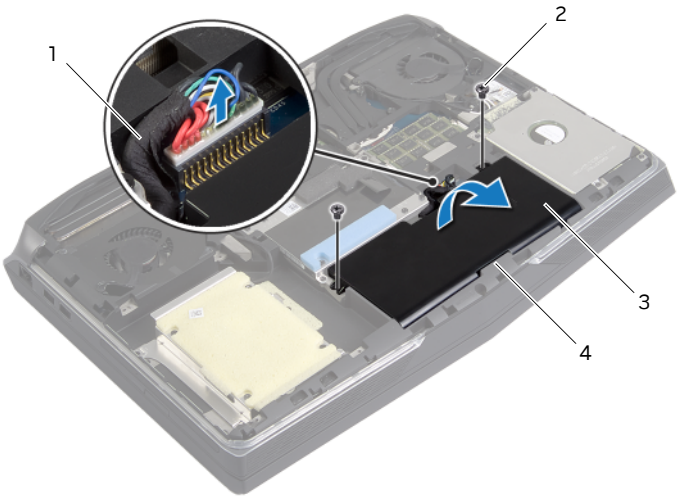
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

Remove the base cover. See "Removing the Base Cover" on page 14.

Procedure

1. Disconnect the battery cable from the system board.
2. Remove the screws that secure the battery to the computer base.
3. Using the battery cable, lift and release the battery from the tabs on the computer base.



1	battery cable	2	screws (2)
3	battery	4	tabs (2)

4. Turn the computer over and open the display.
5. Press and hold the power button for five seconds to ground the system board.

Replacing the Battery

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Procedure

1. Slide the battery under the tabs on the computer base.
2. Align the screw holes on the battery with the screw holes on the computer base.
3. Replace the screws that secure the battery to the computer base.
4. Connect the battery cable to the system board.

Postrequisites

Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Memory Module(s) 3 and 4

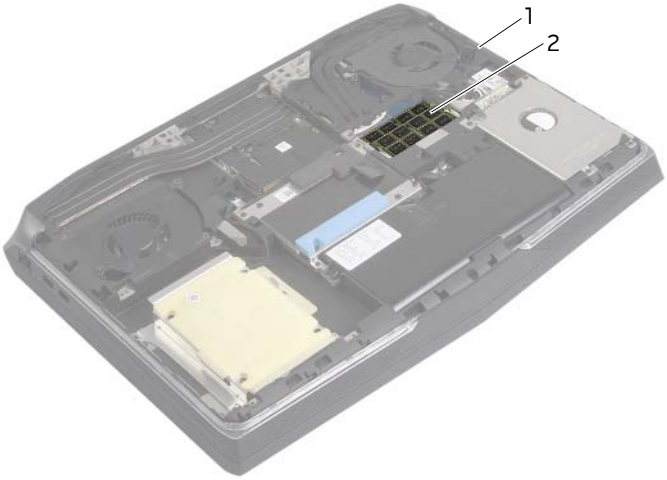
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Your computer supports up to four memory module connectors. You can access connectors DIMM3 and DIMM4 are located under the base cover. DIMM1 and DIMM2 are located under the keyboard.

Prerequisites

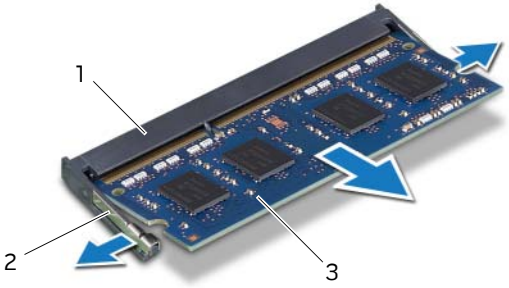
1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure



1	computer base	2	memory-module

1. Using your fingertips, carefully spread apart the securing clips at the sides of the memory-module connector until the memory module pops up.
2. Remove the memory module from the memory-module connector.



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

Replacing the Memory Module(s) 3 and 4

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Your computer supports up to four memory module connectors. You can access connectors DIMM3 and DIMM4 are located under the base cover. DIMM1 and DIMM2 are located under the keyboard.

Procedure

1. Align the notch on the memory module with the tab on the memory-module connector.
2. Slide the memory module into the connector at a 45-degree angle, and press the memory module down until it clicks in place.
   If you do not hear the click, remove and reinstall the memory module.

NOTE: The computer may not boot if the memory module is not installed correctly.

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Primary Hard Drive

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

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

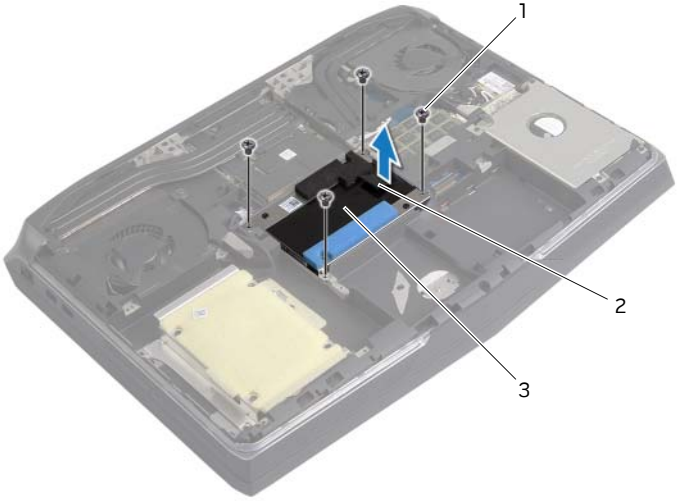
CAUTION: Hard drives are extremely fragile. Exercise care when handling the hard drive.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure

1. Remove the screws that secure the hard-drive assembly to the computer base.
2. Using the pull-tab, lift the hard-drive assembly off the computer base.

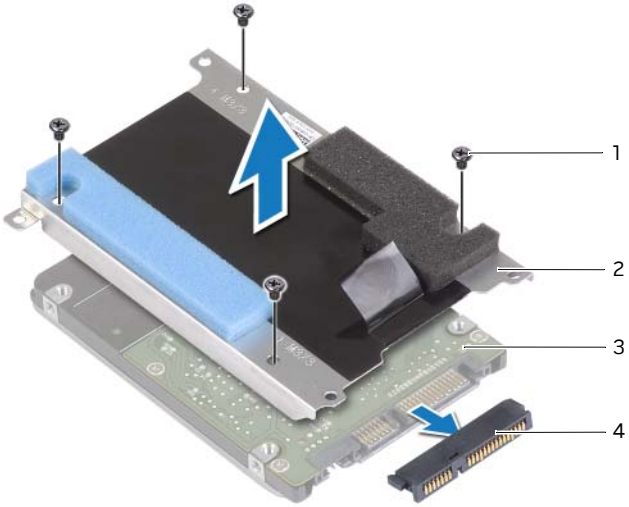


1	screws (4)	2	pull-tab
3	primary hard-drive assembly		

3 Disconnect the interposer from the hard drive.

4 Remove the screws that secure the hard-drive bracket to the hard drive.

5 Lift the hard-drive bracket off the hard drive.



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

Replacing the Primary Hard Drive

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

Procedure

1. Place the hard drive in the hard-drive bracket.
2. Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
3. Replace the screws that secure the hard-drive bracket to the hard drive.
4. Connect the interposer to the hard drive.
5. Place the hard-drive assembly in the hard-drive bay.
6. Align the screw holes on the hard-drive assembly with the screw holes on the computer base.
7. Replace the screws that secure the hard-drive assembly to the computer base.

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Secondary Hard Drive

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

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

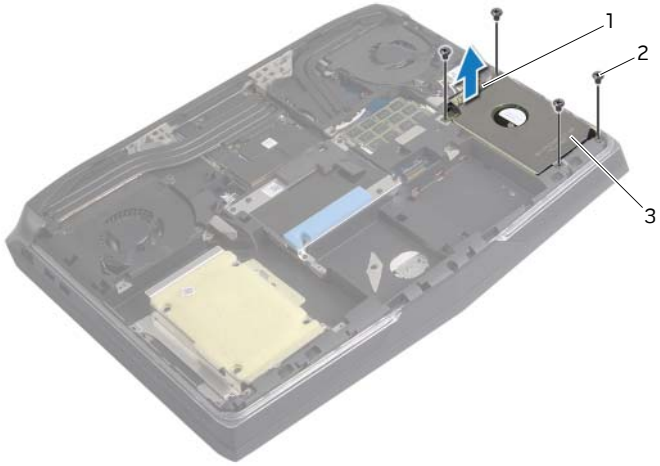
CAUTION: Hard drives are extremely fragile. Exercise care when handling the hard drive.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure

1. Remove the screws that secure the hard-drive assembly to the computer base.
2. Using the pull-tab, gently lift the hard-drive assembly.
3. Lift the latch and disconnect the hard-drive cable from the system board.
4. Lift the hard-drive assembly off the computer base.

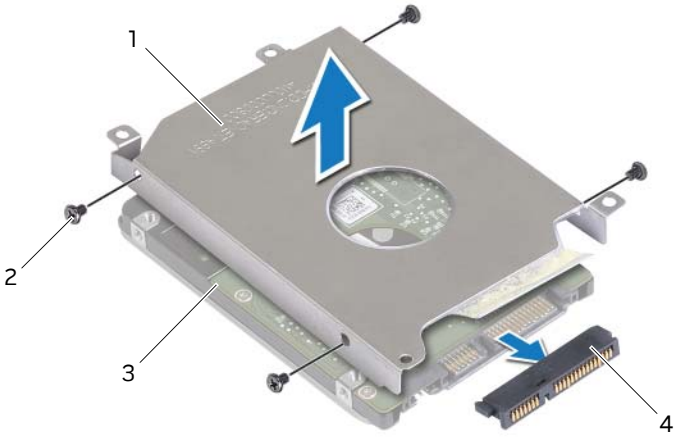


1	pull tab	2	screws (4)
3	secondary hard-drive assembly		

5 Disconnect the interposer from the hard drive.

6 Remove the screws that secure the hard-drive bracket to the hard drive.

7 Lift the hard-drive bracket off the hard drive.



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

Replacing the Secondary Hard Drive

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

Procedure

1. Place the hard drive into the hard-drive bracket.
2. Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
3. Replace the screws that secure the hard-drive bracket to the hard drive.
4. Connect the interposer to the hard drive.
5. Place the hard-drive assembly in the hard-drive bay.
6. Align the screw holes on the hard-drive assembly with the screw holes on the computer base.
7. Replace the screws that secure the hard-drive assembly to the computer base.

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Third Hard Drive (Optional)

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
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CAUTION: To avoid data loss, 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.

