



# HP Pavilion dv6 Entertainment 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	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Product Name</b>	HP Pavilion dv6 Entertainment PC	√	√
<b>Processors</b>	<ul style="list-style-type: none"><li>• AMD® A10-4600M 3.20-GHz processor (4.0-MB L2 cache, 1600-MHz DDR3, quad core, 35 W)</li><li>• AMD A8-4500M 2.80-GHz processor (4.0-MB L2 cache, 1600-MHz DDR3, quad core, 35 W)</li><li>• AMD A6-4400M 3.20-GHz processor (1.0-MB L2 cache, 1600-GHz DDR3, dual core, 35 W)</li><li>• AMD A4-4300M 2.50-GHz processor (1.0-MB L2 cache, 1600-GHz DDR3, dual core, 35 W)</li></ul> <p>Processor is soldered to the system board</p>	√	

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Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	<ul style="list-style-type: none"> <li>Intel® Core i7-3820QM 2.70-GHz processor (8.0-MB L3 cache, 45 W)</li> <li>Intel Core i7-3720QM 2.60-GHz processor (6.0-MB L3 cache, 45 W)</li> <li>Intel Core i7-3612QM 2.10-GHz processor (6.0-MB L3 cache, 35 W)</li> <li>Intel Core i7-3610QM 2.30-GHz processor (6.0-MB L3 cache, 45 W)</li> <li>Intel Core i5-3320M 2.60-GHz processor (3.0-MB L3 cache, 35 W)</li> <li>Intel Core i7-2670QM 2.20-GHz processor (6.0-MB L3 cache, 45 W)</li> <li>Intel Core i5-3210M 2.50-GHz processor (3.0-MB L3 cache, 35 W)</li> <li>Intel Core i5-2450M 2.50-GHz processor (3.0-MB L3 cache, 35 W)</li> <li>Intel Core i3-3110M 2.40-GHz processor (3.0-MB L3 cache, 35 W)</li> <li>Intel Core i3-2370M 2.40-GHz processor (3.0-MB L3 cache, 35 W)</li> <li>Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, 35 W)</li> </ul>		√
<b>Chipset</b>	AMD A70M fusion controller hub (FCH)	√	
	Intel HM77 Express chipset		√
<b>Graphics</b>	<p><b>Switchable discrete graphics:</b></p> <ul style="list-style-type: none"> <li>AMD RadeonT HD 7670M with 1024-MB of dedicated video memory (64-MB×16 DDR3 900-MHz×8 PCs); 128-bit M2 package</li> <li>AMD RadeonT HD 7670M with 2048-MB of dedicated video memory (128-MB×16 DDR3 900-MHz×8 PCs); 128-bit M2 package</li> </ul> <p>Support HD decode, DX11, and HDMI</p>	√	

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	<p><b>Internal graphics:</b></p> <ul style="list-style-type: none"> <li>Intel HD Graphics 4000 (on computer models equipped with an Intel Core i7/i5/i3 3000-series processor)</li> <li>Intel HD Graphics 3000 (on computer models equipped with an Intel Core i7/i5/i3 2000-series processor)</li> </ul> <p><b>Switchable discrete graphics:</b></p> <ul style="list-style-type: none"> <li>NVIDIAR GeForceR 630M with 1024-MB of dedicated video memory (64-MB×16 DDR3 900-MHz×8 PCs); 128-bit M2 29-mm×29-mm</li> <li>NVIDIAR GeForceR 630M with 2048-MB of dedicated video memory (128-MB×16 DDR3 900-MHz×8 PCs); 128-bit M2 29-mm×29-mm</li> <li>NVIDIAR GeForceR 650M with 1024-MB of dedicated video memory (32-MB×32 GDDR5×8 PCs, 5Gbps); 128-bit M2 29-mm×29-mm</li> <li>NVIDIAR GeForceR 650M with 2048-MB of dedicated video memory (64-MB×32 GDDR5×8 PCs, 5Gbps); 128-bit M2 29-mm×29-mm</li> </ul> <p>Support HD decode, DX11, HDMI, and Optimus</p>		√
<b>Panel</b>	<ul style="list-style-type: none"> <li>15.6-in, light-emitting diode (LED), UWVA, full high-definition (FHD), AntiGlare (1920×1080) display, 3.4-mm; typical brightness: 250 nits</li> <li>15.6-in, LED, SVA, HD, BrightView (1366×768) display; 3.8-mm; typical brightness: 200 nits</li> </ul> <p>All display assemblies include 2 wireless local area network (WLAN) antenna cables</p> <p>16:9 Ultra Wide Aspect Ratio</p> <p>Lighted logo on top bezel</p>	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Memory</b>	<p>Two customer-accessible/upgradable memory module slots</p> <p>DDR3-1600-MHz dual channel support</p> <p>Supports up to 16384-MB system RAM</p> <p>Supports the following system RAM configurations:</p> <ul style="list-style-type: none"> <li>• 16384-MB (8192-MB×2; not supported on computer models equipped with a 32-bit operating system)</li> <li>• 12288-MB (8192-MB×1+ 4096-MB×1; not supported on computer models equipped with a 32-bit operating system)</li> <li>• 8192-MB (8192-MB×1 or 4096-MB×2; not supported on computer models equipped with a 32-bit operating system)</li> <li>• 6144-MB (4096-MB×1 + 2048-MB×1; not supported on computer models equipped with a 32-bit operating system)</li> <li>• 4096-MB (4096-MB×1 or 2048-MB×2)</li> <li>• 2048-MB (2048-MB×1)</li> </ul>	√	√
<b>Hard drive</b>	<p>Supports <b>6.35-cm</b> (2.5-in) hard drives in <b>12.7-mm</b> (.50-in), <b>9.5-mm</b> (.37-in), and <b>7.0-mm</b> (.28-in) thicknesses (all hard drives use the same bracket)</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Accelerometer protection support</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> <li>• 1-TB, 5400-rpm, 12.7-mm</li> <li>• 750-GB, 7200-rpm and 5400-rpm, 9.5-mm</li> <li>• 640-GB, 5400-rpm, 9.5-mm</li> <li>• 500-GB, 7200-rpm and 5400-rpm, 9.5-mm</li> <li>• 320-GB, 7200-rpm and 5400-rpm, 9.5-mm and 7.0-mm</li> </ul>	√	√
<b>Solid-state drives</b>	<p>Supports 160-GB drive</p> <p>Supports 32GB mSATA drive</p>	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Optical drive</b>	<p>Fixed</p> <p>Serial ATA</p> <p>12.7-mm tray load</p> <p>Supports the following optical drives:</p> <ul style="list-style-type: none"> <li>• Blu-ray Disc ROM with SuperMulti DVD <math>\pm</math>R/RW Double-Layer Drive</li> <li>• Blu-ray Disc R/RW with SuperMulti Drive</li> <li>• DVD<math>\pm</math>RW Double-Layer with SuperMulti Drive</li> </ul>	√	√
<b>Audio and video</b>	<p>HD audio</p> <p>Beats audio</p> <p>Quad speakers</p> <p>Subwoofer</p> <p>Supports Microsoft Premium requirements</p> <p>HP TrueVision HD webcam (fixed, no tilt with activity LED; 1280×720 by 30 frames per second)</p> <p>Two dual array, digital microphones with appropriate beam-forming, echo-cancellation, noise-reduction software</p>	√	√
<b>Ethernet</b>	Integrated 10/100/1000 NIC	√	√
<b>Wireless</b>	<p>Integrated wireless local area network (WLAN) options by way of wireless module</p> <p>Two WLAN antennas built into display assembly</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 and 3012 Bluetooth 4.0 Combo Adapter</li> <li>• Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter</li> <li>• Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter</li> <li>• Intel Centrino Advanced-N 6230 WLAN module</li> </ul>	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
	Support for the Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) for use only on computer models equipped with an AMD processor in Brazil	√	
	Support for the Intel Centrino Advanced-N 6235 WLAN module for use only on computer models equipped with an Intel processor in Japan		√
<b>External media cards</b>	<p>HP Multi-Format Digital Media Reader slot with push-push technology, supporting the following digital card formats:</p> <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>• Ultra High Speed MultiMediaCard (UHS/MMC)</li> </ul>	√	√
<b>Ports</b>	<ul style="list-style-type: none"> <li>• AC power</li> <li>• Combination audio-out (stereo headphone)/audio-in (mono microphone)</li> <li>• HDMI 1.4a output supporting stereoscopic 3D</li> <li>• VGA (Dsub 15 pin) supporting: 1920x1600 external resolution @ 60 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video</li> <li>• RJ-45 (Ethernet)</li> <li>• USB 3.0 (3 ports), USB 2.0 (1 port)</li> </ul>	√	√
<b>Keyboard/pointing devices</b>	<p>Full-size (15.6-in.), Island-style, with numeric keypad</p> <p>Taps enabled by default</p>	√	√
<b>Power requirements</b>	<p>90-W HP Smart AC adapter (RC, V, PFC, 3-wire)</p> <p>65-W HP Smart AC adapter (RC, V, 3-wire)</p>	√	√

<b>Category</b>	<b>Description</b>	<b>Computer models equipped with an AMD processor</b>	<b>Computer models equipped with an Intel processor</b>
	120-W slim AC adapter (RC, V, PFC, 3-wire)		√
	90-W HP Smart AC adapter (RC, V, PFC, EM, 3-wire)		
	65-W HP Smart AC adapter (RC, V, EM, 3-wire)		
	Supports the following batteries (battery is user-removable)	√	√
	<ul style="list-style-type: none"> <li>• 9-cell, 100-Wh, 3.0-Ah, Li-ion battery</li> <li>• 6-cell, 62-Wh, 2.8-Ah, Li-ion battery</li> </ul>		
<b>Security</b>	Security cable lock	√	√
	Fingerprint reader with Digital Persona software support		
	Intel/VeriSign support		√
	Intel AT-p Ready support		
<b>Operating system</b>	<b>Preinstalled:</b>	√	√
	<ul style="list-style-type: none"> <li>• Windows 7 Home Basic 64- and 32-bit</li> <li>• Windows 7 Home Premium 64- and 32-bit</li> <li>• Windows 7 Professional 64- and 32-bit</li> </ul>		
<b>Serviceability</b>	<b>End user replaceable parts:</b>	√	√
	<ul style="list-style-type: none"> <li>• AC adapter</li> <li>• Battery</li> <li>• Hard drive</li> <li>• Memory module</li> <li>• Optical drive</li> <li>• WLAN module</li> </ul>		

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## 2 External component identification

### Finding your hardware and software information

- ▲ Select **Start > Computer**.

A list displays all the devices installed in your computer, including optical drives, solid-state drives (SSDs), or a secondary hard drive.

To find out what software is included on your computer, select **Start > All Programs**.



# Display



Item	Component	Description
(1)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs.
(2)	Internal microphones (2)	Record sound.
(3)	HP TrueVision HD webcam	Records video, captures still photographs, allows video conferences and online chat by means of streaming video.  To use the webcam, select <b>Start &gt; All Programs &gt; Communication and Chat &gt; CyberLink YouCam</b> .
(4)	Webcam light	On: The webcam is in use.
(5)	Speakers	Produce sound.

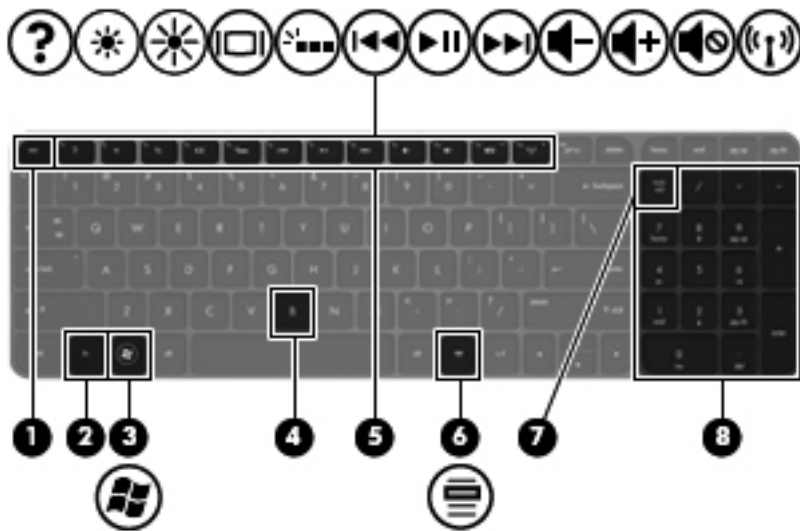
\*The antennas are not visible from the outside of the computer. For optimal transmission, keep the area immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.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

## Buttons, speakers, and fingerprint reader (select models only)



Item	Component	Description
(1)	Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button briefly to initiate Sleep.</li><li>• When the computer is in the Sleep state, press the button briefly to exit Sleep.</li><li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li></ul> <p><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 Microsoft Windows shutdown procedures are ineffective, press and hold down the power button for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, select <b>Start &gt; Control Panel &gt; System and Security &gt; Power Options</b>.</p>
(2)	Speakers (2)	Produce sound.
(3)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

# Keys



Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the <b>fn</b> key.
(2)	fn key	Executes frequently used system functions when pressed in combination with the <b>esc</b> key or the <b>b</b> key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	b key	Enables or disables Beats Audio when pressed in combination with the <b>fn</b> key.  Beats Audio is an enhanced audio feature that provides a deep, controlled bass while maintaining a clear sound. Beats Audio is enabled by default.  Opens Beats Audio Control Panel, which allows you to view and control all audio settings. Beats Audio is an enhanced audio feature that provides a deep, controlled bass while maintaining a clear sound.  <b>NOTE:</b> You can also open the Beats Audio Control Panel by selecting <b>Start &gt; Control Panel &gt; Hardware and Sound &gt; Beats Audio Control Panel</b> .
(5)	Action keys	Execute frequently used system functions.
(6)	Windows applications key	Displays a shortcut menu for items beneath the pointer.

Item	Component	Description
(7)	num lock key	<p>Controls the function of the integrated numeric keypad. Press the key to alternate between the standard numeric function of an external keypad (selected at the factory) and the navigational function (indicated by the directional arrows on the keys).</p> <p><b>NOTE:</b> The keypad function that is active when the computer is turned off is reinstated when the computer is turned back on.</p>
(8)	Integrated numeric keypad	<p>Set at the factory to function like an external numeric keypad. To alternate between this numeric function and the navigational function (indicated by the directional arrows on the keys), press the num lock key.</p>

# Lights



Item	Component	Description
(1)	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> <p><b>NOTE:</b> For select models, the Intel Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p>
(2)	Mute light	<ul style="list-style-type: none"><li>• Amber: Computer sound is off.</li><li>• Off: Computer sound is on.</li></ul>
(3)	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>

Item	Component	Description
(4)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(5)	Fingerprint reader light (select models only)	<ul style="list-style-type: none"> <li>• White: The fingerprint was read.</li> <li>• Amber: The fingerprint was not read.</li> </ul>

## TouchPad



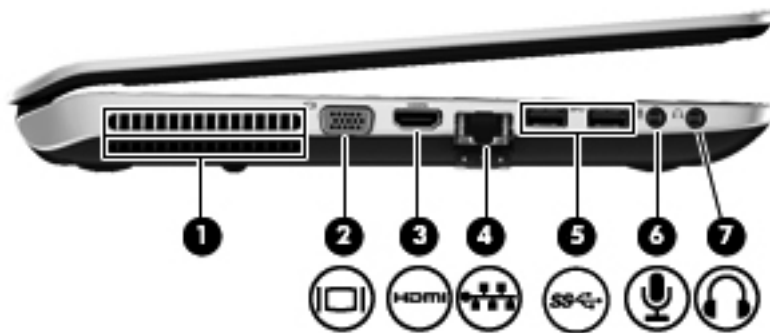
Item	Component	Description
(1)	TouchPad on/off button	Turns the TouchPad on or off.
(2)	TouchPad light	<ul style="list-style-type: none"> <li>• On: The TouchPad is off.</li> <li>• Off: The TouchPad is on.</li> </ul>
(3)	TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.
(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.

## Front



Component	Description
Digital Media slot	Supports the following digital card formats: <ul style="list-style-type: none"><li data-bbox="927 579 1286 600">• Secure Digital (SD) Memory Card</li><li data-bbox="927 632 1442 684">• Secure Digital Extended Capacity (SDxC) Memory Card</li><li data-bbox="927 716 1458 737">• Secure Digital High Capacity (SDHC) Memory Card</li><li data-bbox="927 768 1422 789">• Ultra High Speed MultiMediaCard (UHS/MMC)</li></ul>

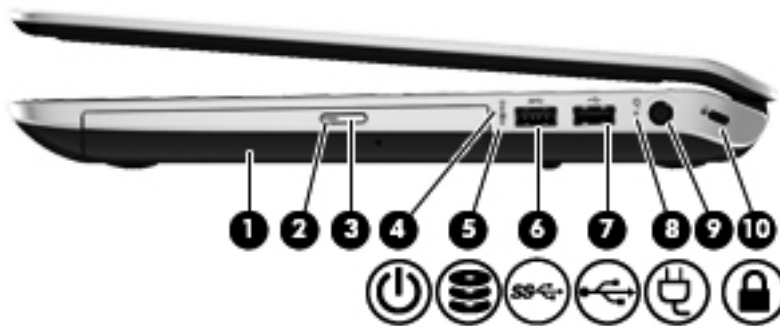
## Left side



Item	Component	Description
(1)	Vent	Enables airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	External monitor port	Connects an external VGA monitor or projector.
(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 an optional USB 3.0 device 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	Connect 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 Regulatory, Safety and Environmental Notices.  <b>NOTE:</b> When a device is connected to a headphone jack, the computer speakers are disabled.



