



# **HP Pavilion dv6 Entertainment PC**

## Maintenance and Service Guide

Document Part Number: 575976-001

September 2009

This guide is a troubleshooting reference used for maintaining and servicing the computer. It provides comprehensive information on identifying computer features, components, and spare parts; troubleshooting computer problems; and performing computer disassembly procedures.

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First Edition: September 2009

Document Part Number: 575976-001

## 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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## Product description

Category	Description
<b>Product Name</b>	<b>HP Pavilion dv6 Entertainment PC</b>
<b>Processors</b>	<b>Intel® Core™ i7 mobile processor:</b> i7-820-QM, 1.73 GHz, SC turbo up to 3.06 GHz i7-720-QM, 1.6 GHz, SC turbo up to 2.8 GHz
<b>Chipset</b>	Northbridge: Intel PM55 (Discrete models) Southbridge: Intel ICH9M
<b>Graphics</b>	Discrete graphics subsystem memory: ■ nVidia N10M-GE with 512-MB dedicated memory ■ nVidia N10P-GE with 1-GB dedicated memory

Category	Description
<b>Panels</b>	15.6-inch, WXGA panel (1366 × 768)
	Typical brightness 220 nits
<b>Webcam</b>	Low profile VGA camera
	Fixed (no tilt)
	Activity LED
	640 × 480 by 24 frames per second
<b>Memory</b>	2 customer-accessible/upgradable memory module slots
	Supports dual-channel memory
	PC3, 1066 MHz front side bus (FSB), DDR3
	Supports up to 8 GB of system RAM in the following configurations:
	<ul style="list-style-type: none"> <li>■ 8192-MB total system memory (4096 MB × 2, dual-channel)</li> <li>■ 6144-MB total system memory (2048 MB × 1 + 4096 MB × 1)</li> <li>■ 4096-MB total system memory (2048 × 2, dual-channel)</li> <li>■ 3072-MB total system memory (2048 × 1024)</li> <li>■ 2048-MB total system memory (1024 × 2, dual-channel)</li> <li>■ 2048-MB total system memory (2048 × 1)</li> <li>■ 1024-MB total system memory (1024 × 1)</li> </ul>
<b>Hard drives</b>	Supports all Serial ATA (SATA) 9.5-mm, 6.35-cm (2.50-inch) hard drives
	Supports up to 2 hard drives
	Support for HP ProtectSmart Hard Drive Protection
	Supports the following drives:
	<ul style="list-style-type: none"> <li>■ 500-GB, 7200-rpm</li> <li>■ 500-GB, 5400-rpm</li> <li>■ 320-GB, 7200-rpm</li> <li>■ 320-GB, 5400-rpm</li> <li>■ 250-GB, 7200-rpm</li> <li>■ 250-GB, 5400-rpm</li> </ul>
<b>Optical drives</b>	Fixed (removal of 1 screw required)
	12.7-mm tray load
	Serial ATA
	Supports the following drives:
	<ul style="list-style-type: none"> <li>■ DVD±RW and CD-RW SuperMulti Double-Layer (DL) Combo Drive with LightScribe</li> <li>■ Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer (DL) Drive</li> </ul>
<b>Microphone</b>	2 omnidirectional microphones, dual-array with appropriate software (supports beam forming, echo cancellation, and noise suppression)
<b>Audio</b>	HD Audio (IDT)
	Supports Microsoft® Premium Requirements
<b>Modem</b>	56K V.92 data/fax modem
	Supports all worldwide certification requirements
<b>Ethernet</b>	Integrated 10/100/1000 network interface card (NIC) (Discrete models)
<b>Wireless</b>	Integrated wireless local area network (WLAN) by way of wireless module:
	2 wireless antennas built into display assembly

Category	Description
	Support for the following WLAN formats:
	■ Broadcom 4322 802.11 a/b/g/n WLAN
	■ Broadcom 4312 802.11b/g WLAN
	■ Intel 512AN 802.11 a/b/g Half-Mini Card (HMC) WLAN
	■ Intel 512AN 802.11 a/g/n Half-Mini Card (HMC) WLAN
<b>TV Tuner</b>	Integrated NTSC/ATSC/QAM hybrid TV tuner module with F-PAL jack (select models only)
	Integrated worldwide analog DVB-T TV tuner module with PAL jack (select models only)
	Integrated worldwide analog DVB-T TV tuner module with F-PAL jack (select models only)
	Integrated DVB-T TV tuner module with PAL jack (select models only)
	Integrated DVB-T/ANG TV tuner module
	Support for TV tuner antennas for both DVB-T and NTSC/ATSC (select models only)
<b>External media card</b>	One ExpressCard 54 slot
	Digital Media Slot supports Secure Digital (SD) Memory Card, MultiMediaCard (MMC), Memory Stick (MS), Memory Stick Pro (MSP), xD Picture Card (XD)
<b>Ports</b>	VGA, 15-pin supporting 1920 x 1200 resolution at 60Hz
	VGA, 15-pin supporting 1600 x 1200 resolution at 75Hz
	High-Definition Multimedia Interface (HDMI) v1.3b supporting 1080p with HDCP key
	eSATA port combo with fourth USB port
	Microphone stereo input (audio-in)
	Two stereo headphone jacks (audio-out)
	Four USB 2.0 ports
	IEEE 1394a
	RJ-11 (modem)
	RJ-45 (Ethernet, includes link and activity lights)
	Consumer infrared
	MCX connector for TV antennas (select models only)
	2-pin AC power for 90-W AC adapter
<b>Docking</b>	Expansion port 3 supports the HP Notebook Expansion Base and HP Notebook QuickDock
<b>Keyboard/pointing devices</b>	16-inch full-size keyboard with numeric keypad
	TouchPad supports 2-way scrolling
	Taps enabled as default
<b>Power requirements</b>	90-W AC adapter with localized cable plug support (2-wire plug with ground pin, supports 2-pin DC connector) (UMA models)
	3-cell 4.4-Ah 47-Wh Li-ion battery
	6-cell 2.55-Ah 55-Wh Li-ion battery
	6-cell 2.20-Ah 47-Wh Li-ion battery
	12-cell 2.20-Ah 95-Wh Li-ion battery
<b>Security</b>	Kensington Security Lock
	Fingerprint reader with Digital Persona software support

<b>Category</b>	<b>Description</b>
<b>Operating system</b>	<b>Preinstalled:</b>
	Windows 7
<b>Serviceability</b>	<b>End-user replaceable parts:</b>
	AC adapter
	Battery (system)
	Hard drive
	Memory module
	MiniCard components
	Optical drive

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## External component identification

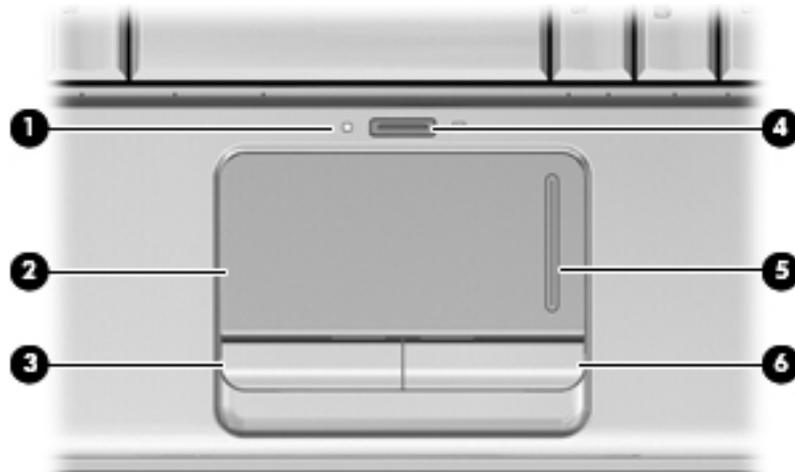
### Top components

### Display components



Item	Component	Description
❶	Internal microphones (2)	Record sound.
❷	Webcam light	On: The webcam is in use.
❸	Webcam	Records audio and video and captures still photographs.

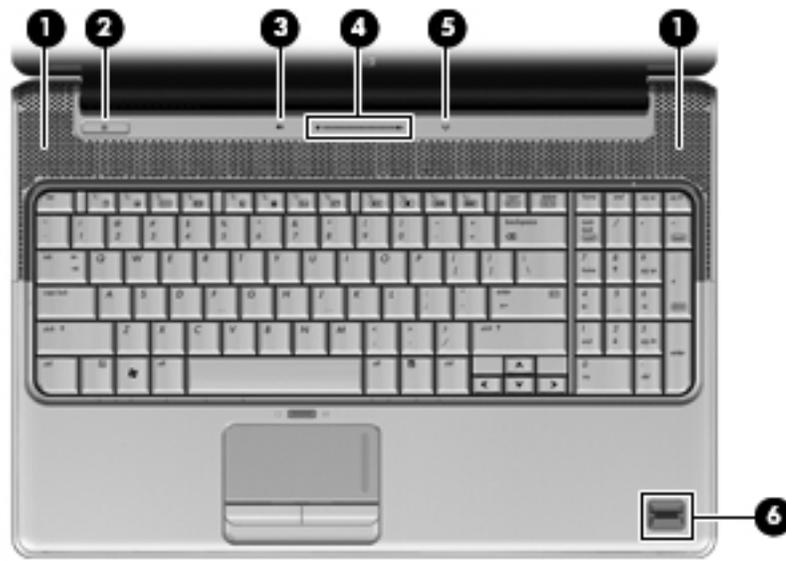
## TouchPad



Item	Component	Function
①	TouchPad light	<ul style="list-style-type: none"> <li>■ White: TouchPad is enabled.</li> <li>■ Amber: TouchPad is disabled.</li> </ul>
②	TouchPad*	Moves the pointer and selects or activates items on the screen.
③	Left TouchPad button*	Functions like the left button on an external mouse.
④	TouchPad on/off button	Enables/disables the TouchPad.
⑤	TouchPad scroll zone	Scrolls up or down.
⑥	Right TouchPad button*	Functions like the right button on an external mouse.

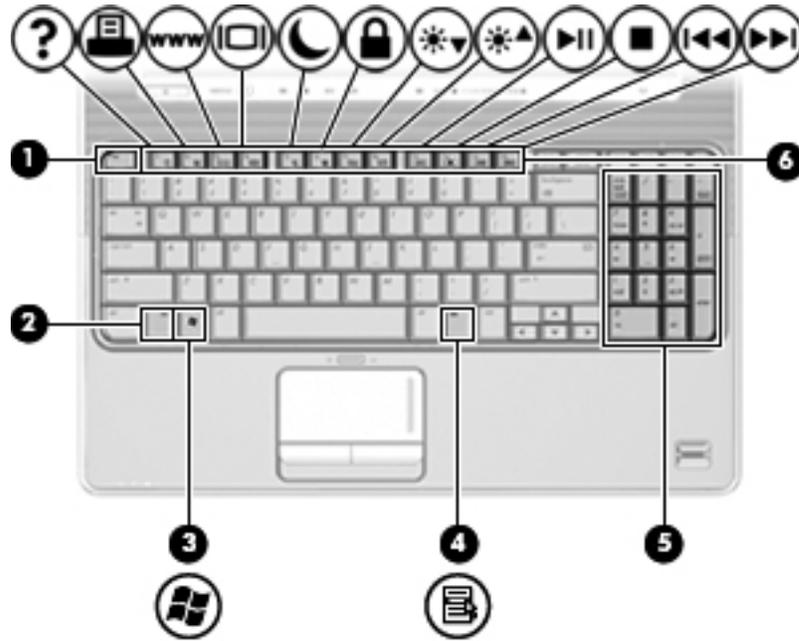
\*This table describes factory settings. To view or change device preferences, select **Start > Devices and Printers**. Then, right-click the device representing your computer, and select **Mouse settings**.

## Buttons, speakers, and fingerprint reader



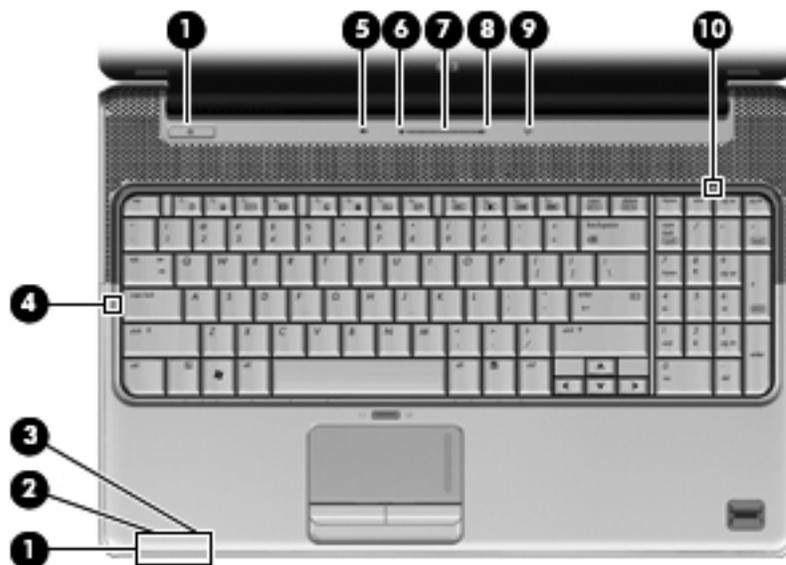
Item	Component	Description
①	Speakers (2)	Produce sound
②	Power button*	<ul style="list-style-type: none"> <li>■ When the computer is off, press the button to turn on the computer.</li> <li>■ When the computer is on, press the button briefly to initiate Sleep.</li> <li>■ When the computer is in the Sleep state, press the button briefly to exit Sleep.</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, Select <b>Start &gt; Control Panel &gt; System and Security &gt; Power Options</b>.</p>
③	Volume mute button	Mutes and restores speaker sound.
④	Volume scroll zone	Adjusts speaker volume. Slide your finger to the left to decrease volume and to the right to increase volume. You can also tap the minus (-) sign on the scroll zone to decrease volume, or tap the plus (+) sign on the scroll zone to increase volume.
⑤	Wireless button	<p>Turns the wireless feature on or off, but does not establish a wireless connection.</p> <p> You must set up or access a wireless network to establish a wireless connection.</p>
⑥	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.
	This table describes factory settings. For information about changing factory settings, refer to the user guides located in Help and Support.	

## Keys



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

## Lights



Item	Component	Description
❶	Power lights (2)*	<ul style="list-style-type: none"> <li>■ On: The computer is on.</li> <li>■ Blinking: The computer is in the Sleep state.</li> <li>■ Off: The computer is off or in Hibernation.</li> </ul>
❷	Battery light (beside power connector)	<ul style="list-style-type: none"> <li>■ On: A battery is charging.</li> <li>■ Blinking: 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 is turned 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>
❸	Drive light	<ul style="list-style-type: none"> <li>■ Blinking: The hard drive or optical drive is being accessed.</li> <li>■ Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.</li> </ul>
❹	Caps lock light	On: Caps lock is on.
❺	Volume mute light	<ul style="list-style-type: none"> <li>■ White: Computer sound is on.</li> <li>■ Amber: Computer sound is off.</li> </ul>
❻	Volume down light	On: The volume scroll zone is being used to decrease speaker volume.
❼	Volume scroll zone	On: The volume scroll zone is being used to increase speaker volume.
❽	Volume up light	On: The volume scroll zone is being used to increase speaker volume.

Item	Component	Description
9	Wireless	<ul style="list-style-type: none"> <li>■ Blue: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.</li> <li>■ Amber: All wireless devices are off.</li> </ul>
10	Num Lock	The integrated numeric keypad is enabled, or num lock is enabled on a connected optional numeric keypad.

\*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.

## Front components



Item	Component	Description
1	Power light	<ul style="list-style-type: none"> <li>■ On: The computer is on.</li> <li>■ Blinking: The computer is in the Sleep state.</li> <li>■ Off: The computer is off or in Hibernation.</li> </ul>
2	Battery light	<ul style="list-style-type: none"> <li>■ On: A battery is charging.</li> <li>■ Blinking: 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 is turned 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>
3	Drive light	<ul style="list-style-type: none"> <li>■ Blinking: The hard drive or optical drive is being accessed.</li> <li>■ Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.</li> </ul>
4	Consumer infrared lens	Receives a signal from the remote control.
5	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
6	Audio-out (headphone) jacks (2)	Produce sound when connected to optional powered stereo speakers, headphones, ear buds, a headset, or television audio.

 This table describes factory settings. For information about changing factory settings, refer to the user guides located in Help and Support.

## Left-side components



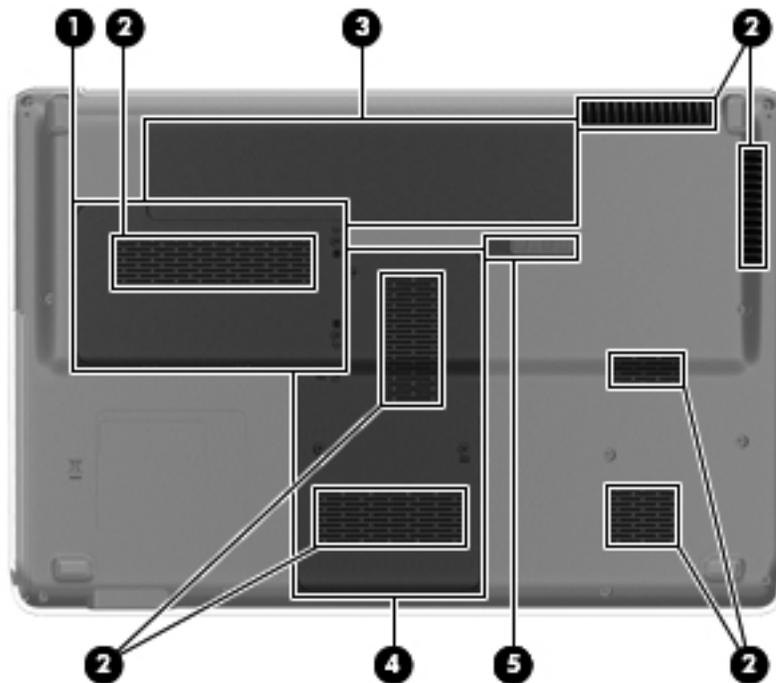
Item	Component	Function
❶	External monitor port	Connects an external VGA monitor or projector.
❷	Expansion port 3	Connects the computer to an optional docking device or an optional expansion product.  The computer has only one expansion port. The term <i>expansion port 3</i> describes the type of expansion port.
❸	RJ-45 (network) jack	Connects a network cable.
❹	HDMI port (select models only)	Connects an optional video or audio device, such as a high-definition television or any compatible digital or audio component.
❺	eSATA/USB port (select models only)	Connects an optional high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.  Depending on your computer model, the computer may include a USB port only.
❻	USB port	Connects an optional USB device.
❼	1394 port (select models only)	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
❽	Digital Media Slot activity light	On: A digital card is being accessed.
❾	Digital Media Slot	Supports the following optional digital card formats: <ul style="list-style-type: none"> <li>■ Memory Stick (MS)</li> <li>■ Memory Stick Pro (MSP)</li> <li>■ MultiMedia Card (MMC)</li> <li>■ Secure Digital (SD) Memory Card</li> <li>■ xD-Picture Card (XD)</li> </ul>
❿	ExpressCard slot	Supports optional ExpressCard/54 cards.

## Right-side components



Item	Component	Function
①	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
②	Optical drive light	Blinking: The optical drive is being accessed.
③	USB ports (2)	Connect optional USB devices.
④	TV antenna/cable jack (select models only)	Connects a TV antenna, a digital cable device, or a satellite device that receives standard or high-definition TV broadcasts.
⑤	RJ-11 (modem) jack (select models only)	Connects a modem cable.
⑥	Security cable slot	Attaches an optional security cable to the computer.  The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
⑦	AC adapter light	<ul style="list-style-type: none"> <li>■ On: The computer is connected to external power.</li> <li>■ Off: The computer is not connected to external power.</li> </ul>
⑧	Power connector	Connects an AC adapter.

## Bottom components



Item	Component	Function
❶	Hard drive bay	Holds the hard drive.
❷	Vents (7)	<p>Enable airflow to cool internal components.</p> <p> 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.</p>
❸	Battery bay	Holds the battery.
❹	Memory module compartment	<p>Contains the memory module.</p> <p>Also holds the WLAN module, TV tuner card (select models only), and the Intel Turbo Memory card (select models only).</p> <p> 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.</p>
❺	Battery release latch	Releases the battery from the battery bay.

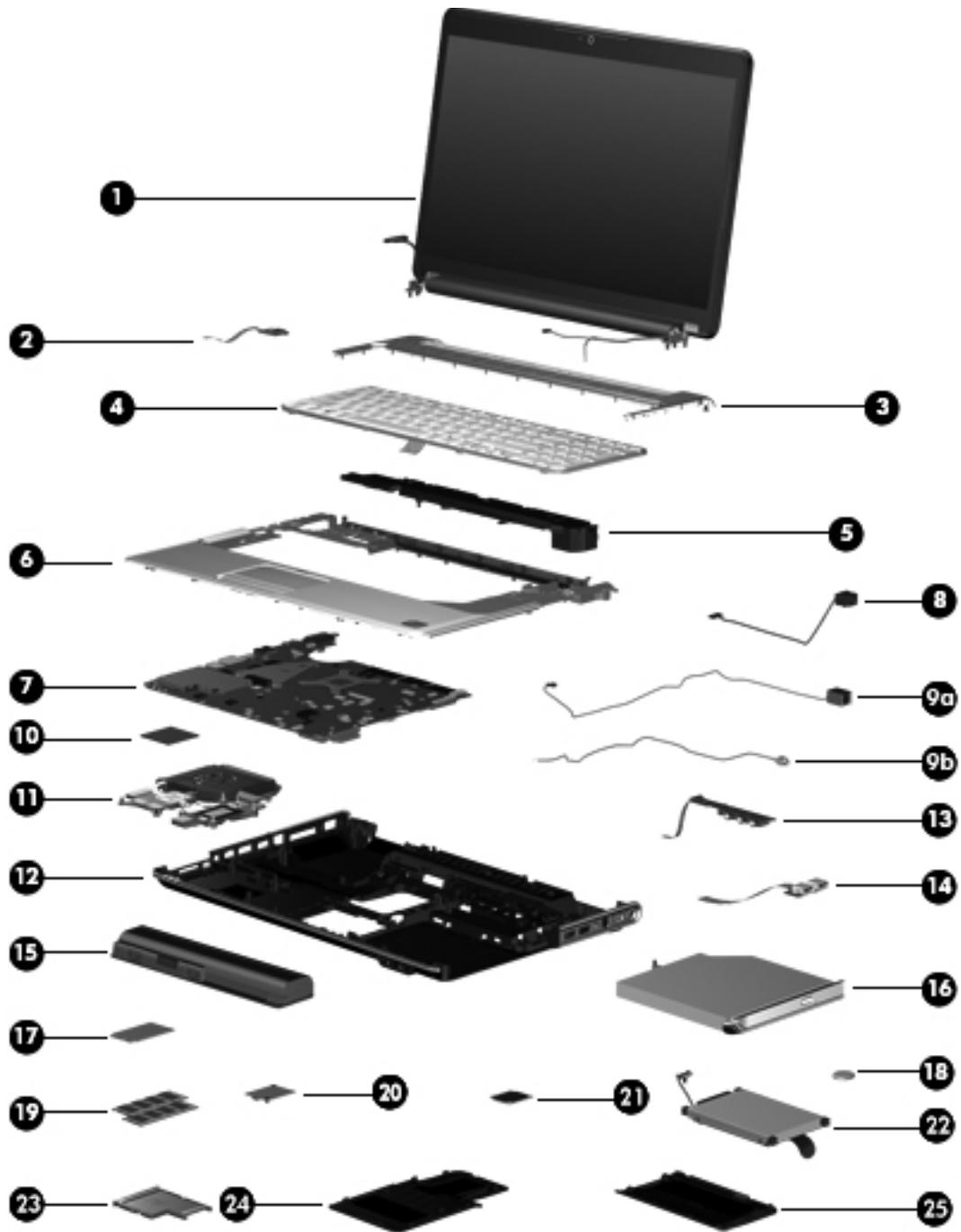
## Service tag

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



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

# Computer major components



Item	Description	Spare Part Number
(1)	<b>15.6-inch display assembly</b> (includes wireless antenna transceivers and cables)  See Display assembly components on page 3-9 for more information on display assembly spare part numbers.	
	BrightView display assembly with webcam and 2 microphones for use in white computers	538348-001
	BrightView display assembly with webcam and 2 microphones for use in black computers	538312-001
(2)	<b>Power button board</b> (includes cable) For use in computers with discrete graphics subsystems	512835-001
(3)	<b>Switch cover</b> (includes LED board and cable) For use in white computers	571747-001
	For use in black computers	571757-001
(4)	<b>Keyboard, Moonlight White</b> , molded keyboard characters (includes keyboard cable)	
	Belgium	517863-A41
	The Czech Republic	517863-221
	Denmark, Finland, Norway, and Sweden	517863-DH1
	France	517863-051
	Germany	517863-041
	Greece	517863-DJ1
	Hungary	517863-211
	For International use	517863-B31
	Israel	517863-BB1
	Italy	517863-061
	Japan	517863-291
	Latin America	517863-161
	Portugal	517863-131
	Russia	517863-251
	Saudi Arabia	517863-171
	South Korea	517863-AD1
	Spain	517863-071
	Taiwan	517863-AB1
	Thailand	517863-281
	Turkey	517863-141
	The United Kingdom	517863-031
	The United States	517863-001
	<b>Keyboard, Moonlight White</b> , textured keyboard characters (includes keyboard cable)	
	Saudi Arabia	517864-171
	The United States	517864-001
	<b>Keyboard, Espresso Black</b> , textured keyboard characters (includes keyboard cable)	
	Belgium	570228-A41
	The Czech Republic	570228-221

