

# Dell™ Latitude™ E6500 Service Manual

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Model PP30L

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## Notes, Notices, and Cautions

-  **NOTE:** A NOTE indicates important information that helps you make better use of your computer.
-  **NOTICE:** A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.
-  **CAUTION:** A CAUTION indicates potential for property damage, personal injury, or death.

If you purchased a DELL™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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August 2008 Rev. A00

## Base Assembly

### Service Manual

- [Removing the Bottom of the Base Assembly](#)
- [Replacing the Bottom of the Base Assembly](#)
- [Removing the Base Assembly](#)
- [Replacing the Base Assembly](#)

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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### Removing the Bottom of the Base Assembly

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Loosen the M2.5 x 5-mm captive screw.
4. Using the rubber feet for leverage, slide the bottom of the base assembly away from computer, then lift to remove it.



1	M2.5 x 5-mm captive screw	2	rubber feet
3	bottom of base assembly		

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### Replacing the Bottom of the Base Assembly

1. Slide the bottom of the base assembly into place.
  2. Replace the M2.5 x 5-mm captive screw.
- 

### Removing the Base Assembly

1. Follow the procedures in [Before Working on Your Computer](#).
  2. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
  3. Remove the system board (see [Removing the System Board Assembly](#)).
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### Replacing the Base Assembly

1. Replace the system board (see [Replacing the System Board Assembly](#)).
2. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).

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## Before Working on Your Computer

### Service Manual

- [Recommended Tools](#)
- [What You Need to Know for Your Safety](#)
- [Removing the Battery](#)
- [Replacing the Battery](#)

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

- 1 You have performed the steps in [Before Working on Your Computer](#).
- 1 You have read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
- 1 When replacing a component, you have already removed the original, if installed.

 **NOTE:** The color of your computer and certain system components may appear differently than shown in this document.

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## Recommended Tools

The procedures in this document may require the following tools:

- 1 Small flat-blade screwdriver
  - 1 Phillips screwdriver
  - 1 Small plastic scribe
  - 1 Flash BIOS update (see the Dell Support website at [support.dell.com](http://support.dell.com))
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## What You Need to Know for Your Safety

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

-  **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
-  **NOTICE:** Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.
-  **NOTICE:** To avoid electrostatic discharge, ground yourself by using a wrist grounding strap or by periodically touching an unpainted metal surface, such as a connector on the back of the computer.
-  **NOTICE:** Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.
-  **NOTICE:** When disconnecting a cable, pull on the cable's connector or on its strain-relief loop, not on the cable itself. For cable connectors with locking tabs, press inward on the locking tabs to release the connector. When connecting a cable, ensure that the connectors are correctly oriented and aligned to avoid damage to the connector and/or the connector's pins.

1. Ensure that the work surface is flat and clean to prevent the computer cover from being scratched.
2. Shut down your computer.
  - 1 In Windows XP, click **Start** → **Shutdown** → **Shutdown**.
  - 1 In Windows Vista, click **Start**  , click the arrow  icon, and then click **Shut Down** to turn off your computer.

 **NOTE:** Ensure that the computer is off and not in a power management mode. If you cannot shut down the computer using the operating system, press and hold the power button for 4 seconds.

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

 **NOTICE:** To disconnect a network cable, first unplug the cable from your computer, and then unplug it from the network wall jack.

4. Disconnect any telephone or network cables from the computer.

5. Remove any installed cards.

 **NOTICE:** To help prevent damage to the system board, you must remove the battery from the battery bay before you service the computer.

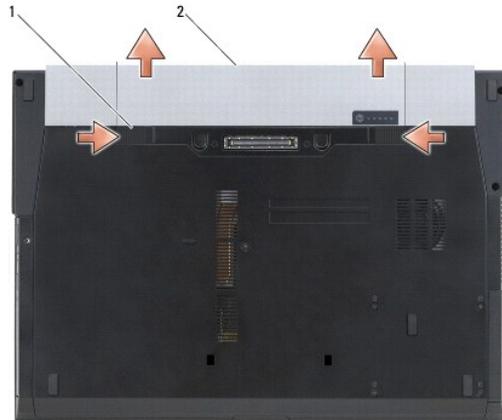
**NOTE:** To avoid damage to the computer, use only the battery designed for this particular Dell computer. Do not use batteries designed for other Dell computers.

6. Turn the computer over.

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## Removing the Battery

1. Slide the battery release latches to the open position. (The latches lock into place).
2. Grip the battery and slide it out of the battery bay.



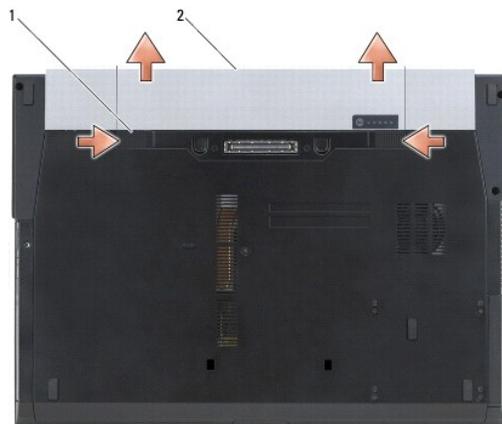
1 battery release latches (2) 2 battery

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

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## Replacing the Battery

To replace a battery, slide it into the battery bay until it clicks into place.



1 battery release latches (2) 2 battery

## Flashing the BIOS

### Service Manual

### Flashing the BIOS From a CD

 **NOTICE:** Plug the DC adapter into a known good power source to prevent a loss of power. Failure to do so may cause system damage.

1. Ensure that the DC adapter is plugged in and that the main battery is installed properly.
2. Press <F12> before inserting the BIOS-update program CD so that you can set up the computer to boot from a CD for one time only. Otherwise, you must enter the system setup program to change the default boot order.
3. Insert the BIOS-update program CD, and turn on the computer.

 **NOTICE:** Do not interrupt this process once it begins. Doing so may cause system damage.

Follow the instructions that appear on the screen. The computer continues to boot and updates the new BIOS. When the flash update is complete, the computer will automatically reboot.

4. Remove the flash BIOS update program CD from the drive.
- 

### Flashing the BIOS From the Hard Drive

 **NOTICE:** Plug the DC adapter into a known good power source to prevent a loss of power. Failure to do so may cause system damage.

1. Ensure that the DC adapter is plugged in, the main battery is properly installed, and a network cable is attached.
2. Turn on the computer.
3. Locate the latest BIOS update file for your computer at [support.dell.com](http://support.dell.com).
4. Click **Download Now** to download the file.
5. If the **Export Compliance Disclaimer** window appears, click **Yes, I Accept this Agreement**.

The **File Download** window appears.

6. Click **Save this program to disk**, and then click **OK**.

The **Save In** window appears.

7. Click the down arrow to view the **Save In** menu, select **Desktop**, and then click **Save**.

The file downloads to your desktop.

8. Click **Close** if the **Download Complete** window appears.

The file icon appears on your desktop and is titled the same as the downloaded BIOS update file.

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

## Card Cage

### Service Manual

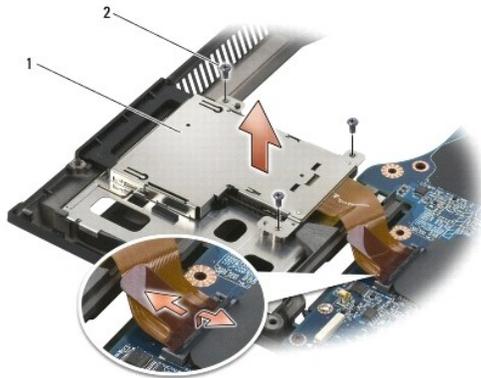
- [Removing the Card Cage](#)
- [Replacing the Card Cage](#)

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## Removing the Card Cage

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the hinge covers (see [Removing the Hinge Covers](#)).
5. Remove the palm rest assembly ([Removing the Palm Rest Assembly](#)).
6. If a card is in the cage, remove the card.
7. Remove the three M2 x 3 screws.
8. Push the carrier to one side to release it from the system board, then pull the carrier in the opposite direction to remove the carrier.



1	card carrier	2	M2 x 3 screws (3)
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## Replacing the Card Cage

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1. Attach one side of the carrier and then the other and set it in place.
2. Replace the three M2 x 3 screws.
3. Replace the palm rest assembly ([Replacing the Palm Rest Assembly](#)).
4. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
5. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).

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## Coin-Cell Battery

### Service Manual

- [Removing the Coin-Cell Battery](#)
- [Replacing the Coin-Cell Battery](#)

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## Removing the Coin-Cell Battery

- ⚠ **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
- 🔊 **NOTICE:** Disconnecting the coin-cell battery from the system board with no other power source causes the BIOS to reset to the default configuration and sets the real-time clock to the build date. System configuration changes made in the BIOS by the user must be reentered, and the system clock must be set.

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Pry up the coin-cell battery to release the double-sided adhesive tape on the bottom.
5. Lift the coin-cell battery out of the computer.
6. Disconnect the coin-cell battery cable from the system board.



1	battery cable connector	2	coin-cell battery
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## Replacing the Coin-Cell Battery

- ⚠ **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Connect the coin-cell battery cable to the system board.
2. Insert the coin-cell battery into the computer.
3. If you are re-installing the old coin-cell battery, slide the battery under the tab, and press down to seal the tape on the bottom.  
If you are installing a new coin-cell battery, remove the adhesive backing from the battery and slide the battery under the tab. Press to seal the tape on the bottom.
4. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).

5. Replace the battery (see [Replacing the Battery](#)).

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## Processor Module

### Service Manual

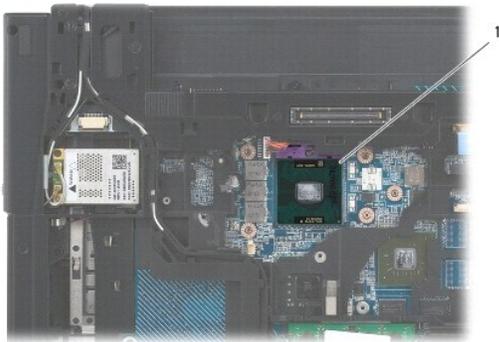
- [Removing the Processor Module](#)
- [Replacing the Processor Module](#)

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## Removing the Processor Module

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the computer (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the fan (see [Removing the Fan](#)).
5. Remove the processor thermal-cooling assembly (see [Removing the Processor Thermal-Cooling Assembly](#)).



1 processor module

➡ **NOTICE:** To avoid damage to the processor, hold the screwdriver so that it is perpendicular to the processor when turning the cam screw.

6. To loosen the ZIF socket, use a small, flat-blade screwdriver and rotate the ZIF-socket cam screw counterclockwise until it comes to the cam stop.



1 ZIF-socket cam screw 2 ZIF socket

➡ **NOTICE:** To ensure maximum cooling for the processor, 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.

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

7. Lift the processor module from the ZIF socket.

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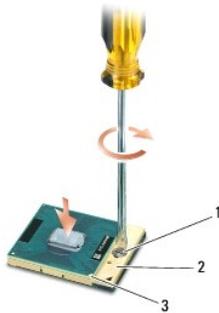
## Replacing the Processor Module

- CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).
- NOTICE:** Do not touch the processor die. Press and hold the processor down on the substrate on which the die is mounted while turning the cam screw to prevent intermittent contact between the cam screw and processor.
- NOTICE:** Ensure that the cam lock is in the fully open position before seating the processor module. Seating the processor module properly in the ZIF socket does not require force. A processor module that is not properly seated can result in an intermittent connection or permanent damage to the microprocessor and ZIF socket.
- NOTE:** If a new processor is installed, you will receive a new thermal-cooling assembly, which will include an affixed thermal pad, or you will receive a new thermal pad along with a tech sheet to illustrate proper installation.

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



1	ZIF-socket cam screw	2	ZIF socket
3	pin-1 corner		

- NOTICE:** To avoid damage to the processor, hold the screwdriver so that it is perpendicular to the processor 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.
  3. Replace the processor thermal-cooling assembly (see [Replacing the Processor Thermal-Cooling Assembly](#)).
  4. Replace the fan (see [Replacing the Fan](#)).
  5. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
  6. Replace the battery (see [Replacing the Battery](#)).

