

# HP Compaq 2510p Notebook PC

## Maintenance and Service Guide

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## MSG revision history

Revision	Publication date	Description
A	October 2009	<p>The fingerprint reader board cable is included in the Cable Kit, spare part number 451722-001. The information was updated in the following locations: <a href="#">Illustrated parts catalog on page 18</a>, <a href="#">Cable Kit on page 26</a>, <a href="#">Sequential part number listing on page 29</a>, and <a href="#">Top cover on page 67</a>.</p> <p>The modem cable, LED cable, and capacity board cable are included in the Cable Kit, spare part number 451722-001. The information was updated in the following location: <a href="#">Cable Kit on page 26</a>.</p>
B	February 2011	<p>The Intel Core Duo U7700 1.33-GHz processor with 533-MHz FSB and 2-MB L2 cache was added in the following location: <a href="#">Product description on page 1</a>. The system board with the Intel Core Duo U7700 1.33-GHz processor, spare part number 464764-001, was added in the following locations: <a href="#">Computer major components on page 19</a>, <a href="#">Sequential part number listing on page 29</a>, and <a href="#">System board on page 70</a>.</p>



## 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

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Category	Description
<b>Branding</b>	<ul style="list-style-type: none"><li>• Long name: HP Compaq 2510p Notebook PC</li><li>• Short name: HP Compaq 2510p</li><li>• Logo badge: Compaq 2510p</li></ul>
<b>Processors</b>	Intel® Core™ Duo processors: <ul style="list-style-type: none"><li>• U7700 1.33-GHz processor with 533-MHz Front Side Bus (FSB) and 2-MB L2 cache</li><li>• U7600 1.20-GHz processor with 533-MHz FSB and 2-MB L2 cache</li><li>• U7500 1.06-GHz processor with 533-MHz FSB and 2-MB L2 cache</li></ul>
<b>Chipsets</b>	<ul style="list-style-type: none"><li>• Northbridge: Intel Crestline GM</li><li>• Southbridge: Intel ICH8-M enhanced</li></ul>
<b>Graphics</b>	Intel Crestline Graphics, Unified Memory Architecture (UMA), integrated with shared video memory, up to 384-MB shared memory
<b>Panels</b>	<ul style="list-style-type: none"><li>• 12.1 WXGA (1280 × 800), configured with 3 WLAN antennas and 2 WWAN antennas</li><li>• Supports privacy filter</li></ul>
<b>Memory</b>	<ul style="list-style-type: none"><li>• One SODIMM slot, customer accessible/upgradable</li><li>• PC2-5300, 667-MHz, DDRII</li><li>• Supports single-channel memory</li><li>• Supported configurations:<ul style="list-style-type: none"><li>◦ 4096-MB total system memory (4096 MB × 1)</li><li>◦ 2048-MB total system memory (2048 × 1)</li><li>◦ 1024-MB total system memory (1024 MB × 1)</li><li>◦ 512-MB total system memory (512 MB × 1)</li></ul></li></ul>

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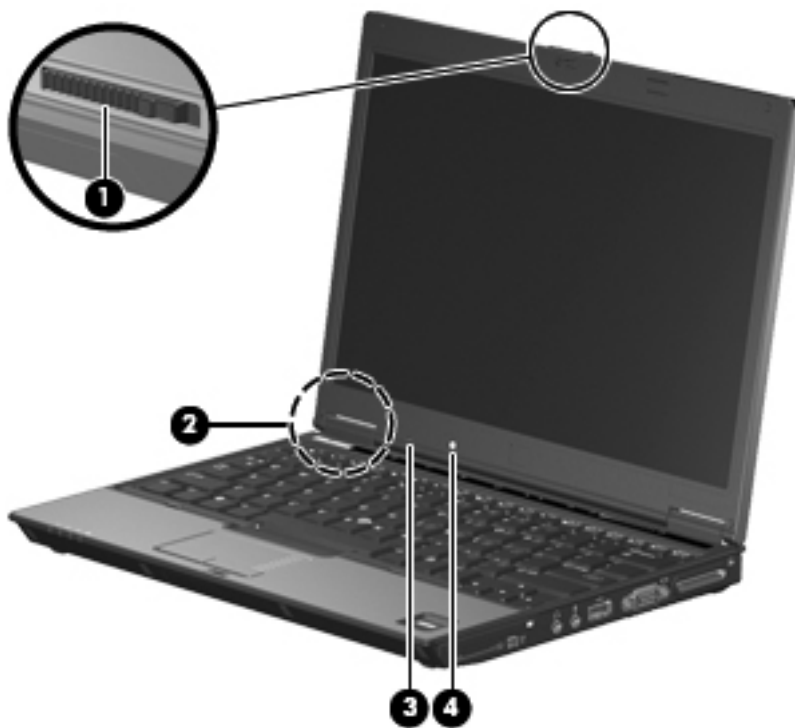
<b>Category</b>	<b>Description</b>
<b>Hard drives</b>	<ul style="list-style-type: none"> <li>• Supports all 1.8-inch hard drives</li> <li>• Parallel ATA</li> <li>• The following hard drives are available: <ul style="list-style-type: none"> <li>◦ 100-GB, 4200-rpm</li> <li>◦ 80-GB, 4200-rpm</li> <li>◦ 60-GB, 4200-rpm</li> </ul> </li> </ul>
<b>Optical drives</b>	<ul style="list-style-type: none"> <li>• 9.5-mm tray load</li> <li>• Parallel ATA</li> <li>• Removable with two screws</li> <li>• Supports the following optical formats: <ul style="list-style-type: none"> <li>◦ DVD±RW and CD-RW Super Multi Double-Layer Combo Drive</li> <li>◦ DVD/CD-RW Combo Drive</li> <li>◦ DVD-ROM Drive</li> </ul> </li> <li>• Supports no-optical-drive option with blank bezel</li> </ul>
<b>Diskette drive</b>	Supports an external Universal Serial Bus (USB) diskette drive only
<b>Audio</b>	<ul style="list-style-type: none"> <li>• Azalia ADI1981HD</li> <li>• Single speaker</li> <li>• Integrated monoaural microphone</li> <li>• Headphone and microphone jacks</li> </ul>
<b>Modem</b>	<ul style="list-style-type: none"> <li>• 56K, v.92, data/fax modem (MDC1.5)</li> <li>• Modem cable included in Brazil, the Czech Republic, France, Greece, Hungary, Israel, Latin America, Poland, Russia, Saudi Arabia, Slovakia, Slovenia, South Africa, Turkey, and the United Kingdom.</li> </ul>
<b>Ethernet</b>	<ul style="list-style-type: none"> <li>• Intel 10/100/1000 Ethernet</li> <li>• Network interface card (NIC) power-down</li> <li>• S4/S5 wake on LAN (on AC power only)</li> </ul>
<b>Wireless</b>	<b>Integrated wireless options by way of wireless module</b>

Category	Description
	<p><b>Wireless local area network (WLAN) options:</b></p> <ul style="list-style-type: none"> <li>• Broadcom 802.11a/b/g</li> <li>• Broadcom 802.11b/g</li> <li>• Intel 802.11a/b/g/n with iAMT support</li> <li>• Intel 802.11a/b/g with iAMT support</li> <li>• Intel 802.11b/g</li> <li>• Three 2.4-/5.0-GHz WLAN antennas built into display panel</li> <li>• Supports no-WLAN option</li> </ul>
	<p><b>Wireless wide area network (WWAN) options:</b></p> <ul style="list-style-type: none"> <li>• Evolution-data optimized (EVDO-A) WWAN module</li> <li>• High-speed downlink packet access (HSPDA) WWAN module</li> <li>• Subscriber identity module (SIM)</li> <li>• Two 5-band antennas built into display panel</li> </ul>
	<p><b>Wireless personal area network (WPAN) options:</b></p> <ul style="list-style-type: none"> <li>• Bluetooth® module</li> <li>• Supports no-WPAN option</li> </ul>
<b>External media card</b>	<ul style="list-style-type: none"> <li>• One Type I/II PC Card slot</li> <li>• 16-bit PCMCIA and 32-bit CardBus</li> <li>• Integrated SD flash media slot (SD/MMC support)</li> </ul>
<b>Ports</b>	<ul style="list-style-type: none"> <li>• 1394a port</li> <li>• Docking connector</li> <li>• Headphone connector</li> <li>• Microphone connector</li> <li>• Primary battery connector</li> <li>• RJ-11 modem port</li> <li>• RJ-45 Ethernet port</li> <li>• Smart AC adapter connector</li> <li>• USB ports (2)</li> <li>• VGA port (Dsub 15-pin) supporting 1600 × 1200 external resolution @ 75 Hz, hot plug/unplug, and auto detect</li> </ul>
<b>Docking</b>	Docking support

Category	Description
<b>Keyboard/pointing devices</b>	<ul style="list-style-type: none"> <li>• Spill-resistant keyboard with embedded numeric keypad, TouchPad, pointing stick, and fingerprint reader</li> <li>• Full-size, 19.05-mm pitch, 4.5-mm height keyboard</li> <li>• One-way scrolling (vertical)</li> <li>• Windows Vista™ hardware Start button</li> <li>• Durable key caps</li> </ul>
<b>Power requirements</b>	<p>Primary batteries:</p> <ul style="list-style-type: none"> <li>• 9-cell, 83-Wh, Li-ion battery with fuel gauge</li> <li>• 6-cell, 55-Wh, Li-ion battery with fuel gauge</li> <li>• 3-cell, 28-Wh Li-ion battery</li> <li>• 65-watt AC adapter with localized cable plug support and 3-wire plug</li> </ul>
<b>Security</b>	<ul style="list-style-type: none"> <li>• Support for Kensington security lock</li> <li>• Optional integrated active smart card reader (installed in the PC Card slot)</li> <li>• Integrated Infineon TPM 1.2 chip (soldered to PCB)</li> <li>• Integrated USB-based fingerprint reader</li> </ul>
<b>Operating system</b>	<p><b>Preinstalled:</b></p> <ul style="list-style-type: none"> <li>• Windows Vista Home Basic (32-bit)</li> <li>• Windows Vista Business (32- and 64-bit)</li> <li>• Windows® XP Professional</li> <li>• FreeDOS</li> </ul> <p><b>Certified:</b> Linux</p>
<b>Serviceability</b>	<p><b>End-user replaceable parts:</b></p> <ul style="list-style-type: none"> <li>• AC adapter</li> <li>• Battery</li> <li>• Bluetooth module</li> <li>• Hard drive</li> <li>• Memory module</li> <li>• Optical drive</li> <li>• Power cord</li> <li>• RTC battery</li> <li>• SIM</li> <li>• WLAN module</li> <li>• WWAN module</li> </ul>

## 2 External component identification

### Display components



Item	Component	Function
(1)	Display release latch	Opens the computer.
(2)	Internal display switch	Turns off the display if the display is closed while the computer is on.
(3)	Internal microphone	Records sound.
(4)	Ambient light sensor	When activated, the sensor automatically adjusts the display brightness based on the surrounding lighting conditions.

# Top components

## Buttons and fingerprint reader




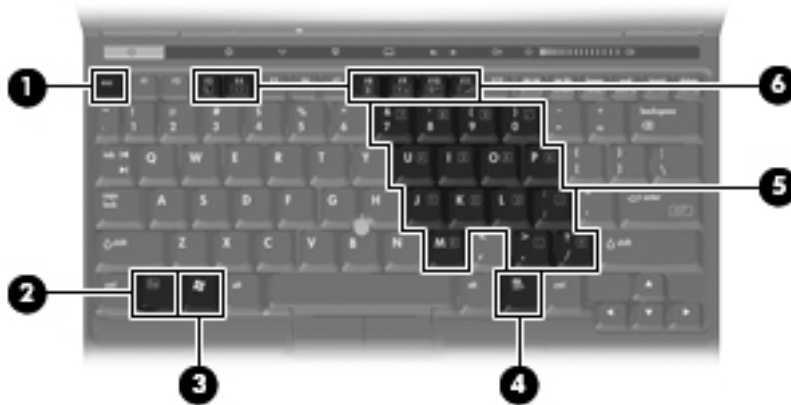
Item	Component	Function
(1)	Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button to shut down the computer.</li><li>• When the computer is in the Sleep state (Windows Vista) or in Standby (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 power settings, follow these steps:</p> <ul style="list-style-type: none"><li>• In Windows Vista, select <b>Start &gt; Control Panel &gt; System and Maintenance &gt; Power Options</b>.</li><li>• In Windows XP, select <b>Start &gt; Control Panel &gt; Performance and Maintenance &gt; Power Options</b>.</li></ul>
(2)	Info button	Launches Info Center, which enables you to open various software solutions.
(3)	Wireless button	Turns the wireless feature on or off, but does not establish a wireless connection.  <b>NOTE:</b> A wireless network must be set up in order to establish a wireless connection.
(4)	Presentation button	Starts the presentation feature.



Item	Component	Function
(5)	TouchPad on/off button	Turns the TouchPad on and off.
(6)	Volume mute button (select models only)	Mutes and restores speaker sound.
(7)	Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume.
(8)	HP Fingerprint Sensor	Allows a fingerprint logon to Windows, instead of a password logon.

## Keys

 **NOTE:** Your computer may look slightly different from the illustration in this section.



Item	Component	Function
(1)	<a href="#">esc</a> key	Displays system information when pressed in combination with the <a href="#">fn</a> key.
(2)	<a href="#">fn</a> key	Executes frequently used system functions when pressed in combination with a function key or the <a href="#">esc</a> 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 <a href="#">fn</a> key.

## Lights



Item	Component	Function
(1)	Wireless lights (2)*	<ul style="list-style-type: none"> <li>On: An integrated wireless device, such as a wireless local area network (WLAN) device, the HP Broadband Wireless Module, and/or a Bluetooth® device, is on.</li> <li>Off: All wireless devices are off.</li> </ul>
(2)	Power lights (2)†	<ul style="list-style-type: none"> <li>On: The computer is on.</li> <li>Blinking: The computer is in Standby.</li> <li>Blinking rapidly: An AC adapter with a higher power rating should be connected.</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>Green: 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>Blinking green: 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)	Caps lock light	On: Caps lock is on.

Item	Component	Function
(6)	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.
(7)	Volume mute light	<ul style="list-style-type: none"> <li>• Off: Computer sound is on.</li> <li>• On: Computer sound is off.</li> </ul>
(8)	Volume down light	On: The volume scroll zone is being used to decrease speaker volume.
(9)	Volume up light	On: The volume scroll zone is being used to increase speaker volume.

\*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.

†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.

## Pointing devices

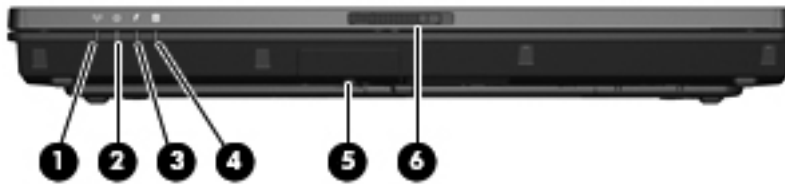


Item	Component	Function
(1)	TouchPad on/off button	Turns the TouchPad on and off.
(2)	Pointing stick	Moves the pointer and selects or activates items on the screen.
(3)	Left pointing stick button*	Functions like the left button on an external mouse.
(4)	TouchPad*	Moves the pointer and selects or activates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

\*This table describes factory settings. View or change pointing device preferences as follows:

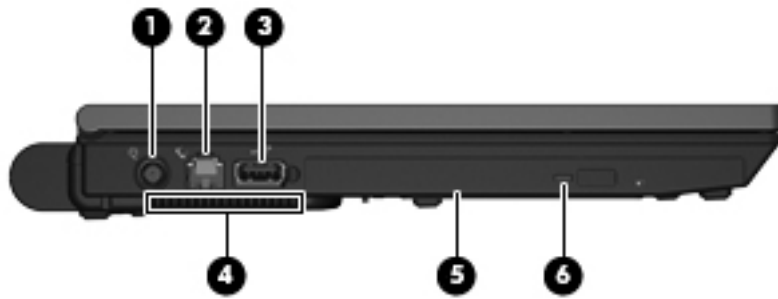
- In Windows Vista, select **Start > Control Panel > Hardware and Sound > Mouse**.
- In Windows XP, select **Start > Control Panel > Printers and Other Hardware > Mouse**.

# Front components



Item	Component	Function
(1)	Wireless light	<ul style="list-style-type: none"> <li>On: An integrated wireless device, such as a WLAN device, the HP Broadband Wireless Module, and/or a Bluetooth device, is turned on.</li> <li>Off: All wireless devices are turned 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 in Standby (Windows XP).</li> <li>Blinking rapidly: An AC adapter with a higher power rating should be connected.</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>Green: 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>Blinking green: The hard drive or optical drive is being accessed.</li> <li>Amber (select models only): HP 3D DriveGuard has temporarily parked the hard drive.</li> </ul>
(5)	Bluetooth module (select models only)	<p>Sends and receives Bluetooth device signals.</p> <p><b>WARNING! Exposure to Radio Frequency Radiation.</b> The radiated output power of this device is below the FCC radio frequency exposure limits. Nevertheless, the device should be used in such a manner that the potential for human contact during normal operation is minimized. To avoid the possibility of exceeding the FCC radio frequency exposure limits, human proximity to the antennae should be not less than 20 cm (8 inches) during normal operation, including when the computer display is closed.</p>
(6)	Display release latch	Opens the computer.

## Left-side components



Item	Component	Function
(1)	Power connector	Connects an AC adapter.
(2)	RJ-11 (modem) jack	Connects a modem cable.
(3)	USB port	Depending on your computer model, the USB port is either a standard USB port or a powered USB port. A standard USB port connects an optional USB device. A powered USB port provides power to an external device if used with a powered USB cable.
(4)	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.
(5)	Optical drive (select models only)	Reads an optical disc.
(6)	Optical drive light	Blinking: The optical drive is being accessed.


## Rear components

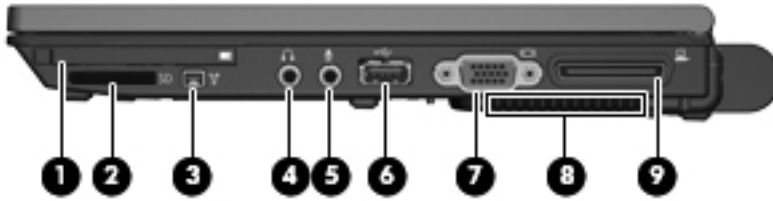


Item	Component	Function
(1)	RJ-45 (network) jack	Connects a network cable.
(2)	Security cable slot	Attaches an optional security cable to the computer.

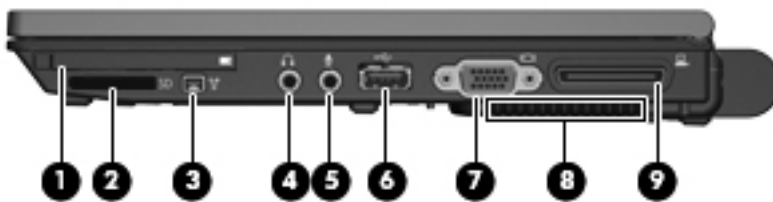
**NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

## Right-side components

 **NOTE:** Computer features vary depending on model. Refer to one of the following illustrations.



Item	Component	Function
(1)	PC Card slot (select models only)	Supports optional Type I or Type II PC Cards.
(2)	Media Card Reader	Supports the following optional digital card formats: Secure Digital (SD) Memory Card, MultiMediaCard (MMC).
(3)	1394a port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(4)	Audio-out (headphone) jack	Produces computer sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(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)	Docking connector	Connects an optional docking device.

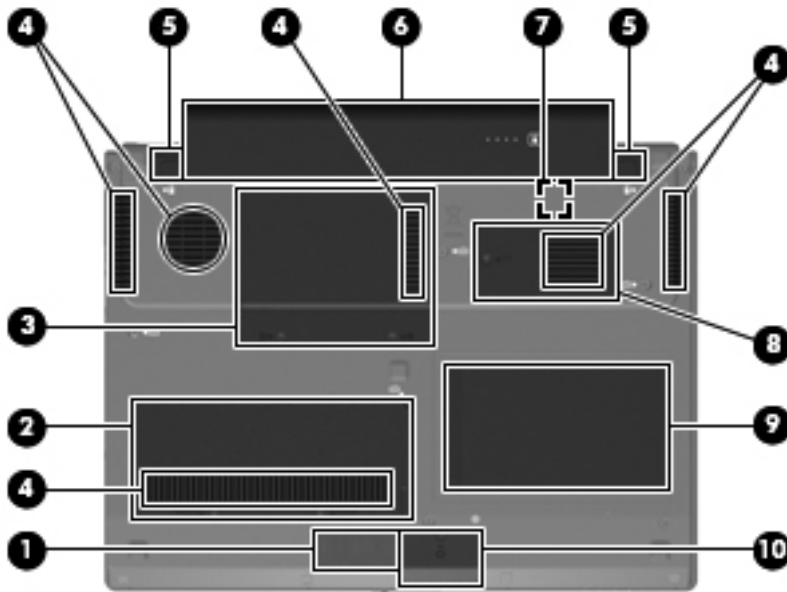


Item	Component	Function
(1)	Smart card reader (select models only)	Supports smart cards and Java™ Cards.
(2)	Media Card Reader	Supports the following optional digital card formats: Secure Digital (SD) Memory Card, MultiMediaCard (MMC).
(3)	1394a port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.



Item	Component	Function
(4)	Audio-out (headphone) jack	Produces computer sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.
(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)	Docking connector	Connects an optional docking device.

## Bottom components



Item	Component	Function
(1)	Speaker	Produces computer sound.
(2)	Memory module/WLAN module compartment	Contains a memory module slot and a WLAN module slot.  <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.
(3)	Hard drive bay	Holds the hard drive.
(4)	Vents (6)	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.
(5)	Battery release latches (2)	Release the battery from the battery bay.
(6)	Battery bay	Holds the battery.
(7)	SIM slot	Contains a subscriber identity module (SIM). The SIM slot is located inside the battery bay.

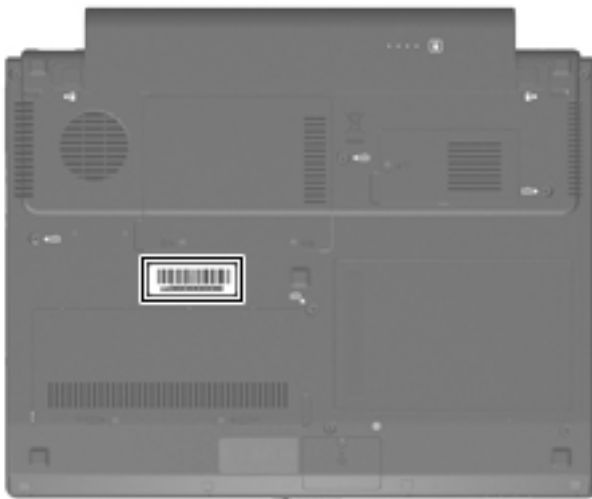
Item	Component	Function
(8)	WWAN module compartment	Contains a WWAN module slot.  <b>CAUTION:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or 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.
(9)	Business-card holder	Holds a standard-sized business card.
(10)	Bluetooth module compartment (select models only)	Contains a Bluetooth device.

