



## HP ENVY dv6 Notebook PC

Maintenance and Service Guide

**IMPORTANT!** This document is intended for HP authorized service providers only.

© Copyright 2012 Hewlett-Packard  
Development Company, L.P.

AMD, the AMD Arrow logo, and combinations thereof, are trademarks of Advanced Micro Devices, Inc. Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel and Core are U.S. registered trademarks of Intel Corporation. Microsoft, Windows, and Windows Vista are U.S. registered trademarks of Microsoft Corporation. SD Logo is a trademark of its proprietor.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: November 2012

Document Part Number: 692788-001

## Safety warning notice

---

**⚠ 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).

---



---

# Table of contents

<b>1 Product description .....</b>	<b>1</b>
<b>2 External component identification .....</b>	<b>10</b>
Finding your hardware and software information .....	10
Display .....	11
Buttons, speakers, and fingerprint reader (select models only) .....	12
Keys .....	13
Lights .....	15
TouchPad .....	16
Front .....	17
Left side .....	18
Right side .....	19
Rear .....	20
Bottom .....	21
<b>3 Illustrated parts catalog .....</b>	<b>22</b>
Service tag .....	23
Computer major components .....	24
Display assembly subcomponents .....	32
Mass storage devices .....	33
Miscellaneous parts .....	34
Sequential part number listing .....	36
<b>4 Removal and replacement procedures .....</b>	<b>45</b>
Preliminary replacement requirements .....	45
Tools required .....	45
Service considerations .....	45
Plastic parts .....	45
Cables and connectors .....	45
Drive handling .....	46
Grounding guidelines .....	46

Electrostatic discharge damage .....	46
Packaging and transporting guidelines .....	48
Component replacement procedures .....	50
Service tag .....	50
Battery .....	51
Hard drive .....	52
RTC battery .....	55
Memory module .....	56
WLAN module .....	57
Optical drive .....	59
Keyboard .....	61
Top cover .....	66
Top speakers .....	69
Power button board .....	70
Fingerprint reader board .....	71
TouchPad button board .....	73
Solid-state drive .....	75
System board .....	77
Fan/heat sink assembly .....	82
Processor .....	88
USB board .....	90
Subwoofer .....	91
Power connector cable .....	93
Optical drive connector cable .....	94
Display assembly .....	95
<b>5 Using Setup Utility (BIOS) and System Diagnostics .....</b>	<b>103</b>
Starting Setup Utility (BIOS) .....	103
Updating the BIOS .....	103
Determining the BIOS version .....	103
Downloading a BIOS update .....	104
Using System Diagnostics .....	105
<b>6 Specifications .....</b>	<b>106</b>
Computer specifications .....	106
15.6-inch display specifications .....	107
Hard drive specifications .....	108
<b>7 Backing up, restoring, and recovering .....</b>	<b>109</b>
Creating recovery media and backups .....	109

Creating HP Recovery media .....	110
Restore and recovery .....	111
Using Windows Refresh for quick and easy recovery .....	112
Remove everything and reinstall Windows .....	113
Recovering using HP Recovery Manager .....	113
What you need to know .....	114
Using the HP Recovery partition to recover a minimized image (select models only) .....	114
Using HP Recovery media to recover .....	115
Changing the computer boot order .....	115
Removing the HP Recovery partition .....	115
<b>8 Power cord set requirements .....</b>	<b>116</b>
Requirements for all countries .....	116
Requirements for specific countries and regions .....	117
<b>9 Recycling .....</b>	<b>118</b>
<b>Index .....</b>	<b>119</b>



---

# 1 Product description

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Product Name</b>	HP ENVY dv6 Notebook PC	√	√
<b>Processors</b>	<ul style="list-style-type: none"><li>• AMD® A10-4600M 3.20-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)</li><li>• AMD A8-4500M 2.80-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)</li><li>• AMD A6-4400M 3.20-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)</li><li>• AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)</li></ul>	√	

---

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Processors</b> <i>(continued)</i>	<ul style="list-style-type: none"> <li data-bbox="504 279 932 401">• Intel® Quad Core® i7-3840QM 2.80-GHz processor (SC turbo up to 3.80-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W)</li> <li data-bbox="504 422 932 543">• Intel Quad Core i7-3820QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W)</li> <li data-bbox="504 564 932 686">• Intel Quad Core i7-3740QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W)</li> <li data-bbox="504 707 932 829">• Intel Quad Core i7-3720QM 2.60-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W)</li> <li data-bbox="504 850 932 972">• Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W)</li> <li data-bbox="504 993 932 1115">• Intel Quad Core i7-3630QM 2.40-GHz processor (SC turbo up to 3.40-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W)</li> <li data-bbox="504 1136 932 1257">• Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W)</li> <li data-bbox="504 1278 932 1400">• Intel Quad Core i7-3610QM 2.30-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W)</li> <li data-bbox="504 1421 932 1520">• Intel Quad Core i7-2670QM 2.20-GHz processor (SC turbo up to 3.10-GHz; 1333-MHz FSB, 6.0-MB L3 cache, 45 W)</li> </ul>		√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Processors</b> <i>(continued)</i>	<ul style="list-style-type: none"> <li>Intel Dual Core i5-3320M 2.60-GHz processor (3C turbo up to 3.30-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i5-3230M 2.60-GHz processor (3C turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i5-3210M 2.50-GHz processor (3C turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i5-2450M 2.50-GHz processor (3C turbo up to 3.10-GHz, 1333-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)</li> <li>Intel Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 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 Radeon™ HD 7670M with 1024-MB of dedicated video memory (64-MB×16 DDR3 900-MHz×8 PCs); 128-bit M2 package</li> <li>AMD Radeon™ 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
<b>Graphics</b> <i>(continued)</i>	<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>NVIDIA 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>NVIDIA 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>NVIDIA 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>NVIDIA 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>	Supports 160-GB drive	√	√
	Supports 32GB mSATA drive		√

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

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Wireless</b> <i>(continued)</i>	Support for the following WLAN formats: <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> <li>• Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter</li> <li>• Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter</li> </ul>	√	√
	Support for the Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor		√
	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>	HP Multi-Format Digital Media Reader slot with push-push technology, supporting the following digital card formats: <ul style="list-style-type: none"> <li>• Secure Digital (SD) Memory Card</li> <li>• Secure Digital Extended Capacity (SDxC) Memory Card</li> <li>• Secure Digital High Capacity (SDHC) Memory Card</li> <li>• Ultra High Speed MultiMediaCard (UHS/MMC)</li> </ul>	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<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> <p>120-W slim AC adapter (RC, V, PFC, 3-wire)</p> <p>90-W HP Smart AC adapter (RC, V, PFC, EM, 3-wire)</p> <p>65-W HP Smart AC adapter (RC, V, EM, 3-wire)</p>	√	√
	<p>Supports the following batteries (battery is user-removable)</p> <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>	<p>Security cable lock</p> <p>Fingerprint reader with Digital Persona software support</p> <p>Intel/VeriSign support</p> <p>Intel AT-p Ready support</p>	√	√

Category	Description	Computer models equipped with an AMD processor	Computer models equipped with an Intel processor
<b>Operating system</b>	<b>Preinstalled:</b> <ul style="list-style-type: none"> <li>• Windows 8 Standard 64-bit</li> <li>• Windows 8 Professional 64-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>	√	√

---

## 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.

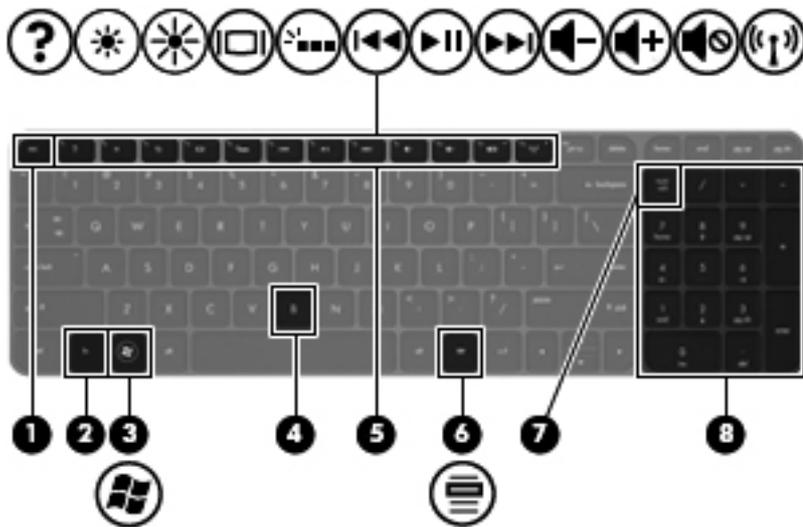
\*The antennas are not visible from the outside of the computer. For optimal transmission, keep the area immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.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



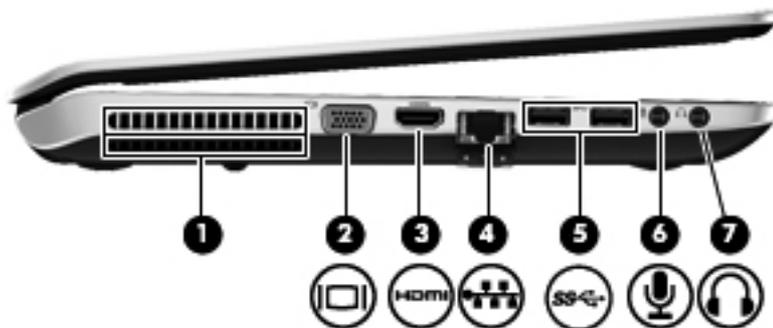
Item	Component	Description
(1)	TouchPad on/off button	Turns the TouchPad on or off.
(2)	TouchPad light	<ul style="list-style-type: none"> <li>• On: The TouchPad is off.</li> <li>• Off: The TouchPad is on.</li> </ul>
(3)	TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.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



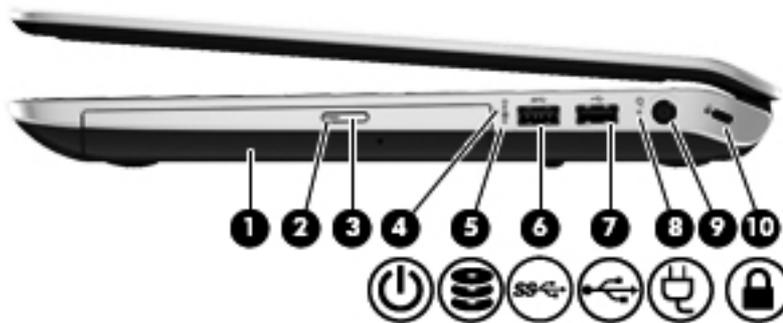
Component	Description
Digital Media slot	Supports the following digital card formats: <ul style="list-style-type: none"><li data-bbox="925 575 1455 609">• Secure Digital (SD) Memory Card</li><li data-bbox="925 630 1455 684">• Secure Digital Extended Capacity (SDxC) Memory Card</li><li data-bbox="925 709 1455 743">• Secure Digital High Capacity (SDHC) Memory Card</li><li data-bbox="925 764 1455 798">• 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>

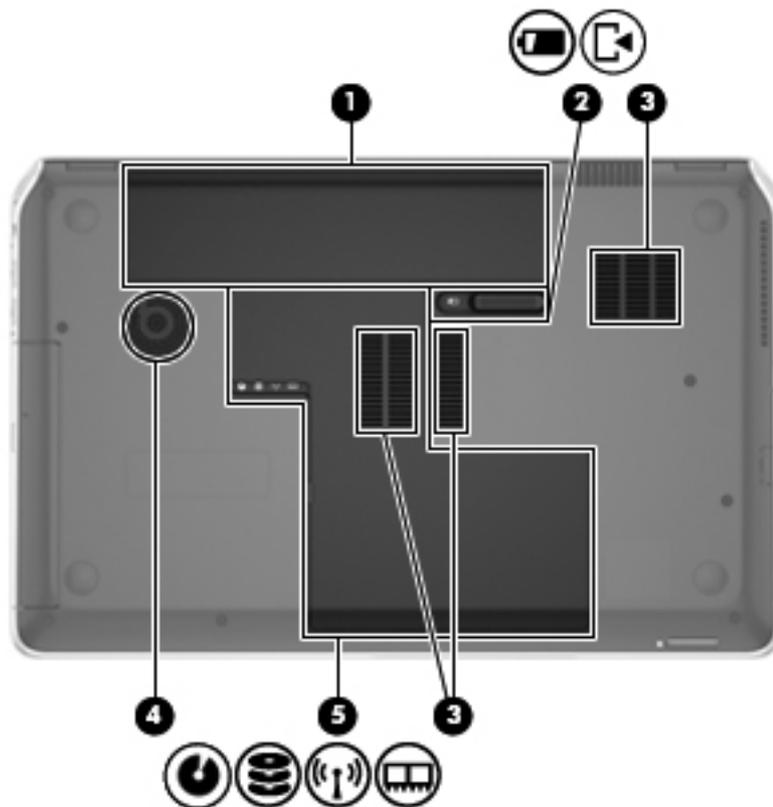
Item	Component	Description
(9)	Power connector	Connects an AC adapter.
(10)	Security cable slot	Attaches an optional security cable to the computer.  <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

## 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



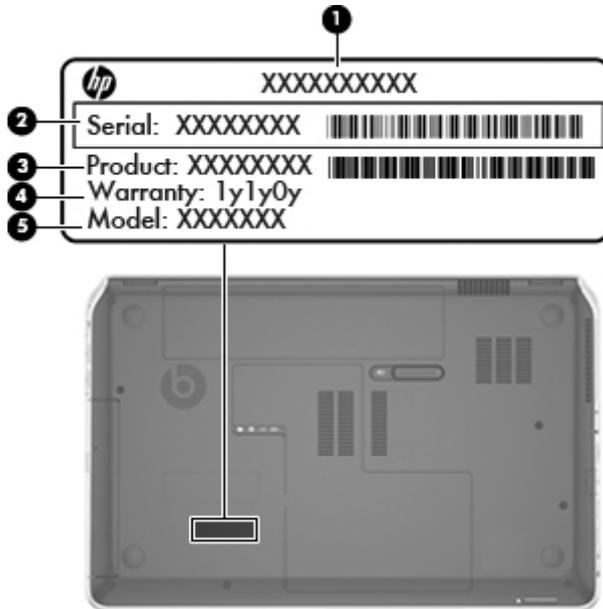
Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	Battery release latch	Releases the battery from the battery bay and opens the service cover.
(3)	Vents (3)	Enable airflow to cool internal components.  <b>NOTE:</b> The computer fan starts up automatically to cool internal components and 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.

