

# **Alienware M18x R2**

# **Owner's Manual**

**Computer model:** M18x R2  
**Regulatory model:** P12E  
**Regulatory type:** P12E002



# 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.

---

**Information in this document is subject to change without notice.  
© 2012 Dell Inc. All rights reserved.**

Reproduction of these materials in any manner whatsoever without the written permission of Dell Inc. is strictly forbidden.

Trademarks used in this text: Alienware® is a registered trademark of Alienware Corporation; Dell™ is a trademark of Dell Inc.; Microsoft®, Windows®, and the Windows start button logo are either trademarks or registered trademarks of Microsoft corporation in the United States and/or other countries; Bluetooth® is a registered trademark owned by Bluetooth SIG, Inc. and is used by Dell under license.

Other trademarks and trade names may be used in this document to refer to either the entities claiming the marks and names or their products. Dell Inc. disclaims any proprietary interest in trademarks and trade names other than its own.

# Contents

<b>1</b>	<b>Before You Begin</b>	<b>9</b>
	Turn Off Your Computer and Connected Devices	9
	Safety Instructions	9
	Recommended Tools	10
<b>2</b>	<b>After Working Inside Your Computer</b>	<b>11</b>
<b>3</b>	<b>Removing the Battery Pack</b>	<b>12</b>
	Procedure	12
<b>4</b>	<b>Replacing the Battery Pack</b>	<b>13</b>
	Procedure	13
	Postrequisites	13
<b>5</b>	<b>Removing the Base Cover</b>	<b>14</b>
	Prerequisites	14
	Procedure	14
<b>6</b>	<b>Replacing the Base Cover</b>	<b>15</b>
	Procedure	15
	Postrequisites	15
<b>7</b>	<b>Removing the mSATA Card</b>	<b>16</b>
	Prerequisites	16
	Procedure	16
<b>8</b>	<b>Replacing the mSATA Card</b>	<b>17</b>
	Procedure	17
	Postrequisites	17
<b>9</b>	<b>Removing the Coin-Cell Battery</b>	<b>18</b>
	Prerequisites	18
	Procedure	19

<b>10</b>	<b>Replacing the Coin-Cell Battery</b>	<b>20</b>
	Procedure	20
	Postrequisites	20
<b>11</b>	<b>Removing the Hard Drive(s)</b>	<b>21</b>
	Prerequisites	21
	Procedure	22
<b>12</b>	<b>Replacing the Hard Drive(s)</b>	<b>25</b>
	Procedure	25
	Postrequisites	25
<b>13</b>	<b>Removing the Center Control Cover</b>	<b>26</b>
	Prerequisites	26
	Procedure	26
<b>14</b>	<b>Replacing the Center Control Cover</b>	<b>29</b>
	Procedure	29
	Postrequisites	29
<b>15</b>	<b>Removing the Power-Button Board</b>	<b>30</b>
	Prerequisites	30
	Procedure	30
<b>16</b>	<b>Replacing the Power-Button Board</b>	<b>31</b>
	Procedure	31
	Postrequisites	31
<b>17</b>	<b>Removing the Keyboard</b>	<b>32</b>
	Prerequisites	32
	Procedure	33
<b>18</b>	<b>Replacing the Keyboard</b>	<b>35</b>
	Procedure	35
	Postrequisites	35
<b>19</b>	<b>Removing the Macro Keyboard</b>	<b>36</b>
	Prerequisites	36
	Procedure	36

<b>20</b>	<b>Replacing the Macro Keyboard</b>	<b>38</b>
	Procedure	38
	Postrequisites	38
<b>21</b>	<b>Removing the Memory Module(s)</b>	<b>39</b>
	Prerequisites	39
	Procedure	40
<b>22</b>	<b>Replacing the Memory Module(s)</b>	<b>41</b>
	Procedure	42
	Postrequisites	42
<b>23</b>	<b>Removing the Display Assembly</b>	<b>43</b>
	Prerequisites	43
	Procedure	43
<b>24</b>	<b>Replacing the Display Assembly</b>	<b>48</b>
	Procedure	48
	Postrequisites	48
<b>25</b>	<b>Removing the Palm Rest</b>	<b>49</b>
	Prerequisites	49
	Procedure	50
<b>26</b>	<b>Replacing the Palm Rest</b>	<b>53</b>
	Procedure	53
	Postrequisites	53
<b>27</b>	<b>Removing the Status-Light Board</b>	<b>54</b>
	Prerequisites	54
	Procedure	54
<b>28</b>	<b>Replacing the Status-Light Board</b>	<b>56</b>
	Procedure	56
	Postrequisites	56
<b>29</b>	<b>Removing the Speakers</b>	<b>57</b>
	Prerequisites	57
	Procedure	58

<b>30</b>	<b>Replacing the Speakers</b>	<b>59</b>
	Procedure	59
	Postrequisites	59
<b>31</b>	<b>Removing the I/O Board</b>	<b>60</b>
	Prerequisites	60
	Procedure	61
<b>32</b>	<b>Replacing the I/O Board</b>	<b>62</b>
	Procedure	62
	Postrequisites	62
<b>33</b>	<b>Removing the Optical Drive</b>	<b>63</b>
	Prerequisites	63
	Procedure	64
<b>34</b>	<b>Replacing the Optical Drive</b>	<b>66</b>
	Procedure	66
	Postrequisites	66
<b>35</b>	<b>Removing the Video-Card Heat-Sink Fan(s)</b>	<b>67</b>
	Prerequisites	67
	Procedure	67
<b>36</b>	<b>Replacing the Video-Card Heat-Sink Fan(s)</b>	<b>69</b>
	Procedure	69
	Postrequisites	69
<b>37</b>	<b>Removing the Video-Card Heat-Sink(s)</b>	<b>70</b>
	Prerequisites	70
	Procedure	70
<b>38</b>	<b>Replacing the Video-Card Heat-Sink(s)</b>	<b>72</b>
	Procedure	72
	Postrequisites	72
<b>39</b>	<b>Removing the Video Card(s)</b>	<b>73</b>
	Prerequisites	73
	Procedure	73

<b>40</b>	<b>Replacing the Video Card(s)</b>	<b>75</b>
	Procedure	75
	Postrequisites	75
<b>41</b>	<b>Removing the Processor Heat-Sink Fan</b>	<b>76</b>
	Prerequisites	76
	Procedure	76
<b>42</b>	<b>Replacing the Processor Heat-Sink Fan</b>	<b>77</b>
	Procedure	77
	Postrequisites	77
<b>43</b>	<b>Removing the Processor Heat-Sink</b>	<b>78</b>
	Prerequisites	78
	Procedure	79
<b>44</b>	<b>Replacing the Processor Heat-Sink</b>	<b>80</b>
	Procedure	80
	Postrequisites	80
<b>45</b>	<b>Removing the Processor Module</b>	<b>81</b>
	Prerequisites	81
	Procedure	82
<b>46</b>	<b>Replacing the Processor Module</b>	<b>83</b>
	Procedure	83
	Postrequisites	83
<b>47</b>	<b>Removing the System Board</b>	<b>84</b>
	Prerequisites	84
	Procedure	85
<b>48</b>	<b>Replacing the System Board</b>	<b>87</b>
	Procedure	87
	Postrequisites	87
	Entering the Service Tag in the BIOS	88
<b>49</b>	<b>Removing the Wireless Mini-Card</b>	<b>89</b>
	Prerequisites	89
	Procedure	89

<b>50</b>	<b>Replacing the Wireless Mini-Card . . . . .</b>	<b>91</b>
	Procedure . . . . .	91
	Postrequisites . . . . .	92
<b>51</b>	<b>Removing the Subwoofer . . . . .</b>	<b>93</b>
	Prerequisites . . . . .	93
	Procedure . . . . .	94
<b>52</b>	<b>Replacing the Subwoofer . . . . .</b>	<b>95</b>
	Procedure . . . . .	95
	Postrequisites . . . . .	95
<b>53</b>	<b>System Setup . . . . .</b>	<b>97</b>
	Overview . . . . .	97
	Entering System Setup . . . . .	97
	System Setup Screens . . . . .	98
	System Setup Options . . . . .	98
	Boot Sequence . . . . .	103
<b>54</b>	<b>Flashing the BIOS . . . . .</b>	<b>105</b>

## Turn Off Your Computer and Connected Devices

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

1 Save and close all open files and exit all open programs.

2 Click **Start**  and click **Shut Down**.

Microsoft Windows shuts down and then the computer turns off.

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

3 Disconnect your computer and all attached devices from their electrical outlets.

4 Disconnect all telephone cables, network cables, and attached devices from your computer.

5 After the computer is unplugged, press and hold the power button for about 5 seconds to ground the system board.

## Safety Instructions

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

 **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.

 **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](http://dell.com/regulatory_compliance).

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

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

-  **CAUTION:** Only a certified service technician is authorized to remove the computer cover and access any of the components inside the computer. See the safety instructions for complete information about safety precautions, working inside your computer, and protecting against electrostatic discharge.
-  **CAUTION:** Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate static electricity, which could harm internal components.
-  **CAUTION:** When you disconnect a cable, pull on its connector or on its pull-tab, not on the cable itself. Some cables have connectors with locking tabs or thumb-screws that you must disengage before disconnecting the cable. When disconnecting cables, keep them evenly aligned to avoid bending any connector pins. When connecting cables, ensure that the 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.

## Recommended Tools

The procedures in this document may require the following tools:

- Phillips screwdriver
- Plastic scribe
- Small flat-blade screwdriver

After you complete the replacement procedures, ensure the following:

- Replace all screws and ensure that no stray screws remain inside your computer
- Connect any external devices, cables, cards, and any other part(s) you removed before working on your computer
- Connect your computer and all attached devices to their electrical outlets



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

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the battery latch to the unlock position. The battery pack pops up.
- 2 Lift and slide the battery pack away from the battery bay.



1 battery pack

2 battery latch

- 
-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).
  -  **CAUTION:** To avoid damage to the computer, use only the battery designed for this particular Alienware computer.

## Procedure

Align the tabs on the battery with the slots on the battery bay and snap the battery into place.

## Postrequisites

Follow the instructions in "After Working Inside Your Computer" on page 11.

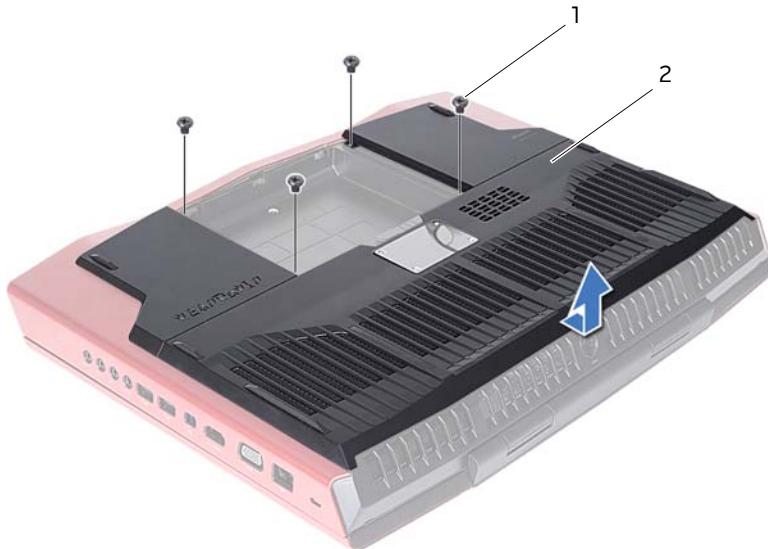
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

Remove the battery pack. See "Removing the Battery Pack" on page 12.

## Procedure

- 1 Remove the screws that secure the base cover to the computer base.
- 2 Slide the base cover toward the back of the computer, and then lift it up to remove it from the computer.



1 screws (4)

2 base cover



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the tabs on the base cover with the slots on the computer base and slide the base cover into place.
- 2 Replace the screws that secure the base cover to the computer base.

## Postrequisites

- 1 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 2 Follow the instructions in "After Working Inside Your Computer" on page 11.