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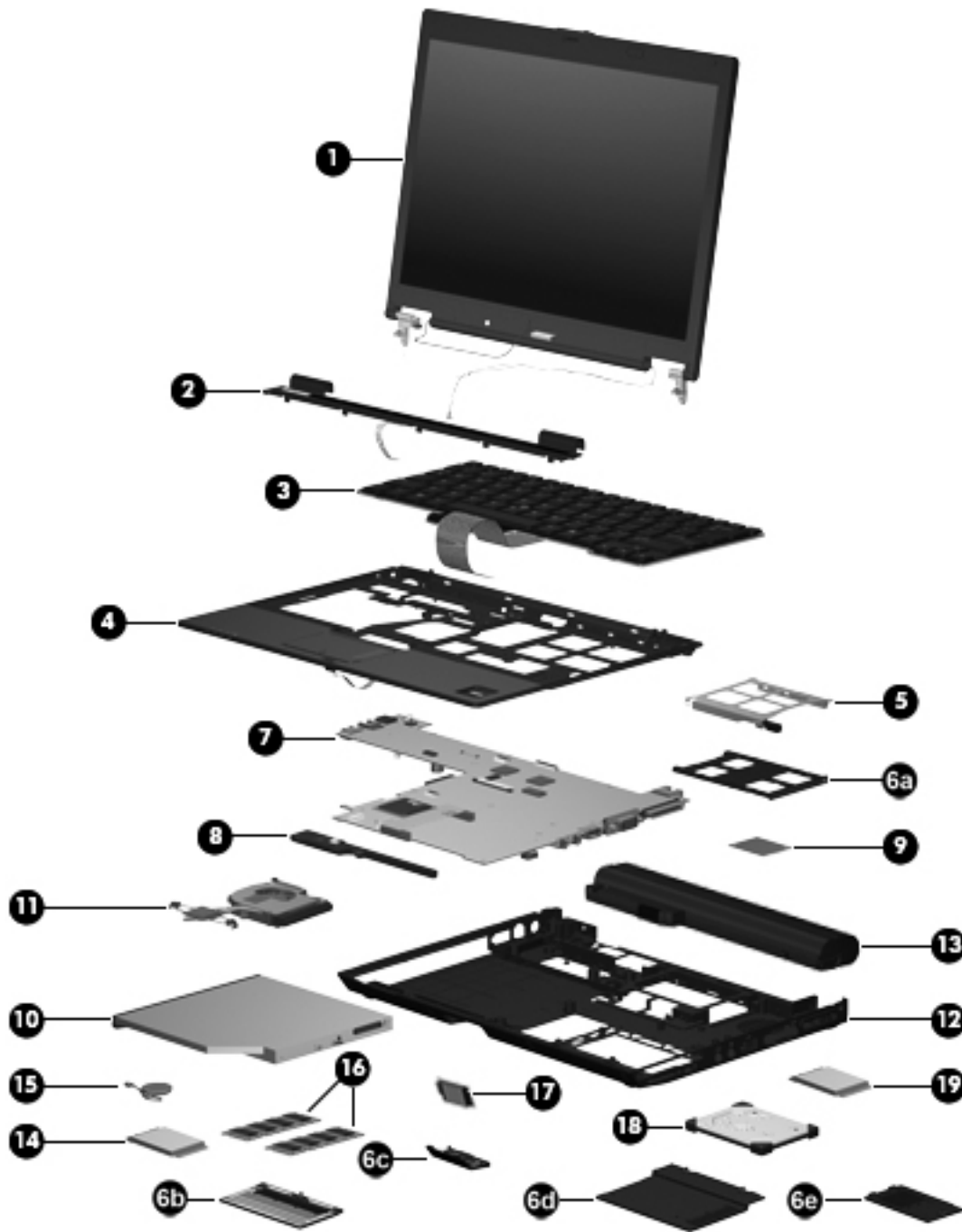
## 3 Illustrated parts catalog

### Serial number location

When ordering parts or requesting information, provide the computer serial number and model number located on the bottom of the computer.



# Computer major components



Item	Description	Spare part number
(1)	12.1-inch, WXGA display assembly with AntiGlare (includes wireless antenna transceivers and cables, and microphone and cable)	451741-001
<b>Display internal components:</b>		
	Display bezel	451733-001
	Display panel cable	451735-001

<b>Item</b>	<b>Description</b>	<b>Spare part number</b>
	Display enclosure (includes WLAN and WWAN antenna transceivers and cables)	451736-001
	Display hinges	451734-001
	Display lid switch module	451724-001
	Display Screw Kit	451737-001
<b>(2)</b>	<b>Switch cover</b> (includes LED board and cable)	451717-001
<b>(3)</b>	<b>Keyboards</b> (include pointing stick and pointing stick cable)	
	Belgium	451748-A41
	Brazil	451748-201
	The Czech Republic	451748-221
	Denmark	451748-081
	France	451748-051
	French Canada	451748-121
	Germany	451748-041
	Greece	451748-151
	Hungary	451748-211
	Iceland	451748-DD1
	The Netherlands and Europe	451748-021
	Israel	451748-BB1
	Italy	451748-061
	Japan	451748-291
	Latin America	451748-161
	Norway	451748-091
	Portugal	451748-131
	Russia	451748-251
	Saudi Arabia	451748-171
	Slovakia	451748-231
	Slovenia	451748-BA1
	South Korea	451748-AD1
	Spain	451748-071
	Sweden and Finland	451748-B71
	Switzerland	451748-111
	Taiwan	451748-AB1
	Thailand	451748-281
	Turkey	451748-141

Item	Description	Spare part number
	The United Kingdom	451748-031
	The United States	451748-001
(4)	<b>Top cover</b> (includes TouchPad and fingerprint reader board)	451723-001
	<b>NOTE:</b> <i>The fingerprint reader board cable is included in the Cable Kit, spare part number 451722-001.</i>	
(5)	<b>PC Card assembly</b>	451742-001
	<b>Plastics Kit</b> (see <a href="#">Plastics Kit on page 25</a> for more Plastics Kit spare part information):	451743-001
(6a)	PC Card slot bezel	
(6b)	Memory module/WLAN module compartment cover	
(6c)	Bluetooth module compartment cover	
(6d)	Hard drive cover	
(6e)	WWAN module compartment cover	
(7)	<b>System boards</b> (include thermal material and alcohol pad)	
	Equipped with Intel Core Duo U7700 (1.33-GHz) processor (533-MHz FSB and 2-MB L2 cache)	464764-001
	Equipped with Intel Core Duo U7600 (1.20-GHz) processor (533-MHz FSB and 2-MB L2 cache)	451720-001
	Equipped with Intel Core Duo U7500 (1.06-GHz) processor (533-MHz FSB and 2-MB L2 cache)	451719-001
(8)	<b>Speaker assembly</b>	451747-001
(9)	<b>Modem modules</b> (include modem module cable)	
	For use in all countries and regions except Australia and New Zealand	443899-001
	For use only in Australia and New Zealand	443899-011
(10)	<b>Optical drives</b> (include bezel)	
	DVD±RW and CD-RW Double-Layer Combo Drive	451727-001
	DVD/CD-RW Combo Drive	451725-001
	DVD-ROM Drive	451726-001
(11)	<b>Fan/heat sink assembly</b> (includes thermal material)	451731-001
(12)	<b>Base enclosure</b> (includes front LED board, front LED board cable, and rubber feet)	451712-001
	<b>Rubber Kit</b> (not illustrated; includes 5 rubber feet and 2 base enclosure screw covers)	451744-001
(13)	<b>Batteries</b>	
	9-cell, 83-Wh Li-ion	451715-001
	6-cell, 55-Wh Li-ion	451714-001
	3-cell, 28-Wh Li-ion	451713-001
(14)	<b>WLAN modules</b>	

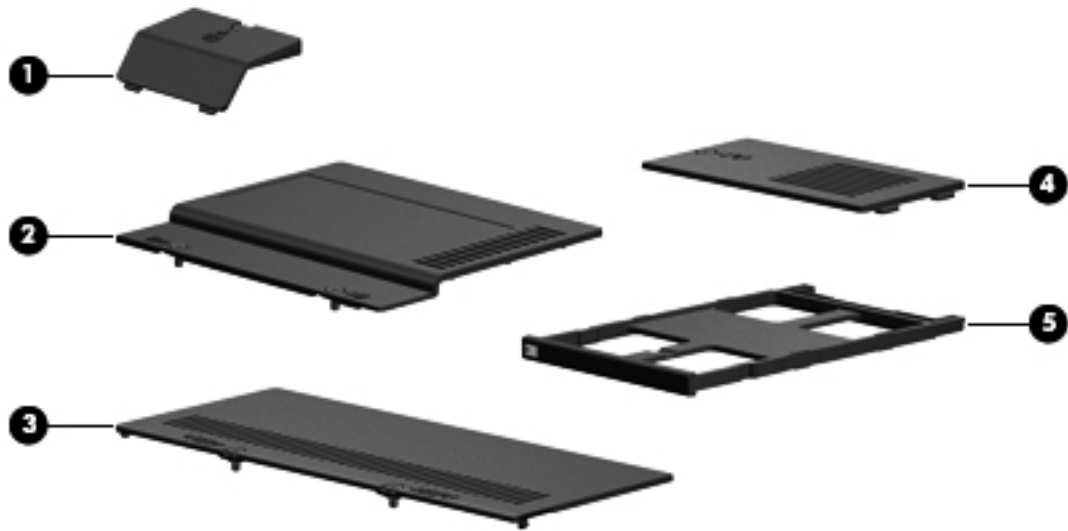
Item	Description	Spare part number
	802.11a/b/g/n Broadcom WLAN modules:	
	<ul style="list-style-type: none"> <li>For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States</li> </ul>	441530-001
	<ul style="list-style-type: none"> <li>For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua &amp; Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia &amp; Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Guam, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts &amp; Nevis, St. Lucia, St. Vincent &amp; Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad &amp; Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe</li> </ul>	441530-002
	<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441530-291
	802.11a/b/g/n Intel WLAN modules:	
	<ul style="list-style-type: none"> <li>For use in Antigua and 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>	441086-001
	<ul style="list-style-type: none"> <li>For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan</li> </ul>	441086-002
	<ul style="list-style-type: none"> <li>For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea</li> </ul>	441086-003
	<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441086-291
	802.11a/b/g Broadcom WLAN modules:	
	<ul style="list-style-type: none"> <li>For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States</li> </ul>	441075-001



Item	Description	Spare part number
	<ul style="list-style-type: none"> <li>For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, 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-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, 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, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia and Montenegro, 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 &amp; Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and 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>	441075-002
	<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441075-291
	802.11a/b/g Intel WLAN modules:	
	<ul style="list-style-type: none"> <li>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, the United States, Uruguay, Venezuela, and Vietnam</li> </ul>	441082-001
	<ul style="list-style-type: none"> <li>For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan</li> </ul>	441082-002
	<ul style="list-style-type: none"> <li>For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea</li> </ul>	441082-003
	<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441082-291
	802.11b/g Broadcom WLAN modules:	
	<ul style="list-style-type: none"> <li>For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States</li> </ul>	441090-001

Item	Description	Spare part number
	<ul style="list-style-type: none"> <li>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-Bissa, 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 and Montenegro, 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 &amp; Grenada, 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>	441090-002
	<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441090-291
	802.11b/g Intel WLAN module for use in Thailand	448675-004
<b>(15)</b>	<b>RTC battery</b>	451716-001
<b>(16)</b>	<b>Memory modules (667-MHz, PC2-5300, 1-DIMM)</b>	
	2048-MB	451739-001
	1024-MB	451738-001
	512-MB	451740-001
<b>(17)</b>	<b>Bluetooth module (includes Bluetooth module cable)</b>	451721-001
<b>(18)</b>	<b>Hard drives (include hard drive bracket and connector)</b>	
	100-GB, 4200-rpm	453504-001
	80-GB, 4200-rpm	451730-001
	60-GB, 4200-rpm	451729-001
<b>(19)</b>	<b>WWAN modules</b>	
	Verizon EVDO-A WWAN module	451131-001
	Cingular HSPDA WWAN module	448673-002
	Vodafone HSPDA WWAN module	448672-002
	<b>Cable Kit</b> (not illustrated; see <a href="#">Cable Kit on page 26</a> for more Cable Kit spare part number information)	451722-001
	<b>Smart card reader module</b> (not illustrated)	451746-001

# Plastics Kit



Item	Description	Spare part number
	<b>Plastics Kit:</b>	451743-001
(1)	Bluetooth module compartment cover (includes 1 captive screw, secured by a C-clip)	
(2)	Hard drive cover (includes 2 captive screws, secured by C-clips)	
(3)	Memory module/WLAN module compartment cover (includes 2 captive screws, secured by C-clips)	
(4)	WWAN module compartment cover (includes 1 captive screw, secured by a C-clip)	
(5)	PC Card slot bezel	

## Cable Kit

Item	Description	Spare part number
	<b>Cable Kit:</b>	451722-001
(1)	Bluetooth module cable	
(2)	<i>Fingerprint reader board cable</i>	
(3)	<i>Modem cable</i>	
(4)	<i>LED cable</i>	
(5)	<i>Capacity board cable</i>	

## Mass storage devices



Item	Description	Spare part number
(1)	<b>Optical drives</b> (include bezel)	
	DVD±RW and CD-RW Double-Layer Combo Drive	451727-001
	DVD/CD-RW Combo Drive	451725-001
	DVD-ROM Drive	451726-001
(2)	<b>Hard drives</b> (include isolator and connector cable)	
	100-GB, 4200-rpm	453504-001
	80-GB, 4200-rpm	451730-001
	60-GB, 4200-rpm	451729-001

## Miscellaneous parts

Description	Spare part number
<b>65-watt AC adapter</b> (HP Smart Adapter)	412786-001
<b>HP 2400 Ultra-Light Docking Station</b>	412787-001
<b>HP 2500 Ultra-Light Docking Station</b>	455157-001
<b>External MultiBay II</b>	366143-001
<b>External MultiBay II power cable and stand</b>	366144-001
<b>HP Extended Life Battery</b>	367456-001
<b>Label Kit</b>	451732-001
<b>MultiBay 8X DVD-ROM Drive</b>	373314-001
<b>MultiBay 24X DVD/CD-RW Combo Drive</b>	373315-001

<b>Description</b>	<b>Spare part number</b>
<b>Nylon carrying case</b>	325814-001
<b>USB 1.1 diskette drive</b>	359118-001
<b>Power cords:</b>	
For use in Argentina	394279-D01
For use in Australia	394279-011
For use in Brazil	394279-201
For use in Denmark	394279-081
For use in Europe, the Middle East, and Africa	394279-021
For use in Israel	394279-BB1
For use in India	394279-D61
For use in Italy	394279-061
For use in Japan	394279-291
For use in the People's Republic of China	394279-AA1
For use in South Korea	394279-AD1
For use in Switzerland	394279-111
For use in Taiwan	394279-AB1
For use in the United Kingdom	394279-031
For use the United States	394279-001
<b>Screw Kit</b>	451745-001
<ul style="list-style-type: none"> <li>• Phillips PM2.5×4.0 screw</li> <li>• Phillips PM2.0×10.0 screw</li> <li>• Phillips PM2.0×5.0 captive screw</li> <li>• Phillips PM2.0×5.0 screw</li> <li>• Phillips PM2.0×4.0 screw</li> <li>• Phillips PM2.0×3.0 screw</li> <li>• Phillips PM2.0×2.0 broad-head screw</li> <li>• Phillips PM2.0×2.0 screw</li> <li>• Phillips PM1.5×3.0 screw</li> <li>• Torx T8M2.5×7.0 screw</li> <li>• Torx T8M2.5×4.0 screw</li> <li>• Torx T6M2.0×5.0 screw</li> </ul>	

## Sequential part number listing

Spare part number	Description
394279-001	3-wire power cord for use in the United States
394279-011	3-wire power cord for use in Australia
394279-021	3-wire power cord for use in Europe
394279-031	3-wire power cord for use in the United Kingdom
394279-061	3-wire power cord for use in Italy
394279-081	3-wire power cord for use in Denmark
394279-111	3-wire power cord for use in Switzerland
394279-201	3-wire power cord for use in Brazil
394279-291	3-wire power cord for use in Japan
394279-AA1	3-wire power cord for use in the People's Republic of China
394279-AB1	3-wire power cord for use in Taiwan
394279-AD1	3-wire power cord for use in South Korea
394279-BB1	3-wire power cord for use in Israel
394279-D01	3-wire power cord for use in Argentina
394279-D61	3-wire power cord for use in India
412786-001	65-watt AC adapter (HP Smart Adapter)
412787-001	HP 2400 Ultra-Light Docking Station
441075-001	802.11a/b/g Broadcom WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441075-002	802.11a/b/g Broadcom WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, 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-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, 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, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, 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 & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, Ukraine, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Vanuatu, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
441075-291	802.11a/b/g Broadcom WLAN module for use in Japan

<b>Spare part number</b>	<b>Description</b>
441082-001	802.11a/b/g Intel 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, the United States, Uruguay, Venezuela, and Vietnam
441082-002	802.11a/b/g Intel WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan
441082-003	802.11a/b/g Intel WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea
441082-291	802.11a/b/g Intel WLAN module for use in Japan
441086-001	802.11a/b/g/n Intel WLAN module for use in Antigua and 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
441086-002	802.11a/b/g/n Intel WLAN module for use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan
441086-003	802.11a/b/g/n Intel WLAN module for use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea
441086-291	802.11a/b/g/n Intel WLAN module for use in Japan
441090-001	802.11b/g Broadcom WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441090-002	802.11b/g Broadcom 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 and Montenegro, 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 & Grenada, 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
441090-291	802.11b/g Broadcom WLAN module for use in Japan



Spare part number	Description
441530-001	802.11a/b/g/n Broadcom WLAN module for use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States
441530-002	802.11a/b/g/n Broadcom WLAN module for use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua & Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia & Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome & Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts & Nevis, St. Lucia, St. Vincent & Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad & Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe
441530-291	802.11a/b/g/n Broadcom WLAN module for use in Japan
443899-001	Modem module for use in all countries and regions except Australia and New Zealand (includes modem module cable)
443899-011	Modem module for use only in Australia and New Zealand (includes modem module cable)
448672-002	Vodafone HSPDA WWAN module
448673-002	Cingular HSPDA WWAN module
448675-004	802.11b/g Intel WLAN module for use in Thailand
451131-001	Verizon EVDO-A WWAN module
451712-001	Base enclosure (includes front LED board, front LED board cable, and rubber feet)
451713-001	3-cell, 28-Wh Li-ion battery
451714-001	6-cell, 55-Wh Li-ion battery
451715-001	9-cell, 83-Wh Li-ion battery
451716-001	RTC battery
451717-001	Switch cover (includes LED board and cable)
451719-001	System board equipped with Intel Core Duo U7600 (1.20-GHz) processor (533-MHz FSB and 2-MB L2 cache; includes thermal material and alcohol pad)
451720-001	System board equipped with Intel Core Duo U7500 (1.06-GHz) processor (533-MHz FSB and 2-MB L2 cache; includes thermal material and alcohol pad)
451721-001	Bluetooth module (includes Bluetooth module cable)
451722-001	Cable Kit (see <a href="#">Cable Kit on page 26</a> for more Cable Kit spare part number information)
451723-001	Top cover (includes TouchPad and fingerprint reader board)

**NOTE:** *The fingerprint reader board cable is included in the Cable Kit, spare part number 451722-001.*

<b>Spare part number</b>	<b>Description</b>
451724-001	Display lid switch module
451725-001	DVD/CD-RW Combo Drive
451726-001	DVD-ROM Drive
451727-001	DVD±RW and CD-RW Double-Layer Combo Drive
451729-001	60-GB, 4200-rpm hard drive (includes hard drive bracket and connector)
451730-001	80-GB, 4200-rpm hard drive (includes hard drive bracket and connector)
451731-001	Fan/heat sink assembly (includes thermal material)
451732-001	Label Kit
451733-001	Display bezel
451734-001	Display hinges
451735-001	Display panel cable
451736-001	Display enclosure (includes WLAN and WWAN antenna transceivers and cables)
451737-001	Display Screw Kit
451738-001	1024-MB memory module (667-MHz, PC2-5300, 1-DIMM)
451739-001	2048-MB memory module (667-MHz, PC2-5300, 1-DIMM)
451740-001	512-MB memory module (667-MHz, PC2-5300, 1-DIMM)
451741-001	12.1-inch, WXGA display assembly with AntiGlare (includes wireless antenna transceivers and cables and microphone and cable)
451742-001	PC Card assembly
451743-001	Plastics Kit (see <a href="#">Plastics Kit on page 25</a> for more Plastics Kit spare part information):
451744-001	Rubber Kit (includes 5 computer feet and 2 base enclosure screw covers)
451745-001	Screw Kit
451746-001	Smart card reader module
451747-001	Speaker assembly
451748-001	Keyboard for use in the United States
451748-021	Keyboard for use in the Netherlands and Europe
451748-031	Keyboard for use in the United Kingdom
451748-041	Keyboard for use in Germany
451748-051	Keyboard for use in France
451748-061	Keyboard for use in Italy
451748-071	Keyboard for use in Spain
451748-081	Keyboard for use in Denmark
451748-091	Keyboard for use in Norway
451748-111	Keyboard for use in Switzerland

<b>Spare part number</b>	<b>Description</b>
451748-121	Keyboard for use in French Canada
451748-131	Keyboard for use in Portugal
451748-141	Keyboard for use in Turkey
451748-151	Keyboard for use in Greece
451748-161	Keyboard for use in Latin America
451748-171	Keyboard for use in Saudi Arabia
451748-201	Keyboard for use in Brazil
451748-211	Keyboard for use in Hungary
451748-221	Keyboard for use in the Czech Republic
451748-231	Keyboard for use in Slovakia
451748-251	Keyboard for use in Russia
451748-281	Keyboard for use in Thailand
451748-291	Keyboard for use in Japan
451748-A41	Keyboard for use in Belgium
451748-AB1	Keyboard for use in Taiwan
451748-AD1	Keyboard for use in South Korea
451748-B71	Keyboard for use in Sweden and Finland
451748-BA1	Keyboard for use in Slovenia
451748-BB1	Keyboard for use in Israel
451748-DD1	Keyboard for use in Iceland
453504-001	100-GB, 4200-rpm hard drive (includes hard drive bracket and connector)
455157-001	HP 2500 Ultra-Light Docking Station
464764-001	System board equipped with Intel Core Duo U7700 (1.33-GHz) processor (533-MHz FSB and 2-MB L2 cache; includes thermal material and alcohol pad)

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# 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.

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### Plastic parts

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

Avoid exposing a 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."

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## 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.

Use nonmagnetic tools.

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 strips 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:



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**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 41](#)).
5. Remove the real-time clock (RTC) battery (see [RTC battery on page 47](#)).
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.

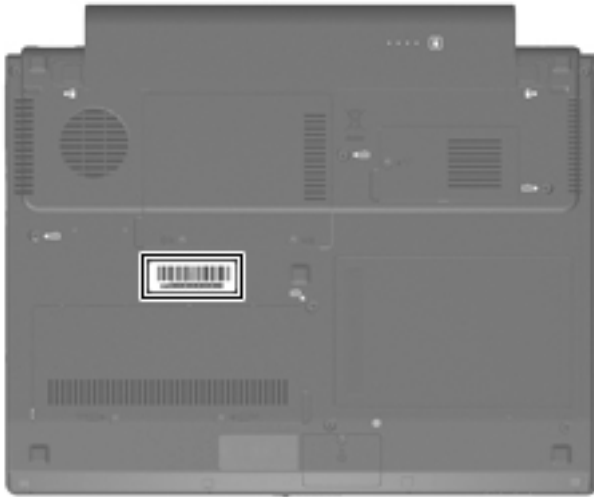
## Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 67 screws, in 12 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.

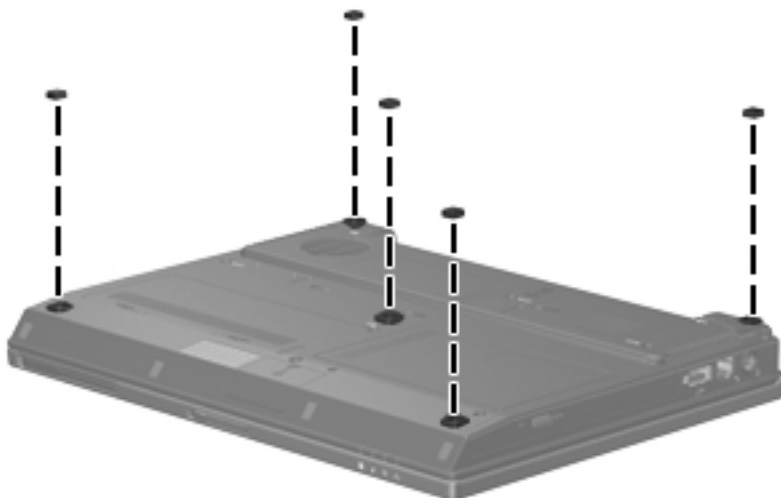
### Serial number

Report the computer serial number to HP when requesting information or ordering spare parts. The serial number is located on the bottom of the computer.



### Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Kit, spare part number 451744-001. There are 5 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

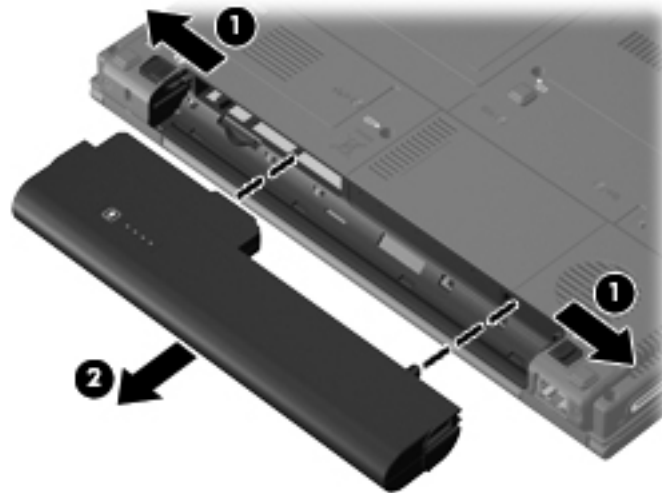
Description	Spare part number
9-cell, 83-Ah, Li-ion battery	451715-001
6-cell, 55-Ah, Li-ion battery	451714-001
3-cell, 28-Ah, Li-ion battery	451713-001

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.

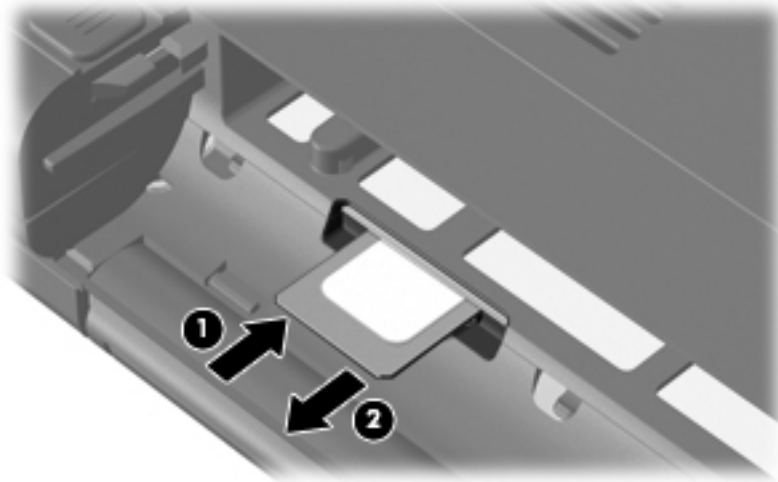
**NOTE:** If there is a SIM inserted in the SIM slot, it must be removed before disassembling the computer. Be sure that the SIM is reinserted in the SIM slot after reassembling the computer.

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 41](#)).

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 install the SIM.

## Bluetooth module

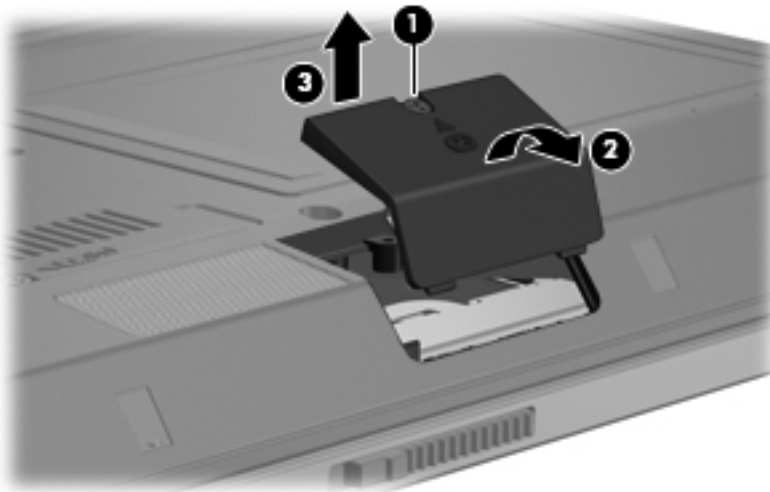
Description	Spare part number
Bluetooth (includes Bluetooth module cable)	451721-001

Before removing the Bluetooth module, follow these steps:

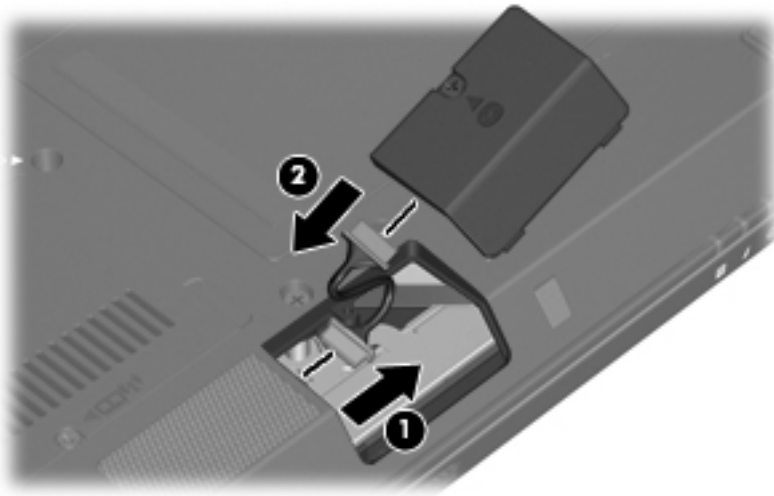
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).

Remove the Bluetooth® module:

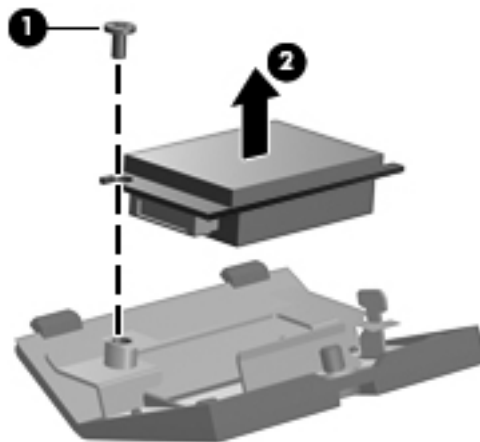
1. Position the computer with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw (1) that secures the Bluetooth module compartment cover to the computer.
3. Tilt the cover (2) forward to disengage it from the base enclosure.
4. Swing the cover (3) up and back to remove it from the base enclosure. The Bluetooth module compartment cover is included in the Plastics Kit, spare part number 451743-001.



5. Disconnect the Bluetooth module cable from the system board (1) and from the Bluetooth module (2).



6. Remove the Phillips PM2.0×5.0 screw (1) that secures the Bluetooth module to the Bluetooth module compartment cover.
7. Remove the Bluetooth module (2) from the cover.



Reverse this procedure to reassemble and install the Bluetooth module.

## Memory module

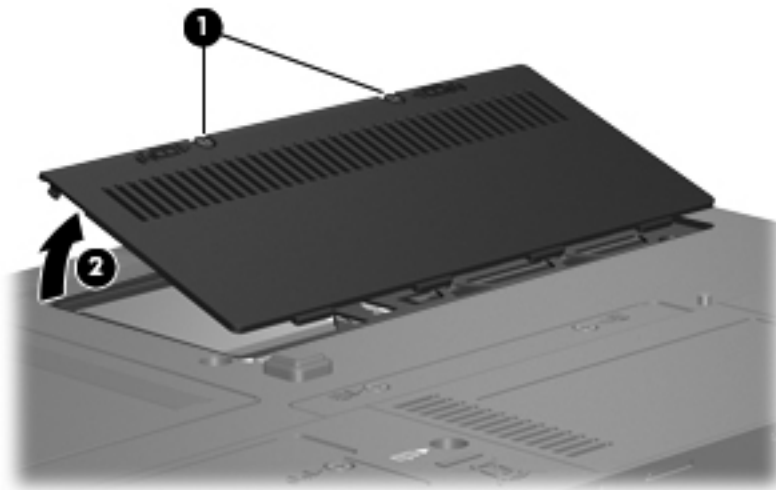
Description	Spare part number
2048-MB (667-MHz, PC2-5300, 1-DIMM)	451739-001
1024-MB (667-MHz, PC2-5300, 1-DIMM)	451738-001
512-MB (667-MHz, PC2-5300, 1-DIMM)	451740-001

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 41](#)).


Remove the memory module:

1. Position the computer with the rear panel toward you.
2. Loosen the two Phillips PM2.0×5.0 captive screws **(1)** that secure the memory module/WLAN module compartment cover to the computer.
3. Lift the rear edge of the cover **(2)**, swing it up and forward, and remove the cover. The memory module/WLAN module compartment cover is included in the Plastics Kit, spare part number 451743-001.

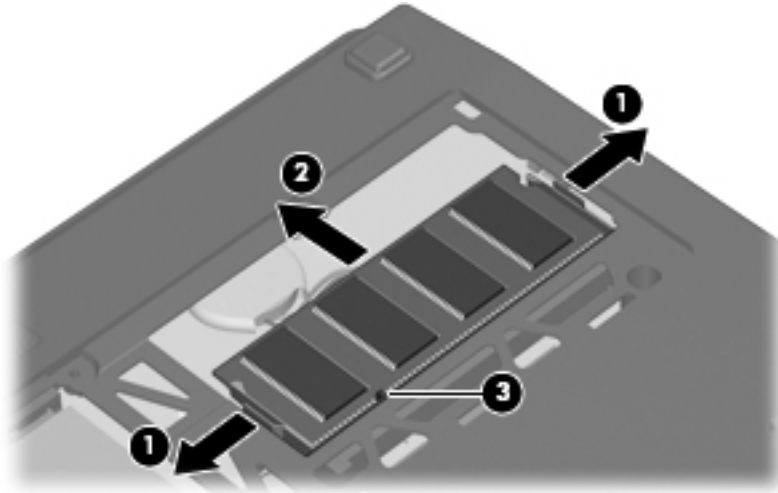


4. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

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

 **NOTE:** Memory modules are designed with a notch (3) to prevent incorrect installation into the memory module slot.


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Reverse this procedure to install the memory module.



## 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.

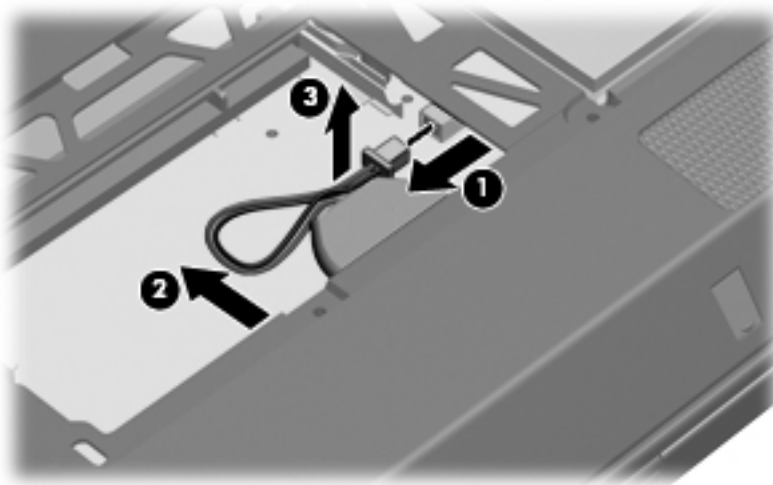
Description	Spare part number
RTC battery	451716-001

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 41](#)).
5. Remove the memory module (see [Memory module on page 45](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable (1) from the system board.
2. Release the RTC battery (2) from the clip built into the base enclosure by sliding it forward.
3. Remove the RTC battery (3).



Reverse this procedure to install the RTC battery.

## WLAN module

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

Description	Spare part number
802.11a/b/g/n Broadcom WLAN modules:	
<ul style="list-style-type: none"> <li>For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States</li> </ul>	441530-001
<ul style="list-style-type: none"> <li>For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua &amp; Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belgium, Belize, Benin, Bermuda, Bolivia, Bosnia &amp; Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, Cameroon, Cape Verde, the Cayman Islands, 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, Guam, Guatemala, Guinea, Guinea-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Italy, the Ivory Coast, Jamaica, Jordan, Kenya, Kiribati, Kyrgyzstan, Laos, Latvia, Lesotho, Liberia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Madagascar, Malawi, the Maldives, Mali, Malta, the Marshall Islands, Martinique, Mauritania, Mauritius, Mexico, Micronesia, Monaco, Mongolia, Montenegro, Morocco, Mozambique, Namibia, Nauru, Nepal, the Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Norway, Oman, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia and Montenegro, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, Spain, Sri Lanka, St. Kitts &amp; Nevis, St. Lucia, St. Vincent &amp; Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad &amp; Tobago, Tunisia, Turkey, Turkmenistan, Tuvalu, Uganda, the United Arab Emirates, the United Kingdom, Uruguay, Uzbekistan, Venezuela, Vietnam, Yemen, Zaire, Zambia, and Zimbabwe</li> </ul>	441530-002
<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441530-291
802.11a/b/g/n Intel WLAN modules:	
<ul style="list-style-type: none"> <li>For use in Antigua and 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>	441086-001
<ul style="list-style-type: none"> <li>For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan</li> </ul>	441086-002
<ul style="list-style-type: none"> <li>For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea</li> </ul>	441086-003
<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441086-291
802.11a/b/g Broadcom WLAN modules:	
<ul style="list-style-type: none"> <li>For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States</li> </ul>	441075-001

Description	Spare part number
<ul style="list-style-type: none"> <li>For use in Afghanistan, Albania, Algeria, Andorra, Angola, Antigua and Barbuda, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Barbados, Belarus, Belgium, Belize, Benin, Bermuda, Bhutan, Bolivia, Bosnia and Herzegovina, Botswana, Brazil, the British Virgin Islands, Brunei, Bulgaria, Burkina Faso, Burundi, 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-Bissa, Guyana, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Jordan, Kazakhstan, Kenya, Kiribati, 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, Pakistan, Palau, Panama, Papua New Guinea, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome &amp; Principe, Saudi Arabia, Senegal, Serbia and Montenegro, 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 &amp; Grenada, Suriname, Swaziland, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Togo, Tonga, Trinidad and 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>	441075-002
<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441075-291
802.11a/b/g Intel WLAN modules:	
<ul style="list-style-type: none"> <li>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, the United States, Uruguay, Venezuela, and Vietnam</li> </ul>	441082-001
<ul style="list-style-type: none"> <li>For use in Austria, Azerbaijan, Bahrain, Belgium, Brazil, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, the Netherlands, Norway, Oman, the Philippines, Poland, Portugal, Qatar, Romania, Russia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Turkey, Ukraine, the United Kingdom, and Uzbekistan</li> </ul>	441082-002
<ul style="list-style-type: none"> <li>For use in Australia, New Zealand, Pakistan, the People's Republic of China, and South Korea</li> </ul>	441082-003
<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441082-291
802.11b/g Broadcom WLAN modules:	
<ul style="list-style-type: none"> <li>For use in Canada, the Cayman Islands, Guam, Puerto Rico, the U.S. Virgin Islands, and the United States</li> </ul>	441090-001


Description	Spare part number
<ul style="list-style-type: none"> <li>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-Bissa, 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 and Montenegro, 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 &amp; Grenada, 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>	441090-002
<ul style="list-style-type: none"> <li>For use in Japan</li> </ul>	441090-291
802.11b/g Intel WLAN module for use in Thailand	448675-004

Before removing the WLAN module, follow these steps:

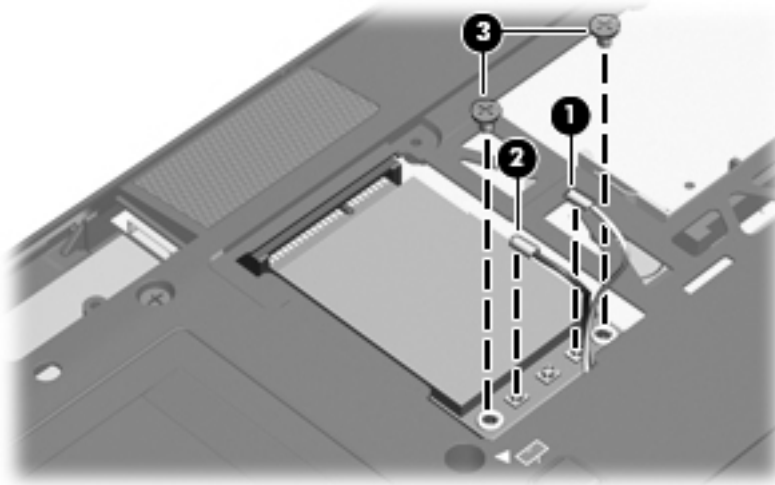
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the memory module/WLAN module compartment cover (see [Memory module on page 45](#)).

Remove the WLAN module:


1. Disconnect the WLAN antenna cables **(1)** and **(2)** from the terminals on the WLAN module.

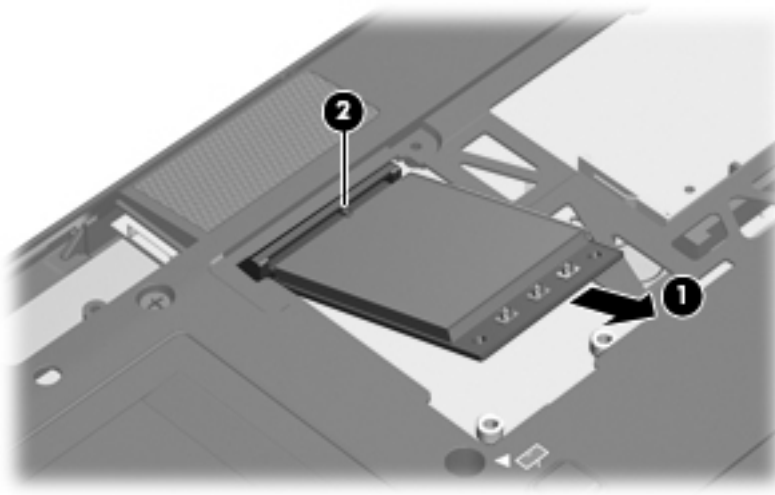
 **NOTE:** The WLAN antenna cable labeled (1) is connected to the WLAN module “Main” terminal. The WLAN antenna cable labeled (2) is connected to the WLAN module “Aux” terminal. To easily identify the correct cable locations, matching numbers are displayed on the modules next to the antenna connectors.

2. Remove the two Phillips PM2.0×3.0 screws (3) that secure the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)



3. Remove the WLAN module (1) by pulling the module away from the slot at an angle.

 **NOTE:** WLAN modules are designed with a notch (2) to prevent incorrect installation.



Reverse this procedure to install the WLAN module.

## Hard drive

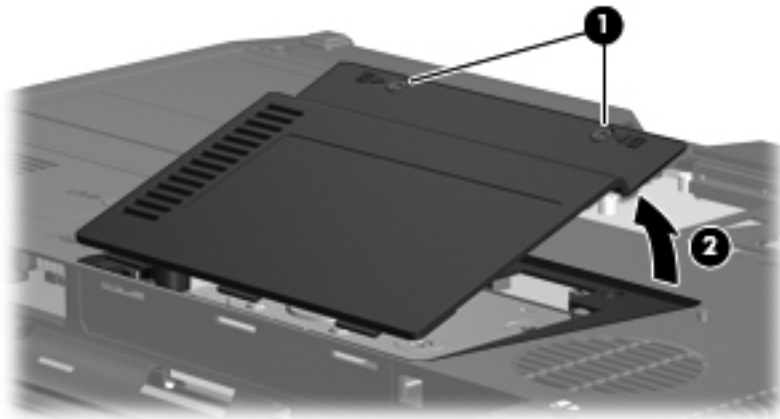
Description	Spare part number
100-GB, 4200-rpm hard drive	453504-001
80-GB, 4200-rpm hard drive	451730-001
60-GB, 4200-rpm hard drive	451729-001

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.
4. Remove the battery (see [Battery on page 41](#)).

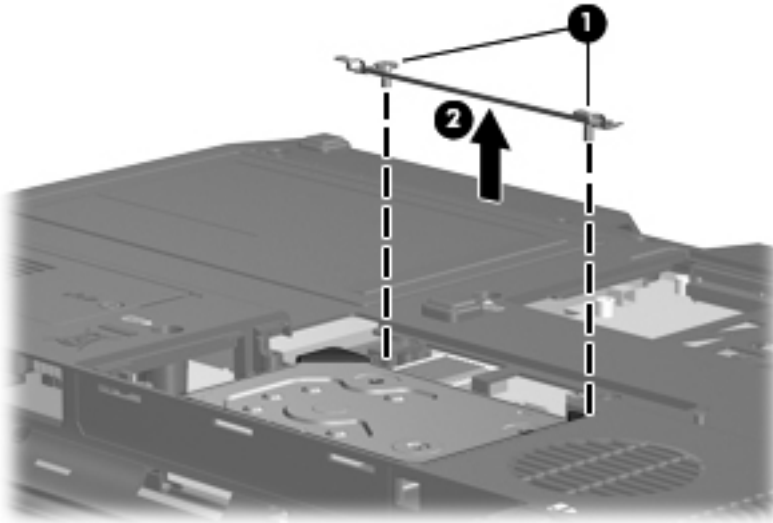
Remove the hard drive:

1. Loosen the two Phillips PM2.0×5.0 captive screws (1) that secure the hard drive cover to the computer.
2. Lift the front edge of the hard drive cover (2), swing it up and back, and remove the cover. The hard drive cover is included in the Plastics Kit, spare part number 451743-001.

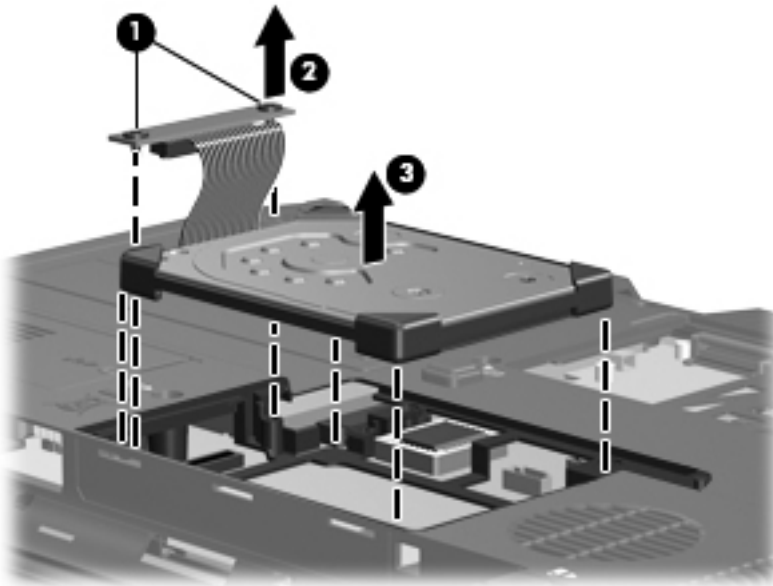


3. Loosen the two Phillips PM2.0×5.0 captive screws (1) that secure the hard drive bracket to the computer.

4. Remove the hard drive bracket (2).



5. Loosen the two Phillips PM2.0×5.0 captive screws (1) that secure the hard drive connector to the system board.
6. Disconnect the hard drive connector (2) from the system board.
7. Lift the hard drive (3) straight up to remove it from the hard drive.



Reverse this procedure to install the hard drive.

## WWAN module

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

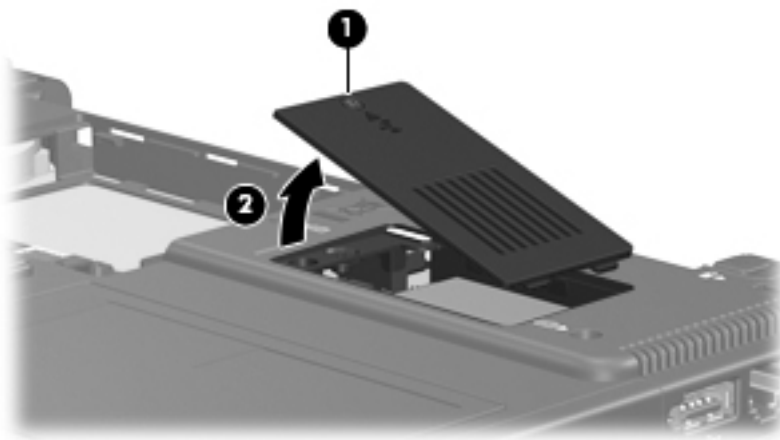
Description	Spare part number
Verizon EVDO-A WWAN module	451131-001
Cingular HSPDA WWAN module	448673-002
Vodafone HSPDA WWAN module	448672-002

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 41](#)).
5. Remove the SIM (see [SIM on page 42](#)).