---

# 3 Illustrated parts catalog

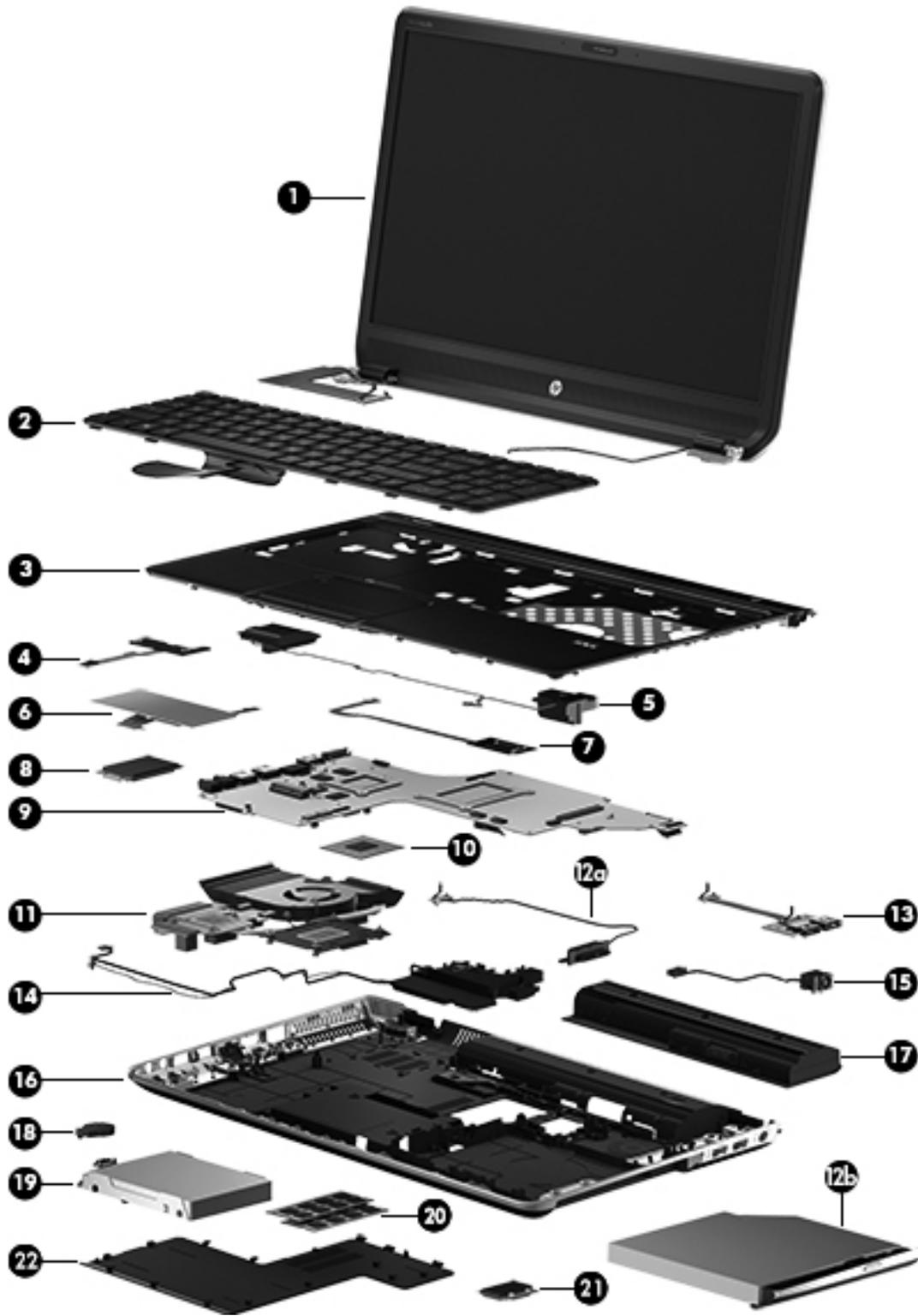
# Service tag

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	698958-001
	15.6-in, BrightView, HD display assembly in aluminum finish	698957-001
	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)	698960-001
	15.6-in, BrightView, HD display assembly in aluminum finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	698959-001
	<b>NOTE:</b> For more display assembly spare part information, see <a href="#">Display assembly subcomponents on page 32</a> .	
<b>(2)</b>	<b>Keyboard</b> in black finish (includes keyboard cable):	
	Keyboard with backlight (includes backlight cable):	
	For use only on computer models equipped with an Intel processor in Belgium	698951-A41
	For use only on computer models equipped with an Intel processor in Denmark, Finland, and Norway	698951-DH1
	For use only on computer models equipped with an Intel processor in Germany	698951-041
	For use only on computer models equipped with an Intel processor in Israel	698951-BB1
	For use only on computer models equipped with an Intel processor in Latin America	698951-161
	For use only on computer models equipped with an Intel processor in the Netherlands	698951-B31
	For use only on computer models equipped with an Intel processor in Portugal	698951-131
	For use only on computer models equipped with an Intel processor in Saudi Arabia	698951-171
	For use only on computer models equipped with an Intel processor in Switzerland	698951-BG1
	For use only on computer models equipped with an Intel processor in Turkey	698951-141
	For use on all computer models in the United States	698951-001
	Keyboard without backlight:	
	For use only on computer models equipped with an Intel processor in Brazil	698952-201
	For use on all computer models in Canada	698952-DB1
	For use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	698952-FL1
	For use only on computer models equipped with an Intel processor in France	698952-051
	For use only on computer models equipped with an Intel processor in Italy	698952-061
	For use on all computer models in Japan	698952-291
	For use on all computer models in Latin America	698952-161

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	For use only on computer models equipped with an Intel processor in the Netherlands	698952-B31
	For use only on computer models equipped with an Intel processor in Russia	698952-251
	For use only on computer models equipped with an Intel processor in South Korea	698952-AD1
	For use only on computer models equipped with an Intel processor in Spain	698952-071
	For use only on computer models equipped with an Intel processor in Taiwan	698952-AB1
	For use only on computer models equipped with an Intel processor in Thailand	698952-281
	For use only on computer models equipped with an Intel processor in the United Kingdom and Singapore	698952-031
	For use on all computer models in the United States	698952-001
<b>(3)</b>	<b>Top cover</b> (includes TouchPad and cable)	708033-001
<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, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682182-601
	For use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682182-501
	For use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	682181-601
	For use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	682181-501
	For use only on computer models equipped with the AMD A70M chipset, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system	682180-601
	For use only on computer models equipped with the AMD A70M chipset, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system	682180-501
	For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682174-601

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682174-501
	For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682175-601
	For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682175-501
	For use only on computer models equipped with the Intel 635M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	710988-601
	For use only on computer models equipped with the Intel 635M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	710988-501
	For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	710989-601
	For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	710989-501
	For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	710991-601
	For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	710991-501
	For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682170-601
	For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682170-501
	For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	682168-601
	For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	682168-501
	For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682171-601
	For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682171-501

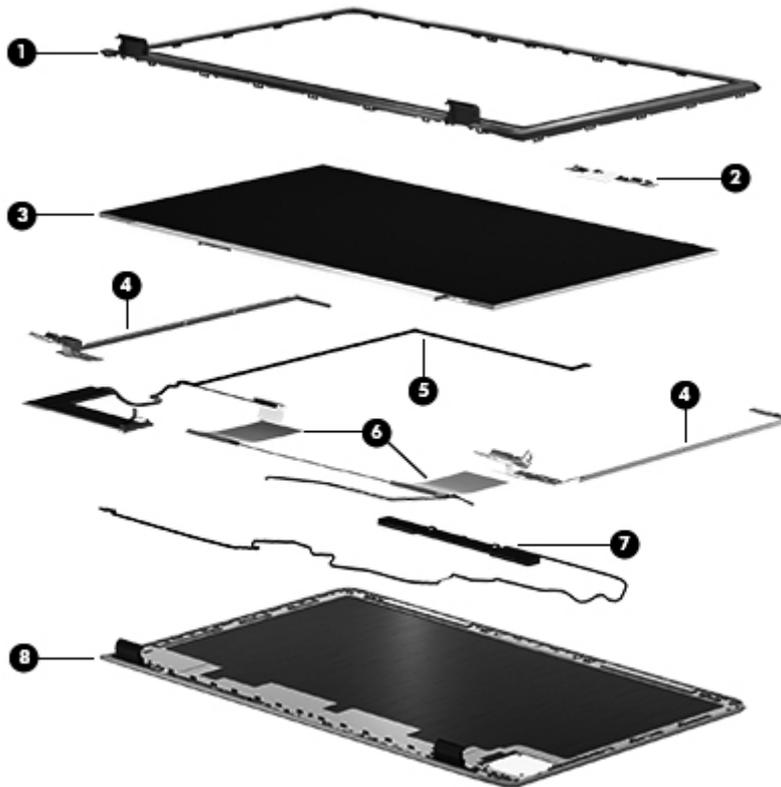
<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	682169-601
	For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	682169-501
	For use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system	682176-601
	For use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system	682176-501
	For use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system	682177-601
	For use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system	682177-501
	<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):	
	AMD A10-4600M 3.20-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683046-001
	AMD A8-4500M 2.80-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683048-001
	AMD A6-4400M 3.20-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	683047-001
	AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	685990-001
	Intel Quad Core i7-3840QM 2.80-GHz processor (SC turbo up to 3.80-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W)	703266-001
	Intel Quad Core i7-3820QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W)	681284-001
	Intel Quad Core i7-3740QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	702840-001
	Intel Quad Core i7-3720QM 2.60-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	681283-001
	Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	701658-001
	Intel Quad Core i7-3630QM 2.40-GHz processor (SC turbo up to 3.40-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	702081-001

Item	Component	Spare part number
	Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	680647-001
	Intel Quad Core i7-3610QM 2.30-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	680646-001
	Intel Quad Core i7-2670QM 2.20-GHz processor (SC turbo up to 3.10-GHz; 1333-MHz FSB, 6.0-MB L3 cache, 45 W)	665116-001
	Intel Dual Core i5-3320M 2.60-GHz processor (SC turbo up to 3.30-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	681952-001
	Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	711903-001
	Intel Dual Core i5-3210M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	680645-001
	Intel Dual Core i5-2450M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1333-MHz FSB, 3.0-MB L3 cache, 35 W)	676359-001
	Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	713163-001
	Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	700627-001
	Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	682417-001
	Intel Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	677152-001
<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>Item</b>	<b>Component</b>	<b>Spare part number</b>
<b>(15)</b>	<b>Power connector cable</b> (includes bracket):	
	For use only on computer models equipped with an AMD processor and a 90-W AC adapter	681973-001
	For use only on computer models equipped with an Intel processor and a 120-W AC adapter	682059-001
	For use only on computer models equipped with an Intel processor and a 90-W AC adapter	682058-001
<b>(16)</b>	<b>Base enclosure:</b>	
	Base enclosure for use on computer models in all countries and regions except Japan	707924-001
	Base enclosure for use only on computer models equipped with an Intel processor in Japan	707924-291
<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
	6-cell, 47-Wh, 2.2-Ah, Li-ion battery	699468-001
<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
	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):	

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	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
	Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter	691415-001
	Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
	Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor	690019-001
	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

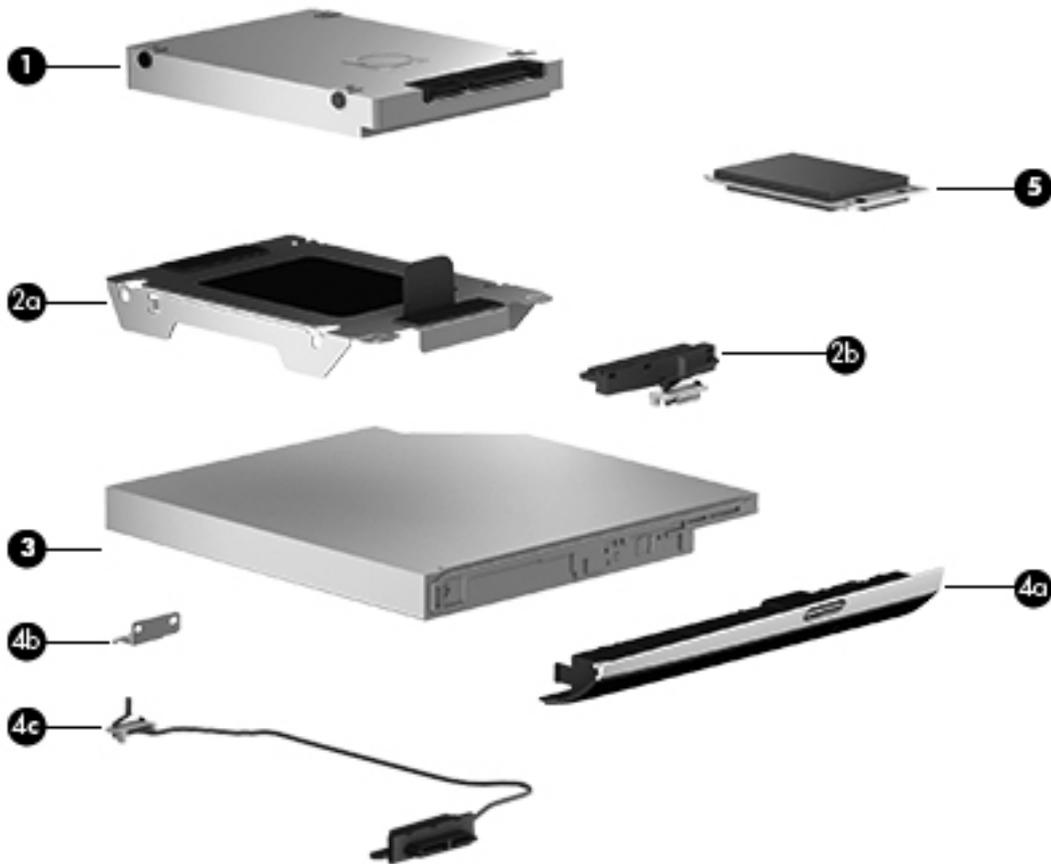
## Display assembly subcomponents



Item	Component	Spare part number
(1)	<b>Display bezel</b>	698954-001
(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 in aluminum finish</b>	682047-001
	<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
	320-GB, 7200-rpm, 9.5-mm	641672-001
	For use only on computer models equipped with an AMD processor:	

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	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

<b>Component</b>	<b>Spare part number</b>
<b>AC adapter:</b>	
For use on all computer models:	
90-W HP Smart AC adapter (PFC, 3-wire)	693712-001
65-W HP Smart AC adapter (non-PFC, 3-wire)	693711-001
For use only on computer models equipped with an Intel processor:	
120-W slim AC adapter (PFC, 3-wire)	693709-001
90-W HP Smart AC adapter (PFC, EM, 3-wire)	693713-001

<b>Component</b>	<b>Spare part number</b>
65-W HP Smart AC adapter (RC/V, EM, 3-wire)	693710-001
<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	490371-201
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 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 only on computer models equipped with an Intel processor in India (3-pin, black, 1.83-m)
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.