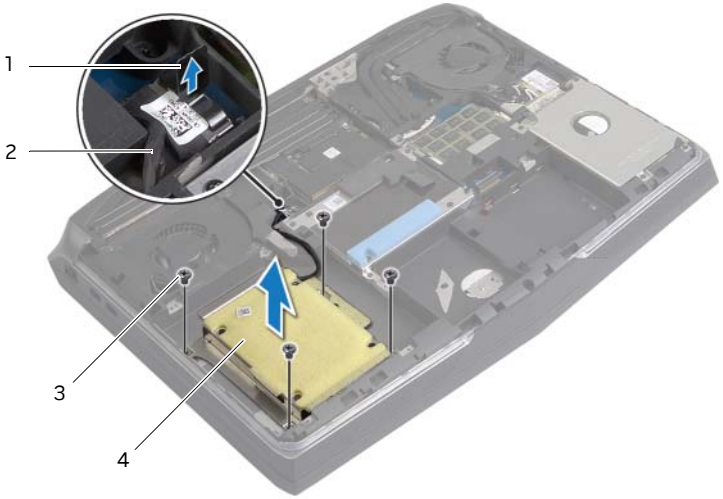
NOTE: The media bay can accommodate an optical drive, a hard drive, or a solid-state drive.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure

1. Remove the screws that secure the tertiary hard drive assembly to the computer base.
2. Using the pull-tab, disconnect the hard-drive cable from the system board.
3. Lift the hard-drive assembly off the computer base.

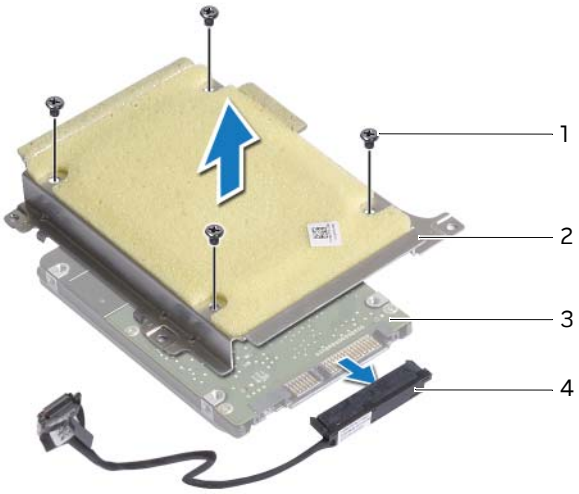


1	pull tab	2	hard-drive cable
3	screws (4)	4	tertiary hard-drive assembly

4 Disconnect the interposer from the hard drive.

5 Remove the screws that secure the hard-drive bracket to the hard drive.

6 Lift the hard-drive bracket off the hard drive.



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

Replacing the Third Hard Drive (Optional)

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

Procedure

1. Align the screw holes on the hard-drive bracket with the screw holes on the hard drive.
2. Replace the screws that secure the hard-drive bracket to the hard drive.
3. Connect the interposer to the hard drive.
4. Align the screw holes on the hard-drive assembly with the screw holes on the computer base.
5. Replace the screws that secure the hard-drive assembly to the computer base.
6. Connect the hard-drive cable to the system board.

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Wireless Mini-Card

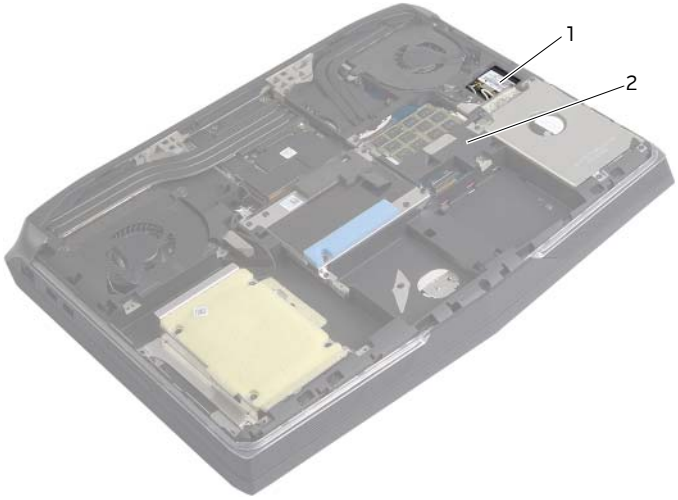
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure

1. Locate the wirless mini-card on the computer base.

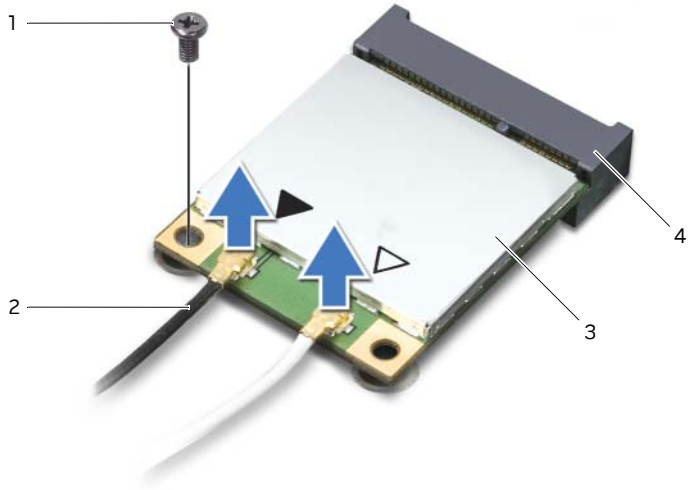


1	wireless mini-card	2	computer base

2 Disconnect the antenna cables from the wireless mini-card.

3 Remove the screw that secures the wireless mini-card to the system board.

4 Slide and remove the wireless mini-card from the mini-card connector.



1	screw	2	antenna cables (2)
3	wireless mini-card	4	mini-card connector

Replacing the Wireless Mini-Card

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For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

CAUTION: To avoid damage, never place cables under the wireless mini-card.

1. Align the notch on the wireless mini-card with the tab on the mini-card connector.
2. Slide the wireless mini-card, at a 45-degree angle, into the mini-card connector.
3. Press the other end of the wireless mini-card down and replace the screw that secures the wireless mini-card to the system board.
4. Connect the antenna cables to the wireless mini-card.

   The following table provides the antenna-cable color scheme for the wireless mini-card supported by your computer.

Connectors on the wireless mini-card	Antenna-cable color
Main WLAN + Bluetooth (white triangle)	white
Auxiliary WLAN + Bluetooth (black triangle)	black

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Processor Fan

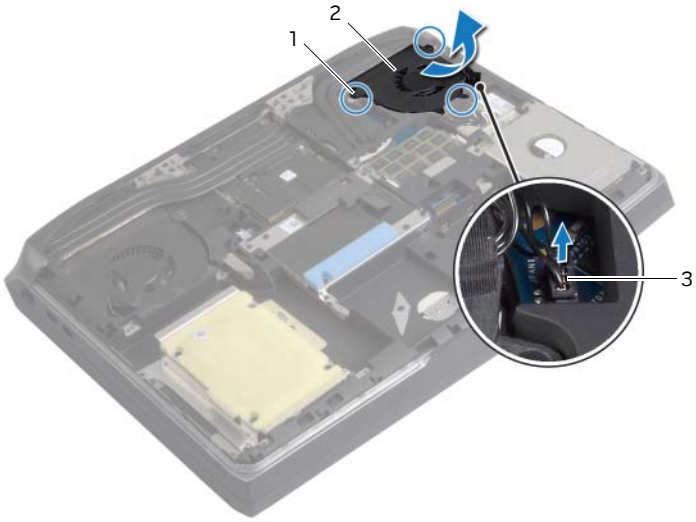
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure

1. Loosen the captive screws that secure the processor fan to the computer base.
2. Gently lift the fan and disconnect the fan cable from the system board.
3. Lift the fan away from the computer base.



1	captive screws (3)	2	processor fan
3	fan cable		

Replacing the Processor 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Connect the processor-fan cable to the system board.
2. Place the processor fan in the computer base.
3. Align the captive screws on the fan with the screw holes on the computer base and tighten the screws.

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Video-card Fan

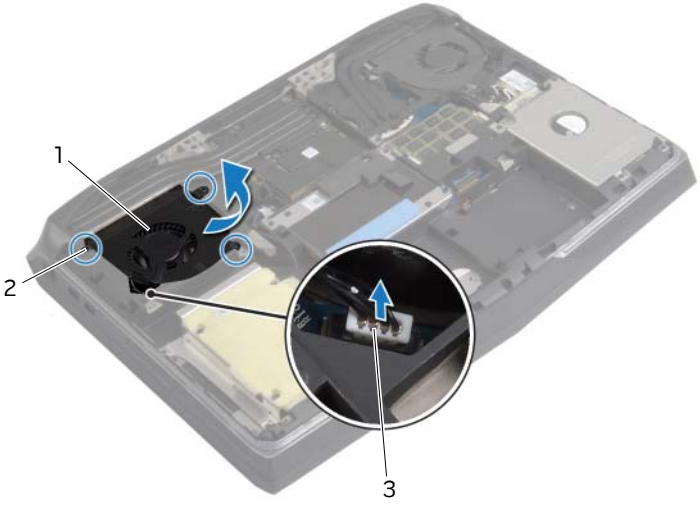
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.

Procedure

1. Loosen the captive-screws that secure the video-card fan to the computer base.
2. Lift the fan away from the computer base
3. Disconnect the fan cable from the system-board connector.



1	fan cable	2	screws (3)
3	fan		

Replacing the Video-card 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13. For additional safety best practices information, see the Regulatory Compliance Homepage at dell.com/regulatory_compliance.

Procedure

1. Connect the video-card fan cable to the system-board connector.
2. Place the video-card fan in the computer base and align the screws on the fan with the screw holes on the computer base.
3. Tighten the captive screws that secure the fan to the computer base.

Postrequisites

1. Replace the battery. See "Replacing the Battery" on page 17.
2. Replace the base cover. See "Replacing the Base Cover" on page 15.
3. Follow the instructions in "After Working Inside Your Computer" on page 13.

Removing the Processor Heat Sink

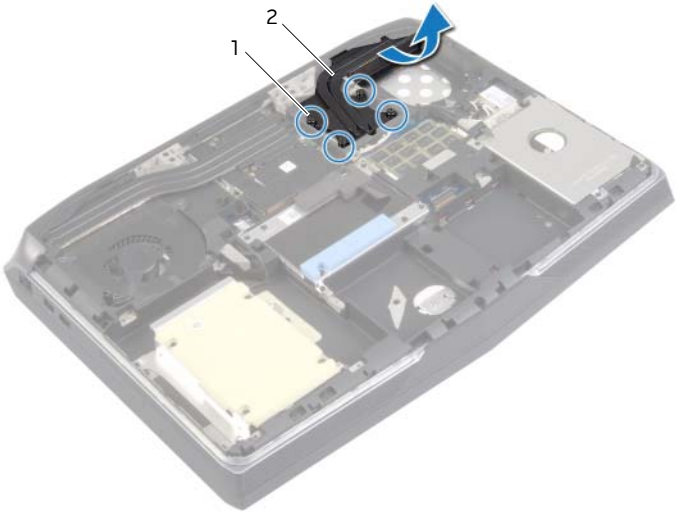
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the processor fan. See "Removing the Processor Fan" on page 34.

Procedure

1. In sequential order (indicated on the heat sink), loosen the captive screws that secure the heat sink to the system board.
2. Tilt and lift the heat sink off the computer base.



1	captive screws (4)	2	processor heat sink

Replacing the Processor 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

NOTE: The original thermal grease can be reused, if the original system board and heat sink are reinstalled together. If either the video card or the heat sink is replaced, use the thermal pad provided in the kit to make sure that thermal conductivity is achieved.

