

# HP EliteBook 2530p Notebook PC

## Maintenance and Service Guide



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## Safety warning notice

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- ⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).
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# 1 Product description

Category	Description
<b>Product Name</b>	HP EliteBook 2530p Notebook PC
<b>Processors</b>	<p>Intel® LV Core™2 Duo, soldered uFBGA</p> <ul style="list-style-type: none"><li>• SL9600 2.13-GHz, 1066MHz front side bus (FSB) with 6-MB cache</li><li>• SL9400 1.86-GHz, 1066MHz FSB with 6-MB cache</li><li>• SL9300 1.6-GHz, 1066MHz FSB with 6-MB cache</li></ul> <p>Intel ULV Core2 Duo, soldered uFBGA</p> <ul style="list-style-type: none"><li>• SU9400, 1.4-GHz, 800 MHz, FSB with 3-MB cache</li><li>• SU9300, 1.2-GHz, 800MHz FSB with 3-MB cache</li></ul>
<b>Chipset</b>	<p>Mobile Intel Express GS45</p> <p>ICH9m-SFF-enhanced</p>
<b>Graphics</b>	Intel Universal Memory Architecture (UMA) graphics subsystem integrated with up to 384-MB shared system memory
<b>Panels</b>	12.1-inch WXGA display assembly (1280 × 800) with Antiglare, includes 2 wireless local area network (WLAN) antennae, and supports privacy filter
<b>Memory</b>	<p>Two customer-accessible/upgradable memory module slots</p> <p>Supports up to 8 GB of system RAM</p> <p>800-MHz, DDR2</p> <p>Supports the following configurations:</p> <ul style="list-style-type: none"><li>• 8192-MB total system memory (4096 × 2)</li><li>• 6144-MB total system memory (4096 + 2048)</li><li>• 5120-MB total system memory (4096 + 1024)</li><li>• 4096-MB total system memory (4096 × 1)</li><li>• 4096-MB total system memory (2048 × 2)</li><li>• 3072-MB total system memory (2048 + 1024)</li><li>• 2048-MB total system memory (2048 × 1)</li><li>• 2048-MB total system memory (1024 × 2)</li><li>• 1024-MB total system memory (1024 × 1)</li></ul>

Category	Description	
<b>Hard drives</b>	Customer-accessible	
	Supports the following SATA primary drives:	
	<b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.	
	<ul style="list-style-type: none"> <li>• 160-GB, 5400-rpm</li> <li>• 120-GB, 5400-rpm</li> <li>• 80-GB, 5400-rpm</li> </ul>	
	Supports the following primary solid-state drive:	
<ul style="list-style-type: none"> <li>• 80-GB, Intel</li> </ul>		
<b>Optical drives</b>	Supports the following SATA secondary drives installed in the optical drive bay:	
	<b>NOTE:</b> The 6.35-cm (2.50-inch) secondary hard drive must be installed in the optical drive bay. Installation of this drive in the hard drive bay is not supported. (This option is not available when the optical drive is installed.)	
	<ul style="list-style-type: none"> <li>• 320-GB, 7200-rpm</li> <li>• 250-GB, 5400-rpm</li> <li>• 160-GB, 7200-rpm</li> <li>• 160-GB, 5400-rpm</li> <li>• 120-GB, 5400-rpm</li> </ul>	
	<b>Optical drives</b>	Fixed (removal of 1 screw required)
	<b>NOTE:</b> This option is not available with a secondary hard drive installed as primary storage.	
<b>Diskette drive</b>	Customer-accessible	
	Serial ATA (SATA)	
	9.5-mm tray load	
	Supports the following drive options:	
	<ul style="list-style-type: none"> <li>• DVD-ROM Drive</li> <li>• DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive</li> <li>• No optical drive, with optical drive space-saver</li> </ul>	
<b>Diskette drive</b>	Supports external USB diskette drive only	
	Supports boot from external USB diskette drive	
<b>Audio</b>	HD audio - ADI1984A	
	Integrated single speaker, no speaker branding	
	Integrated dual-array microphone	
<b>Webcam</b>	Optional 2.1-megapixel webcam with support for a business card reader	
<b>Modem</b>	56K V.92 data/fax modem	
<b>Ethernet</b>	Integrated Gigabit 10/100/1000 local access network (LAN)	

Category	Description
	S4/S5 wake on LAN on AC power
	NIC power-down technology
<b>Wireless LAN</b>	<b>Integrated WLAN options by way of mini-slot which supports WLAN only:</b>
	Support for 2 dual-band 2.4-/5.0-GHz WLAN antennae cabled to mini-slot
	Support for the following WLAN options:
	<ul style="list-style-type: none"> <li>• 802.11a/b/g with Intel Active Management Technology (iAMT) support</li> <li>• 802.11a/b/g/n with iAMT support</li> <li>• 802.11a/b/g/draft-n</li> <li>• 802.11b/g</li> <li>• no-WLAN option</li> </ul>
	<b>Integrated WWAN options by way of mini-slot which supports WWAN only:</b>
	Support for 2 five-band WWAN antennae cabled to mini-slot
	SIM is user-accessible behind battery
	Supports the following WWAN options:
	<ul style="list-style-type: none"> <li>• HP un2400 Mobile Broadband Module</li> <li>• WWAN aftermarket option</li> </ul>
	<b>Integrated WPAN option by way of mini-slot which supports WPAN only:</b>
	Supports no-wireless PAN option
	Blueflame Bluetooth® module
<b>External media card</b>	SD Card Reader supporting Secure Digital (SD) Memory Card and MultiMediaCard (MMC)
<b>Ports</b>	Audio-in (stereo microphone)
	Audio-out (stereo headphone)
	Docking
	RJ-11 (modem)
	RJ-45 (Ethernet, includes link and activity lights)
	USB (2 ports on models with an optical drive installed, 3 ports on models without an optical drive installed)
	VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75-GHz (hot plug/unplug with auto-detect)
	3-pin AC power via the HP Smart AC Adapter
<b>Docking</b>	HP 2400/2500 Series Docking Station
<b>Keyboard/pointing devices</b>	Full-size 4.5-mm×19.05-mm keyboard with embedded numeric keypad
	Pointing stick with 2 pointing stick buttons
	TouchPad with 2 TouchPad buttons and vertical scrolling zone

Category	Description
	Spill-resistant keyboard
	Windows Vista® Start button
	Durable key caps
<b>Power requirements</b>	65-W Smart AC adapter with localized cable plug support (3-wire plug with ground pin)
	9-cell, 83.0-Wh Li-ion battery with fuel gauge
	6-cell, 55.0-Wh Li-ion battery with fuel gauge
	3-cell, 31.0-Wh Li-ion battery
<b>Security</b>	Supports Kensington security lock
	Supports integrated USB-based fingerprint reader
<b>Operating system</b>	<b>Preinstalled:</b>
	Vista Home Basic (32-bit)
	Vista Business (32-bit)
	Vista Ultimate (32-bit)
	FreeDOS
<b>Serviceability</b>	<b>End-user replaceable parts:</b>
	AC adapter and power cord
	Battery (system)
	SIM
	Bluetooth module
	Memory module
	WLAN module
	WWAN module
	Optical drive
	RTC battery
	Switch cover
	Keyboard
	Primary hard drive
	Primary hard drive (solid-state)
	<b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.
	Secondary hard drive
	<b>NOTE:</b> The 6.35-cm (2.50-inch) secondary hard drive must be installed in the optical drive bay. Installation of this drive in the hard drive bay is not supported. (This option is not available when the optical drive is installed.)

## 2 External component identification

### Top components

#### Pointing devices



Component	Description
(1) Left TouchPad button*	Functions like the left button on an external mouse.
(2) TouchPad*	Moves the pointer and selects or activates items on the screen.
(3) Left pointing stick button*	Functions like the left button on an external mouse.
(4) Pointing stick*	Moves the pointer and selects or activates items on the screen.
(5) TouchPad on/off button	Turns the TouchPad on and off.
(6) Right pointing stick button*	Functions like the right button on an external mouse.
(7) TouchPad scroll zone	Scrolls up or down.
(8) Right TouchPad button*	Functions like the right button on an external mouse.

\*This table describes factory settings. To view or change pointing device preferences:

- For Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**.
- For Windows® XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

## Lights



Component	Description
(1) Power lights (2)*	<ul style="list-style-type: none"> <li>On: The computer is on.</li> <li>Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP).</li> <li>Off: The computer is off or in Hibernation.</li> </ul>
(2) Wireless lights (2)†	<ul style="list-style-type: none"> <li>Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Mobile Broadband Module, and/or a Bluetooth device, is on.</li> <li>Amber: All wireless devices are off.</li> </ul>
(3) TouchPad on/off light	<ul style="list-style-type: none"> <li>Turquoise: TouchPad is on.</li> <li>Amber: TouchPad is off.</li> </ul>
(4) Caps lock light	On: Caps lock is on.
(5) Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
(6) Volume mute light	<ul style="list-style-type: none"> <li>Turquoise: Speaker sound is on.</li> <li>Amber: Speaker sound is off.</li> </ul>

Component	Description
(7) Battery light	<ul style="list-style-type: none"> <li>• Amber: A battery is charging.</li> <li>• Turquoise: A battery is close to full charge capacity.</li> <li>• Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</li> <li>• Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.</li> </ul>
(8) Drive light	<ul style="list-style-type: none"> <li>• Blinking turquoise: The hard drive or optical drive is being accessed.</li> <li>• Amber: HP 3D DriveGuard has temporarily parked the internal hard drive.</li> </ul>

\*The 2 power lights display the same information. The light on the power button is visible only when the computer is open. The power light on the front of the computer is visible whether the computer is open or closed.

†The 2 wireless lights display the same information. The light on the wireless button is visible only when the computer is open. The wireless light on the front of the computer is visible whether the computer is open or closed.

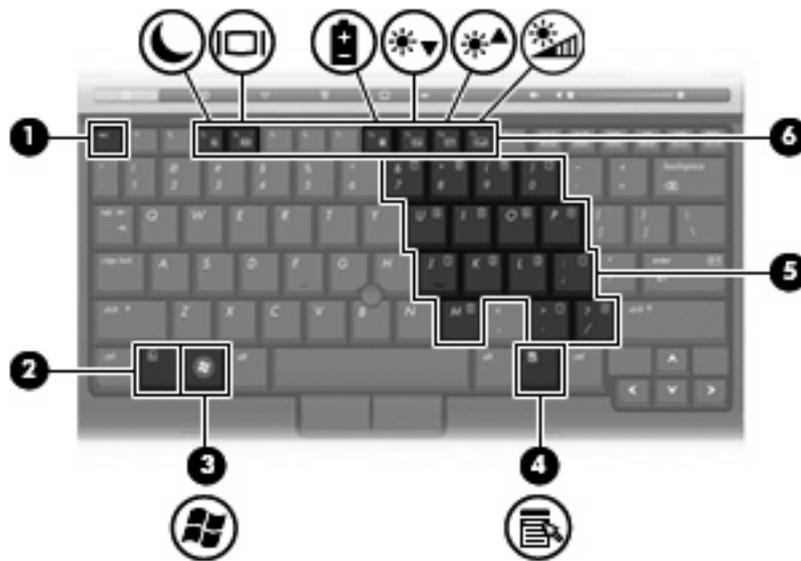
## Buttons, switches, and fingerprint reader



Component	Description
(1) Power button	<ul style="list-style-type: none"> <li>When the computer is off, press the button to turn on the computer.</li> <li>When the computer is on, press the button to shut down the computer.</li> <li>When the computer is in the Sleep state (Windows Vista) or Standby (Windows XP), press the button briefly to exit the Sleep state or Standby.</li> <li>When the computer is in Hibernation, press the button briefly to exit Hibernation.</li> </ul> <p>If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings:</p> <ul style="list-style-type: none"> <li>For Windows Vista, select <b>Start &gt; Control Panel &gt; System and Maintenance &gt; Power Options</b>.</li> <li>For Windows XP, select <b>Start &gt; Control Panel &gt; Performance and Maintenance &gt; Power Options</b>.</li> </ul>
(2) Info button	<p>Launches Info Center, which enables you to open various software solutions.</p>
(3) Internal display switch	<p>Turns off the display if the display is closed while the power is on.</p>
(4) Wireless button	<p>Turns the wireless feature on or off but does not establish a wireless connection.</p> <p><b>NOTE:</b> A wireless network must be set up in order to establish a wireless connection.</p>

Component	Description
(5) Presentation button	Starts the presentation feature.
(6) TouchPad on/off button	Turns the TouchPad on or off.
(7) Volume mute button	Mutes and restores speaker sound.
(8) Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume. You can also press and hold the minus (–) sign to decrease volume, or press and hold the plus (+) sign to increase volume.
(9) Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon.

## Keys



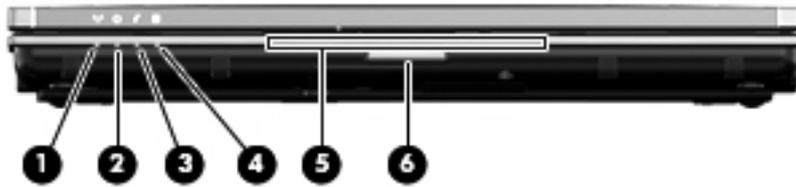
Component	Description
(1) <b>esc</b> key	Displays system information when pressed in combination with the <b>fn</b> key.
(2) <b>fn</b> key	Executes frequently used system functions when pressed in combination with a function key or the <b>esc</b> key.
(3) Windows logo key	Displays the Windows Start menu.
(4) Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5) Embedded numeric keypad keys	Can be used like the keys on an external numeric keypad.
(6) Function keys	Execute frequently used system functions when pressed in combination with the <b>fn</b> key.

## Display



Component	Description
(1) Ambient light sensor	Automatically adjusts the display brightness based on the lighting conditions in your environment.
(2) Webcam light (select models only)	On: The integrated camera is in use.
(3) Webcam (select models only)	Records audio and video and captures still photographs.
(4) Keyboard light	Illuminates the keyboard in low-light conditions when the keyboard light button is pressed.
(5) Keyboard light button	Opens and turns on the keyboard light.
(6) Internal microphone	Records sound. <b>NOTE:</b> The internal microphone makes use of dual array technology, which provides speech enhancement and suppresses surrounding noises.

# Front components



Component	Description
(1) Wireless light	<ul style="list-style-type: none"> <li>Blue: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Mobile Broadband Module, and/or a Bluetooth device, is on.</li> <li>Amber: All wireless devices are off.</li> </ul>
(2) Power light	<ul style="list-style-type: none"> <li>On: The computer is on.</li> <li>Blinking: The computer is in the Sleep state (Windows Vista) or Standby (Windows XP).</li> <li>Off: The computer is off or in Hibernation.</li> </ul>
(3) Battery light	<ul style="list-style-type: none"> <li>Amber: A battery is charging.</li> <li>Turquoise: A battery is close to full charge capacity.</li> <li>Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.</li> <li>Off: If the computer is plugged into an external power source, the light turns off when all batteries in the computer are fully charged. If the computer is not plugged into an external power source, the light stays off until the battery reaches a low battery level.</li> </ul>
(4) Drive light	<ul style="list-style-type: none"> <li>Turquoise: The hard drive or optical drive is being accessed.</li> <li>Amber: HP 3D DriveGuard has temporarily parked the internal hard drive.</li> </ul>
(5) Business card slot	Holds a business card in position so that the webcam can capture the information on the card.
(6) Display release button	Opens the computer.

## Rear components

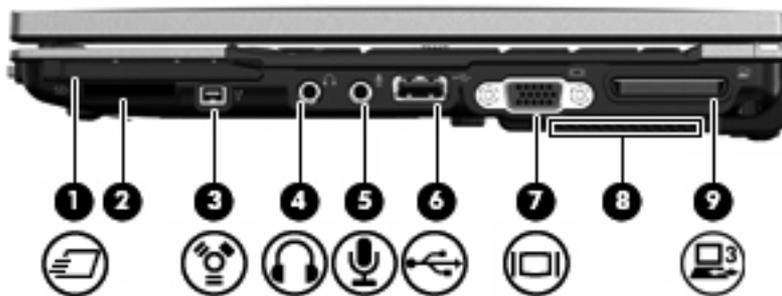


Component	Description
(1) RJ-45 (network) jack	Connects a network cable.
(2) Security cable slot	Attaches an optional security cable to the computer.

**NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

## Right-side components

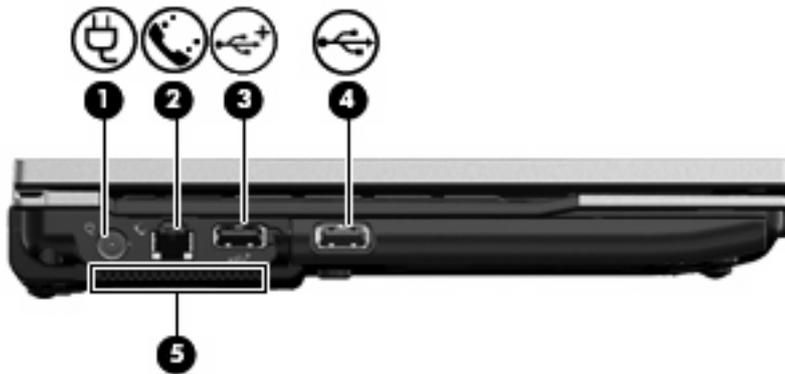
 **NOTE:** Refer to the illustration that most closely matches your computer.



Component	Description
(1) ExpressCard slot	Supports optional ExpressCards.
(2) SD Card Reader	Supports the Secure Digital (SD) Memory Card and MultiMediaCard (MMC) optional digital card formats.
(3) 1394 port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(4) Audio-out (headphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.  <b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety and Environmental Notices</i> .  <b>NOTE:</b> When a device is connected to the headphone jack, the computer speakers are disabled.
(5) Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(6) USB port	Connects an optional USB device.
(7) External monitor port	Connects an external VGA monitor or projector.
(8) Vent	Enables airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(9) Expansion port 3	Connects an optional docking device.

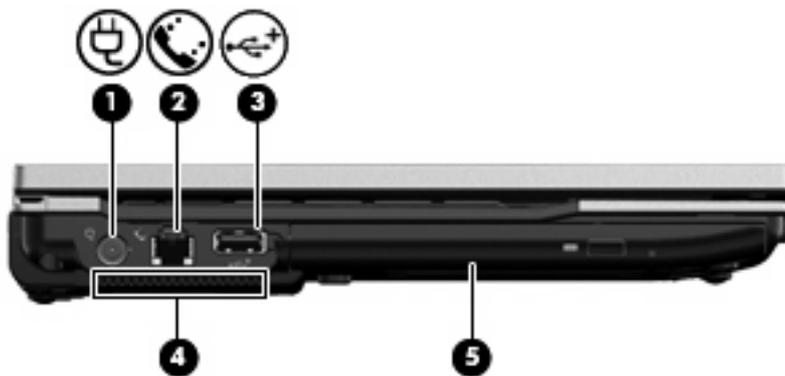
## Left-side components

 **NOTE:** Refer to the illustration that most closely matches your computer.



Component	Description
(1) Power connector	Connects an AC adapter.
(2) RJ-11 (modem) jack	Connects a modem cable.
(3) Powered USB port	Provides power to an external device if used with a powered USB cable.
(4) USB port	Connects an optional USB device.
(5) Vent	Enables airflow to cool internal components.

**NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.



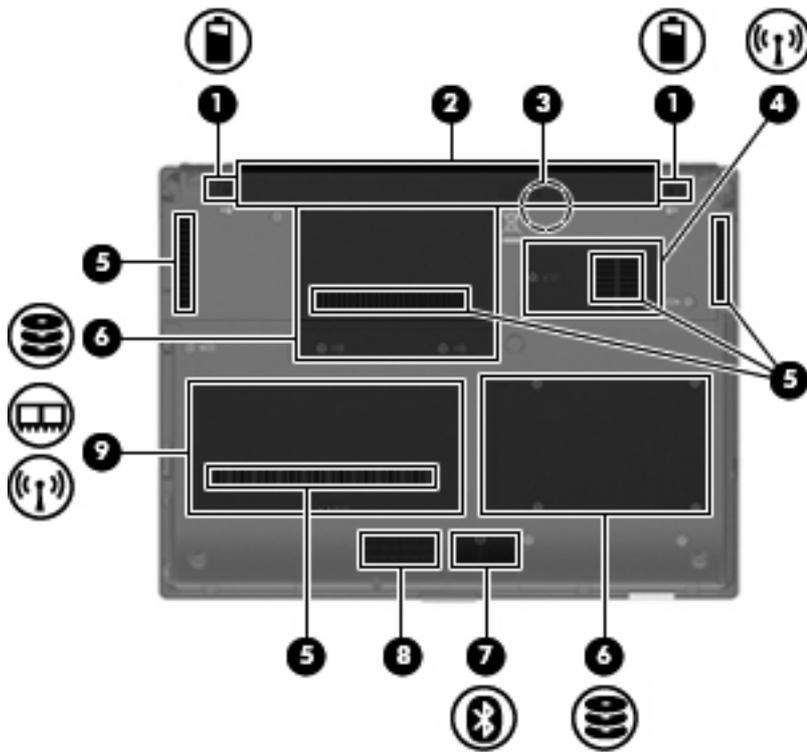
Component	Description
(1) Power connector	Connects an AC adapter.
(2) RJ-11 (modem) jack	Connects a modem cable.
(3) Powered USB port	Provides power to an external device if used with a powered USB cable.

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<b>(4)</b>	Vent	Enables airflow to cool internal components.
<b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.		
<b>(5)</b>	Optical drive	Reads and writes to an optical disc.

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## Bottom components



Component	Description
(1) Battery release latches (2)	Release the battery from the battery bay.
(2) Battery bay	Holds the battery.
(3) SIM slot (select models only)	Contains a wireless subscriber identity module (SIM). The SIM slot is located inside the battery bay.
(4) Broadband wireless module compartment	Contains an HP Mobile Broadband Module (select models only).  <b>CAUTION:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(5) Vents (5)	Enable airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(6) Hard drive bay	Holds the hard drive.  <b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.
(7) Bluetooth compartment	Contains a Bluetooth device.

Component	Description
(8) Speaker	Produces sound.
(9) Memory module compartment	Contains an expansion memory module slot and a WLAN module (select models only).  <b>NOTE:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

## Wireless antennae (select models only)



Component	Description
(1) WLAN antennae (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(2) WWAN antennae (2)*	Send and receive wireless signals to communicate with wireless wide-area networks (WWAN).

\*The antennae are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennae free from obstructions.

To see wireless regulatory notices, refer to the section of the *Regulatory, Safety and Environmental Notices* that applies to your country or region. These notices are located in Help and Support.

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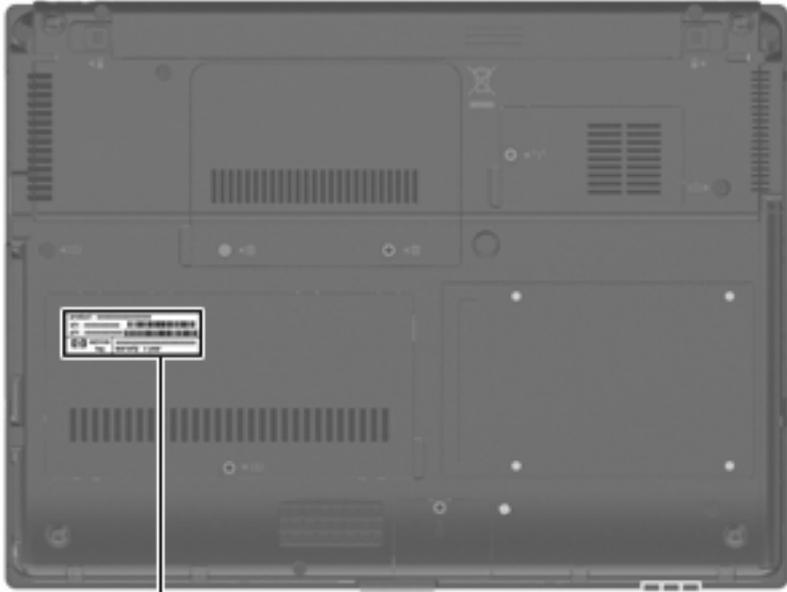
## 3 Illustrated parts catalog

### Serial number location

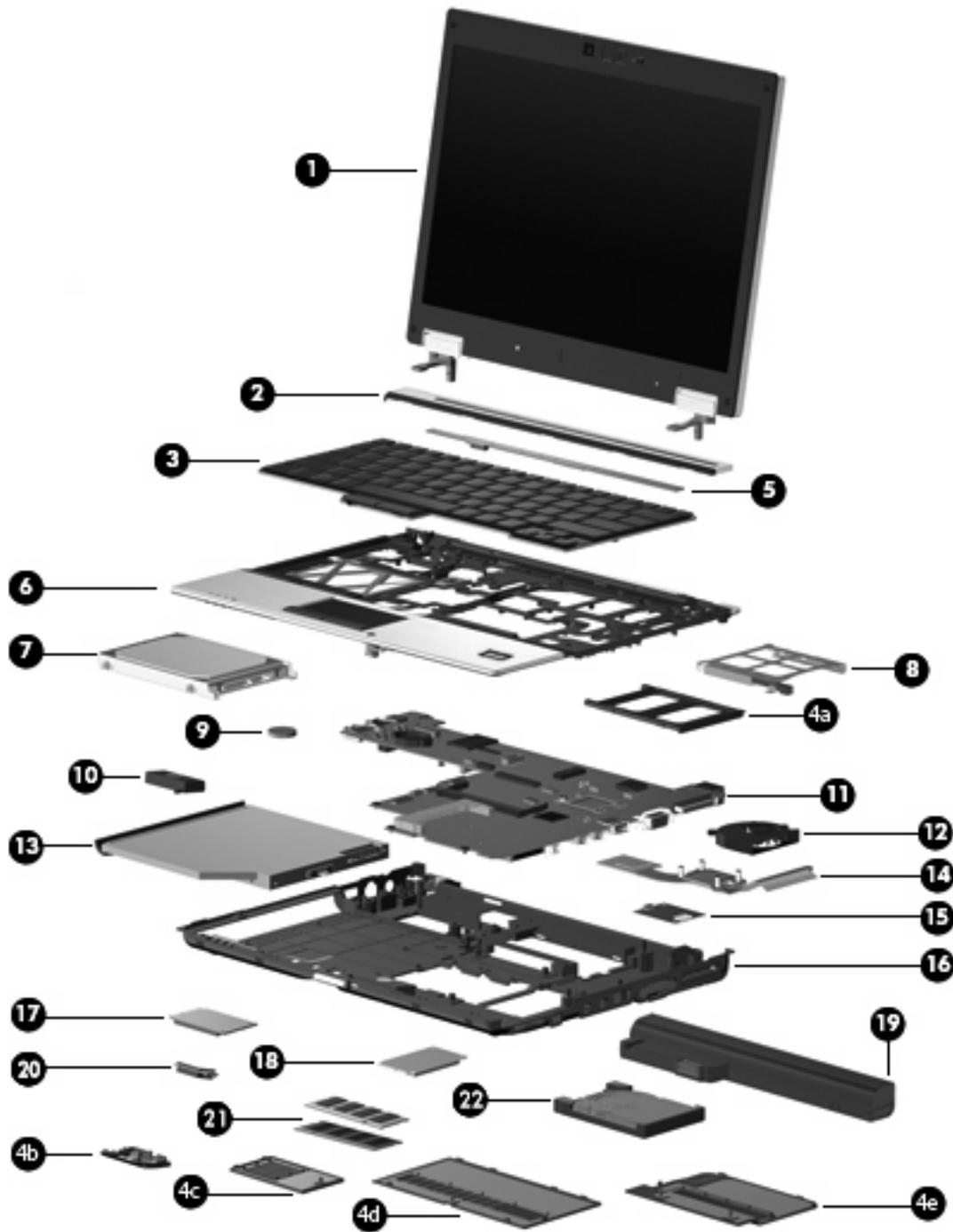
The service tag, affixed to the bottom of the computer, provides information that may be needed when troubleshooting system problems. The service tag provides the following information:

- (1) Product name: This is the product name affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- (4) Model description: This is the number used to locate documents, drivers, and support for the computer.
- (5) Warranty period: This number describes the duration of the warranty period for the computer.

