



# **HP Pavilion dv8 Entertainment PC**

## Maintenance and Service Guide

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April 2010

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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## 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>	HP Pavilion dv8 Entertainment PC
<b>Processors</b>	<p>Intel® Core™ i7-840QM 1.86-GHz processor (SC turbo up to 3.2 GHz)</p> <p>Intel Core i7-820QM 1.73-GHz processor (SC turbo up to 3.06 GHz)</p> <p>Intel Core i7-740QM 1.73-GHz processor (SC turbo up to 2.93 GHz)</p> <p>Intel Core i7-720QM 1.60-GHz processor (SC turbo up to 2.80 GHz)</p> <p>Intel Core i5-540M 2.53-GHz processor (SC turbo up to 3.06 GHz)</p> <p>Intel Core i5-520M 2.4-GHz processor (SC turbo up to 2.93 GHz)</p> <p>Intel Core i5-450M 2.4-GHz processor (SC turbo)</p> <p>Intel Core i5-430QM 2.26-GHz processor (SC turbo up to 2.53 GHz)</p> <p>Intel Core i3-370M 2.4-GHz processor</p> <p>Intel Core i3-350M 2.26-GHz processor</p>
<b>Chipset</b>	<p>Intel 5 Series express chipsets</p> <p>PM55 - platform controller hub (PCH) Peak-M</p>
<b>Graphics</b>	<p>nVidia GeForce 230M GT (N10P-GE, 40-nm) with 1024 MB of dedicated video memory</p> <p>nVidia GeForce 250M GTS (N10E-GE, 40-nm) with 1024 MB of dedicated video memory</p> <p>Support for Blu-ray playback with high-definition (HD) decode, DX10, PhysX, and CUDA</p> <p>Support for Blu-ray playback with HD decode, DX10, PhysX, CUDA, and Hybrid</p>
<b>Panel</b>	<p>18.4-inch dual-channel low-voltage differential signaling (LVDS), full high-definition (FHD), AntiGlare (1920 × 1080) display assembly with dual lamps</p> <p>16:9 ultra-wide aspect ratio</p> <p>Typical brightness: 250 nits</p> <p>Supports flush glass AntiGlare panel cover support</p> <p>Lighted logo on display enclosure</p> <p>All display assemblies include 2 wireless local-area network (WLAN) antennas</p>
<b>Memory</b>	<p>2 customer-accessible/upgradable memory module slots</p> <p>Supports dual-channel memory</p> <p>Supports up to 8 GB of system RAM</p> <p>PC2-6400, 1066-MHz, DDR3</p> <ul style="list-style-type: none"> <li>■ 8192 MB (4096 MB × 2, dual-channel, 64-bit operating systems only)</li> <li>■ 6144 MB (4096 MB + 2048 MB, 64-bit operating systems only)</li> <li>■ 4096 MB (2048 MB × 2, dual-channel)</li> <li>■ 3072 MB (2048 MB + 1024 MB)</li> <li>■ 2048 MB (2048MB × 1)</li> <li>■ 2048 MB (1024 MB × 2, dual-channel)</li> </ul>
<b>Mass storage devices</b>	<p>Supports 9.50-mm, 6.35-cm (2.50-inch) hard drives</p> <p>Supports second hard drive</p> <p>Supports solid-state drive (SSD)</p> <p>Supports HP ProtectSmart Hard Drive Protection</p> <p>Customer-accessible</p> <p>Serial ATA</p>

Category	Description
	Supports the following hard drives: <ul style="list-style-type: none"> <li>■ 500-GB, 7200- and 5400-rpm</li> <li>■ 320-GB, 7200- and 5400-rpm</li> <li>■ 250-GB, 7200- and 5400-rpm</li> </ul>
<b>Mass storage devices</b> <i>(continued)</i>	Supports the following dual hard drive configurations: <ul style="list-style-type: none"> <li>■ 1000-GB, 7200-rpm (500-GB × 2)</li> <li>■ 1000-GB, 5400-rpm (500-GB × 2)</li> <li>■ 640-GB, 7200-rpm (320-GB × 2)</li> <li>■ 640-GB, 5400-rpm (320-GB × 2)</li> <li>■ 500-GB, 7200-rpm (250-GB × 2)</li> <li>■ 500-GB, 5400-rpm (250-GB × 2)</li> </ul> Supports the following combination hard drive/solid-state drive configurations: <ul style="list-style-type: none"> <li>■ 500-GB, 7200-rpm hard drive + 256-GB SSD</li> <li>■ 320-GB, 7200-rpm hard drive + 128-GB SSD</li> </ul>
<b>Optical drives</b>	12.7-mm tray load Serial ATA (SATA) Fixed (removal of 1 screw required) Customer-accessible Parallel ATA Supports no-optical-drive option Supports the following drives: <ul style="list-style-type: none"> <li>■ Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive</li> <li>■ Blu-ray ROM DVD±RW SuperMulti DL Drive</li> </ul>
<b>Microphone</b>	2 digital dual-array microphones with beam-forming, echo-cancellation, noise-suppression software
<b>Audio</b>	HD audio Integrated subwoofer Supports Microsoft® premium requirements and SRS logo requirements 2 Altec Lansing Pavilion-branded HDX speakers
<b>Webcam</b>	Low-light VGA camera Fixed (no tilt) Activity LED 640 × 480 × 30 24 frames per second
<b>Ethernet</b>	Intel Realtek 8111C 10/100/1000 network interface card (NIC) Intel Realtek 8102E 10/100 NIC Ethernet cable included
<b>Wireless</b>	Integrated WLAN options by way of wireless module: 2 wireless antennas built into display assembly Supports no-WLAN option Support for the following WLAN formats: <ul style="list-style-type: none"> <li>■ Intel WiFi Link 5100 802.11a/g/n</li> <li>■ Intel WiFi Link 5100 802.11a/g/n with Bluetooth®</li> <li>■ Intel WiFi Link 5100 802.11a/b/g</li> <li>■ Intel WiFi Link 5100 802.11a/b/g with Bluetooth</li> </ul>

*(Continued)*

Category	Description
<b>TV tuner</b>	DVB-T TV tuner module DVB-T/ANG TV tuner module NTSC/ATSC/ANG TV tuner module TV tuner antenna with F-PAL or PAL jack
<i>(Continued)</i>	
<b>External media cards</b>	One ExpressCard slot, supporting optional ExpressCard/54 cards Digital Media Slot supporting the following digital card formats: <ul style="list-style-type: none"> <li>■ Memory Stick (MS)</li> <li>■ Memory Stick Pro (MSP)</li> <li>■ MultiMediaCard (MMC)</li> <li>■ Secure Digital (SD) Memory Card</li> <li>■ xD-Picture Card (XD)</li> </ul>
<b>Ports</b>	1394 Audio-in (mono microphone) Audio-out (stereo headphones, 2) Consumer infrared eSATA HDMI Multi-pin AC power RJ-45 (Ethernet, includes link and activity lights) TV tuner USB (3) VGA (Dsub 15-pin) supporting 1600 × 1200 external resolution at 75 GHz (hot plug/unplug with auto-detect)
<b>Docking</b>	Supports expansion port 3
<b>Keyboard/pointing devices</b>	Spill-resistant keyboard TouchPad with 2 TouchPad buttons Supports 2-way scroll Taps enabled by default
<b>Power requirements</b>	120-W AC adapter with localized and pointing stick cable plug support (3-wire plug with ground pin, supports 3-pin DC connector) 8-cell, 2.55-Ah (73-Wh) Li-ion battery 4-cell, 4.40-Ah (63-Wh) Li-ion battery
<b>Security</b>	Security cable slot Fingerprint reader with Digital Persona software support
<b>Operating system</b>	Preinstalled: Windows® 7
<b>Serviceability</b>	End-user replaceable parts: <ul style="list-style-type: none"> <li>AC adapter</li> <li>Battery (system)</li> <li>Hard drive</li> <li>Memory module</li> <li>Optical drive</li> <li>WLAN module</li> </ul>



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## External component identification

To see a list of hardware installed in the computer:

» Select **Start > Control Panel > System and Security**. Then in the **System** area, click **Device Manager**.

You can also add hardware or modify device configurations using Device Manager.

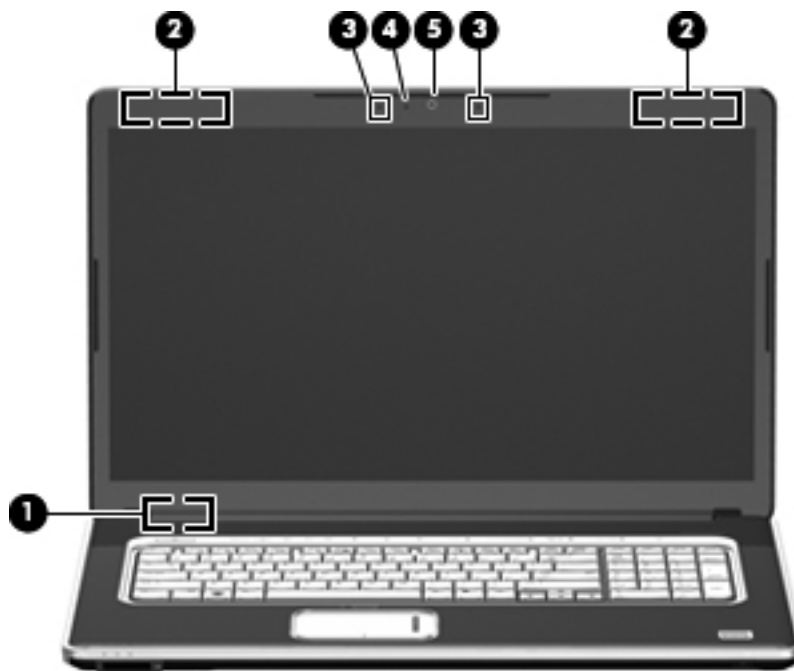




Windows includes the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Help and Support for more information.

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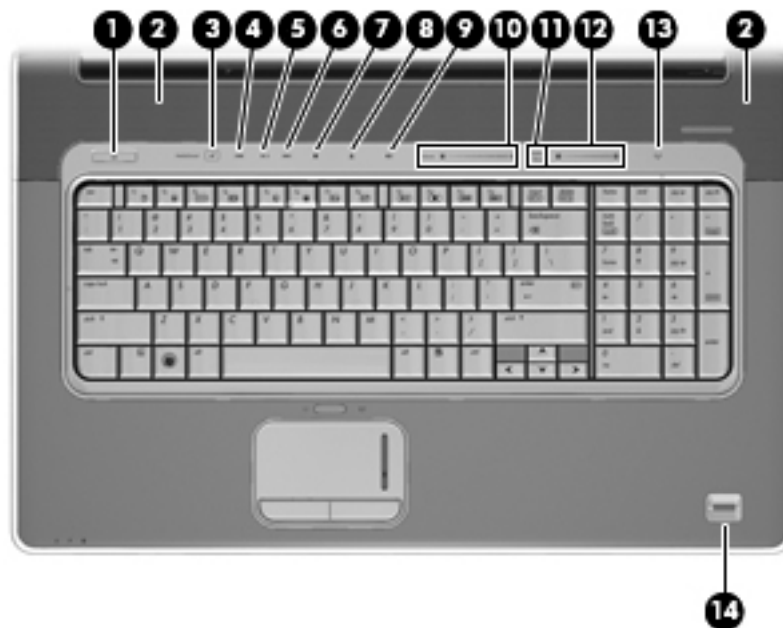
## Top components

### Display components




Item	Component	Description
(1)	Internal display switch	Turns off the display if the display is closed while the computer is on.
(2)	Wireless antennas (2)	Send and receive wireless signals to communicate with WLANs.  The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.
(3)	Internal digital dual-array microphones (2)	Record sound.
(4)	Webcam light	On: The webcam is in use.
(5)	Webcam	Records audio and video and captures still photographs.
	To see wireless regulatory notices, refer to the section of the <i>Regulatory, Safety and Environmental Notices</i> that applies to your country or region. These notices are located in Help and Support.	

## Buttons, speakers, and fingerprint reader



Item	Component	Description
(1)	Power button*	<ul style="list-style-type: none"> <li>■ When the computer is off, press the button to turn on the computer.</li> <li>■ When the computer is on, briefly press the button to initiate Sleep.</li> <li>■ When the computer is in the Sleep state, briefly press the button to exit Sleep.</li> <li>■ When the computer is in Hibernation, briefly press the button to exit Hibernation.</li> </ul> <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select <b>Start &gt; Control Panel &gt; System and Security &gt; Power Options</b>.</p>
(2)	Speakers (2)	Produce sound.

(Continued)

Item	Component	Description
(3)	Media button	Starts the MediaSmart program.
(4)	Previous/rewind button	<ul style="list-style-type: none"> <li>■ Plays the previous track or chapter when the button is pressed once.</li> <li>■ Rewinds media when the button is pressed in combination with the <b>fn</b> key.</li> </ul>
(5)	Play/pause button	Plays or pauses media.
(6)	Next/fast forward button	<ul style="list-style-type: none"> <li>■ Plays the next track or chapter when the button is pressed once.</li> <li>■ Fast forwards media when pressed in combination with the <b>fn</b> key.</li> </ul>
(7)	Stop button	Stops playback.
(8)	Optical drive button	Releases the media tray.
(9)	Volume mute button	Mutes and restores speaker sound.
(10)	Volume scroll zone	Adjusts speaker volume. To decrease volume, slide your finger to the left, or press and hold the minus (-) sign. You can also tap the minus sign. To increase volume, slide your finger to the right, or press and hold the plus (+) sign. You can also tap the plus sign.
(11)	Treble/bass button	Press the button to alternate between the treble and bass functions.
(12)	Treble or bass scroll zone	Adjusts treble or bass level in the audio. (Select treble or bass by pressing the treble/bass button.) To decrease the treble/bass level, slide your finger to the left, or press and hold the minus (-) sign. You can also tap the minus sign. To increase the treble/bass level, slide your finger to the right, or press and hold the plus (+) sign. You can also tap the plus sign.
(13)	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 in order to establish a wireless connection.</p>
(14)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon.

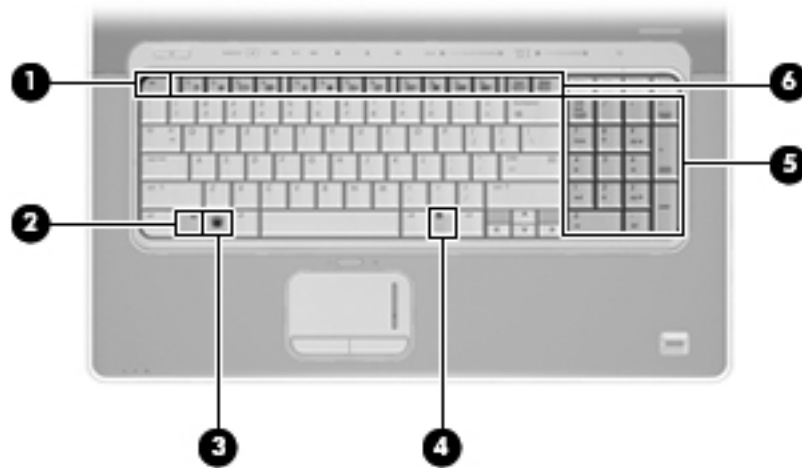
\*This table describes factory settings. For information about changing factory settings, refer to the user guides located in Help and Support.



## Keys



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



Item	Component	Description
(1)	<b>esc</b> key	Displays system information when pressed in combination with the <b>fn</b> key.
(2)	<b>fn</b> key	Executes frequently used system functions when pressed in combination with a function key or the <b>esc</b> key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(5)	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
(1)	Caps lock light	On: Caps lock is on.
(2)	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>
(3)	Volume mute light	<ul style="list-style-type: none"> <li>■ White: Computer sound is on.</li> <li>■ Amber: Computer sound is off.</li> </ul>
(4)	Volume down light	On: The volume scroll zone is being used to decrease speaker volume.
(5)	Volume up light	On: The volume scroll zone is being used to increase speaker volume.
(6)	Treble light	On: The treble function is on.
(7)	Bass light	On: The bass function is on.
(8)	Treble/bass down light	On: The treble or bass scroll zone is being used to decrease the level of treble or bass in the audio.
(9)	Treble/bass up light	On: The treble or bass scroll zone is being used to increase the level of treble or bass in the audio.
(10)	Wireless light	<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>
(11)	Num lock light	On: Num lock is on or the embedded numeric keypad is enabled.

(Continued)

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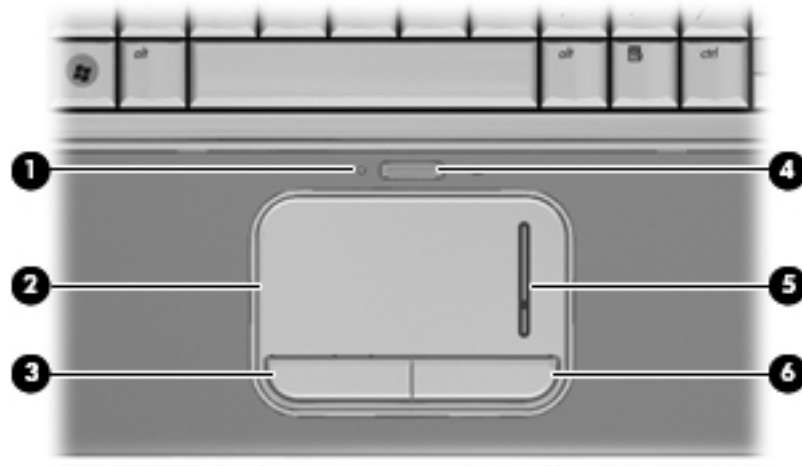
<b>Item</b>	<b>Component</b>	<b>Description</b>
(12)	Drive light	<ul style="list-style-type: none"><li>■ Blinking: The hard drive or optical drive is being accessed.</li><li>■ Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the internal hard drive.</li></ul>
(13)	Battery light	<ul 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 or a critical 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>

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\*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.

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## Pointing devices



Item	Component	Description
(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 pointing device preferences, select **Start > Devices and Printers**. Then, right-click the device representing your computer, and select **Mouse settings**.

## Front components

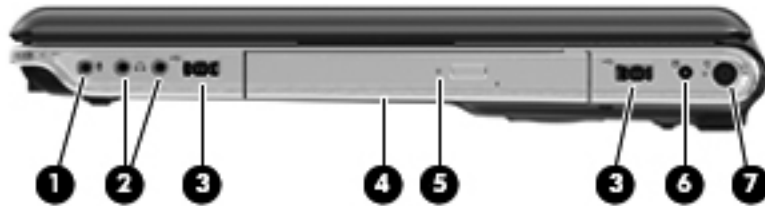


Item	Component	Description
(1)	Digital Media Slot	Supports the following optional digital card formats: <ul style="list-style-type: none"> <li>■ Memory Stick (MS)</li> <li>■ Memory Stick Pro (MSP)</li> <li>■ MultiMediaCard (MMC)</li> <li>■ Secure Digital (SD) Memory Card</li> <li>■ xD-Picture Card (XD)</li> </ul>
(2)	Digital Media Slot light	On: A digital card is being accessed.
(3)	Consumer infrared lens	Receives a signal from the remote control (select models only).

## Right-side components





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



Item	Component	Description
(1)	Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(2)	Audio-out (headphone) jacks (2)	Produce sound when connected to optional powered stereo speakers, headphones, ear buds, headsets, or television audio.
(3)	USB ports (2)	Connect optional USB devices.
(4)	Optical drive	Reads optical discs and, on select models, also writes to optical discs.
(5)	Optical drive light	Blinking: The optical drive is being accessed.
(6)	TV antenna/cable jack (select models only)	Connects an optional TV antenna or an optional digital cable device that receives standard or high-definition TV broadcasts.
(7)	Power connector	Connects an AC adapter.


## Left-side components



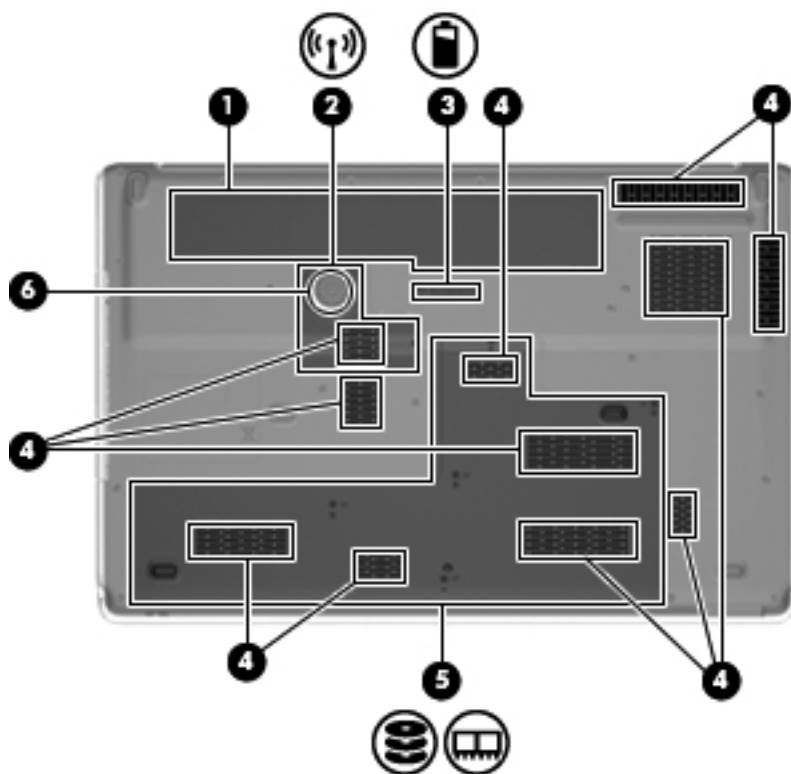
Item	Component	Description
(1)	Security cable slot	Attaches an optional security cable to the computer.  The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	Expansion port 3	Connects the computer to an optional docking device or optional expansion product.  The computer has only one expansion port. The term <i>expansion port 3</i> describes the type of expansion port.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio component.
(6)	eSATA/USB port	Connects an optional high-performance eSATA component, such as an eSATA external hard drive, or connects an optional USB device.
(7)	USB port	Connects an optional USB device.
(8)	1394 port	Connects an optional IEEE 1394 or 1394a device, such as a camcorder.
(9)	ExpressCard slot	Supports optional ExpressCards.

## Rear component



Component	Description
Vent	Enables airflow to cool internal components.  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.

## Bottom components



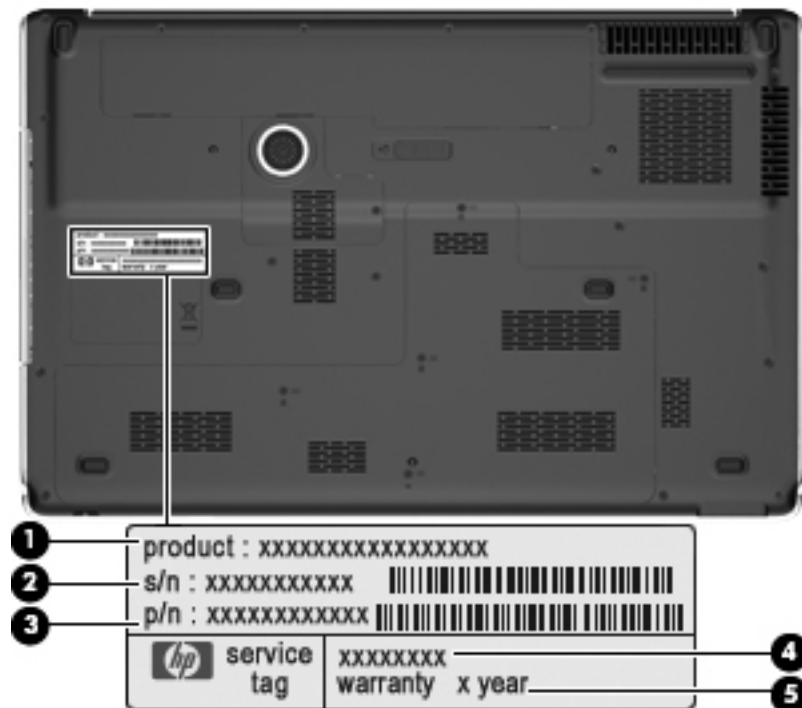
Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	Mini Card compartment	Holds the WLAN module.  ⚠ To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact technical support through Help and Support.
(3)	Battery release latch	Releases the battery from the battery bay.
(4)	Vents (11)	Enable airflow to cool internal components.  🖋 The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	Hard drive bay	Holds 1 or 2 hard drives (depending on the model), the TV tuner module (select models only), and the 2 memory module slots.
(6)	Subwoofer	Contains the subwoofer speaker.