Spare part number	Description
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.
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)
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 Quad Core i7-2670QM 2.20-GHz processor (SC turbo up to 3.1-GHz; 1333-MHz FSB, 6.0-MB L3 cache, 45 W; includes replacement thermal material)
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

Spare part number	Description
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 Dual Core i5-2450M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1333-MHz FSB, 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 Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
680645-001	Intel Dual Core i5-3210M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
680646-001	Intel Quad Core i7-3610QM 2.30-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W; includes replacement thermal material)
680647-001	Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W; includes replacement thermal material)
681283-001	Intel Quad Core i7-3720QM 2.60-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W; includes replacement thermal material)
681284-001	Intel Quad Core i7-3820QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W; includes replacement thermal material)
681952-001	Intel Dual Core i5-3320M 2.60-GHz processor (SC turbo up to 3.30-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
681973-001	Power connector cable for use only on computer models equipped with an AMD processor and a 90-W AC adapter (includes bracket)
682046-001	Wireless Antenna Kit (includes wireless antenna cables and transceivers)
682047-001	Display enclosure in aluminum finish
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 an Intel processor and a 90-W AC adapter (includes bracket)
682059-001	Power connector cable for use only on computer models equipped with an Intel processor and a 120-W AC adapter (includes bracket)
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)

<b>Spare part number</b>	<b>Description</b>
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)
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)
682105-001	Webcamera/microphone module
682168-501	System board for use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
682168-601	System board for use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
682169-501	System board for use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
682169-601	System board for use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory and replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
682170-501	System board for use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682170-601	System board for use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682171-501	System board for use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682171-601	System board for use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682174-501	System board for use only on computer models equipped with the Intel 650M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682174-601	System board for use only on computer models equipped with the Intel 650M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682175-501	System board for use only on computer models equipped with the Intel 650M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682175-601	System board for use only on computer models equipped with the Intel 650M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682176-501	System board for use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system (includes replacement thermal material)
682176-601	System board for use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system (includes replacement thermal material)
682177-501	System board for use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system (includes replacement thermal material)
682177-601	System board for use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system (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)
682180-501	System board for use only on computer models equipped with the AMD A70M chipset, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system (includes replacement thermal material)

Spare part number	Description
682180-601	System board for use only on computer models equipped with the AMD A70M chipset, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system (includes replacement thermal material)
682181-501	System board for use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
682181-601	System board for use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
682182-501	System board for use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682182-601	System board for use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
682225-001	TouchPad button board (includes cable and bracket)
682417-001	Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
683046-001	AMD A10-4600M 3.20-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W; includes replacement thermal material)
683047-001	AMD A6-4400M 3.20-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W; includes replacement thermal material)
683048-001	AMD A8-4500M 2.80-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 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.
685990-001	AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W; includes replacement thermal material)
690019-001	Atheros AR9565 802.11b/g/n 1x1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor
690020-001	Ralink RT3290LE 802.11b/g/n 1x1 WiFi and Bluetooth 4.0 Combo Adapter for use on all computer models
691415-001	Ralink RT5390R 802.11b/g/n 1x1 WiFi Adapter for use on all computer models
692846-001	180-GB, SATA, 2.5-in solid-state drive for use on all computer models
693709-001	120-W slim AC adapter for use only on computer models equipped with an Intel processor (PFC, 3-wire)
693710-001	65-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC/V, EM, 3-wire)
693711-001	65-W HP Smart AC adapter for use on all computer models (non-PFC, 3-wire)

<b>Spare part number</b>	<b>Description</b>
693712-001	90-W HP Smart AC adapter for use on all computer models (PFC, 3-wire)
693713-001	90-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (PFC, EM, 3-wire)
698951-001	Keyboard with backlight for use on all computer models in the United States (includes backlight cable and keyboard cable)
698951-041	Keyboard with backlight for use only on computer models equipped with an Intel processor in Germany (includes backlight cable and keyboard cable)
698951-131	Keyboard with backlight for use only on computer models equipped with an Intel processor in Portugal (includes backlight cable and keyboard cable)
698951-141	Keyboard with backlight for use only on computer models equipped with an Intel processor in Turkey (includes backlight cable and keyboard cable)
698951-161	Keyboard with backlight for use only on computer models equipped with an Intel processor in Latin America (includes backlight cable and keyboard cable)
698951-171	Keyboard with backlight for use only on computer models equipped with an Intel processor in Saudi Arabia (includes backlight cable and keyboard cable)
698951-A41	Keyboard with backlight for use only on computer models equipped with an Intel processor in Belgium (includes backlight cable and keyboard cable)
698951-B31	Keyboard with backlight for use only on computer models equipped with an Intel processor in the Netherlands (includes backlight cable and keyboard cable)
698951-BB1	Keyboard with backlight for use only on computer models equipped with an Intel processor in Israel (includes backlight cable and keyboard cable)
698951-BG1	Keyboard with backlight for use only on computer models equipped with an Intel processor in Switzerland (includes backlight cable and keyboard cable)
698951-DH1	Keyboard with backlight for use only on computer models equipped with an Intel processor in Denmark, Finland, and Norway (includes backlight cable and keyboard cable)
698952-001	Keyboard without backlight for use on all computer models in the United States (includes keyboard cable)
698952-031	Keyboard without backlight for use only on computer models equipped with an Intel processor in the United Kingdom and Singapore (includes keyboard cable)
698952-051	Keyboard without backlight for use only on computer models equipped with an Intel processor in France (includes keyboard cable)
698952-061	Keyboard without backlight for use only on computer models equipped with an Intel processor in Italy (includes keyboard cable)
698952-071	Keyboard without backlight for use only on computer models equipped with an Intel processor in Spain (includes keyboard cable)
698952-161	Keyboard without backlight for use on all computer models in Latin America (includes keyboard cable)
698952-201	Keyboard without backlight for use only on computer models equipped with an Intel processor in Brazil (includes keyboard cable)
698952-251	Keyboard without backlight for use only on computer models equipped with an Intel processor in Russia (includes keyboard cable)

<b>Spare part number</b>	<b>Description</b>
698952-281	Keyboard without backlight for use only on computer models equipped with an Intel processor in Thailand (includes keyboard cable)
698952-291	Keyboard without backlight for use on all computer models in Japan (includes keyboard cable)
698952-AB1	Keyboard without backlight for use only on computer models equipped with an Intel processor in Taiwan (includes keyboard cable)
698952-AD1	Keyboard without backlight for use only on computer models equipped with an Intel processor in South Korea (includes keyboard cable)
698952-B31	Keyboard without backlight for use only on computer models equipped with an Intel processor in the Netherlands (includes keyboard cable)
698952-DB1	Keyboard without backlight for use on all computer models in Canada (includes keyboard cable)
698952-FL1	Keyboard without backlight for use only on computer models equipped with an Intel processor in the Czech Republic and Slovenia (includes keyboard cable)
698954-001	Display bezel in aluminum finish for use on all computer models
698957-001	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 webcam/microphone module and cable)
698958-001	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 webcam/microphone module and cable)
698959-001	15.6-in, BrightView, HD display assembly in aluminum finish for use only on computer models equipped with an Intel processor (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)
698960-001	15.6-in, AntiGlare, FHD display assembly in aluminum finish for use only on computer models equipped with an Intel processor (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)
699468-001	6-cell, 47-Wh, 2.2-Ah, Li-ion battery
700627-001	Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
701658-001	Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W; includes replacement thermal material)
702081-001	Intel Quad Core i7-3630QM 2.40-GHz processor (SC turbo up to 3.40-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W; includes replacement thermal material)
702840-001	Intel Quad Core i7-3740QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W; includes replacement thermal material)
703266-001	Intel Quad Core i7-3840QM 2.80-GHz processor (SC turbo up to 3.80-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W; includes replacement thermal material)
707924-001	Base enclosure for use on computer models in all countries and regions except Japan
707924-291	Base enclosure for use only on computer models equipped with an Intel processor in Japan
708033-001	Top cover in aluminum finish (includes TouchPad board and cable)

<b>Spare part number</b>	<b>Description</b>
710988-501	System board for use only on computer models equipped with the Intel 635M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
710988-601	System board for use only on computer models equipped with the Intel 635M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
710989-501	System board for use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
710989-601	System board for use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory and replacement thermal material)
710991-501	System board for use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
710991-601	System board for use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory and replacement thermal material)
711903-001	Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
713163-001	Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)

---

# 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.

---

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

---

### Plastic parts

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

---

### Cables and connectors

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

---

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

## Drive handling

---

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

Avoid exposing 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."

---

## 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.

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

## 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

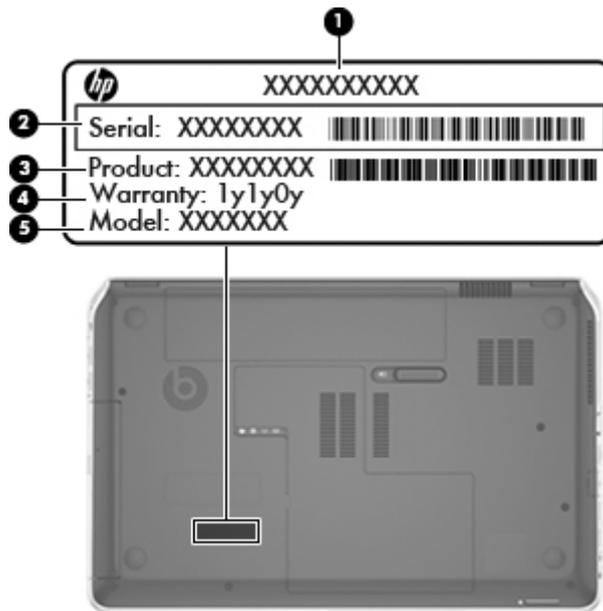
# Component replacement procedures

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 51](#) 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
6-cell, 47-Wh, 2.2-Ah, Li-ion battery	699468-001

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

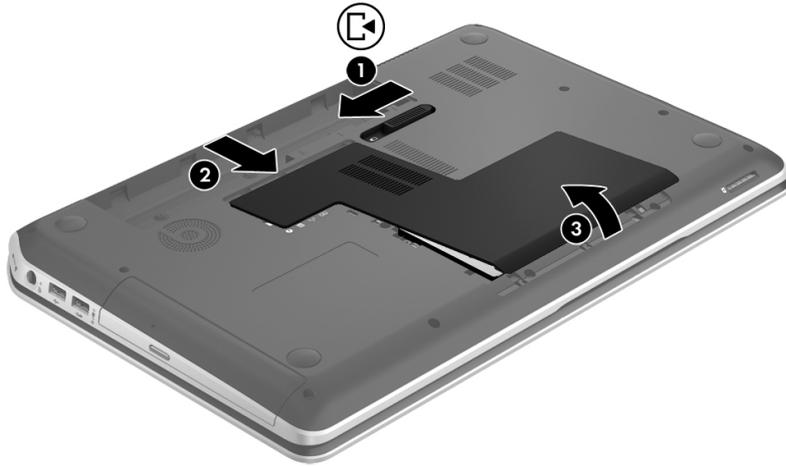
Before removing the hard drive, follow these steps:

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 51](#)).

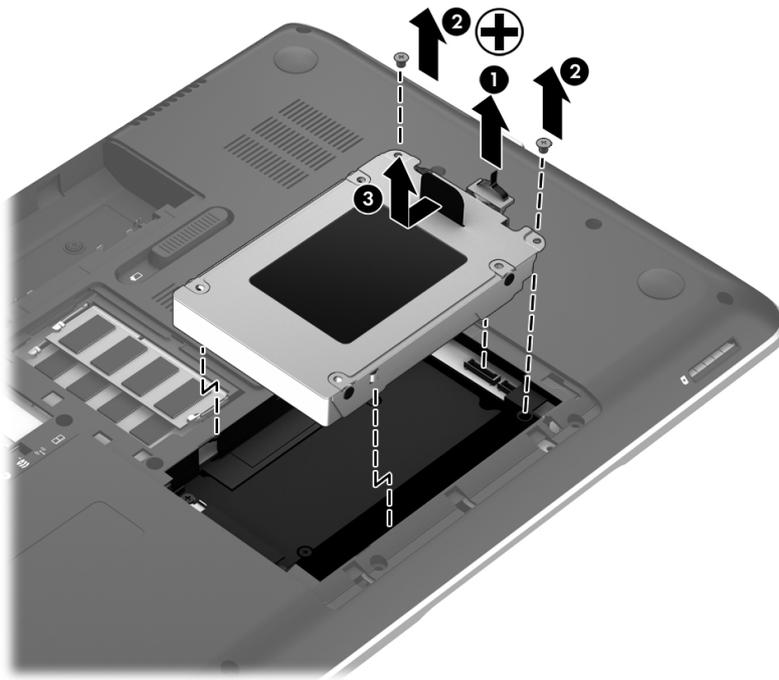
Remove the hard drive:

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

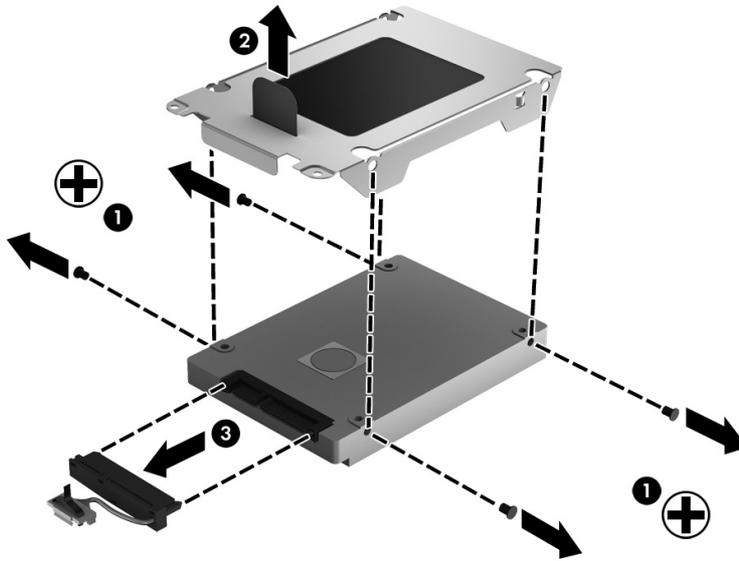
3. Remove the service cover **(3)**. The service cover is available using spare part number 682088-001.