Remove the WWAN module:

1. Position the computer with the front toward you.
2. Loosen the Phillips PM2.0×5.0 captive screw (1) that secures the WWAN module compartment cover to the computer.
3. Lift the left side of the WWAN module compartment cover (2), swing it up and to the right, and remove the cover. The WWAN module compartment cover is included in the Plastics Kit, spare part number 451743-001.

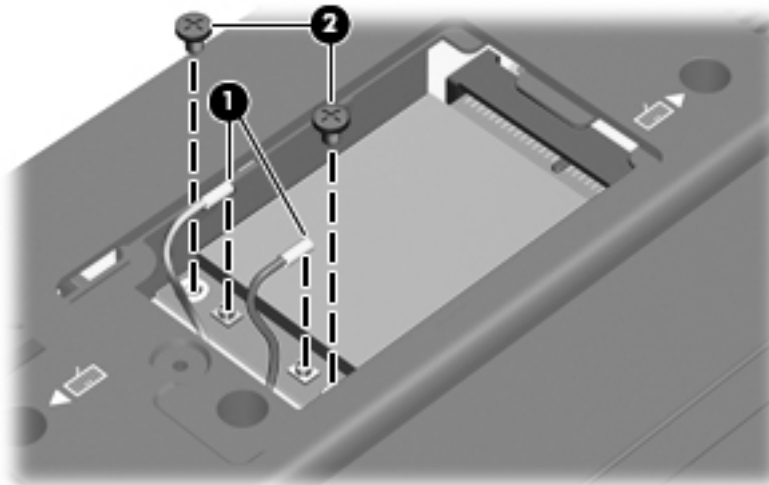


4. Disconnect the WWAN antenna cables (1) from the terminals on the WWAN module.


 **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.

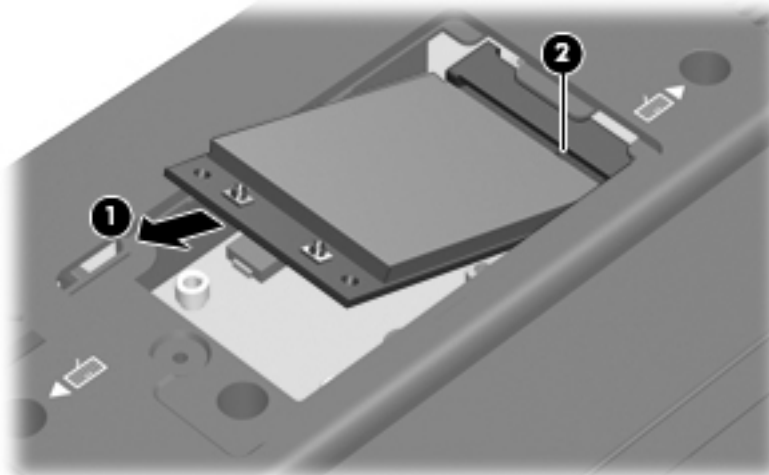


5. Remove the two Phillips PM2.5×4.0 screws (2) that secure the WWAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)



6. Remove the WWAN module (1) by pulling the module away from the slot at an angle.

 **NOTE:** WWAN modules are designed with a notch (2) to prevent incorrect installation.



Reverse this procedure to install the WWAN module.

## Optical drive

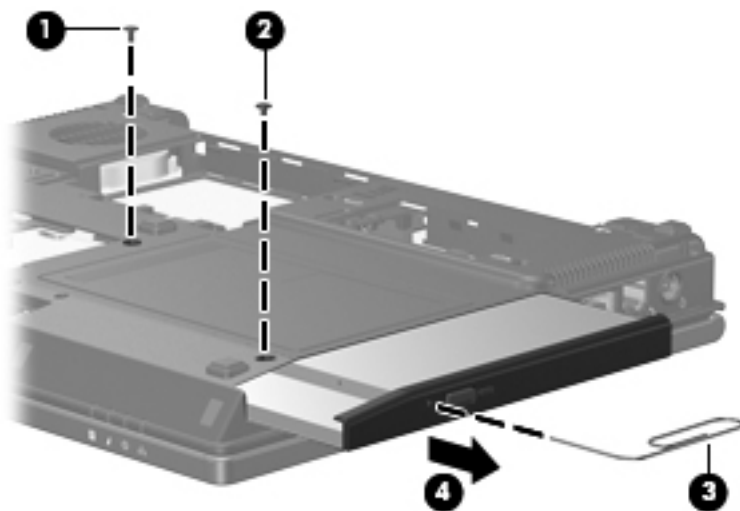
Description	Spare part number
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	451727-001
DVD/CD-RW Combo Drive	451725-001
DVD-ROM Drive	451726-001

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 41](#)).

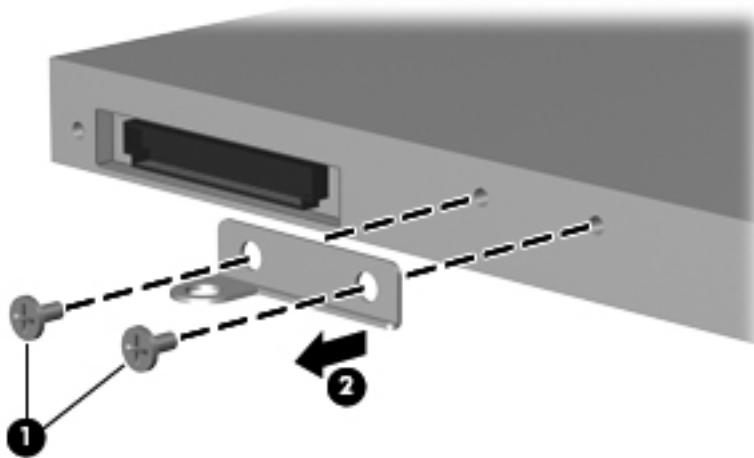
Remove the optical drive:

1. Position the computer with the right side toward you.
2. Remove the Torx T8M2.5×7.0 screw (1) that secures the optical drive to the computer.
3. If present, remove the Torx T8M2.5×4.0 security screw (2) that secures the optical drive to the computer.
4. Insert a thin tool, such as a paper clip (3), into the disc tray release access. (The optical drive disc tray is partially ejected from the optical drive.)
5. Use the disc tray frame to slide the optical drive (4) out of the computer.



6. If it is necessary to replace the optical drive bracket, position the optical drive with the optical drive bracket toward you.

7. Remove the two Phillips PM2.0×3.0 screws (1) that secure the optical drive bracket to the optical drive.
8. Remove the optical drive bracket (2).



Reverse this procedure to reassemble and install the optical drive.

## Switch cover

Description	Spare part number
Switch cover (includes LED board and cable)	451717-001

Before removing the switch 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 41](#)).

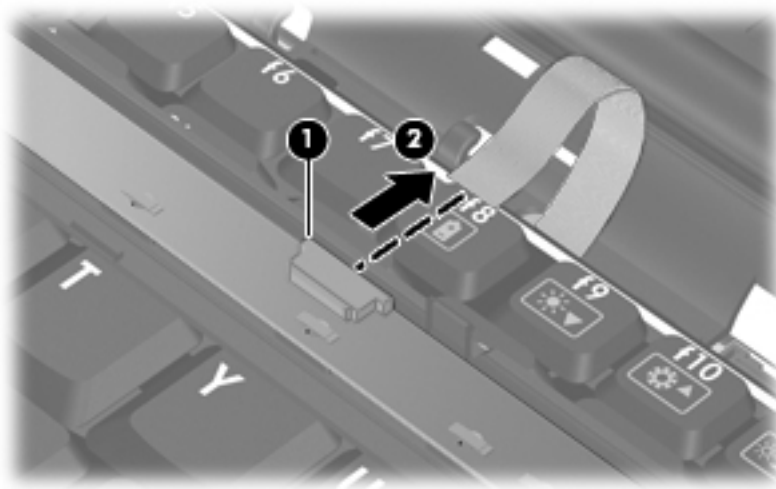
Remove the switch cover:

1. Turn the computer right-side up, with the front toward you.
2. Open the computer as far as possible.

3. Release the switch cover by lifting and swinging the hinge cover sections up and forward until the switch cover rests upside down on the keyboard.



4. Release the zero insertion force (ZIF) connector (1) to which the LED board cable is attached, and disconnect the LED board cable (2) from the connector.



5. Remove the switch cover.

Reverse this procedure to install the switch cover.

## Keyboard

For use in:	Spare part number	For use in:	Spare part number
Belgium	451748-A41	The Netherlands and Europe	451748-021
Brazil	451748-201	Norway	451748-091
The Czech Republic	451748-221	Portugal	451748-131
Denmark	451748-081	Russia	451748-251
France	451748-051	Saudi Arabia	451748-171
French Canada	451748-121	Slovakia	451748-231
Germany	451748-041	Slovenia	451748-BA1
Greece	451748-151	Spain	451748-071
Hungary	451748-211	Sweden and Finland	451748-B71
Iceland	451748-DD1	Switzerland	451748-111
Israel	451748-BB1	Taiwan	451748-AB1
Italy	451748-061	Thailand	451748-281
Japan	451748-291	Turkey	451748-141
South Korea	451748-AD1	The United Kingdom	451748-031
Latin America	451748-161	The United States	451748-001

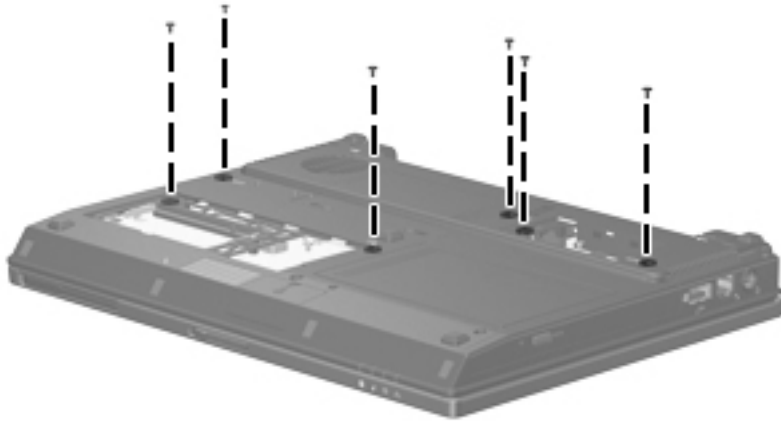
Before removing the keyboard, follow these steps:

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 41](#)).
5. Remove the switch cover (see [Switch cover on page 57](#)).

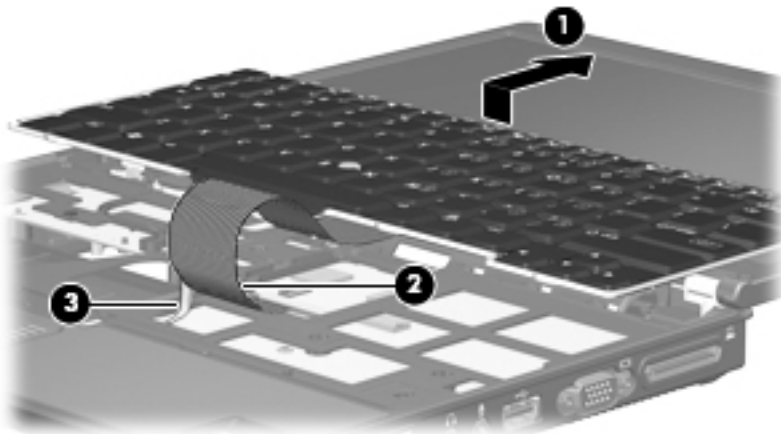
Remove the keyboard:

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

2. Remove the six Torx T8M2.5×7.0 screws that secure the keyboard to the computer.

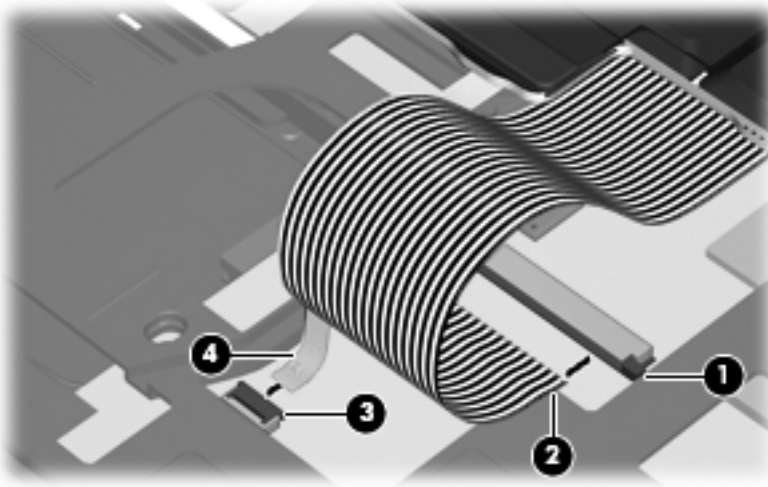


3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Lift the rear edge of the keyboard (1) and slide it back until the keyboard cable (2) and pointing stick cable (3) are accessible.

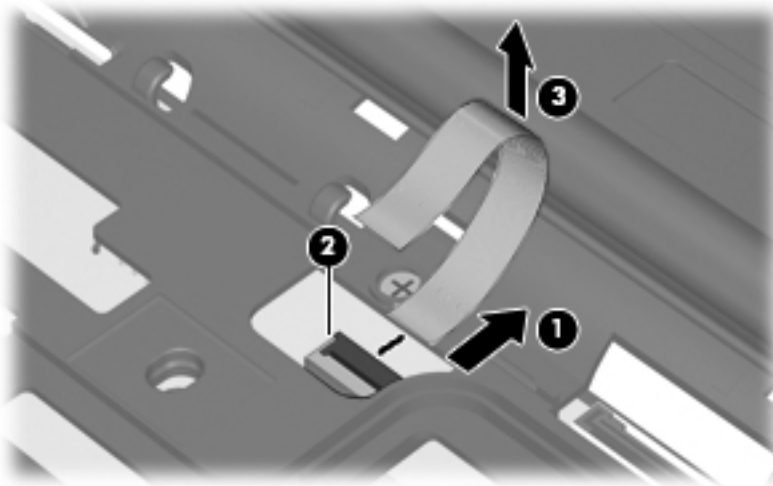


6. Release the ZIF connector (1) to which the keyboard cable is attached, and disconnect the keyboard cable (2) from the system board.

7. Release the ZIF connector (3) to which the pointing stick cable is attached, and disconnect the pointing stick cable (4) from the system board.



8. Remove the keyboard.
9. If it is necessary to replace the LED board cable, turn the keyboard upside down, with the bottom of the keyboard toward you.
10. If it is necessary to replace the LED board cable, disconnect the cable (1) from the low insertion force (LIF) connector (2) to which it is attached, and remove the LED board cable (3). The LED board cable is included in the Cable Kit, spare part number 451722-001.



Reverse this procedure to install the keyboard.

## Display assembly

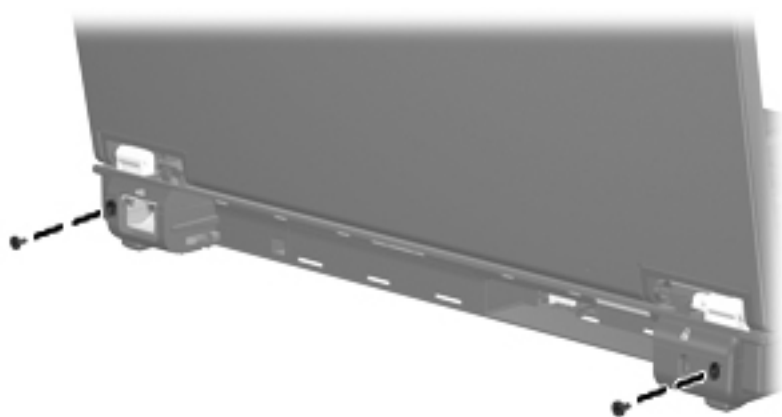
Description	Spare part number
12.1-inch, WXGA display assembly with AntiGlare (includes wireless antenna transceivers and cables and microphone and cable)	451741-001

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 41](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 48](#)) and the WWAN module (see [WWAN module on page 54](#)).
6. Remove the following components:
  - a. Switch cover (see [Switch cover on page 57](#))
  - b. Keyboard (see [Keyboard on page 59](#))

Remove the display assembly:

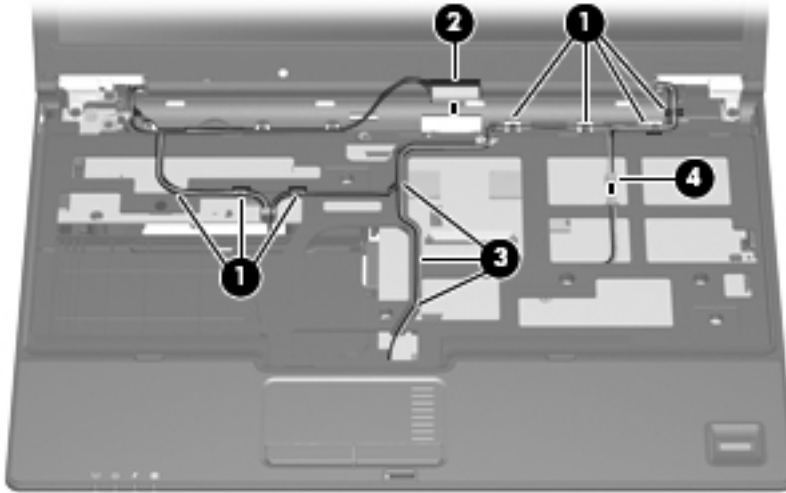
1. Position the computer with the rear panel toward you and the display in an upright position.
2. Remove the two Torx T8M2.5×7.0 screws that secure the display assembly to the computer.



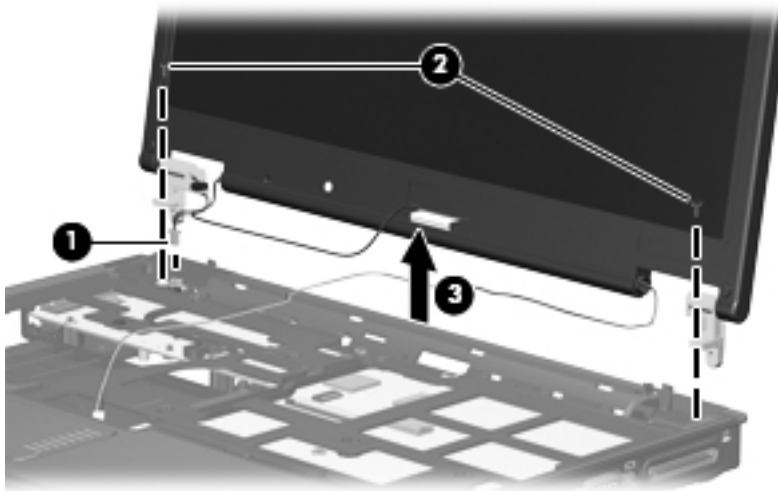
3. Position the computer with the front toward you.
4. Remove the WWAN antenna cables **(1)** from the routing channel and clips built into the top cover.
5. Disconnect the display panel cable **(2)** from the system board.



6. Remove the WLAN antenna cables (3) from the routing channel and clips built into the top cover.
7. Disconnect the microphone cable (4) from the microphone pass-through cable.

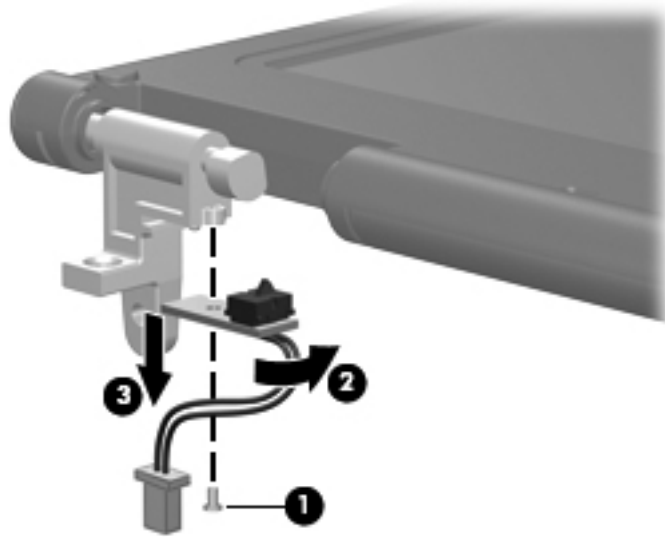


8. Disconnect the display lid switch module cable (1) from the system board.
9. Remove the two Torx T8M2.5×7.0 screws (2) that secure the display assembly to the computer.
10. Lift the display assembly straight up and remove it (3).

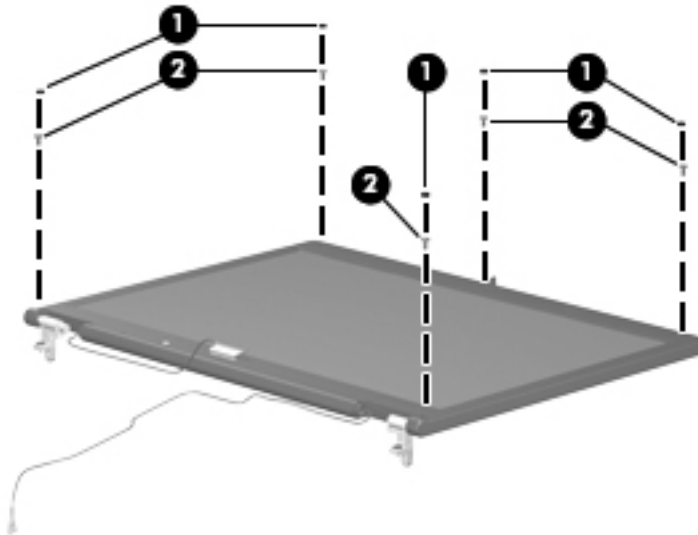


11. If it is necessary to replace the display lid switch module, remove the Phillips PM1.5×3.0 screw (1) that secures the module to the display assembly left hinge.
12. Rotate the module (2) ¼-turn counterclockwise.

13. Remove the display lid switch module (3). The display lid switch module is available using spare part number 451724-001.

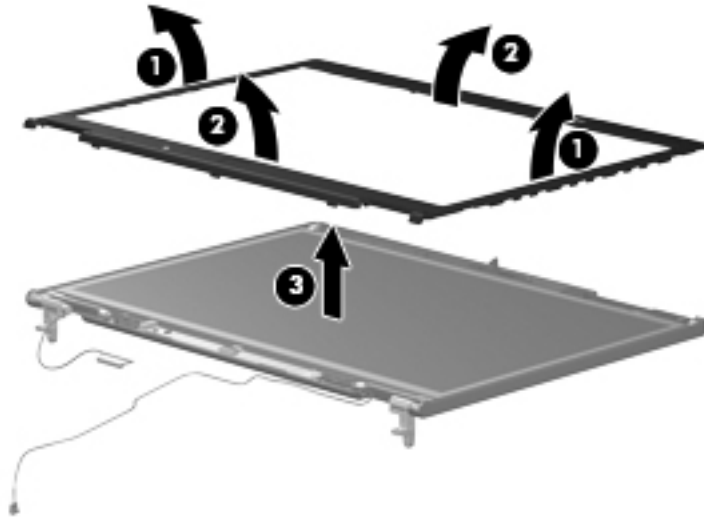


14. If it is necessary to replace the display bezel or any of the display assembly internal components, remove the five rubber screw covers (1) and the five Torx T7M2.0×5.0 screws (2) that secure the display bezel to the display assembly.