Item	Description	Spare Part Number
	Denmark, Finland, Norway, and Sweden	570228-DH1
	France	570228-051
	French Canada	570228-121
	Germany	570228-041
	Greece	570228-DJ1
	Hungary	570228-211
	For International use	570228-B31
	Israel	570228-BB1
	Italy	570228-061
	Japan	570228-291
	Latin America	570228-161
	Portugal	570228-131
	Russia	570228-251
	Saudi Arabia	570228-171
	South Korea	570228-AD1
	Spain	570228-071
	Taiwan	570228-AB1
	Thailand	570228-281
	Turkey	570228-141
	The United Kingdom	570228-031
	The United States	570228-001
	<b>Keyboard, Espresso Black</b> , molded keyboard characters (includes keyboard cable)	
	Belgium	518965-A41
	The Czech Republic	518965-221
	Denmark, Finland, Norway, and Sweden	518965-DH1
	France	518965-051
	Germany	518965-041
	Greece	518965-DJ1
	Hungary	518965-211
	For International use	518965-B31
	Israel	518965-BB1
	Italy	518965-061
	Japan	518965-291
	Latin America	518965-161
	Portugal	518965-131
	Russia	518965-251
	Saudi Arabia	518965-171
	South Korea	518965-AD1
	Spain	518965-071

Item	Description	Spare Part Number
	Switzerland	518965-111
	Taiwan	518965-AB1
	Thailand	518965-281
	Turkey	518965-141
	The United Kingdom	518965-031
	The United States	518965-001
	<b>Keyboard, Espresso Black</b> , textured keyboard characters (includes keyboard cable) for use in the United States	518966-001
(5)	<b>Speaker assembly</b> (includes left and right speakers and cable)	
	For use in all countries and regions except India	533865-001
	For use only in India	571902-001
(6)	<b>Top cover</b> (includes speakers, TouchPad and cable, LED board and cable, and switch cover)	
	For use only with white computer models not equipped with a fingerprint reader	518108-001
	For use only with black computer models not equipped with a fingerprint reader	518788-001
	For use only with black computer models equipped with a fingerprint reader	579160-001
(7)	<b>System board</b> (includes replacement thermal material)	
	With discrete graphics subsystem and 1-GB of dedicated memory	574902-001
(8)	<b>Power connector cable</b>	533465-001
	<b>Cable Kit</b> (see <a href="#">“Cable Kit” on page 3-12</a> for more Cable Kit spare part information)	512832-001
(9a)	<b>Modem module cable</b>	
	 The modem module cable includes the RJ-11 jack	
(9b)	<b>TV tuner cable</b>	
	<b>Plastics Kit</b> (see <a href="#">“Plastics Kit” on page 3-11</a> for more Plastics Kit spare part information)	579162-001
(10a)	<b>ExpressCard port bezel</b>	
(10b)	<b>Memory module compartment cover</b>	
(10c)	<b>Hard drive port bezel cover</b>	
(11)	<b>Processor</b> (includes replacement thermal material)	
	Intel Core™ i7-820-QM processor 1.73 GHz, SC turbo up to 3.06 GHz	583053-001
	Intel Core™ i7-720-QM processor 1.6 GHz, SC turbo up to 2.8 GHz	586170-001
(12)	<b>Fan/heat sink assembly</b> (includes replacement thermal material)	
	For use only with computer models equipped with graphics subsystems with discrete memory	579158-001
(13)	<b>Base enclosure</b> (includes rubber feet)	579157-001
	<b>Rubber Feet Kit</b> (not illustrated, includes 4 base enclosure rubber feet)	516499-001
(14)	<b>Audio/infrared board</b> (includes cable)	
	For use in computers with discrete graphics subsystems	512836-001
(15)	<b>USB board</b> (includes cable)	
	For use in computers with discrete graphics subsystems	516855-001
(16)	<b>Battery</b>	
	12-cell, 95-Wh, 8.8-Ah Li-ion battery	511884-001

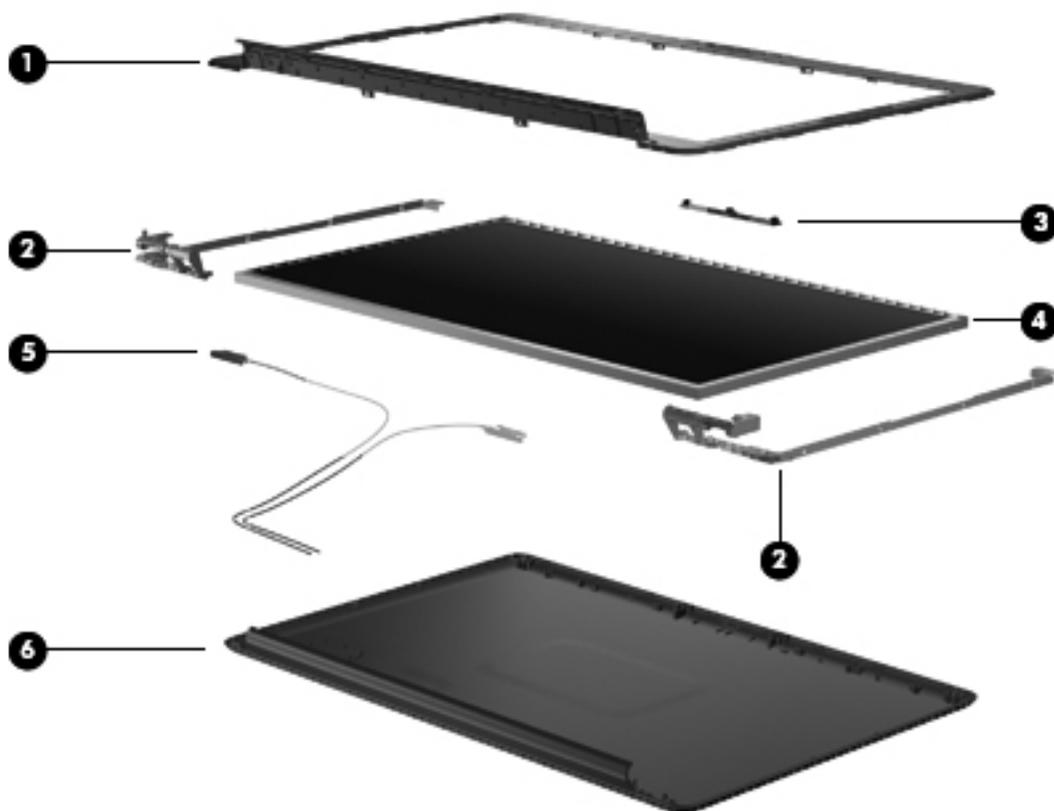
Item	Description	Spare Part Number
	6-cell, 55-Wh, 2.55-Ah Li-ion battery	511872-001
	6-cell, 47-Wh, 2.2-Ah Li-ion battery	484170-001
	3-cell, 47-Wh, 4.4-Ah Li-ion battery	516915-001
(17)	<b>Optical drive</b> (includes bezel and bracket)	
	■ DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	511880-001
	■ Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Drive	511882-001
(18)	<b>TV tuner module</b>	
	 The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 512832-001.	
	DVB-T TV tuner module	482899-003
	DVB-T/ANG TV tuner module	482899-002
	ATSC/NTSC/QAM hybrid TV tuner module	482899-001
	<b>TV tuner external antenna cable</b> (not illustrated)	
	With F-PAL jack	482900-001
	With PAL jack	482900-002
(19)	<b>RTC battery</b>	449729-001
(20)	<b>Memory modules, PC3, 1066-MHz FSB</b>	
	■ 4096-MB	579156-001
	■ 2048-MB	579155-001
	■ 1024-MB	579154-001
(21)	<b>Modem module</b>	
	 The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 512832-001.	
	For use in all countries and regions except Australia and New Zealand	510100-001
	For use only in Australia and New Zealand	510100-011
(22)	<b>WLAN module</b>	
	<b>Broadcom 4312 802.11b/g WLAN module:</b>	
	■ For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-003

Item	Description	Spare Part Number
■	For use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Belarus, Belgium, 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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	504593-004
<b>Broadcom 4322AGN 802.11 a/b/g/n WiFi Adapter WLAN module:</b>		
■	For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
■	For use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Belarus, Belgium, 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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	518434-002
<b>Intel 512AN 802.11 a/g/n WLAN Half-Mini Card (HMC)</b>		

Item	Description	Spare Part Number
	<ul style="list-style-type: none"> <li>■ For use in Andorra, Antigua and Barbuda, Argentina, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Pakistan, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the United States, Venezuela, and Vietnam</li> </ul>	572507-001
	<ul style="list-style-type: none"> <li>■ <b>Intel 512AN 802.11 a/b/g WLAN Half-Mini Card (HMC)</b></li> </ul>	
	<ul style="list-style-type: none"> <li>■ For use in Andorra, Antigua and Barbuda, Argentina, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Pakistan, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the United States, Venezuela, and Vietnam</li> </ul>	572508-001
(23)	<b>Hard drive</b> (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	
	<ul style="list-style-type: none"> <li>■ 500-GB, 7200-rpm</li> </ul>	575402-001
	<ul style="list-style-type: none"> <li>■ 500-GB, 5400-rpm</li> </ul>	511879-001
	<ul style="list-style-type: none"> <li>■ 320-GB, 7200-rpm</li> </ul>	511876-001
	<ul style="list-style-type: none"> <li>■ 320-GB, 5400-rpm</li> </ul>	511877-001
	<ul style="list-style-type: none"> <li>■ 250-GB, 7200-rpm</li> </ul>	511874-001
	<ul style="list-style-type: none"> <li>■ 250-GB, 5400-rpm</li> </ul>	511875-001
	<b>Hard Drive Hardware Kit</b> (not illustrated: includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	483862-001
	<b>Bluetooth module</b> (does not include cable) (not illustrated)	537921-001
	<b>Bluetooth module cable</b> (not illustrated)	579161-001
	<b>ExpressCard module</b> (not illustrated)	464793-002

## Display assembly components

### BrightView panel



Item	Description	Spare part number
❶	Display bezel	512364-001
❷	Display Hinge Kit (includes right and left hinges and display panel cable)	574556-001
❸	Webcam/microphone module	571742-001
❹	Display panel	570095-001
❺	Display panel (LED) cable	574554-001
❻	Display enclosure (includes wireless antenna transceivers and cables and logo LED board and cable)	
	For use in white computers	570390-001
	For use in black computers	570391-001
	Display inverter (not illustrated)	488317-001
	Lower trim cover (not illustrated)	533464-001
	Display Rubber Kit (not illustrated, includes display bezel rubber screw covers)	512361-001
	Display Screw Kit (not illustrated), includes:	512362-001
	■ Phillips PM2.0x3.0 screw	
	■ Phillips PM2.5x5.0 screw	

## Mass storage devices



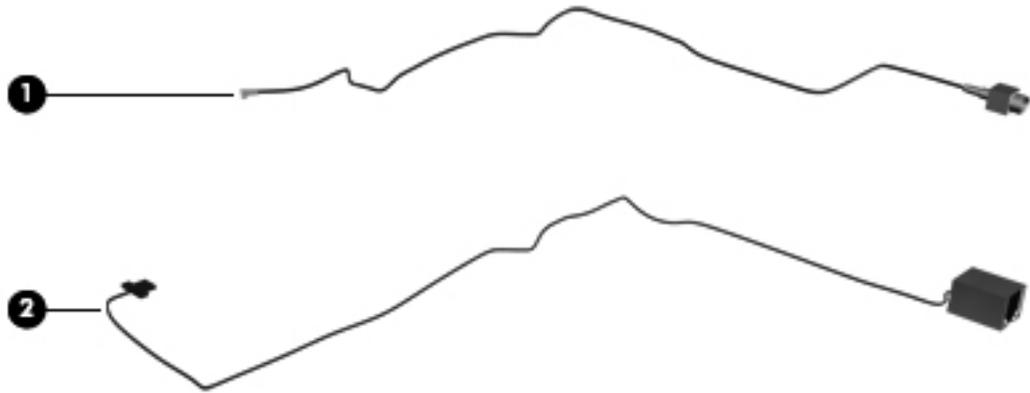
Item	Description	Spare part number
❶	<b>Hard drive</b> (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators):	
	■ 500-GB, 7200-rpm	575402-001
	■ 500-GB, 5400-rpm	511879-001
	■ 320-GB, 7200-rpm	511876-001
	■ 320-GB, 5400-rpm	511877-001
	■ 250-GB, 7200-rpm	511874-001
	■ 250-GB, 5400-rpm	511875-001
	<b>Hard Drive Hardware Kit</b> (not illustrated, includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	483862-001
❷	<b>Optical drive</b> (includes bezel and bracket)	
	■ DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	511880-001
	■ Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Drive	511882-001

## Plastics Kit



Item	Description	Spare part number
	<b>Plastics Kit</b>	5979162-001
❶	ExpressCard door	
❷	Hard drive port bezel cover	
❸	Memory module compartment cover	

## Cable Kit



Item	Description	Spare part number
	<b>Cable Kit, includes:</b>	512832-001
❶	TV tuner cable	
❷	Modem module cable (includes RJ-11 jack)	

## Miscellaneous parts

Description	Spare part number
<b>AC adapter:</b>	
120-W AC adapter	463953-001
<b>Wired headset with volume control</b>	371693-001
<b>Wireless laser mouse</b> (includes infrared transceiver)	430958-001
<b>Power cords:</b>	
For use in Argentina	490371-D01
For use in Australia and New Zealand	490371-011
For use in Belgium, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Iceland, the Netherlands, northwest Africa, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, and Turkey	490371-021
For use in the Asia/Pacific region, French Canada, Latin America, Thailand, and the United States	490371-001
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in North America	490371-001
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in the United Kingdom and Singapore	490371-031
<b>Remote controls:</b>	
Full-function remote control	465540-001
Full-function remote control with teletext	465541-001
ExpressCard remote	464793-002
<b>Screw Kit</b> , includes:	516498-001
■ Phillips PM2.0×3.0 screws	
■ Phillips PM2.5×3.0 screws	
■ Phillips PM2.5×4.0 screws	
■ Phillips PM2.5×6.5 screws	

## Sequential part number listing

Spare part number	Description
371693-001	Wired headset with volume control
430958-001	Wireless laser mouse (includes infrared transceiver)
449729-001	RTC battery
463953-001	120-W AC adapter
464793-002	ExpressCard module
465540-001	Full-function remote control
465541-001	Full-function remote control with teletext
482899-001	ATSC/NTSC/QAM hybrid TV tuner module  The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 512832-001.
482899-002	DVB-T/ANG TV tuner module  The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 512832-001.
482899-003	DVB-T TV tuner module  The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 512832-001.
482900-001	TV tuner external antenna cable with F-PAL jack
482900-002	TV tuner external antenna cable with PAL jack
483862-001	Hard Drive Hardware Kit
484170-001	Battery, 6-cell, 47-Wh, 2.2-Ah Li-ion
488317-001	Display inverter
490371-001	Power cord for use in the Asia/Pacific region, French Canada, Latin America, Thailand, and the United States
490371-011	Power cord for use in Australia and New Zealand
490371-021	Power cord for use in Belgium, Bulgaria, the Czech Republic, Finland, France, Germany, Greece, Hungary, Iceland, the Netherlands, northwest Africa, Norway, Poland, Portugal, Russia, Slovakia, Spain, Sweden, and Turkey
490371-031	Power cord for use in the United Kingdom and Hong Kong
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-111	Power cord for use in Switzerland
490371-201	Power cord for use in Brazil
490371-291	Power cord for use in Japan
490371-AA1	Power cord for use in the People's Republic of China
490371-AB1	Power cord for use in Taiwan
490371-AD1	Power cord for use in South Korea
490371-AR1	Power cord for use in South Africa
490371-BB1	Power cord for use in Israel
490371-D01	Power cord for use in Argentina

Spare part number	Description
490371-D61	Power cord for use in India
504593-003	Broadcom 4312 802.11b/g WLAN module for use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
504593-004	Broadcom 4312 802.11b/g 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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
510100-001	Modem module for use in all countries and regions except Australia and New Zealand  The modem module spare part kit does not include a modem module cable. The modem model cable is included in the Cable Kit, spare part number 512832-001.
510110-011	Modem module for use in Australia and New Zealand  The modem module spare part kit does not include a modem module cable. The modem model cable is included in the Cable Kit, spare part number 512832-001.
511872-001	Battery, 6-cell, 55-Wh, 2.55-Ah Li-ion
511874-001	Hard drive, 250-GB, 7200-rpm (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
511875-001	Hard drive, 250-GB, 5400-rpm (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
511876-001	Hard drive, 320-GB, 7200-rpm (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
511877-001	Hard drive, 320-GB, 5400-rpm (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
511879-001	Hard drive, 500-GB, 5400-rpm (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
511880-001	DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe
511882-001	Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Drive
512361-001	Display Rubber Kit
512362-001	Display Screw Kit
512364-001	Display bezel
512832-001	Cable Kit
512835-001	Power button board for use in computers with discrete graphics subsystems (includes cable)

<b>Spare part number</b>	<b>Description</b>
512836-001	Audio/infrared board for use in computers with discrete graphics subsystems (includes cable)
516498-001	Screw Kit
516499-001	Rubber Feet Kit
516855-001	USB board for use in computers with discrete graphics subsystems
516915-001	Battery, 3-cell, 47-Wh, 4.4-Ah Li-ion
517863-001	Keyboard, Moonlight White, molded keyboard characters for use in the United States (includes keyboard cable)
517863-031	Keyboard, Moonlight White, molded keyboard characters for use in the United Kingdom (includes keyboard cable)
517863-041	Keyboard, Moonlight White, molded keyboard characters for use in (includes keyboard cable)
517863-051	Keyboard, Moonlight White, molded keyboard characters for use in France (includes keyboard cable)
517863-061	Keyboard, Moonlight White, molded keyboard characters for use in Italy (includes keyboard cable)
517863-071	Keyboard, Moonlight White, molded keyboard characters for use in Spain (includes keyboard cable)
517863-131	Keyboard, Moonlight White, molded keyboard characters for use in Portugal (includes keyboard cable)
517863-141	Keyboard, Moonlight White, molded keyboard characters for use in Turkey (includes keyboard cable)
517863-161	Keyboard, Moonlight White, molded keyboard characters for use in Latin America (includes keyboard cable)
517863-171	Keyboard, Moonlight White, molded keyboard characters for use in Saudi Arabia (includes keyboard cable)
517863-211	Keyboard, Moonlight White, molded keyboard characters for use in Hungary (includes keyboard cable)
517863-221	Keyboard, Moonlight White, molded keyboard characters for use in the Czech Republic (includes keyboard cable)
517863-251	Keyboard, Moonlight White, molded keyboard characters for use in Russia (includes keyboard cable)
517863-281	Keyboard, Moonlight White, molded keyboard characters for use in Thailand (includes keyboard cable)
517863-291	Keyboard, Moonlight White, molded keyboard characters for use in Japan (includes keyboard cable)
517863-A41	Keyboard, Moonlight White, molded keyboard characters for use in Belgium (includes keyboard cable)
517863-AB1	Keyboard, Moonlight White, molded keyboard characters for use in Taiwan (includes keyboard cable)
517863-AD1	Keyboard, Moonlight White, molded keyboard characters for use in South Korea (includes keyboard cable)
517863-B31	Keyboard, Moonlight White, molded keyboard characters for International use (includes keyboard cable)
517863-BB1	Keyboard, Moonlight White, molded keyboard characters for use in Israel (includes keyboard cable)
517863-DH1	Keyboard, Moonlight White, molded keyboard characters for use in Denmark, Finland, Norway, and Sweden (includes keyboard cable)
517863-DJ1	Keyboard, Moonlight White, molded keyboard characters for use in Greece (includes keyboard cable)
517864-001	Keyboard, Moonlight White, textured keyboard characters for use in the United States (includes keyboard cable)

Spare part number	Description
517864-171	Keyboard, Moonlight White, textured keyboard characters for use in Saudi Arabia (includes keyboard cable)
518108-001	Top cover for use only with white computer models not equipped with a fingerprint reader (includes speaker, TouchPad and cable, LED board and cable, and switch cover)
518434-001	Broadcom 4322 AGN 802.11a/b/g/n WLAN module for use in Antigua and Barbuda, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States
518434-002	Broadcom 4322 AGN802.11a/b/g/n 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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
518788-001	Top cover for use only with black computer models not equipped with a fingerprint reader (includes speaker, TouchPad and cable, LED board and cable, and switch cover)
518965-001	Keyboard, Espresso Black, molded keyboard characters for use in the United States (includes keyboard cable)
518965-031	Keyboard, Espresso Black, molded keyboard characters for use in the United Kingdom (includes keyboard cable)
518965-041	Keyboard, Espresso Black, molded keyboard characters for use in Germany (includes keyboard cable)
518965-051	Keyboard, Espresso Black, molded keyboard characters for use in France (includes keyboard cable)
518965-061	Keyboard, Espresso Black, molded keyboard characters for use in Italy (includes keyboard cable)
518965-071	Keyboard, Espresso Black, molded keyboard characters for use in Spain (includes keyboard cable)
518965-111	Keyboard, Espresso Black, molded keyboard characters for use in Switzerland (includes keyboard cable)
518965-131	Keyboard, Espresso Black, molded keyboard characters for use in Portugal (includes keyboard cable)
518965-141	Keyboard, Espresso Black, molded keyboard characters for use in Turkey (includes keyboard cable)
518965-161	Keyboard, Espresso Black, molded keyboard characters for use in Latin America (includes keyboard cable)
518965-171	Keyboard, Espresso Black, molded keyboard characters for use in Saudi Arabia (includes keyboard cable)
518965-211	Keyboard, Espresso Black, molded keyboard characters for use in Hungary (includes keyboard cable)

<b>Spare part number</b>	<b>Description</b>
518965-221	Keyboard, Espresso Black, molded keyboard characters for use in the Czech Republic (includes keyboard cable)
518965-251	Keyboard, Espresso Black, molded keyboard characters for use in Russia (includes keyboard cable)
518965-281	Keyboard, Espresso Black, molded keyboard characters for use in Thailand (includes keyboard cable)
518965-291	Keyboard, Espresso Black, molded keyboard characters for use in Japan (includes keyboard cable)
518965-A41	Keyboard, Espresso Black, molded keyboard characters for use in Belgium (includes keyboard cable)
518965-AB1	Keyboard, Espresso Black, molded keyboard characters for use in Taiwan (includes keyboard cable)
518965-AD1	Keyboard, Espresso Black, molded keyboard characters for use in South Korea (includes keyboard cable)
518965-B31	Keyboard, Espresso Black, molded keyboard characters for International use (includes keyboard cable)
518965-BB1	Keyboard, Espresso Black, molded keyboard characters for use in Israel (includes keyboard cable)
518965-DH1	Keyboard, Espresso Black, molded keyboard characters for use in Denmark, Finland, Norway, and Sweden (includes keyboard cable)
518965-DJ1	Keyboard, Espresso Black, molded keyboard characters for use in Greece (includes keyboard cable)
518966-001	Keyboard, Espresso Black, textured keyboard characters for use in the United States (includes keyboard cable)
533464-001	Lower trim cover
533465-001	Power connector cable
533865-001	Speaker assembly for use in all countries and regions except India (includes left and right speakers and cable)
537921-001	Bluetooth module
538312-001	15.6-inch BrightView display assembly with webcam and 2 microphones for use in black computers
538348-001	15.6-inch BrightView display assembly with webcam and 2 microphones for use in white computers
570095-001	Display panel
570228-001	Keyboard, Espresso Black, textured keyboard characters for use in the United States (includes keyboard cable)
570228-031	Keyboard, Espresso Black, textured keyboard characters for use in the United Kingdom (includes keyboard cable)
570228-041	Keyboard, Espresso Black, textured keyboard characters for use in Germany (includes keyboard cable)
570228-051	Keyboard, Espresso Black, textured keyboard characters for use in France (includes keyboard cable)
570228-061	Keyboard, Espresso Black, textured keyboard characters for use in Italy (includes keyboard cable)
570228-071	Keyboard, Espresso Black, textured keyboard characters for use in Spain (includes keyboard cable)
570228-121	Keyboard, Espresso Black, textured keyboard characters for use in French Canada (includes keyboard cable)
570228-131	Keyboard, Espresso Black, textured keyboard characters for use in Portugal (includes keyboard cable)
570228-141	Keyboard, Espresso Black, textured keyboard characters for use in Turkey (includes keyboard cable)

<b>Spare part number</b>	<b>Description</b>
570228-161	Keyboard, Espresso Black, textured keyboard characters for use in Latin America (includes keyboard cable)
570228-171	Keyboard, Espresso Black, textured keyboard characters for use in Saudi Arabia (includes keyboard cable)
570228-211	Keyboard, Espresso Black, textured keyboard characters for use in Hungary (includes keyboard cable)
570228-221	Keyboard, Espresso Black, textured keyboard characters for use in the Czech Republic (includes keyboard cable)
570228-251	Keyboard, Espresso Black, textured keyboard characters for use in Russia (includes keyboard cable)
570228-281	Keyboard, Espresso Black, textured keyboard characters for use in Thailand (includes keyboard cable)
570228-291	Keyboard, Espresso Black, textured keyboard characters for use in Japan (includes keyboard cable)
570228-A41	Keyboard, Espresso Black, textured keyboard characters for use in Belgium (includes keyboard cable)
570228-AB1	Keyboard, Espresso Black, textured keyboard characters for use in Taiwan (includes keyboard cable)
570228-AD1	Keyboard, Espresso Black, textured keyboard characters for use in South Korea (includes keyboard cable)
570228-B31	Keyboard, Espresso Black, textured keyboard characters for International use (includes keyboard cable)
570228-BB1	Keyboard, Espresso Black, textured keyboard characters for use in Israel (includes keyboard cable)
570228-DH1	Keyboard, Espresso Black, textured keyboard characters for use in Denmark, Finland, Norway, and Sweden (includes keyboard cable)
570228-DJ1	Keyboard, Espresso Black, textured keyboard characters for use in Greece (includes keyboard cable)
570390-001	Display enclosure for use in white computers (includes wireless antenna transceivers and cables and LED board and cable)
570391-001	Display enclosure for use in black computers (includes wireless antenna transceivers and cables and LED board and cable)
571742-001	Webcam/microphone module
571747-001	Switch cover for use in white computers (includes LED board and cable)
571757-001	Switch cover for use in black computers (includes LED board and cable)
571902-001	Speaker assembly for use only in India (includes left and right speakers and cable)

Spare part number	Description
572507-001	Intel 512AN, 802.11a/g/n WLAN HMC 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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
572508-001	Intel 512AN, 802.11a/g/n WLAN HMC for use in Russia and Ukraine
574554-001	Display panel (LED) cable
574556-001	Display Hinge Kit
575402-001	Hard drive, 500-GB, 7200-rpm (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)
579154-001	Memory module, 1024-MB
579155-001	Memory module, 2048-MB
579156-001	Memory module, 4096-MB
579157-001	Base enclosure (includes rubber feet)
579158-001	Fan/heat sink assembly for use only with computer models equipped with graphics subsystems with discrete memory (includes replacement thermal material)
579160-001	Top cover for use only with black computer models equipped with a fingerprint reader (includes speakers, TouchPad and cable, LED board and cable, and switch cover)
579161-001	Bluetooth module cable
579162-001	Plastics Kit

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# 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
- Phillips P0 and P1 screwdrivers
- Torx T8 screwdriver

### Service considerations



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

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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



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

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### Cables and connectors



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**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.