## Illustrated parts catalog

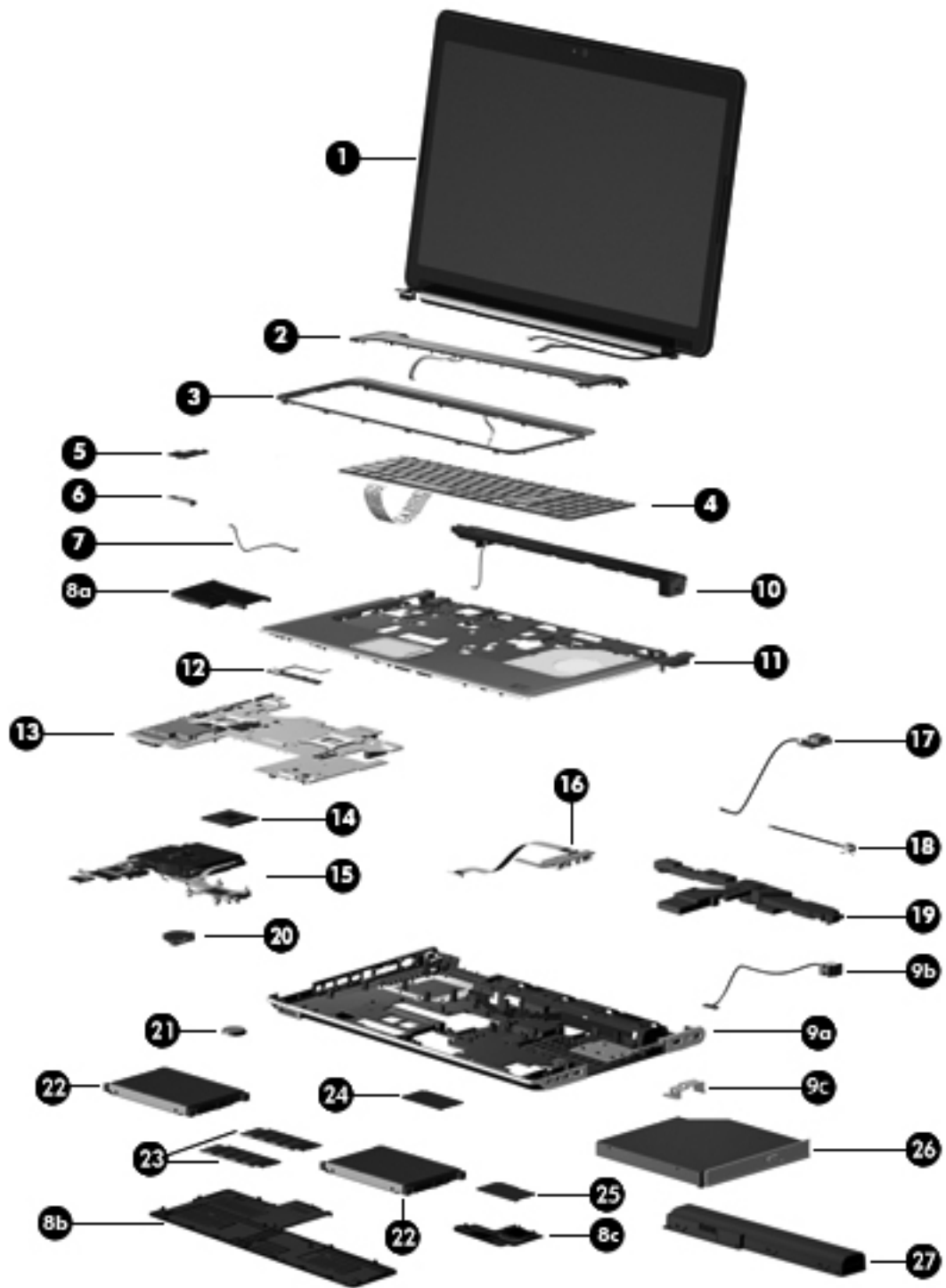
### Service tag




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



Item	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 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 (in years) of the warranty period for the computer.

# Computer major components




Item	Description	Spare part number
(1)	<b>18.4-inch, AntiGlare, high-definition, dual-lamp display assembly</b> (includes 2 WLAN antenna transceivers and cables, webcam, microphones, and logo)  See <a href="#">"Display assembly components"</a> on page 3-7 for information on display assembly spare part numbers.	577001-001
(2)	<b>Switch cover</b>	577008-001
(3)	<b>Keyboard cover</b> (includes LED board and cable)	577009-001
(4)	<b>Keyboard</b> (includes cable): For use in Belgium For use in Denmark, Finland, and Norway For use in France For use in French Canada For use in Germany For use in Italy For use in the Netherlands For use in Portugal For use in Russia For use in Saudi Arabia For use in South Korea For use in Spain For use in Switzerland For use in Taiwan For use in Turkey For use in the United Kingdom For use in the United States	578916-A41 578916-DH1 578916-051 578917-121 578916-041 578916-061 578916-B31 578916-131 578916-251 578916-171 578916-AD1 578916-071 578916-111 578916-AB1 578916-141 578916-031 578916-001
(5)	<b>Power button board</b> (includes cable)	580987-001
(6)	<b>Bluetooth module</b>  The Bluetooth module spare part kit does not include a Bluetooth module cable. The Bluetooth module cable is available using spare part number 537921-001.	577000-001
(7)	<b>Bluetooth module cable</b>	537921-001
	<b>Plastics Kit</b> , includes:	580404-001
(8a)	ExpressCard slot bezel	
(8b)	Mass storage device cover	
(8c)	WLAN module compartment cover  See <a href="#">"Plastics Kit"</a> on page 3-9 for more Plastics Kit spare part information.	
(9a)	<b>Base enclosure</b> , includes:	577005-001
(9b)	Power connector cable	
(9c)	Power connector cable bracket 7 rubber feet (not illustrated)	
	<b>Rubber Feet Kit</b> (not illustrated, includes 7 rubber feet)	496889-001

(Continued)

Item	Description	Spare part number
(10)	<b>Speaker assembly</b>	496887-001
(11)	<b>Top cover</b> (includes fingerprint reader board, fingerprint reader board cable, TouchPad, and TouchPad cables)	577007-001
(12)	<b>TouchPad on/off button board</b> (includes cable)	580986-001
(13)	<b>System board</b> (includes 1024 MB of graphics subsystem memory and replacement thermal material)	573758-001
(14)	<b>Processor</b> (includes replacement thermal material):	
	Intel Core i7-820QM 1.73-GHz processor (SC turbo up to 3.06 GHz)	583053-001
	Intel Core i7-720QM 1.60-GHz processor (SC turbo up to 2.80 GHz)	586170-001
	Intel Core i7-620M 2.66-GHz processor	587259-001
	Intel Core i3-540M 2.53-GHz processor	594188-001
	Intel Core i3-520M 2.40-GHz processor	594187-001
	Intel Core i3-330M 2.26-GHz processor	597623-001
	Intel Core i5-430M 2.26-GHz processor	597624-001
	Intel Core i7-740QM 1.73-GHz processor (SC turbo up to 2.8-GHz)	612259-001
	Intel Core i7-840QM 1.86-GHz processor (SC turbo up to 3.06-GHz)	612260-001
	Intel Core i5-450M 2.4-GHz processor	613585-001
	Intel Core i3-370M 2.4-GHz processor	613584-001
(15)	<b>Fan/heat sink assembly</b> (includes replacement thermal material)	579989-001
(16)	<b>Audio/infrared board</b> (includes cable)	595232-001
(17)	<b>USB board</b> (includes cable)	580989-001
	<b>Cable Kit</b> , includes:	496891-001
(18)	TV tuner module cable	
(19)	<b>Subwoofer</b> (includes 3 mounting grommets)	577010-001
(20)	<b>Fan</b>	514290-001
(21)	<b>RTC battery</b>	449729-001
(22)	<b>Mass storage device:</b>	
	Hard drive (includes left and right brackets, Mylar sleeve, connector, and 4 isolators):	
	■ 640-GB, 5400-rpm	593571-001
	■ 500-GB, 7200-rpm	577607-001
	■ 320-GB, 7200-rpm	507553-001
	■ 250-GB, 7200-rpm	507552-001
	Solid-state drive (includes left and right brackets, Mylar sleeve, connector, and 4 isolators):	
	■ 256-GB	577609-001
	■ 128-GB	577608-001
	<b>Mass Storage Device Hardware Kit</b> (not illustrated, includes left and right brackets, Mylar sleeve, connector, and 4 isolators)	483862-001

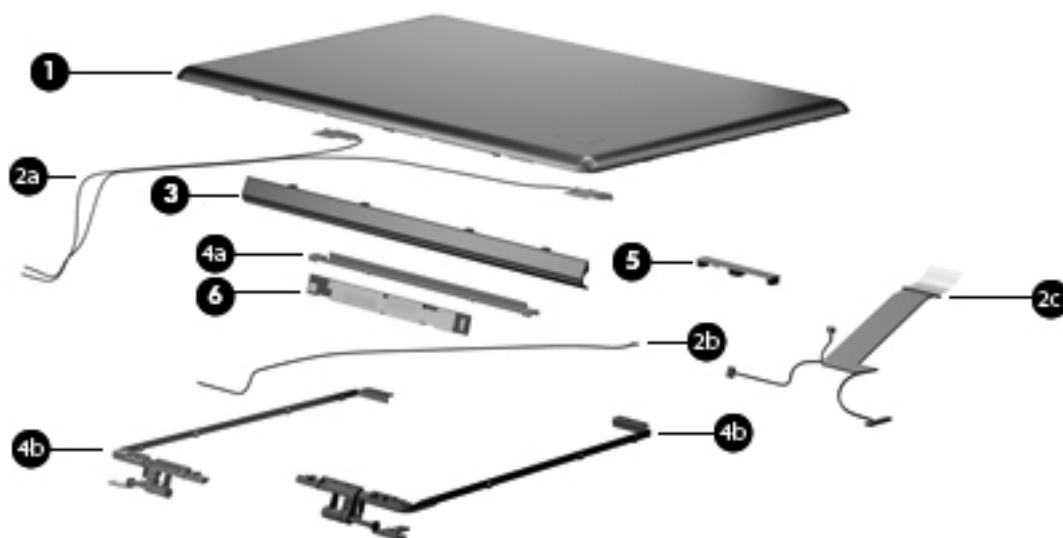
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Item	Description	Spare part number
(23)	<b>Memory modules</b> (1066-MHz, DDR3):	
	4096-MB	577606-001
	2048-MB	577605-001
	1024-MB	577604-001
(24)	<b>WLAN module:</b>	
	Intel WiFi Link 5100 802.11 a/g/n WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	572509-001
	Intel WiFi Link 5100 802.11 a/b/g WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	572508-010
(25)	<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 496891-001.	
	DMB-TANG TV tuner module	482899-004
	DVB-T TV tuner module	482899-003
	DVB-T/ANG TV tuner module	482899-002
	NTSC/ATSC/ANG TV tuner module	482899-001
	<b>TV tuner external antenna cable</b> (not illustrated):	
	With F-PAL jack	482900-002
	With PAL jack	482900-001

(Continued)

<b>Item</b>	<b>Description</b>	<b>Spare part number</b>
<b>(26)</b>	<b>Optical drive</b> (includes optical drive bezel and bracket):	
	Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive	503488-001
	Blu-ray ROM DVD±RW SuperMulti DL Drive	503487-001
<b>(27)</b>	<b>Battery:</b>	
	8-cell, 73-Wh Li-ion battery	480385-001
	4-cell, 63-Wh Li-ion battery	516916-001

## Display assembly components



Item	Description	Spare part number
(1)	<b>Display enclosure</b>	577003-001
	<b>Display Cable Kit</b> , includes:	496876-001
(2a)	Wireless antenna transceivers and cables	
(2b)	Webcam/microphone module cable	
(2c)	Display panel cable	
(3)	<b>Display hinge cover</b>	577004-001
	<b>Display Hinge Kit</b> , includes:	496874-001
(4a)	Display hinge bracket	
(4b)	Display left and right hinges	
(5)	<b>Webcam/microphone module</b>	499242-001
(6)	<b>Display inverter</b>	498324-001

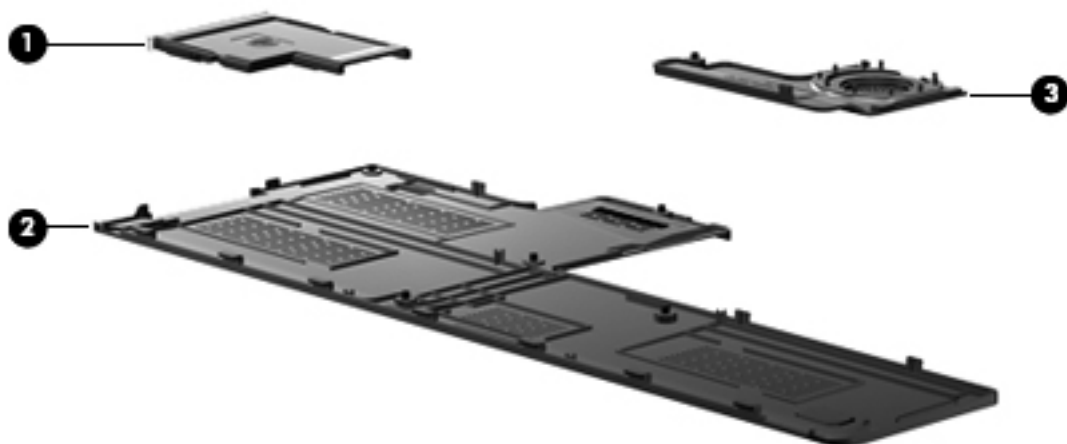
## Mass storage devices



Item	Description	Spare part number
(1)	<b>Hard drive</b> (includes left and right brackets, Mylar sleeve, connector, and 4 isolators):	
	500-GB, 7200-rpm	577607-001
	500-GB, 5400-rpm	501911-001
	320-GB, 7200-rpm	507553-001
	320-GB, 5400-rpm	503485-001
	250-GB, 7200-rpm	507552-001
	250-GB, 5400-rpm	503484-001
(2)	<b>Optical drive</b> (includes optical drive bezel and bracket):	
	Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive	503488-001
	Blu-ray ROM DVD±RW SuperMulti DL Drive	503487-001
(3)	<b>Solid-state drive</b> (includes left and right brackets, Mylar sleeve, connector, and 4 isolators):	
	256-GB	577609-001
	128-GB	577608-001



## Plastics Kit






Item	Description	Spare part number
	<b>Plastics Kit:</b>	580404-001
(1)	ExpressCard slot bezel	
(2)	Mass storage device cover (includes five captive screws, secured by C-clips)	
(3)	WLAN module compartment cover (includes one captive screw, secured by a C-clip)	

## Miscellaneous parts

Description	Spare part number
<b>120-W AC adapter</b>	463953-001
<b>Power cord:</b>	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-201
For use in Denmark	490371-081
For use in Europe, the Middle East, and Africa	490371-021
For use in India	490371-D61
For use in Italy	490371-061
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 Taiwan	490371-AB1
For use in the United Kingdom and Singapore	490371-031
For use in Canada, Mexico, and the United States	490371-001
<b>Remote control:</b>	
Full-function remote control with teletext	465541-001
Full-function remote control without teletext	465540-001
<b>Screw Kit</b> , includes:	496890-001
■ Phillips PM3.0×4.0 screw	
■ Phillips PM2.5×7.0 screw	
■ Phillips PM2.5×6.0 captive screw	
■ Phillips PM2.5×5.0 broadhead screw	
■ Phillips PM2.5×5.0 captive screw	
■ Phillips PM2.5×4.0 screw	
■ Phillips PM2.0×11.0 captive screw	
■ Phillips PM2.0×4.0 screw	
<b>Wired headset with volume control</b>	371693-001


## Sequential part number listing

Spare part number	Description
371693-001	Wired headset with volume control
449729-001	RTC battery
463953-001	120-W AC adapter
465540-001	Full-function remote control without teletext
465541-001	Full-function remote control with teletext
480385-001	8-cell, 73-Wh Li-ion battery
482899-001	NTSC/ATSC/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 496891-001.
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 496891-001.
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 496891-001.
482900-001	TV tuner external antenna cable with PAL jack
482900-002	TV tuner external antenna cable with F-PAL jack
483862-001	Mass Storage Device Hardware Kit (includes left and right brackets, Mylar sleeve, connector, and 4 isolators)
490371-001	Power cord for use in Canada, Mexico, and the United States
490371-011	Power cord for use in Australia
490371-021	Power cord for use in Europe, the Middle East, and Africa
490371-031	Power cord for use in the United Kingdom and Singapore
490371-061	Power cord for use in Italy
490371-081	Power cord for use in Denmark
490371-201	Power cord for use in Brazil
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-D01	Power cord for use in Argentina
490371-D61	Power cord for use in India
496874-001	Display Hinge Kit (includes hinge bracket, and left and right hinges)


(Continued)

Spare part number	Description
496876-001	Display Cable Kit (includes wireless antenna transceivers and cables, webcam/microphone module cable, and display panel cable)
496887-001	Speaker assembly
496889-001	Rubber Feet Kit (includes 7 rubber feet)
496890-001	Screw Kit
496891-001	Cable Kit (includes TV tuner module cable)
498324-001	Display inverter
499242-001	Webcam/microphone module
501911-001	500-GB, 5400-rpm hard drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
503484-001	250-GB, 5400-rpm hard drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
503485-001	320-GB, 5400-rpm hard drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
503487-001	Blu-ray ROM DVD±RW SuperMulti DL Drive (includes optical drive bezel and bracket)
503488-001	Blu-ray ROM with LightScribe DVD±RW SuperMulti DL Drive (includes optical drive bezel and bracket)
507552-001	250-GB, 7200-rpm hard drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
507553-001	320-GB, 7200-rpm hard drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
514290-001	Fan
516916-001	4-cell, 63-Wh Li-ion battery
537921-001	Bluetooth module cable
572507-001	Intel WiFi Link 5100 802.11 a/g/n WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam
572508-001	Intel WiFi Link 5100 802.11 a/b/g WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam

(Continued)

Spare part number	Description
573758-001	System board (includes 1024 MB of graphics subsystem memory and replacement thermal material)
577000-001	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 537921-001.
577001-001	18.4-inch, AntiGlare, high-definition, dual-lamp display assembly (includes 2 WLAN antenna transceivers and cables, webcam, microphones, and logo)
577003-001	Display enclosure
577004-001	Display hinge cover
577005-001	Base enclosure (includes power connector cable, power connector cable bracket, and 7 rubber feet)
577007-001	Top cover (includes fingerprint reader board, fingerprint reader board cable, TouchPad, and TouchPad cables)
577008-001	Switch cover
577009-001	Keyboard cover (includes LED board and cable)
577010-001	Subwoofer (includes 3 mounting grommets)
577604-001	1024-MB memory module (1066-MHz, DDR3)
577605-001	2048-MB memory module (1066-MHz, DDR3)
577606-001	4096-MB memory module (1066-MHz, DDR3)
577607-001	500-GB, 7200-rpm hard drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
577608-001	128-GB solid-state drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
577609-001	256-GB solid-state drive (includes left and right brackets, Mylar sleeve, connector, and isolators)
578916-001	Keyboard for use in the United States (includes keyboard cable)
578916-031	Keyboard for use in the United Kingdom (includes keyboard cable)
578916-041	Keyboard for use in Germany (includes keyboard cable)
578916-051	Keyboard for use in France (includes keyboard cable)
578916-061	Keyboard for use in Italy (includes keyboard cable)
578916-071	Keyboard for use in Spain (includes keyboard cable)
578916-111	Keyboard for use in Switzerland (includes keyboard cable)
578916-131	Keyboard for use in Portugal (includes keyboard cable)
578916-141	Keyboard for use in Turkey (includes keyboard cable)
578916-171	Keyboard for use in Saudi Arabia (includes keyboard cable)
578916-251	Keyboard for use in Russia (includes keyboard cable)
578916-A41	Keyboard for use in Belgium (includes keyboard cable)
578916-AB1	Keyboard for use in Taiwan (includes keyboard cable)
578916-AD1	Keyboard for use in South Korea (includes keyboard cable)
578916-B31	Keyboard for use in the Netherlands (includes keyboard cable)
578916-DH1	Keyboard for use in Denmark, Finland, and Norway (includes keyboard cable)

(Continued)

Spare part number	Description
578917-121	Keyboard for use in French Canada (includes keyboard cable)
579989-001	Fan/heat sink assembly (includes replacement thermal material)
580404-001	Plastics Kit  See <a href="#">"Plastics Kit" on page 3-9</a> for information on Plastics Kit spare part information.
580986-001	TouchPad on/off button board (includes cable)
580987-001	Power button board (includes cable)
580988-001	Audio/infrared board (includes cable)
580989-001	USB board (includes cable)
583053-001	Intel Core i7-820QM 1.73-GHz processor (SC turbo up to 3.06 GHz, includes replacement thermal material)
586170-001	Intel Core i7-720QM 1.60-GHz processor (SC turbo up to 2.80 GHz, includes replacement thermal material)

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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
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers

### Service considerations

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 mass storage device, 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 mass storage device, place it in a static-proof bag.
  - Avoid exposing a mass storage device to products that have magnetic fields, such as monitors or speakers.
  - Avoid exposing a mass storage device to temperature extremes or liquids.
  - If a mass storage device must be mailed, place it in a bubble pack mailer or other suitable form of protective packaging, and label the package "FRAGILE."
- 

## Grounding guidelines

### Electrostatic discharge damage

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

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

An electronic device exposed to ESD may not be affected at all and 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

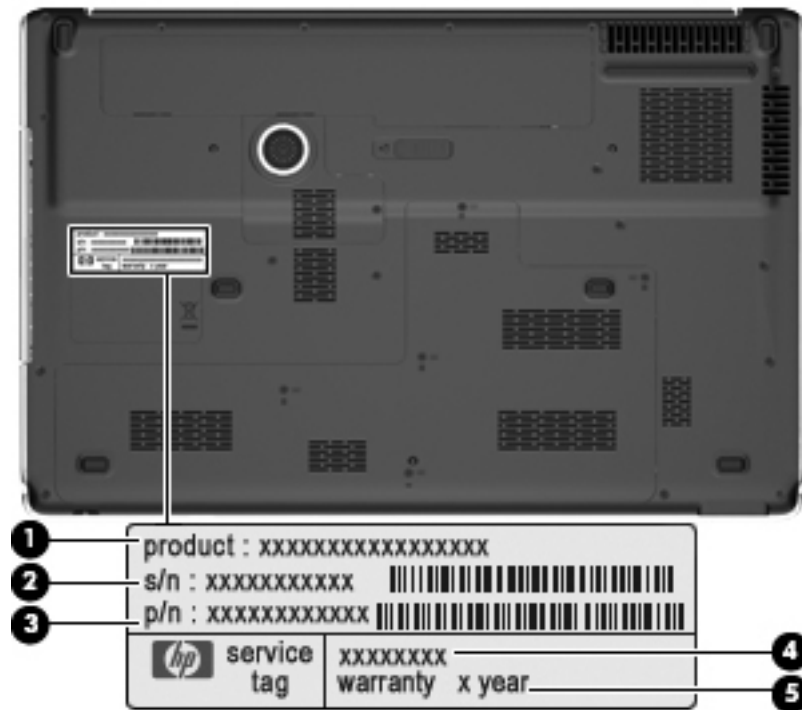
## Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 101 screws, in 8 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

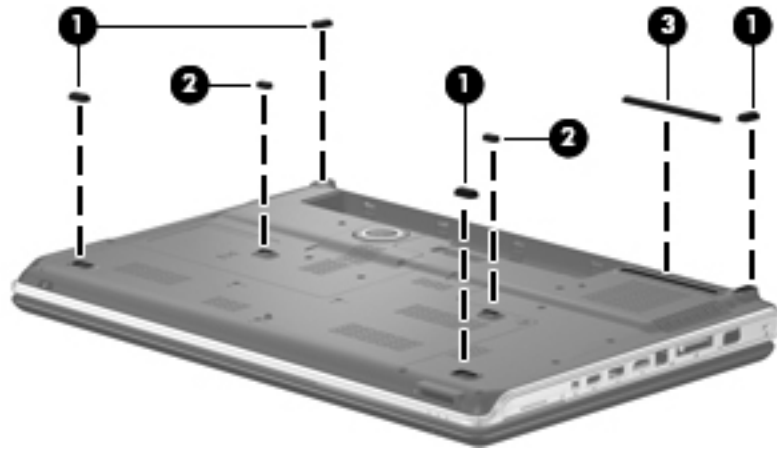
When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



Item	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 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 (in years) of the warranty period for the computer.

## Computer feet

The computer feet are adhesive-backed rubber pads. The feet are included in the Rubber Feet Kit, spare part number 496889-001. There are 7 rubber feet, in three different sizes (❶, ❷, and ❸), that attach to the base enclosure in the locations shown in the following illustration.



## Battery

Description	Spare part number
8-cell, 73-Wh Li-ion battery	480385-001
4-cell, 63-Wh Li-ion battery	516916-001

Before removing the 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.

Remove the battery:

1. Turn the computer upside down on a flat surface, with the front toward you.
2. Slide the battery release latch **1** to release the battery.
3. Pivot the battery **2** upward and remove it **3** from the computer.



To insert 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.

## Optical drive



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

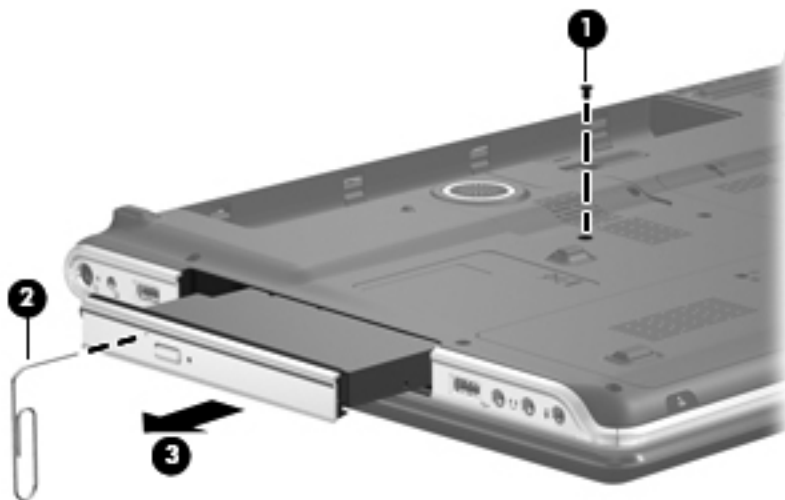
Description	Spare part number
Blu-ray ROM with LightScribe DVD±RW Drive	603052-001
Blu-ray ROM DVD±RW Drive	603053-001
Blu-ray ROM DVD±RW with LightScribe Tray	609264-001

Before the optical drive, follow these steps:

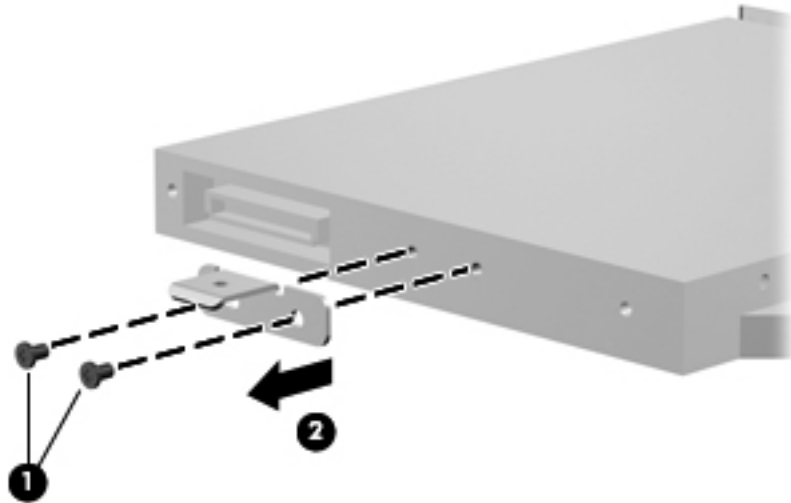
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).