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

Postrequisites

1. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
2. Replace the battery. See "Replacing the Battery" on page 17.
3. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Video-Card Heat Sink

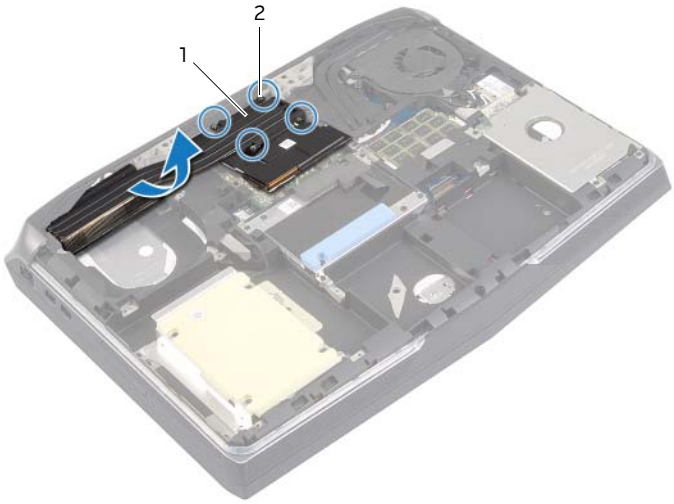
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.

Procedure

1. In sequential order (indicated on the heat sink), loosen the captive screws that secure the heat sink to the system board.
2. Tilt and lift the heat sink off the system board.



1	video-card heat sink	2	captive screws (4)

Replacing the Video-Card 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

NOTE: The original thermal grease can be reused, if the original video-card and heat sink are reinstalled together. If either the video card or the heat sink is replaced, use the thermal pad provided in the kit to ensure that thermal conductivity is achieved.

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

Postrequisites

1. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
2. Replace the battery. See "Replacing the Battery" on page 17.
3. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Video Card

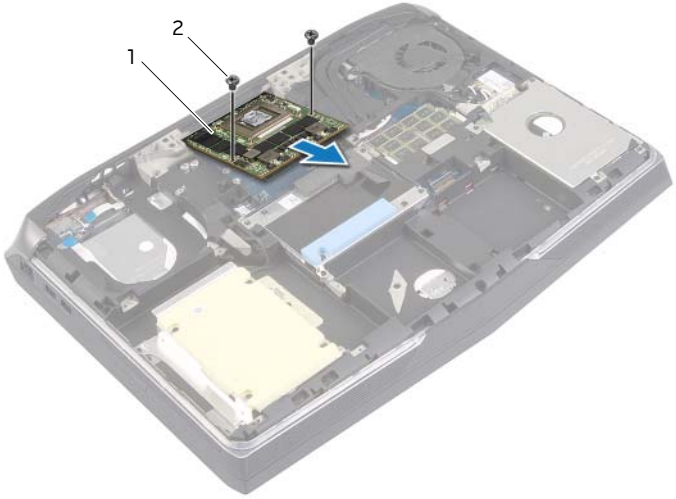
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
4. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.

Procedure

1. Remove the screws that secure the video card to the system board.
2. Slide and remove the video card from the video-card connector.



1	video card	2	screws (2)

Replacing the Video Card

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the notch on the video card with the tab on the video-card connector.
2. Insert the video card, at a 45-degree angle, into the video-card connector.
3. Press the other end of the video card down and replace the screws that secure the video card to the system board.

Postrequisites

1. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
2. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
3. Replace the battery. See "Replacing the Battery" on page 17.
4. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Palm Rest

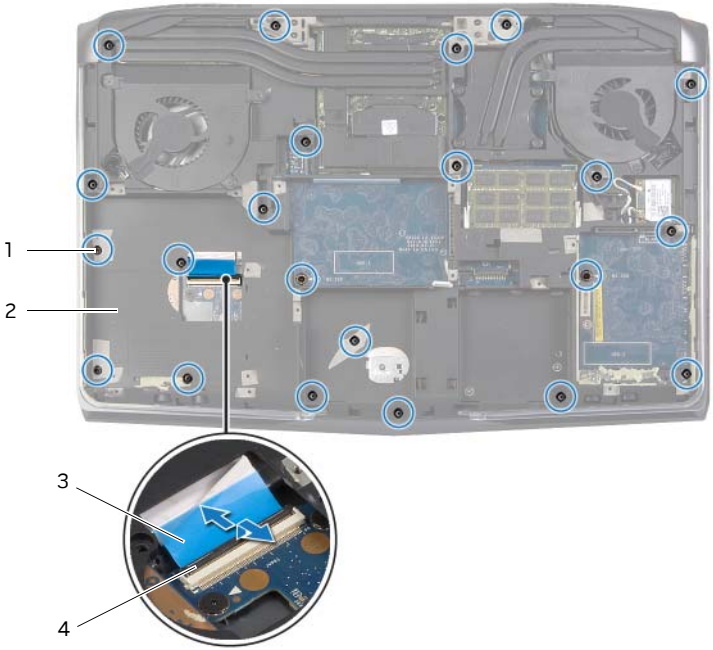
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.

Procedure

1. Lift the connector latch and, using the pull-tab, disconnect the keyboard daughter-card cable from the system board.
2. Remove the screws that secure the palm-rest assembly to the computer base.



1	screws (22)	2	computer base
3	keyboard daughter-card cable	4	latch

3 Using a plastic scribe, pry the palm-rest assembly from the computer base.

CAUTION: Push the palm rest down carefully to avoid scratching the display.

4 Push down the palm-rest tabs to release them from the computer base.

1	computer base	2	palm-rest assembly
3	tabs		

5 Turn the computer over and open the display as far as possible.

6 Carefully lift the palm-rest assembly off the computer base and place it aside.

7 Disconnect the status-light board cable from the media-card reader.

8 Lift the palm-rest assembly off the computer base.

1	status-light board cable	2	media-card reader
3	palm-rest assembly		

9 Remove the keyboard. See "Removing the Keyboard" on page 53.

10 Remove the power-button board. See "Removing the Power-Button Board" on page 57.

11 Remove the status-light board. See "Removing the Status-Light Board" on page 60.

12 Remove the keyboard daughter board. See "Removing the Keyboard Daughter Board" on page 63.

Replacing the Palm Rest

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Replace the keyboard daughter board. See "Replacing the Keyboard Daughter Board" on page 65.
2. Replace the status-light board. See "Replacing the Status-Light Board" on page 62.
3. Replace the power-button board. See "Replacing the Power-Button Board" on page 59.
4. Replace the keyboard. See "Replacing the Keyboard" on page 56.
5. Connect the status-light board cable to the media-card reader.
6. Align the palm-rest assembly over the computer base and snap the palm-rest assembly into place.
7. Close the display and turn the computer over.
8. Replace the screws that secure the palm-rest assembly to the computer base.
9. Connect the keyboard daughter-card cable to the system board and press down on the latch to secure the cable.

Postrequisites

1. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
2. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
3. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
4. Replace the battery. See "Replacing the Battery" on page 17.
5. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Memory Module(s) 1 and 2

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Your computer supports up to four memory module connectors. You can access connectors DIMM3 and DIMM4 are located under the base cover. DIMM1 and DIMM2 are located under the keyboard.

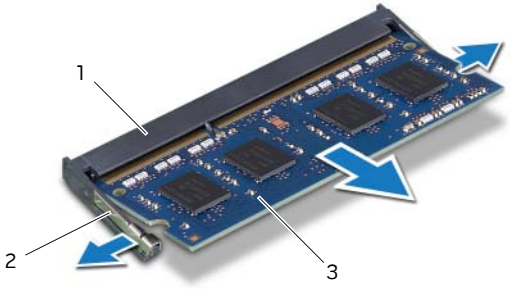
Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1	memory-module	2	computer base

1. Using your fingertips, carefully spread apart the securing clips at the sides of the memory-module connector until the memory module pops up.
2. Slide and remove the memory module from the memory-module connector.



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

Replacing the Memory Module(s) 1 and 2

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Your computer supports up to four memory module connectors. You can access connectors DIMM3 and DIMM4 are located under the base cover. DIMM1 and DIMM2 are located under the keyboard.

Procedure

1. Align the notch on the memory module with the tab on the memory-module connector.
2. Slide the memory module into the connector at a 45-degree angle, and press the memory module down until it clicks in place.
   If you do not hear the click, remove and reinstall the memory module.

NOTE: The computer may not boot if the memory module is not installed correctly.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
3. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
4. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
5. Replace the battery. See "Replacing the Battery" on page 17.
6. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Keyboard

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

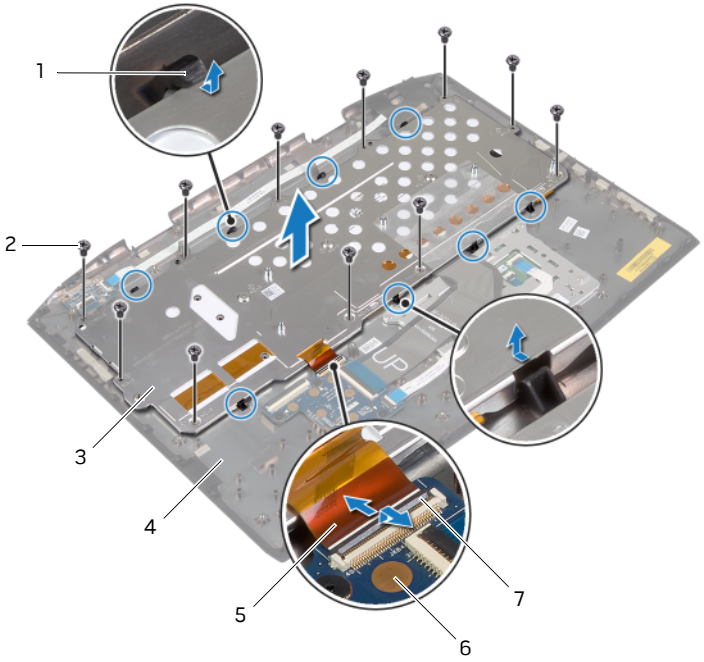
Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

CAUTION: The key caps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Be careful when removing and handling the keyboard.

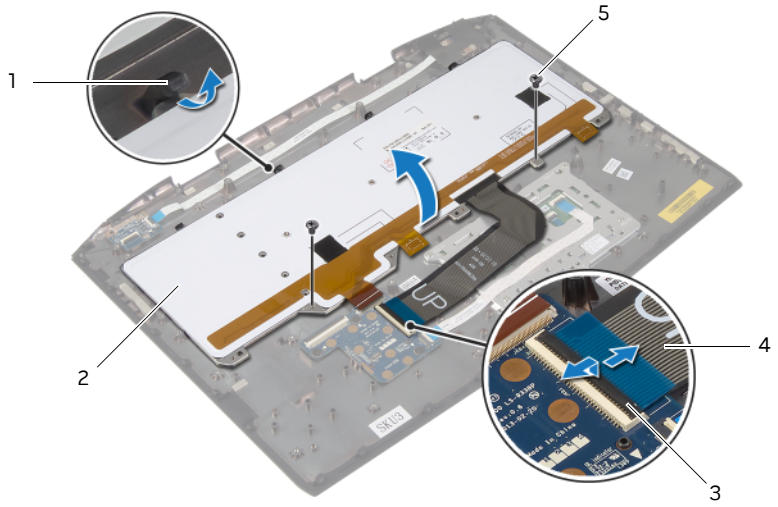
1. Remove the screws that secure the keyboard bracket to the palm-rest assembly.
2. Lift the latch and disconnect the keyboard-backlight cable from the keyboard daughter board.
3. Slide the keyboard-backlight cable through the keyboard bracket.
4. Release the keyboard bracket from the tabs on the palm-rest assembly.
5. Lift the keyboard bracket off the palm-rest assembly.