When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



# Computer major components



Item	Description	Spare part number
(1)	<b>12.1-inch, WXGA AntiGlare display assembly</b> (See <a href="#">Display components on page 27</a> for display assembly component spare part number information.)	
	With webcam	492576-001
	Without webcam	492575-001

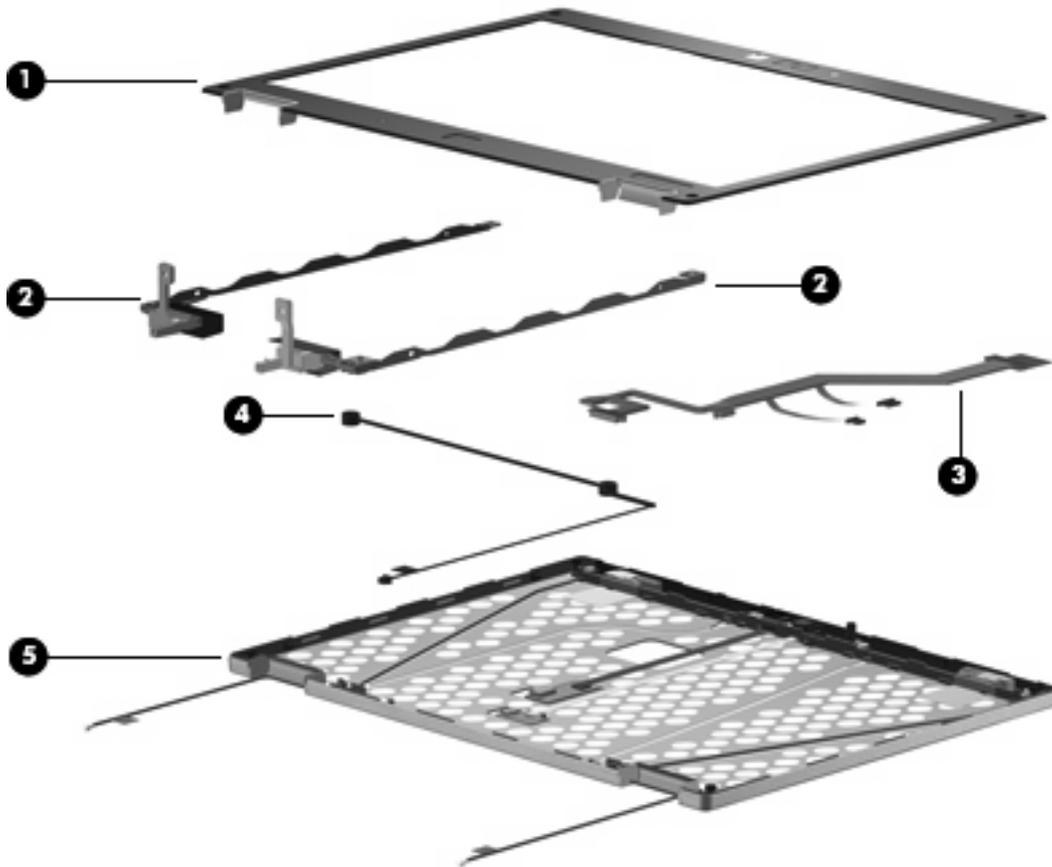
Item	Description	Spare part number
(2)	<b>Switch cover</b> (includes display lid switch board and cable)	492556-001
(3)	<b>Keyboard with pointing stick</b> (includes keyboard cable and pointing stick cable)	
	• For use in Brazil	506677-201
	• For use in the Czech Republic	506677-221
	• For use in Denmark	506677-081
	• For use in Europe	506677-021
	• For use in Finland and Sweden	506677-B71
	• For use in France	506677-051
	• For use in French Canada	506677-121
	• For use in Germany	506677-041
	• For use in Greece	506677-151
	• For use in Hungary	506677-211
	• For use in Iceland	506677-DD1
	• For use in Israel	506677-BB1
	• For use in Italy	506677-061
	• For use in Japan	506677-291
	• For use in Latin America	506677-161
	• For use in the Netherlands and Europe	506677-A41
	• For use in Norway	506677-091
	• For use in Portugal	506677-131
	• For use in Russia	506677-251
	• For use in Saudi Arabia	506677-171
	• For use in Slovakia	506677-231
	• For use in South Korea	506677-AD1
	• For use in Spain	506677-071
	• For use in Switzerland	506677-111
	• For use in Taiwan	506677-AB1
	• For use in Thailand	506677-281
	• For use in Turkey	506677-141
	• For use in the United Kingdom	506677-031
	• For use in the United States	506677-001
	<b>Plastics Kit</b> (See <a href="#">Plastics Kit on page 31</a> for more Plastics Kit spare part information):	492577-001
(4a)	ExpressCard slot insert	
(4b)	Bluetooth module compartment cover	

Item	Description	Spare part number
(4c)	Broadband wireless module compartment cover	
(4d)	Memory module compartment cover	
(4e)	Hard drive bay cover	
	<b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.	
(5)	<b>LED board</b> (includes cable and Mylar cover)	499209-001
(6)	<b>Top cover</b> (includes TouchPad board and cable, TouchPad button board and cable, and TouchPad bracket)	
	With fingerprint reader	492557-001
	Without fingerprint reader	514059-001
(8)	<b>ExpressCard assembly</b>	492567-001
(9)	<b>RTC battery</b>	481089-001
(10)	<b>Speaker</b>	481109-001
(11)	<b>System board</b> (includes processor, replacement thermal material, and replacement thermal material cleaning kit)	
	With LV SL9600 processor	513947-001
	With LV SL9400 processor	492552-001
	With LV SL9300 processor	492551-001
	With ULV SU9400 processor	513946-001
	With ULV SU9300 processor	492553-001
(12)	<b>Fan</b>	492568-001
(13)	<b>Optical drive</b> (includes bezel and bracket) See <a href="#">Mass storage on page 29</a> for optical drive spare part number information.	
(14)	<b>Heat sink</b> (includes replacement thermal material and replacement thermal material cleaning kit)	492582-001
(15)	<b>Modem module</b>	
	<b>NOTE:</b> The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 492555-001.	
	For use in all countries and regions except Australia and New Zealand	461750-001
	For use only in Australia and New Zealand	461750-011
(16)	<b>Base enclosure</b> (includes display latch switch, battery release latch, and rubber feet)	492547-001
(17)	<b>WLAN module</b>	
	802.11a/b/g/n WLAN modules:	
	<ul style="list-style-type: none"> <li><b>Intel WiFi Link 5100ABGN</b> for use in Antigua &amp; Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam</li> </ul>	480985-001

Item	Description	Spare part number
•	<b>Broadcom 4322AGN WiFi Adapter</b> for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe	487330-002
•	<b>Broadcom 4322AGN WiFi Adapter</b> for use in the United States and Canada	487330-001
•	<b>Intel WiFi Link 5100ABGN with Active Management Technology (AMT)</b> for use in the United States and Canada	506678-001
	802.11a/b/g WLAN modules:	
•	<b>Intel WiFi Link 5100ABG</b> for use in the United States and Canada	482957-001
•	<b>Intel WiFi Link 5100ABG with AMT</b> for use in the United States and Canada	506680-001
	802.11b/g WLAN modules:	

Item	Description	Spare part number
	<ul style="list-style-type: none"> <li>• <b>Broadcom 4312G WiFi Adapter</b> for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua &amp; Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia &amp; Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equitorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts &amp; Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad &amp; Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe</li> </ul>	459263-002
	<ul style="list-style-type: none"> <li>• <b>Broadcom 4312G WiFi Adapter</b> for use in the United States and Canada</li> </ul>	459263-001
(18)	<b>HP un2400 Mobile Broadband Module</b>	483377-002
(19)	<b>Battery</b>	
	9-cell, 83.0-WH Li-ion	492550-001
	6-cell, 55.0-WH Li-ion	492549-001
	3-cell, 31.0-WH Li-ion	492548-001
(20)	<b>Bluetooth module</b>	483113-001
(21)	<b>Memory module (PC2-6400, 800-MHz, DDR2)</b>	
	4-GB	492572-001
	2-GB	492571-001
	1-GB	492570-001
(22)	<b>Primary hard drive</b> (includes bezel and bracket) (See <a href="#">Mass storage on page 29</a> for hard drive spare part number information.)	
	<b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.	

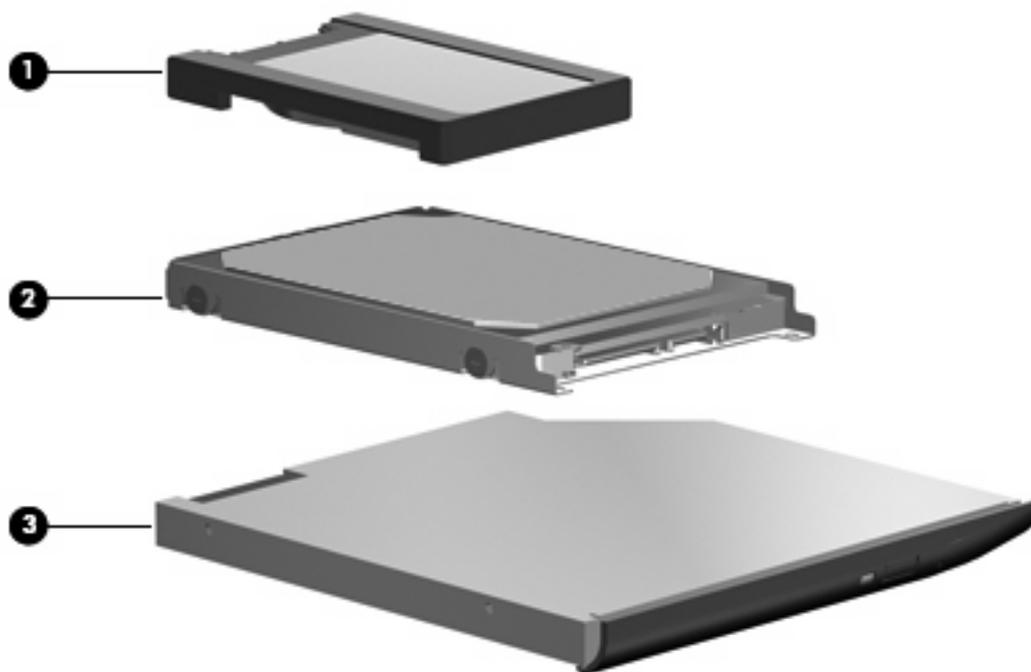
# Display components



Item	Description	Spare part number
	<b>12.1-inch, WXGA AntiGlare display assembly</b> (not illustrated)	
	With a webcam	492576-001
	Without a webcam	492575-001
(1)	<b>Display bezel</b> (includes HP logo and computer model number label)	
	For use with models that include a webcam	495022-001
	For use with models that do not include a webcam	495019-001
	<b>Display bezel adhesive</b> (not illustrated)	497013-001
(2)	<b>Display Hinge Kit</b> (includes left and right hinges and brackets)	481098-001
(3)	<b>Display panel cable</b>	
	For use with models that include a webcam	495023-001
	For use with models that do not include a webcam	495021-001
(4)	<b>Microphone</b>	492573-001
(5)	<b>Display enclosure</b> (includes HP logo, wireless antenna transceivers, and cables)	

Item	Description	Spare part number
	With webcam	496490-001
	Without webcam	495020-001

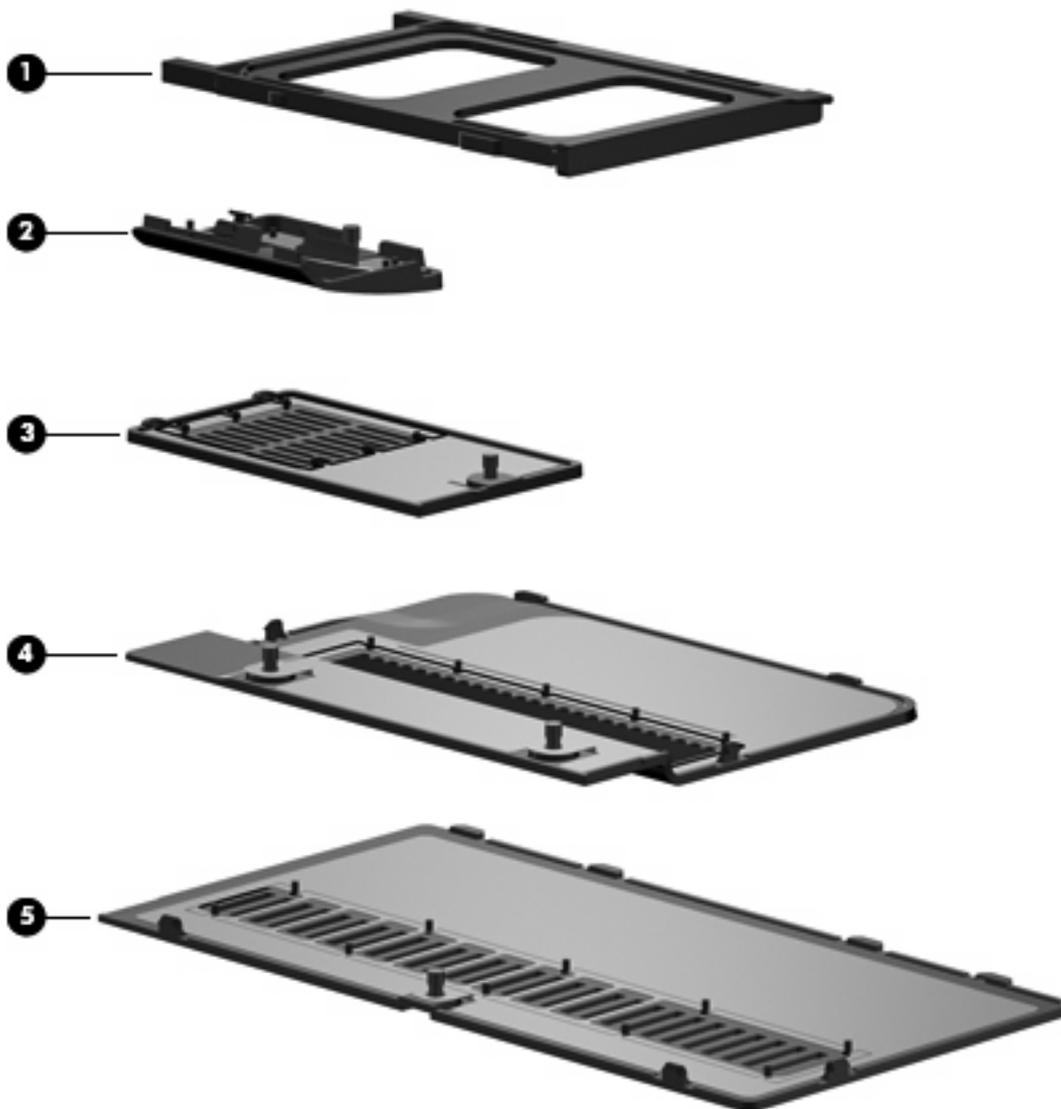
## Mass storage



Item	Description	Spare part number
(1)	<b>Primary hard drive</b>	
	<b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.	
	160-GB, 5400-rpm hard drive	503732-001
	120-GB, 5400-rpm hard drive	492560-001
	80-GB, 5400-rpm hard drive	492565-001
	80-GB, solid-state hard drive	492566-001
	Primary hard drive connector board (required for installation of primary hard drive)	495026-001
(2)	<b>Secondary hard drive</b>	
	<b>NOTE:</b> The 6.35-cm (2.50-inch) secondary hard drive must be installed in the optical drive bay. Installation of this drive in the hard drive bay is not supported. (This option is not available when the optical drive is installed.)	
	320-GB, 7200-rpm hard drive	513949-001
	250-GB, 5400-rpm hard drive	513948-001
	160-GB, 7200-rpm hard drive	492564-001
	160-GB, 5400-rpm hard drive	513950-001
	120-GB, 5400-rpm hard drive	492561-001
	Secondary hard drive cage assembly, includes additional USB port (required for installation of secondary hard drive)	492574-001
	Secondary hard drive connector board (required for installation of secondary hard drive)	495027-001

<b>Item</b>	<b>Description</b>	<b>Spare part number</b>
	Secondary hard drive system connector board (required for installation of secondary hard drive)	495028-001
<b>(3)</b>	<b>Optical drive</b>	
	DVD-ROM Drive	492558-001
	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	492559-001

# Plastics Kit



Item	Description	Spare part number
<b>Plastics Kit:</b>		492577-001
(1)	ExpressCard slot insert	
(2)	Bluetooth module compartment cover (includes one captive screw, secured by a C-clip)	
(3)	Broadband wireless module compartment cover (includes one captive screw, secured by a C-clip)	
(4)	Hard drive bay cover (includes 2 captive screws, secured by C-clips)	
<p><b>NOTE:</b> The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.</p>		
(5)	Memory module compartment cover, (includes one captive screw, secured by a C-clip)	

## Miscellaneous parts

Description	Spare part number
65-W Smart AC Adapter	463958-001
Cable Kit, includes Bluetooth, LED, and modem cables	492555-001
Optical drive bay insert assembly, includes additional USB port	498455-001
Power cord	490371-001
Rubber Kit (includes all rubber/mylar computer components)	492578-001
Screw Kit	492579-001
Smart card reader	492581-001

# Sequential part number listing

Spare part number	Description
459263-001	Broadcom 4312G WiFi Adapter (802.11b/g WLAN module) for use in the United States and Canada
459263-002	Broadcom 4312G WiFi Adapter (802.11b/g WLAN module) for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
461750-001	Modem module for use in all countries and regions except Australia and New Zealand
461750-011	Modem module for use only in Australia and New Zealand
463958-001	65-W Smart AC Adapter
480985-001	Intel WiFi Link 5100ABGN (802.11a/b/g/n WLAN module) for use in Antigua & Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam
481089-001	RTC battery
481098-001	Display Hinge Kit (includes left and right hinges and brackets)
481109-001	Speaker
482957-001	Intel WiFi Link 5100ABG (802.11a/b/g WLAN module) for use in the United States and Canada
483113-001	Bluetooth module
483377-002	HP un2400 Mobile Broadband Module
487330-001	Broadcom 4322AGN WiFi Adapter (802.11a/b/g/n WLAN module) for use in the United States and Canada

Spare part number	Description
487330-002	Broadcom 4322AGN WiFi Adapter (802.11a/b/g/n WLAN module) for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia & Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
490371-001	Power cord
492547-001	Base enclosure (includes display latch switch, battery release latch, and rubber feet)
492548-001	3-cell, 31.0-Wh Li-ion battery
492549-001	6-cell, 55.0-Wh Li-ion battery
492550-001	9-cell, 83.0-Wh Li-ion battery
492551-001	System board with LV SL9300 processor (includes processor, replacement thermal material, and replacement thermal material cleaning kit)
492552-001	System board with LV SL9400 processor (includes processor, replacement thermal material, and replacement thermal material cleaning kit)
492553-001	System board with ULV SU9300 processor (includes processor, replacement thermal material, and replacement thermal material cleaning kit)
492555-001	Cable Kit (includes Bluetooth, LED, and modem cables)
492556-001	Switch cover (includes display lid switch board and cable)
492557-001	Top cover (includes TouchPad board and cable, TouchPad button board and cable, TouchPad bracket, and fingerprint reader board)
492558-001	DVD-ROM Drive
492559-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive
492560-001	120-GB, 5400-rpm, 4.57-cm (1.80-inch) primary hard drive
492561-001	120-GB, 5400-rpm, 6.35-cm (2.50-inch) secondary hard drive
492564-001	160-GB, 7200-rpm, 6.35-cm (2.50-inch) secondary hard drive
492565-001	80-GB, 5400-rpm, 4.57-cm (1.80-inch) primary hard drive
492566-001	80-GB, solid-state, 4.57-cm (1.80-inch) primary hard drive
492567-001	ExpressCard assembly
492568-001	Fan

Spare part number	Description
492570-001	1-GB, PC2-6400, 800-MHz, DDR2 memory module
492571-001	2-GB, PC2-6400, 800-MHz, DDR2 memory module
492572-001	4-GB, PC2-6400, 800-MHz, DDR2 memory module
492573-001	Microphone
492574-001	6.35-cm (2.50-inch) secondary hard drive cage assembly (includes additional USB port)
492575-001	12.1-inch, WXGA AntiGlare display assembly (without webcam)
492576-001	12.1-inch, WXGA AntiGlare display assembly (with webcam)
492577-001	Plastics Kit
492578-001	Rubber Kit (includes all rubber/mylar computer components)
492579-001	Screw Kit
492581-001	Smart card reader
492582-001	Heat sink (includes replacement thermal material and replacement thermal material cleaning kit)
495019-001	Display bezel for use with models that do not include a webcam (include HP logo and computer model number label)
495020-001	Display enclosure without webcam (includes HP logo, wireless antenna transceivers and cables)
495021-001	Display panel cable for use with models that do not include a webcam
495022-001	Display bezel for use with models that do not include a webcam (include HP logo and computer model number label)
495023-001	Display panel cable for use with models that include a webcam
495026-001	4.57-cm (1.80-inch) primary hard drive connector board
495027-001	6.35-cm (2.50-inch) secondary hard drive connector board
495028-001	6.35-cm (2.50-inch) secondary hard drive system connector board
496490-001	Display enclosure with webcam (includes HP logo, wireless antenna transceivers and cables)
497013-001	Display bezel adhesive
498455-001	Optical drive bay insert assembly, includes additional USB port
499209-001	LED board (includes cable and Mylar cover)
503732-001	160-GB, 5400-rpm, 4.57-cm (1.80-inch ) primary hard drive
506677-001	Keyboard with pointing stick for use in the United States
506677-021	Keyboard with pointing stick for use in Europe
506677-031	Keyboard with pointing stick for use in the United Kingdom
506677-041	Keyboard with pointing stick for use in Germany
506677-051	Keyboard with pointing stick for use in France
506677-061	Keyboard with pointing stick for use in Italy
506677-071	Keyboard with pointing stick for use in Spain

Spare part number	Description
506677-081	Keyboard with pointing stick for use in Denmark
506677-091	Keyboard with pointing stick for use in Norway
506677-111	Keyboard with pointing stick for use in Switzerland
506677-121	Keyboard with pointing stick for use in French Canada
506677-131	Keyboard with pointing stick for use in Portugal
506677-141	Keyboard with pointing stick for use in Turkey
506677-151	Keyboard with pointing stick for use in Greece
506677-161	Keyboard with pointing stick for use in Latin America
506677-171	Keyboard with pointing stick for use in Saudi Arabia
506677-201	Keyboard with pointing stick for use in Brazil
506677-211	Keyboard with pointing stick for use in Hungary
506677-221	Keyboard with pointing stick for use in the Czech Republic
506677-231	Keyboard with pointing stick for use in Slovakia
506677-251	Keyboard with pointing stick for use in Russia
506677-281	Keyboard with pointing stick for use in Thailand
506677-291	Keyboard with pointing stick for use in Japan
506677-A41	Keyboard with pointing stick for use in the Netherlands and Europe
506677-AB1	Keyboard with pointing stick for use in Taiwan
506677-AD1	Keyboard with pointing stick for use in South Korea
506677-B71	Keyboard with pointing stick for use in Finland and Sweden
506677-BB1	Keyboard with pointing stick for use in Israel
506677-DD1	Keyboard with pointing stick for use in Iceland
506678-001	Intel WiFi Link 5100ABGN with AMT (802.11a/b/g/n WLAN module) for use in the United States and Canada
506680-001	Intel WiFi Link 5100ABG with AMT (802.11a/b/g WLAN module) for use in the United States and Canada
513946-001	System board with ULV SU9400 processor (includes processor, replacement thermal material, and replacement thermal material cleaning kit)
513947-001	System board with LV SL9600 processor (includes processor, replacement thermal material, and replacement thermal material cleaning kit)
513948-001	250-GB, 5400-rpm, 6.35-cm (2.50-inch) secondary hard drive
513949-001	320-GB, 7200-rpm, 6.35-cm (2.50-inch) secondary hard drive
513950-001	160-GB, 5400-rpm, 6.35-cm (2.50-inch) secondary hard drive
514059-001	Top cover (includes TouchPad board and cable, TouchPad button board and cable, and TouchPad bracket)

---

# 4 Removal and replacement procedures

## Preliminary replacement requirements

### Tools required

You will need the following tools to complete the removal and replacement procedures:

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Torx T8 screwdriver

### Service considerations

The following sections include some of the considerations that you must keep in mind during disassembly and assembly procedures.

---

 **NOTE:** As you remove each subassembly from the computer, place the subassembly (and all accompanying screws) away from the work area to prevent damage.

---

### Plastic parts

 **CAUTION:** Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

---

## Cables and connectors

- 
- △ **CAUTION:** When servicing the computer, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.
- 

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

## Drive handling

- 
- △ **CAUTION:** Drives are fragile components that must be handled with care. To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:
- 

Before removing or inserting an internal hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

Before removing a diskette drive or optical drive, be sure that a diskette or disc is not in the drive and be sure that the optical drive tray is closed.

Handle drives on surfaces covered with at least one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

After removing an internal hard drive, an optical drive, or a diskette drive, place it in a static-proof bag.

Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.

Avoid exposing a drive to temperature extremes or liquids.

If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package "FRAGILE."

---

# Grounding guidelines

## Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, ESD contains enough power to alter device parameters or melt silicon junctions.

A discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Even if the spark is neither felt nor heard, damage may have occurred.

An electronic device exposed to ESD may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

- △ **CAUTION:** To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

Keep components in their electrostatic-safe containers until you are ready to install them.

Before touching an electronic component, discharge static electricity by using the guidelines described in this section.

Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

If you remove a component, place it in an electrostatic-safe container.

The following table shows how humidity affects the electrostatic voltage levels generated by different activities.

- △ **CAUTION:** A product can be degraded by as little as 700 V.

Typical electrostatic voltage levels			
Event	Relative humidity		
	10%	40%	55%
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

## Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

## Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

## Equipment guidelines

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm  $\pm 10\%$  resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

The following table lists the shielding protection provided by antistatic bags and floor mats.

Material	Use	Voltage protection level
Antistatic plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

## Unknown user password

If the computer you are servicing has an unknown user password, follow these steps to clear the password:

---

 **NOTE:** These steps also clear CMOS.

---

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the real-time clock (RTC) battery (see [RTC battery on page 67](#)).
6. Wait approximately 5 minutes.
7. Replace the RTC battery and reassemble the computer.
8. Connect AC power to the computer. Do not reinsert any batteries at this time.
9. Turn on the computer.

All passwords and all CMOS settings have been cleared.

## Component replacement procedures

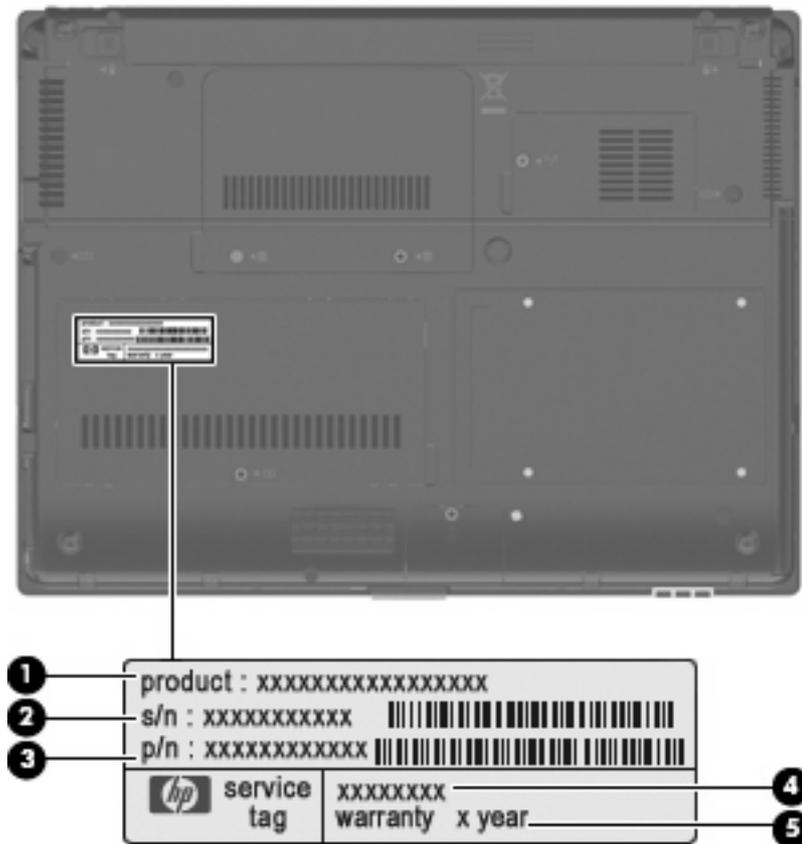
This chapter provides removal and replacement procedures.

There are as many as 60 screws, in 9 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

## Service tag

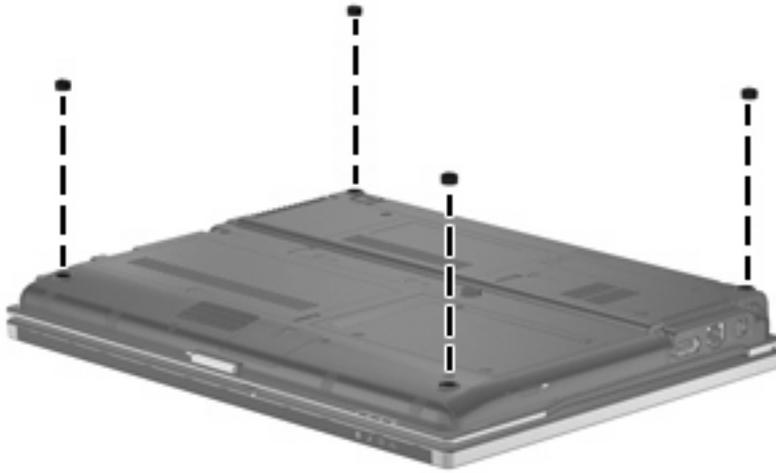
The service tag, affixed to the bottom of the computer, provides information that may be needed when troubleshooting system problems. The service tag provides the following information:

- (1) Product name: This is the product name affixed to the front of the computer.
- (2) Serial number (s/n): This is an alphanumeric identifier that is unique to each product.
- (3) Part number/Product number (p/n): This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- (4) Model description: This is the number used to locate documents, drivers, and support for the computer.
- (5) Warranty period: This number describes the duration of the warranty period for the computer.



## Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 492578-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

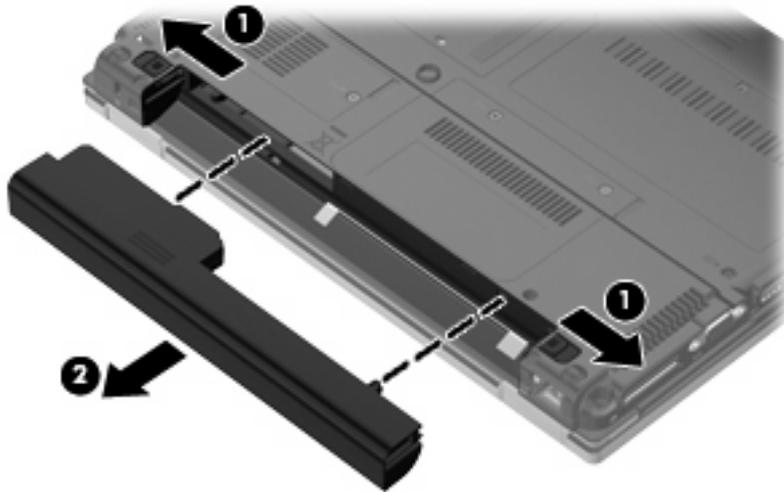
Description	Spare part number
9-cell, 83.0-Wh Li-ion battery	492550-001
6-cell, 55.0-Wh Li-ion battery	492549-001
3-cell, 31.0-Wh Li-ion battery	492548-001

Before disassembling the computer, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

Remove the battery:

1. Turn the computer upside down on a flat surface, with the battery bay toward you.
2. Slide the battery release latches (1) to release the battery.
3. Remove the battery (2) from the computer.



Install the battery by inserting it into the battery bay until you hear a click.

## SIM

 **NOTE:** This section applies only to computer models with WWAN capability.

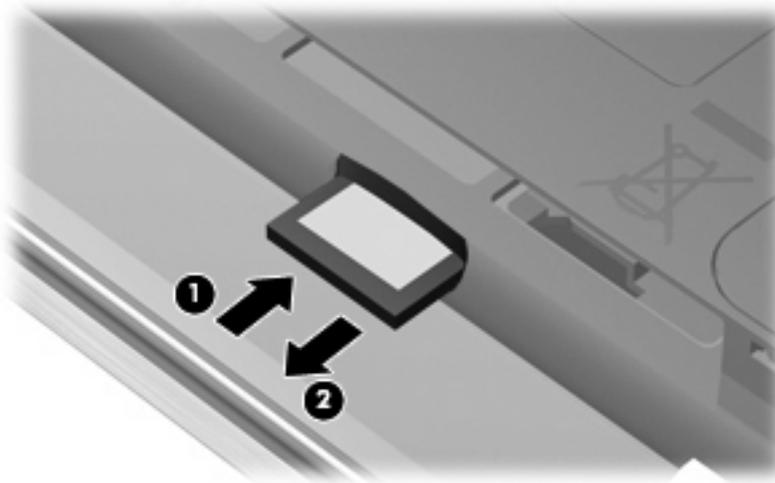
**NOTE:** If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

Before removing the SIM, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

Remove the SIM:

1. Press in on the SIM **(1)**. (The module is partially ejected from the SIM slot.)
2. Remove the SIM **(2)** from the SIM slot.



Reverse this procedure to insert the SIM.

## Bluetooth module

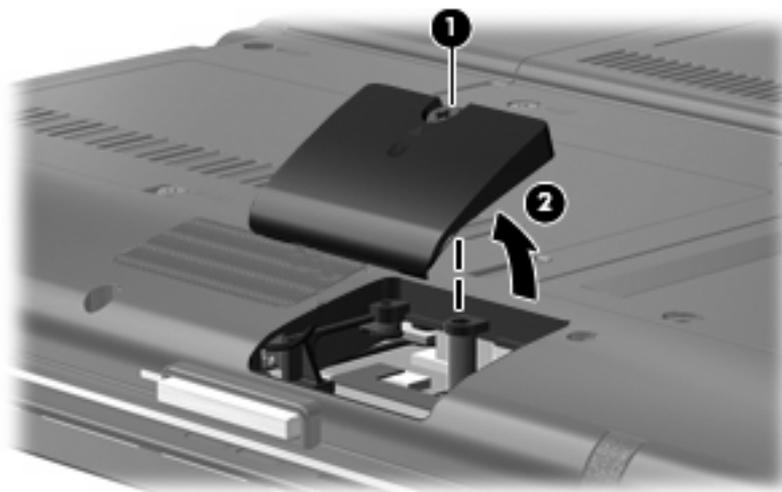
Description	Spare part number
Bluetooth module	483113-001

Before removing the Bluetooth module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

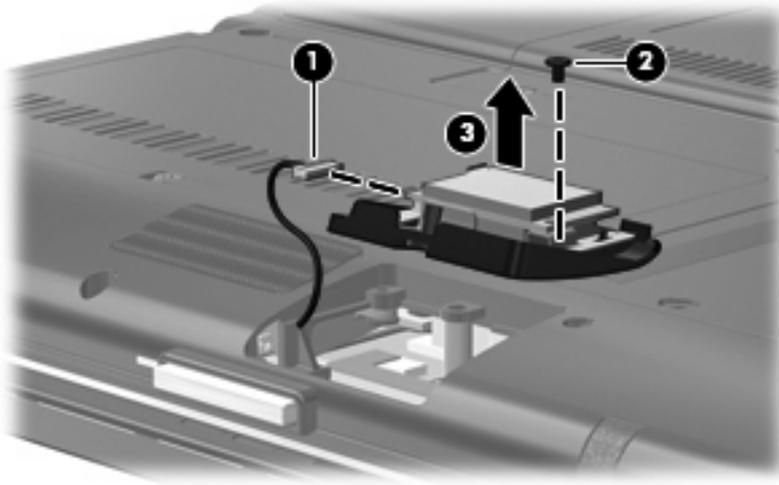
Remove the Bluetooth module:

1. Loosen the Phillips PM2.5×6.0 captive screw (1) that secures the Bluetooth module cover to the computer. (The edge of the module opposite the slot rises away from the computer.)
2. Lift the front edge of the cover (2), swing it back, and remove the cover. The Bluetooth module compartment cover is included in the Plastics Kit, spare part number 492577-001.



3. Disconnect the Bluetooth module cable from the Bluetooth module (1).
4. Remove the Phillips PM2.0×4.0 screw (2) that secures the Bluetooth module to the Bluetooth module compartment cover.

5. Remove the Bluetooth module (3).



Reverse the above procedure to install the Bluetooth module.

## Expansion memory module

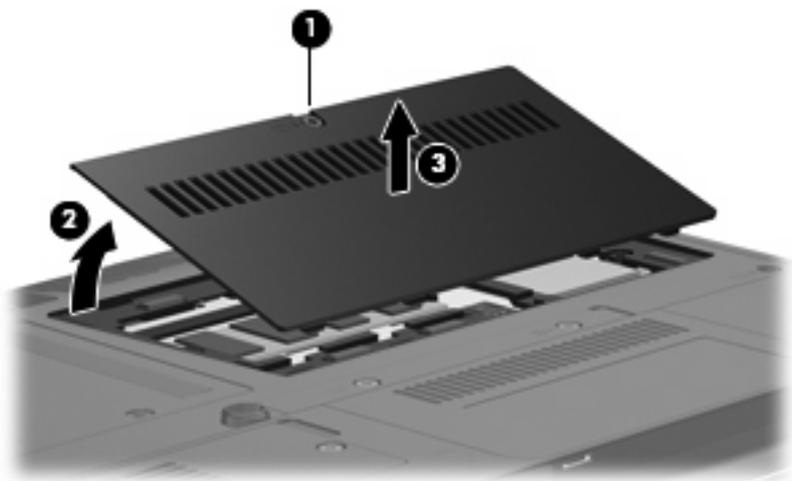
Description	Spare part number
<b>Memory modules</b> (PC2-6400, 800-MHz, DDR2)	
4-GB	492572-001
2-GB	492571-001
1-GB	492570-001

Before removing the memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

Remove the memory module:

1. Loosen the Phillips PM2.5×6.0 captive screw (1) that secures the memory module compartment cover to the computer.
2. Lift the front edge of the cover (2), swing it back, and remove the cover (3). The memory module compartment cover is included in the Plastics Kit, spare part number 492577-001.

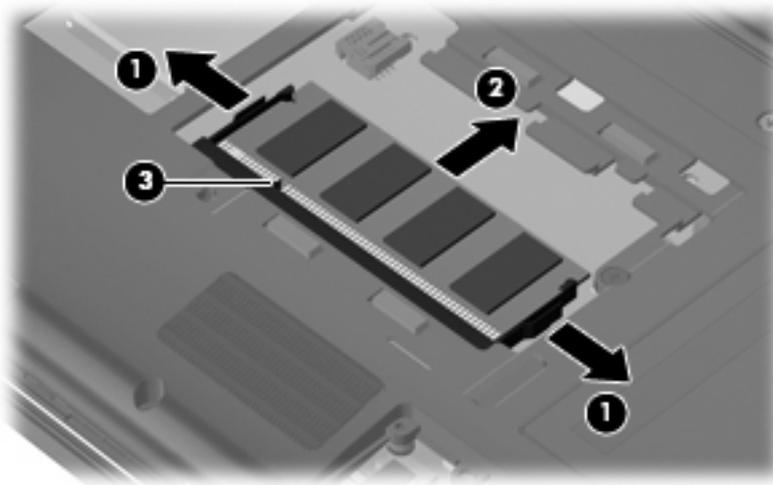


3. Spread the retaining tabs (1) on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

4. Remove the memory module (2) by pulling the module away from the slot at an angle.

 **NOTE:** The memory module is designed with a notch (3) to prevent incorrect insertion into the memory module slot.

---



Reverse this procedure to install the memory module.

## WLAN module

Description	Spare part number
<ul style="list-style-type: none"> <li>Intel WiFi Link 5100ABGN (802.11a/b/g/n WLAN module): For use in Antigua &amp; Barbuda, Argentina, Aruba, the Bahamas, Barbados, Bermuda, Brunei, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, the Dominican Republic, Ecuador, El Salvador, Guam, Guatemala, Haiti, Honduras, Hong Kong, India, Indonesia, Malaysia, Mexico, Panama, Paraguay, Peru, Saudi Arabia, Taiwan, Uruguay, the United States, Venezuela, and Vietnam</li> </ul>	480985-001
<ul style="list-style-type: none"> <li>Broadcom 4322AGN WiFi Adapter (802.11a/b/g/n WLAN module): For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua &amp; Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia &amp; Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts &amp; Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad &amp; Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe</li> </ul>	487330-002
<ul style="list-style-type: none"> <li>Broadcom 4322AGN WiFi Adapter (802.11a/b/g/n WLAN module): For use in the United States and Canada</li> </ul>	487330-001
<ul style="list-style-type: none"> <li>Intel WiFi Link 5100ABGN with AMT (active management technology) (802.11a/b/g/n WLAN module): For use in the United States and Canada</li> </ul>	506678-001
<ul style="list-style-type: none"> <li>Intel WiFi Link 5100ABG (802.11a/b/g WLAN module): For use in the United States and Canada</li> </ul>	482957-001
<ul style="list-style-type: none"> <li>Intel WiFi Link 5100ABG with AMT (active management technology) (802.11a/b/g WLAN module): For use in the United States and Canada</li> </ul>	506680-001

Description	Spare part number
<ul style="list-style-type: none"> <li>Broadcom 4312G WiFi Adapter (802.11b/g WLAN module): For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua &amp; Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia &amp; Herzegovina Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, the Central African Republic, Chad, Chile, Colombia, Comoros, the Congo, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, Djibouti, Dominica, the Dominican Republic, East Timor, Ecuador, Egypt, El Salvador, Equatorial Guinea, Eritrea, Estonia, Ethiopia, Fiji, Finland, France, French Guiana, Gabon, Gambia, Georgia, Germany, Ghana, Gibraltar, Greece, Grenada, Guadeloupe, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, Kuwait, Kyrgyzstan, Laos, Latvia, Lebanon, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, Malaysia, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Qatar, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts &amp; Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Thailand, Togo, Tonga, Trinidad &amp; Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe</li> </ul>	459263-002
<ul style="list-style-type: none"> <li>Broadcom 4312G WiFi Adapter (802.11b/g WLAN module): For use in the United States and Canada</li> </ul>	459263-001

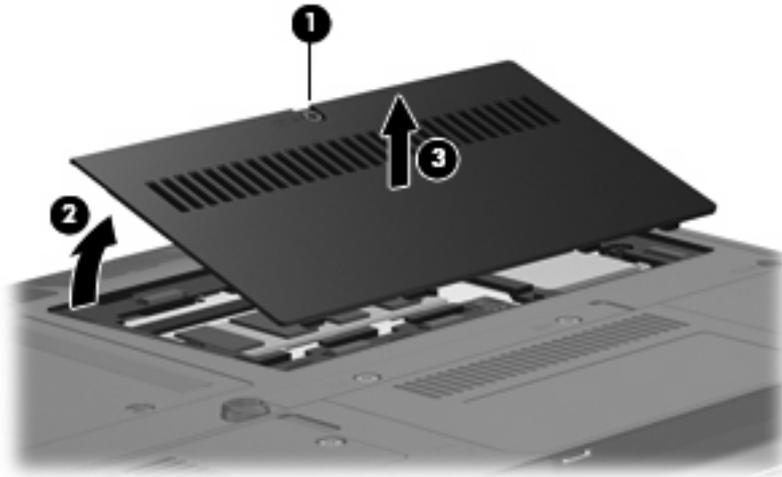
Before removing the WLAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

Remove the WLAN module:

1. Loosen the Phillips PM2.5×6.0 captive screw **(1)** that secures the memory module compartment cover to the computer.

2. Lift the front edge of the memory module compartment cover (2), swing it back, and remove the cover (3). The memory module compartment cover is included in the Plastics Kit, spare part number 492577-001.

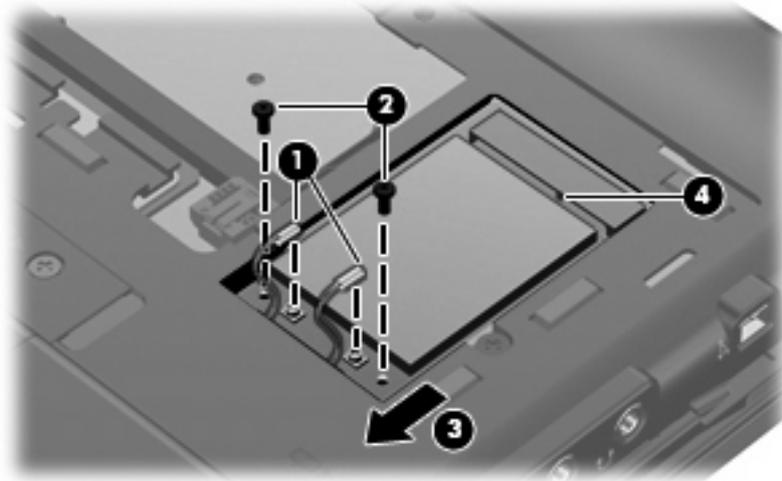


3. Disconnect the WLAN antenna cables (1) from the terminals on the WLAN module.

 **NOTE:** The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The white WLAN antenna cable is connected to the WLAN module “Aux” terminal.

4. Remove the two Phillips PM2.0×4.0 screws (2) that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)
5. Remove the WLAN module (3) by pulling the module away from the slot at an angle.

 **NOTE:** WLAN modules are designed with a notch (4) to prevent incorrect insertion.



Reverse this procedure to install the WLAN module.

## Primary hard drive

 **NOTE:** The 4.57-cm (1.80-inch) primary hard drive must be installed in the hard drive bay. Installation of this drive in the optical drive bay is not supported.

**NOTE:** All primary hard drive spare part kits include a hard drive bracket.

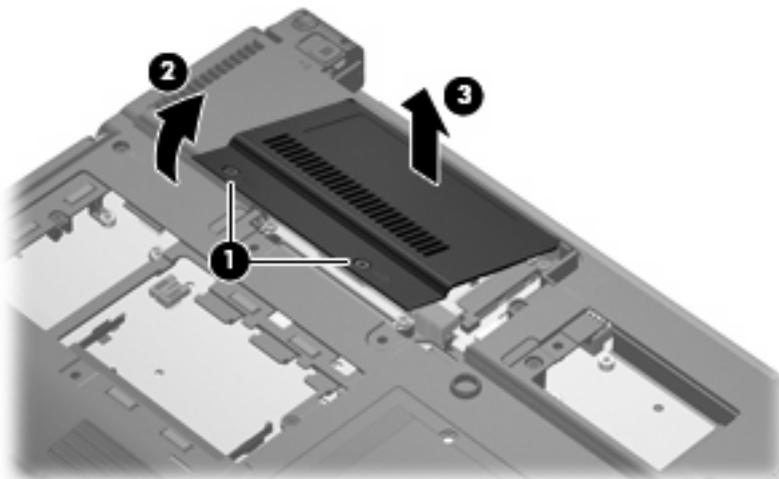
Description	Spare part number
160-GB, 5400-rpm hard drive	503732-001
120-GB, 5400-rpm hard drive	492560-001
80-GB, 5400-rpm hard drive	492565-001
80-GB, solid-state hard drive	492566-001
Primary hard drive connector board (required for installation of primary hard drive)	495026-001

Before removing the primary hard drive, follow these steps:

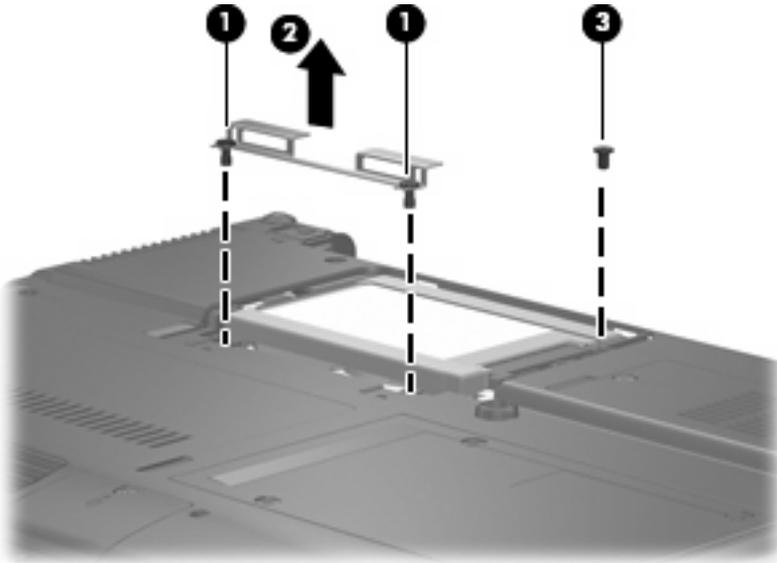
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

Remove the primary hard drive:

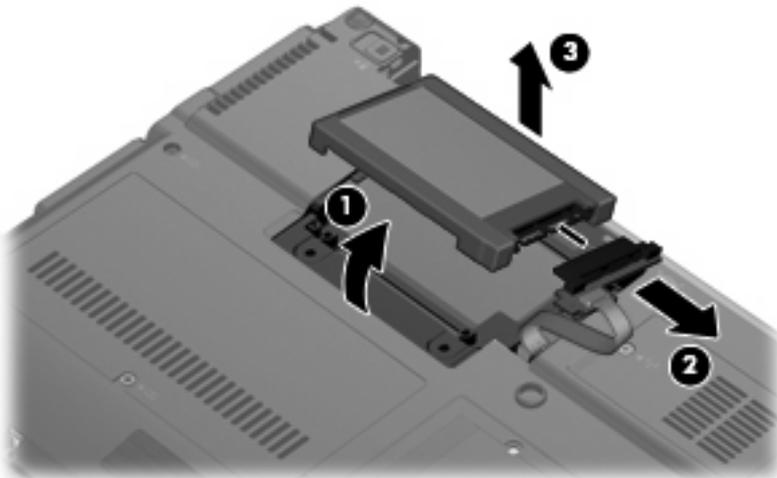
1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.5×6.0 captive screws (1) that secure the primary hard drive bay cover to the computer.
3. Lift the inner side of the primary hard drive bay cover (2), swing it up, and remove the cover (3). The primary hard drive bay cover is included in the Plastics Kit, spare part number 492577-001.



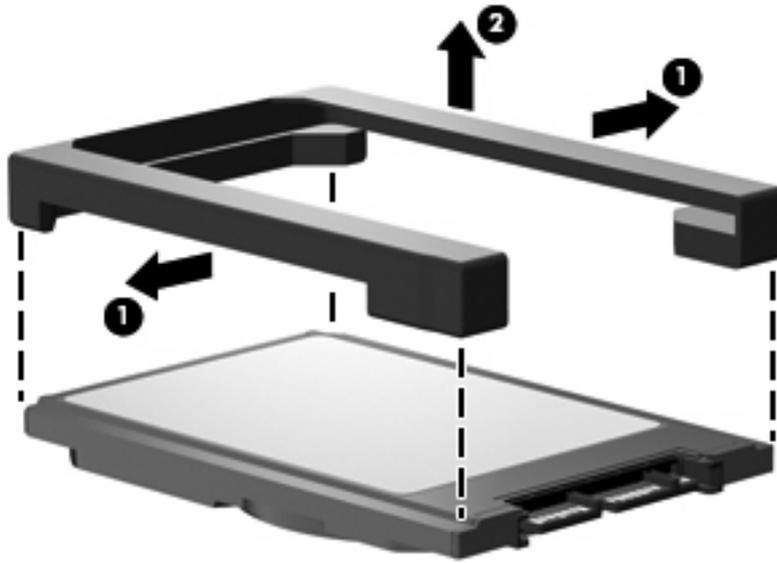
4. Loosen the 2 Phillips 2.0×6.0 captive screws (1) that secure the hard drive bracket, and remove the hard drive bracket (2).
5. Remove the Phillips screw that secures the connector board to the base enclosure(3).



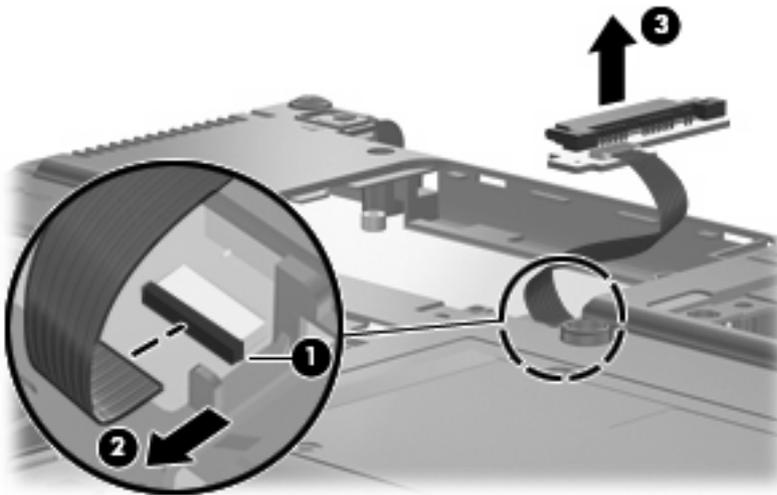
6. Tilt the primary hard drive up toward you (1) to disengage it from the compartment.
7. Grasp the edges of the connector board, and disconnect the hard drive (2) from the connector board.
8. Remove the hard drive (3).



9. Pull the edges of the protective rubber gasket out and away from the hard drive (1), and remove the gasket (2).



10. If it is necessary to replace the primary hard drive connector board, release the ZIF connectors (1) to which the primary hard drive connector board cable is attached, and disconnect the cable (2).
11. Remove the primary hard drive connector board (3).



Reverse this procedure to reassemble and install the primary hard drive.

## WWAN module

Description	Spare part number
HP un2400 Mobile Broadband Module	483377-002

△ **CAUTION:** The WWAN module and the WLAN module are not interchangeable.

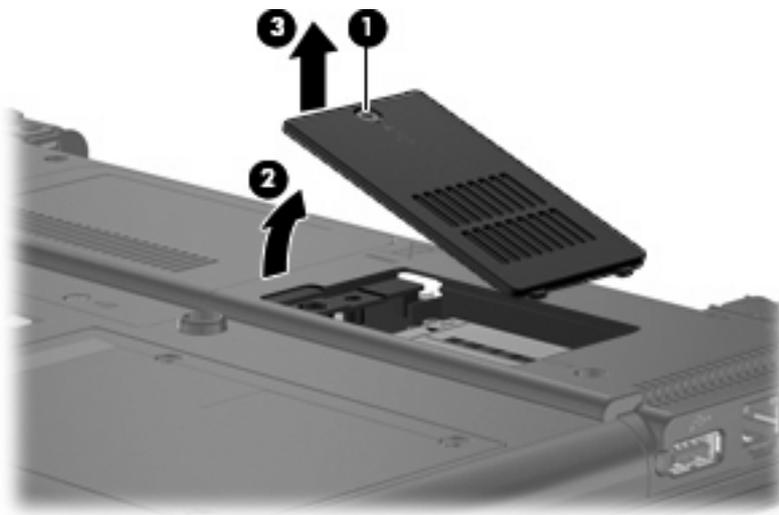
**CAUTION:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.

Before removing the WWAN module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).

Remove the WWAN module:

1. Loosen the Phillips PM2.5×6.0 captive screw (1) that secures the broadband wireless module cover to the computer. (The edge of the module opposite the slot rises away from the computer.)
2. Lift the inside edge of the cover and slide out to disengage the tabs (2).
3. Remove the cover (3).

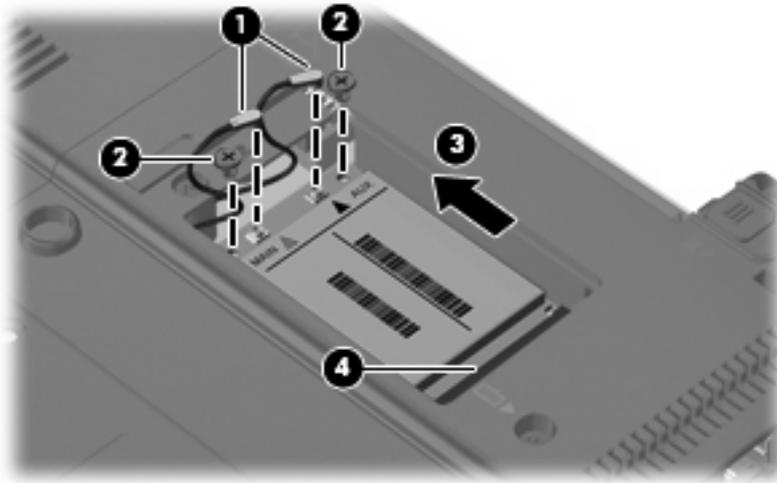


4. Disconnect the WWAN antenna cables (1) from the terminals on the WWAN module.

 **NOTE:** The red WWAN antenna cable is connected to the WWAN module “Main” terminal. The blue WWAN antenna cable is connected to the WWAN module “Aux” terminal.

5. Remove the two Phillips PM2.0×4.0 screws that secure the module to the computer **(2)**.
6. Remove the WWAN module **(3)** by pulling the module away from the slot at an angle.

 **NOTE:** WWAN modules are designed with a notch **(4)** to prevent incorrect insertion.



Reverse this procedure to install the WWAN module.

## Optical drive

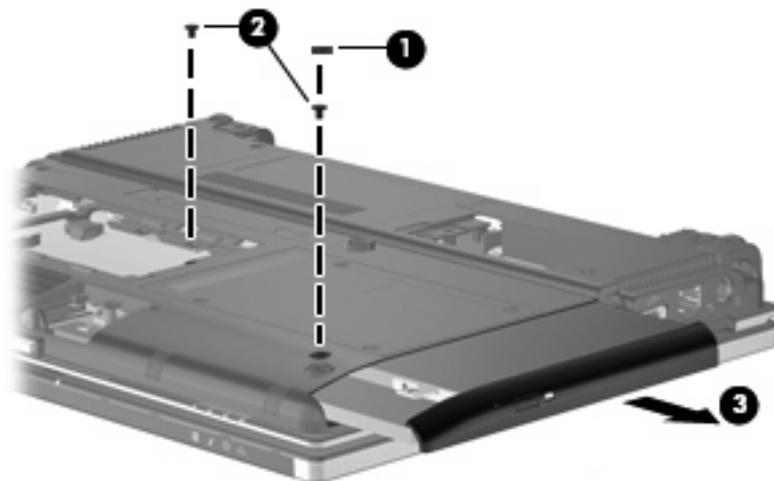
Description	Spare part number
<b>Optical drives</b>	
DVD-ROM Drive	492558-001
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive	492559-001

Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the memory module compartment cover (see [Expansion memory module on page 50](#)).