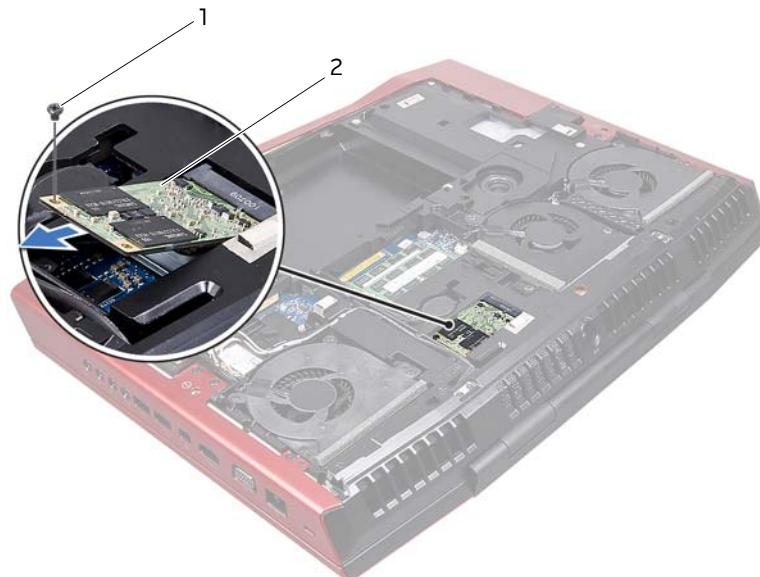
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.

## Procedure

- 1 Remove the screw that secures the mSATA to the system board.
- 2 Slide and remove the mSATA card off the system-board connector.



1 screw

2 mSATA card

---

**⚠️ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Insert the mSATA card connector at a 45-degree angle into the system- board connector.
- 2 Press the other end of the mSATA card down into the slot on the system board and replace the screw that secures the mSATA card to the system-board connector.

## Postrequisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

The coin-cell battery may need replacing if an incorrect time or date is displayed during the boot routine along with a message such as:

Time-of-day not set - please run SETUP program

or

Invalid configuration information -  
please run SETUP program

or

Strike the F1 key to continue,  
F2 to run the setup utility

To determine whether you need to replace the coin-cell battery, reenter the time and date in system setup and exit the program to save the information. Turn off your computer and disconnect it from the electrical outlet for a few hours; then reconnect the computer, turn it on, and enter system setup. If the date and time are not correct in system setup, replace the coin-cell battery.

You can operate your computer without a coin-cell battery; however, without a coin-cell battery, the configuration information is erased if the computer is turned off or disconnected from the electrical outlet. In this case, you must enter system setup and reset the configuration options.

**⚠ 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.

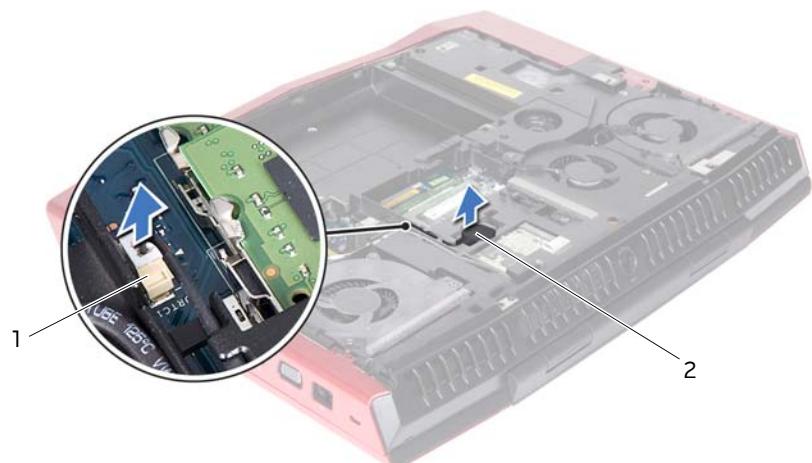
**⚠ CAUTION:** Removing the coin-cell battery resets the BIOS settings to default. It is recommended that you note the BIOS settings before removing the coin-cell battery.

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.

## Procedure

- 1 Disconnect the coin-cell battery cable from the connector on the system board.



1 coin-cell battery cable connector

2 coin-cell battery

- 2 Remove the coin-cell battery cable from the routing guides on the computer base.
- 3 Pry up the coin-cell battery from the slot on the system board.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Place the coin-cell battery into the slot and press gently to adhere it to the computer base.
- 2 Route the coin-cell battery cable through the routing guides on the computer base.
- 3 Connect the coin-cell battery cable to the connector on the system board.

## Postrequisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.

- ⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).
- ⚠ CAUTION:** To avoid data loss, do not remove the hard drive while the computer is in Sleep or On state.
- ⚠ CAUTION:** Hard drives are extremely fragile. Exercise care when handling the hard drive.

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.

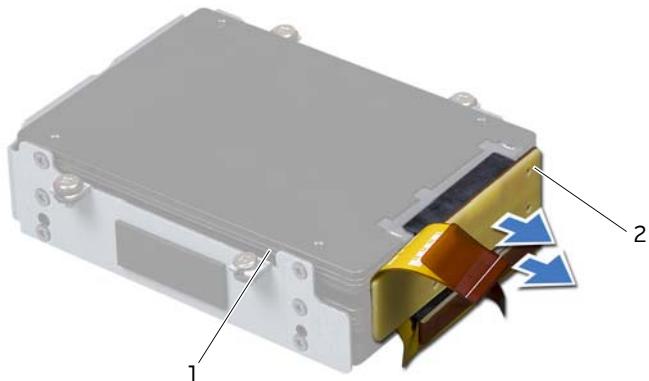
## Procedure

- 1 Lift the connector latch that secures the hard-drive cable to the connector on the system board, and then disconnect the hard-drive cable from the connector on the system board.
- 2 Loosen the captive screws that secure the hard-drive assembly to the computer base.
- 3 Using the pull-tab, lift the hard-drive assembly out of the computer base.



1	hard-drive assembly	2	captive screws (4)
3	connector latch	4	hard-drive cable

- 4** Disconnect the interposer from the hard drives.



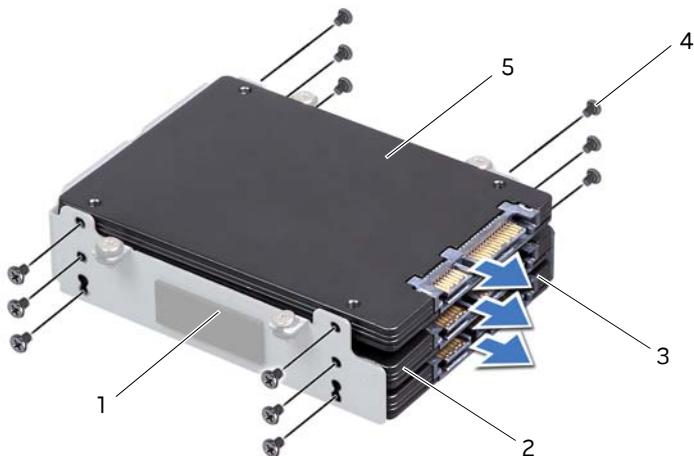
---

1 hard drives (3)

2 interposer

---

- 5** Remove the screws that secure the hard drive(s) and slide the hard drive(s) out of the hard-drive bracket.



---

1 hard-drive bracket

2 HDD 2 (SATA 2.0)

---

3 HDD 1 (SATA 3.0)

4 screws (12)

---

5 HDD 0 (SATA 3.0)

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

The following table provides the drive configurations supported on your computer:

Number of drives	Dimensions supported	Connect to
One	9.5 mm or 7.0 mm	top (HDD 0) or bottom (HDD 1) connector of the interposer
Two	9.5 mm and/or 7.0 mm	top (HDD 0) and bottom (HDD 1) connectors of the interposer
Three	7.0 mm only	all the three connectors of the interposer

 **NOTE:** For more information, see *Specifications* at [support.dell.com/manuals](http://support.dell.com/manuals).

## Procedure

- 1 Place the primary hard drive (HDD 0) in the hard-drive bracket.
- 2 If applicable, slide the secondary and tertiary hard drive(s) into the hard-drive bracket.
- 3 Replace the screws that secure the primary hard drive (HDD 0).
- 4 If applicable, replace the screws that secure the secondary hard drive (HDD 1) and tertiary hard drive (HDD 2) to the hard-drive bracket.
- 5 Connect the interposer to the hard drive(s).
- 6 Place the hard-drive assembly in the computer base.
- 7 Tighten the captive screws that secure the hard-drive assembly to the computer base.
- 8 Slide the hard-drive cable into the connector on the system board and press down on the connector latch to secure the cable.

## Postrequisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.
- 4 Install the operating system for your computer, if needed.
- 5 Install the drivers and utilities for your computer, if needed.

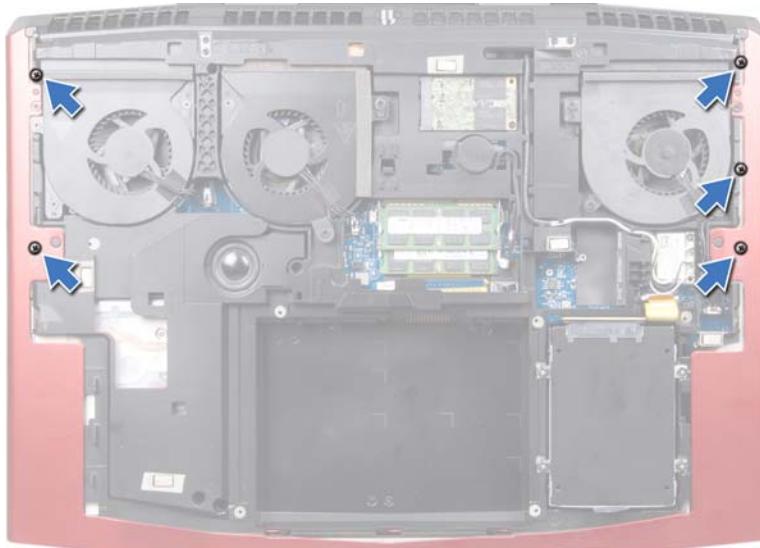
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.

## Procedure

- 1 Remove the screws that secure the center control cover to the computer base.



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

- 2 Turn the computer over and open the display as far as possible.
- 3 Gently pry up the center control cover and then ease the tabs on the center control cover out of the slots on the palm-rest assembly.



---

1 center control cover

2 palm-rest assembly

---

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

- 4 Turn the center control cover over and place it on the palm-rest assembly.
- 5 Lift the connector latch and disconnect the central control cover cable from the connector on the system board.



---

1 center control cover cable      2 connector latch

---

- 6 Remove the center control cover away from the computer.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the central control cover cable into the connector on the system board and press down on the connector latch to secure the cable.
- 2 Align the tabs on the center control cover with the slots on the palm-rest assembly and snap the center control cover into place.
- 3 Close the display and turn the computer over.
- 4 Replace the screws that secure the center control cover to the computer base.

## Postrequisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.

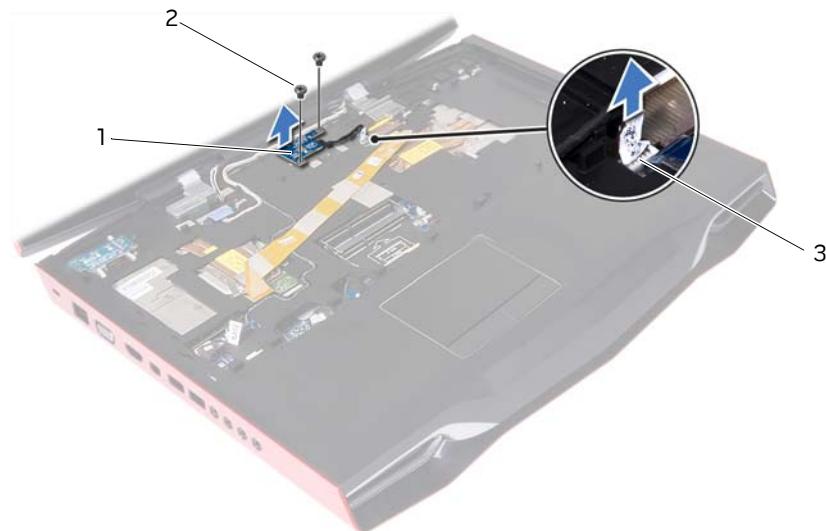
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.

## Procedure

- 1 Disconnect the power-button board cable from the system-board connector.
- 2 Remove the screws that secure the power-button board to the palm-rest assembly.
- 3 Lift the power-button board off the palm-rest assembly.



1 power-button board

2 screws (2)

3 system-board connector



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screws 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 Connect the power-button board cable to the system-board connector.