## Processor Thermal-Cooling Assembly

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- [Removing the Processor Thermal-Cooling Assembly](#)
- [Replacing the Processor Thermal-Cooling Assembly](#)

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

There are two types of thermal solutions for your computer:

- 1 Discrete graphics which requires two thermal-cooling assemblies.
- 1 Integrated graphics (which does not include a discrete graphics processor) which requires one thermal-cooling assembly.

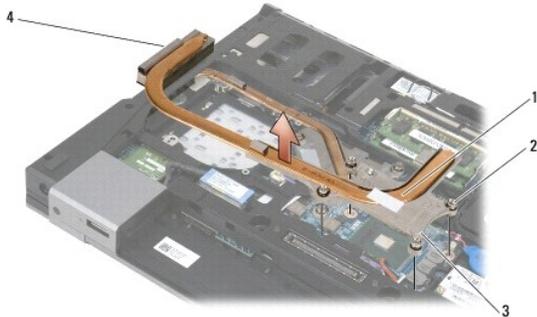
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## Removing the Processor Thermal-Cooling Assembly

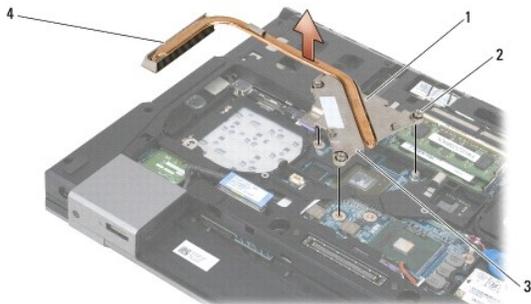
### Discrete Graphics Thermal-Cooling Assembly

If you have purchased a system board containing the discrete graphics option, complete the following steps:

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the fan (see [Removing the Fan](#)).
5. Loosen the four captive screws in sequential order that secure the processor thermal-cooling assembly to the system board.
6. Carefully lift the screw-end of the assembly at an angle, then ease the vent- end of the assembly out of the computer.



1 processor thermal-cooling assembly	2 captive screws (4)
3 screw-end of assembly	4 vent-end of assembly



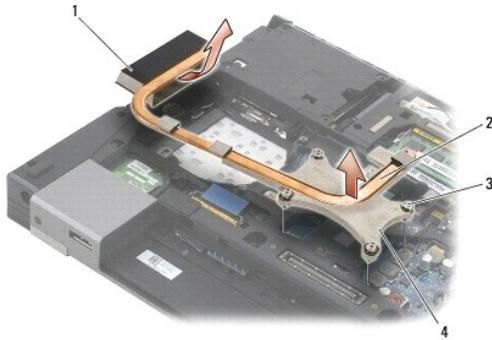
1	processor thermal-cooling assembly	2	captive screws (4)
3	screw-end of assembly	4	vent-end of assembly

7. Loosen the three captive screws that secure the graphics thermal-cooling assembly to the system board.
8. Carefully lift the screw-end of the assembly up at an angle, then ease the vent-end of the assembly out of the computer.

## Integrated Graphics Thermal-Cooling Assembly

If you have purchased a system board with integrated graphics, complete the following steps:

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the fan (see [Removing the Fan](#)).
5. Loosen the four captive screws that secure the thermal-cooling assembly to the system board.
6. Carefully lift the screw-end of the assembly up at an angle, then ease the vent-end of the assembly out of the computer.



1	vent-end of assembly	2	processor thermal-cooling assembly
3	captive screws (4)	4	screw-end of assembly

## Replacing the Processor Thermal-Cooling Assembly

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## Discrete Graphics Thermal-Cooling Assembly

1. Place the vent-end of the graphics thermal-cooling assembly into the computer at an angle, then align the three captive screws on the thermal-cooling assembly with the screw holes on the system board.
2. In sequential order, tighten the three captive screws to secure the thermal-cooling assembly to the system board.
3. Place the vent-end of the processor thermal-cooling assembly into the computer at an angle, then align the four captive screws on the thermal-cooling assembly with the screw holes on the system board.
4. In sequential order, tighten the four captive screws to secure the thermal-cooling assembly to the system board.
5. Replace the fan (see [Replacing the Fan](#)).

6. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
7. Replace the battery (see [Replacing the Battery](#)).

## Integrated Graphics Thermal-Cooling Assembly

1. Place the vent-end of the thermal-cooling assembly into the computer at an angle, then align the four captive screws on the thermal-cooling assembly with the screw holes on the system board.
  2. In sequential order, tighten the four captive screws to secure the thermal-cooling assembly to the system board.
  3. Replace the fan (see [Replacing the Fan](#)).
  4. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
  5. Replace the battery (see [Replacing the Battery](#)).
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## I/O Daughter Card

### Service Manual

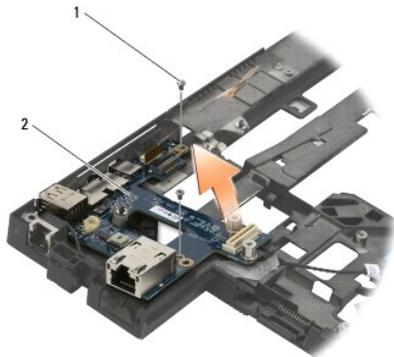
- [Removing the I/O Daughter Card](#)
- [Replacing the I/O Daughter Card](#)

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## Removing the I/O Daughter Card

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the (see [Removing the Hinge Covers](#)).
5. Remove the palm rest assembly (see [Removing the Palm Rest Assembly](#)).
6. Remove the system board (see [Removing the System Board Assembly](#)).
7. Remove the modem (see [Removing the Modem](#)).
8. Remove the two M2 x 3-mm screws from the I/O daughter card.
9. Remove the I/O daughter card.



1	M2 x 3-mm screws (2)	2	I/O daughter card
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## Replacing the I/O Daughter Card

**⚠ CAUTION:** Before you begin the following procedure, follow the safety instructions that shipped with your computer.

1. Place the I/O daughter card in the base assembly.
2. Replace the two M2 x 3-mm screws to secure the I/O daughter card to the base assembly.
3. Replace the modem (see [Replacing the Modem](#)).

4. Replace the system board (see [Replacing the System Board Assembly](#)).
  5. Replace the palm rest assembly ([Replacing the Palm Rest Assembly](#)).
  6. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
  7. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
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# Display

## Service Manual

<a href="#">Removing the Display Assembly</a>	<a href="#">Display Inverter</a>
<a href="#">Replacing the Display Assembly</a>	<a href="#">Removing the Camera and Microphone Assembly</a>
<a href="#">Removing the Display Bezel</a>	<a href="#">Replacing the Camera and Microphone Assembly</a>
<a href="#">Replacing the Display Bezel</a>	<a href="#">Removing the Latch Hook Assembly</a>
<a href="#">Removing the Display Panel</a>	<a href="#">Replacing the Latch Hook Assembly</a>
<a href="#">Replacing the Display Panel</a>	<a href="#">Removing the Display Cover</a>
<a href="#">Removing the Display Panel Brackets</a>	<a href="#">Replacing the Display Cover</a>
<a href="#">Replacing the Display Panel Brackets</a>	

**NOTE:** Some graphics may vary slightly, depending on whether you ordered a cold-cathode fluorescent lamp (CCFL) display or an LED display.

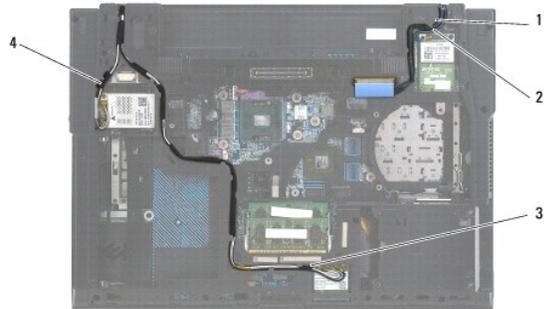
## Removing the Display Assembly

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the hinge covers (see [Removing the Hinge Covers](#)).
5. Disconnect the display cable, the WPAN cable, and the modem cable.

**NOTICE:** After unrouting the cables, place all cables to the rear and away from the computer.

6. Unroute the display cable and the wireless cables (WLAN, WWAN, and WPAN).



1	display cable	2	WPAN cable
3	WLAN cable	4	WWAN cable

7. Remove the M2.5 x 5-mm screws from each hinge.



1	M2.5 x 5-mm screws (2)		
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8. Turn the computer top-side up.
9. Open the display to 90 degrees and lift the display assembly off the base assembly.



1	display assembly	2	base assembly
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## Replacing the Display Assembly

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**➡ NOTICE:** After unrouting cables, position the cables to the rear and away from the base assembly before installing the display assembly.

1. Align the display hinges with the holes in the base of the computer, and lower the display into place.
2. Replace the two M2.5 x 5-mm screws on the hinges.
3. Close the display and turn the computer over.
4. Route the display cable and wireless (WLAN, WWAN, and WPAN) cables, and fit the cables under each tab in the cable routing channels, including the tabs on the rear of the assembly.
5. Connect the WWAN antenna cables to the WWAN card, and place any unused antenna cables in the base assembly cable holders next to the card slot.
6. Connect the WPAN antenna cable to the WPAN card, and place any unused antenna cables in the base assembly cable holders next to the card slot.
7. Connect the WLAN antenna cables to the WLAN card, and place any unused antenna cables in the base assembly cable holders next to the card slot.
8. Connect the display cable to the display cable connector on the system board.
9. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
10. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
11. Replace the battery (see [Replacing the Battery](#)).

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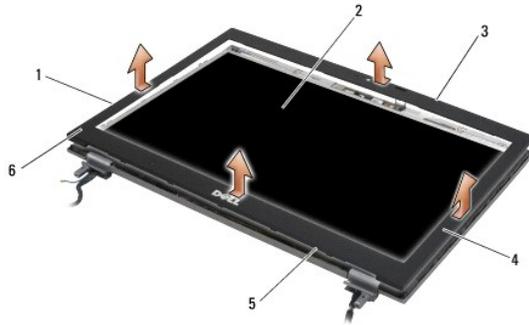
## Removing the Display Bezel

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Remove the display assembly (see [Removing the Display Assembly](#)).

- ➡ **NOTICE:** Removal of the bezel from the display cover requires extreme care to avoid damage to the bezel.
- ➡ **NOTICE:** To release the snaps on the left and right sides of the bezel, push the bezel sides *away or out* from the display while lifting the bezel. To release the snaps along the top and the bottom of the bezel, pull the bezel top or bottom *towards or in* to the display while lifting the bezel. Special attention is required for the corners, especially for bezels used with LED display panels.
- ➡ **NOTICE:** Be careful not to scratch the display screen while removing the bezel.

3. Carefully lift and unsnap the bezel from the left and right sides, and the top of the bottom of the display panel.
4. Once all snaps are released, lift the bezel from the display assembly.



1	left side of bezel	2	display panel
3	top of bezel	4	right side of bezel
5	bottom of bezel	6	display bezel

---

## Replacing the Display Bezel

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Align the latch hook on the display panel with the small rectangular opening on the display bezel.
- ➡ **NOTICE:** To engage the snaps on the left and right sides of the bezel, pull the bezel sides *towards or in* to the display while pushing down on the bezel. To engage the snaps along the top and bottom of the bezel, push the bezel top or bottom *away or out* from the display while pushing down on the bezel.
2. Starting at any corner, use your fingers to gently snap the bezel into place to secure it to the display panel.
3. Replace the display assembly (see [Replacing the Display Assembly](#)).

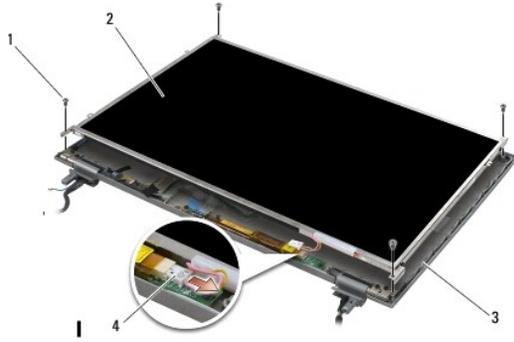
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## Removing the Display Panel

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Remove the display assembly (see [Removing the Display Assembly](#)).
3. Remove the display bezel (see [Removing the Display Bezel](#)).
4. Remove the four M2.5 x 5-mm screws from the display panel.

