



# HP Pavilion g6 Notebook PC

Maintenance and Service Guide

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## Safety warning notice

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 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device 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 device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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# 1 Product description

Category	Description
Product Name	HP Pavilion g6 Notebook PC
Processors	<p>AMD® A10-4600M processor (3.2 GHz/2.3 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)</p> <p>AMD A8-4500M processor (2.8 GHz/1.9 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)</p> <p>AMD A6-4400M processor (3.2 GHz/2.7 GHz, 1600 MHz/1.0 MB L2 cache, DDR3, dual core, 35W)</p>
Chipset	AMD A70M FCH
Graphics	<p><b>Internal Graphics (UMA):</b></p> <ul style="list-style-type: none"><li>• AMD Radeon HD 7660G graphics supporting HD decode, DX11, and HDMI for use with computer models equipped with an AMD A10-4600M processor</li><li>• AMD Radeon HD 7640G graphics supporting HD decode, DX11, and HDMI for use with computer models equipped with an AMD A8-4500M processor</li><li>• AMD Radeon HD 7520G graphics supporting HD decode, DX11, and HDMI for use with computer models equipped with an AMD A6-4400M processor</li></ul> <p><b>Switchable Discrete Graphics:</b></p> <ul style="list-style-type: none"><li>• AMD Radeon HD 7670M with 2 GB of dedicated video memory (128 MB x 16 DDR3 @ 900 MHz x 8 pcs) 128-bit M2 package, supports HD Decode, DX11, HDMI, and PX5</li><li>• AMD Radeon HD 7670M with 1 GB of dedicated video memory (64 MB x 16 DDR3 @ 900 MHz x 8 pcs) 128-bit M2 package, supports HD Decode, DX11, HDMI, and PX5</li></ul> <p><b>Dual graphics:</b></p> <ul style="list-style-type: none"><li>• AMD Radeon HD 7660G+HD 7670M Dual Graphics for computer models equipped with an AMD A10-4600M APU and AMD Radeon HD 7670M graphics card</li><li>• AMD Radeon HD 7640G+HD 7670M Dual Graphics for computer models equipped with an AMD A8-4500M APU and AMD Radeon HD 7670M graphics card</li><li>• AMD Radeon HD 7520G+HD 7670M Dual Graphics for computer models equipped with an AMD A6-4400M APU and AMD Radeon HD 7670M graphics card (no support for 1 DIMM memory)</li></ul>
Display Panel	<p><b>39.6 cm</b> (15.6 in) high-definition (HD), light-emitting diode (LED), SVA BrightView (1366×768) display; typical brightness: 200 cd/m2 (nits)</p> <p>All display assemblies include two wireless local area network (WLAN) antenna cables</p> <p>Supports 16:9 ultra-wide aspect ratio</p>

Category	Description
<b>Memory</b>	<p>2 customer-accessible/upgradable SODIMM slots:</p> <p>DDR3-1333 MHz Dual Channel Support</p> <p>Supports the following configurations up to 8 GB:</p> <ul style="list-style-type: none"> <li>• 8192 MB total system memory (4096×2) (No support for 32 bit OS)</li> <li>• 6144 MB total system memory (4096×1 + 2048×1) (No support for 32 bit OS)</li> <li>• 4096 MB total system memory (4096×1 or 2048×2)</li> <li>• 2048 MB total system memory (2048×1)</li> </ul>
<b>Hard drives</b>	<p>Supports <b>6.35 cm</b> (2.5 in) hard drives in <b>9.5 mm</b> (.37 in) and <b>7.0 mm</b> (.28 in) thicknesses</p> <p>Supports HP 3D Drive Guard</p> <p>Customer-accessible</p> <p>Serial ATA (SATA)</p> <p>Supports the following single hard drive configurations:</p> <ul style="list-style-type: none"> <li>• 1 TB, 5400 rpm, 9.5 mm</li> <li>• 750 GB, 7200 rpm, 9.5 mm</li> <li>• 750 GB, 5400 rpm, 9.5 mm</li> <li>• 640 GB, 5400 rpm, 9.5 mm</li> <li>• 500 GB, 7200 rpm, 9.5 mm</li> <li>• 500 GB, 5400 rpm, 9.5 mm</li> <li>• 320 GB, 7200 rpm, 9.5 mm and 7.0 mm</li> <li>• 320 GB, 5400 rpm, 9.5 mm and 7.0 mm</li> </ul>
<b>Optical drive</b>	<p>Fixed</p> <p>Customer-accessible</p> <p>SATA</p> <p>12.7 mm tray load</p> <p>Supports Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive</p> <p>Supports DVD±RW Super Multi Double-Layer Combo Drive</p> <p>Supports zero-power optical drive</p>
<b>Webcam</b>	VGA camera (640x480 by 24 frames per second), fixed angle (no tilt), with activity light and single digital microphone
<b>Audio</b>	<p>High-definition audio supports:</p> <p>Microsoft® Premium requirements with HP Altec Lansing speakers (2)</p> <p>Supports Dolby Advanced Audio v2</p>
<b>Ethernet</b>	Integrated 10/100 network interface card (NIC)

Category	Description
<b>Wireless</b>	<p>Integrated wireless local area network (WLAN) options by way of wireless module</p> <p>Customer-accessible</p> <p>Two WLAN antennas</p> <p>Support for the following WLAN formats:</p> <ul style="list-style-type: none"> <li>• Atheros 9485GN 802.11b/g/n 1×1 WiFi Adapter and 3012 Bluetooth 4.0 Combo Adapter (select models only)</li> <li>• Atheros HB125 802.11b/g/n 1×1 WiFi Adapter (select models only)</li> <li>• Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter</li> <li>• Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter</li> </ul>
<b>External media card</b>	<p>HP Multi-Format Digital Media Reader supports the following digital card formats:</p> <ul style="list-style-type: none"> <li>• MultiMediaCard (MMC)</li> <li>• Secure Digital (SD) Memory Card</li> <li>• Secure Digital High Capacity (SDHC) Memory Card</li> <li>• Secure Digital Extended Capacity (SDXC) Memory Card</li> </ul>
<b>Internal card</b>	<p>One half-size Mini Card slot for WLAN</p>
<b>Ports</b>	<ul style="list-style-type: none"> <li>• Audio-in (digital microphone)</li> <li>• Audio-out (stereo headphone)</li> <li>• RJ-45 (Ethernet, includes link and activity lights)</li> <li>• USB 3.0 ports (two on left side)</li> <li>• USB 2.0 port (right side)</li> <li>• VGA (Dsub 15 pin) supporting: <ul style="list-style-type: none"> <li>◦ 1920x1200 external resolution @ 60 Hz</li> <li>◦ Hot plug/unplug with auto-detect for correct output to wide-aspect vs. standard aspect video</li> </ul> </li> <li>• High-Definition Multimedia Interface (HDMI) version 1.4 supporting up to 1920x1200 @ 60 Hz</li> <li>• AC Smart Pin adapter</li> </ul>
<b>Keyboard/pointing devices</b>	<p>Full size island style textured keyboard with numeric keypad (Black)</p> <p>TouchPad with 2 buttons</p> <ul style="list-style-type: none"> <li>• Multitouch gestures enabled</li> <li>• Taps enabled as default</li> </ul>
<b>Power requirements</b>	<p>Battery:</p> <ul style="list-style-type: none"> <li>• 6 cell, 2.22 Ah, 47 Wh battery</li> <li>• 6 cell, 2.55 Ah, 55 Wh battery</li> <li>• Supports fast charge</li> </ul>

Category	Description
	<p data-bbox="619 216 837 247">HP Smart AC adapter:</p> <ul data-bbox="619 258 1444 457" style="list-style-type: none"> <li data-bbox="619 258 1444 352">• 90 W RC V HP Smart AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector) (for computer models equipped with a graphics subsystem with switchable discrete memory only)</li> <li data-bbox="619 363 1444 457">• 65 W RC V HP Smart AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector) (for computer models equipped with a graphics subsystem with UMA memory only)</li> </ul>
<b>Security</b>	Security lock slot
<b>Operating system</b>	<p data-bbox="619 520 742 552">Preinstalled:</p> <ul data-bbox="619 562 1005 783" style="list-style-type: none"> <li data-bbox="619 562 1005 594">• Windows 7® Professional (64 bit)</li> <li data-bbox="619 604 1005 636">• Windows 7 Home Premium (64 bit)</li> <li data-bbox="619 646 1005 678">• Windows 7 Home Basic (64 bit)</li> <li data-bbox="619 688 1005 720">• FreeDOS</li> <li data-bbox="619 730 1005 762">• SUSE Linux</li> </ul>
<b>Serviceability</b>	<p data-bbox="619 793 885 825">End-user replaceable parts:</p> <ul data-bbox="619 835 869 1144" style="list-style-type: none"> <li data-bbox="619 835 869 867">• AC adapter</li> <li data-bbox="619 877 869 909">• Battery (system)</li> <li data-bbox="619 919 869 951">• Hard drive</li> <li data-bbox="619 961 869 993">• Keyboard</li> <li data-bbox="619 1003 869 1035">• Memory modules (2)</li> <li data-bbox="619 1045 869 1077">• Optical drive</li> <li data-bbox="619 1087 869 1119">• WLAN module</li> </ul>

## 2 External component identification

### Display




Item	Component	Description
(1)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLAN devices.
(2)	Internal microphone	Records sound.
(3)	Webcam	Records video and captures still photographs. To use the webcam, select <b>Start &gt; All Programs &gt; CyberLink YouCam &gt; CyberLink YouCam</b> .
(4)	Webcam light	On: The webcam is in use.

\*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. To see wireless regulatory notices, refer to the section of the Regulatory, Safety, and Environmental Notices that applies to your country or region. These notices are located in Help and Support.

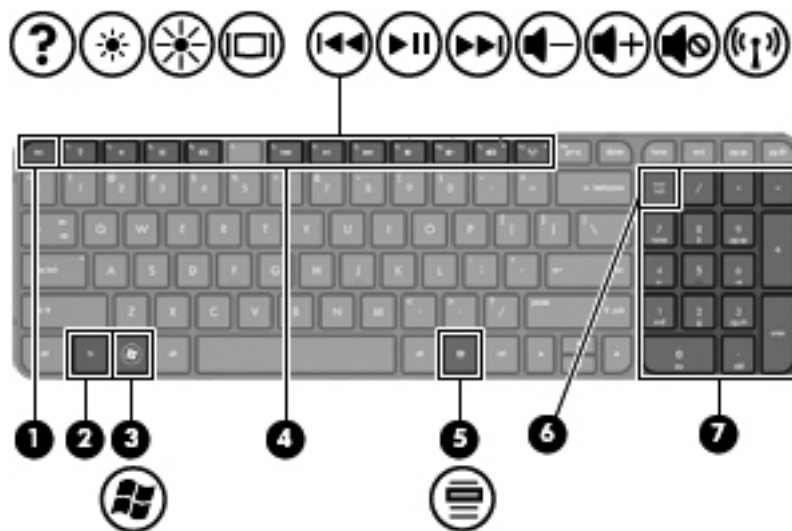
# Top



## Buttons and speakers



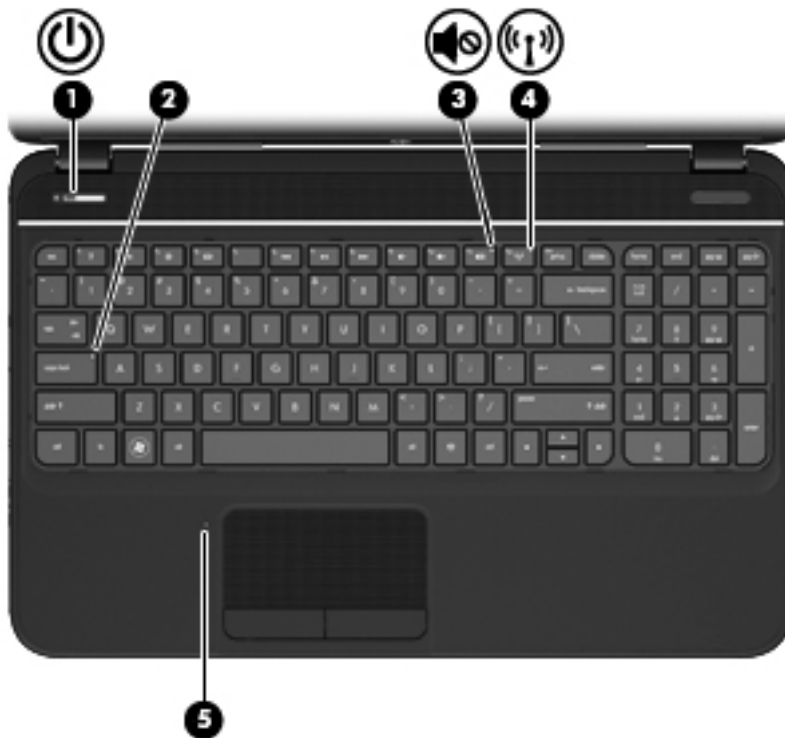
Component	Description
(1)  Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button briefly to initiate Sleep.</li><li>• When the computer is in the Sleep state, press the button briefly to exit Sleep.</li><li>• When the computer is in Hibernation, press the button down briefly to exit Hibernation.</li></ul> <p><b>CAUTION:</b> Pressing and holding down the power button will result in the loss of unsaved information.</p> <p>If the computer has stopped responding and the operating system shutdown procedures are ineffective, press and hold the power button down 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>, or see the <i>HP User Guide</i>.</p>
(2) Speakers (2)	Produce sound.




## Keys



Component	Description
(1) <a href="#">esc</a> key	Displays system information when pressed in combination with the <a href="#">fn</a> key (select models only).
(2) <a href="#">fn</a> key	Displays system information when pressed in combination with the <a href="#">esc</a> key (select models only).
(3)  Operating system logo key	Displays the Start menu.
(4) Action keys	Execute frequently used system functions.
(5)  Operating system applications key	Displays a shortcut menu for items beneath the cursor.
(6) <a href="#">num lock</a>	Alternates between the navigational and numeric functions on the integrated numeric keypad. <b>NOTE:</b> The keypad function that is active when the computer is turned off remains on when the computer is turned back on.
(7) Integrated numeric keypad	Can be used like an external numeric keypad.

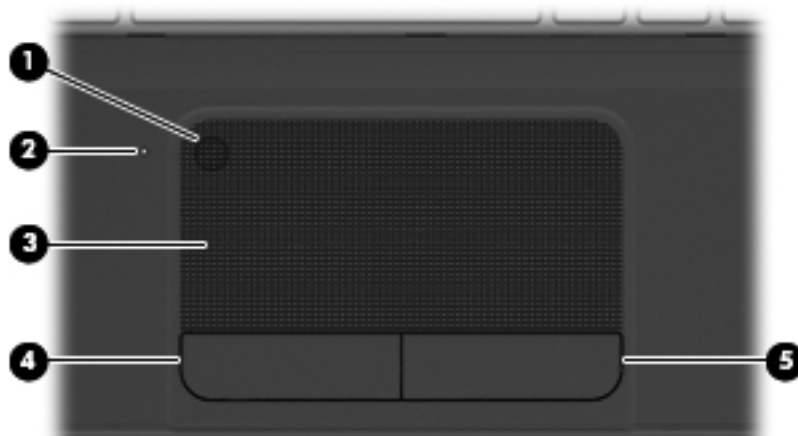
## Lights



Component	Description
(1)  Power light	<ul style="list-style-type: none"><li>• White: The computer is on.</li><li>• Blinking: The computer is in Sleep mode.</li><li>• Off: The computer is off or in Hibernation mode.</li></ul>
(2) Caps lock light	White: Caps lock is on, which switches the keys to all capital letters.
(3)  Mute light	<ul style="list-style-type: none"><li>• Amber: Computer sound is off.</li><li>• Off: Computer sound is on.</li></ul>
(4)  Wireless light	<ul style="list-style-type: none"><li>• White: 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>
(5) TouchPad light	<ul style="list-style-type: none"><li>• Amber: The TouchPad is off.</li><li>• Off: The TouchPad is on.</li></ul>

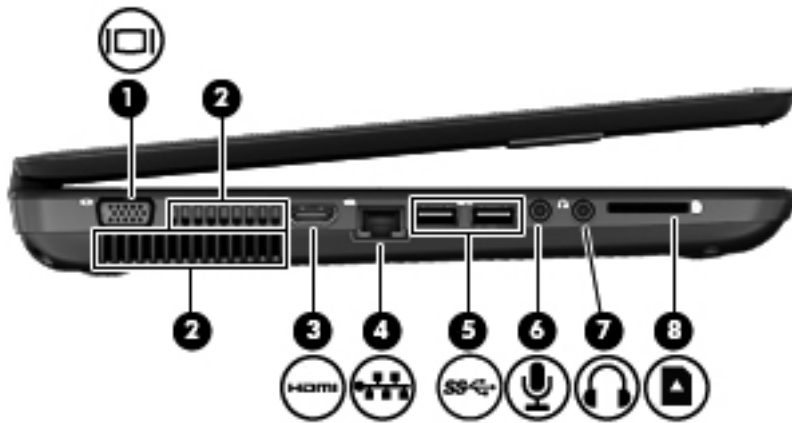









## TouchPad



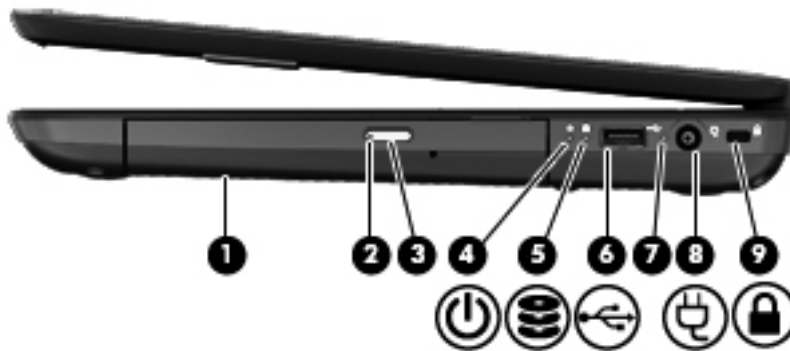
Component	Description
(1) TouchPad on/off button	Turns the TouchPad on or off.
(2) TouchPad light	<ul style="list-style-type: none"><li>• Amber: The TouchPad is off.</li><li>• Off: The TouchPad is on.</li></ul>
(3) TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.
(4) Left TouchPad button	Functions like the left button on an external mouse.
(5) Right TouchPad button	Functions like the right button on an external mouse.