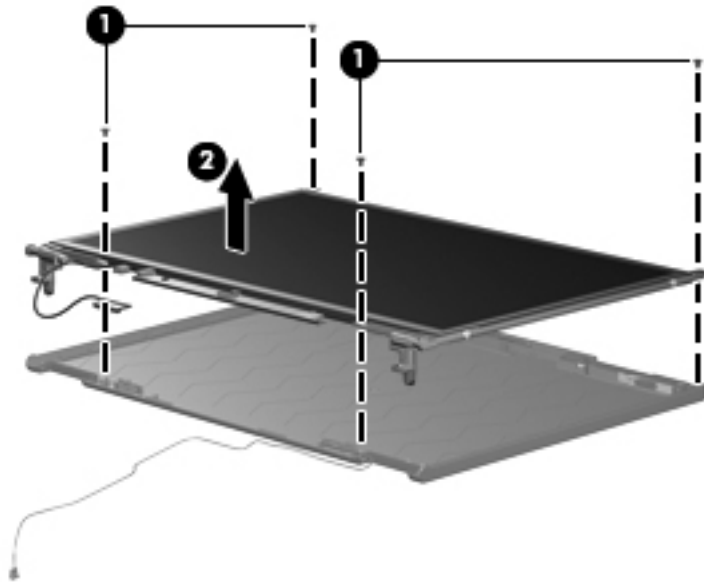


15. Flex the inside edges of the left and right sides (1) and the top and bottom sides (2) of the display bezel until the bezel disengages from the display enclosure.

16. Remove the display bezel (3). The display bezel is available using spare part number 451733-001.

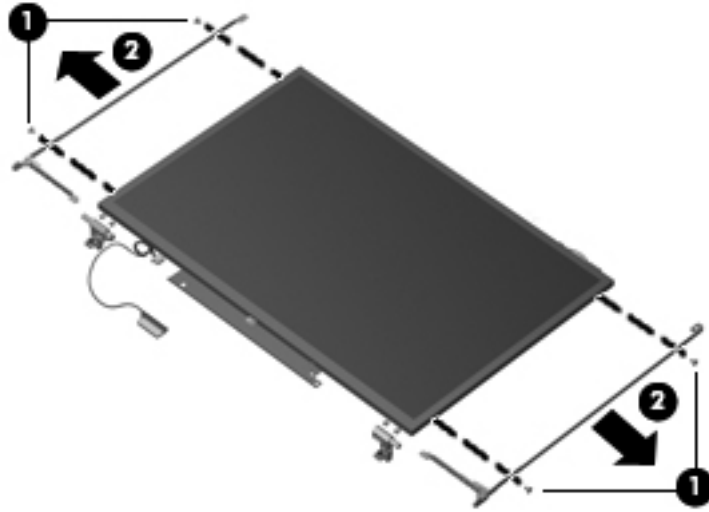


17. If it is necessary to replace the display hinges, remove the four Torx T7M2.0×5.0 screws (1) that secure the display panel to the display enclosure.
18. Remove the display panel (2).



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

20. Remove the display hinges (2). The left and right display hinges are available using spare part number 451734-001.



Reverse this procedure to reassemble and install the display assembly.

## Top cover

Description	Spare part number
Top cover (includes TouchPad, TouchPad cable, and fingerprint reader board)	451723-001

**NOTE:** *The fingerprint reader board cable is included in the Cable Kit, spare part number 451722-001.*

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 41](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 56](#))
  - c. Switch cover (see [Switch cover on page 57](#))
  - d. Keyboard (see [Keyboard on page 59](#))
  - e. Display assembly (see [Display assembly on page 62](#))

Remove the top cover:

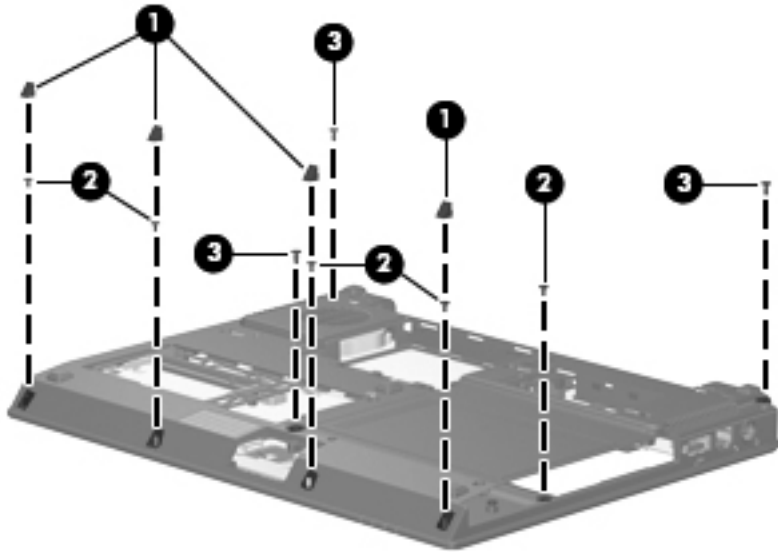
1. Turn the computer upside down, with the front toward you.

2. Remove the following:

(1) Four base enclosure rubber screw covers. The base enclosure rubber screw covers are included in the Rubber Kit, spare part number 451744-001.

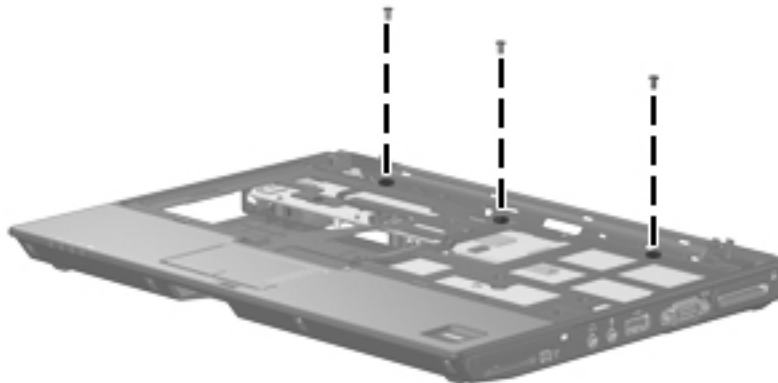
(2) Five Torx T8M2.5×4.0 screws.

(3) Three Torx T8M2.5×7.0 screw.



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

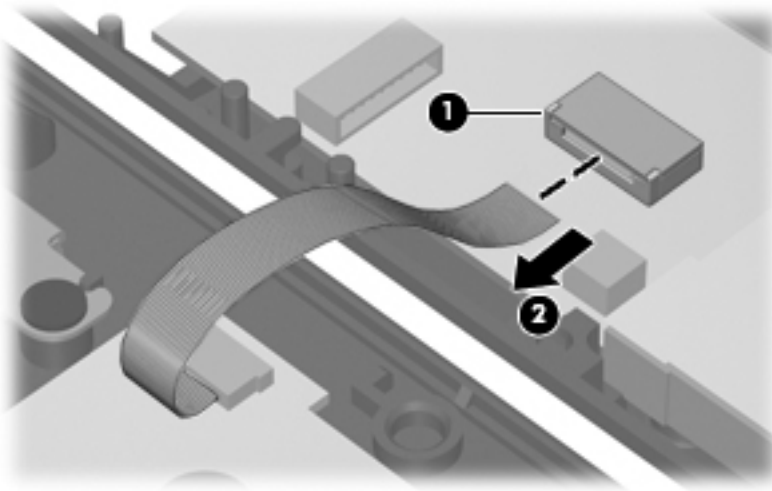
4. Remove the three Torx T8M2.5×7.0 screws that secure the top cover to the computer.



5. Lift the rear edge of the top cover and swing it up and forward until the top cover rests upside down in front of the base enclosure.



6. Release the ZIF connector (1) to which the fingerprint reader board cable is connected and disconnect the fingerprint reader board cable (2) from the system board.



7. Remove the top cover.

Reverse this procedure to install the top cover.

## System board

Description	Spare part number
Equipped with Intel Core Duo U7700 (1.33-GHz) processor (533-MHz FSB and 2-MB L2 cache)	464764-001
Equipped with Intel Core Duo U7600 (1.20-GHz) processor (533-MHz FSB and 2-MB L2 cache)	451720-001
Equipped with Intel Core Duo U7500 (1.06-GHz) processor (533-MHz FSB and 2-MB L2 cache)	451719-001

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 41](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 56](#))
  - c. Switch cover (see [Switch cover on page 57](#))
  - d. Keyboard (see [Keyboard on page 59](#))
  - e. Display assembly (see [Display assembly on page 62](#))
  - f. Top cover (see [Top cover on page 67](#))

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:

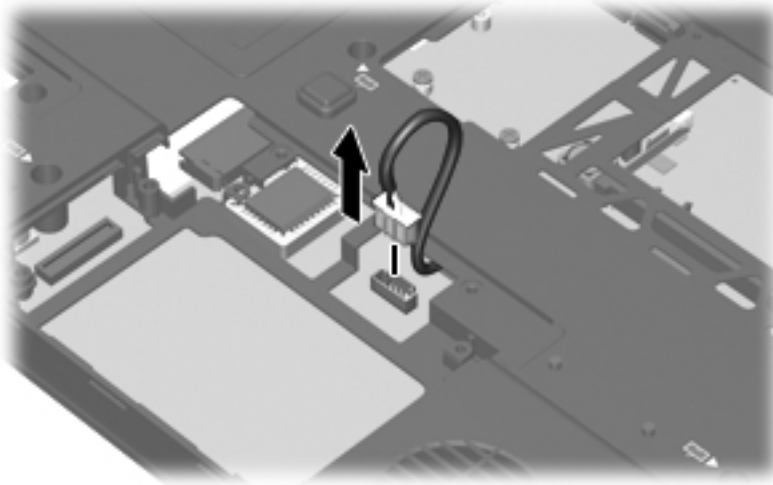
- SIM (see [SIM on page 42](#))
- Memory module (see [Memory module on page 45](#))
- RTC battery (see [RTC battery on page 47](#))
- WLAN module (see [WLAN module on page 48](#))
- WWAN module (see [WWAN module on page 54](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 74](#))
- PC Card assembly (see [PC Card assembly on page 76](#))
- Modem module (see [Modem module on page 78](#))

Remove the system board:

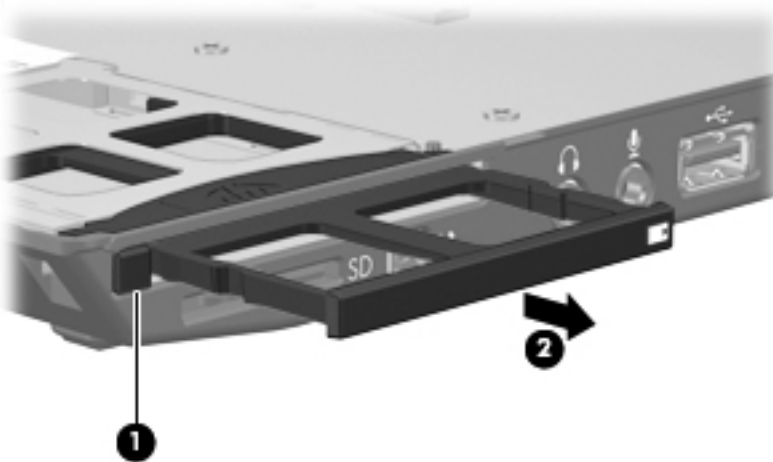
1. Turn the computer upside down, with the rear panel toward you.



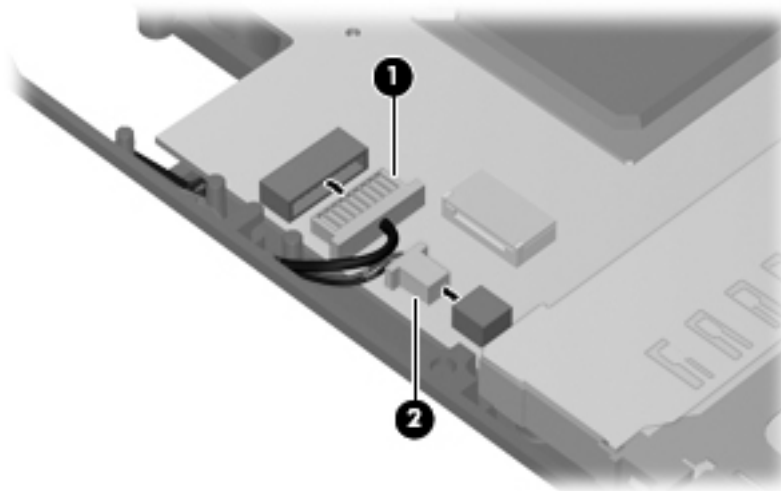
2. Disconnect the fan cable from the system board.



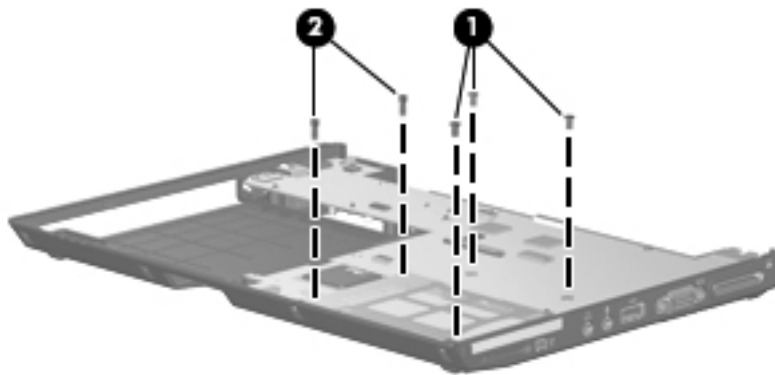
3. Turn the computer right-side up, with the front toward you.
4. Press the PC Card eject button (1) twice. The first press releases the PC Card eject button from the PC Card slot. The second press releases the PC Card slot bezel from the PC Card slot. (The PC Card slot bezel is partially ejected from the PC Card slot.) The PC Card slot bezel is included in the Plastics Kit, spare part number 451743-001.
5. Remove the PC Card slot bezel (2).



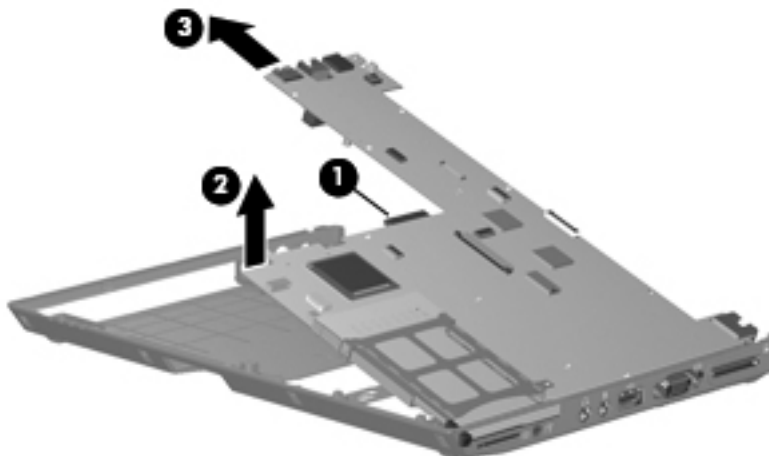
6. Disconnect the front LED board cable (1) and the speaker cable (2) from the system board.



7. Remove the three Torx T8M2.5×7.0 screws (1) and the two Phillips PM2.0×10.0 screws (2) that secure the system board to the base enclosure.



8. Use the optical drive connector (1) to lift the left side of the system board (2) until it rests at an angle.
9. Remove the system board (3) by sliding it away from the base enclosure at an angle.



Reverse the preceding procedure to install the system board.

## Speaker assembly

Description	Spare part number
Speaker assembly	451747-001

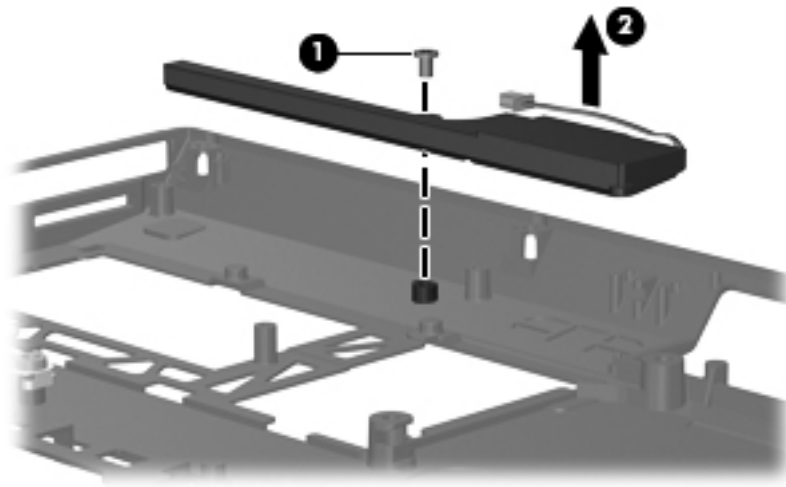
Before removing the speaker assembly, follow these steps:

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 41](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 56](#))
  - c. Switch cover (see [Switch cover on page 57](#))
  - d. Keyboard (see [Keyboard on page 59](#))
  - e. Display assembly (see [Display assembly on page 62](#))
  - f. Top cover (see [Top cover on page 67](#))
  - g. System board (see [System board on page 70](#))

Remove the speaker assembly:


1. Remove the Torx T8M2.5×4.0 screw **(1)** that secures the speaker assembly to the base enclosure.

2. Remove the speaker assembly (2) from the base enclosure.



Reverse this procedure to install the speaker assembly.

## Fan/heat sink assembly

 **NOTE:** All fan/heat sink assembly spare part kits include thermal material.

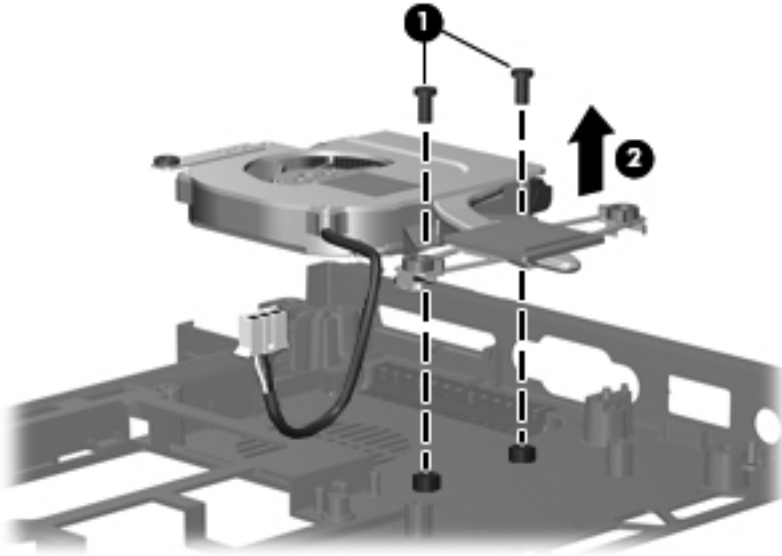
Description	Spare part number
Fan/heat sink assembly	451731-001

Before removing the fan/heat sink assembly, follow these steps:

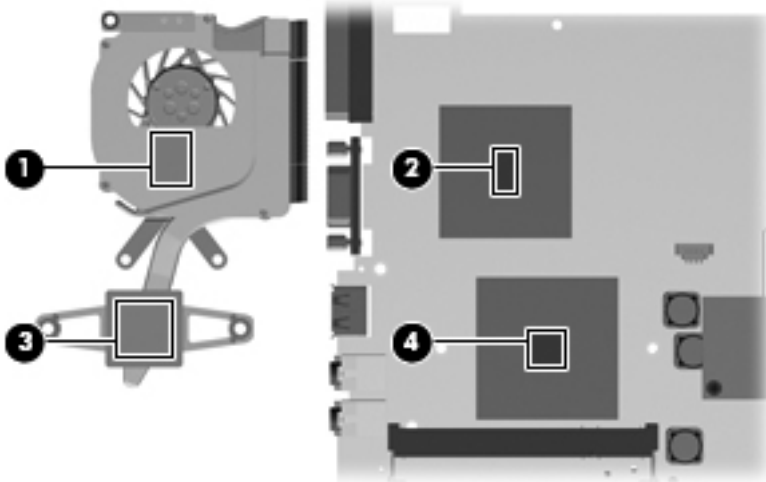
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 56](#))
  - c. Switch cover (see [Switch cover on page 57](#))
  - d. Keyboard (see [Keyboard on page 59](#))
  - e. Display assembly (see [Display assembly on page 62](#))
  - f. Top cover (see [Top cover on page 67](#))
  - g. System board (see [System board on page 70](#))

Remove the fan/heat sink assembly:

1. Remove the two Torx T8M2.5×4.0 screws (1) that secure the fan/heat sink assembly to the base enclosure.
2. Remove the fan/heat sink assembly (2) from the base enclosure.



**NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink (1) and (3), the processor (2), and graphics system component (4) each time the heat sink is removed. Thermal material is included with all heat sink and processor spare part kits.



Reverse this procedure to install the fan/heat sink assembly.

**NOTE:** To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left and right sides 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.

## PC Card assembly

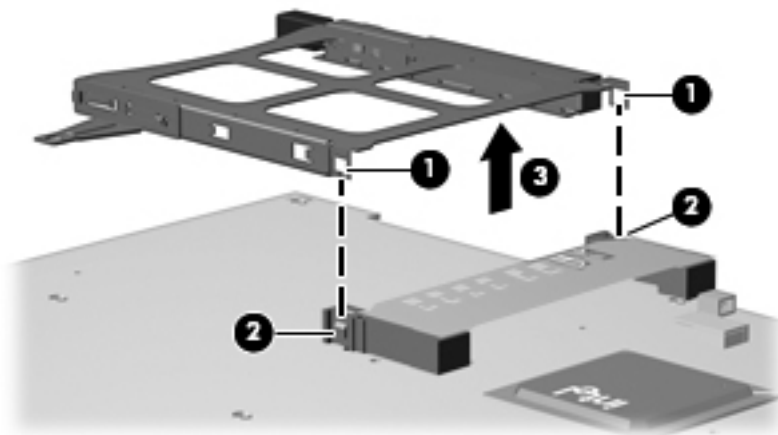
Description	Spare part number
PC Card assembly	451742-001

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 41](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 56](#))
  - c. Switch cover (see [Switch cover on page 57](#))
  - d. Keyboard (see [Keyboard on page 59](#))
  - e. Display assembly (see [Display assembly on page 62](#))
  - f. Top cover (see [Top cover on page 67](#))
  - g. System board (see [System board on page 70](#))


Remove the PC Card assembly:

1. Turn the system board upside down, with the front toward you.
2. Detach the slots on the PC Card assembly (1) from the tabs on the PC Card connector (2).
3. Remove the PC Card assembly (3).



Reverse this procedure to install the PC Card assembly.

## Modem module

 **NOTE:** All modem module spare part kits include a modem module cable.

Description	Spare part number
For use in all countries and regions except Australia and New Zealand	443899-001
For use only in Australia and New Zealand	443899-011

Before removing the modem module, follow these steps:

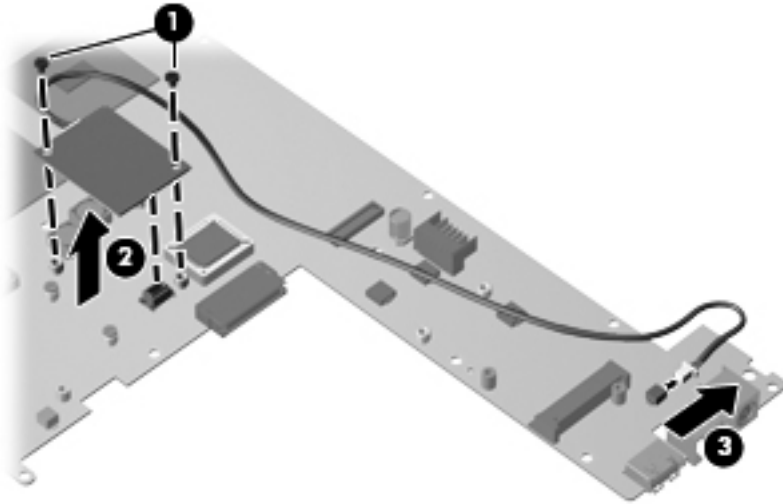
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 56](#))
  - c. Switch cover (see [Switch cover on page 57](#))
  - d. Keyboard (see [Keyboard on page 59](#))
  - e. Display assembly (see [Display assembly on page 62](#))
  - f. Top cover (see [Top cover on page 67](#))
  - g. System board (see [System board on page 70](#))

Remove the modem module:

1. Turn the system board upside down, with the front toward you.
2. Remove the two Phillips PM2.5×4.0 screws **(1)** that secure the modem module to the system board.
3. Disconnect the modem module **(2)** from the system board by lifting it straight up.