## Right side



Item	Component	Description
(1)	Optical drive	Reads and writes (select models only) to an optical disc.
(2)	Optical drive light	<ul style="list-style-type: none"> <li>Green: 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.</li> <li>Off: The computer is off or in Hibernation.</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> <p><b>NOTE:</b> For information about HP 3D DriveGuard Protection, see the <i>HP Notebook Reference Guide</i>.</p>
(6)	USB 3.0 port	<p>Connects an optional USB 3.0 device and provides enhanced USB power performance.</p> <p><b>NOTE:</b> For details about different types of USB ports, see the <i>HP Notebook Reference Guide</i>.</p>
(7)	USB 2.0 port	<p>Connects an optional USB device.</p> <p><b>NOTE:</b> For details about different types of USB ports, see the <i>HP Notebook Reference Guide</i>.</p>
(8)	AC adapter light	<ul style="list-style-type: none"> <li>White: The AC adapter is connected and the battery is charged.</li> <li>Amber: The AC adapter is connected and the battery is charging.</li> <li>Off: The computer is using DC power</li> </ul>

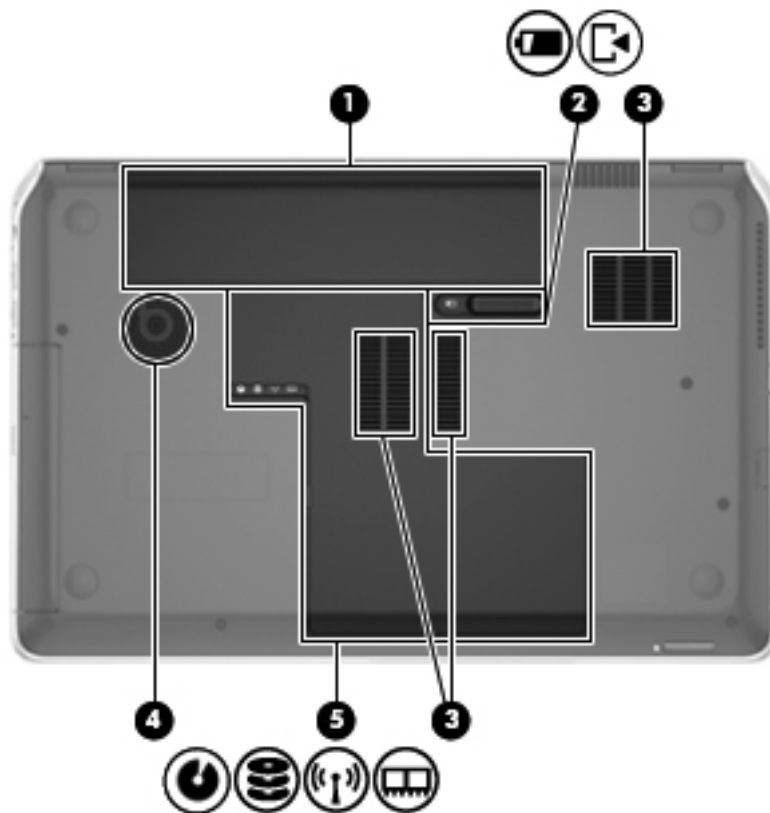
Item	Component	Description
(9)	Power connector	Connects an AC adapter.
(10)	Security cable slot	Attaches an optional security cable to the computer.  <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

## Rear



Component	Description
Vent	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.

# Bottom



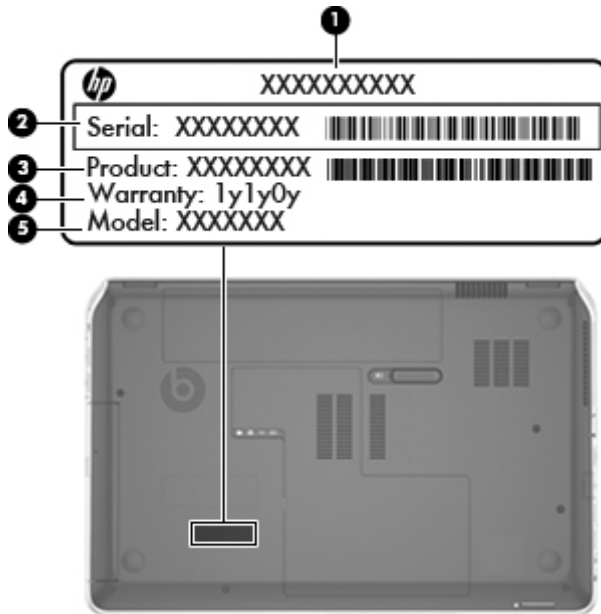
Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	Battery release latch	Releases the battery from the battery bay and opens the service cover.
(3)	Vents (3)	Enable airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)	Integrated subwoofer	Provides superior bass sound.
(5)	Service cover	The service cover provides access to the hard drive bay, wireless compartment, and memory module compartment.  <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.

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# 3 Illustrated parts catalog

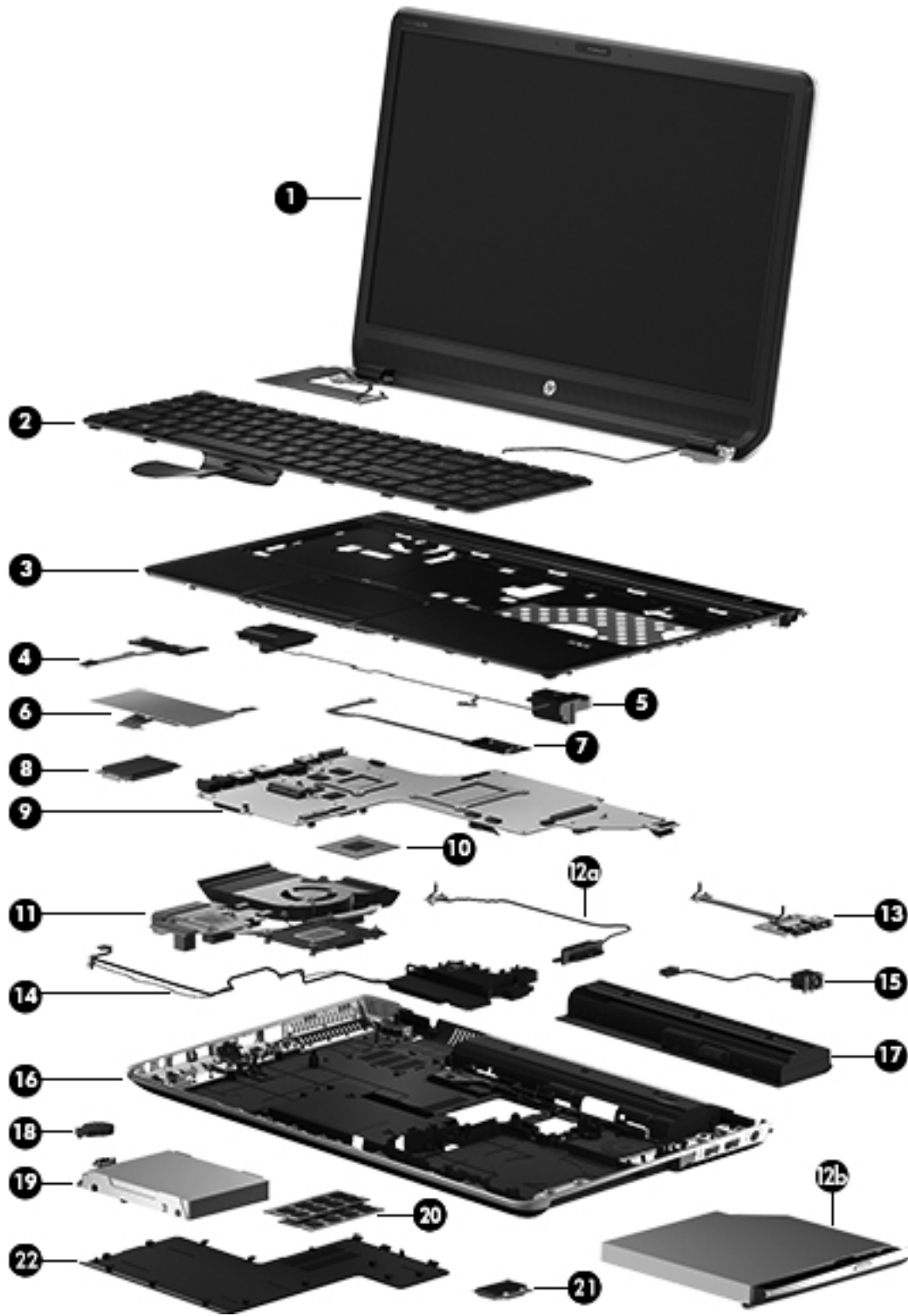
# Service tag

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



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

# Computer major components



Item	Component	Spare part number
<b>(1)</b>	<b>15.6-in display assembly</b> (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcamera/microphone module and cable)	
	For use on all computer models:	
	15.6-in, AntiGlare, FHD display assembly in aluminum finish	682066-001
	15.6-in, BrightView, HD display assembly in aluminum finish	682065-001
	For use only with computer models equipped with an Intel processor:	
	15.6-in, AntiGlare, FHD display assembly in aluminum finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	682068-001
	15.6-in, AntiGlare, FHD display assembly in magenta finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	685985-001
	15.6-in, AntiGlare, FHD display assembly in magenta finish	685983-001
	15.6-in, BrightView, HD display assembly in aluminum finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	682067-001
	15.6-in, BrightView, HD display assembly in magenta finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	685984-001
	15.6-in, BrightView, HD display assembly in magenta finish	685982-001
	<b>NOTE:</b> For more display assembly spare part information, see <a href="#">Display assembly subcomponents on page 28</a> .	
<b>(2)</b>	<b>Keyboard</b> in black finish (includes keyboard cable):	
	Keyboard with backlight (includes backlight cable):	
	For use on all computer models in the United States	682081-001
	For use only on computer models equipped with an Intel processor in Saudi Arabia	682081-171
	For use only on computer models equipped with an Intel processor in Belgium	682081-A41
	For use only on computer models equipped with an Intel processor in the Netherlands	682081-B31
	Keyboard without backlight:	
	For use only on computer models equipped with an Intel processor in Belgium	682082-A41
	For use on all computer models in Brazil	682082-201
	For use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	682082-FL1
	For use only on computer models equipped with an Intel processor in Denmark, Finland, and Norway	682082-DH1
	For use only on computer models equipped with an Intel processor in French Canada	682082-DB1
	For use only on computer models equipped with an Intel processor in France	682082-051
	For use only on computer models equipped with an Intel processor in Germany	682082-041
	For use only on computer models equipped with an Intel processor in Greece	682082-151
	For use only on computer models equipped with an Intel processor in Hungary	682082-211

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	For use only on computer models equipped with an Intel processor in India	682082-D61
	For use only on computer models equipped with an Intel processor in Israel	682082-BB1
	For use only on computer models equipped with an Intel processor in Italy	682082-061
	For use on all computer models in Japan	682082-291
	For use on all computer models in Latin America	682082-161
	For use only on computer models equipped with an Intel processor in the Netherlands	682082-B31
	For use only on computer models equipped with an Intel processor in Portugal	682082-131
	For use only on computer models equipped with an Intel processor in Romania	682082-271
	For use only on computer models equipped with an Intel processor in Russia	682082-251
	For use only on computer models equipped with an Intel processor in Saudi Arabia	682082-171
	For use only on computer models equipped with an Intel processor in Slovenia	682082-BA1
	For use only on computer models equipped with an Intel processor in South Korea	682082-AD1
	For use only on computer models equipped with an Intel processor in Spain	682082-071
	For use only on computer models equipped with an Intel processor in Switzerland	682082-BG1
	For use only on computer models equipped with an Intel processor in Taiwan	682082-AB1
	For use only on computer models equipped with an Intel processor in Thailand	682082-281
	For use only on computer models equipped with an Intel processor in Turkey	682082-141
	For use only on computer models equipped with an Intel processor in the United Kingdom	682082-031
	For use on all computer models in the United States	682082-001
<b>(3)</b>	<b>Top cover</b> (includes TouchPad and cable)	682101-001
<b>(4)</b>	<b>Power button board</b> (includes cable)	682086-001
<b>(5)</b>	<b>Top speakers</b> (include speaker cables)	682095-001
<b>(6)</b>	<b>TouchPad button board</b> (includes cable and bracket)	682225-001
<b>(7)</b>	<b>Fingerprint reader board</b> (includes bracket and cable)	682062-001
<b>(8)</b>	<b>Solid-state drive:</b>	
	160-GB solid-state drive for use on all computer models	682098-001
	32-GB mSATA solid-state drive for use only on computer models equipped with an Intel processor	682099-001
<b>(9)</b>	<b>System board</b> (includes replacement thermal material):	
	For use only on computer models equipped with the AMD A70M chipset and the AMD RadeonT HD 7730M graphics subsystem (includes 2.0-GB of discrete video memory)	682183-001
	For use only on computer models equipped with the AMD A70M chipset and the AMD RadeonT HD 7670M graphics subsystem (includes 2.0-GB of discrete video memory)	682182-001

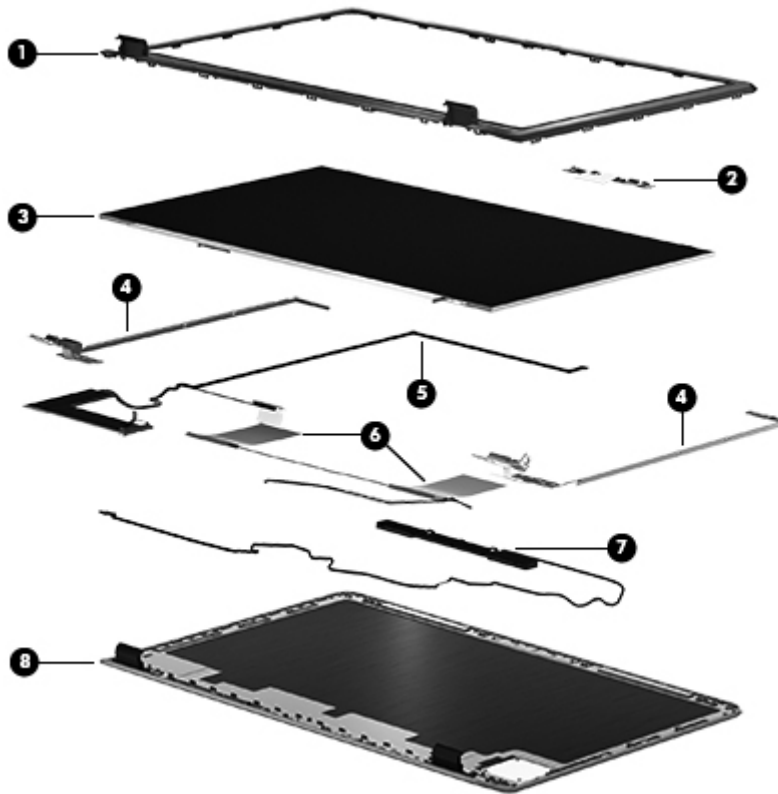


Item	Component	Spare part number
	For use only on computer models equipped with the AMD A70M chipset and the AMD RadeonT HD 7670M graphics subsystem (includes 1.0-GB of discrete video memory)	682181-001
	For use only on computer models equipped with the AMD A70M chipset and a graphics subsystem with UMA video memory	682180-001
	For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682174-001
	For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682175-001
	For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682172-001
	For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682173-001
	For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682170-001
	For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682171-001
	For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682168-001
	For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682169-001
	For use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, and a graphics subsystem with UMA video memory	682176-001
	For use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, and a graphics subsystem with UMA video memory	682177-001
	<b>Thermal Material Kit</b> (not illustrated, includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor	685348-001
	For use only on computer models equipped with an Intel processor	682100-001
<b>(10)</b>	<b>Processor</b> (includes replacement thermal material):	
	Intel Core i7-3820QM 2.70-GHz processor (8.0-MB L3 cache, 45 W)	681284-001
	Intel Core i7-3720QM 2.60-GHz processor (6.0-MB L3 cache, 45 W)	681283-001
	Intel Core i7-3612QM 2.10-GHz processor (6.0-MB L3 cache, 35 W)	680647-001
	Intel Core i7-3610QM 2.30-GHz processor (6.0-MB L3 cache, 45 W)	680646-001
	Intel Core i5-3320M 2.60-GHz processor (3.0-MB L3 cache, 35 W)	681952-001

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	Intel Core i7-2670QM 2.20-GHz processor (6.0-MB L3 cache, 45 W)	665116-001
	Intel Core i5-3210M 2.50-GHz processor (3.0-MB L3 cache, 35 W)	680645-001
	Intel Core i5-2450M 2.50-GHz processor (3.0-MB L3 cache, 35 W)	676359-001
	Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, 35 W)	682417-001
	Intel Core i3-2370M 2.40-GHz processor (3.0-MB L3 cache, 35 W)	677152-001
	Intel Core i3-2350M 2.20-GHz processor (3.0-MB L3 cache, 35 W)	653340-001
<b>(11)</b>	<b>Fan/heat sink assembly</b> (includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory	682179-001
	For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	682178-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory	682061-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	682060-001
<b>(12a)</b>	<b>Optical drive connector cable</b> (included with the optical drive spare part kit)	
<b>(12b)</b>	<b>Optical drive</b> (includes bezel and bracket):	
	Blu-ray Disc ROM with SuperMulti DVD±R/RW Double-Layer Drive	682084-001
	Blu-ray Disc R/RW with SuperMulti Drive	682085-001
	DVD±RW Double-Layer with SuperMulti Drive	682083-001
<b>(13)</b>	<b>USB board</b> (includes cable)	682087-001
<b>(14)</b>	<b>Subwoofer</b> (includes subwoofer cable, top speaker passthrough cable, and 2 rubber isolators)	682097-001
<b>(15)</b>	<b>Power connector cable</b> (includes bracket):	
	For use only on computer models equipped with a 120-W AC adapter	682059-001
	For use only on computer models equipped with a 90-W or 65-W AC adapter	682058-001
<b>(16)</b>	<b>Base enclosure</b>	682051-001
<b>(17)</b>	<b>Battery:</b>	
	9-cell, 100-Wh, 3.0-Ah, Li-ion battery	672412-001
	6-cell, 62-Wh, 2.8-Ah, Li-ion battery	671731-001
<b>(18)</b>	<b>RTC battery</b> (includes cable and double-sided tape)	682091-001
<b>(19)</b>	<b>Hard drive</b> (does not include the hard drive connector cable, hard drive bracket, or screws):	
	For use on all computer models:	
	750-GB, 7200-rpm, 9.5-mm	633252-001