## Removing the CCFL Display Panel



1	M2.5 x 5-mm screws (4)	2	display panel
3	display cover	4	inverter backlight cable

1. Disconnect the inverter backlight cable from the inverter.

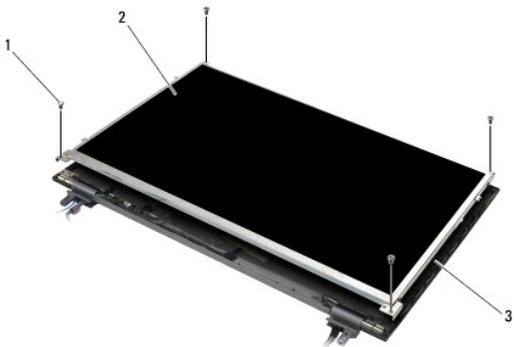
➔ **NOTICE:** Be careful not to damage the display with the hinges and cables on the display cover.

2. Lift the display panel out of the display cover and lay the display panel flat on your workspace.

3. Disconnect the display cable and squeeze the release tabs together to remove the cable.

4. Remove the display panel brackets, if needed (see [Removing the Display Panel Brackets](#)).

## Removing the LED Display Panel



1	M2.5 x 5-mm screws (4)	2	display panel
3	display cover		

➔ **NOTICE:** Be careful not to damage the display with the hinges and cables on the display cover.

1. Lift the display panel out of the display cover and lay the display panel flat on your workspace.

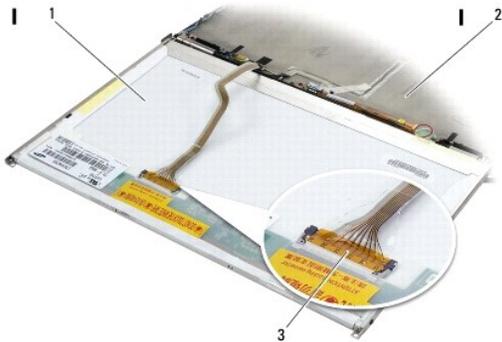
2. Pull the pull-tab to disconnect the display cable.

## Replacing the Display Panel

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

Replace the display panel brackets if you removed them (see [Replacing the Display Panel Brackets](#)).

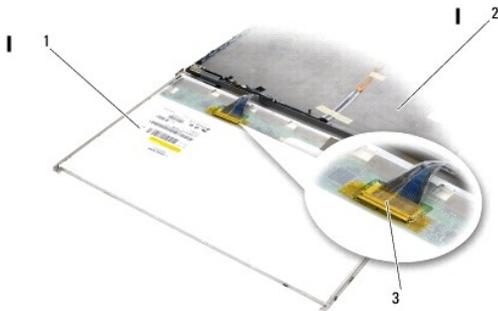
## Replacing the CCFL Display Panel



1	display panel	2	display cover
3	display cable		

1. Connect the display cable to the connector on the back of the display panel.
2. Route the display cable around the notch on the display cover and set the display panel in place.
3. Connect the inverter backlight cable to the inverter.
4. Replace the four M2.5 x 5-mm screws that secure the display panel to the display cover.
5. Replace the display bezel (see [Replacing the Display Bezel](#)).
6. Replace the display assembly (see [Replacing the Display Assembly](#)).

## Replacing the LED Display Panel



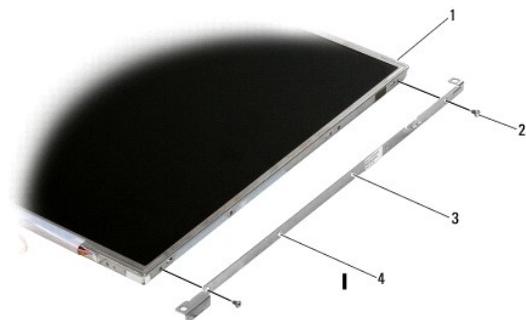
1	display panel	2	display cover
3	display cable		

1. Connect the display cable to the connector on the back of the display panel.
  2. Route the display cable around the notch on the display cover and set the display panel in place.
  3. Replace the four M2.5 x 5-mm screws that secure the display panel to the display cover.
  4. Replace the display bezel (see [Replacing the Display Bezel](#)).
  5. Replace the display assembly (see [Replacing the Display Assembly](#)).
-

## Removing the Display Panel Brackets

1. Remove the M2.5 x 5-mm screws (and plastic plugs, where applicable)(two screws and two plastic plugs for CCFL displays; two screws for LED displays) from the display panel brackets on either side of the display panel.
2. Remove the display panel brackets.

 **NOTE:** LED display panel brackets do not have plastic plugs.



1	display panel	2	M2.5 x 5-mm screws (2)
3	display panel brackets	4	plastic plugs (2—CCFL displays only)

---

## Replacing the Display Panel Brackets

 **NOTE:** The display panel brackets are labeled "L" (left) and "R" (right).

1. Replace the display panel brackets.
2. Replace the M2.5 x 5-m screws (four each for CCFL displays; two each for LED displays) from the display panel brackets.

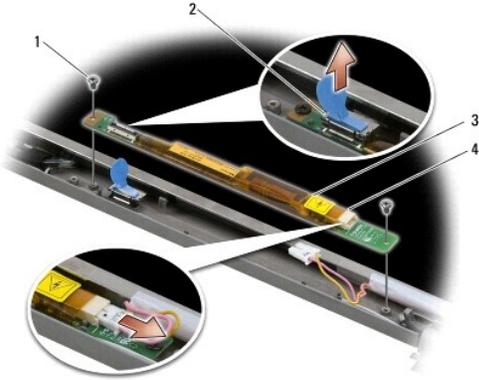
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## Display Inverter

### Removing the Display Inverter

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Remove the display assembly (see [Removing the Display Assembly](#)).
3. Remove the display bezel (see [Removing the Display Bezel](#)).
4. Remove the M2 x 3-mm screw from the display inverter.
5. Disconnect the two display inverter connectors.
6. Lift the display inverter out of the display cover.



1	M2 x 3-mm screws (2)	2	display inverter connector
3	display inverter	4	display inverter connector

## Replacing the Display Inverter

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

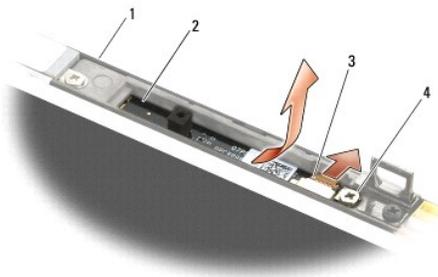
1. Connect the two display inverter connectors to the display inverter.
2. Replace the two M2 x 3-mm screws that secure the display inverter.
3. Replace the display bezel (see [Replacing the Display Bezel](#)).
4. Replace the display assembly (see [Replacing the Display Assembly](#)).

## Removing the Camera and Microphone Assembly

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**🔍 NOTE:** The camera and microphone assembly is optional and may not have shipped with your computer.

1. Follow the instructions in [Before Working on Your Computer](#).
2. Remove the display assembly (see [Removing the Display Assembly](#)).
3. Remove the display bezel (see [Removing the Display Bezel](#)).
4. Lift the small connector lever on the camera/microphone cable.
5. Loosen the M2 x 3-mm captive screw, and carefully lift the camera/microphone assembly up at an angle and disconnect the camera/microphone cable.



1	display cover	2	camera microphone assembly
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3	camera microphone cable	4	M2 x 3-mm screw (1)
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## Replacing the Camera and Microphone Assembly

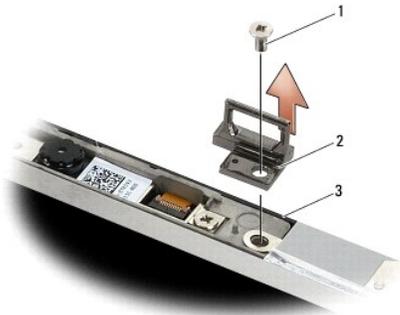
**CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Slide the cable connector of the camera/microphone cable into the connector on the camera/microphone assembly.
2. Close the lever on the connector on the camera/microphone assembly.
3. Angle in and align the camera/microphone assembly with the notch on the display cover.
4. Tighten the M2 x 3-mm screw that secures the camera/microphone assembly to the display cover.
5. Replace the display bezel (see [Replacing the Display Bezel](#)).
6. Replace the display assembly (see [Replacing the Display Assembly](#)).

## Removing the Latch Hook Assembly

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Remove the display assembly (see [Removing the Display Assembly](#)).
3. Remove the display bezel (see [Removing the Display Bezel](#)).
4. Remove the M2.5 x 5-mm screw.
5. Push in from the front and lift the stabilizer bars to pull out.



1	M2 x 5-mm screw	2	latch hook assembly
3	display cover		

## Replacing the Latch Hook Assembly

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

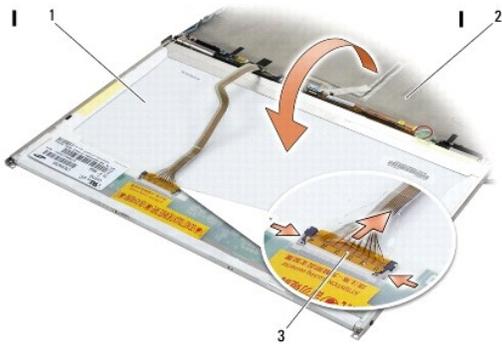
1. Place the latch hook assembly on the display cover, aligning the screw holes on the assembly and the cover.

2. Replace the M2 x 5-mm screw.
3. Replace the display bezel (see [Replacing the Display Bezel](#)).
4. Replace the display assembly (see [Replacing the Display Assembly](#)).

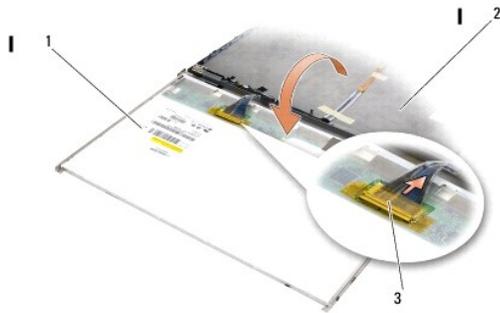
## Removing the Display Cover

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Remove the display assembly (see [Removing the Display Assembly](#)).
3. Remove the display bezel (see [Removing the Display Bezel](#)).
4. Remove the display panel (see [Removing the Display Panel](#)).
5. Remove the camera and microphone assembly, if present (see [Removing the Camera and Microphone Assembly](#)).
6. Disconnect the display cable from the back of the display panel and lift away the panel.



1	display panel	2	display cover
3	display cable		



1	display panel	2	display cover
3	display cable		

## Replacing the Display Cover

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Remove the packaging of the display cover.
1. Connect the display cable to the connector on the back of the display panel.
2. Replace the camera and microphone assembly, if you ordered one with your computer (see [Replacing the Camera and Microphone Assembly](#)).

 **NOTICE:** When replacing the display panel, ensure that any unconnected cables on the display cover point away from the cover and do not get caught underneath the panel.

3. Replace the display panel (see [Replacing the Display Panel](#)).
4. Replace the display bezel (see [Replacing the Display Bezel](#)).
5. Replace the display assembly (see [Removing the Display Assembly](#)).

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## Fan

### Service Manual

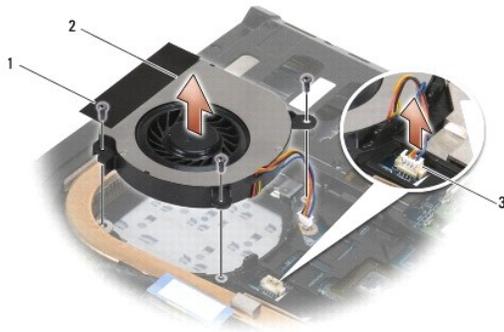
- [Removing the Fan](#)
- [Replacing the Fan](#)

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## Removing the Fan

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the three M2.5 x 5-mm screws that secure the fan to the base of the computer.
5. Disconnect the fan connector from the system board.
6. Lift the fan up at an angle to remove it.



1	M2.5 x 5-mm screws (3)	2	fan
3	fan connector		

---

## Replacing the Fan

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Insert the fan at an angle, and push down aligning the screws holes in the fan with the screw holes in the heat sink.
2. Replace the three M2.5 x 5-mm screws to secure the fan to the base of the computer.
3. Connect the fan connector to the system board connector.
4. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).

## Flash Cache Modules

### Service Manual

- [Removing an FCM](#)
- [Replacing an FCM Card](#)

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

Flash Cache Modules (FCMs) are internal memory cards that help to improve the performance of your computer. You can install FCMs in either the WWAN or WPAN Mini-Card slot.

