

# Dell™ XPS™ L401X Service Manual

Regulatory model: P12G series

Regulatory type: P12G001



# 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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Regulatory model: P12G series

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# Before You Begin

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

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

## Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Plastic scribe
- BIOS executable update program available at [support.dell.com](http://support.dell.com)

## Turning Off Your Computer

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

- 1 Save and close all open files and exit all open programs.
- 2 To shut down the operating system, click **Start**  and then click **Shut Down**.
- 3 Ensure that the computer is turned off. If your computer did not automatically turn off when you shut down the operating system, press and hold the power button until the computer turns off.

# Before Working Inside Your Computer

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

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

6 Disconnect all attached devices from your computer.

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

7 Remove the battery (see "Removing the Battery" on page 13).

8 Turn the computer top-side up, open the display, and press the power button to ground the system board.

 **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.**

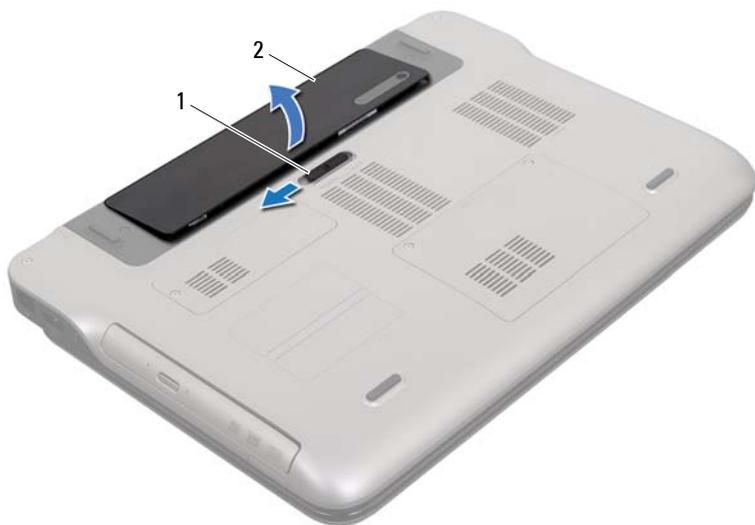


# Battery

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

## Removing the Battery

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Turn the computer over.
- 3 Slide the battery release latch to the side.
- 4 Lift the battery up at an angle and remove it from the battery bay.



- 1 battery release latch    2 battery

## Replacing the Battery

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

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

## Memory Module(s)

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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

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

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

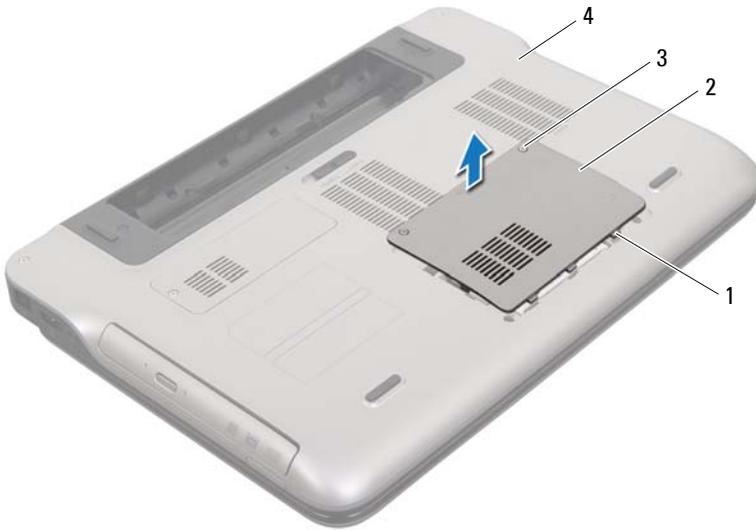
You can increase your computer memory by installing memory modules on the system board. See "Specifications" in the *Setup Guide* that shipped with your computer or at [support.dell.com/manuals](http://support.dell.com/manuals) for information on the type of memory supported by your computer.

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

Your computer has two user-accessible SODIMM connectors.

### Removing the Memory Module(s)

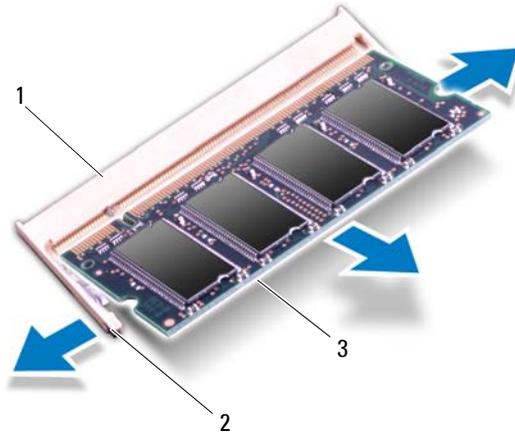
- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Loosen the two captive screws that secure the memory-module cover to the base cover.
- 4 Use your fingertips to pry out the memory-module cover and lift it off the base cover.



- |   |                    |   |                     |
|---|--------------------|---|---------------------|
| 1 | tabs (5)           | 2 | memory-module cover |
| 3 | captive screws (2) | 4 | base cover          |

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

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



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

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

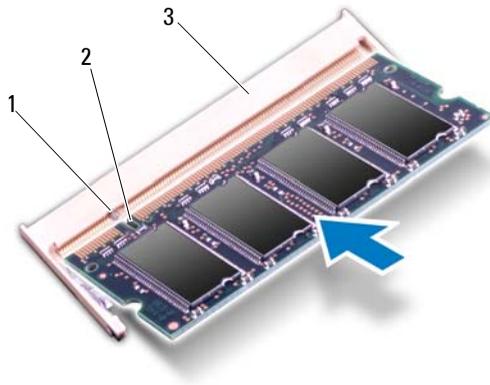
## Replacing the Memory Module(s)

**CAUTION:** If you need to install memory modules in two connectors, install a memory module in the connector labeled "DIMM A" before you install a memory module in the connector labeled "DIMM B".

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the notch in the memory module with the tab in the memory-module connector.

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

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



- 1 tab
- 2 notch
- 3 memory-module connector
- 4 Align the tabs on the memory-module cover with the slots on the base cover and snap the memory-module cover into place.
- 5 Tighten the two captive screws that secure the memory-module cover to the base cover.
- 6 Replace the battery (see "Replacing the Battery" on page 14).
- 7 Connect the AC adapter to your computer and an electrical outlet.
- 8 Turn on the computer.

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

To confirm the amount of memory installed in the computer:

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



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



## Wireless Mini-Card(s)

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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

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

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

 **NOTE:** Dell does not guarantee compatibility or provide support for Mini-Cards from sources other than Dell.

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

Your computer has one full Mini-Card slot and one half Mini-Card slot:

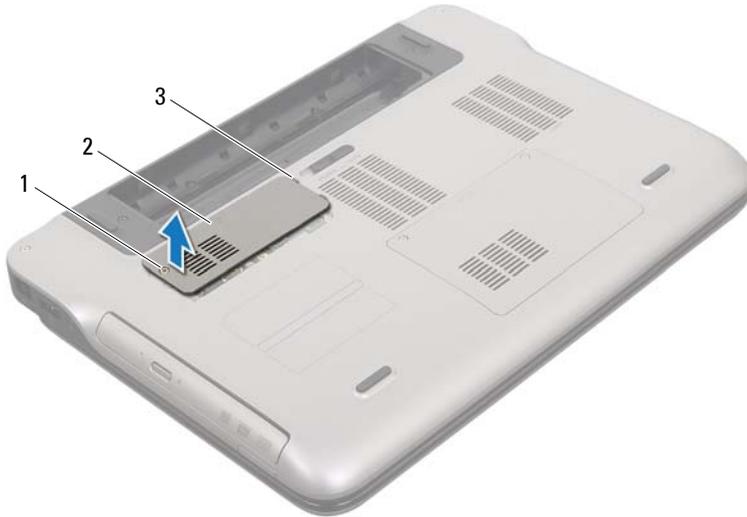
- One full Mini-Card slot — supports Wireless Wide Area Network (WWAN) or TV tuner module.
- One half Mini-Card slot — supports Wireless Local Area Network (WLAN) or Worldwide Interoperability for Microwave Access (WiMax)

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

## Removing the Mini-Card(s)

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Loosen the captive screw that secures the Mini-Card cover to the base cover.