## Left side



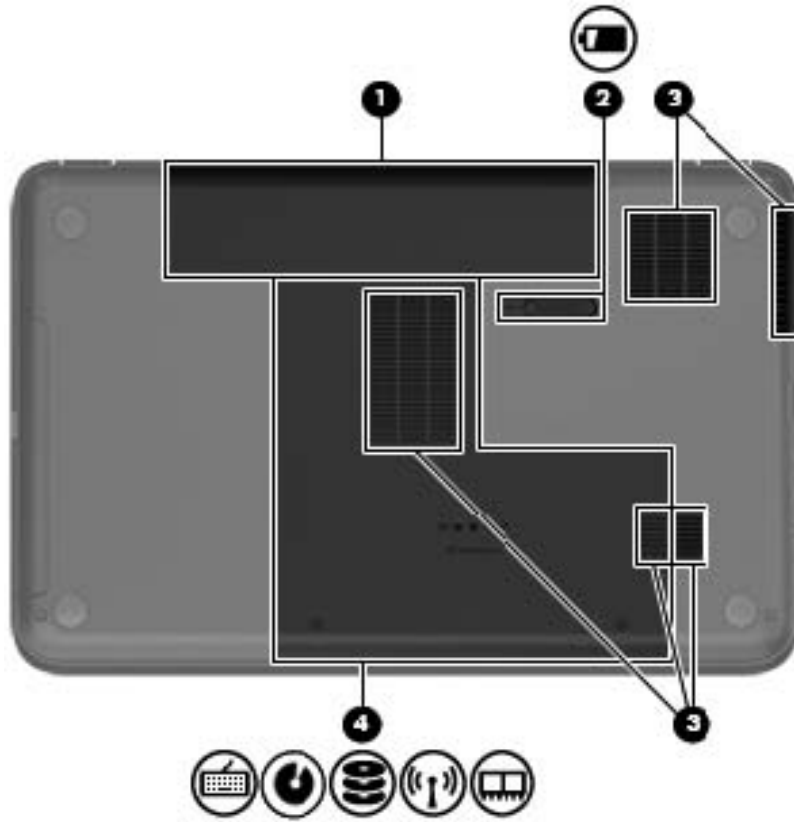
Component	Description
(1) 	External monitor port Connects an external VGA monitor or projector.
(2)	Vents (2) <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3) 	HDMI port Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio device.
(4) 	RJ-45 (network) jack Connects a network cable.
(5) 	USB 3.0 ports (2) Connect optional USB 3.0 compatible devices and provide enhanced USB power performance.
(6) 	Audio-in (microphone) jack Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(7) 	Audio-out (headphone) jack Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. <b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety and Environmental Notices</i> . <b>NOTE:</b> When a device is connected to a headphone jack, the computer speakers are disabled.
(8) 	Digital media slot Supports the following digital card formats: <ul style="list-style-type: none"> <li>Secure Digital (SD) Memory Card</li> <li>Secure Digital Extended Capacity (SDxC) Memory Card</li> <li>Secure Digital High Capacity (SDHC) Memory Card</li> <li>MultiMediaCard (MMC)</li> </ul>







## Right side



Component	Description
(1) Optical drive	Reads and writes to an optical disc.
(2) Optical drive light	<ul style="list-style-type: none"> <li>Green or amber: The optical drive is being accessed.</li> <li>Off: The optical drive is idle.</li> </ul>
(3) Optical drive eject button	Releases the disc tray.
(4)  Power light	<ul style="list-style-type: none"> <li>White: The computer is on.</li> <li>Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components.</li> <li>Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power.</li> </ul>
(5)  Hard drive light	<ul style="list-style-type: none"> <li>Blinking white: The hard drive is being accessed.</li> <li>Amber: HP 3D DriveGuard has temporarily parked the hard drive.</li> </ul>
(6)  USB 2.0 port	Connects an optional USB 2.0 compatible device.
(7) AC adapter light	<ul style="list-style-type: none"> <li>White: The AC adapter is connected and the battery is charged.</li> <li>Blinking white: The battery has reached a low battery level.</li> <li>Amber: The AC adapter is connected and the battery is charging.</li> <li>Off: The computer is using DC power.</li> </ul>
(8)  Power connector	Connects an AC adapter.
(9)  Security cable lock slot	<p>Attaches an optional security cable to the computer.</p> <p><b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p>

# Bottom components



Component	Description
(1)	Battery bay Holds the battery.
(2) 	Battery release latch Releases the battery from the battery bay.
(3)	Vents (5) Enable airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)     	Service door Provides access to the keyboard, optical drive, hard drive, wireless module, and memory modules.  <b>CAUTION:</b> To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact customer support through Help and Support.

# 3 Illustrated parts catalog

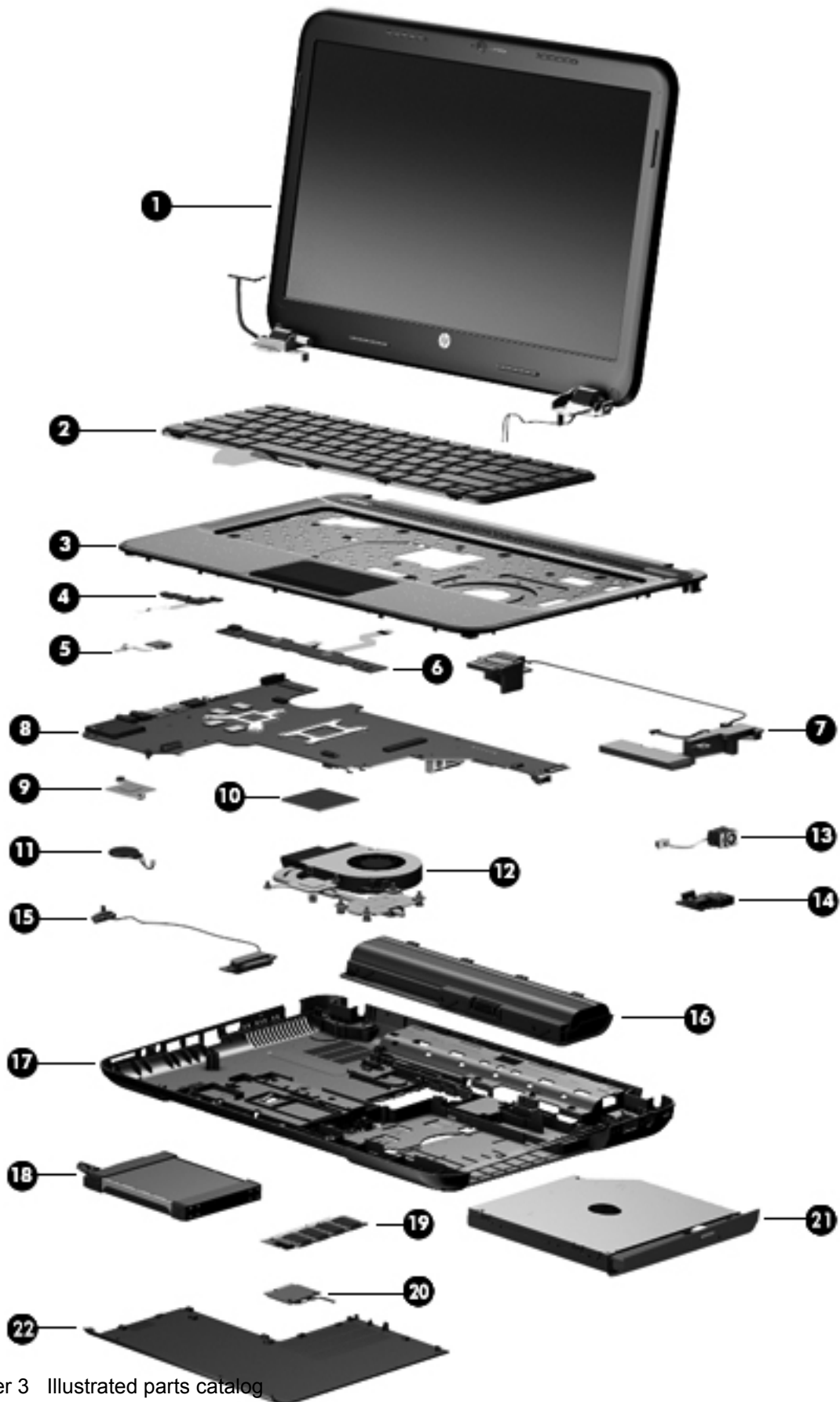
## Serial number location

When ordering parts or requesting information, provide the computer serial number and model number located in the battery bay of the computer.



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

# Computer major components



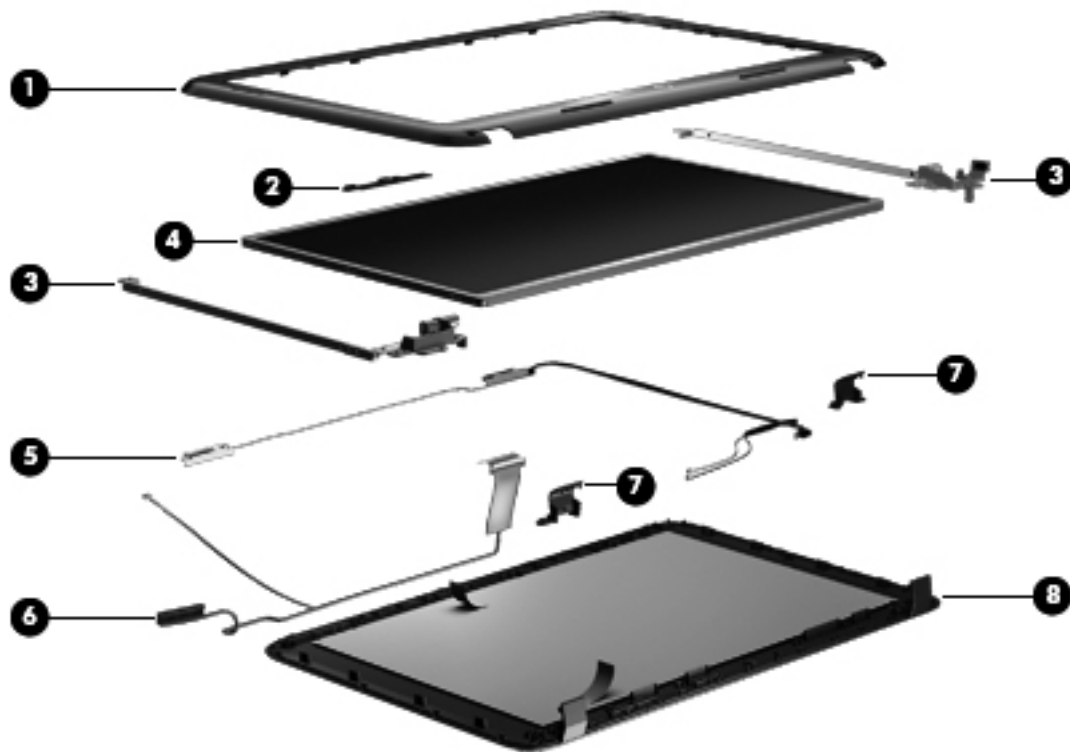
Item	Description	Spare part number
(1)	<b>39.6 cm (15.6 in) High Definition (HD), LED, BrightView (1366×768) display assembly</b>  <b>NOTE:</b> For more display assembly internal component spare part information, see <a href="#">Display assembly subcomponents on page 18</a> .	
(2)	<b>Keyboard</b> (includes keyboard cable):	
	• For use in the United States, Black	681800-001
	• For use in the United Kingdom, Black	681800-031
	• For use in Germany, Black	681800-041
	• For use in France, Black	681800-051
	• For use in Italy, Black	681800-061
	• For use in Spain, Black	681800-071
	• For use in Portugal, Black	681800-131
	• For use in Turkey, Black	681800-141
	• For use in Greece, Black	681800-151
	• For use in Saudi Arabia, Black	681800-171
	• For use in Hungary, Black	681800-211
	• For use in Russia, Black	681800-251
	• For use in Bulgaria, Black	681800-261
	• For use in Romania, Black	681800-271
	• For use in Thailand, Black	681800-281
	• For use in Japan, Black	681800-291
	• For use in Europe, Black	681800-A41
	• For use in Taiwan, Black	681800-AB1
	• For use in Korea, Black	681800-AD1
	• For International use, Black	681800-B31
	• For use in the Adriatics, Black	681800-BA1
	• For use in Israel, Black	681800-BB1
	• For use in Switzerland, Black	681800-BG1
	• For use in the Netherlands, Black	681800-DH1
	• For use in the Adriatics, Black	681800-FL1
	• For use in Canada, Black	681800-DB1
(3)	<b>Top cover</b> (includes TouchPad board):	
	• For use in Ruby red computer models	681823-001
	• For use in Winter blue computer models	681824-001
	• For use in Sparkling black computer models	681825-001

Item	Description	Spare part number
(4)	<b>Power button board</b> (includes cable)	683549-001
(5)	<b>TouchPad LED board</b> (includes cable)	684061-001
(6)	<b>TouchPad button board</b> (includes cable)	683548-001
(7)	<b>Speaker assembly</b> (includes cable)	681821-001
(8)	<b>System board</b> (includes replacement thermal material):	
	<ul style="list-style-type: none"> <li>For use only with computer models equipped with UMA video memory</li> </ul>	683029-001
	<ul style="list-style-type: none"> <li>For use only with computer models equipped with 1024 MB of dedicated discrete video memory</li> </ul>	683030-001
	<ul style="list-style-type: none"> <li>For use only with computer models equipped with 2048 MB of dedicated discrete video memory</li> </ul>	683031-001
(9)	<b>Platform Controller Hub (PCH) heat sink</b>	683843-001
(10)	<b>Processor</b> (includes replacement thermal material):	
	<ul style="list-style-type: none"> <li>AMD A10-4600M processor (3.2 GHz/2.3 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)</li> </ul>	683046-001
	<ul style="list-style-type: none"> <li>AMD A8-4500M processor (2.8 GHz/1.9 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)</li> </ul>	683048-001
	<ul style="list-style-type: none"> <li>AMD A6-4400M processor (3.2 GHz/2.7 GHz, 1600 MHz/1.0 MB L2 cache, DDR3, dual core, 35W)</li> </ul>	683047-001
(11)	<b>RTC battery</b> (includes mounting adhesive)	637193-001
(12)	<b>Heat sink assembly</b> (includes replacement thermal material):	
	<ul style="list-style-type: none"> <li>For use in AMD UMA computer models</li> </ul>	683027-001
	<ul style="list-style-type: none"> <li>For use in AMD discrete computer models</li> </ul>	683028-001
	<ul style="list-style-type: none"> <li>Fan (available separately)</li> </ul>	680551-001
(13)	<b>Power connector</b> (includes cable)	682744-001
(14)	<b>USB board</b> (includes cable)	683547-001
(15)	<b>Optical drive cable</b>	682742-001
(16)	<b>Battery:</b>	
	<ul style="list-style-type: none"> <li>6 cell Li-ion, 2.20 Ah, 47 Wh</li> </ul>	593553-001
	<ul style="list-style-type: none"> <li>6 cell Li-ion, 2.55 Ah, 55 Wh</li> </ul>	593554-001
(17)	<b>Base enclosure</b>	681805-001
(18)	<b>Hard drive:</b>	
	Supports the following <b>9.5 mm, 6.35 cm</b> (2.5 in) SATA hard drives:	
	<ul style="list-style-type: none"> <li>1 TB, 5400 rpm</li> </ul>	676521-001
	<ul style="list-style-type: none"> <li>750 GB, 7200 rpm</li> </ul>	633252-001
	<ul style="list-style-type: none"> <li>750 GB, 5400 rpm</li> </ul>	633250-001
	<ul style="list-style-type: none"> <li>640 GB, 5400 rpm</li> </ul>	669300-001



Item	Description	Spare part number
	<ul style="list-style-type: none"> <li>500 GB, 7200 rpm</li> </ul>	634925-001
	<ul style="list-style-type: none"> <li>500 GB, 5400 rpm</li> </ul>	669299-001
	<ul style="list-style-type: none"> <li>320 GB, 7200 rpm</li> </ul>	641672-001
	<ul style="list-style-type: none"> <li>320 GB, 5400 rpm</li> </ul>	622643-001
	Supports the following <b>7.0 mm, 6.35 cm</b> (2.5 in) SATA hard drives:	
	<ul style="list-style-type: none"> <li>320 GB, 7200 rpm</li> </ul>	634862-001
	<ul style="list-style-type: none"> <li>320 GB, 5400 rpm</li> </ul>	645193-001
	<ul style="list-style-type: none"> <li>Hard Drive Hardware Kit (not illustrated, includes hard drive cable, hard drive bumpers, and hard drive bracket and screws)</li> </ul>	682745-001
<b>(19)</b>	<b>Memory modules</b> (1066 MHz, DDR3):	
	<ul style="list-style-type: none"> <li>4 GB PC3 12800 1600 MHz shared</li> </ul>	641369-001
	<ul style="list-style-type: none"> <li>2 GB PC3 12800 1600 MHz shared</li> </ul>	652972-001
<b>(20)</b>	<b>Wireless (WLAN) module:</b>	
	<ul style="list-style-type: none"> <li>Atheros 9485GN 802.11b/g/n 1×1 WiFi Adapter and 3012 Bluetooth 4.0 Combo Adapter (select models only)</li> </ul>	655795-001
	<ul style="list-style-type: none"> <li>Broadcom 4313GN 802.11b/g/n 1×1 WiFi Adapter and 20702 Bluetooth 4.0+HS Combo Adapter</li> </ul>	657325-001
	<ul style="list-style-type: none"> <li>Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter</li> </ul>	670691-001
	<ul style="list-style-type: none"> <li>Atheros HB125 802.11b/g/n 1×1 WiFi Adapter (select models only)</li> </ul>	675794-001
<b>(21)</b>	<b>Optical drive</b> (includes optical drive bezel and bracket):	
	<ul style="list-style-type: none"> <li>DVD±RW and CD-RW SuperMulti Double-Layer Combo Drive</li> </ul>	681814-001
	<ul style="list-style-type: none"> <li>Blu-ray Disc ROM and DVD±R/RW SuperMulti Double-Layer Drive</li> </ul>	681815-001
<b>(22)</b>	<b>Service Door</b> (included in Plastics kit)	681816-001
	<b>Rubber Kit</b> (not illustrated, includes rubber feet)	680563-001