1	tabs	2	screws (11)
3	keyboard bracket	4	palm-rest assembly
5	keyboard-backlight cable	6	keyboard daughter board
7	latch		

6 Lift the latch and disconnect the keyboard cable from the keyboard daughter board.

7 Lift the keyboard at an angle and release it from the tabs on the palm-rest assembly.



1	tabs	2	keyboard
3	latch	4	keyboard cable
5	screws (2)		

Replacing the Keyboard

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Slide the keyboard under the tabs on the palm-rest assembly.
2. Align the screw holes on the keyboard with the screw holes on the palm-rest assembly.
3. Replace the screws that secure the keyboard to the palm-rest assembly.
4. Connect the keyboard cable to the keyboard daughter board and press down on the latch to secure the cable.
5. Slide the keyboard-backlight cable through the keyboard bracket.
6. Slide the keyboard bracket under the tabs on the palm-rest assembly.
7. Align the screw holes on the keyboard bracket with the screw holes on the palm-rest assembly.
8. Replace the screws that secure the keyboard bracket to the palm-rest assembly.
9. Connect the keyboard-backlight cable to the keyboard daughter board and press down on the connector latch to secure the cable.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
3. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
4. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
5. Replace the battery. See "Replacing the Battery" on page 17.
6. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Power-Button Board

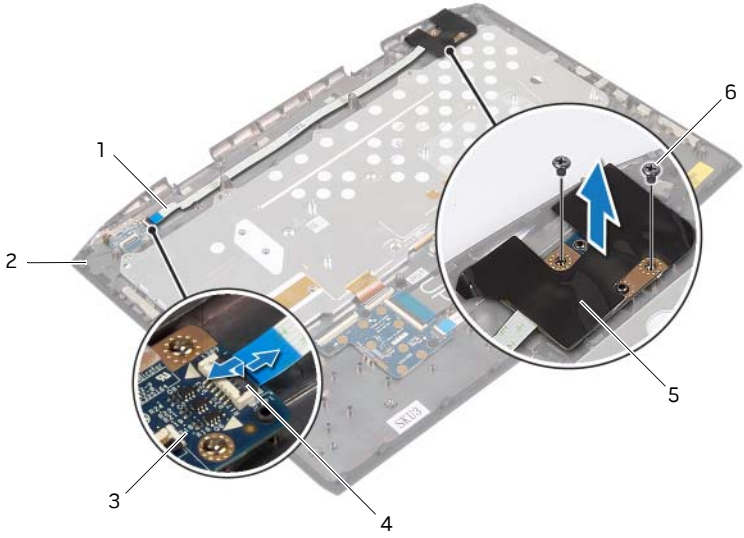
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Lift the latch and disconnect the power-button cable from the status-light board.
2. Note of power-button cable routing and peel off the power-button cable from the palm-rest assembly.
3. Remove the screws that secure the power-button board to the palm-rest assembly.
4. Lift the power-button board, along with its cable, off the palm-rest assembly.



1	power-button cable	2	palm-rest assembly
3	status-light board	4	latch
5	power-button board	6	screws (2)

Replacing the Power-Button 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the power-button board with the screw holes on the palm-rest assembly.
2. Replace the screws that secure the power-button board to the palm-rest assembly.
3. Adhere the power-button board cable to the palm-rest assembly.
4. Connect the power-button board cable to the status-light board and press down on the latch to secure the cable.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
3. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
4. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
5. Replace the battery. See "Replacing the Battery" on page 17.
6. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Status-Light Board

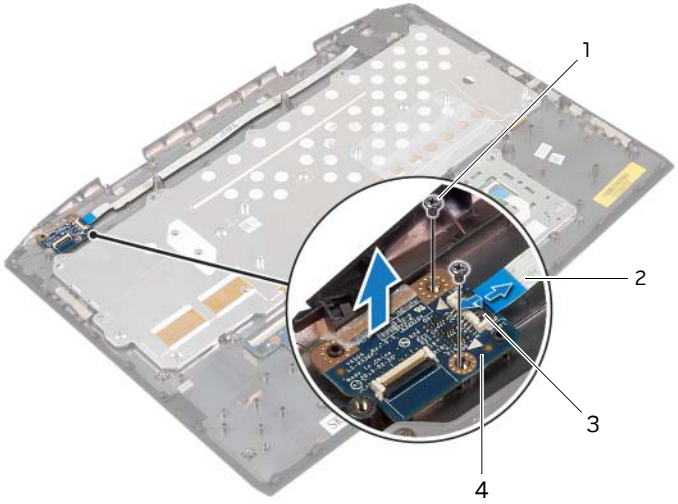
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Lift the latch and disconnect the power-button board cable from the status-light board.
2. Remove the screws that secure the status-light board to the palm-rest assembly.
3. Lift the status-light board off the palm-rest assembly.



1	screws (2)	2	power-button board cable
3	latch	4	status-light board

Replacing the Status-Light 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the status-light board with the screw holes on the palm-rest assembly.
2. Replace the screws that secure the status-light board to the palm-rest assembly.
3. Connect the power-button board cable to the status-light board and press down on the latch to secure the cable.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
3. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
4. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
5. Replace the battery. See "Replacing the Battery" on page 17.
6. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Keyboard Daughter Board

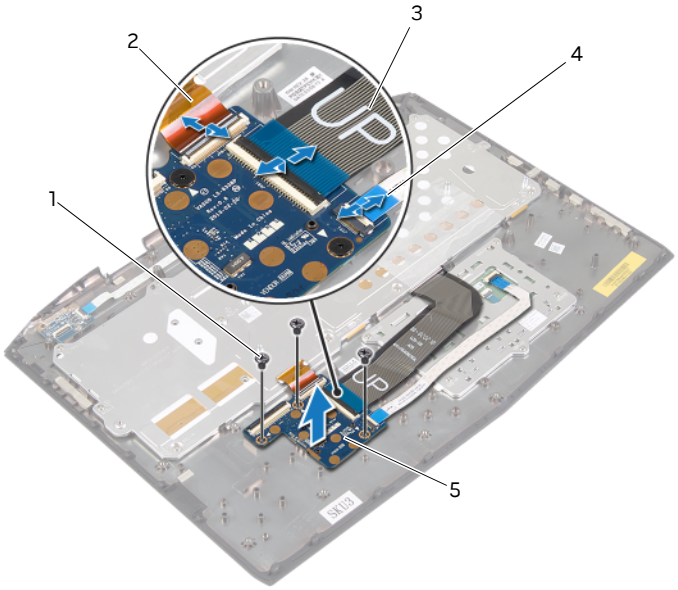
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Lift the latch and disconnect the keyboard cable, the keyboard-backlight cable, and the touchpad cable from the keyboard daughter board.
2. Remove the screws that secure the keyboard daughter board to the palm-rest assembly.
3. Lift the keyboard daughter board, along with its cable, off the palm-rest assembly.



1	screws (3)	2	keyboard-backlight cable
3	keyboard cable	4	touchpad cable
5	keyboard daughter board		

Replacing the Keyboard Daughter Board

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the keyboard daughter board with the screw holes on the palm-rest assembly.
2. Replace the screws that secure the keyboard daughter board to the palm-rest assembly.
3. Connect the keyboard cable, the keyboard-backlight cable, and the touchpad cable to the keyboard daughter board and press down on the latches to secure the cables.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
3. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
4. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
5. Replace the battery. See "Replacing the Battery" on page 17.
6. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Speakers

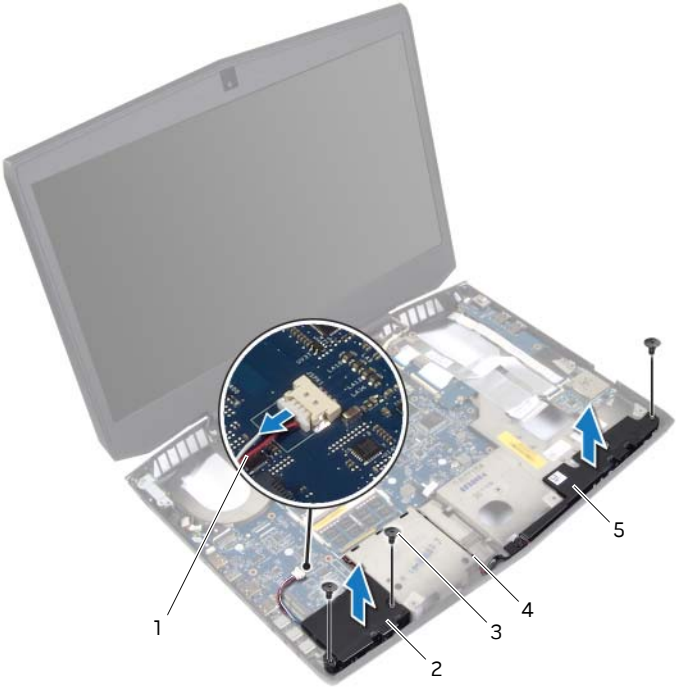
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Disconnect the speaker cable from the system board.
2. Remove the screws that secure the speakers to the computer base.
3. Lift the left speaker, note the speaker-cable routing, and remove the cable from the routing guides.
4. Lift the speakers, along with the cable, off the computer base.



1	speaker cable	2	left-speaker
3	screws (3)	4	speaker-cable routing
5	right speaker		

Replacing the Speakers

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw hole on the right speaker with the screw hole on the computer base.
2. Replace the screw that secures the right speaker to the computer base.
3. Route the speaker cable through the routing guides.
4. Align the screw holes on the left speaker with the screw holes on the computer base.
5. Replace the screws that secure the left speaker to the computer base.
6. Connect the speaker cable to the system board.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the video card. See "Replacing the Video Card" on page 44.
3. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
4. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
5. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
6. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
7. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
8. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
9. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
10. Replace the battery. See "Replacing the Battery" on page 17.
11. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Disconnect the right tron-lights cable from the I/O board.
2. Remove the screws that secure the I/O board to the system board.
3. Ease the ports on the I/O board out of the slots on the computer base and lift the I/O board off the computer base.

1	tron-lights (right) cable	2	screws (2)
3	I/O board		

Replacing the 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Insert the ports on the I/O board into the slots on the computer base.
2. Align the screw holes on the I/O board with the screw holes on the system board.
3. Press down on the I/O board to connect it to the system board.
4. Connect the right tron-lights cable to the I/O board.
5. Replace the screws that secure the I/O board to the system board.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the video card. See "Replacing the Video Card" on page 44.
3. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
4. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
5. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
6. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
7. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
8. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
9. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
10. Replace the battery. See "Replacing the Battery" on page 17.
11. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Media-Card Reader

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Lift the latches and disconnect the status-light cable and the media-card reader cable from the media-card reader.
2. Remove the screws that secure the media-card reader to the computer base.
3. Lift the media-card reader off the computer base.