- 4 Pry out the Mini-Card cover using your finger.

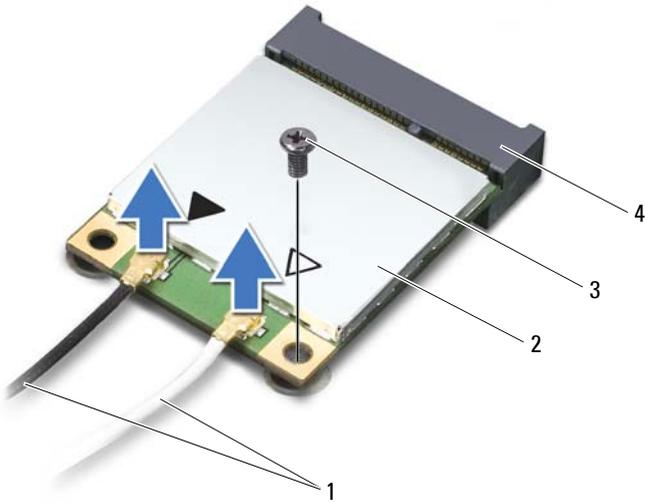


- |   |               |   |                 |
|---|---------------|---|-----------------|
| 1 | captive screw | 2 | Mini-Card cover |
| 3 | tabs (4)      |   |                 |

- 5 Disconnect the antenna cables from the Mini-Card(s).
- 6 Remove the screw that secures the Mini-Card to the system board.

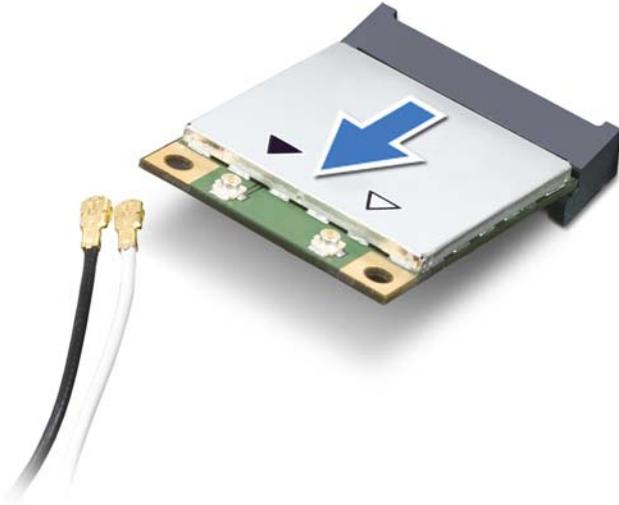


**NOTE:** Your computer can only support either a WWAN Mini-Card or a TV tuner module in the full Mini-Card slot at a time.



- |   |                    |   |                        |
|---|--------------------|---|------------------------|
| 1 | antenna cables (2) | 2 | Mini-Card              |
| 3 | screw              | 4 | system-board connector |

**7** Lift the Mini-Card(s) out of the system-board connector.



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

## Replacing the Mini-Card(s)

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

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

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

△ **CAUTION:** To avoid damage to the Mini-Card, never place cables under the card.

- 3 Insert the Mini-Card connector at a 45-degree angle into the system-board connector.
- 4 Press the other end of the Mini-Card down into the slot on the system board and replace the screw that secures the Mini-Card to the system board.
- 5 Connect the appropriate antenna cables to the Mini-Card you are installing. The following table provides the antenna cable color scheme for the Mini-Cards supported by your computer.

Connectors on the Mini-Card	Antenna Cable Color Scheme
<b>WLAN (2 antenna cables)</b>	
Main WLAN (white triangle)	white with gray stripe
Auxiliary WLAN (black triangle)	black with gray stripe
<b>WWAN (2 antenna cables)</b>	
Main WWAN (white triangle)	white
Auxiliary WWAN (black triangle)	black
<b>TV tuner (1 antenna cable)</b>	black

- 6 Align the tabs on the Mini-Card cover with the slots on the base cover and snap the Mini-Card cover into place.
- 7 Replace the captive screw that secures the Mini-Card cover to the base cover.
- 8 Replace the battery (see "Replacing the Battery" on page 14).



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

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



**NOTE:** If you are installing a communication card from a source other than Dell, you must install the appropriate drivers and utilities.



# Hard Drive

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **WARNING:** If you remove the hard drive from the computer when the drive is hot, *do not touch* the metal housing of the hard drive.

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

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

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

 **CAUTION:** To prevent data loss, turn off your computer (see "Turning Off Your Computer" on page 9) before removing the hard-drive assembly. Do not remove the hard drive while the computer is On or in Sleep state.

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

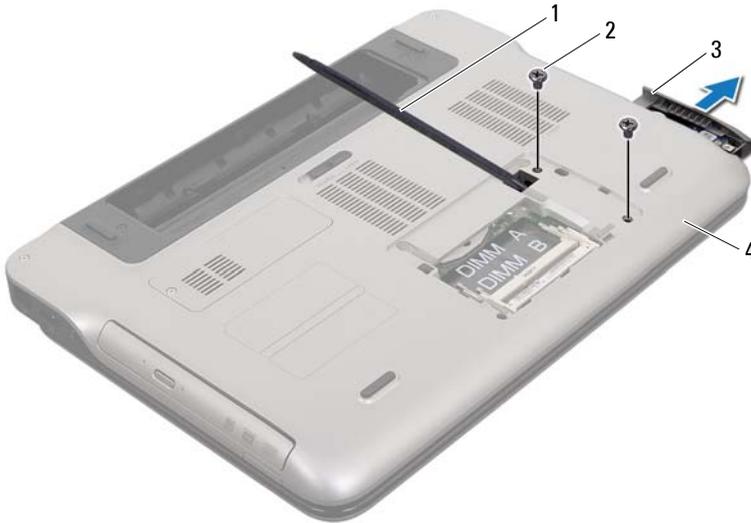
 **NOTE:** Dell does not guarantee compatibility or provide support for hard drives from sources other than Dell.

 **NOTE:** If you are installing a hard drive from a source other than Dell, you need to install an operating system, drivers, and utilities on the new hard drive.

## Removing the Hard Drive

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the two screws that secure the hard drive to the base cover.

- 5 Insert a plastic scribe into the slot on the base cover and push the hard-drive out.
- 6 Slide the hard drive out of the hard-drive bay.



- |                  |              |
|------------------|--------------|
| 1 plastic scribe | 2 screws (2) |
| 3 hard drive     | 4 base cover |

## Replacing the Hard Drive

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the new hard drive from its packaging.  
Save the original packaging for storing or shipping the hard drive.
- 3 Slide the hard drive into the hard-drive bay until it is fully seated.
- 4 Replace the two screws that secure the hard drive to the base cover.
- 5 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).

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



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



# Optical Drive

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

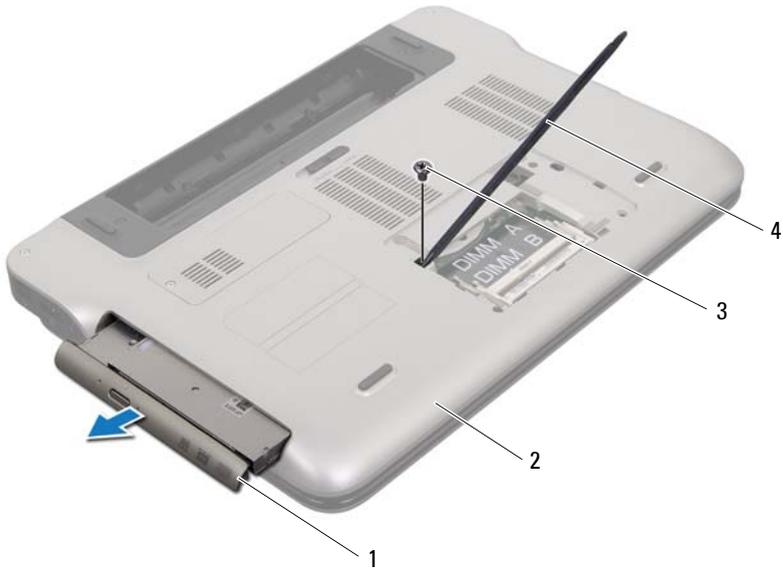
 **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell™ is not covered by your warranty.