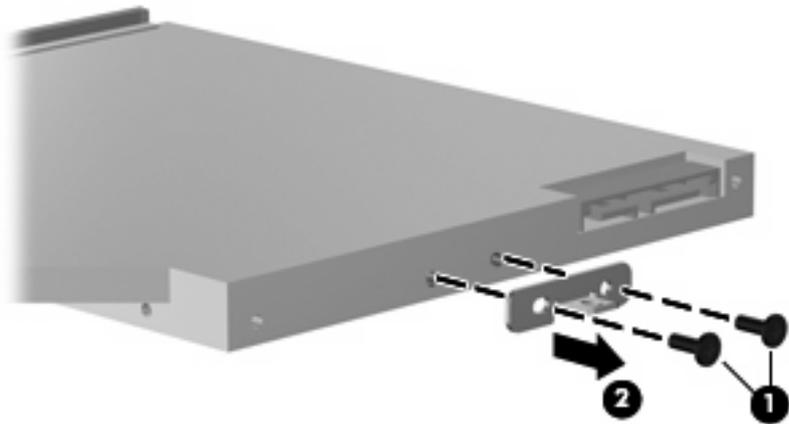
Remove the optical drive:

1. Position the computer with the right side toward you.
2. Remove the Mylar screw cover **(1)** that secures the optical drive retention screw. The Mylar screw cover is available in the Rubber Kit, spare part number 481106-001.
3. Remove the two Torx T8M2.0×5.0 screws **(2)** that secure the optical drive to the computer.
4. Remove the optical drive **(3)** from the computer.



5. If it is necessary to replace the optical drive bracket, position the optical drive with the rear toward you.
6. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the optical drive bracket to the optical drive.

7. Remove the optical drive bracket (2).



Reverse this procedure to reassemble and install an optical drive.

## Switch cover and keyboard

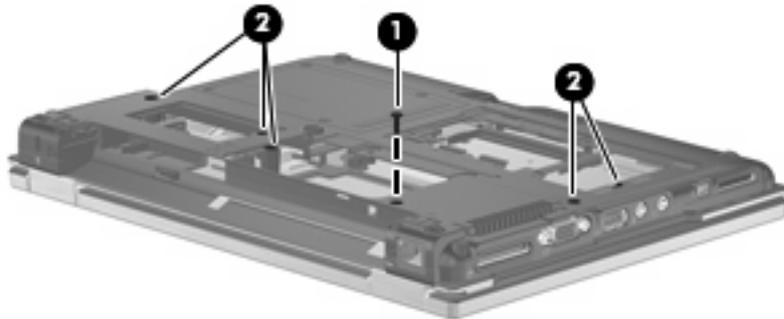
Description	Spare part number
<b>Switch cover</b> (includes display lid switch board and cable)	492556-001
<b>Keyboard with pointing stick</b> (includes keyboard cable and pointing stick cable)	
• For use in Brazil	506677-201
• For use in the Czech Republic	506677-221
• For use in Denmark	506677-081
• For use in Europe	506677-021
• For use in Finland and Sweden	506677-B71
• For use in France	506677-051
• For use in French Canada	506677-121
• For use in Germany	506677-041
• For use in Greece	506677-151
• For use in Hungary	506677-211
• For use in Iceland	506677-DD1
• For use in Israel	506677-BB1
• For use in Italy	506677-061
• For use in Japan	506677-291
• For use in Latin America	506677-161
• For use in the Netherlands and Europe	506677-A41
• For use in Norway	506677-091
• For use in Portugal	506677-131
• For use in Russia	506677-251
• For use in Saudi Arabia	506677-171
• For use in Slovakia	506677-231
• For use in South Korea	506677-AD1
• For use in Spain	506677-071
• For use in Switzerland	506677-111
• For use in Taiwan	506677-AB1
• For use in Thailand	506677-281
• For use in Turkey	506677-141
• For use in the United Kingdom	506677-031
• For use in the United States	506677-001

Before removing the switch cover and keyboard, follow these steps:

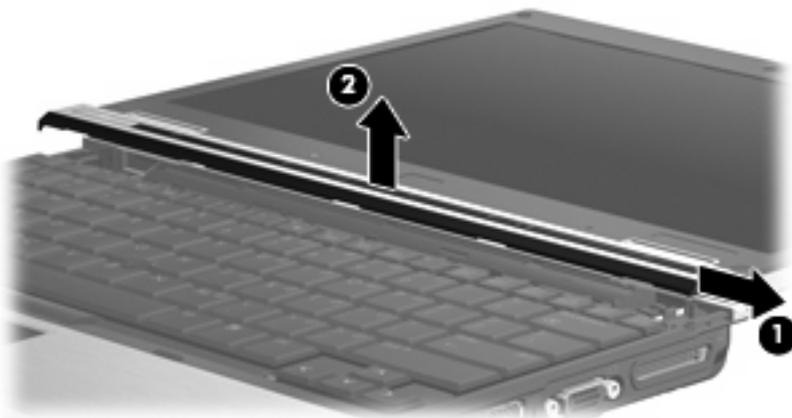
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the WWAN module compartment cover (see [WWAN module on page 58](#)).
6. Remove the expansion memory module compartment cover (see [Expansion memory module on page 50](#)).
7. Remove the hard drive bay cover (see [Primary hard drive on page 55](#)).

Release the switch cover and keyboard:

1. Position the computer with the bottom facing up.
2. Remove the Phillips BP2.5×6.0 screw (1) that secures the switch cover to the computer.
3. Loosen the five Phillips PM2.5×11.0 captive screws (2) that secure the keyboard to the computer.



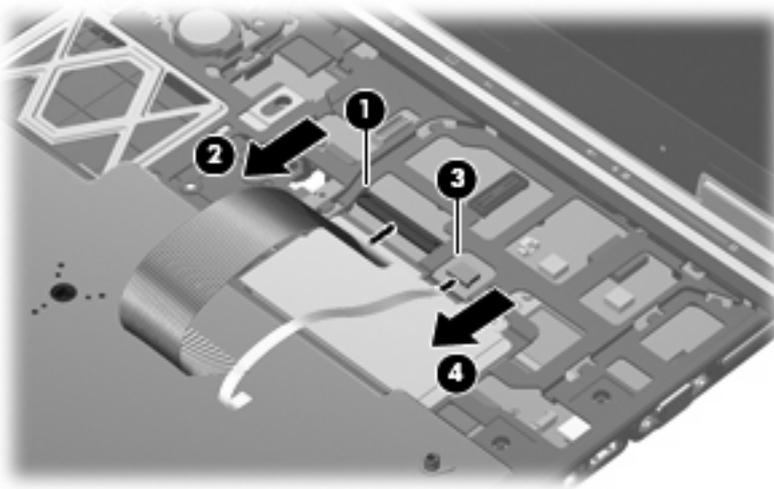
4. Turn the computer over so that the top side is facing up, and the front is facing toward you.
5. Open the display as far as possible.
6. Slide the switch cover to the right (1), and lift to release the switch cover (2).



7. Lift the rear edge of the keyboard and swing it up and forward until it rests upside down on the palm rest.

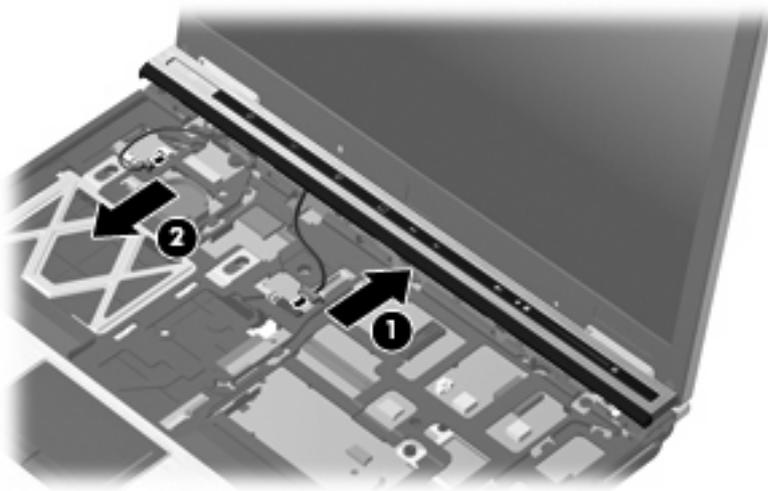


8. Release the zero insertion force (ZIF) connectors (1) to which the keyboard cable is attached, and disconnect the keyboard cable (2) from the system board.
9. Release the ZIF connector (3) to which the pointing stick cable is attached, and disconnect the pointing stick cable (4) from the system board.



10. Remove the keyboard.
11. Disconnect the LED board cable (1) and the power button board cable (2) from the system board.

12. Remove the switch cover.



Reverse this procedure to install the switch cover and keyboard.

## LED board

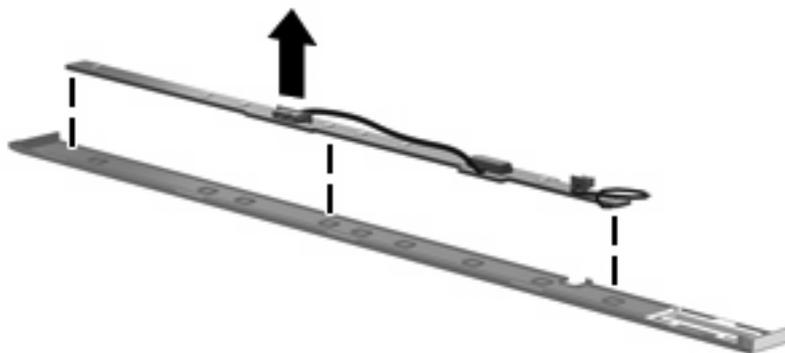
Description	Spare part number
LED board (includes cable and Mylar cover)	499209-001

Before removing the LED board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - c. Switch cover (see [Switch cover and keyboard on page 62](#))

Remove the LED board:

- Peel the LED board away from the switch cover to remove it.



 **NOTE:** The LED board cable is included with the LED board and is also available in the Cables Kit, spare part number 492555-001.

Reverse the above procedure to install the LED board.

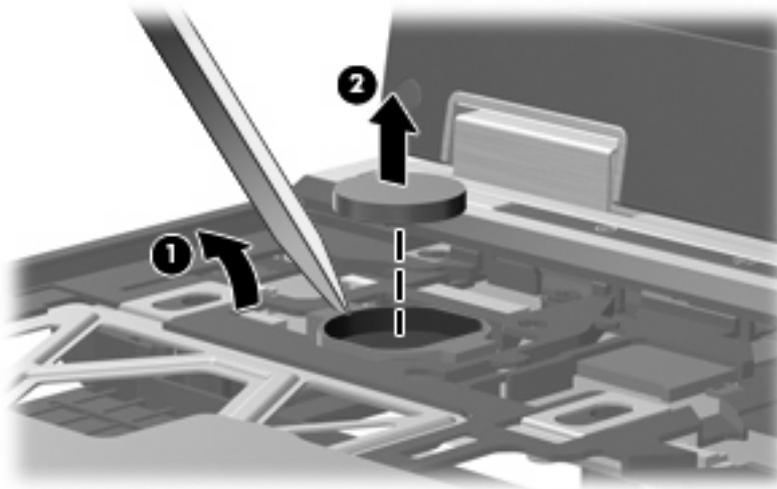
## RTC battery

 **NOTE:** Removing the RTC battery and leaving it uninstalled for 5 or more minutes causes all passwords and CMOS settings to be cleared.

Description	Spare part number
RTC battery	481089-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Release the switch cover and keyboard (see [Switch cover and keyboard on page 62](#)).
6. Use a fingernail or other tool to lift the RTC battery from the socket (1).
7. Remove the RTC battery from the socket on the system board (2).



Reverse this procedure to install the RTC battery.

## Secondary hard drive

 **NOTE:** The 6.35-cm (2.50-inch) secondary hard drive must be installed in the optical drive bay. Installation of this drive in the hard drive bay is not supported. (This option is not available when the optical drive is installed.)

Description	Spare part number
320-GB, 7200-rpm hard drive	513949-001
250-GB, 5400-rpm hard drive	513948-001
160-GB, 7200-rpm hard drive	492564-001
160-GB, 5400-rpm hard drive	513950-001
120-GB, 5400-rpm hard drive	492561-001
Secondary hard drive cage assembly, includes additional USB port (required for installation of secondary hard drive)	492574-001
Secondary hard drive connector board (required for installation of secondary hard drive)	495027-001
Secondary hard drive system connector board (required for installation of secondary hard drive)	495028-001

 **NOTE:** The optional secondary hard drive is installed in the optical drive bay, and replaces the optical drive.

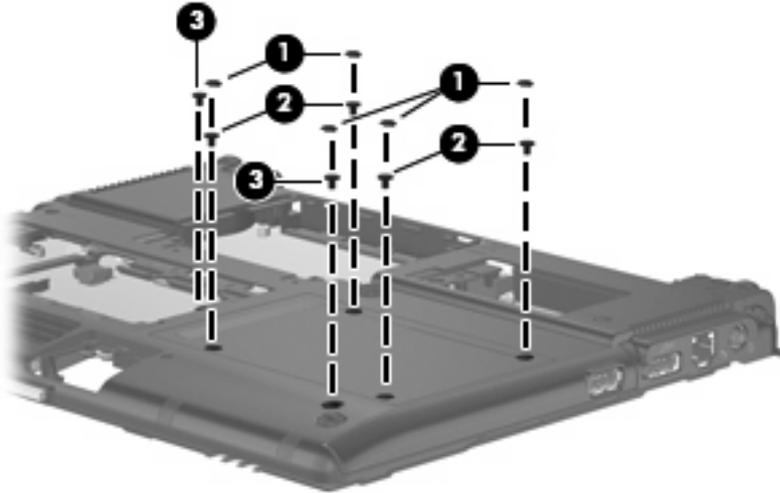
Before removing the secondary hard drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery. (See [Battery on page 46](#))
5. Remove the switch cover and keyboard. (See [Switch cover and keyboard on page 62](#))

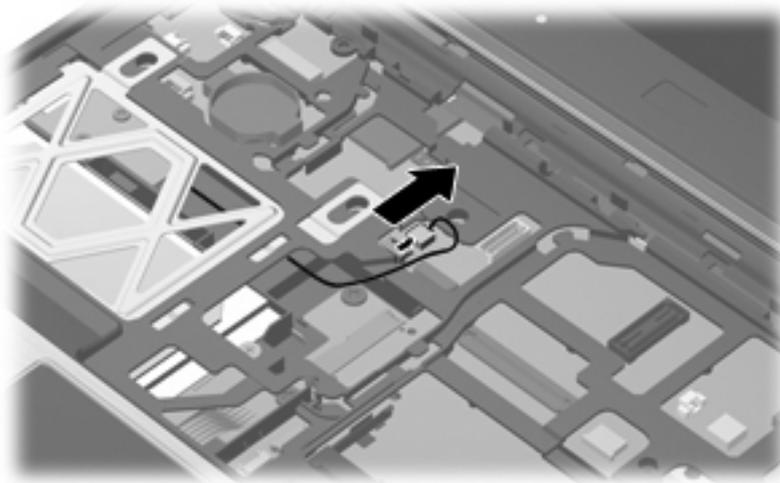
Remove the secondary hard drive:

1. Close the display, and position the computer upside down, with the right side toward you.

2. Remove the 5 Mylar screw covers (1), the 4 Phillips screws (2), and the 2 Phillips PM2.0×6.0 screws (3) that secure the secondary hard drive cradle assembly to the computer.



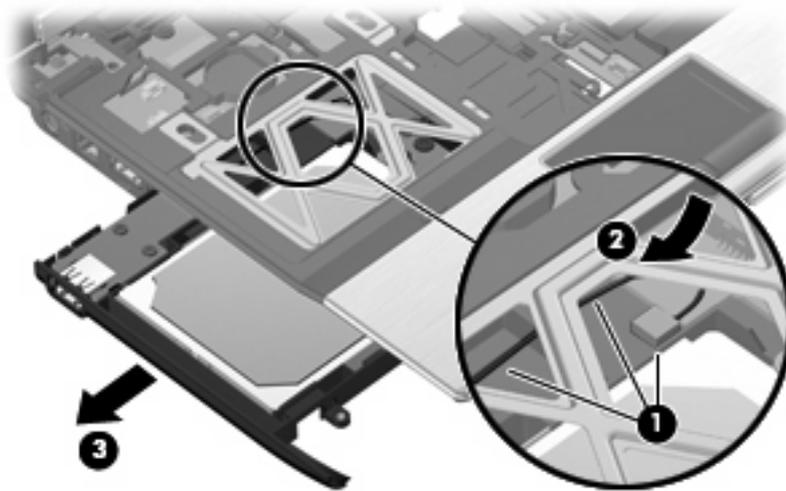
3. Turn the computer right-side up, and open the display as far as possible.
4. Disconnect the secondary hard drive cradle assembly USB cable from the system board.



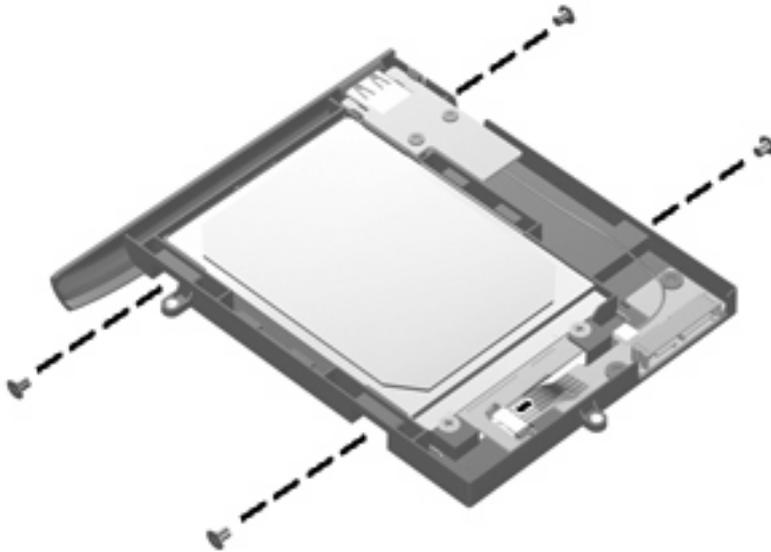
5. Release the USB cable from all obstructions (1) and tuck the excess cable and connector securely into the cradle assembly (2).

 **NOTE:** Be sure that the USB connector and cable are completely disconnected from the system board and secured inside the cradle assembly before you remove the cradle assembly from the optical drive bay.

6. Remove the secondary hard drive cradle assembly (3) from the optical drive bay.

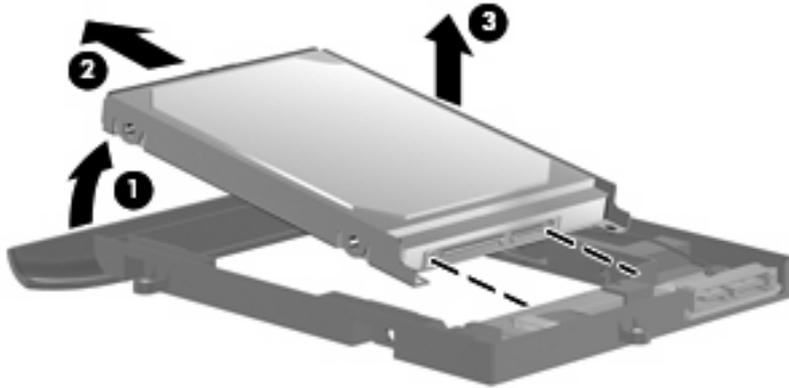


7. Remove the four Phillips PM3.0×4.0 secondary hard drive screws that secure the secondary hard drive to the cradle assembly.

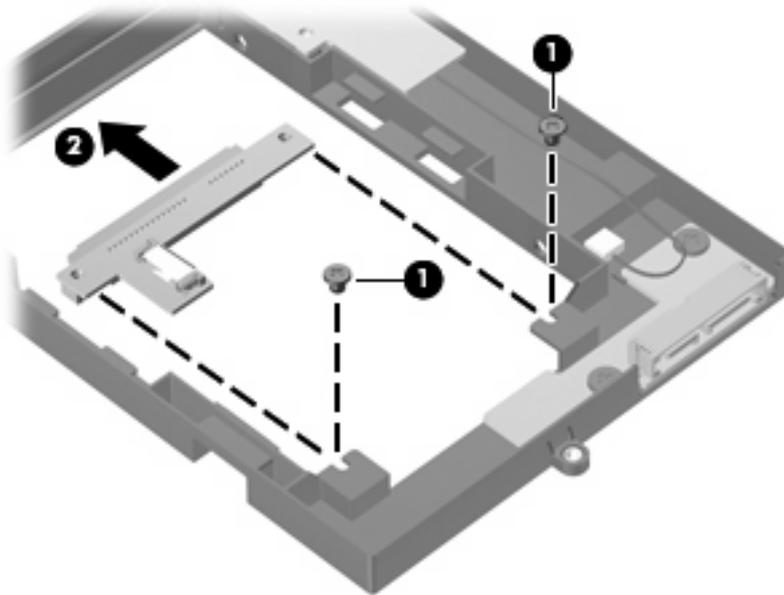


8. Tilt the hard drive up and away from the connector board (1), and disconnect the hard drive from the connector board (2).

9. Remove the hard drive from the cradle assembly (3).

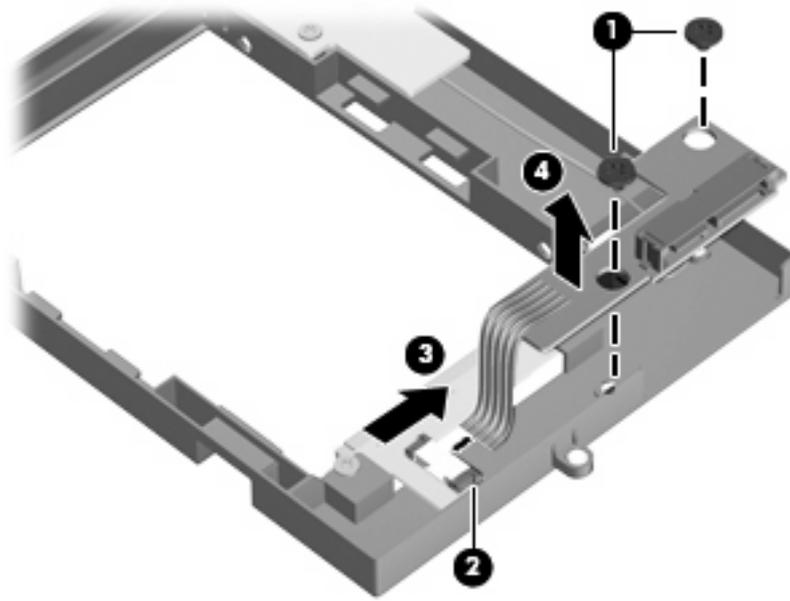


10. If it is necessary to replace the secondary hard drive connector board, remove the two Phillips screws that secure the connector board to the cradle assembly (1).
11. Remove the secondary hard drive connector board (2).



12. If it is necessary to replace the secondary hard drive system connector board, remove the two Phillips screws that secure the connector board to the cradle assembly (1).
13. Release the ZIF connector (2), and disconnect the cable (3).

14. Remove the secondary hard drive system connector board (4).



Reverse the above procedure to reassemble and install the secondary hard drive.

## Primary memory module

Description	Spare part number
<b>Memory modules</b> (PC2-6400, 800-MHz, DDR2)	
4-GB	492572-001
2-GB	492571-001
1-GB	492570-001

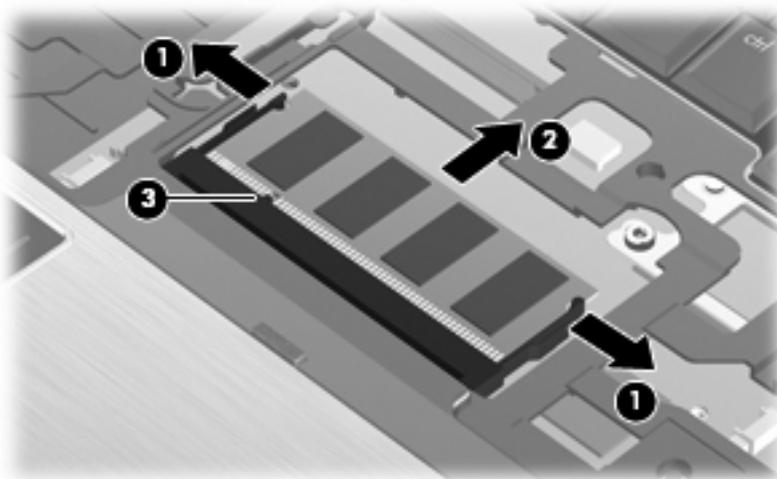
Before removing the primary memory module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Release the switch cover and keyboard (see [Switch cover and keyboard on page 62](#)).

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

 **NOTE:** The memory module is designed with a notch **(3)** to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install the memory module.

## Display assembly

Description	Spare part number
<b>12.1-inch, WXGA AntiGlare display assembly</b>	
With a webcam	492576-001
Without a webcam	492575-001
<b>Display bezel</b> (includes HP logo and computer model number label)	
For use with models that include a webcam	495022-001
For use with models that do not include a webcam	495019-001
<b>Display bezel adhesive</b>	497013-001
<b>Display Hinge Kit</b> (includes left and right hinges and brackets)	481098-001
<b>Display panel cable</b>	
For use with models that include a webcam	495023-001
For use with models that do not include a webcam	495021-001
<b>Microphone</b>	492573-001
<b>Display enclosure</b> (includes HP logo, wireless antenna transceivers and cables)	
With webcam	496490-001
Without webcam	495020-001

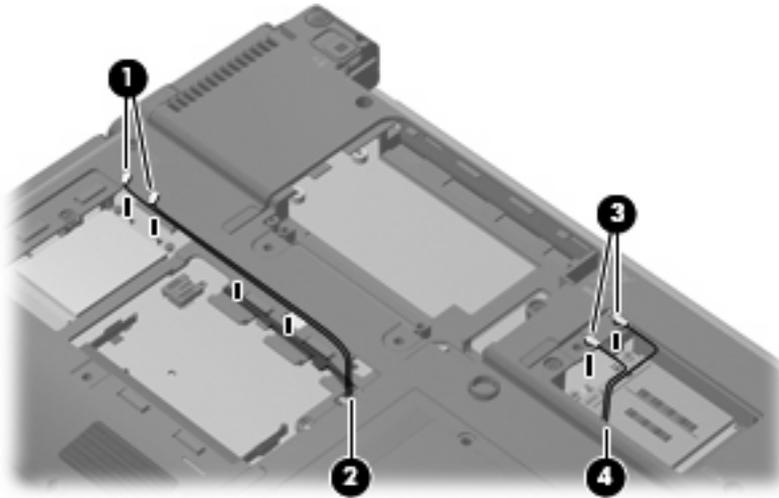
Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the Bluetooth compartment cover (see [Bluetooth module on page 48](#)).
6. Remove the memory module compartment cover (see [Expansion memory module on page 50](#)).
7. Remove the hard drive bay cover (see [Primary hard drive on page 55](#)).
8. Remove the broadband wireless compartment cover (see [WWAN module on page 58](#)).
9. Remove the switch cover and keyboard (see [Switch cover and keyboard on page 62](#)).

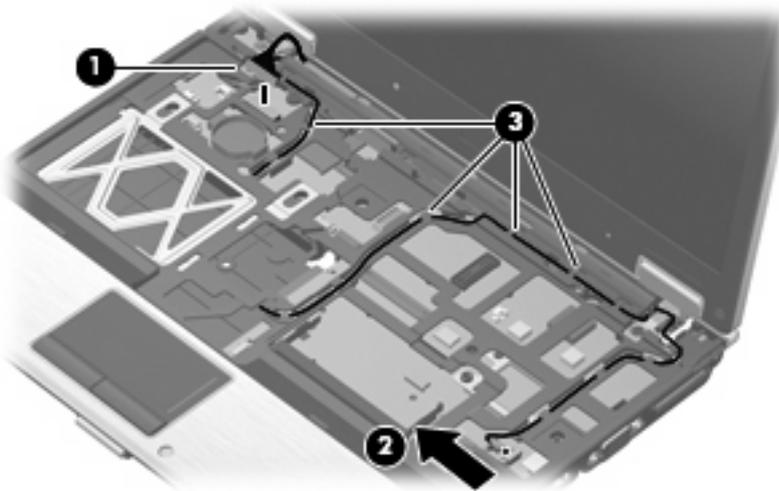
Remove the display assembly:

1. Close the computer and turn it upside down, with the rear panel toward you.
2. Disconnect the wireless antenna cables from the WLAN module **(1)**, and feed them down through the hole **(2)**.

3. Disconnect the wireless antenna cables from the WWAN module (3), and feed them down through the hole (4).

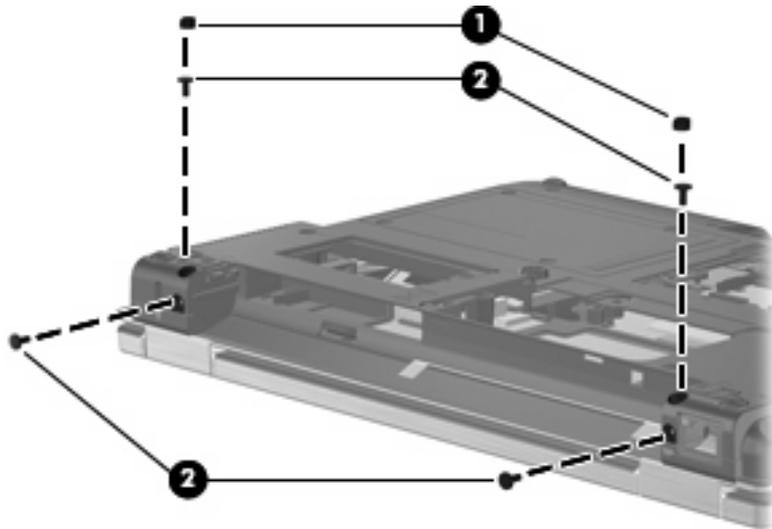


4. Turn the computer right side up, and open the display .
5. Thread the WLAN (1) and WWAN (2) cables out through the top cover, and release the cables from the top cover clips (3).