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	750-GB, 5400-rpm, 9.5-mm	634250-001
	640-GB, 5400-rpm, 9.5-mm	669300-001
	500-GB, 7200-rpm, 9.5-mm	634925-001
	500-GB, 5400-rpm, 9.5-mm	669299-001
	320-GB, 7200-rpm, 9.5-mm	641672-001
	For use only on computer models equipped with an AMD processor:	
	1-TB, 5400-rpm, 12.7-mm	638974-001
	320-GB, 5400-rpm, 9.5-mm	645193-001
	For use only on computer models equipped with an Intel processor:	
	1-TB, 5400-rpm, 12.7-mm	676521-001
	750-GB, 7200-rpm, 9.5-mm	684506-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
	<b>Hard Drive Hardware Kit</b> (not illustrated, includes the hard drive connector cable, hard drive bracket, and screws)	682063-001
<b>(20)</b>	<b>Memory modules</b> (2, PC3, 12800, 1600-MHz):	
	8-GB memory module	670034-001
	4-GB memory module	641369-001
	2-GB memory module	652972-001
<b>(21)</b>	<b>WLAN module:</b>	
	For use with all computer models:	
	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
	Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter	675794-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
	Intel Centrino Advanced-N 6230 WLAN module	670691-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) for use only on computer models equipped with an AMD processor in Brazil	600370-201
	Intel Centrino Advanced-N 6235 WLAN module for use only on computer models equipped with an Intel processor in Japan	670290-001
<b>(22)</b>	<b>Service cover</b>	682088-001

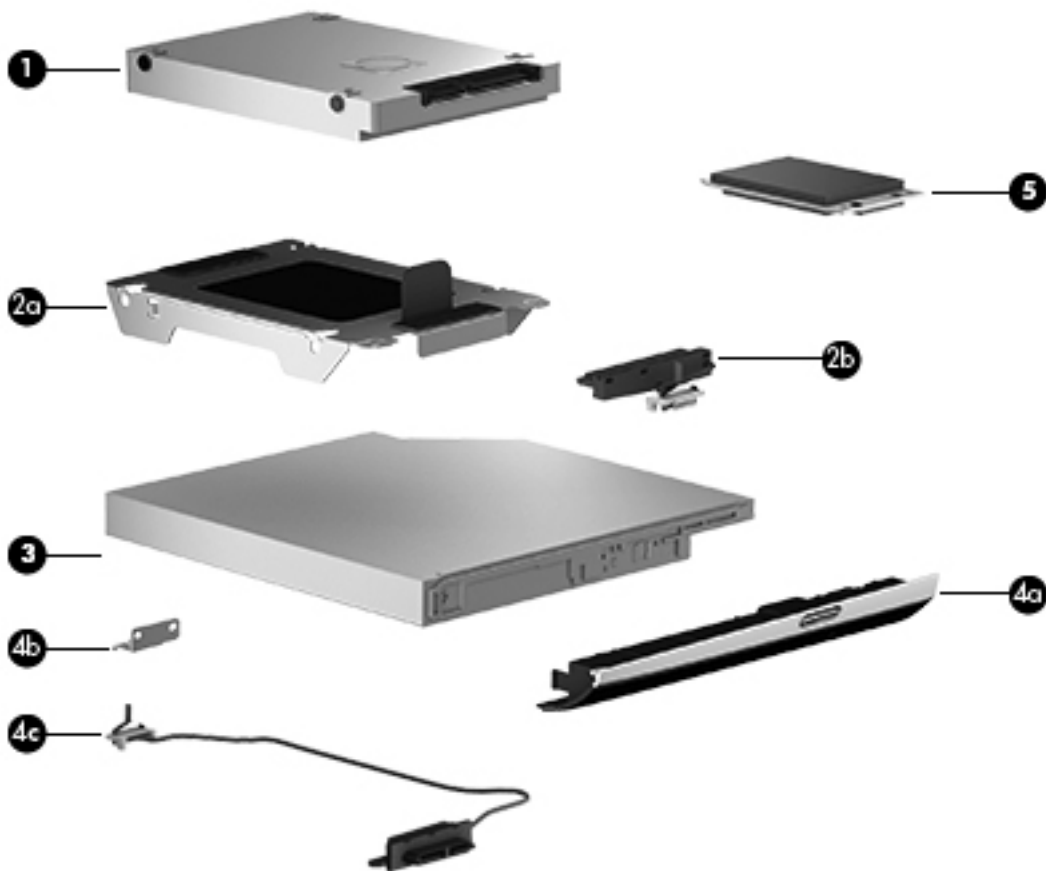
## Display assembly subcomponents



Item	Component	Spare part number
(1)	<b>Display bezel</b>	682052-001
(2)	<b>Webcamera/microphone module</b>	682105-001
(3)	<b>Display panel:</b>	
	15.6-in, AntiGlare, FHD display panel	682090-001
	15.6-in, BrightView, HD display panel	682089-001
(4)	<b>Display Hinge Kit</b> (includes left and right hinges and brackets)	682064-001
(5)	<b>Display panel cable:</b>	
	Display panel cable for use only on computer models equipped with an FHD display assembly	682055-001
	Display panel cable for use only on computer models equipped with an FHD display assembly and an Intel processor	682057-001
	Display panel cable for use only on computer models equipped with an HD display assembly	682054-001
	Display panel cable for use only on computer models equipped with an HD display assembly and an Intel processor	682056-001
(6)	<b>Antenna Kit</b> (includes left and right wireless antenna cables and transceivers)	682046-001
(7)	<b>Display speakers</b> (include speaker cables)	682096-001

Item	Component	Spare part number
(8)	<b>Display enclosure:</b>	
	In aluminum finish (for use on all computer models)	682047-001
	In magenta finish (for use only on computer models equipped with an Intel processor)	685736-001
	<b>Display Screw Kit</b>	682093-001

## Mass storage devices



Item	Component	Spare part number
(1)	<b>Hard drive</b> (does not include the hard drive bracket, hard drive connector cable, or screws)	
	For use on all computer models:	
	750-GB, 7200-rpm, 9.5-mm	633252-001
	750-GB, 5400-rpm, 9.5-mm	634250-001
	640-GB, 5400-rpm, 9.5-mm	669300-001
	500-GB, 7200-rpm, 9.5-mm	634925-001
	500-GB, 5400-rpm, 9.5-mm	669299-001

Item	Component	Spare part number
	320-GB, 7200-rpm, 9.5-mm	641672-001
	For use only on computer models equipped with an AMD processor:	
	1-TB, 5400-rpm, 12.7-mm	638974-001
	320-GB, 5400-rpm, 9.5-mm	645193-001
	For use only on computer models equipped with an Intel processor:	
	1-TB, 5400-rpm, 12.7-mm	676521-001
	750-GB, 7200-rpm, 9.5-mm	684506-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
	<b>Hard Drive Hardware Kit</b> , includes:	682063-001
<b>(2a)</b>	Hard drive bracket	
<b>(2b)</b>	Hard drive connector cable	
	Screws (not illustrated)	
<b>(3)</b>	<b>Optical drive:</b>	
	Blu-ray Disc ROM with SuperMulti DVD±R/RW Double-Layer Drive	682084-001
	Blu-ray Disc R/RW with SuperMulti Drive	682085-001
	DVD±RW Double-Layer with SuperMulti Drive	682083-001
	Includes:	
<b>(4a)</b>	Optical drive bezel	
<b>(4b)</b>	Optical drive bracket	
<b>(5)</b>	<b>Solid-state drive</b>	
	160-GB solid-state drive for use on all computer models	682098-001
	32-GB mSATA solid-state drive for use only on computer models equipped with an Intel processor	682099-001

## Miscellaneous parts

Component	Spare part number
<b>AC adapter:</b>	
For use on all computer models:	
90-W HP Smart AC adapter (RC, V, PFC, 3-wire)	609940-001
65-W HP Smart AC adapter (RC, V, 3-wire)	609939-001
For use only on computer models equipped with an Intel processor:	

<b>Component</b>	<b>Spare part number</b>
120-W slim AC adapter (RC, V, PFC, 3-wire)	645156-001
90-W HP Smart AC adapter (RC, V, PFC, EM, 3-wire)	609947-001
65-W HP Smart AC adapter (RC, V, EM, 3-wire)	609948-001
<b>Power cord</b> (3-pin, black, 1.83-m):	
For use on all computer models:	
For use in Argentina	490371-D01
For use in Australia	490371-011
For use in Brazil	490371-202
For use in Italy	490371-061
For use in Japan	490371-291
For use in North America	490371-001
For use only on computer models equipped with an Intel processor:	
For use in Denmark	490371-081
For use in Europe	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in Thailand	490371-281
For use in the United Kingdom and Singapore	490371-031
<b>Screw Kit</b>	682094-001

# Sequential part number listing

Spare part number	Description
490371-001	Power cord for use on all computer models in North America (3-pin, black, 1.83-m)
490371-011	Power cord for use on all computer models in Australia (3-pin, black, 1.83-m)
490371-021	Power cord for use only on computer models equipped with an Intel processor in Europe (3-pin, black, 1.83-m)
490371-031	Power cord for use only on computer models equipped with an Intel processor in the United Kingdom and Singapore (3-pin, black, 1.83-m)
490371-061	Power cord for use on all computer models in Italy (3-pin, black, 1.83-m)
490371-081	Power cord for use only on computer models equipped with an Intel processor in Denmark (3-pin, black, 1.83-m)
490371-111	Power cord for use only on computer models equipped with an Intel processor in Switzerland (3-pin, black, 1.83-m)
490371-201	Power cord for use only on computer models equipped with an Intel processor in Thailand (3-pin, black, 1.83-m)
490371-202	Power cord for use on all computer models in Brazil (3-pin, black, 1.83-m)
490371-291	Power cord for use on all computer models in Japan (3-pin, black, 1.83-m)
490371-AA1	Power cord for use only on computer models equipped with an Intel processor in the People's Republic of China (3-pin, black, 1.83-m)
490371-AB1	Power cord for use only on computer models equipped with an Intel processor in Taiwan (3-pin, black, 1.83-m)
490371-AD1	Power cord for use only on computer models equipped with an Intel processor in South Korea (3-pin, black, 1.83-m)
490371-AR1	Power cord for use only on computer models equipped with an Intel processor in South Africa (3-pin, black, 1.83-m)
490371-BB1	Power cord for use Power cord for use only on computer models equipped with an Intel processor in Israel (3-pin, black, 1.83-m)
490371-D01	Power cord for use on all computer models in Argentina (3-pin, black, 1.83-m)
490371-D61	Power cord for use on all computer models in India (3-pin, black, 1.83-m)
600370-201	Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) for use only on computer models equipped with an AMD processor in Brazil
609939-001	65-W HP Smart AC adapter for use on all computer models (RC, V, 3-wire)
609940-001	90-W HP Smart AC adapter for use on all computer models (RC, V, PFC, 3-wire)
609947-001	90-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC, V, PFC, EM, 3-wire)
609948-001	65-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC, V, EM, 3-wire)



Spare part number	Description
622643-001	320-GB, 5400-rpm hard hard for use only on computer models equipped with an Intel processor (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
633252-001	750-GB, 7200-rpm hard hard for use on all computer models (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
634250-001	750-GB, 5400-rpm hard hard for use on all computer models (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
634925-001	500-GB, 7200-rpm hard hard for use on all computer models (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
638974-001	1-TB, 5400-rpm hard hard for use only on computer models equipped with an AMD processor (SATA, 12.7-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
641369-001	4-GB memory module (PC3, 12800, 1600-MHz)
641672-001	320-GB, 7200-rpm hard hard for use on all computer models (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
645156-001	120-W slim AC adapter for use only on computer models equipped with an Intel processor (RC, V, PFC, 3-wire)
645193-001	320-GB, 5400-rpm hard hard for use only on computer models equipped with an AMD processor (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
652972-001	2-GB memory module (PC3, 12800, 1600-MHz)
653340-001	Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, 35 W; includes replacement thermal material)
655795-001	Atheros 9485GN 802.11b/g/n 1x1 WiFi and 3012 Bluetooth 4.0 Combo Adapter for use on all computer models
657325-001	Broadcom 4313GN 802.11b/g/n 1x1 WiFi and 20702 Bluetooth 4.0 Combo Adapter for use on all computer models
665116-001	Intel Core i7-2670QM 2.20-GHz processor (6.0-MB L3 cache, 45 W; includes replacement thermal material)

Spare part number	Description
669299-001	500-GB, 5400-rpm hard hard for use on all computer models (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
669300-001	640-GB, 5400-rpm hard hard for use on all computer models (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
670034-001	8-GB memory module (PC3, 12800, 1600-MHz)
670290-001	Intel Centrino Advanced-N 6235 WLAN module for use only on computer models equipped with an Intel processor in Japan
670691-001	Intel Centrino Advanced-N 6230 WLAN module for use on all computer models
671731-001	6-cell, 62-Wh, 2.8-Ah, Li-ion battery
672412-001	9-cell, 100-Wh, 3.0-Ah, Li-ion battery
675794-001	Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter for use on all computer models
676359-001	Intel Core i5-2450M 2.50-GHz processor (3.0-MB L3 cache, 35 W; includes replacement thermal material)
676521-001	1-TB, 5400-rpm hard hard for use only on computer models equipped with an Intel processor (SATA, 12.7-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
677152-001	Intel Core i3-2370M 2.40-GHz processor (3.0-MB L3 cache, 35 W; includes replacement thermal material)
680645-001	Intel Core i5-3210M 2.50-GHz processor (3.0-MB L3 cache, 35 W; includes replacement thermal material)
680646-001	Intel Core i7-3610QM 2.30-GHz processor (6.0-MB L3 cache, 45 W; includes replacement thermal material)
680647-001	Intel Core i7-3612QM 2.10-GHz processor (6.0-MB L3 cache, 35 W; includes replacement thermal material)
681283-001	Intel Core i7-3720QM 2.60-GHz processor (6.0-MB L3 cache, 45 W; includes replacement thermal material)
681284-001	Intel Core i7-3820QM 2.70-GHz processor (8.0-MB L3 cache, 45 W; includes replacement thermal material)
681952-001	Intel Core i5-3320M 2.60-GHz processor (3.0-MB L3 cache, 35 W; includes replacement thermal material)
682046-001	Wireless Antenna Kit (includes wireless antenna cables and transceivers)
682047-001	Display enclosure in aluminum finish
682051-001	Base enclosure
682052-001	Display bezel in aluminum finish for use on all computer models

<b>Spare part number</b>	<b>Description</b>
682054-001	Display panel cable for use only on computer models equipped with an HD display assembly
682055-001	Display panel cable for use only on computer models equipped with an FHD display assembly
682056-001	Display panel cable for use only on computer models equipped with an HD display assembly and an Intel processor
682057-001	Display panel cable for use only on computer models equipped with an FHD display assembly and an Intel processor
682058-001	Power connector cable for use only on computer models equipped with a 65-W and 90-W AC adapter
682059-001	Power connector cable for use only on computer models equipped with a 120-W AC adapter
682060-001	Fan/heat sink assembly for use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
682061-001	Fan/heat sink assembly for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes replacement thermal material)
682062-001	Fingerprint reader board (includes bracket and cable)
682063-001	Hard Drive Hardware Kit
682064-001	Display Hinge Kit (includes left and right hinges and brackets)
682065-001	15.6-in, BrightView, HD display assembly in aluminum finish for use on all computer models (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcamera/microphone module and cable)
682066-001	15.6-in, AntiGlare, FHD display assembly in aluminum finish for use on all computer models (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcamera/microphone module and cable)
682067-001	15.6-in, BrightView, HD display assembly in aluminum finish for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcamera/microphone module and cable)
682068-001	15.6-in, AntiGlare, FHD display assembly in aluminum finish for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcamera/microphone module and cable)
682081-001	Keyboard in black finish with backlight for use on all computer models in the United States (includes keyboard cable and backlight cable)
682081-171	Keyboard in black finish with backlight for use only on computer models equipped with an Intel processor in Saudi Arabia (includes keyboard cable and backlight cable)
682081-A41]	Keyboard in black finish with backlight for use only on computer models equipped with an Intel processor in Belgium (includes keyboard cable and backlight cable)
682081-B31	Keyboard in black finish with backlight for use only on computer models equipped with an Intel processor in the Netherlands (includes keyboard cable and backlight cable)
682082-001	Keyboard in black finish without backlight for use on all computer models in the United States (includes keyboard cable)

<b>Spare part number</b>	<b>Description</b>
682082-031	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in the United Kingdom (includes keyboard cable)
682082-041	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Germany (includes keyboard cable)
682082-051	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in France (includes keyboard cable)
682082-061	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Italy (includes keyboard cable)
682082-071	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Spain (includes keyboard cable)
682082-131	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Portugal (includes keyboard cable)
682082-141	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Turkey (includes keyboard cable)
682082-151	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Greece (includes keyboard cable)
682082-161	Keyboard in black finish without backlight for use on all computer models in Latin America (includes keyboard cable)
682082-171	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Saudi Arabia (includes keyboard cable)
682082-201	Keyboard in black finish without backlight for use on all computer models in Brazil (includes keyboard cable)
682082-211	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Hungary (includes keyboard cable)
682082-251	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Russia (includes keyboard cable)
682082-271	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Romania (includes keyboard cable)
682082-281	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Thailand (includes keyboard cable)
682082-291	Keyboard in black finish without backlight for use on all computer models in Japan (includes keyboard cable)
682082-A41	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Belgium (includes keyboard cable)
682082-AB1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Taiwan (includes keyboard cable)
682082-AD1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in South Korea (includes keyboard cable)
682082-B31	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in the Netherlands (includes keyboard cable)