## Postrequisites

- 1 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 2 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 3 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 4 Follow the instructions in "After Working Inside Your Computer" on page 11.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

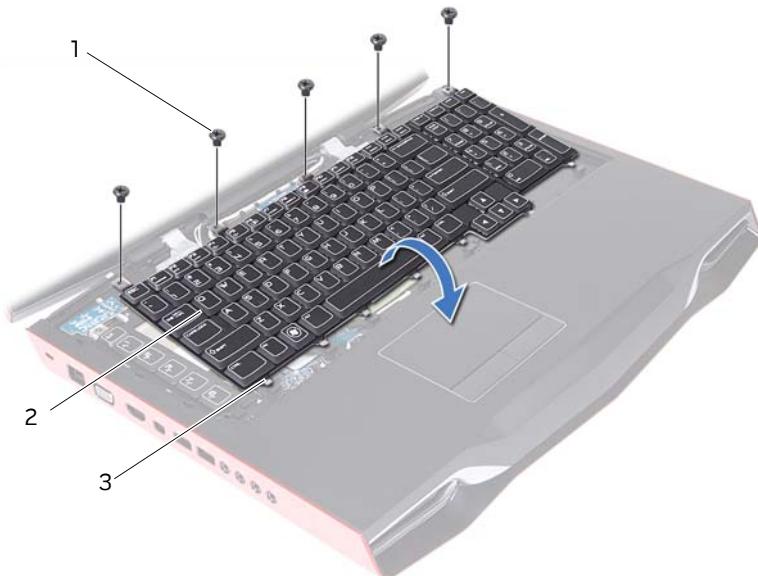
- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.

## Procedure

- 1 Remove the screws that secure the keyboard to the computer base.

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

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



---

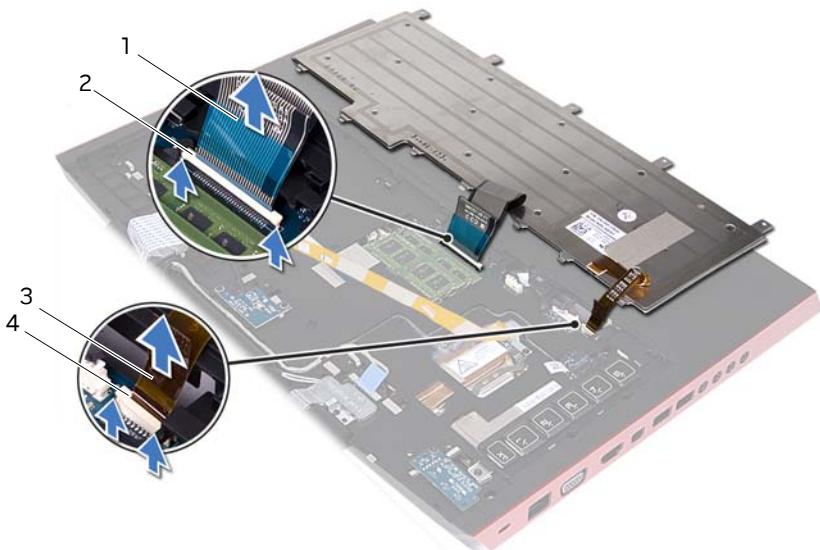
1 screws (5)

2 keyboard

---

3 tabs (7)

- 2** Lift the keyboard and slide the keyboard tabs out of the slots on the palm-rest assembly.
- 3** Turn the keyboard over and place it on the palm-rest assembly.
- 4** Lift the connector latches and pull the pull-tabs to disconnect the keyboard cable and keyboard-backlight cable from the connectors on the system board.



---

1	keyboard cable	2	connector latch
3	keyboard-backlight cable	4	connector latch

---

- 5** Lift the keyboard off the palm-rest assembly.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the keyboard cable and keyboard-backlight cable into their connectors on the system board, and press down on their connector latches to secure the cables.
- 2 Slide the tabs on the keyboard into the slots on the palm-rest assembly and lower the keyboard into place.
- 3 Replace the screws that secure the keyboard to the computer base.

## Postrequisites

- 1 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 2 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 3 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 4 Follow the instructions in "After Working Inside Your Computer" on page 11.

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.

## Procedure

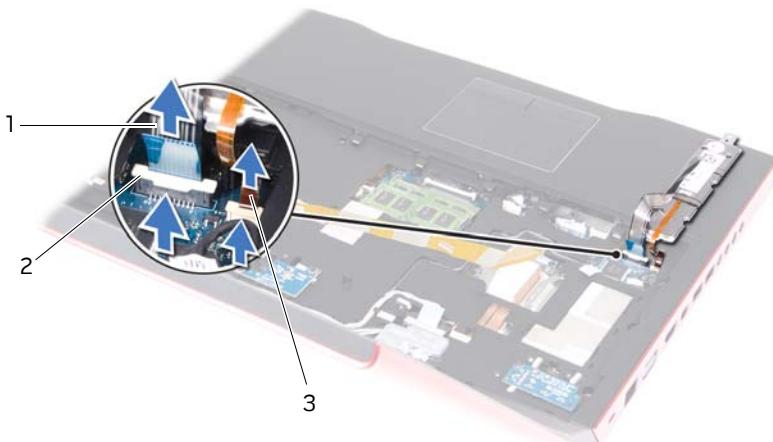
- 1 Remove the screw that secures the macro keyboard to the computer base.
- ⚠ CAUTION:** The keycaps on the macro keyboard are fragile, easily dislodged, and time-consuming to replace. Be careful when removing and handling the macro keyboard.



1 screw

2 macro keyboard

- 2** Lift the macro keyboard and slide the tab on the macro-keyboard out of the slot on the palm-rest assembly.
- 3** Carefully turn the macro keyboard over and place it on the palm-rest assembly.
- 4** Lift the connector latches and pull the pull-tabs to disconnect the macro-keyboard cable and macro-keyboard backlight cable from the connectors on the system board.



- 
- |   |                                |   |                 |
|---|--------------------------------|---|-----------------|
| 1 | macro-keyboard cable           | 2 | connector latch |
| 3 | macro-keyboard backlight cable |   |                 |
- 

- 5** Lift the macro keyboard off the palm-rest assembly.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Slide the macro-keyboard cable and macro-keyboard backlight cable into the respective connectors on the system board, and press down on the connector latches to secure the cables.
- 2 Slide the tab on the macro keyboard into the slot on the palm-rest assembly and lower the macro keyboard into place.
- 3 Replace the screw that secures the macro keyboard to the computer base.

## Postrequisites

- 1 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 2 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 3 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 4 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 5 Follow the instructions in "After Working Inside Your Computer" on page 11.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

You can increase your computer memory by installing memory modules on the system board. For information on the type of memory supported by your computer, see *Views & Specifications* at [support.dell.com/manuals](http://support.dell.com/manuals).

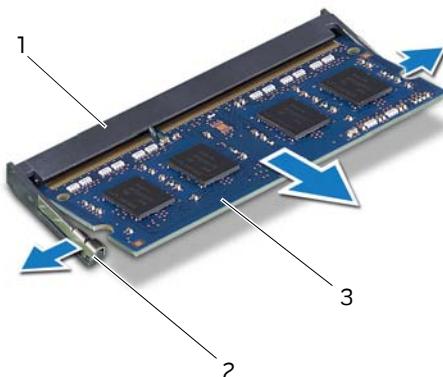
- NOTE:** Memory modules purchased from Dell or Alienware are covered under your computer warranty.
- NOTE:** If you purchased a dual-core processor, your computer supports only memory modules installed in connectors DIMM A and DIMM B.
- NOTE:** Your computer supports up to four memory module connectors. You can access connectors DIMM A and DIMM B by removing the base cover at the bottom of your computer. You can access connectors DIMM C and DIMM D by removing the keyboard.

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 7.
- 2 Remove the base cover. See "Removing the Base Cover" on page 7.

## Procedure

- 1 To remove memory module(s) from connectors DIMM A and DIMM B, go to step 3.
- 2 To remove memory module(s) from connectors DIMM C and DIMM D:
  - a Remove the center control cover. See "Removing the Center Control Cover" on page 26.
  - b Remove the keyboard. See "Removing the Keyboard" on page 32.
- 3 CAUTION: To prevent damage to the memory-module connector, do not use tools to spread the memory module securing clips.
- 4 Using your fingertips, spread apart the securing clips on each end of the memory-module connector until the memory module pops up.
- 5 Remove the memory module from the memory-module connector.



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

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

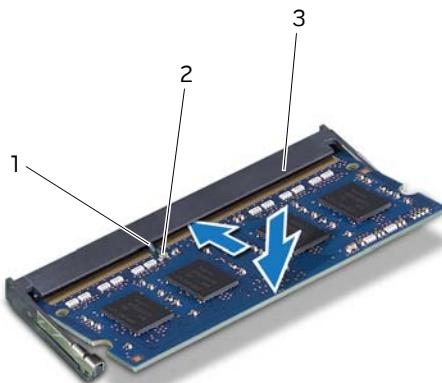
You can increase your computer memory by installing memory modules on the system board. For information on the type of memory supported by your computer, see *Views & Specifications* at [support.dell.com/manuals](http://support.dell.com/manuals).

-  **NOTE:** Memory modules purchased from Dell or Alienware are covered under your computer warranty.
-  **NOTE:** If you purchased a dual-core processor, your computer supports only memory modules installed in connectors DIMM A and DIMM B.
-  **NOTE:** Your computer supports up to four memory module connectors. You can access connectors DIMM A and DIMM B by removing the base cover at the bottom of your computer. You can access connectors DIMM C and DIMM D by removing the keyboard.

## Procedure

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

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



---

1 tab

2 notch

---

3 memory-module connector

---

- 3 If you have replaced memory module(s) in connectors DIMM A and DIMM B, go to Postprerequisites.
- 4 If you have replaced memory module(s) in connectors DIMM C and DIMM D:
  - a Replace the keyboard. See "Replacing the Keyboard" on page 35.
  - b Replace the center control cover. See "Replacing the Center Control Cover" on page 29.

## Postprerequisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.

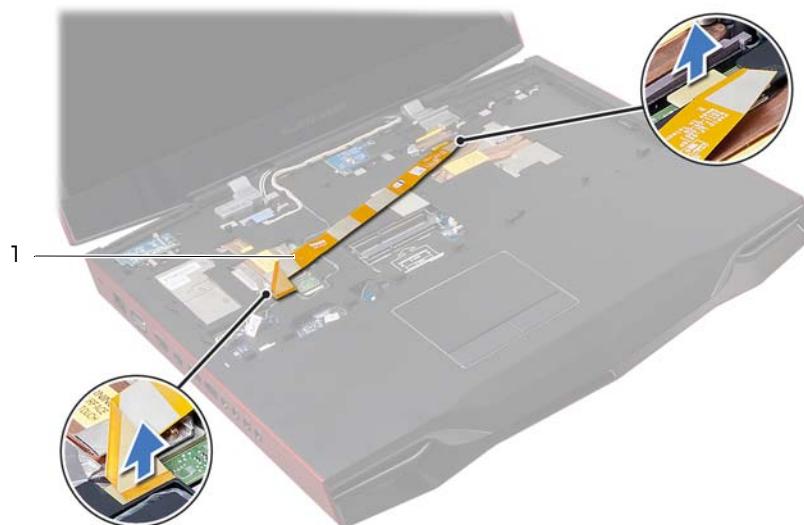
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.

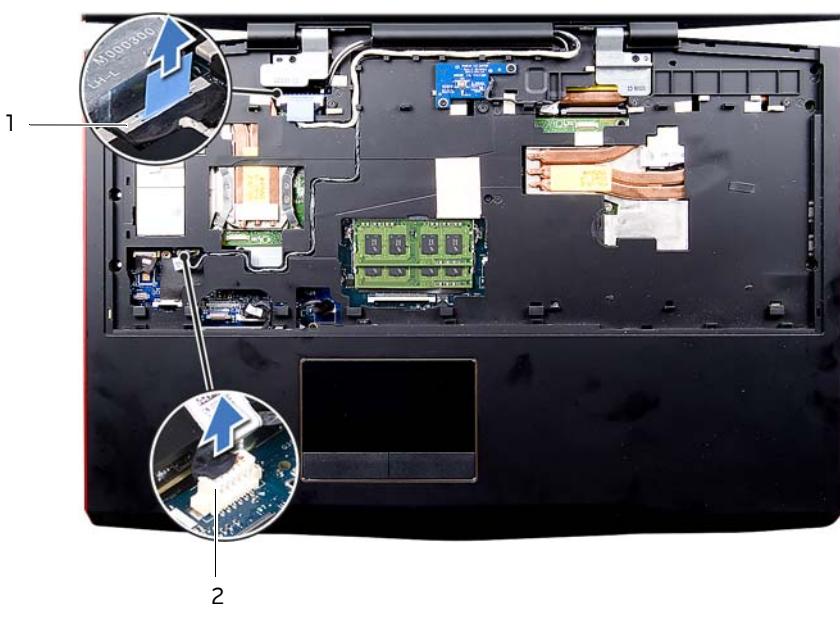
## Procedure

- 1 Disconnect and peel off the video-card connector cable from the connectors on the system board.