**🔍 NOTE:** FCMs are compatible with the Windows Vista® operating system only.

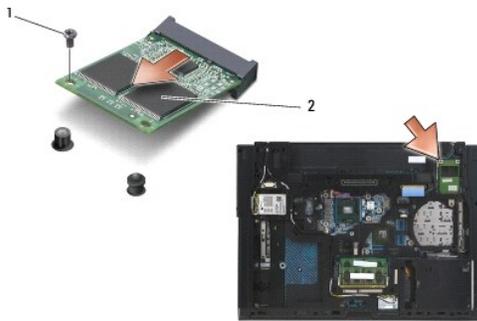
If you ordered an FCM card with your computer, the card is already installed.

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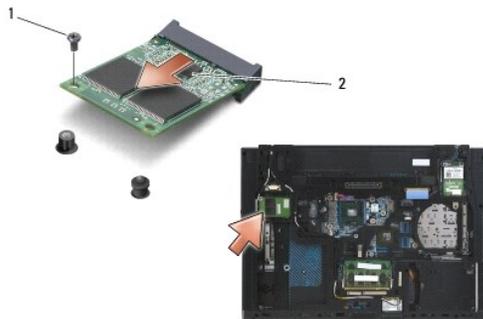
## Removing an FCM

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the left hinge cover (see [Removing the Hinge Covers](#)).
5. Remove the M2x3 screw from the FCM card.  
The card pops up to a 45-degree angle.

6. Slide the FCM card at a 45-degree angle out of its connector.



1	M2x3 screw	2	WPAN/UWB/FCM card
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1	M2x3 screw	2	WWAN/FCM card
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## Replacing an FCM Card

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

➡ **NOTICE:** To avoid damage to the FCM card, ensure the cables are not under the card when you replace the card.

➡ **NOTICE:** The Mini-Card slot has WPAN/UWB/FCM silk-screened inside the slot. Do not install FCM cards in any other Mini-Card slot.

1. Slide the FCM card into the connector.
2. Press the card down to the alignment post and hold in position.
3. Replace the screw in the FCM card.
4. Replace the left hinge cover (see [Replacing the Hinge Covers](#)).
5. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
6. Replace the battery (see [Replacing the Battery](#)).

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## Hard Drive

### Service Manual

- [Removing the Hard Drive](#)
- [Replacing the Hard Drive](#)

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

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## Removing the Hard Drive

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **CAUTION:** Do not touch the metal housing of the hard drive if you remove the hard drive from the computer while the drive is hot.

 **NOTICE:** To prevent data loss, turn off your computer before removing the hard drive. Do not remove the hard drive while the computer is on or in Sleep state.

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

To remove the hard drive in the hard drive bay:

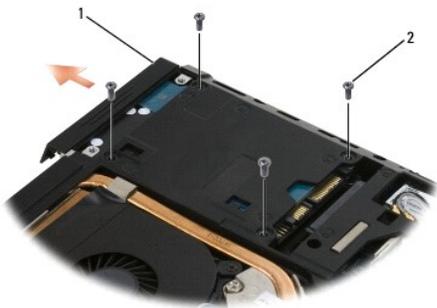
1. Follow the procedures in [Before Working on Your Computer](#).
2. Place the computer upside down on a clean, flat surface.

 **NOTICE:** When the hard drive is not in the computer, store it in protective antistatic packaging.

3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).

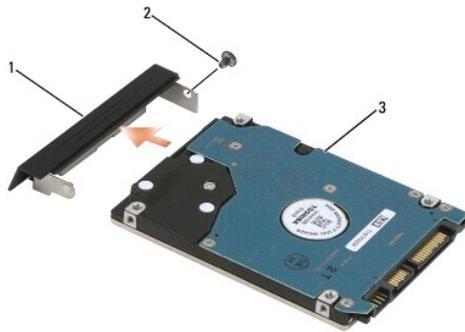
 **NOTE:** The hard drive can be removed with or without removing the bottom of the base assembly. However, if you are removing more than just the hard drive, you'll have to remove the bottom of the base assembly first.

4. Remove the four M3 x 3-mm screws (marked with an "H") that secure the hard drive.
5. Slide the hard drive out of the computer.



1	M3 x 3mm screws (4)	2	hard drive
---	---------------------	---	------------

6. Remove the screw from the bezel and take the bezel off the hard drive.



1	hard drive bezel	2	M2 x 3mm screw
3	hard drive		

---

## Replacing the Hard Drive

1. If replacing the hard drive with a new one, remove the new drive from its packaging.

Save the original packaging for storing or shipping the hard drive.

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

2. Screw the bezel to the hard drive.
3. Slide the hard drive into the bay until it is fully seated.
4. If removed, replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
5. Replace and tighten the four M3 x 3-mm hard-drive screws.
6. Replace the battery.
7. Turn the computer over so the top side is up, open the display, and start your computer.
8. If you have installed a new drive, try and boot it. If it doesn't boot:
  - 1 use your *Operating System* installation media to install the operating system for your computer (see your *Setup and Quick Reference Guide* for information).
  - 1 use the *Drivers and Utilities* media to install the drivers and utilities for your computer (see your *Setup and Quick Reference Guide* for information).

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## Hinge Covers

### Service Manual

- [Removing the Hinge Covers](#)
- [Replacing the Hinge Covers](#)

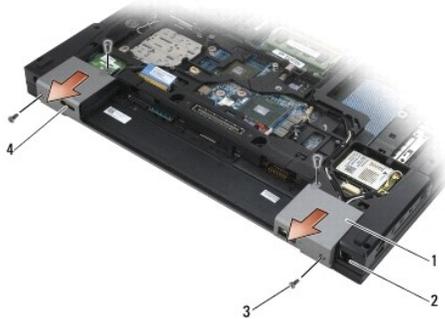
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## Removing the Hinge Covers

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

The hinge covers are not interchangeable: the left one covers the multimode DisplayPort, and the right one covers the RJ-45 network connector.

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the two each M2.5 x 5-mm screws from each hinge cover.
4. Slide each hinge cover off the computer and lift to remove it.



1	hinge covers	2	RJ-11 network connector
3	M2.5 x 5-mm screws (4)	4	display port

---

## Replacing the Hinge Covers

1. Slide the left hinge cover over the display port and slide the right hinge cover over the RJ-45 network connector.
2. Replace the two each M2.5x5-mm screws in each hinge cover.

## Keyboard

### Service Manual

- [Removing the Keyboard](#)
- [Replacing the Keyboard](#)

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## Removing the Keyboard

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the procedures in [Before Working on Your Computer](#).
2. Remove the hinge covers (see [Removing the Hinge Covers](#)).
3. Remove the LED cover (see [Removing the LED Cover](#)).
4. Remove the two M2 x 3-mm screws along the top of the keyboard.

**NOTICE:** The key caps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Exercise care when removing and handling the keyboard.

5. Using the pull tab, gently lift the top of the keyboard only, then lift out at an angle to remove the keyboard from its connector.



1	M2 x 3-mm screws (2)	2	keyboard
3	blue pull tab		

---

## Replacing the Keyboard

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**NOTICE:** The key caps on the keyboard are fragile, easily dislodged, and time-consuming to replace. Exercise care when removing and handling the keyboard.

1. Holding the top of the keyboard slightly above the computer, slide the bottom of the keyboard in at an angle, and fit the tabs and keyboard connector along the bottom of the keyboard beneath the front-inside edge of the palm rest.

**NOTE:** Pressing down on the ALT keys helps to seat the keyboard properly.

2. Carefully press each side to snap the keyboard into place.
3. Replace the two M2 x 3-mm screws at the top of the keyboard.



1	M2 x 3-mm screws (2)	2	tabs (5)
3	keyboard connector		

4. Replace the dashboard panel from the top of the keyboard and carefully snap the panel.
5. Replace the LED cover (see [Replacing the LED Cover](#)).
6. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
7. Close the display and turn the computer over.
8. Replace the battery (see [Replacing the Battery](#)).

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## LED Cover

Service Manual

- [Removing the LED Cover](#)
- [Replacing the LED Cover](#)

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### Removing the LED Cover

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the hinge covers (see [Removing the Hinge Covers](#)).
5. Remove the display assembly (see [Display](#)).
6. Turn the computer upside down and locate the four tabs in the battery bay that secure the LED cover to the top of the computer. Using a plastic scribe, gently push on the tabs to release the LED cover.



1	LED cover	2	scribe
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### Replacing the LED Cover

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Working at an angle, snap the LED cover into place one tab at a time.
2. Replace the display assembly (see [Display](#)).
3. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
4. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).

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# Memory

## Service Manual

- [Removing a Memory Module](#)
- [Replacing a Memory Module](#)
- [Operation of the Computer](#)

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

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

**NOTICE:** If your computer has only one memory module, install the memory module in the socket labeled "DIMM A".

**NOTICE:** If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. If possible, *do not* pair an original memory module with a new memory module. Otherwise, your computer may not function at optimal performance.

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

## Removing a Memory Module

Your computer supports the following modules:

Size	Slot	Windows XP	Windows Vista
512 MB	DIMM A	X	X
1 GB	DIMM A or DIMM A and DIMM B	X	X
2 GB	DIMM A or DIMM A and DIMM B	X	X
3 GB	DIMM A and DIMM B	X	X
4 GB	DIMM A or DIMM A and DIMM B		X
8 GB	DIMM A and DIMM B		X

Your computer has two user-accessible SODIMM sockets, referred to as DIMM A and DIMM B. DIMM A is the slot closest to the system board and always contains a memory module. The DIMM B socket may contain an additional module for improved system memory performance. If the module in the DIMM A socket must be replaced and DIMM B is installed, DIMM B must be removed first.

1. Follow the procedures in [Before Working on Your Computer](#).
2. Lay the computer upside down onto a clean, flat surface.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).

## DIMM B

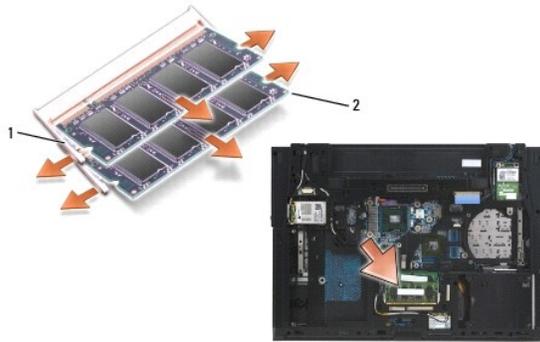
The DIMM B socket may or may not be populated with a memory module, depending on the configuration of your computer. When viewing the memory compartment from the underside of the computer, the DIMM B socket is uppermost and DIMM A is closest to the system board.

## Removing the DIMM B Module

**NOTICE:** To prevent damage to the memory module connector, do not use tools to spread the memory-module retaining clips.

1. To remove the DIMM B module, spread away the retaining clips from the side edges of the memory module and lift the free edge of the module so that it sits at about a 45-degree angle to the system board.

1	memory-module retaining clips (2)	2	memory module
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2. Grasp the module at the side edges and pull it straight away from the connector. Place the module into anti-static packaging such as an anti-static bag.

## DIMM A

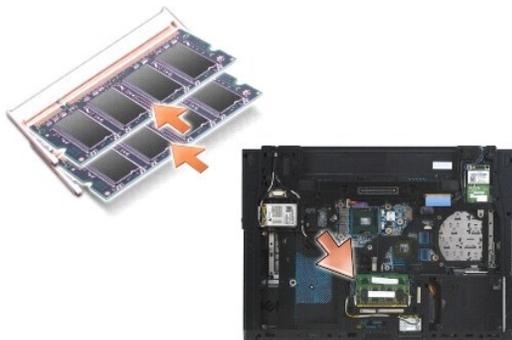
➡ **NOTICE:** To prevent damage to the memory module connector, do not use tools to spread the memory-module retaining clips.

1. To remove the DIMM A module, spread away the retaining clips from the side edges of the memory module and lift the free edge of the module so that it sits at about a 45-degree angle to the system board.
2. Grasp the module at the side edges and pull it straight away from the connector. Place the module into anti-static packaging such as an anti-static bag.

## Replacing a Memory Module

### DIMM B

1. Ground yourself by touching a bare-metal part in the computer chassis.
2. Remove the memory module from its anti-static packaging and, grasping the module at the side edges, align the slot in the module edge connector with the key in the socket connector.
3. Gently slide the memory module into the DIMM B connector at a 45-degree angle to the system board until it is fully seated.