<b>Spare part number</b>	<b>Description</b>
682082-BA1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Slovenia (includes keyboard cable)
682082-BB1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Israel (includes keyboard cable)
682082-BG1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Switzerland (includes keyboard cable)
682082-D61	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in India (includes keyboard cable)
682082-DB1	Keyboard in black finish without backlight for use on all computer models in French Canada (includes keyboard cable)
682082-DH1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in Denmark, Finland, and Norway (includes keyboard cable)
682082-FL1	Keyboard in black finish without backlight for use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia (includes keyboard cable)
682083-001	DVD±RW Double-Layer with SuperMulti Drive (includes bezel and bracket)
682084-001	Blu-ray Disc ROM with SuperMulti DVD±R/RW Double-Layer Drive (includes bezel and bracket)
682085-001	Blu-ray Disc R/RW with SuperMulti Drive (includes bezel and bracket)
682086-001	Power button board (includes cable)
682087-001	USB board (includes cable)
682088-001	Service cover
682089-001	15.6-in, BrightView, HD display panel
682090-001	15.6-in, AntiGlare, FHD display panel
682091-001	RTC battery (includes cable and double-sided tape)
682093-001	Display Screw Kit
682094-001	Screw Kit
682095-001	Top speakers (includes cable)
682096-001	Display speakers (includes cable)
682097-001	Subwoofer (includes subwoofer cable, top speaker passthrough cable, and 2 rubber isolators)
682098-001	160-GB solid-state drive for use with all computer models
682099-001	32-GB mSATA solid-state drive for use only with computer models equipped with an Intel processor
682100-001	Thermal Material Kit for use only on computer models equipped with an Intel processor (includes replacement thermal pads and paste)
682101-001	Top cover in aluminum finish (includes TouchPad board and cable)
682105-001	Webcamera/microphone module
682168-001	System board for use only on computer models equipped with the Intel 630M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory and replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
682169-001	System board for use only on computer models equipped with the Intel 630M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682170-001	System board for use only on computer models equipped with the Intel 630M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682171-001	System board for use only on computer models equipped with the Intel 630M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682172-001	System board for use only on computer models equipped with the Intel 650M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682173-001	System board for use only on computer models equipped with the Intel 650M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682174-001	System board for use only on computer models equipped with the Intel 650M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682175-001	System board for use only on computer models equipped with the Intel 650M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory and replacement thermal material)
682176-001	System board for use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, and a graphics subsystem with UMA video memory (includes replacement thermal material)
682177-001	System board for use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, and a graphics subsystem with UMA video memory (includes replacement thermal material)
682178-001	Fan/heat sink assembly for use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
682179-001	Fan/heat sink assembly for use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
682180-001	System board for use only on computer models equipped with the AMD A70M chipset and a graphics subsystem with UMA video memory (includes replacement thermal material)
682181-001	System board for use only on computer models equipped with the AMD A70M chipset and the AMD RadeonT HD 7670M graphics subsystem (includes 1.0-GB of discrete video memory and replacement thermal material)
682182-001	System board for use only on computer models equipped with the AMD A70M chipset and the AMD RadeonT HD 7670M graphics subsystem (includes 2.0-GB of discrete video memory and replacement thermal material)
682183-001	System board for use only on computer models equipped with the AMD A70M chipset and the AMD RadeonT HD 7730M graphics subsystem (includes 2.0-GB of discrete video memory and replacement thermal material)
682225-001	TouchPad button board (includes cable and bracket)

Spare part number	Description
682417-001	Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, 35 W; includes replacement thermal material)
684506-001	750-GB, 7200-rpm hard hard for use only computer models equipped with an Intel processor (SATA, 9.5-mm, does not include hard drive connector cable, hard drive bracket, or screws)  <b>NOTE:</b> The hard drive connector cable, hard drive bracket, and screws are included in the Hard Drive Hardware Kit, spare part number 682063-001.
685348-001	Thermal Material Kit for use only on computer models equipped with an AMD processor (includes replacement thermal pads and paste)
685736-001	Display enclosure in magenta finish for use only with computer models equipped with an Intel processor
685982-001	15.6-in, BrightView, HD display assembly in magenta finish for use only with computer models equipped with an Intel processor (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)
685983-001	15.6-in, AntiGlare, FHD display assembly in magenta finish for use only with computer models equipped with an Intel processor (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)
685984-001	15.6-in, BrightView, HD display assembly in magenta finish for use only with computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)
685985-001	15.6-in, AntiGlare, FHD display assembly in magenta finish for use only with computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)

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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 screw driver
- Magnetic screw driver
- Phillips P0 and P1 screw drivers

### Service considerations

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



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**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.

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### Cables and connectors



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

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



## Drive handling

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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.

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

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

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

## Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

## Workstation guidelines

Follow these grounding workstation guidelines:

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

## Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

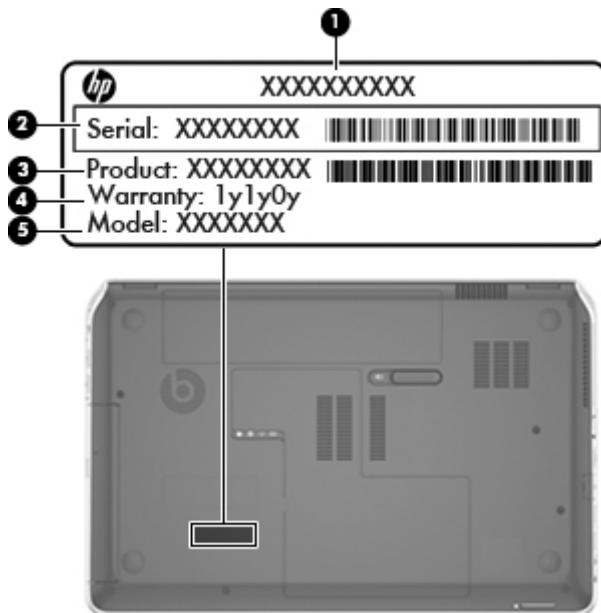
# Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 77 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

## Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag. It is necessary to remove the battery to obtain these numbers. See [Battery on page 46](#) for battery removal instructions.



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

## Battery

Description	Spare part number
9-cell, 100-Wh, 3.0-Ah, Li-ion battery	672412-001
6-cell, 62-Wh, 2.8-Ah, Li-ion battery	671731-001

Before disassembling the computer, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the front edge of the battery **(2)** up and back.
4. Remove the battery **(3)** from the computer.



To insert the battery:

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

## Hard drive



**NOTE:** The hard drive spare part kit does not include the hard drive connector cable, hard drive bracket, or screws. These components are included in the Hard Drive Hardware Kit, spare part number 682063-001.

Description	Spare part number
For use on all computer models:	
750-GB, 7200-rpm, 9.5-mm	633252-001
750-GB, 5400-rpm, 9.5-mm	634250-001
640-GB, 5400-rpm, 9.5-mm	669300-001
500-GB, 7200-rpm, 9.5-mm	634925-001
500-GB, 5400-rpm, 9.5-mm	669299-001
320-GB, 7200-rpm, 9.5-mm	641672-001
For use only on computer models equipped with an AMD processor:	
1-TB, 5400-rpm, 12.7-mm	638974-001
320-GB, 5400-rpm, 9.5-mm	645193-001
For use only on computer models equipped with an Intel processor:	
1-TB, 5400-rpm, 12.7-mm	676521-001
750-GB, 7200-rpm, 9.5-mm	684506-001
320-GB, 5400-rpm, 9.5-mm	622643-001

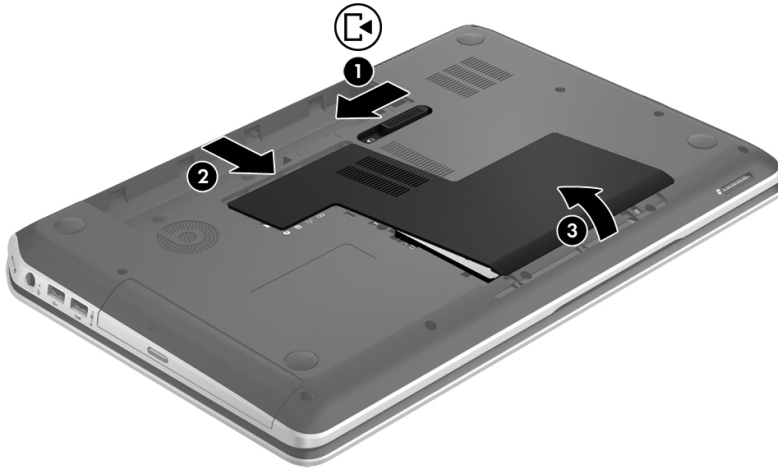
Before removing the hard drive, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).

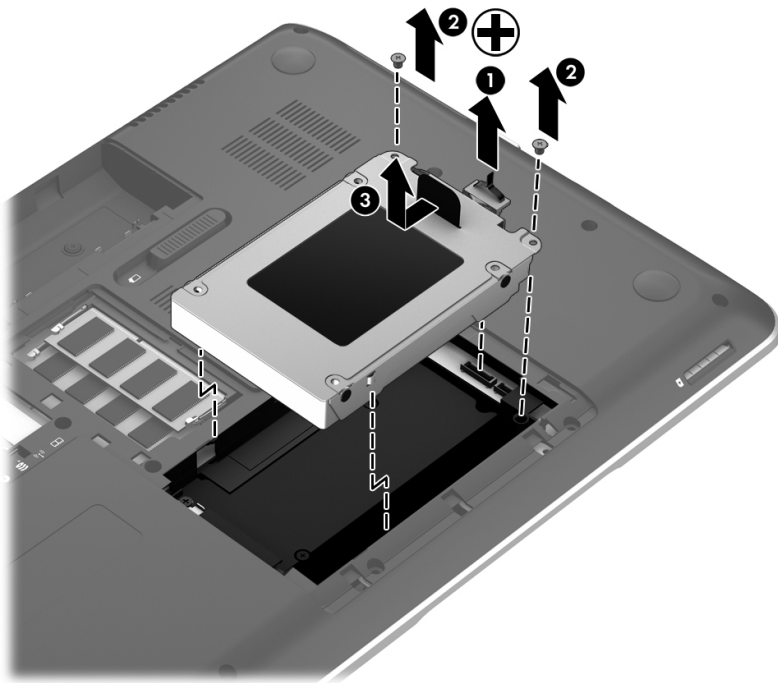
Remove the hard drive:

1. Slide the battery release latch **(1)** to release the service cover.
2. Slide the service cover **(2)** toward the front of the computer.

3. Remove the service cover **(3)**. The service cover is available using spare part number 682088-001.

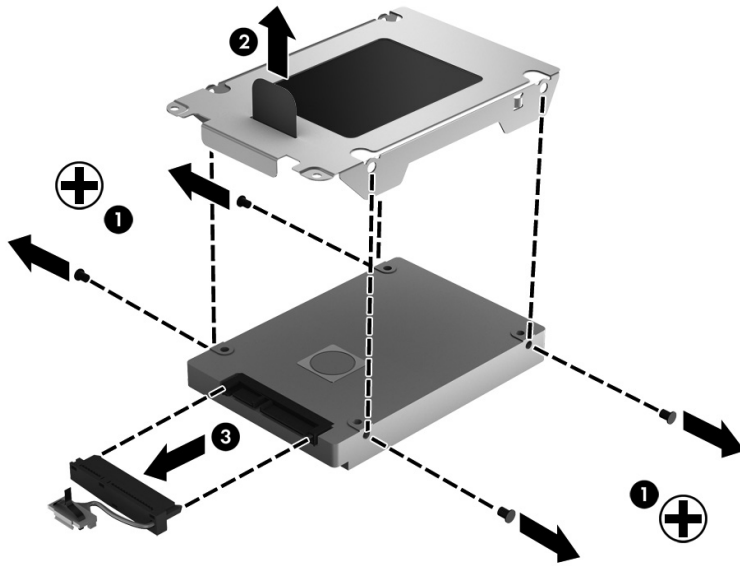


4. Disconnect the hard drive connector cable **(1)** from the system board.
5. Remove the two Phillips PM2.5×3.5 screws **(2)** that secure the hard drive to the computer.
6. Use the tab to slide the hard drive **(3)** to the left, and then remove the hard drive.





7. If it is necessary to replace the hard drive screws **(1)**, hard drive bracket **(2)**, or hard drive connector cable **(3)**, remove and replace the components. The hard drive screws, hard drive bracket, and hard drive connector cable are available in the Hard Drive Hardware Kit, spare part number 682063-001.



Reverse this procedure to reassemble and install the hard drive.

## RTC battery


Description	Spare part number
RTC battery (includes cable and double-sided tape)	682091-001

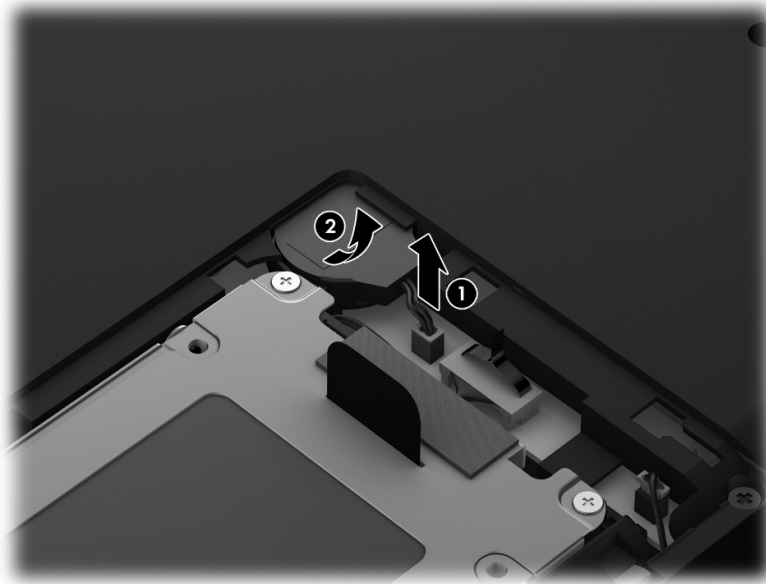
Before removing the RTC battery, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the service cover(see [Hard drive on page 47](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Release the RTC battery **(2)** from the cavity in the base enclosure.

 **NOTE:** The RTC battery is attached to the base enclosure with double-sided tape. Firm pressure may be required to release the RTC battery from the base enclosure.



3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

## Memory module

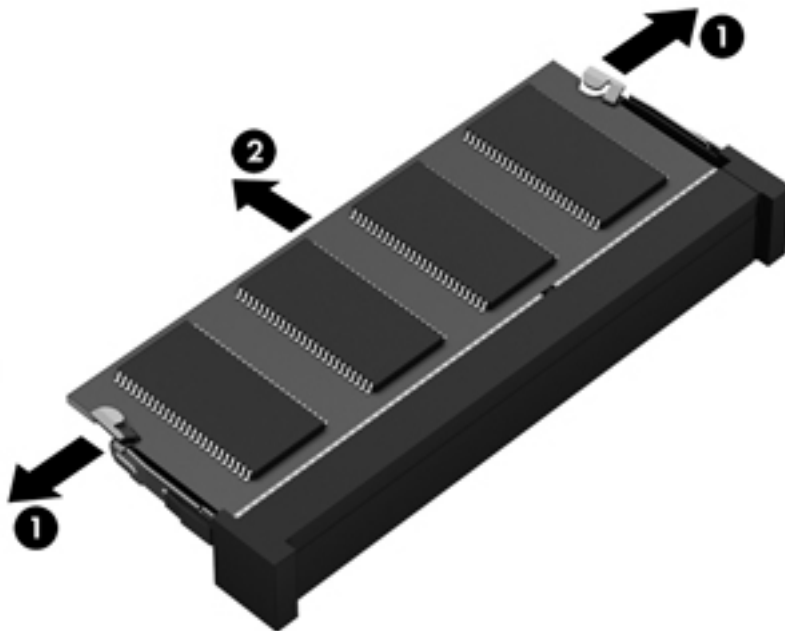
Description	Spare part number
8-GB memory module (PC3, 12800, 1600-MHz)	670034-001
4-GB memory module (PC3, 12800, 1600-MHz)	641369-001
2-GB memory module (PC3, 12800, 1600-MHz)	652972-001

Before removing the memory module, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the service cover (see [Hard drive on page 47](#)).

Remove the memory module:


1. Turn the system board upside down, with the front toward you.
2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)
3. Remove the memory module **(2)** by pulling it away from the slot at an angle.



Reverse this procedure to install the memory module.

## WLAN module

Description	Spare part number
For use with all computer models:	
Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter	675794-001
Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
Intel Centrino Advanced-N 6230 WLAN module	670691-001
Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 2070 Bluetooth 2.1+EDR Combo Adapter (BT3.0+HS ready) for use only on computer models equipped with an AMD processor in Brazil	600370-201
Intel Centrino Advanced-N 6235 WLAN module for use only on computer models equipped with an Intel processor in Japan	670290-001

 **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. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the service cover (see [Hard drive on page 47](#)).

Remove the WLAN module:

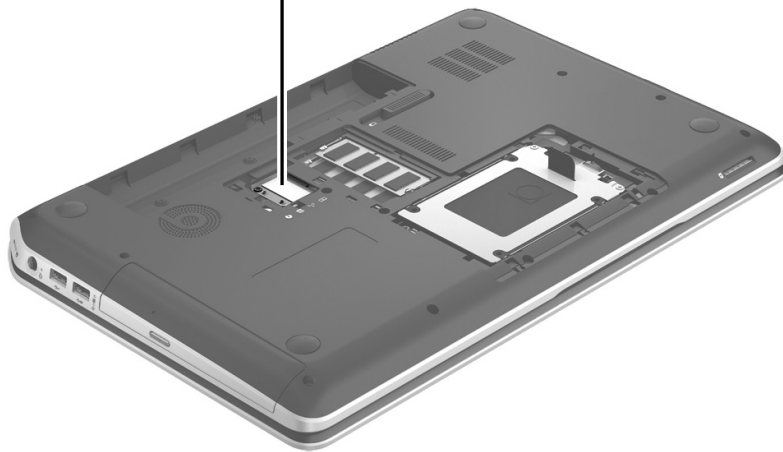
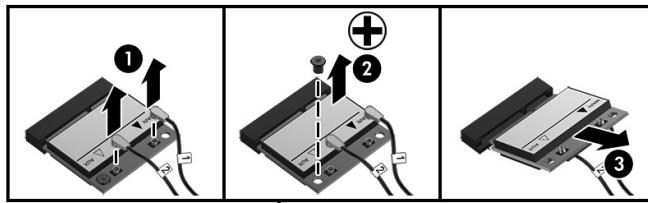
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.




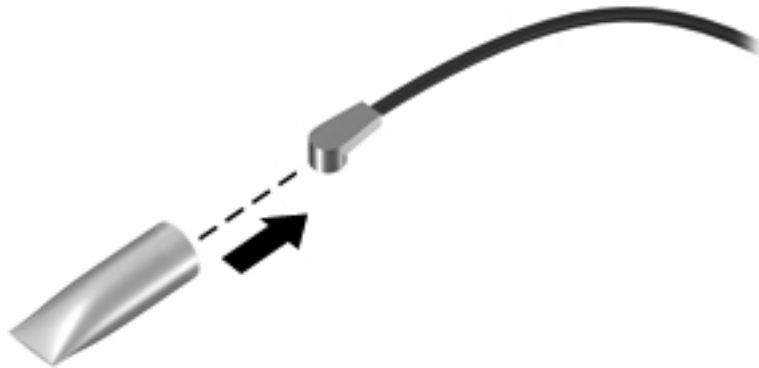
**NOTE:** The #1 WLAN antenna cable is connected to the WLAN module “Main” terminal. The #2 WLAN antenna cable is connected to the WLAN module “Aux” terminal.