Remove the optical drive:

1. Position the computer with the left side toward you.
2. Remove the Phillips PM2.5×7.0 screw ❶ that secures the optical drive to the computer.
3. Insert a paper clip or similar tool into the optical drive tab access ❷, and push the tab forward to release the optical drive from the computer.
4. Remove the optical drive ❸ from the computer.



5. If it is necessary to replace the optical drive bracket:
  - a. Position the optical drive with the rear toward you.
  - b. Remove the two Phillips PM2.0×4.0 screws ❶ that secure the optical drive bracket to the optical drive.
  - c. Remove the optical drive bracket ❷.



Reverse this procedure to reassemble and install an optical drive.

## Mass storage device



The mass storage device spare part kit includes a left and right bracket, Mylar sleeve, connector, and 4 isolators.

Description	Spare part number
Hard drive:	
■ 640-GB, 5400-rpm	593571-001
■ 500-GB, 7200-rpm	577607-001
■ 320-GB, 7200-rpm	507553-001
■ 250-GB, 7200-rpm	507552-001
Solid-state drive:	
■ 256-GB	577609-001
■ 128-GB	577608-001
Mass Storage Device Hardware Kit (includes left and right brackets, Mylar sleeve, connector, and 4 isolators)	483862-001

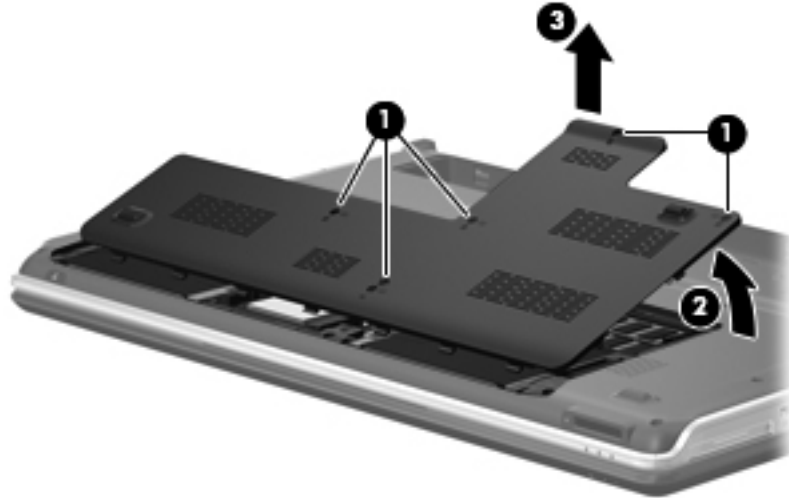
Before removing the mass storage devices, follow these steps:

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 4-7](#)).

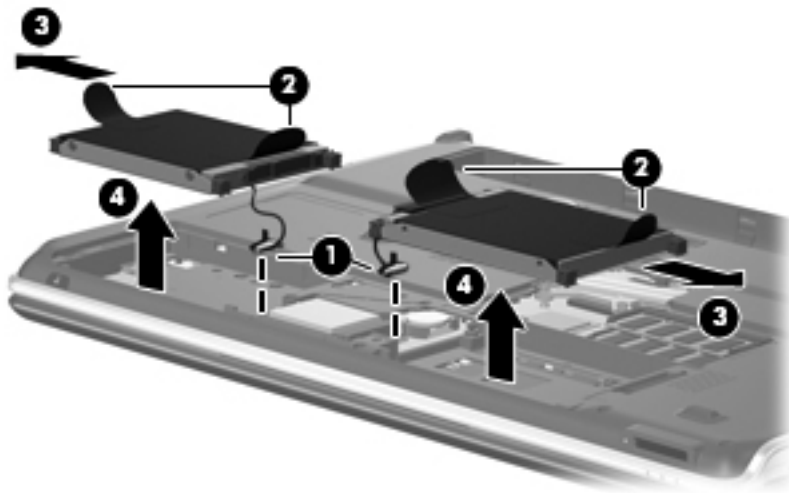


Remove the mass storage devices:

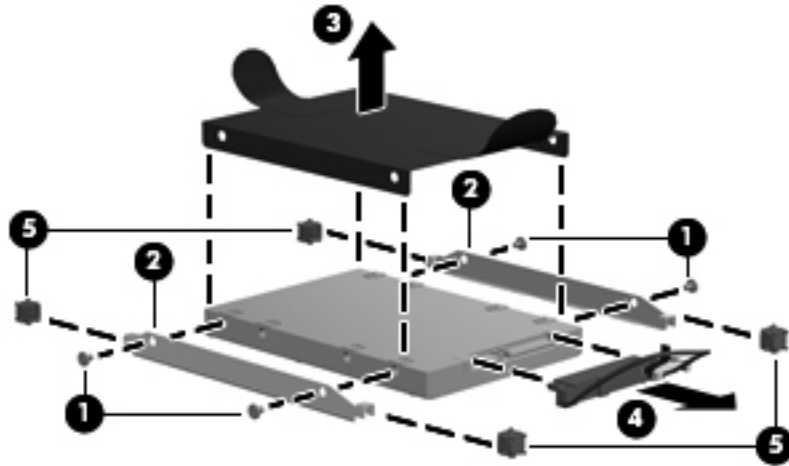
1. Loosen the five Phillips PM2.5×6.0 captive screws **1** that secure the mass storage device cover to the computer.
2. Lift the rear edge of the mass storage device cover **2**, swing it up and forward, and then remove the cover **3**. The mass storage device cover is included in the Plastics Kit, spare part number 580404-001.



3. Disconnect the mass storage device cable **1** from the system board.
4. Grasp the Mylar tabs **2** on the mass storage device, and slide the mass storage device **3** away from the mass storage device connector.
5. Remove the mass storage device **4** from the mass storage device bay.



6. If it is necessary to replace the left and right brackets, Mylar sleeve, connector, and isolators:
  - a. Remove the two Phillips PM3.0×4.0 screws ❶ from each side of the mass storage device.
  - b. Remove the left and right brackets ❷.
  - c. Lift the Mylar sleeve ❸ straight up to remove it from the mass storage device.
  - d. Remove the mass storage device connector ❹.
  - e. Remove the four isolators ❺.



Reverse this procedure to reassemble and install the mass storage devices.

## 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 496891-001.

Description	Spare part number
DMB-TANG TV tuner module	482899-004
DVB-T TV tuner module	482899-003
DVB-T/ANG TV tuner module	482899-002
NTSC/ATSC/ANG TV tuner module	482899-001

Before removing the TV tuner module, follow these steps:

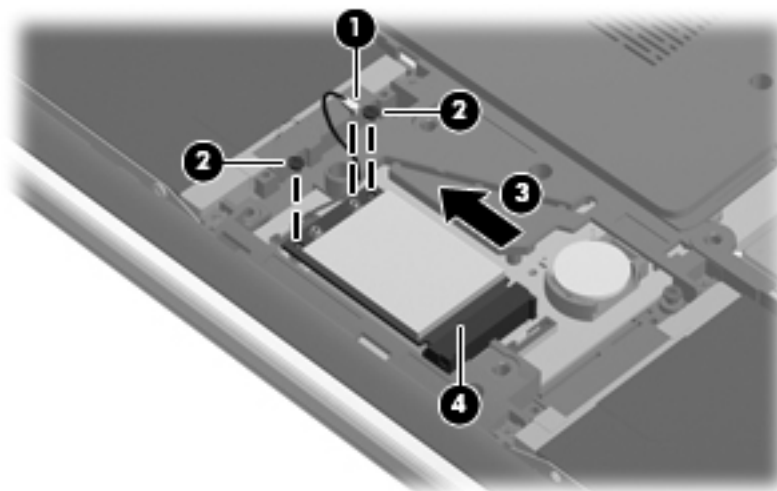
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the mass storage device cover (see [“Mass storage device” on page 4-10](#)).


Remove the TV tuner module:

1. Disconnect the TV tuner module antenna cable ❶ from the terminal on the TV tuner module.
2. Remove the two Phillips PM2.0×4.0 screws ❷ that secure the TV tuner module to the system board. (The TV tuner module tilts up.)
3. Remove the TV tuner module ❸ by pulling it away from the slot at an angle.

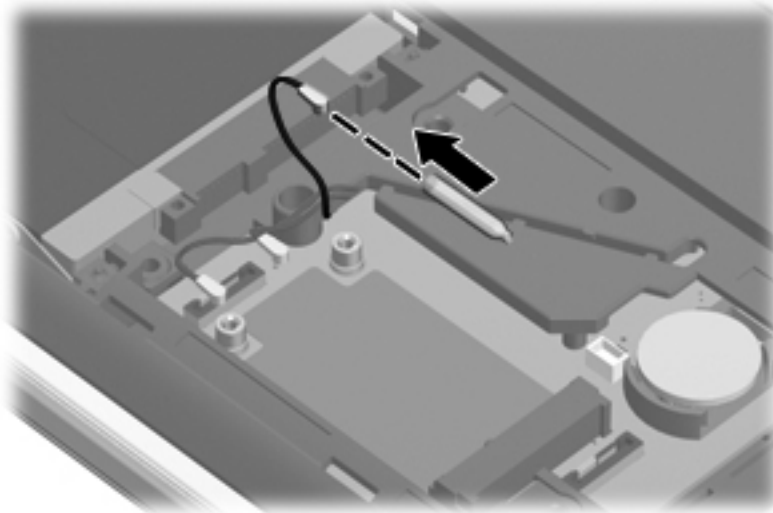


The TV tuner module is designed with a notch ❹ to prevent incorrect insertion into the TV tuner module slot.



 If the TV tuner module is removed and not replaced, a protective sleeve must be installed on the antenna connector, as shown in the following illustration.

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Reverse this procedure to install the TV tuner module.

## RTC battery

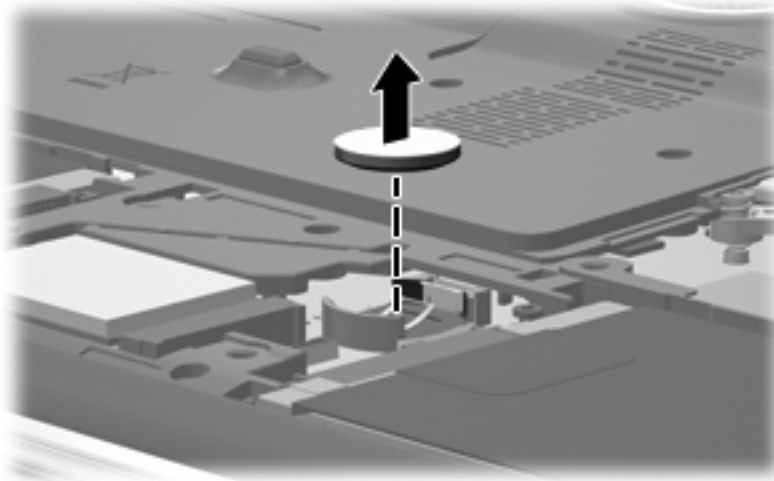
Description	Spare part number
RTC battery	449729-001

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 4-7](#)).
5. Remove the mass storage device cover (see [“Mass storage device” on page 4-10](#)).

Remove the RTC battery:

- » Lift the RTC battery from the socket.



Reverse this procedure to install the RTC battery.

## Memory module

Description	Spare part number
1-GB (1333-MHz, DDR3)	598859-001
2 -GB (1333-MHz, DDR3)	598856-001
4-GB (1333-MHz, DDR3)	599092-001

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 4-7](#)).
5. Remove the mass storage device cover (see [“Mass storage device” on page 4-10](#)).

Remove the memory module:

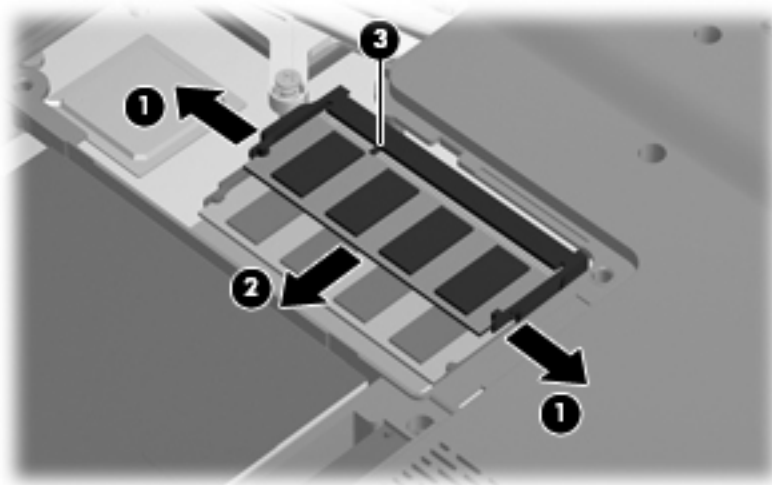


The top memory module slot contains the expansion memory module. The bottom slot contains the primary memory module.

1. Spread the retaining tabs **1** on each side of the memory module slot to release the memory module. (The memory module tilts up.)
2. Remove the memory module **2** by pulling it 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.

## WLAN module

Description	Spare part number
Intel WiFi Link 5100 802.11 a/g/n WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	572509-001
Intel WiFi Link 5100 802.11 a/b/g WLAN module for use in Andorra, Antigua and Barbuda, Argentina, Aruba, Australia, Austria, Azerbaijan, the Bahamas, Bahrain, Barbados, Belgium, Bermuda, Bolivia, Bosnia, Brazil, Brunei, Bulgaria, Canada, the Cayman Islands, Chile, Colombia, Costa Rica, Croatia, Cyprus, the Czech Republic, Denmark, the Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Finland, France, French Guiana, Georgia, Germany, Ghana, Greece, Guadeloupe, Guam, Guatemala, Haiti, Herzegovina, Honduras, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Israel, Italy, the Ivory Coast, Jamaica, Japan, Jordan, Kenya, Kuwait, Kyrgyzstan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Martinique, Mauritius, Mexico, Monaco, Montenegro, Morocco, the Nether Antilles, the Netherlands, New Zealand, Nicaragua, Nigeria, Norway, Oman, Pakistan, Panama, Paraguay, the People's Republic of China, Peru, the Philippines, Poland, Portugal, Puerto Rico, Qatar, Romania, San Marino, Saudi Arabia, Senegal, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tanzania, Thailand, Trinidad and Tobago, Turkey, the United Arab Emirates, the United Kingdom, the United States, Uruguay, the U.S. Virgin Islands, Venezuela, and Vietnam	572510-001

Before removing the WLAN module, follow these steps:

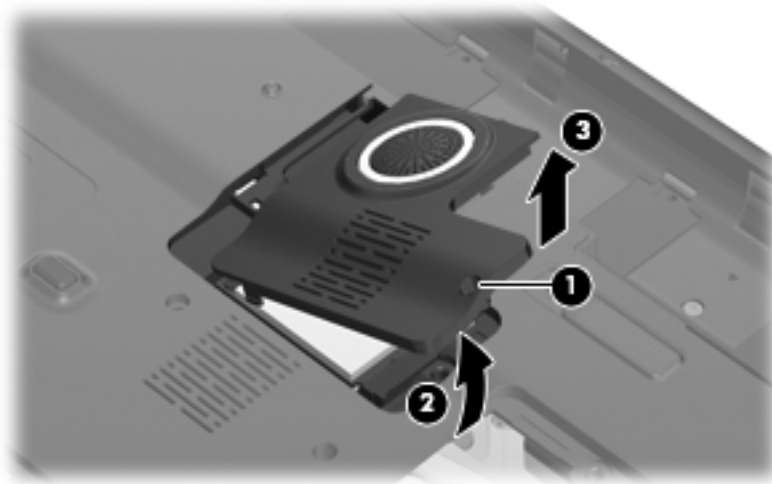
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).

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. Loosen the Phillips PM2.5×6.0 captive screw **1** that secures the WLAN module compartment cover to the computer.
2. Lift the right side of the WLAN module compartment cover **2**, swing it up and to the left, and then remove the cover **3**. The WLAN module compartment cover is included in the Plastics Kit, spare part number 580404-001.





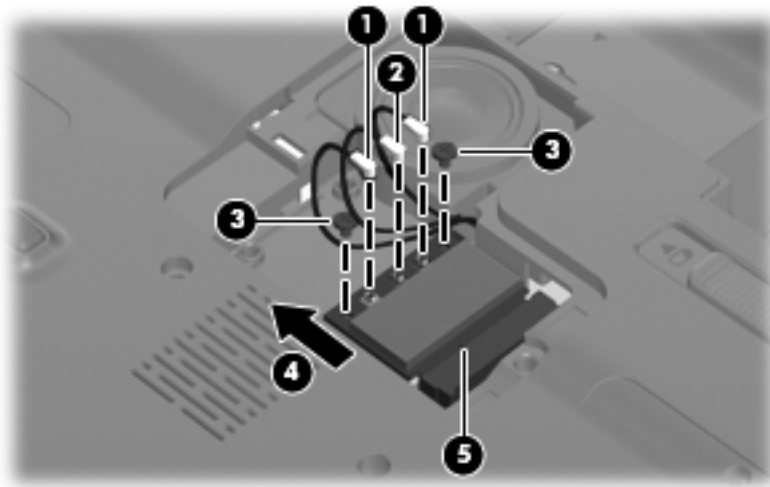
3. Disconnect the WLAN antenna cables ❶ from the terminals on the WLAN module.

 The black WLAN antenna cable is connected to the WLAN module “Main” terminal. The white WLAN antenna cable is connected to the WLAN module “Aux” terminal. If the computer is equipped with an 802.11a/g/n WLAN module, the yellow WLAN antenna cable ❷ is connected to the middle terminal on the WLAN module.

4. Remove the two Phillips PM2.0×4.0 screws ❸ that secure the WLAN module to the system board.  
(The WLAN module tilts up.)

5. Remove the WLAN module ❹ by pulling it away from the slot at an angle.

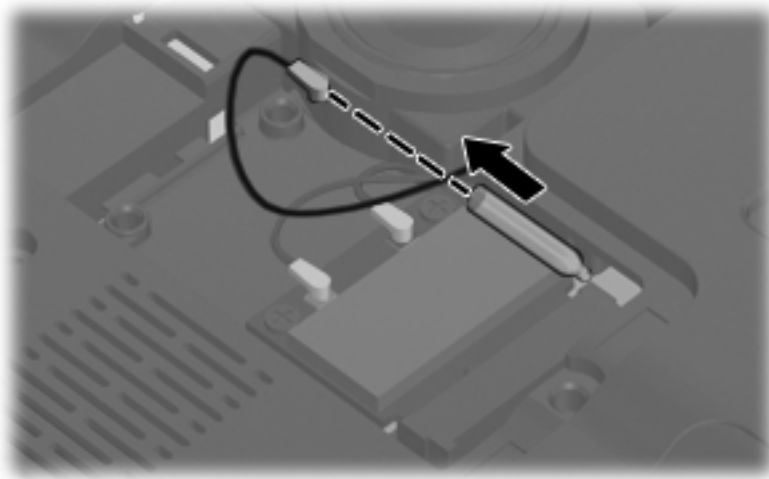
 WLAN modules are designed with a notch ❺ to prevent incorrect insertion into the WLAN module slot.





If a WLAN antenna is not connected to the terminals on the WLAN module, a protective sleeve must be installed on the antenna connectors, as shown in the following illustration.

---



Reverse this procedure to install the WLAN module.

## Switch cover

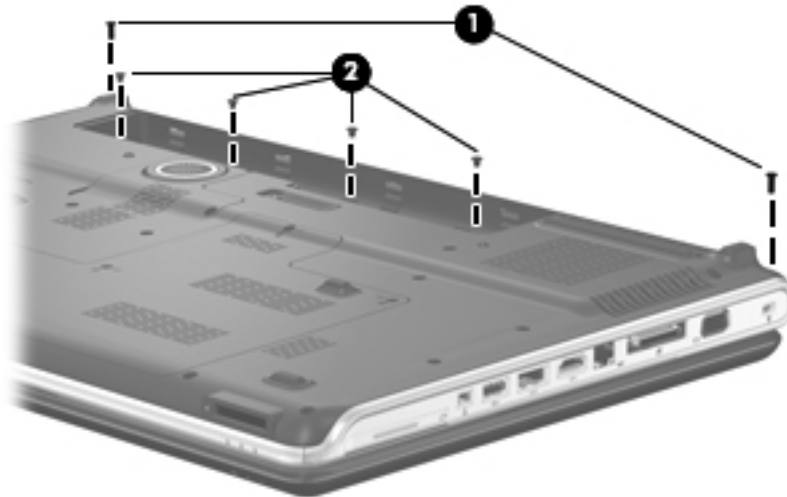
Description	Spare part number
Switch cover	577008-001

Before removing the switch cover, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).

Remove the switch cover:

1. Remove the two Phillips PM2.5×7.0 screws ❶ that secure the switch cover to the computer.
2. Remove the four Phillips PM2.0×4.0 screws ❷ that secure the switch cover to the computer.



3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Lift the right side of the switch cover ❶ until it detaches from the computer.
6. Remove the switch cover ❷ by lifting it straight up.



Reverse this procedure to install the switch cover.

## Keyboard cover

Description	Spare part number
Keyboard cover (includes LED board and cable)	577009-001

Before removing the keyboard cover, follow these steps:

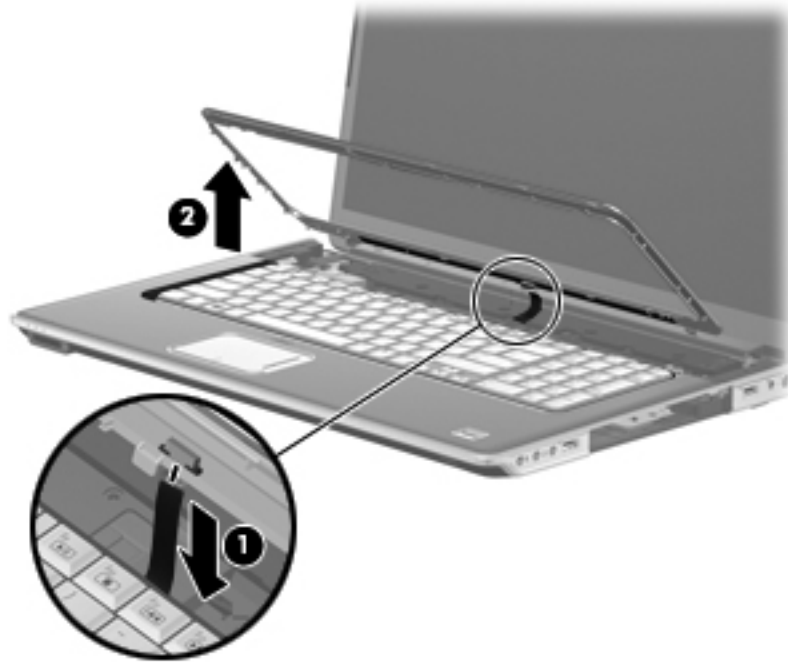
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the switch cover (see [“Switch cover” on page 4-21](#)).

Remove the keyboard cover:

1. Release the keyboard cover ❶ by lifting the front edge until it rests at an angle.
2. Lift the keyboard cover ❷ as far as the power button board cable allows.



3. Disconnect the LED board cable ❶ from the low insertion force (LIF) connector on the LED board.
4. Remove the keyboard cover ❷.



Reverse this procedure to install the keyboard cover.

## Power button board

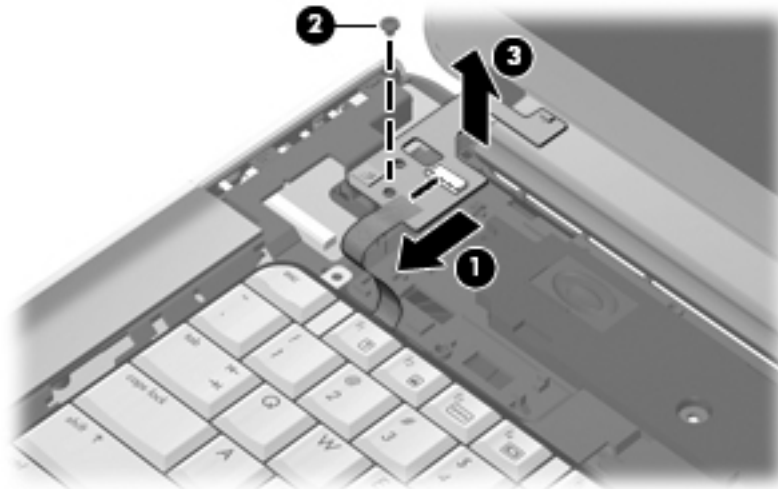
Description	Spare part number
Power button board (includes cable)	580987-001

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 4-7](#)).
5. Remove the switch cover (see [“Switch cover” on page 4-21](#)).
6. Remove the keyboard cover (see [“Keyboard cover” on page 4-23](#)).

Remove the power button board:

1. Disconnect the power button board cable ❶ from the LIF connector on the power button board.
2. Remove the Phillips PM2.0×4.0 screw ❷ that secures the power button board to the top cover.
3. Remove the power button board ❸.



Reverse this procedure to install the power button board.

## 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 537921-001. See [“Bluetooth module cable” on page 4-31](#) for Bluetooth module cable removal information.

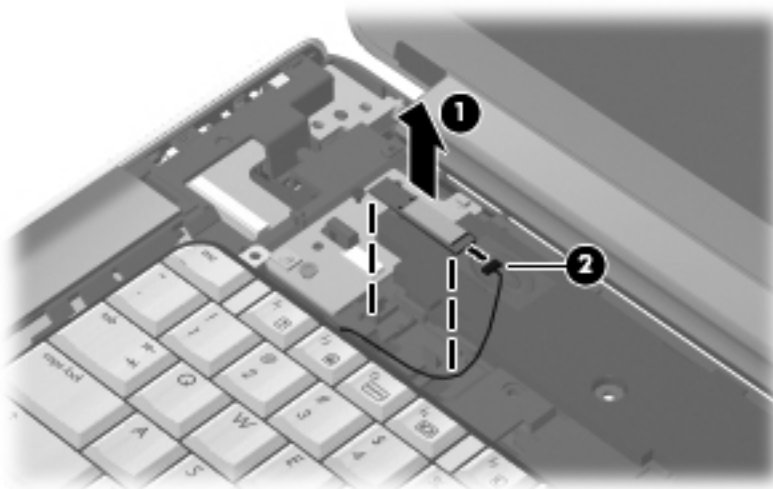
Description	Spare part number
Bluetooth module	577000-001

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 4-7](#)).
5. Remove the following components:
  - a. Switch cover (see [“Switch cover” on page 4-21](#))
  - b. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - c. Power button board (see [“Power button board” on page 4-25](#))

Remove the Bluetooth module:

1. Release the Bluetooth module ❶ as far as the Bluetooth module cable allows.
2. Disconnect the Bluetooth module cable ❷ from the Bluetooth module.