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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 may work perfectly throughout a normal cycle. Or the device may function normally for a while, and 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

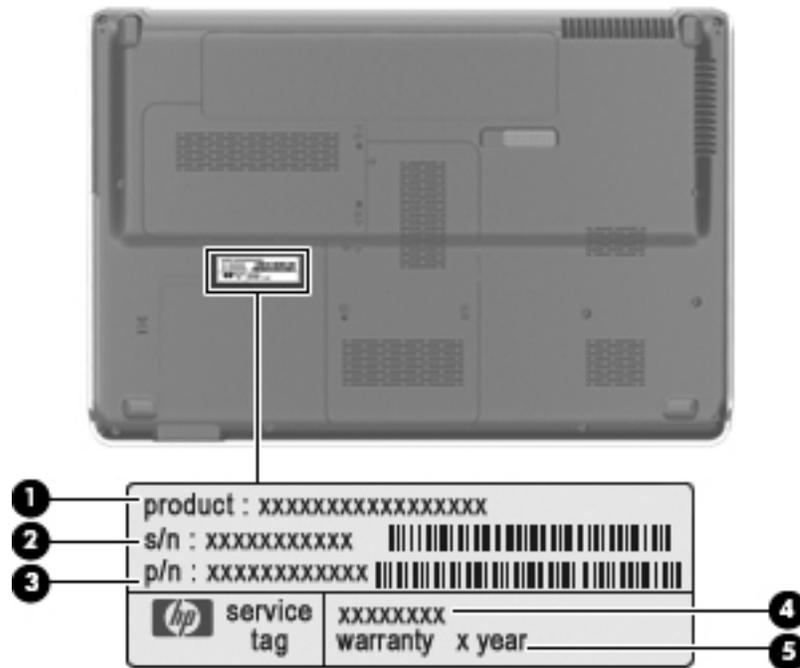
## Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 73 screws including captive screws, in 9 different sizes, that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

### Service tag

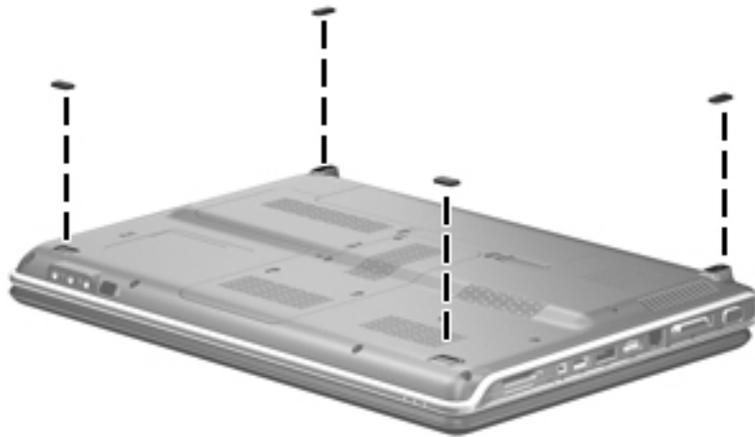
When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



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

## Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 516499-001. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

Description	Spare part number
12-cell, 95-Wh, 8.8 Ah Li-ion battery	570228-001
6-cell, 55-Wh, 2.55-Ah Li-ion battery	511872-001
6-cell, 47-Wh, 2.2-Ah Li-ion battery	484170-001
3-cell, 47-Wh, 4.4-Ah Li-ion battery	516915-001

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.
2. Slide the battery release latch ❶ to release the battery.
3. Pivot the battery ❷ upward and remove it ❸ from the computer.



To install the battery, insert the rear edge of the battery into the battery bay and pivot the front edge of the battery downward until it is seated. The battery release latch automatically locks the battery into place.

## Webcam/microphone module



This section applies only to computer models equipped with BrightView display assemblies. If it has been determined that the webcam/microphone module is the component that must be replaced to complete the computer repair, the display assembly does not have to be removed. Follow the procedures in this section to replace the webcam/microphone module. For information on replacing the display assembly and other display assembly internal components, see [“Display assembly” on page 4-24](#).

Description	Spare part number
Webcam/microphone module with cable	571742-001

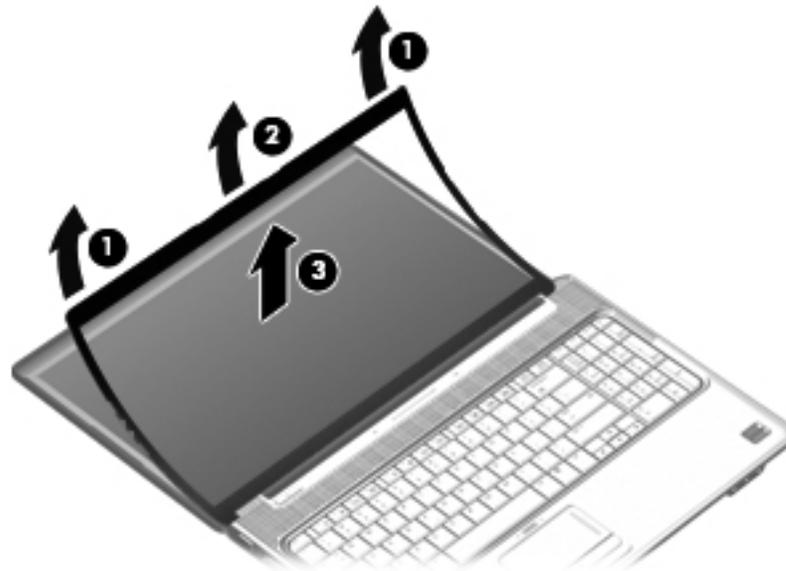
Before removing the webcam/microphone module, follow these steps:

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 4-6](#)).

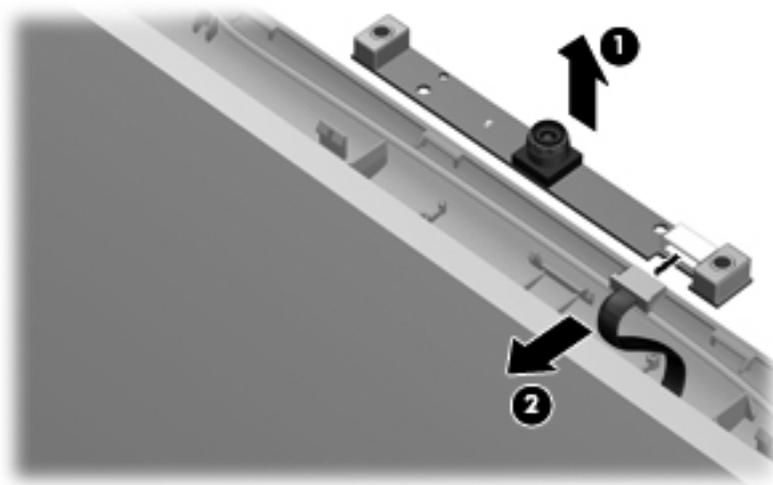
Remove the webcam/microphone module:

1. Turn the computer display-side up, with the front toward you.
2. Open the computer as far as possible.
3. Flex the inside edges of the top edge ❶ and the upper left and upper right corners ❷ of the display bezel until the bezel disengages from the display enclosure.

4. Release the display bezel top edge ❸ from the display enclosure.



5. Release the webcam/microphone module ❶ from the display enclosure as far as the webcam/microphone module cable allows.
6. Disconnect the webcam/microphone module cable ❷ from the webcam/microphone module.



7. Remove the webcam/microphone module.
- Reverse this procedure to install the webcam/microphone module.

## Optical drive



The optical drive spare part kit includes an optical drive bezel and bracket.

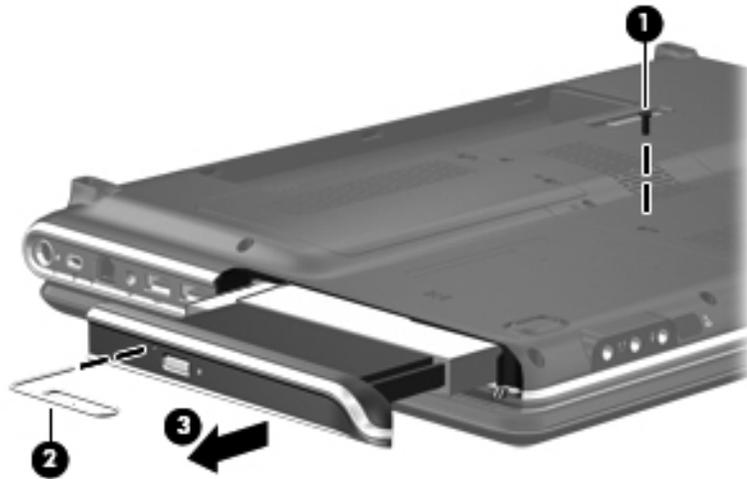
Description	Spare part number
DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive with LightScribe	511880-001
Blu-ray ROM with LightScribe DVD±R/RW SuperMulti Double-Layer Drive	511882-001

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 4-6).

Remove the optical drive:

1. Position the computer with the front toward you.
2. Remove the Phillips PM2.5×6.5 screw ❶ that secures the optical drive to the computer.
3. Insert a thin tool, such as a paper clip, into the disc tray release access hole ❷. (The optical drive disc tray is partially ejected from the optical drive.)
4. Use the disc tray frame to slide the optical drive ❸ out of the computer.



5. Remove the optical drive.
6. If it is necessary to replace the optical drive bracket, follow these steps:
  - a. Position the optical drive with the optical drive bracket toward you.
  - b. Remove the two Phillips PM2.0×3.0 screws that secure the optical drive bracket to the optical drive.
  - c. Remove the optical drive bracket.



Reverse this procedure to reassemble and install the optical drive.

## Memory module

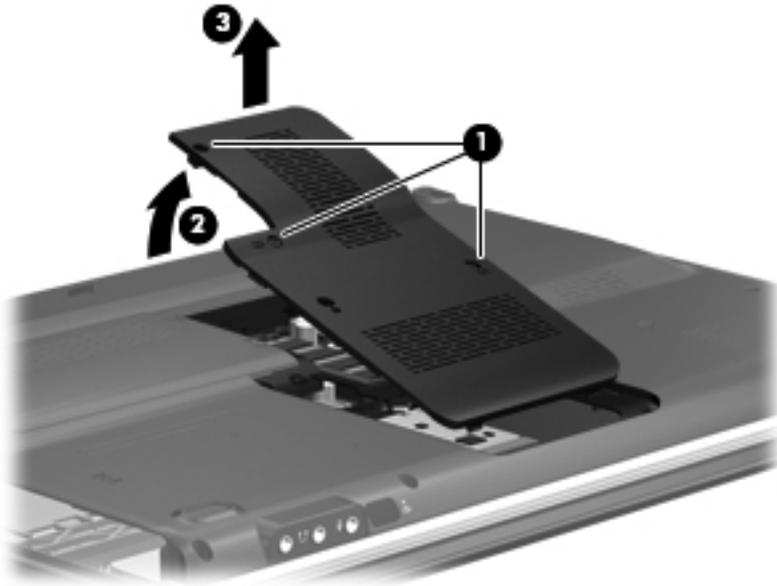
Description	Spare part number
4096-MB, 1066 MHz DDR-3 DIMM	579156-001
2048-MB, 1066 MHz DDR-3 DIMM	579155-001
1024-MB, 1066 MHz DDR-3 DIMM	579154-001

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 4-6](#)).

Remove the memory module:

1. Position the computer with the front toward you.
2. Remove the single screw that secures the optical drive to the computer (see [“Optical drive” on page 4-9](#)).
3. Loosen the three Phillips PM2.5×14.0 captive screws ❶ that secure the memory module compartment cover to the computer.
4. Lift the rear edge ❷ of the cover, swing it up and to the front, and remove the cover ❸. The memory module compartment cover is included in the Plastics Kit, spare part number 579162-001.



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

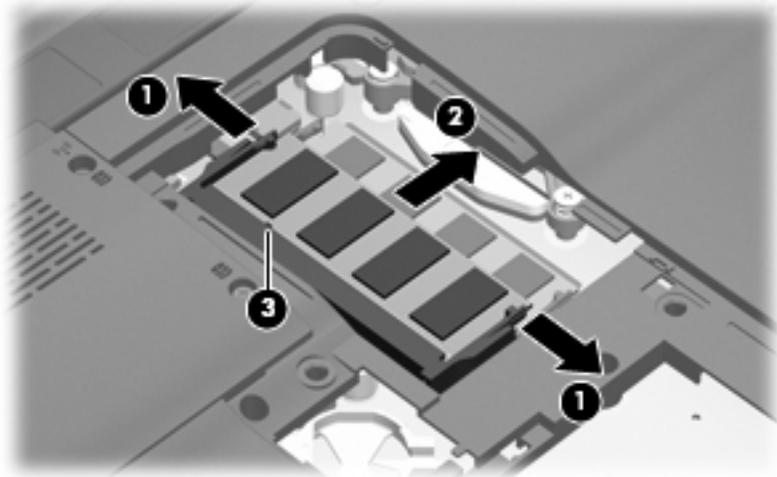


If necessary, use a non-conductive pointed tool to spread the retaining tabs.

6. Remove the memory module **2** by pulling the module away from the slot at an angle.



Memory modules are designed with a notch **3** to prevent incorrect insertion into the memory module slot.



Reverse this procedure to install a memory module.

## TV tuner module

 The TV tuner module spare part kit does not include a TV tuner module cable. The TV tuner module cable is included in the Cable Kit, spare part number 512832-001.

 The TV tuner external antenna cables are available using spare part numbers 482900-001 (with F-PAL jack) and 482900-002 (with PAL jack).

Description	Spare part number
DVB-T TV tuner module	482899-003
DVB-T/ANG TV tuner module	482899-002
ATSC/NTSC/QAM hybrid TV tuner module	482899-001

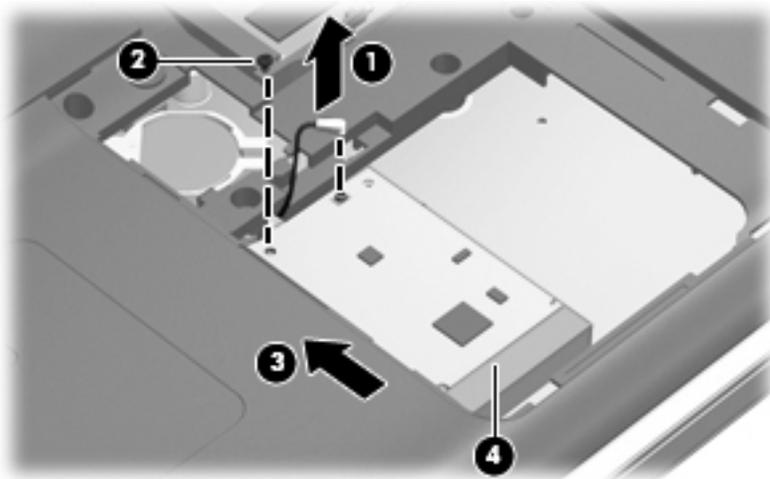
Before removing the TV tuner module, follow these steps:

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 4-6](#)).
5. Remove the memory module compartment cover (see [“Memory module” on page 4-10](#)).

Remove the TV tuner module:

1. Disconnect the TV tuner module antenna cable **1** from the terminal on the TV tuner module.
2. Remove the Phillips PM2.0×3.0 screw **2** that secures the TV tuner module to the computer.
3. Lift the edge of the TV tuner module **3**, and pull the module away from the slot at an angle.

 The TV tuner module is designed with a notch **4** to prevent incorrect insertion into the TV tuner module slot.



Reverse this procedure to install the TV tuner module.

## RTC battery

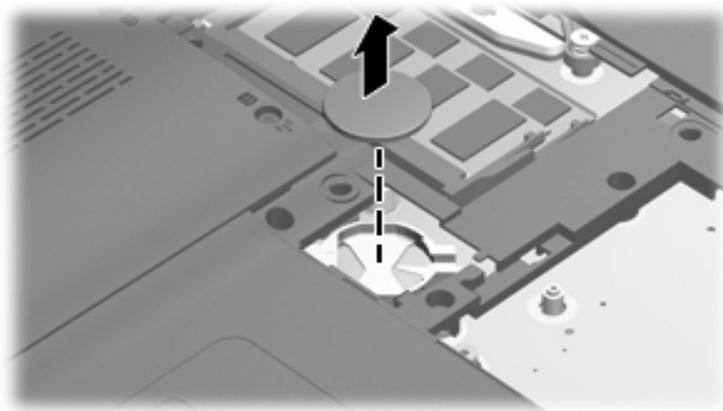
Description	Spare part number
RTC battery	449729-001

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 4-6](#)).
5. Remove the memory module compartment cover (see [“Memory module” on page 4-10](#)).
6. Remove the RTC battery.



Use a non-conductive pointed tool to pry the RTC battery from the socket on the system board.



Reverse this procedure to install the RTC battery. Be sure that the RTC battery is installed with the “+” sign facing up.

## Hard drive



The hard drive spare part kit includes left and right bracket rails, a connector cable, Mylar cover with tab, and 4 rubber isolators.

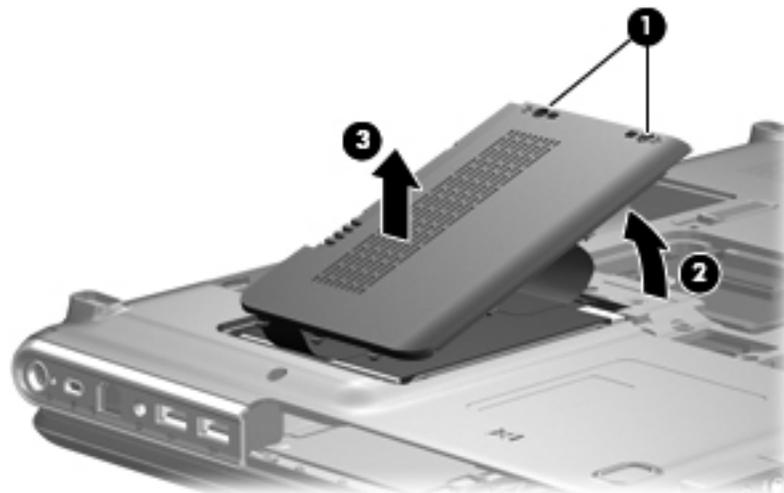
Description	Spare part number
500-GB, 7200-rpm hard drive	575402-001
500-GB, 5400-rpm hard drive	511879-001
320-GB, 7200-rpm hard drive	511876-001
320-GB, 5400-rpm hard drive	511877-001
250-GB, 7200-rpm hard drive	511874-001
250-GB, 5400-rpm hard drive	511875-001
Hard Drive Hardware Kit (includes left and right bracket rails, connector cable, Mylar cover with tab, and 4 rubber isolators)	483862-001

Before removing the hard drive, follow these steps:

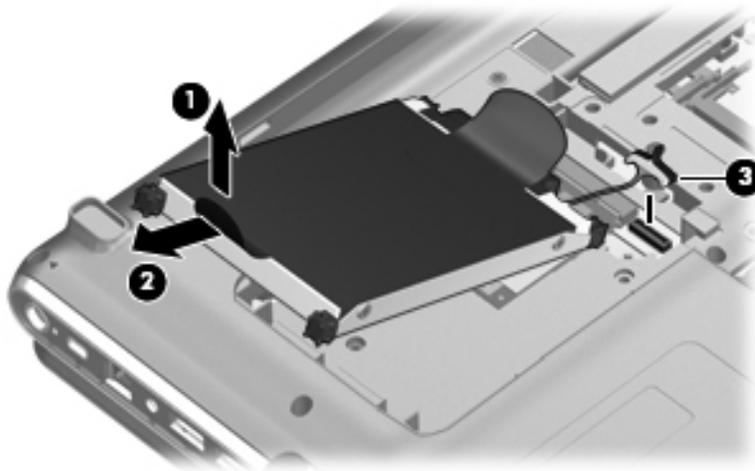
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see “[Battery](#)” on page 4-6).

Remove the hard drive:

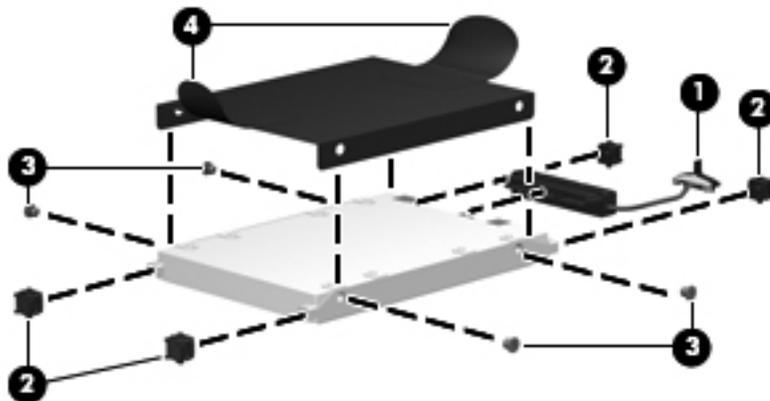
1. Position the computer with the front toward you.
2. Loosen the two Phillips PM2.5×5.5 captive screws ❶ that secure the hard drive port bezel cover to the computer.
3. Lift the right side ❷ of the hard drive port bezel cover, swing it up and to the left, and remove the cover ❸. The spare hard drive port bezel cover is included in the Plastics Kit, 579162-001.



4. Use the Mylar tab ❶ to lift the hard drive up, and then slide it to the left ❷ to release it from the hard drive bay.
5. Disconnect the hard drive cable ❸ from the system board.



6. Remove the hard drive from the hard drive bay.
7. If it is necessary to replace the hard drive bracket or any of the hard drive bracket components, remove the following:
  - a. Hard drive connector cable ❶
  - b. Four rubber isolators ❷
  - c. Four Phillips PM3.0×3.5 screws ❸ that secure the hard drive bracket rails and Mylar cover to the hard drive.
  - d. Left and right hard drive bracket rails with Mylar cover tabs ❹.



Reverse this procedure to reassemble and install the hard drive.

## WLAN module

Description	Spare part number
<b>Broadcom 4312 802.11b/g WLAN module:</b>	
■ For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	504593-003
■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Belarus, Belgium, 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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	504593-004
<b>Broadcom 4322 AGN802.11a/b/g/n WiFi Adapter WLAN module:</b>	
■ For use in Antigua and Barbuda, Barbados, Belize, Canada, the Cayman Islands, Guam, Puerto Rico, Trinidad and Tobago, the U.S. Virgin Islands, and the United States	518434-001
■ For use in Afghanistan, Albania, Algeria, Andorra, Angola, Argentina, Armenia, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Bangladesh, Belarus, Belgium, 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, the People's Republic of China, 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, 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, Peru, the Philippines, Poland, Portugal, the Republic of Moldova, Romania, Russia, Rwanda, Samoa, San Marino, Sao Tome and Principe, Saudi Arabia, Senegal, Serbia, the Seychelles, Sierra Leone, Singapore, Slovakia, Slovenia, the Solomon Islands, Somalia, South Africa, South Korea, Spain, Sri Lanka, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, 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	518434-002
<b>Intel 512AN 802.11 a/g/n Half-Mini Card (HMC)</b>	

Description	Spare part number
<ul style="list-style-type: none"> <li>■ For use in Andorra, Antigua and Barbuda, Argentina, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Pakistan, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the United States, Venezuela, and Vietnam</li> </ul>	572507-001
<ul style="list-style-type: none"> <li>■ <b>Intel 512AN 802.11 a/b/g Half-Mini Card (HMC)</b></li> </ul>	
<ul style="list-style-type: none"> <li>■ For use in Andorra, Antigua and Barbuda, Argentina, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Brunei, Bulgaria, Canada, Chile, the People's Republic of China, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala, Haiti, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Pakistan, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, Uruguay, the United States, Venezuela, and Vietnam</li> </ul>	572508-001

Before removing the WLAN module, follow these steps:

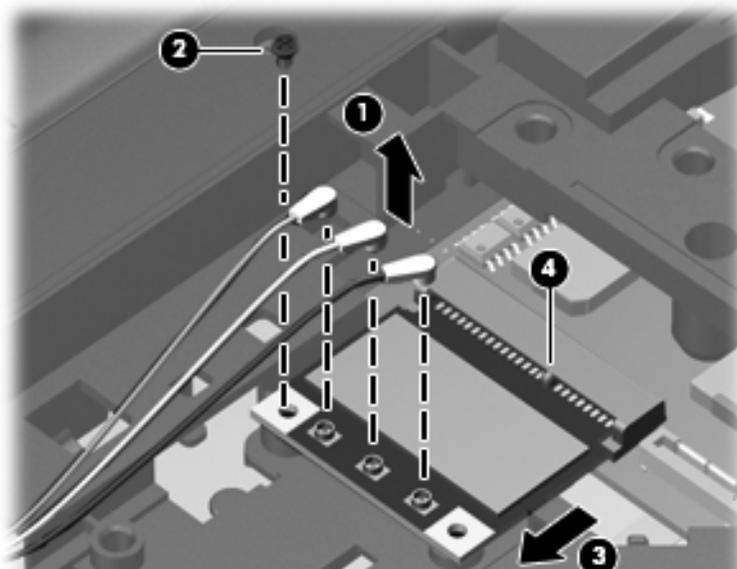
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-6](#)).
5. Remove the hard drive (see [“Hard drive” on page 4-14](#)).