2. Remove the Phillips PM2.0×3.5 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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



 **NOTE:** If the WLAN antennas are not connected to the terminals on the WLAN module, the protective sleeves should be installed on the antenna connectors, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

## Optical drive



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

Description	Spare part number
Blu-ray Disc ROM with SuperMulti DVD±R/RW Double-Layer Drive	682084-001
Blu-ray Disc R/RW with SuperMulti Drive	682085-001
DVD±RW Double-Layer with SuperMulti Drive	682083-001

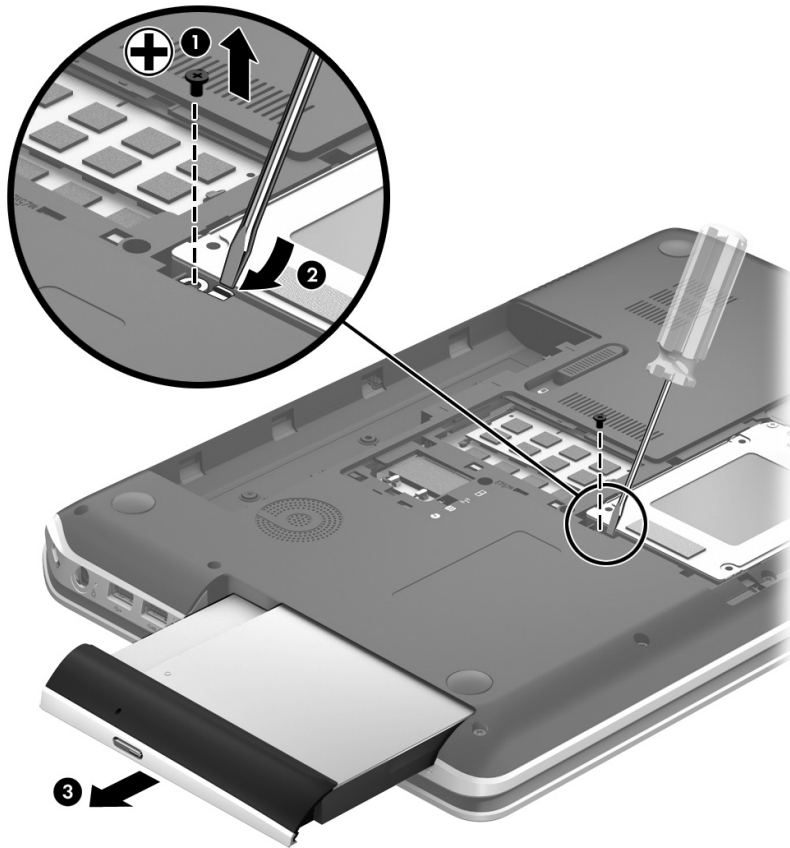
Before removing the optical drive, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the service cover (see [Hard drive on page 47](#)).

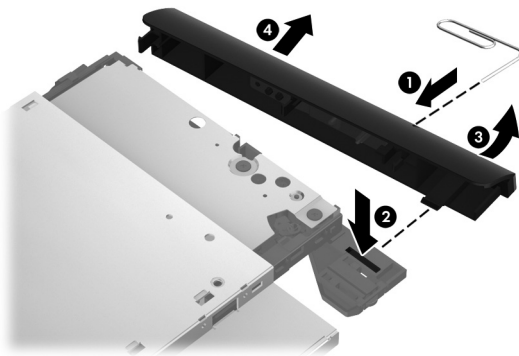
Remove the optical drive:

1. Remove the Phillips PM2.5×5.5 screw **(1)** that secures the optical drive to the computer.
2. Use a flat-blade screw driver or similar tool to press on the optical drive bracket tab **(2)** to release the optical drive.

3. Remove the optical drive **(3)** from the computer.

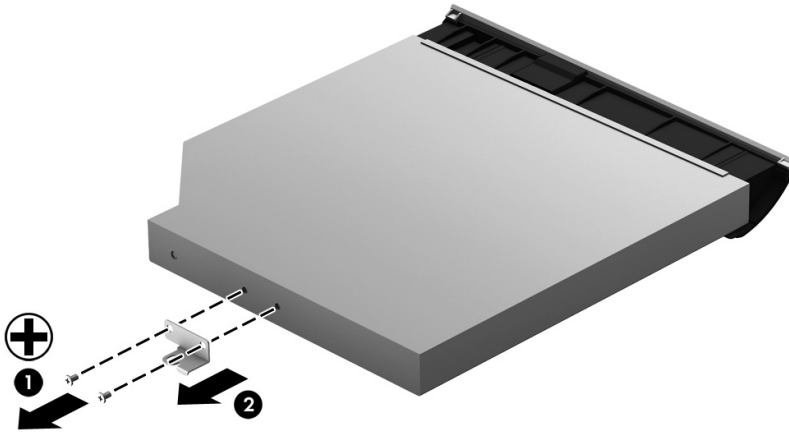


4. If it is necessary to replace the optical drive bezel, use a thin tool or an unbent paper clip **(1)** to release the optical drive tray.
5. Use a flat-blade screw driver or similar tool to press on the optical drive bezel tab **(2)** to release the optical drive bezel.
6. Release the left side of the optical drive bezel **(3)**.
7. Remove the optical drive bezel **(4)**.



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

9. Remove the two Phillips PM2.0×3.5 screws **(1)** that secure the optical drive bracket to the optical drive.
10. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.



## Keyboard

Description	Spare part number
Keyboard with backlight (includes backlight cable):	
For use on all computer models in the United States	682081-001
For use only on computer models equipped with an Intel processor in Saudi Arabia	682081-171
For use only on computer models equipped with an Intel processor in Belgium	682081-A41
For use only on computer models equipped with an Intel processor in the Netherlands	682081-B31
Keyboard without backlight:	
For use only on computer models equipped with an Intel processor in Belgium	682082-A41
For use on all computer models in Brazil	682082-201
For use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	682082-FL1
For use only on computer models equipped with an Intel processor in Denmark, Finland, and Norway	682082-DH1
For use only on computer models equipped with an Intel processor in French Canada	682082-DB1
For use only on computer models equipped with an Intel processor in France	682082-051
For use only on computer models equipped with an Intel processor in Germany	682082-041
For use only on computer models equipped with an Intel processor in Greece	682082-151
For use only on computer models equipped with an Intel processor in Hungary	682082-211
For use only on computer models equipped with an Intel processor in India	682082-D61
For use only on computer models equipped with an Intel processor in Israel	682082-BB1
For use only on computer models equipped with an Intel processor in Italy	682082-061
For use on all computer models in Japan	682082-291
For use on all computer models in Latin America	682082-161
For use only on computer models equipped with an Intel processor in the Netherlands	682082-B31
For use only on computer models equipped with an Intel processor in Portugal	682082-131
For use only on computer models equipped with an Intel processor in Romania	682082-271
For use only on computer models equipped with an Intel processor in Russia	682082-251
For use only on computer models equipped with an Intel processor in Saudi Arabia	682082-171
For use only on computer models equipped with an Intel processor in Slovenia	682082-BA1
For use only on computer models equipped with an Intel processor in South Korea	682082-AD1
For use only on computer models equipped with an Intel processor in Spain	682082-071
For use only on computer models equipped with an Intel processor in Switzerland	682082-BG1
For use only on computer models equipped with an Intel processor in Taiwan	682082-AB1

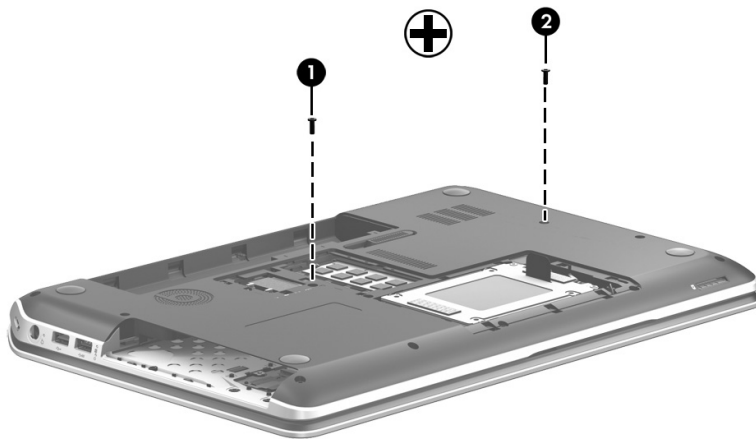
Description	Spare part number
For use only on computer models equipped with an Intel processor in Thailand	682082-281
For use only on computer models equipped with an Intel processor in Turkey	682082-141
For use only on computer models equipped with an Intel processor in the United Kingdom	682082-031
For use on all computer models in the United States	682082-001

Before removing the keyboard, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the service cover (see [Hard drive on page 47](#)).

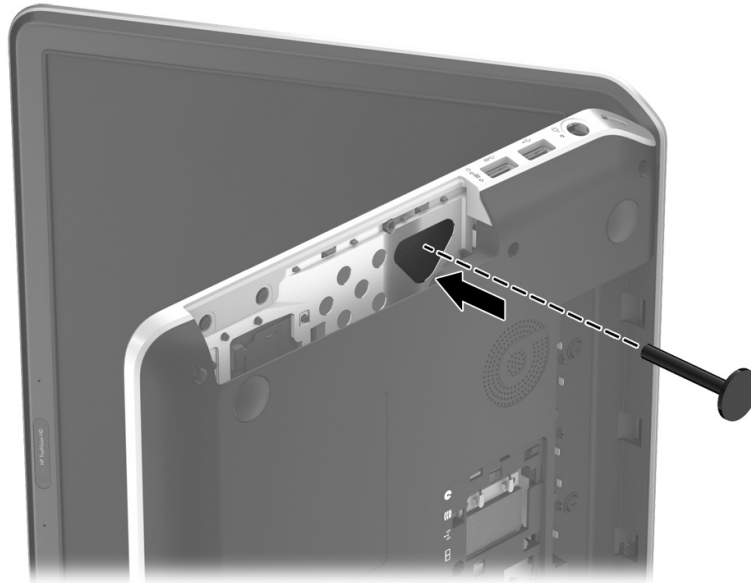
Remove the keyboard:

1. Remove the Phillips PM2.5×5.5 screw **(1)** and the Phillips PM2.5×9.5 screw **(2)** that secure the keyboard to the computer.



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

4. Insert a thin tool into the opening in the optical drive bay, and then press on the back of the keyboard until the keyboard disengages from the computer.



5. Turn the computer right-side up with the front toward you.
6. 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 backlight cable is connected, and then disconnect the cable **(2)** from the system board.
8. Release the ZIF connector **(3)** to which the keyboard cable is connected, and then disconnect the cable **(4)** from the system board.

9. Remove the keyboard (5).




Reverse this procedure to install the keyboard.

## Top cover

Description	Spare part number
Top cover (includes TouchPad and cable)	682101-001

Before removing the top cover, follow these steps:

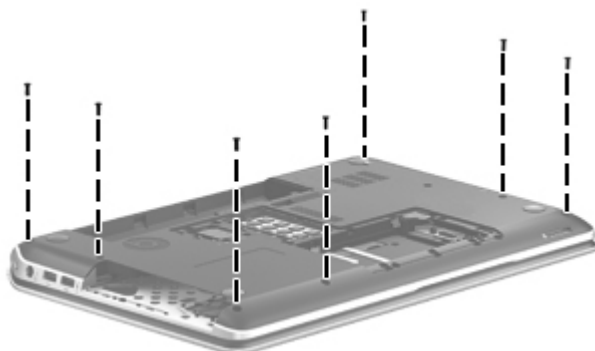
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))

 **NOTE:** When replacing the top cover, be sure to remove the following components from the defective top cover and install them on the replacement top cover:

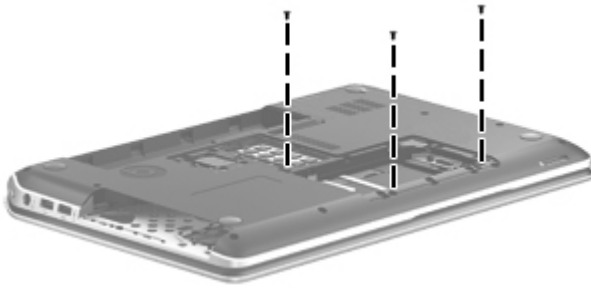
- Top speakers (see [Top speakers on page 64](#))
- Power button board and cable (see [Power button board on page 65](#))
- Fingerprint reader board (see [Fingerprint reader board on page 66](#))
- TouchPad button board (see [TouchPad button board on page 67](#))

Remove the top cover:

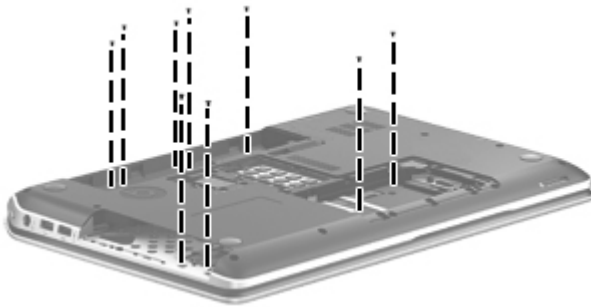
1. Remove the seven Phillips PM2.5×8.5 screws that secure the top cover to the computer.



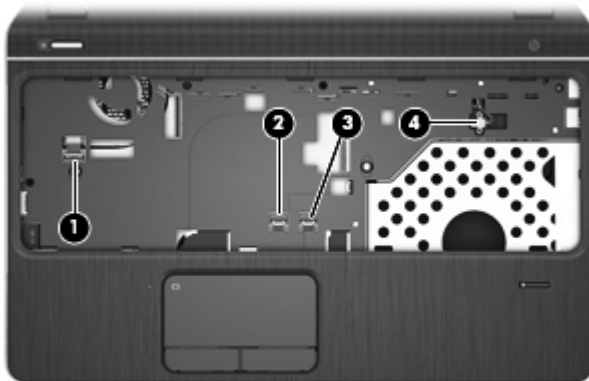
2. Remove the three Phillips PM2.5×5.5 screws that secure the top cover to the computer.



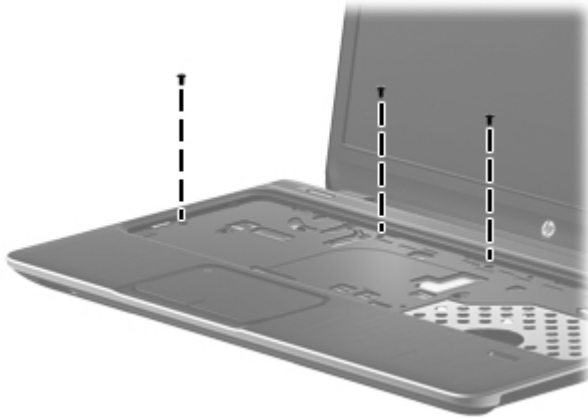
3. Remove the nine Phillips PM2.5×3.5 screws that secure the top cover to the computer.



4. Turn the computer right side up, with the front toward you.
5. Open the computer.
6. Release the corresponding ZIF connectors, and then disconnect the following cables from the system board:
  - (1) Power button board cable
  - (2) TouchPad button board cable
  - (3) Fingerprint reader board cable
  - (4) Top speakers cable

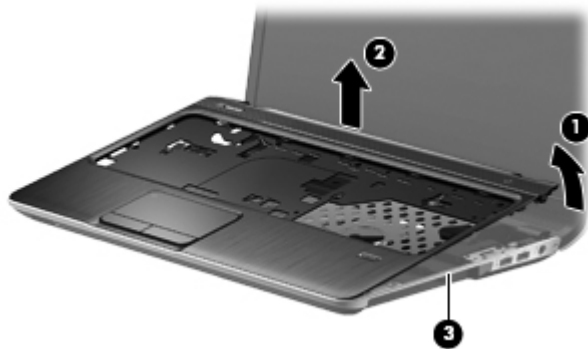


7. Remove the three Phillips PM2.5×5.5 screws that secure the top cover to the computer.



8. Lift the rear edge of the top cover **(1)** until the left and right sides have disengaged from the base enclosure.
9. Remove the top cover **(2)**.

**⚠ CAUTION:** Be careful not to damage the thin section of the base enclosure **(3)** around the optical drive bay when removing the top cover.



Reverse this procedure to install the top cover.

## Top speakers

Description	Spare part number
Top speakers (include speaker cables)	682095-001

Before removing the top speakers, follow these steps:

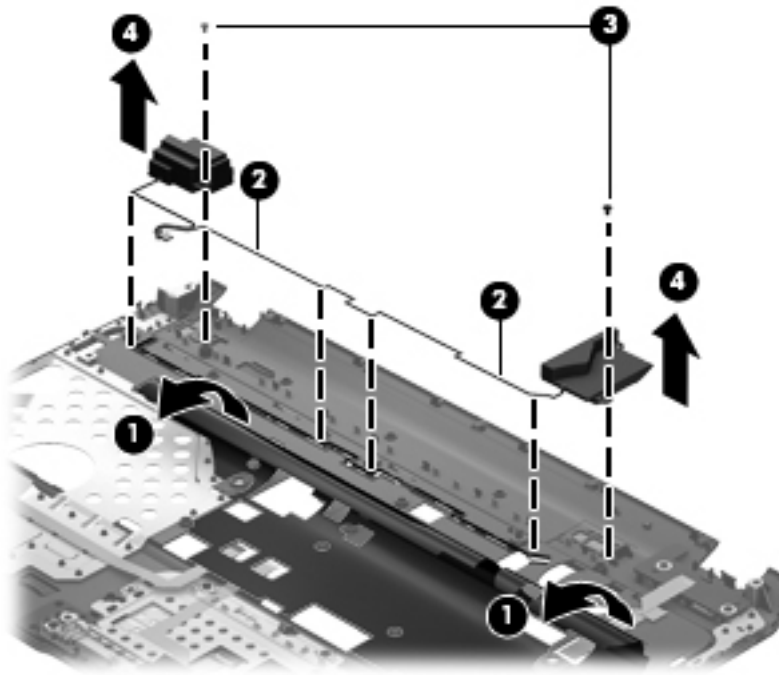
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))

Remove the top speakers:

1. Fold back the shielding **(1)** that covers the top speaker cables.
2. Release the top speaker cables **(2)** from the clips and routing channel built into the top cover.
3. Remove the two Phillips PM2.5×3.5 screws **(3)** that secure the top speakers to the top cover.



4. Remove the top speakers (4).



Reverse this procedure to install the top speakers.