1	status-light cable	2	media-card reader cable
3	latches (2)	4	media-card reader
5	screws (3)		

Replacing the Media-Card Reader

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the media-card reader with the screw holes on the computer base.
2. Replace the screws that secure the media-card reader to the computer base.
3. Connect the media-card reader cable and the status-light cable to the media-card reader and press down on the latches to secure the cables.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the video card. See "Replacing the Video Card" on page 44.
3. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
4. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
5. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
6. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
7. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
8. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
9. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
10. Replace the battery. See "Replacing the Battery" on page 17.
11. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display Mini-Card

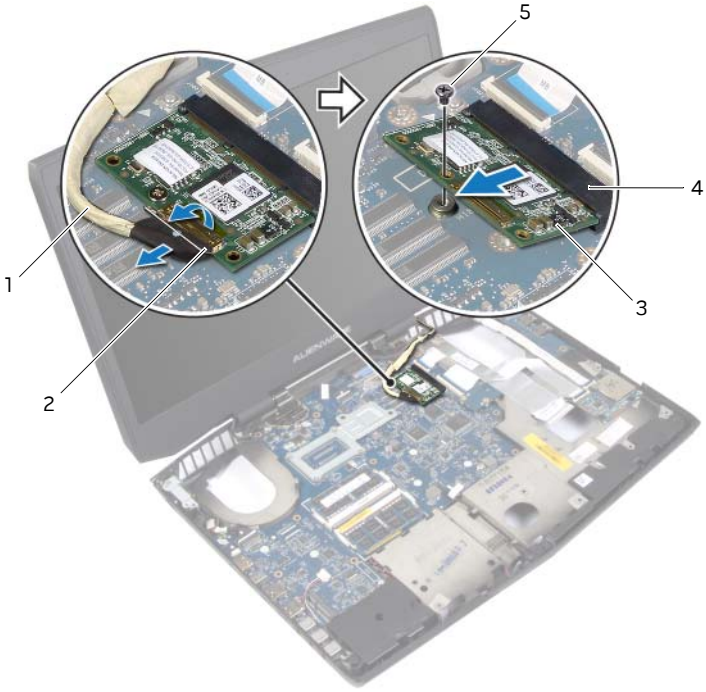
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Lift the latch and disconnect the display mini-card cable from the display mini-card.
2. Remove the screw that secures the display mini-card to the system board.
3. Slide and remove the display mini-card from the mini-card connector.



1	display mini-card cable	2	latch
3	display mini-card	4	mini-card connector
5	screw		

Replacing the Display Mini-Card

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the notch on the display mini-card with the tab on the mini-card connector.
2. Slide the display mini-card, at a 45-degree angle, into the mini-card connector.
3. Replace the screw that secures the display mini-card to the system board.
4. Connect the display mini-card cable to the display mini-card and press down on the latch to secure the cable.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the video card. See "Replacing the Video Card" on page 44.
3. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
4. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
5. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
6. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
7. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
8. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
9. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
10. Replace the battery. See "Replacing the Battery" on page 17.
11. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Power-Adapter Port

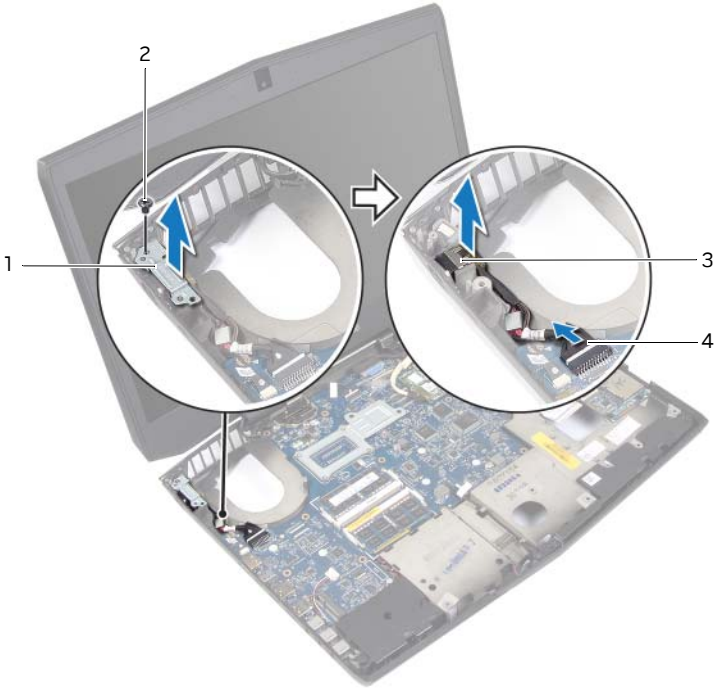
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Remove the screw that secures the power-adapter port bracket to the computer base.
2. Disconnect the power-adapter port cable from the system board.
3. Lift the power-adapter port off the computer base.



1	power-adapter port bracket	2	screw
3	power-adapter port	4	power-adapter port cable

Replacing the Power-Adapter Port

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the power-adapter port on the slot on the computer base and slide the power-adapter port into place.
2. Align the screw hole on the power-adapter port bracket with the screw hole on the computer base.
3. Replace the screw that secures the power-adapter port bracket to the computer base.
4. Connect the power-adapter port cable to the system board.

Postrequisites

1. Replace the system board. See "Replacing the System Board" on page 84.
2. Replace the speakers. See "Replacing the Speakers" on page 68.
3. Replace the display mini-card. See "Replacing the Display Mini-Card" on page 77.
4. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
5. Replace the video card. See "Replacing the Video Card" on page 44.
6. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
7. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
8. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
9. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
10. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
11. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
12. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
13. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
14. Replace the battery. See "Replacing the Battery" on page 17.
15. Replace the base cover. See "Replacing the Base Cover" on page 15.

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the memory module(s) 3 and 4. See "Removing the Memory Module(s) 3 and 4" on page 18.
4. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
5. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
6. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
7. Remove the wireless mini-card. See "Removing the Wireless Mini-Card" on page 31.
8. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
9. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
10. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
11. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
12. Remove the video card. See "Removing the Video Card" on page 43.
13. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
14. Remove the speakers. See "Removing the Speakers" on page 66.
15. Remove the memory modules(s) 1 and 2. See "Removing the Memory Module(s) 1 and 2" on page 50.
16. Remove the status-light board. See "Removing the Status-Light Board" on page 60.
17. Remove the power-button board. See "Removing the I/O Board" on page 69.
18. Remove the display mini-card. See "Removing the Display Mini-Card" on page 75.

Procedure

NOTE: Your computer's Service Tag is located under the system badge. You must enter the Service Tag in the BIOS after you replace the system board.

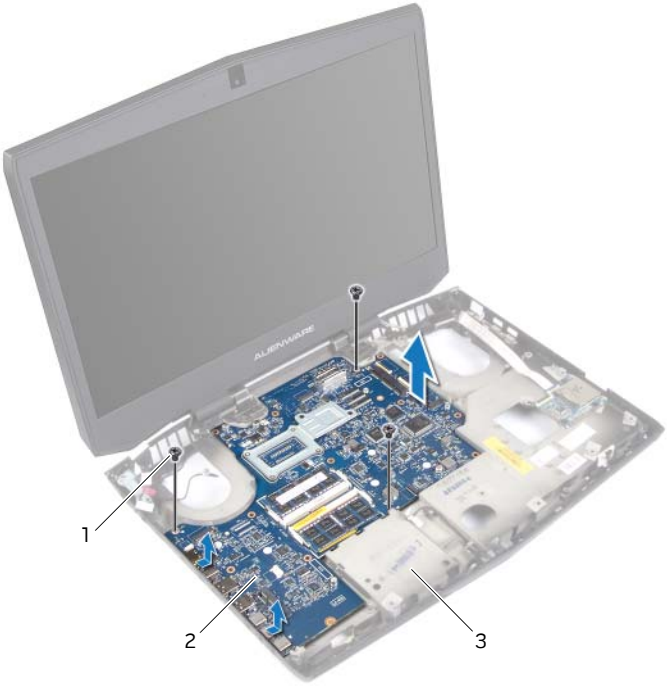
NOTE: Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect them correctly after you replace the system board.

1 Disconnect the display cable, display-light board cable, power-adapter port cable, left tron-lights cable, and front tron-lights cable from the system board.

1	display cable	2	display-light board cable
3	power-adapter port cable	4	left tron-lights cables
5	front tron-lights cables		

2 Remove the screws that secure the system board to the computer base.

3 Lift the system board at an angle and remove the ports on the system board from the slots on the computer base.



1	screws (3)	2	system board
3	computer base		

4 Remove the coin-cell battery. "Removing the Coin-Cell Battery" on page 87.

5 Remove the processor. See "Removing the Processor" on page 90.

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Replace the processor. See "Replacing the Processor" on page 92.
2. Replace the coin-cell battery. See "Replacing the Coin-Cell Battery" on page 89.
3. Slide the ports on the system board into the slots on the computer base.
4. Align the screw holes on the system board with the screw holes on the computer base.
5. Replace the screws that secure the system board to the computer base.
6. Connect the display cable, display-light board cable, power-adapter port cable, left tron-lights cable, and front tron-lights cable to the system board.

Postrequisites

1. Replace the speakers. See "Replacing the Speakers" on page 68.
2. Replace the memory module(s) 1 and 2. "Replacing the Memory Module(s) 1 and 2" on page 52.
3. Replace the display mini-card. See "Replacing the Display Mini-Card" on page 77.
4. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
5. Replace the video card. See "Replacing the Video Card" on page 44.
6. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
7. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
8. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
9. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
10. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
11. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
12. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.

13 Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.

14 Replace the battery. See "Replacing the Battery" on page 17.

15 Replace the base cover. See "Replacing the Base Cover" on page 15.

Entering the Service Tag in the BIOS

1. Turn on the computer.
2. Press <F2> during POST to enter the system setup program.
3. Navigate to the main tab and enter the Service Tag in the **Service Tag** field.

Removing the Coin-Cell Battery

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

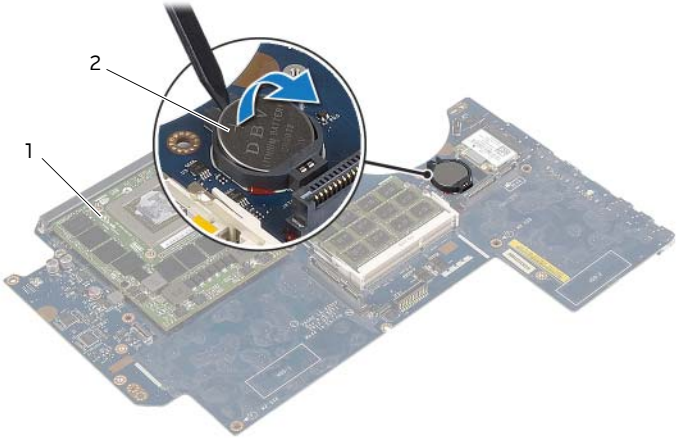
CAUTION: Removing the coin-cell battery resets the BIOS settings to defaults. It is recommended that you note the BIOS settings before removing the coin-cell battery.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the speakers. See "Removing the Speakers" on page 66.
13. Remove the power-button board. See "Removing the I/O Board" on page 69.
14. Remove the display mini-card. See "Removing the Display Mini-Card" on page 75.
15. Remove the system board. See "Removing the System Board" on page 81.