## Display assembly subcomponents



Item	Description	Spare part number
(1)	Display bezel	681806-001
(2)	Webcam/microphone module	680577-001
(3)	Display hinge kit (includes left and right display hinges and brackets)	681812-001
(4)	39.6 cm (15.6 in) high-definition, BrightView LED display panel	681817-001
(5)	Wireless antenna (includes wireless antenna transceivers and cable)	681813-001
(6)	Display cable (included in the Display Cable Kit)	681808-001
(7)	Display hinge covers	681811-001
(8)	Display back cover (includes logo):	
	• For use in Ruby red computer models	681802-001
	• For use in Winter blue computer models	681803-001
	• For use in Sparkling black computer models	681804-001
	Display Screw Kit (not illustrated)	681819-001

## Mass storage devices



Item	Description	Spare part number
(1)	<b>Optical drive</b> (12.7 mm, SATA, fixed, includes bezel and bracket)	
	<ul style="list-style-type: none"> <li>• Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive</li> </ul>	681814-001
	<ul style="list-style-type: none"> <li>• DVD±RW and CD-RW Super Multi Double-Layer Combo Drive</li> </ul>	681815-001
	<ul style="list-style-type: none"> <li>• Optical drive cable</li> </ul>	682742-001
(2)	<b>Hard drive</b>	
	Supports the following <b>9.50 mm, 6.35 cm</b> (2.50 in) SATA hard drives:	
	<ul style="list-style-type: none"> <li>• 1 TB, 5400 rpm</li> </ul>	676521-001
	<ul style="list-style-type: none"> <li>• 750 GB, 7200 rpm</li> </ul>	633252-001
	<ul style="list-style-type: none"> <li>• 750 GB, 5400 rpm</li> </ul>	634250-001
	<ul style="list-style-type: none"> <li>• 640 GB, 5400 rpm</li> </ul>	669300-001
	<ul style="list-style-type: none"> <li>• 500 GB, 7200 rpm</li> </ul>	634925-001
	<ul style="list-style-type: none"> <li>• 500 GB, 5400 rpm</li> </ul>	669299-001
	<ul style="list-style-type: none"> <li>• 320 GB, 7200 rpm</li> </ul>	641672-001
	<ul style="list-style-type: none"> <li>• 320 GB, 5400 rpm</li> </ul>	622643-001
	Supports the following <b>7.00 mm, 6.35 cm</b> (2.50 in) SATA hard drives:	
	<ul style="list-style-type: none"> <li>• 320 GB, 7200 rpm</li> </ul>	634862-001
	<ul style="list-style-type: none"> <li>• 320 GB, 5400 rpm</li> </ul>	645193-001
	<b>Hard drive hardware kit</b> (includes hard drive cable, hard drive bumpers, and hard drive bracket and screws)	682745-001

## Miscellaneous parts

Description	Spare part number
<b>AC adapters</b>	
<ul style="list-style-type: none"><li>90 W HP Smart AC adapter with Power Factor Correction (PFC) (for computer models equipped with a graphics subsystem with discrete memory only)</li></ul>	609940-001
<ul style="list-style-type: none"><li>65 W HP Smart AC adapter with PFC (for computer models equipped with a graphics subsystem with UMA memory only)</li></ul>	609939-001
<ul style="list-style-type: none"><li>90 W HP Smart AC adapter with PFC (for select computer models equipped with a graphics subsystem with discrete memory only)</li></ul>	609947-001
<ul style="list-style-type: none"><li>65 W HP Smart AC adapter (for select computer models equipped with a graphics subsystem with UMA memory only)</li></ul>	609948-001
<b>Power cord, AC, 3 wire, black, 1.83 m</b>	
<ul style="list-style-type: none"><li>For use in North America</li></ul>	490371-001
<ul style="list-style-type: none"><li>For use in Australia</li></ul>	490371-011
<ul style="list-style-type: none"><li>For use in Europe</li></ul>	490371-021
<ul style="list-style-type: none"><li>For use in the United Kingdom and Singapore</li></ul>	490371-031
<ul style="list-style-type: none"><li>For use in Italy</li></ul>	490371-061
<ul style="list-style-type: none"><li>For use in Denmark</li></ul>	490371-081
<ul style="list-style-type: none"><li>For use in Switzerland</li></ul>	490371-111
<ul style="list-style-type: none"><li>For use in Japan</li></ul>	490371-291
<ul style="list-style-type: none"><li>For use in the People's Republic of China</li></ul>	490371-AA1
<ul style="list-style-type: none"><li>For use in Taiwan</li></ul>	490371-AB1
<ul style="list-style-type: none"><li>For use in South Korea</li></ul>	490371-AD1
<ul style="list-style-type: none"><li>For use in South Africa</li></ul>	490371-AR1
<ul style="list-style-type: none"><li>For use in Israel</li></ul>	490371-BB1
<ul style="list-style-type: none"><li>For use in India</li></ul>	490371-D61
<b>Thermal pad</b>	680571-001
<b>Display screw kit</b>	681819-001
<b>Screw kit</b>	681820-001

## Sequential part number listing

Spare part number	Description
490371-001	Power cord, AC, 3 wire, black, 1.83 m for use in North America
490371-011	Power cord, AC, 3 wire, black, 1.83 m for use in Australia
490371-021	Power cord, AC, 3 wire, black, 1.83 m for use in Europe
490371-031	Power cord, AC, 3 wire, black, 1.83 m for use in the United Kingdom and Singapore
490371-061	Power cord, AC, 3 wire, black, 1.83 m for use in Italy
490371-081	Power cord, AC, 3 wire, black, 1.83 m for use in Denmark
490371-111	Power cord, AC, 3 wire, black, 1.83 m for use in Switzerland
490371-291	Power cord, AC, 3 wire, black, 1.83 m for use in Japan
490371-AA1	Power cord, AC, 3 wire, black, 1.83 m for use in the People's Republic of China
490371-AB1	Power cord, AC, 3 wire, black, 1.83 m for use in Taiwan
490371-AD1	Power cord, AC, 3 wire, black, 1.83 m for use in Korea
490371-AR1	Power cord, AC, 3 wire, black, 1.83 m for use in South Africa
490371-BB1	Power cord, AC, 3 wire, black, 1.83 m for use in Israel
490371-D61	Power cord, AC, 3 wire, black, 1.83 m for use in India
593553-001	Battery, 6 cell, 2.20 Ah, 47 Wh
593554-001	Battery, 6-cell, 2.55 Ah, 55 Wh
609939-001	65 W AC adapter
609940-001	90 W AC adapter
609947-001	90 W AC adapter (EM)
609948-001	65 W AC adapter (EM)
622643-001	320 GB, 5400 rpm hard drive
633252-001	750 GB, 7200 rpm hard drive
634250-001	750 GB, 5400 rpm hard drive
634862-001	320 GB, 7200 rpm hard drive
634925-001	500 GB, 7200 rpm hard drive
637193-001	RTC battery (includes mounting adhesive)
641369-001	4 GB (PC3, 12800, 1600 MHz) memory module
641672-001	320 GB, 7200 rpm hard drive
645193-001	320 GB, 5400 rpm hard drive
652972-001	2 GB (PC3, 12800, 1600 MHz) memory module
655795-001	WLAN Atheros 9485GN 802.11b/g/n 1×1 WiFi Adapter and 3012 Bluetooth 4.0 Combo Adapter (select models only)
656120-001	WLAN Ralink RT5390BC8 802.11b/g/n 1×1 WiFi and Bluetooth 3.0+HS Combo Adapter

<b>Spare part number</b>	<b>Description</b>
657325-001	WLAN Broadcom 4313GN 802.11b/g/n 1×1 WiFi Adapter and 20702 Bluetooth 4.0+HS Combo Adapter
669299-001	500 GB, 5400 rpm hard drive
669300-001	640 GB, 5400 rpm hard drive
670691-001	WLAN Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter
675794-001	WLAN Atheros HB125 802.11b/g/n 1×1 WiFi Adapter (select models only)
676521-001	1 TB, 5400 rpm hard drive
680551-001	Fan
680563-001	Rubber Kit (includes rubber feet)
680571-001	Thermal Material Kit (includes replacement thermal paste and pads)
680577-001	Webcam/microphone module
681800-001	Keyboard for use in the United States, black
681800-031	Keyboard for use in the United Kingdom, black
681800-041	Keyboard for use in Germany, black
681800-051	Keyboard for use in France, black
681800-061	Keyboard for use in Italy, black
681800-071	Keyboard for use in Spain, black
681800-131	Keyboard for use in Portugal, black
681800-141	Keyboard for use in Turkey, black
681800-151	Keyboard for use in for use in Greece, Black
681800-171	Keyboard for use in Saudi Arabia, black
681800-211	Keyboard for use in Hungary, black
681800-251	Keyboard for use in Russia, black
681800-261	Keyboard for use in Bulgaria, black
681800-271	Keyboard for use Romania, black
681800-291	Keyboard for use in Japan, black
681800-A41	Keyboard for use in Europe, black
681800-AB1	Keyboard for use in Taiwan, black
681800-AD1	Keyboard for use in Korea, black
681800-B31	Keyboard for International use, black
681800-BA1	Keyboard for use in the Adriatics, black
681800-BB1	Keyboard for use in Israel, black
681800-BG1	Keyboard for use in Switzerland, black
681800-DB1	Keyboard for use in Canada, black
681800-DH1	Keyboard for use in the Netherlands, black

Spare part number	Description
681800-FL1	Keyboard for use in the Adriatics, black
681802-001	Display back cover for use in Ruby red computer models
681803-001	Display back cover for use in Winter blue computer models
681804-001	Display back cover for use in Sparkling black computer models
681805-001	Base enclosure
681806-001	Display Bezel
681808-001	Display cable
681811-001	Display hinge covers
681812-001	Display bracket (with hinges)
681813-001	Wireless antenna (includes wireless antenna transceivers and cable)
681814-001	Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive
681815-001	DVD±RW and CD-RW Super Multi Double-Layer Combo Drive
681816-001	Service Door (included in Plastics kit)
681817-001	<b>39.6 cm</b> (15.6 in) high-definition, BrightView LED display panel
681819-001	Display screw kit
681820-001	Screw kit
681821-001	Speaker assembly (includes cable)
681823-001	Top cover for use in Ruby red computer models
681824-001	Top cover for use in Winter blue computer models
681825-001	Top cover for use in Sparkling black computer models
682742-001	Optical drive cable
682744-001	Power connector
682745-001	Hard drive hardware kit (includes hard drive cable, hard drive bumpers, and hard drive bracket and screws)
683027-001	Heat sink for use only with computer models equipped with UMA video memory
683028-001	Heat sink for use only with computer models equipped with discrete video memory
683029-001	System board for use only with computer models equipped with UMA video memory (includes replacement thermal material)
683030-001	System board for use only with computer models equipped with a graphics subsystem with 1 GB of switchable discrete video memory (includes replacement thermal material)
683031-001	System board for use only with computer models equipped with a graphics subsystem with 2 GB of switchable discrete video memory (includes replacement thermal material)
683046-001	AMD A10-4600M processor (3.2 GHz/2.3 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)
683047-001	AMD A8-4500M processor (3.2 GHz/2.1 GHz, 1600 MHz/1.0 MB L2 cache, DDR3, quad core, 35W)
683048-001	AMD A6-4400M processor (3.0 GHz/2.6 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, dual core, 35W)
683547-001	USB board (includes cable)

<b>Spare part number</b>	<b>Description</b>
683548-001	TouchPad button board
683549-001	Power button board
683843-001	PCH heat sink
684061-001	TouchPad LED board



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# 4 Removal and replacement procedures

## Preliminary replacement requirements

### Tools required


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

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

### Service considerations

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


---

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

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### Plastic parts


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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.

---

### 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.

---

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

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

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## Grounding guidelines

### Electrostatic discharge damage

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

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

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

---

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

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

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.

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

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

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**Typical electrostatic voltage levels**

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<b>Event</b>	<b>Relative humidity</b>		
	<b>10%</b>	<b>40%</b>	<b>55%</b>
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

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## Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

## Workstation guidelines

Follow these grounding workstation guidelines:

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

## Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

Material	Use	Voltage protection level
Antistatic plastics	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 63 screws that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw and screw lock size and location during removal and replacement.

## Service label

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

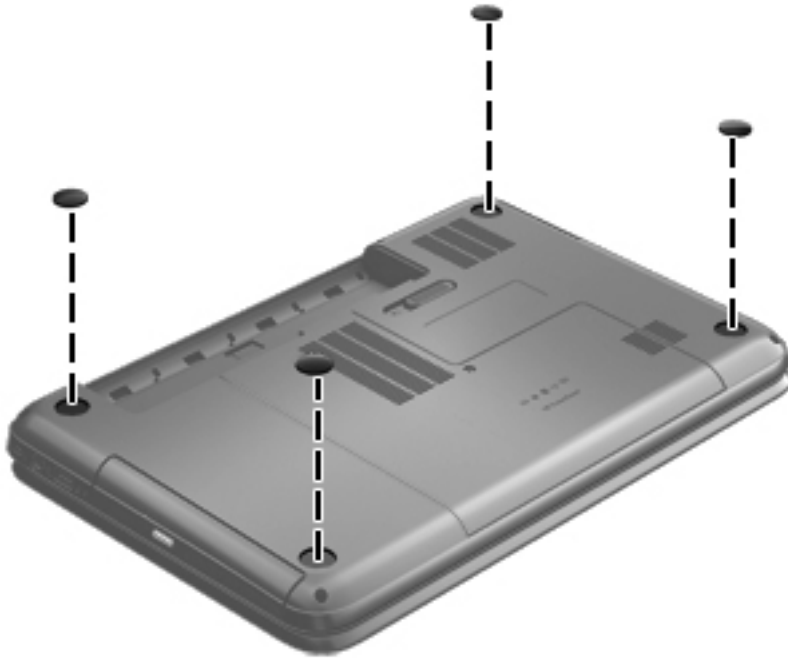


Item	Description	Function
(1)	Product name	The name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components.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

## Computer feet

Description	Spare part number
Rubber feet kit	680563-001

The computer feet are adhesive-backed rubber pads. There are 4 rubber feet that attach to the base enclosure in the locations illustrated below.



## Battery

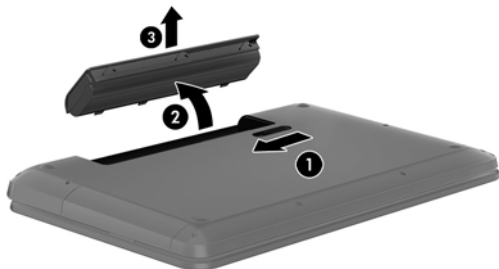
Description	Spare part number
6 cell, 55-Whr, 2.55-Ah Li-ion battery	593554-001
6 cell, 47-Whr, 2.20-Ah Li-ion battery	593553-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Slide the battery release latch **(1)** to release the battery.
2. Pivot the front edge of the battery **(2)** up and back.
3. Remove the battery **(3)** from the computer.



To insert the battery:

1. Align the tabs on the rear edge of the battery **(1)** with the notches on the rear edge of the battery bay.
2. Pivot the front edge of the battery **(2)** down into the battery bay until it is seated. (The battery release latch will automatically lock into place.)





## Service door

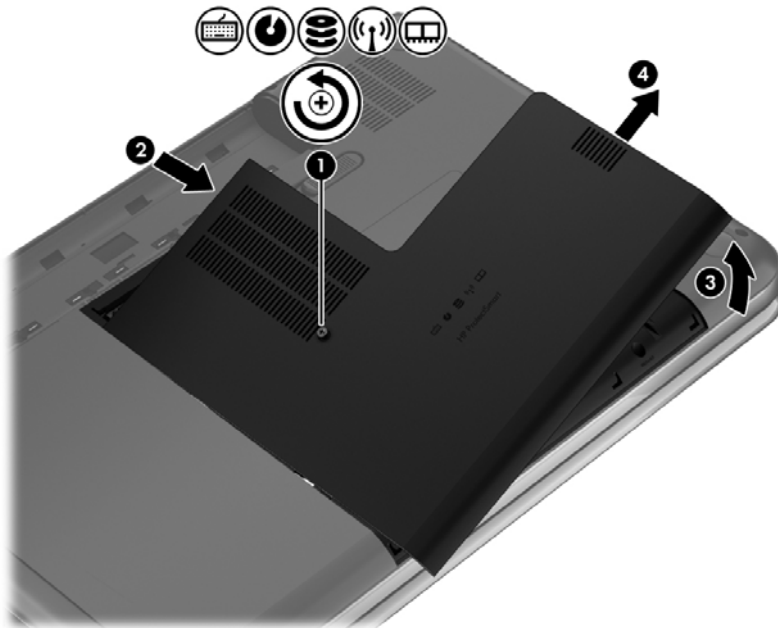
Description	Spare part number
<b>Plastics kit</b> (contains the service door)	681816-001

Before removing the service door, 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 32](#)).

Remove the service door:

1. Using a small Phillips screwdriver, loosen the service door capture screw (1).
2. Slide the service door (2) forward slightly and lift the front right corner (3) to tilt the service door.
3. Remove the service door (4) at an angle.



Reverse this procedure to replace the service door.