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

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

## Removing the Optical Drive

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the screw that secures the optical drive to the base cover.
- 5 Insert a plastic scribe into the slot on the base cover and push the optical drive out.
- 6 Slide the optical drive out of the optical-drive bay.



1 optical drive

2 base cover

3 screw

4 plastic scribe

- 7 Lift and pull the optical-drive bezel to remove it from the optical drive.
- 8 Remove the two screws that secure the optical-drive bracket to the optical drive.
- 9 Remove the optical-drive bracket.



- |   |                       |   |               |
|---|-----------------------|---|---------------|
| 1 | optical-drive bezel   | 2 | optical drive |
| 3 | optical-drive bracket | 4 | screws (2)    |

## Replacing the Optical Drive

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the screw holes on the optical-drive bracket with the screw holes on the optical drive.
- 3 Replace the two screws that secure the optical-drive bracket to the optical drive.
- 4 Snap the optical-drive bezel onto the optical drive.
- 5 Slide the optical drive into the optical-drive bay until it is fully seated.
- 6 Replace the screw that secures the optical drive to the base cover.
- 7 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 8 Replace the battery (see "Replacing the Battery" on page 14).



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

## Palm-Rest Assembly

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

## Removing the Palm-Rest Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 5 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 6 Remove the seven screws that secure the palm-rest assembly to the base cover.



1 base cover

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

8 Using your fingertip, gently push the tab to release the palm-rest assembly.



1 tab

2 palm-rest assembly

- 9 Using your fingertips, gently ease the palm-rest assembly from the computer base.
- 10 Without pulling hard on the palm-rest assembly, place it away from the display as shown in the illustration below.

- 11 Lift the connector latch and pull the pull-tab to disconnect the touch-pad cable from the system-board connector.
  - 12 Disconnect the control-strip cable from the system-board connector.
- ⚠ CAUTION: Carefully separate the palm-rest assembly from the computer base to avoid damage to the palm-rest assembly.**
- 13 Lift the palm-rest assembly off the computer base.



- |                       |                             |
|-----------------------|-----------------------------|
| 1 control-strip cable | 2 top cover                 |
| 3 tabs (3)            | 4 palm-rest assembly        |
| 5 pull tab            | 6 touch-pad cable connector |

## Replacing the Palm-Rest Assembly

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

- 2 Connect the control-strip cable to the system-board connector.
- 3 Slide the touch-pad cable into the system-board connector and press down on the connector latch to secure the cable.
- 4 Align the three tabs on the palm-rest assembly with the slots on the top cover and gently snap the palm-rest assembly into place.
- 5 Close the display and turn the computer over.
- 6 Replace the seven screws that secure the palm-rest assembly to the base cover.
- 7 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 8 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 9 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 10 Replace the battery (see "Replacing the Battery" on page 14).



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



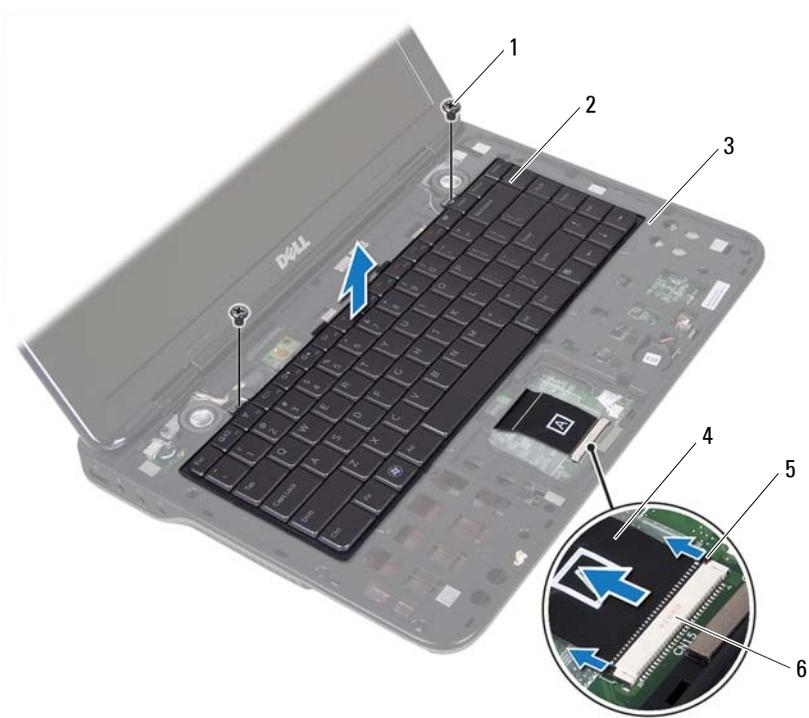
# Keyboard

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

## Removing the Keyboard

- 1 Follow the instructions in "Before You Begin" on page 9.
  - 2 Remove the battery (see "Removing the Battery" on page 13).
  - 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
  - 4 Remove the hard drive (see "Removing the Hard Drive" on page 27).
  - 5 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
  - 6 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
  - 7 Remove the two screws that secure the keyboard to the top cover.
  - 8 Push the connector tabs up and disconnect the keyboard cable from the system-board connector.
-  **CAUTION:** The keycaps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Be careful when removing and handling the keyboard.

**CAUTION:** Be extremely careful when removing and handling the keyboard. Failure to do so could result in scratching the display panel.



- |   |                    |   |                        |
|---|--------------------|---|------------------------|
| 1 | screws (2)         | 2 | keyboard               |
| 3 | top cover          | 4 | keyboard cable         |
| 5 | connector tabs (2) | 6 | system-board connector |

**9** Without pulling hard on the keyboard, carefully lift the keyboard and slide the keyboard tabs out of the slots on the top cover.

- 10 Note the routing of the keyboard cable and remove the cable from the routing guide on the top cover.
- 11 Push the connector tabs up and pull the pull-tab to disconnect the keyboard backlight cable from the system-board connector.



- |   |                          |   |                    |
|---|--------------------------|---|--------------------|
| 1 | keyboard                 | 2 | tabs (4)           |
| 3 | top cover                | 4 | connector tabs (2) |
| 5 | keyboard backlight cable |   |                    |

- 12 Lift the keyboard off the top cover.

## Replacing the Keyboard

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

- 2 Slide the keyboard backlight cable into the system-board connector and press the connector tabs into the connector to secure the cable.
- 3 Route the keyboard cable through the routing guide on the top cover.
- 4 Slide the keyboard cable into the system-board connector and press the connector tabs into the connector to secure the cable.
- 5 Slide the tabs on the keyboard into the slots on the top cover and lower the keyboard into place.
- 6 Replace the two screws that secure the keyboard to the top cover.
- 7 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 8 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 9 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 10 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 11 Replace the battery (see "Replacing the Battery" on page 14).



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

# Power-Button Board

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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

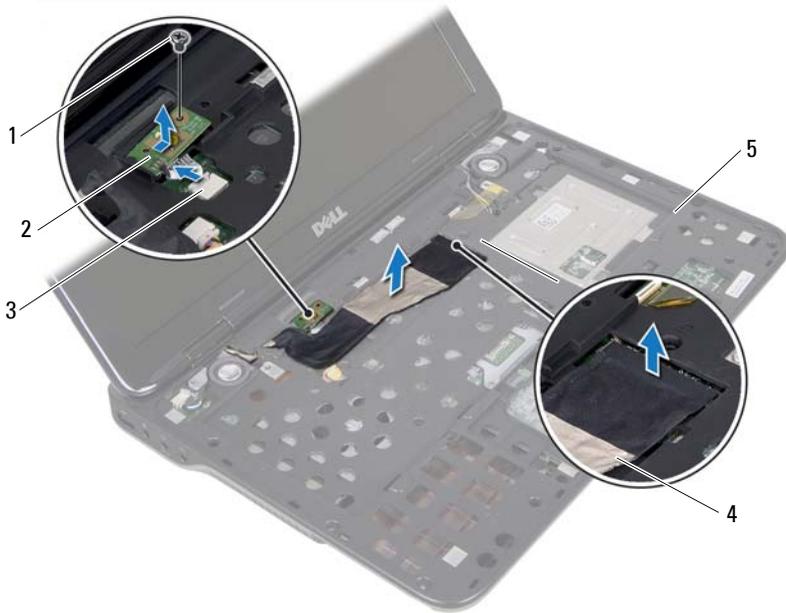
 **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

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

## Removing the Power-Button Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 5 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 6 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 7 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 8 Disconnect the display cable from the system-board connector.
- 9 Move the display cable away from the power-button board cable.
- 10 Disconnect the power-button board cable from the system-board connector.
- 11 Remove the screw that secures the power-button board to the top cover.