Procedure

1. Using a plastic scribe, pry the coin-cell battery from the coin-cell battery socket on the system board.
2. Lift the coin-cell battery off the system board.



1	coin-cell-battery	2	system board

Replacing the Coin-Cell Battery

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

WARNING: The battery may explode if installed incorrectly. Replace the battery only with the same or equivalent type. Discard used batteries according to the manufacturer's instructions.

Procedure

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

Postrequisites

1. Replace the system board. See "Replacing the System Board" on page 84.
2. Replace the speakers. See "Replacing the Speakers" on page 68.
3. Replace the display mini-card. See "Replacing the Display Mini-Card" on page 77.
4. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
5. Replace the video card. See "Replacing the Video Card" on page 44.
6. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
7. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
8. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
9. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
10. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
11. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
12. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
13. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
14. Replace the battery. See "Replacing the Battery" on page 17.
15. Replace the base cover. See "Replacing the Base Cover" on page 15.

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

CAUTION: To prevent intermittent contact between the ZIF-socket cam screw and the processor when removing the processor, press to apply slight pressure to the center of the processor while turning the cam screw.

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

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the speakers. See "Removing the Speakers" on page 66.
13. Remove the power-button board. See "Removing the I/O Board" on page 69.
14. Remove the display mini-card. See "Removing the Display Mini-Card" on page 75.
15. Remove the system board. See "Removing the System Board" on page 81.
16. Remove the coin-cell battery. See "Removing the Coin-Cell Battery" on page 87.

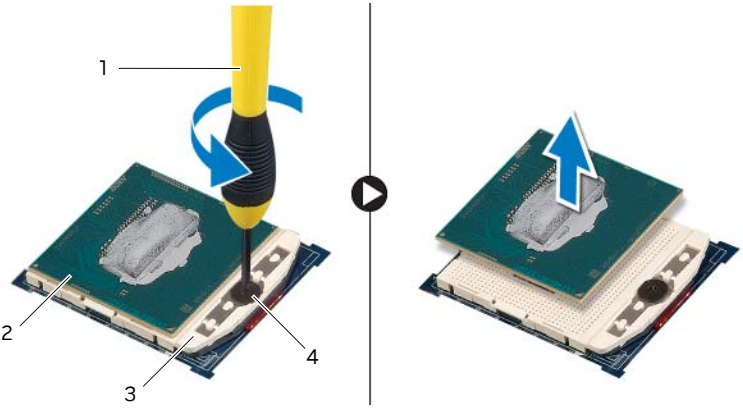
Procedure

1 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.

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

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

2 Lift the processor off the ZIF socket.



1	screwdriver	2	processor
3	ZIF-socket	4	ZIF-socket cam screw

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

NOTE: If a new processor 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.

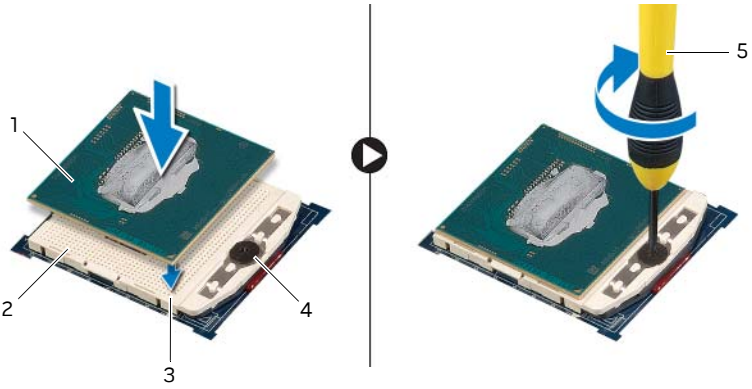
1 Align the pin-1 corner of the processor with the pin-1 corner of the ZIF socket, then place the processor in the ZIF-socket.

NOTE: The pin-1 corner of the processor has a triangle that aligns with the triangle on the pin-1 corner of the ZIF 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: To prevent intermittent contact between the ZIF-socket cam screw and the processor when replacing the processor, press to apply slight pressure to the center of the processor while turning the cam screw.

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

2 Tighten the ZIF socket by turning the cam screw clockwise to secure the processor to the ZIF socket.



1	processor	2	ZIF-socket
3	pin-1 corner	4	ZIF-socket cam screw
5	screwdriver		

Postrequisites

1 Replace the coin-cell battery. See "Replacing the Coin-Cell Battery" on page 89.
2 Replace the system board. See "Replacing the System Board" on page 84.
3 Replace the speakers. See "Replacing the Speakers" on page 68.
4 Replace the display mini-card. See "Replacing the Display Mini-Card" on page 77.
5 Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
6 Replace the video card. See "Replacing the Video Card" on page 44.
7 Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
8 Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
9 Replace the processor fan. See "Replacing the Processor Fan" on page 35.
10 Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
11 Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
12 Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
13 Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
14 Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
15 Replace the battery. See "Replacing the Battery" on page 17.

16 Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display Assembly

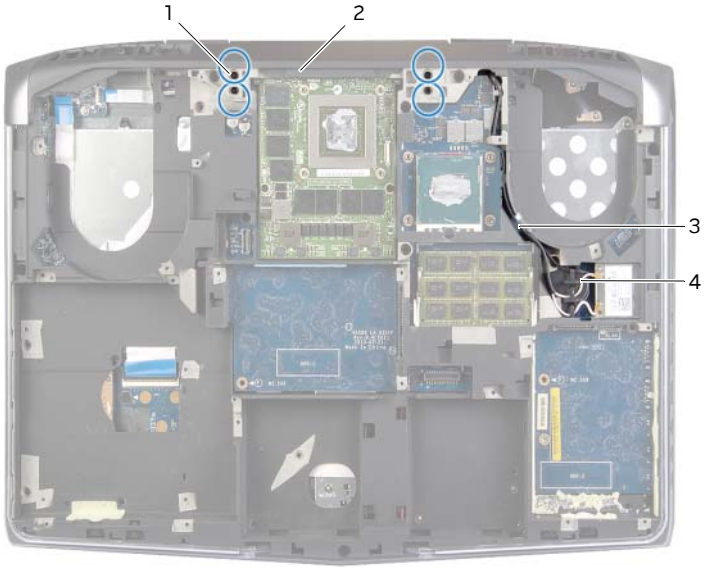
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.

Procedure

1. Disconnect the antenna cables from the wireless mini-card.
2. Remove the screws that secure the display assembly to the computer base.
3. Note the antenna cables routings and remove the cables from their routing guides.



1	screws (4)	2	computer base
3	antenna cables routing guide	4	antenna cable(s)(3)

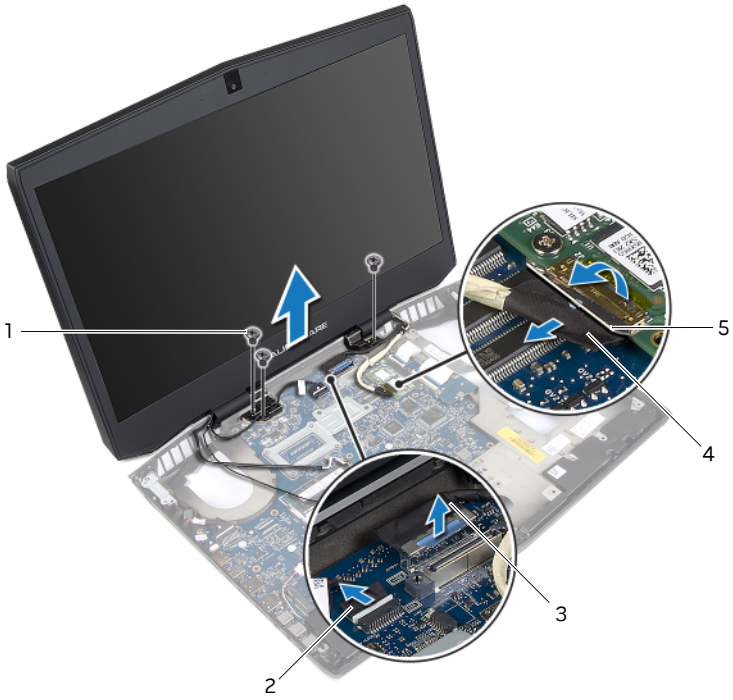
4 Turn the computer over and open the display as far as possible.

5 Disconnect the display cable, display mini-card cable, and display-light board cable from the system board.

6 Remove the cables from their routing guides.

7 Remove the screws that secure the display assembly to the computer base.

8 Lift the display assembly off the computer base.



1	screws (3)	2	display-light board cable
3	display cable	4	latch
5	display mini-card cable		

Replacing the Display Assembly

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the display assembly with the screw holes on the computer base.
2. Replace the screws that secure the display assembly to the computer base.
3. Connect the display cable, display mini-card cable, and display-light board cable to the system board.
4. Close the display and turn the computer over.
5. Route the antenna cables through their routing guides on the computer base.
6. Replace the screws that secure the display assembly to the computer base.
7. Connect the antenna cables to the wireless mini-card.

Postrequisites

1. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
2. Replace the video card. See "Replacing the Video Card" on page 44.
3. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
4. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
5. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
6. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
7. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
8. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
9. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
10. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
11. Replace the battery. See "Replacing the Battery" on page 17.
12. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display Bezel

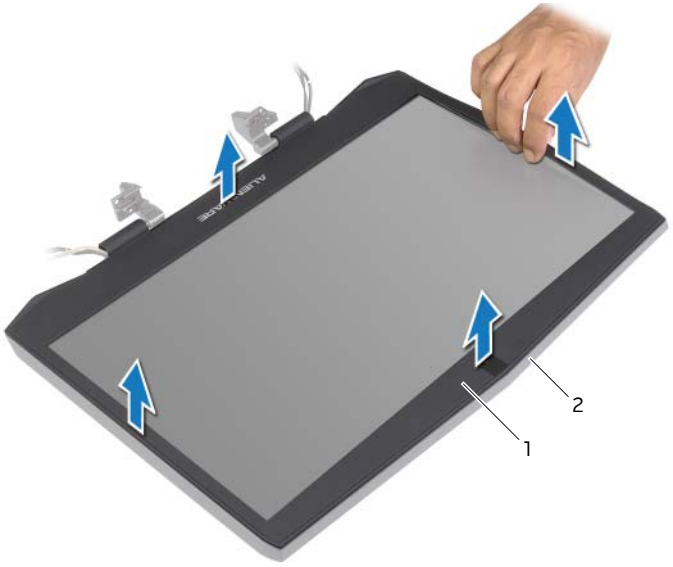
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.

Procedure

1. Using your fingertips, carefully pry up the inside edges of the display bezel.
2. Remove the display bezel off the display back-cover.