## Optical drive



**NOTE:** The optical drive spare part kit includes a bezel and bracket.

Description	Spare part number
Blu-ray ROM DVD±R/RW Super Multi Double-Layer Drive	681814-001
DVD±RW and CD-RW Super Multi Double-Layer Combo Drive	681815-001
Optical drive cable kit	682742-001

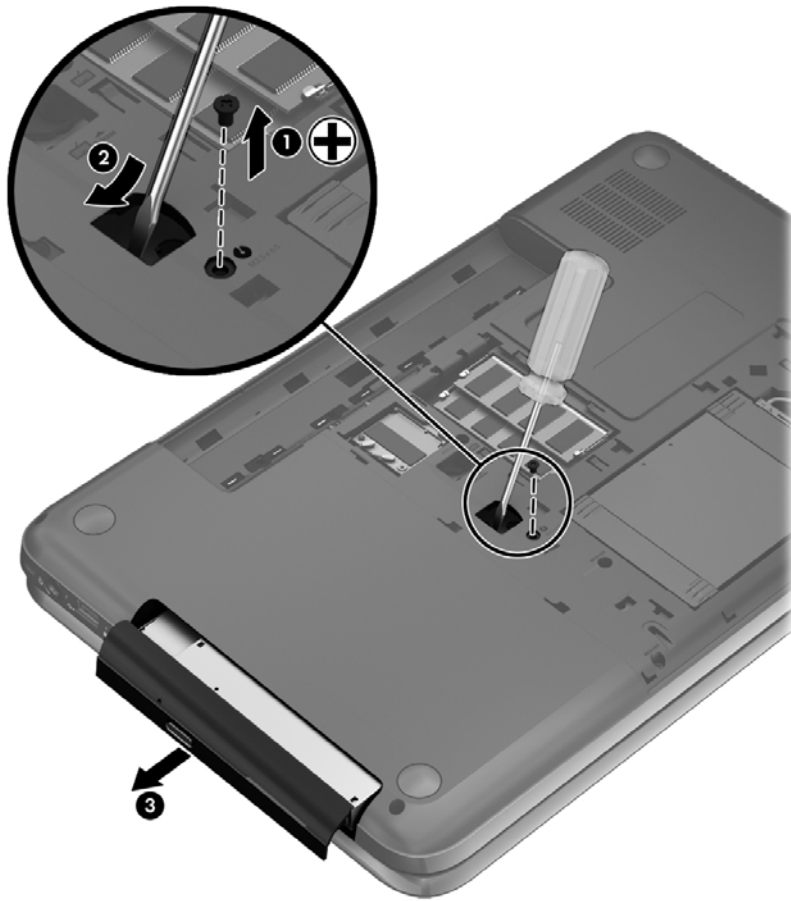
Before removing the optical drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).

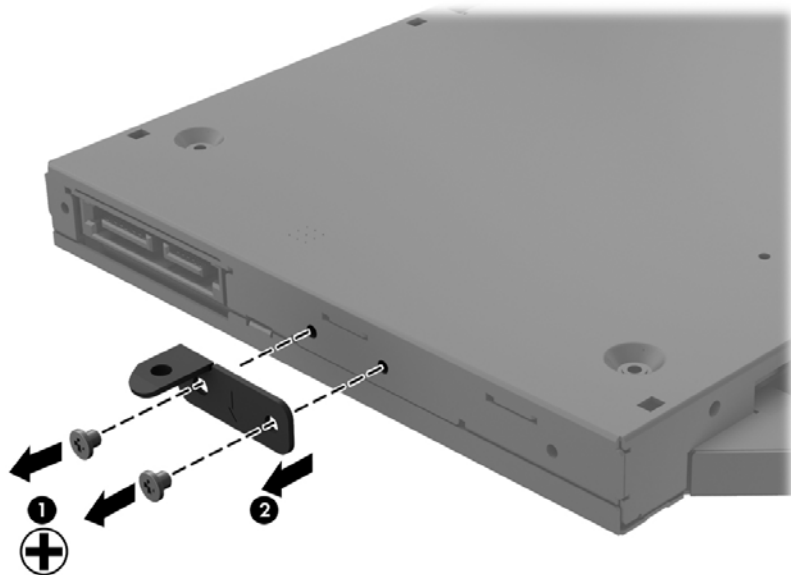
Remove the optical drive:

1. Using a small Phillips screwdriver, remove the PM 2.5 x 6.5 screw **(1)** that secures the optical drive to the computer.
2. Insert a screwdriver or other narrow tool through the release access hole **(2)** in the bottom of the computer. Push the rear of the optical drive until it is released.

3. Pull the optical drive (3) out from the front until the optical drive is completely removed from the computer.

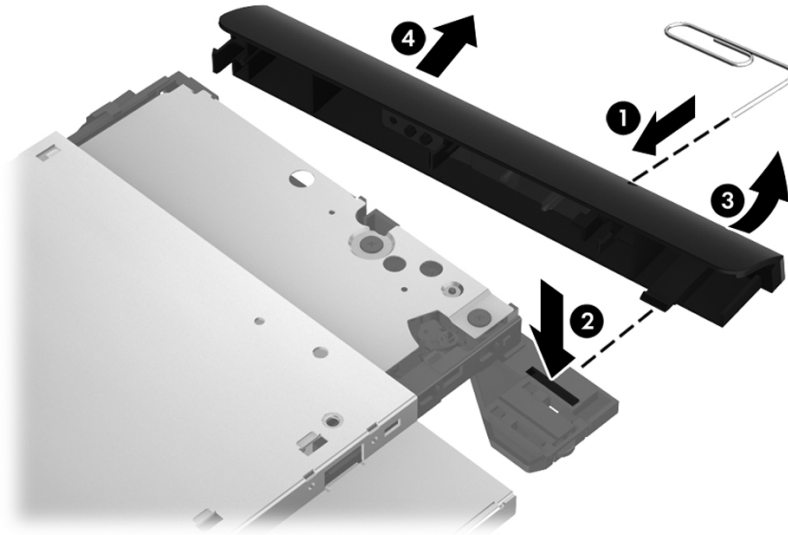


4. Remove the 2 PM 2.0 x 3.0 screws (1) that secure the optical drive bracket to the optical drive and then remove the bracket (2) from the optical drive.



5. Insert a straightened paper clip (1) into the release access opening in the bezel.

6. Press the release tab (2) and remove the bezel from the tab side (3).
7. Remove the bezel (4) from the optical drive.



Reverse this procedure to reassemble and install the optical drive.

## Hard drive



**NOTE:** The hard drive spare part kit does not include the hard drive cable, hard drive bumpers, or hard drive bracket and screws.

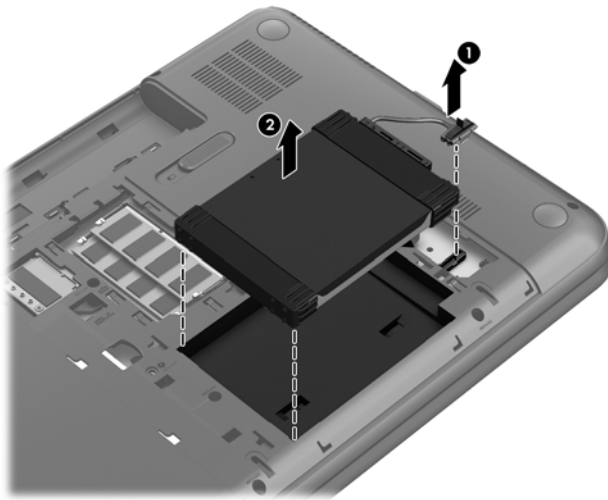
Description	Spare part number
Supports the following <b>9.50 mm, 6.35 cm</b> (2.50 in) SATA hard drives:	
1 TB, 5400 rpm	676521-001
750 GB, 7200 rpm	633252-001
750 GB, 5400 rpm	634250-001
640 GB, 5400 rpm	669300-001
500 GB, 7200 rpm	634925-001
500 GB, 5400 rpm	669299-001
320 GB, 7200 rpm	641672-001
320 GB, 5400 rpm	622643-001
Supports the following <b>7.00 mm, 6.35 cm</b> (2.50 in) SATA hard drives:	
320 GB, 7200 rpm	634862-001
320 GB, 5400 rpm	645193-001
Hard drive hardware kit (includes hard drive cable, hard drive bumpers, and hard drive bracket and screws)	682745-001

Before removing the hard drive, follow these steps:

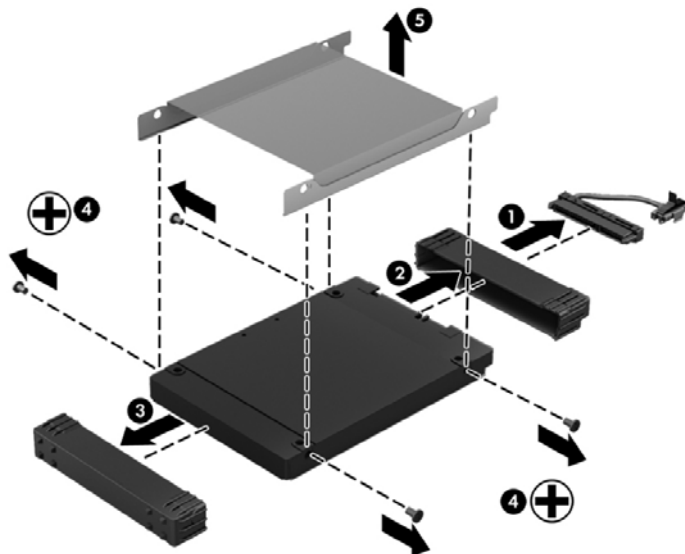
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).

Remove the hard drive:

1. Disconnect the hard drive cable (1) from the computer.
2. Lift the hard drive (2) to remove.




3. Disconnect the hard drive cable (1). Remove the front bumper (2) and back bumper (3).
4. Remove the 4 PM 3.0 x 3.5 screws (4), and then remove the bracket (5) from the hard drive.





## Replacing the hard drive

Reverse this procedure to reassemble and install the hard drive.

## Memory module


 **WARNING!** To reduce the risk of electric shock and damage to the equipment, unplug the power cord and remove all batteries before installing a memory module.

 **CAUTION:** Electrostatic discharge (ESD) can damage electronic components. Before beginning any procedure, ensure that you are discharged of static electricity by touching a grounded metal object.

 **NOTE:** To use a dual-channel configuration with a second memory module, be sure that both memory modules are identical.

Description	Spare part number
4 GB (PC3, 12800, 1600 MHz)	641369-001
2 GB (PC3, 12800, 1600 MHz)	652972-001

Before removing a memory module, follow these steps:

 **CAUTION:** To prevent information loss or an unresponsive system:

Shut down the computer before adding or replacing memory modules. Do not remove a memory module while the computer is on, in the Sleep state, or in Hibernation.

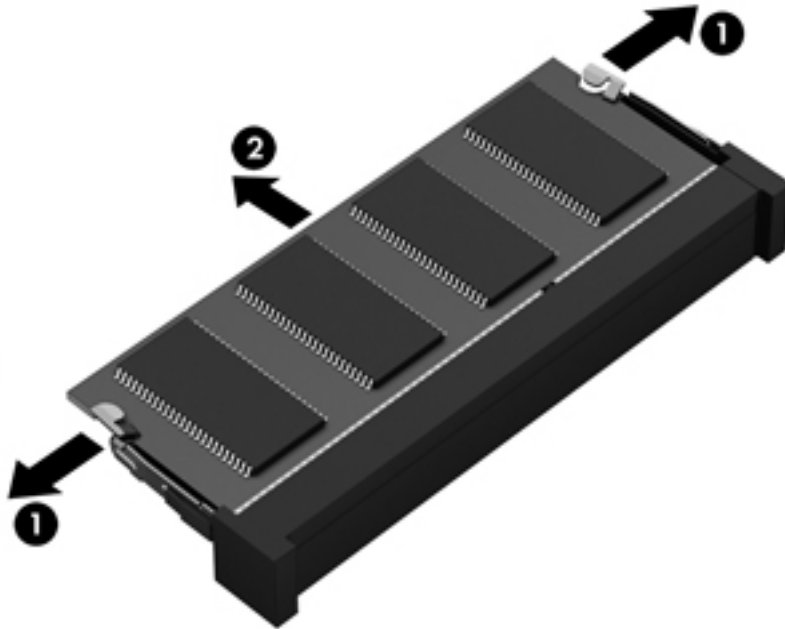
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).

To add or replace a memory module:

1. Spread the retention clips **(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.

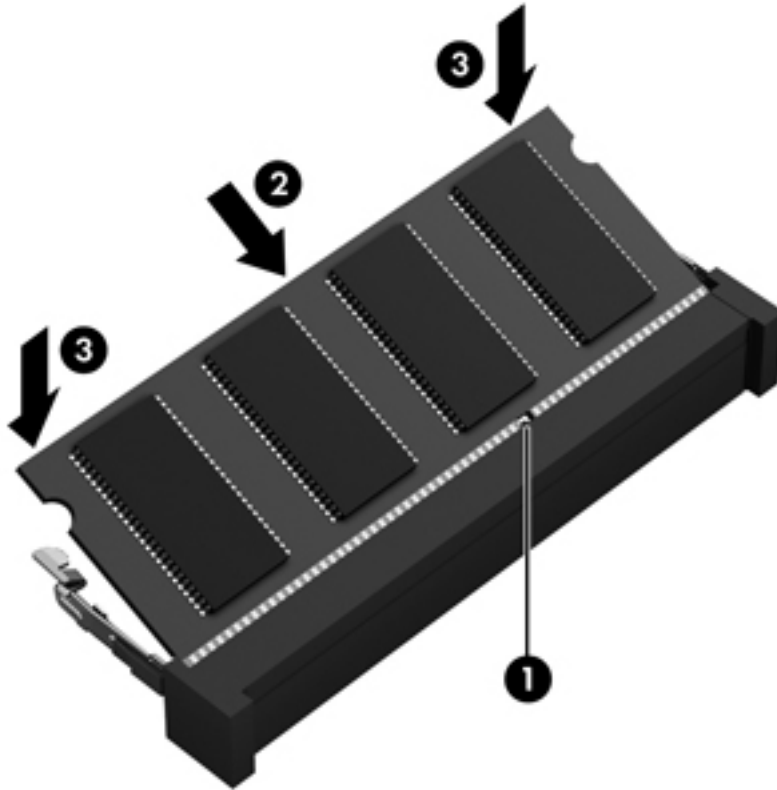
**⚠ CAUTION:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.



**⚠ CAUTION:** To protect a memory module after removal, place it in an electrostatic-safe container.

3. Align the notched edge **(1)** of the memory module with the tab in the memory module slot.
4. With the memory module at a 45-degree angle from the surface of the memory module compartment, press the module into the memory module slot **(2)** until it is seated.


5. Gently press the memory module (**3**) down, applying pressure to both the left and right edges of the module, until the retention clips snap into place.





## WLAN module

Description	Spare part number
<b>Atheros 9485GN</b> 802.11b/g/n 1×1 WiFi Adapter and 3012 Bluetooth 4.0 Combo Adapter (select models only)	655795-001
<b>Broadcom 4313GN</b> 802.11b/g/n 1×1 WiFi Adapter and 20702 Bluetooth 4.0+HS Combo Adapter	657325-001
<b>Ralink RT5390R</b> 802.11b/g/n 1×1 WiFi Adapter	670691-001
<b>Atheros HB125</b> 802.11b/g/n 1×1 WiFi Adapter (select models only)	675794-001

 **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 device functionality, and then contact technical support.

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).

Remove the WLAN module:


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

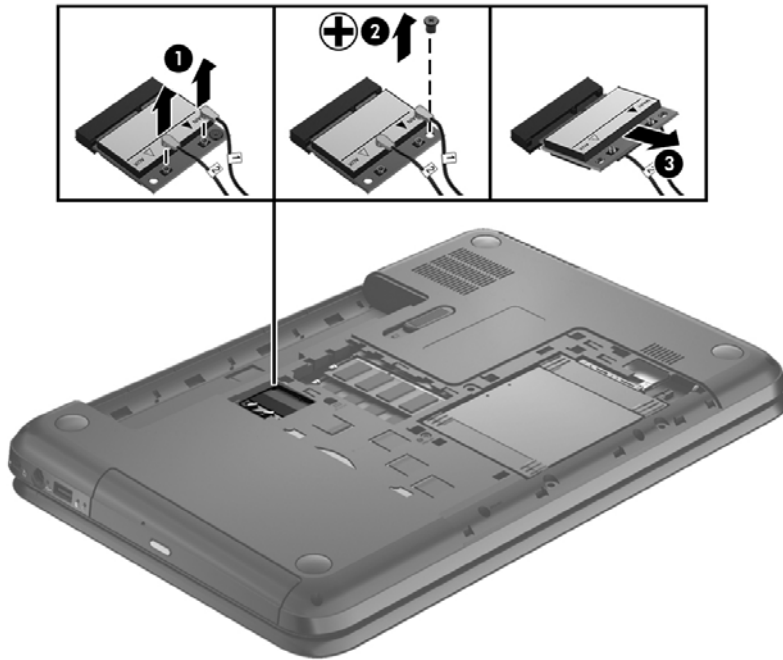


**NOTE:** The 1/black WLAN antenna cable is connected to the WLAN module 1/Main terminal. The 2/gray WLAN antenna cable is connected to the WLAN module 2/Aux terminal.

2. Remove the PM 2.5 × 2.5 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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

 **NOTE:** The WLAN module is designed with a notch to prevent incorrect installation into the WLAN module socket.



Reverse this procedure to install the WLAN module.