12 Lift the power-button board off the top cover.



- |   |                        |   |                    |
|---|------------------------|---|--------------------|
| 1 | screw                  | 2 | power-button board |
| 3 | system-board connector | 4 | display cable      |
| 5 | top cover              |   |                    |

## Replacing the Power-Button Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Use the alignment post to place the power-button board on the top cover.
- 3 Replace the screw that secures the power-button board to the top cover.
- 4 Connect the power button-board cable to the system-board connector.

- 5 Connect the display cable to the system-board connector.
- 6 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 7 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 8 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 9 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 10 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 11 Replace the battery (see "Replacing the Battery" on page 14).



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



## Coin-Cell Battery

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-  **CAUTION:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell™ is not covered by your warranty.
-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery" on page 13) before working inside the computer.

### Removing the Coin-Cell Battery

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 5 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 6 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 7 Disconnect the coin-cell battery cable from the system-board connector.
- 8 The coin-cell battery is glued to a slot on the top cover. Using a plastic scribe, gently pry the coin-cell battery off the slot.



- 1 coin-cell battery      2 coin-cell battery cable

## Replacing the Coin-Cell Battery

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Connect the coin-cell battery cable to the system-board connector.
- 3 With the adhesive side of the coin-cell battery facing down, press the coin-cell battery on the slot on the top cover.
- 4 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 5 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 6 Replace the hard drive (see "Replacing the Hard Drive" on page 28).

- 7 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 8 Replace the battery (see "Replacing the Battery" on page 14).



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



# Display

-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
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-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery" on page 13) before working inside the computer.

## Display Assembly

### Removing the Display Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the two screws that secure the display assembly to the base cover.



1 base cover

**CAUTION:** Be extremely careful when opening the display to prevent damaging the display assembly.

- 10 Turn the computer over and open the display as far as possible.
- 11 Disconnect the speaker cable from the system-board connector.
- 12 Disconnect the display cable from the system-board connector.
- 13 Note the routing of the display cable and remove the cable from the routing guide.
- 14 Note the routing of the Mini-Card antenna cables and slide them up through the slot on the computer base.
- 15 Remove the four screws that secure the display assembly to the top cover.
- 16 Lift the display assembly off the computer base.



- |   |                         |   |               |
|---|-------------------------|---|---------------|
| 1 | display assembly        | 2 | screws (4)    |
| 3 | speaker cable           | 4 | display cable |
| 5 | Mini-Card cable routing |   |               |

## Replacing the Display Assembly

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

- 2 Place the display assembly in position and replace the four screws that secure the display assembly to the top cover.
- 3 Route the Mini-Card antenna cables through the slot on the computer base.
- 4 Route the display cable through the routing guide.
- 5 Connect the display cable to the system-board connector.
- 6 Connect the speaker cable to the system-board connector.
- 7 Replace the two screws that secure the display assembly to the base cover.
- 8 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 9 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 10 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 11 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 12 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 13 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 14 Replace the battery (see "Replacing the Battery" on page 14).



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

## Display Bezel

### Removing the Display Bezel



**CAUTION: The display bezel is extremely fragile. Be careful when removing it to prevent damaging the bezel.**

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 3 Using your fingertips, carefully pry up the inside edge of the display bezel.
- 4 Lift the display bezel off the display assembly.



- 1 display bezel

## Replacing the Display Bezel

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the display bezel with the display back cover, and gently snap it into place.
- 3 Replace the display assembly (see "Replacing the Display Assembly" on page 55).

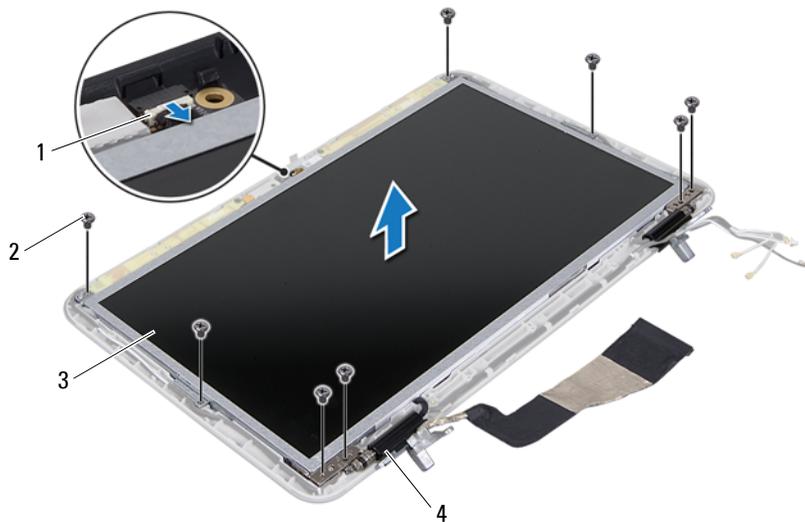


**CAUTION:** Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.

# Display Panel

## Removing the Display Panel

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 3 Remove the display bezel (see "Removing the Display Bezel" on page 56).
- 4 Disconnect the camera cable from the connector on the camera module.
- 5 Remove the eight screws that secure the display panel to the display back cover.
- 6 Note the routing of the Mini-Card antenna cables and remove them from the routing guides on the hinge.
- 7 Note the routing of the display cable and remove it from the routing guide on the hinge.
- 8 Lift the display panel off the display back cover.



- |   |                        |   |            |
|---|------------------------|---|------------|
| 1 | camera cable connector | 2 | screws (8) |
| 3 | display                | 4 | hinges (2) |

## Replacing the Display Panel

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Place the display panel over the display back cover.
- 3 Connect the camera cable to the connector on the camera module.
- 4 Route the display cable through the routing guide on the hinge.
- 5 Route the Mini-Card antenna cables through the routing guide on the hinge.
- 6 Replace the eight screws that secure the display panel to the display back cover.
- 7 Replace the display bezel (see "Replacing the Display Bezel" on page 57).

- 8 Replace the display assembly (see "Replacing the Display Assembly" on page 55).

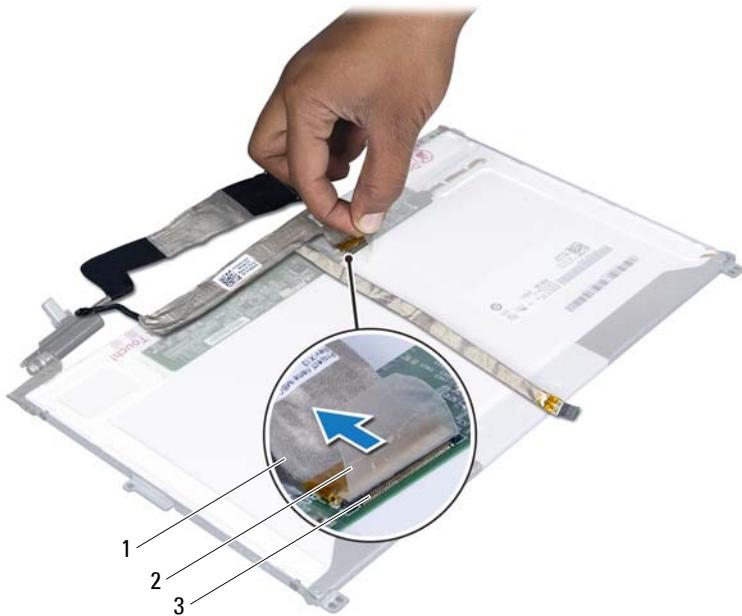


**CAUTION: Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.**

## Display Cable

### Removing the Display Cable

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 3 Remove the display bezel (see "Removing the Display Bezel" on page 56).
- 4 Remove the display panel (see "Removing the Display Panel" on page 58).
- 5 Turn the display panel over and place it on a clean surface.
- 6 Pull the pull-tab to disconnect the display cable from the connector on the display panel.