4. Disconnect the hard drive connector cable **(1)** from the system board.
5. Remove the two Phillips PM2.5x3.5 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

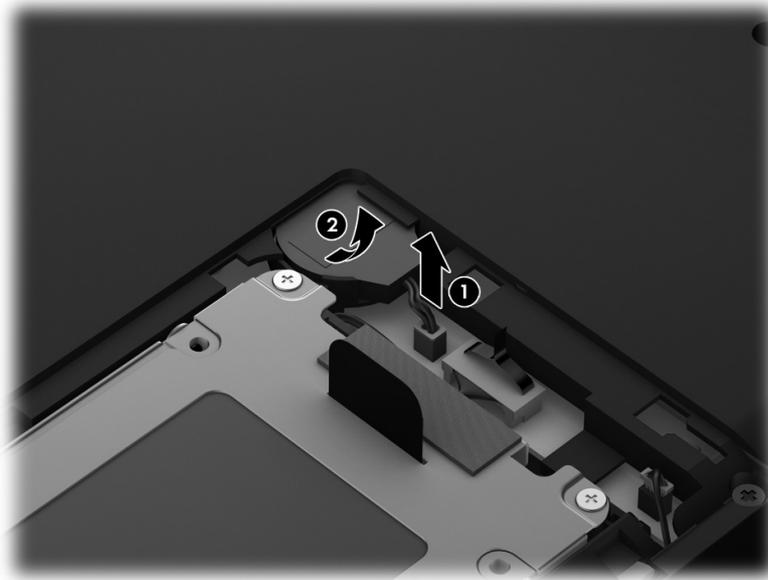
Before removing the RTC battery, follow these steps:

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 51](#)).
5. Remove the service cover(see [Hard drive on page 52](#)).

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

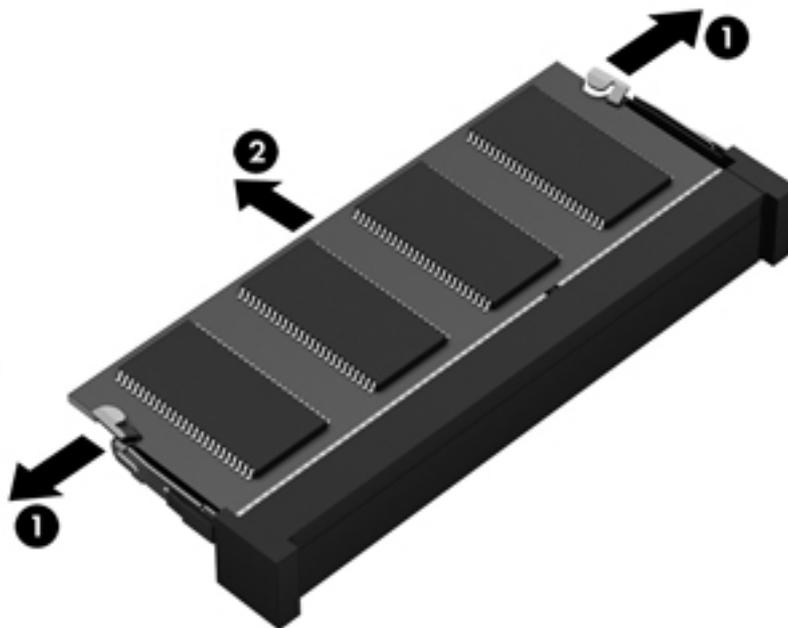
Description	Spare part number
8-GB memory module (PC3, 12800, 1600-MHz)	670034-001
4-GB memory module (PC3, 12800, 1600-MHz)	641369-001
2-GB memory module (PC3, 12800, 1600-MHz)	652972-001

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 51](#)).
5. Remove the service cover (see [Hard drive on page 52](#)).

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
Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter	691415-001
Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor	690019-001
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 51](#)).
5. Remove the service cover (see [Hard drive on page 52](#)).

Remove the WLAN module:

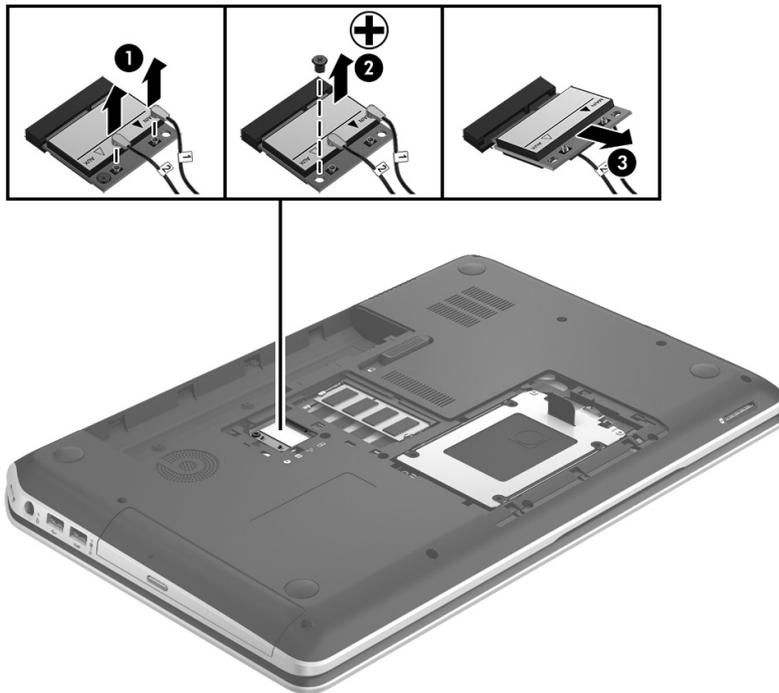
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.



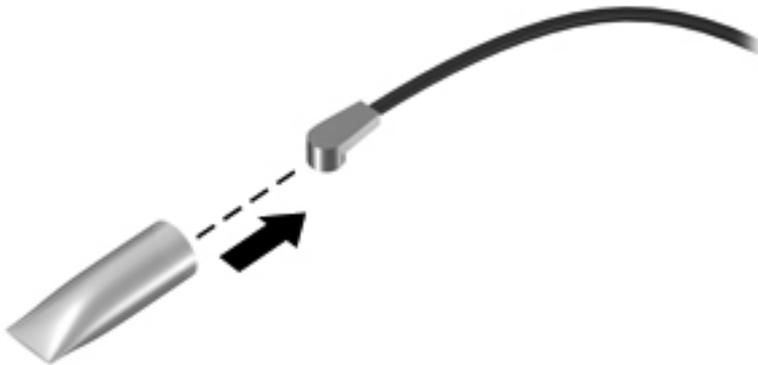
**NOTE:** The #1 WLAN antenna cable is connected to the WLAN module “Main” terminal. The #2 WLAN antenna cable is connected to the WLAN module “Aux” terminal.

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

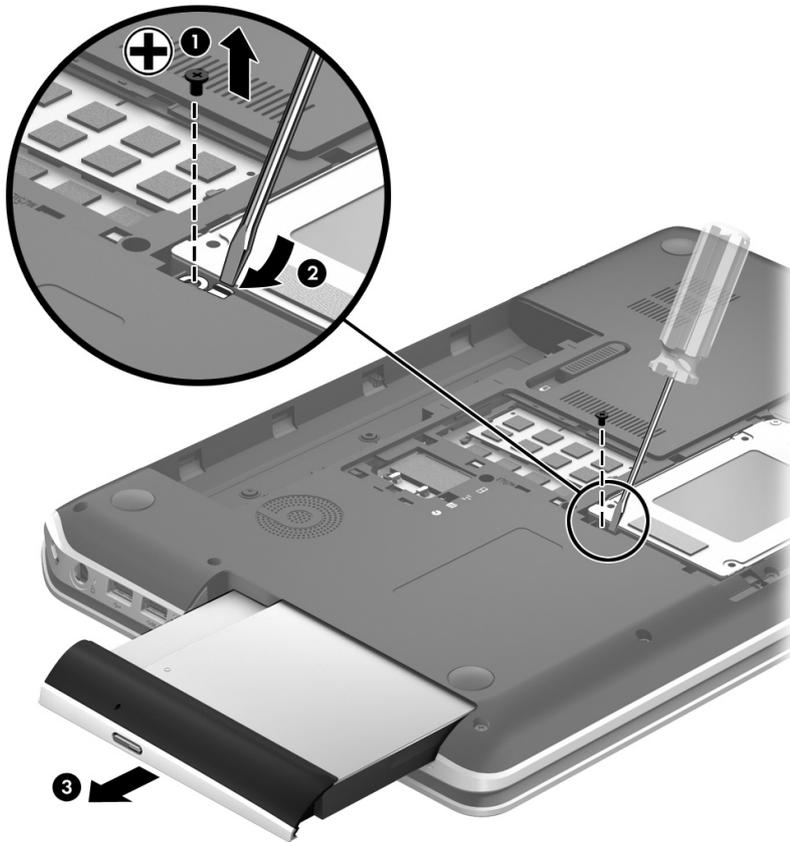
Before removing the optical drive, follow these steps:

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 51](#)).
5. Remove the service cover (see [Hard drive on page 52](#)).

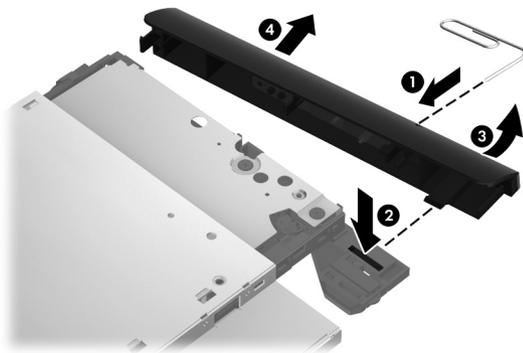
Remove the optical drive:

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.

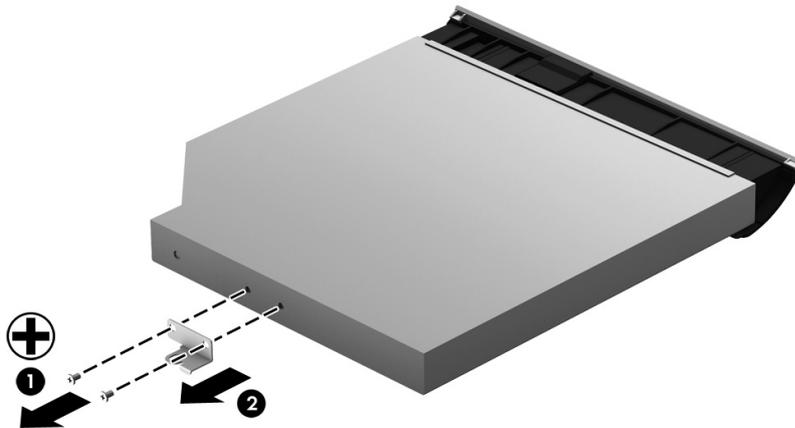


4. If it is necessary to replace the optical drive bezel, use a thin tool or an unbent paper clip **(1)** to release the optical drive tray.
5. Use a flat-blade screw driver or similar tool to press on the optical drive bezel tab **(2)** to release the optical drive bezel.
6. Release the left side of 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 only on computer models equipped with an Intel processor in Belgium	698951-A41
For use only on computer models equipped with an Intel processor in Denmark, Finland, and Norway	698951-DH1
For use only on computer models equipped with an Intel processor in Germany	698951-041
For use only on computer models equipped with an Intel processor in Israel	698951-BB1
For use only on computer models equipped with an Intel processor in Latin America	698951-161
For use only on computer models equipped with an Intel processor in the Netherlands	698951-B31
For use only on computer models equipped with an Intel processor in Portugal	698951-131
For use only on computer models equipped with an Intel processor in Saudi Arabia	698951-171
For use only on computer models equipped with an Intel processor in Switzerland	698951-BG1
For use only on computer models equipped with an Intel processor in Turkey	698951-141
For use on all computer models in the United States	698951-001
Keyboard without backlight:	
For use only on computer models equipped with an Intel processor in Brazil	698952-201
For use on all computer models in Canada	698952-DB1
For use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	698952-FL1

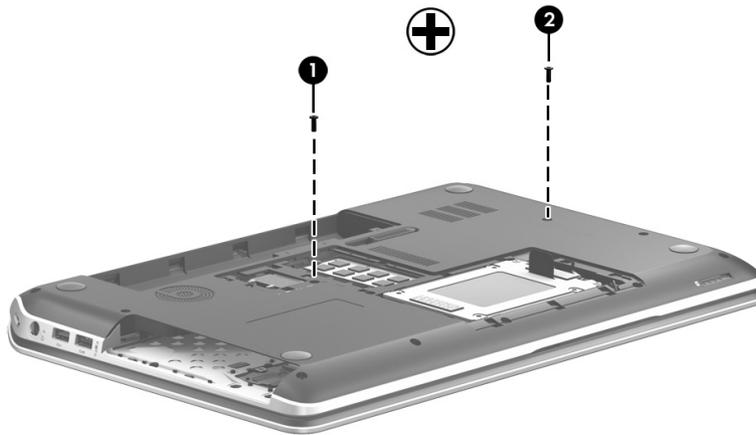
<b>Description</b>	<b>Spare part number</b>
For use only on computer models equipped with an Intel processor in France	698952-051
For use only on computer models equipped with an Intel processor in Italy	698952-061
For use on all computer models in Japan	698952-291
For use on all computer models in Latin America	698952-161
For use only on computer models equipped with an Intel processor in the Netherlands	698952-B31
For use only on computer models equipped with an Intel processor in Russia	698952-251
For use only on computer models equipped with an Intel processor in South Korea	698952-AD1
For use only on computer models equipped with an Intel processor in Spain	698952-071
For use only on computer models equipped with an Intel processor in Taiwan	698952-AB1
For use only on computer models equipped with an Intel processor in Thailand	698952-281
For use only on computer models equipped with an Intel processor in the United Kingdom and Singapore	698952-031
For use on all computer models in the United States	698952-001

Before removing the keyboard, follow these steps:

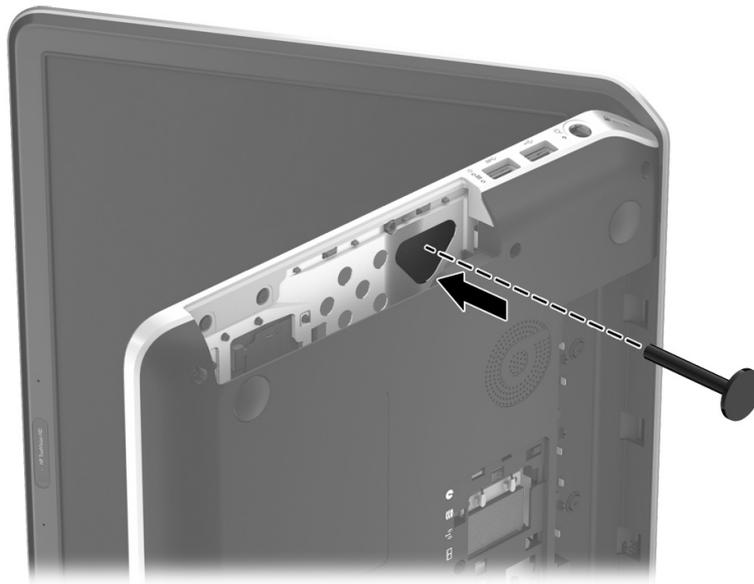
- 1.** Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2.** Disconnect the power from the computer by unplugging the power cord from the computer.
- 3.** Disconnect all external devices from the computer.
- 4.** Remove the battery (see [Battery on page 51](#)).
- 5.** Remove the service cover (see [Hard drive on page 52](#)).