1 video-card connector cable

- 2** Pull the pull-tab to disconnect the display cable from the connector on the system board.
- 3** Disconnect the LED-logo board cable from the connector on the system board.



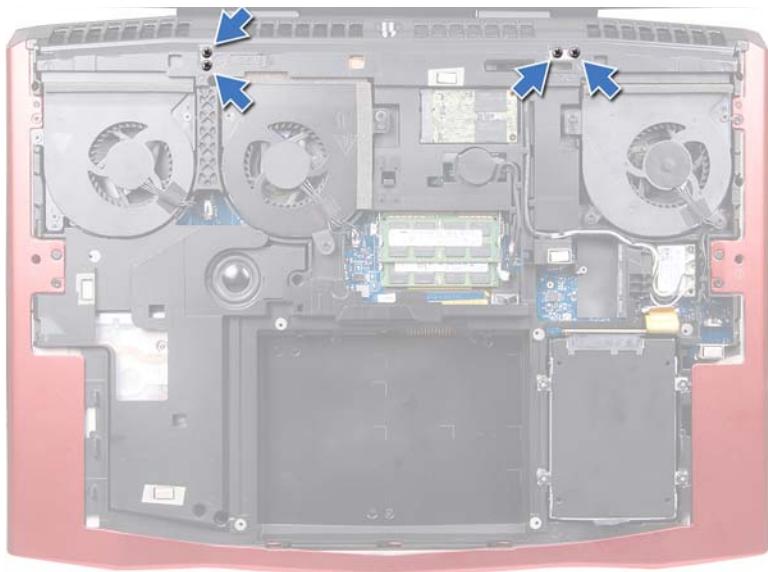
---

1 display-cable connector

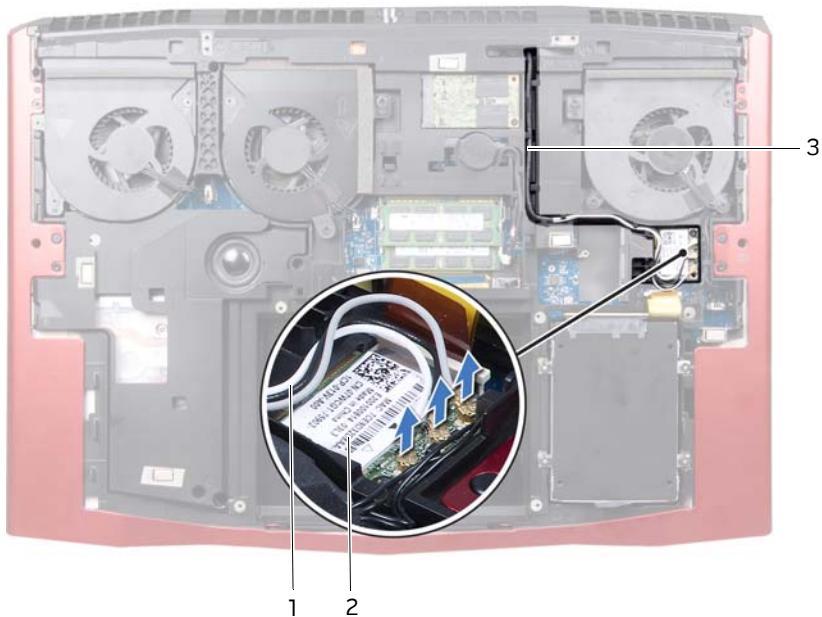
2 LED logo-board cable

---

- 4** Close the display and turn the computer over.
- 5** Remove the screws that secure the display assembly on the computer base.



- 6** Disconnect the antenna cables from the connectors on the Mini-Card. See "Removing the Wireless Mini-Card" on page 89.
- 7** Note the routing of the antenna cables, and then remove the cables from the routing guides on the computer base.



---

**1** antenna cables (3)

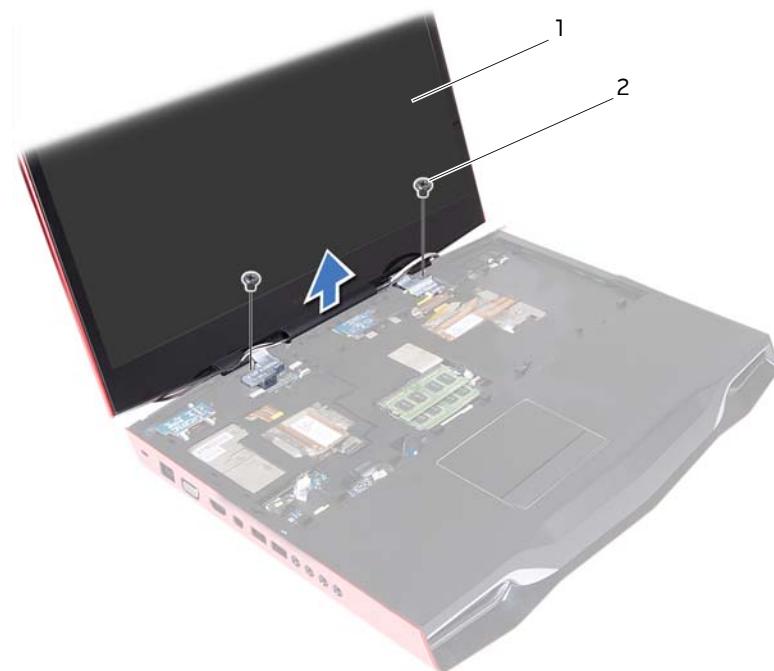
**2** Mini-Card

---

**3** Mini-Card cable routing

---

- 8** Turn the computer over and open the display.
- 9** Note the routing of the display cable and LED-logo board cable, and then remove the cables from the routing guides on the palm-rest assembly.
- 10** Remove the screws, on the display hinges, that secure the display assembly to the computer base.
- 11** Gently slide out the antenna cables through the slot on the computer base.
- 12** Move the display to a perpendicular position to the computer base, and then lift the display assembly off the computer.



---

1 display assembly

2 screws (2)

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Place the display assembly in position and replace the screws, on the display hinges, that secure the display assembly to the computer base.
- 2 Route the display cable and LED-logo board cable through the routing guides on the palm-rest assembly.
- 3 Connect the display cable, video-card connector cable, and LED-logo board cable to the respective connectors on the system board.
- 4 Slide the Mini-Card antenna cables through the slot on the computer base.
- 5 Close the display and turn the computer over.
- 6 Route the Mini-Card antenna cables through the routing guides on the computer base.
- 7 Connect the Mini-Card antenna cables to the Mini-Card. See "Replacing the Wireless Mini-Card" on page 91.
- 8 Turn the computer over.

## Postrequisites

- 1 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 2 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 3 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 4 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 5 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 6 Follow the instructions in "After Working Inside Your Computer" on page 11.



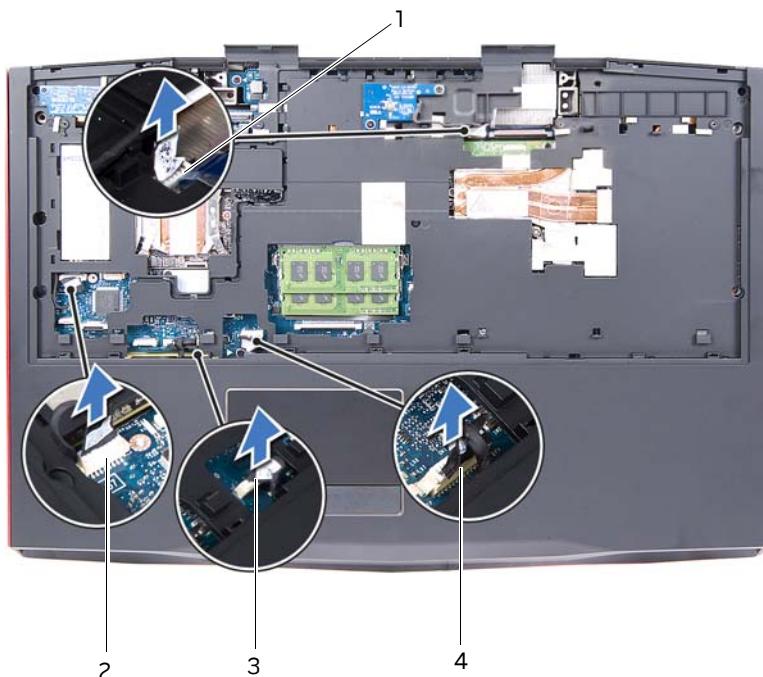
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove any installed card or blank from the Media-Card Reader.
- 2 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 3 Remove the base cover. See "Removing the Base Cover" on page 14.
- 4 Remove the hard drive. See "Removing the Hard Drive(s)" on page 21.
- 5 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 6 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 7 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 8 Remove the display assembly. See "Removing the Display Assembly" on page 43.

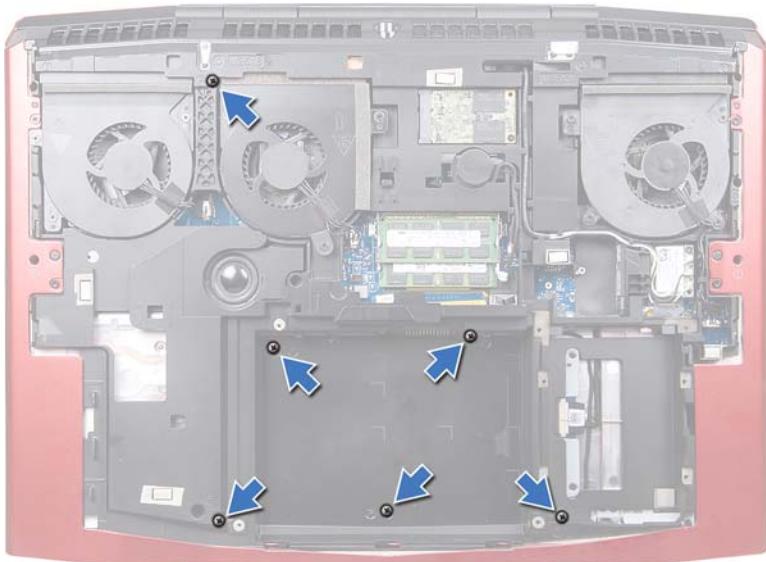
## Procedure

- 1 Disconnect the power-button board cable, status-light board cable, speaker-LED board cable, and touchpad cable from the connectors on the system board.



1 power-button board cable connector	2 status-light board cable connector
3 speaker-LED board cable	4 touchpad cable connector

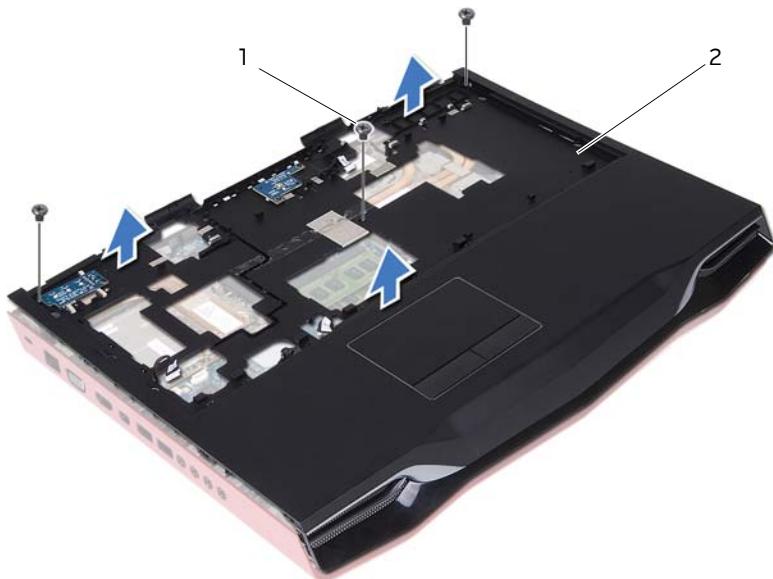
- 2** Turn the computer over.
- 3** Remove the screws that secure the palm-rest assembly to the computer base.



- 4** Turn the computer over.
- 5** Remove the screws that secure the palm-rest assembly to the computer base.
- 6** Carefully pry out the palm-rest assembly from the two tabs along the rear edge of the computer, and then ease the palm-rest assembly from the computer base.

**△ CAUTION: Carefully separate the palmrest from the computer base to avoid damage to the palmrest.**

- 7** Lift the palm-rest assembly off the computer base.
- 8** Remove the status-light board. See "Removing the Status-Light Board" on page 54.