- 1 display cable
- 2 pull tab
- 3 display-cable connector

7 Gently peel off the display cable from the display panel.

### Replacing the Display Cable

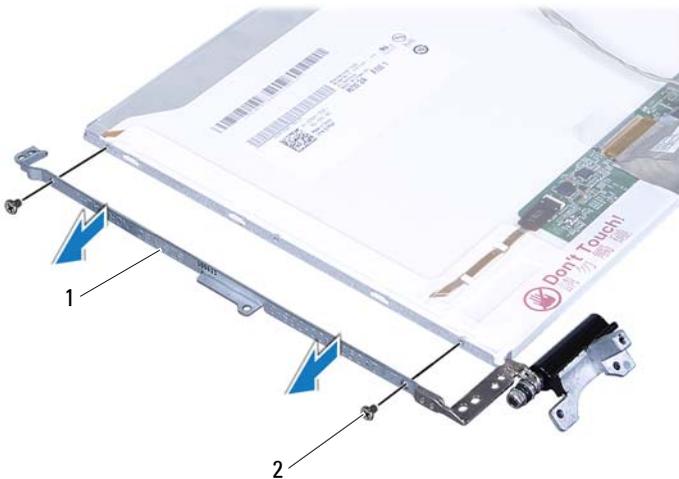
- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Adhere the display cable along the edge of the display panel.
- 3 Connect the display cable to the connector on the display panel.
- 4 Replace the display panel (see "Replacing the Display Panel" on page 59).
- 5 Replace the display bezel (see "Replacing the Display Bezel" on page 57).

- 6 Replace the display assembly ("Replacing the Display Assembly" on page 55).

## Display-Panel Brackets

### Removing the Display-Panel Brackets

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 3 Remove the display bezel (see "Removing the Display Bezel" on page 56).
- 4 Remove the display panel (see "Removing the Display Panel" on page 58).
- 5 Remove the four screws (two on each side) that secure the display-panel brackets to the display panel.
- 6 Remove the display-panel brackets off the display panel.



- 1 display panel brackets (2)      2 screws (4)

## Replacing the Display-Panel Brackets

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Place the display-panel brackets in position.
- 3 Replace the four screws (two on each side) that secure the display-panel brackets to the display panel.
- 4 Replace the display panel (see "Replacing the Display Panel" on page 59).
- 5 Replace the display bezel (see "Replacing the Display Bezel" on page 57).
- 6 Replace the display assembly ("Replacing the Display Assembly" on page 55).



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



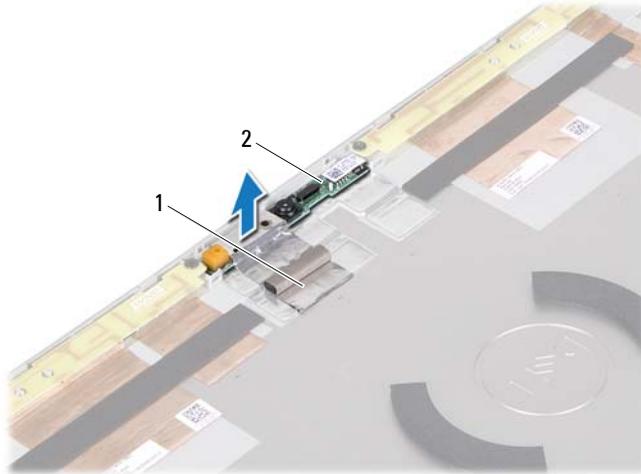
# Camera Module

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

## Removing the Camera Module

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 10 Remove the display bezel (see "Removing the Display Bezel" on page 56).
- 11 Remove the display panel (see "Removing the Display Panel" on page 58).

- 12 Gently peel the aluminum foil that secures the camera module to the display back cover.
- 13 Remove the camera module from the display back cover.



1 aluminum foil

2 camera module

## Replacing the Camera Module

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Use the alignment posts on the display back cover to place the camera module in position.
- 3 Adhere the aluminum foil over the camera module.
- 4 Replace the display panel (see "Replacing the Display Panel" on page 59).
- 5 Replace the display bezel (see "Replacing the Display Bezel" on page 57).
- 6 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 7 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 8 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).

- 9 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 10 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 11 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 12 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 13 Replace the battery (see "Replacing the Battery" on page 14).



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



## Top Cover

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-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery" on page 13) before working inside the computer.

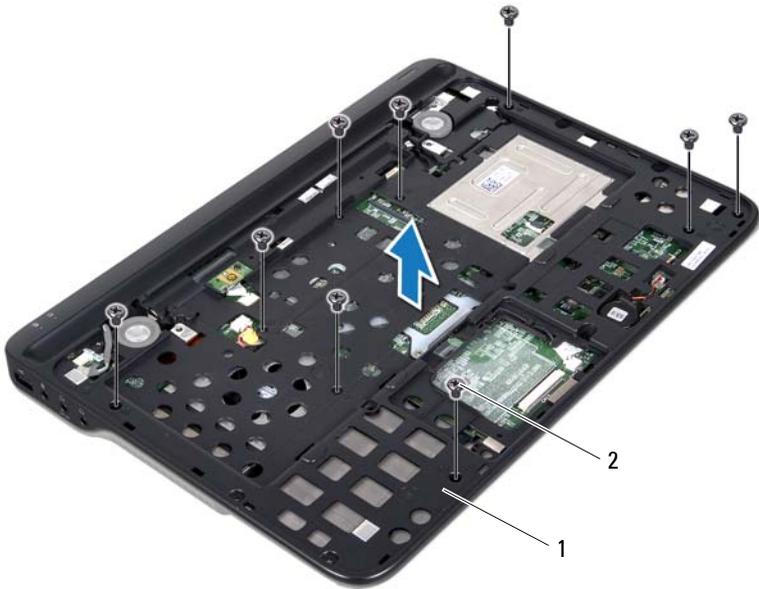
## Removing the Top Cover

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove any installed card or blank from the Media Card Reader slot.
- 3 Remove the battery (see "Removing the Battery" on page 13).
- 4 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 5 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 6 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 7 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 8 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 9 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 10 Remove the display assembly (see "Removing the Display Assembly" on page 53).

- 11** Remove the power-button board (see "Removing the Power-Button Board" on page 45).
- 12** Remove the coin-cell battery (see "Removing the Coin-Cell Battery" on page 49).
- 13** Remove the four screws that secure the top-cover assembly to the base cover.



- 14** Turn the computer over.
- 15** Make note of the speakers cable routing.
- 16** Remove the nine screws that secure the top-cover assembly to the base cover.
- 17** Using your fingertips, gently ease the top-cover assembly from the base cover.
- 18** Lift the top cover assembly off the base cover.



1 top-cover assembly    2 screws (9)

- 19 Remove the Bluetooth-card (see "Removing the Bluetooth Card" on page 93).
- 20 Remove the daughter board (see "Removing the Daughter Board" on page 89).
- 21 Remove the AC-adapter connector (see "Removing the AC-Adapter Connector" on page 97).
- 22 Remove the processor fan and heat-sink assembly (see "Removing the Processor Fan and Heat-Sink Assembly" on page 79).
- 23 Remove the processor module (see "Removing the Processor Module" on page 85).

- 24 Remove the system board (see "Removing the System Board" on page 101).

## Replacing the Top Cover

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Replace the system board (see "Replacing the System Board" on page 104)
- 3 Replace the processor module (see "Replacing the Processor Module" on page 87).
- 4 Replace the processor fan and heat-sink assembly (see "Replacing the Processor Fan and Heat-Sink Assembly" on page 82).
- 5 Replace the AC-adaptor connector (see "Replacing the AC-Adapter Connector" on page 98).
- 6 Replace the daughter board (see "Replacing the Daughter Board" on page 91).
- 7 Replace the Bluetooth-card (see "Replacing the Bluetooth Card" on page 94).
- 8 Route the speakers cable through the routing guide.
- 9 Align the tabs on the top cover with the slots on the base cover and snap the top-cover assembly onto the base cover.
- 10 Replace the nine screws that secure the top-cover assembly to the base cover.
- 11 Turn the computer over and replace the four screws that secure the top-cover assembly to the base cover.
- 12 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 13 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 14 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 15 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 16 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 17 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).

- 18 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 19 Replace any blank or card you removed from the Media Card Reader slot.
- 20 Replace the battery (see "Replacing the Battery" on page 14).