3. Remove the Bluetooth module.

Reverse this procedure to install the Bluetooth module.



## Keyboard



The keyboard spare part kit includes a keyboard cable.

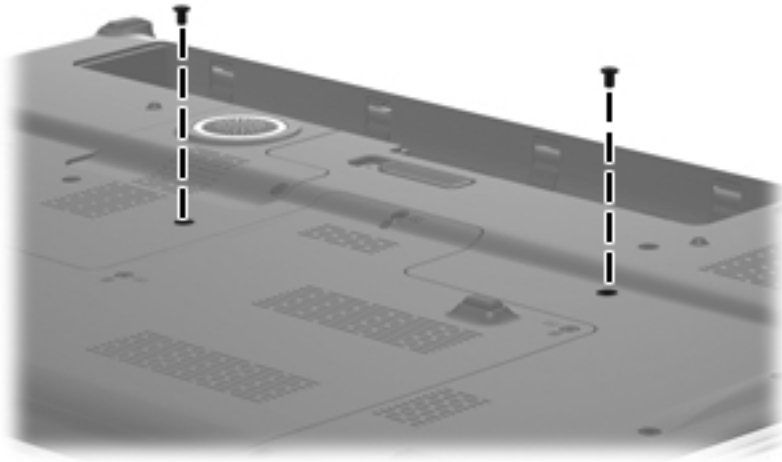
For use in country or region:	Spare part number	For use in country or region:	Spare part number
Belgium	578916-A41	Saudi Arabia	578916-171
Denmark, Finland, and Norway	578916-DH1	South Korea	578916-AD1
France	578916-051	Spain	578916-071
French Canadian	578916-121	Switzerland	578916-111
Germany	578916-041	Taiwan	578916-AB1
Italy	578916-061	Turkey	578916-141
The Netherlands	578916-B31	The United Kingdom	578916-031
Portugal	578916-131	The United States	578916-001
Russia	578916-251		

Before removing the keyboard, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the switch cover (see [“Switch cover” on page 4-21](#)).
6. Remove the keyboard cover (see [“Keyboard cover” on page 4-23](#)).

Remove the keyboard:

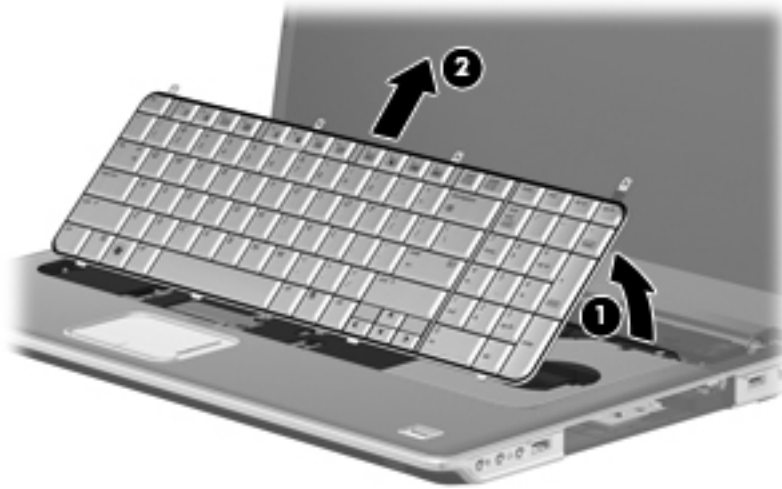
1. Turn the computer upside down, with the front toward you.
2. Remove the two Phillips PM2.5×7.0 screws that secure the keyboard to the computer.



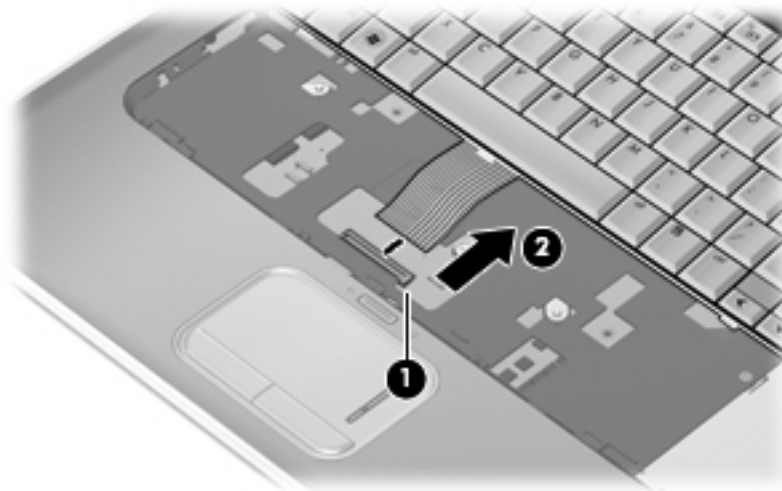
3. Turn the computer display-side up, with the front toward you.
4. Open the computer as far as possible.
5. Remove the four Phillips PM2.0×4.0 screws that secure the keyboard to the computer.



6. Lift the rear edge of the keyboard **1** until it rests at an angle.
7. Release the keyboard **2** by sliding it back to disengage the tabs on the front edge of the keyboard from the top cover, and rest it on the display.



8. Release the zero insertion force (ZIF) connector **1** to which the keyboard cable is attached, and disconnect the keyboard cable **2** from the system board.



9. Remove the keyboard.
- Reverse this procedure to install the keyboard.

## Power button board cable



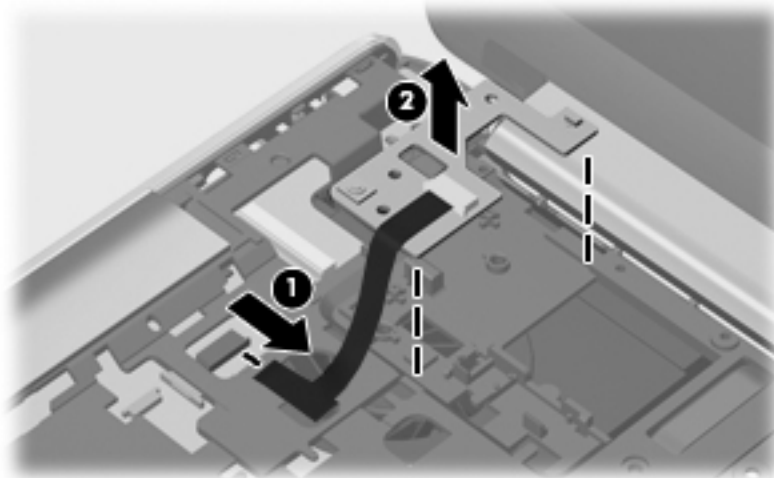
The power button board cable is included with the power button board, spare part number 580987-001.

Before removing the power button board 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 4-7](#)).
5. Remove the following components:
  - a. Switch cover (see [“Switch cover” on page 4-21](#))
  - b. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - c. Power button board (see [“Power button board” on page 4-25](#))
  - d. Keyboard (see [“Keyboard” on page 4-27](#))

Remove the power button board cable:

1. Disconnect the power button board cable ❶ from the LIF connector on the system board.
2. Remove the power button board cable ❷.



Reverse this procedure to install the power button board cable.

## Bluetooth module cable

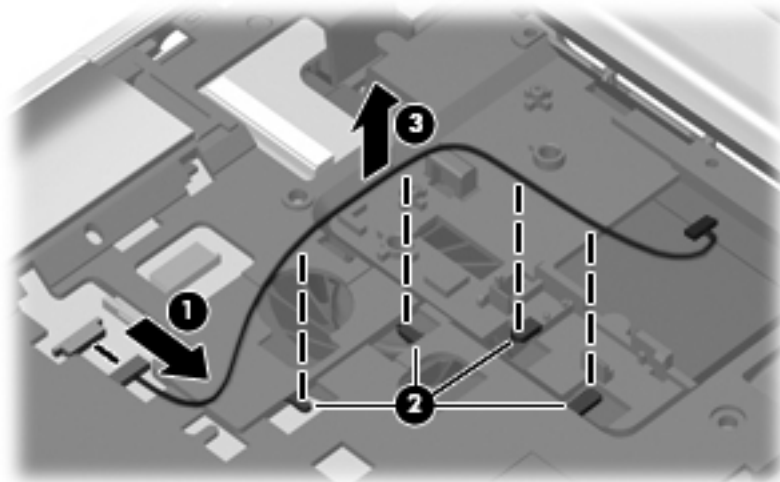
Description	Spare part number
Bluetooth module cable	537921-001

Before removing the Bluetooth 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 4-7](#)).
5. Remove the following components:
  - a. Switch cover (see [“Switch cover” on page 4-21](#))
  - b. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - c. Power button board (see [“Power button board” on page 4-25](#))
  - d. Keyboard (see [“Keyboard” on page 4-27](#))

Remove the Bluetooth module cable:

1. Disconnect the Bluetooth module cable ❶ from the system board.
2. Release the Bluetooth module cable from the clips ❷ built into the top cover.
3. Remove the Bluetooth module cable ❸.



Reverse this procedure to install the Bluetooth module cable.

## LED board cable



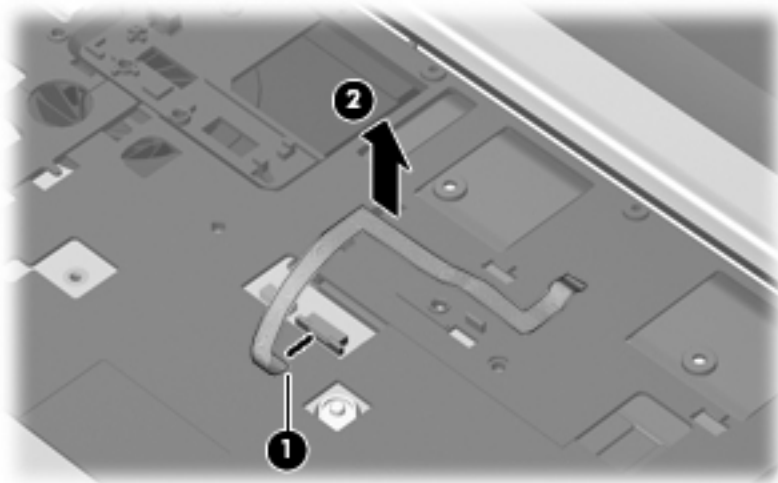
The LED board cable is included with the keyboard cover, spare part number 577009-001.

Before removing the LED board 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 4-7](#)).
5. Remove the following components:
  - a. Switch cover (see [“Switch cover” on page 4-21](#))
  - b. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - c. Keyboard (see [“Keyboard” on page 4-27](#))

Remove the LED board cable:

1. Release the ZIF connector ❶ to which the LED board cable is attached, and disconnect the LED board cable from the system board.
2. Remove the LED board cable ❷.



Reverse this procedure to install the LED board cable.

## Speaker assembly

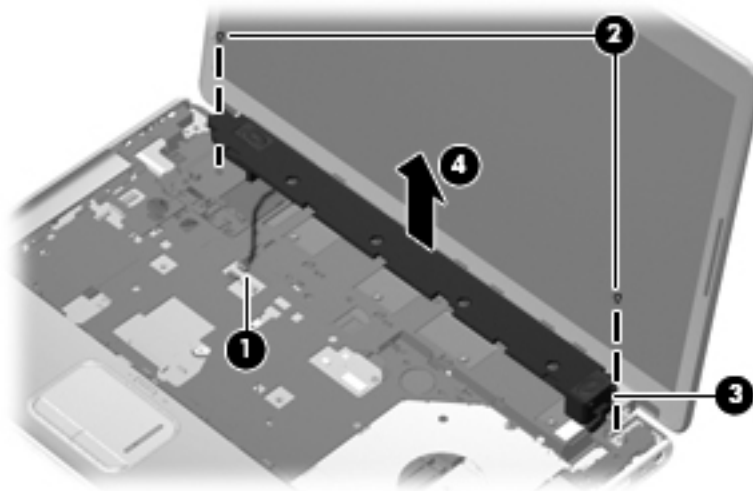
Description	Spare part number
Speaker assembly	496887-001

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 4-7](#)).
5. Remove the following components:
  - a. Switch cover (see [“Switch cover” on page 4-21](#))
  - b. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - c. Keyboard (see [“Keyboard” on page 4-27](#))

Remove the speaker assembly:

1. Disconnect the speaker assembly cable ❶ from the system board.
2. Remove the two Phillips PM2.0×4.0 screws ❷ that secure the speaker assembly to the top cover.
3. Release the wireless antenna cables from the routing channel ❸ built into the right side of the speaker assembly.
4. Remove the speaker assembly ❹.



Reverse this procedure to install the speaker assembly.

## Display assembly

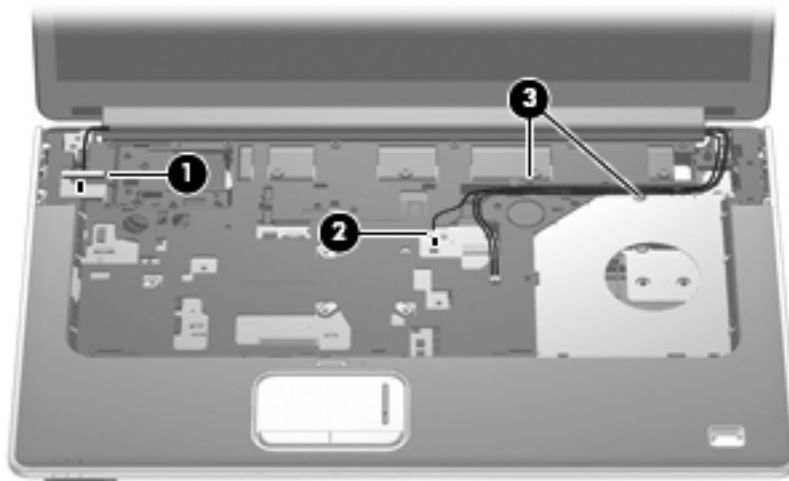
Description	Spare part number
18.4-inch, AntiGlare, high-definition, dual-lamp display assembly (includes 2 WLAN antenna transceivers and cables, webcam, microphones, and logo)	577001-001

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the following components:
  - a. Switch cover (see [“Switch cover” on page 4-21](#))
  - b. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - c. Keyboard (see [“Keyboard” on page 4-27](#))
  - d. Speaker assembly (see [“Speaker assembly” on page 4-33](#))

Remove the display assembly:

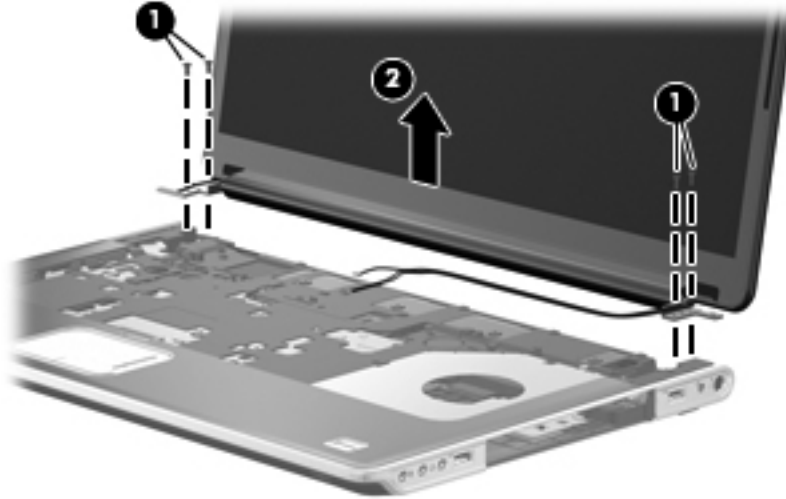
1. Open the computer as far as possible.
2. Disconnect the display panel cable ❶ from the system board.
3. Disconnect the webcam/microphone module cable ❷ from the system board.
4. Remove the WLAN antenna cable ❸ from the opening and the routing channel built into the top cover.



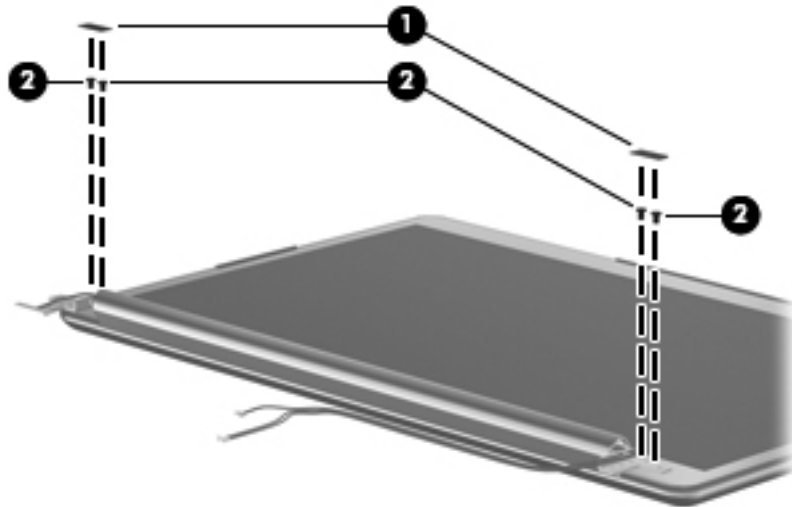


**CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

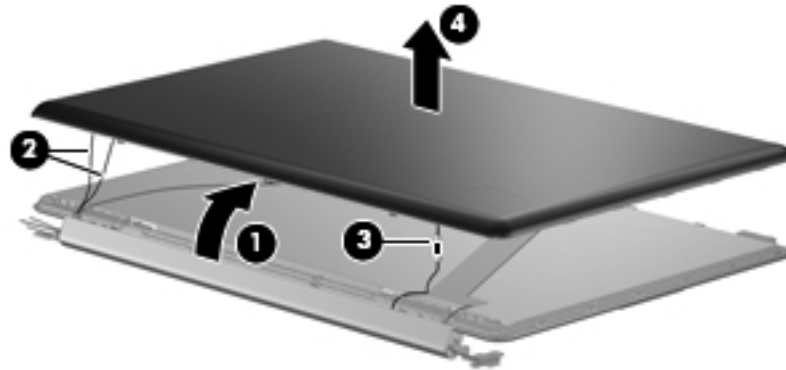
5. Remove the four Phillips PM2.5×7.0 screws ❶ that secure the display assembly to the computer. Be sure to hold the display before removing the last screw, to prevent damage to the display.
6. Lift the display assembly ❷ straight up, and remove it.



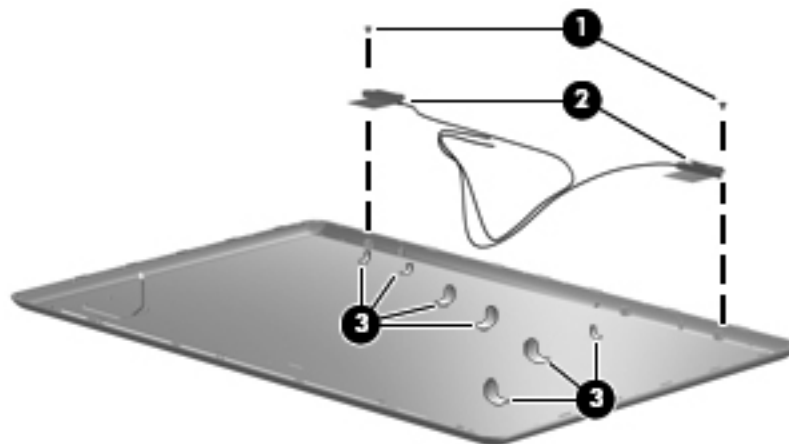
7. If it is necessary to replace the display enclosure or any of the display assembly internal components:
  - a. Remove the rubber screw covers ❶ and the four Phillips PM2.5×7.0 screws ❷ on the display bezel lower edge.



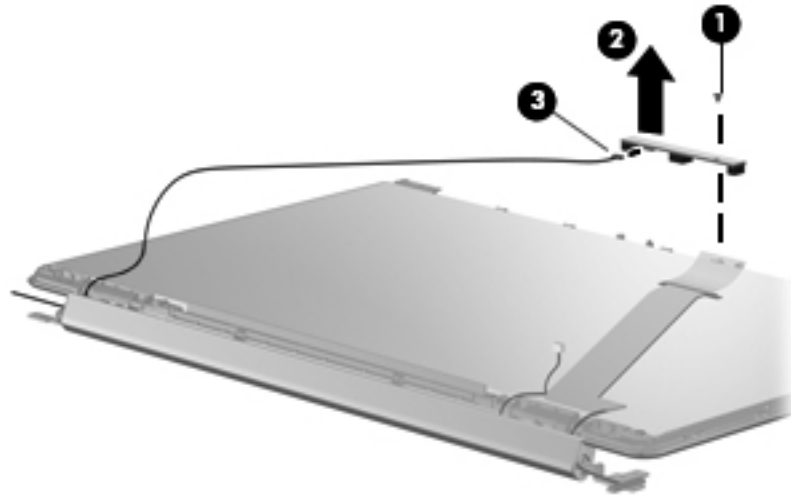
- b. Turn the display assembly upside down, with the bottom edge toward you.
- c. Release the display enclosure bottom edge ❶ as far as the wireless antenna cables and display logo LED cable allow.
- d. Remove the wireless antenna cables ❷ from the slot built into the display hinge cover.
- e. Disconnect the display logo LED cable ❸ from the display logo LED board.
- f. Remove the display enclosure ❹. The display enclosure is available using spare part number 577003-001.



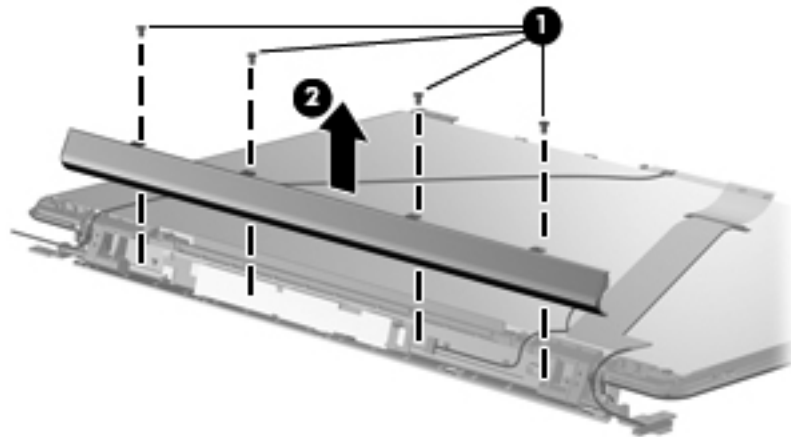
8. If it is necessary to replace the wireless antenna transceivers and cables:
  - a. Remove the Phillips PM2.0×4.0 screw ❶ that secures each transceiver to the display enclosure.
  - b. Detach the transceivers ❷ from the display enclosure.
  - c. Release the retention tabs ❸ built into the display enclosure, and remove the wireless antenna cables from the tabs. The wireless antenna transceivers and cables are included in the Display Cable Kit, spare part number 496876-001.



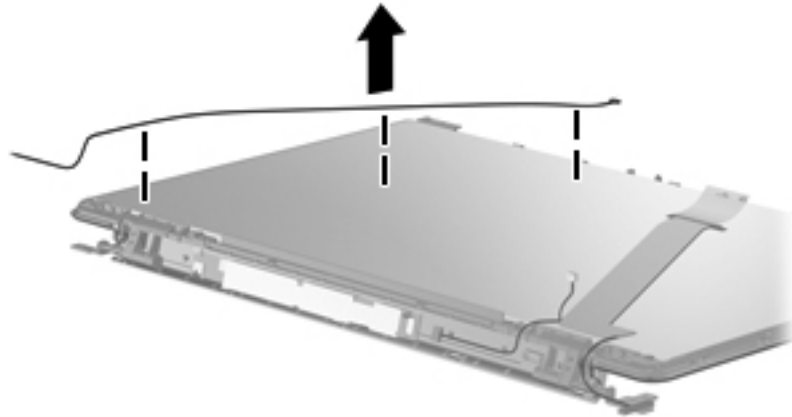
9. If it is necessary to replace the webcam/microphone module:
  - a. Remove the Phillips PM2.0×4.0 screw ❶ that secures the module to the display bezel.
  - b. Release the webcam/microphone module ❷ as far from the display bezel as the webcam/microphone module cable allows.
  - c. Disconnect the webcam/microphone module cable ❸ from the webcam/microphone module, and remove the webcam/microphone module. The webcam/microphone module is available using spare part number 499242-001.



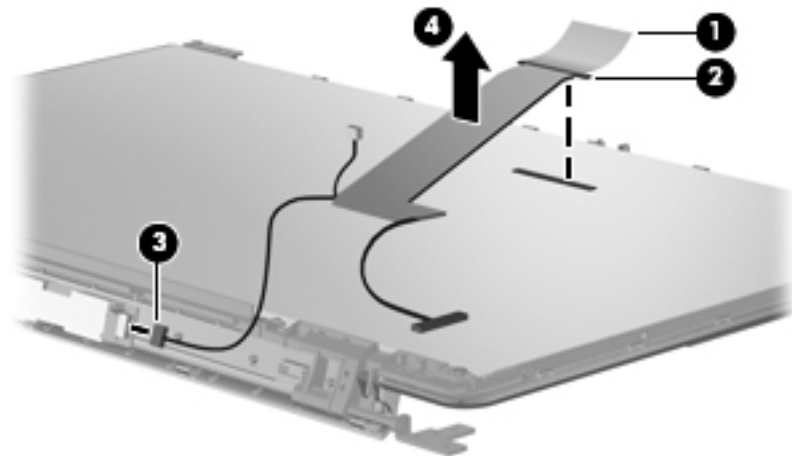
10. If it is necessary to replace the display hinge cover, display inverter, or webcam/microphone module cable:
  - a. Remove the four Phillips PM2.0×4.0 screws ❶ that secure the display hinge cover to the display bezel.
  - b. Remove the display hinge cover ❷ from the display bezel. The display hinge cover is available using spare part number 577004-001.



11. If it is necessary to replace the webcam/microphone module cable, remove the cable from the display panel.  
The webcam/microphone module cable is included in the Display Cable Kit, spare part number 496876-001.