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)	708033-001

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))

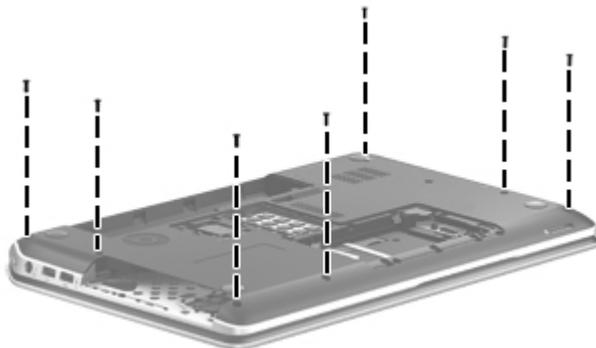


**NOTE:** When replacing the top cover, be sure to remove the following components from the defective top cover and install them on the replacement top cover:

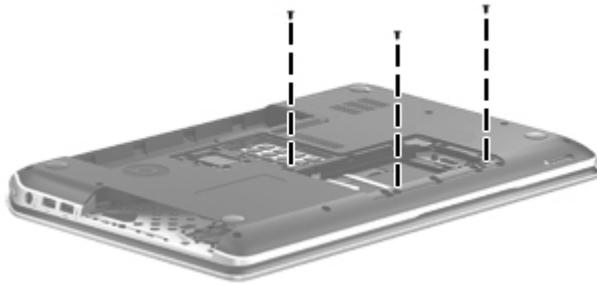
- Top speakers (see [Top speakers on page 69](#))
- Power button board and cable (see [Power button board on page 70](#))
- Fingerprint reader board (see [Fingerprint reader board on page 71](#))
- TouchPad button board (see [TouchPad button board on page 73](#))

Remove the top cover:

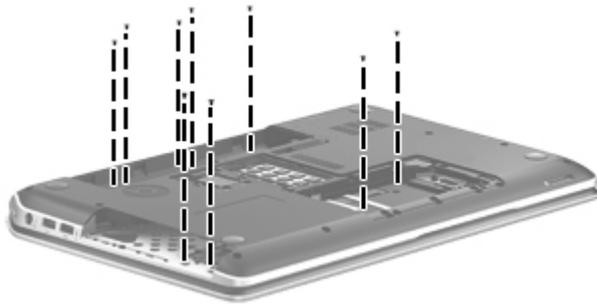
1. Remove the seven Phillips PM2.5×8.5 screws that secure the top cover to the computer.



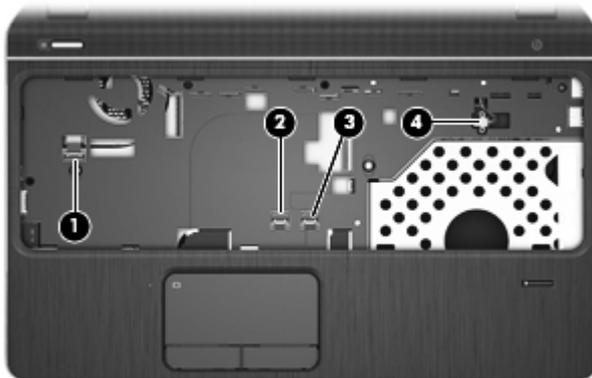
2. Remove the three Phillips PM2.5×5.5 screws that secure the top cover to the computer.



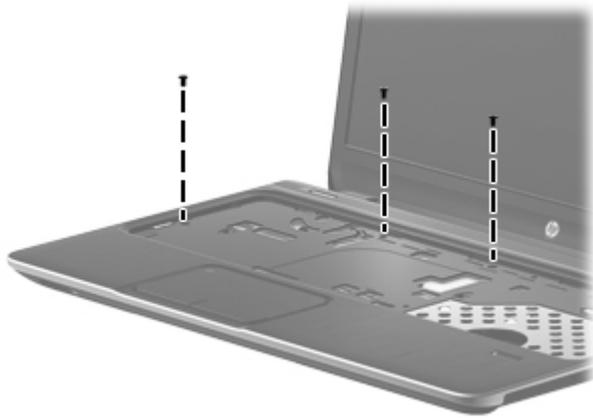
3. Remove the nine Phillips PM2.5×3.5 screws that secure the top cover to the computer.



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 PM2.5x5.5 screws that secure the top cover to the computer.

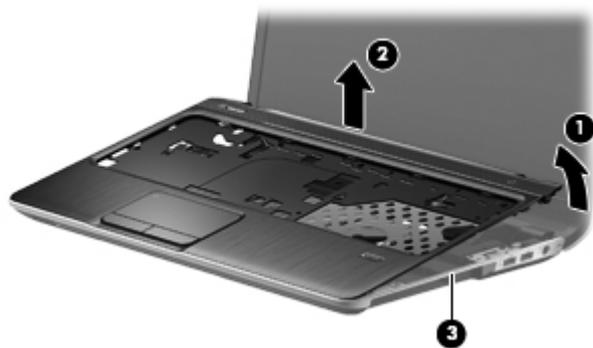


8. Lift the rear edge of the top cover **(1)** until the left and right sides have disengaged from the base enclosure.
9. Remove the top cover **(2)**.

---

**⚠ 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

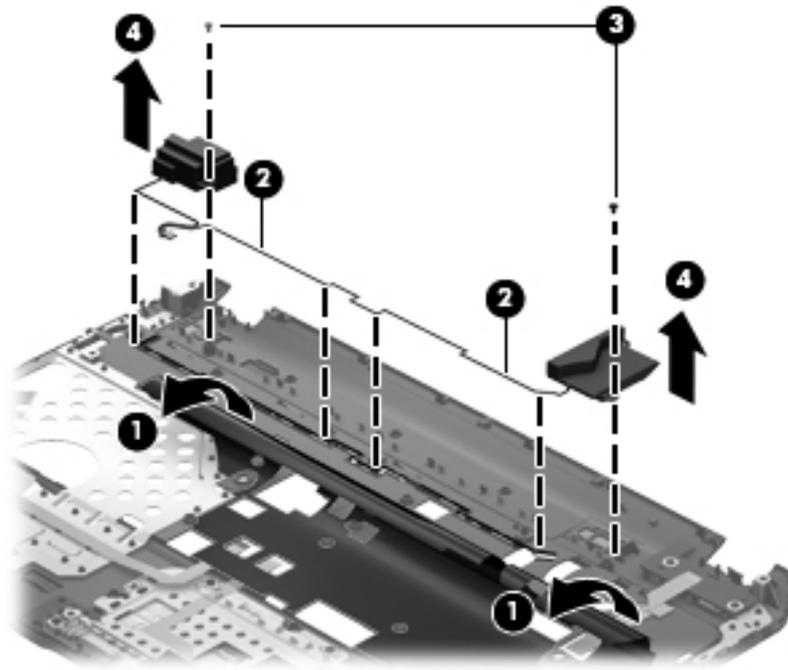
Before removing the top speakers, follow these steps:

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))

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

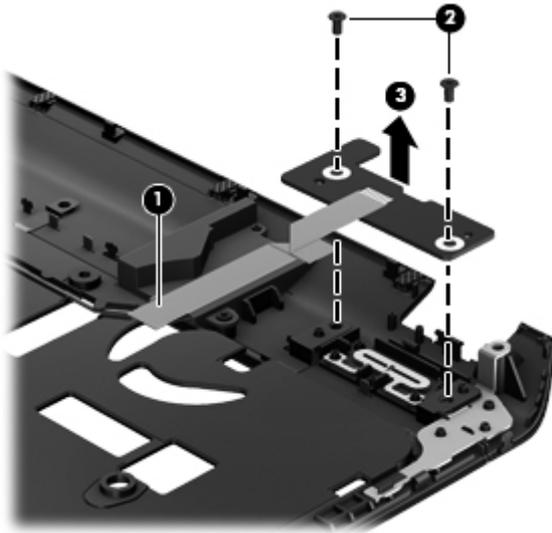
Description	Spare part number
Power button board (includes cable)	682086-001

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))

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

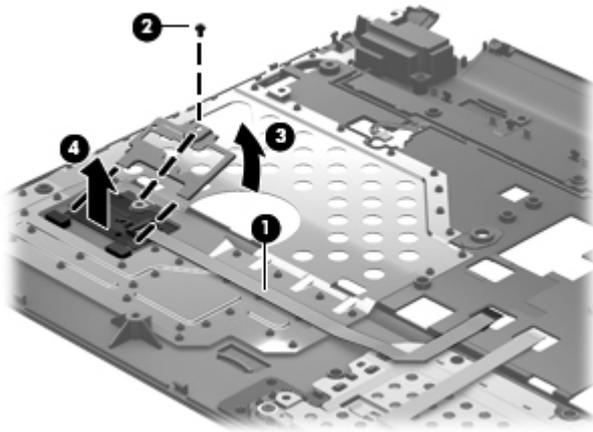
Before removing the fingerprint reader board, follow these steps:

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))

- c. Keyboard (see [Keyboard on page 61](#))
- d. Top cover (see [Top cover on page 66](#))

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

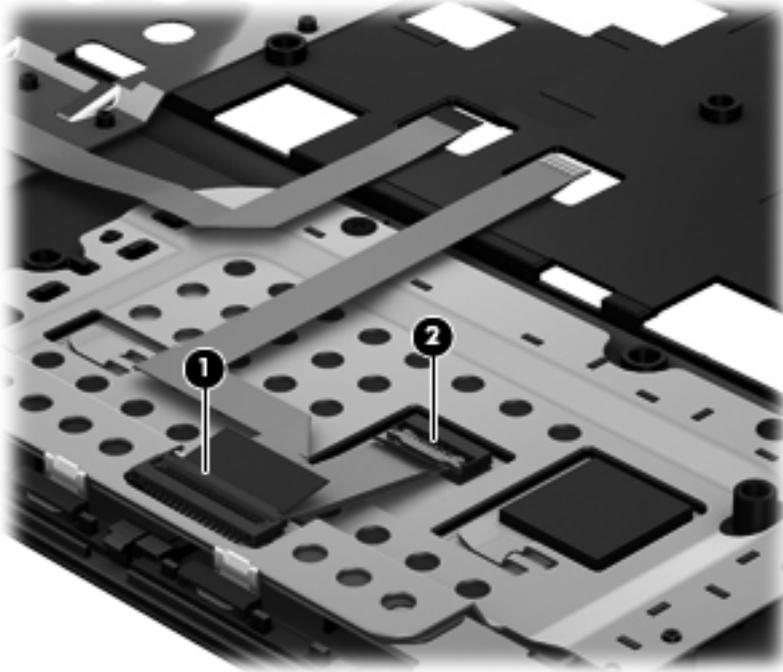
Before removing the TouchPad button board, follow these steps:

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))

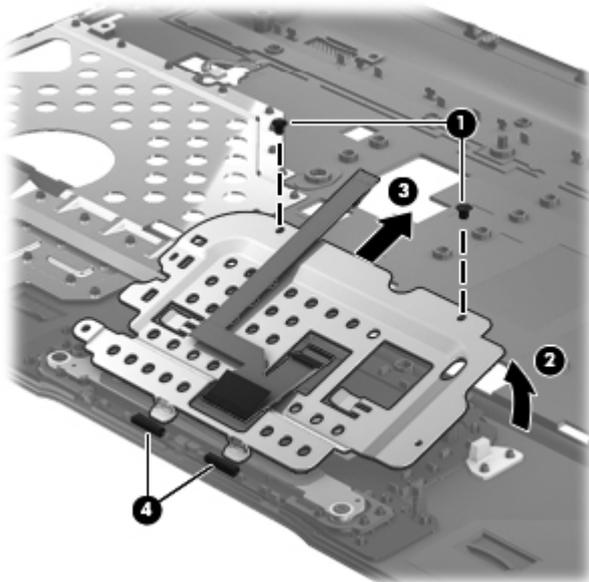
Remove the TouchPad button board:

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.

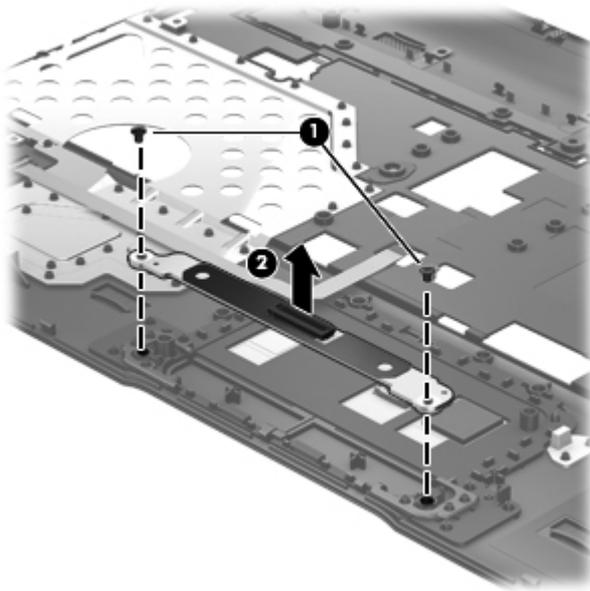
3. Release the TouchPad board ZIF connector **(2)** to which the TouchPad button board cable is connected, and then disconnect the cable from the TouchPad board.