## Power button board

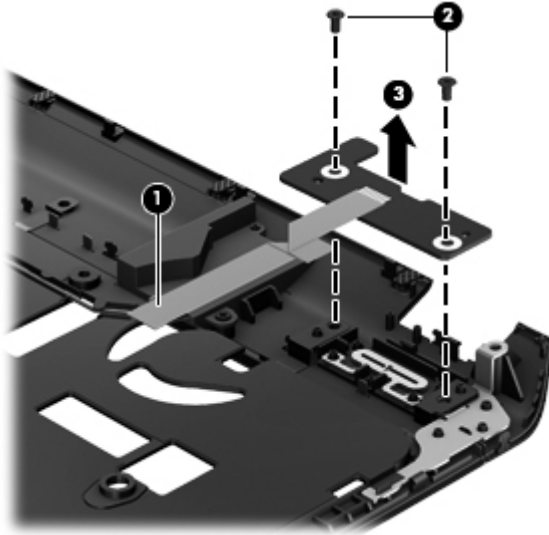
Description	Spare part number
Power button board (includes cable)	682086-001

Before removing the power button board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))

Remove the power button board:

1. Turn the top cover upside down, with the front toward you.
2. Detach the power button board cable (1) from the top cover. (The power button board cable is attached to the top cover double-sided tape.)
3. Remove the two Phillips PM2.0x4.0 screws (2) that secure the power button board to the top cover.
4. Remove the power button board (3) and cable.



Reverse this procedure to install the power button board.

## Fingerprint reader board

Description	Spare part number
Fingerprint reader board (includes cable and bracket)	682062-001

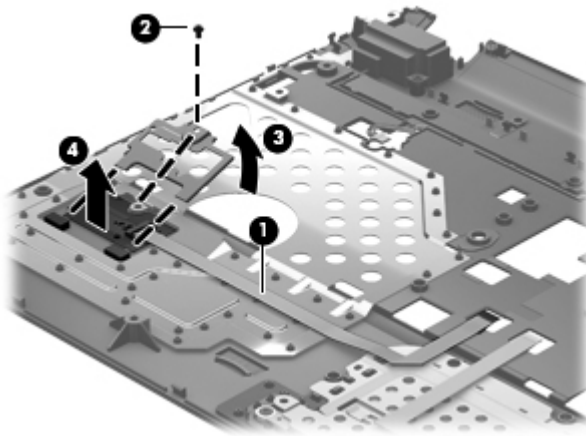
Before removing the fingerprint reader board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))

- c. Keyboard (see [Keyboard on page 57](#))
- d. Top cover (see [Top cover on page 61](#))

Remove the fingerprint reader board:

1. Turn the top cover upside down, with the front toward you.
2. Detach the fingerprint reader board cable from the top cover. (The fingerprint reader board cable is attached to the top cover with double-sided tape.)
3. Remove the Phillips PM2.5×3.5 screw **(2)** that secures the fingerprint reader board bracket to the top cover.
4. Slide the fingerprint reader board bracket **(3)** up and away from the top cover.
5. Remove the fingerprint reader board **(4)**.



Reverse this procedure to install the fingerprint reader board.

## TouchPad button board

Description	Spare part number
TouchPad button board (includes cable and bracket)	682225-001

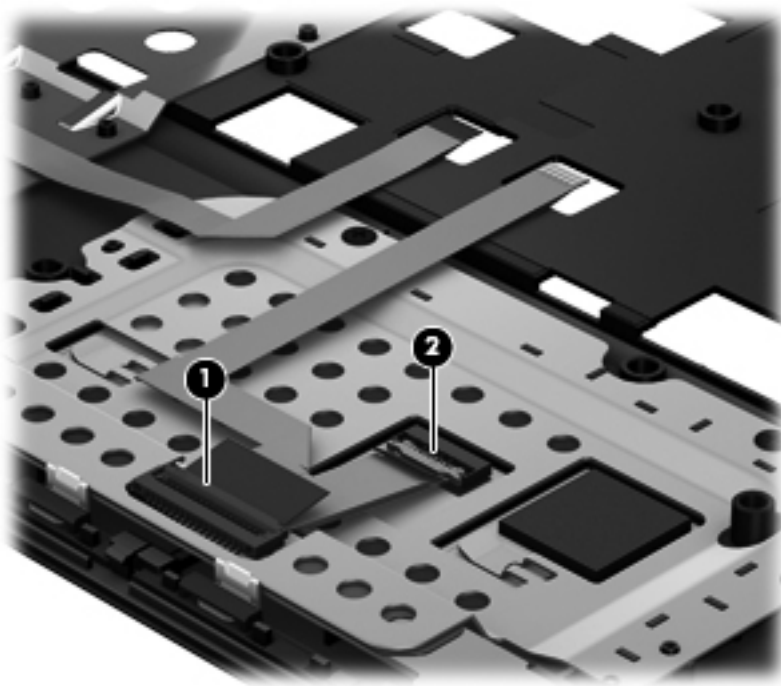
Before removing the TouchPad button board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))

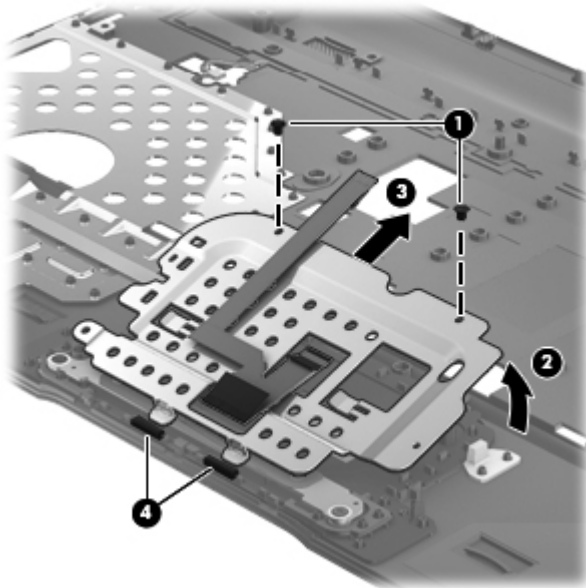
Remove the TouchPad button board:

1. Turn the top cover upside down, with the front toward you.
2. Release the TouchPad button board ZIF connector **(1)** to which the TouchPad button board cable is connected, and then disconnect the cable from the TouchPad button board.
3. Release the TouchPad board ZIF connector **(2)** to which the TouchPad button board cable is connected, and then disconnect the cable from the TouchPad board.

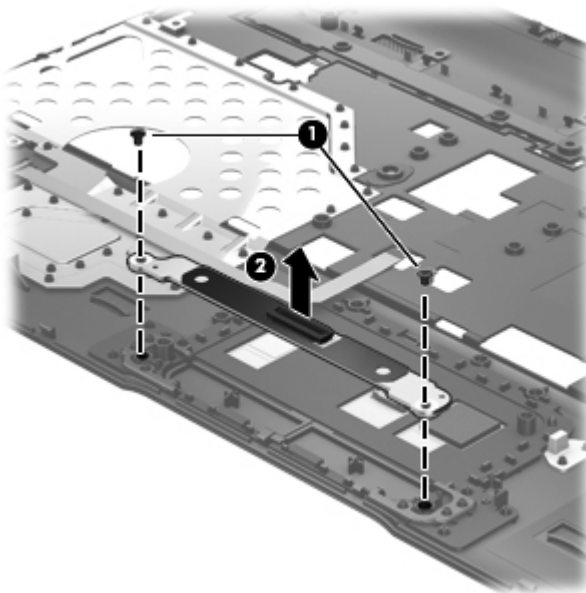


4. Remove the two Phillips PM2.5×3.5 screws **(1)** that secure the TouchPad button board bracket to the top cover.
5. Lift the rear edge of the TouchPad button board bracket **(2)** until it rests at an angle.

- Slide the TouchPad button board bracket **(3)** up and away from the top cover until the tabs **(4)** on the front edge of the bracket disengage from the top cover.



- Remove the two Phillips PM2.5x3.5 screws **(1)** that secure the TouchPad button board to the top cover.
- Remove the TouchPad button board **(2)**.



Reverse this procedure to install the TouchPad button board.

## Solid-state drive

Description	Spare part number
160-GB solid-state drive for use on all computer models	682098-001
32-GB solid-state drive for use only on computer models equipped with an Intel processor	682099-001


Before removing the solid-state drive, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))

Remove the solid-state drive:

1. Remove the Phillips PM2.0×3.5 screw **(1)** that secures the solid-state drive to the system board. (The solid-state drive tilts up.)

2. Remove the solid-state drive by pulling the drive away from the slot at an angle **(2)**.

 **NOTE:** The solid-state drive is designed with a notch to prevent incorrect installation into the solid-state drive slot.

---



Reverse this procedure to install the solid-state drive.

## System board



**NOTE:** The system board spare part kit includes replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part numbers 685348-001 (for use on computer models equipped with an AMD processor) and 682100-001 (for use on computer models equipped with an Intel processor).

Description	Spare part number
For use only on computer models equipped with the AMD A70M chipset and the AMD Radeon™ HD 7730M graphics subsystem (includes 2.0-GB of discrete video memory)	682183-001
For use only on computer models equipped with the AMD A70M chipset and the AMD Radeon™ HD 7670M graphics subsystem (includes 2.0-GB of discrete video memory)	682182-001
For use only on computer models equipped with the AMD A70M chipset and the AMD Radeon™ HD 7670M graphics subsystem (includes 1.0-GB of discrete video memory)	682181-001
For use only on computer models equipped with the AMD A70M chipset and a graphics subsystem with UMA video memory	682180-001
For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682174-001
For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682175-001
For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682172-001
For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682173-001
For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682170-001
For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 2.0-GB of graphics subsystem with discrete video memory)	682171-001
For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682168-001
For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, and a graphics subsystem with discrete video memory (includes 1.0-GB of graphics subsystem with discrete video memory)	682169-001
For use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, and a graphics subsystem with UMA video memory	682176-001
For use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, and a graphics subsystem with UMA video memory	682177-001



Before removing the system board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the hard drive (see [Hard drive on page 47](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 52](#)).
7. Remove the following components:
  - a. Optical drive (see [Optical drive on page 54](#))
  - b. Keyboard (see [Keyboard on page 57](#))
  - c. Top cover (see [Top cover on page 61](#))

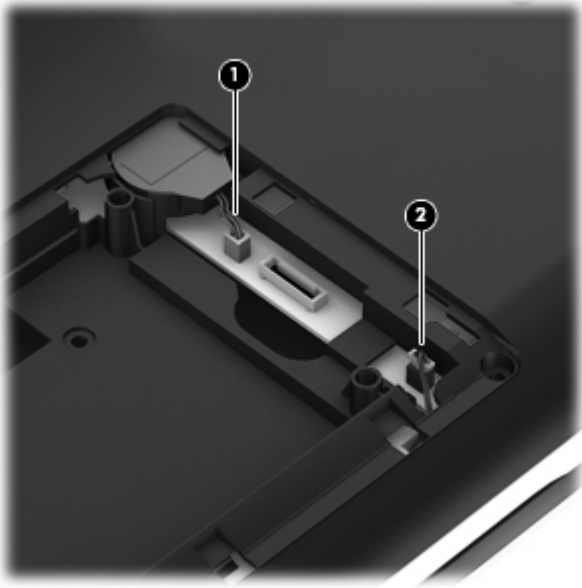
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory module (see [Memory module on page 51](#))
- WLAN module (see [WLAN module on page 52](#))
- Solid-state drive (see [Solid-state drive on page 70](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 77](#))
- Processor (see [Processor on page 82](#))

Remove the system board:

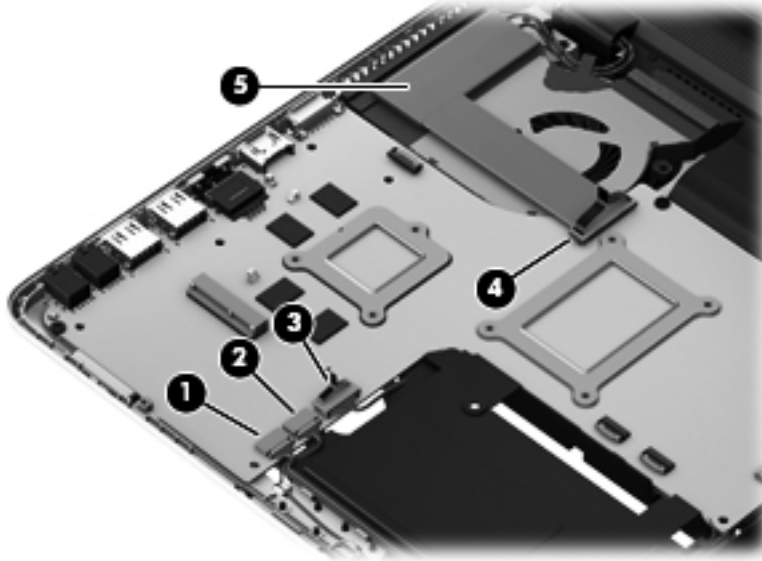
1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the RTC battery cable **(1)** from the system board.

4. Disconnect the subwoofer cable **(2)** from the system board.

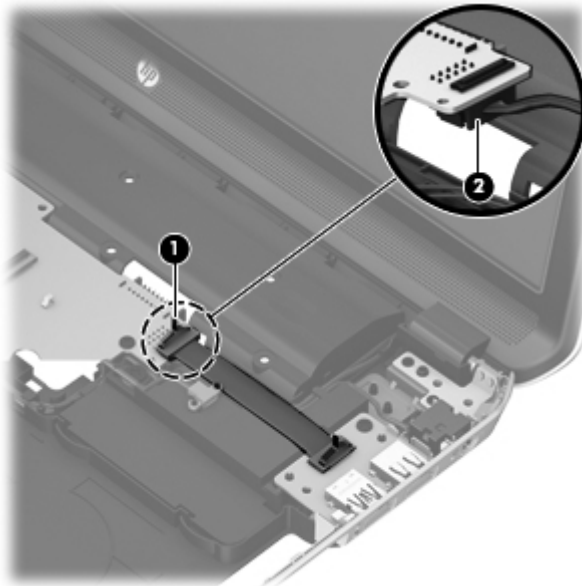


5. Turn the computer right side up, with the front toward you.
6. Open the computer.
7. Disconnect the following cables from the system board:
  - (1)** Display speakers cable
  - (2)** Top speakers passthrough cable
  - (3)** Optical drive connector cable
  - (4)** Display panel cable

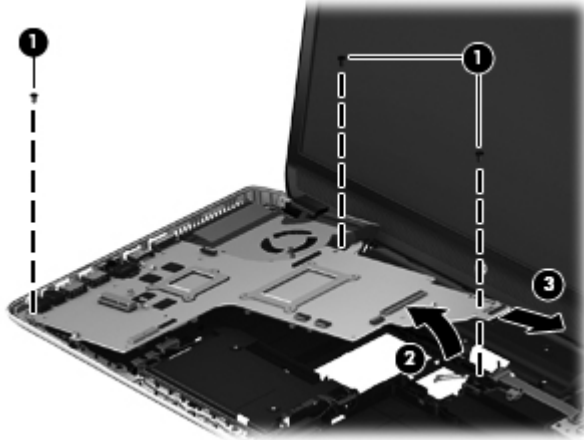
8. Detach the display panel cable **(5)** from the heat sink. (The display panel cable is attached to the heat sink with double-sided tape.)



9. Disconnect the USB board cable **(1)** from the system board.
10. Disconnect the power connector cable **(2)** from the system board.




11. Remove the three Phillips PM2.5×5.5 screws **(1)** that secure the system board to the base enclosure.




Reverse this procedure to install the system board.

## Fan/heat sink assembly

 **NOTE:** The fan/heat sink assembly spare part kit include replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part numbers 685348-001 (for use on computer models equipped with an AMD processor) and 682100-001 (for use on computer models equipped with an Intel processor).

Description	Spare part number
For use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory	682179-001
For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	682178-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory	682061-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	682060-001

 **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/heat sink assembly, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))
  - e. System board (see [System board on page 72](#))

Remove the fan/heat sink assembly:

1. Turn the system board upside down, with the front toward you.


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 **NOTE:** Steps 2 and 3 apply to computer models equipped with a graphics subsystem with discrete memory. See steps 4 and 5 for fan/heat sink assembly removal information for computer models equipped with a graphics subsystem with UMA memory.


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2. Disconnect the fan cable **(1)** from the system board.
3. Following the 1, 2, 3, 4, 5, 6, 7 sequence stamped into the fan/heat sink assembly, loosen the seven captive Phillips screws **(2)** and **(3)** that secure the fan/heat sink assembly to the system board, and then remove the fan/heat sink assembly **(4)**.

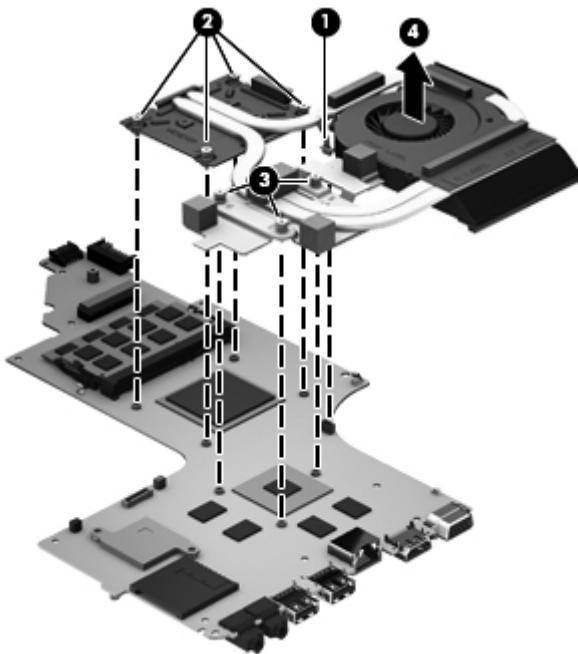
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 **NOTE:** Due to the adhesive quality of the thermal material located between the fan/heat sink assembly and the system board components, it may be necessary to move the fan/heat sink assembly from side to side to detach it.


---

 **NOTE:** The following illustration shows the fan/heat sink assembly removal process for a computer model equipped with an AMD processor. The process for removing the fan/heat sink assembly on a computer model equipped with an Intel processor is identical.