4. Push the long edge of the memory module down until retaining clips lock the module in place.

📌 **NOTE:** If the memory module is not installed properly, the retaining clips will not hold the module securely and the computer may not boot properly. No error message indicates this failure.

### DIMM A

The DIMM A socket is the one closest to the system board. If a memory module is installed in the DIMM B socket, it must be removed before a memory module

in the DIMM A socket can be replaced.

1. Ground yourself by touching a bare-metal part in the computer chassis.
2. Remove the memory module from its anti-static packaging and, grasping the module at the side edges, align the slot in the module edge connector with the key in the DIMM A socket connector.
3. Gently slide the memory module into the socket connector at a 45-degree angle to the system board until it is fully seated.
4. Push the long edge of the memory module down until retaining clips lock the module in place.

 **NOTE:** If the memory module is not installed properly, the retaining clips will not hold the module securely and the computer may not boot properly. No error message indicates this failure.

5. If a memory module is installed into the DIMM B socket, replace it using procedures in [DIMM B](#).

---

## Operation of the Computer

To verify that your computer operates correctly:

1. Slide the bottom of the base assembly into place and tighten the captive screw.
2. Insert the battery into the battery bay, or connect the DC adapter to your computer and an electrical outlet.
3. Set the computer upright and open the display.
4. Start your computer. As the computer boots, it detects the additional memory and automatically updates the system configuration information. Verify that the memory capacity shown on the display is what is expected.
5. To confirm the amount of memory installed in the computer:
  1. In the Microsoft® Windows Vista® operating system, click **Start**  → **Help and Support** → **Computer Information**.
  1. In the Microsoft Windows® XP operating system, right-click the **My Computer** icon on your desktop, click **Properties**, and then click **General**.

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## Modem

### Service Manual

- [Removing the Modem](#)
- [Replacing the Modem](#)

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## Removing the Modem

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the hinge covers (see [Removing the Hinge Covers](#)).
5. Remove the palm rest assembly ([Removing the Palm Rest Assembly](#)).
6. Remove the orange modem flex-cable by pushing the tabs forward and removing the cable.
7. Remove the black RJ11 modem cable from the modem.
8. Remove the M2 x 3-mm screw from the modem.
9. Remove the modem.



1	modem	2	M2 x 3-mm screw
3	orange modem flex-cable	4	black RJ11 modem cable

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## Replacing the Modem

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Place the modem on into the base assembly.
2. Insert the black RJ11 modem cable into the space provided on the base assembly.
3. Replace the M2 x 3-mm screw to secure the modem to the I/O daughter card.
4. Connect the black RJ11 modem cable to the modem.

5. Connect the orange modem flex-cable to the I/O board.
  6. Replace the palm rest assembly ([Replacing the Palm Rest Assembly](#)).
  7. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
  8. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
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## Optical Drive

### Service Manual

- [Removing the Optical Drive](#)
- [Replacing the Optical Drive](#)

The optical drive supports either a second hard drive, an optical drive, or an air bay for travel.

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### Removing the Optical Drive

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**🔧 NOTE:** The optical drive security screw is optional and may not be installed on your computer.

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. If a security screw is in place, remove it from the drive.
5. Push the drive lever in to release it.
6. Pull the drive out of the optical bay.



1	media bay	2	optical drive
3	drive lever	4	security screw (optional)

### Replacing the Optical Drive

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**🔧 NOTE:** The optical drive security screw is optional and may not be installed on your computer.

1. Slide the drive in the optical bay.
  2. Push the release latch in to secure the drive.
  3. If a security screw was removed, replace the security screw.
  4. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
  5. Replace the battery (see [Replacing the Battery](#)).
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## Palm Rest Assembly

### Service Manual

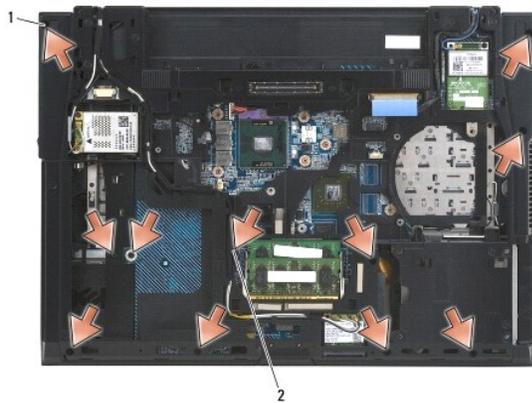
- [Removing the Palm Rest Assembly](#)
- [Replacing the Palm Rest Assembly](#)

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## Removing the Palm Rest Assembly

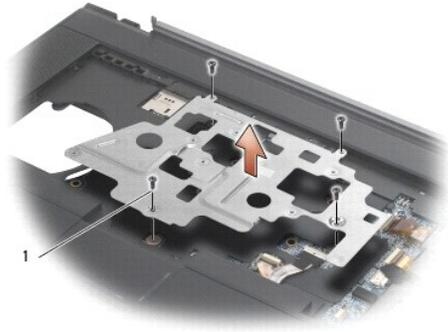
**⚠ CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the hard drive (see [Removing the Hard Drive](#)).
5. Remove the optical drive (see [Removing the Optical Drive](#)).
6. Remove the fan with the thermal-cooling assembly (see [Removing the Processor Thermal-Cooling Assembly](#)).
7. Remove the hinge covers (see [Removing the Hinge Covers](#)).
8. Remove the display assembly (see [Display](#)).
9. Remove the keyboard (see [Removing the Keyboard](#)).
10. Turn the computer over and remove the 10 M2.5 x 5-mm screws and one M2.5 x 8 screw.



1	M2.5 x 5 screws (10)	2	M2.5 x 8 screw
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11. Turn the computer top-side up and remove the four M2.5 x 5-mm screws labeled "P".
12. Lift off the thermal plate.

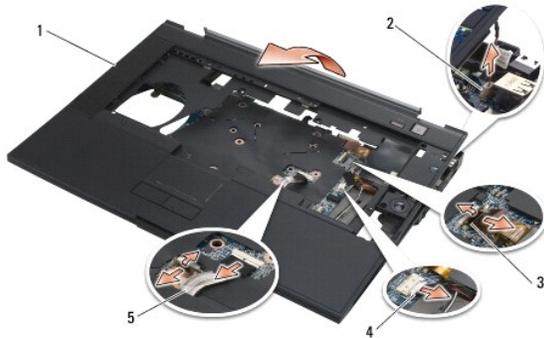


1	screws M2.5 x 5 (4)		
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13. Use the blue pull tab to disconnect the wireless catcher cable from the system board.
14. Lift on the lever to disconnect the speaker cable from the system board.
15. Use the black pull tab to disconnect the touch pad cable from the system board.
16. Lift up on the lever to disconnect the contactless smart-card cable from the system board.
17. Lift on the lever to disconnect the fingerprint reader cable from the system board (optional).

**NOTICE:** Do not use force to separate the palm rest from the computer. If you encounter resistance, gently *flex* or apply pressure to the palm rest, or move along the edge, working away from the area of resistance, until the palm rest is free.

18. Remove the silk-screen bar.
19. Lift the left side of the palm rest, then push in on the right side to release the palm rest, then gently lift it from the computer.



1	palm rest	2	suspend switch cable
3	fingerprint reader cable	4	speaker cable
5	touch pad cable		

## Replacing the Palm Rest Assembly

**CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Angle and connect the right side of the palm rest, then lower and snap the left side into place.
2. Replace the right speaker (see [Replacing the Right-Speaker and Fingerprint Reader Cover](#)).
3. Replace the silk-screen bar.

4. Connect the contactless smart-card cable, the touch pad cable, the speaker cable, the wireless switch cable, and the fingerprint reader cable (optional) to the system board.
  5. Replace the four M2.5 x 5-mm screws, two on the silk-screen bar and two on the palm rest.
  6. Turn the computer over and replace the eleven M2.5 x 5-mm screws on the bottom of the computer to secure the palm rest.
  7. Replace the fan (see [Replacing the Fan](#)).
  8. Replace the optical drive (see [Replacing the Optical Drive](#)).
  9. Turn the computer top-side up and replace the keyboard (see [Replacing the Keyboard](#)).
  10. Replace the display assembly (see [Display](#)).
  11. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
  12. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
  13. Replace the battery (see [Replacing the Battery](#)).
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## DC Power Module

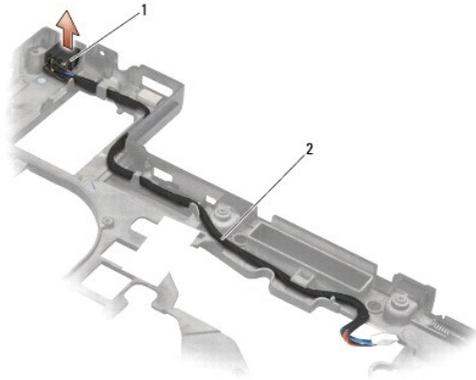
### Service Manual

- [Removing the DC Power Module](#)
  - [Replacing the DC Power Module](#)
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## Removing the DC Power Module

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the coin-cell battery (see [Removing the Coin-Cell Battery](#)).
5. Remove the hard drive (see [Removing the Hard Drive](#)).
6. Remove the fan (see [Removing the Fan](#)).
7. Remove the processor thermal-cooling assembly (see [Removing the Processor Thermal-Cooling Assembly](#)).
8. Remove the optical drive (see [Removing the Optical Drive](#)).
9. Remove the hinge covers (see [Removing the Hinge Covers](#)).
10. Remove the display assembly (see [Display](#)).
11. Remove three M2.5 x 5-mm screws labeled with white arrows from the system board.
12. Pull out on the top, left corner of the base assembly to release the DC power, USB, and serial connectors.
13. Remove the LED cover (see [Removing the LED Cover](#)).
14. Remove the keyboard (see [Removing the Keyboard](#)).
15. Remove the speaker/fingerprint reader cover (see [Removing the Right- Speaker and Fingerprint Reader Cover](#)).
16. Remove the palm rest assembly (see [Removing the Palm Rest Assembly](#)).
17. Remove the card cage (see [Removing the Card Cage](#)).
- 🔍 **NOTICE:** Do not remove the wireless card, memory module, or processor from the system board.
18. Remove the system board (see [Removing the System Board Assembly](#)).
19. Disconnect and unrout the DC power cable.
20. Remove the DC power connector from the base assembly.



1	DC power connector	2	DC power cable
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## Replacing the DC Power Module

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Position the DC power cable in the base assembly, aligning the guides on the connector sides with the base.
2. Connect the DC power cable to the system board (see illustration in [Removing the DC Power Module](#) for proper cable routing).
3. Replace the system board (see [Replacing the System Board Assembly](#)).
4. Replace the card cage (see [Replacing the Card Cage](#)).
5. Replace the palm rest (see [Replacing the Palm Rest Assembly](#)).
6. Replace the right-speaker/fingerprint reader cover (see [Replacing the Right-Speaker and Fingerprint Reader Cover](#)).
7. Replace the processor thermal-cooling assembly (see [Replacing the Processor Thermal-Cooling Assembly](#)).
8. Replace the keyboard (see [Replacing the Keyboard](#)).
9. Replace the LED cover (see [Replacing the LED Cover](#)).
10. Replace the display assembly (see [Replacing the Display Assembly](#)).
11. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
12. Replace the optical drive (see [Replacing the Optical Drive](#)).
13. Replace the hard drive (see [Replacing the Hard Drive](#)).
14. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).

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## Right-Speaker and Fingerprint Reader Cover

### Service Manual

- [Removing the Right-Speaker and Fingerprint Reader Cover](#)
- [Replacing the Right-Speaker and Fingerprint Reader Cover](#)

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## Removing the Right-Speaker and Fingerprint Reader Cover

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**🔧 NOTE:** If you don't have a fingerprint reader, ignore steps to remove or install the reader.

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the hard drive (see [Removing the Hard Drive](#)).
4. Remove the optical drive (see [Removing the Optical Drive](#)).
5. Remove the LED cover (see [Removing the LED Cover](#)).
6. Remove the keyboard (see [Removing the Keyboard](#)).
7. Loosen the two captured screws (indicated by an S stenciled on the base plate).



1 captured screws (2)

8. Turn the computer top-side up.
9. Remove the fingerprint reader cable (if you have a fingerprint reader).
10. Remove the plastic speaker/fingerprint reader cover.