# Keyboard



**NOTE:** The keyboard spare part kit includes a keyboard cable.

Description	Spare part number
<b>Keyboard</b>	
• For use in the United States, Black	681800-001
• For use in the United Kingdom, Black	681800-031
• For use in Germany, Black	681800-041
• For use in France, Black	681800-051
• For use in Italy, Black	681800-061
• For use in Spain, Black	681800-071
• For use in Portugal, Black	681800-131
• For use in Turkey, Black	681800-141
• For use in Greece, Black	681800-151
• For use in Saudi Arabia, Black	681800-171
• For use in Hungary, Black	681800-211
• For use in Russia, Black	681800-251
• For use in Bulgaria, Black	681800-261
• For use in Romania, Black	681800-271
• For use in Japan, Black	681800-291
• For use in Europe, Black	681800-A41
• For use in Taiwan, Black	681800-AB1
• For use in Korea, Black	681800-AD1
• For International use, Black	681800-B31
• For use in Adriatics, Black	681800-BA1
• For use in Israel, Black	681800-BB1
• For use in Switzerland, Black	681800-BG1
• For use in Canada, Black	681800-DB1
• For use in the Netherlands, Black	681800-DH1
• For use in the Czech Republic and Slovakia, Black	681800-FL1

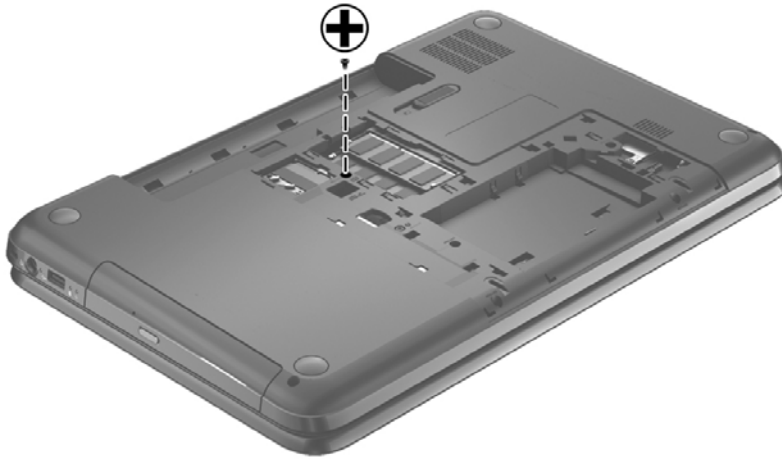
Before removing the keyboard, follow these steps:

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the hard drive (see [Xref Error! Target does not exist.](#))



Remove the keyboard:

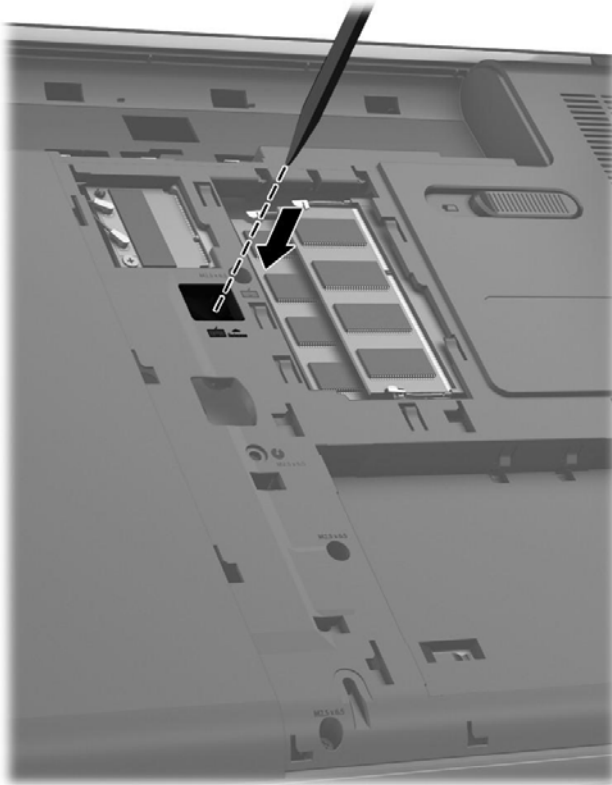
1. Remove the PM 2.5 × 6.5 screw that secures the keyboard to the computer.



2. Rest the computer on its left side.
3. Open the computer.

- Using a thin, non-conductive tool, press on the back of the keyboard through the release access hole until the keyboard disengages from the computer.

 **NOTE:** The keyboard icon  indicates the location of the keyboard release access hole.



- Turn the computer right-side up with the front toward you.
- Lift the rear edge of the keyboard (1), and then swing the keyboard (2) up and forward until it rests upside down on the palm rest.



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



8. Remove the keyboard.

Reverse this procedure to install the keyboard.

## Top cover



**NOTE:** The top cover spare part kit includes the TouchPad.

Description	Spare part number
Ruby red	681823-001
Winter blue	681824-001
Sparkling black	681825-001

Before removing the top cover, follow these steps:

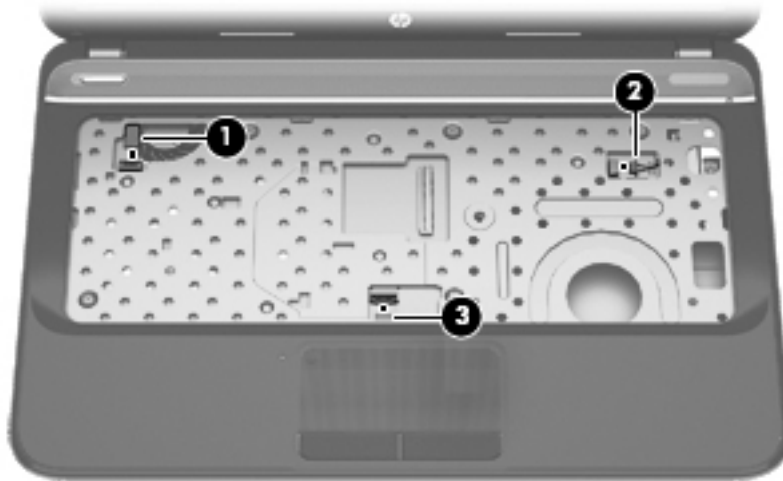
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).

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 and cable (see [Power button board on page 51](#)).
- TouchPad button board and cable (see [TouchPad button board on page 53](#)).
- TouchPad LED board and cable (see [TouchPad LED board on page 54](#)).
- Speakers and cable (see [Speakers on page 50](#)).

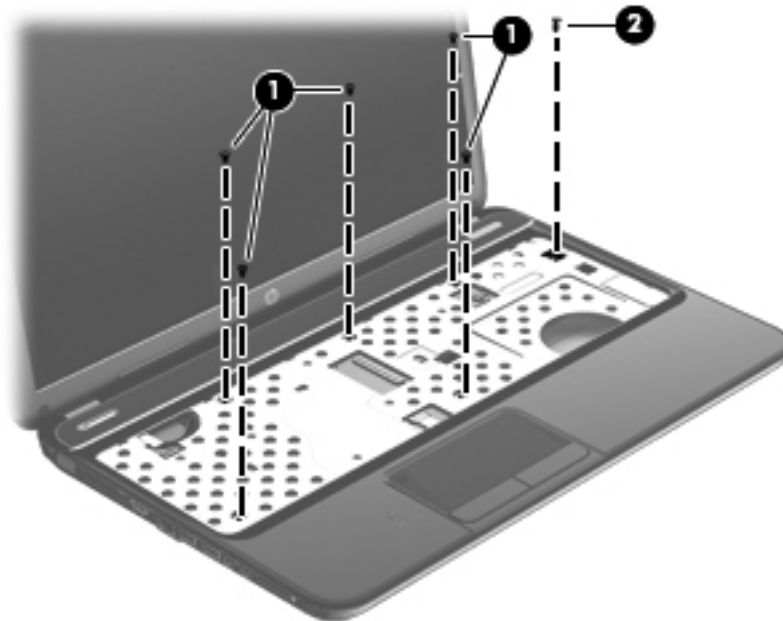
Remove the top cover:

1. Disconnect these cables from the system board:
  - (1) Power button board ZIF cable
  - (2) Speaker cable
  - (3) TouchPad button board ZIF cable



2. Remove the following screws under the keyboard:
  - (1) Five PM 2.5 x 4.0
  - (2) One PM 2.5 x 6.5

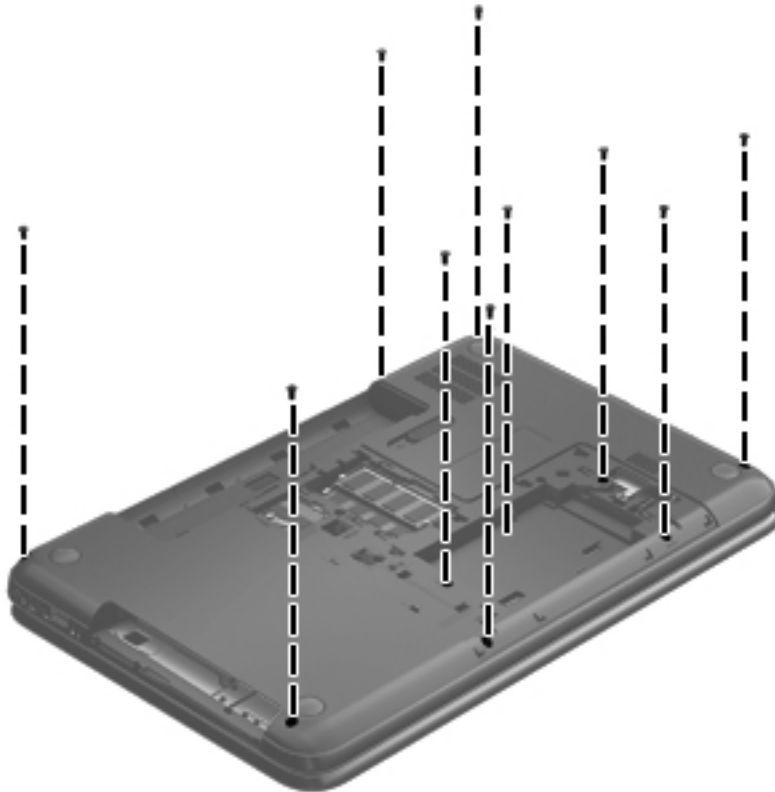
 **NOTE:** This screw (2) also secures the speaker underneath the top cover.



3. Close the computer.
4. Turn the computer upside down, with the front toward you.



5. Remove the following ten PM 2.5 x 6.5 screws that secure the top cover to the computer.



6. Turn the computer right-side up, with the front toward you.
7. Open the computer.
8. Lift the front edge of the top cover (1) until the left and right sides disengage from the base enclosure.
9. Remove the top cover (2).



Reverse this procedure to install the top cover.

## Speakers

Description	Spare part number
<b>Speaker Kit</b> (includes left and right speakers and cable)	681821-001

Before removing the speakers, 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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).

Remove the speakers:

1. There are two clips that hold the left speaker in place **(1)**.



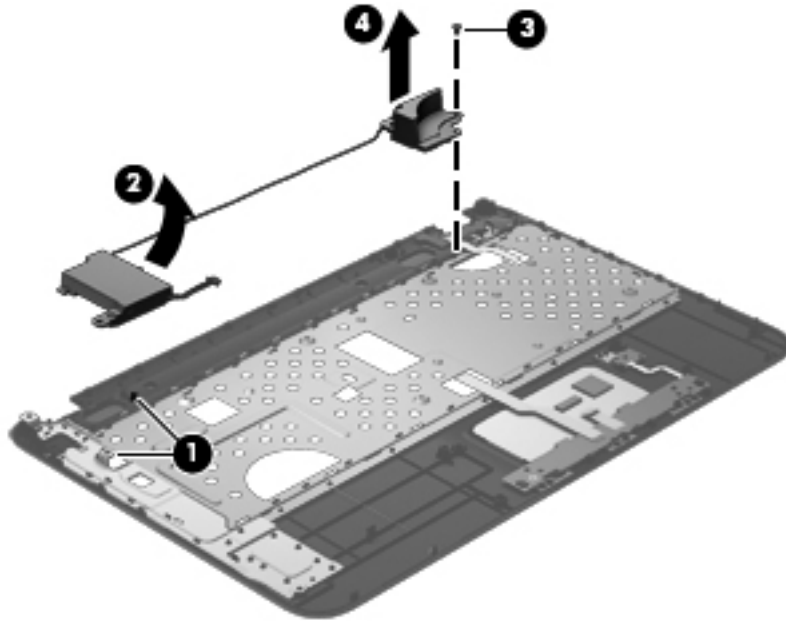
**NOTE:** A previously removed top cover screw also secures the right speaker in place.

2. Rotate and lift the left speaker from the top cover **(2)**. Release the speaker cable from the clips built into the top cover.
3. Remove one PM 2.5 x 3.5 screw **(3)** from the right speaker that secures it to the top cover **(2)**.



**NOTE:** This screw also secures the power button board to the top cover.

- Lift the speakers from the top cover (4).



Reverse this procedure to install the speakers.

## Power button board


Description	Spare part number
Power button board	683549-001

Before removing the power button board, follow these steps:

- Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Disconnect all external devices connected to the computer.
- Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- Remove the battery (see [Battery on page 32](#)).
- Remove the service door (see [Service door on page 33](#)).
- Remove the optical drive (see [Optical drive on page 34](#)).
- Remove the hard drive (see [Xref Error! Target does not exist.](#))
- Remove the keyboard (see [Keyboard on page 43](#)).
- Remove the top cover (see [Top cover on page 47](#)).
- Remove the speakers (see [Speakers on page 50](#)).

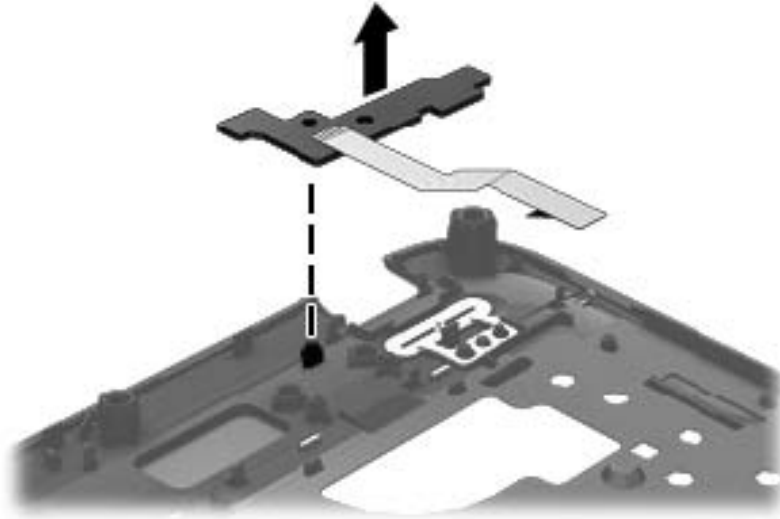
Remove the power button board:

1. Turn the top cover upside down, with the front toward you.

 **NOTE:** The power button board is secured by a screw that was previously removed when releasing the speaker.

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2. Release the tape securing the power button board cable and remove the power button board and cable.



Reverse this procedure to install the power button board.

## TouchPad button board

Description	Spare part number
TouchPad button board (includes cable)	683548-001

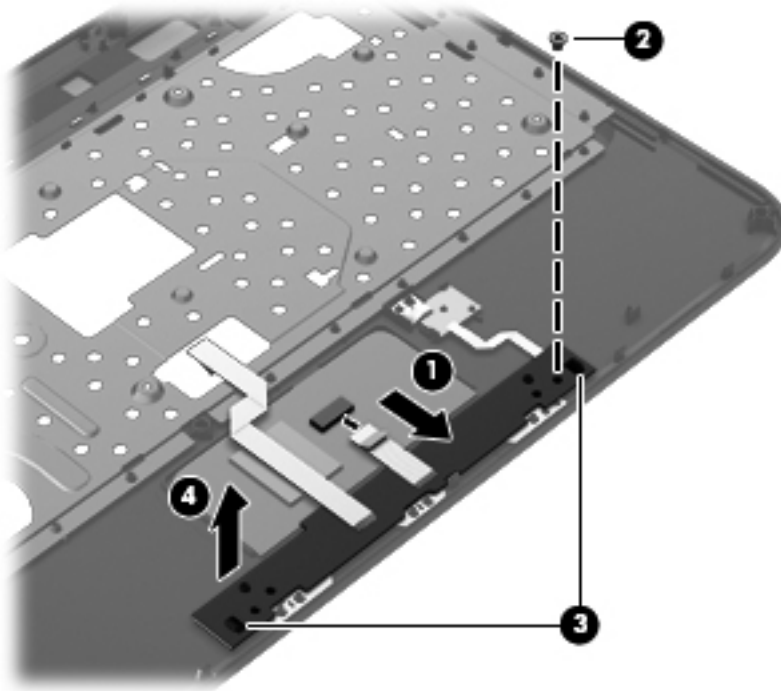
Before removing the TouchPad button board, follow these steps:

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).

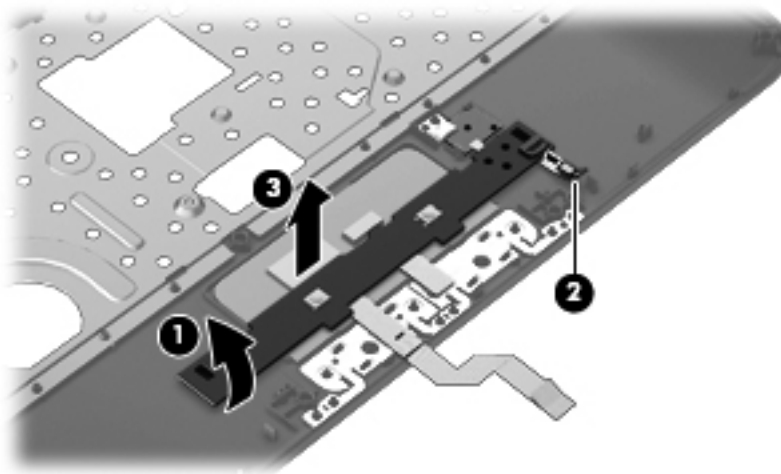
Remove the TouchPad button board and cable:

1. Turn the top cover upside down, with the front toward you.
2. Release the ZIF connector to which the TouchPad button board cable is connected, and then disconnect the TouchPad button board cable **(1)** from the back of the TouchPad.
3. Remove the PM 2.5 x 2.5 screw **(2)** that secures the TouchPad button board cable to the top cover.
4. Lift the front edge of the TouchPad button board **(3)** until it is released from the clips built into the top cover.

5. Lift the TouchPad button board (4) slightly to perform the next step.



6. Carefully invert the TouchPad button board (1).
7. Release the ZIF connector to which the TouchPad LED board cable is connected, and then disconnect the TouchPad LED board cable (2) from the TouchPad button board.
8. Lift the TouchPad button board away from the top cover (3).



Reverse this procedure to install the TouchPad button board and cable.