1	display bezel	display back-cover

Replacing the Display Bezel

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

Align the display bezel with the display back-cover, and gently snap the display bezel into place.

Postrequisites

1. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
2. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
3. Replace the video card. See "Replacing the Video Card" on page 44.
4. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
5. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
6. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
7. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
8. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
9. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
10. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
11. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
12. Replace the battery. See "Replacing the Battery" on page 17.
13. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display Hinges

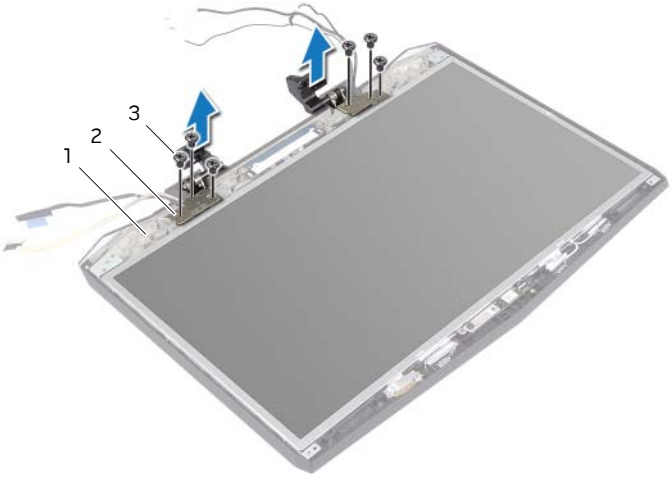
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.
13. Remove the display bezel. See "Removing the Display Bezel" on page 99.

Procedure

1. Remove the screws that secure the display hinges to the display back-cover.
2. Lift the display hinges off the display back-cover.



1	display back-cover	2	display hinges (2)
3	screws (6)		

Replacing the Display Hinges

WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Route the display cable, display-light board cable, and antenna cable through the routing guides on the display hinges.
2. Align the screw holes on the display hinges with the screw holes on the display back-cover.
3. Replace the screws that secure the display hinges to the display back-cover.

Postrequisites

1. Replace the display bezel. See "Replacing the Display Bezel" on page 101.
2. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
3. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
4. Replace the video card. See "Replacing the Video Card" on page 44.
5. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
6. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
7. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
8. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
9. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
10. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
11. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
12. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
13. Replace the battery. See "Replacing the Battery" on page 17.
14. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display Panel

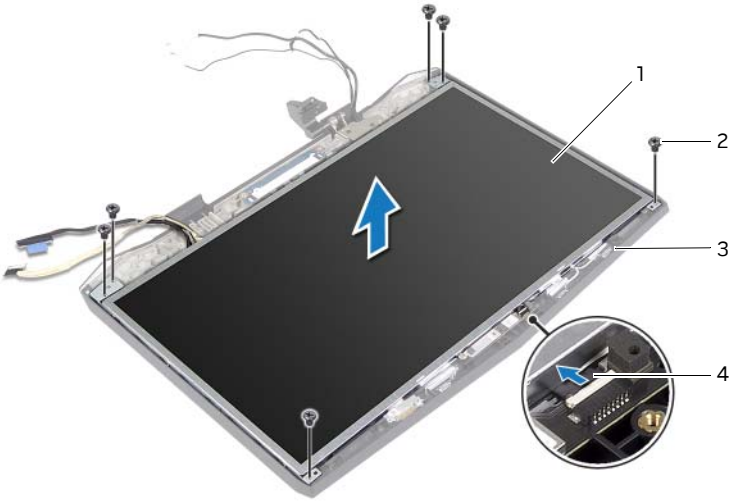
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.
13. Remove the display bezel. See "Removing the Display Bezel" on page 99.

Procedure

1. Disconnect the camera cable from the camera.
2. Remove the screws that secure the display panel to the display back-cover.
3. Lift the display panel off the display back-cover.



1	display panel	2	screws (6)
3	display back-cover	4	camera cable

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Align the screw holes on the display panel with the screw holes on the display back-cover.
2. Replace the screws that secure the display panel to the display back-cover.
3. Connect the camera cable to the camera.

Postrequisites

1. Replace the display hinges. See "Replacing the Display Hinges" on page 104.
2. Replace the display bezel. See "Replacing the Display Bezel" on page 101.
3. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
4. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
5. Replace the video card. See "Replacing the Video Card" on page 44.
6. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
7. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
8. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
9. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
10. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
11. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
12. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
13. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
14. Replace the battery. See "Replacing the Battery" on page 17.
15. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Logo Board

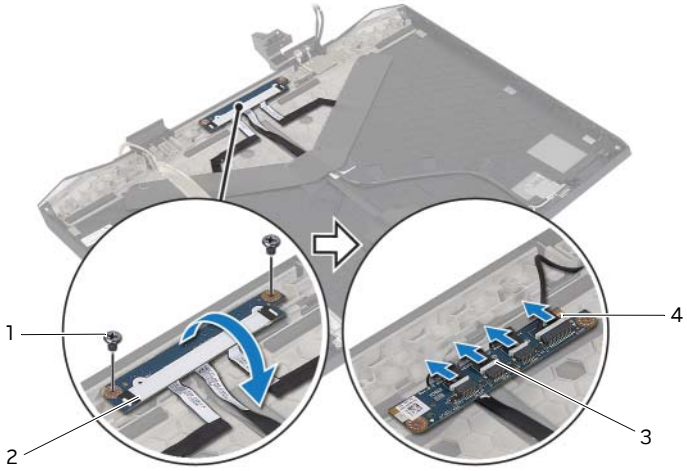
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.
13. Remove the display bezel. See "Removing the Display Bezel" on page 99.
14. Remove the display panel. See "Removing the Display Panel" on page 105.

Procedure

1. Remove the screws that secure the logo board to the display back-cover.
2. Carefully rotate the logo board and disconnect the display light-board cables and logo-board cable from the logo-board connectors.
3. Lift the logo board off the display back-cover.



1	screws (2)	2	logo board
3	logo-board cable	4	display-light board cables (3)

Replacing the Logo 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Connect the display light-board cables and logo-board cable to the logo board.
2. Carefully rotate the logo board over and align the screw holes on the logo board with the screw holes on the display back-cover.
3. Replace the screws that secure the logo board to the display back-cover.

Postrequisites

1. Replace the display panel. See "Replacing the Display Panel" on page 107.
2. Replace the display hinges. See "Replacing the Display Hinges" on page 104.
3. Replace the display bezel. See "Replacing the Display Bezel" on page 101.
4. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
5. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
6. Replace the video card. See "Replacing the Video Card" on page 44.
7. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
8. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
9. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
10. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
11. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
12. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
13. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
14. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
15. Replace the battery. See "Replacing the Battery" on page 17.
16. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display Mini-Card Cable

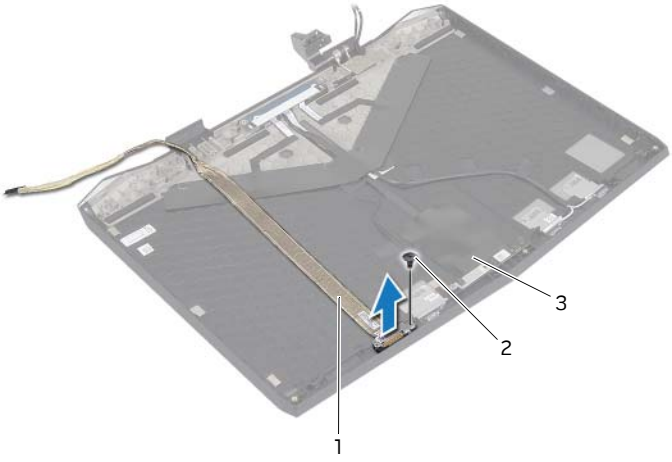
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.
13. Remove the display bezel. See "Removing the Display Bezel" on page 99.
14. Remove the display hinges. See "Removing the Display Hinges" on page 102.
15. Remove the display panel. See "Removing the Display Panel" on page 105.

Procedure

1. Remove the screw that secures the display mini-card cable to the display back-cover.
2. Peel off the display mini-card cable from the display back-cover.
3. Lift the display mini-card cable off the display back-cover.



1	display mini-card cable	2	screw
3	display back-cover		

Replacing the Display Mini-Card Cable

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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Adhere the display mini-card cable to the display back-cover.
2. Replace the screw that secures the display mini-card cable to the display back-cover.

Postrequisites

3. Replace the display panel. See "Replacing the Display Panel" on page 107.
4. Replace the display hinges. See "Replacing the Display Hinges" on page 104.
5. Replace the display bezel. See "Replacing the Display Bezel" on page 101.
6. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
7. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
8. Replace the video card. See "Replacing the Video Card" on page 44.
9. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
10. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
11. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
12. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
13. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
14. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
15. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
16. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
17. Replace the battery. See "Replacing the Battery" on page 17.
18. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Display-Light Boards

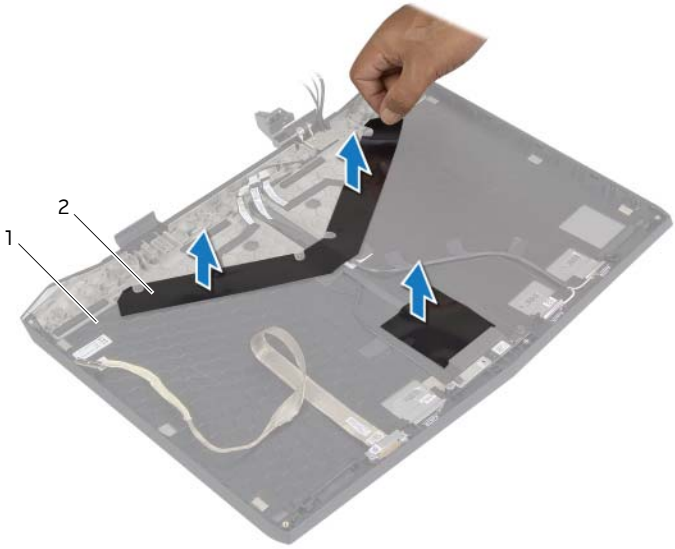
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.
13. Remove the display bezel. See "Removing the Display Bezel" on page 99.
14. Remove the display panel. See "Removing the Display Panel" on page 105.

Procedure

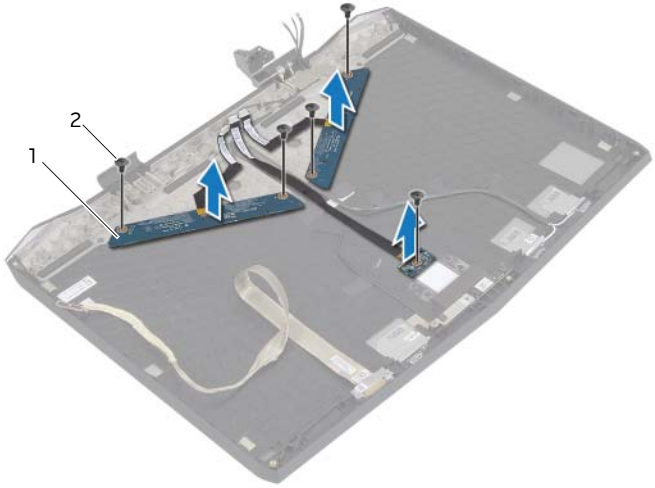
1 Peel the Mylar tapes that cover the display-light boards.