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## Replacing the Right-Speaker and Fingerprint Reader Cover

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**➡ NOTICE:** If you are installing a new fingerprint reader/speaker cover assembly, remove the backing paper from the bottom of the cable.

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

1. If you have a fingerprint reader, connect the fingerprint reader cable. Press along the cable to seal the cable into the palm rest.
2. Snap the speaker/fingerprint reader cover into place
3. Turn the computer upside down, and tighten the two M2.5 x 5-mm captured screws.
4. Replace the keyboard (see [Replacing the Keyboard](#)).
5. Replace the LED cover (see [Replacing the LED Cover](#)).
6. Replace the optical drive (see [Replacing the Optical Drive](#)).
7. Replace the battery (see [Replacing the Battery](#)).

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## System Board Assembly

Service Manual

- [Removing the System Board Assembly](#)
- [Replacing the System Board Assembly](#)

The system board's BIOS chip contains the Service Tag, which is also visible on a barcode label on the bottom of the computer. The replacement kit for the system board includes media that provides a utility for transferring the Service Tag to the replacement system board.

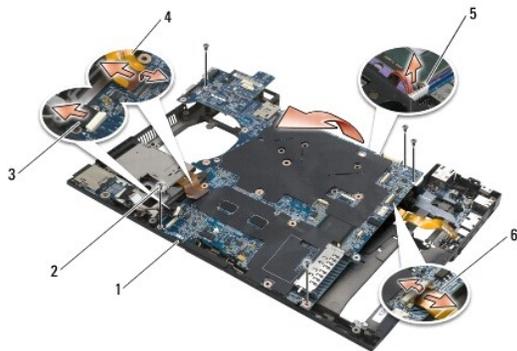
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### Removing the System Board Assembly

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

1. Follow the instructions in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Remove the Mini-Card from the WWAN/FCM card slot, if present (see [Removing a WWAN Card](#) or [Removing an FCM](#)).
5. Remove the Mini-Card from the WLAN/WiMax card slot, if present (see [Removing a WLAN/WiMax Card](#)).
6. Remove the hinge covers (see [Removing the Hinge Covers](#)).
7. Remove the Mini-Card in the WPAN/UWB/FCM card slot, if present (see [Removing a WPAN/UWB Card](#) or [Removing an FCM](#)).
8. Remove the hard drive (see [Removing the Hard Drive](#)).
9. Disconnect the coin-cell battery cable from the system board (see [Removing the Coin-Cell Battery](#)).
10. Remove the memory modules (see [Removing a Memory Module](#)).
11. Remove the processor thermal-cooling assembly (see [Removing the Processor Thermal-Cooling Assembly](#)).
12. Remove the processor (see [Removing the Processor Module](#)).
13. Remove the fan (see [Removing the Fan](#)).
14. Remove the optical drive (see [Removing the Optical Drive](#)).
15. Remove the display assembly (see [Display](#)).
16. Remove the keyboard (see [Removing the Keyboard](#)).
17. Remove the speaker/fingerprint reader cover (see [Removing the Right-Speaker and Fingerprint Reader Cover](#)).
18. Remove the palm rest assembly (see [Removing the Palm Rest Assembly](#)).
19. Remove the card cage (see [Removing the Card Cage](#)).
20. Disconnect the DC power cable.
21. Disconnect the Secure Digital card cable from the system board.
22. Disconnect the ExpressCard cable from the system board.
23. Disconnect the I/O board cable from the system board.
24. Remove the five M2.5 x 5-mm screws labeled with white arrows from the system board.
25. Pull out on the top, left corner of the base assembly to release the DC, USB, and serial connectors.

26. Lift the top, right edge of the system board to disconnect it from the I/O daughter card, then carefully lift the system board out of the computer.
27. Unroute the DC power cable.



1	system board	2	M2.5 x 5-mm system board screws (5)
3	Secure Digital cable connector	4	ExpressCard-cage cable connector
5	DC power cable connector	6	I/O board (expansion ports) cable connector

## Replacing the System Board Assembly

**⚠ CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

**👉 NOTICE:** Ensure that any loose cables do not get caught beneath the system board.

To replace the system board, follow the removal steps in reverse order:

1. Route the DC power cable and place the DC power connector in the base assembly.
2. Insert the bottom edge of the system board into the base of the computer, ensuring that the system board is placed under the metal latch mechanism.
3. Lower the top of the system board to reconnect the DC power, USB, and serial connectors.
4. Connect the top right of the system board to the I/O board connector.
5. Place the top side of the system board in the base.
6. Replace the five M2.5 x 5-mm screws on the top of the system board.
7. Connect the ExpressCard cable to the system board.
8. Connect the Secure Digital card cable to the system board.
9. Connect the DC power cable.
10. Replace the card cage (see [Replacing the Card Cage](#)).
11. Replace the palm rest assembly (see [Replacing the Palm Rest Assembly](#)).
12. Replace the speaker/fingerprint reader cover (see [Replacing the Right-Speaker and Fingerprint Reader Cover](#)).
13. Replace the keyboard (see [Replacing the Keyboard](#)).
14. Replace the display assembly (see [Display](#)).
15. Replace the optical drive (see [Removing the Optical Drive](#)).
16. Replace the fan (see [Replacing the Fan](#)).

17. Replace the processor (see [Replacing the Processor Module](#)).
  18. Replace the processor thermal-cooling assembly (see [Replacing the Processor Thermal-Cooling Assembly](#)).
  19. Replace the memory modules (see [Replacing a Memory Module](#)).
  20. Reconnect the coin-cell battery cable (see [Replacing the Coin-Cell Battery](#)).
  21. Replace the hard drive (see [Removing the Hard Drive](#)).
  22. Replace the WPAN card (see [Replacing a WPAN/UWB Card](#)).
  23. Replace the hinge covers (see [Replacing the Hinge Covers](#)).
  24. Replace the WLAN card (see [Replacing a WLAN/WiMax Card](#)).
  25. Replace the WWAN card (see [Replacing a WWAN Card](#)).
  26. Replace the bottom of the base assembly (see [Replacing the Bottom of the Base Assembly](#)).
-  **NOTICE:** Before turning on the computer, replace all screws and ensure that no stray screws remain inside the computer. Failure to do so may result in damage to the computer.
27. Turn on the computer.
-  **NOTE:** If you use a BIOS update program CD to flash the BIOS, press <F12> before inserting the CD in order to set the computer to boot from the CD for one time only. Otherwise, you must enter the system setup program to change the default boot order.
28. Flash update the BIOS (see [Flashing the BIOS](#) for more information).
  29. Enter the system setup program to update the BIOS on the new system board with the computer Service Tag. For information about the system setup program, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com).
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## Service Manual



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



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



**CAUTION:** A CAUTION indicates potential for property damage, personal injury, or death.

If you purchased a DELL™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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August 2008 Rev. A00

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# Troubleshooting

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## Troubleshooting Tools

### Diagnostic Lights

**⚠ CAUTION:** 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](#) on [www.dell.com](#) at: [www.dell.com/regulatory\\_compliance](#).

Your computer has three keyboard status lights located above the keyboard. During normal operation, the keyboard status lights display the current status (*on* or *off*) of the Num Lock, Caps Lock, and Scroll Lock features. If the computer starts without error, the lights flash, and then turn off. If the computer malfunctions, however, you can use the status of the lights to help identify the problem.

**🔧 NOTE:** After the computer completes POST, the Num Lock light may remain on, depending on your BIOS settings. For more information on using the system setup program, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](#).

### Diagnostic Light Codes During POST

To troubleshoot a problem with your computer, read the sequence of the keyboard status lights in order from left to right (Num Lock, Caps Lock, and then Scroll Lock). If the computer malfunctions the individual lights display a status of either *On* ●, *Off* ○, or *Flashing* \*.

Light Pattern	Problem Description	Suggested Resolution
● * *	No memory modules are detected.	<ul style="list-style-type: none"><li>1 If two or more memory modules are installed, remove the modules (see <a href="#">Removing a Memory Module</a>), then reinstall one module (see <a href="#">Replacing a Memory Module</a>) and restart the computer. If the computer starts normally, continue to install additional memory modules (one at a time) until you have identified a faulty module or reinstalled all modules without error.</li><li>1 If available, install working memory of the same type into your computer (see <a href="#">Memory</a>).</li><li>1 If the problem persists, contact Dell Support.</li></ul>
● * ●	Memory modules are detected, but a memory failure has occurred.	<ul style="list-style-type: none"><li>1 If two or more memory modules are installed, remove the modules (see <a href="#">Removing a Memory Module</a>), then reinstall one module (see <a href="#">Replacing a Memory Module</a>) and restart the computer. If the computer starts normally, continue to install additional memory modules (one at a time) until you have identified a faulty module or reinstalled all modules without error.</li><li>1 If available, install working memory of the same type into your computer (see <a href="#">Memory</a>).</li><li>1 If the problem persists, contact Dell Support.</li></ul>
* ● ●	A possible processor failure has occurred.	<ul style="list-style-type: none"><li>1 Reseat the processor (see <a href="#">Removing the Processor Module</a>).</li><li>1 If the problem persists, contact Dell Support.</li></ul>
* * ●	A possible graphics card/video failure has occurred.	<ul style="list-style-type: none"><li>1 Reseat any installed graphics cards.</li><li>1 If available, install a working graphics card into your computer.</li><li>1 If the problem persists, contact Dell Support.</li></ul>
* ● *	A possible display failure has occurred.	<ul style="list-style-type: none"><li>1 Reseat the display cable (see <a href="#">Removing the Display Assembly</a>).</li><li>1 If the problem persists, contact Dell Support.</li></ul>
* ○ *	SPD data indicates all SODIMMs are unusable.	<ul style="list-style-type: none"><li>1 Remove the unusable memory module (see <a href="#">Removing a Memory Module</a>).</li><li>1 Replace with a usable memory module (see <a href="#">Replacing a Memory Module</a>).</li></ul>

### Hardware Troubleshooter

If a device is either not detected during the operating system setup or is detected, but incorrectly configured, you can use the Hardware Troubleshooter to resolve the incompatibility.

Windows XP:

1. Click **Start**→ **Help and Support**.

2. Type `hardware troubleshooter` in the search field and press <Enter> to start the search.
3. In the **Fix a Problem** section, click **Hardware Troubleshooter**.
4. In the **Hardware Troubleshooter** list, select the option that best describes the problem, and click **Next** to follow the remaining troubleshooting steps.

Windows Vista®:

1. Click the Windows Vista start button , and click **Help and Support**.
2. Type `hardware troubleshooter` in the search field and press <Enter> to start the search.
3. In the search results, select the option that best describes the problem and follow the remaining troubleshooting steps.

## Dell Diagnostics

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### When to Use the Dell Diagnostics

If you experience a problem with your computer, perform the checks in [Solving Problems](#), and then run the Dell Diagnostics before contacting Dell for assistance.

Start the Dell Diagnostics from your hard drive or from the *Drivers and Utilities* media provided with your computer.

 **NOTE:** The *Drivers and Utilities* media is optional and may not ship with your computer.

 **NOTE:** The Dell Diagnostics only operate on Dell computers.

### Starting the Dell Diagnostics From Your Hard Drive

Before running the Dell Diagnostics, enter system setup to review your computer's configuration information, and ensure that the device you want to test is displayed in system setup and is active. For more information on using the system setup program, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com).

The Dell Diagnostics is located on a separate diagnostic utility partition on your hard drive.

 **NOTE:** If the computer is connected to a docking device (docked), undock it. See the documentation that came with your docking device for instructions.

 **NOTE:** If your computer does not display a screen image, contact Dell Support.

1. Ensure that the computer is connected to an electrical outlet that is known to be working properly.
2. Press and hold the <Fn> key or the mute button then turn on your computer.

 **NOTE:** Alternatively, you can select **Diagnostics** from the one-time boot menu at startup to boot to the diagnostic utility partition and run the Dell Diagnostics.

The computer runs the Pre-boot System Assessment (PSA), a series of initial tests of your system board, keyboard, display, memory, hard drive, etc.

- o During the assessment, answer any questions that appear.
- o If failures are detected during the Pre-boot System Assessment, write down the error code(s) and contact Dell Support.
- o If the Pre-boot System Assessment completes successfully, the following message appears: "Booting Dell Diagnostic Utility Partition. Press any key to continue."