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 **NOTE:** Steps 4 and 5 apply to computer models equipped with a graphics subsystem with UMA memory. See steps 2 and 3 for fan/heat sink assembly removal information for computer models equipped with a graphics subsystem with discrete memory.

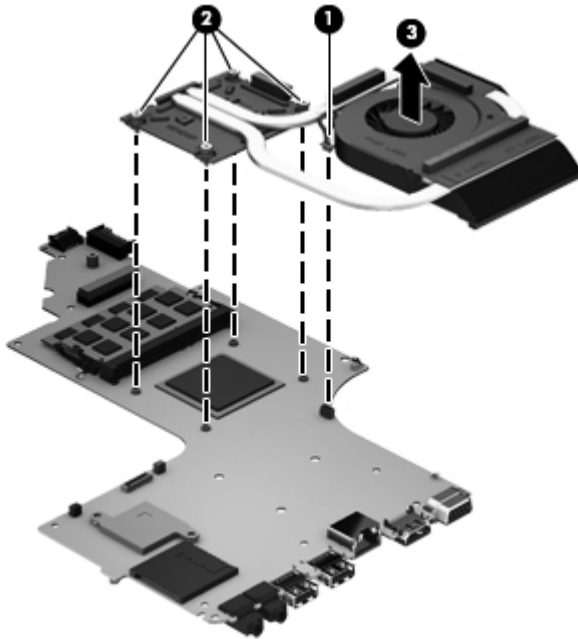
---


4. Disconnect the fan cable **(1)** from the system board.


- Following the 1, 2, 3, 4 sequence stamped into the fan/heat sink assembly, loosen the four captive Phillips screws **(2)** that secure the fan/heat sink assembly to the system board, and then remove the fan/heat sink assembly **(3)**.

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

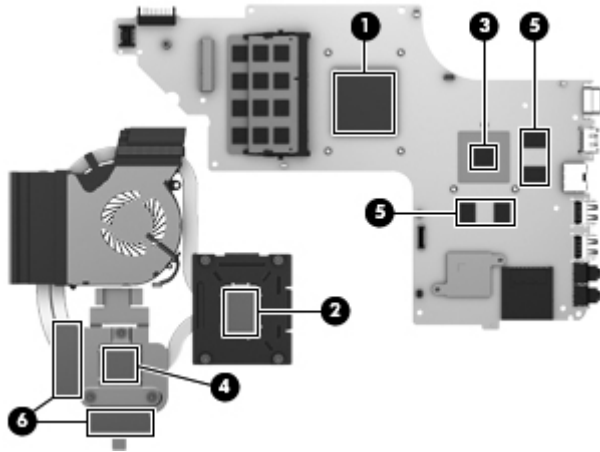
 **NOTE:** The following illustration shows the fan/heat sink assembly removal process for a computer model equipped with an AMD processor. The process for removing the fan/heat sink assembly on a computer model equipped with an Intel processor is identical.



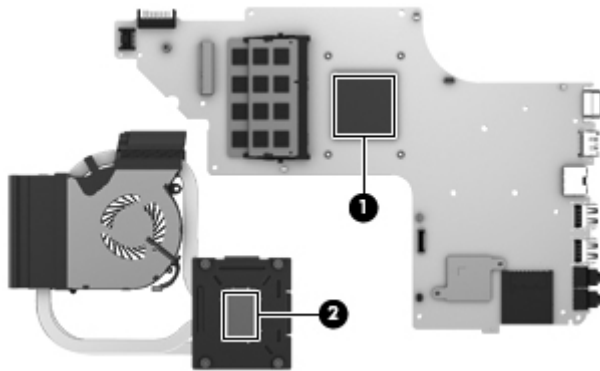
 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the fan/heat sink assembly, processor, and system board spare part kits. Replacement thermal material is also available in the Thermal Material Kit, spare part numbers 685348-001 (for use on computer models equipped with an AMD processor) and 682100-001 (for use on computer models equipped with an Intel processor).

 **NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an AMD processor and a graphics subsystem with discrete memory.

- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- Thermal paste is used on the graphics subsystem chip **(3)** and the heat sink section **(4)** that services it
- Thermal pads are used on the system board components **(5)** and the heat sink sections **(6)** that service them



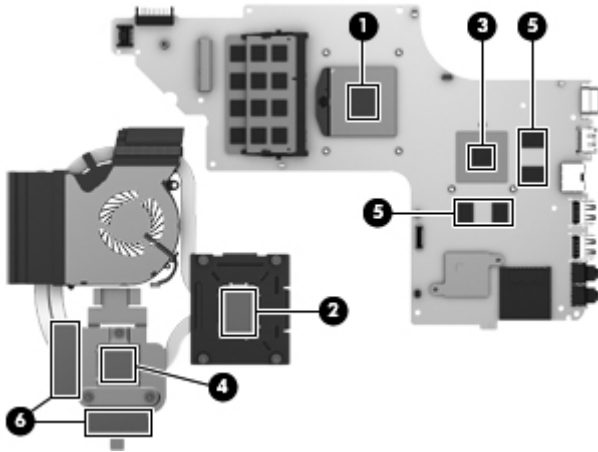
**NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an AMD processor and a graphics subsystem with UMA memory. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.




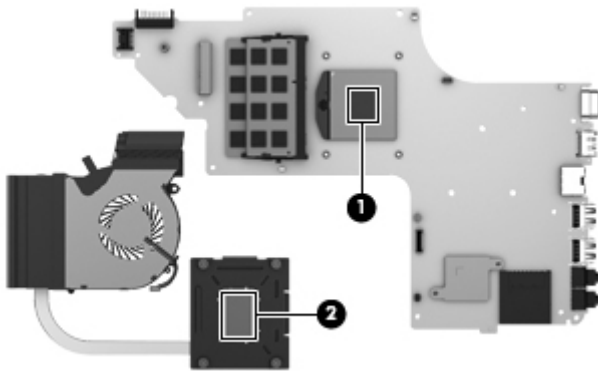
**NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an Intel processor and a graphics subsystem with discrete memory.

- Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
- Thermal paste is used on the graphics subsystem chip **(3)** and the heat sink section **(4)** that services it
- Thermal pads are used on the system board components **(5)** and the heat sink sections **(6)** that service them







 **NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an Intel processor and a graphics subsystem with UMA memory. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



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

## Processor

 **NOTE:** This section applies only to computer models equipped with an Intel processor.

 **NOTE:** The processor spare part kit include replacement thermal material. Replacement thermal material is also available in the Thermal Material Kit, spare part number 682100-001.

Description	Spare part number
Intel Core i7-3820QM 2.70-GHz processor (8.0-MB L3 cache, 45 W)	681284-001
Intel Core i7-3720QM 2.60-GHz processor (6.0-MB L3 cache, 45 W)	681283-001
Intel Core i7-3612QM 2.10-GHz processor (6.0-MB L3 cache, 35 W)	680647-001
Intel Core i7-3610QM 2.30-GHz processor (6.0-MB L3 cache, 45 W)	680646-001
Intel Core i5-3320M 2.60-GHz processor (3.0-MB L3 cache, 35 W)	681952-001
Intel Core i7-2670QM 2.20-GHz processor (6.0-MB L3 cache, 45 W)	665116-001
Intel Core i5-3210M 2.50-GHz processor (3.0-MB L3 cache, 35 W)	680645-001
Intel Core i5-2450M 2.50-GHz processor (3.0-MB L3 cache, 35 W)	676359-001
Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, 35 W)	682417-001
Intel Core i3-2370M 2.40-GHz processor (3.0-MB L3 cache, 35 W)	677152-001
Intel Core i3-2350M 2.30-GHz processor (3.0-MB L3 cache, 35 W)	653340-001


Before removing the processor, follow these steps:

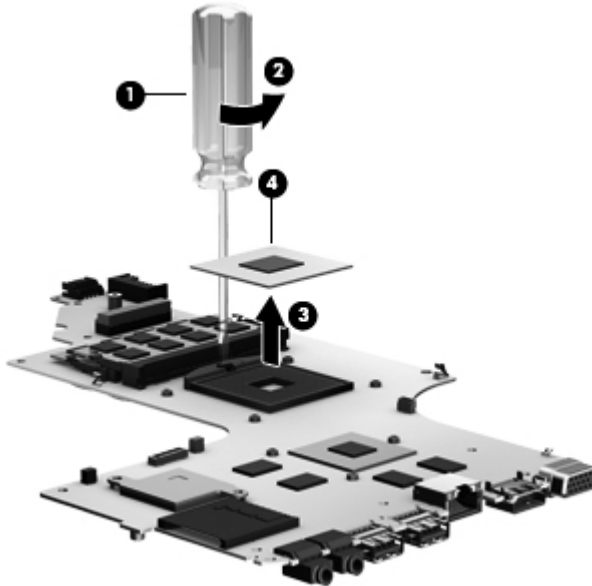
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))
  - e. System board (see [System board on page 72](#))

Remove the processor:

1. Turn the system board upside down, with the front toward you.
2. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise **(2)**, until you hear a click.

3. Lift the processor **(3)** straight up, and remove it.

 **NOTE:** The gold triangle **(4)** on the processor must be aligned with the triangle icon embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

## USB board

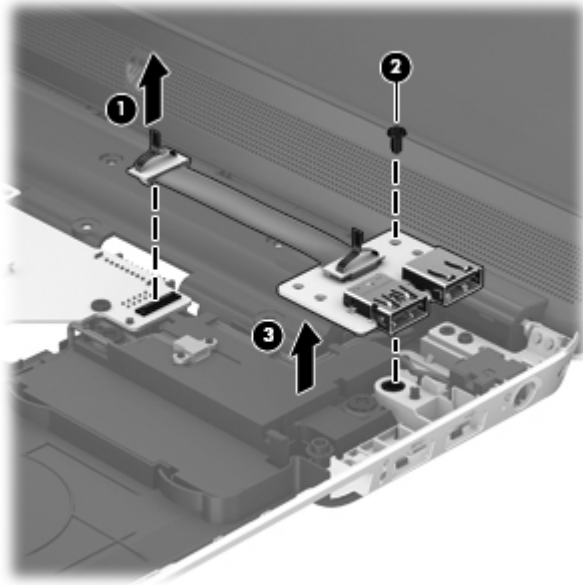
Description	Spare part number
USB board (includes cable)	682087-001

Before removing the USB board, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))

Remove the USB board:

1. Disconnect the USB board cable **(1)** from the system board.
2. Remove the Phillips PM2.5×5.5 screw **(2)** that secures the USB board to the base enclosure.
3. Remove the USB board **(3)**.



Reverse this procedure to install the USB board.

## Subwoofer

Description	Spare part number
Subwoofer (includes subwoofer cable, top speakers passthrough cable, and 2 rubber isolators)	682097-001

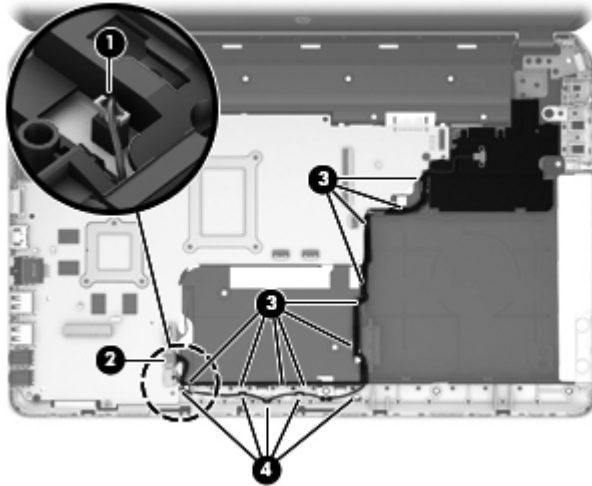
Before removing the subwoofer, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))


- d. Top cover (see [Top cover on page 61](#))
- e. USB board (see [USB board on page 83](#))

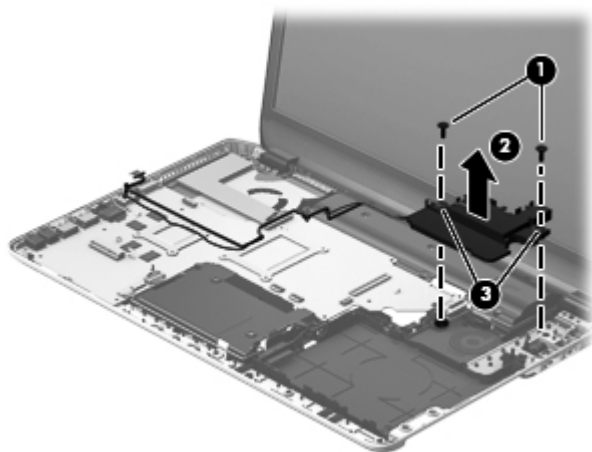
Remove the subwoofer:

1. Disconnect the subwoofer cable **(1)** from the bottom of the system board.
2. Disconnect the top speakers passthrough cable **(2)** from the system board.
3. Release the subwoofer cable **(3)** and the top speakers passthrough cable **(4)** from the clips and routing channel built into the base enclosure.



4. Remove the two Phillips PM2.5×10.0 screws **(1)** that secure the subwoofer to the base enclosure.
5. Remove the subwoofer **(2)**.

 **NOTE:** The subwoofer includes two rubber isolators that are installed in the screw holes **(3)**. These isolators are crucial to the performance of the subwoofer.



Reverse this procedure to install the subwoofer.

## Power connector cable



**NOTE:** The power connector cable spare part kit includes the bracket.

Description	Spare part number
For use only on computer models equipped with a 120-W AC adapter	682059-001
For use only on computer models equipped with a 90-W or 65-W AC adapter	682058-001

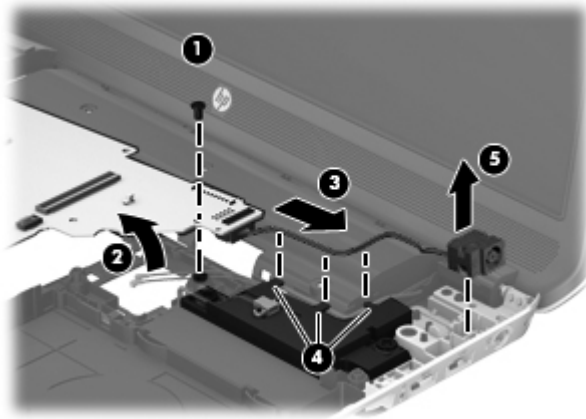
Before removing the power connector cable, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))
  - e. USB board (see [USB board on page 83](#))
  - f. Subwoofer (see [Subwoofer on page 84](#))

Remove the power connector cable:

1. Remove the Phillips PM2.5×5.5 screw **(1)** that secures the right edge of the system board to the base enclosure.
2. Lift the right edge of the system board **(2)** until the power connector is accessible.
3. Release the power connector cable **(3)** from the clips**(4)** and routing channel built into the base enclosure.


4. Release the power connector **(5)** from the clip built into the base enclosure.



5. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

## Optical drive connector cable

 **NOTE:** The optical drive connector cable is included in the optical drive spare part kit. See [Optical drive on page 54](#) for optical drive spare part number information.

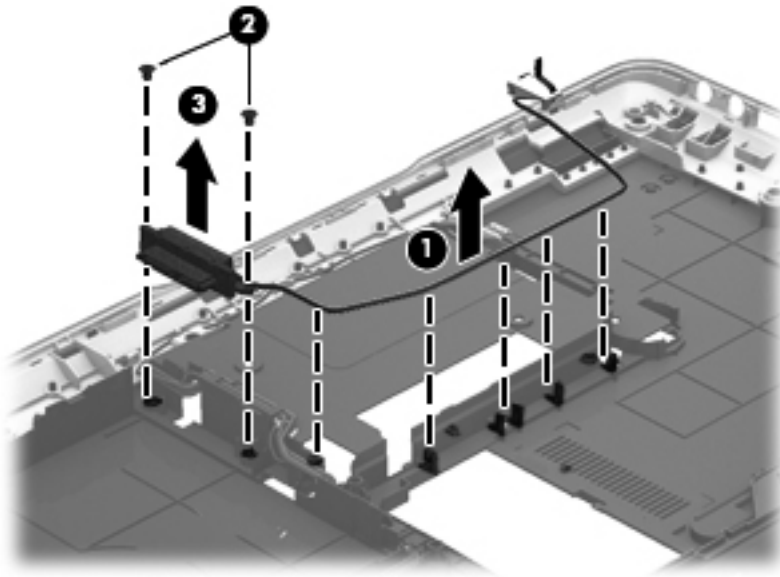
Before removing the optical drive connector cable, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 47](#))
  - b. Optical drive (see [Optical drive on page 54](#))
  - c. Keyboard (see [Keyboard on page 57](#))
  - d. Top cover (see [Top cover on page 61](#))
  - e. System board (see [System board on page 72](#))

Remove the optical drive connector cable:

1. Release the optical drive connector cable **(1)** from the clips and routing channel built into the base enclosure.
2. Remove the two Phillips PM2.0×3.5 screws **(2)** that secure the optical drive connector cable to the base enclosure.

- Remove the optical drive connector (3).



Reverse this procedure to install the optical drive connector cable.

## Display assembly



**NOTE:** The display assembly spare part kit includes the display panel cable, 2 WLAN antenna transceivers and cables, and the webcam/microphone module and cable.