1	display back-cover	2	Mylar tapes

2 Remove the screws that secure the display-light boards to the display back-cover.

3 Lift the display-light boards off the display back-cover.



1	display-light boards (3)	2	screws (3)

Replacing the Display-Light Boards

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Procedure

1. Align the screw holes on the display-light boards with the screw holes on the display back-cover.
2. Replace the screws that secure the display-light boards to the display back-cover.
3. Adhere the Mylar tapes on the display-light boards.

Postrequisites

1. Replace the logo board. See "Replacing the Logo Board" on page 110.
2. Replace the display hinges. See "Replacing the Display Hinges" on page 104.
3. Replace the display bezel. See "Replacing the Display Bezel" on page 101.
4. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
5. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
6. Replace the video card. See "Replacing the Video Card" on page 44.
7. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
8. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
9. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
10. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
11. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
12. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
13. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
14. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
15. Replace the battery. See "Replacing the Battery" on page 17.
16. Replace the base cover. See "Replacing the Base Cover" on page 15.

Removing the Camera

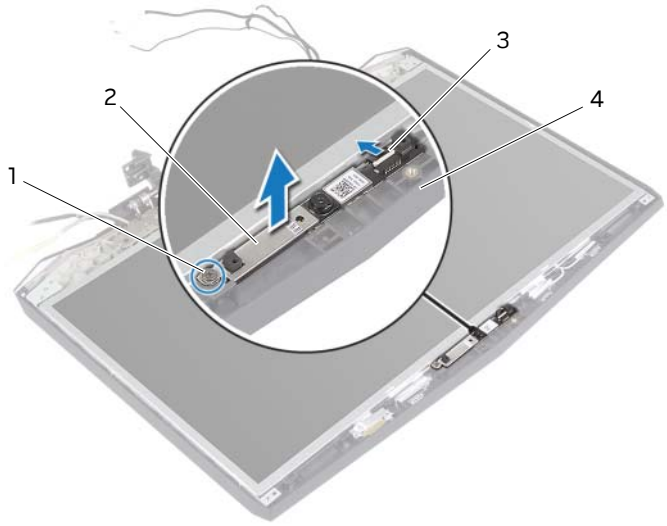
WARNING: Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before Working Inside Your Computer" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Prerequisites

1. Remove the base cover. See "Removing the Base Cover" on page 14.
2. Remove the battery. See "Removing the Battery" on page 16.
3. Remove the primary hard drive. See ""Removing the Primary Hard Drive" on page 21.
4. Remove the secondary hard drive. See "Removing the Secondary Hard Drive" on page 24.
5. Remove the tertiary hard drive. See "Removing the Third Hard Drive (Optional)" on page 27.
6. Remove the processor fan. See ""Removing the Processor Fan" on page 34.
7. Remove the video-card fan. See "Removing the Video-card Fan" on page 36.
8. Remove the processor heat sink. See "Removing the Processor Heat Sink" on page 39.
9. Remove the video-card heat sink. See "Removing the Video-Card Heat Sink" on page 41.
10. Remove the video card. See "Removing the Video Card" on page 43.
11. Follow step 1 to step 8 in "Removing the Palm Rest" on page 45.
12. Remove the display assembly. See "Removing the Display Assembly" on page 95.
13. Remove the display bezel. See "Removing the Display Bezel" on page 99.

Procedure

1. Disconnect the camera cable from the camera.
2. Remove the screw that secures the camera to the display back-cover.
3. Pry and lift the camera off the display back-cover.



1	screw	2	camera
3	camera cable	4	display back-cover

Replacing 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" on page 11. After working inside your computer, follow the instructions in "After Working Inside Your Computer" on page 13.
For more safety best practices, see the Regulatory Compliance home page at dell.com/regulatory_compliance.

Procedure

1. Place the camera in the display back-cover.
2. Align the screw holes on the camera with the screw holes on the display back-cover.
3. Replace the screw that secures the camera to the display back-cover.
4. Connect the camera cable to the camera.

Postrequisites

1. Replace the display hinges. See "Replacing the Display Hinges" on page 104.
2. Replace the display bezel. See "Replacing the Display Bezel" on page 101.
3. Replace the display assembly. See "Replacing the Display Assembly" on page 98.
4. Follow step 5 to step 9 in "Replacing the Palm Rest" on page 49.
5. Replace the video card. See "Replacing the Video Card" on page 44.
6. Replace the video-card heat sink. See "Replacing the Video-Card Heat Sink" on page 42.
7. Replace the processor heat sink. See "Replacing the Processor Heat Sink" on page 40.
8. Replace the processor fan. See "Replacing the Processor Fan" on page 35.
9. Replace the video-card fan. See "Replacing the Video-card Fan" on page 38.
10. Replace the tertiary hard drive. See "Replacing the Third Hard Drive (Optional)" on page 30.
11. Replace the secondary hard drive. See "Replacing the Secondary Hard Drive" on page 26.
12. Replace the primary hard drive. See "Replacing the Primary Hard Drive" on page 23.
13. Replace the memory modules. See "Replacing the Memory Module(s) 3 and 4" on page 20.
14. Replace the battery. See "Replacing the Battery" on page 17.
15. Replace the base cover. See "Replacing the Base Cover" on page 15.

System Setup

Overview

Use system setup to:

- Get information about the hardware installed in your computer, such as the amount of RAM, the size of the hard drive, and so on.
- Change the system setup configurations.
- Set or change a user-selectable option, such as the user password, type of hard drive installed, enabling or disabling base devices, and so on.

Entering System Setup

CAUTION: Unless you are an expert computer user, do not change the settings in the system setup program. Certain changes can make your computer work incorrectly.

NOTE: Before you change system setup, it is recommended that you write down the system setup screen information for future reference.

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 has 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 operating system's desktop. Then, turn off your computer and try again.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the **setup item**, active **help screen**, and **key functions**.

Setup Item — This field appears on the left side of the system setup window. This field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features. Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the **Help Screen** displays more information about that option and available settings.	**Help Screen** — This field appears on the right side of the system setup window and contains information about each option listed in the **Setup Item**. In this field you can view information about your computer and make changes to your current settings. Press the up- and down-arrow keys to highlight an option. Press <Enter> to make that selection active and return to the **Setup Item**. **NOTE:** Not all settings listed in the **Setup Item** are changeable.
Key Functions — This field appears below the **Help Screen** and lists keys and their functions within the active system setup field.	

System Setup Options

NOTE: Depending on your computer and installed devices, the items listed in this section may 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.
BIOS Version	Displays the BIOS version.
Product Name	Displays the model number of your computer.
Service Tag	Displays the service tag of your computer.
Asset Tag	Displays the Asset Tag of your computer.
CPU Type	Displays the type of processor installed.
CPU Speed	Displays the speed of the processor.
CPU ID	Displays the processor identification value.
CPU Cache	
L1 Cache	Displays the processor's L1 cache size.

Main Menu	
L2 Cache	Displays the processor's L2 cache size.
L3 Cache	Displays the processor's L3 cache size.
Integrated Graphics	Displays the integrated graphics.
Discrete Graphics 1	Displays the first discrete graphics installed on your computer.
Discrete Graphics 2	Displays the second discrete graphics installed on your computer.
Fixed HDD	Displays the type of hard drive installed.
SATA ODD	Displays the type of optical drive installed.
Second HDD	Displays the type of secondary hard drive installed.
eSATA Device	Displays the type of eSATA device installed.
mSATA Device	Displays the type of mSATA device installed.
AC Adapter Type	Displays the type of AC adapter connected to your computer.
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.

Advanced Menu	
Intel(R) 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.
Integrated NIC	Allows you to enable or disable the on-board LAN controller. ▪ Disabled: Internal LAN is disabled and is not visible to the operating system. ▪ Enabled: Internal LAN is enabled.

Advanced Menu	
USB Emulation	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. **NOTE:** You cannot boot any type of USB device (floppy, hard drive, or memory key) when this option is off.
USB Powershare	Allows you to charge USB devices when the computer is turned off or in standby mode. ▪ 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.
USB Wake Support	Allows you to enable USB devices to wake the computer from standby or to disable the USB wake support feature. **NOTE:** If USB Powershare is enabled, a device connected to the USB Powershare connector may not wake the computer.
SATA Operation	Allows you to configure the operating mode of the integrated SATA hard drive controller. ▪ AHCI: SATA is configured for AHCI mode. ▪ RAID: STAT is configured for RAID mode.
Adapter Warnings	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.
Function Key Behavior	Allows you to set function key or multimedia key as the default function key behavior.
Touchpad Backlight	Allows you to set the touchpad backlight to be on or in auto mode.

Advanced Menu	
Battery Health	Displays the battery health.
USB debug	Allows you to enable or disable this port for Windows debugging.
External USB Ports	Allows you to disable or enable the external USB ports.

Advanced Menu—Performance Options	
CPU Turbo Mode	Allows you to disable or enable the processor turbo mode.
Overclocking Feature	Allows you to disable or enable the global overclocking feature. ▪ Disabled: The overclocking feature is disabled. ▪ Enabled: Displays additional overclocking options.
Non-Turbo Flex Support	Allows you to enable or disable non-turbo flex support.
Flex Ratio Override	Allows you to set the flex ratio override value.
Extreme Edition	Allows you to disable or choose BIOS or cTDP.
Extreme Edition Core Ratio Limits	Allows you to set the extreme edition core ratio limit.
Override Turbo Settings	Allows you to enable or disable the override turbo settings.
Long Duration PWR Limit	Allows you to set the turbo mode long duration power limit.
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 Options	Allows you to set the turbo mode power limit 2value in watts.
Bus Clock	
Current Frequency	Displays the current bus clock frequency.

Advanced Menu—Performance Options	
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.
GT Overclocking Frequency	Allows you to set the GT Overclocking frequency.
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. ▪ 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. ▪ 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	
Admin Password	Displays if the administrator password is clear or set.
System Password	Displays if the system password is clear or 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.
Admin Password	Allows you to set the administrator password. The administrator password controls access to the system setup utility.
System Password	Allows you to set the system password. The system password controls access to the computer at boot.
Computrace	Allows you to disable, activate, or deactivate 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

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

1. Turn on the computer.
2. Go to **dell.com/support**.
3. If you have your computer's Service Tag, type your computer's Service Tag and click **Submit**.

   If you do not have your computer's Service Tag, click **Detect Service Tag** to allow automatic detection of the Service Tag.

   NOTE: If the Service Tag cannot be detected automatically, select your product under the product categories.
4. Click **Drivers and Downloads**.
5. In the **Operating System** drop-down, select the operating system installed on your computer.
6. Click **BIOS**.
7. Click **Download File** to download the latest version of the BIOS for your computer.
8. On the next page, select **Single-file download** and click **Continue**.
9. Save the file and once the download is complete, navigate to the folder where you saved the BIOS update file.
10. Double-click the BIOS update file icon and follow the instructions on the screen.