6. Close the computer and turn the computer upside down, with the rear of the computer toward you.

7. Remove the two Mylar screw covers (1) and the four Torx T8M2.0×6.0 screws (2) that secure the display assembly to the computer.

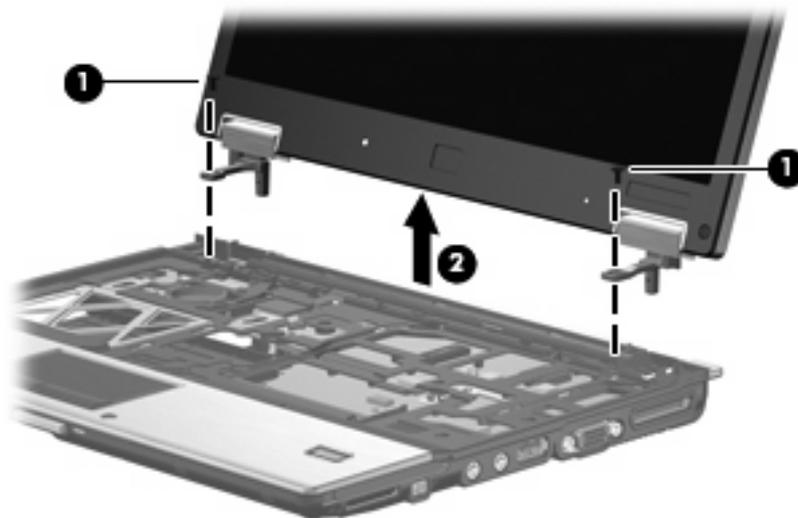


8. Turn the computer right-side up, with the front toward you.

9. Open the computer.

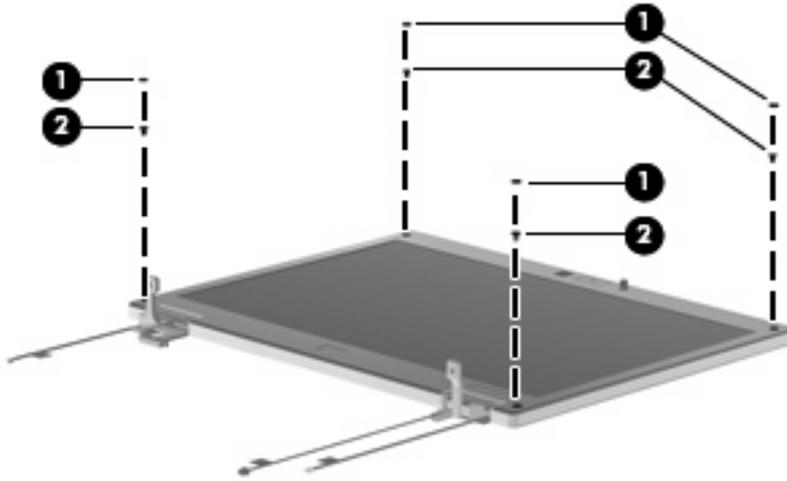
△ **CAUTION:** The display assembly will be unsupported when the following screws are removed. To prevent damage to the display assembly, support it before removing the screws.

10. Remove the two Torx8 T8M2.5×6.0 screws (one at each hinge) (1) that secure the display assembly hinges to the computer.
11. Lift the display assembly straight up to remove it (2).



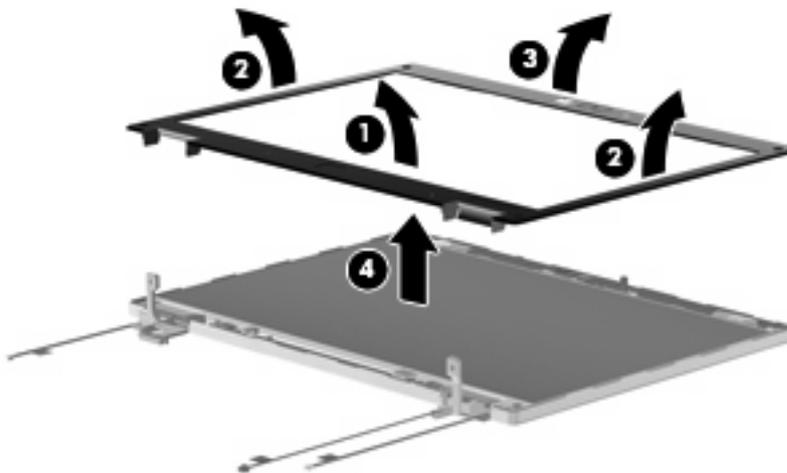
12. If it is necessary to replace the display bezel, remove the four rubber screw covers (1) and the four Torx T8M2.5×6.0 screws (2) that secure the display bezel to the display assembly.

 **NOTE:** The rubber screw covers on the display bezel top edge are thicker than the rubber screw covers on the display bezel bottom edge.



13. Flex the inside edges of the bottom (1), left and right sides (2), and the top (3) of the display bezel until the bezel disengages from the display enclosure.

14. Remove the display bezel (4).

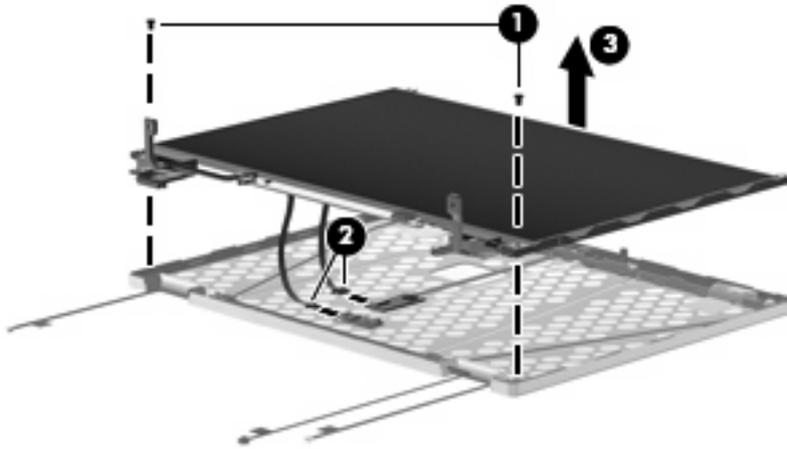


 **NOTE:** Remove excess adhesive from the bezel and display enclosure when you remove the bezel, and reapply adhesive before replacing the bezel.

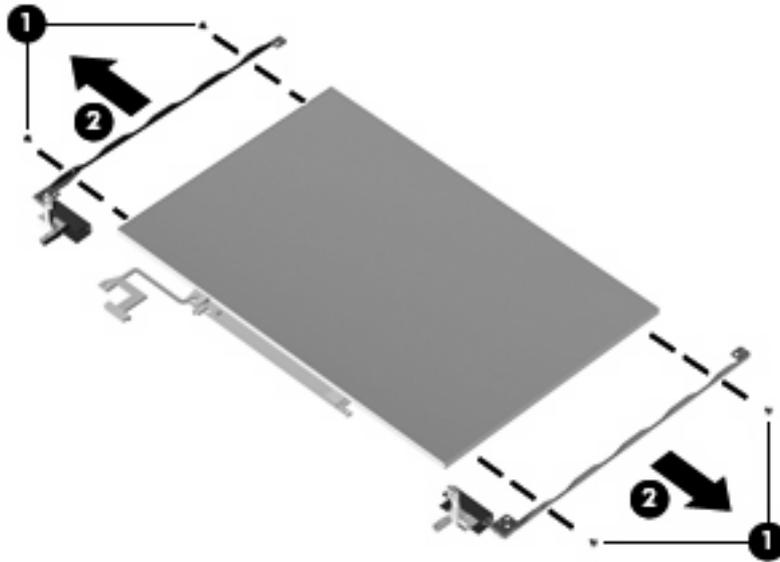
15. If it is necessary to replace the display hinges, remove the two Phillips PM2.5×4.0 screws (1) that secure the display panel to the display enclosure.

16. Disconnect the display passthrough board and camera passthrough board cables (2).

17. Remove the display panel (3).

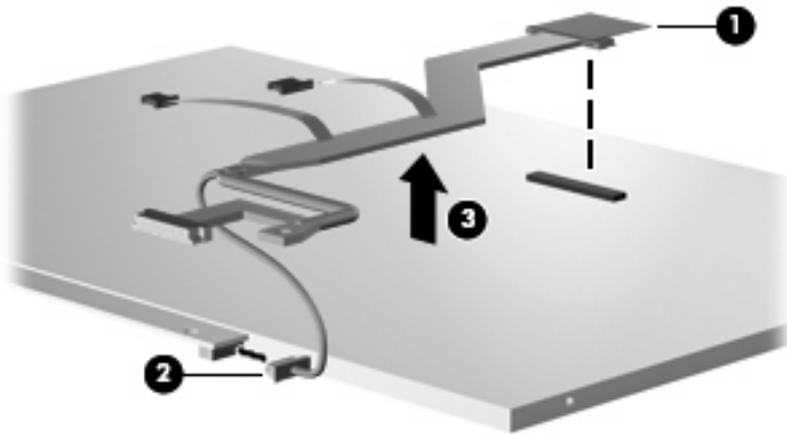


18. Remove the two Phillips PM2.0×4.0 screws (1) that secure each display hinge to the display panel.
19. Remove the display hinges (2).

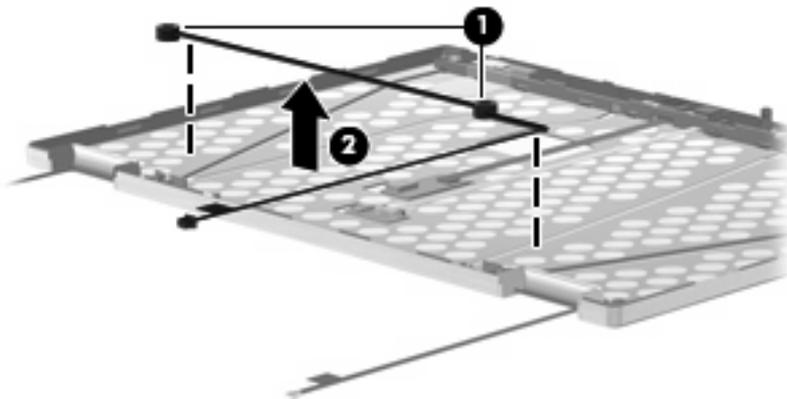


20. If it is necessary to replace the display panel cable, turn the display panel upside down, with the display panel bottom edge toward you.
21. Disconnect the display panel cable from the inverter (1).
22. Disconnect the display panel cable (2) from the display panel.

23. Remove the display panel cable (3).



24. If it is necessary to replace the microphones (1), remove the microphones from the display enclosure (2).



Reverse this procedure to reassemble and install the display assembly.

## Top cover

Description	Spare part number
<b>Top cover</b> (includes TouchPad board and cable, TouchPad button board and cable, and TouchPad bracket)	
With fingerprint reader	492557-001
Without fingerprint reader	514059-001

Before removing the top cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - d. Display assembly (see [Display assembly on page 74](#))

Remove the top cover:

1. Turn the computer upside down, with the front toward you.

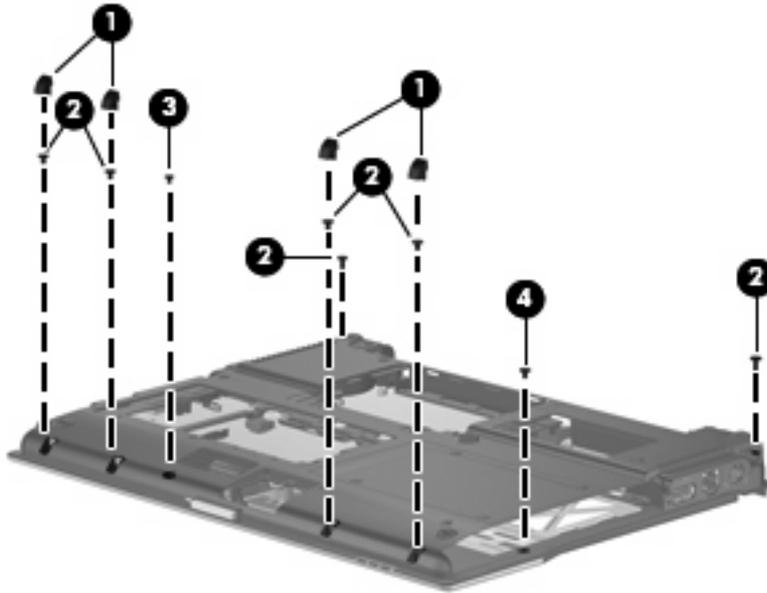
2. Remove the following screw covers and screws:

(1) Four rubber screw covers. The rubber screw covers are included in the Rubber Kit, spare part number 481106-001.

(2) Six Torx T8M2.5×6.0 screws.

(3) One Phillips PM2.0×5.0 screw.

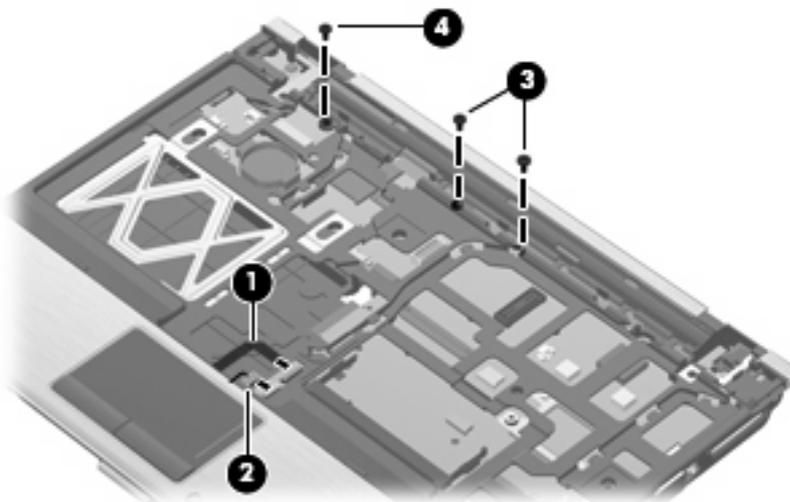
(4) One Torx T8M2.0×5.0 screw.



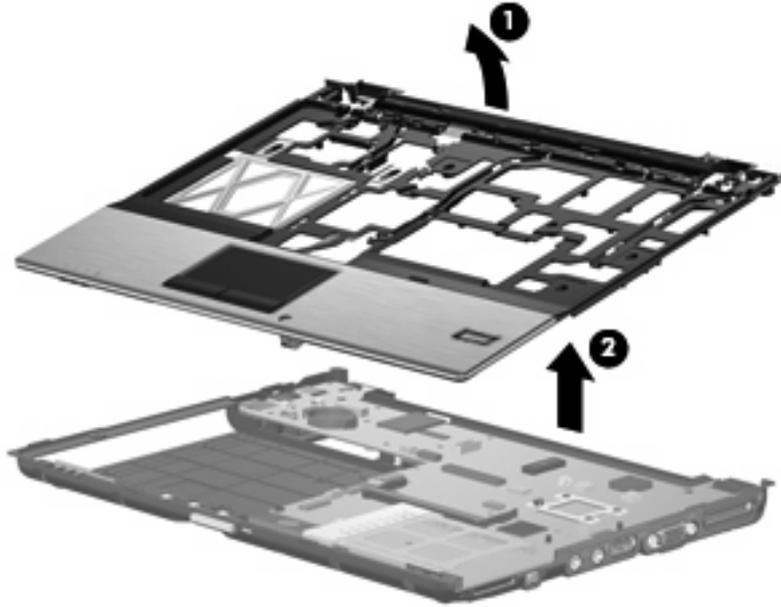
3. Turn the computer right-side up, with the front toward you.

4. Disconnect the TouchPad cable (1), and the fingerprint reader board cable (2) from the system board.

5. Remove the two Torx T8M2.5×6.0 screws (3) and the Phillips PM2.0×6.0 screw (4) that secure the top cover to the computer.



6. Lift the rear edge of the top cover (1) and swing it up and forward until it rests at an angle.
7. Lift the front edge of the top cover (2) until it disengages from the base enclosure.



8. Remove the top cover.

Reverse this procedure to install the top cover.

# Speaker

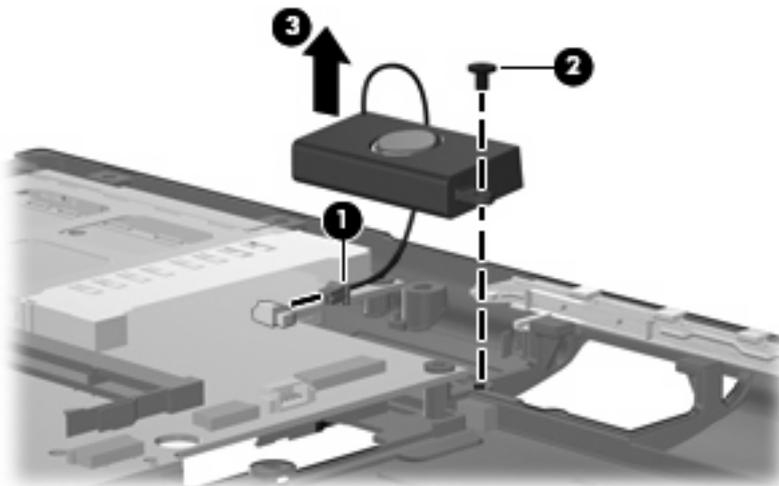
Description	Spare part number
Speaker	481109-001

Before removing the speaker, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - d. Display assembly (see [Display assembly on page 74](#))
  - e. Top cover (see [Top cover on page 80](#))

Remove the speaker:

1. Disconnect the speaker cable (1) from the system board.
2. Remove the Phillips PM2.0×4.0 screw (2) that secures the speaker to the base enclosure.
3. Remove the speaker (3) from the base enclosure.



Reverse this procedure to install the speaker.

## System board

Description	Spare part number
<b>System board</b> (includes processor, replacement thermal material, and replacement thermal material cleaning kit)	
With LV SL9600 processor	513947-001
With LV SL9400 processor	492552-001
With LV SL9300 processor	492551-001
With ULV SU9400 processor	513946-001
With ULV SU9300 processor	492553-001

Before removing the system board, follow these steps:

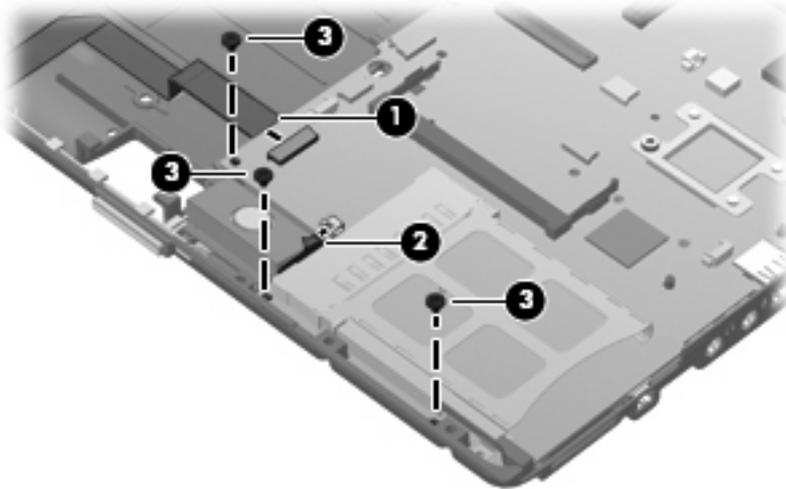
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. WLAN module (see [WLAN module on page 52](#))
  - c. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - d. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - e. Display assembly (see [Display assembly on page 74](#))
  - f. Top cover (see [Top cover on page 80](#))

When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

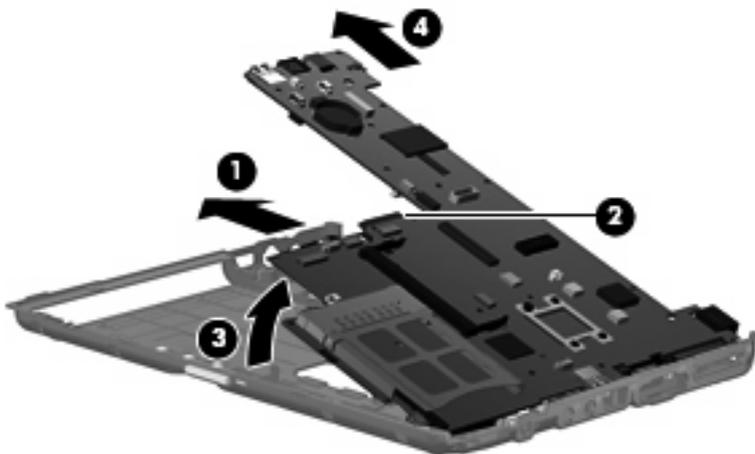
- Memory module (see [Expansion memory module on page 50](#))
- Primary hard drive (see [Primary hard drive on page 55](#))
- Fan (see [Fan on page 90](#))
- Heat sink (see [Heat sink on page 92](#))
- WLAN module (see [WLAN module on page 52](#))
- WWAN module (see [WWAN module on page 58](#))

Remove the system board:

1. Release the ZIF connector to which the front LED board cable is attached and disconnect the front LED board cable (1) from the system board.
2. Disconnect the speaker cable (2) from the system board.
3. Remove the three Torx8 T8M2.5×6.0 screws (3) that secure the system board to the base enclosure.



4. Flex the left side of the base enclosure (1) until the RJ-11 jack and USB ports are clear of the openings in the base enclosure.
5. Use the optical drive connector (2) to lift the left side of the system board (3) until it rests at an angle.
6. Remove the system board (4) from the base enclosure by sliding it up and to the left.



Reverse this procedure to install the system board.

## ExpressCard assembly

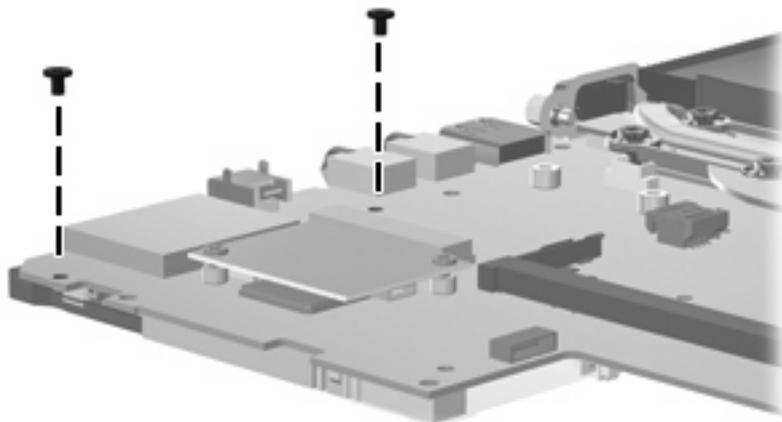
Description	Spare part number
ExpressCard assembly	492567-001

Before removing the PC Card assembly, follow these steps:

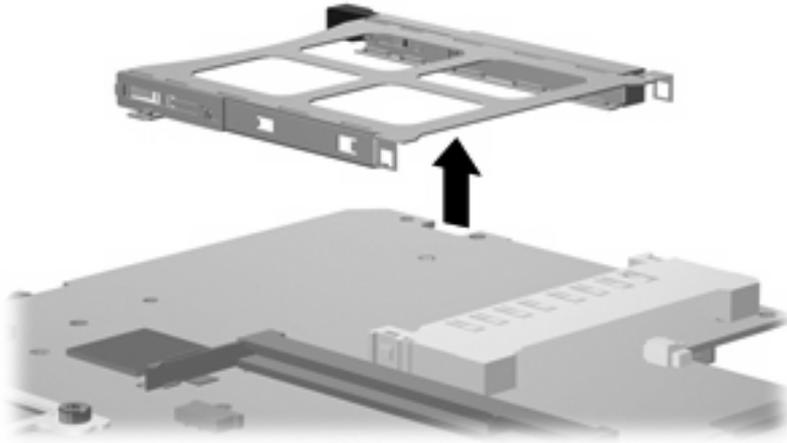
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. WLAN module (see [WLAN module on page 52](#))
  - c. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - d. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - e. Display assembly (see [Display assembly on page 74](#))
  - f. Top cover (see [Top cover on page 80](#))
  - g. System board (see [System board on page 84](#))

Remove the ExpressCard assembly:

1. Turn the system board upside down, with the front toward you.
2. Remove the two Torx T8M2.0×5.0 screws that secure the ExpressCard assembly to the system board.



3. Turn the system board rightside up, with the rear toward you.
4. Remove the ExpressCard assembly.



Reverse this procedure to install the ExpressCard assembly.

## Modem module

Description	Spare part number
<b>Modem modules</b>	
<b>NOTE:</b> The modem module spare part kits do not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 492555-001.	
For use in all countries and regions except Australia and New Zealand	461750-001
For use only in Australia and New Zealand	461750-011

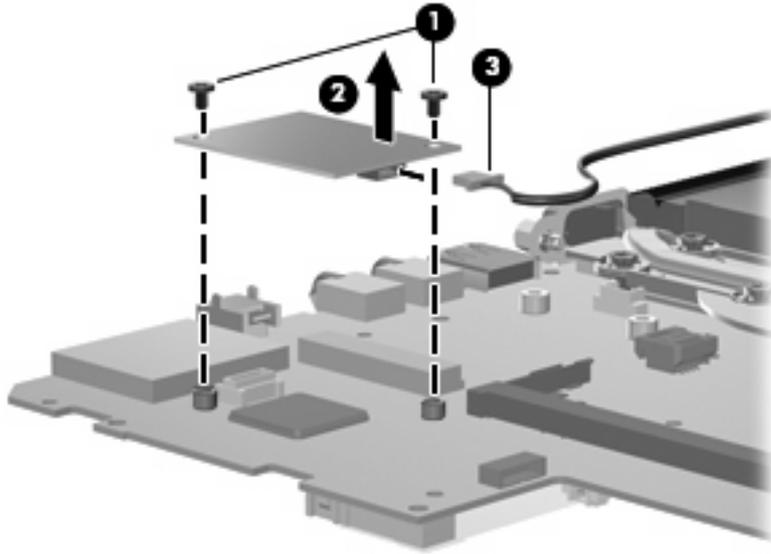
Before removing the modem module, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. WLAN module (see [WLAN module on page 52](#))
  - c. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - d. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - e. Display assembly (see [Display assembly on page 74](#))
  - f. Top cover (see [Top cover on page 80](#))
  - g. System board (see [System board on page 84](#))

Remove the modem module:

1. Remove the two Phillips PM2.0×4.0 screws **(1)** that secure the modem module to the system board.
2. Lift the modem module up **(2)** from the system board.
3. Disconnect the modem module cable **(3)** from the modem module.

4. Remove the modem module .



Reverse this procedure to install the modem module.

## Fan

Description	Spare part number
Fan (includes thermal material)	492568-001

 **NOTE:** To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the right side and rear panel of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

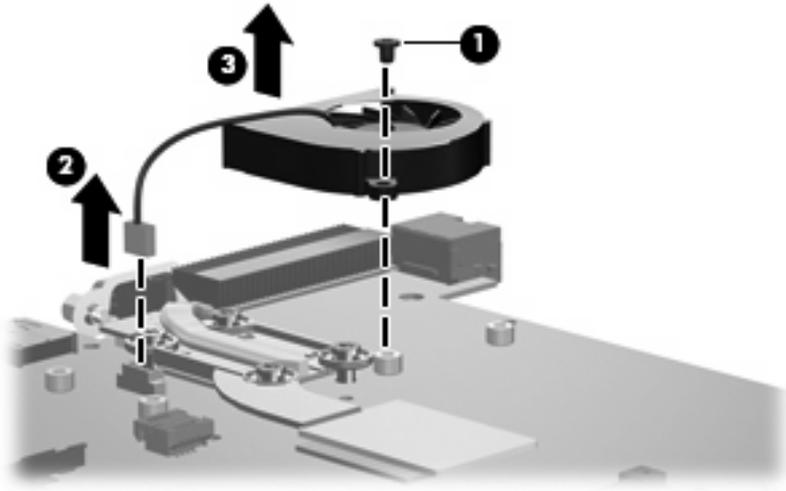
Before removing the fan, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - c. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - d. Display assembly (see [Display assembly on page 74](#))
  - e. Top cover (see [Top cover on page 80](#))
  - f. System board (see [System board on page 84](#))

Remove the fan:

1. Turn the system board upside down with the front toward you.
2. Remove the Phillips PM2.5×4.0 screw **(1)** securing the fan to the system board.
3. Disconnect the cable from the system board **(2)**.

4. Lift the fan up (3) to remove.



Reverse this procedure to install the fan.