## TouchPad LED board

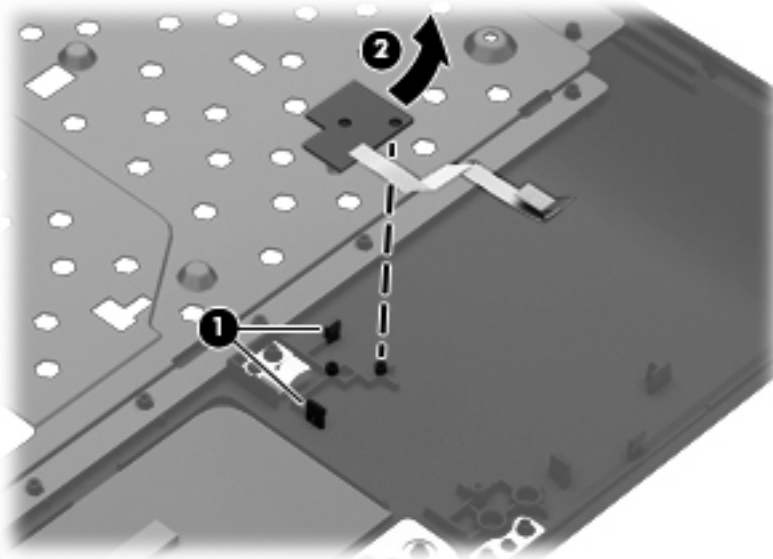
Description	Spare part number
TouchPad LED board (includes cable)	684061-001

Before removing the TouchPad LED board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).
10. Remove the TouchPad button board (see [TouchPad button board on page 53](#)).

Remove the TouchPad LED board and cable:

1. Turn the top cover upside down, with the front toward you.
2. Apply slight pressure to the retention clips **(1)** of the top cover.
3. Lift the TouchPad LED board on the right front corner **(2)** up and away from the top cover.



4. Remove the TouchPad LED board and cable.

Reverse this procedure to install the TouchPad LED board and cable.

## Display assembly

Description	Spare part number
<b>Display back cover:</b>	
• Ruby red	681802-001
• Winter blue	681803-001
• Sparkling black	681804-001
<b>Bezel</b>	681806-001
<b>Webcam/microphone module</b>	680577-001
<b>Hinge covers</b>	681811-001
<b>Display panel</b>	681817-001
<b>Display hinges.</b>	681812-001
<b>Display cable kit</b> (includes webcam/microphone module cable)	681808-001
<b>Antenna kit</b> (includes the wireless antenna cables and transceivers).	681813-001

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [{Xref Error! Target does not exist.}](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).

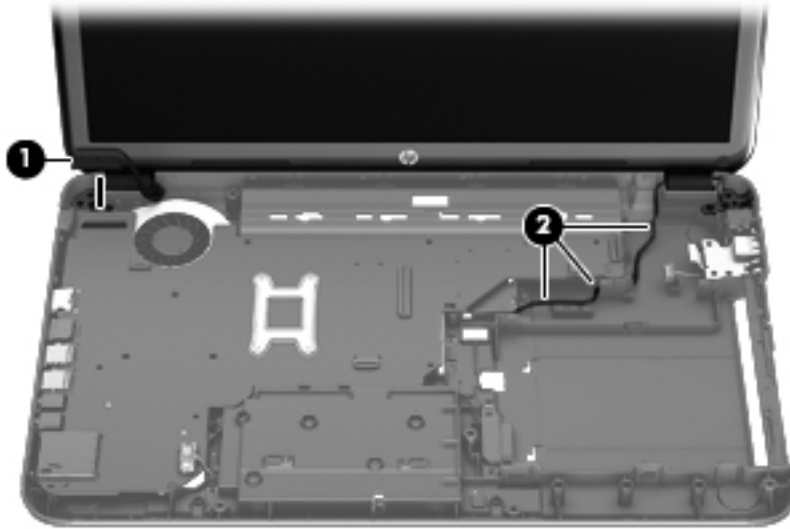
Remove the display assembly:


1. Disconnect the display panel cable **(1)** from the system board.



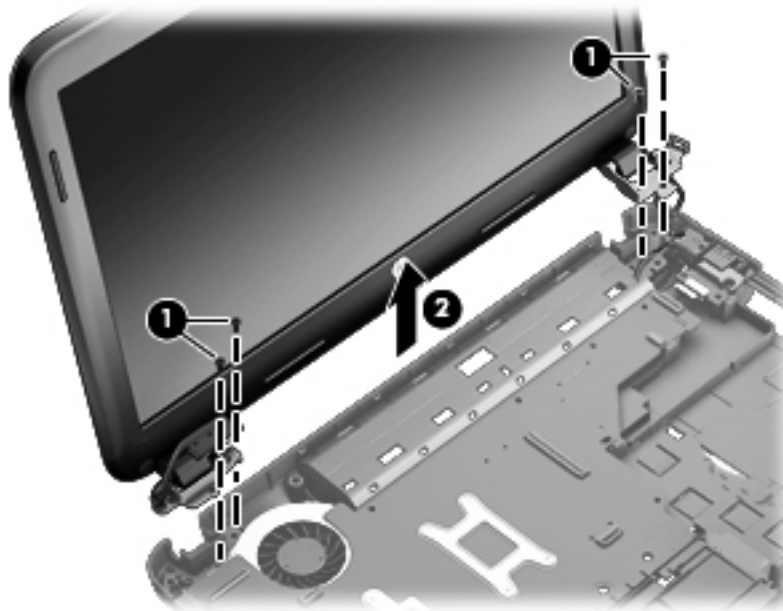
2. Release the wireless antenna cables (2) from the clips and the opening in the base enclosure.

 **NOTE:** It may be necessary to release the USB board ZIF cable to remove the wireless antenna cables.

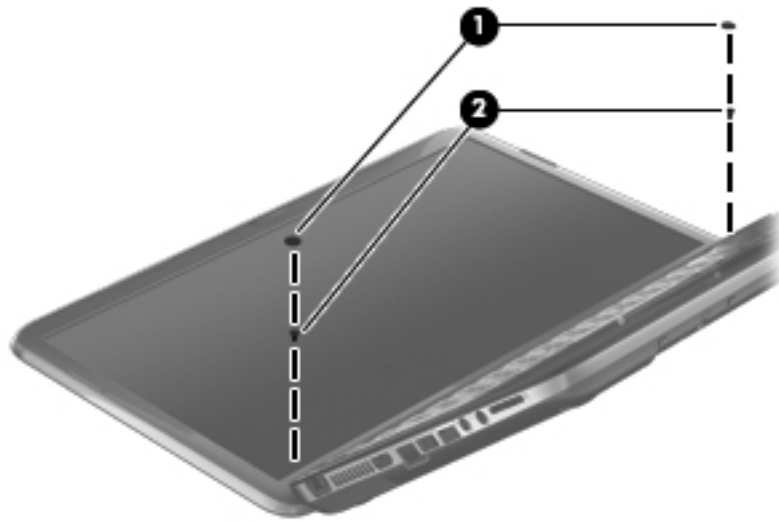


 **CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

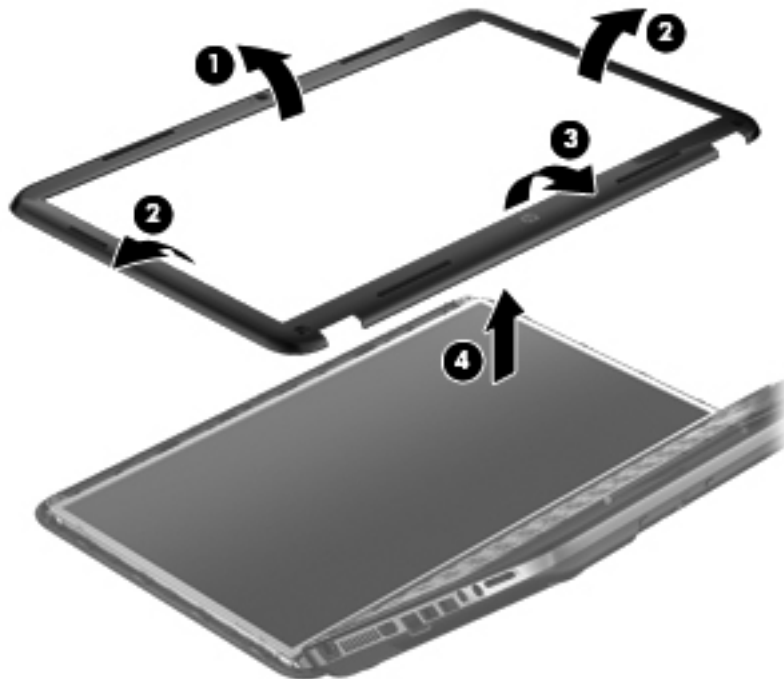
3. Remove the four PM 2.5 × 6.5 screws (1) that secure the display assembly to the computer.
4. Remove the display assembly by lifting straight up (2).



5. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
- Remove the plastic screw covers (1) and the two PM 2.5 × 3.5 screws (2) that secure the display bezel to the display assembly.

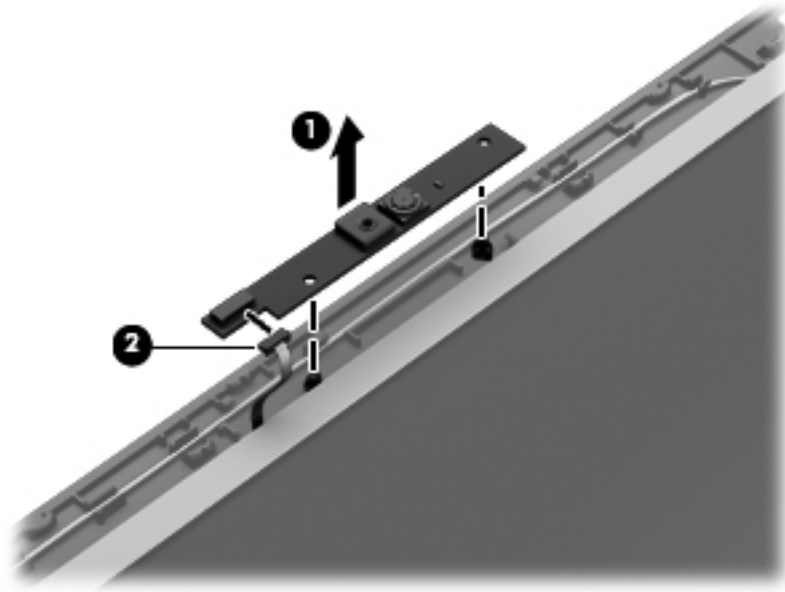


- Flex the inside edges of the top edge (1), the left and right sides (2), and the bottom edge (3) of the display bezel until the bezel disengages from the display enclosure.
- Remove the display bezel (4).



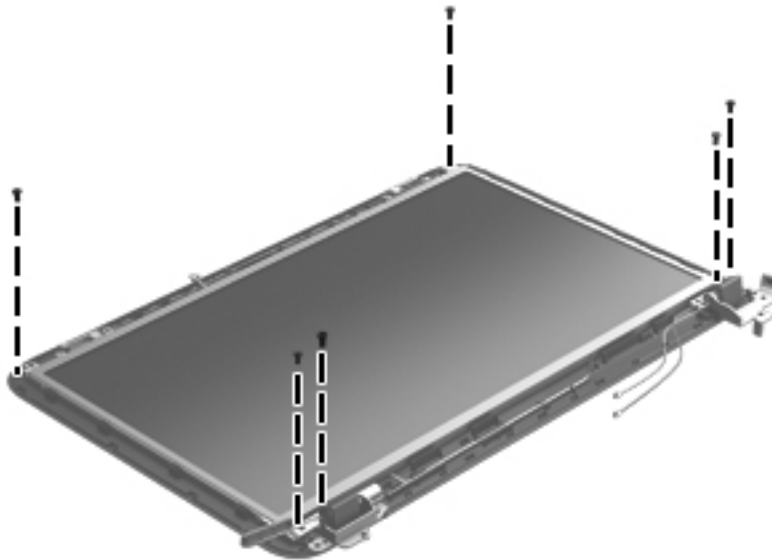
6. If it is necessary to replace the webcam/microphone module:
- Detach and release the webcam/microphone module (1) as far as the webcam/microphone module cable allows. (The webcam/microphone module is attached to the display enclosure with double-sided tape.)
  - Disconnect the webcam/microphone cable (2) from the webcam/microphone module.

- c. Remove the webcam/microphone module.



- 7. If it is necessary to replace the display panel:

- a. Remove the six PM 2.5 × 6.0 screws that secure the display panel to the display enclosure.



- b. The hinge covers are held in place by two of the same screws as the display hinges. Using a small tool to pry, remove the hinge covers.

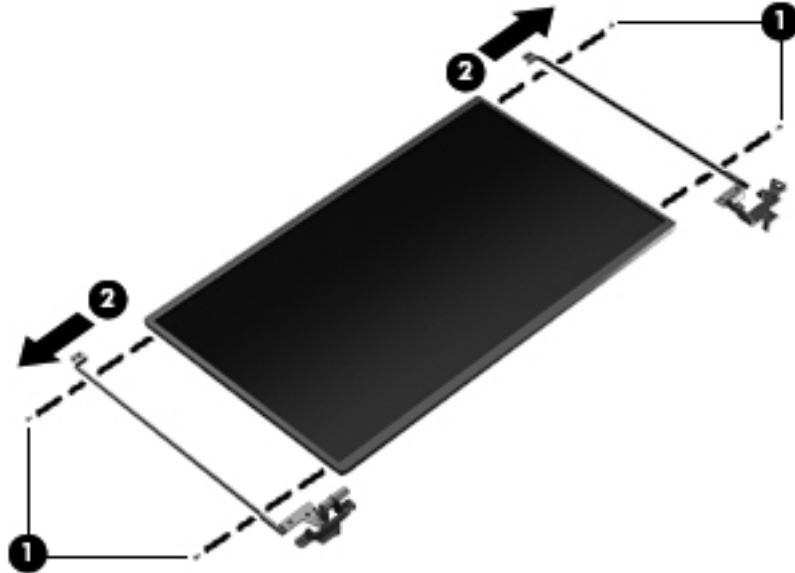


- c. Lift the top edge of the display enclosure, (1) and then swing it up and forward until it is perpendicular to the display panel.
- d. Release the adhesive strip (2) that secures the display panel cable to the display panel, and then disconnect the display panel cable (3) from the display panel.

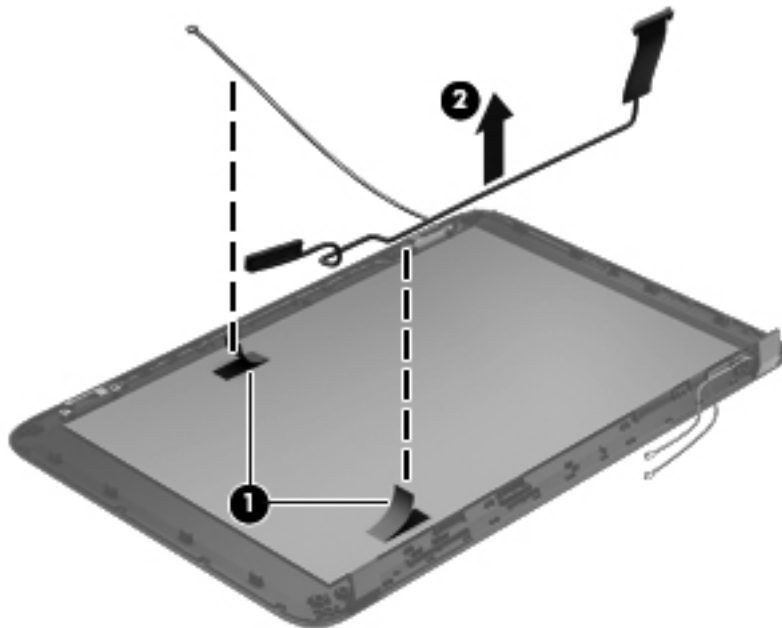


- e. Remove the display panel.

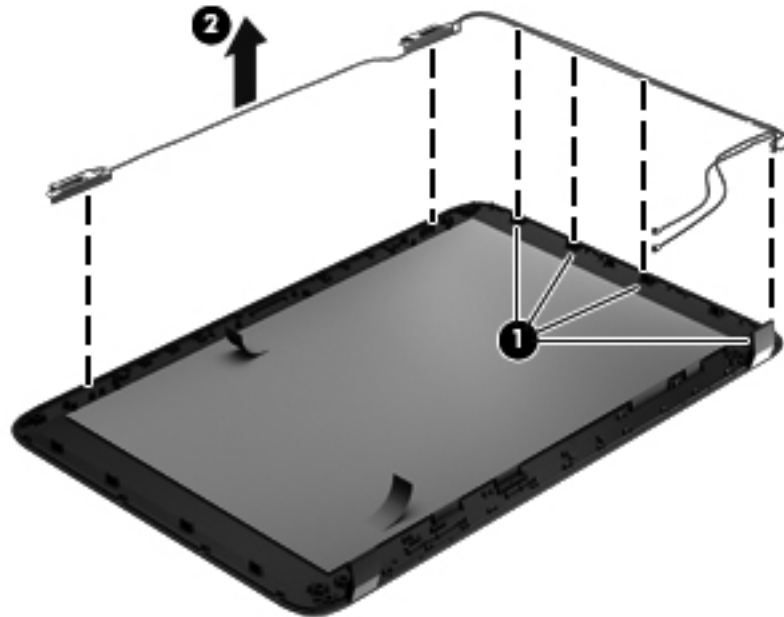
8. If it is necessary to replace the display hinges:
- Remove the four PM 2.0 × 3.0 screws (1) that secure the display hinges to the display panel.
  - Remove the display hinges (2). The display hinges include the display hinges and brackets



9. If it is necessary to replace the display panel cable:
- Release the tabs (1) built into the display enclosure shielding that secure the display panel cable to the display enclosure.
  - Release the display panel cable from the clips (2) built into the display enclosure.
  - Remove the display panel cable. The display panel cable includes the webcam/microphone module cable and is available in the Display Cable Kit.