---

**1** screws (3)

**2** palm-rest assembly

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Replace the status-light board. See "Replacing the Status-Light Board" on page 56.
- 2 Align the palm-rest assembly with the computer base and gently snap the palm-rest assembly into place.
- 3 Replace the screws that secure the palm-rest assembly to the computer base.
- 4 Connect the power-button board cable, status-light board cable, speaker-LED board cable, and touchpad cable to the respective connectors on the system board.
- 5 Turn the computer over and replace the screws that secure the palm-rest assembly to the computer base.

## Postrequisites

- 1 Replace the display assembly. See "Replacing the Display Assembly" on page 48.
- 2 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 3 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 4 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 5 Replace the hard drive(s). See "Replacing the Hard Drive(s)" on page 25.
- 6 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 7 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 8 Replace any card or blank that you removed from the Media-Card Reader.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 11.

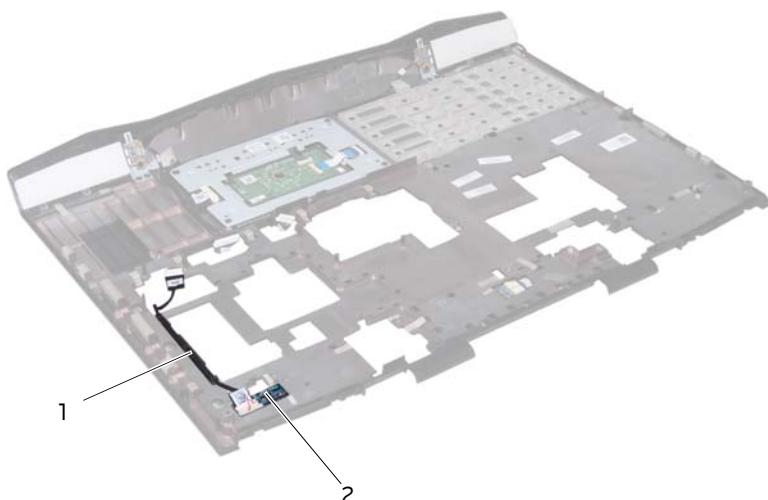
 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.

## Procedure

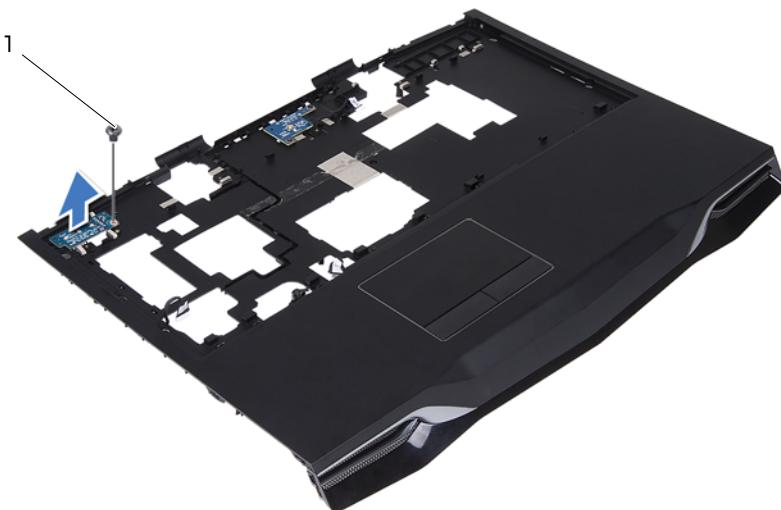
- 1 Note the routing of status-light board cable and remove the cable from the routing guides.



1 status-light board cable routing

2 status-light board

- 2** Remove the screw that secures the status-light board to the palm-rest assembly.
- 3** Lift the status-light board off the palmrest.



---

1 screw

---

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the slots on the status-light board with the alignment posts on the palm-rest assembly and secure the status-light board in place.
- 2 Replace the screw that secures the status-light board to the palm-rest assembly.
- 3 Route the status-light board cable through the routing guides on the palm-rest assembly.

## Postquisites

- 1 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 2 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 3 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 4 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 5 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 6 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 7 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 8 Follow the instructions in "After Working Inside Your Computer" on page 11.



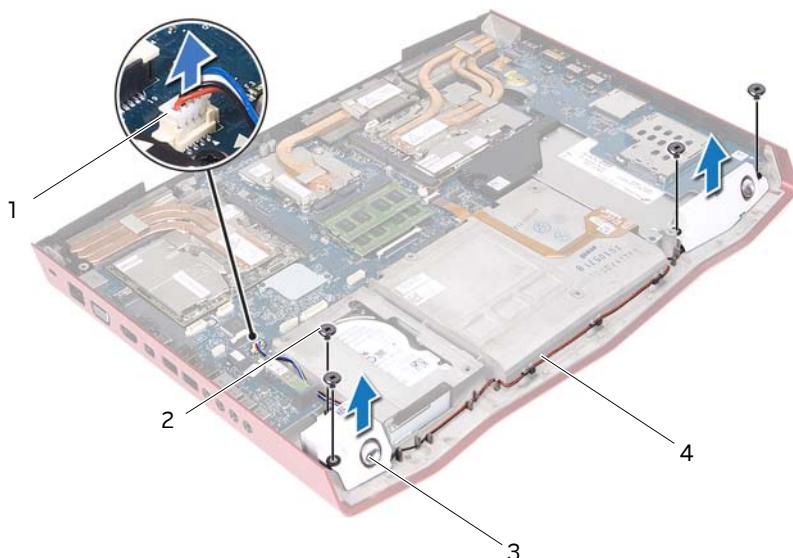
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.

## Procedure

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



---

1	speakers-cable connector	2	screws (4)
3	speakers (2)	4	speakers-cable routing

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the speakers with the screw holes on the computer base and replace the screws that secure the speakers to the computer base.
- 2 Route the speakers cable through the routing guides on the computer base and then connect the speakers cable to the connector on the system board.

## Postrequisites

- 1 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 2 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 3 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 4 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 5 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 6 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 7 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 8 Follow the instructions in "After Working Inside Your Computer" on page 11.



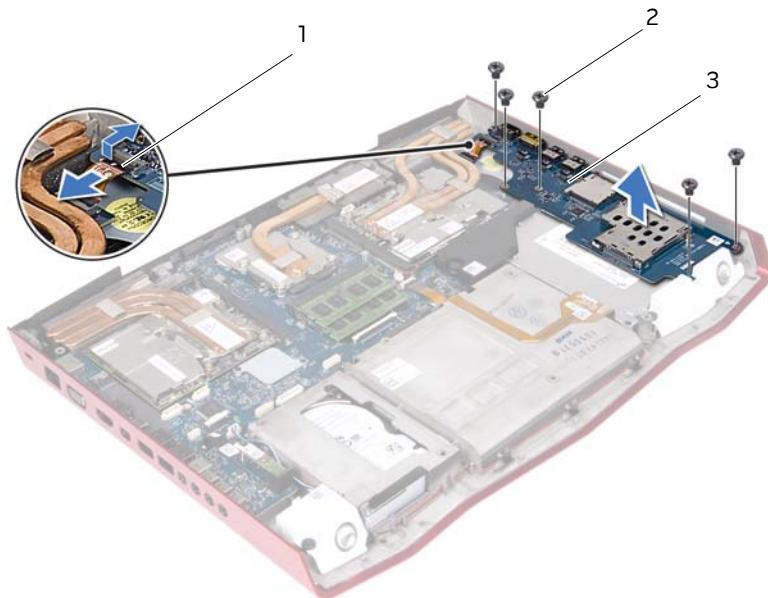
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove any installed card or blank from the Media-Card Reader.
- 2 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 3 Remove the base cover. See "Removing the Base Cover" on page 14.
- 4 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 5 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 6 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 7 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 8 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.

## Procedure

- 1 Lift the connector latch and disconnect the I/O board cable from the connector on the system board.
- 2 Remove the screws that secure the I/O board to the computer base.
- 3 Gently lift the I/O board and ease the connectors on the I/O board out of the slots on the computer base.



---

1 I/O board cable connector

2 screws (5)

---

3 I/O board

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the connectors on the I/O board with the slots on the computer base and gently press down on the I/O board.
- 2 Replace the screws that secure the I/O board to the computer base.
- 3 Slide the I/O board cable into the connector on the system board and press down on the connector latch to secure the cable.

## Postrequisites

- 1 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 2 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 3 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 4 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 5 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 6 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 7 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 8 Replace any cards or blank that you removed from the Media-Card Reader.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 11.



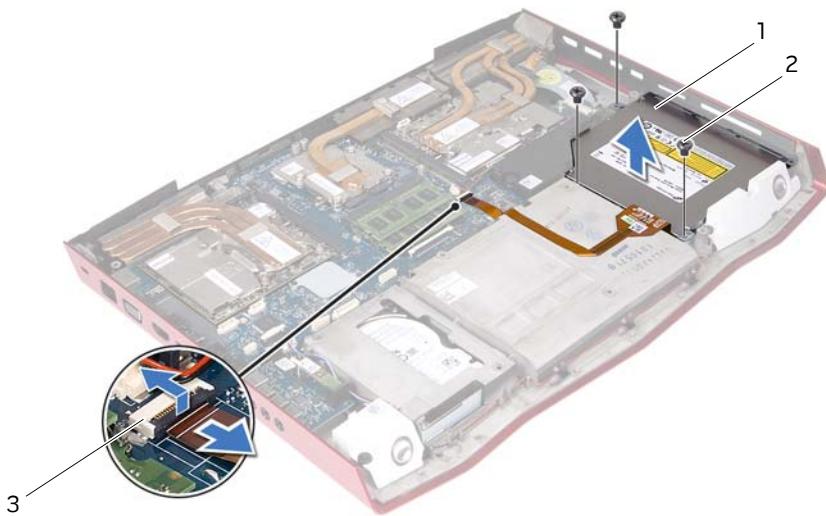
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.
- 8 Remove the I/O board. See "Removing the I/O Board" on page 60.

## Procedure

- 1 Lift the connector latch and disconnect the optical-drive cable from the connector on the system board, and then gently peel off the optical-drive cable from the computer base.
- 2 Remove the screws that secure the optical-drive assembly to the computer base.



---

1 optical drive

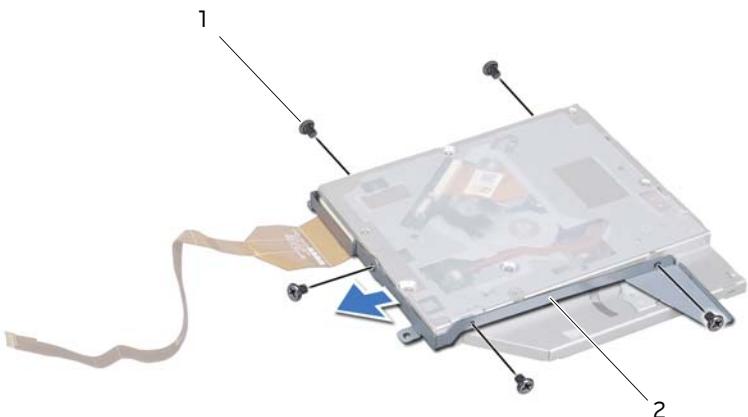
2 screws (3)

---

3 optical-drive cable connector

---

- 3** Lift the optical-drive assembly off the computer base.
- 4** Remove the screws that secure the optical-drive bracket to the optical drive.
- 5** Remove the optical-drive bracket from the optical drive.



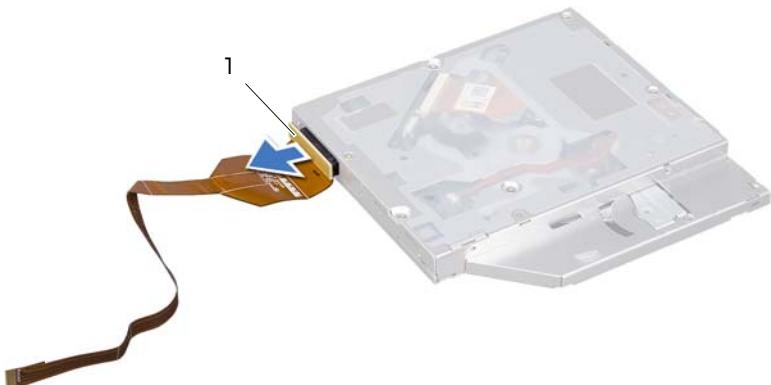
---

1 screws (5)

2 optical-drive bracket

---

- 6** Remove the interposer from the optical drive.



---

1 interposer

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Connect the interposer to the optical drive.
- 2 Align the screw holes on the optical-drive bracket with the screw holes on the optical drive and replace the screws that secure the optical-drive bracket to the optical drive.
- 3 Align the slot on the optical-drive bracket with the alignment posts on computer base and place the optical-drive assembly in the computer base.
- 4 Replace the screws that secure the optical-drive assembly to the computer base.
- 5 Adhere the optical-drive cable to the computer base, slide the cable into the connector on the system board, and press down on the connector latch to secure the cable.