 **NOTE:** If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from your *Drivers and Utilities* media (see [Starting the Dell Diagnostics From the Drivers and Utilities Media](#)).

3. Press any key to start the Dell Diagnostics from the diagnostics utility partition on your hard drive.
4. Press <Tab> to select **Test System** and then press <Enter>.

 **NOTE:** It is recommended that you select **Test System** to run a complete test on your computer. Selecting **Test Memory** initiates the extended memory test, which can take up to thirty minutes or more to complete. When the test completes, record the test results and then press any key to return to the previous menu.

- At the Dell Diagnostics Main Menu, left-click with the touch pad/mouse, or press <Tab> and then <Enter>, to select the test you want to run (see [Dell Diagnostics Main Menu](#)).

 **NOTE:** Write down any error codes and problem descriptions exactly as they appear and follow the instructions on the screen.

- After all tests have completed, close the test window to return to the Dell Diagnostics Main Menu.
- Close the Main Menu window to exit the Dell Diagnostics and restart the computer.

 **NOTE:** If you see a message stating that no diagnostics utility partition has been found, run the Dell Diagnostics from your *Drivers and Utilities* media (see [Starting the Dell Diagnostics From the Drivers and Utilities Media](#)).

## Starting the Dell Diagnostics From the Drivers and Utilities Media

Before running the Dell Diagnostics, enter system setup to review your computer's configuration information, and ensure that the device you want to test is displayed in system setup and is active. For more information on using the system setup program, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com).

- Insert the *Drivers and Utilities* media into the optical drive.
- Restart your computer.
- When the DELL logo appears, press <F12> immediately.

 **NOTE:** Keyboard failure may result when a key is held down for extended periods of time. To avoid possible keyboard failure, press and release <F12> in even intervals to open the Boot Device Menu.

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.

- When the boot device list appears, use the up- or down- arrow keys to highlight **CD/DVD/CD-RW Drive** then press <Enter>.

 **NOTE:** Using the one-time boot menu changes the boot sequence for the current boot only. Upon restart, the computer boots according to the boot sequence specified in system setup.

- Press any key to confirm that you want to start from the CD/DVD.

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.

- Type 1 to **Run the 32 Bit Dell Diagnostics**.
- At the **Dell Diagnostics Menu**, type 1 to select **Dell 32-bit Diagnostics for Resource CD (graphical user interface)**.
- Press <Tab> to select **Test System** and then press <Enter>.

 **NOTE:** It is recommended that you select **Test System** to run a complete test on your computer. Selecting **Test Memory** initiates the extended memory test, which can take up to thirty minutes or more to complete. When the test completes, record the test results and then press any key to return to the previous menu.

- At the Dell Diagnostics Main Menu, left-click with the mouse, or press <Tab> and then <Enter>, to select the test you want to run (see [Dell Diagnostics Main Menu](#)).

 **NOTE:** Write down any error codes and problem descriptions exactly as they appear and follow the instructions on the screen.

- After all tests have completed, close the test window to return to the Dell Diagnostics Main Menu.
- Close the Main Menu window to exit the Dell Diagnostics and restart the computer.
- Remove the *Drivers and Utilities* media from the optical drive.

## Dell Diagnostics Main Menu

After the Dell Diagnostics loads the following menu appears:

Option	Function

Test Memory	Run the stand-alone memory test
Test System	Run system diagnostics
Exit	Exit the diagnostics

Press <Tab> to select the test you want to run and then press <Enter>.

 **NOTE:** It is recommended that you select **Test System** to run a complete test on your computer. Selecting **Test Memory** initiates the extended memory test, which can take up to thirty minutes or more to complete. When the test completes, record the test results and then press any key to return to this menu.

After **Test System** is selected, the following menu appears:

Option	Function
Express Test	Performs a quick test of devices in the system. This typically can take 10 to 20 minutes.  <b>NOTE:</b> The Express Test requires no interaction on your part. Run Express Test first to increase the possibility of tracing a problem quickly.
Extended Test	Performs a thorough check of devices in the system. This typically can take 1 hour or more.  <b>NOTE:</b> The Extended Test periodically requires your input to answer specific questions.
Custom Test	Use to test a specific device or customize the tests to be run.
Symptom Tree	This option allows you to select tests based on a symptom of the problem you are having. This option lists the most common symptoms.

 **NOTE:** It is recommended that you select **Extended Test** to perform a more thorough check of devices in the computer.

For any problem encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description exactly as it appears and follow the instructions on the screen. If you cannot resolve the problem, contact Dell Support.

 **NOTE:** When contacting Dell Support, have your Service Tag ready. The Service Tag for your computer is located at the top of each test screen.

The following tabs provide additional information for tests run from the Custom Test or Symptom Tree option:

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and any requirements for running the test.
Configuration	Displays the hardware configuration for the selected device.  The Dell Diagnostics obtains configuration information for all devices from System Setup, memory, and various internal tests, and displays the information in the device list in the left pane of the screen.  <b>NOTE:</b> The device list may not display the names of all components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test, if applicable, by changing the test settings.

## Error Messages

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If the error message is not listed, see the documentation for the operating system or the program that was running when the message appeared.

**A filename cannot contain any of the following characters:**

\ / : \* ? " < > | — Do not use these characters in filenames.

**A required .DLL file was not found** — The program that you are trying to open is missing an essential file. To remove and then reinstall the program:

Windows XP:

1. Click **Start**→ **Control Panel**→ **Add or Remove Programs**→ **Programs and Features**.
2. Select the program you want to remove.

3. Click **Uninstall**.
4. See the program documentation for installation instructions.

*Windows Vista:*

1. Click **Start**  → **Control Panel** → **Programs** → **Programs and Features**.
2. Select the program you want to remove.
3. Click **Uninstall**.
4. See the program documentation for installation instructions.

**drive letter :\< is not accessible. The device is not ready** — The drive cannot read the disk. Insert a disk into the drive and try again.

**Insert bootable media** — Insert a bootable floppy disk, CD, or DVD.

**Non-system disk error** — Remove the floppy disk from the floppy drive and restart your computer.

**Not enough memory or resources. Close some programs and try again** — Close all windows and open the program that you want to use. In some cases, you may have to restart your computer to restore computer resources. If so, run the program that you want to use first.

**Operating system not found** — Contact Dell Support.

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## Solving Problems

Follow these tips when troubleshooting your computer:

1. If you added or removed a part before the problem started, review the installation procedures and ensure that the part is correctly installed.
1. If a peripheral device does not work, ensure that the device is properly connected.
1. If an error message appears on the screen, write down the exact message. This message may help support personnel diagnose and fix the problem(s).
1. If an error message occurs in a program, see the program's documentation.

 **NOTE:** The procedures in this document were written for the Windows default view, so they may not apply if you set your Dell computer to the Windows Classic view.

## Battery Problems

 **CAUTION:** There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

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## Drive Problems

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**Ensure that Microsoft® Windows® Recognizes the drive** —

*Windows XP:*

1. Click **Start** and click **My Computer**.

*Windows Vista:*

1. Click **Start**  and click **Computer**.

If the drive is not listed, perform a full scan with your antivirus software to check for and remove viruses. Viruses can sometimes prevent Windows from recognizing the drive.

**Test the drive** —

- 1 Insert another disc to eliminate the possibility that the original drive is defective.
- 1 Insert a bootable floppy disk and restart the computer.

#### Clean the drive or disk —

For information on cleaning your computer, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com).

#### Check the cable connections

#### Run the Hardware Troubleshooter —

See [Hardware Troubleshooter](#).

#### Run the Dell Diagnostics —

See [Dell Diagnostics](#).

## Optical drive problems

 **NOTE:** High-speed optical drive vibration is normal and may cause noise, which does not indicate a defect in the drive or the media.

 **NOTE:** Because of different regions worldwide and different disc formats, not all DVD titles work in all DVD drives.

#### Adjust the Windows volume control —

- 1 Click the speaker icon in the lower-right corner of your screen.
- 1 Ensure that the volume is turned up by clicking the slider and dragging it up.
- 1 Ensure that the sound is not muted by clicking any boxes that are checked.

#### Check the speakers and subwoofer —

See [Sound and Speaker Problems](#).

## Problems writing to an optical drive

#### Close other programs —

The optical drive must receive a steady stream of data during the writing process. If the stream is interrupted, an error occurs. Try closing all programs before you write to the optical.

#### Turn off standby mode in Windows before writing to a disc —

For information about setting power options, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com). You can also search for the keyword *standby* in Windows Help and Support for information on power management modes.

## Hard drive problems

#### Run Check Disk —

*Windows XP:*

1. Click **Start** and click **My Computer**.
2. Right-click **Local Disk C:**.
3. Click **Properties**→**Tools**→**Check Now**.
4. Click **Scan for and attempt recovery of bad sectors** and click **Start**.

*Windows Vista:*

1. Click **Start**  and click **Computer**.
2. Right-click **Local Disk C:**.
3. Click **Properties**→**Tools**→**Check Now**.

The **User Account Control** window may appear. If you are an administrator on the computer, click **Continue**; otherwise, contact your administrator to continue the desired action.

4. Follow the instructions on the screen.

## IEEE 1394 Device Problems

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **NOTE:** Your computer supports only IEEE 1394a standard.

**Ensure that the cable for the IEEE 1394 device is properly inserted into the device and into the connector on the computer**

**Ensure that the IEEE 1394 device is enabled in system setup** — For more information on using the system setup program, see the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com).

**Ensure that the IEEE 1394 device is recognized by Windows** —

*Windows XP:*

1. Click **Start** and click **Control Panel**.
2. Under **Pick a Category**, click **Performance and Maintenance** → **System** → **System Properties** → **Hardware** → **Device Manager**.

*Windows Vista:*

1. Click **Start**  → **Control Panel** → **Hardware and Sound**.
2. Click **Device Manager**.

If your IEEE 1394 device is listed, Windows recognizes the device.

**If you have problems with a Dell IEEE 1394 device** —

Contact Dell Support.

**If you have problems with an IEEE 1394 device not provided by Dell** — Contact the IEEE 1394 device manufacturer.

## Lockups and Software Problems

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

### The computer does not start up

**Check the diagnostic lights** —

See [Power Problems](#).

**Ensure that the power cable is firmly connected to the computer and to the electrical outlet**

### The computer stops responding

 **NOTICE:** You may lose data if you are unable to perform an operating system shutdown.

**Turn the computer off** — If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds (until the computer turns off), and then restart your computer.

### A program stops responding

### End the program —

1. Press <Ctrl><Shift><Esc> simultaneously to access the Task Manager.
2. Click the **Applications** tab.
3. Click to select the program that is no longer responding.
4. Click **End Task**.

## A program crashes repeatedly

 **NOTE:** Most software includes installation instructions in its documentation or on a floppy disk, CD, or DVD.

### Check the software documentation —

If necessary, uninstall and then reinstall the program.

## A program is designed for an earlier Windows operating system

### Run the Program Compatibility Wizard —

*Windows XP:*

The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-XP operating system environments.

1. Click **Start** → **All Programs** → **Accessories** → **Program Compatibility Wizard** → **Next**.
2. Follow the instructions on the screen.

*Windows Vista:*

The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-Windows Vista operating system environments.

1. Click **Start**  → **Control Panel** → **Programs** → **Use an older program with this version of Windows**.
2. In the welcome screen, click **Next**.
3. Follow the instructions on the screen.

## A solid blue screen appears

### Turn the computer off —

If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds (until the computer turns off), and then restart your computer.

## Other software problems

### Check the software documentation or contact the software manufacturer for troubleshooting information —

1. Ensure that the program is compatible with the operating system installed on your computer.
1. Ensure that your computer meets the minimum hardware requirements needed to run the software. See the software documentation for information.
1. Ensure that the program is installed and configured properly.
1. Verify that the device drivers do not conflict with the program.
1. If necessary, uninstall and then reinstall the program.

### Back up your files immediately

Use a virus-scanning program to check the hard drive, floppy disks, CDs, or DVDs

Save and close any open files or programs and shut down your computer through the Start menu

## Memory Problems

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

#### If you receive an insufficient memory message —

- 1 Save and close any open files and exit any open programs you are not using to see if that resolves the problem.
- 1 See the software documentation for minimum memory requirements. If necessary, install additional memory (see [Replacing a Memory Module](#)).
- 1 Reseat the memory modules (see [Memory](#)) to ensure that your computer is successfully communicating with the memory.
- 1 Run the Dell Diagnostics (see [Dell Diagnostics](#)).