Remove the WLAN module:

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

1. Disconnect the three WLAN antenna cables ❶ from the WLAN module.
2. Remove the Phillips PM2.0×3.0 screw ❷ that secures the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)
3. Remove the WLAN module ❸ by pulling it away from the slot at an angle.

 WLAN modules are designed with a notch ❹ to prevent incorrect insertion into the WLAN module slot.



Reverse this procedure to install the WLAN module.

 When attaching the WLAN antenna cables to the module make sure that the cable tag numbers are matched to the numbers on the module. Cable 1 should be attached to TR1, cable 2 to TR2, and cable 3 to TR3.

## Switch cover and keyboard

Description:	Spare part number
Switch cover for use in white computers (includes LED board and cable)	571747-001
Switch cover for use in black computers (includes LED board and cable)	571757-001

 For a detailed list of available keyboards for your country or region, see pages 3-3 through 3-5.

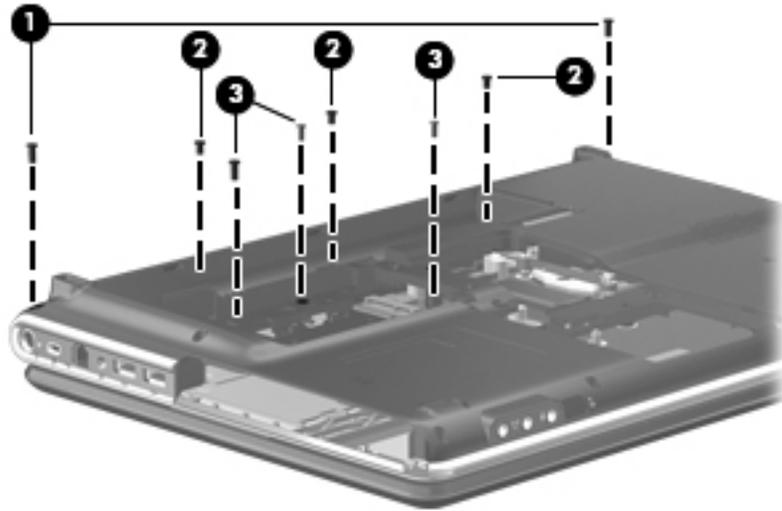
Before removing the switch cover and keyboard, follow these steps:

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

4. Remove the battery (see “Battery” on page 4-6).

Remove the switch cover and keyboard:

1. Turn the computer upside down, with the front toward you.
2. Remove the following screws:
  - a. Two Phillips PM2.5×7.0 screws ❶ that secure the switch cover to the computer
  - b. Three Phillips PM2.5×4.0 screws ❷ that secure the switch cover to the computer (these are inside the battery bay)
  - c. Three Phillips PM2.5×6.5 screws ❸ that secure the keyboard to the computer



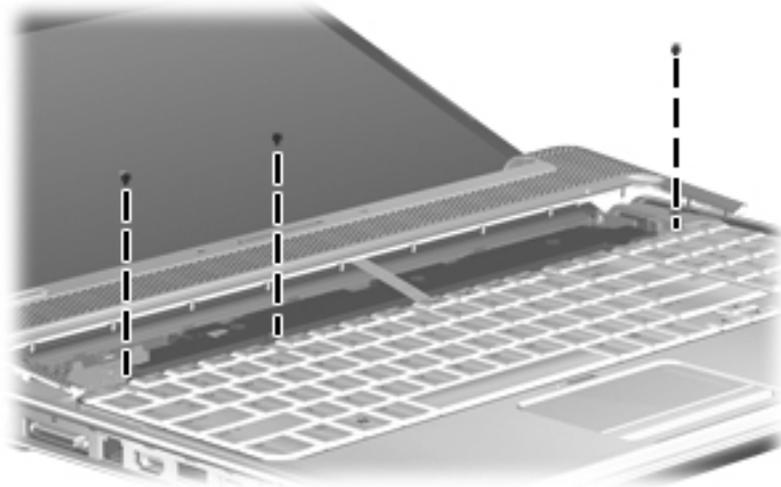
3. Turn the computer display-side up, with the front toward you, and open the computer as far as possible.
4. Lift the rear edge of the switch cover until it detaches from the computer.



5. Move the switch cover back so it rests on the display.



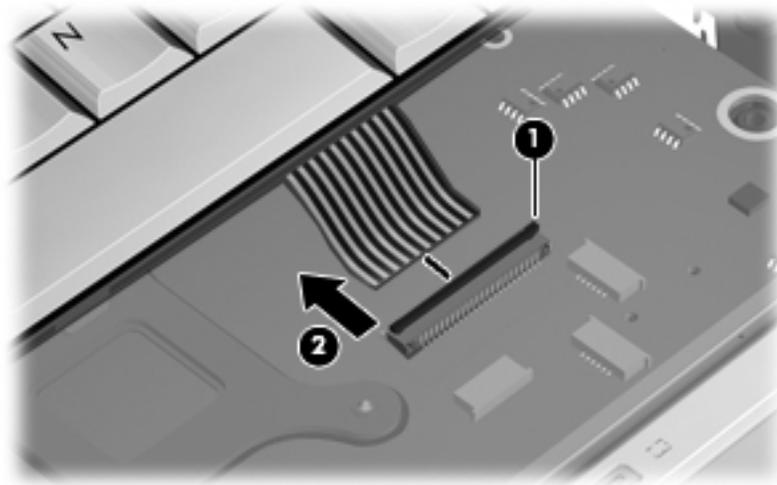
6. Remove the three silver Phillips PM2.0×3.0 screws that secure the keyboard to the computer.



7. Lift the rear edge ❶ of the keyboard.
8. Slide the keyboard ❷ back until the keyboard connector on the system board is accessible.

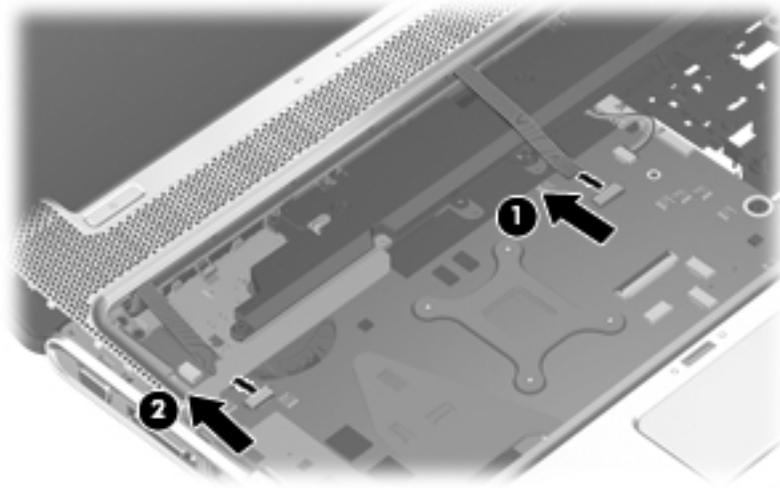


9. Release the zero insertion force (ZIF) connector ❶ to which the keyboard cable is connected and disconnect the cable ❷ from the system board.



10. Remove the keyboard.

11. Disconnect the LED board cable ❶ from the low insertion force (LIF) connector on the system board.
12. Disconnect the power button board cable ❷ from the LIF connector on the system board.



13. Remove the switch cover.
- Reverse this procedure to install the switch cover and keyboard.

## Power button board

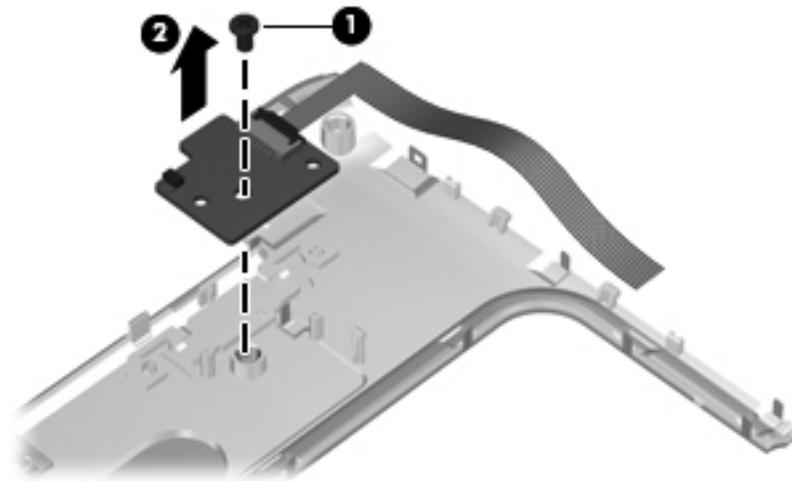
Description	Spare part number
Power button board for use in computers with discrete graphics subsystems (includes cable)	512835-001

Before removing the power button 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 4-6](#)).
5. Remove the switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#)).

Remove the power button board:

1. Turn the switch cover upside down with the front toward you.
2. Remove the Phillips PM2.5×4.0 screw ❶ that secures the power button board to the switch cover.
3. Remove the power button board ❷ and cable.



Reverse this procedure to install the power button board.

## Speaker assembly



The Speaker assembly kit includes left and right speakers and cable.

Description	Spare part number
Speaker assembly for use in all countries and regions except India	533865-001
Speaker assembly for use only in India	571902-001

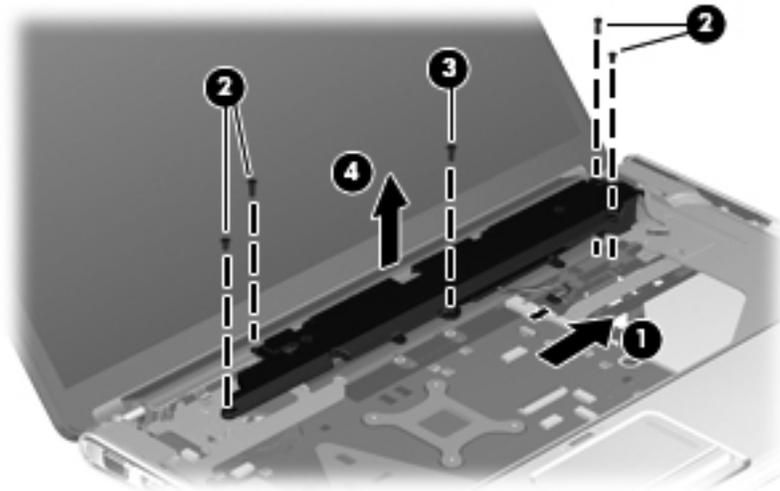
Before removing the speaker assembly, follow these steps:

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 4-6](#)).
5. Remove the switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#)).
6. Remove the power button board (see [“Power button board” on page 4-22](#))

Remove the speaker assembly.

1. Position the computer with the keyboard facing up its front edge toward you.
2. Disconnect the speaker cable ❶ from the system board.
3. Remove the four Phillips PM2.0×4.0 screws ❷ that secure the speaker assembly.
4. Remove the Phillips PM2.5×7.0 screw ❸ that secures the center of the speaker assembly.

- Remove the speaker assembly ④.



Reverse this procedure to install the speaker assembly.

## Display assembly

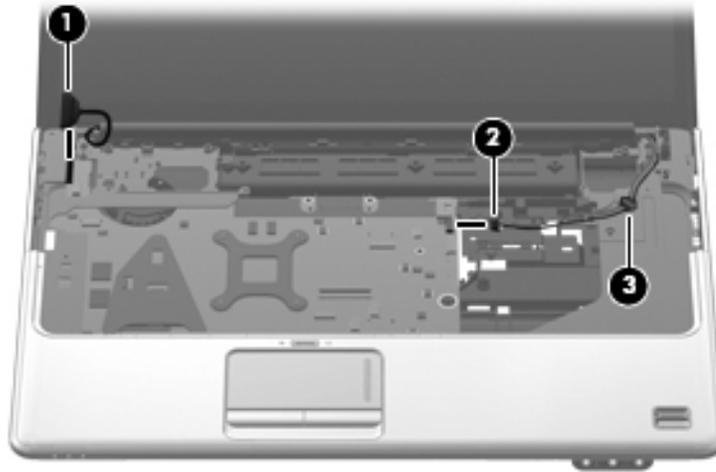
Description	Spare part number
15.6-inch BrightView display assembly with webcam and 2 microphones for use in white computers	538348-001
15.6-inch BrightView display assembly with webcam and 2 microphones for use in black computers	538312-001

Before removing the display assembly, follow these steps:

- 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.
- Disconnect all external devices connected to the computer.
- 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 (see [“Battery” on page 4-6](#)).
- Remove the wireless antenna cables from the WLAN module (see [“WLAN module” on page 4-16](#)).
- Remove the switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#)).

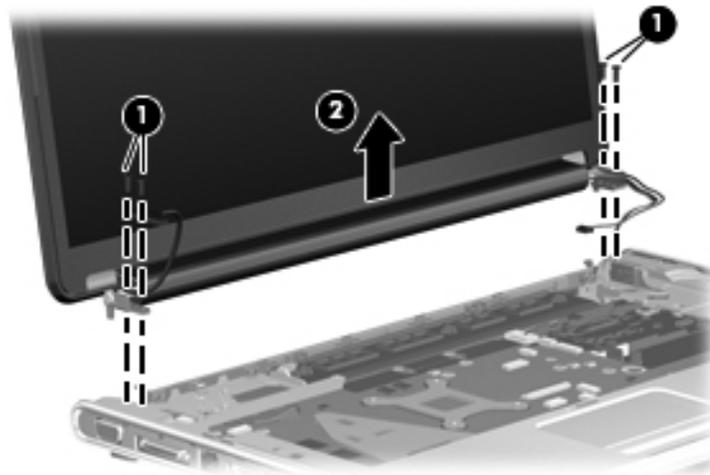
Remove the display assembly:

- Disconnect the display panel cable ① and the webcam/microphone cable ② from the system board.
- Remove the WLAN antenna cables from the clips ③ built into the top cover.



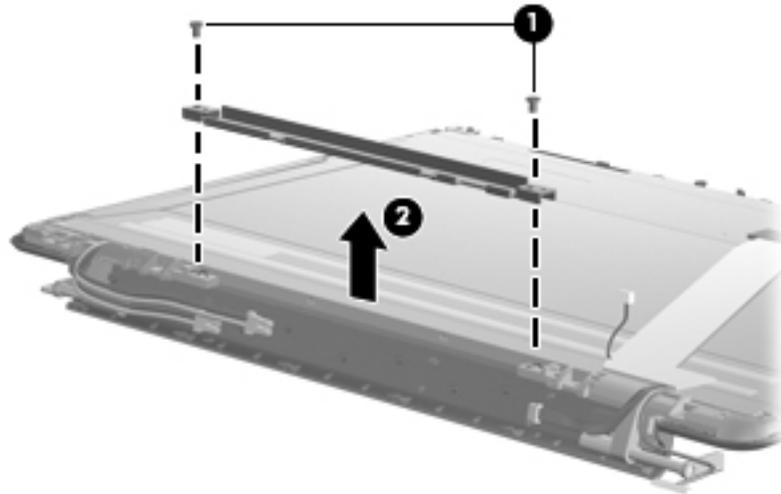
**CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

3. Remove the four Phillips PM2.5×6.5 screws ❶ that secure the display assembly to the computer.
4. Lift the display assembly ❷ straight up and remove it.

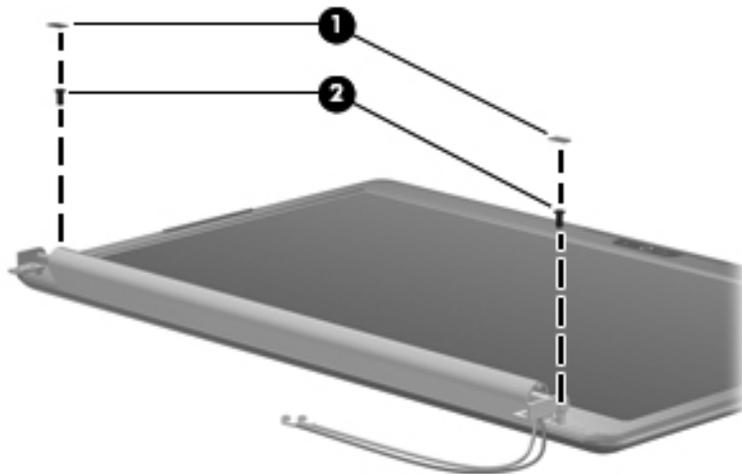


 See “[Webcam/microphone module](#)” on page 4-7 for webcam/microphone module replacement instructions for computer models equipped with BrightView display assemblies.

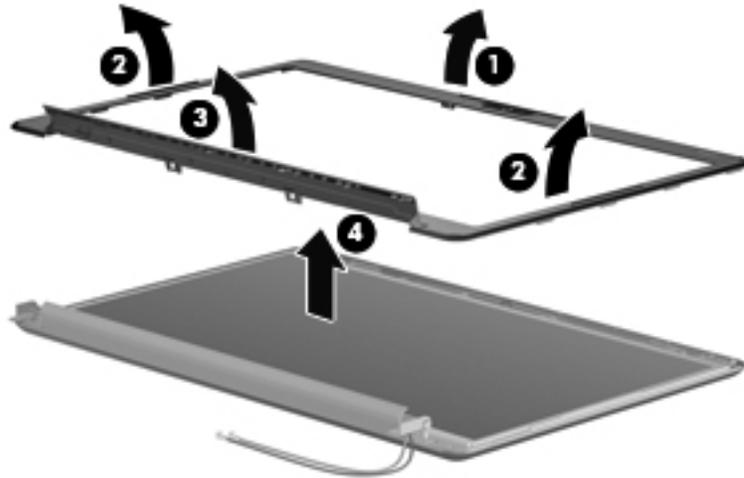
5. Remove the two Phillips PM2.5×5.0 screws ❶ that secure the display hinge to the display panel.
6. Remove the display hinge ❷. The display hinge is available in the Display Hinge Kit, spare part number 574556-001.



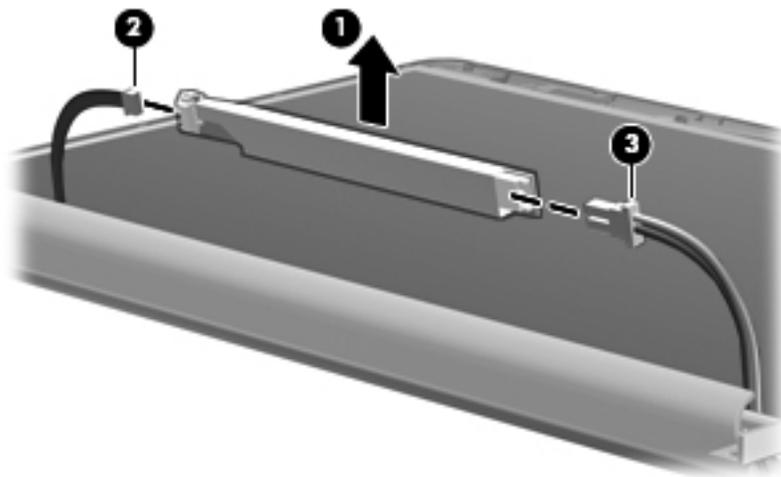
7. If it is necessary to replace the display bezel or any of the display assembly internal components, remove the following screw covers and screws: Two rubber screw covers on the display bezel bottom edge ❶. Two Phillips PM2.5×6.5 screws ❷. The display rubber screw covers are included in the Display Rubber Kit, spare part number 512361-001.



8. Flex the inside edges of the top edge ❶, the left and right sides ❷, and the bottom edge ❸ of the display bezel until the bezel disengages from the display enclosure.
9. Remove the display bezel ❹. The display bezel is available using spare part number 512364-001.

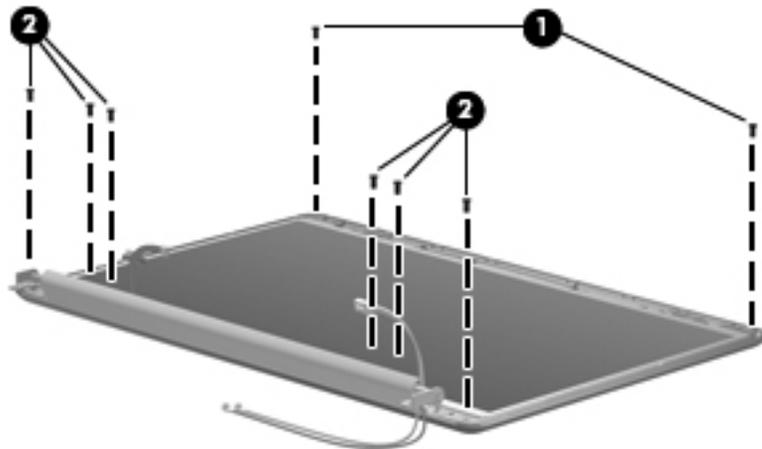


10. If it is necessary to replace the display inverter, release the display inverter ① as far from the display enclosure as the display panel cable and backlight cable allow.
11. Disconnect the display panel cable ② and the backlight cable ③ from the display inverter.

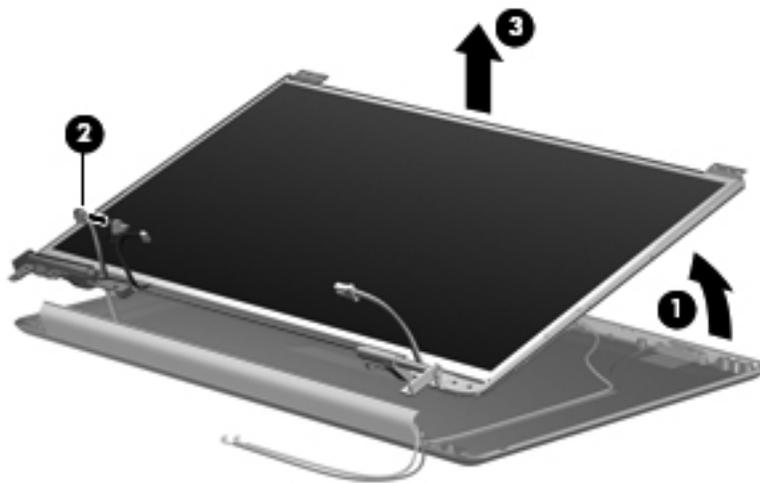


12. Remove the display inverter. The display inverter is available using spare part number 488317-001.

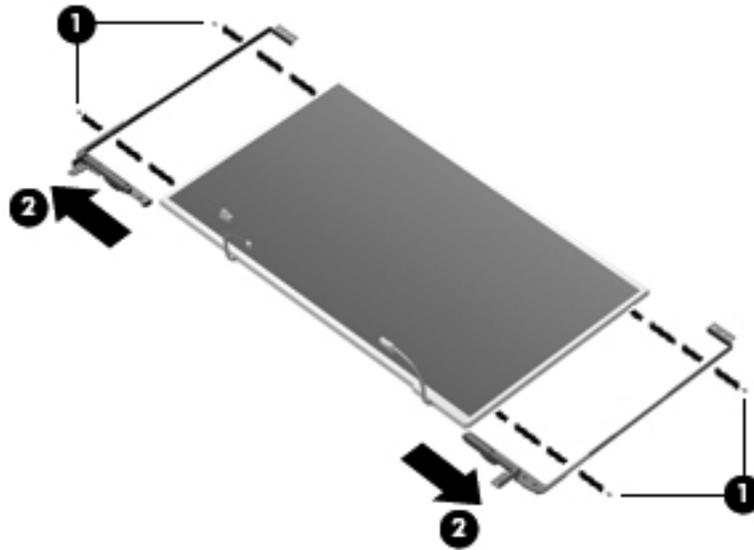
13. If it is necessary to replace the display panel, remove the two Phillips PM2.5×5.0 screws **1** from the top corners and the six Phillips PM2.5×5.0 screws **2** from the display hinges.



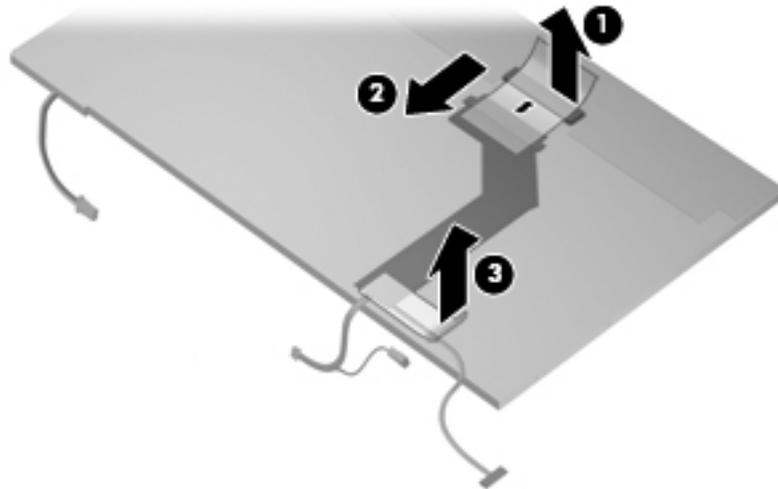
14. Flex the bottom **1** of the display panel and release the display hinges. Disconnect the display LED cable **2** from the display panel cable. Remove the display panel **3**. The display panel is available using spare part number 570095-001.