4. Disconnect the modem module cable (3) from the system board.



Reverse this procedure to install the modem module.


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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.

---

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

**NOTE:** Pointing devices are not supported in Computer Setup. You must use the keyboard to navigate and make selections.

**NOTE:** An external keyboard connected by USB can be used with Computer Setup only if USB legacy support is enabled.

---

To start Computer Setup, follow these steps:

1. Turn on or restart the computer.
2. Before Windows® opens and while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen, press **F10**.

# 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.

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.

Because Computer Setup is not Windows-based, it does not support the TouchPad. Navigation and selection are by keystroke:

- To choose a menu or a menu item, use the arrow keys.
  - To select an item, press **enter**.
  - To close open dialog boxes and return to the main Computer Setup screen, press **esc**.
  - To view navigation information, press **f1**.
  - To change the language, press **f2**.
2. Select the **File**, **Security**, **Diagnostics**, or **System Configuration** menu.
  3. To exit Computer Setup, choose one of the following methods:
    - To exit Computer Setup without saving your preferences, use the arrow keys to select **File > Ignore Changes and Exit**. Then follow the instructions on the screen.
    - To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.


## Restoring factory settings in Computer Setup

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

1. Open Computer Setup by turning on or restarting the computer, and then pressing **f10** while the "F10 = ROM Based Setup" message is displayed in the lower-left corner of the screen.
2. Use the arrow keys to select **File > Restore** defaults, and then press **enter**.
3. When the confirmation dialog box opens, press **f10**.
4. To save your preferences and exit Computer Setup, use the arrow keys to select **File > Save Changes and Exit**. Then follow the instructions on the screen.

Your preferences go into effect when the computer restarts.


---

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

---

# 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>
Restore defaults	Replace the configuration settings in Computer Setup with the original factory settings. (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

Select	To do this
Setup password	Enter, change, or delete a setup password.
Power-On password	Enter, change, or delete a power-on password.
Password options	<ul style="list-style-type: none"><li>• Enable/disable stringent security.</li><li>• Enable/disable password requirement on computer restart.</li></ul>
DriveLock passwords	<ul style="list-style-type: none"><li>• Enable/disable DriveLock on any computer hard drive and on optional MultiBay hard drives.</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>
Smart Card security	Enable/disable support for smart card and Java™ Card power-on authentication.  <p><b>NOTE:</b> Power-on authentication for smart cards is supported only on computers with optional smart card readers.</p> <p><b>NOTE:</b> You must have an administrator password to change this setting.</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.  <p><b>NOTE:</b> You must have a setup password to change this setting.</p>
System IDs	Enter user-defined computer asset tracking number and ownership tag.
Disk Sanitizer	Run Disk Sanitizer to destroy all existing data on the primary hard drive. The following options are available: <ul style="list-style-type: none"><li>• Fast: Runs the Disk Sanitizer erase cycle once.</li><li>• Optimum: Runs the Disk Sanitizer erase cycle 3 times.</li><li>• Custom: Allows you to select the desired number of Disk Sanitizer erase cycles from a list.</li></ul> <p><b>CAUTION:</b> If you run Disk Sanitizer, the data on the primary hard drive is destroyed permanently.</p>

## Diagnostics menu

Select	To do this
Hard Drive Self-Test options	Run a comprehensive self-test on any hard drive in the system or on any optional MultiBay hard drive.
Memory Check	Run a comprehensive check on system memory.
Startup Check (select models only)	Verify the system components needed for starting the computer.

## System Configuration menu

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

Select	To do this
Language (or press <b>f2</b> )	Change the Computer Setup language.
Boot options	<ul style="list-style-type: none"><li>• Set <b>f9</b>, <b>f10</b>, and <b>f12</b> delay when starting up.</li><li>• Enable/disable CD-ROM boot.</li><li>• Enable/disable floppy boot.</li><li>• Enable/disable internal network adapter boot and set the boot mode (PXE or RPL).</li><li>• Enable/disable MultiBoot, which sets a boot order that can include most boot devices in the system.</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>• Swap the functions of the fn key and left ctrl key.</li><li>• Enable/disable multiple standard pointing devices at startup. (To set the computer to support only a single, usually nonstandard, pointing device at startup, select <b>Disable</b>.)</li><li>• Enable/disable USB legacy support. When enabled, USB legacy support allows the following:<ul style="list-style-type: none"><li>◦ Use of a USB keyboard, mouse, and hub 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 or to an optional docking device (select models only).</li></ul></li><li>• Select a parallel port mode: EPP (Enhanced Parallel Port), standard, bidirectional, or ECP (Enhanced Capabilities Port).</li><li>• Enable/disable BIOS DMA data transfers.</li><li>• Enable/disable fan always on while connected to an AC outlet.</li><li>• Enable/disable Intel® Data Execution Prevention or AMD® PSAE Execution Disable. When enabled, the processor can disable some virus code execution, which helps to improve computer security.</li><li>• Enable/disable LAN Power Save. When enabled, saves power by turning off the LAN when not in use.</li><li>• Enable/disable SATA Native Mode.</li><li>• Enable/disable Dual Core CPU.</li><li>• Enable/disable Secondary Battery Fast Charge.</li><li>• Choose Bit-shift or LBA assisted HDD Translation Mode.</li><li>• Enable/disable Windows direct application launcher.</li><li>• Enable/disable HP Lockout.</li></ul>

Select	To do this
Built-In Device Options	<ul style="list-style-type: none"> <li>• Enable/disable embedded WWAN Device Radio.</li> <li>• Enable/disable embedded WLAN Device Radio.</li> <li>• Enable/disable embedded Bluetooth® Device Radio.</li> <li>• Enable/disable LAN/WLAN Switching. When enabled, switches to a WLAN when a LAN is either unavailable or disconnected.</li> <li>• Enable/disable Wake on LAN from Off.</li> <li>• Enable/disable the ambient light sensor.</li> </ul>
Port Options	<ul style="list-style-type: none"> <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> <li>• Enable/disable the cardbus slot.</li> <li>• Enable/disable the ExpressCard slot.</li> <li>• Enable/disable the infrared port.</li> <li>• Enable/disable the optical disk drive.</li> <li>• Enable/disable the network controller.</li> </ul>

# 6 Specifications

## Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Depth	21.29 cm	8.38 in
Width	28.22 cm	11.11 in
Height (front to rear)	2.46 to 3.20 cm	0.97 to 1.26 in
<b>Weight</b> (varies by configuration)		
Equipped with optical drive, 9-cell battery, and WLAN module	1.77 kg	3.9 lbs
Equipped with optical drive, 6-cell battery, and WLAN module	1.63	3.6 lbs
Equipped with optical drive, 3-cell battery, and WLAN module	1.45	3.2 lbs
Equipped with 3-cell battery and WLAN module	1.27	2.8 lbs
<b>Input power</b>		
Operating voltage	19.0 V dc @ 4.74 A – 90 W	
Operating current	4.74 A	
<b>Temperature</b>		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
<b>Relative humidity</b>		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
<b>Shock</b>		



	Metric	U.S.
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
<b>Random vibration</b>		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	
<b>NOTE:</b> 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, +120/-40° vertical (typical)	

## Hard drive specifications

	100-GB*	80-GB*	60-GB*
<b>Dimensions</b>			
Height	9.5 mm	9.5 mm	9.5 mm
Width	70 mm	70 mm	70 mm
Weight	101 g	101 g	101 g
<b>Interface type</b>			
	SATA	SATA	SATA
<b>Transfer rate</b>			
	100 MB/sec	100 MB/sec	100 MB/sec
<b>Security</b>			
	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)			
Single track	3 ms	3 ms	3 ms
Average	13 ms	13 ms	13 ms
Maximum	24 ms	24 ms	24 ms
<b>Logical blocks</b>			
	195,350,400	156,280,320	117,210,240
<b>Disc rotational speed</b>			
	4200 rpm	4200 rpm	4200 rpm
<b>Operating temperature</b>			
	5°C to 55°C (41°F to 131°F)		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.			
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.			

# DVD±RW and CD-RW 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>Center hole diameter</b>	1.5 cm (0.59 in)	
<b>Disc diameter</b>		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
<b>Disc thickness</b>	1.2 mm (0.047 in)	
<b>Track pitch</b>	0.74 μm	
<b>Access time</b>	<b>CD</b>	<b>DVD</b>
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
<b>Audio output level</b>	Line-out, 0.7 Vrms	
<b>Cache buffer</b>	2 MB	
<b>Data transfer rate</b>		
24X CD-ROM	3,600 KB/sec	
8X DVD-ROM	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	
<b>Startup time</b>	< 15 seconds	
<b>Stop time</b>	< 6 seconds	

## DVD/CD-RW Combo Drive specifications

<b>Applicable disc</b>	<b>Read:</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	<b>Write:</b> CD-R and CD-RW
<b>Center hole diameter</b>	1.5 cm (0.59 in)	
<b>Disc diameter</b>		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
<b>Disc thickness</b>	1.2 mm (0.047 in)	
<b>Track pitch</b>	0.74 $\mu$ m	
<b>Access time</b>	<b>CD</b>	<b>DVD</b>
Random	< 110 ms	< 130 ms
Full stroke	< 210 ms	< 225 ms
<b>Audio output level</b>	Line-out, 0.7 Vrms	
<b>Cache buffer</b>	2 MB	
<b>Data transfer rate</b>		
24X CD-ROM	3,600 KB/sec	
8X DVD	3,600 KB/sec	
24X CD-R	3,600 KB/sec	
24X CD-RW	3,600 KB/sec	
<b>Transfer mode</b>	Multiword DMA mode 2	
<b>Startup time</b>	< 15 seconds	
<b>Stop time</b>	< 6 seconds	

# DVD-ROM Drive

<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-R, CD-RW, Photo CD (single and multisession), CD-Bridge	
<b>Center hole diameter</b>	1.5 cm (0.59 in)	
<b>Disc diameter</b>		
Standard disc	12 cm (4.72 in)	
Mini disc	8 cm (3.15 in)	
<b>Disc thickness</b>	1.2 mm (0.047 in)	
<b>Track pitch</b>	0.74 $\mu$ m	
<b>Access time</b>	<b>CD</b>	<b>DVD</b>
Random	< 100 ms	< 125 ms
Full stroke	< 175 ms	< 225 ms
<b>Audio output level</b>	Line-out, 0.7 Vrms	
<b>Cache buffer</b>	512 KB	
<b>Data transfer rate</b>		
CD-R (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
CD-RW (10X)	1500 KB/s (150 KB/s at 1X CD rate)	
CD-ROM (24X)	3600 KB/s (150 KB/s at 1X CD rate)	
DVD (8X)	10,800 KB/s (1,352 KB/s at 1X DVD rate)	
Multiword DMA mode 2	16.6 MB/s	
<b>Startup time</b>	< 10 seconds	
<b>Stop time</b>	< 3 seconds	

## 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 PC Card
DMA6	Not assigned
DMA7	Not assigned

\*PC Card 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:** PC Cards 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



<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
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	PC Card 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

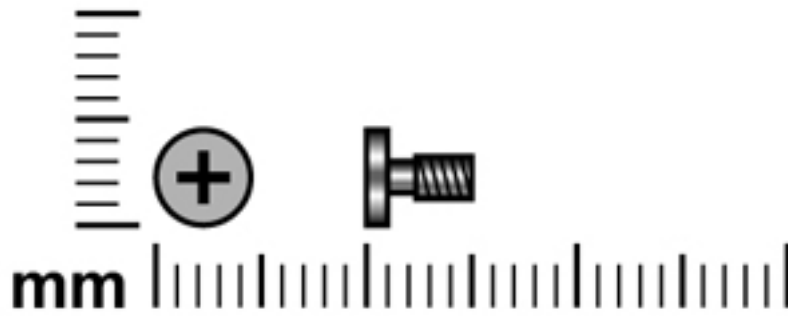
Size	Memory address	System function
640 KB	00000000-0009FFFF	Base memory
128 KB	000A0000-000BFFFF	Video memory
48 KB	000C0000-000CBFFF	Video BIOS
160 KB	000C8000-000E7FFF	Unused
64 KB	000E8000-000FFFFFF	System BIOS
15 MB	00100000-00FFFFFF	Extended memory
58 MB	04800000-07FFFFFF	Super extended memory
58 MB	04800000-07FFFFFF	Unused
2 MB	08000000-080FFFFFF	Video memory (direct access)
4 GB	08200000-FFFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

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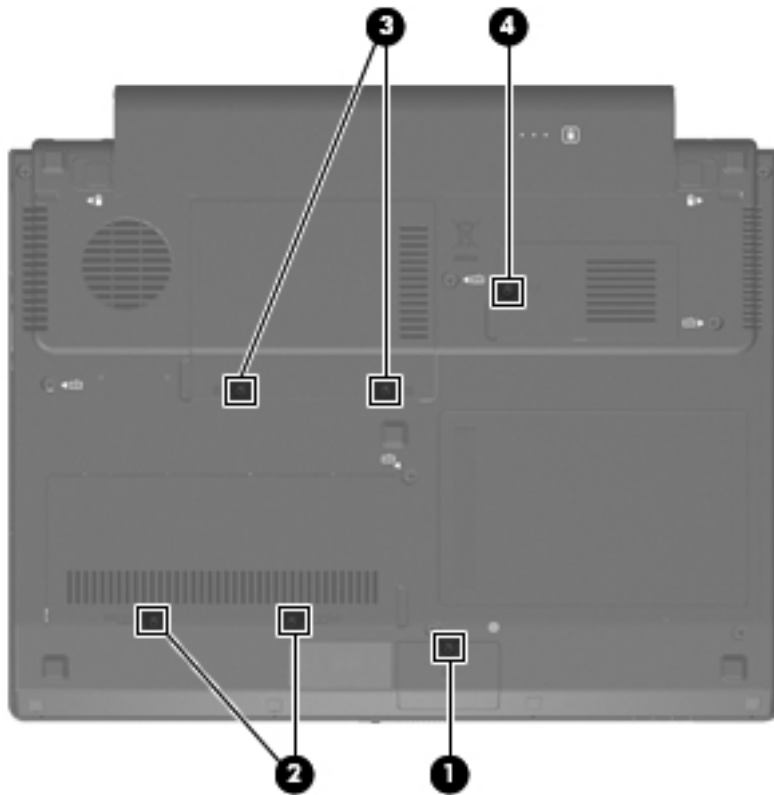
## 7 Screw listing

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 451745-001, and the Display Screw Kit, spare part number 451737-001.

## Phillips PM2.0×5.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Black	8	5.0 mm	2.0 mm	4.5 mm



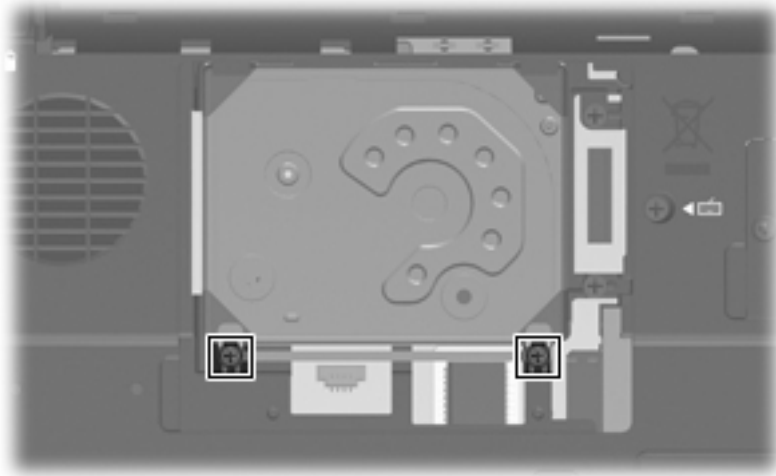
### Where used:

(1) One screw that secures the Bluetooth module compartment cover to the computer (screw is captured on the cover by a C-clip)

(2) Two screws that secure the memory module/WLAN module compartment cover to the computer (screws are captured on the cover by C-clips)

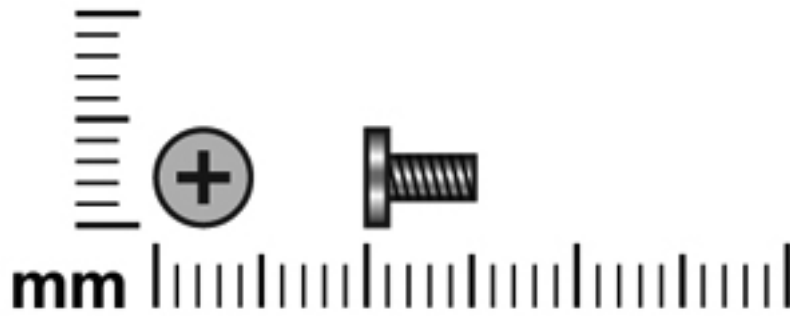
(3) Two screws that secure the hard drive cover to the computer (screws are captured on the cover by C-clips)

(4) One screw that secures the WWAN module compartment cover to the computer (screw is captured on the cover by a C-clip)

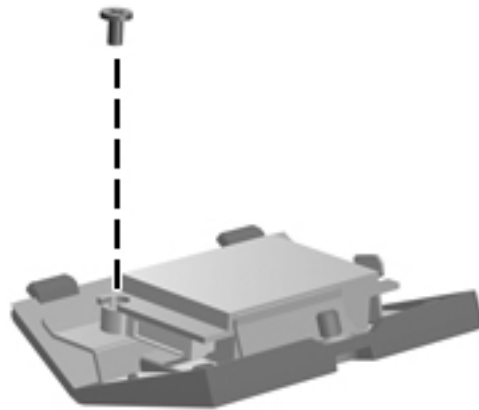


**Where used:** 2 captive screws that secure the hard drive bracket to the computer (screws are captured on the bracket by C-clips)

## Phillips PM2.0×5.0 screw

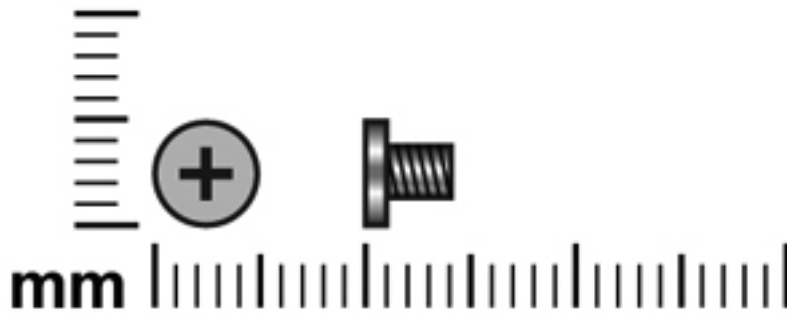


Color	Quantity	Length	Thread	Head diameter
Black	1	5.0 mm	2.0 mm	4.5 mm

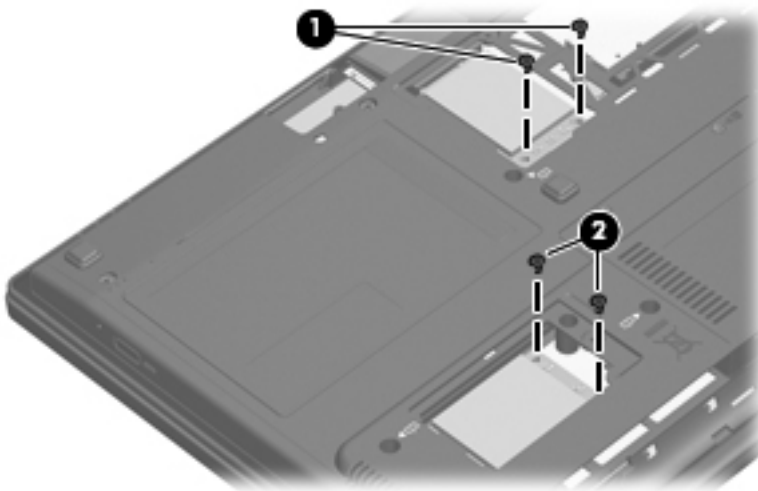


**Where used:** One screw that secures the Bluetooth module to the Bluetooth module compartment cover

## Phillips PM2.5×4.0 screw

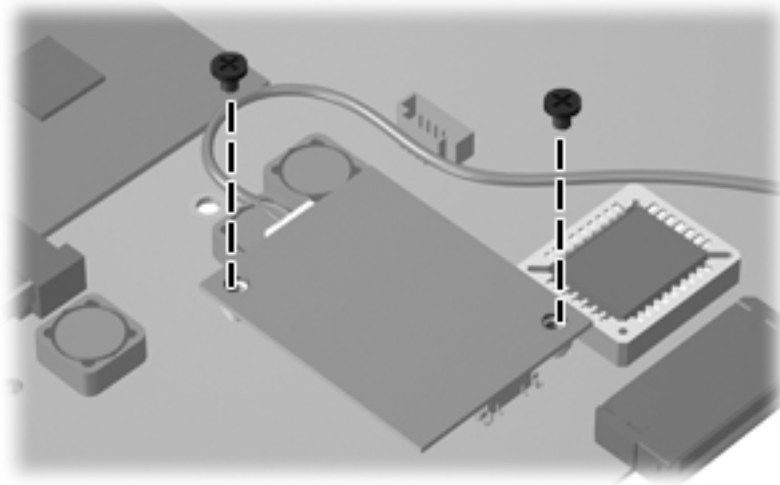


Color	Quantity	Length	Thread	Head diameter
Black	6	4.0 mm	2.5 mm	5.0 mm



### Where used:

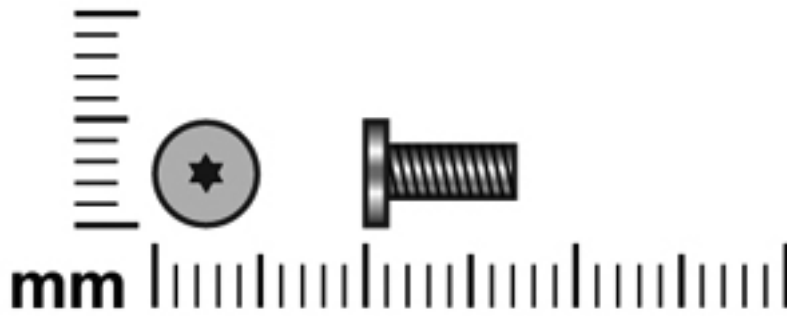
- (1) Two screws that secure the WLAN module to the system board
- (2) Two screws that secure the WWAN module to the system board



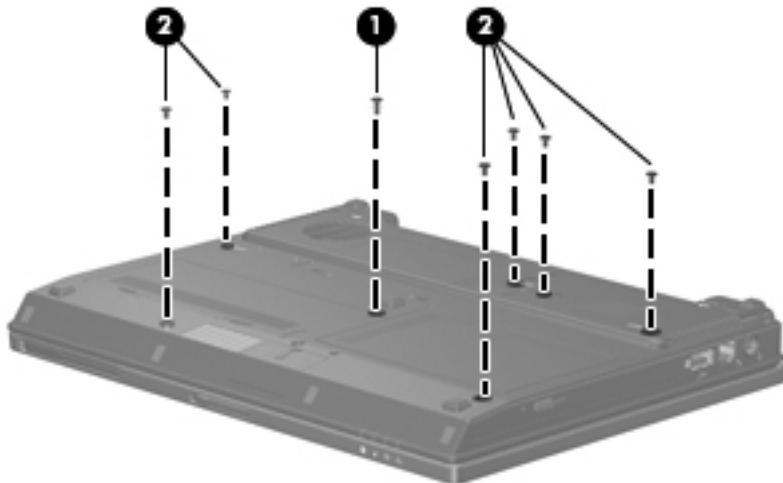
**Where used:** 2 screws that secure the modem module to the system board