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.
6. 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.



7. Remove the two Phillips PM2.5×3.5 screws **(1)** that secure the TouchPad button board to the top cover.
8. 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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))

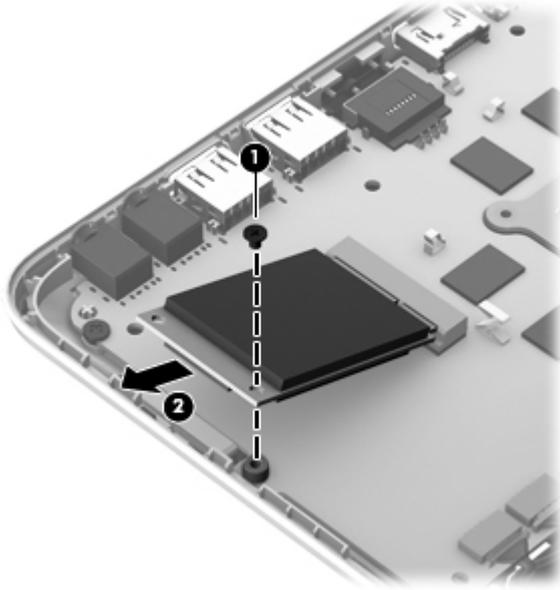
Remove the solid-state drive:

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, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682182-601
For use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682182-501
For use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	682181-601
For use only on computer models equipped with the AMD A70M chipset, the AMD RadeonT HD 7670M graphics subsystem, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	682181-501
For use only on computer models equipped with the AMD A70M chipset, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system	682180-601
For use only on computer models equipped with the AMD A70M chipset, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system	682180-501
For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682174-601
For use only on computer models equipped with the Intel 650M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682174-501
For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682175-601
For use only on computer models equipped with the Intel 650M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682175-501
For use only on computer models equipped with the Intel 635M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	710988-601
For use only on computer models equipped with the Intel 635M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	710988-501
For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	710989-601

Description	Spare part number
For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	710989-501
For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	710991-601
For use only on computer models equipped with the Intel 635M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	710991-501
For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682170-601
For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682170-501
For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	682168-601
For use only on computer models equipped with the Intel 630M chipset, a 45-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	682168-501
For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 2.0-GB of discrete video memory)	682171-601
For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 2.0-GB of discrete video memory)	682171-501
For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Professional operating system (includes 1.0-GB of discrete video memory)	682169-601
For use only on computer models equipped with the Intel 630M chipset, a 35-W processor, a graphics subsystem with discrete video memory, and the Windows 8 Standard operating system (includes 1.0-GB of discrete video memory)	682169-501
For use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system	682176-601
For use only on computer models equipped with the Intel UM77 chipset, a 45-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system	682176-501
For use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Professional operating system	682177-601
For use only on computer models equipped with the Intel UM77 chipset, a 35-W processor, a graphics subsystem with UMA video memory, and the Windows 8 Standard operating system	682177-501
<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

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 51](#)).
5. Remove the hard drive (see [Hard drive on page 52](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 57](#)).
7. Remove the following components:
  - a. Optical drive (see [Optical drive on page 59](#))
  - b. Keyboard (see [Keyboard on page 61](#))
  - c. Top cover (see [Top cover on page 66](#))

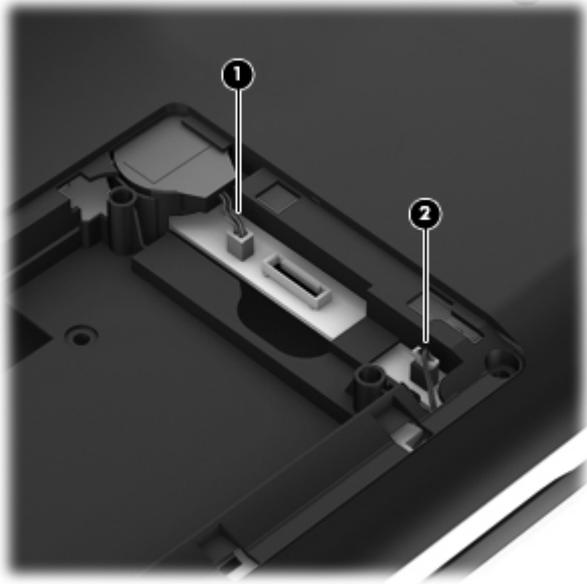
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory module (see [Memory module on page 56](#))
- WLAN module (see [WLAN module on page 57](#))
- Solid-state drive (see [Solid-state drive on page 75](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 82](#))
- Processor (see [Processor on page 88](#))

Remove the system board:

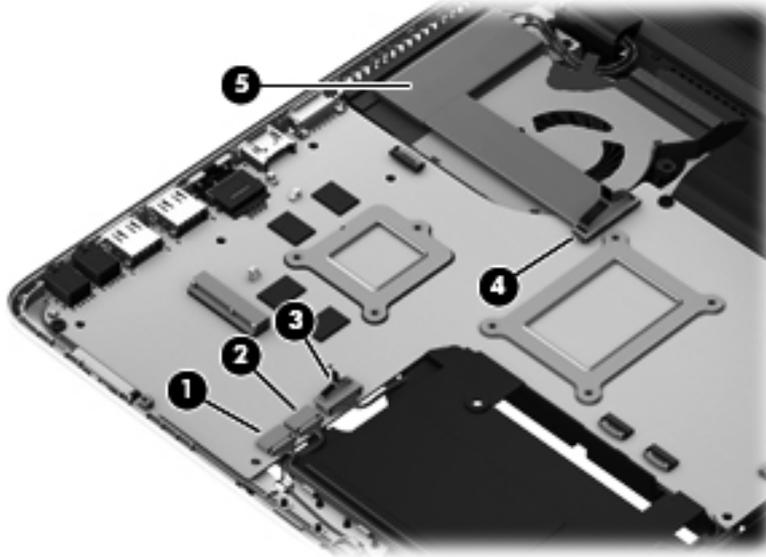
1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the RTC battery cable **(1)** from the system board.

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

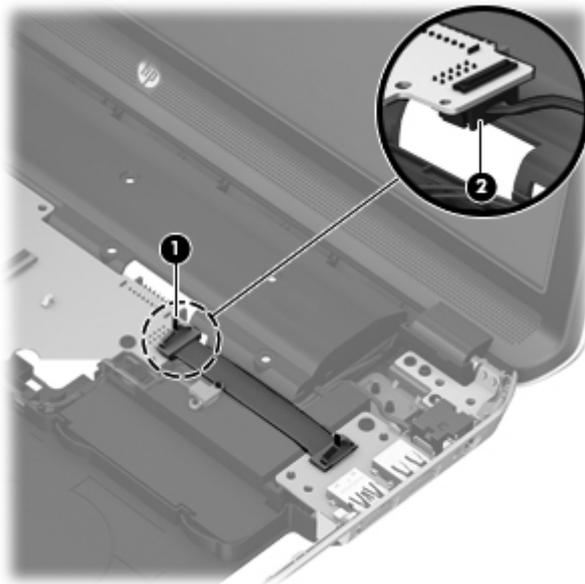


5. Turn the computer right side up, with the front toward you.
6. Open the computer.
7. Disconnect the following cables from the system board:
  - (1)** Display speakers cable
  - (2)** Top speakers passthrough cable
  - (3)** Optical drive connector cable
  - (4)** Display panel cable

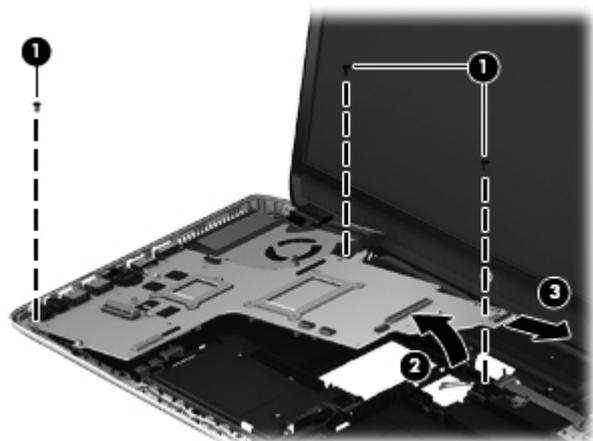
8. Detach the display panel cable **(5)** from the heat sink. (The display panel cable is attached to the heat sink with double-sided tape.)



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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))
  - e. System board (see [System board on page 77](#))

Remove the fan/heat sink assembly:

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



**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.

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

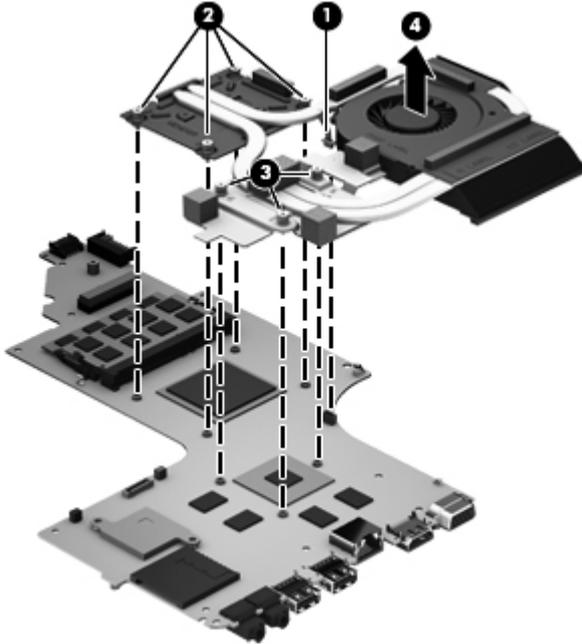
3. Following the 1, 2, 3, 4, 5, 6, 7 sequence stamped into the fan/heat sink assembly, loosen the seven captive Phillips screws **(2)** and **(3)** that secure the fan/heat sink assembly to the system board, and then remove the fan/heat sink assembly **(4)**.

---

 **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.

---



---

 **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.

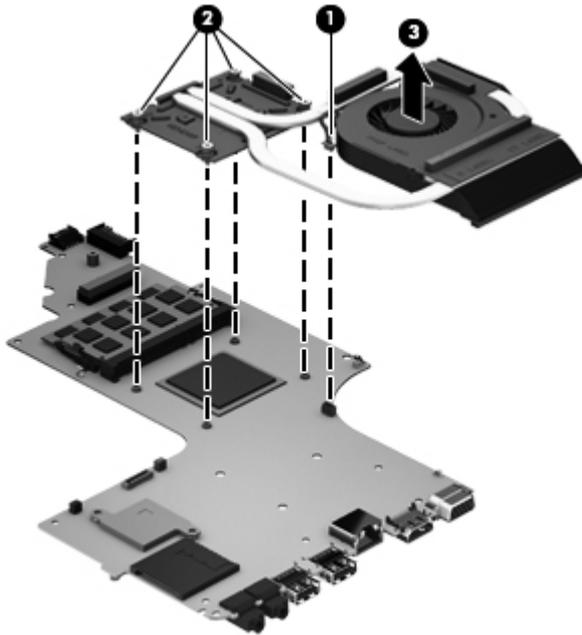
---

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.

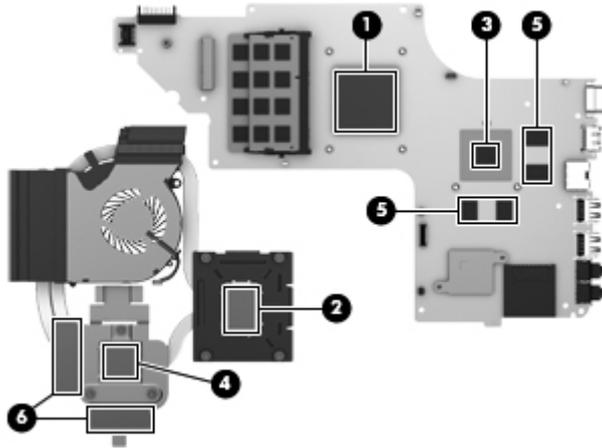
 **NOTE:** The following illustration shows the fan/heat sink assembly removal process for a computer model equipped with an AMD processor. The process for removing the fan/heat sink assembly on a computer model equipped with an Intel processor is identical.



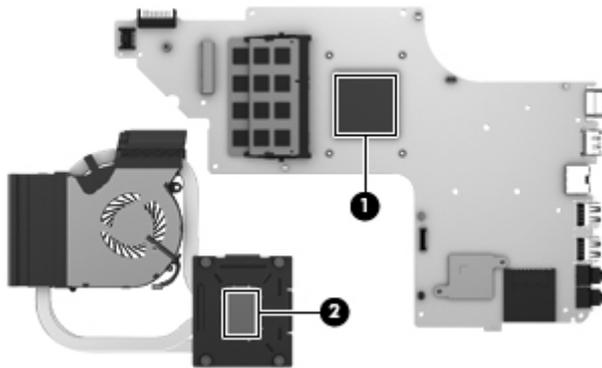
 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the fan/heat sink assembly, processor, and system board spare part kits. Replacement thermal material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

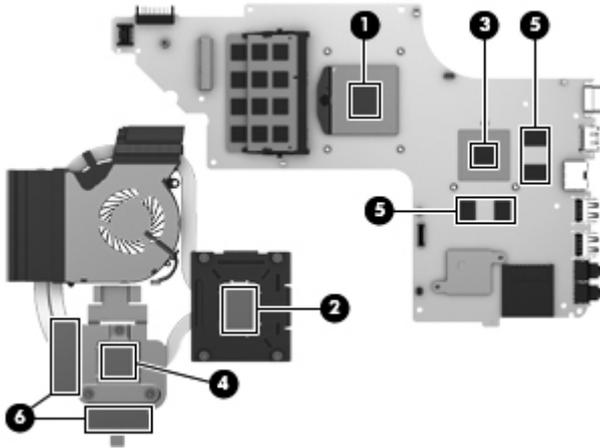


**NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an AMD processor and a graphics subsystem with UMA memory. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.