15. If it is necessary to replace the display hinges, remove the two Phillips PM2.0×3.0 screws ❶ that secure each display hinge to the display panel.
16. Remove the display hinges ❷. The display hinges are available in the Display Hinge Kit, spare part number 574556-001. The display hinge screws are available in the Display Screw Kit, spare part number 512362-001.



17. If it is necessary to remove the display panel cable, remove the adhesive plastic strip ❶ from the display panel cable, and disconnect the display panel cable from the top of the display panel ❷. Remove the tape ❸ that secures the cable to the display panel. The display panel cable is available using spare part number 574554-001.



Reverse this procedure to reassemble and install the display assembly.

## Top cover



The top cover spare parts kit includes the following: speakers, TouchPad and cable, LED board and cable, and switch cover.

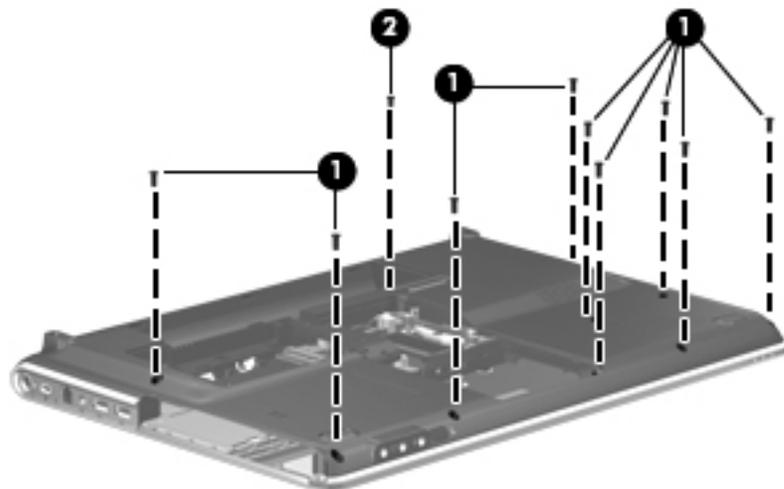
Description	Spare part number
Top cover for use only with black computer models equipped with a fingerprint reader	579160-001
Top cover for use only with black computer models not equipped with a fingerprint reader	518788-001
Top cover for use only with white computer models not equipped with a fingerprint reader	518108-001

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 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Speaker assembly (see [“Speaker assembly” on page 4-23](#))
  - e. Display assembly (see [“Display assembly” on page 4-24](#))

Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the 9 Phillips 2.5×6.5 screws ❶ that secure the top cover to the bottom of the computer.
3. Remove the one Phillips PM2.5×7.0 screw ❷ that secures the top cover to the computer. This screw is in the battery bay.



4. Turn the computer right-side up, with the front toward you.
5. Disconnect the following cables from the system board:

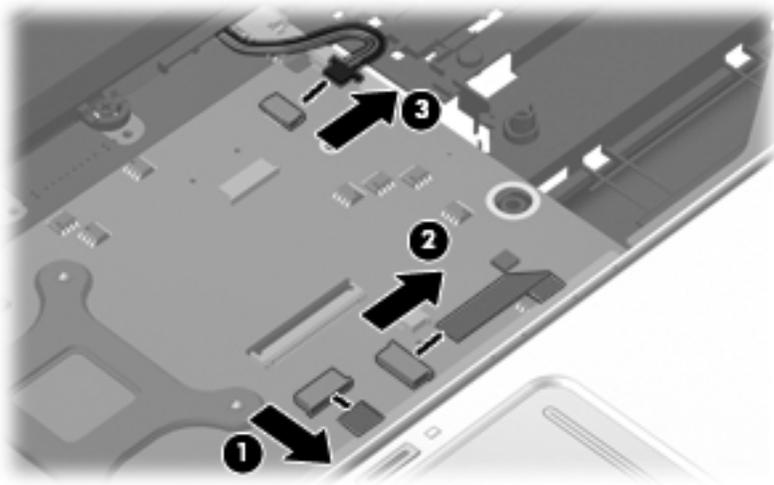
- a. TouchPad cable ❶

 On computer models equipped with a standard display assembly, this cable connects to a ZIF connector on the system board. On computer models equipped with a Flush Glass display assembly, this cable connects to a LIF connector on the system board.

- b. Fingerprint reader board cable ❷

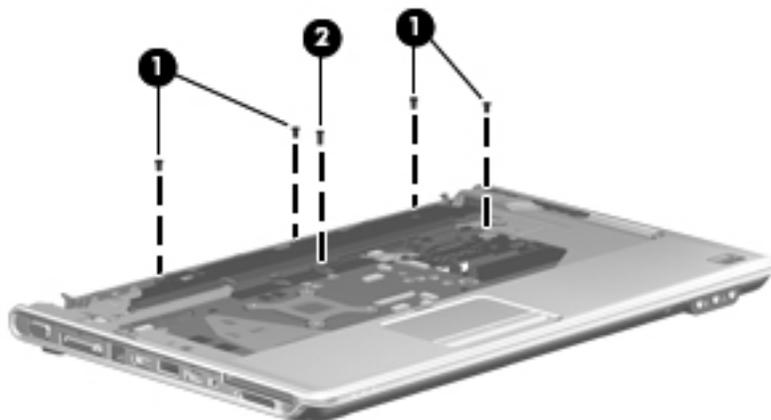
 This cable connects to a LIF connector on the system board.

- c. Speaker cable ❸

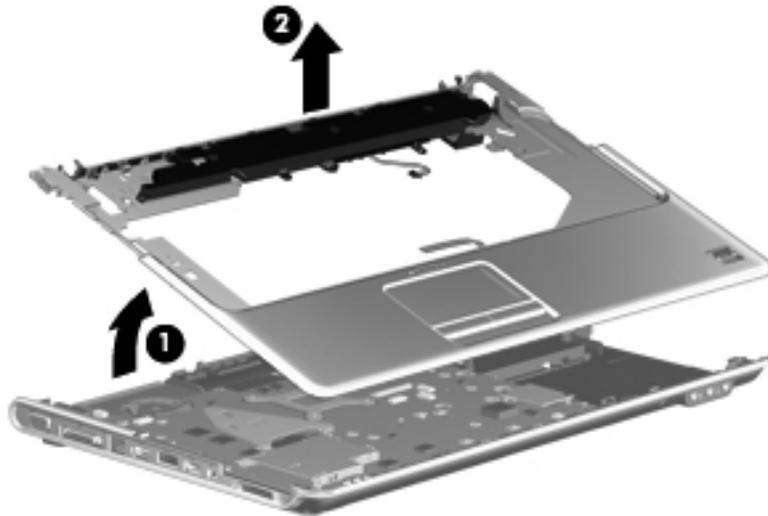


 Step 6 applies only to computer models equipped with standard display assemblies.

6. Remove the four Phillips PM2.5×4.0 screws that secure the top cover to the computer.
7. Remove the Phillips PM2.5×7.0 screw that secures the top cover to the computer.



8. Lift the rear edge ❶ of the top cover until it rests at an angle.
9. Remove the top cover ❷ by lifting it straight up.



Reverse this procedure to install the top cover.

## Bluetooth module



The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is available using spare part number 579161-001.

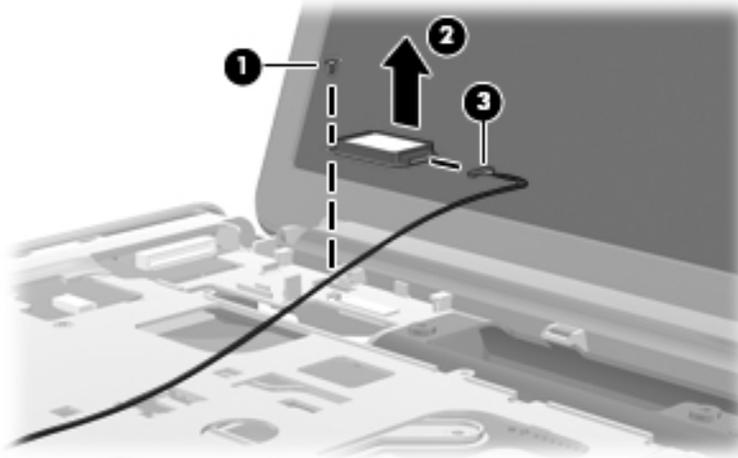
Description	Spare part number
Bluetooth module	537921-001

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 4-6](#)).
5. Remove the switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#)).

Remove the Bluetooth module:

1. Remove the Phillips PM2.0x3.0 screw ❶ that secures the Bluetooth module to the top cover.
2. Release the Bluetooth module ❷ as far from the top cover as the Bluetooth module cable allows.
3. Disconnect the Bluetooth module cable ❸ from the Bluetooth module.



4. Remove the Bluetooth module.

Reverse this procedure to install the Bluetooth module.

## Modem module



The modem module spare part kit does not include a modem module cable. The modem module cable is included in the Cable Kit, spare part number 512832-001.

Description	Spare part number
Modem module for use in all countries and regions except Australia and New Zealand	510100-001
For use only in Australia and New Zealand	510100-011

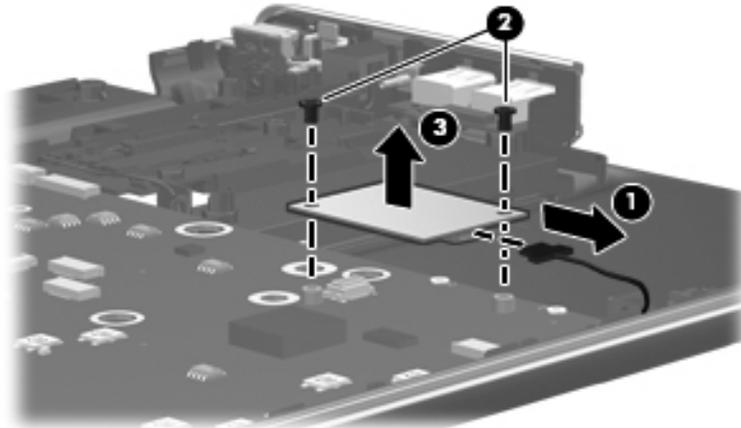
Before removing the modem module, follow these steps:

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 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Display assembly (see [“Display assembly” on page 4-24](#))
  - e. TV tuner module (see [“TV tuner module” on page 4-12](#))

- f. Top cover (see [“Top cover” on page 4-30](#))

Remove the modem module:

1. Disconnect the modem module cable ❶ from the modem module.
2. Remove the two Phillips PM2.5×3.0 screws ❷ that secure the modem module to the system board.
3. Lift the modem module ❸ straight up to disconnect it from the system board.



Reverse this procedure to install the modem module.

## Audio/infrared board

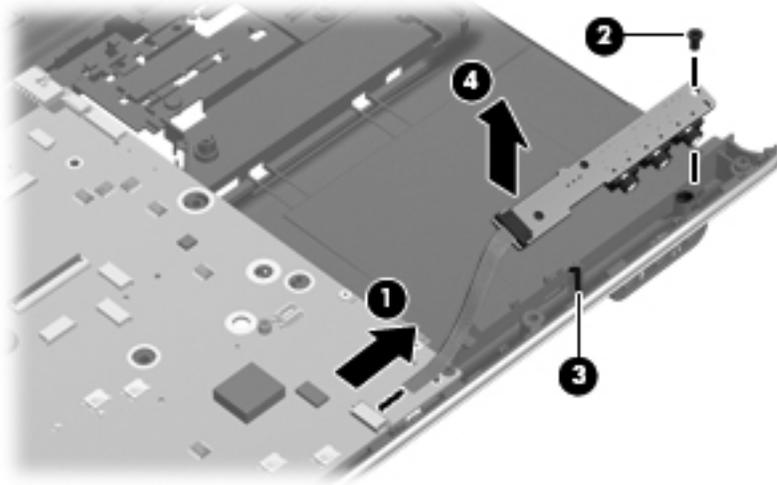
Description	Spare part number
Audio/infrared board for use in computers with discrete graphics subsystems (includes cable)	512836-001

Before removing the audio/infrared 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 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Display assembly (see [“Display assembly” on page 4-24](#))
  - e. Top cover (see [“Top cover” on page 4-30](#))

Remove the audio/infrared board:

1. Disconnect the audio/infrared board cable ❶ from the LIF connector on the system board.
2. Remove the one Phillips PM2.5×3.0 screw ❷.
3. Release the clip ❸ built into the base enclosure that secures the audio/infrared board.
4. Lift the audio/infrared board ❹ straight up to remove it from the base enclosure.



Reverse this procedure to install the audio/infrared board.

## USB board

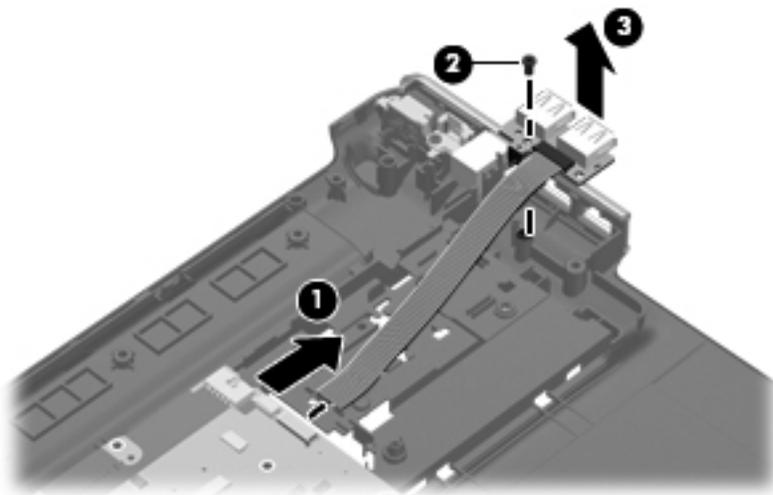
Description	Spare part number
USB board for use in computers with discrete graphics subsystems (includes cable)	516855-001

Before removing the USB 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 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Speaker assembly (see [“Speaker assembly” on page 4-23](#))
  - e. Display assembly (see [“Display assembly” on page 4-24](#))
  - f. Top cover (see [“Top cover” on page 4-30](#))

Remove the USB board:

1. Disconnect the USB board cable ❶ from the LIF connector on the system board.
2. Remove the Phillips PM2.5×6.5 screw ❷ that secures the USB board to the base enclosure.
3. Remove the USB board ❸ from the base enclosure.



Reverse this procedure to install the USB board.

## Power connector cable

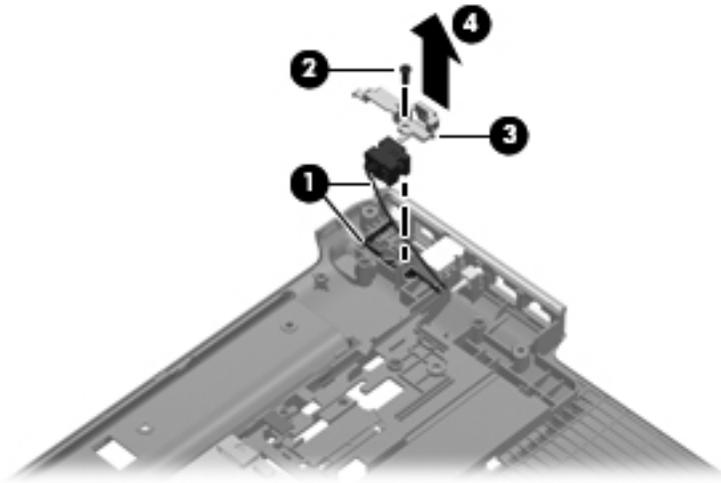
Description	Spare part number
Power connector cable	533465-001

Before removing the power connector cable, 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 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Display assembly (see [“Display assembly” on page 4-24](#))
  - e. Top cover (see [“Top cover” on page 4-30](#)).
  - f. USB board (see [“USB board” on page 4-35](#))
  - g. System board (see [“System board” on page 4-37](#))

Remove the power connector cable:

1. Remove the power connector cable ❶ from the clips and routing channel built into the base enclosure.
2. Remove the Phillips PM2.5×6.5 screw ❷ that secures the power connector and bracket to the base enclosure.
3. Remove the power connector bracket ❸ by pulling it straight up ❹.



Reverse this procedure to install the power connector cable.

## System board



The system board spare part kit includes replacement thermal material.

Description	Spare part number
System board with discrete graphics subsystem and 1 GB of dedicated memory	574902-001

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 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Display assembly (see [“Display assembly” on page 4-24](#))
  - e. Top cover (see [“Top cover” on page 4-30](#))

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

- TV tuner module (see [“TV tuner module” on page 4-12](#))
- RTC battery (see [“RTC battery” on page 4-13](#))

- Memory module (see “Memory module” on page 4-10)
- WLAN module (see “WLAN module” on page 4-16)
- Modem module (see “Modem module” on page 4-33)
- Fan/heat sink assembly (see “Fan/heat sink assembly” on page 4-40)
- Processor (see “Processor” on page 4-42)

Remove the system board:

1. Disconnect the modem module cable ❶ from the modem module.
2. Disconnect the following cables from the system board:
  - ❷ Audio/infrared board cable



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The audio/infrared board cable connects to a LIF connector on the system board.

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- ❸ USB board cable



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The USB board cable connects to a LIF connector on the system board.

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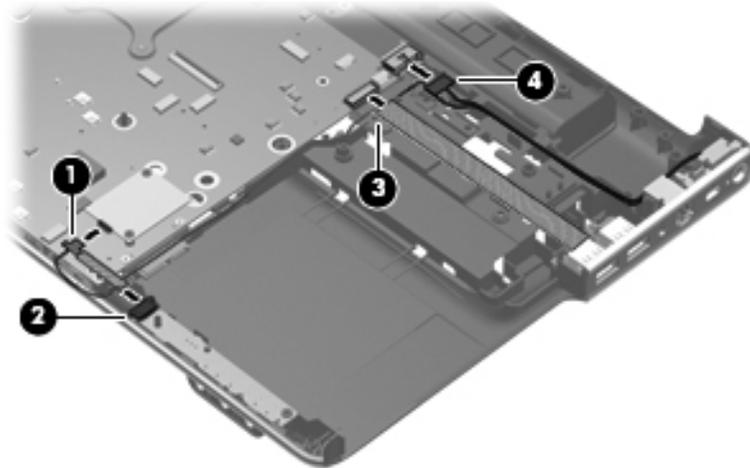
- ❹ Power connector cable



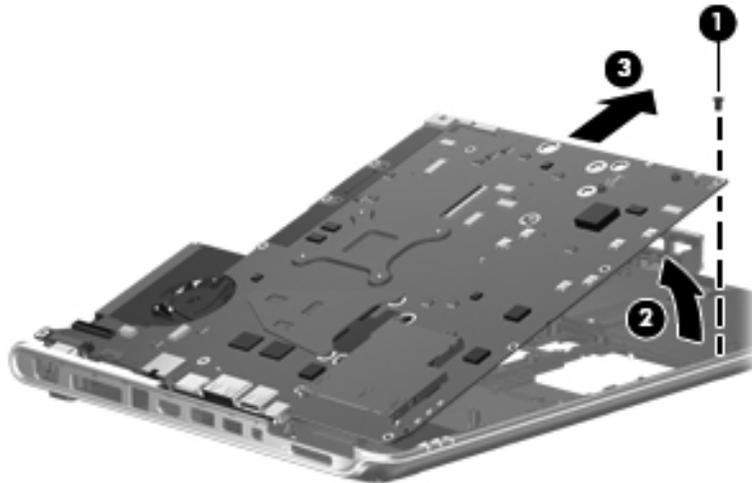
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The power connector cable splits into two cables near the system board. One cable plugs into a connector on the top of the system board. The other cable plugs into a connector on the bottom of the system board.

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3. Remove the Phillips PM2.5×6.5 screw ❶ that secures the system board to the base enclosure.
4. Lift up on the right side of the system board until it is at approximately a 45-degree angle ❷.
5. Remove the system board by sliding it to the right out of the base enclosure ❸.



Reverse this procedure to install the system board.

## Modem module cable



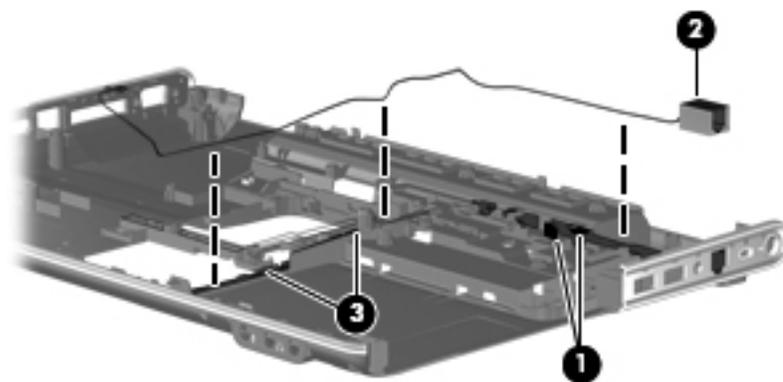
The modem module cable is available in the Cable Kit, spare part number 512832-001. The modem module cable includes the RJ-11 jack.

Before removing the modem module cable, 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 4-6).
5. Remove the following components:
  - a. Hard drive (see “[Hard drive](#)” on page 4-14)
  - b. Optical drive (see “[Optical drive](#)” on page 4-9)
  - c. Switch cover and keyboard (see “[Switch cover and keyboard](#)” on page 4-18)
  - d. Display assembly (see “[Display assembly](#)” on page 4-24)
  - e. Top cover (see “[Top cover](#)” on page 4-30).
  - f. USB board (see “[USB board](#)” on page 4-35)
  - g. System board (see “[System board](#)” on page 4-37)

Remove the modem module cable:

1. Release the cable from the clips ❶ built into the base enclosure.
2. Remove the RJ-11 jack ❷ from the clip built into the base enclosure.
3. Remove the cable assembly from the base enclosure ❸.



Reverse this procedure to install the modem module cable.

## Fan/heat sink assembly



The fan/heat sink assembly spare kit includes replacement thermal material.

Description	Spare part number
For use only with computer models equipped with graphics subsystems with discrete memory	579158-001



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

Before removing the heat sink, follow these steps:

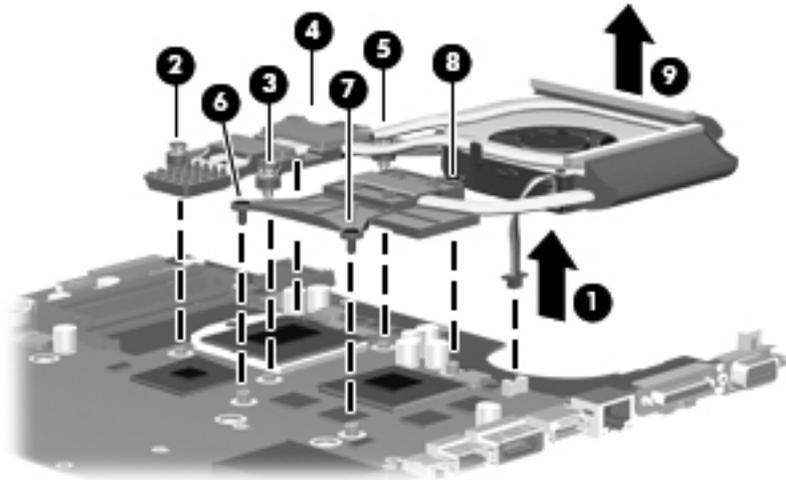
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-6](#)).
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Display assembly (see [“Display assembly” on page 4-24](#))
  - e. Top cover (see [“Top cover” on page 4-30](#))
  - f. USB board (see [“USB board” on page 4-35](#))
  - g. System board (see [“System board” on page 4-37](#))

Remove the fan/heat sink assembly:

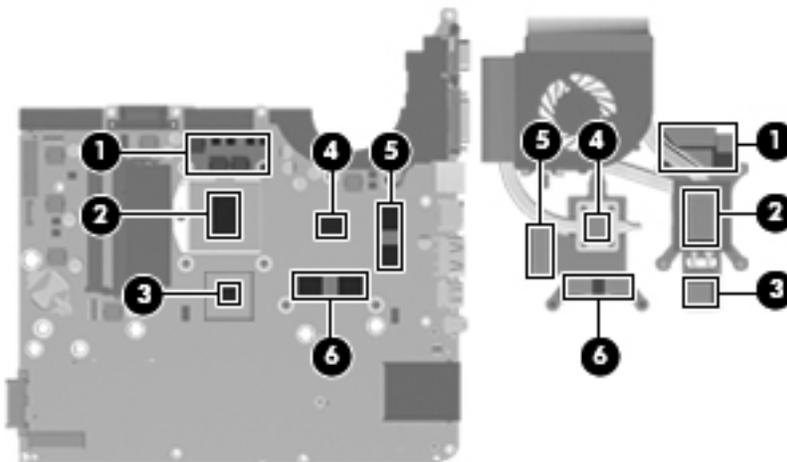
1. Turn the system board upside down, with the expansion port and external monitor port toward you.
2. Disconnect the fan cable ❶ from the system board.
3. Loosen the seven Phillips captive screws ❷ through ❸ that secure the fan/heat sink assembly to the system board.
4. Remove the fan/heat sink assembly ❹.