## Torx T8M2.5×7.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	20	7.0 mm	2.5 mm	5.0 mm

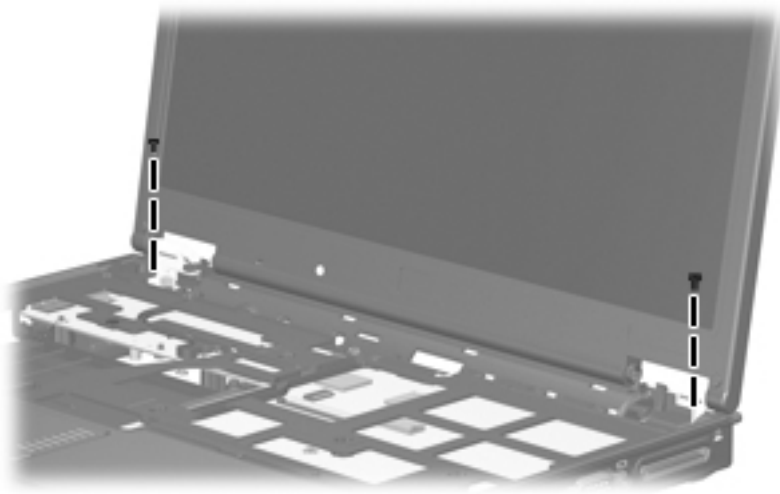


### Where used:

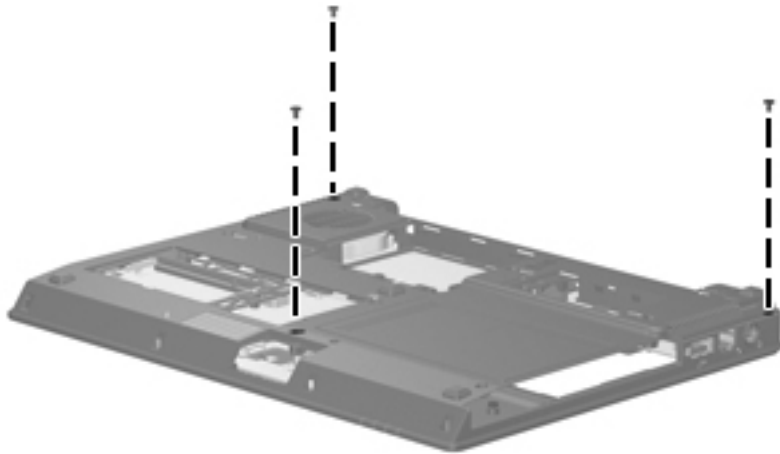
- (1) One screw that secures the optical drive to the computer
- (2) Six screws that secure the keyboard to the computer



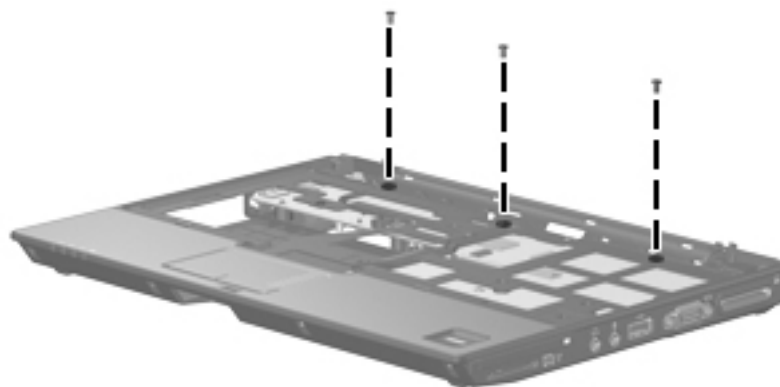
**Where used:** 2 screws that secure the display assembly to the computer



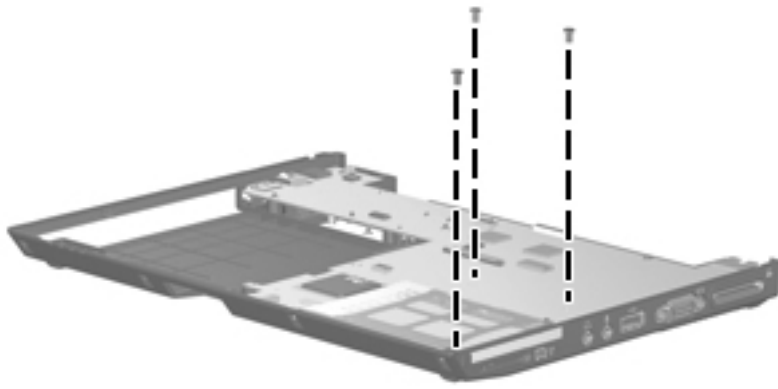
**Where used:** 2 screws that secure the display assembly to the computer



**Where used:** 3 screws that secure the top cover to the base enclosure

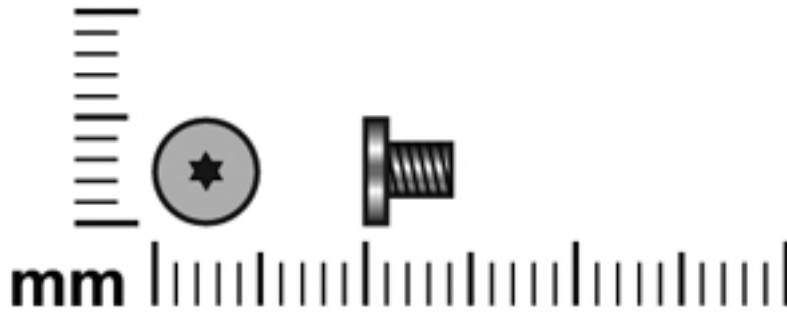


**Where used:** 3 screws that secure the top cover to the base enclosure

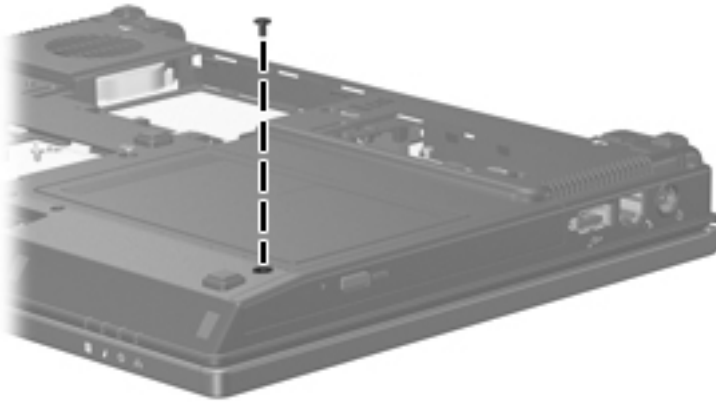


**Where used:** 3 screws that secure the system board to the base enclosure

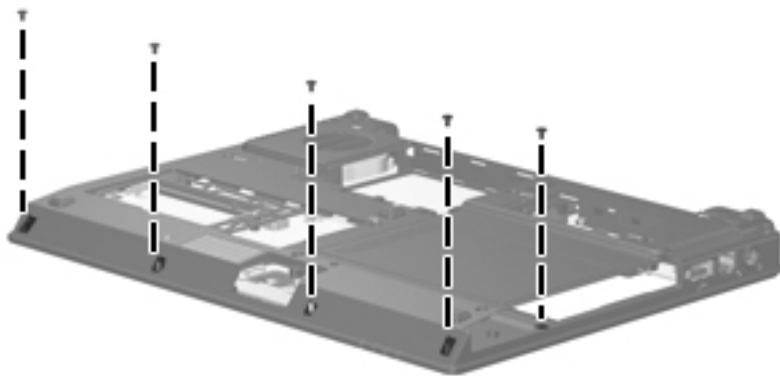
## Torx T8M2.5×4.0 screw



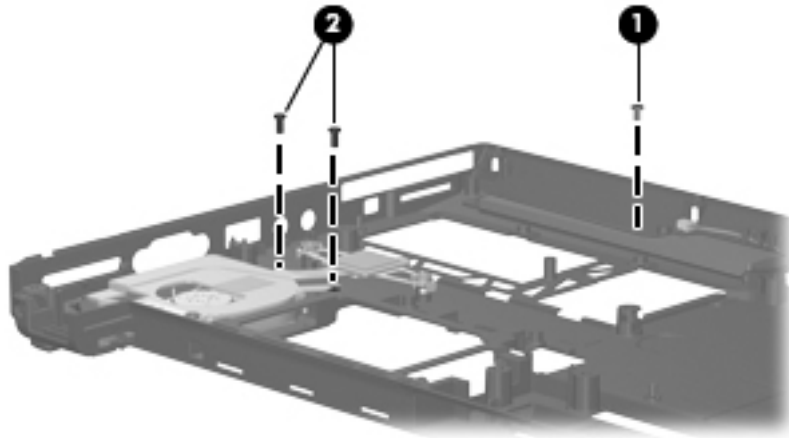
Color	Quantity	Length	Thread	Head diameter
Black	9	4.0 mm	2.5 mm	5.0 mm



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



**Where used:** 5 screws that secure the top cover to the base enclosure

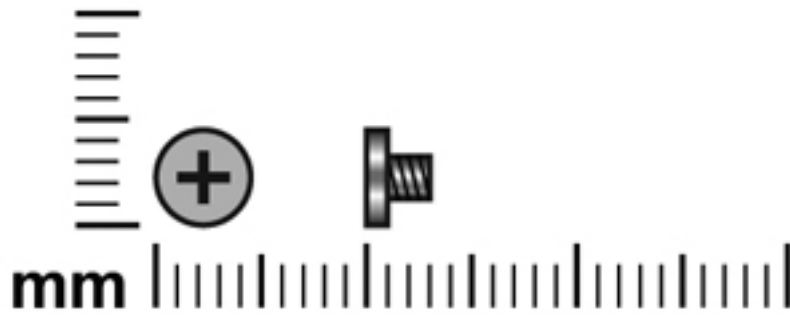


**Where used:**

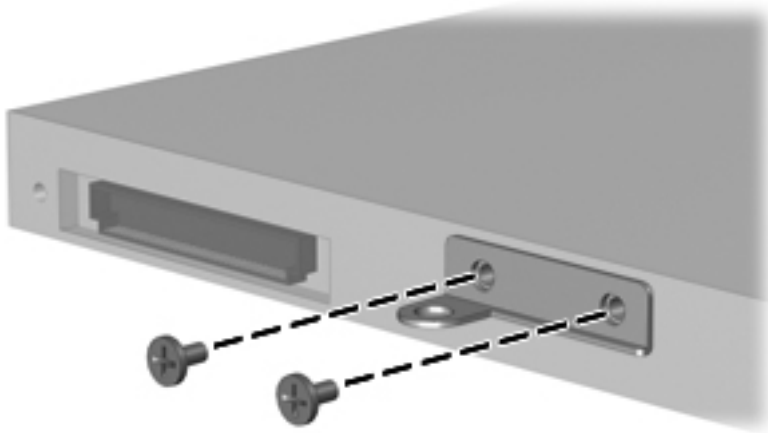
(1) One screw that secures the speaker to the base enclosure

(2) Two screws that secure the fan/heat sink assembly to the base enclosure

## Phillips PM2.0×3.0 screw

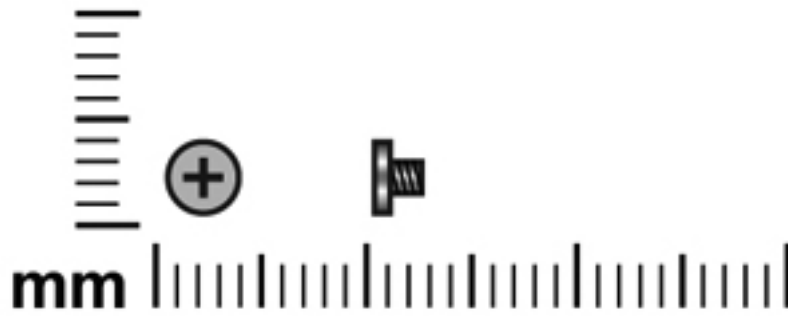


Color	Quantity	Length	Thread	Head diameter
Silver	2	3.0 mm	2.0 mm	4.5 mm

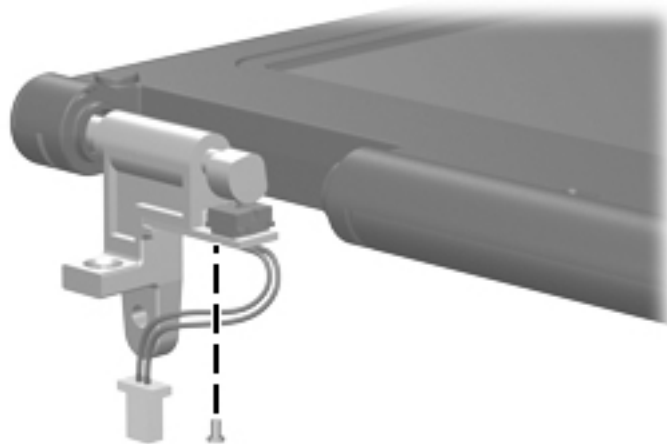


**Where used:** 2 screws that secure the optical drive bracket to the optical drive

## Phillips PM1.5×3.0 screw

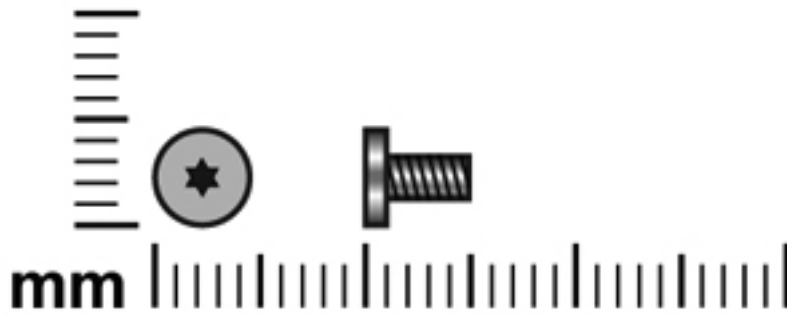


Color	Quantity	Length	Thread	Head diameter
Silver	1	3.0 mm	1.5 mm	4.0 mm

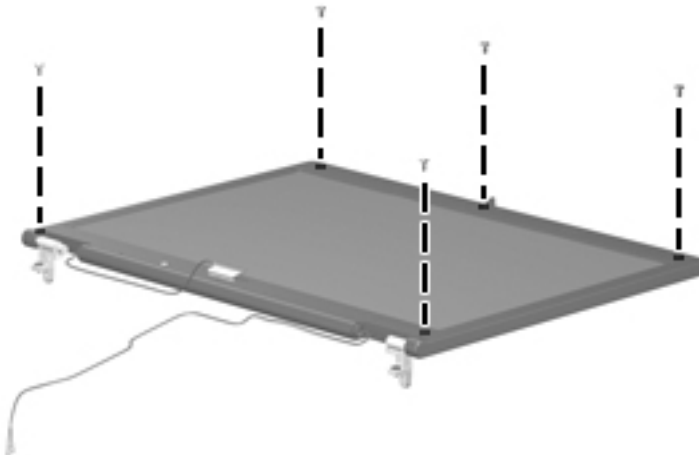


**Where used:** One screw that secures the display lid switch module to the display assembly

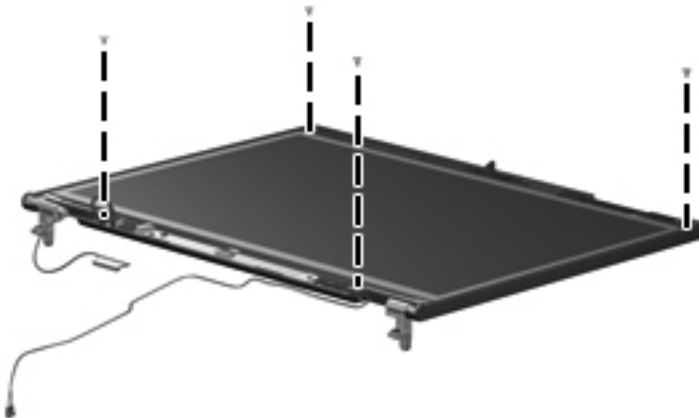
## Torx T6M2.0×5.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	9	5.0 mm	2.0 mm	4.5 mm



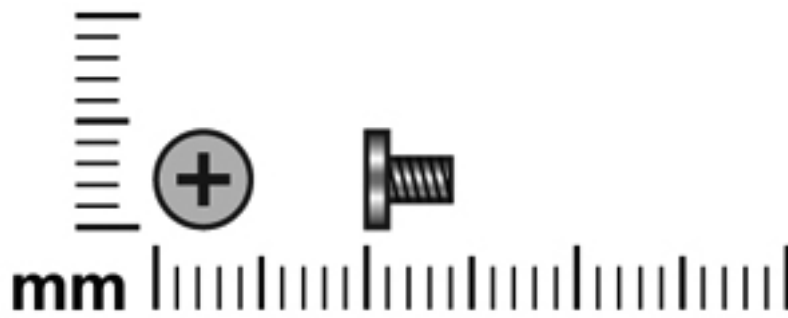
**Where used:** 5 screws that secure the display bezel to the display enclosure



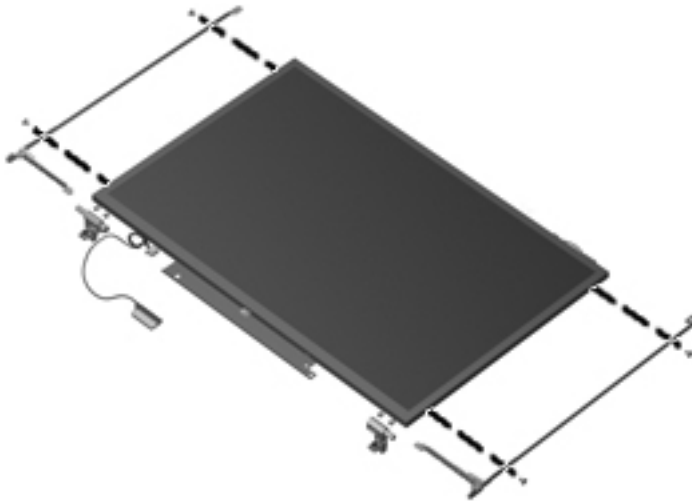
**Where used:** 4 screws that secure the display panel to the display enclosure



## Phillips PM2.0×4.0 screw

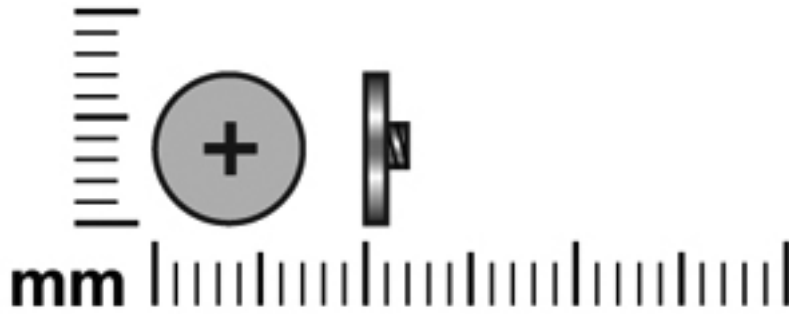


Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	2.0 mm	4.5 mm

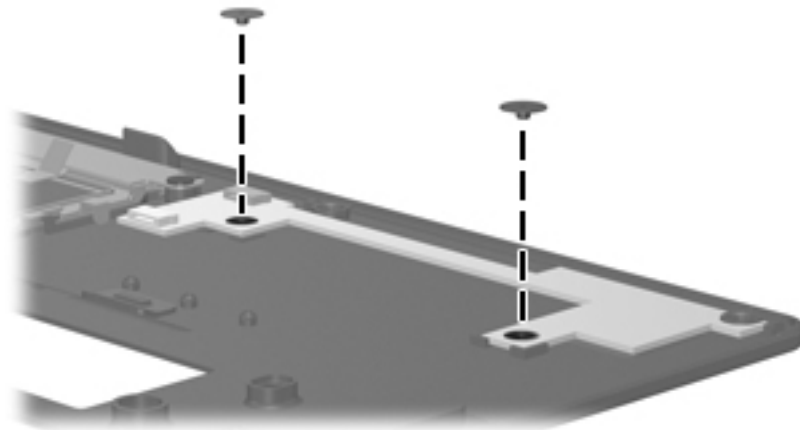


**Where used:** 4 screws that secure the display hinges to the display panel

## Phillips PM2.0×2.0 broad-head screw

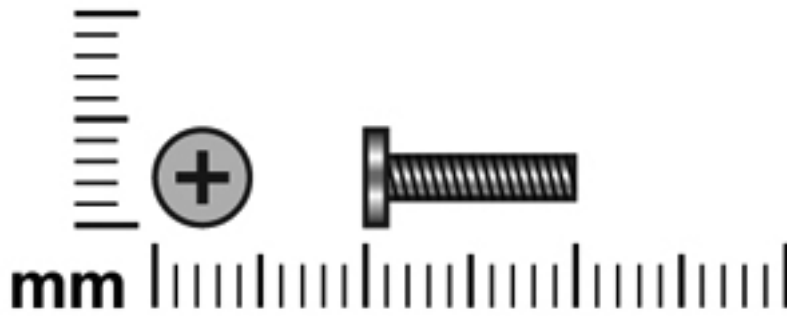


Color	Quantity	Length	Thread	Head width
Silver	2	7.0 mm	2.5 mm	7.0 mm

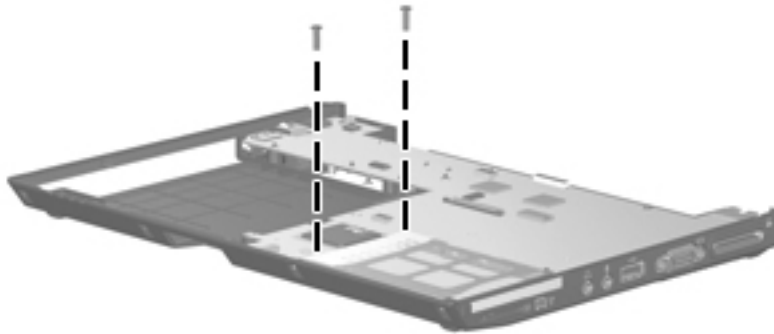


**Where used:** 2 screws that secure the fingerprint reader board to the top cover

## Phillips PM2.0×10.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	2	10.0 mm	2.0mm	4.5 mm



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

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# 8 Backup and recovery

## Backup and recovery using Windows Vista


### Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed in your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.

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 **NOTE:** Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the HP Backup & Recovery Manager software.

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- The computer must be connected to AC power during the process.
- Only one set of the recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel the disc creation before you have finished creating the recovery discs. The next time you select **Create a set of recovery discs (Recommended)**, you will be prompted to continue the disc creation.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create a set of recovery discs (Recommended)**, and then click **Next**.
4. Follow the on-screen instructions.

### Backing up your information

---

 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup & Recovery Manager to create an entire drive backup as soon as you set up your computer.

---


With HP Backup & Recovery Manager, you can perform the following tasks:

- Backing up your information regularly to protect your important system files
- Creating system recovery points that allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state
- Scheduling backups at specific intervals or events

## When to back up

- On a regularly scheduled basis

---

 **NOTE:** Set reminders to back up your information periodically.

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- Before the computer is repaired or restored
- Before you add or modify hardware or software

## Backup suggestions

- Create a set of recovery discs using HP Backup & Recovery Manager.
- Create system recovery points using HP Backup & Recovery Manager, and periodically copy them to disc.
- Store personal files in the Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings 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.
- b. Copy the screen.

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, and then select **Edit > Paste**.

---

 **NOTE:** Before you can perform backup and recovery procedures, the computer must be connected to external power.


**NOTE:** Drivers, utilities, and software installed by HP can be copied to a CD or to a DVD using HP Backup & Recovery Manager.

---

## Backing up specific files or folders

You can back up specific files or folders to the recovery partition on the hard drive, to an optional external hard drive, or to optical discs (CDs or DVDs).