## Heat sink

Description	Spare part number
<b>Heat sink</b> (includes replacement thermal material and replacement thermal material cleaning kit)	492582-001

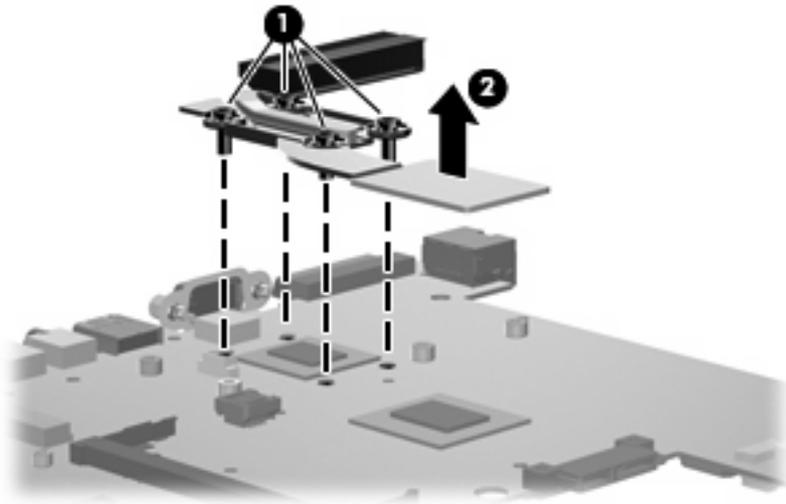
Before removing the heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the following components:
  - a. Primary hard drive (see [Primary hard drive on page 55](#))
  - b. WLAN module (see [WLAN module on page 52](#))
  - c. Optical drive (see [Optical drive on page 60](#)) or Secondary hard drive (see [Secondary hard drive on page 68](#))
  - d. Switch cover and keyboard (see [Switch cover and keyboard on page 62](#))
  - e. Display assembly (see [Display assembly on page 74](#))
  - f. Top cover (see [Top cover on page 80](#))
  - g. System board (see [System board on page 84](#))

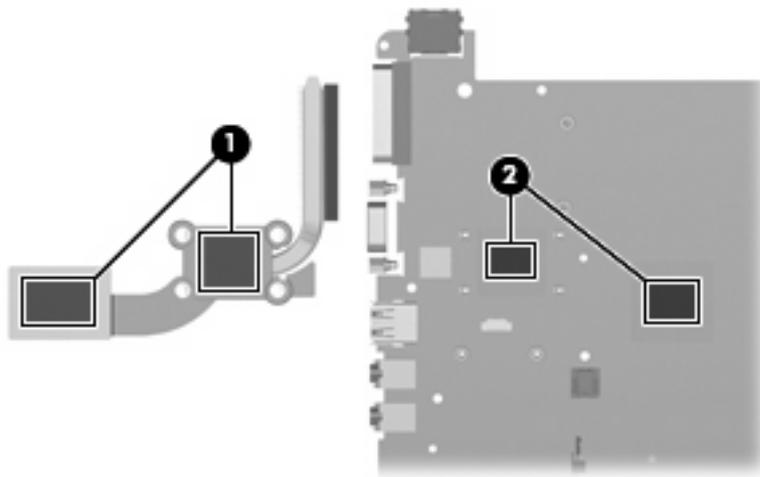
Remove the heat sink:

1. Turn the system board upside down, with the front toward you.
2. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the four Torx8 T8M2.0×10.0 screws (1) that secure the heat sink to the system board.

3. Remove the heat sink (2).



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and system board each time the heat sink is removed. Thermal paste and pads are located on the heat sink (1) and on system board components (2). Replacement thermal material is included with all heat sink and system board spare part kits.



Reverse this procedure to install the heat sink.

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# 5 Computer Setup

## Starting Computer Setup

Computer Setup is a preinstalled, ROM-based utility that can be used even when the operating system is not working or will not load.

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 **NOTE:** Some of the Computer Setup menu items listed in this guide may not be supported by your computer.

**NOTE:** An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

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To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.

# Using Computer Setup

## Navigating and selecting in Computer Setup

The information and settings in Computer Setup are accessed from the File, Security, Diagnostics, and System Configuration menus.

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
  - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
  - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
  - To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

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 **NOTE:** You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

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2. Press **f10** to enter BIOS Setup.
3. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the tab key and the arrow keys to select **File > Ignore changes and exit**, and then press **enter**.

– or –
- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the tab key and the arrow keys to select **File > Save changes and exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

## Restoring factory settings in Computer Setup

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 **NOTE:** Restoring defaults will not change the hard drive mode.

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To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter BIOS Setup.
3. Use a pointing device or the arrow keys to select **File > Restore defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **File > Save changes and exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

---

 **NOTE:** Your password settings and security settings are not changed when you restore the factory settings.

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# Computer Setup menus

The menu tables in this section provide an overview of Computer Setup options.

 **NOTE:** Some of the Computer Setup menu items listed in this chapter may not be supported by your computer.

## File menu

Select	To do this
System Information	<ul style="list-style-type: none"><li>• View identification information for the computer and the batteries in the system.</li><li>• View specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li></ul>
Set System Date and Time	Set or change the date and time on the computer.
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (Hard drive mode, password settings, and security settings are not changed when you restore the factory settings.)
Ignore changes and exit	Cancel any changes entered during the current session. Then exit and restart the computer.
Save changes and exit	Save any changes entered during the current session. Then exit and restart the computer. Your changes go into effect when the computer restarts.

## Security menu

 **NOTE:** Some of the menu items listed in this section may not be supported by your computer.

Select	To do this
Setup BIOS Administrator Password	Set up a BIOS administrator password.
User Management (requires a BIOS administrator password)	<ul style="list-style-type: none"><li>• Create a new BIOS user account.</li><li>• View a list of ProtectTools users.</li></ul>
Password Policy (requires a BIOS administrator password)	Revise password policy criteria.
HP SpareKey	Enable/disable HP SpareKey (enabled by default).
Always Prompt for HP SpareKey Enrollment	Enable/disable HP SpareKey enrollment (enabled by default).
Fingerprint Reset on Reboot (If Present)	Reset/clear the fingerprint reader ownership (select models only; disabled by default).
Allow Reset of HP ProtectTools security keys	Enable/disable reset of HP ProtectTools security keys.
Change Password	Enter, change, or delete a BIOS administrator password.
HP SpareKey Enrollment	Enroll or reset HP SpareKey, which is a set of security questions and answers used if you forget your password.
DriveLock Passwords	<ul style="list-style-type: none"><li>• Enable/disable DriveLock on any computer hard drive (enabled by default).</li><li>• Change a DriveLock user password or master password.</li></ul> <p><b>NOTE:</b> DriveLock settings are accessible only when you enter Computer Setup by turning on (not restarting) the computer.</p>
TPM Embedded Security	Enable/disable support for Trusted Platform Module (TPM) Embedded Security, which protects the computer from unauthorized access to owner functions available in Embedded Security for ProtectTools. For more information, refer to the ProtectTools software Help.  <b>NOTE:</b> You must have a setup password to change this setting.
Automatic DriveLock	Enable/disable Automatic DriveLock support.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive or the drive in the upgrade bay.  <b>CAUTION:</b> If you run Disk Sanitizer, the data on the selected drive is destroyed permanently.
System IDs	Enter a user-defined computer asset tracking number and ownership tag.

## Diagnostics menu

Select	To do this
System Diagnostics menu	<ul style="list-style-type: none"><li>• F1 System Information—Displays the following information:<ul style="list-style-type: none"><li>◦ Identification information for the computer and the batteries in the system.</li><li>◦ Specification information for the processor, cache and memory size, system ROM, video revision, and keyboard controller version.</li></ul></li><li>• F2 Start-up Test—Verifies the system components needed for starting the computer.</li><li>• F3 Run-In Test—Runs a comprehensive check on system memory.</li><li>• F4 Hard Disk Test—Runs a comprehensive self-test on any hard drive in the system.</li><li>• F5 Error Log—Displays a log file if any errors have occurred.</li></ul>

## System Configuration menu

 **NOTE:** Some of the listed System Configuration options may not be supported by your computer.

Select	To do this
Language	Change the Computer Setup language.
Boot Options	<ul style="list-style-type: none"><li>• Set a Startup Menu delay (in seconds).</li><li>• Enable/disable Custom Logo (disabled by default).</li><li>• Enable/disable Display Diagnostic URL (enabled by default).</li><li>• Enable/disable CD-ROM boot (enabled by default).</li><li>• Enable/disable SD Card boot (enabled by default).</li><li>• Enable/disable floppy boot (enabled by default).</li><li>• Enable/disable PXE Internal NIC boot (enabled by default).</li><li>• Set the Express Boot Popup delay in seconds.</li><li>• Set the boot order.</li></ul>
Device Configurations	<ul style="list-style-type: none"><li>• Enable/disable USB legacy support (enabled by default). When enabled, USB legacy support allows the following:<ul style="list-style-type: none"><li>◦ Use of a USB keyboard in Computer Setup even when a Windows® operating system is not running.</li><li>◦ Startup from bootable USB devices, including a hard drive, diskette drive, or optical drive connected by a USB port to the computer.</li></ul></li><li>• Select a parallel port mode: ECP (Enhanced Capabilities Port), standard, bidirectional, or EPP (Enhanced Parallel Port).</li><li>• Enable/disable fan always on while connected to an AC outlet (enabled by default).</li><li>• Enable/disable LAN Power Save (select models only). When enabled, saves power by turning off the LAN when not in use (enabled by default).</li><li>• Enable/disable Data Execution Prevention. When enabled, the processor can disable some virus code execution, which helps to improve computer security.</li><li>• SATA (Serial Advanced Technology Attachment) device mode. The following options are available:<ul style="list-style-type: none"><li>◦ AHCI (Advanced Host Controller Interface)</li><li>◦ IDE (Integrated Drive Electronics)</li><li>◦ RAID (select models only)</li></ul></li></ul>

Select	To do this
	<p><b>NOTE:</b> Availability of the options above varies by computer model.</p> <ul style="list-style-type: none"> <li>• Enable/disable secondary battery fast charge (enabled by default).</li> <li>• Enable/disable HP QuickLook 2 (enabled by default).</li> <li>• Enable/disable Virtualization Technology (select models only; disabled by default).</li> <li>• Enable/disable TXT (Intel® Trusted Execution Technology) (select models only; disabled by default).</li> <li>• Enable/disable Dual Core CPU (select models only; enabled by default).</li> <li>• Enable/Disable Unified Extensible Firmware Interface (UEFI) mode (disabled by default).</li> </ul>
Built-In Device Options	<ul style="list-style-type: none"> <li>• Enable/disable the wireless button state (enabled by default).</li> <li>• Enable/disable embedded WWAN device radio (select models only; enabled by default).</li> <li>• Enable/disable embedded Bluetooth device radio (enabled by default).</li> <li>• Enable/disable the Network Interface Controller (LAN) (enabled by default).</li> <li>• Set the wake on LAN state. Options include the following: <ul style="list-style-type: none"> <li>◦ Disabled</li> <li>◦ Boot to Network (set by default)</li> <li>◦ Follow Boot Order</li> </ul> </li> <li>• Enable/disable the fingerprint device (enabled by default).</li> <li>• Enable/disable a modem device (enabled by default).</li> <li>• Enable/disable the embedded WLAN device (enabled by default).</li> <li>• Enable/disable LAN/WLAN switching (disabled by default).</li> <li>• Enable the ambient light sensor (enabled by default).</li> <li>• Enable/disable the Notebook Multibay device (enabled by default).</li> <li>• Enable/disable the integrated camera (select models only; enabled by default).</li> </ul>

Select	To do this
Port Options (all are enabled by default)	<p><b>NOTE:</b> All port options are enabled by default.</p> <ul style="list-style-type: none"> <li>• Enable/disable the Smart Card slot.</li> <li>• Enable/disable the ExpressCard slot.</li> <li>• Enable/disable the serial port.</li> <li>• Enable/disable the parallel port.</li> <li>• Enable/disable the flash media reader.</li> <li>• Enable/disable the USB port.</li> </ul> <p><b>CAUTION:</b> Disabling the USB port also disables MultiBay devices and ExpressCard devices on the advanced port replicator.</p> <ul style="list-style-type: none"> <li>• Enable/disable the 1394 port.</li> </ul>
AMT Options	<p><b>NOTE:</b> All AMT options are disabled by default.</p> <ul style="list-style-type: none"> <li>• Enable/disable Firmware Verbosity.</li> <li>• Enable/disable AMT Setup Prompt (CTRL-P).</li> <li>• Enable/disable USB Key Provisioning Support.</li> <li>• Enable/disable Unconfigure AMT on Next Boot.</li> <li>• Enable/disable Terminal Emulation Mode.</li> <li>• Enable/disable Firmware Progress Event Support.</li> <li>• Enable/disable include TYPE-131 in SMBIOS.</li> </ul>
Set Security Level	Change, view, or hide security levels for all BIOS menu items.
Restore Security Defaults	Restore the default security settings.

# 6 Specifications

## Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Depth	21.43 cm	8.44 in
Width	28.23 cm	11.11 in
Height (front to rear)	2.52 to 3.40 cm	0.99 to 1.34 in
<b>Weight</b>		
Equipped with DVD-ROM Drive, 9-cell battery, and WLAN module	1.79 kg	3.95 lbs
Equipped with DVD-ROM Drive, 6-cell battery, and WLAN module	1.64 kg	3.62 lbs
Equipped with DVD-ROM Drive, 3-cell battery, and WLAN module	1.48 kg	3.26 lbs
Equipped with 3-cell battery and WLAN module	1.29 kg	2.84 lbs
<b>Input power</b>		
Operating voltage	18.5 V dc @ 3.50 A – 65 W	
Operating current	3.50 A	
<b>Temperature</b>		
Operating (reading to optical disc)	0°C to 35°C	32°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
<b>Relative humidity (noncondensing)</b>		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude (unpressurized)</b>		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft

**NOTE:** Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

## 12.1-inch, WXGA display specifications

	Metric	U.S.
<b>Dimensions</b>		
Height	16.9 cm	6.7 in
Width	26.2 cm	10.3 in
Diagonal	30.8 cm	12.1 in
<b>Number of colors</b>	Up to 16.8 million	
<b>Contrast ratio</b>	250:1 (typical)	
<b>Brightness</b>	180 nits (typical)	
<b>Pixel resolution</b>		
Pitch	0.279 × 0.279 mm	
Format	1280 × 800	
Configuration	RGB vertical stripe	
<b>Backlight</b>	Edge lit	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	4.0 W	
<b>Viewing angle</b>	+/-40 horizontal, +20/-40° vertical (typical)	

# Hard drive specifications

	250-GB*	200-GB*	160-GB*	120-GB*	80-GB*
<b>Dimensions</b>					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	102 g	102 g	102 g	102 g	102 g
<b>Interface type</b>					
	SATA	SATA	SATA	SATA	SATA
<b>Transfer rate</b>					
Synchronous (maximum)	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec	100 MB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)					
Single track	3 ms	2 ms	3 ms	3 ms	3 ms
Average	13 ms	12 ms	13 ms	13 ms	13 ms
Maximum	24 ms	22 ms	24 ms	24 ms	24 ms
<b>Logical blocks</b>					
	495,702,655	390,721,968	317,249,699	237,937,274	158,624,849
<b>Disk rotational speed</b>					
	5400 rpm				
<b>Operating temperature</b>					
	5°C to 55°C (41°F to 131°F)				

**NOTE:** Certain restrictions and exclusions apply. Consult technical support for details.

\*1 GB = 1 billion bytes when referring to hard drive storage capacity. Accessible capacity is less. Actual drive specifications may differ slightly.

## DVD-ROM Drive specifications

<b>Applicable disc</b>	DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), CD-ROM (Mode 1 and 2), CD Digital Audio, CD-XA ready (Mode 2, Form 1 and Form 2), CD-I (Mode 2, Form 1 and Form 2), CD-RW, Photo CD (single and multisession), and CD-Bridge	
<b>Access time</b>	<b>CD</b>	<b>DVD</b>
Random	< 100 ms	< 125 ms
<b>Cache buffer</b>	512 KB	
<b>Data transfer rate</b>		
CD-R (24X)	3,600 KB/sec (150 KB/s at 1X CD rate)	
CD-RW (10X)	1,500 KB/sec (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3,600 KB/sec (150 KB/s at 1X CD rate)	
DVD	10,800 KB/sec (1,352 KB/s at 1X DVD rate)	
Transfer mode	16.6 MB/sec Multiword DMA mode 2	

# DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive specifications

<b>Applicable disc</b>	<b>Read:</b>	<b>Write:</b>
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
<b>Access time</b>	CD	DVD
Random	< 175 ms	< 230 ms
<b>Cache buffer</b>	2 MB	
<b>Data transfer rate</b>		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
<b>Transfer mode</b>	Multiword DMA Mode	

## System DMA specifications

Hardware DMA	System function
DMA0	Not applicable
DMA1*	Not applicable
DMA2*	Not applicable
DMA3	Not applicable
DMA4	Direct memory access controller
DMA5*	Available for ExpressCard
DMA6	Not assigned
DMA7	Not assigned

\*ExpressCard controller can use DMA 1, 2, or 5.

# System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-Key or Microsoft® Natural Keyboard
IRQ2	Cascaded
IRQ3	Intel 82801DB/DBM USB2 Enhanced Host Controller—24CD
IRQ4	COM1
IRQ5*	Conexant AC—Link Audio Intel 82801DB/DBM SMBus Controller—24C3 Data Fax Modem with SmartCP
IRQ6	Diskette drive
IRQ7*	Parallel port
IRQ8	System CMOS/real-time clock
IRQ9*	Microsoft ACPI-compliant system
IRQ10*	Intel USB UHCI controller—24C2 Intel 82852/82855 GM/GME Graphic Controller Realtek RTL8139 Family PCI Fast Ethernet Controller
IRQ11	Intel USB EHCI controller—24CD Intel USB UHCI controller—24C4 Intel USB UHCI controller—24C7 Intel Pro/Wireless 2200BG TI OHCI 1394 host controller TI PCI1410 CardBus controller
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ14	Primary IDE channel
IRQ15	Secondary IDE channel

\*Default configuration; audio possible configurations are IRQ5, IRQ7, IRQ9, IRQ10, or none.

**NOTE:** ExpressCards may assert IRQ3, IRQ4, IRQ5, IRQ7, IRQ9, IRQ10, IRQ11, or IRQ15. Either the infrared or the serial port may assert IRQ3 or IRQ4.

# System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000 - 00F	DMA controller no. 1
010 - 01F	Unused
020 - 021	Interrupt controller no. 1
022 - 024	Opti chipset configuration registers
025 - 03F	Unused
02E - 02F	87334 "Super I/O" configuration for CPU
040 - 05F	Counter/timer registers
044 - 05F	Unused
060	Keyboard controller
061	Port B
062 - 063	Unused
064	Keyboard controller
065 - 06F	Unused
070 - 071	NMI enable/RTC
072 - 07F	Unused
080 - 08F	DMA page registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0A1	Interrupt controller no. 2
I/O Address (hex)	System Function (shipping configuration)
0A2 - 0BF	Unused
0C0 - 0DF	DMA controller no. 2
0E0 - 0EF	Unused
0F0 - 0F1	Coprocessor busy clear/reset
0F2 - 0FF	Unused
100 - 16F	Unused
170 - 177	Secondary fixed disk controller
178 - 1EF	Unused
1F0 - 1F7	Primary fixed disk controller
1F8 - 200	Unused
201	Joystick (decoded in ESS1688)
202 - 21F	Unused

I/O address (hex)	System function (shipping configuration)
220 - 22F	Entertainment audio
230 - 26D	Unused
26E - 26	Unused
278 - 27F	Unused
280 - 2AB	Unused
2A0 - 2A7	Unused
2A8 - 2E7	Unused
2E8 - 2EF	Reserved serial port
2F0 - 2F7	Unused
2F8 - 2FF	Infrared port
300 - 31F	Unused
320 - 36F	Unused
370 - 377	Secondary diskette drive controller
378 - 37F	Parallel port (LPT1/default)
380 - 387	Unused
388 - 38B	FM synthesizer—OPL3
38C - 3AF	Unused
3B0 - 3BB	VGA
3BC - 3BF	Reserved (parallel port/no EPP support)
3C0 - 3DF	VGA
3E0 - 3E1	ExpressCard controller in CPU
3E2 - 3E3	Unused
3E8 - 3EF	Internal modem
3F0 - 3F7	"A" diskette controller
3F8 - 3FF	Serial port (COM1/default)
CF8 - CFB	PCI configuration index register (PCIDIVO-1)
CFC - CFF	PCI configuration data register (PCIDIVO-1)

## System memory map specifications

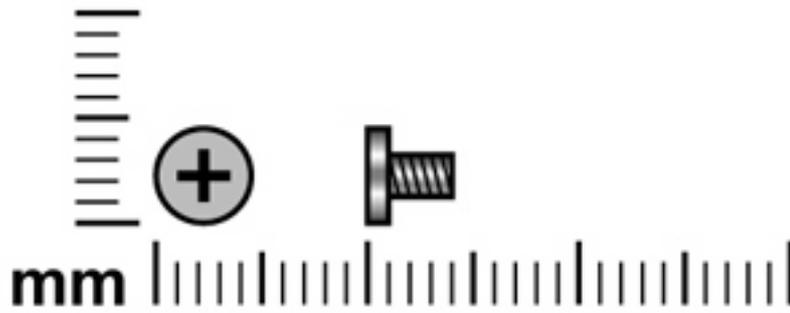
Size	Memory address	System function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-08FFFFFF	Video memory (direct access)
4 GB	08200000-FFFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

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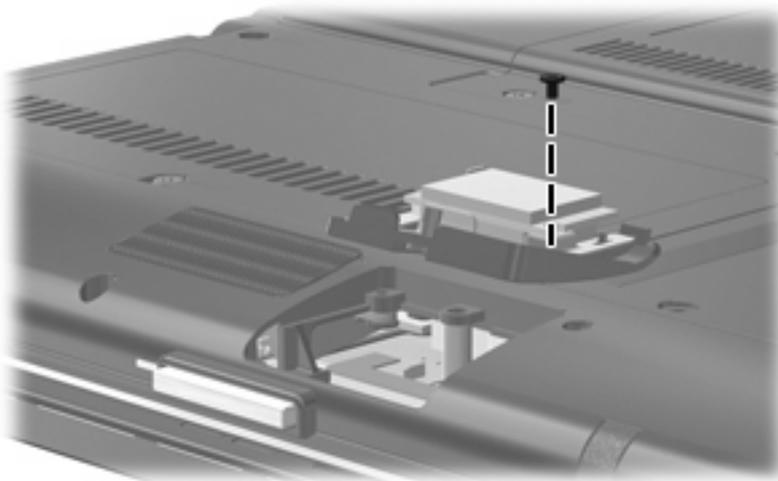
## 7 Screw listing

This section provides specification and reference information for the screws and screw locks used in the computer. All screws listed in this section are available in the Screw Kit, spare part number 492579-001.

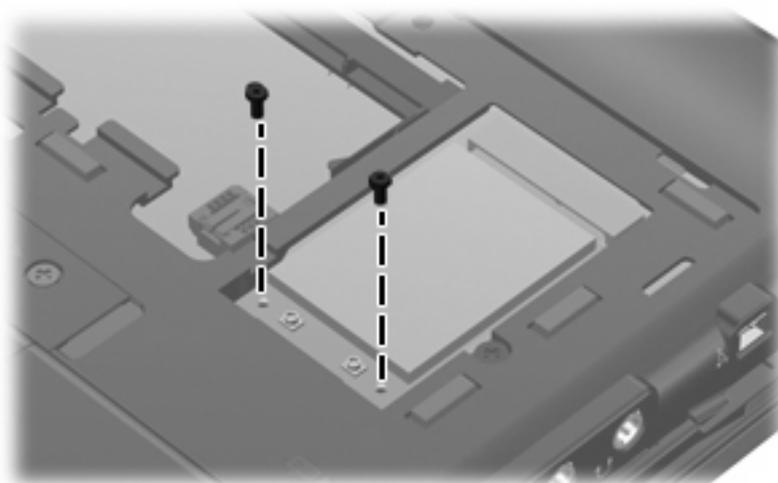
## Phillips PM 2.0×4.0 screw



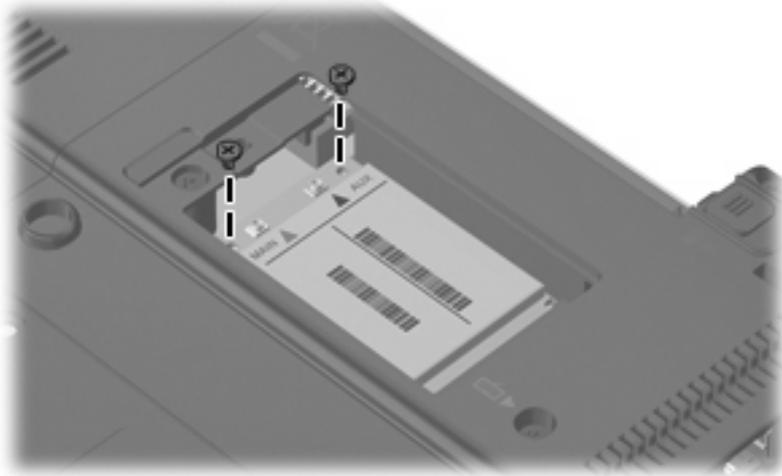
Color	Quantity	Length	Thread	Head diameter
Black	16	4.0 mm	2.0 mm	4.5 mm



**Where used:** 1 screw that secures the Bluetooth module to the Bluetooth module compartment cover



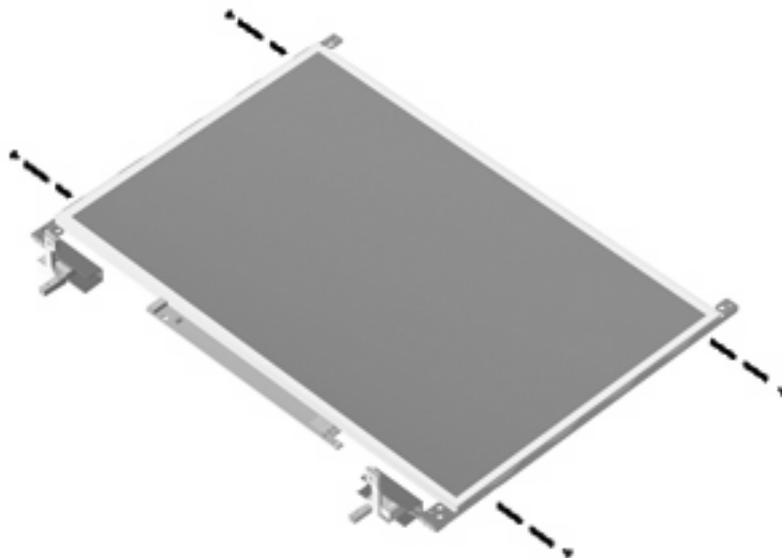
**Where used:** 2 screws that secure the WLAN module to the base enclosure



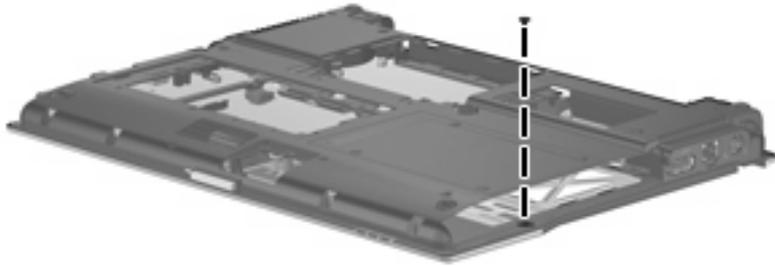
**Where used:** 2 screws that secure the WWAN board to the base enclosure



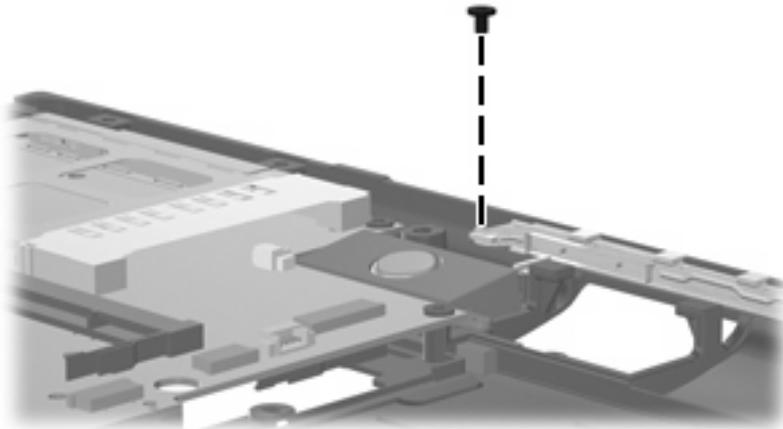
**Where used:** 2 screws that secure the optical drive bracket to the optical drive



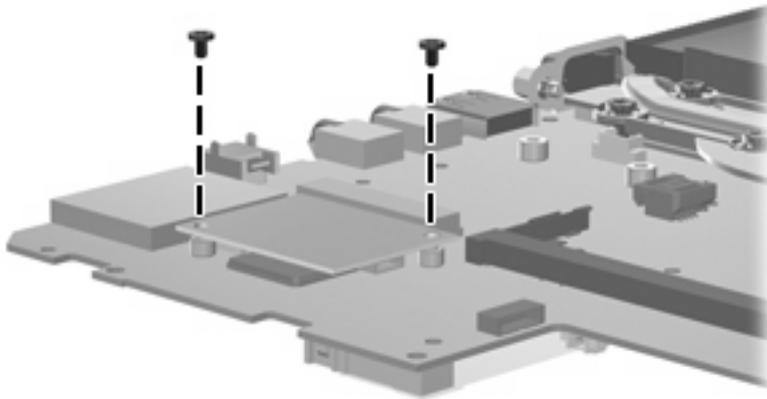
**Where used:** 4 screws that secure the display hinges to the display panel