Due to the adhesive quality of the thermal material located between the fan/heat sink assembly and system board components, it may be necessary to move the fan/heat sink assembly from side to side to detach the assembly.



The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed. The numbers on the drawing identify the section of the heat sink assembly that services its corresponding components on the system board. Thermal paste is used on the processor's power choke and transistor ❶, the processor ❷, the PCH ❸, the graphics processing unit (GPU) ❹, and the video random access memory (VRAM) ❺ and ❻. Thermal pads are used on all of the corresponding components on the fan/heat sink assembly. Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.



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

## Processor



The processor spare part kit includes replacement thermal material.

Description	Spare part number
<b>Intel® Core™ 2 Quad processors</b> (12-MB L2 cache, 1066-MHz FSB)	
i7-820-QM, 1.73 GHz, SC turbo up to 3.06 GHz	583053-001
i7-720-QM, 1.6 GHz, SC turbo up to 2.8 GHz	586170-001

Before removing the processor, follow these steps:

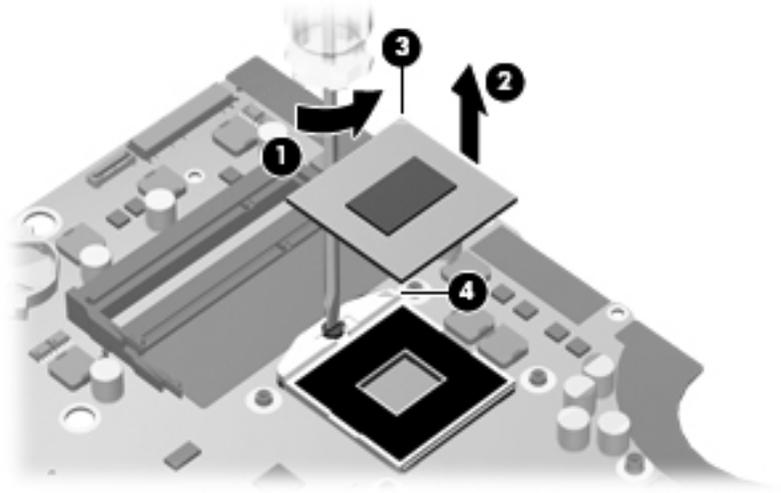
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-6](#))
5. Remove the following components:
  - a. Hard drive (see [“Hard drive” on page 4-14](#))
  - b. Optical drive (see [“Optical drive” on page 4-9](#))
  - c. Switch cover and keyboard (see [“Switch cover and keyboard” on page 4-18](#))
  - d. Display assembly (see [“Display assembly” on page 4-24](#))
  - e. Top cover (see [“Top cover” on page 4-30](#))
  - f. USB board (see [“USB board” on page 4-35](#))
  - g. System board (see [“System board” on page 4-37](#))
  - h. Fan/heat sink assembly (see [“Fan/heat sink assembly” on page 4-40](#))

Remove the processor:

1. Use a flat-bladed screwdriver to turn the processor locking screw ❶ one-half turn counterclockwise until you hear a click.
2. Lift the processor ❷ straight up and remove it.



When you install the processor, the gold triangle ❸ on the processor must be aligned with the triangle icon ❹ embossed on the processor socket.



Reverse this procedure to install the processor.



**WARNING:** Only authorized technicians trained by HP must repair this equipment. All troubleshooting and repair procedures are detailed to allow repair at only the subassembly or module level. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or modify any printed wiring board. Improper repairs can create a safety hazard. Any indication of component replacement or printed wiring board modification may void any warranty or exchange allowances.

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## Starting the Setup Utility

The Setup Utility is a ROM-based information and customization utility that can be used even when your Windows® operating system is not working.



The fingerprint reader (select models only) cannot be used to access the Setup Utility.

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The utility reports information about the computer and provides settings for startup, security, and other preferences.

To start the Setup Utility:

» Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

1. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**.
2. When the Startup Menu is displayed, press **f10**.

## Using the Setup Utility

### Changing the language of the Setup Utility

The following procedure explains how to change the language of the Setup Utility. If the Setup Utility is not already running, begin at step 1. If the Setup Utility is already running, begin at step 2.

1. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.

– or –

Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.

2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Use the arrow keys to select a language, and then press **enter**.
4. When a confirmation prompt with your language selected is displayed, press **enter**.

5. To save your change and exit the Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your change goes into effect immediately.

## Navigating and selecting in the Setup Utility

Because the Setup Utility 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 choose an item in a list or to toggle a field, for example an Enable/Disable field, use either the arrow keys or **f5** or **f6**.
- To select an item, press **enter**.
- To close a text box or return to the menu display, press **esc**.

To display additional navigation and selection information while the Setup Utility is open, press **f1**.

## Displaying system information

The following procedure explains how to display system information in the Setup Utility. If the Setup Utility is not open, begin at step 1. If the Setup Utility is open, begin at step 2.

1. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.  
– or –  
Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key from Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.
2. Select the **Main** menu. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit the Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## Restoring default settings in the Setup Utility

The following procedure explains how to restore the Setup Utility default settings. If the Setup Utility is not already running, begin at step 1. If the Setup Utility is already running, begin at step 2.

1. Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **f10**.  
– or –  
Open the Setup Utility by turning on or restarting the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f10**.
2. Use the arrow keys to select **Exit > Load Setup Defaults**, and then press **enter**.
3. When the Setup Confirmation is displayed, press **enter**.
4. To save your change and exit the Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

The Setup Utility default settings go into effect when the computer restarts.



Your password, security, and language settings are not changed when you restore the factory default settings.

## Exiting the Setup Utility

You can exit the Setup Utility with or without saving changes.

- To exit the Setup Utility and save your changes from the current session:

If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

- To exit the Setup Utility without saving your changes from the current session:

If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

After either choice, the computer restarts in Windows.

## Setup Utility menus

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



Some of the Setup Utility menu items listed in this chapter may not be supported by your computer.

### Main menu

Select	To do this
System information	<ul style="list-style-type: none"> <li>■ View and change the system time and date.</li> <li>■ View identification information about the computer.</li> <li>■ View specification information about the processor, memory size, system BIOS, and keyboard controller version (select models only).</li> </ul>

### Security menu

Select	To do this
Administrator password	Enter, change, or delete an administrator password.
Power-On Password	Enter, change, or delete a power-on password.

### System Configuration menu

Select	To do this
Language Support	Change the Setup Utility language.
Button Sound (select models only)	Enable/disable the capacitive button tapping sound.
Virtualization Technology	Enable/disable the processor Virtualization Technology.
Processor C6 State (select models only)	Enable/disable the processor C6 sleep state.

Select	To do this
LAN Power Saving (select models only)	Enable/disable LAN Power Saving. When enabled, saves power when the computer is in DC mode.
Card Reader/1394 Power Saving (select models only)	Enable/disable Card Reader/1394 Power Saving. When enabled, saves power when the computer is in DC mode.
Fan Always On	Enabled/disable Fan Always On. When enabled, the computer fan will always be on.
Boot Options	<p>Set the following boot options:</p> <ul style="list-style-type: none"> <li>■ <b>f9</b> and <b>f10</b> Delay (sec.)—Set the delay for the <b>f9</b> and <b>f10</b> functions of the Setup Utility in intervals of 5 seconds each (0, 5, 10, 15, 20).</li> <li>■ CD-ROM boot—Enable/disable boot from CD-ROM.</li> <li>■ Floppy boot—Enable/disable boot from diskette.</li> <li>■ Internal Network Adapter boot—Enable/disable boot from Internal Network Adapter.</li> <li>■ Boot Order—Set the boot order for: <ul style="list-style-type: none"> <li><input type="checkbox"/> USB Floppy</li> <li><input type="checkbox"/> Internal CD/DVD ROM drive</li> <li><input type="checkbox"/> Hard drive</li> <li><input type="checkbox"/> USB Diskette on Key</li> <li><input type="checkbox"/> USB Hard drive</li> <li><input type="checkbox"/> Network adapter</li> </ul> </li> </ul>

## Diagnosics menu

Select	To do this
Hard Disk Self Test	<p>Run a comprehensive self-test on the hard drive.</p> <p> On models with two hard drives, this menu option is called the <b>Primary Hard Disk Self Test</b>.</p>
Secondary Hard Disk Self Test (select models only)	Run a comprehensive self-test on a secondary hard drive.
Memory Test	Run a diagnostic test on the system memory.

# Specifications

## Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Width	37.85 cm	14.90 in
Depth	25.80 cm	10.16 in
Height (front to back)	3.50 to 4.40 cm	1.38 to 1.73 in
<b>Weight</b>		
Equipped with optical drive, hard drive, and battery	3.14 kg	6.93 lbs
Camera adds	0.009 kg	0.02 lbs
<b>Input power</b>		
Operating voltage	18.5 V dc @ 3.5 A - 65 W	
Operating current	3.5 A or 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	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
 Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.		

## 15.6-inch, HD BrightView display specifications

	Metric	U.S.
<b>Dimensions</b>		
Height	21.0 cm	8.3 in
Width	35.9 cm	14.1 in
Diagonal	39.5 cm	15.6 in
<b>Number of colors</b>	Up to 262,000	
<b>Contrast ratio</b>	500:1 (typical)	
<b>Brightness</b>	220 nits (typical)	
<b>Pixel resolution</b>		
Pitch	0.255 × 0.255 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
<b>Backlight</b>	Edge lit	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	6.5 W	
<b>Viewing angle</b>	±45° horizontal, ±15° upper vertical, ±35° lower vertical (typical)	

## Hard drive specifications

	500-GB*	320-GB*	250-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>			
	1,048,576,000	625,142,448	488,397,168
<b>Disc rotational speed</b>			
	5400 rpm and 7200 rpm	5400 rpm and 7200 rpm	5400 rpm and 7200 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.			
 Certain restrictions and exclusions apply. Contact technical support for details.			

## Blu-ray ROM DVD±R/RW SuperMulti DL Drive specification

Applicable disc	Read:	Write:
	BD-ROM, BD-ROM-DL, BD-R, BD-R-DL, BD-RE, BD-RE-DL, DVD-ROM, DVD+R, DVD+R-DL, DVD+RW, DVD-R, DVD-R-DL, DVD-RW, DVD-RAM (Ver.2), CD-DA, CD-ROM (Mode 1 and mode 2), CD-ROM XA (Mode 2, form 1 and form 2), Photo CD (Single and multiple sessions), CD Extra, CD-R, CD-RW, and CD-TEXT	DVD-RAM (Ver.2), DVD+R, DVD-R, CD-R, and CD-RW
<b>Access time</b>	<b>BD</b>	<b>DVD</b>
Random	< 230 ms	< 180 ms
<b>Cache buffer</b>	8 MB	
<b>Data transfer rate</b>		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
1X BD-ROM	4,500 KB/sec	
1X BD-R read	4,500 KB/sec	
1X BD-RE read	4,500 KB/sec	
Transfer mode	Multiword DMA Mode	

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

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CDTEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo- CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CDR, 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
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Full stroke	< 285 ms	< 335 ms
Cache buffer	2 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 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	
Transfer mode	Multiword DMA Mode	

## System DMA specifications

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

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

## System interrupt specifications

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

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

 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 - 01F	DMA controller channel 0-3
CF7	PCI Bus on MS ACPI-Compliant System
020 - 021	Program interrupt controller (Master controller)
024 - 025	Program interrupt controller (Aliases)
028 - 029	Program interrupt controller (Aliases)
02C - 03D	Program interrupt controller (Aliases)
02E - 02F	Motherboard resource (LPC controller)
030 - 031	Program interrupt controller (Aliases)
034 - 035	Program interrupt controller (Aliases)
038 - 039	Program interrupt controller (Aliases)
03C- 03D	Program interrupt controller (Aliases)
040 - 043	System Timer
04E-04F	Motherboard resource (LPC controller)
050-053	System Timer
060	EC
061	LPC
062	EC
063	LPC
064	EC
065	LPC
066	EC
067	LPC
070	Motherboard resources
070-077	System CMOS/real time clock
080	Motherboard resources
081-091	DMA controller channel 2
092	LPC
0A0-0A1	Program interrupt controller (Slave controller)
0A4-0A5	Program interrupt controller (Aliases)
0A8-0A9	Program interrupt controller (Aliases)
0AC-0AD	Program interrupt controller (Aliases)
0B0-0B1	Program interrupt controller (Aliases)
0B2-0B3	LPC
0B4- 0B5	Program interrupt controller (Aliases)
0B8-0B9	Program interrupt controller (Aliases)
0BC- 0BD	Program interrupt controller (Aliases)

(Continued)

<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
0C0-0DF	Direct memory access controller channel 4-7
F0	Numeric data processor
380-383	ENE CIR Receiver
384-38E	EC
3B0-3BB	VGA
3C0-3DF	VGA
400-47F	LPC
4D0-4D1	Programmable interrupt controller
500-53F	LPC
600-60F	LPC
610	LPC
800-80F	LPC
810-817	LPC
820-823	LPC
D00-FFFF	PCI Bus on MS ACPI-Compliant System
164E-164F	LPC
2000-20FF	ICH9 Family PCI Express Root Port 6 (B0/D28/F5)
3000-3FFF	ICH9 Family PCI Express Root Port 5 (B0/D28/F4)
4000-4FFF	ICH9 Family PCI Express Root Port 4 (B0/D28/F3)
5000-50FF	Realtek RTL8168C/8111C PCI-E Gigabit Ethernet NIC (B3/D0/F0)
6000-6FFF	ICH9 Family PCI Express Root Port 1 (B0/D28/F0)
7000-70FF	VGA
7000-7FFF	PCI-E Root Port (B0/D1/F0)
8000-801F	SMBus Controller
8020-803F	SATA AHCI controller - 2929
8040-805F	USB UHCI controller - 2939
8060-807F	USB UHCI controller - 2936
8080-809F	USB UHCI controller - 2935
80A0-80BF	USB UHCI controller - 2934
80C0-80DF	USB UHCI controller - 3938
80E0-80FF	USB UHCI controller - 2937
8100-8117	SATA AHCI controller - 2929

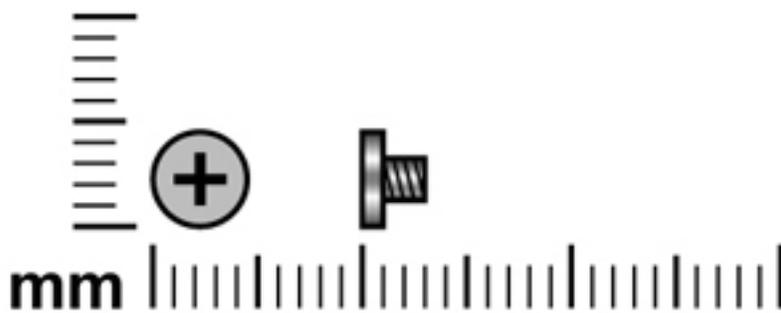
## System memory map specifications

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-FFFEFFFF	Unused
64 KB	FFFF0000-FFFFFFFF	System BIOS

## Screw listing

This section provides specification and reference information for the screws used in the computer. Some screws listed in this section are available in the Screw Kit, spare part number 516498-001.

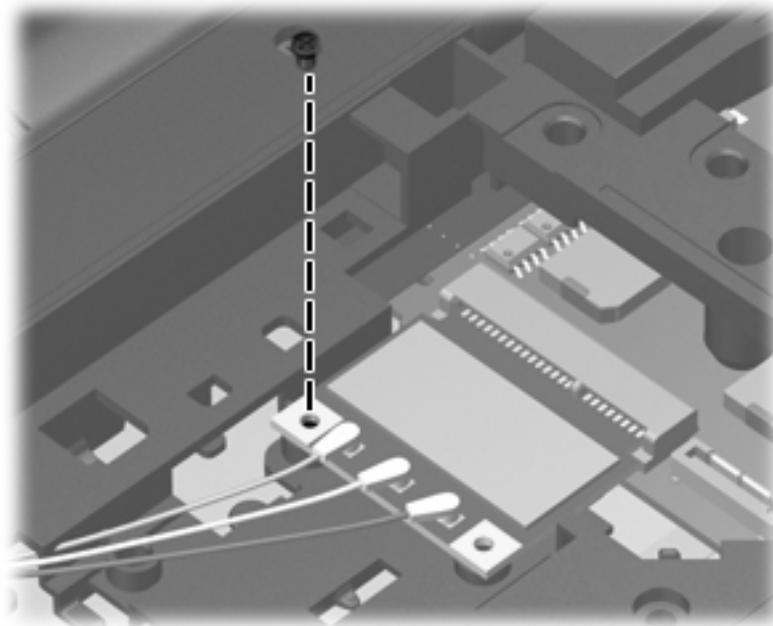
### Phillips PM2.0×3.0 black screw



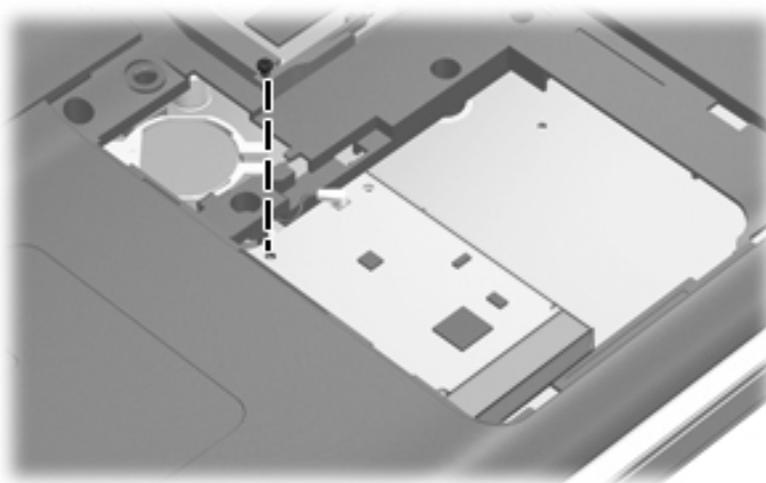
Color	Quantity	Length	Thread	Head diameter
Black	9	3.0 mm	2.0 mm	5.0 mm



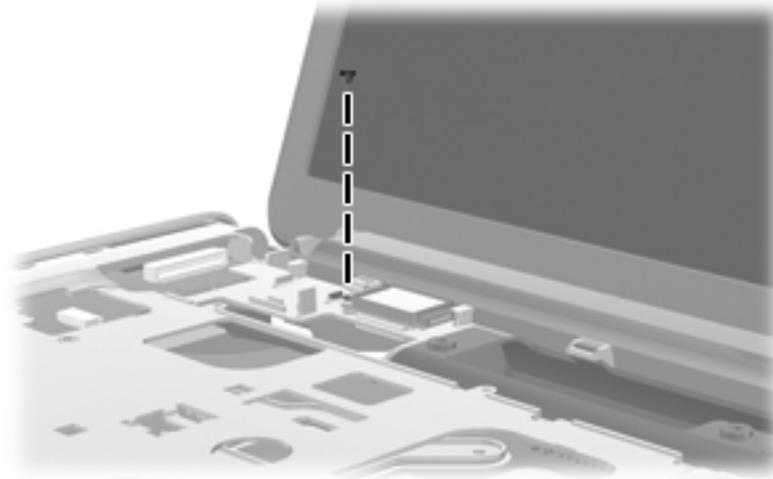
**Where used:** 2 screws that secure the mounting bracket to the hard drive



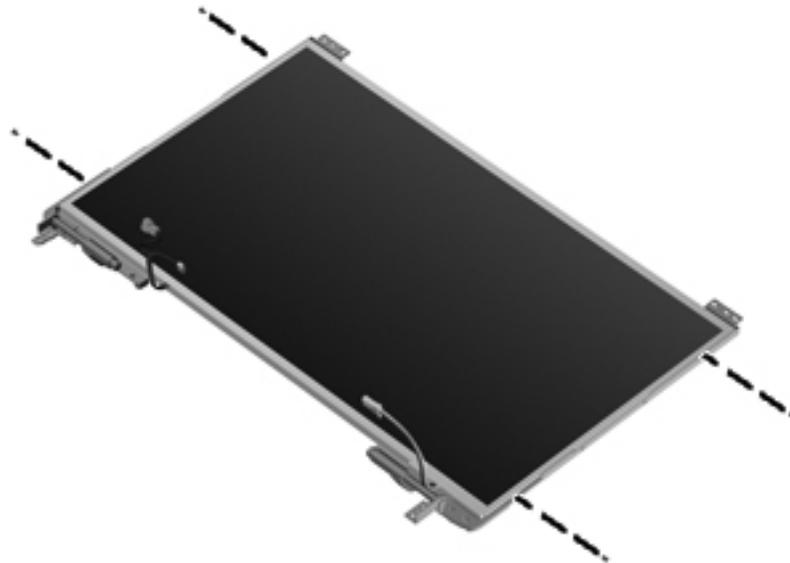
**Where used:** One screw that secures the WLAN to the system board



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



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

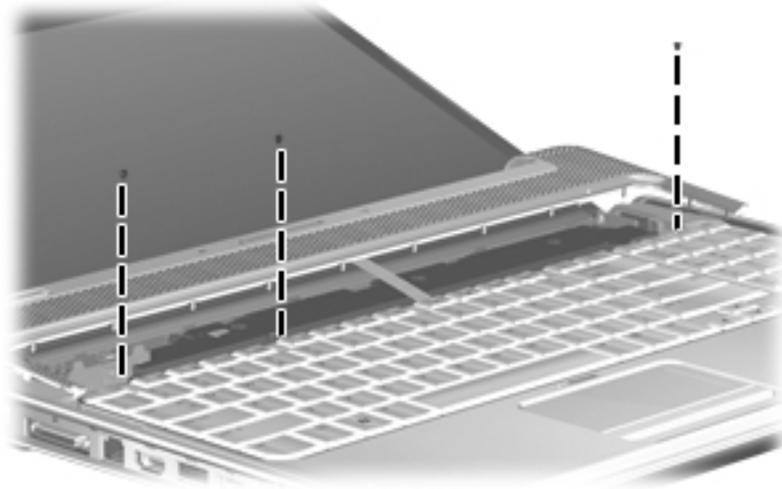


**Where used:** 4 screws that secure the display hinge to the display panel

## Phillips PM2.0×3.0 silver screw

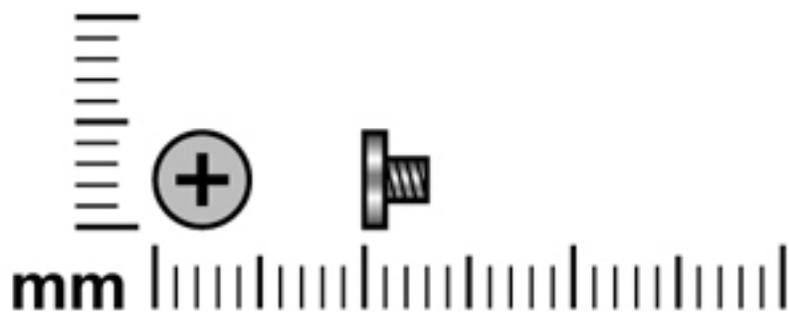


Color	Quantity	Length	Thread	Head diameter
Silver	3	3.0 mm	2.0 mm	5.0 mm

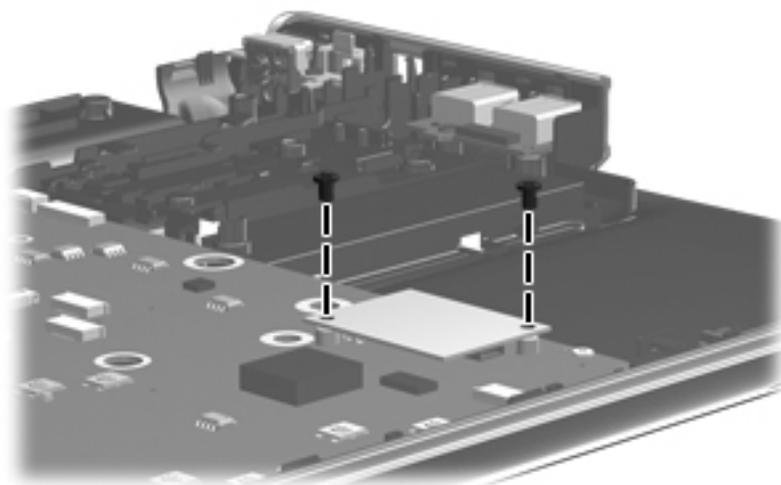


**Where used:** 3 screws that secure the keyboard to the computer

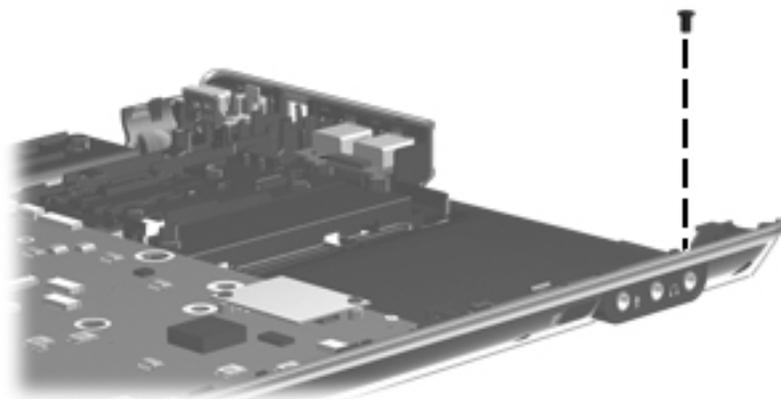
## Phillips PM2.5×3.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	3	3.0 mm	2.5 mm	5.0 mm