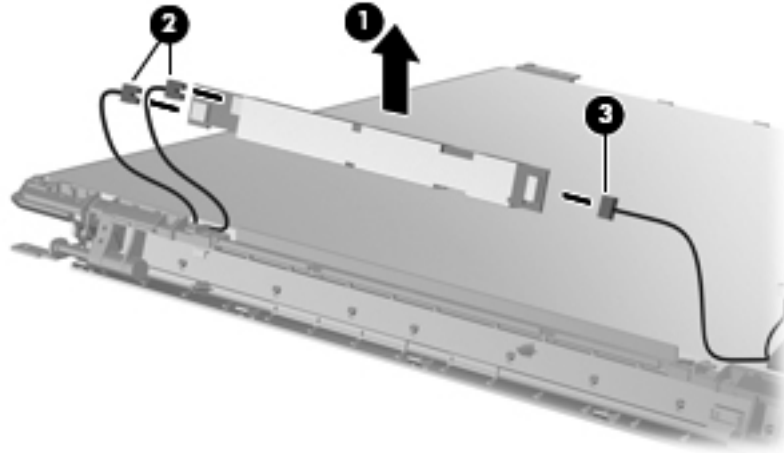


12. If it is necessary to replace the display panel cable:
  - a. Detach the adhesive reinforcement strip ❶ that secures the display panel cable to the display panel.
  - b. Disconnect the display panel cable ❷ from the display panel.
  - c. Disconnect the display panel cable from the display inverter ❸, and remove the display panel cable ❹.  
The display panel cable is included in the Display Cable Kit, spare part number 496876-001.



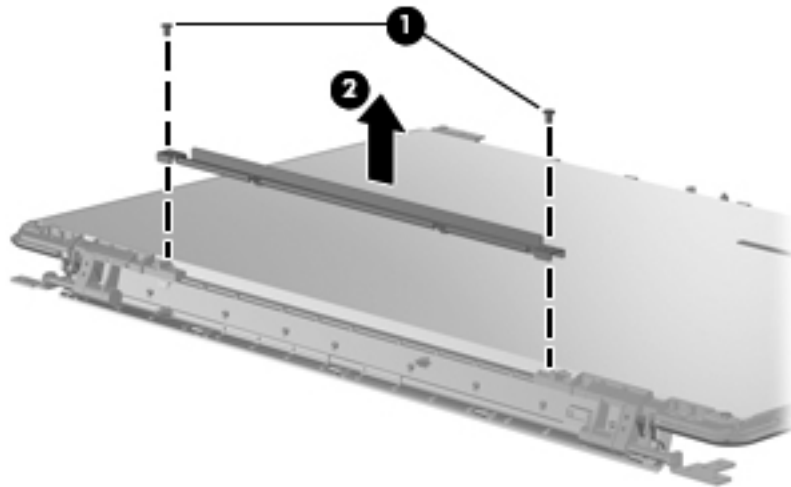
13. If it is necessary to replace the display inverter:

- a. Release the display inverter **1** as far from the display bezel as the backlight cables and display panel cable allow.
- b. Disconnect the two backlight cables **2** and the display panel cable **3** from the display inverter, and remove the display inverter. The display inverter is available using spare part number 498324-001.

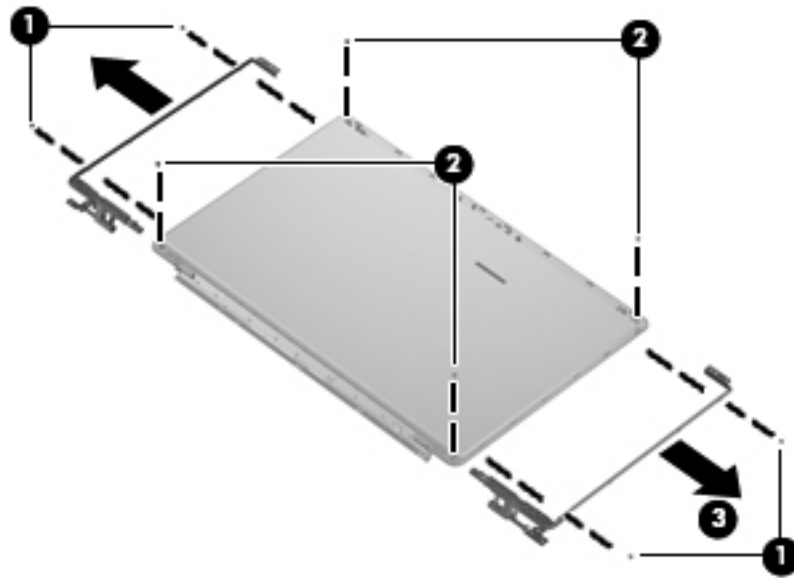


14. If it is necessary to replace the display hinges:

- a. Remove the two Phillips PM2.0×4.0 screws **1** that secure the display hinge bracket to the display bezel.
- b. Remove the display hinge bracket **2**.



- c. Remove the four Phillips PM2.0×4.0 screws ❶ that secure the display hinges to the display panel.
- d. Remove the four Phillips PM2.5×7.0 screws ❷ that secure the display hinges to the display panel.
- e. Remove the display hinges ❸. The display hinges and display hinge bracket are included in the Display Hinge Kit, spare part number 496874-001.



Reverse this procedure to reassemble and install the display assembly.

## Top cover

Description	Spare part number
Top cover (includes fingerprint reader board, fingerprint reader board cable, TouchPad, and TouchPad cables)	577007-001

Before removing the top cover, follow these steps:

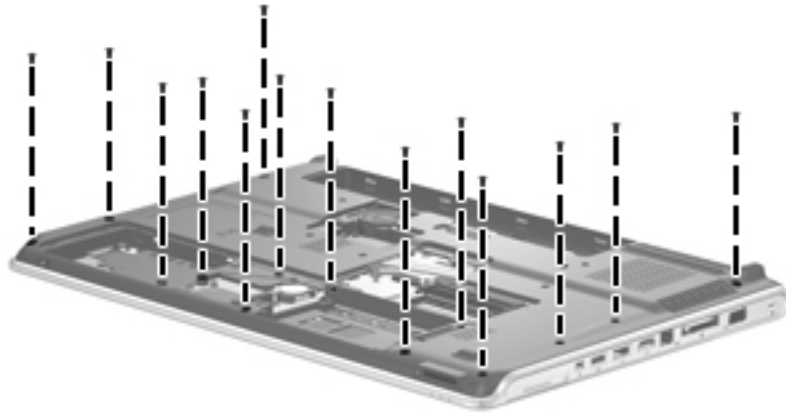
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))

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

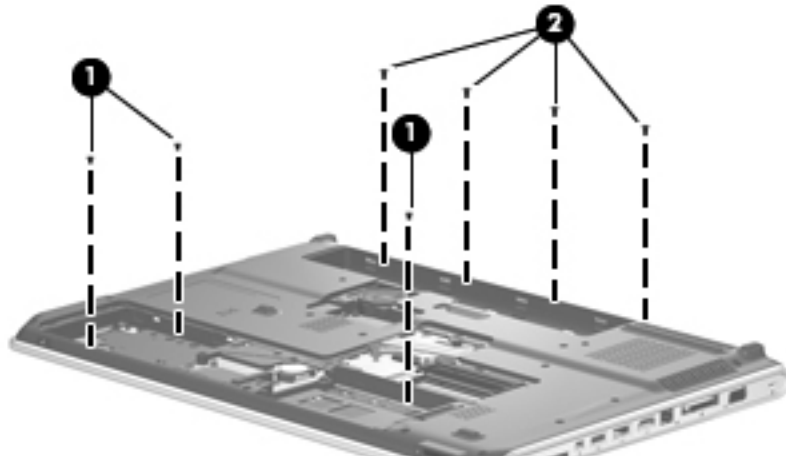
- Power button board (see [“Power button board” on page 4-25](#))
- Bluetooth module (see [“Bluetooth module” on page 4-26](#))
- Bluetooth module cable (see [“Bluetooth module cable” on page 4-31](#))

Remove the top cover:

1. Turn the computer upside down, with the front toward you.
2. Remove the 14 Phillips PM2.5×7.0 screws that secure the top cover to the base enclosure.

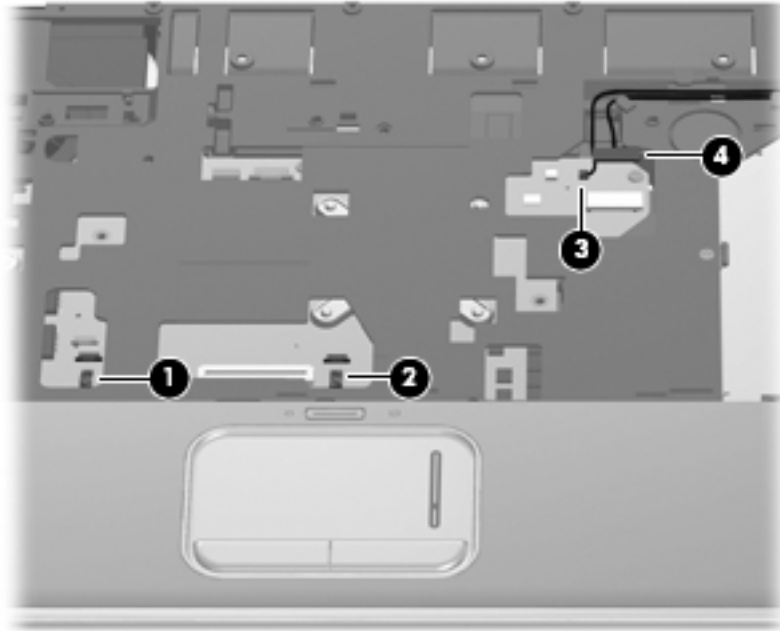


3. Remove the three Phillips PM2.0×4.0 screws ❶ in the mass storage device bay, and the four Phillips PM2.5×4.0 screws ❷ in the battery bay, that secure the top cover to the base enclosure.

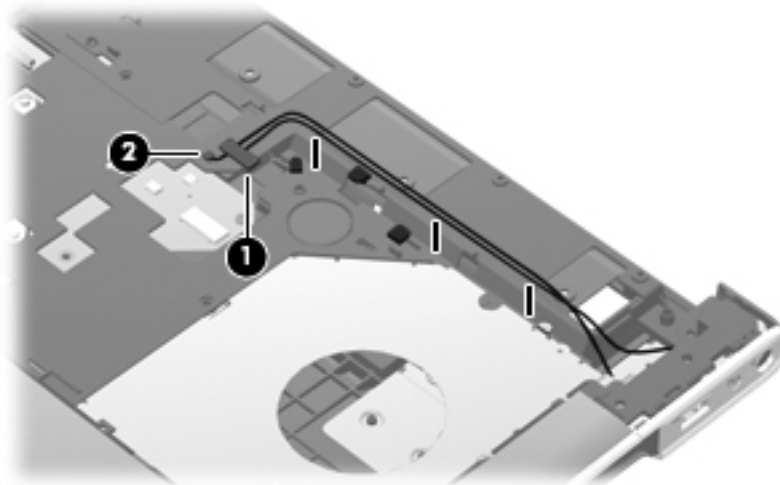




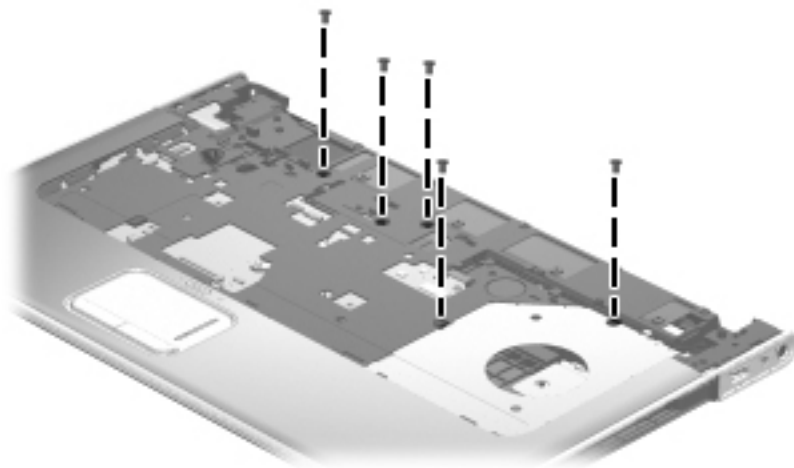
4. Turn the computer right-side up, with the front toward you.
5. Disconnect the following cables from the system board:
  - ❶ TouchPad board cable
  - ❷ TouchPad on/off button board cable
  - ❸ USB board cable
  - ❹ Power connector cable



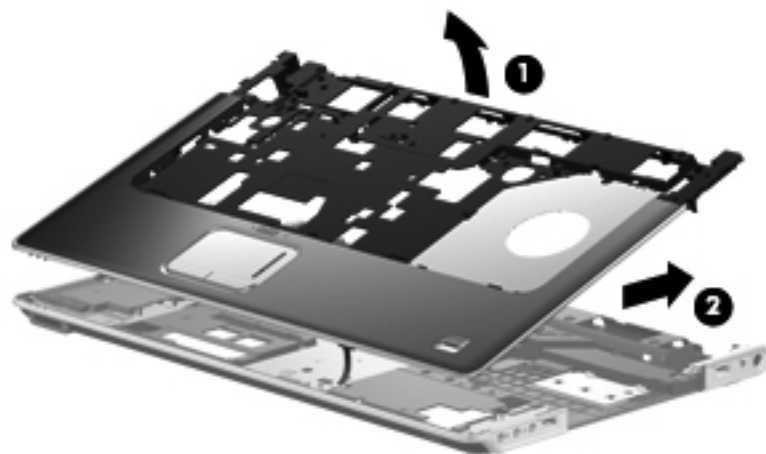
6. Release the power connector cable ❶ and USB board cable ❷ from the clips and routing channel built into the top cover.



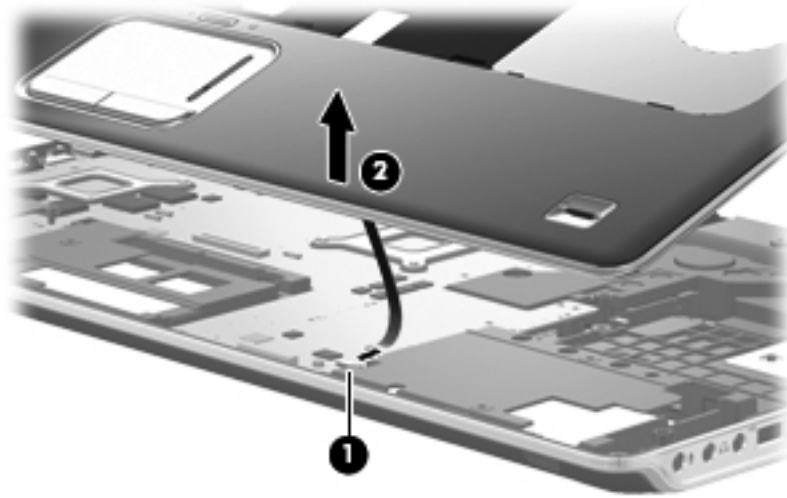
7. Remove the five Phillips PM2.5×7.0 screws that secure the top cover to the base enclosure.



8. Lift the rear edge ❶ of the top cover until it rests at an angle.
9. Slide the top cover ❷ back until the fingerprint reader board cable is accessible.



10. Release the ZIF connector **1** to which the fingerprint reader board cable is attached, and disconnect the fingerprint reader board cable from the system board.
11. Remove the top cover **2**.



Reverse this procedure to install the top cover.

## TouchPad on/off button board

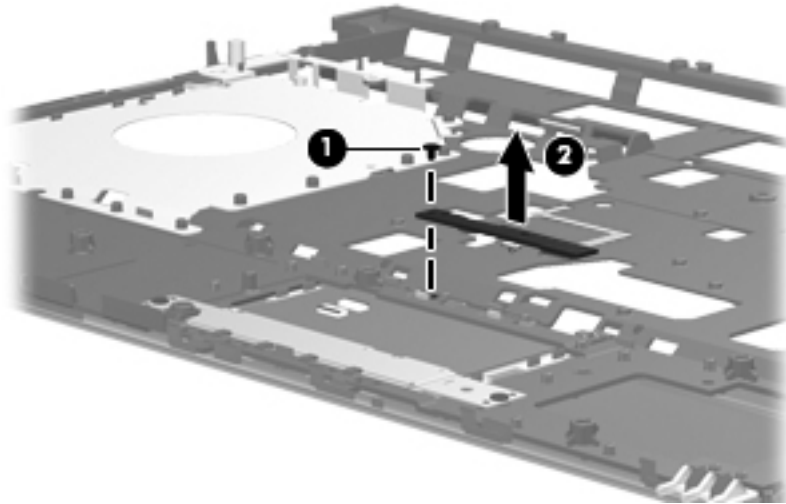
Description	Spare part number
TouchPad on/off button board (includes cable)	580986-001

Before removing the TouchPad on/off 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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))

Remove the TouchPad on/off button board:

1. Turn the top cover upside down, with the front toward you.
2. Remove the Phillips PM2.0×4.0 screw ❶ that secures the TouchPad on/off button board to the top cover.
3. Remove the TouchPad on/off button board ❷.



Reverse this procedure to install the TouchPad on/off button board.

## System board

Description	Spare part number
System board (includes 1024 MB of graphics subsystem memory and replacement thermal material)	573758-001

Before removing the system board, follow these steps:

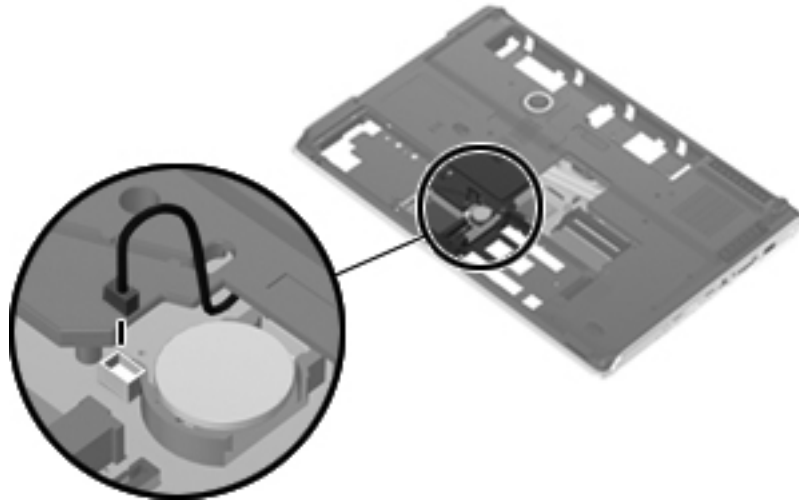
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))

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

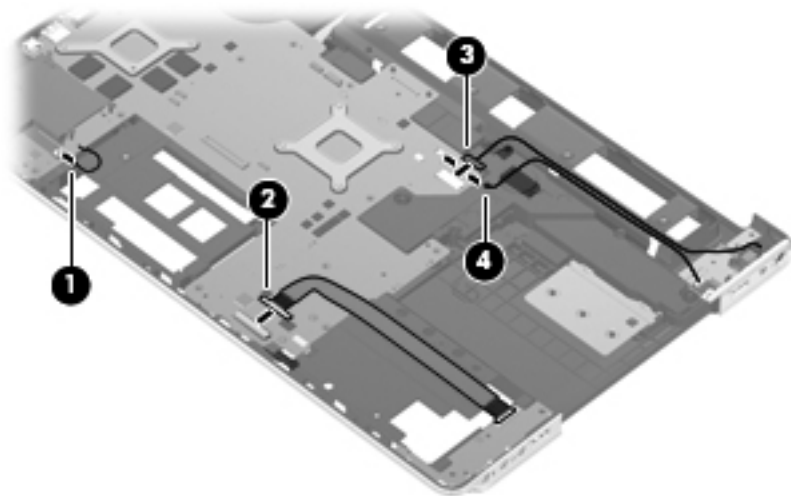
- RTC battery (see [“RTC battery” on page 4-15](#))
- Fan/heat sink assembly (see [“Fan/heat sink assembly” on page 4-60](#))
- Processor (see [“Processor” on page 4-63](#))

Remove the system board:

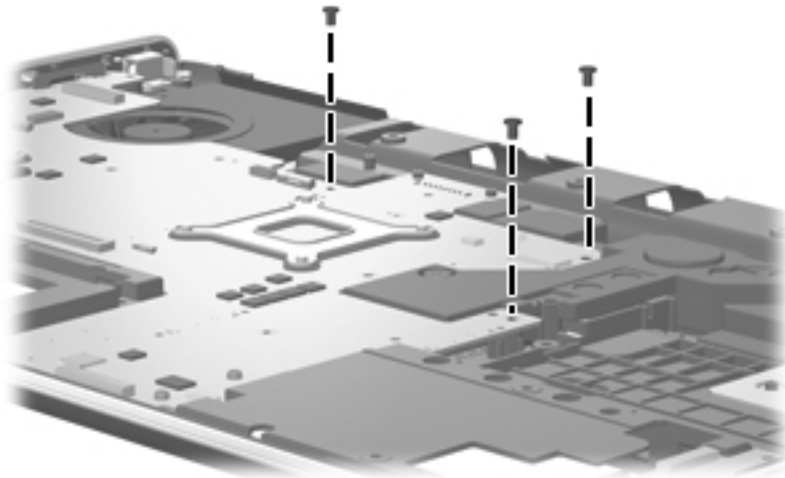
1. Turn the computer upside down, with the front toward you.
2. Disconnect the subwoofer cable from the system board.



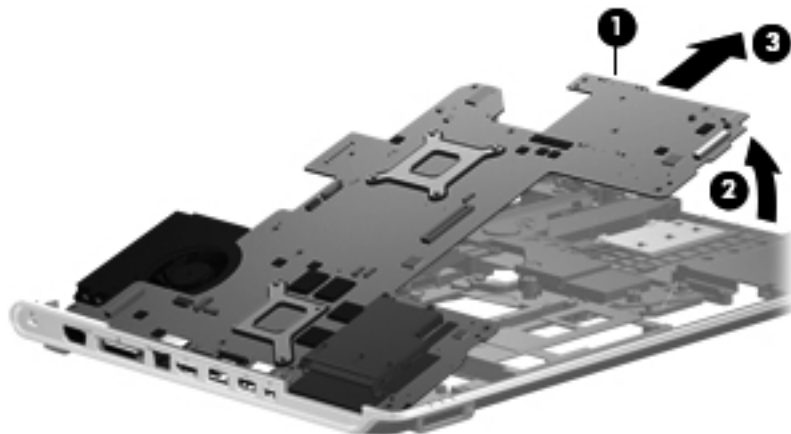
3. Turn the computer right-side up, with the front toward you.
4. Disconnect the fan cable ❶ from the system board.
5. Release the ZIF connector to which the audio/infrared board cable ❷ is attached, and disconnect the audio/infrared board cable from the system board.
6. Disconnect the USB board cable ❸ from the system board.
7. Disconnect the power connector cable ❹ from the system board.



8. Remove the three Phillips PM2.5×7.0 screws that secure the system board to the base enclosure.



- 9. Use the optical drive connector ❶ to lift the system board ❷ until it rests at an angle.
- 10. Remove the system board ❸ by sliding it up and to the right.



Reverse this procedure to install the system board.



## Fan

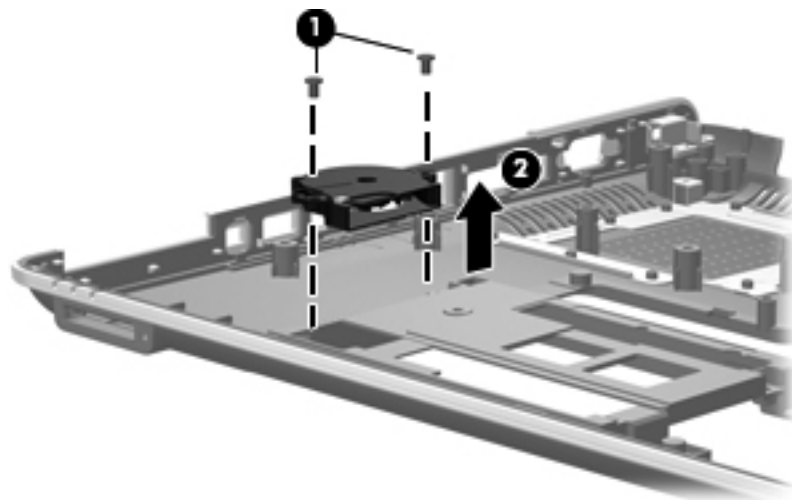
Description	Spare part number
Fan	514290-001

Before removing the fan, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))
  - l. System board (see [“System board” on page 4-48](#))

Remove the fan:

1. Remove the two Phillips PM2.0×4.0 screws ❶ that secure the fan to the base enclosure.
2. Remove the fan ❷ from the base enclosure.



Reverse this procedure to install the fan.

## Subwoofer

Description	Spare part number
Subwoofer (includes 3 mounting grommets)	577010-001

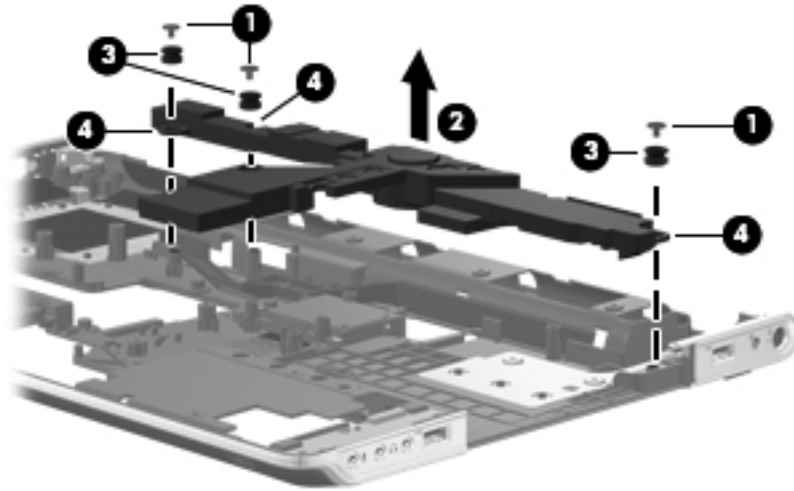
Before removing the subwoofer, follow these steps:

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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))
  - l. System board (see [“System board” on page 4-48](#))

Remove the subwoofer:

1. Remove the three Phillips PM2.5×5.0 broadhead screws ❶ that secure the subwoofer to the base enclosure.
2. Remove the subwoofer ❷ by lifting it straight up.