#### If you experience other memory problems —

- 1 Reseat the memory modules (see [Memory](#)) to ensure that your computer is successfully communicating with the memory.
- 1 Ensure that you are following the memory installation guidelines (see [Replacing a Memory Module](#)).
- 1 Ensure that the memory you are using is supported by your computer. For more information about the type of memory supported by your computer, see the *Setup and Quick Reference Guide* for your computer at [support.dell.com](http://support.dell.com).
- 1 Run the Dell Diagnostics (see [Dell Diagnostics](#)).

## Power Problems

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If the power light is green and the computer is not responding — See [Diagnostic Lights](#).

If the power light is off — The computer is either turned off or is not receiving power.

- 1 Reseat the power cable in the power connector on the back of the computer and the electrical outlet.
- 1 Bypass power strips, power extension cables, and other power protection devices to verify that the computer turns on properly.
- 1 Ensure that any power strips being used are plugged into an electrical outlet and are turned on.
- 1 Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

Eliminate interference — Some possible causes of interference are:

- 1 Power, keyboard, and mouse extension cables
- 1 Too many devices connected to the same power strip
- 1 Multiple power strips connected to the same electrical outlet

## Sound and Speaker Problems

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

#### No sound from speakers

 **NOTE:** The volume control in MP3 and other media players may override the Windows volume setting. Always check to ensure that the volume on the media player(s) has not been turned down or off.

**Adjust the Windows volume control** — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

**Disconnect headphones from the headphone connector** — Sound from the speakers is automatically disabled when headphones are connected to the computer's front-panel headphone connector.

**Eliminate possible interference** — Turn off nearby fans, fluorescent lights, or halogen lamps to check for interference.

**Run the Hardware Troubleshooter** — See [Hardware Troubleshooter](#).

#### No sound from headphones

**Check the headphone cable connection** — Ensure that the headphone cable is securely inserted into the headphone connector. See the *Setup and Quick Reference Guide* for your computer at [support.dell.com](http://support.dell.com).

**Adjust the Windows volume control** — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

## Video and Display Problems

 **CAUTION:** 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 on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

 **NOTICE:** If your computer came with a PCI graphics card installed, removal of the card is not necessary when installing additional graphics cards; however, the card is required for troubleshooting purposes. If you remove the card, store it in a safe and secure location. For information about your graphics card, go to [support.dell.com](http://support.dell.com).

### Check the diagnostic lights —

See [Diagnostic Lights](#).

### Check the display settings —

See the *Dell™ Technology Guide* on your computer or at [support.dell.com](http://support.dell.com).

### Adjust the Windows display settings —

*Windows XP:*

1. Click **Start** → **Control Panel** → **Appearance and Themes**.
2. Click the area you want to change or click the **Display** icon.
3. Try different settings for **Color quality** and **Screen resolution**.

*Windows Vista:*

1. Click **Start**  → **Control Panel** → **Hardware and Sound** → **Personalization** → **Display Settings**.
2. Adjust **Resolution** and **Colors settings**, as needed.

## Only part of the display is readable

### Connect an external monitor —

1. Shut down your computer and connect an external monitor to the computer.
2. Turn on the computer and the monitor and adjust the monitor brightness and contrast controls.

If the external monitor works, the computer display or video controller may be defective. Contact Dell Support.

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## Dell™ Technical Update Service

The Dell Technical Update service provides proactive e-mail notification of software and hardware updates for your computer. The service is free and can be customized for content, format, and how frequently you receive notifications.

To enroll for the Dell Technical Update service, go to [support.dell.com/technicalupdate](http://support.dell.com/technicalupdate).

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## WLAN/WiMax Cards

### Service Manual

- [Removing a WLAN/WiMax Card](#)
- [Replacing a WLAN/WiMax Card](#)

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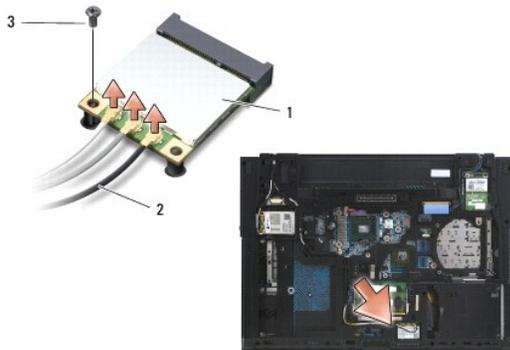
Your computer supports a Wireless Local Area Network (WLAN) card or a WiMax card. If you ordered a WLAN/WiMax card with your computer, the card is already installed.

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## Removing a WLAN/WiMax Card

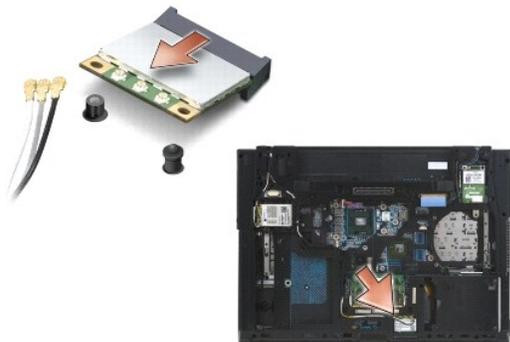
1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Disconnect the antenna cables from the WLAN/WiMax card.
5. Remove the M2x3 screw that secures the WLAN/WiMax card.

The card will pop up to a 45-degree angle.



1	WLAN/WiMax card	2	antenna cable connectors (3)
3	M2x3 screw		

6. Slide the WLAN/WiMax card out at a 45-degree angle from its connector.



## Replacing a WLAN/WiMax Card

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

 **NOTICE:** To avoid damage to the WLAN/WiMax card, ensure the cables are not under the card when you place the card.

 **NOTE:** The card slot will be marked by a WLAN/WiMax silk-screen. Do not install the WLAN/WiMax card into any other card slot.

1. Slide the WLAN/WiMax card into the connector.
2. Press the card down to the alignment post and hold in position.
3. Tighten the screw on the WLAN/WiMax card.
4. Connect the appropriate antenna cables to the WLAN/WiMax card you are installing:

If the WLAN/WiMax card has two triangles on the label (white and black), connect the white antenna cable to the connector labeled "main" (white triangle), and connect the black antenna cable to the connector labeled "aux" (black triangle). Place the remaining gray cable in the chassis next to holder next to the card.

If the WLAN/WiMax card has three triangles on the label (white, black, and gray), connect the white antenna cable to the white triangle, connect the black antenna cable to the black triangle, and connect the gray antenna cable to the gray triangle.

 **NOTE:** Ensure the cables are tucked into the cable channel.

5. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
6. Replace the battery (see [Replacing the Battery](#)).

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## WPAN/UWB Cards

### Service Manual

- [Removing a WPAN/UWB Card](#)
- [Replacing a WPAN/UWB Card](#)

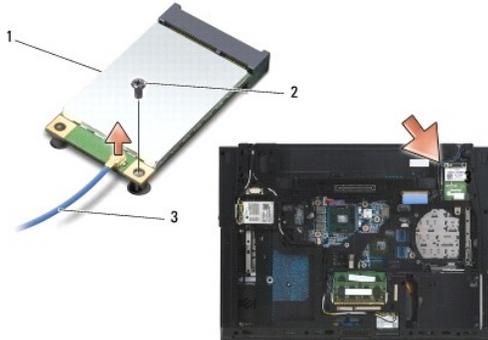
**⚠ CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

Your computer supports a Wireless Personal Area Network (WPAN/UWB) card. If you ordered a WPAN/UWB card with your computer, the card is already installed.

**🔍 NOTE:** Flash Cache Modules (FCMs) fit into both WWAN and WPAN Mini-Card slots. For more information about FCMs, see [Flash Cache Modules](#).

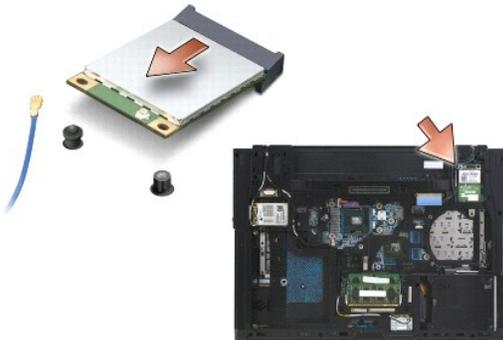
### Removing a WPAN/UWB Card

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the left hinge cover (see [Removing the Hinge Covers](#)).
4. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
5. Disconnect the blue antenna cable from the WPAN/UWB card.
6. Remove the M2x3 screw from the WPAN/UWB card.



1	WPAN/UWB card	2	M2x3 screw
3	antenna cable		

7. Slide the WPAN/UWB card at a 45-degree angle out of its connector.



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## Replacing a WPAN/UWB Card

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

➡ **NOTICE:** To avoid damage to the WPAN/UWB card, ensure the cables are not under the card when you replace the card.

➡ **NOTICE:** WPAN/UWB/FCM is silk-screened inside the Mini-Card slot. Do not install WPAN (BT/UWB) cards in any other Mini-Card slot.

1. Slide the WPAN/UWB card into the connector.
2. Press the card down to the alignment post and hold in position.
3. Replace the screw in the WPAN/UWB card.
4. Connect the blue antenna cable to the WPAN/UWB card.
5. Replace the left hinge cover (see [Replacing the Hinge Covers](#)).
6. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
7. Replace the battery (see [Replacing the Battery](#)).

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## WWAN Card

Service Manual

- [Removing a WWAN Card](#)
- [Replacing a WWAN Card](#)

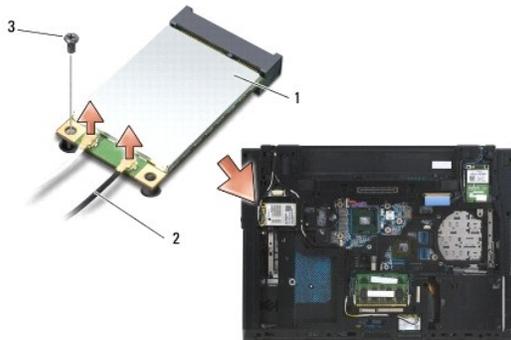
**⚠ CAUTION:** Before working inside your computer, read the safety information that shipped with your computer. For additional safety best practices information, see the Regulatory Compliance Homepage on [www.dell.com](http://www.dell.com) at: [www.dell.com/regulatory\\_compliance](http://www.dell.com/regulatory_compliance).

Your computer supports a Wireless Wide Area Network (WWAN) card. If you ordered a WWAN card with your computer, the card is already installed.

**🔧 NOTE:** Flash Cache Modules (FCMs) fit into WWAN and WPAN Mini-Card slots. For more information about FCMs, see [Flash Cache Modules](#).

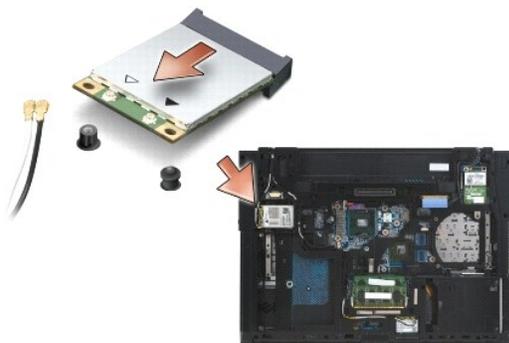
### Removing a WWAN Card

1. Follow the procedures in [Before Working on Your Computer](#).
2. Close the display and turn the computer over.
3. Remove the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).
4. Disconnect the antenna cables from the WWAN card.
5. Press the small black tabs to release the WWAN card.



1	WWAN card	2	antenna cable connectors (2)
3	M2 x 3 screw		

6. Slide the WWAN card at a 45-degree angle out of its connector.



### Replacing a WWAN Card

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

➡ **NOTICE:** To avoid damage to the WWAN card, ensure the cables are not under the card when you click the card into place.

➡ **NOTICE:** The words **WWAN/FCM** are silk-screened inside the card slot. Do not install WWAN cards in any other Mini-Card slot.

1. Slide the WWAN card into the connector.
2. Press the card down to the alignment post and hold in position.
3. Replace the M2 x 3 screw.
4. Connect the white antenna cable to the connector labeled "main" (white triangle), and connect the black antenna cable to the connector labeled "aux" (black triangle).
5. Replace the bottom of the base assembly (see [Removing the Bottom of the Base Assembly](#)).

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