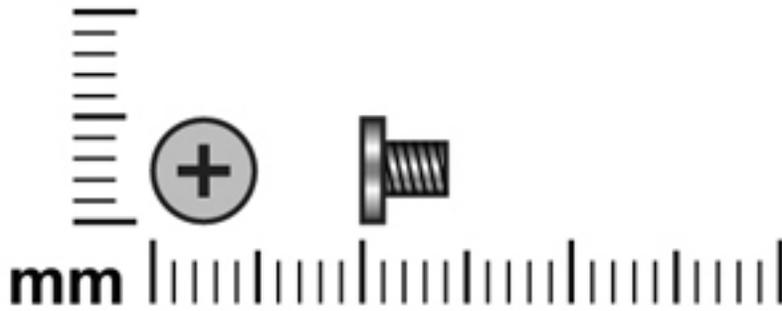


**Where used:** 2 screws that secure the modem to the system board

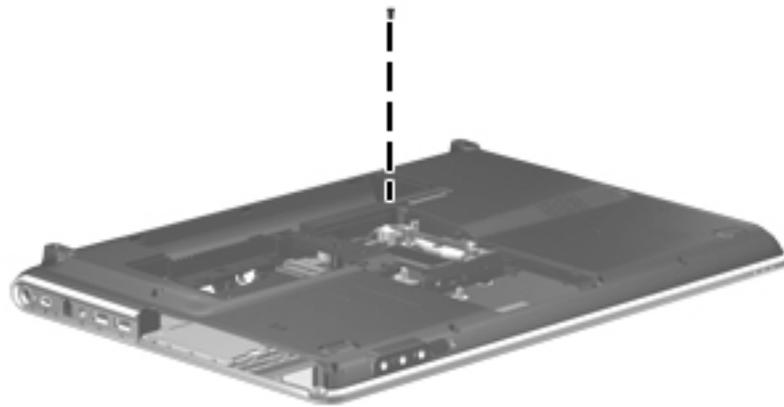


**Where used:** One screw that secures the audio/infrared board to the system board

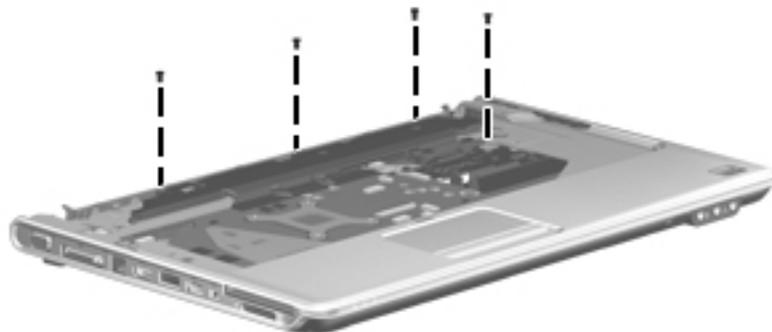
## Phillips PM2.5×4.0 screw



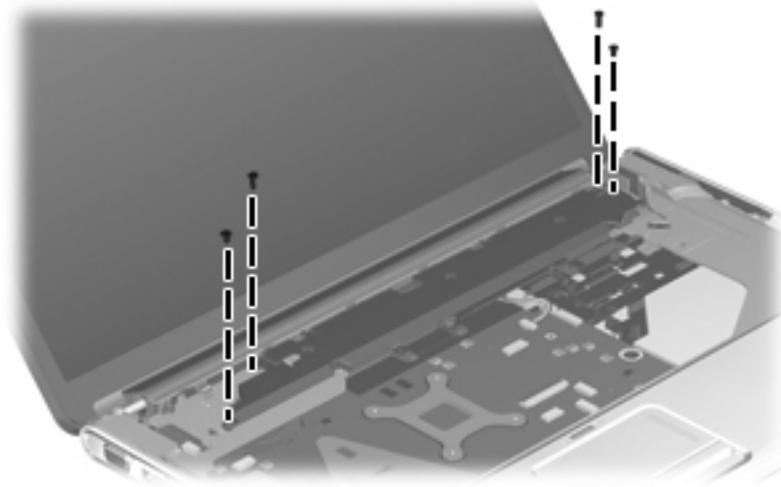
Color	Quantity	Length	Thread	Head diameter
Black	13	4.0 mm	2.5 mm	5.0 mm



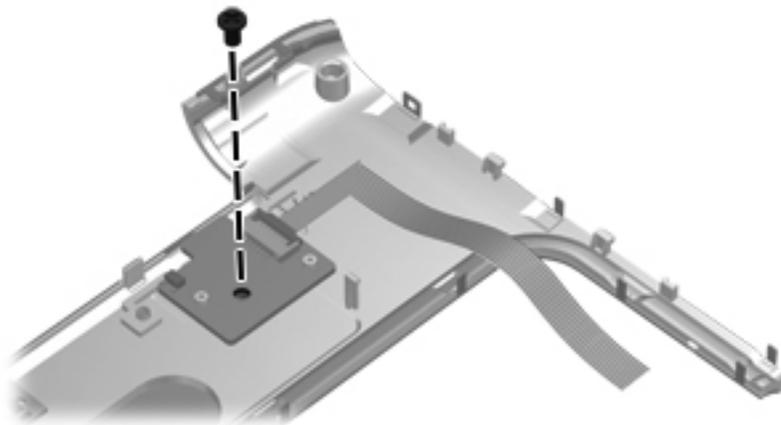
**Where used:** One screw that secures the top cover to the computer



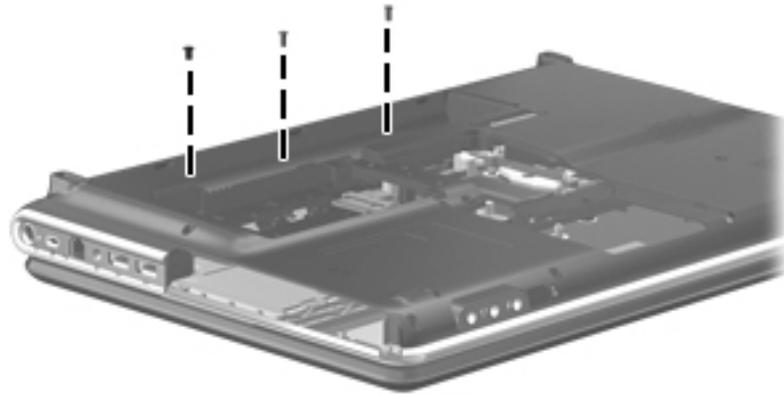
**Where used:** 4 screws that secure the top cover to the computer



**Where used:** 4 screws that secures the speaker assembly to the computer

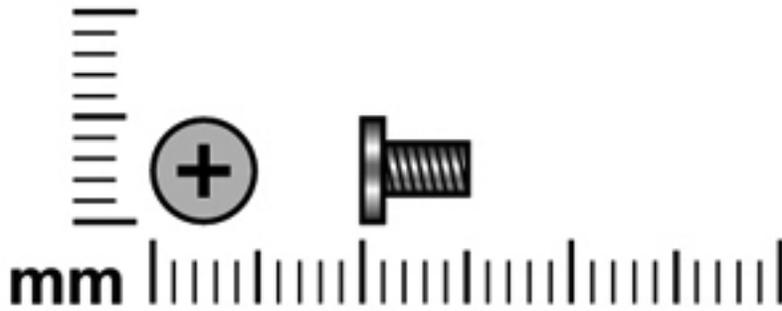


**Where used:** One screw that secures the power button board to the switch cover

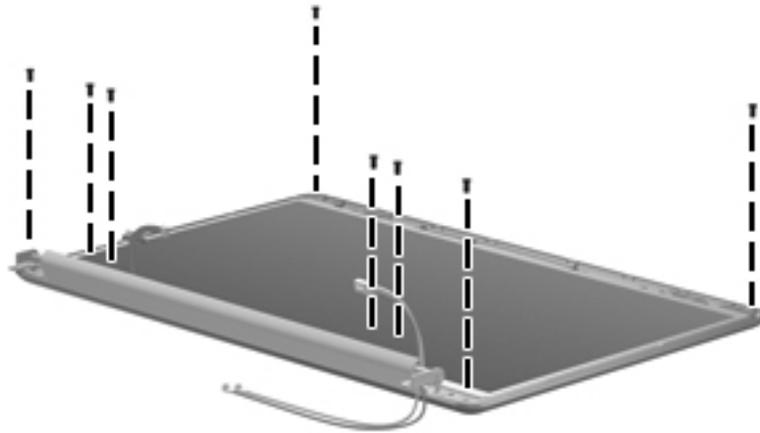


**Where used:** 3 screws, located inside the battery bay, that secure the switch cover to the computer

## Phillips PM2.5×5.0 screw

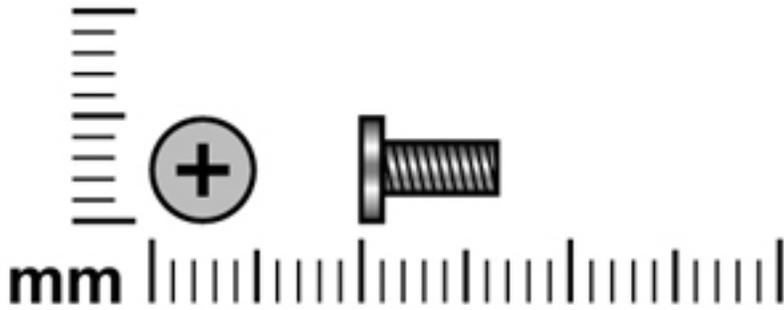


Color	Quantity	Length	Thread	Head diameter
Black	8	5.0 mm	2.5 mm	5.0 mm

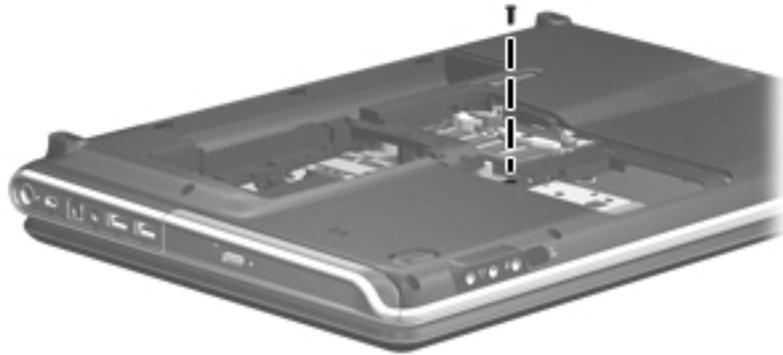


**Where used:** 8 screws that secure the display panel to the display enclosure

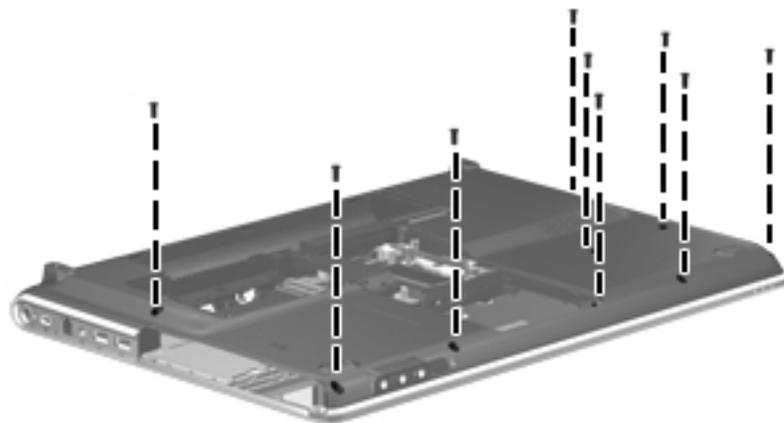
## Phillips PM2.5×6.5 screw



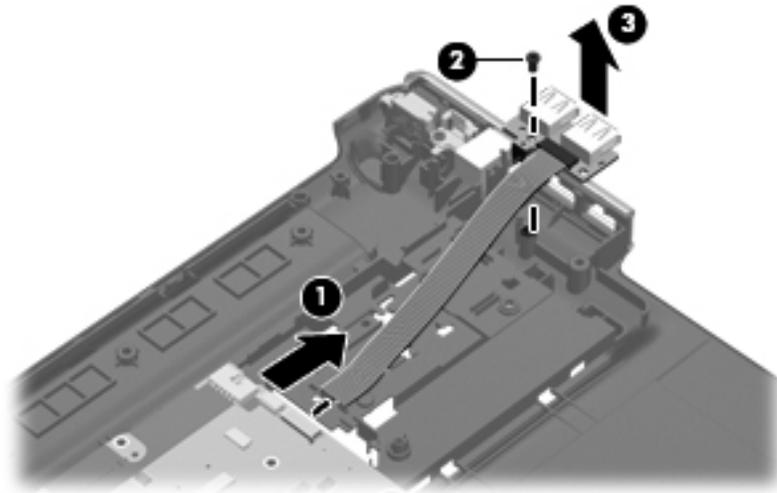
Color	Quantity	Length	Thread	Head diameter
Black	26	6.5 mm	2.5 mm	5.0 mm



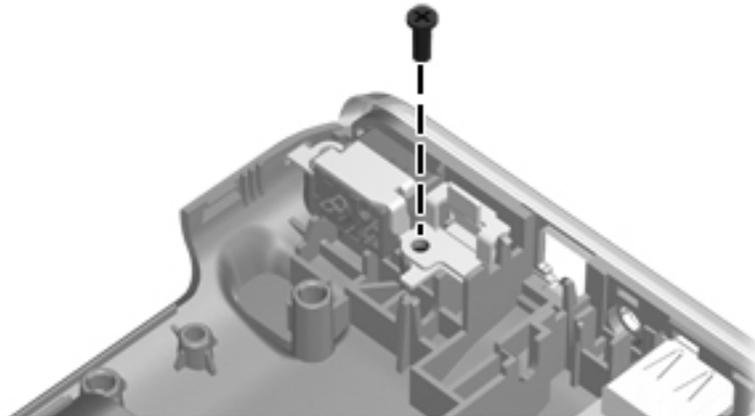
**Where used:** One screw that secures the optical drive to the computer



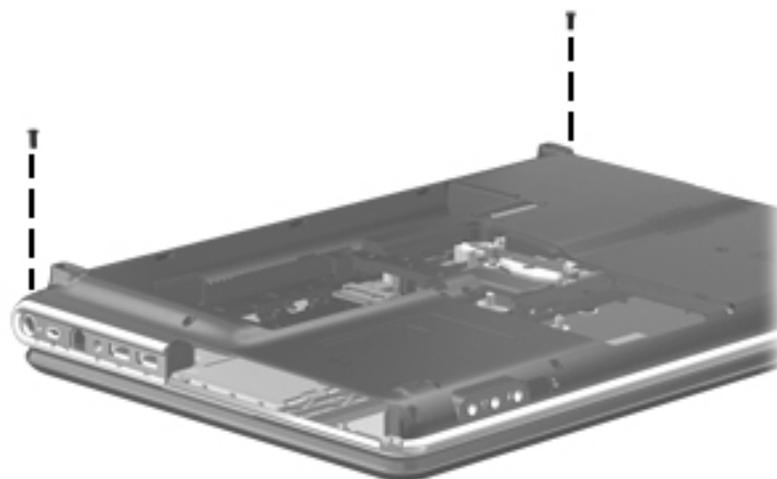
**Where used:** 9 screws that secure the top cover to the bottom of the computer



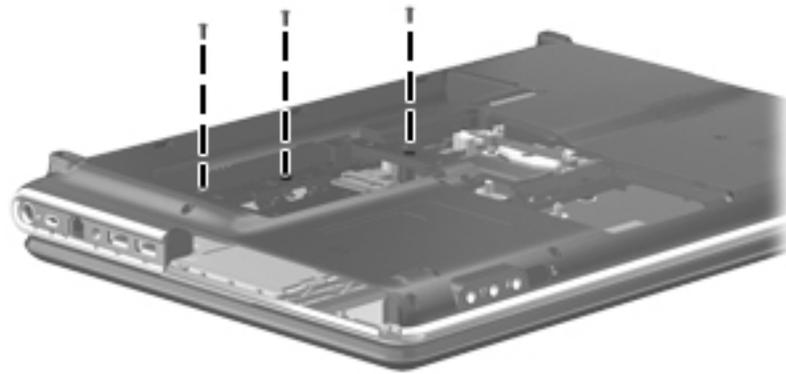
**Where used:** One screw that secures the USB connector to the base enclosure



**Where used:** One screw that secures the power connector and bracket to the base enclosure



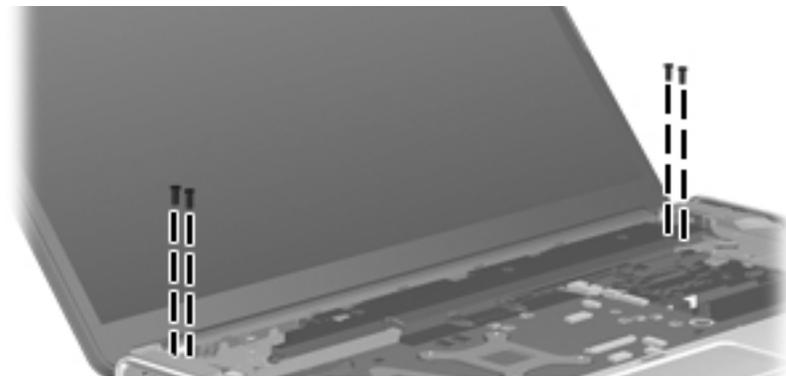
**Where used:** 2 screws that secure the switch cover to the computer



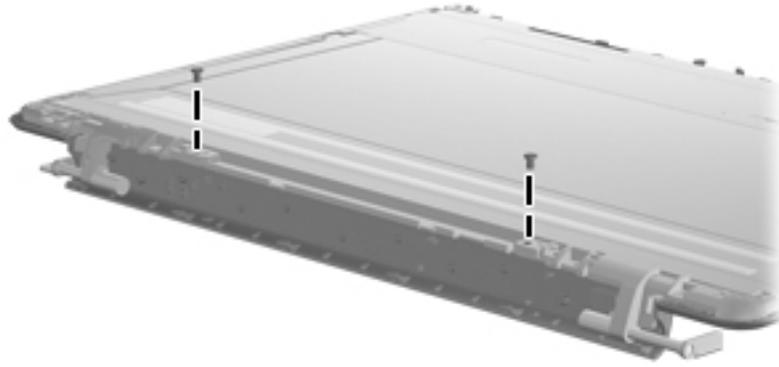
**Where used:** 3 screws that secure the keyboard to the computer



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

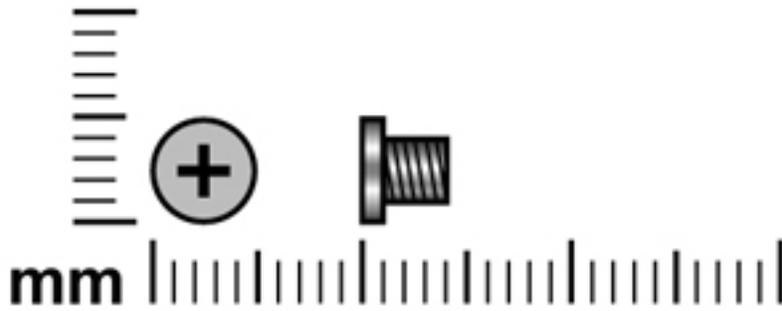


**Where used:** 4 screws that secure the display assembly to the computer



**Where used:** 2 screws that secure the hinge bracket to the display

## Phillips PM3.0×3.5 screw

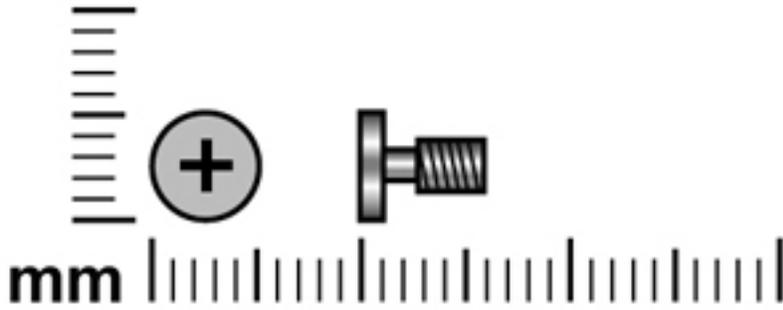


Color	Quantity	Length	Thread	Head diameter
Black	4	3.5 mm	3.0 mm	5.0 mm

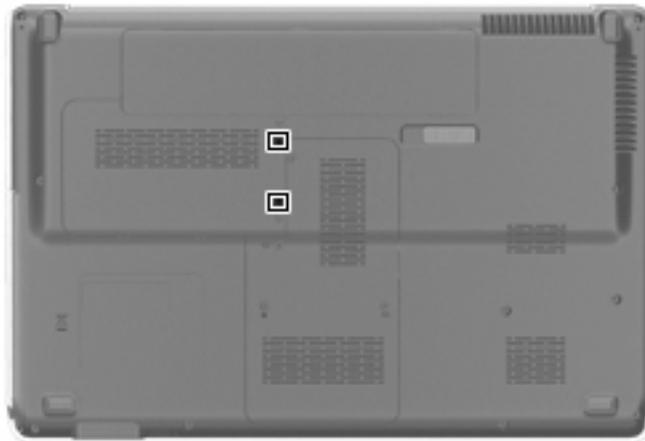


**Where used:** 4 screws that secure the hard drive brackets to the rail

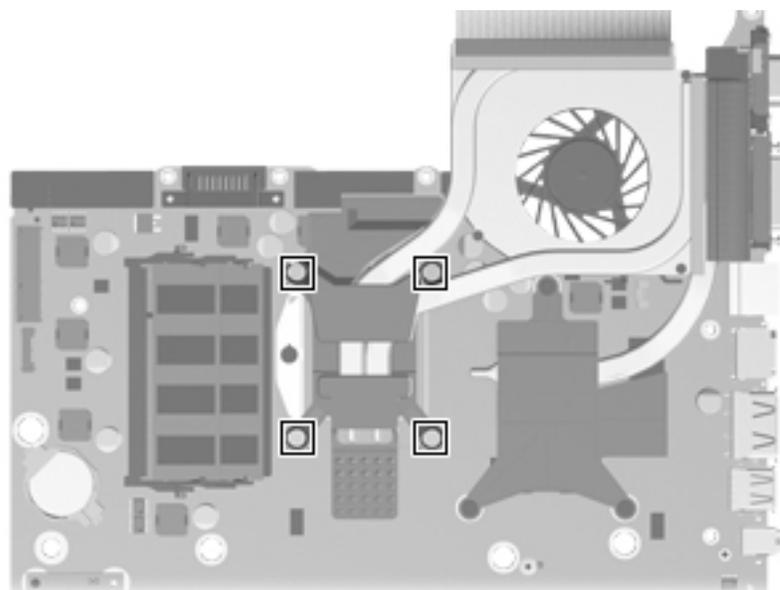
## Phillips PM2.5x5.5 captive screw



Color	Quantity	Length	Thread	Head diameter
Black	6	5.5 mm	2.5 mm	5.0 mm

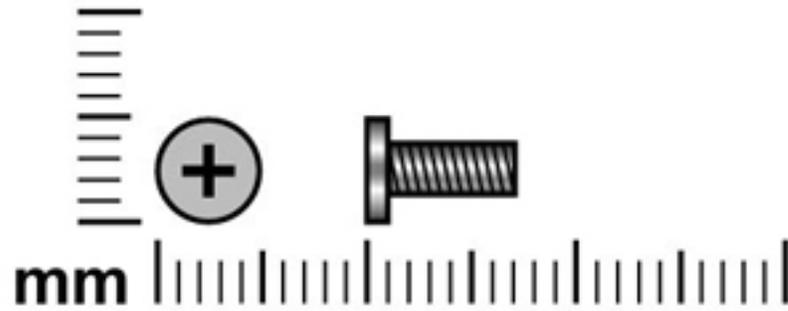


**Where used:** 2 captive screws that secure the hard drive cover to the computer (screws are secured by C-clips)

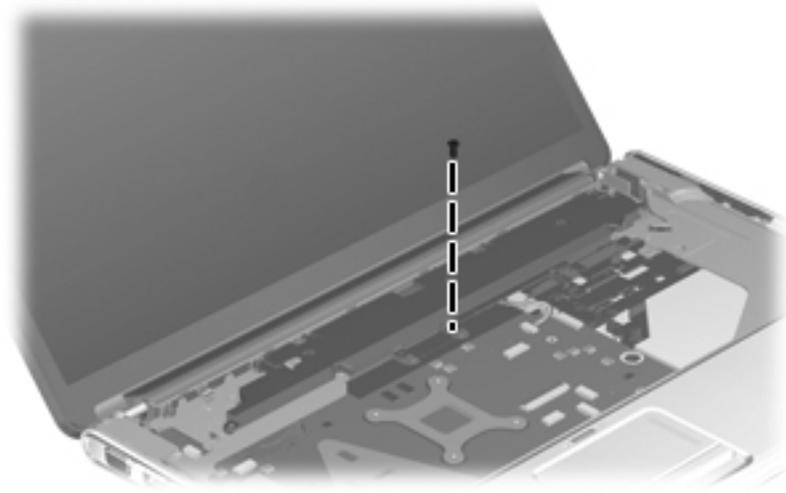


**Where used:** 4 captive screws that secure the fan/heat sink to the system board (screws are secured by C-clips)

## Phillips PM2.5×7.0 screw

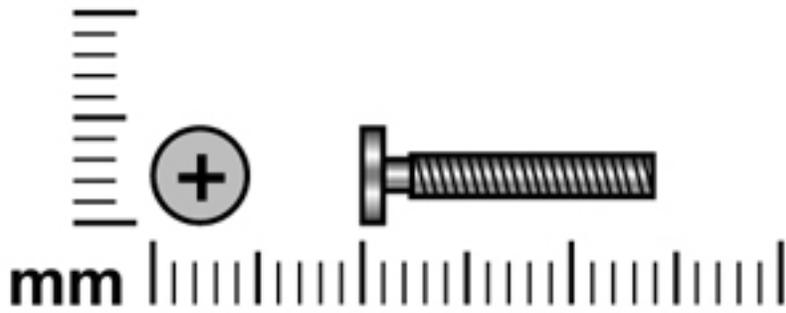


Color	Quantity	Length	Thread	Head diameter
Black	1	7.0 mm	2.5 mm	5.0 mm

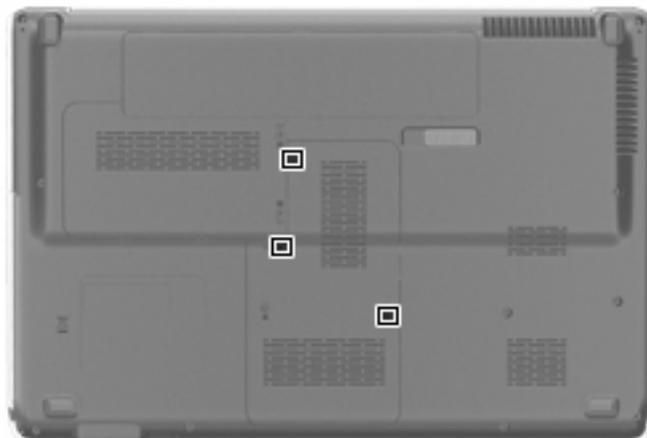


**Where used:** One screw that secures the top cover to the computer as well as the speaker to the system board

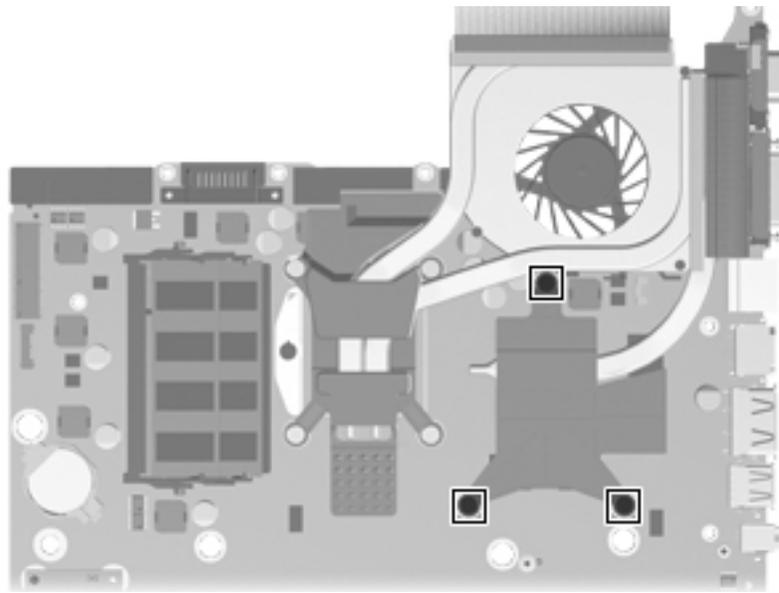
## Phillips PM2.5×14.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Black	6	14.0 mm	2.5 mm	5.0 mm