## Postrequisites

- 1 Replace the I/O board. See "Replacing the I/O Board" on page 62.
- 2 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 3 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 4 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 5 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 6 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 7 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 8 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 11.

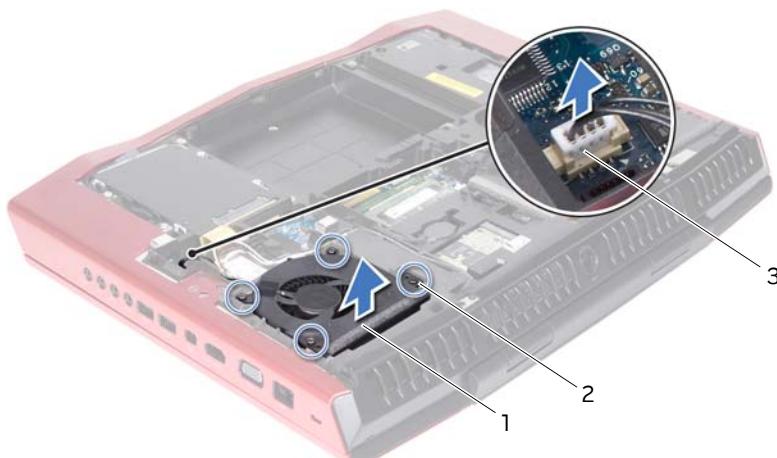
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.

## Procedure

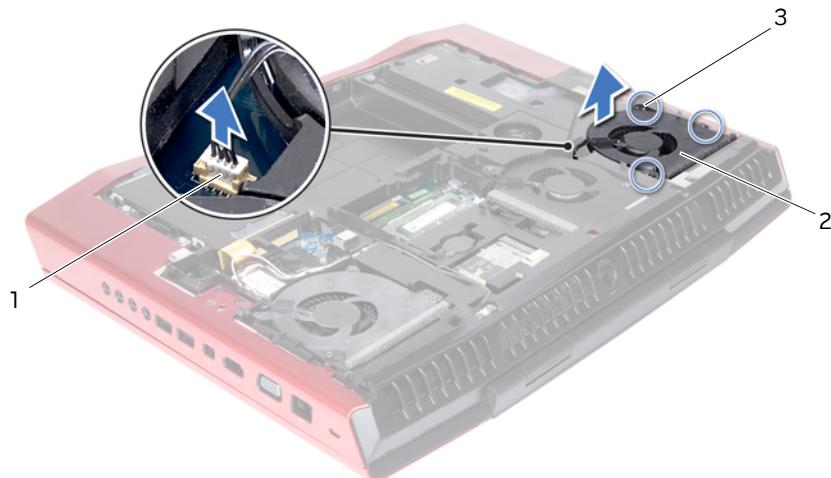
- 1 Disconnect the primary video-card heat-sink fan cable from the connector on the system board.
- 2 Remove the primary video-card heat-sink fan cable from the routing guides on the computer base.
- 3 Loosen the captive screws that secure the primary video-card heat-sink fan to the computer base.



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

3 primary video-card heat-sink  
fan cable connector

- 4** Disconnect the secondary video-card heat-sink fan cable from the connector on the system board.
- 5** Loosen the captive screws that secure the secondary video-card heat-sink fan to the computer base.



---

1	secondary video-card heat-sink fan cable connector	2	secondary video-card heat-sink fan
---	--	---	------------------------------------

---

3 captive screws (3)

- 6** Lift the video-card heat-sink fan(s) along with the cable away from the computer base.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the video-card heat-sink fan(s) with the screw holes on the computer base.
- 2 Tighten the captive screws that secure the secondary video-card heat-sink fan to the computer base.
- 3 Tighten the captive screws that secure the primary video-card heat-sink fan to the computer base.
- 4 Route the primary video-card heat-sink fan cable through the routing guides on the computer base.
- 5 Connect the primary video-card heat-sink fan cable to the connector on the system board.
- 6 Connect the secondary video-card heat-sink fan cable to the connector on the system board.

## Postrequisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

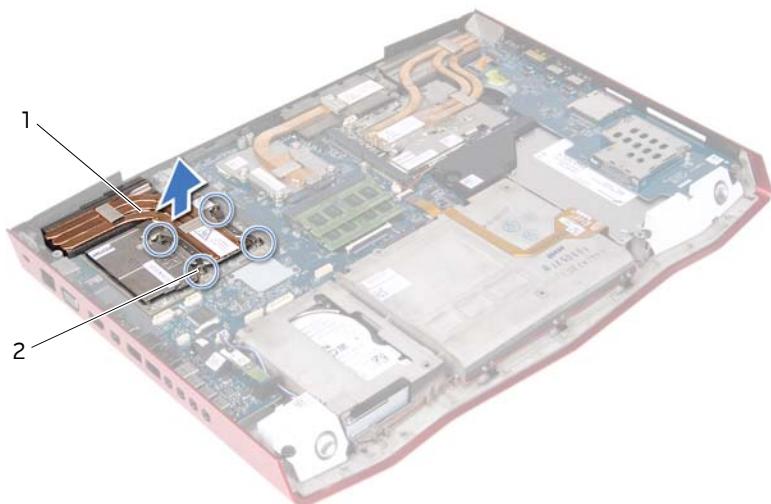
## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.

## Procedure

- 1 Loosen the captive screws that secure the primary video-card heat-sink to the computer base.
- 2 Loosen the captive screws that secure the secondary video-card heat-sink to the computer base.
- 3 Lift the video-card heat-sink(s) off the video card(s).

## Primary video-card heat-sink

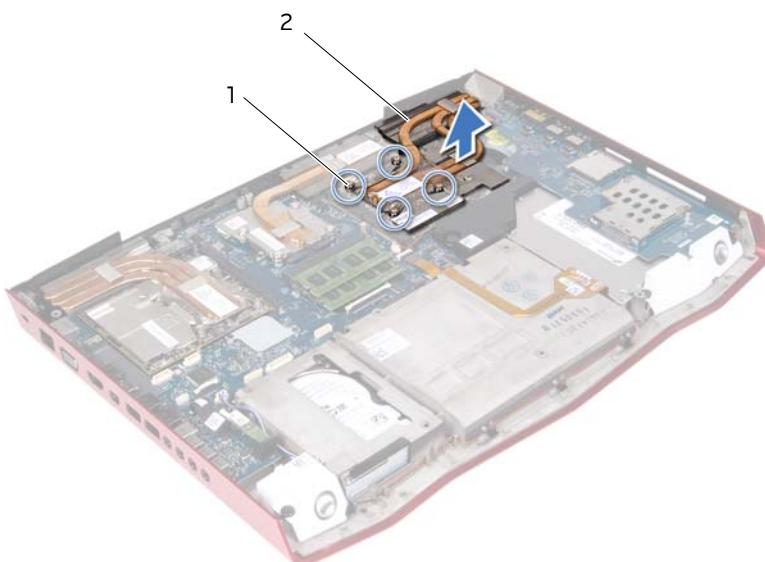


---

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

---

## Secondary video-card heat-sink



---

1 captive screws (4)                          2 secondary 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 You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the video-card heat-sink(s) with the screw holes on the computer base.
- 2 Tighten the captive screws that secure the primary video-card heat-sink to the computer base.
- 3 Tighten the captive screws that secure the secondary video-card heat-sink to the computer base.

## Postrequisites

- 1 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 2 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 3 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 4 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 5 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 6 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 7 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 8 Follow the instructions in "After Working Inside Your Computer" on page 11.



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

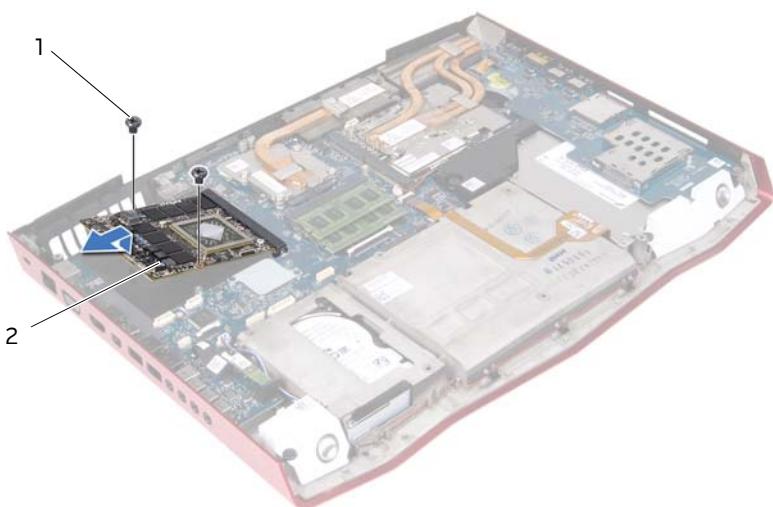
## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.
- 8 Remove the video-card heat-sink(s). See "Removing the Video-Card Heat-Sink(s)" on page 70.

## Procedure

- 1 Remove the screws that secure the video-card(s) to the system board.
- 2 Lift and slide the video-card(s) out to disconnect it from the connector on the system board.

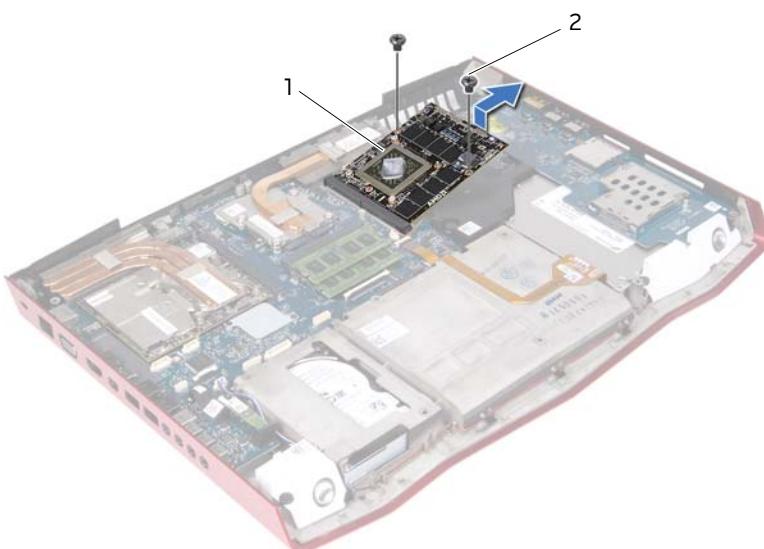
## Primary Video Card



1 screw (2)

2 primary video-card

## Secondary Video Card



1 secondary video card

2 screws (2)



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Insert the video card connector at a 45-degree angle into the connector on the system board.
- 2 Press the other end of the video-card down into the slot on the system board and replace the screws that secure the video-card(s) to the system board.

## Postrequisites

- 1 Replace the video card heat-sink(s). See "Replacing the Video-Card Heat-Sink(s)" on page 72.
- 2 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 3 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 4 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 5 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 6 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 7 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 8 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 11.

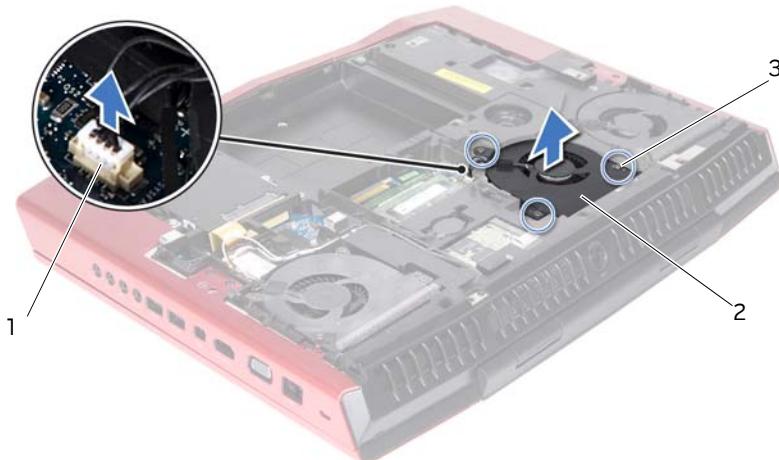
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 7.
- 2 Remove the base cover. See "Removing the Base Cover" on page 7.

## Procedure

- 1 Disconnect the processor heat-sink fan cable from the connector on the system board.
- 2 Loosen the captive screws that secure the processor heat-sink fan to the computer base.
- 3 Lift the processor heat-sink fan along with the cable away from the computer base.