10. If it is necessary to replace the wireless antenna cables and transceivers:
  - a. Release the wireless antenna cables from the clips (1) built into the display enclosure.
  - b. Release the wireless antenna transceivers (2) from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)
  - c. Remove the wireless antenna cables and transceivers.



Reverse this procedure to reassemble and install the display assembly.

## USB board

Description	Spare part number
USB board (includes cable)	683547-001

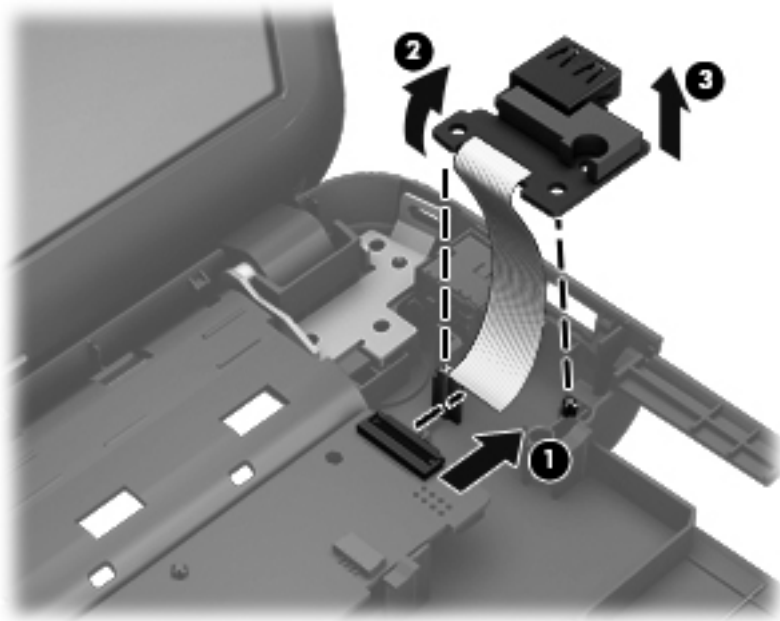
Before removing the USB board, follow these steps:

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))

8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).

Remove the USB board:

1. If not released already, release the ZIF connector (1) to which the USB board cable is connected, and then disconnect the USB board cable from the system board.
2. Pry the clip (2) that secures the USB board to the base enclosure.
3. Remove the USB board and cable by lifting straight up (3).



Reverse this procedure to install the USB board.

## Power connector

Description	Spare part number
Power connector (includes cable)	682744-001

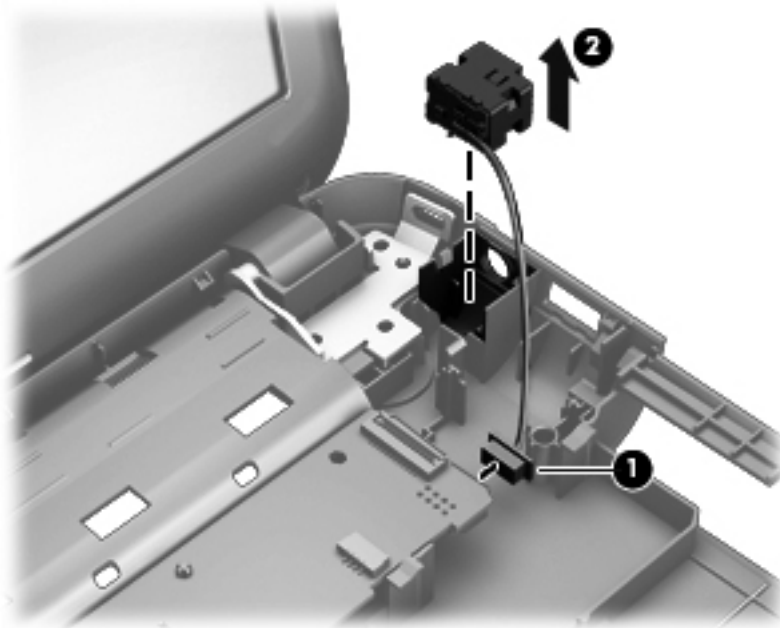
Before removing the power connector, follow these steps:

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))

8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).

Remove the power connector:

1. Disconnect the power connector cable (1) from the system board.
2. Remove the power connector from the the base enclosure (2).



Reverse this procedure to install the power connector.

## System board

Description	Spare part number
For use only with computer models equipped with UMA video memory	683029-001
For use only with computer models equipped with 2048 MB of dedicated discrete video memory	683031-001
For use only with computer models equipped with 1024 MB of dedicated discrete video memory	683030-001
<b>System board thermal pad kit</b> (includes replacement thermal material)	680571-001

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).



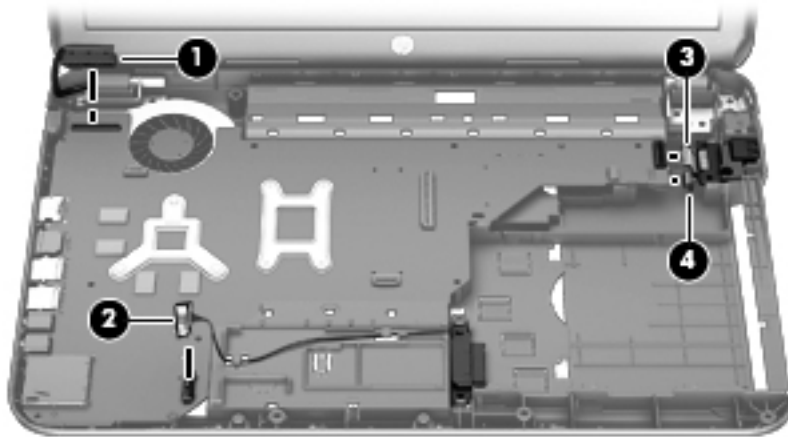
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).

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

- Memory module (see [Memory module on page 38](#))
- RTC battery (see [RTC battery on page 67](#))
- Fan and heat sink (see [Fan and heat sink on page 68](#))
- PCH heat sink (see [PCH heat sink on page 71](#))
- Processor (see [Processor on page 72](#))

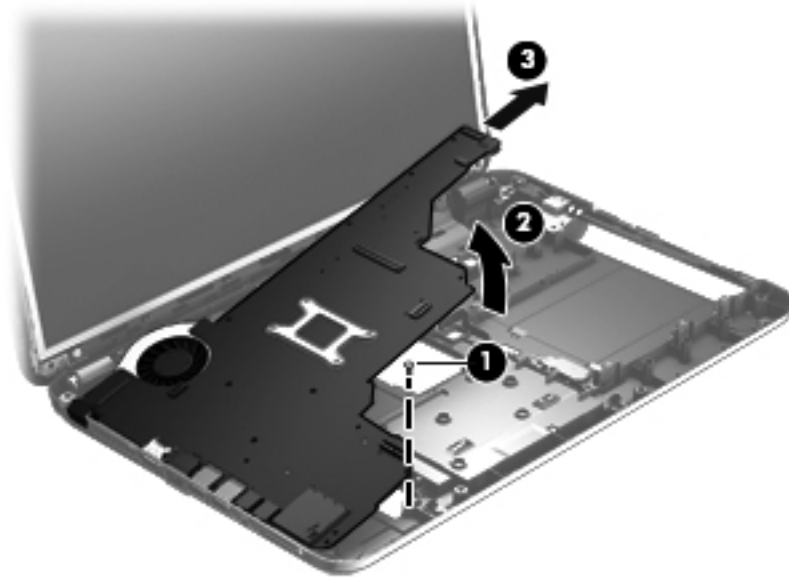
Remove the system board:

1. Disconnect the following cables from the system board:
  - (1) Display panel cable
  - (2) Optical drive cable
  - (3) USB board cable
  - (4) Power connector cable



2. Remove the PM 2.5 × 4.5 screw **(1)** that secures the system board to the base enclosure.
3. Lift the right side of the system board **(2)** until it rests at an angle.

4. Remove the system board (3) by sliding it up and to the right at an angle.



Reverse this procedure to install the system board.

## RTC battery

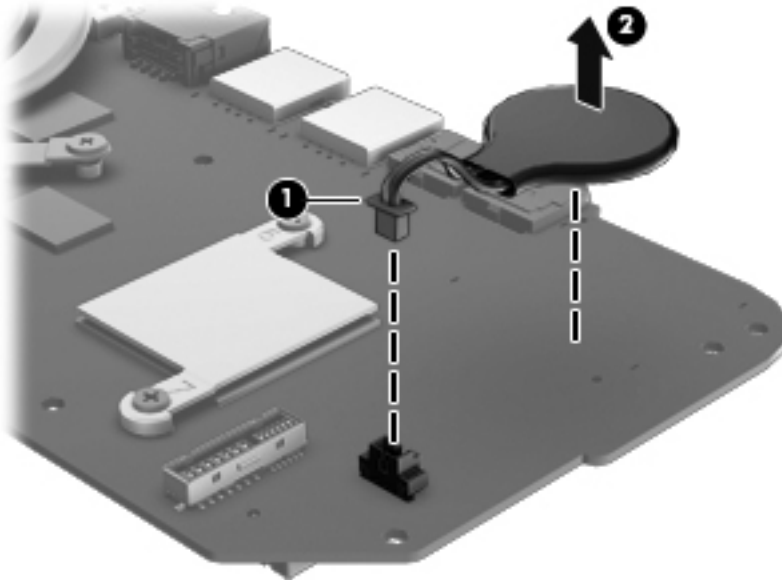
Description	Spare part number
RTC battery (includes cable and double-sided tape)	637193-001

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).
10. Remove the system board (see [System board on page 64](#)).


Remove the RTC battery:

1. Turn the system board upside down, with the front toward you.
2. Disconnect the RTC battery cable (1) from the system board.
3. Remove the RTC battery (2) from the system board. (The RTC battery is attached to the system board with double-sided tape.)




Reverse this procedure to install the RTC battery.

## Fan and heat sink

 **NOTE:** The fan and heat sink spare part kits include replacement thermal material.

Description	Spare part number
Fan	680551-001
Heat sink for use only with computer models equipped with UMA video memory	683027-001
Heat sink for use only with computer models equipped with Discrete video memory	683028-001


 **NOTE:** 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 and heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).
10. Remove the system board (see [System board on page 64](#)).

Remove the fan and heat sink:


1. Turn the system board upside down, with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.

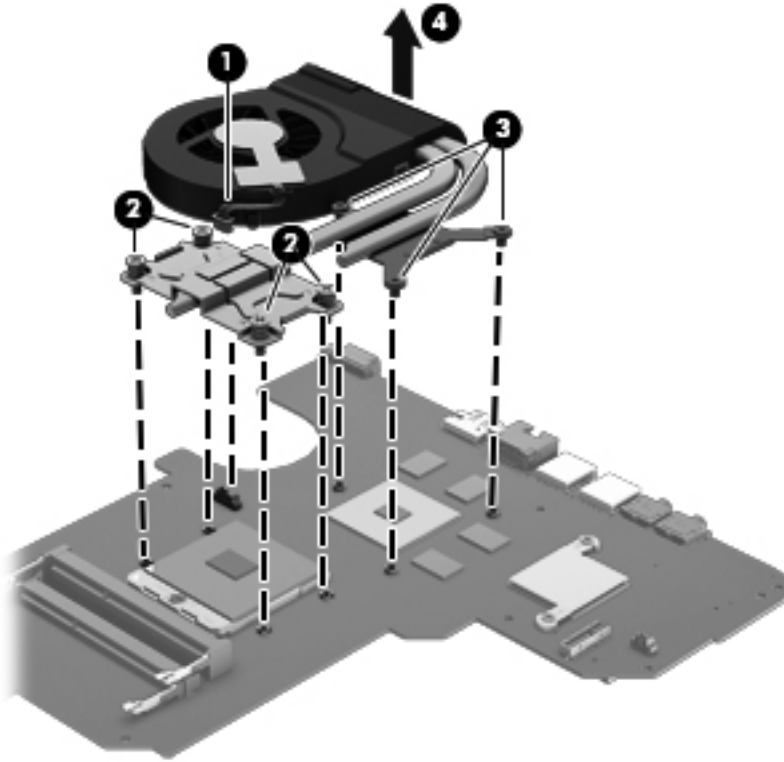
 **CAUTION:** To prevent damage to heat sinks and/or processors, loosen/tighten captive screws in sequence as numerically labeled.


 **NOTE:** The heat sink and fan appearance and the number of screws may be different from the heat sink and fan pictured.

3. Loosen the four Phillips captive screws **(2)** and the three Phillips captive screws **(3)** that secure the heat sink to the system board.

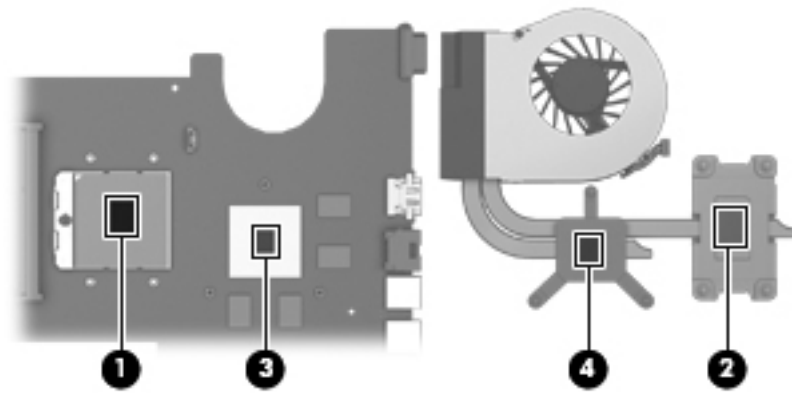
4. Remove the fan and heat sink (4).

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

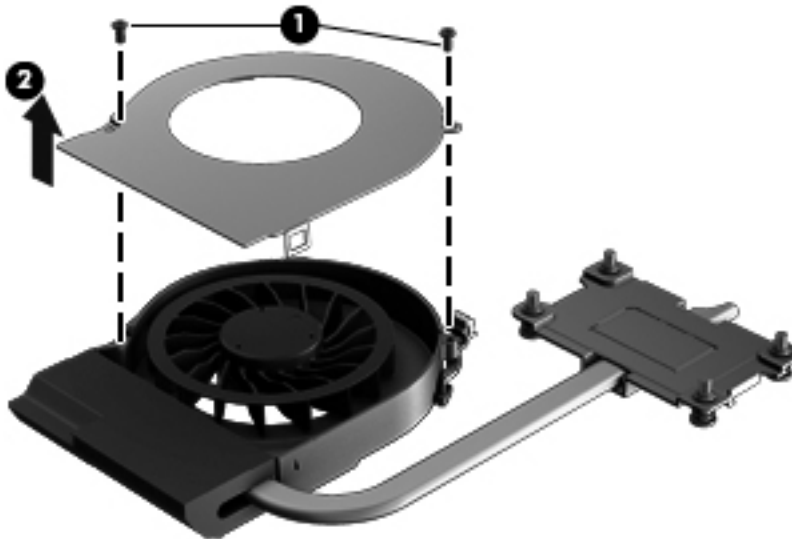


 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the base enclosure, heat sink, processor, and system board spare part kits.

- Thermal paste is used on the processor (1) and the heat sink section (2) that services it
- A thermal pad is used on the graphics subsystem chip (3) and the heat sink section (4) that services it (only on computer models equipped with a graphics subsystem with discrete memory)



1. If it is necessary to replace the fan, turn the fan and heat sink upside down with the fan toward you.
2. Remove the two PM 1.5 × 2.5 screws (1) that secure the fan to the heat sink and remove the two clips that secure the fan to the heat sink.
3. Remove the heat sink (2) from the fan.



Reverse this procedure to reassemble and install the fan and heat sink.

## PCH heat sink

Description	Spare part number
PCH heat sink	683843-001


Before removing the PCH heat sink, follow these steps:

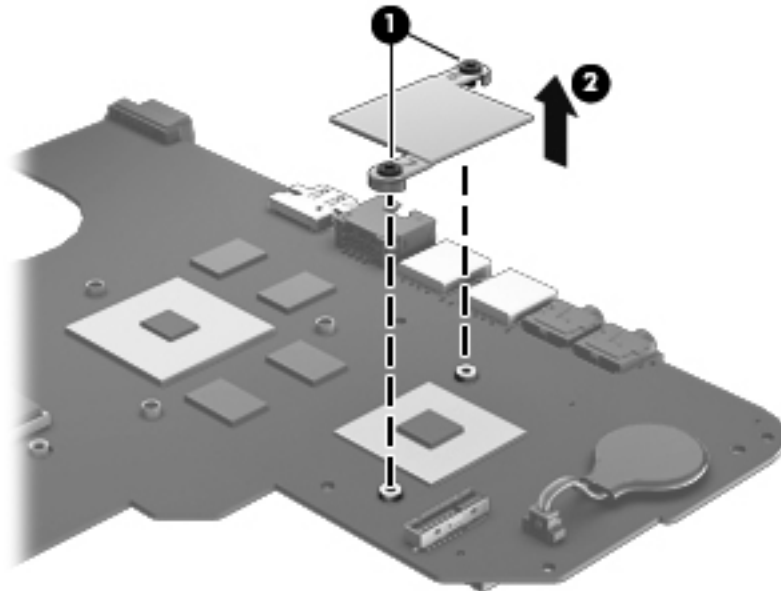
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 32](#)).
5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).
10. Remove the system board (see [System board on page 64](#)).


Remove the PCH heat sink:

1. Remove the two PM 2.0 x 3.0 screws **(1)** that secure the PCH heat sink to the system board.

2. Remove the PCH heat sink by lifting straight up (2).


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



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the base enclosure, heat sink, processor, and system board spare part kits.

Reverse this procedure to install the PCH heat sink.

## Processor

 **NOTE:** The processor spare part kit includes replacement thermal material.

Description	Spare part number
AMD A10-4600M processor (3.2 GHz/2.3 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)	683046-001
AMD A8-4500M processor (2.8 GHz/1.9 GHz, 1600 MHz/4.0 MB L2 cache, DDR3, quad core, 35W)	683048-001
AMD A6-4400M processor (3.2 GHz/2.7 GHz, 1600 MHz/1.0 MB L2 cache, DDR3, dual core, 35W)	683047-001

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 32](#)).