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



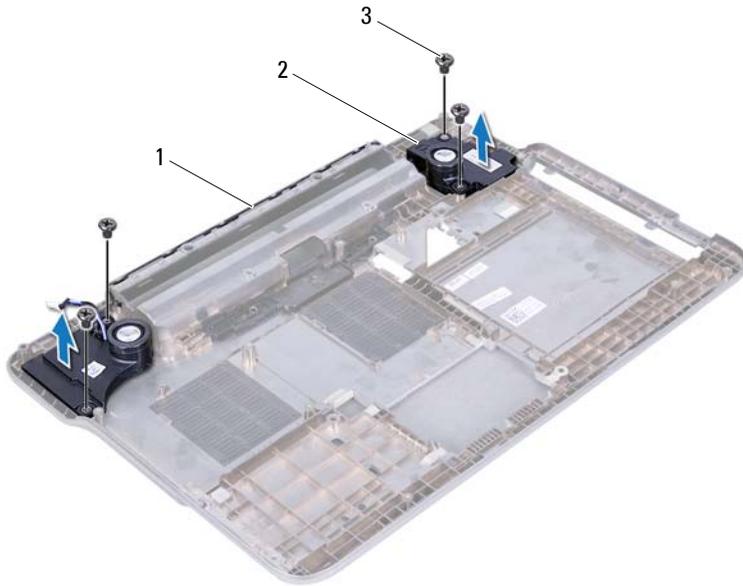
# Speakers

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-  **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).
-  **CAUTION:** To help prevent damage to the system board, remove the main battery (see "Removing the Battery" on page 13) before working inside the computer.

## Removing the Speakers

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 10 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.

- 11 Make note of the speakers cable routing and remove the cable from the routing guides.
- 12 Remove the four screws (two on each speaker) that secure the speakers to the base cover.
- 13 Lift the speakers along with the cable off the base cover.



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

## Replacing the Speaker

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Route the speakers cable through the routing guides
- 3 Align the screw holes on the speakers with the screw holes on the base cover.

- 4 Replace the four screws (two on each speaker) that secure the speakers to the base cover.
- 5 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72.
- 6 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 7 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 8 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 9 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 10 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 11 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 12 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 13 Replace the battery (see "Replacing the Battery" on page 14).



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



# Processor Fan and Heat-Sink Assembly

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **WARNING:** If you remove the processor fan and heat-sink assembly from the computer when the heat sink is hot, *do not touch* the metal housing of the processor fan and heat-sink assembly.

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

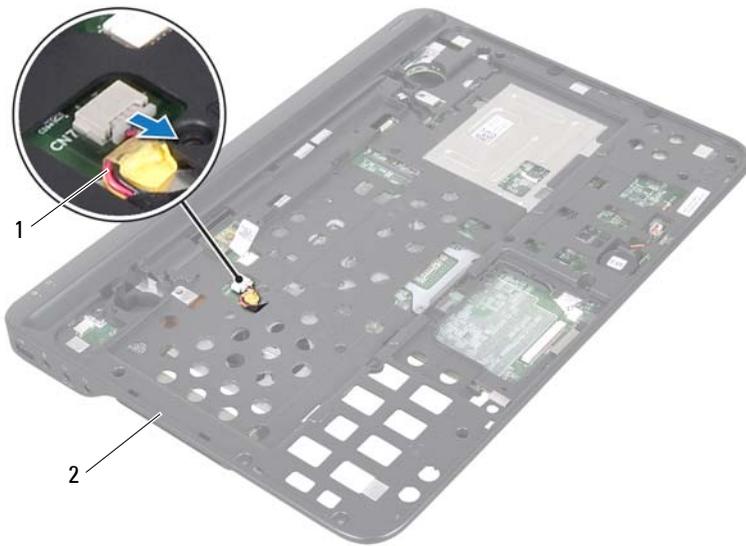
 **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

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

## Removing the Processor Fan and Heat-Sink Assembly

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).

- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 10 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.
- 11 Turn the top-cover assembly over.
- 12 Disconnect the processor-fan cable from the system-board connector and turn the top-cover assembly over.

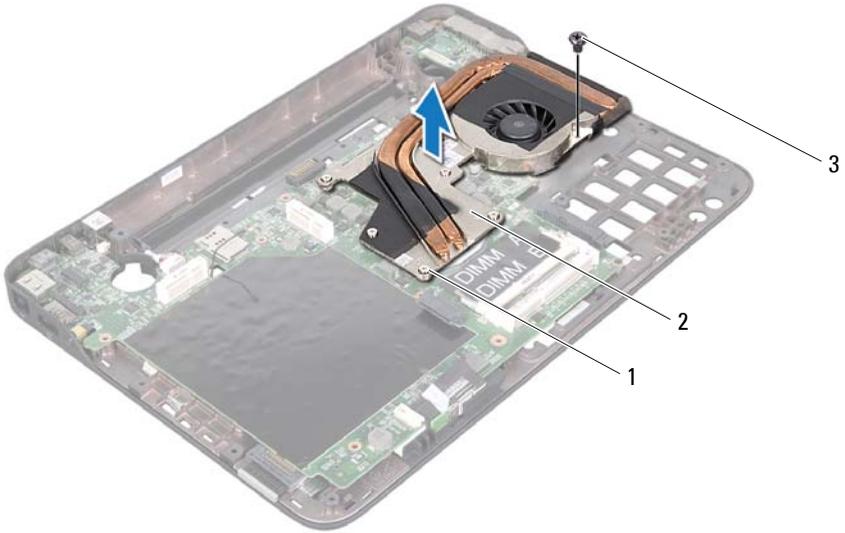


1 processor-fan cable

2 top-cover assembly

- 13 Remove the screw that secures the processor fan and heat-sink assembly to the top cover.

- 14** In sequential order (indicated on the processor heat-sink), loosen the five captive screws that secure the processor fan and heat-sink assembly to the system board.
- 15** Make note of the processor-fan cable routing and carefully lift the processor fan and heat-sink assembly away from the top-cover assembly.



1 captive screws (5)

2 processor fan and heat-sink assembly

3 screw

# Replacing the Processor Fan and Heat-Sink Assembly



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

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Clean the thermal grease from the bottom of the processor fan and heat-sink assembly and reapply it.
- 3 Route the processor-fan cable through the slot in the top cover.
- 4 Align the five captive screws on the processor fan and heat sink assembly with the screw holes on the system board and tighten the screws in sequential order (indicated on the processor heat-sink).
- 5 Replace the screw that secures the processor fan and heat-sink assembly to the top-cover assembly.
- 6 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72
- 7 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 8 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 9 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 10 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 11 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 12 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 13 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 14 Replace the battery (see "Replacing the Battery" on page 14).



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





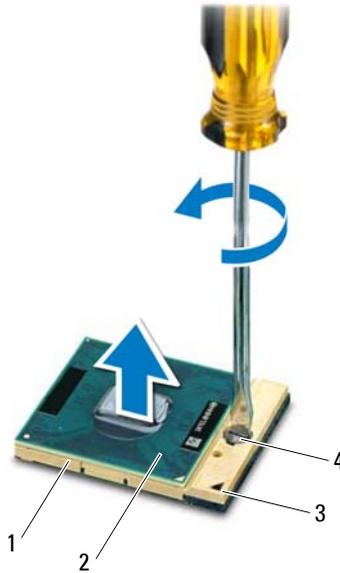
# Processor Module

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

## Removing the Processor Module

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 10 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.

- 11 Turn the top-cover assembly over.
  - 12 Remove the processor fan and heat-sink assembly (see "Removing the Processor Fan and Heat-Sink Assembly" on page 79).
- △ **CAUTION:** To prevent intermittent contact between the ZIF-socket cam screw and the processor when removing or replacing the processor, press to apply slight pressure to the centre of the processor while turning the cam screw.
- △ **CAUTION:** To avoid damage to the processor, hold the screwdriver so that it is perpendicular to the processor when turning the cam screw.
- 13 To loosen the ZIF socket, use a small, flat-blade screwdriver and rotate the ZIF-socket cam screw counterclockwise until it comes to the cam stop.



- |   |              |   |                      |
|---|--------------|---|----------------------|
| 1 | ZIF socket   | 2 | processor module     |
| 3 | pin-1 corner | 4 | ZIF-socket cam screw |

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

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

- 14 Lift the processor module off the ZIF socket.