---

1 processor heat-sink fan cable connector    2 processor heat-sink fan

---

3 captive screws (3)



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the processor heat-sink fan with the screw holes on the computer base.
- 2 Tighten the captive screws that secure the processor heat-sink fan to the computer base.
- 3 Connect the processor heat-sink fan cable to the connector on the system board.

## Postquisites

- 1 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3 Follow the instructions in "After Working Inside Your Computer" on page 11.



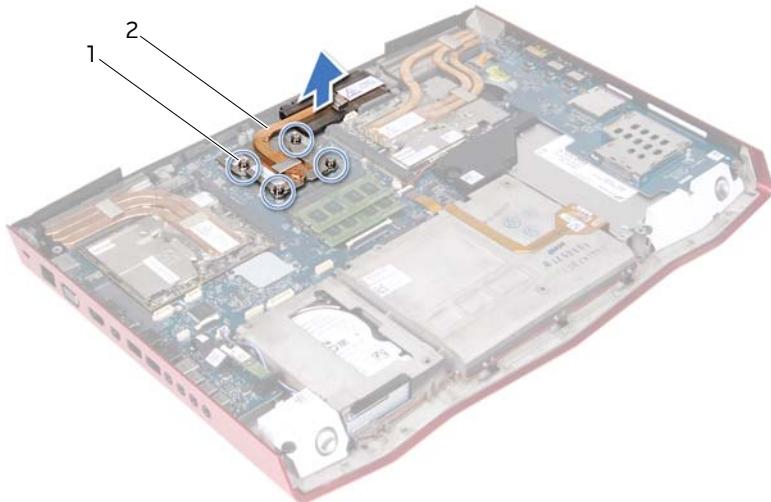
**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.

## Procedure

- 1 In sequential order (indicated on the processor heat-sink), loosen the captive screws that secure the processor heat-sink to the system board.
- 2 Carefully lift the processor heat-sink out of the computer base.



---

1 captive screws (4)

2 processor heat-sink

---

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

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

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

## Procedure

Align the captive screws on the processor heat-sink with the screw holes on the system board and tighten the screws in sequential order (indicated on the processor heat-sink).

## Postrequisites

- 1 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 2 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 3 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 4 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 5 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 6 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 7 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 8 Follow the instructions in "After Working Inside Your Computer" on page 11.

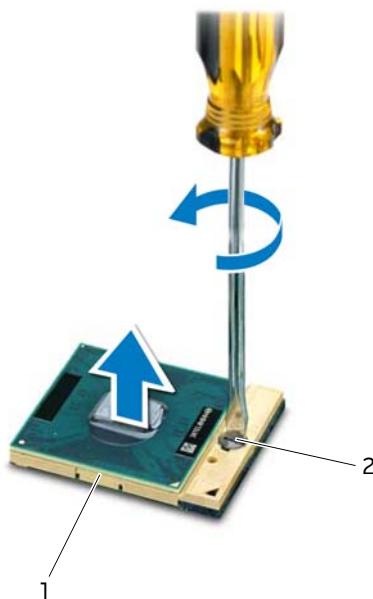
-  **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).
-  **CAUTION:** Processors are extremely fragile. Handle the processor only by the edges and do not touch the metal pins.

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.
- 3 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 4 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 5 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 6 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 7 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.
- 8 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 78.

## Procedure

- 1 To loosen the ZIF socket, use a small, flat-blade screwdriver to rotate the ZIF-socket cam screw counterclockwise until it comes to the cam stop.
- △ CAUTION: To ensure maximum cooling for the processor module, do not touch the heat-transfer areas on the processor thermal cooling assembly. The oils in your skin can reduce the heat transfer capability of the thermal pads.**
- △ CAUTION: When removing the processor module, lift the module straight up. Be careful not to bend the pins on the processor module.**
- 2 Lift the processor module from the ZIF socket.



---

1 ZIF socket

2 ZIF-socket cam screw

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).



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

## Procedure

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



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

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



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

- 2 Tighten the ZIF socket by turning the cam screw clockwise to secure the processor module to the system board.

## Postrequisites

- 1 Replace the processor heat-sink. See ."Replacing the Processor Heat-Sink" on page 80.
- 2 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 3 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 4 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 5 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 6 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 7 Replace the base cover. See "Replacing the Base Cover" on page 15.
- 8 Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 9 Follow the instructions in "After Working Inside Your Computer" on page 11.

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

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

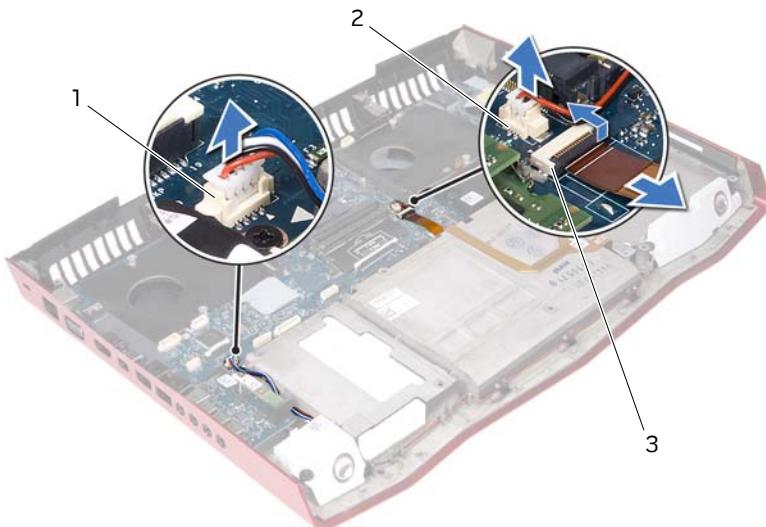
 **NOTE:** Before disconnecting the cables from the system board, note the location of the connectors so that you can reconnect them correctly after you replace the system board.

## Prerequisites

- 1 Remove any installed card or blank from the Media-Card Reader.
- 2 Remove the battery pack. See "Removing the Battery Pack" on page 7.
- 3 Remove the base cover. See "Removing the Base Cover" on page 7.
- 4 Remove the hard drive(s). See "Removing the Hard Drive(s)" on page 21.
- 5 Remove the coin-cell battery. See "Removing the Coin-Cell Battery" on page 18.
- 6 Remove the video-card heat-sink fan(s). See "Removing the Video-Card Heat-Sink Fan(s)" on page 67.
- 7 Remove the video-card heat-sink(s).  
See "Removing the Video-Card Heat-Sink(s)" on page 70.
- 8 Remove the video card(s). See "Removing the Video Card(s)" on page 73.
- 9 Remove the processor heat-sink fan. See "Removing the Processor Heat-Sink Fan" on page 76.
- 10 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 11 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 12 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 13 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 14 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.
- 15 Remove the memory modules. See "Removing the Memory Module(s)" on page 39.
- 16 Remove the mSATA card. See "Removing the mSATA Card" on page 16.
- 17 Remove the wireless Mini-Card. See "Removing the Wireless Mini-Card" on page 89.
- 18 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 78.
- 19 Remove the processor module. See "Removing the Processor Module" on page 81.

## Procedure

- 1 Disconnect the speaker cable and the subwoofer cable from the connectors on the system board.
- 2 Lift the connector latch and disconnect the optical-drive cable from the connector on the system board.



---

1 speaker-cable connector

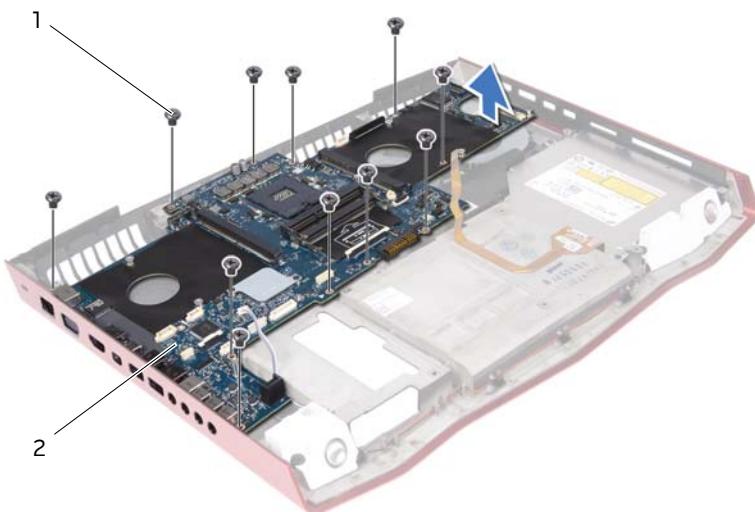
2 subwoofer-cable connector

---

3 optical-drive cable connector

---

- 3** Remove the screws that secure the system board to the computer base.
- 4** Carefully ease the connectors on the system board out of the slots in the computer base and lift the system board off the computer base.



---

1 screws (11)

---

2 system board

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the connectors on the system board with the slots on the computer base and place the system board on the computer base.
- 2 Replace the screws that secure the system board to the computer base.
- 3 Connect the speaker cable and the subwoofer cable to the connectors on the system board.
- 4 Slide the optical-drive cable into the connector on the system board and press down on the connector latch to secure the cable.

## Postrequisites

- 1 Replace the processor module. See "Replacing the Processor Module" on page 83.
- 2 Replace the processor heat-sink. See "Replacing the Processor Heat-Sink" on page 80.
- 3 Replace the wireless Mini-Card. See "Replacing the Wireless Mini-Card" on page 91.
- 4 Replace the mSATA card. See "Replacing the mSATA Card" on page 17.
- 5 Replace the memory module(s). See "Replacing the Memory Module(s)" on page 41.
- 6 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 7 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 8 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 9 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 10 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 11 Replace the processor heat-sink fan. See "Replacing the Processor Heat-Sink Fan" on page 77.
- 12 Replace the video card(s). See "Replacing the Video Card(s)" on page 75.
- 13 Replace the video-card heat-sink(s).  
See "Replacing the Video-Card Heat-Sink(s)" on page 72.
- 14 Replace the video-card heat-sink fan(s). See "Replacing the Video-Card Heat-Sink Fan(s)" on page 69.
- 15 Replace the coin-cell battery. See "Replacing the Coin-Cell Battery" on page 20.

- 16** Replace the hard drive(s). See "Replacing the Hard Drive(s)" on page 25.
- 17** Replace the base cover. See "Replacing the Base Cover" on page 15.
- 18** Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 19** Replace any installed card or blank from the Media-Card Reader.
- 20** Follow the instructions in "After Working Inside Your Computer" on page 11.

## 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 Setting** field.

**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

**NOTE:** Dell does not guarantee compatibility or provide support for wireless 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 half Mini-Card slot which supports a Wireless Local Area Network (WLAN) + Bluetooth combo card.

## Prerequisites

- 1 Remove the battery pack. See "Removing the Battery Pack" on page 12.
- 2 Remove the base cover. See "Removing the Base Cover" on page 14.

## Procedure

- 1 Disconnect the antenna cables from the connectors on the wireless Mini-Card.



1 wireless Mini-Card

2 antenna cables (3)

- 2** Remove the screw that secures the wireless Mini-Card to the system board.
- 3** Lift the wireless Mini-Card out of the connector on the system board.



---

1 screw

2 wireless Mini-Card

---

 **WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the notch on the wireless Mini-Card with the tab on the system-board connector.
-  **CAUTION:** Use firm and even pressure to slide the wireless Mini-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 wireless Mini-Card and on the system board, and realign the wireless Mini-Card.
-  **CAUTION:** To avoid damage to the wireless Mini-Card, never place cables under the wireless Mini-Card.
- 2 Insert the wireless Mini-Card connector at a 45-degree angle into the system-board connector.
- 3 Press the other end of the wireless Mini-Card down into the slot on the system board and replace the screws that secure the wireless Mini-Card to the system board.
- 4 Connect the antenna cables to the connectors on 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 Scheme
<b>WLAN + Bluetooth (2 or 3 cables)</b>	
Main WLAN + Bluetooth (white triangle)	white
Auxiliary WLAN + Bluetooth (black triangle)	black
Auxiliary WLAN + Bluetooth (black triangle)	grey

## **Postrequisites**

- 1** Replace the base cover. See "Replacing the Base Cover" on page 15.
- 2** Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 3** Follow the instructions in "After Working Inside Your Computer" on page 11.