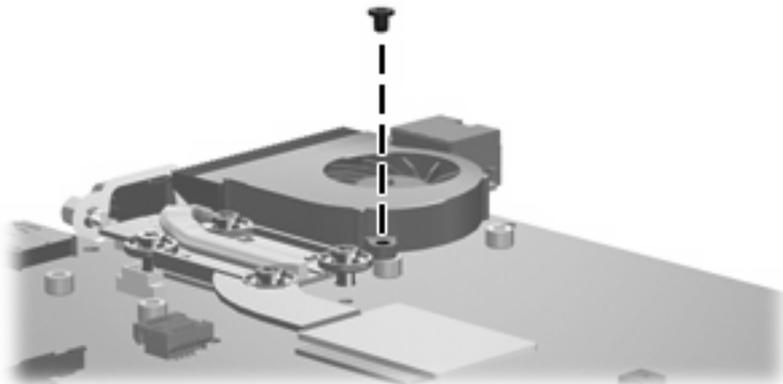
**Where used:** One screw that secures the top cover to the base enclosure



**Where used:** One screw that secures the speaker to the base enclosure

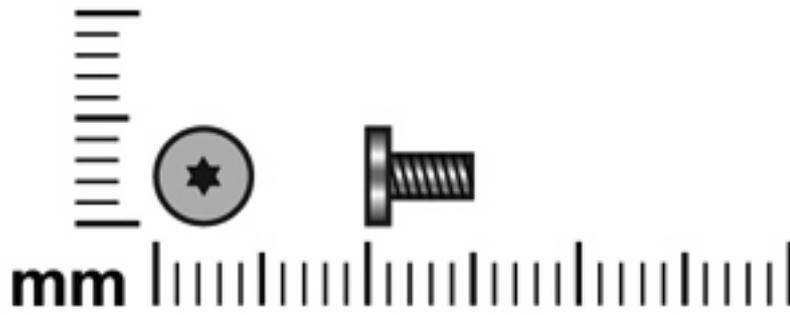


**Where used:** 2 screws that secure the modem module to the system board

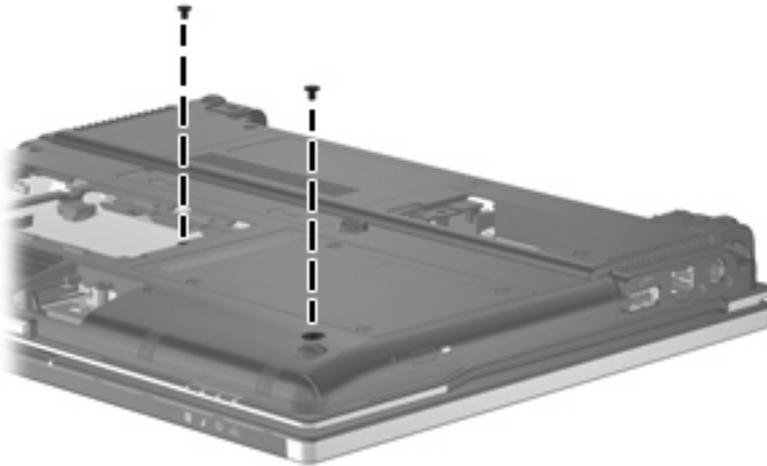


**Where used:** One screw that secures the fan to the system board

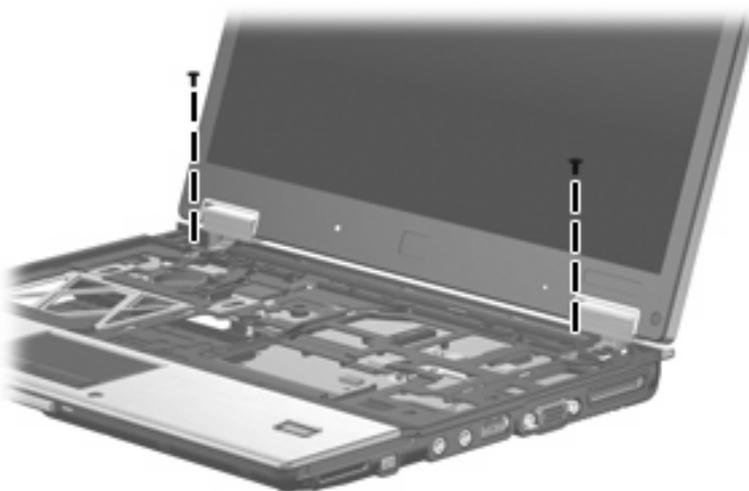
## Torx T8M2.0×5.0 screw



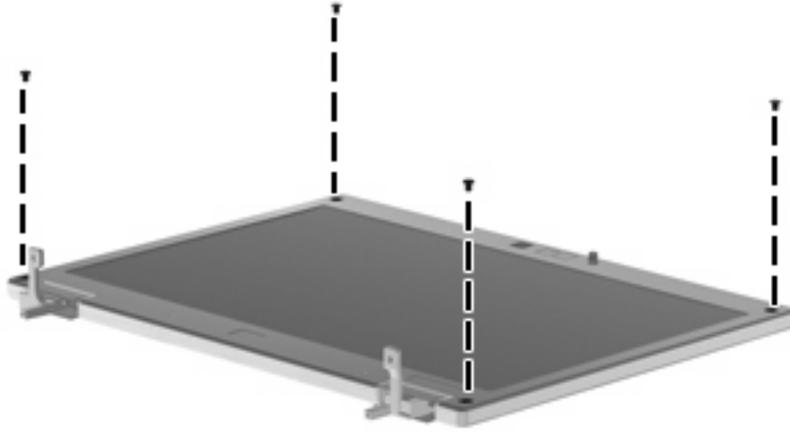
Color	Quantity	Length	Thread	Head diameter
Black	13	5.0 mm	2.0 mm	4.5 mm



**Where used:** 2 screws that secure the optical drive to the computer



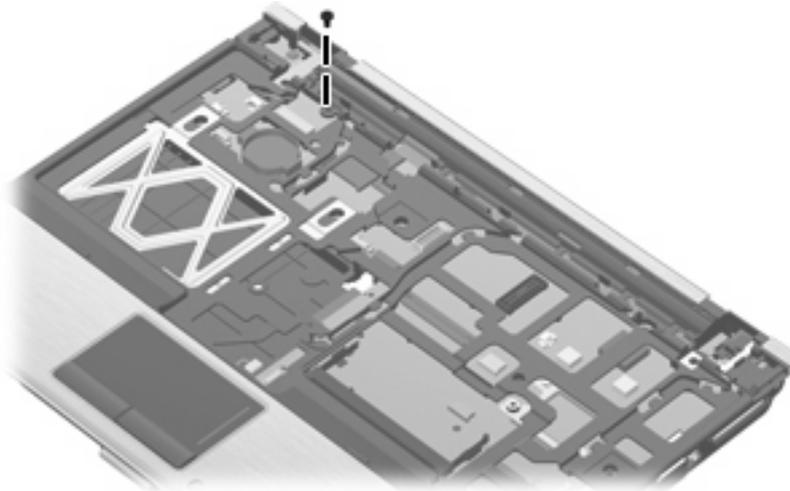
**Where used:** 2 screws that secure the display assembly to the computer



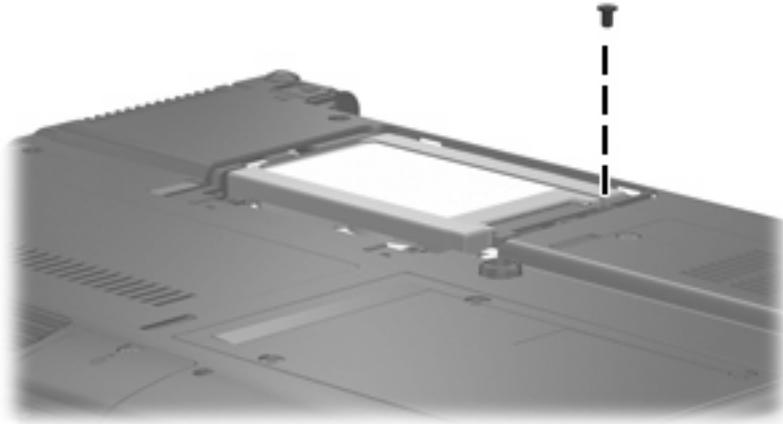
**Where used:** 4 screws that connect the bezel to the display assembly



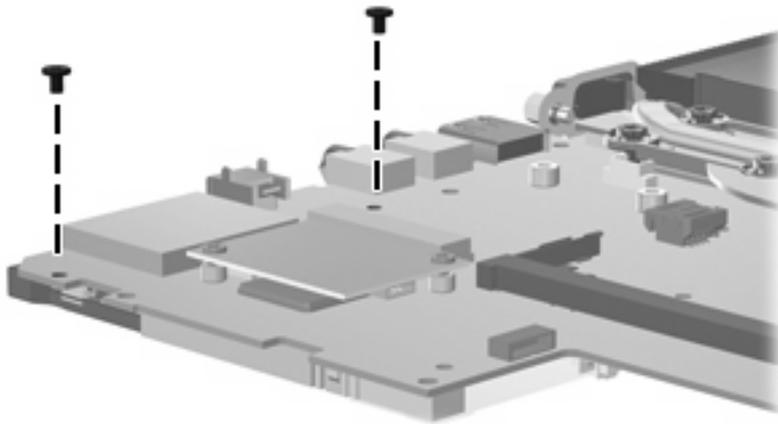
**Where used:** One screw that secures the top cover to the base enclosure



**Where used:** One screw that secures the top cover to the base enclosure

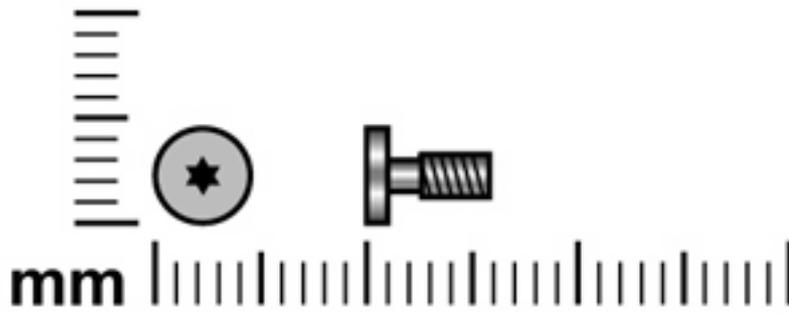


**Where used:** One screw that secures the primary hard drive to the computer

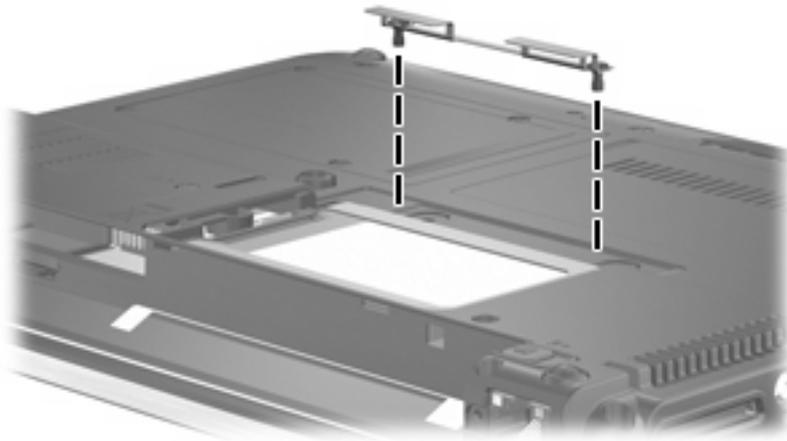


**Where used:** Two screws that secure the ExpressCard assembly to the system board

## Torx T8M2.0×6.0 captive screw

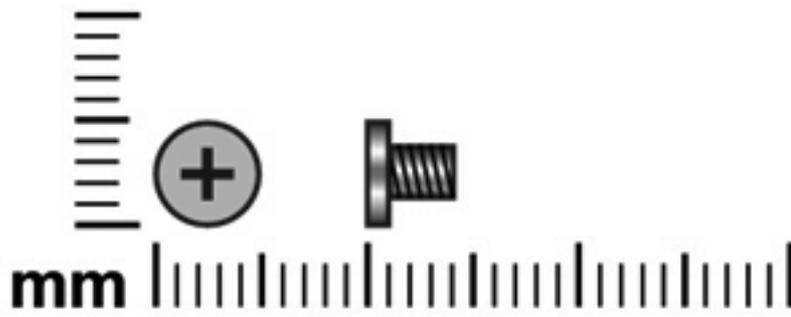


Color	Quantity	Length	Thread	Head diameter
Black	2	6.0 mm	2.0 mm	5.0 mm

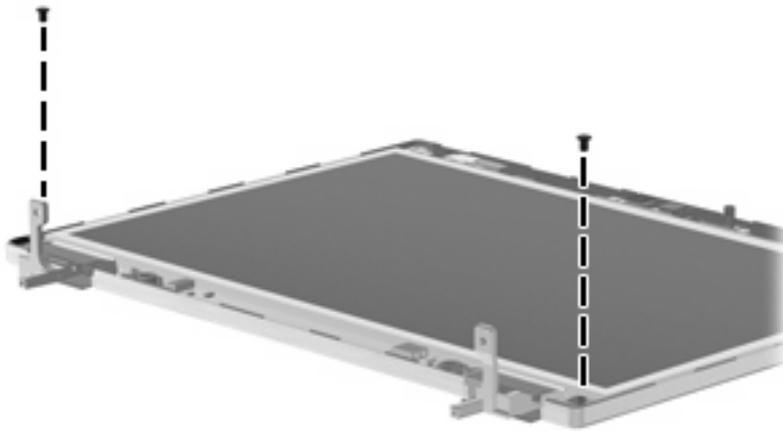


**Where used:** 2 captive screws that secure the hard drive bracket to the primary hard drive (screws secured by C-clips)

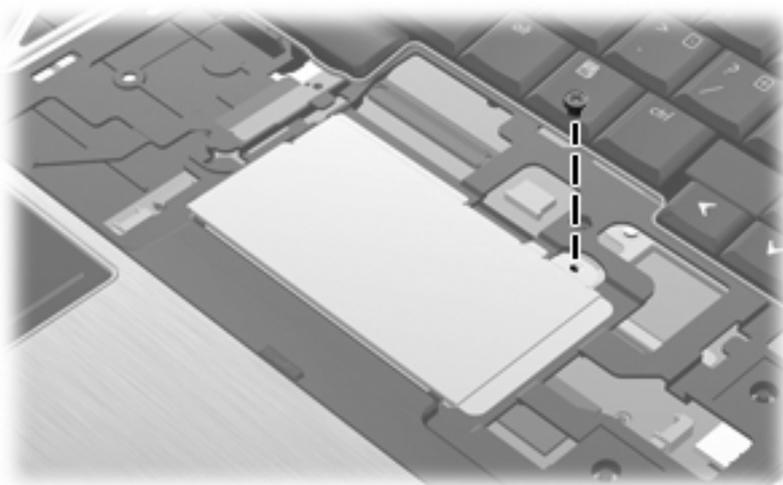
## Phillips PM2.5×4.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	3	6.0 mm	2.0 mm	5.0 mm

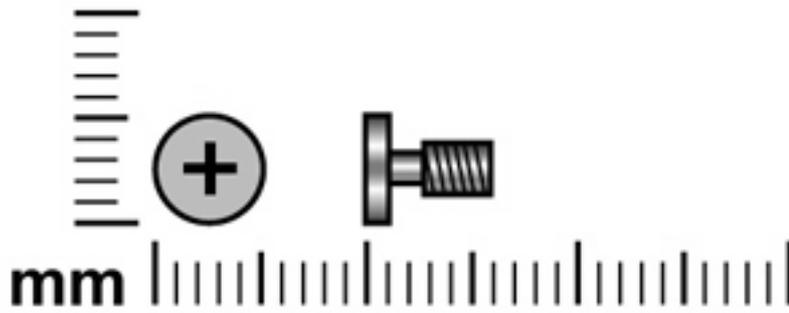


**Where used:** 2 screws that secure the display panel to the display enclosure

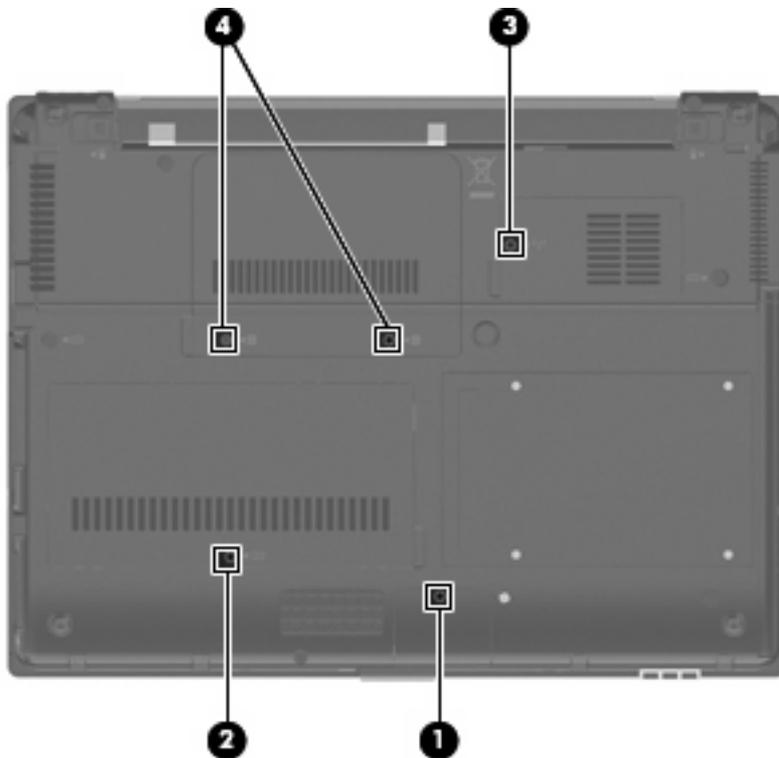


**Where used:** One screw that secures the primary memory module shield to the top cover

## Phillips PM2.5×6.0 captive screw



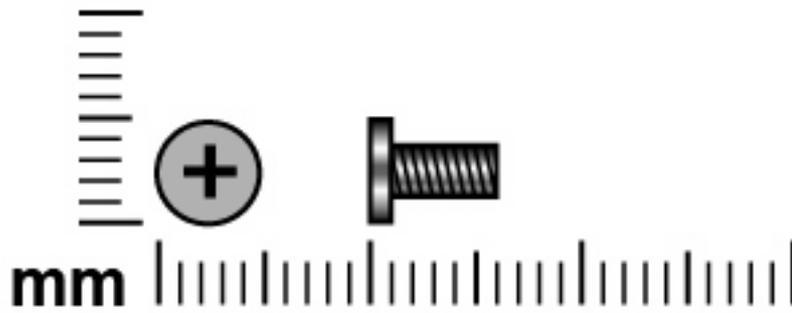
Color	Quantity	Length	Thread	Head diameter
Black	5	6.0 mm	2.5 mm	5.0 mm



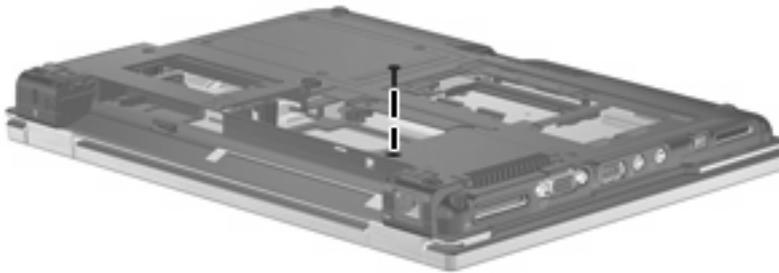
### Where used:

- (1) One captive screw that secures the Bluetooth module cover to the computer (screw is secured by a C-clip)
- (2) One captive screw that secures the memory module compartment cover to the computer (screw is secured by a C-clip)
- (3) One captive screw that secures the broadband wireless module compartment cover to the computer (screw is secured by a C-clip)
- (4) Two captive screws that secure the hard drive bay cover to the computer (screws are secured by C-clips)

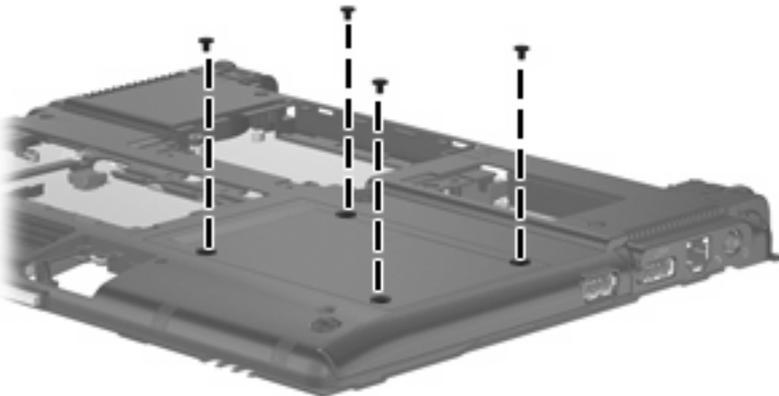
## Phillips PM2.5×6.0 screw



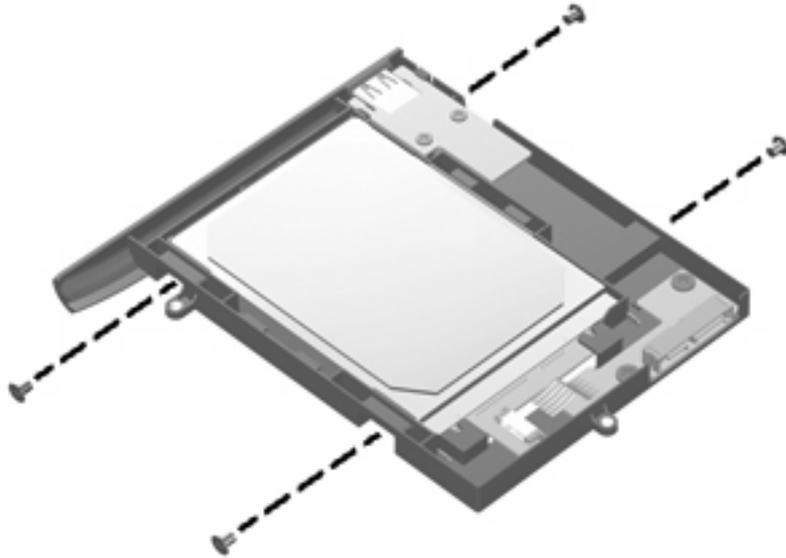
Color	Quantity	Length	Thread	Head diameter
Black	11	6.0 mm	2.5 mm	5.0 mm



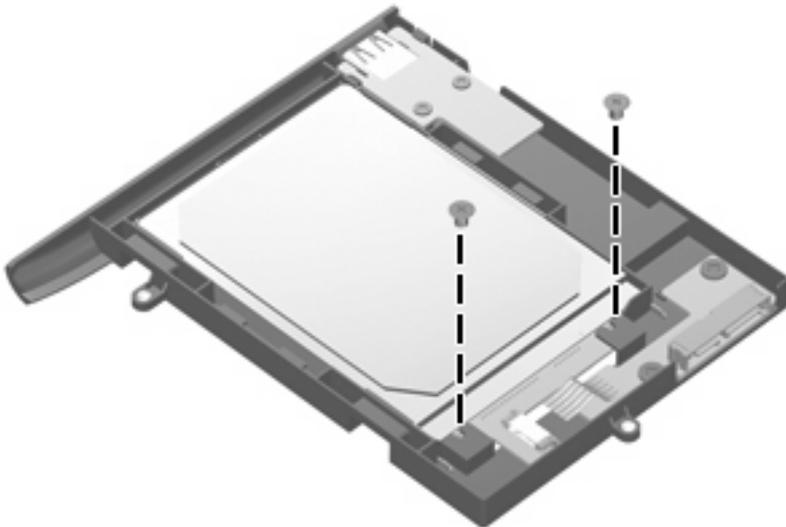
**Where used:** One screw that secures the switch cover to the base enclosure



**Where used:** 4 screws that secure the optical bay hard drive to the computer

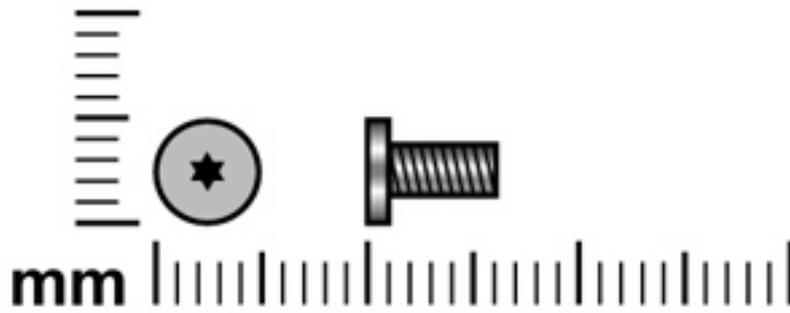


**Where used:** 4 screws that secure the optical bay hard drive to the hard drive bracket

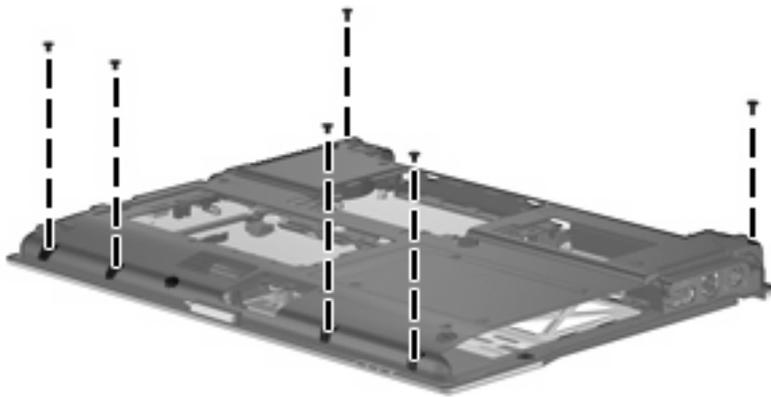


**Where used:** 2 screws that secure the hard drive to the connector board

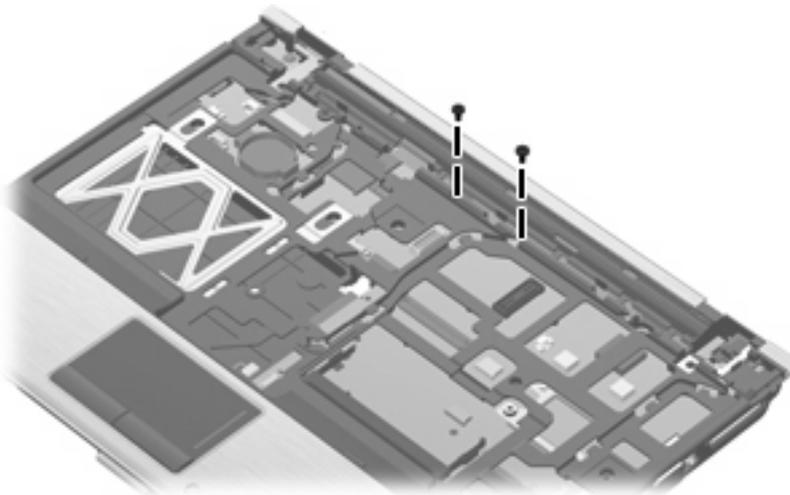
## Torx T8M2.5×6.0 screw



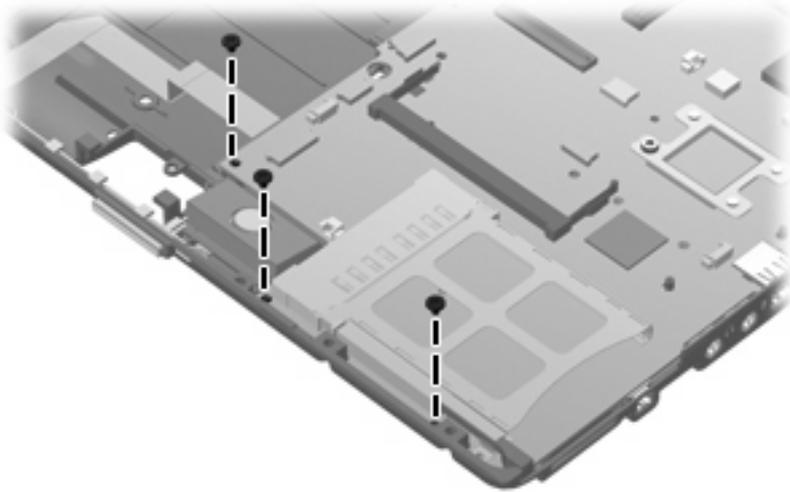
Color	Quantity	Length	Thread	Head diameter
Black	11	6.0 mm	2.5 mm	5.0 mm