---

 **NOTE:** This process will take several minutes, depending on the file size and the speed of the computer.

---


To back up specific files or folders:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Back up user created files and folders**, and then click **Next**.
5. Follow the on-screen instructions.

## Backing up the entire hard drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows® operating system, software, and all personal files and folders.

---

 **NOTE:** A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.

**NOTE:** This process may take over an hour, depending on your computer speed and the amount of data being stored.

---


To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Create or manage Entire Drive Backups**, and then click **Next**.
5. Follow the on-screen instructions.

## Creating recovery points

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

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 **NOTE:** The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make copies of changes made after that time.

---

HP recommends that you create recovery points at the following times:

- Before you add or extensively modify software or hardware
- Periodically, whenever the system is performing optimally

---

 **NOTE:** Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

---

To create a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
2. Click **Next**.
3. Click **Create or manage backups**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.
5. Follow the on-screen instructions.

## Scheduling backups


Use HP Backup Scheduler to schedule backups for the entire system, for recovery points, or for specific files and folders. With this tool, you can schedule backups at specific intervals (daily, weekly, or monthly) or at specific events, such as at system restart or when you dock to an optional docking station (select models only).

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.
2. Follow the on-screen instructions.

## Performing a recovery

---

 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup & Recovery Manager to create an entire drive backup as soon as you set up your computer.

---

HP Backup & Recovery Manager helps you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Recovering important files—This feature helps you reinstall important files without performing a full system recovery.
- Performing a full system recovery—With HP Backup & Recovery Manager, you can recover your full factory image if you experience system failure or instability. HP Backup & Recovery Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

## Performing a recovery from the recovery discs

To perform a recovery from the recovery discs, follow these steps:

1. Back up all personal files.
2. Insert the first recovery disc into the optical drive and restart the computer.
3. Follow the on-screen instructions.

## Performing a recovery from the hard drive

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows
- From the recovery partition



## Initiating a recovery in Windows

To initiate a recovery in Windows, follow these steps:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > Backup & Recovery Manager**.
3. Click **Next**.
4. Click **Perform a recovery**, and then click **Next**.
5. Follow the on-screen instructions.

## Initiating a recovery from the hard drive recovery partition

To initiate a recovery from the hard drive recovery partition, follow these steps:

1. Back up all personal files.
2. Restart the computer, and then press **f11** before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.

# Backup and recovery using Windows XP


## Creating recovery discs

After setting up the computer for the first time, be sure to create a set of recovery discs of the full factory image. The recovery discs are used to start up (boot) the computer and recover the operating system and software to factory settings in case of system instability or failure.

Note the following guidelines before creating recovery discs:

- Use any of the following types of discs: CD-R, DVD+R, DVD+R DL, DVD-R, or DVD-R DL (purchased separately). The discs you use will depend on the type of optical drive installed in your computer. Because DVDs store more information than CDs, DVDs and DVDs with double-layer (DL) support reduce the number of discs required.

---

 **NOTE:** Read-write discs, such as CD-RW, DVD+RW, and DVD-RW, are not compatible with the HP Backup and Recovery Manager software.

---


- The computer must be connected to AC power during the process.
- Only one set of the recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive of the computer.
- If necessary, you can cancel the disc creation before you have finished creating the recovery discs. The next time you select **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, you will be prompted to continue the disc creation.

To create a set of recovery discs:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Create factory software recovery CDs or DVDs to recover the system (Highly recommended)**, and then click **Next**.
4. Follow the on-screen instructions.

## Backing up your information

---

 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup and Recovery Manager to create an entire drive backup as soon as you set up your computer.

---


With HP Backup and Recovery Manager, you can perform the following tasks:

- Backing up your information regularly to protect your important system files
- Creating system recovery points that allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state
- Scheduling backups at specific intervals or events

## When to back up

- On a regularly scheduled basis

---

 **NOTE:** Set reminders to back up your information periodically.

---

- Before the computer is repaired or restored
- Before you add or modify hardware or software

## Backup suggestions

- Create a set of recovery discs using HP Backup and Recovery Manager.
- Create system recovery points using HP Backup and Recovery Manager, and periodically copy them to disc.
- Store personal files in the My Documents folder and back up these folders periodically.
- Back up templates stored in their associated programs.
- Save customized settings 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.
- b. Copy the screen.

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, and then select **Edit > Paste**.

---

 **NOTE:** Before you can perform backup and recovery procedures, the computer must be connected to external power.


**NOTE:** Drivers, utilities, and software installed by HP can be copied to a CD or to a DVD using HP Backup and Recovery Manager.

---

## Backing up specific files or folders

You can back up specific files or folders to the recovery partition on the hard drive, to an optional external hard drive, or to optical discs (CDs or DVDs).

---

 **NOTE:** This process will take several minutes, depending on the file size and the speed of the computer.

---

To back up specific files or folders:


1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.

4. Click **Back up individual files and folders**, and then click **Next**.
5. Follow the on-screen instructions.

## Backing up the entire hard drive

When you perform a complete backup of the hard drive, you are saving the full factory image, including the Windows® operating system, software, and all personal files and folders.

---

 **NOTE:** A copy of the entire hard drive image can be stored on another hard drive, on a network drive, or on recovery discs that you create.

**NOTE:** This process may take over an hour, depending on your computer speed and the amount of data being stored.

---


To back up your entire hard drive:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Back up entire hard drive**, and then click **Next**.
5. Follow the on-screen instructions.

## Creating recovery points

When you back up modifications since your last backup, you are creating system recovery points. This allows you to save a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes made to your system.

---


 **NOTE:** The first system recovery point, a snapshot of the entire image, is automatically created the first time you perform a backup. Subsequent recovery points make copies of changes made after that time.

---

HP recommends that you create recovery points at the following times:

- Before you add or extensively modify software or hardware
- Periodically, whenever the system is performing optimally

---

 **NOTE:** Recovering to an earlier recovery point does not affect data files or e-mails created since that recovery point.

---

To create a system recovery point:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
2. Click **Next**.
3. Click **Back up to protect system settings and important data files**, and then click **Next**.
4. Click **Create or manage Recovery Points**, and then click **Next**.
5. Follow the on-screen instructions.

## Scheduling backups


Use HP Backup Scheduler to schedule backups for the entire system, for recovery points, or for specific files and folders. With this tool, you can schedule backups at specific intervals (daily, weekly, or monthly) or at specific events, such as at system restart or when you dock to an optional docking station (select models only).

To schedule backups:

1. Select **Start > All Programs > HP Backup & Recovery > HP Backup Scheduler**.
2. Follow the on-screen instructions.

## Performing a recovery

---

 **NOTE:** You can only recover files that you have previously backed up. HP recommends that you use HP Backup and Recovery Manager to create an entire drive backup as soon as you set up your computer.

---

HP Backup and Recovery Manager helps you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Recovering important files—This feature helps you reinstall important files without performing a full system recovery.
- Performing a full system recovery—With HP Backup and Recovery Manager, you can recover your full factory image if you experience system failure or instability. HP Backup and Recovery

Manager works from a dedicated recovery partition on the hard drive or from recovery discs you create.

### **Performing a recovery from the recovery discs**

To perform a recovery from the recovery discs, follow these steps:

1. Back up all personal files.
2. Insert the first recovery disc into the optical drive and restart the computer.
3. Follow the on-screen instructions.

### **Performing a recovery from the hard drive**

There are 2 ways to initiate a recovery from the hard drive:

- From within Windows
- From the recovery partition

## Initiating a recovery in Windows

To initiate a recovery in Windows, follow these steps:

1. Back up all personal files.
2. Select **Start > All Programs > HP Backup & Recovery > HP Backup and Recovery Manager**.
3. Click **Next**.
4. Click **Recover important files or the entire system**, and then click **Next**.
5. Follow the on-screen instructions.

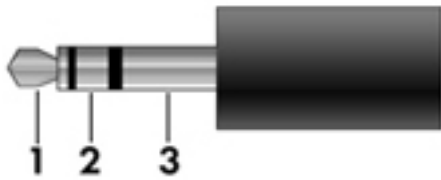
## Initiating a recovery from the hard drive recovery partition

To initiate a recovery from the hard drive recovery partition, follow these steps:

1. Back up all personal files.
2. Restart the computer, and then press **f11** before the Windows operating system loads.
3. Click a recovery option, and then click **Next**.
4. Follow the on-screen instructions.

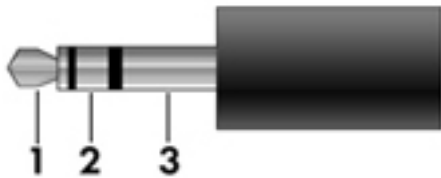
## 9 Connector pin assignments

### Audio-out (headphone)



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

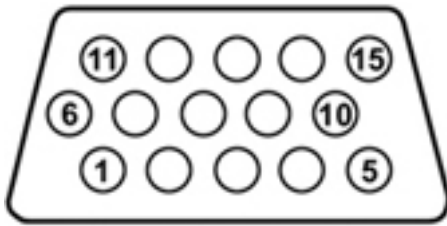
### Audio-in (microphone)



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

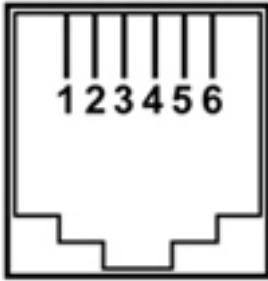


## External monitor



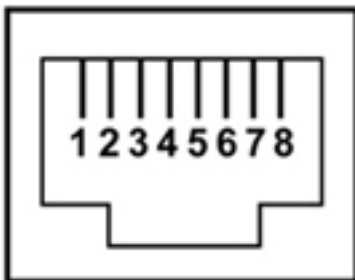
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

## RJ-11 (modem)



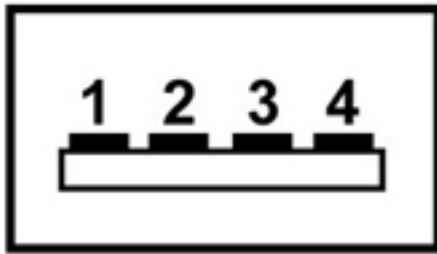
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

## 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
Korea	EK	4
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	CCC	5
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 appendix can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. Careful handling must be exercised when removing these components. 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>.
- 

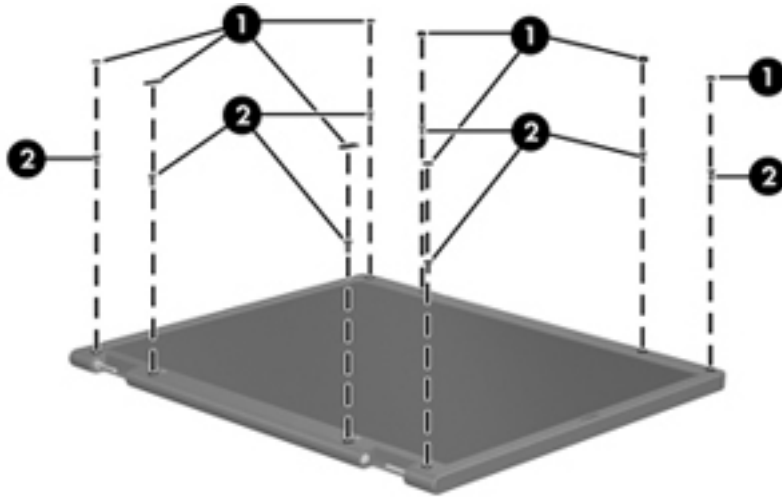
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight **(1)** and the liquid crystal display (LCD) panel **(2)**.



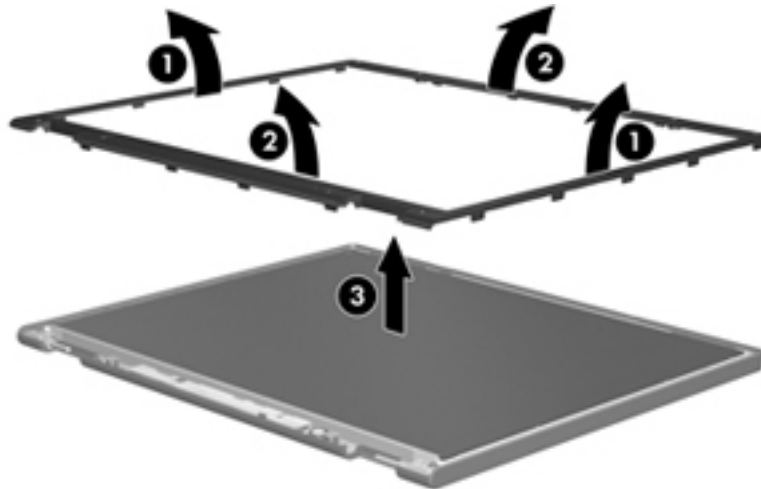
- 
- 📄 **NOTE:** The procedures provided in this appendix are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.
-

Perform the following steps to disassemble the display assembly:

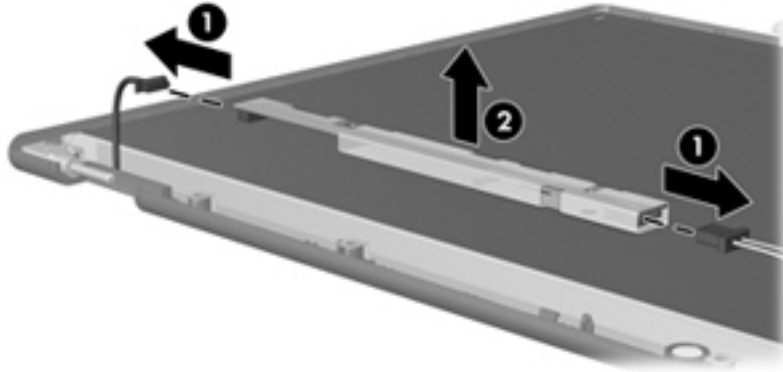
1. Remove all screw covers (1) and screws (2) that secure the display bezel to the display assembly.



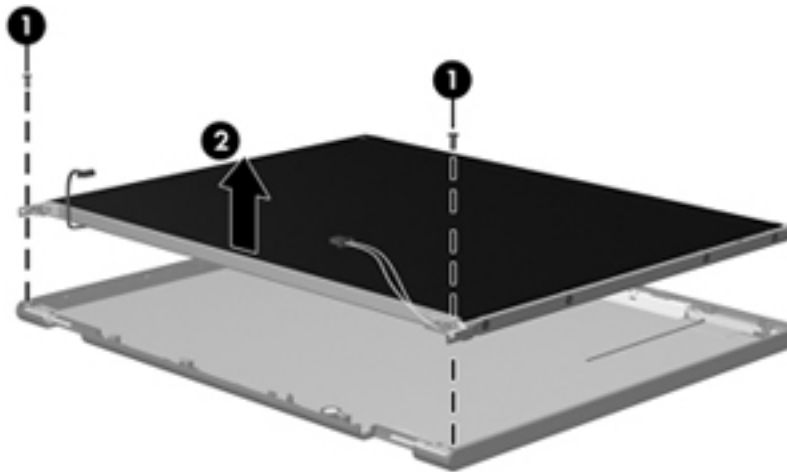
2. Lift up and out on the left and right inside edges (1) and the top and bottom inside edges (2) of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel (3).



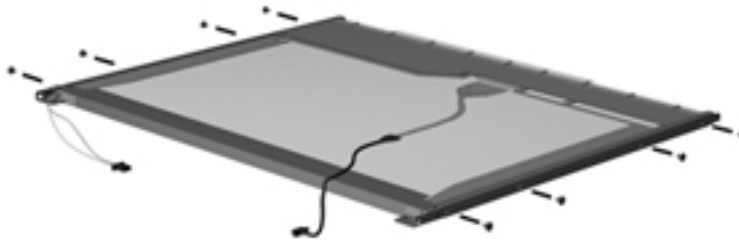
4. Disconnect all display panel cables (1) from the display inverter and remove the inverter (2).



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.



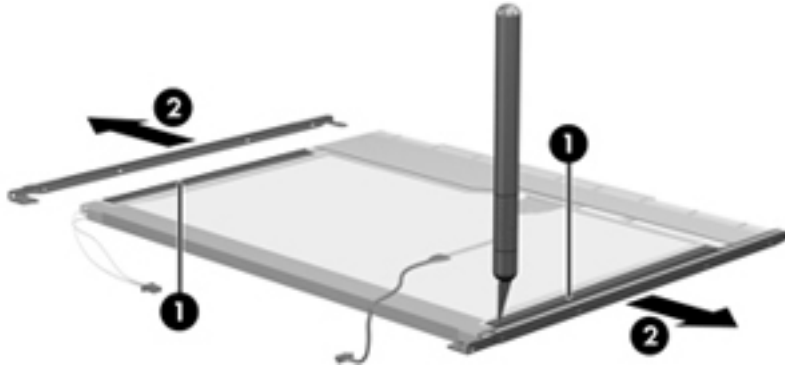
7. Turn the display panel assembly upside down.
8. Remove all screws that secure the display panel frame to the display panel.



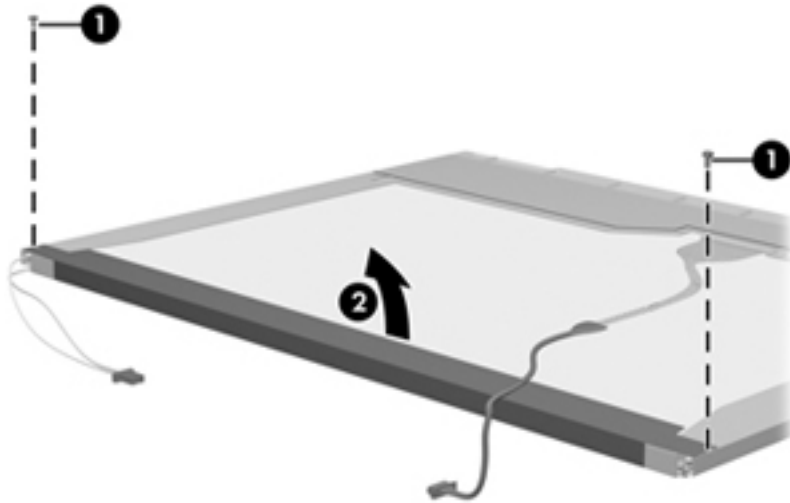
9. Use a sharp-edged tool to cut the tape (1) that secures the sides of the display panel to the display panel frame.



10. Remove the display panel frame (2) from the display panel.

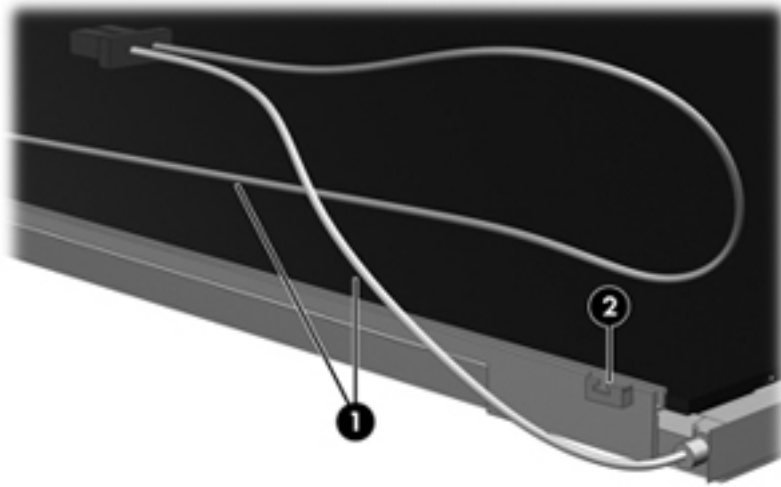


11. Remove the screws (1) that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover (2) and swing it outward.



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

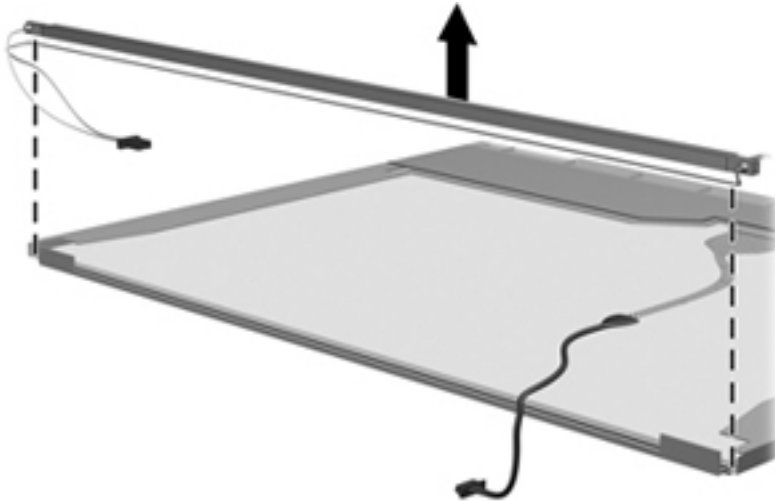
15. Remove the backlight cables (1) from the clip (2) in the display panel.



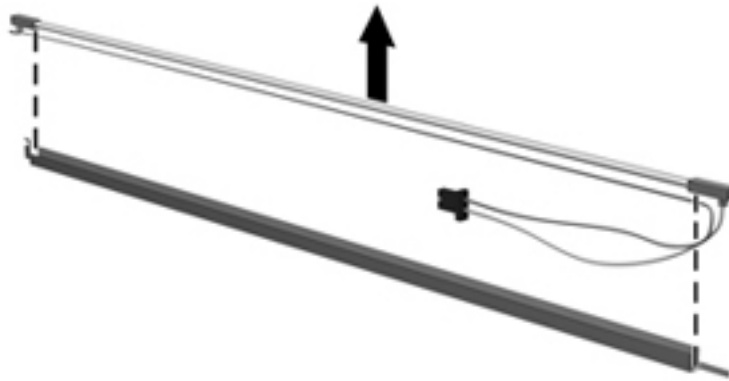
16. Turn the display panel upside down.

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

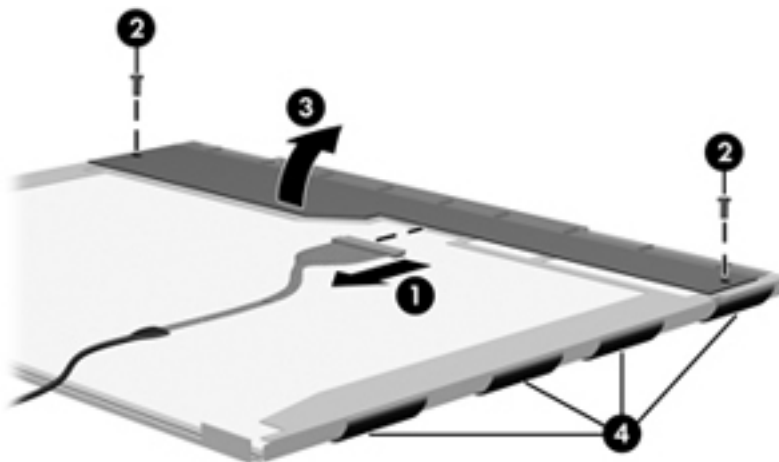
17. Remove the backlight frame from the display panel.



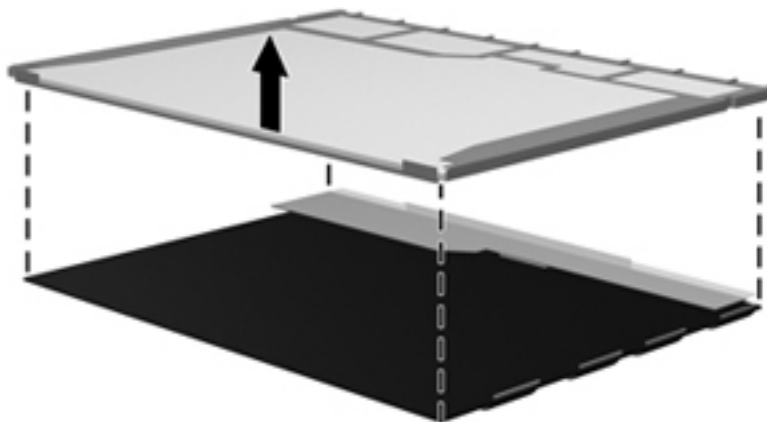
18. Remove the backlight from the backlight frame.



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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