## Replacing the Processor Module

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

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the pin-1 corner of the processor module with the pin-1 corner of the ZIF socket.

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

- 3 Place the processor module lightly in the ZIF socket and ensure that the processor module is positioned correctly.

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

- 4 Tighten the ZIF socket by turning the cam screw clockwise to secure the processor module to the system board.
- 5 Replace the processor fan and heat-sink assembly (see "Replacing the Processor Fan and Heat-Sink Assembly" on page 82).
- 6 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72.
- 7 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 8 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 9 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 10 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.

- 11 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 12 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 13 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 14 Replace the battery (see "Replacing the Battery" on page 14).



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

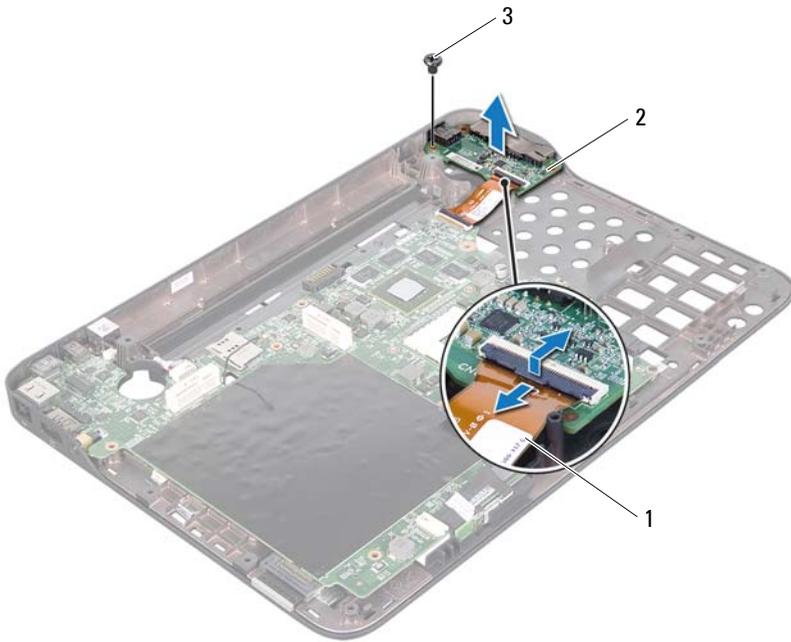
# Daughter Board

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

## Removing the Daughter Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 10 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.

- 11 Turn the top-cover assembly over.
- 12 Remove the processor fan and heat-sink assembly (see "Removing the Processor Fan and Heat-Sink Assembly" on page 79).
- 13 Lift the connector latch and disconnect the daughter-board cable from the connector on the daughter board.
- 14 Remove the screw that secures the daughter board to the top cover.
- 15 Carefully ease the connectors on the daughter board out of the slots in the top cover, and lift the daughter board out of the top cover.



1 daughter-board cable  
3 screw

2 daughter board

## Replacing the Daughter Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the connectors on the daughter board with the slots on the top cover and place it on the top cover.
- 3 Replace the screw that secures the daughter board to the top cover.
- 4 Slide the daughter-board cable into the connector on the daughter board and press the connector latch down to secure the cable.
- 5 Replace the processor fan and heat-sink assembly (see "Replacing the Processor Fan and Heat-Sink Assembly" on page 82).
- 6 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72.
- 7 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 8 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 9 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 10 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 11 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 12 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 13 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 14 Replace the battery (see "Replacing the Battery" on page 14).



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



# Internal Card With Bluetooth<sup>®</sup> Wireless Technology

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage at [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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

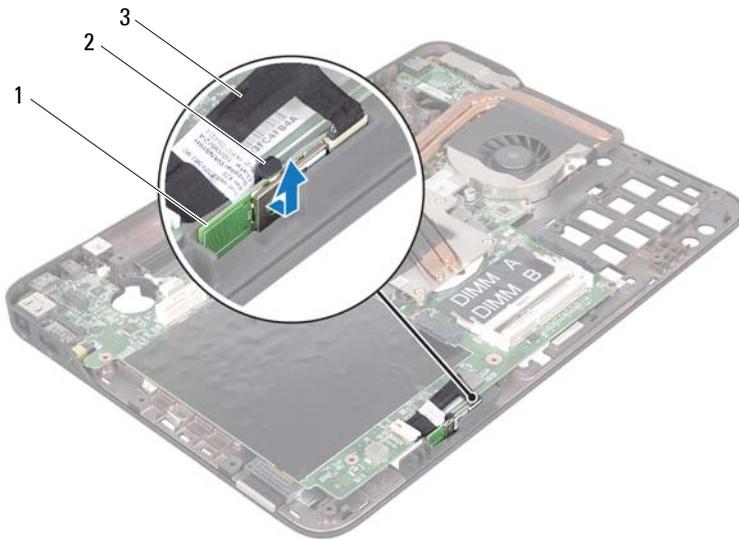
 **CAUTION:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface (such as a connector on your computer).

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

## Removing the Bluetooth Card

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).

- 10 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.
- 11 Turn the top-cover assembly over.
- 12 Disconnect the Bluetooth-card cable from the connector on the Bluetooth card.
- 13 Release the Bluetooth card from the tab on the top cover.
- 14 Lift the Bluetooth card off the top cover.



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

## Replacing the Bluetooth Card

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

- 2 Slide the Bluetooth card into the slot on the top cover and secure it in place.
- 3 Connect the Bluetooth-card cable to the connector on the Bluetooth card.
- 4 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72.
- 5 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 6 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 7 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 8 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 9 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 10 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 11 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 12 Replace the battery (see "Replacing the Battery" on page 14).



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



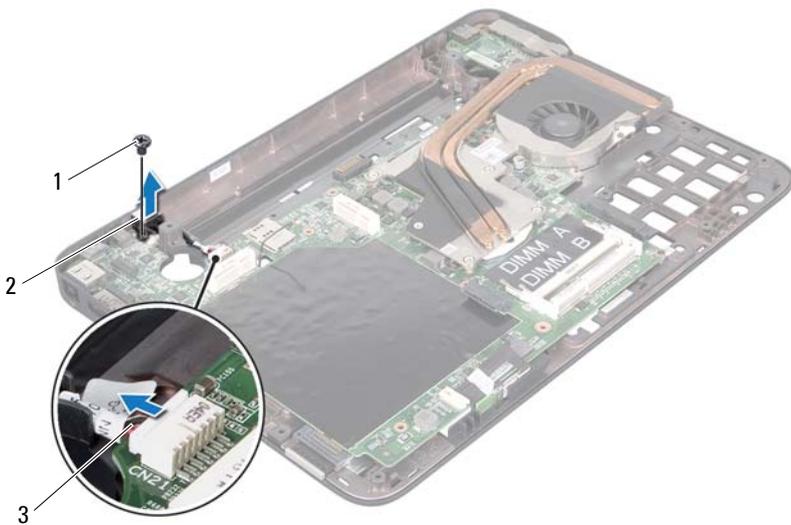
# AC-Adapter Connector

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

## Removing the AC-Adapter Connector

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove the battery (see "Removing the Battery" on page 13).
- 3 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 4 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 5 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 6 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 7 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 8 Remove the keyboard (see "Removing the Keyboard" on page 41).
- 9 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 10 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.

- 11 Turn the top-cover assembly over.
- 12 Disconnect the AC-adapter connector cable from the system-board connector.
- 13 Make note of the AC-adapter connector cable routing and remove the cable from the routing guide.
- 14 Remove the screw that secures the AC-adapter connector to the top cover.
- 15 Lift the AC-adapter connector off the top cover.



- |   |                            |   |                      |
|---|----------------------------|---|----------------------|
| 1 | screw                      | 2 | AC adapter connector |
| 3 | AC-adapter connector cable |   |                      |

## Replacing the AC-Adapter Connector

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the screw hole on the AC-adapter connector with the screw hole on the top cover.

- 3 Replace the screw that secures the AC-adapter connector to the top cover.
- 4 Route the AC-adapter connector cable through the routing guide.
- 5 Connect the AC-adapter connector cable to the system-board connector.
- 6 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72.
- 7 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 8 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 9 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 10 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 11 Replace the hard drive (see "Replacing the Hard Drive" on page 28).
- 12 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
- 13 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
- 14 Replace the battery (see "Replacing the Battery" on page 14).