 The rubber grommets ❸ should be inspected and replaced in the correct locations ❹ on the subwoofer. These grommets are critical for satisfactory subwoofer performance.



Reverse this procedure to install the subwoofer.

## Audio/infrared board

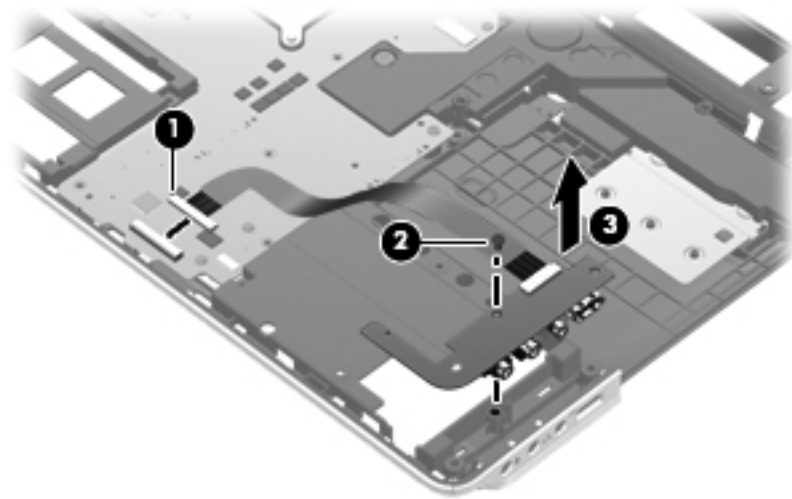
Description	Spare part number
Audio/infrared board (includes cable)	595232-001

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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))

Remove the audio/infrared board:

1. Release the ZIF connector ❶ to which the audio/infrared board cable is attached, and disconnect the audio/infrared board cable from the system board.
2. Remove the Phillips PM2.0×4.0 screw ❷ that secures the audio/infrared board to the base enclosure.
3. Remove the audio/infrared board ❸ by lifting it straight up.



Reverse this procedure to install the audio/infrared board.

## USB board

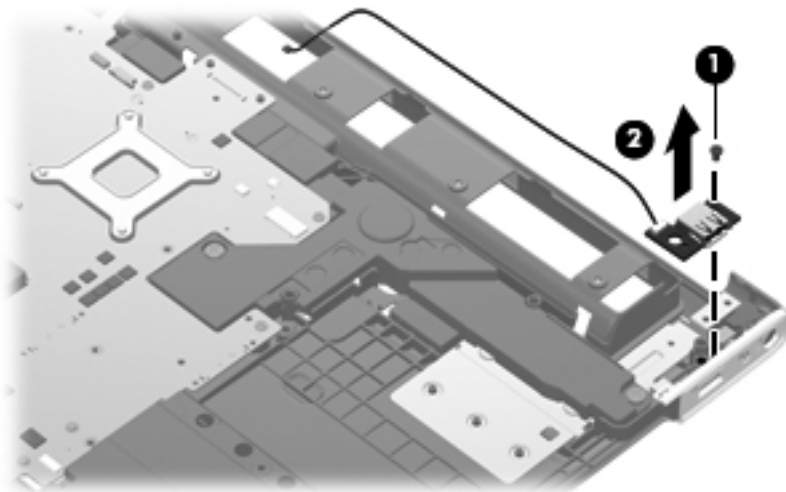
Description	Spare part number
USB board (includes cable)	595233-001

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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))

Remove the USB board:

1. Remove the Phillips PM2.0×4.0 screw **1** that secures the USB board to the base enclosure.
2. Remove the USB board and cable **2** by lifting them straight up.



Reverse this procedure to install the USB board.

## Power connector cable



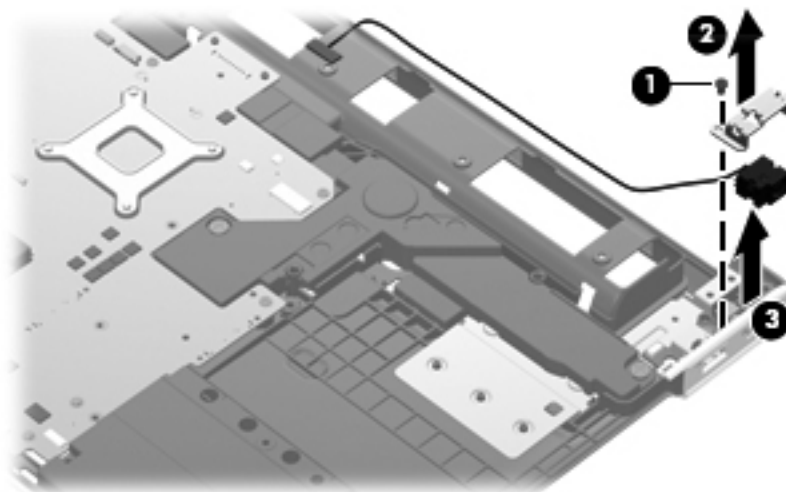
The power connector cable is included in the base enclosure spare part kit, spare part number 577005-001.

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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))

Remove the power connector cable:

1. Remove the Phillips PM2.0×4.0 screw **①** that secures the power connector and bracket to the base enclosure.
2. Remove the power connector bracket **②**.
3. Remove the power connector and cable **③**.



Reverse this procedure to install the power connector cable.



## TV tuner module cable



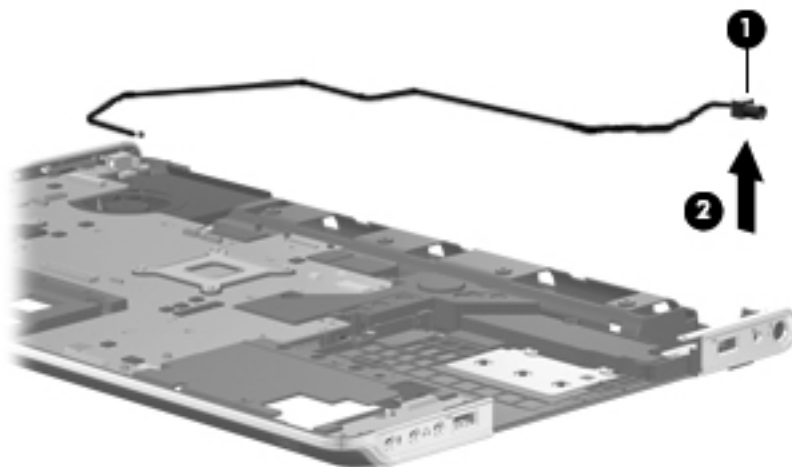
The TV tuner module cable is included in the Cable Kit, spare part number 496891-001.

Before removing the TV tuner 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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))

Remove the TV tuner module cable:

1. Remove the TV tuner module cable connector ❶ from the clip in the base enclosure.
2. Remove the TV tuner module cable ❷.



Reverse this procedure to install the TV tuner module cable.

## Fan/heat sink assembly

Description	Spare part number
Fan/heat sink assembly (includes replacement thermal material)	579824-001




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

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

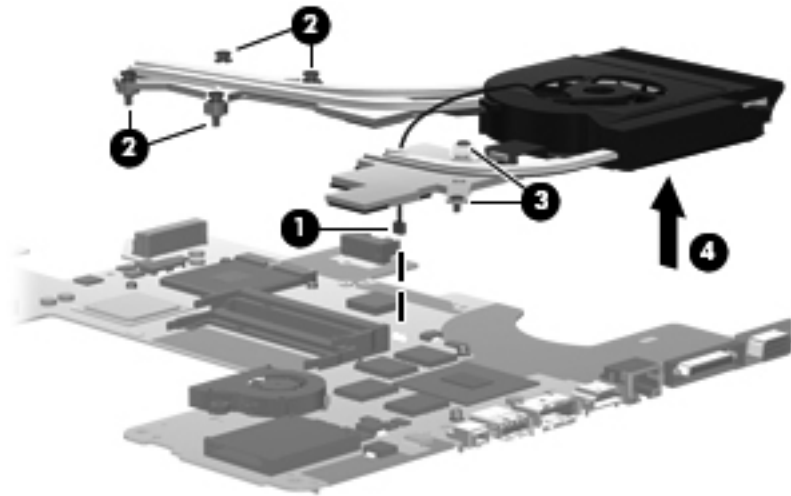
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [“Battery” on page 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))
  - l. System board (see [“System board” on page 4-48](#))

Remove the fan/heat sink assembly:

1. Disconnect the fan cable ❶ from the system board.
2. Loosen the four Phillips PM2.0×11.0 captive screws ❷ and the two Phillips PM2.5×5.0 captive screws ❸ that secure the fan/heat sink assembly to the system board.

 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 it.

3. Remove the fan/heat sink assembly ❹.



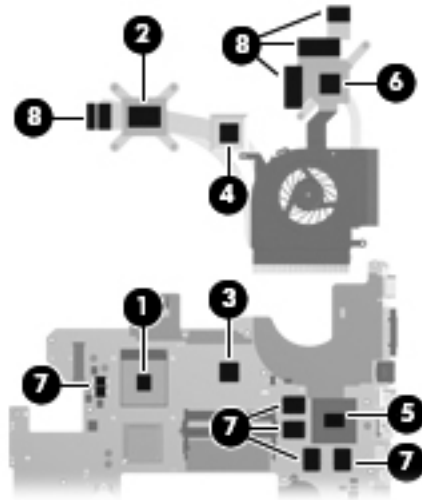


The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board each time the fan/heat sink assembly is removed:

- Thermal paste is used on the processor ❶ and the heat sink section ❷ that services it.
- Thermal pads are used on the Northbridge chip ❸ and the heat sink section ❹ that services it.
- Thermal pads are used on various other system board components ❺ and ❻, and heat sink sections ❼ and ❽ that service them.

Replacement thermal material is included with all fan/heat sink assembly, system board, and processor spare part kits.

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

## Processor



The processor spare part kit includes replacement thermal material.


Description	Spare part number
Intel Core i7-820QM 1.73-GHz processor (SC turbo up to 3.06-GHz)	583053-001
Intel Core i7-720QM 1.60-GHz processor (SC turbo up to 2.80-GHz)	586170-001
Intel Core i7-620M 2.66-GHz processor	587259-001
Intel Core i3-540M 2.53-GHz processor	594188-001
Intel Core i3-520M 2.40-GHz processor	594187-001
Intel Core i3-330M 2.26-GHz processor	597623-001
Intel Core i5-430M 2.26-GHz processor	597624-001
Intel Core i7-740QM 1.73-GHz processor (SC turbo up to 2.8-GHz)	612259-001
Intel Core i7-840QM 1.86-GHz processor (SC turbo up to 3.06-GHz)	612260-001
Intel Core i5-450M 2.4-GHz processor	613585-001
Intel Core i3-370M 2.4-GHz processor	613584-001

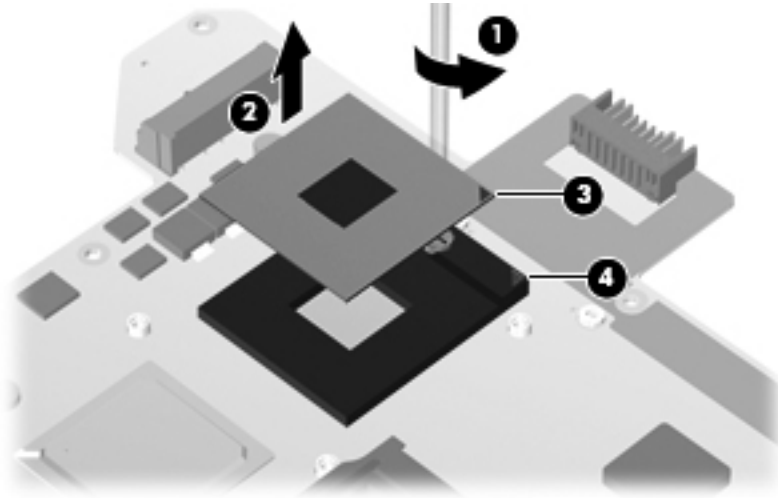
Before removing the processor, follow these steps:

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 4-7](#)).
5. Remove the following components:
  - a. Optical drive (see [“Optical drive” on page 4-8](#))
  - b. Mass storage device (see [“Mass storage device” on page 4-10](#))
  - c. TV tuner module (see [“TV tuner module” on page 4-13](#))
  - d. Memory module (see [“Memory module” on page 4-16](#))
  - e. WLAN module (see [“WLAN module” on page 4-17](#))
  - f. Switch cover (see [“Switch cover” on page 4-21](#))
  - g. Keyboard cover (see [“Keyboard cover” on page 4-23](#))
  - h. Keyboard (see [“Keyboard” on page 4-27](#))
  - i. Speaker assembly (see [“Speaker assembly” on page 4-33](#))
  - j. Display assembly (see [“Display assembly” on page 4-34](#))
  - k. Top cover (see [“Top cover” on page 4-41](#))
  - l. System board (see [“System board” on page 4-48](#))
  - m. Fan/heat sink assembly (see [“Fan/heat sink assembly” on page 4-60](#))

Remove the processor:

1. Turn the processor locking screw **1** one-half turn counterclockwise, until you hear a click.
2. Lift the processor **2** straight up, and remove it.

 The gold triangle **3** on the processor must be aligned with the triangle icon **4** embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

## Starting Setup Utility

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



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The fingerprint reader cannot be used to access Setup Utility.

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

To start Setup Utility:

- » Open 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 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 Setup Utility

### Changing the language of Setup Utility

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

1. Open 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 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 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 Setup Utility

Because 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 Setup Utility is open, press **f1**.

## Displaying system information

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

1. Open 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 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. Select the **Main** menu. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## Restoring default settings in Setup Utility

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

1. Open 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 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 Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

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 Setup Utility

You can exit Setup Utility with or without saving changes.

- To exit 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 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 (select models only)	Enable/disable the processor Virtualization Technology.
Processor C6 State (select models only)	Enable/disable the processor C6 sleep state.
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.
Fan Always On	Enable/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 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"/> USB 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>

## Diagnostics 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	43.6 cm	17.17 in
Depth	28.6 cm	11.26 in
Height (front to rear)	3.4 to 4.4 cm	1.33 to 1.72 in
<b>Weight</b>		
	4.1 kg	8.95 lbs
<b>Input power</b>		
Operating voltage	19.0 V dc @ 4.74 A–120 W	
Operating current	4.74 A	
<b>Temperature</b>		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
<b>Relative humidity</b>		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		
Operating	-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.		

## 18.4-inch display specifications

	Metric	U.S.
<b>Dimensions</b>		
Height	23.0 cm	9.06 in
Width	39.9 cm	15.71 in
Diagonal	46.7 cm	18.40 in
<b>Number of colors</b>	Up to 16.8 million	
<b>Contrast ratio</b>	250:1 (typical)	
<b>Brightness</b>	250 nits (typical)	
<b>Pixel resolution</b>		
Pitch	0.279 × 0.279 mm	
Format	1920 × 1080	
Configuration	RGB vertical stripe	
<b>Backlight</b>	Edge lit	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	4.0 W	
<b>Viewing angle</b>	±40° horizontal, +120°/-40° vertical (typical)	

## Hard drive specifications

	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>	976,809,728	625,127,124	488,380,566
<b>Disc rotational speed</b>	7200 rpm and 5400 rpm	7200 rpm and 5400 rpm	7200 rpm and 5400 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±RW SuperMulti DL Drive specifications

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-ROM
<b>Access time</b>	<b>BD</b>	<b>DVD</b>
Random	< 230 ms	< 180 ms
<b>Cache buffer</b>	4.5 MB	
<b>Data transfer rate</b>		
2X BD-RAM	9 MB/sec	
8X DVD	2,400 KB/sec	
16X CD-R	2,400 KB/sec	
16X CD-RW	2,400 KB/sec	

## 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*	Not applicable
DMA6	Not assigned
DMA7	Not assigned

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


## System memory map specifications

Size	Memory address	System function
640 KB	00000000–0009FFFF	Base memory
128 KB	000A0000–000BFFFF	Video memory
64 KB	000C0000–000CFFFF	Video BIOS
64 KB	000E8000–000FFFFFF	System BIOS
	00100000–XFFFFFFF	Extended memory (based on memory installed)
	(X+1)0000000–FEDFFFFFF	PCI bus
	FED00000–FED003FF	High-precision event timer
	FEE01000–FFFFFFFF	PCI bus

## System interrupt specifications

Hardware IRQ	System function
IRQ0	System timer
IRQ1	Standard 101-/102-key or Microsoft natural keyboard
IRQ8	System CMOS/real-time clock
IRQ12	Synaptics PS/2 TouchPad
IRQ13	Numeric data processor
IRQ16	Intel ICH9 family USB universal host controller 2937 Mobile Intel 5 Series express chipset family
IRQ17*	High-definition audio controller Intel ICH9 family USB universal host controller 2938 Marvell Yukon 88E8072 PCIe-gigabit Ethernet controller
IRQ18	Intel ICH9 family USB universal host controller 2939 Intel ICH9 family USB universal host controller 2936
IRQ19	Intel ICH9 family USB2 enhanced controller 293C
IRQ20	Intel ICH9 family USB2 enhanced controller 293A Intel ICH9 family USB universal host controller 2934
IRQ21	Intel ICH9M-E/M SATA AHCI controller
IRQ22	Intel ICH9 family USB universal host controller 2935

\*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.

 For operating systems after Windows 2000, APIC (advanced programming interrupt controller) is used.

## System I/O address specifications

I/O address (hex)	System function (shipping configuration)
000–01F	DMA controller
020–021	Program interrupt controller
024–025	Program interrupt controller
028–029	Program interrupt controller
02C–03D	Program interrupt controller
02E–02F	Motherboard resources
030–031	Program interrupt controller
034–035	Program interrupt controller
038–039	Program interrupt controller
03C–03D	Program interrupt controller
040–043	System timer
04E–04F	Motherboard resources
050–053	System timer
060	Standard 101-/102-key or Microsoft natural keyboard
061	Motherboard resources
062	Microsoft ACPI-compliant embedded controller
063	Motherboard resources
064	Standard 101-/102-key or Microsoft natural keyboard
065	Motherboard resources
066	Microsoft ACPI-compliant embedded controller
067	Motherboard resources
070	Motherboard resources
071–077	System CMOS/real-time clock
080	Motherboard resources
081–091	Direct memory access controller
092	Motherboard resources
093–09F	Direct memory access controller
0A0–0A1	Program interrupt controller
0A4–0A5	Program interrupt controller
0A8–0A9	Program interrupt controller
0AC–0AD	Program interrupt controller
0B0–0B1	Program interrupt controller
0B2–0B3	Motherboard resources
0B4–0B5	Program interrupt controller
0B8–0B9	Program interrupt controller
0BC–0BD	Program interrupt controller

(Continued)

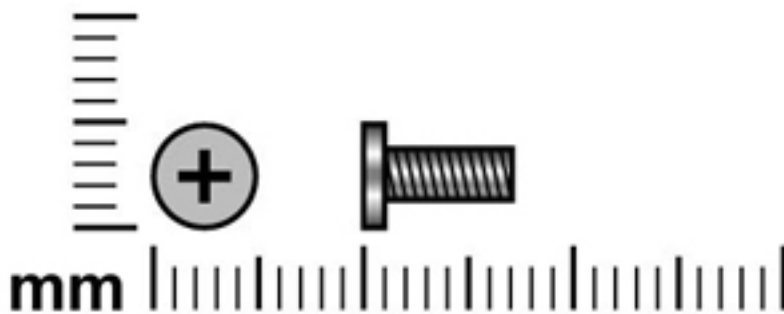
<b>I/O address (hex)</b>	<b>System function (shipping configuration)</b>
0C0–0DF	Direct memory access controller
0F0–0F0	Numeric data processor
0200–027F	Motherboard resources
3B0–3BB	Mobile Intel 5 Series express chipset family
3C0–3DF	Mobile Intel 5 Series express chipset family
400–47F	Motherboard resources
4D0–4D1	Programmable interrupt controller
500–57F	Motherboard resources
1000–1003	Motherboard resources
1010–101F	Motherboard resources
2000–20FF	Marvell Yukon 88E8072 PCIe-gigabit Ethernet controller
2000–2FFF	ICH9 family PCI express root port6-294A
3000–4FFF	ICH9 family PCI express root port5-2948
5000–6FFF	ICH9 family PCI express root port3-2944
7000–701F	ICH9M-E/M SATA AHCI controller
7020–703F	ICH9 family USB universal host controller 2936
7040–705F	ICH9 family USB universal host controller 2935
7060–707F	ICH9 family USB universal host controller 2934
7080–709F	ICH9 family USB universal host controller 2939
70A0–70BF	ICH9 family USB universal host controller 2938
70C0–70DF	ICH9 family USB universal host controller 2937
70E0–70E7	ICH9M-E/M SATA AHCI controller
70E8–70EF	ICH9M-E/M SATA AHCI Controller
70F0–70F7	Mobile Intel 5 Series express chipset family
70F8–70FB	ICH9M-E/M SATA AHCI controller
70FC–70FF	ICH9M-E/M SATA AHCI controller
EF80–EF9F	Motherboard resources
FE00–FE0F	Motherboard resources
FE80–EF8F	Motherboard resources
FFFF	Motherboard resources



## Screw listing

This section provides specification and reference information for the screws used in the computer. The screws listed in this section are available in the Screw Kit, spare part number 496890-001.

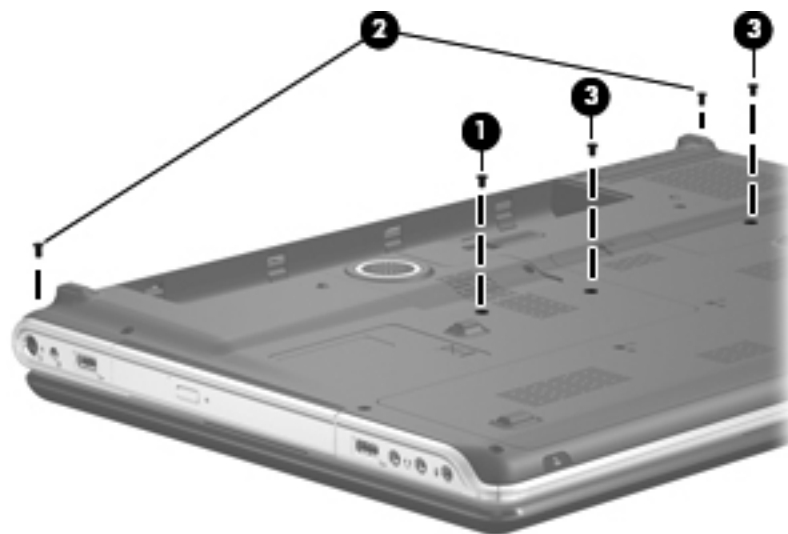
### Phillips PM2.5×7.0 screw



Color	Quantity	Length	Thread	Head diameter
Black	39	7.0 mm	2.5 mm	5.0 mm

#### Where used:

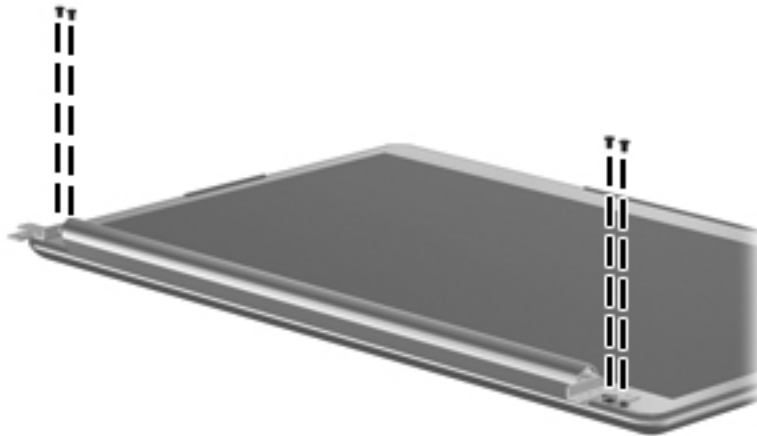
- ❶ One screw that secures the optical drive to the computer
- ❷ Two screws that secure the switch cover to the computer
- ❸ Two screws that secure the keyboard to the computer



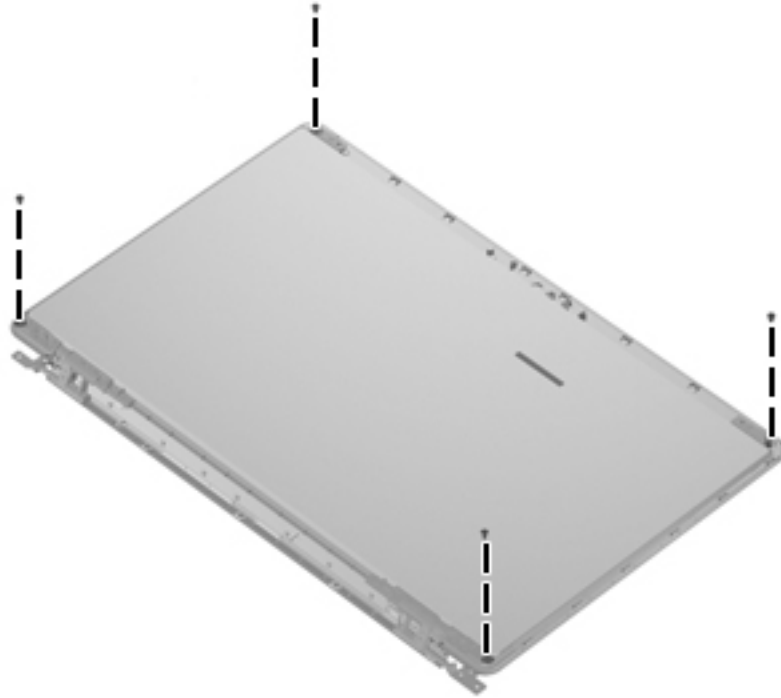
**Where used:** 4 screws that secure the display assembly to the computer



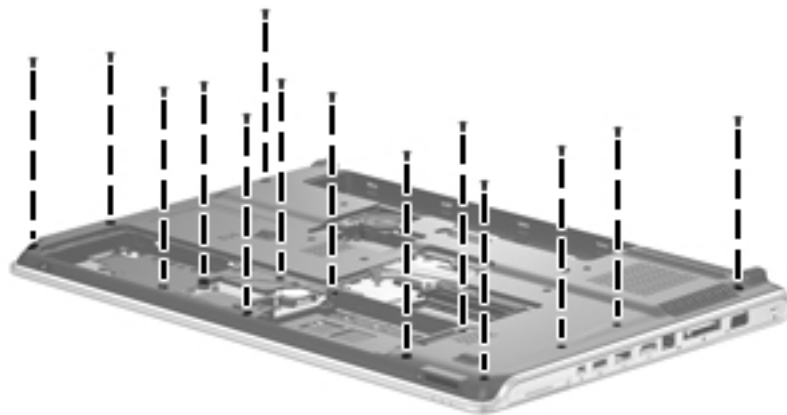
**Where used:** 4 screws that secure the display enclosure to the display assembly