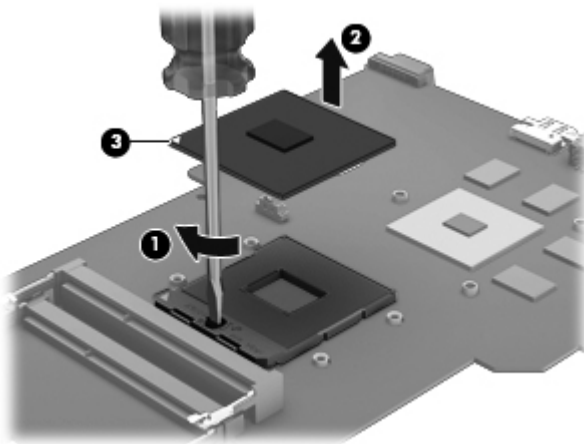


5. Remove the service door (see [Service door on page 33](#)).
6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Xref Error! Target does not exist.](#))
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).
10. Remove the system board (see [System board on page 64](#)).
11. Remove the heat sink (see [Fan and heat sink on page 68](#)).

Remove the processor:

1. Use a flat-bladed screw driver (1) to turn the processor locking screw one-half turn counterclockwise, until you hear a click.
2. Lift the processor (2) straight up, and remove it.

 **NOTE:** The gold triangle on the processor (3) must be aligned with the triangle icon embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

## Optical drive cable

Description	Spare part number
Optical drive cable	682742-001

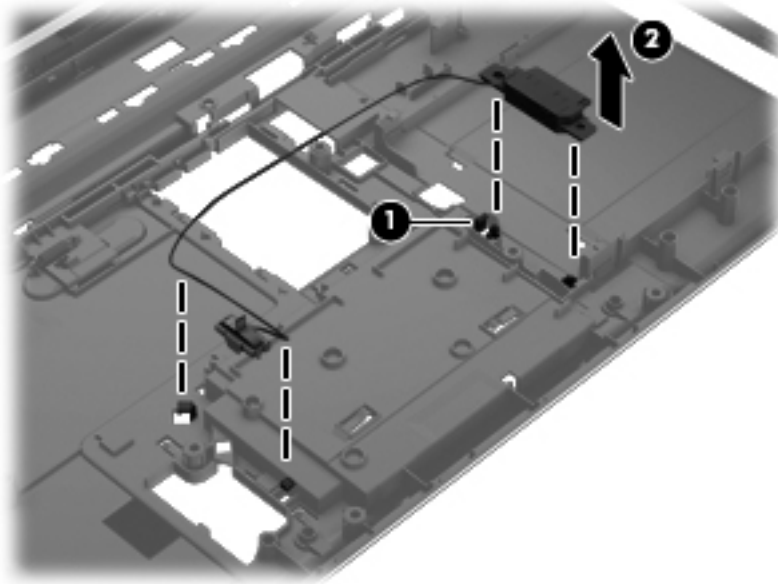
Before removing the optical drive cable, follow these steps:

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 32](#)).
5. Remove the service door (see [Service door on page 33](#)).

6. Remove the optical drive (see [Optical drive on page 34](#)).
7. Remove the hard drive (see [Hard drive on page 35](#)).
8. Remove the keyboard (see [Keyboard on page 43](#)).
9. Remove the top cover (see [Top cover on page 47](#)).
10. Remove the system board (see [System board on page 64](#)).

Remove the optical drive cable:

1. Release the optical drive cable from the clips built into the base enclosure.
2. Release the optical drive connector from the base enclosure by prying the clips (1) that secure the optical drive connector to the base enclosure.
3. Remove the optical drive cable from the base enclosure (2).



Reverse this procedure to install the optical drive cable.

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# 5 Using Setup Utility (BIOS) and System Diagnostics

Setup Utility, or Basic Input/Output System (BIOS), controls communication between all the input and output devices on the system (such as disk drives, display, keyboard, mouse, and printer). Setup Utility (BIOS) includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

## Starting Setup Utility (BIOS)

To start Setup Utility (BIOS), follow these steps:

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

Information on how to navigate in Setup Utility (BIOS) is located at the bottom of the screen.



**NOTE:** Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.

---

## Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named *Readme.txt*, which contains information regarding installing and troubleshooting the file.


## Determining the BIOS version

To determine whether available BIOS updates contain later BIOS versions than those currently installed on the computer, you need to know the version of the system BIOS currently installed.

BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed by pressing **fn+esc** (if you are already in Windows) or by using Setup Utility (BIOS).

1. Start Setup Utility (BIOS).
2. Use the arrow keys to select **Main**.
3. To exit Setup Utility (BIOS) without saving your changes, use the tab key and the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## Downloading a BIOS update

 **CAUTION:** To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:


Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep or Hibernation.

Do not insert, remove, connect, or disconnect any device, cable, or cord.


1. Select **Start > Help and Support > Maintain**.
2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
  - a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
  - b. Follow the on-screen instructions to download your selection to the hard drive.

Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

 **NOTE:** If you connect your computer to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Open Windows Explorer by selecting **Start > Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename.exe*).  
The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

 **NOTE:** After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

## Using System Diagnostics

System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly.

To start System Diagnostics:

1. Turn on or restart 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 **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



---

**NOTE:** If you need to stop a diagnostics test while it is running, press **esc**.

---

# 6 Specifications

## Computer specifications

<b>Dimensions</b>	
Depth	<b>24.5 cm</b> (9.6 in)
Width	<b>37.4 cm</b> (14.7 in)
Height (front to rear)	<b>3.1 to 3.6 cm</b> (1.2 to 1.4 in)
<b>Weight</b> (lowest weight configuration)	<b>&lt; 2.5 kg</b> (5.5 lbs)
<b>Input power</b>	
Operating voltage	18.5 V dc @ 3.5 A or 19.5 V dc @ 3.33 A – 65 W 19 V dc @ 4.74 A or 19.5 V dc @ 4.62 A – 90 W
Operating current	3.5 A
<b>Temperature</b>	
Operating	<b>5°C to 35°C</b> (41°F to 95°F)
Nonoperating	<b>-20°C to 60°C</b> (-4°F to 140°F)
<b>Relative humidity</b>	
Operating	10% to 90%
Nonoperating	5% to 95%
<b>Maximum altitude</b> (unpressurized)	
Operating	<b>-15 m to 3,048 m</b> (-50 ft to 10,000 ft)
Nonoperating	<b>-15 m to 12,192 m</b> (-50 ft to 40,000 ft)
<b>Shock</b>	
Operating	125 g, 2 ms, half-sine
Nonoperating	200 g, 2 ms, half-sine
<b>Random vibration</b>	
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate

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

## 39.6-cm (15.6-in) display specifications

<b>Dimensions</b>	
Height	<b>21.0 cm</b> (8.27 in)
Width	<b>35.9 cm</b> (14.1 in)
Diagonal	<b>39.6 cm</b> (15.6)
<b>Number of colors</b>	Up to 16.8 million
<b>Contrast ratio</b>	300:1 (typical)
<b>Brightness</b>	200 cd/m <sup>2</sup> (nits) (typical)
<b>Backlight</b>	LED
<b>Total power consumption</b>	4.1 W
<b>Viewing angle</b>	±45° horizontal, +15° up/-35° down (typical)

## Hard drive specifications

	1 TB*	750 GB*	640 GB*	500 GB*	320 GB*
<b>Dimensions</b>					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm and 7.0 mm
Width	70 mm	70 mm	70 mm	70 mm	70 mm
Weight	107 g max	107 g max	107 g max	107 g max	107 g max
<b>Interface type</b>	SATA	SATA	SATA	SATA	SATA
<b>Transfer rate</b>	300 MB/sec	300 MB/sec	300 MB/sec	300 MB/sec	300 MB/sec
<b>Security</b>	ATA security	ATA security	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)					
Single track	1.5 ms	1.0 ms	1.0 ms	1.5 ms	2.0 ms
Average	11.0 ms	14.0 ms	14.0 ms	12.0 ms	12.0 ms
Maximum	22.0 ms	24.0 ms	22.0 ms	22.0 ms	22.0 ms
<b>Logical blocks</b>	1,953,525,168	1,465,128,359	1,250,242,867	976,752,240	625,121,433
<b>Disc rotational speed</b>	5400 rpm	5400 and 7200 rpm	5400 rpm	5400 and 7200 rpm	5400 and 7200 rpm
<b>Operating temperature</b>	<b>5°C to 55°C (41°F to 131°F)</b>				
<b>*Hard drive storage capacity</b>					
When referring to hard drive storage capacity:					
<ul style="list-style-type: none"> <li>• 1 TB = 1 trillion bytes</li> <li>• 1 GB = 1 billion bytes</li> </ul>					
Actual accessible capacity is less. Actual drive specifications may differ slightly.					
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.					



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

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

# Blu-ray Disc ROM and DVD±R/RW SuperMulti Double-Layer Drive specifications

<b>Applicable disc</b>	
Read	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
Write	DVD-RAM (Ver.2), DVD+R, DVD-R, CD-R, and CD-ROM
<b>Random access time</b>	
BD	< 230 ms
DVD	< 180 ms
CD	< 180 ms
<b>Cache buffer</b>	4.5 MB
<b>Data transfer rate</b>	
24X CD-ROM	3,600 KB/sec
8X DVD-ROM	10,800 KB/sec
4X BD	18,000 KB/sec
24X CD-R	3,600 KB/sec
16X CD-RW	2,400 KB/sec
8X DVD+R	10,800 KB/sec
4X DVD+RW	5,400 KB/sec
8X DVD-R	10,800 KB/sec
4X DVD-RW	5,400 KB/sec
2.4X DVD+R(9)	2,700 KB/sec
5X DVD-RAM	6,750 KB/sec
1X BD-ROM	4,500 KB/sec
1X BD-R read	4,500 KB/sec
1X BD-RE read	4,500 KB/sec
<b>Transfer mode</b>	Multiword DMA Mode

---

# 7 Backing up, restoring, and recovering

Your computer includes tools provided by the operating system and HP to help you safeguard your information and retrieve it if ever needed.



**NOTE:** For SUSE Linux backup, restore, and recovery steps, refer to the User Guide provided. Double-click the HP Documents icon on the desktop to access this documentation.

---

## Creating backups

1. Use HP Recovery Manager to create recovery media immediately after you set up the working computer.
2. As you add hardware and software programs, create system restore points.
3. As you add photos, video, music, and other personal files, create a backup of your system and personal information.

## Creating recovery media to recover the original system

After you successfully set up the computer, you should create recovery discs or a recovery flash drive using HP Recovery Manager. You will need these recovery discs or recovery flash drive to perform a system recovery should the hard drive become corrupted. A system recovery reinstalls the original operating system, and then configures the settings for the default programs.

### What you need to know

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the flash drive or the number of blank DVD discs that will be required.  
  
Use DVD-R, DVD+R, DVD-R DL, DVD+R DL discs or a flash drive. Do not use rewriteable discs such as CD±RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software.
- If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.
- Store the recovery media in a safe location, separate from the computer.
- If necessary, you can exit the program before you have finished creating the recovery media. The next time you open HP Recovery Manager, you will be prompted to continue the process.

## Creating the recovery media

1. Select **Start** and type `recovery` in the search field. Select **Recovery Manager** from the list. Allow the action to continue, if prompted.
2. Click **Recovery Media Creation**.
3. Follow the on-screen instructions to continue.

To recover, see [Recovering the original system using HP Recovery Manager on page 86](#)

## Creating system restore points

A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A restore point contains information such as registry settings that Windows uses. Restoring to a previous restore point allows you to reverse changes that have been made to the system since the restore point was created.

Restoring to an earlier system restore point does not affect data files saved or emails created since the last restore point, but it does affect software you may have installed.

For example, if you download a photo from a digital camera and then restore the computer to the state it was on the previous day, the photo remains on the computer.

However, if you install photo viewing software and then restore your computer to the state it was on the previous day, the software will be uninstalled, and you won't be able to use it.

## What you need to know

- If you restore to a restore point and then change your mind, you can undo the restoration.
- You should create system restore points:
  - Before you add or change software or hardware
  - Periodically, whenever the computer is running normally
- System Restore also saves shadow copies of files that have been changed since the last restore point was created. For more information about using shadow copies to restore, see Help and Support.

## Creating 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. Click **Create**, and follow the on-screen instructions.

To restore, see [Restoring to a previous system restore point on page 86](#).

## Backing up system and personal information

Your computer stores information that is important to you, such as files, emails, and photos, and you will want to keep that information even if you download a virus or the system stops working properly. How completely you are able to recover your files depends on how recent your backup is. As you add new software and data files, you should create backups on a regular basis.

## Tips for a successful backup

- Number backup discs before inserting them into the optical drive.
- Store personal files in the Documents, Music, Pictures, and Videos libraries, and back up these folders periodically.
- 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 re-enter your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image:  
To copy only the active window, press **alt+prt sc**.  
To copy the entire screen, press **prt sc**.
3. Open a word-processing document or graphics editing program, and then select **Edit > Paste**. The screen image is added to the document.
4. Save and print the document.

## What you need to know


- You can back up your information to an optional external hard drive, a flash drive, a network drive, or discs.
- Connect the computer to AC power during backups.
- Allow enough time for the backup. Depending on files sizes, it may take more than an hour.
- Verify the amount of free space on your backup storage device before you back up.
- You should back up:
  - Before adding or changing software or hardware.
  - Before the computer is repaired or restored.
  - On a regular schedule to be sure you have recent copies of personal information.
  - After you add many files—for example, if you saved videos from a birthday party.
  - Before using antivirus software to remove a malicious program.
  - After adding information that is hard to replace, such as pictures, videos, music, project files, or data records.

## Creating a backup using Windows Backup and Restore

Windows allows you to back up files using Windows Backup and Restore. You can select the level you want to back up, from individual folders to drives. The backups are compressed to save space. To back up:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to schedule and create a backup.

---

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

---

To restore, see [Restoring specific files using Windows Backup and Restore on page 86](#).

## Restore and recovery

### Restoring to a previous system restore point

Sometimes installing a software program causes your computer or Windows to behave unpredictably. Usually uninstalling the software fixes the problems. If uninstalling does not fix the problems, you can restore the computer to a previous system restore point (created at an earlier date and time).

To restore to a previous system restore point, when the computer was running correctly:

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**, and follow the on-screen instructions.

### Restoring specific files

If files are accidentally deleted from the hard disk and they can no longer be restored from the Recycle Bin, or if files become corrupt, restoring specific files is useful. Restoring specific files is also useful if you ever choose to recover the original system using HP Recovery Manager. You can only restore specific files that you have backed up before.

### Restoring specific files using Windows Backup and Restore

Windows allows you to restore files that were backed up using Windows Backup and Restore:

1. Select **Start > Control Panel > System and Security > Backup and Restore**.
2. Follow the on-screen instructions to restore your backup.



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

### Recovering the original system using HP Recovery Manager

HP Recovery Manager software allows you to repair or recover the computer to its original factory state.

#### What you need to know


- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the disc provided by the manufacturer.
- A system recovery should be used as a final attempt to correct computer issues. If you have not already tried restore points (see [Restoring to a previous system restore point on page 86](#)) and partial restores (see [Restoring specific files on page 86](#)), try them before using HP Recovery Manager to recover your system.
- A system recovery must be performed if the computer hard drive fails or if all attempts to correct any functional computer issues fail.

- If the recovery media do not work, you can obtain recovery discs for your system from the HP website.
- The Minimized Image Recovery option is recommended for advanced users only. All hardware-related drivers and software are re-installed, but other software applications are not. Do not interrupt the process until it is complete, otherwise the recovery will fail.

## Recovering using HP Recovery partition (select models only)

The HP Recovery partition (select models only), allows you to restore your system without the need for recovery discs or a recovery flash drive. This type of recovery can only be used if the hard drive is still working.


To check for the presence of a recovery partition, select **Start**, right-click **Computer** then select **Manage > Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

 **NOTE:** Recovery discs have been included if your computer did not ship with a recovery partition.

1. Access HP Recovery Manager in either of the following ways:
  - Select **Start** and type `recovery` in the search field. Select **Recovery Manager** from the list.
  - 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 “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the **HP Recovery Manager** window.
3. Follow the on-screen instructions.

## Recovering using the recovery media

1. If possible, back up all personal files.
2. Insert the first recovery disc into the optical drive on your computer or an optional external optical drive, and then restart the computer.
- or –
- Insert the recovery flash drive into a USB port on your computer, and then restart the computer.

 **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 87](#).

3. Press `f9` at system bootup.
4. Select the optical drive or the flash drive.
5. Follow the on-screen instructions.

## Changing the computer boot order

To change the boot order for recovery discs:

1. Restart the computer.
2. Press `esc` while the computer is restarting, and then press `f9` for boot options.
3. Select **Internal CD/DVD ROM Drive** from the boot options window.

To change the boot order for a recovery flash drive:

1. Insert the flash drive into a USB port.
2. Restart the computer.
3. Press `esc` while the computer is restarting, and then press `f9` for boot options.
4. Select the flash drive from the boot options window.



---

## 8 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 V ac, or from 220 to 240 V 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 or regions must meet the requirements of the country and region where the computer is used.

### Requirements for all countries

The following requirements 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 A 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
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	ISI	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1

Country/region	Accredited agency	Applicable note number
The United States	UL	2
<ol style="list-style-type: none"> <li>1. The flexible cord must be Type HO5VV-F, 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.</li> <li>2. The flexible cord must be Type SVT/SJT 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 ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.</li> <li>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 VCTF, 3-conductor, 0.75 mm<sup>2</sup> or 1.25 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 ac) configuration.</li> <li>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 CCC certification mark.</li> <li>5. The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm<sup>2</sup> conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.</li> <li>6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.</li> <li>7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3-conductor, 0.75 mm<sup>2</sup> or 1.00 mm<sup>2</sup> conductor size, with plug BS 1363/A with BSI or ASTA marks.</li> </ol>		

---

## 9 Recycling

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 battery disposal. HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries.

For more information about recycling programs, see the HP website at [www.hp.com/recycle](http://www.hp.com/recycle).

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