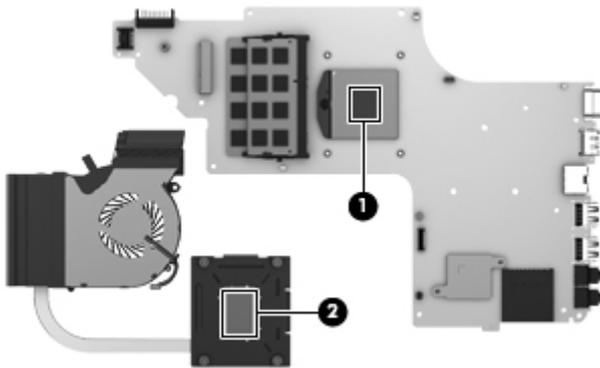


**NOTE:** The following illustration shows the replacement thermal material locations on a computer model equipped with an Intel processor and a graphics subsystem with discrete memory.

- 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:** The processor 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
AMD A10-4600M 3.20-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683046-001
AMD A8-4500M 2.80-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683048-001
AMD A6-4400M 3.20-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	683047-001
AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	685990-001
Intel Quad Core i7-3840QM 2.80-GHz processor (SC turbo up to 3.80-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W)	703266-001
Intel Quad Core i7-3820QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 8.0-MB L3 cache, 45 W)	681284-001
Intel Quad Core i7-3740QM 2.70-GHz processor (SC turbo up to 3.70-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	702840-001
Intel Quad Core i7-3720QM 2.60-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	681283-001
Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	701658-001
Intel Quad Core i7-3630QM 2.40-GHz processor (SC turbo up to 3.40-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	702081-001
Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	680647-001
Intel Quad Core i7-3610QM 2.30-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 45 W)	680646-001
Intel Quad Core i7-2670QM 2.20-GHz processor (SC turbo up to 3.10-GHz; 1333-MHz FSB, 6.0-MB L3 cache, 45 W)	665116-001
Intel Dual Core i5-3320M 2.60-GHz processor (SC turbo up to 3.30-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	681952-001
Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	711903-001
Intel Dual Core i5-3210M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	680645-001
Intel Dual Core i5-2450M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1333-MHz FSB, 3.0-MB L3 cache, 35 W)	676359-001
Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	713163-001

Description	Spare part number
Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	700627-001
Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	682417-001
Intel Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	677152-001

Before removing the processor, follow these steps:

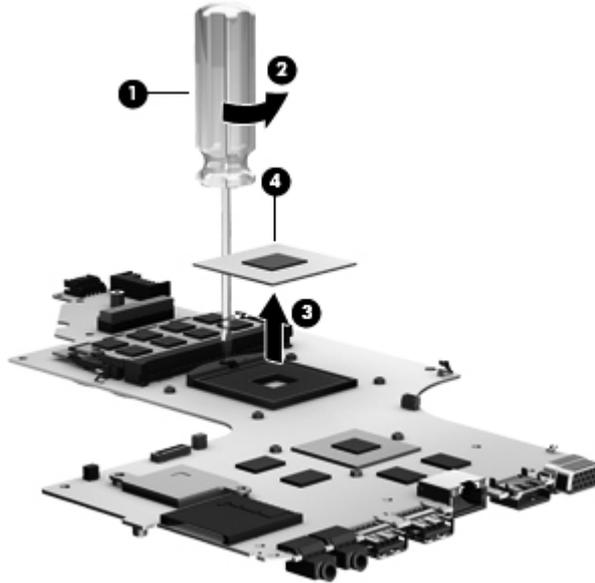
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))
  - e. System board (see [System board on page 77](#))

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

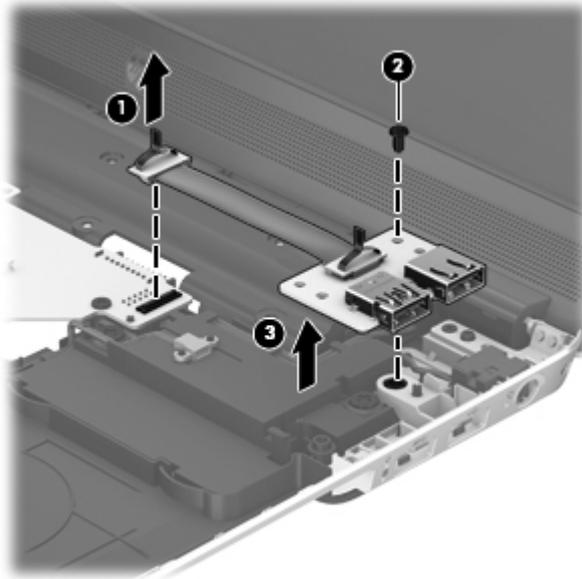
Description	Spare part number
USB board (includes cable)	682087-001

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))

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

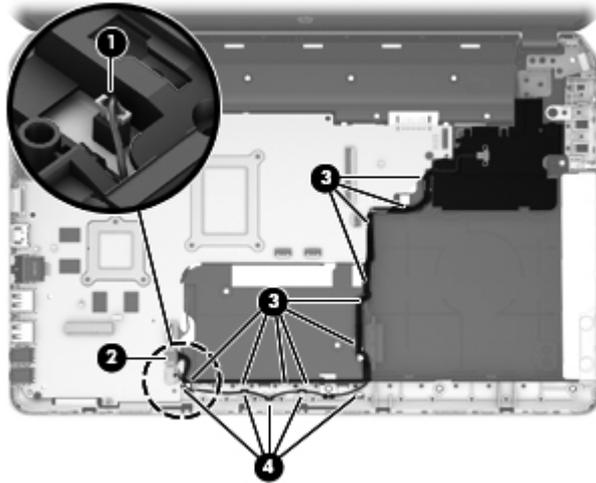
Before removing the subwoofer, follow these steps:

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))

- d. Top cover (see [Top cover on page 66](#))
- e. USB board (see [USB board on page 90](#))

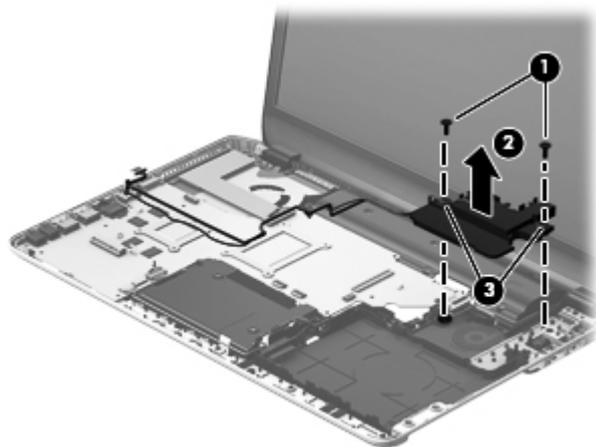
Remove the subwoofer:

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 an AMD processor and a 90-W AC adapter	681973-001
For use only on computer models equipped with an Intel processor and a 120-W AC adapter	682059-001
For use only on computer models equipped with an Intel processor and a 90-W AC adapter	682058-001

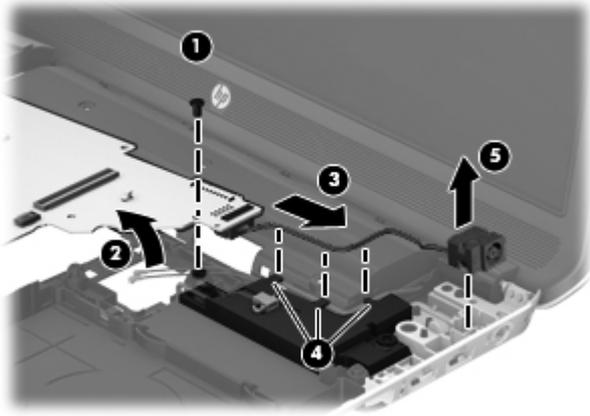
Before removing the power connector cable, follow these steps:

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))
  - e. USB board (see [USB board on page 90](#))
  - f. Subwoofer (see [Subwoofer on page 91](#))

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 59](#) for optical drive spare part number information.

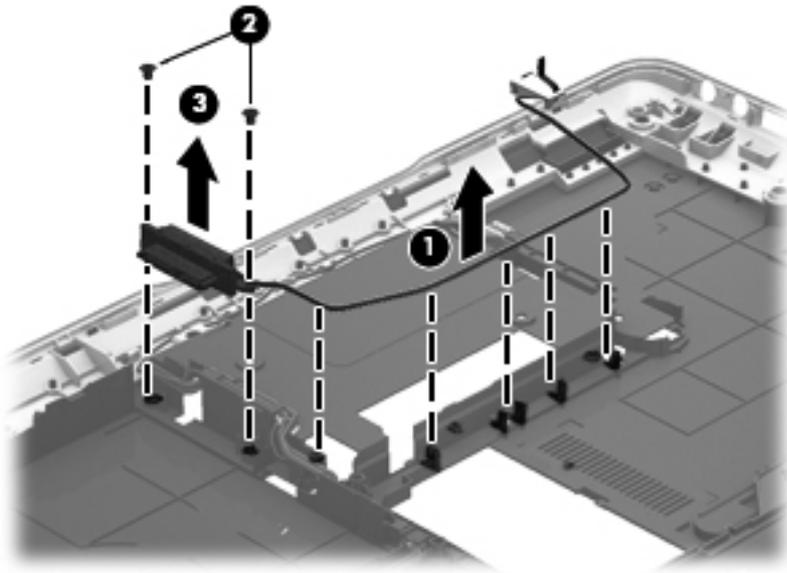
Before removing the optical drive connector cable, follow these steps:

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 51](#)), and then remove the following components:
  - a. Hard drive (see [Hard drive on page 52](#))
  - b. Optical drive (see [Optical drive on page 59](#))
  - c. Keyboard (see [Keyboard on page 61](#))
  - d. Top cover (see [Top cover on page 66](#))
  - e. System board (see [System board on page 77](#))

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.

3. 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	698958-001
15.6-in, BrightView, HD display assembly in aluminum finish	698957-001
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)	698960-001
15.6-in, BrightView, HD display assembly in aluminum finish (for use only on computer models equipped with a graphics subsystem with discrete memory)	698959-001

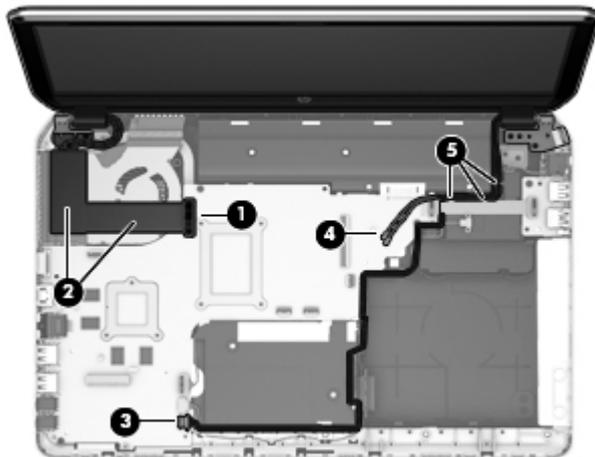
Before removing the display assembly, follow these steps:

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 51](#)).

5. Remove the hard drive (see [Hard drive on page 52](#)).
6. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 57](#)).
7. Remove the following components:
  - a. Optical drive (see [Optical drive on page 59](#))
  - b. Keyboard (see [Keyboard on page 61](#))
  - c. Top cover (see [Top cover on page 66](#))

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.



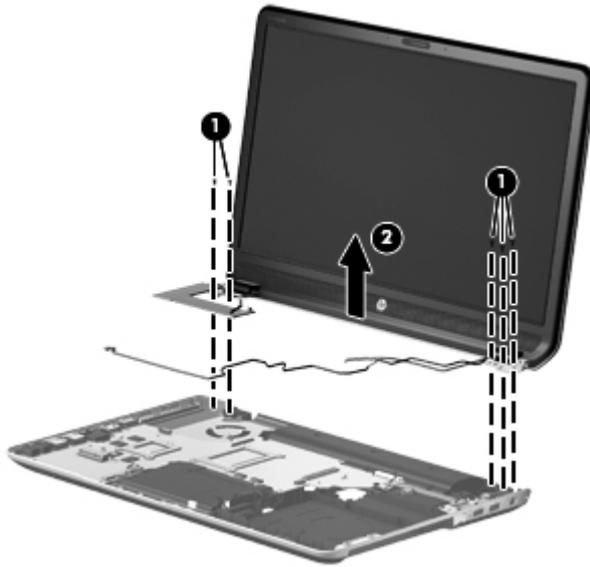
---

**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.

---

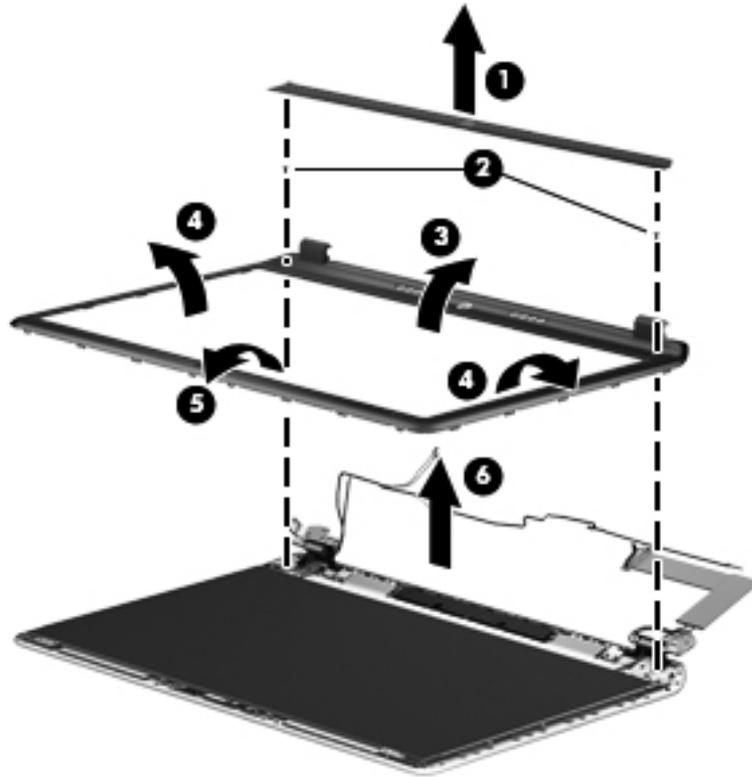
5. Remove the five Phillips PM2.5×5.5 screws **(1)** that secure the display assembly to the base enclosure.