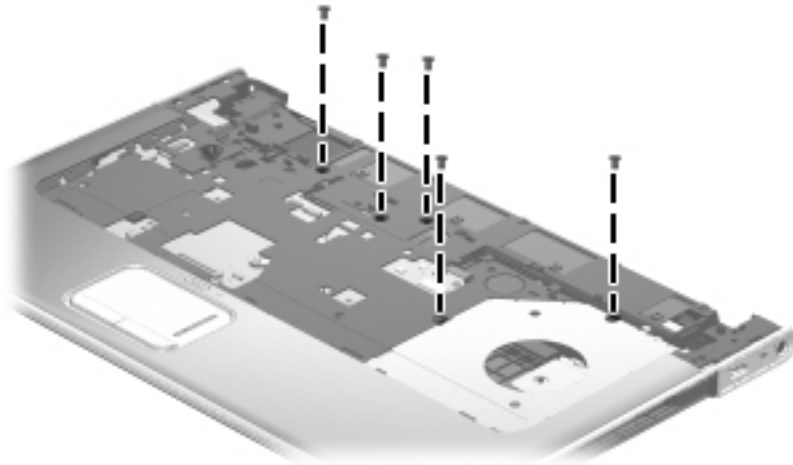
**Where used:** 4 screws that secure the display hinges to the display panel



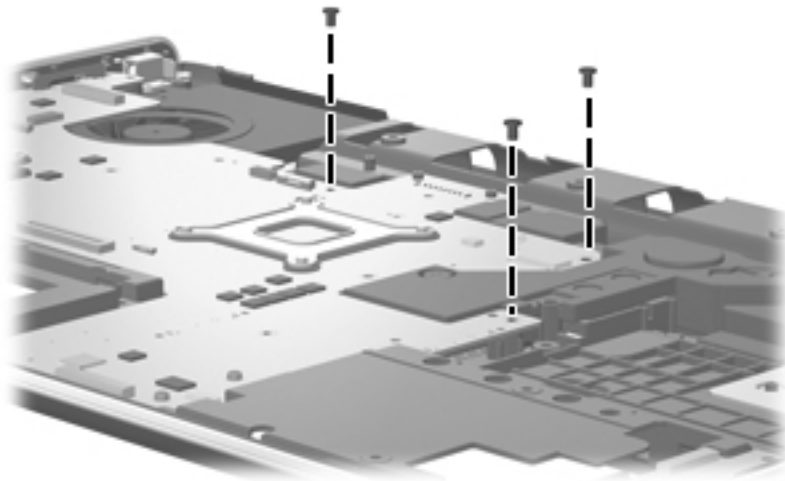
**Where used:** 14 screws that secure the top cover to the base enclosure



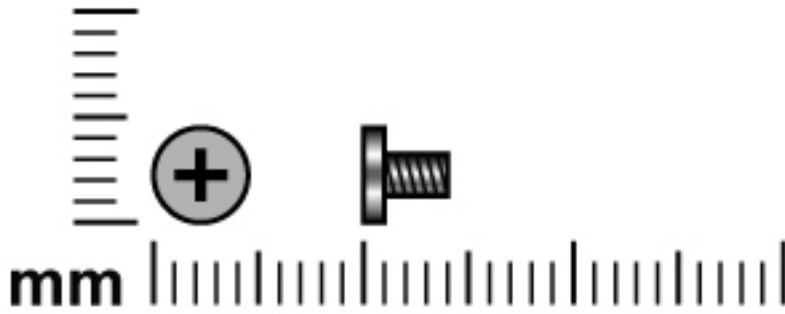
**Where used:** 5 screws that secure the top cover to the base enclosure



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

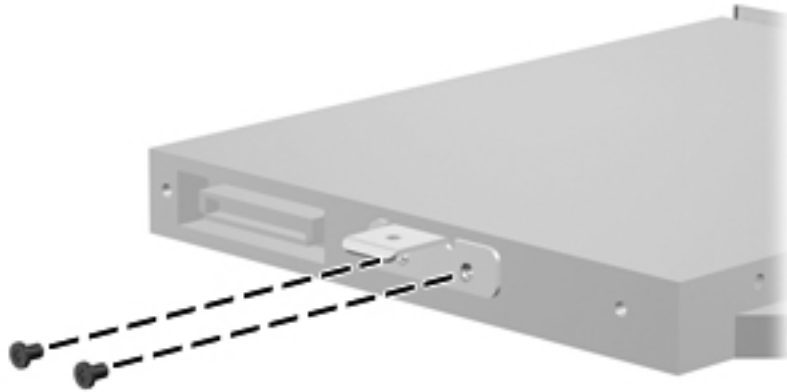


## Phillips PM2.0×4.0 screw



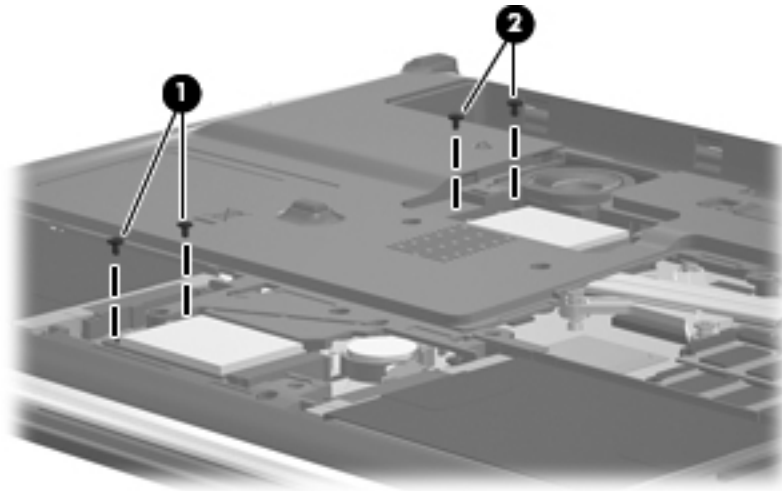
Color	Quantity	Length	Thread	Head diameter
Black	39	4.0 mm	2.0 mm	4.5 mm

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

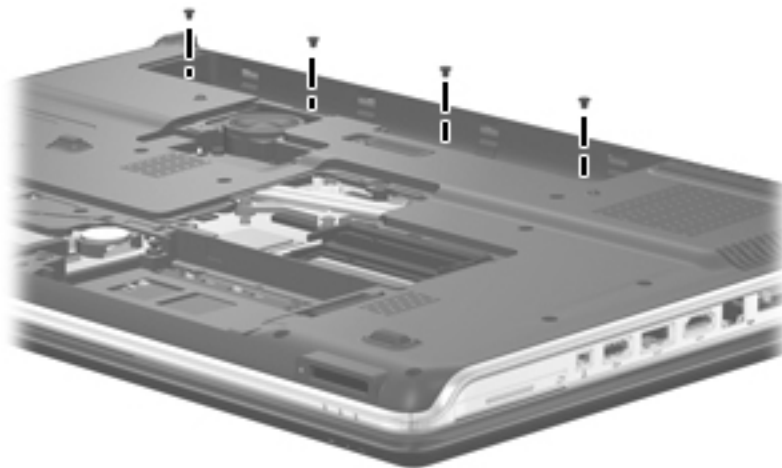


**Where used:**

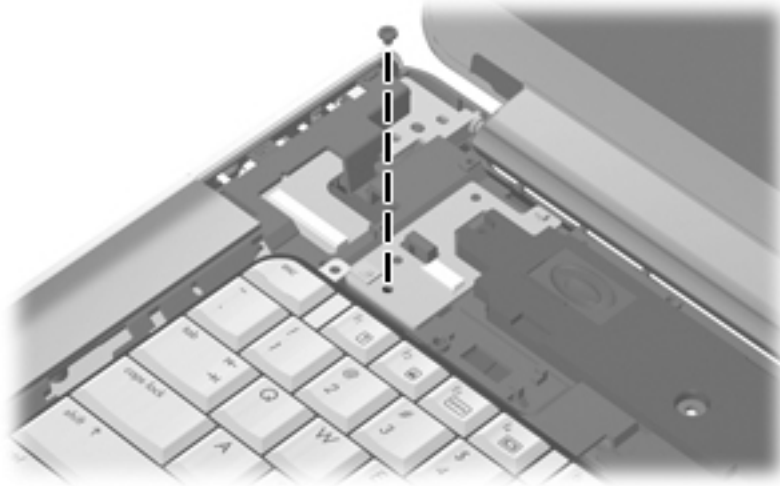
- ❶ Two screws that secure the TV tuner module to the system board
- ❷ Two screws that secure the WLAN module to the system board



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

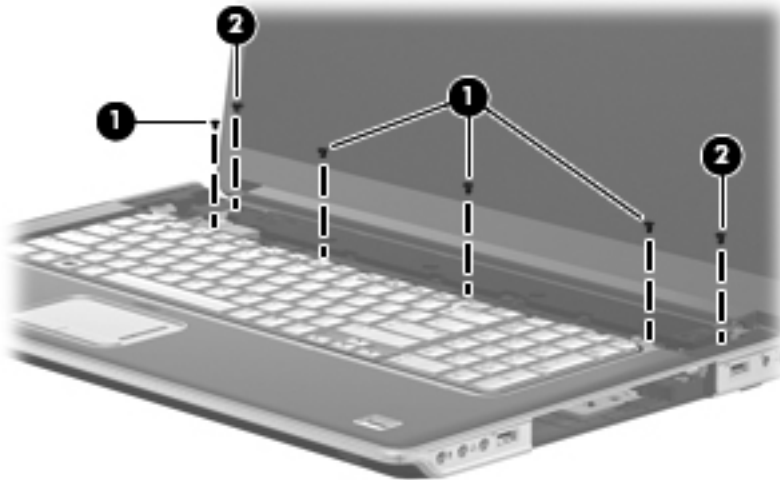


**Where used:** One screw that secures the power button board to the top cover

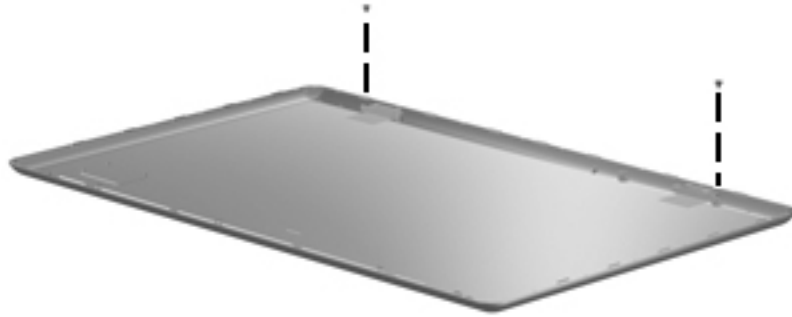


**Where used:**

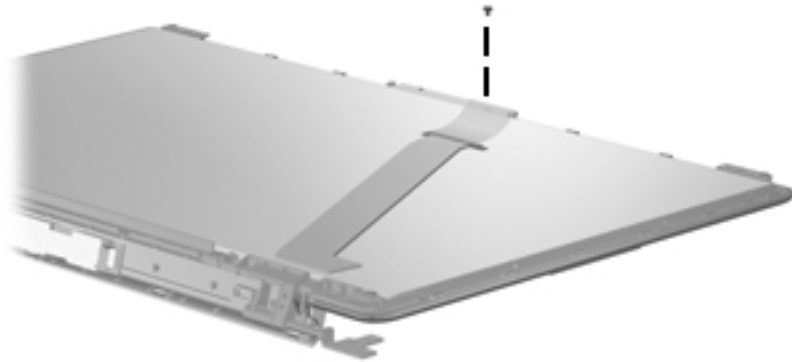
- ❶ Four screws that secure the keyboard to the computer
- ❷ Two screws that secure the speaker assembly to the top cover



**Where used:** 2 screws that secure the wireless antenna transceivers to the display enclosure

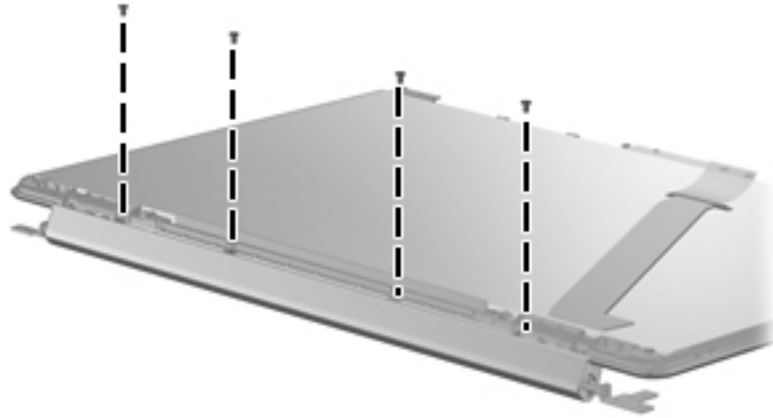


**Where used:** One screw that secures the webcam/microphone module to the display bezel

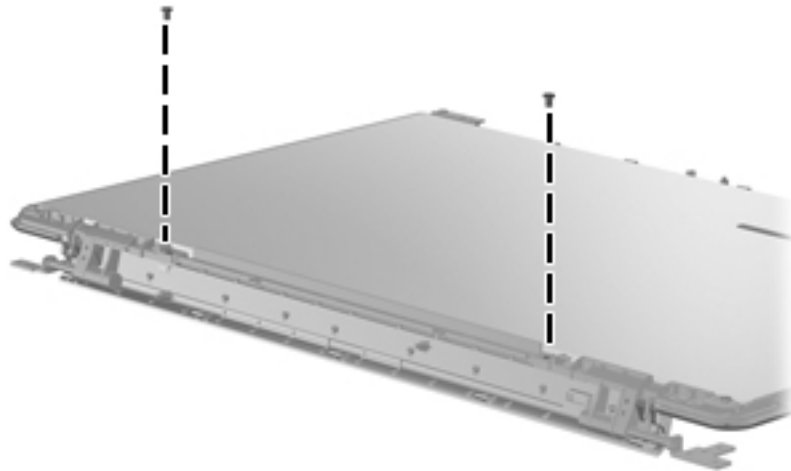




**Where used:** 4 screws that secure the display hinge cover to the display bezel



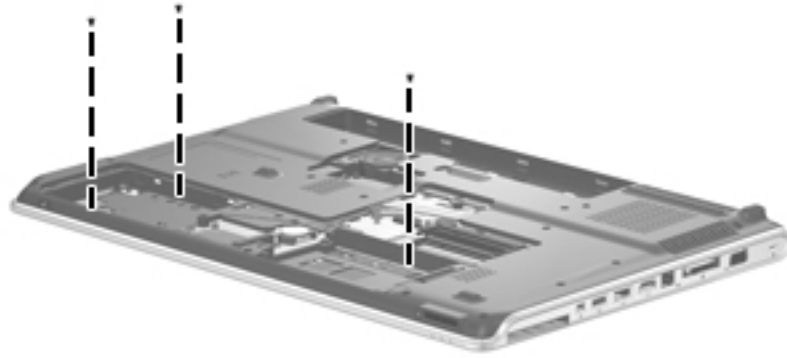
**Where used:** 2 screws that secure the display hinge bracket to the display bezel



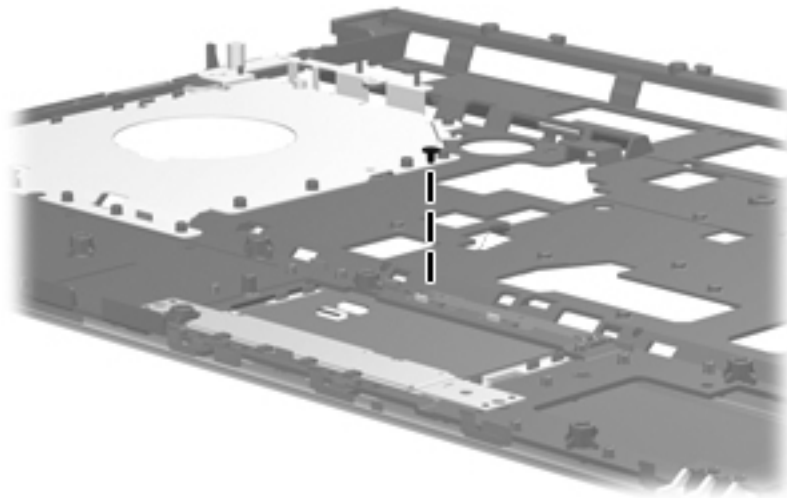
**Where used:** 4 screws that secure the display hinges to the display panel



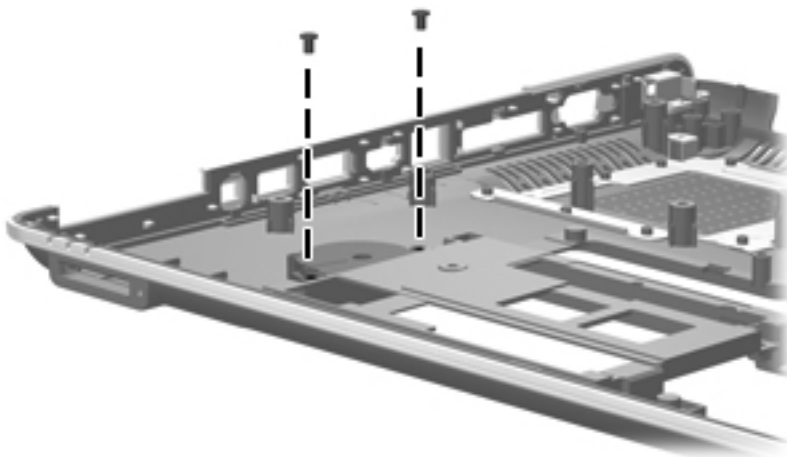
**Where used:** 3 screws that secure the top cover to the base enclosure



**Where used:** One screw that secures the TouchPad on/off button board to the top cover

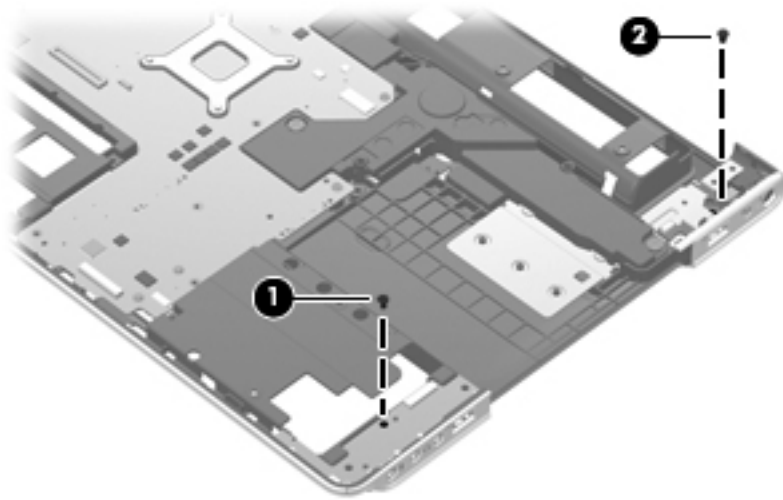


**Where used:** 2 screws that secure the fan to the base enclosure

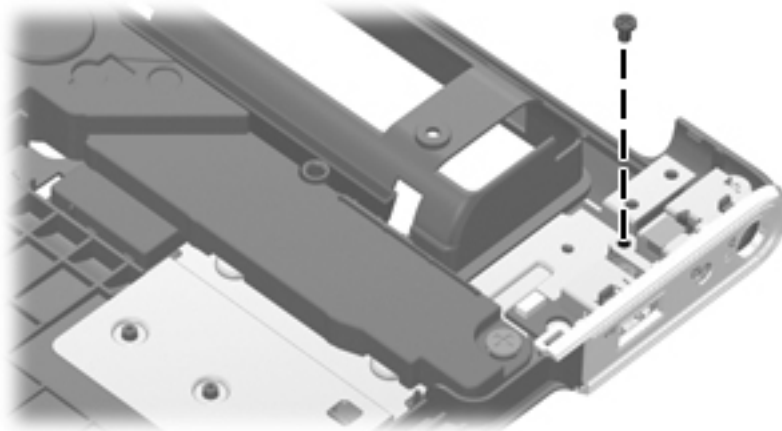


**Where used:**

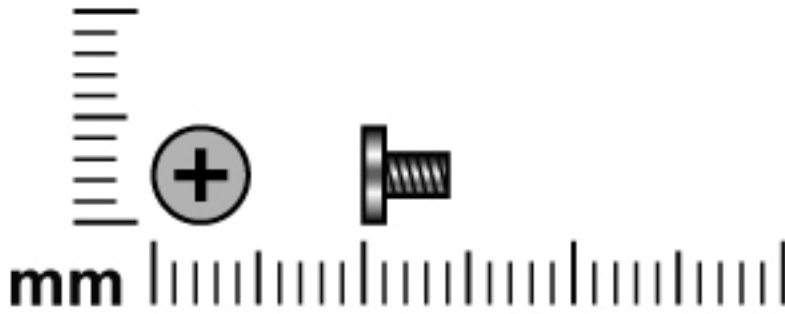
- ❶ One screw that secures the audio/infrared board to the base enclosure
- ❷ One screw that secures the USB board to the base enclosure



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

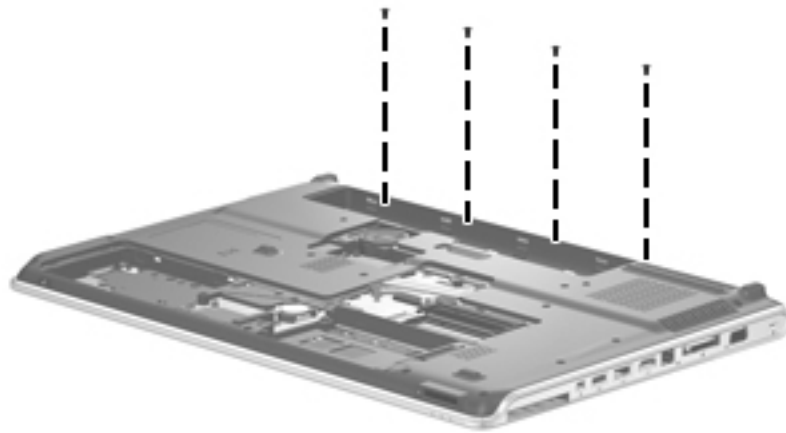


## Phillips PM2.5×4.0 screw

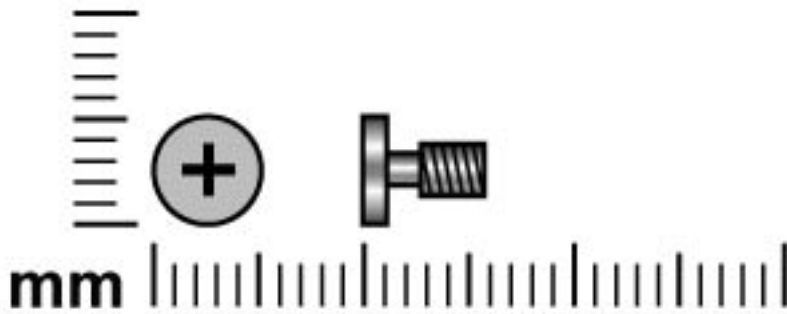


Color	Quantity	Length	Thread	Head diameter
Black	4	4.0 mm	2.5 mm	5.0 mm

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



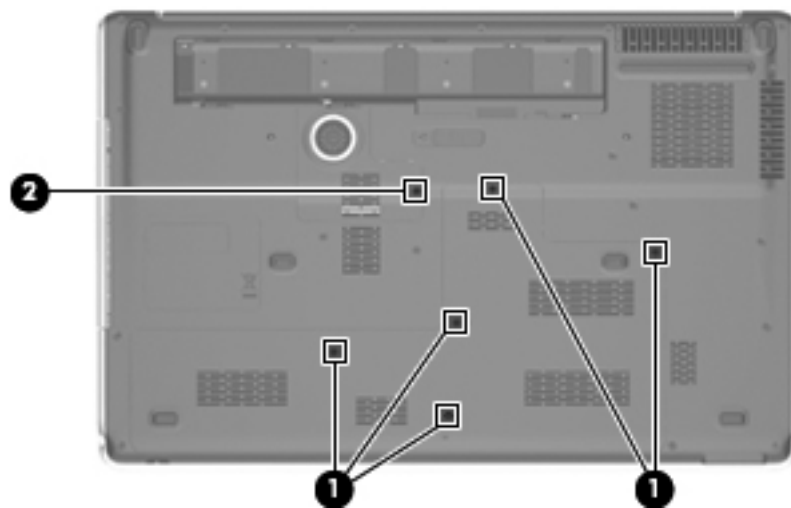
## Phillips PM2.5×6.0 captive screw



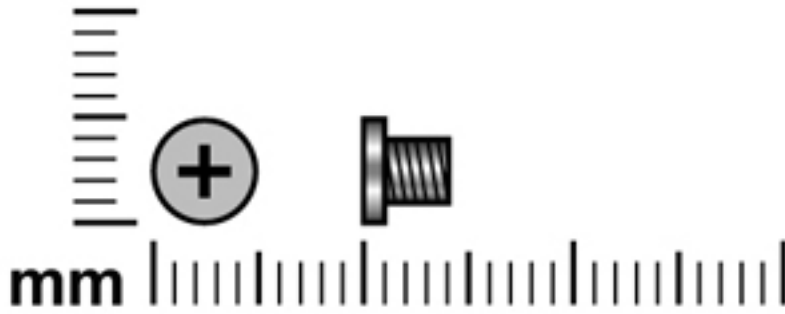
Color	Quantity	Length	Thread	Head diameter
Black	6	6.0 mm	2.5 mm	5.0 mm

### Where used:

- ❶ Five captive screws that secure the mass storage device cover to the computer (screws are secured by C clips)
- ❷ One captive screw that secures the WLAN module compartment cover to the computer (screw is secured by a C clip)