Description	Spare part number
For use on all computer models:	
15.6-in, AntiGlare, FHD display assembly in aluminum finish	682066-001
15.6-in, BrightView, HD display assembly in aluminum finish	682065-001
For use only with computer models equipped with an Intel processor:	
15.6-in, AntiGlare, FHD display assembly in aluminum finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	682068-001
15.6-in, AntiGlare, FHD display assembly in magenta finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	685985-001
15.6-in, AntiGlare, FHD display assembly in magenta finish	685983-001
15.6-in, BrightView, HD display assembly in aluminum finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	682067-001
15.6-in, BrightView, HD display assembly in magenta finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	685984-001
15.6-in, BrightView, HD display assembly in magenta finish	685982-001

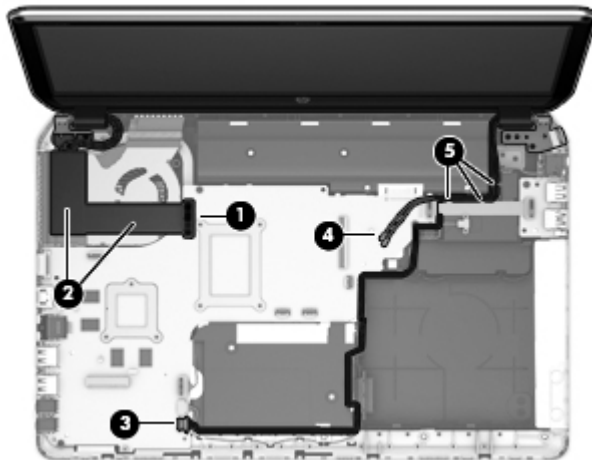


Before removing the display assembly, follow these steps:

1. Turn off 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 the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 46](#)).
5. Remove the hard drive (see [Hard drive on page 47](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 52](#)).
7. Remove the following components:
  - a. Optical drive (see [Optical drive on page 54](#))
  - b. Keyboard (see [Keyboard on page 57](#))
  - c. Top cover (see [Top cover on page 61](#))

Remove the display assembly:

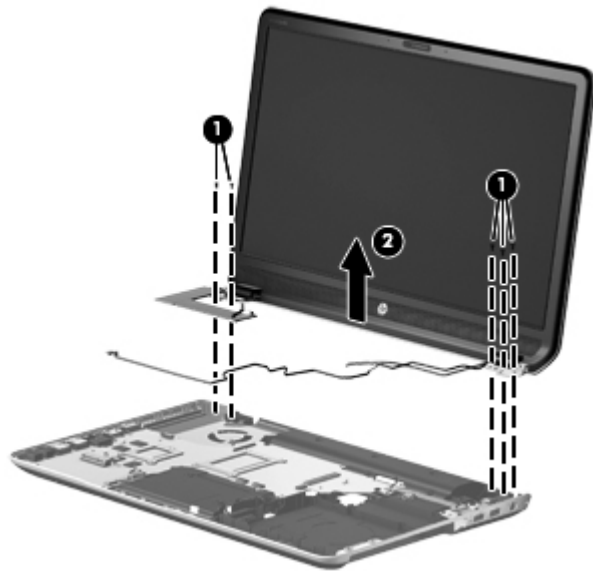
1. Disconnect the display panel cable **(1)** from the system board.
2. Release the display panel cable **(2)** from the heat sink. (The display panel cable is attached to the heat sink with double-sided tape.)
3. Disconnect the top speakers passthrough cable **(3)** from the system board.
4. Release the wireless antenna cables **(4)** from the clips **(5)** built into the base enclosure.



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

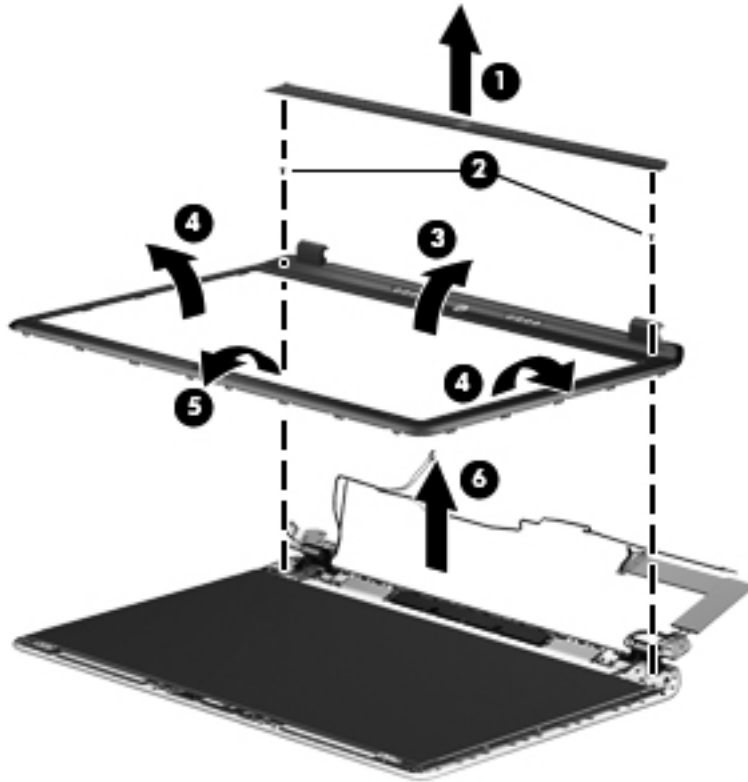
5. Remove the five Phillips PM2.5×5.5 screws **(1)** that secure the display assembly to the base enclosure.

6. Remove the display assembly **(2)**.



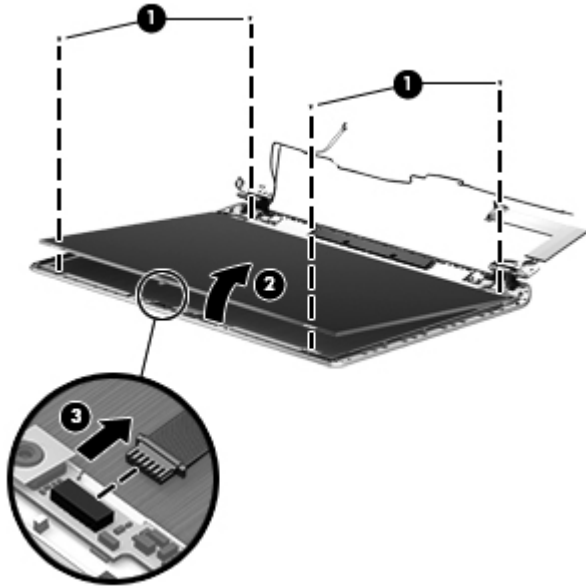
7. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
  - a. Remove the display bezel screw cover **(1)** and the two Phillips PM2.5×5.5 screws **(2)** that secure the display bezel to the display assembly. The display bezel screw cover is available in the Display Screw Kit, spare part number 682093-001.
  - b. Flex the inside edges of the bottom edge **(3)**, the left and right sides **(4)**, and the top edge **(5)** of the display bezel until the bezel disengages from the display enclosure.

- c. Remove the display bezel **(6)**. The display bezel is available using spare part number 682052-001.

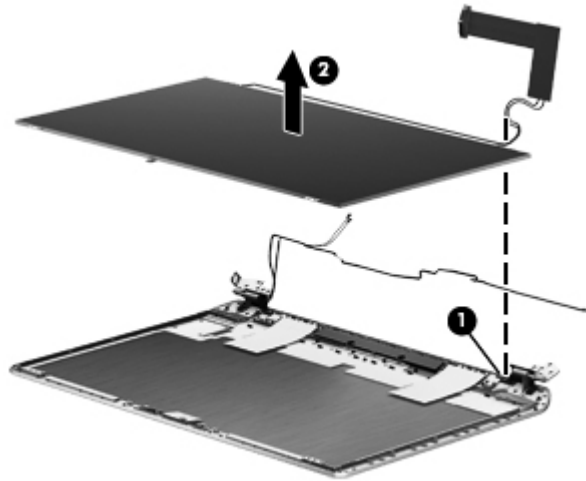


- 8. If it is necessary to replace the display panel:
  - a. Remove the four Phillips PM2.0×4.4 screws **(1)** that secure the display panel to the display enclosure.
  - b. Lift the top edge of the display panel **(2)** until the webcam/microphone module connector is accessible.

- c. Disconnect the webcam/microphone module cable **(3)** from the webcam/microphone module.



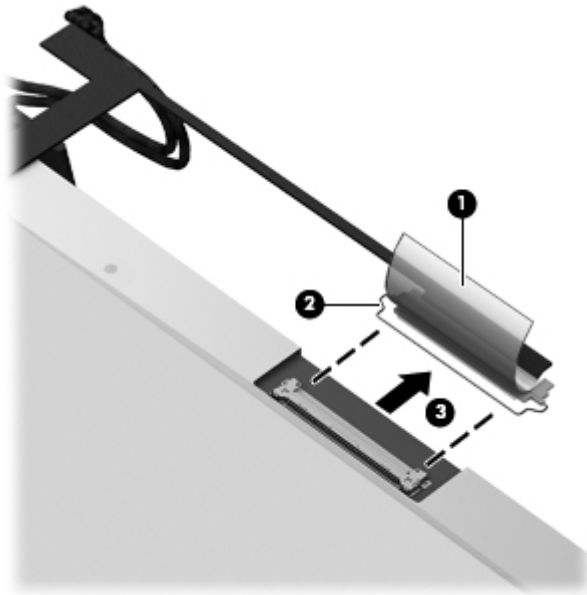
- d. Release the display panel cable from the clip built into display enclosure **(1)** near the left hinge area.
- e. Remove the display panel **(2)** from the display enclosure. The display panel is available using spare part numbers 682090-001 (for use only on computer models equipped with a 15.6-in, AntiGlare, FHD display assembly) and 682089-001 (for use only on computer models equipped with a 15.6-in, BrightView, HD display assembly).



9. If it is necessary to replace the display panel cable:

**⚠ CAUTION:** Be sure the work surface is clear of all tools, screws, and computer components before turning the display panel upside down on the work surface.

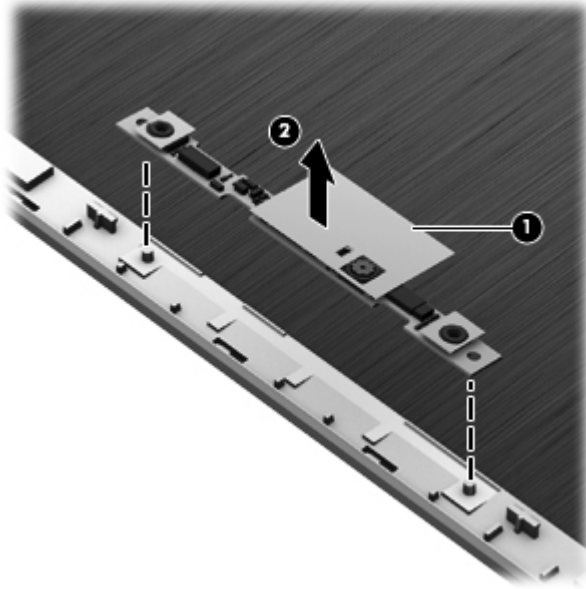
- a. Turn the display panel upside down, with the top edge toward you.
- b. Release the adhesive support strip **(1)** that secures the display panel cable connector to the display panel.
- c. Release the handle **(2)** that secures the display panel cable connector to the display panel.
- d. Disconnect the display panel cable **(3)** from the display panel. The display panel cable is available using the following spare part numbers:
  - 682055-001—Display panel cable for use only on computer models equipped with an FHD display assembly
  - 682057-001—Display panel cable for use only on computer models equipped with an FHD display assembly and an Intel processor
  - 682054-001—Display panel cable for use only on computer models equipped with an HD display assembly
  - 682056-001—Display panel cable for use only on computer models equipped with an HD display assembly and an Intel processor



10. If it is necessary to replace the webcam/microphone module:

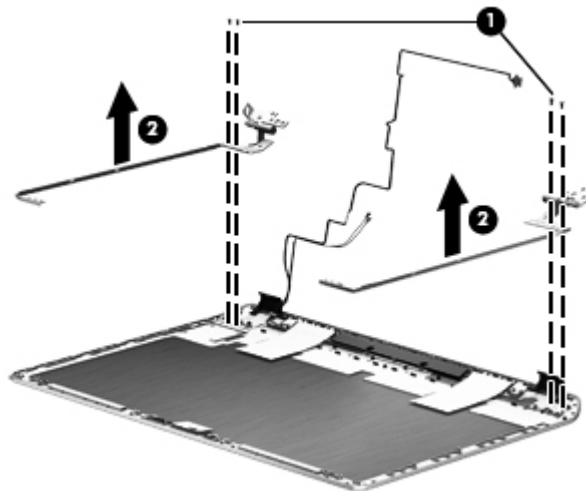
- a. Release the grounding strip **(1)** that secures the webcam/microphone module to the display enclosure.

- b.** Remove the webcam/microphone module **(2)** from the display enclosure. The webcam/microphone module is available using the following spare part number 682105-001.



- 11.** If it is necessary to replace the hinges:

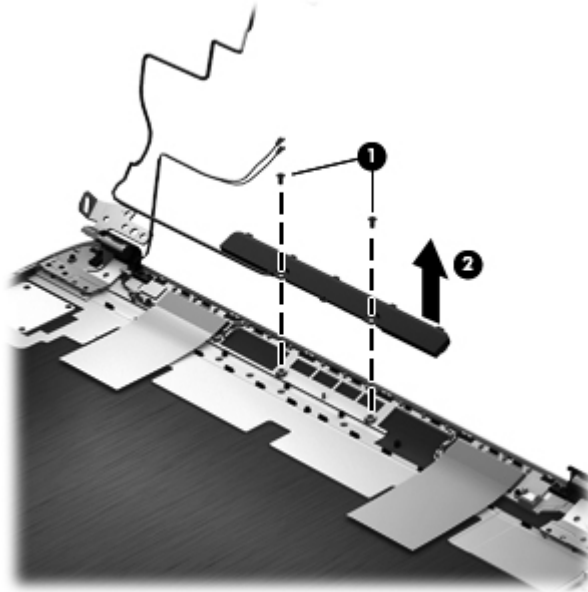
- a.** Remove the four Phillips PM2.0×4.4 screws **(1)** that secure the hinges to the display enclosure.
- b.** Remove the hinges **(2)** from the display enclosure. The hinges are available using spare part number 682064-001.



- 12.** If it is necessary to replace the display speakers:

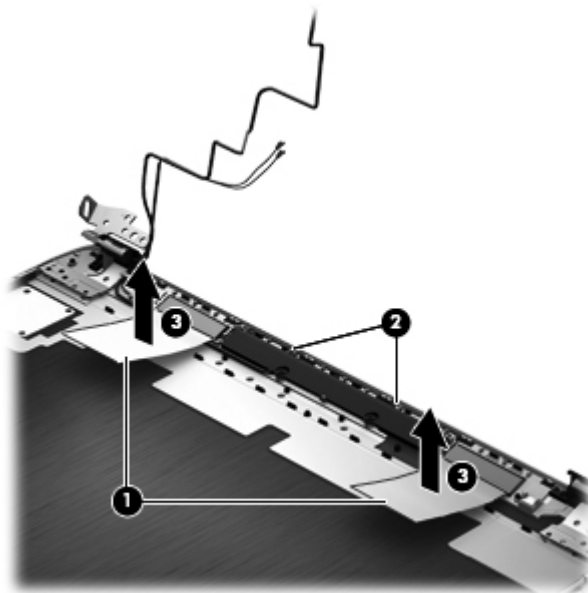
- a.** Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the display speakers to the display enclosure.

- b. Remove the display speakers **(2)** from the display enclosure. The display speakers are available using spare part number 682096-001.



**13.** If it is necessary to replace the wireless antenna cables and transceivers:

- a. Release the wireless antenna transceivers **(1)** from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)
- b. Release the wireless antenna cables from the clips **(2)** built into the display enclosure.
- c. Remove the wireless antenna cables and transceivers **(3)**. The wireless antenna cables and transceivers are available in the Antenna Kit, spare part number 682046-001.



Reverse this procedure to install the display assembly.

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# 5 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 about 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.

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## 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.



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

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## 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

	Metric	U.S.
<b>Dimensions</b>		
Width	<b>37.8 cm</b>	14.88 in
Depth	<b>24.7 cm</b>	9.72 in
Height (front to back)	<b>2.94 to 3.25 cm</b>	1.16 to 1.28 in
<b>Weight</b>	<b>2.57 kg</b>	5.66 lb
<b>Input power</b>		
Operating voltage and current	18.5 V dc @ 3.5 A – 65 W	
	19 V dc @ 4.74 A – 90 W	
	18.5 V dc @ 6.5 A – 120 W	
	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 4.62 A – 90 W	
	19.5 V dc @ 6.15 A – 120 W	
<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> (noncondensing)		
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

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

## 15.6-inch display specifications

	<b>Metric</b>	<b>U.S.</b>
<b>Dimensions</b>		
Height	<b>19.6 cm</b>	7.72 in
Width	<b>34.7 cm</b>	13.66 in
Diagonal	<b>39.8 cm</b>	15.67 in
<b>Number of colors</b>	Up to 16.8 million	
<b>Contrast ratio</b>	200:1 (typical)	
<b>Brightness</b>	250 nits (typical: UWVA, FHD, AntiGlare) or 200 nits (typical: SVA, HD, BrightView)	
<b>Pixel resolution</b>		
Pitch	<b>0.197 × 0.197 mm</b>	
Format	1920×1080 (UWVA, FHD, AntiGlare) or 1366×768 (SVA, HD, BrightView)	
Configuration	RGB vertical stripe	
<b>Backlight</b>	LED	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	2.0 W	
<b>Viewing angle</b>	±65° horizontal, ±50° vertical (typical)	

# Hard drive specifications

	1-TB*	750-GB**	640-GB**	500-GB**	320-GB**
<b>Dimensions</b>					
Height	12.7 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm and 7.0 mm
Length	100.2 mm	100.2 mm	100.4 mm	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm	69.9 mm	69.9 mm
Weight	152 g	110 g	110 g	110 g	110 g
<b>Interface type</b>	SATA	SATA	SATA	SATA	SATA
<b>Transfer rate</b>					
Synchronous (maximum)	97 MB/sec	97 MB/sec	97 MB/sec	97 MB/sec	97 MB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)					
Single track	2.0 ms	2.0 ms	1.5 ms	1.5 ms	1.5 ms
Average (read/write)	12/16 ms	12/16 ms	11/13 ms	11/13 ms	11/13 ms
Maximum	21 ms	22 ms	22 ms	22 ms	22 ms
<b>Logical blocks</b>	1,953,525,168	1,465,149,168	1,282,009,226	976,773,168	628,142,448
<b>Disk rotational speed</b>	5400 rpm	7200 and 5400 rpm	5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm
<b>Operating temperature</b>	0°C to 60°C (32°F to 140°F)				
*1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.					
**1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.					
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.					

---

# 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.

## 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 the “Recovering the original system using HP Recovery Manager” section in this chapter.

### 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 the “Restoring to a previous system restore point” section in this chapter.

## 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 the “Restoring specific files using Windows Backup and Restore” section in this chapter.

# Restoring 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 the "Restoring to a previous system restore point" in this section) and partial restores (see the "Restoring specific files" in this section), 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 the “Changing the computer boot order” section in this chapter.

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 volts AC, or from 220 to 240 volts AC.

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

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

### Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

## Requirements for specific countries and regions

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

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

---

## 9 Recycling

When a non-rechargeable or rechargeable 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 Web site at <http://www.hp.com/recycle>.

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