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



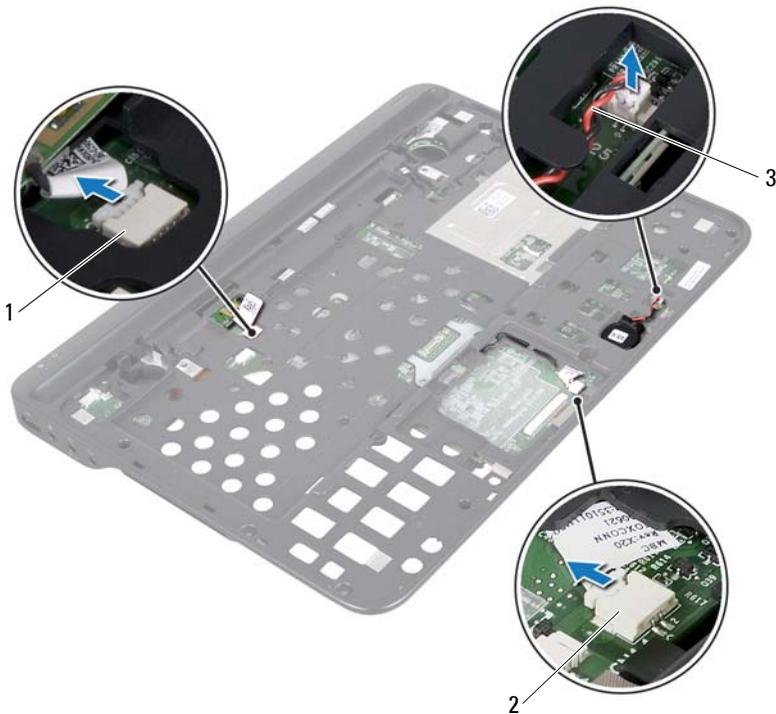
## System Board

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

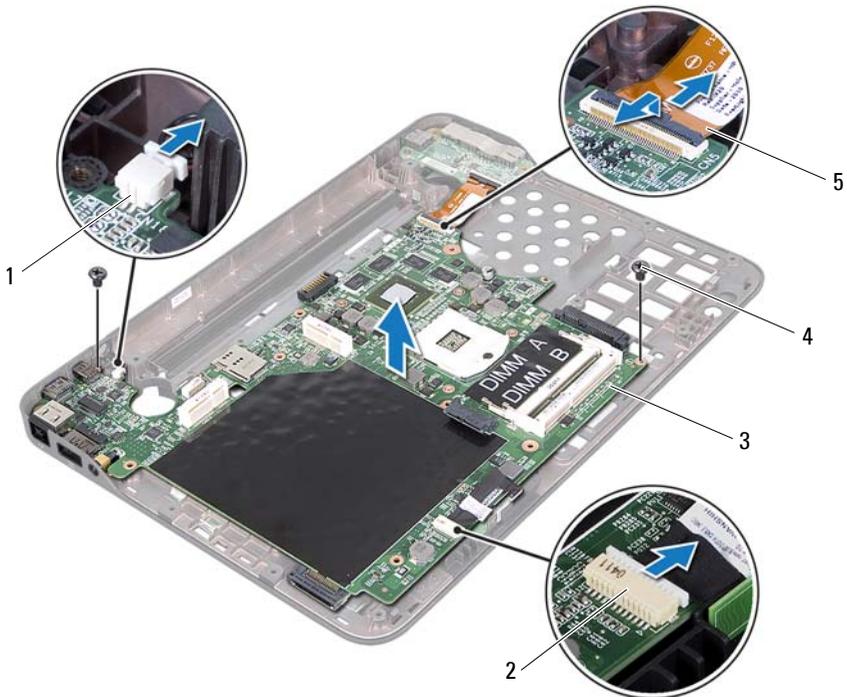
## Removing the System Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Remove any installed card or blank from the Media Card Reader slot.
- 3 Remove the battery (see "Removing the Battery" on page 13).
- 4 Remove the memory module(s) (see "Removing the Memory Module(s)" on page 15).
- 5 Remove the Mini-Card(s) (see "Removing the Mini-Card(s)" on page 21).
- 6 Remove the hard drive (see "Removing the Hard Drive" on page 27).
- 7 Follow the instructions from step 4 to step 6 in "Removing the Optical Drive" on page 31.
- 8 Remove the palm-rest assembly (see "Removing the Palm-Rest Assembly" on page 35).
- 9 Remove the keyboard (see "Removing the Keyboard" on page 41).

- 10 Remove the display assembly (see "Removing the Display Assembly" on page 53).
- 11 Disconnect the power-button board cable, coin-cell battery cable, and touch-pad status light cable from their connectors on the system board.
- 12 Follow the instructions from step 13 to step 18 in "Removing the Top Cover" on page 69.
- 13 Remove the processor fan and heat-sink assembly (see "Removing the Processor Fan and Heat-Sink Assembly" on page 79).
- 14 Remove the processor module (see "Removing the Processor Module" on page 85).



- 1 power-button board cable connector
  - 2 touch-pad status light cable connector
  - 3 coin-cell battery cable
  - 4 touch-pad status light cable connector
  - 5 touch-pad status light cable connector
- 15 Remove the AC-adapter connector (see "Removing the AC-Adapter Connector" on page 97).
  - 16 Disconnect the Bluetooth-card cable, logo-light cable, and daughter-board cable from their connectors on the system board.
  - 17 Remove the two screws that secure the system board to the top cover.



- |   |                            |   |                                |
|---|----------------------------|---|--------------------------------|
| 1 | logo-light cable connector | 2 | Bluetooth-card cable connector |
| 3 | system board               | 4 | screws (2)                     |
| 5 | daughter-board cable       |   |                                |

- 18** Carefully ease the connectors on the system board out of the slots in the top cover, and lift the system board off the top cover.

## Replacing the System Board

- 1 Follow the instructions in "Before You Begin" on page 9.
- 2 Align the connectors on the system board with the slots on the top cover and place it on the top cover.
- 3 Replace the two screws that secure the system board to the top cover.
- 4 Connect the Bluetooth-card cable, logo-light cable, and daughter-board cable to their connectors on the system board.
- 5 Replace the AC-adaptor connector (see "Replacing the AC-Adaptor Connector" on page 98).
- 6 Replace the processor module (see "Replacing the Processor Module" on page 87).
- 7 Replace the processor fan and heat-sink assembly (see "Replacing the Processor Fan and Heat-Sink Assembly" on page 82).
- 8 Follow the instructions from step 9 to step 11 in "Replacing the Top Cover" on page 72.
- 9 Connect the Bluetooth-card cable, logo-light cable, and daughter-board cable to their connectors on the system board.
- 10 Replace the display assembly (see "Replacing the Display Assembly" on page 55).
- 11 Replace the keyboard (see "Replacing the Keyboard" on page 43).
- 12 Replace the palm-rest assembly (see "Replacing the Palm-Rest Assembly" on page 38).
- 13 Follow the instructions from step 5 to step 6 in "Replacing the Optical Drive" on page 33.
- 14 Replace the hard drive (see "Replacing the Hard Drive" on page 28).

- 15 Replace the Mini-Card(s) (see "Replacing the Mini-Card(s)" on page 24).
  - 16 Replace the memory module(s) (see "Replacing the Memory Module(s)" on page 17).
  - 17 Replace the battery (see "Replacing the Battery" on page 14).
  - 18 Replace any blank or card you removed from the Media Card Reader slot.
-  **CAUTION:** Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.
- 19 Turn on the computer.
-  **NOTE:** After you have replaced the system board, enter the computer Service Tag into the BIOS of the replacement system board.
- 20 Enter the service tag (see "Entering the Service Tag in the BIOS" on page 105).

## Entering the Service Tag in the BIOS

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



# Flashing the BIOS

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

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



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

If you have your computer's Service Tag:

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

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

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



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

- e Click **Confirm**.
- 4 A list of results appear on the screen. Click **BIOS**.
- 5 Click **Download Now** to download the latest BIOS file. The **File Download** window appears.
- 6 Click **Save** to save the file on your desktop. The file downloads to your desktop.
- 7 Click **Close** if the **Download Complete** window appears. The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.

- 8 Double-click the file icon on the desktop and follow the instructions on the screen.