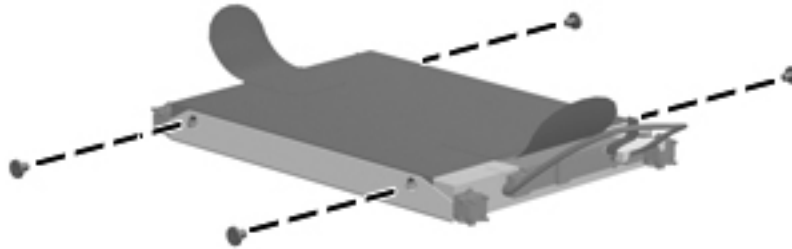


## Phillips PM3.0×4.0 screw

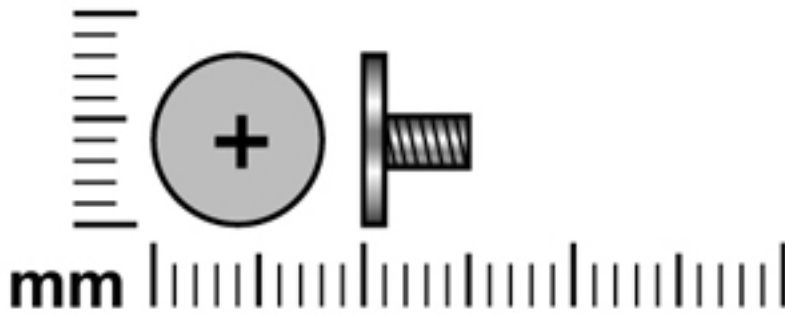


Color	Quantity	Length	Thread	Head diameter
Silver	4	4.0 mm	3.0 mm	5.0 mm

**Where used:** 4 screws that secure the left and right brackets to the mass storage device

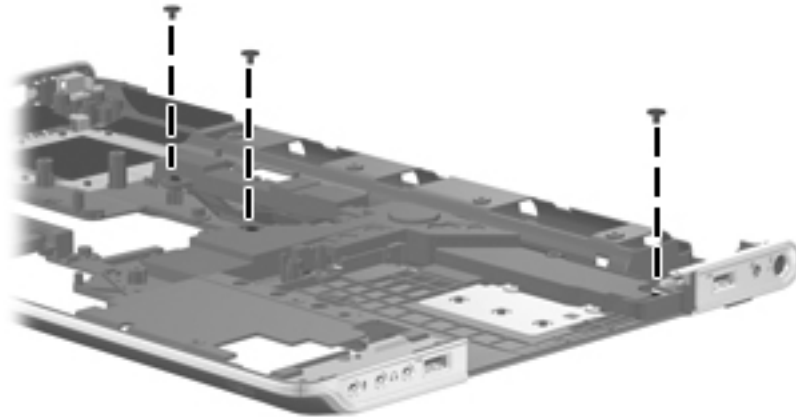


## Phillips PM2.5×5.0 broadhead screw

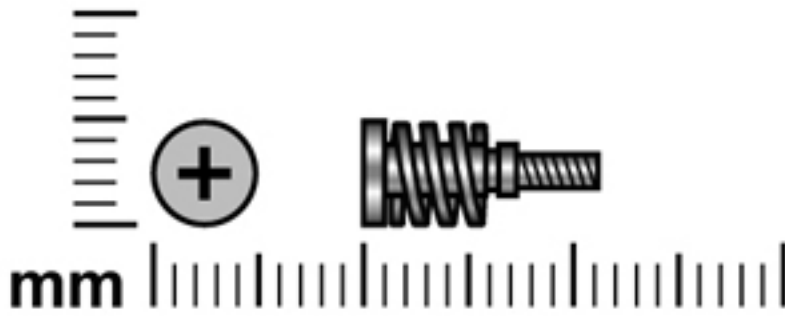


Color	Quantity	Length	Thread	Head diameter
Silver	3	5.0 mm	2.5 mm	8.0 mm

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

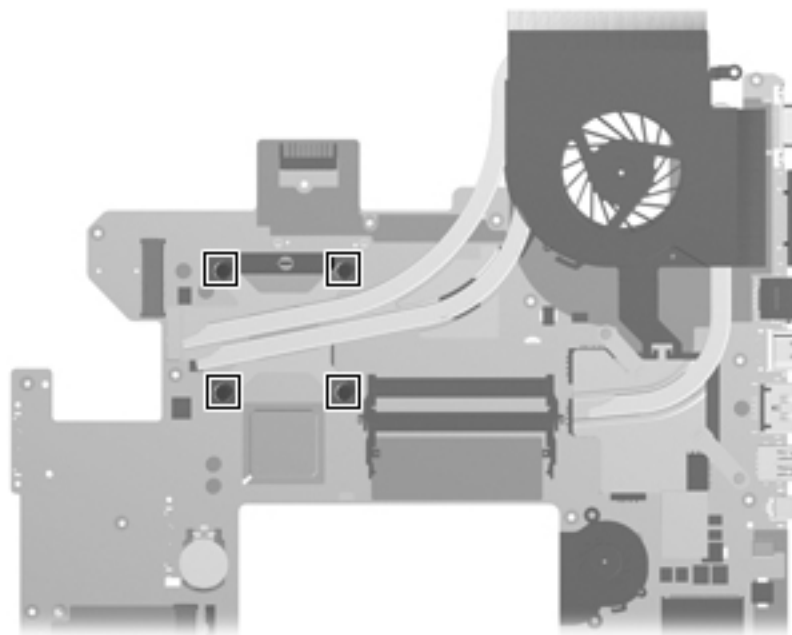


## Phillips PM2.0×11.0 captive screw



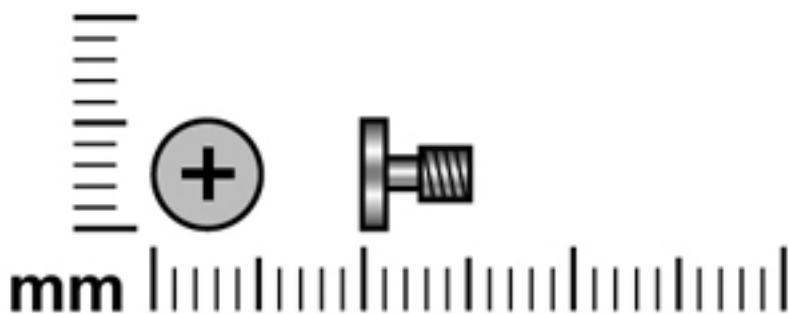
Color	Quantity	Length	Thread	Head diameter
Silver	4	11.0 mm	2.0 mm	5.0 mm

**Where used:** 4 captive screws that secure the fan/heat sink assembly to the system board (screws are secured by O rings)



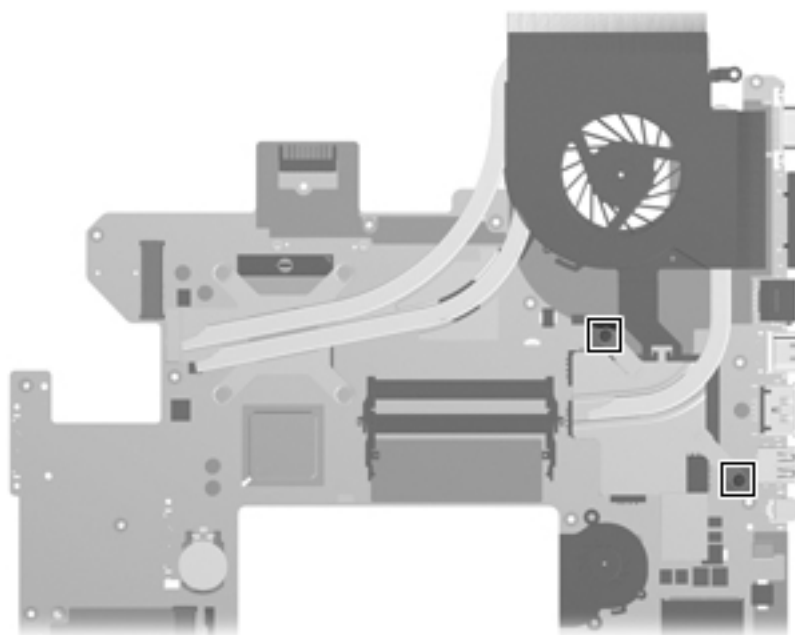


## Phillips PM2.5×5.0 captive screw



Color	Quantity	Length	Thread	Head diameter
Silver	2	5.0 mm	2.5 mm	5.0 mm

**Where used:** 2 captive screws that secure the fan/heat sink assembly to the system board (screws are secured by O rings)





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## Backup and recovery

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 HP 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.



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, click **Start**, right-click **Manage**, and then click **Disk Management**. If the partition is present, an HP Recovery drive is listed in the window.

---

### 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.


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

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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 larger storage capacity than CDs. If you use CDs, up to 20 discs may be required, whereas only a few DVDs or BDs are required.
  -  Double-layer discs and read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, 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 computer 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 DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive installed in your computer.
    -  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. Select **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. Select **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



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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 (entire drive backup) as soon as you set up your computer.

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Recovery Manager software allows you to repair or restore the system if you experience system failure or instability. Recovery Manager works from recovery discs that you create 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.



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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. Select **Start > Help and Support**.

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

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## 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)



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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.

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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.

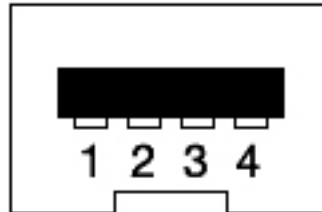
To restore the system from the partition, follow these steps:

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 at 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.

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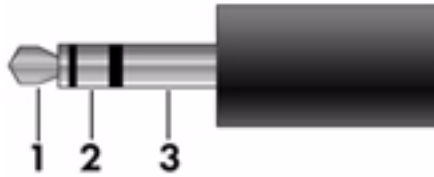
## Connector pin assignments

1394



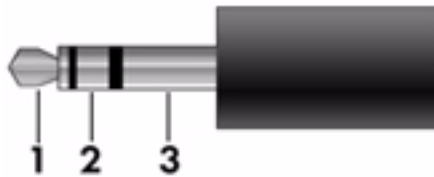
Pin	Signal
1	TPB-
2	TPB+
3	TPA-
4	TPA+

## Audio-in (microphone)



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

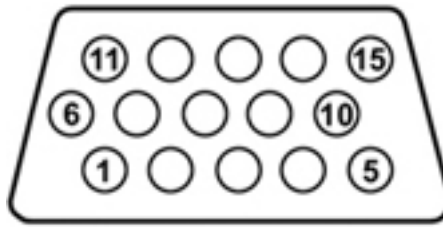
## Audio-out (headphone)



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

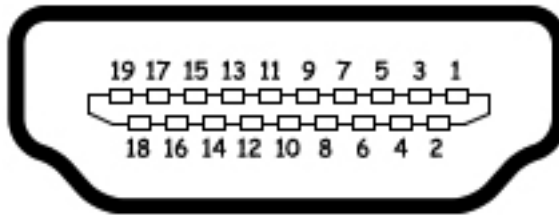


## External monitor



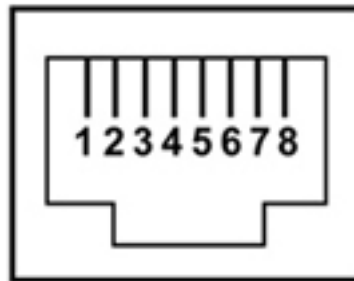
Pin	Signal
1	Red analog
2	Green analog
3	Blue analog
4	Not connected
5	Ground
6	Ground analog
7	Ground analog
8	Ground analog
9	+5 VDC
10	Ground
11	Monitor detect
12	DDC 2B data
13	Horizontal sync
14	Vertical sync
15	DDC 2B clock

# HDMI



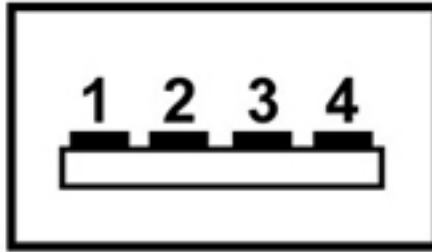
Pin	Signal
1	Transition minimized differential signal (TDMS) data 2+
2	TDMS data 2 shield
3	TDMS data 2-
4	TDMS data 1+
5	TDMS data 1 shield
6	TDMS data 1 shield
7	TDMS data 0+
8	TDMS data 0 shield
9	TDMS data 0-
10	TDMS clock +
11	TDMS data clock shield
12	TDMS data clock-
13	Consumer electronics control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

## 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. Caution must be exercised 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>.

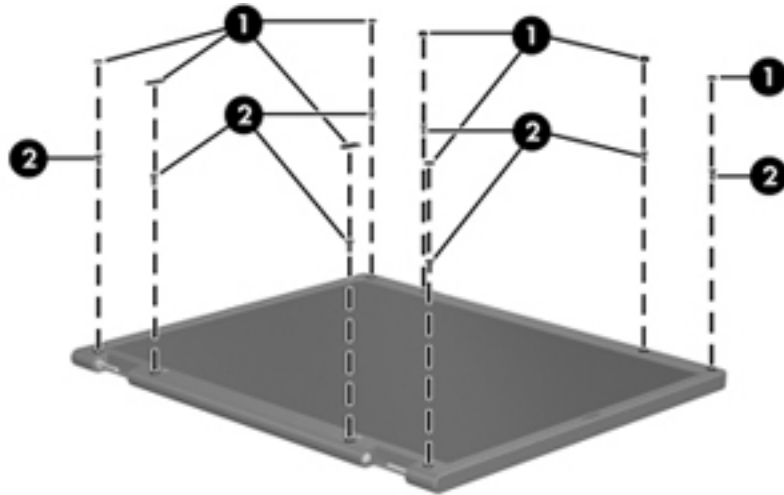
This section provides disassembly instructions for the display assembly. The display assembly must be disassembled to gain access to the backlight ❶ and the liquid crystal display (LCD) panel ❷.



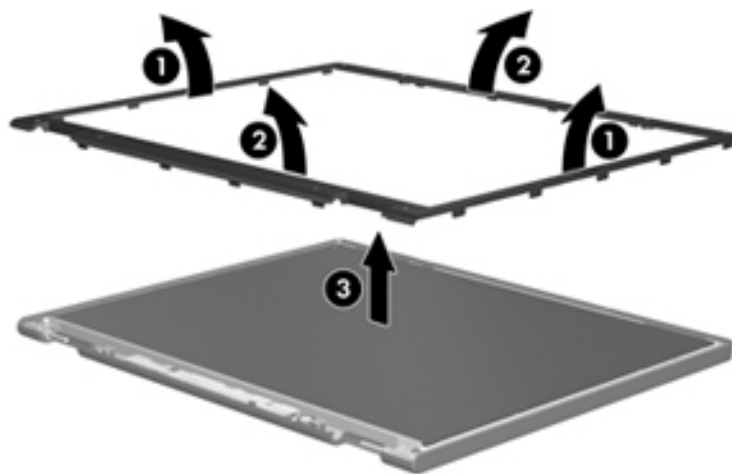
 The procedures provided in this chapter are general disassembly instructions. Specific details, such as screw sizes, quantities, and locations, and component shapes and sizes, can vary from one computer model to another.

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.

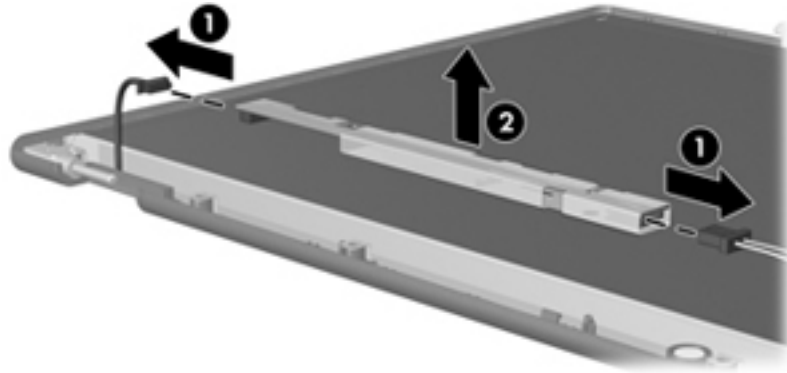


2. Lift up and out on the left and right inside edges ① and the top and bottom inside edges ② of the display bezel until the bezel disengages from the display assembly.
3. Remove the display bezel ③.



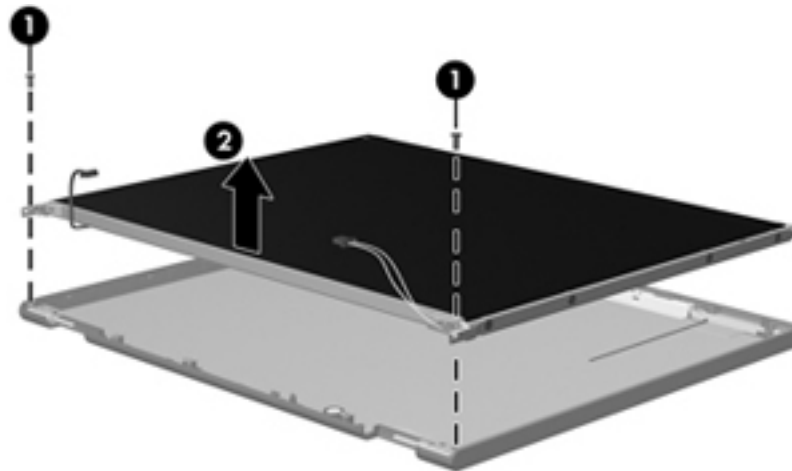


4. Disconnect all display panel cables ❶ from the display inverter and remove the inverter ❷.



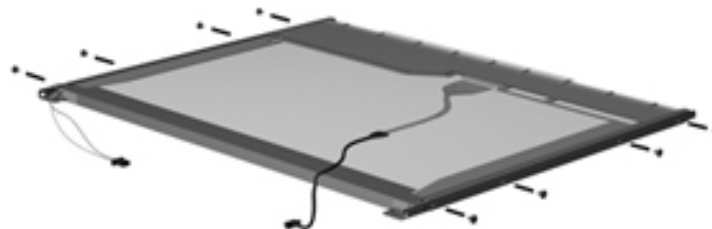
5. Remove all screws ❶ that secure the display panel assembly to the display enclosure.

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

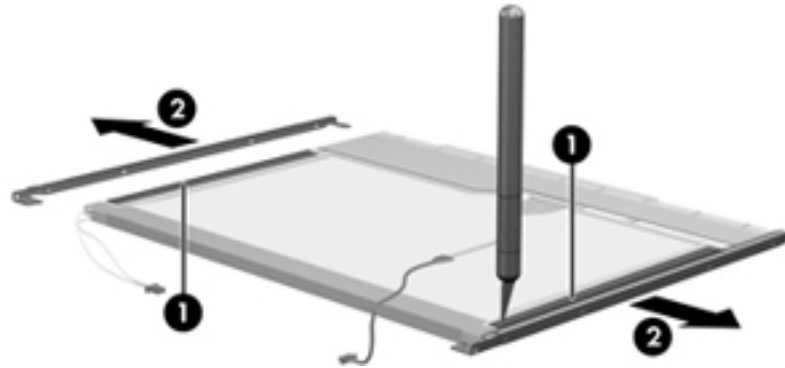


7. Turn the display panel assembly upside down.

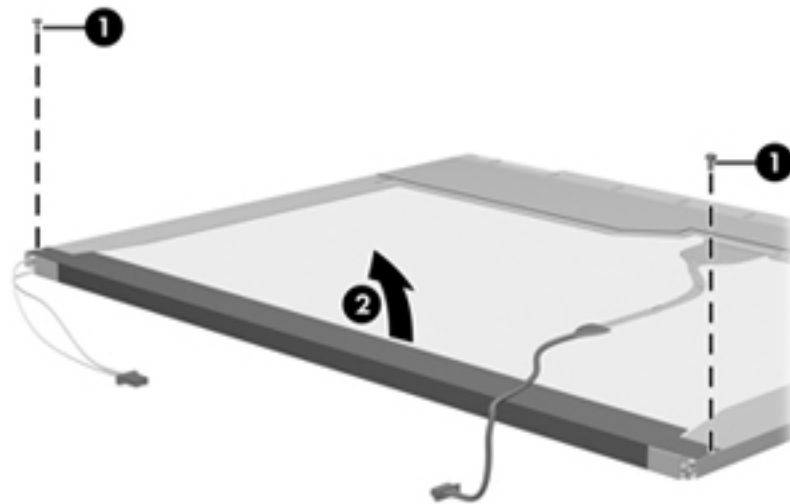
8. Remove all screws that secure the display panel frame to the display panel.



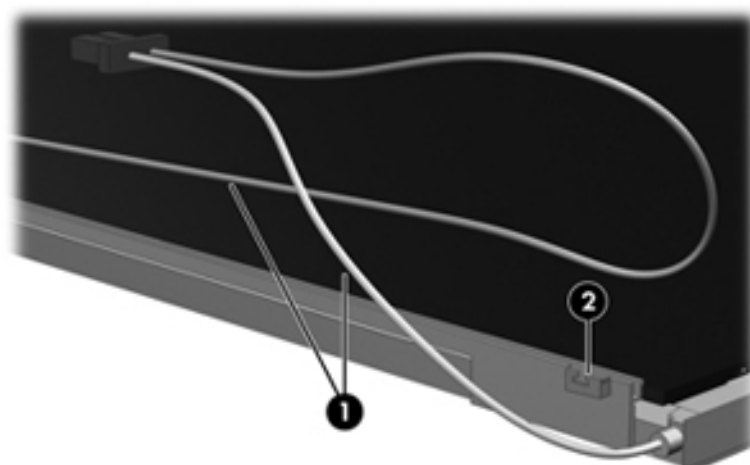
9. Use a sharp-edged tool to cut the tape ❶ that secures the sides of the display panel to the display panel frame.
10. Remove the display panel frame ❷ from the display panel.



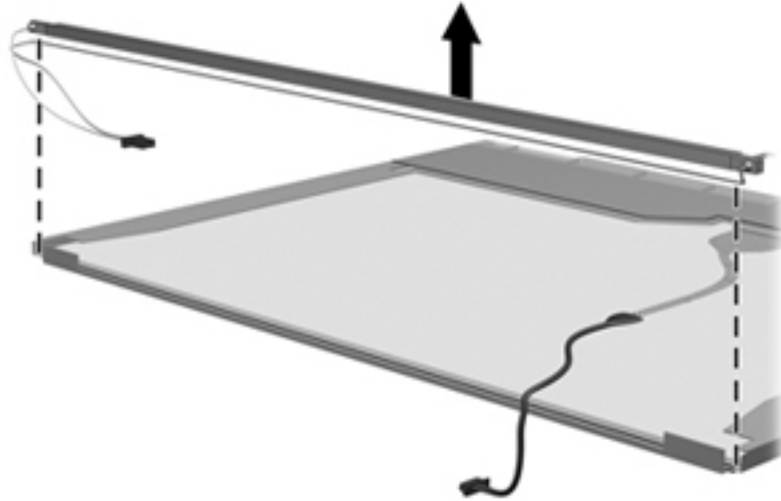
11. Remove the screws ❶ that secure the backlight cover to the display panel.
12. Lift the top edge of the backlight cover ❷ and swing it outward.



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.

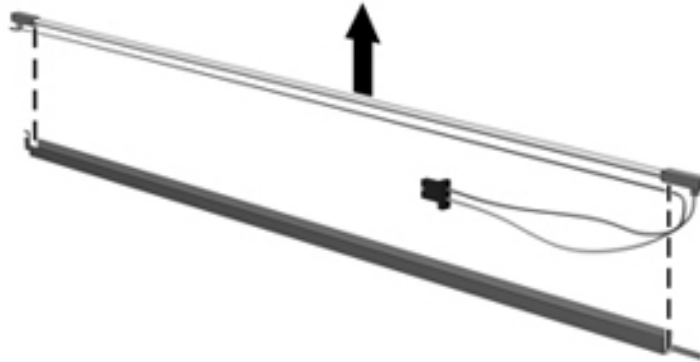


16. Turn the display panel upside down.
17. Remove the backlight frame from the display panel.

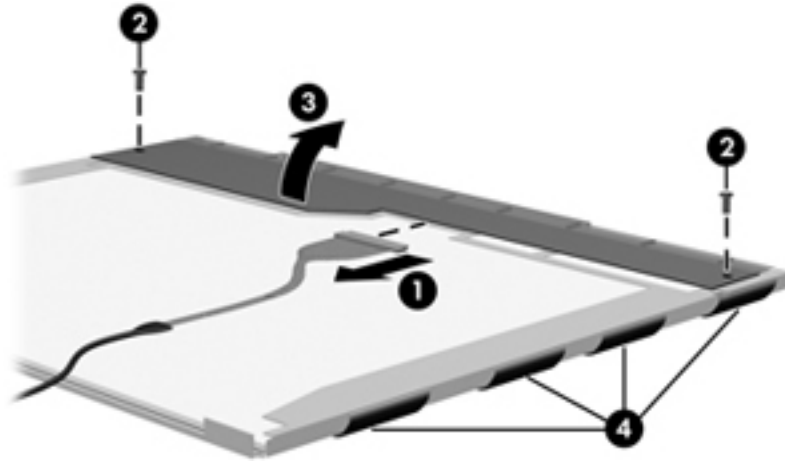


**WARNING:** The backlight contains mercury. Exercise caution when removing and handling the backlight to avoid damaging this component and causing exposure to the mercury.

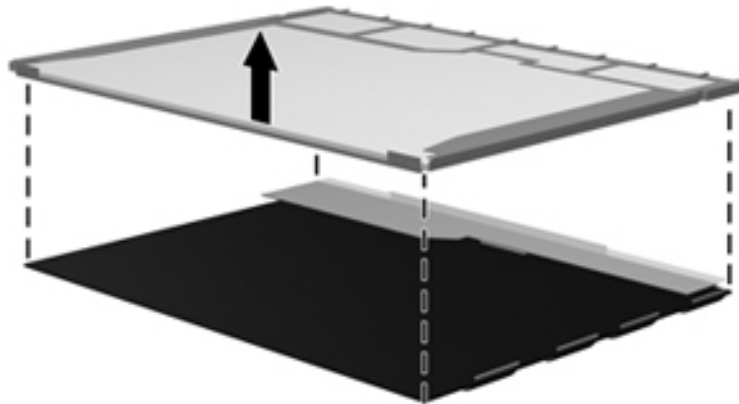
18. Remove the backlight from the backlight frame.



19. Disconnect the display 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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