**Where used:** 6 screws that secure the top cover to the base enclosure

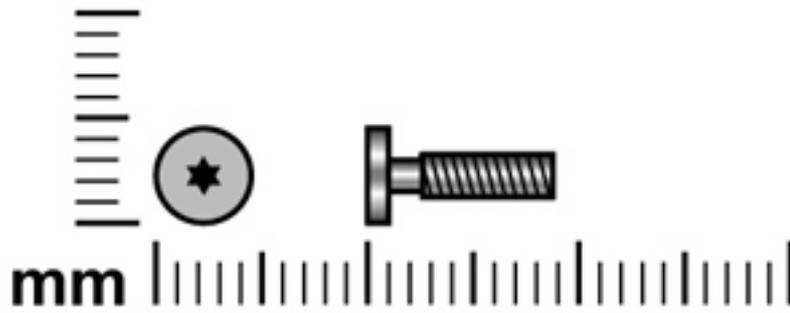


**Where used:** 2 screws that secure the top cover to the base enclosure

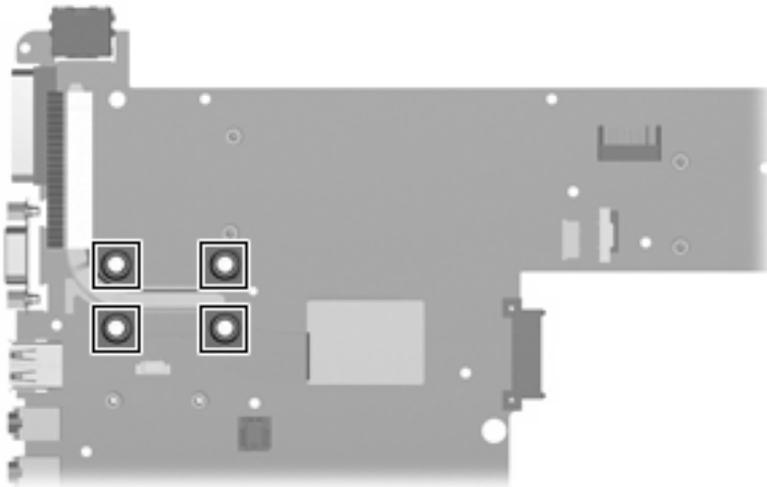


**Where used:** 3 screws that secure the system board to the base enclosure

## Torx T8M2.5×9.0 captive screw

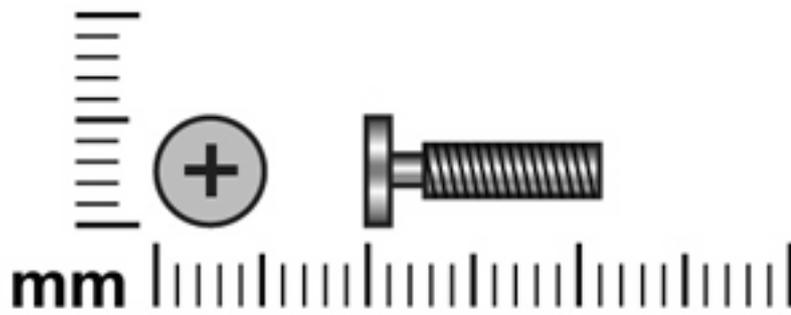


Color	Quantity	Length	Thread	Head diameter
Black	4	9.0 mm	2.5 mm	5.0 mm

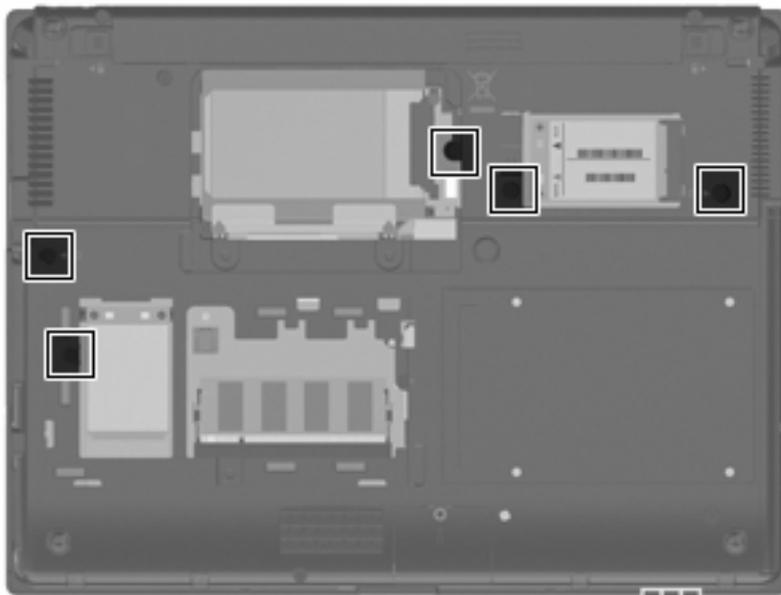


**Where used:** 4 captive screws that secure the heat sink to the system board (screws secured by C-clips)

## Phillips PM2.5×11.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Black	5	11.0 mm	2.5 mm	5.0 mm



**Where used:** 5 captive screws that secure the keyboard to the computer (screws secured by C-clips)

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# 8 Backup and recovery

## Backup and recovery in Windows Vista

### Overview

To protect your information, use the Backup and Restore Center to back up individual files and folders, back up your entire hard drive (select models only), or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

The Backup and Restore Center provides the following options:

- Backing up individual files and folders
- Backing up the entire hard drive (select models only)
- Scheduling automatic backups (select models only)
- Creating system restore points
- Recovering individual files
- Restoring the computer to a previous state
- Recovering information using recovery tools

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 **NOTE:** For detailed instructions, perform a search for these topics in Help and Support.

**NOTE:** In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

---

## Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents folder, and back it up regularly.
- Back up templates that are stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:

To copy only the active window, press **alt+fn+prt sc**.

To copy the entire screen, press **fn+prt sc**.

3. Open a word-processing document, and then select **Edit > Paste**.

The screen image is added to the document.

4. Save the document.

- When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.

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 **NOTE:** DVDs and DVDs with double-layer (DL) support store more information than CDs, so using them for backup reduces the number of recovery discs required.

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- When backing up to discs, number each disc before inserting it into the optical drive of the computer.

To create a backup using Backup and Restore Center, follow these steps:

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 **NOTE:** Be sure that the computer is connected to AC power before you start the backup process.

---

**NOTE:** The backup process may take over an hour, depending on file size and the speed of the computer.

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1. Select **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to back up your entire computer (select models only) or your files.

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 **NOTE:** Windows® includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

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## Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use the Backup and Restore Center to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- **f11** recovery tools: You can use the **f11** recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

 **NOTE:** If you are unable to boot (start up) your computer, you must purchase a Windows Vista® operating system DVD to reboot the computer and repair the operating system. For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

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## Using the Windows recovery tools

To recover information you previously backed up, follow these steps:

1. Click **Start > All Programs > Maintenance > Backup and Restore Center**.
2. Follow the on-screen instructions to recover your entire computer (select models only) or your files.

 **NOTE:** Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

---

To recover your information using Startup Repair, follow these steps:

 **CAUTION:** Using Startup Repair completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

---

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition and the HP Recovery partition. To find the partitions, select **Start > Computer**.

 **NOTE:** If the Windows partition and the HP Recovery partition have been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

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3. Restart the computer, and then press **f8** before the Windows operating system loads.
4. Select **Repair your computer**.
5. Follow the on-screen instructions.

 **NOTE:** For additional information on recovering information using the Windows tools, perform a search for these topics in Help and Support.

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## Using f11

- △ **CAUTION:** Using **f11** completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

To recover the original hard drive image using **f11**, follow these steps:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition. To find the partition, select **Start > Computer**.

 **NOTE:** If the HP Recovery partition has been deleted, you must recover your operating system and programs using the Windows Vista operating system DVD and the *Driver Recovery* disc (both purchased separately). For additional information, refer to the “Using a Windows Vista operating system DVD (purchased separately)” section in this guide.

3. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
4. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

## Using a Windows Vista operating system DVD (purchased separately)

If you are unable to boot (start up) your computer, you must purchase a Windows Vista operating system DVD to reboot the computer and repair the operating system. Make sure that your most recent backup (stored on discs or on an external drive) is easily accessible. To order a Windows Vista operating system DVD, go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions. You can also order the DVD by calling technical support. For contact information, refer to the *Worldwide Telephone Numbers* booklet included with the computer.

- △ **CAUTION:** Using a Windows Vista operating system DVD completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows Vista operating system DVD, follow these steps:

 **NOTE:** This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows Vista operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

# Backup and recovery in Windows XP

## Overview

To protect your information, use the Windows® Backup utility (select models only) to back up files and folders or create recovery points. In case of system failure, you can use the backup files to restore your computer.

Windows provides the following options:

- Backing up individual files and folders
- Backing up all files and folders
- Scheduling automatic backups
- Creating recovery points
- Recovering information

---

 **NOTE:** For detailed instructions, perform a search for these topics in Help and Support.

**NOTE:** In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

---

## Backing up your information

Recovery after a system failure is as complete as your most current backup. You should create your initial backup immediately after software setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

You can back up individual files or folders to an optional external hard drive or to a network drive.

Note the following when backing up:

- Store personal files in the My Documents folder, and back it up periodically.
- Back up templates stored in their associated programs.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time saver if you have to reset your preferences.

To copy the screen and paste it into a word-processing document:

- a. Display the screen you want to save.
- b. Copy the screen image:  
To copy only the active window, press **alt+fn+prt sc**.  
To copy the entire screen, press **fn+prt sc**.
- c. Open a word-processing document, click **Edit > Paste**.  
The screen image is added to the document.
- d. Save the document.

To create a backup using the Windows Backup utility (select models only), follow these steps:

---

 **NOTE:** Be sure that the computer is connected to AC power before you start the backup process.

**NOTE:** The backup process may take over an hour, depending on file size and the speed of the computer.

---

1. Click **Start > All Programs > Accessories > System Tools > Backup**.
2. Follow the on-screen instructions.

## Performing a recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools (select models only): You can use the Windows Backup utility to recover information you have previously backed up.
- *Operating System* and *Driver Recovery* discs (included with your computer): You can use the discs to recover your operating system and programs installed at the factory.

## Recovering your information

To recover information you previously backed up, follow these steps:

1. If possible, back up all personal files.
2. Click **Start > All Programs > Accessories > System Tools > Backup**.

The Backup or Restore Wizard opens.

3. Click **Restore files and settings**, and then click **Next**.
4. Follow the on-screen instructions.

---

 **NOTE:** For additional information on initiating a recovery in Windows, perform a search for this topic in Help and Support.

---

## Recovering the operating system and programs

---

△ **CAUTION:** The recovery process reformats and completely erases the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery process reinstalls the original operating system, software, and drivers. Software, drivers, and updates not installed by HP must be manually reinstalled.

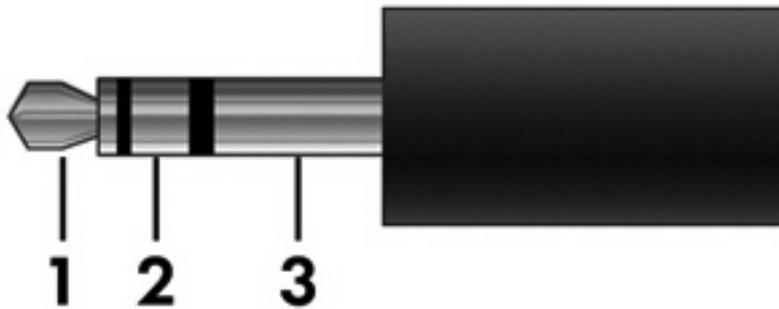
---

To recover your operating system and programs, follow these steps:

1. If possible, back up all personal files.
2. Insert the *Operating System* disc into the optical drive.
3. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
4. Turn on the computer.
5. Follow the on-screen instructions to install the operating system.
6. After the operating system is installed, remove the *Operating System* disc and insert the *Driver Recovery* disc.
7. Follow the on-screen instructions to install the drivers and programs.

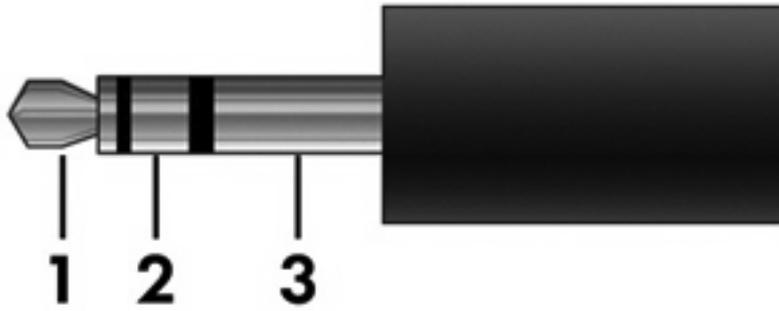
## 9 Connector pin assignments

### Audio-in (microphone)



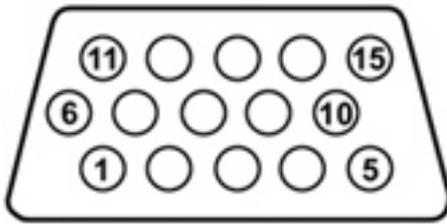
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

## Audio-out (headphone)



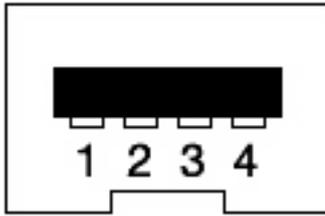
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

## External monitor



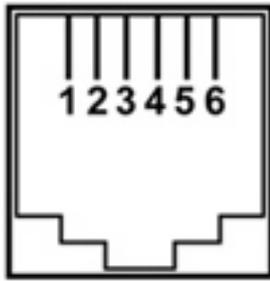
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

## IEEE 1394 (FireWire)



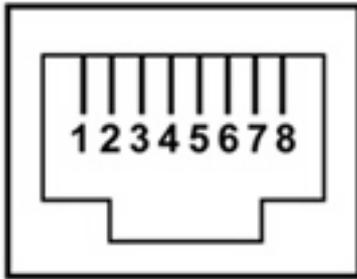
Pin	Signal
1	Twisted-pair B, differential signals
2	Twisted-pair B, differential signals
3	Twisted-pair A, differential signals
4	Twisted-pair A, differential signals

## RJ-11 (modem)



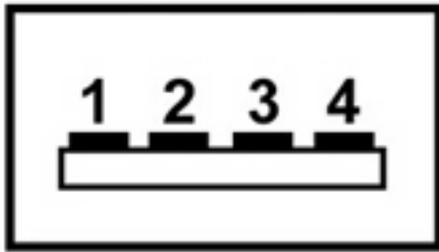
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

## RJ-45 (network)



Pin	Signal
1	Transmit +
2	Transmit -
3	Receive +
4	Unused
5	Unused
6	Receive -
7	Unused
8	Unused

# Universal Serial Bus



Pin	Signal
1	+5 VDC
2	Data -
3	Data +
4	Ground

---

# 10 Power cord set requirements

The wide range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC or from 220 to 240 volts AC.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the computer is used.

## Requirements for all countries and regions

The requirements listed below are applicable to all countries and regions:

- The length of the power cord set must be at least 1.5 m (5.0 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

## Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
South Korea	EK	4
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm<sup>2</sup> conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

---

# 11 Recycling

## Battery

When a battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for computer battery disposal.

# Display

- ⚠ **WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.
- ⚠ **CAUTION:** The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.
- 📄 **NOTE: Materials Disposal.** This HP product contains mercury in the backlight in the display assembly that might require special handling at end-of-life. Disposal of mercury may be regulated because of environmental considerations. For disposal or recycling information, contact your local authorities, or see the Electronic Industries Alliance (EIA) Web site at <http://www.eiae.org>.

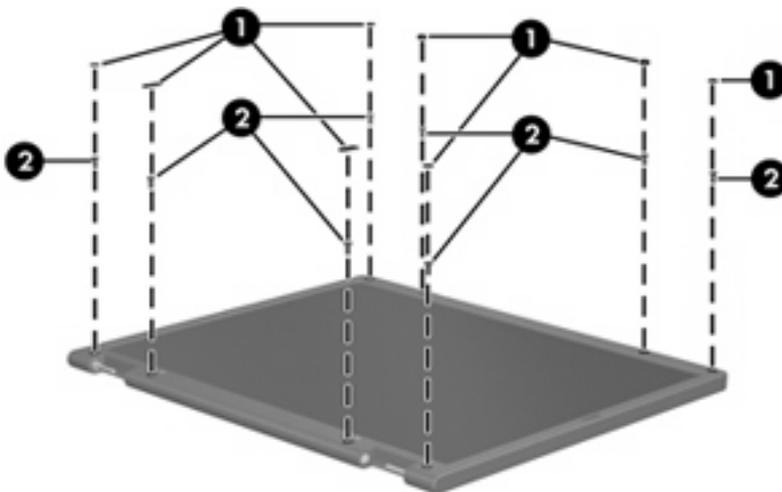
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight (1) and the liquid crystal display (LCD) panel (2).



- 📄 **NOTE:** The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

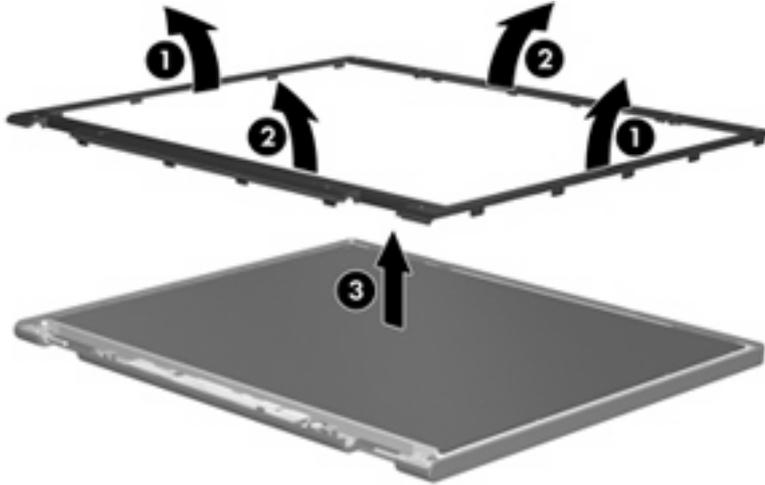
Perform the following steps to disassemble the display assembly:

1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.

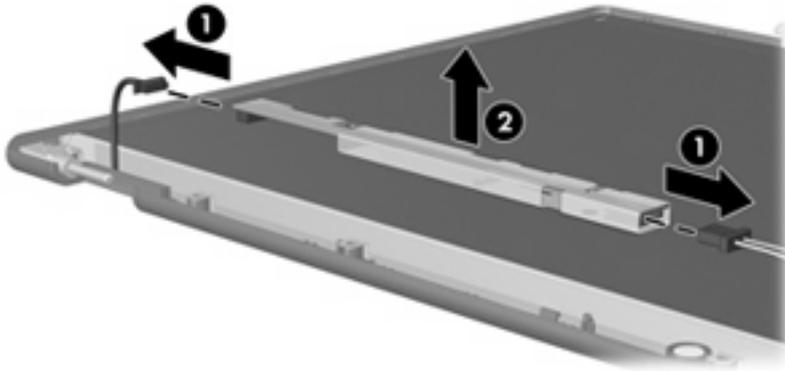


2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.

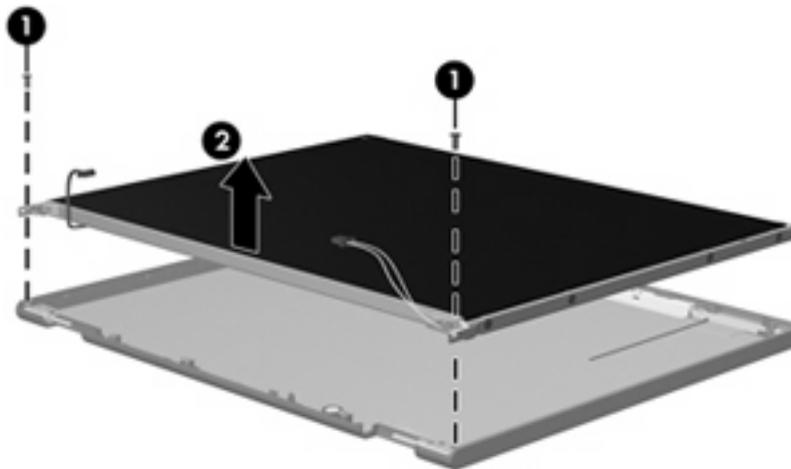
3. Remove the display bezel (3).



4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).

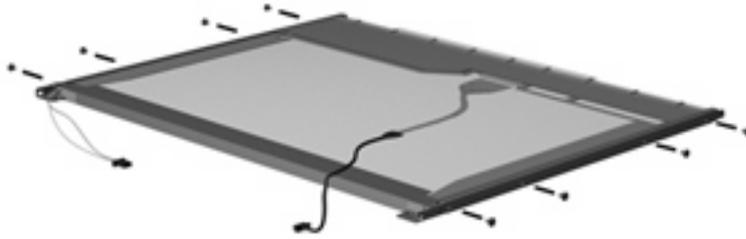


5. Remove all screws (1) that secure the display panel assembly to the display enclosure.
6. Remove the display panel assembly (2) from the display enclosure.

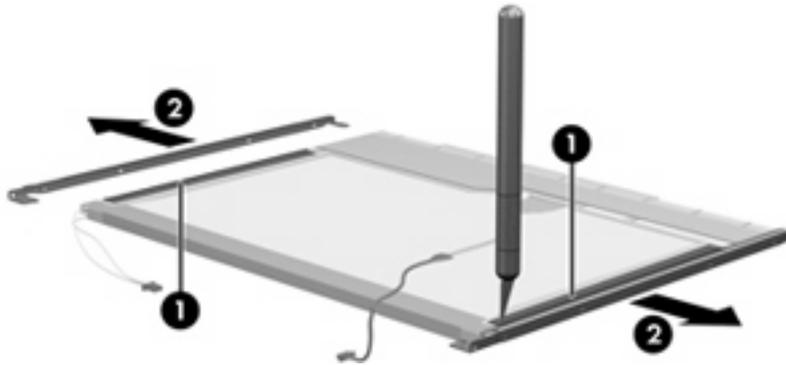


7. Turn the display panel assembly upside down.

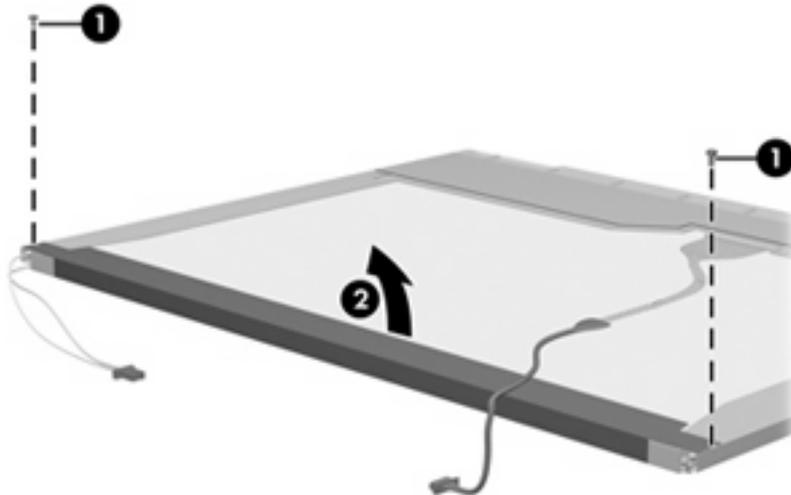
8. Remove all screws that secure the display panel frame to the display panel.



9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame (2) from the display panel.

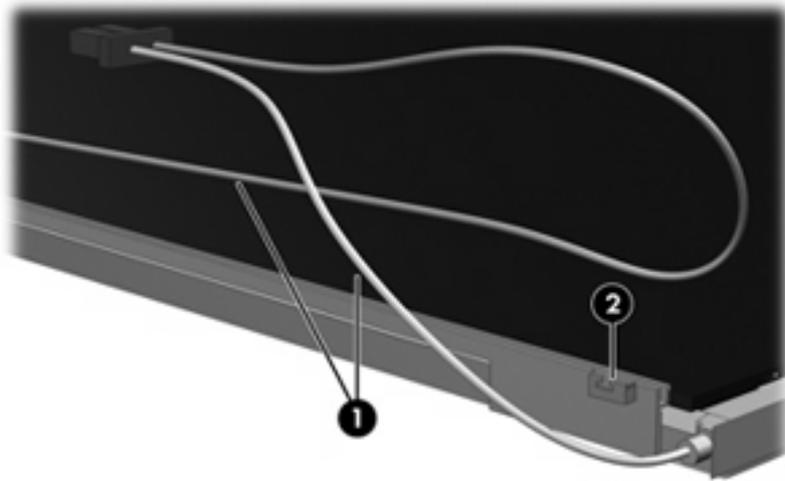


11. Remove the screws (1) that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover (2) and swing it outward.



13. Remove the backlight cover.
14. Turn the display panel right-side up.

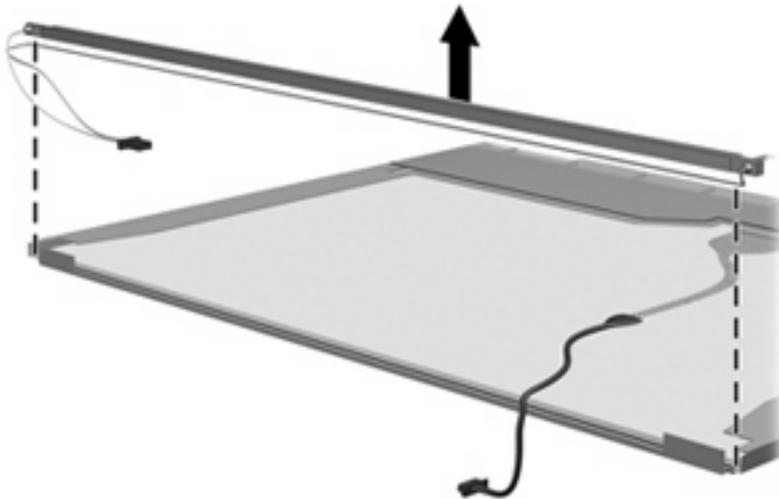
15. Remove the backlight cables (1) from the clip (2) in the display panel.



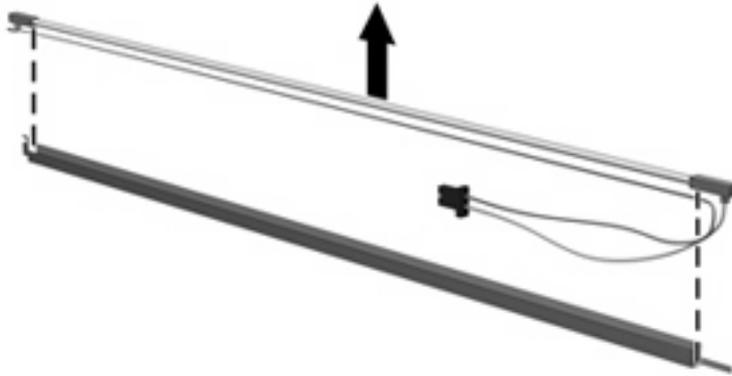
16. Turn the display panel upside down.

**⚠ WARNING!** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

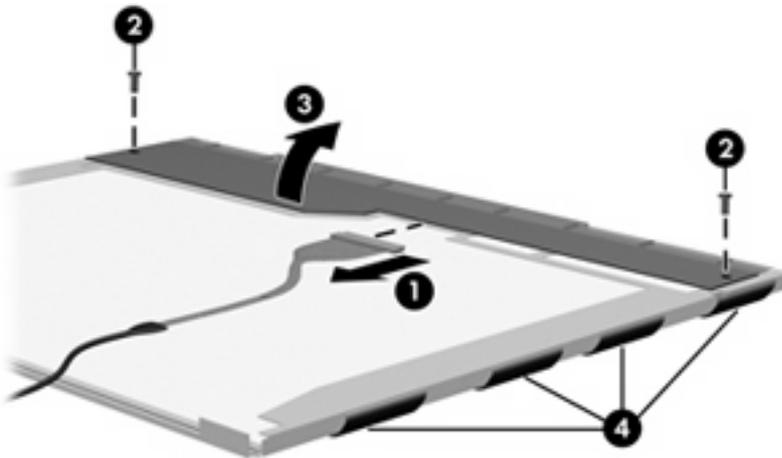
17. Remove the backlight frame from the display panel.



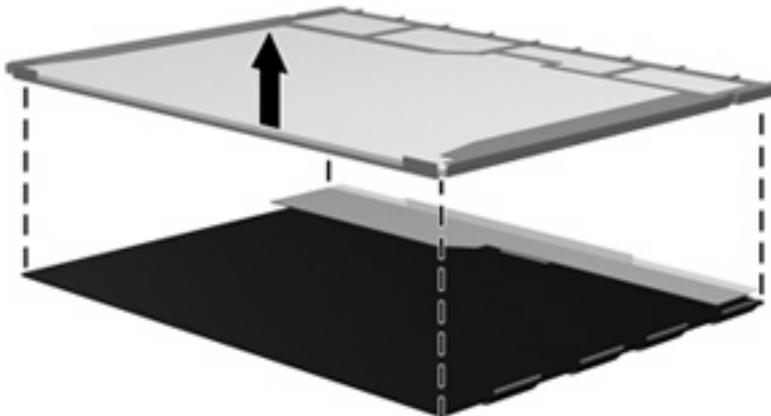
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel cable (1) from the LCD panel.
20. Remove the screws (2) that secure the LCD panel to the display rear panel.
21. Release the LCD panel (3) from the display rear panel.
22. Release the tape (4) that secures the LCD panel to the display rear panel.



23. Remove the LCD panel.



24. Recycle the LCD panel and backlight.

---

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