**Where used:** 3 captive screws that secure the memory module compartment cover to the computer (screws are secured by C-clips)



**Where used:** 3 captive screws that secure the fan/heat sink to the system board (screws are secured by C-clips)

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# Backup and Recovery

## Recovering system information

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

Tools provided by the operating system and Recovery Manager software are designed to help you with the following tasks for safeguarding your information and restoring it in case of a system failure:

- Creating a set of recovery discs (Recovery Manager software feature). Recovery discs are used to start up (boot) your computer and restore the operating system and software programs to factory settings in case of system failure or instability.
- Backing up your information regularly to protect your important system files.
- Creating system restore points (operating system feature). System restore points allow you to reverse undesirable changes to your computer by restoring the computer to an earlier state.
- Recovering a program or driver (Recovery Manager software feature). This feature helps you reinstall a program or driver without performing a full system recovery.
- Performing a full system recovery (Recovery Manager software feature). With Recovery Manager, you can recover your full factory image if you experience system failure or instability. Recovery Manager works from a dedicated recovery partition (select models only) on the hard drive or from recovery discs you create.



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Computers with a solid-state drive (SSD) may not have a recovery partition. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software. To check for the presence of a recovery partition, select **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window.

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## Creating recovery discs

HP recommends that you create recovery discs to be sure that you can restore your system to its original factory state if you experience serious system failure or instability. Create these discs after setting up the computer for the first time.

Handle these discs carefully and keep them in a safe place. The software allows the creation of only one set of recovery discs.

Note the following guidelines before creating recovery discs:

- You will need high-quality DVD-R, DVD+R, BD-R (writable Blu-ray), or CD-R discs. All these discs are purchased separately. DVDs and BDs have a much higher capacity than CDs. If you use CDs, up to 20 discs may be required, whereas only a few DVDs or BDs are required.
  -  Read-write discs, such as CD-RW, DVD±RW, double-layer discs, and BD-RE (rewritable Blu-ray) discs, are not compatible with the Recovery Manager software.
- The computer must be connected to AC power during this process.
- Only one set of recovery discs can be created per computer.
- Number each disc before inserting it into the optical drive.

- If necessary, you can exit the program before you have finished creating the recovery discs. The next time you open Recovery Manager, you will be prompted to continue the disc creation process.

To create a set of recovery discs:

1. Select **Start > All Programs > Recovery Manager > Recovery Disc Creation**.
2. Follow the on-screen instructions.

## Backing up your information

As you add new software and data files, you should back up your system on a regular basis to maintain a reasonably current backup. Back up your system at the following times:

- At regularly scheduled times
  -  Set reminders to back up your information periodically.

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

Note the following when backing up:

- Create system restore points using the Windows® System Restore feature, and periodically copy them to disc.
- Store personal files in the Documents library and back up this folder 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, follow these steps:

- 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**.
  - d. Save the document.
- You can back up your information to an optional external hard drive, a network drive, or discs.
  - When backing up to discs, use any of the following types of discs (purchased separately): CD-R, CD-RW, DVD+R, DVD-R, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.
    -  DVDs store more information than CDs, so using them for backup reduces the number of recovery discs required.
  - When backing up to discs, number each disc before inserting it into the optical drive of the computer.

## Using Windows Backup and Restore

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



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

---

---

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

---

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
  2. Follow the on-screen instructions to set up and create a backup.
- 

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

---

## Using system restore points

When you back up your system, you are creating a system restore point. A system restore point allows you to save and name 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.

---

 Recovering to an earlier restore point does not affect data files saved or e-mails created since the last restore point.

---

You also can create additional restore points to provide increased protection for your system files and settings.

## When to create restore points

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

 If you revert to a restore point and then change your mind, you can reverse the restoration.

---

## Create a system restore point

1. Click **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System Protection**.
3. Click the **System Protection** tab.
4. Under **Protection Settings**, select the disk for which you want to create a restore point.
5. Click **Create**.
6. Follow the on-screen instructions.

## Restore to a previous date and time

To revert to a restore point (created at a previous date and time), when the computer was functioning optimally, follow these steps:

1. Click **Start > Control Panel > System and Security > System**.
2. In the left pane, click **System protection**.
3. Click the **System Protection** tab.
4. Click **System Restore**.
5. Follow the on-screen instructions.

## Performing a recovery



You can recover only files that you have previously backed up. HP recommends that you use HP Recovery Manager to create a set of recovery discs (an entire drive backup) as soon as you set up your computer.

---

Recovery Manager software allows you to repair or restore the system if you experience system failure or instability. Recovery Manager works from recovery discs or from a dedicated recovery partition (select models only) on the hard drive. However, if your computer includes a solid-state drive (SSD), you may not have a recovery partition. If that is the case, recovery discs have been included with your computer. Use these discs to recover your operating system and software.

---



Windows has its own built-in repair features, such as System Restore. If you have not already tried these features, try them before using Recovery Manager.

---

Recovery Manager recovers only software that was preinstalled at the factory. Software not provided with this computer must be downloaded from the manufacturer's Web site or reinstalled from the disc provided by the manufacturer.

---

## Recovering from the recovery discs

To restore the system from the recovery discs:

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.

## Recovering from the dedicated recovery partition (select models only)



Computers with an SSD may not have a recovery partition. If the computer does not have a recovery partition, you will not be able to recover using this procedure. Recovery discs have been included for computers that do not have a partition. Use these discs to recover your operating system and software.

---

On some models, you can perform a recovery from the partition on the hard drive, accessed by pressing either the Start button or **f11**. This restores the computer to its factory condition.

To restore the system from the partition, follow these steps:

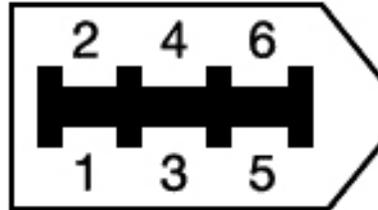
1. Access Recovery Manager in either of the following ways:
  - Select **Start > All Programs > Recovery Manager > Recovery Manager**.
  - or–
  - Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed on the bottom of the screen. Then, Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.



2. Click **System Recovery** in the Recovery Manager window.
3. Follow the on-screen instructions.

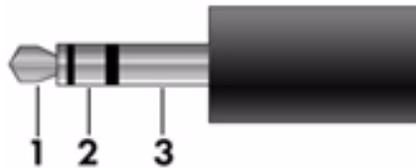
## Connector pin assignments

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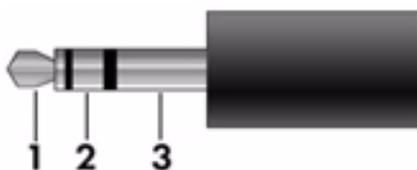
Pin	Signal
1	Power
2	Ground
3	TPB-
4	TPB+
5	TPA-
6	TPA+

### Audio-in (microphone)



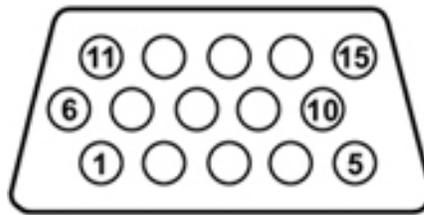
Pin	Signal
1	Audio signal in
2	Audio signal in
3	Ground

## Audio-out (headphone)



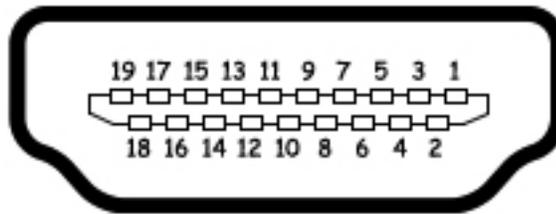
Pin	Signal
1	Audio out, left channel
2	Audio out, right channel
3	Ground

## External monitor



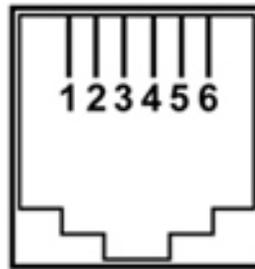
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

# HDMI



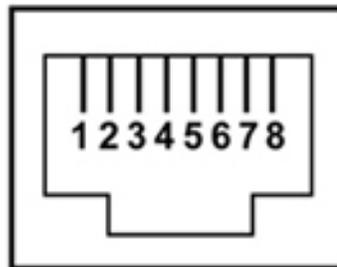
Pin	Signal
1	Transition minimized differential signal (TDMS) data 2+
2	Transition minimized differential signal (TDMS) data 2 shield
3	Transition minimized differential signal (TDMS) data 2-
4	Transition minimized differential signal (TDMS) data 1+
5	Transition minimized differential signal (TDMS) data 1 shield
6	Transition minimized differential signal (TDMS) data 1 shield
7	Transition minimized differential signal (TDMS) data 0+
8	Transition minimized differential signal (TDMS) data 0 shield
9	Transition minimized differential signal (TDMS) data 0-
10	Transition minimized differential signal (TDMS) Clock +
11	Transition minimized differential signal (TDMS) data clock shield
12	Transition minimized differential signal (TDMS) data clock-
13	Consumer electronics control (CEC)
14	Not connected
15	Display data channel (DDC) clock
16	Display data channel (DDC) data
17	Ground
18	+5V Power
19	Hot plug detect

## RJ-11 (modem)



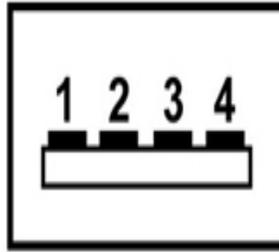
Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused
5	Unused
6	Unused

## 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

---

## Power cord set requirements

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

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

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

### Requirements for all countries and regions

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

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

## Requirements for specific countries and regions

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

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

## Battery

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

## Display

---

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

---

 **CAUTION:** The procedures in this chapter can result in damage to display components. The only components intended for recycling purposes are the liquid crystal display (LCD) panel and the backlight. When you remove these components, handle them carefully.

---

 **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 ❶ and the liquid crystal display (LCD) panel ❷.



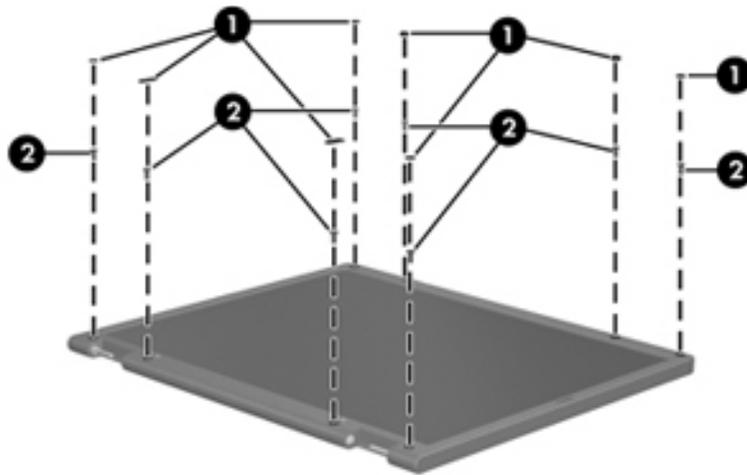
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 The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

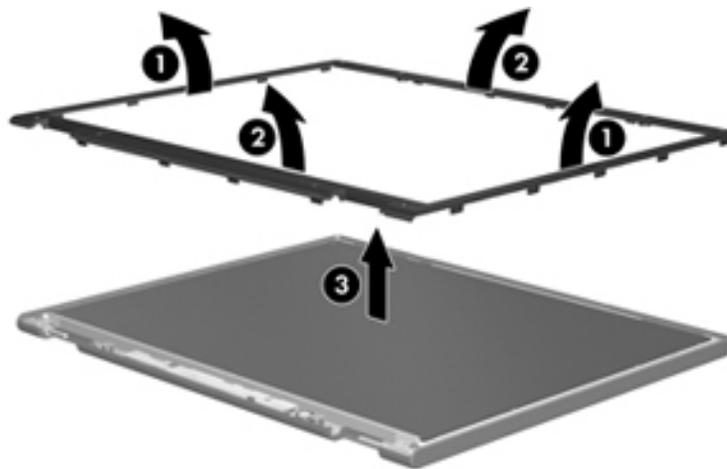
---

Perform the following steps to disassemble the display assembly:

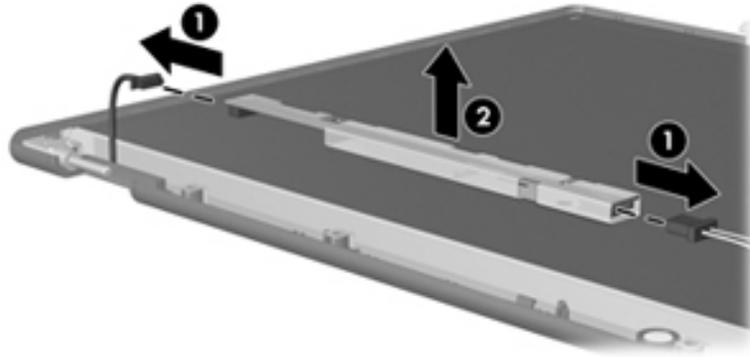
1. Remove all screw covers **1** and screws **2** that secure the display bezel to the display assembly.



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**.

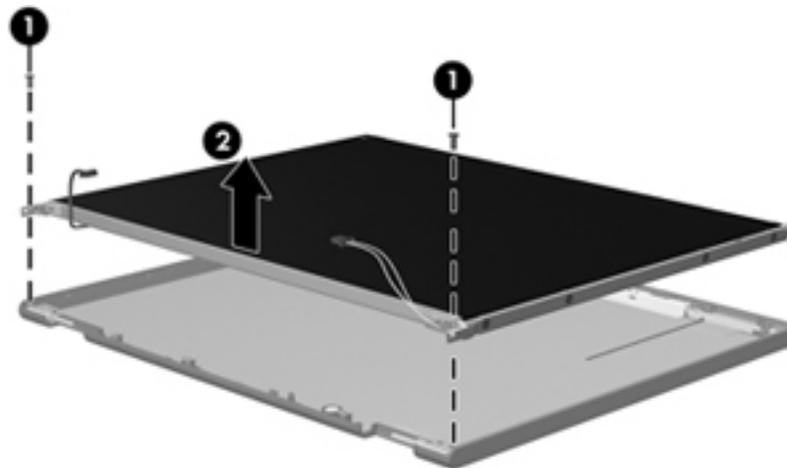


4. Disconnect all display panel cables ❶ from the display inverter and remove the inverter ❷.



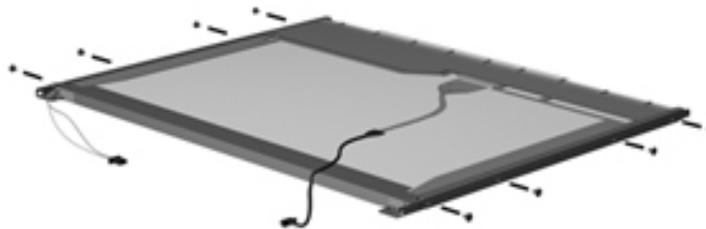
5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.

6. Remove the display panel assembly ❷ from the display enclosure.

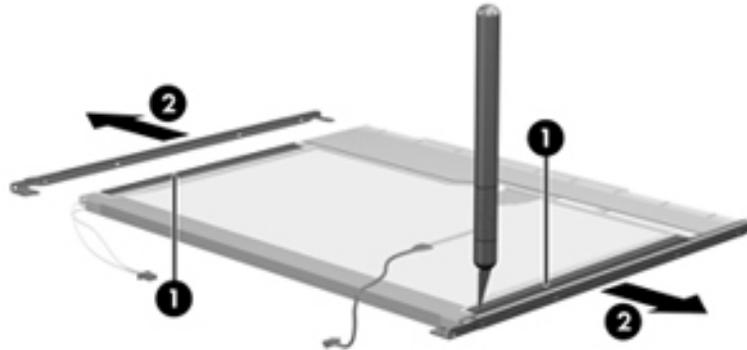


7. Turn the display panel assembly upside down.

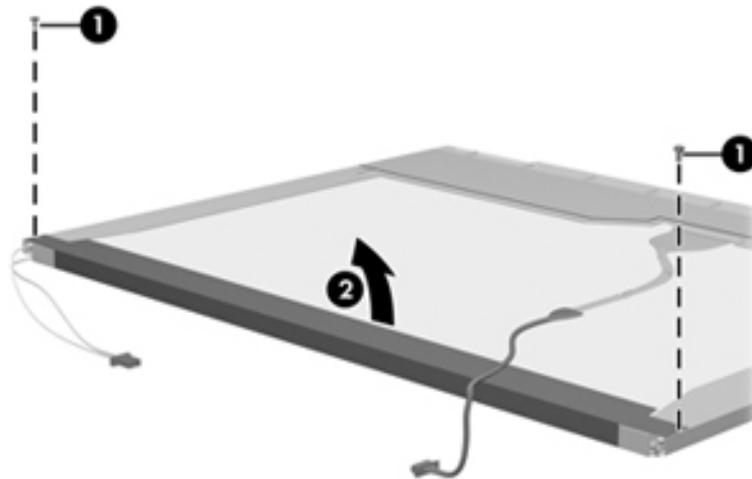
8. Remove all screws that secure the display panel frame to the display panel.



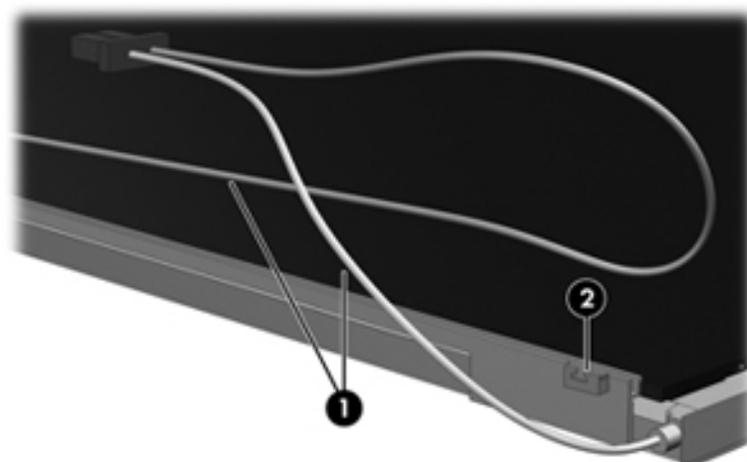
9. Use a sharp-edged tool to cut the tape ❶ that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



11. Remove the screws ❶ that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover ❷ and swing it outward.



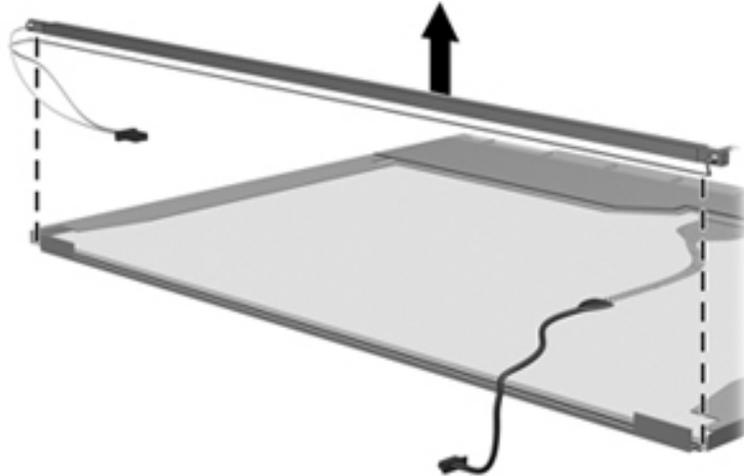
13. Remove the backlight cover.
14. Turn the display panel right-side up.
15. Remove the backlight cables ❶ from the clip ❷ in the display panel.



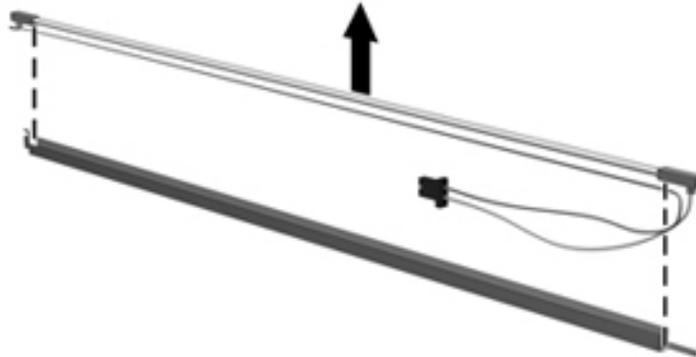
16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.



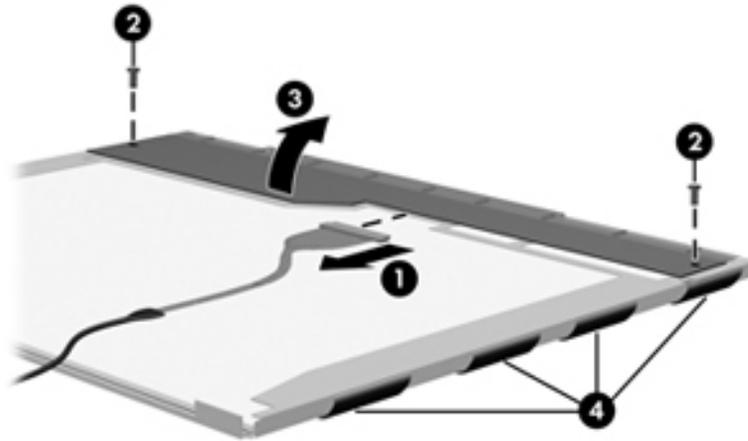
**WARNING:** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.



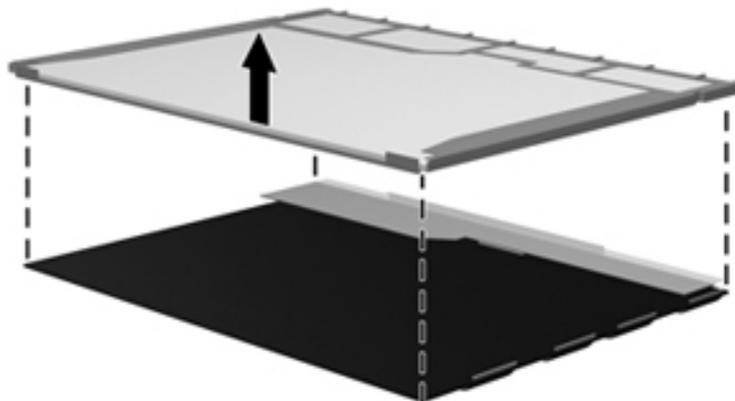
18. Remove the backlight from the backlight frame.



19. Disconnect the display panel cable ❶ from the LCD panel.
20. Remove the screws ❷ that secure the LCD panel to the display rear panel.
21. Release the LCD panel ❸ from the display rear panel.
22. Release the tape ❹ 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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