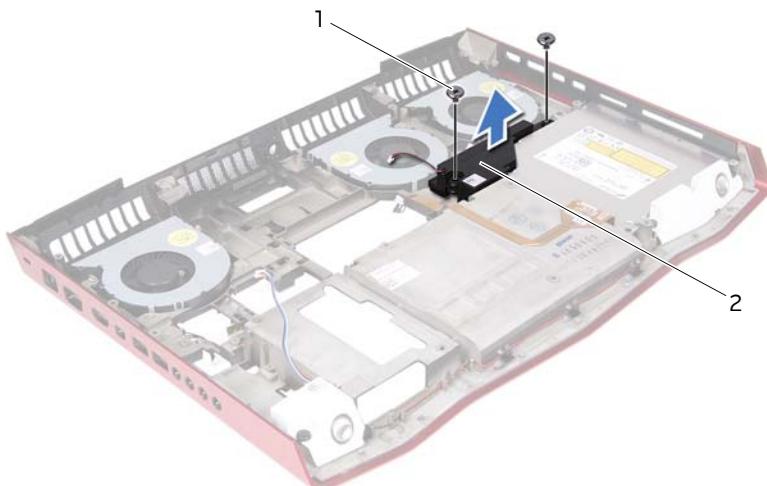
**⚠ WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Prerequisites

- 1 Remove any installed card or blank from the Media-Card Reader.
- 2 Remove the battery pack. See "Removing the Battery Pack" on page 7.
- 3 Remove the base cover. See "Removing the Base Cover" on page 7.
- 4 Remove the hard drive(s). See "Removing the Hard Drive(s)" on page 21.
- 5 Remove the coin-cell battery. See "Removing the Coin-Cell Battery" on page 18.
- 6 Disconnect the video-card heat-sink fan(s) cable from the connector on the system board. See "Removing the Video-Card Heat-Sink Fan(s)" on page 67.
- 7 Disconnect the processor heat-sink fan cable from the connector on the system board. See "Removing the Processor Heat-Sink Fan" on page 76.
- 8 Remove the video-card heat-sink(s).  
See "Removing the Video-Card Heat-Sink(s)" on page 70.
- 9 Remove the video card(s). See "Removing the Video Card(s)" on page 73.
- 10 Remove the center control cover. See "Removing the Center Control Cover" on page 26.
- 11 Remove the keyboard. See "Removing the Keyboard" on page 32.
- 12 Remove the macro keyboard. See "Removing the Macro Keyboard" on page 36.
- 13 Remove the display assembly. See "Removing the Display Assembly" on page 43.
- 14 Follow the instructions from step 1 to step 7 in Removing the Palm Rest.
- 15 Remove the memory modules. See "Removing the Memory Module(s)" on page 39.
- 16 Remove the mSATA card. See "Removing the mSATA Card" on page 16.
- 17 Remove the wireless Mini-Card. See "Removing the Wireless Mini-Card" on page 89.
- 18 Remove the processor heat-sink. See "Removing the Processor Heat-Sink" on page 78.
- 19 Remove the processor module. See "Removing the Processor Module" on page 81.
- 20 Remove the system board. See "Removing the System Board" on page 84.

## Procedure

- 1 Remove the screws that secure the subwoofer to the computer base.
- 2 Lift the subwoofer along with the cable off the computer base.



---

1 screws (2)

2 subwoofer

---



**WARNING:** Before working inside your computer, read the safety information that shipped with your computer and follow the steps in "Before You Begin" on page 9. For additional safety best practices information, see the Regulatory Compliance Homepage at [dell.com/regulatory\\_compliance](http://dell.com/regulatory_compliance).

## Procedure

- 1 Align the screw holes on the subwoofer with the screw holes on the computer base.
- 2 Replace the screws that secure the subwoofer to the computer base.

## Postrequisites

- 1 Replace the system board. See "Replacing the System Board" on page 87.
- 2 Replace the processor module. See "Replacing the Processor Module" on page 83.
- 3 Replace the processor heat-sink. See "Replacing the Processor Heat-Sink" on page 80.
- 4 Replace the wireless Mini-Card. See "Replacing the Wireless Mini-Card" on page 91.
- 5 Replace the mSATA card. See "Replacing the mSATA Card" on page 17.
- 6 Replace the memory module(s). See "Replacing the Memory Module(s)" on page 41.
- 7 Follow the instructions from step 2 to step 5 in Replacing the Palm Rest.
- 8 Replace the dispaly assembly. See "Replacing the Display Assembly" on page 48.
- 9 Replace the macro keyboard. See "Replacing the Macro Keyboard" on page 38.
- 10 Replace the keyboard. See "Replacing the Keyboard" on page 35.
- 11 Replace the center control cover. See "Replacing the Center Control Cover" on page 29.
- 12 Replace the video card(s). See "Replacing the Video Card(s)" on page 75.
- 13 Replace the video-card heat-sink(s).  
See "Replacing the Video-Card Heat-Sink(s)" on page 72.
- 14 Connect the processor heat-sink fan cable to the connector on the system board. See "Replacing the Processor Heat-Sink Fan" on page 77.
- 15 Connect the video card heat-sink fan cable to the connector on the system board.  
See "Replacing the Video-Card Heat-Sink Fan(s)" on page 69.

- 16** Replace the coin-cell battery. See "Replacing the Coin-Cell Battery" on page 20.
- 17** Replace the hard drive(s). See "Replacing the Hard Drive(s)" on page 25.
- 18** Replace the base cover. See "Replacing the Base Cover" on page 15.
- 19** Replace the battery pack. See "Replacing the Battery Pack" on page 13.
- 20** Replace any installed card or blank from the Media-Card Reader.
- 21** Follow the instructions in "After Working Inside Your Computer" on page 11.

## Overview

Use the 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 configuration information
- 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

 **CAUTION: Unless you are an expert computer user, do not change the settings for this 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.

## Entering System Setup

- 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 Microsoft Windows desktop. Then, turn off your computer and try again. See "Turn Off Your Computer and Connected Devices" on page 9.

# 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. The 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.
Alienware	Displays the model number of your computer.
Service Tag	Displays the Service Tag of your computer.
BIOS Version	Displays the BIOS version.
EC Version	Displays the EC firmware version.
ME Version	Displays the Intel ME firmware version.
CPU	Displays the type of processor installed.
CPU Frequency	Displays the speed of the processor.
CPU L3 Cache	Displays the processor cache size.
CPUID	Displays the ID of the processor.
Integrated Graphics	Displays the integrated graphics.

---

## Main Menu (Continued)

---

Discrete Graphics	Displays the discrete graphics.
Total Memory	Displays the total memory available in your computer.
Memory Bank 0	Displays the memory size installed in DIMM A.
Memory Bank 1	Displays the memory size installed in DIMM B.
Memory Bank 2	Displays the memory size installed in DIMM C.
Memory Bank 3	Displays the memory size installed in DIMM D.

---

## Advanced Menu

---

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

---

## Advanced Menu (Continued)

---

Integrated Network	Allows you to enable or disable the on-board LAN controller. <ul style="list-style-type: none"><li>▪ Disabled: Internal LAN is disabled and is not visible to the operating system.</li><li>▪ Enabled: Internal LAN is enabled.</li></ul>
High Definition Audio	Allows you to enable or disable the internal high definition audio device. <ul style="list-style-type: none"><li>▪ Disabled: The internal audio device is disabled and is not visible to the operating system.</li><li>▪ Enabled: The internal audio device is enabled.</li></ul>
SD Card Reader	Allows you to enable or disable the internal SD card reader.
CPU Turbo Mode	Allows you to enable or disable the Intel CPU turbo mode performance option.
Performance Options	Allows you to configure fields in the Performance Options sub-menu. For more information, see "Advanced Menu—Performance Options" on page 123.
SATA Operation	Allows you to configure the operating mode of the integrated SATA hard drive controller. <ul style="list-style-type: none"><li>▪ AHCI: SATA is configured for AHCI mode.</li><li>▪ RAID: SATA is configured for RAID mode.</li></ul>
SATA HARD DRIVE 1	Displays the installed primary SATA hard drive model.
SATA HARD DRIVE 2	Displays the installed secondary SATA hard drive model.
Adapter Warnings	<ul style="list-style-type: none"><li>▪ Allows you to choose if the computer should display warning messages when you use AC adapters that are not supported by your computer.</li><li>▪ Enabled: BIOS will detect unsupported AC adapters and display an error on the screen.</li></ul>
Charger Behavior	Allows you to enable or disable battery charging.
Primary Display	Allows you to choose a primary display.

---

---

## Advanced Menu—Performance Options

---

	Allows you to enable or disable the global overclocking feature. <ul style="list-style-type: none"><li>▪ Disabled: The overclocking feature is disabled.</li><li>▪ Enabled: Displays additional overclocking options.</li></ul>
Non-Turbo Flex Support	Allows you to modify the CPU flex ratio with Turbo Mode disabled.
Flex Ratio Override	Appears when Non-Turbo Flex is enabled and allows you to specify the flex ratio for all CPU cores.
Extreme Edition	Allows Extreme Edition CPUs to adjust the flex ratio in a Turbo Mode environment that allows each individual core ratio to be modified.
Extreme Edition Core Ratio Limits	Allows you to modify the flex ratio of individual cores physically present in the CPU.
Memory Override Support	Allows you to enable or disable the memory override option support. <ul style="list-style-type: none"><li>▪ Disabled: The memory override support is disabled.</li><li>▪ Enabled: Displays additional memory override support options.</li></ul>
Memory Voltage	Allows you to modify memory voltage.
Memory Frequency	Allows you to modify memory frequency.
DIMM Profile (XMP)	Allows you to configure different XMP options.
Override Turbo Settings	Allows you to override CPU Turbo Mode settings.
Long Duration PWR Limit	Allows you to specify the Turbo Mode power limit 1 in Watts.
	Indicates the time window over which TDP value should be maintained. A value of 0 programs this value to the fused limit.
Short Duration PWR Limit	Power Limit 1 time value in seconds.
Short Duration PWR Limit	Turbo Mode Power Limit 2 value in Watts.
PWR Limit	A value of 0 programs this value to 1.25 x TDP.

---

---

## Wireless Menu

---

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

---

## Security Menu

---

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

---

---

## Boot Menu

---

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

Hard Drive

USB Storage

CD/DVD/BD

Removal Devices

Network

---

---

## Exit Menu

---

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

---

## Boot Sequence

This feature allows you to change the boot sequence for devices.

## Boot Options

- **Diskette Drive** — The computer attempts to boot from the floppy drive. If no operating system is on the drive, the computer generates an error message.
- **Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer generates an error message.
- **CD/DVD/CD-RW Drive** — The computer attempts to boot from the optical drive. If no disc is in the drive, or if the disc is not bootable, the computer generates an error message.

- **USB Storage Device** — Insert the memory device into a USB connector and restart the computer. When F12 Boot Options appears in the lower-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB flash option to the boot menu.
-  **NOTE:** To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.
- **Network** — The computer attempts to boot from the network. If no operating system is found on the network, the computer generates an error message.

## Changing Boot Sequence for the Current Boot

You can use this feature to change the current boot sequence, for example, to boot from the optical drive to run Dell Diagnostics from the *Drivers and Utilities* disc. The previous boot sequence is restored at the next boot.

- 1 If you are booting from a USB device, connect the USB device to a USB port.
- 2 Turn on (or restart) your computer.
- 3 When F2 Setup, F12 Boot Options appears in the lower-right corner of the screen, press <F12>.

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

- The **Boot Device Menu** appears, listing all available boot devices.
- 4 On the Boot Device Menu choose the device you want to boot from.  
For example, if you are booting to a USB memory key, highlight **USB Storage Device** and press <Enter>.

## Changing Boot Sequence for Future Boots

- 1 Enter system setup. See "Entering System Setup" on page 97.
- 2 Use the arrow keys to highlight the **Boot** menu option and press <Enter> to access the menu.

-  **NOTE:** Write down your current boot sequence in case you want to restore it.
- 3 Press the up- and down-arrow keys to move through the list of devices.
  - 4 Press plus (+) or minus (-) to change the boot priority of the device.

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. For more information, see the Quick Start Guide that shipped with your computer.

If you have your computer's Service Tag or Express Service Code:

- a Enter your computer's Service Tag or Express Service Code in the **Service Tag or Express Service Code** field.
- b Click **Submit** and proceed to step 4.

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

- a Select one of the following options:
  - **Automatically detect my Service Tag for me**
  - **Choose from My Products and Services List**
  - **Choose from a list of all Dell products**
- b Click **Continue** and follow the instructions on the screen.
- 4 A list of results appears on the screen. Click **BIOS**.
- 5 Click **Download File** to download the latest BIOS file.
- 6 In the **Please select your download method below** window, click **For Single File Download via Browser**, and then click **Download Now**.
- 7 In the **Save As** window, select an appropriate location to download the file on your computer.
- 8 If the **Download Complete** window appears, click **Close**.
- 9 Navigate to the folder where you downloaded the BIOS update file. The file icon appears in the folder and is titled the same as the downloaded BIOS update file.
- 10 Double-click the BIOS update file icon and follow the instructions that appear on the screen.