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



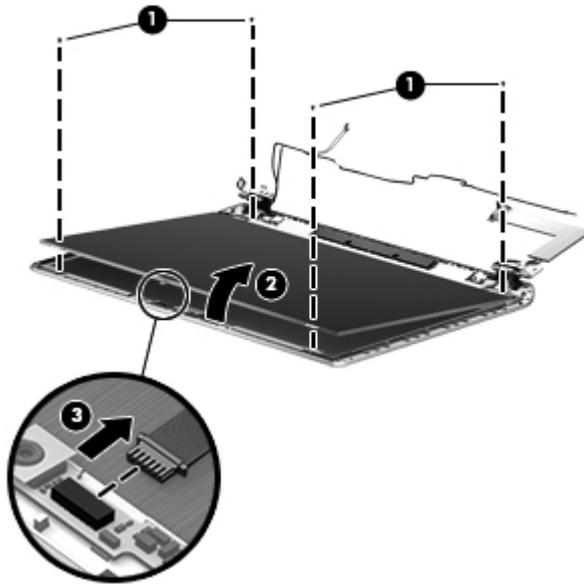
7. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
  - a. Remove the display bezel screw cover **(1)** and the two Phillips PM2.5×5.5 screws **(2)** that secure the display bezel to the display assembly. The display bezel screw cover is available in the Display 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 698954-001.

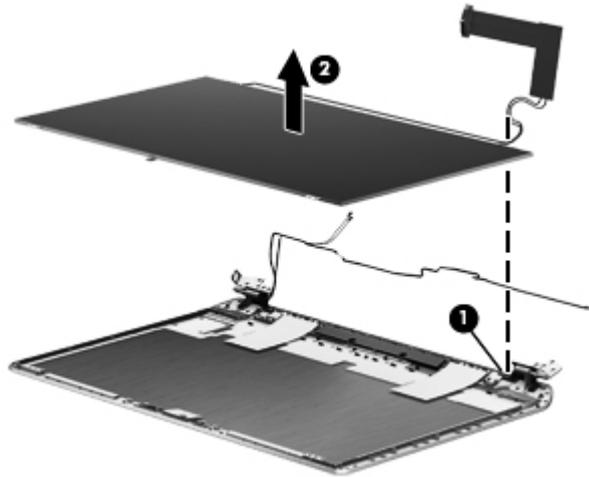


- 8. If it is necessary to replace the display panel:
  - a. Remove the four Phillips PM2.0×4.4 screws **(1)** that secure the display panel to the display enclosure.
  - b. Lift the top edge of the display panel **(2)** until the webcam/microphone module connector is accessible.

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



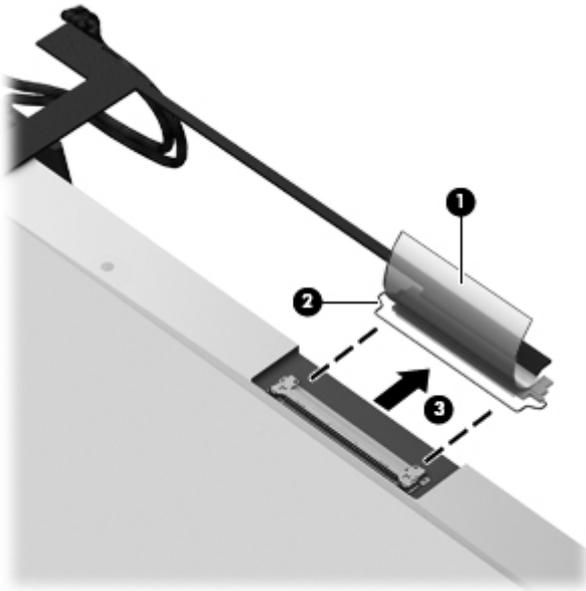
- d. Release the display panel cable from the clip built into display enclosure **(1)** near the left hinge area.
- e. Remove the display panel **(2)** from the display enclosure. The display panel is available using spare part numbers 682090-001 (for use only on computer models equipped with a 15.6-in,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

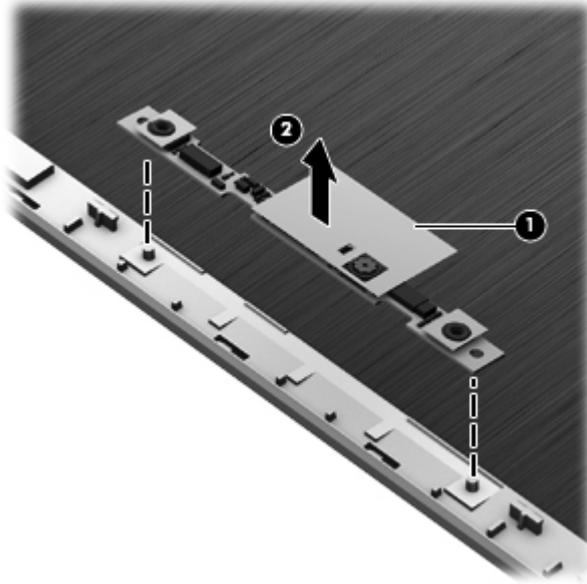
- a. Turn the display panel upside down, with the top edge toward you.
- b. Release the adhesive support strip **(1)** that secures the display panel cable connector to the display panel.
- c. Release the handle **(2)** that secures the display panel cable connector to the display panel.
- d. Disconnect 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:

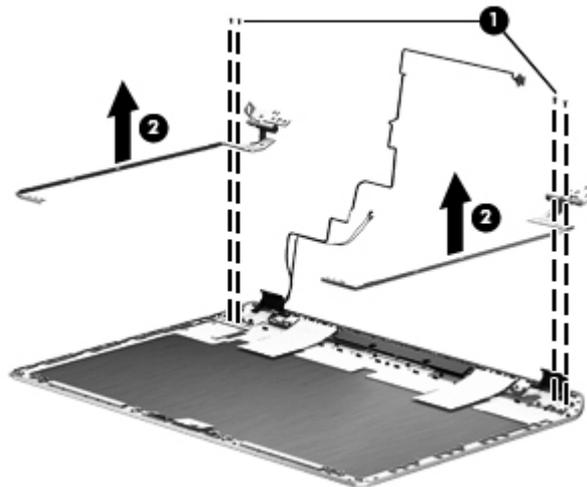
- a. Release the grounding strip **(1)** that secures the webcam/microphone module to the display enclosure.

- 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:

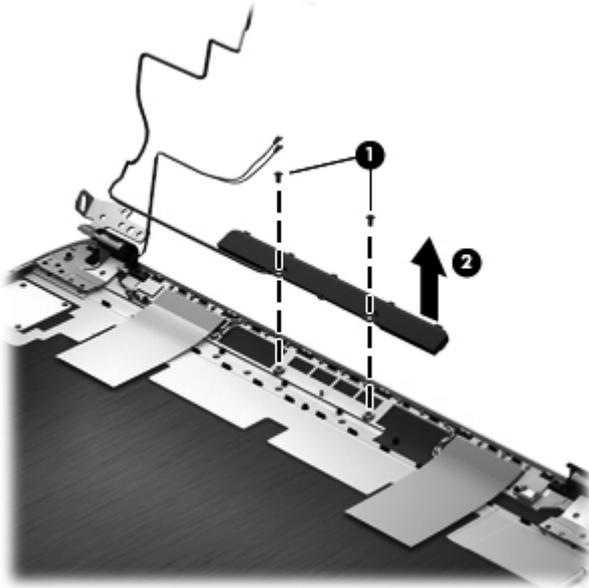
- a.** Remove the four Phillips PM2.0×4.4 screws **(1)** that secure the hinges to the display enclosure.
- b.** Remove the hinges **(2)** from the display enclosure. The hinges are available using spare part number 682064-001.



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

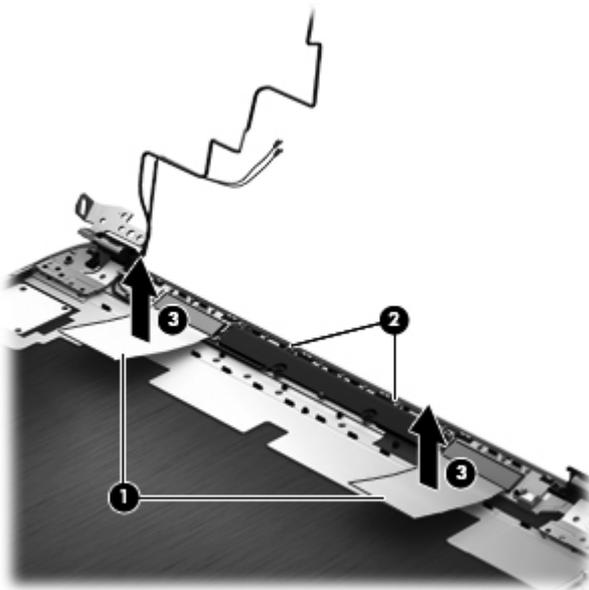
- a.** Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the display speakers to the display enclosure.

- 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.

---

# 5 Using Setup Utility (BIOS) and System Diagnostics

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

## Starting Setup Utility (BIOS)

To start Setup Utility (BIOS), turn on or restart the computer, quickly press [esc](#), and then press [f10](#).

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.

---

## 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 arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press [enter](#).

## Downloading a BIOS update

 **CAUTION:** 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.

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

1. From the Start screen, select the **HP Support Assistant** app.
2. Select **Updates and tune-ups**, and then select **Check for HP updates now**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
  - a. Identify the most recent BIOS update and compare it to 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. From the Start screen, type *e*, and then select **File Explorer**.
2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename.exe*).

The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.

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

# Using System Diagnostics

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

To start System Diagnostics:

1. Turn on or restart the computer, quickly press `esc`, and then 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 diagnostic 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
<b>NOTE:</b> 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	221 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 HP and the operating system to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your computer to a proper working state or even back to the original factory state, all with simple steps.

This chapter provides information about the following processes:

- Creating recovery media and backups
- Restoring and recovering your system

---

 **NOTE:** This guide describes an overview of backing up, restoring and recovering options. For more details about the tools provided, see Help and Support. From the Start screen, type **h**, and then select **Help and Support**.

---

## Creating recovery media and backups

Recovery after a system failure is only as good as your most recent backup.

1. After you successfully set up the computer, create HP Recovery media. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced.

HP Recovery media you create will provide the following recovery options:

- **System Recovery**—Reinstalls the original operating system and the programs that were installed at the factory.
- **Minimized Image Recovery**—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.
- **Factory Reset**—Restores the computer to the state its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

See [Creating HP Recovery media on page 110](#).

2. As you add hardware and software programs, create 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 system restore point contains information that Windows uses, such as registry settings. Windows creates a system restore point for you automatically during a Windows update and during other system maintenance (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Windows Help and Support. From the Start screen, type **h**, and then select **Help and Support**.
3. As you add photos, video, music, and other personal files, create a backup of your personal information. Windows File History can be set to regularly and automatically back up files from libraries, Desktop, contacts, and favorites. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can restore the files that you backed up using File History. Restoring files is also useful if you ever choose to reset the computer by reinstalling Windows or choose to recover using HP Recovery Manager.

---

 **NOTE:** File History is not enabled by default, so you must turn it on.

---

For more information and steps for enabling Windows File History, see Windows Help and Support. From the Start screen, type **h**, and then select **Help and Support**.

## Creating HP Recovery media

HP Recovery Manager is a software program that offers a way to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and the software programs installed at the factory, and then configures the settings for the programs. HP Recovery media can also be used to customize the system or aid in the replacement of a hard drive.

- Only one set of HP 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 blank USB flash drive or the number of blank DVD discs that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or instead you can use a high-quality blank USB flash drive.
- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to [http://welcome.hp.com/country/us/en/wwcontact\\_us.html](http://welcome.hp.com/country/us/en/wwcontact_us.html). If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected 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.
- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Recovery Media Creation**, and follow the on-screen instructions to continue.

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 113](#).

## Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:

- If you need to restore your personal files and data, you can use Windows File History to restore your information from the backups you created. For more information and steps for using File History, see Windows Help and Support. From the Start screen, type `h`, and then select **Help and Support**.
- If you need to correct a problem with a preinstalled application or driver, use the Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.

From the Start screen, type `recovery`, select **HP Recovery Manager**, and then select **Drivers and Applications Reinstall**, and follow the on-screen instructions.

- If you want to restore the system to a previous state without losing any personal information, Windows System Restore is an option. System Restore allows you to restore without the requirements of Windows Refresh or a reinstallation. Windows creates system restore points automatically during a Windows update and other system maintenance events. Even if you did not manually create a restore point, you can choose to restore to a previous point, automatically created. For more information and steps for using Windows System Restore, see Windows Help and Support. From the Start screen, type `h`, and then select **Help and Support**.
- If you want a quick and easy way to recover the system without losing your personal information, settings, or apps that came preinstalled on your computer or were purchased from the Windows Store, consider using Windows Refresh. This option does not require backing up data to another drive. See [Using Windows Refresh for quick and easy recovery on page 112](#).
- If you want to reset your computer to its original state, Windows provides an easy way to remove all personal data, apps, and settings, and reinstall Windows.

For more information, see [Remove everything and reinstall Windows on page 113](#).

- If you want to reset your computer using a minimized image, you can choose the HP Minimized Image Recovery option from the HP Recovery partition (select models only) or HP Recovery media.

Minimized Image Recovery installs only drivers and hardware-enabling applications. Other applications included in the image continue to be available for installation through the Drivers and Applications Reinstall option in HP Recovery Manager.

For more information, see [Recovering using HP Recovery Manager on page 113](#).

- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 113](#).
- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see [Recovering using HP Recovery Manager on page 113](#).
- If you wish to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see [Removing the HP Recovery partition on page 115](#).

## Using Windows Refresh for quick and easy recovery

When your computer is not working properly and you need to regain system stability, the Windows Refresh option allows you to start fresh and keep what is important to you.

---

 **IMPORTANT:** Refresh removes any traditional applications that were not originally installed on the system at the factory.

 **NOTE:** During Refresh, a list of removed traditional applications will be saved so that you have a quick way to see what you might need to reinstall. See Help and Support for instructions on reinstalling traditional applications. From the Start screen, type **h**, and then select **Help and Support**.

 **NOTE:** You may be prompted for your permission or password when using Refresh. See Windows Help and Support for more information. From the Start screen, type **h**, and then select **Help and Support**.

---

To start Refresh:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Refresh your PC without affecting your files**, select **Get started**, and follow the on-screen instructions.

## Remove everything and reinstall Windows

Sometimes you want to perform detailed reformatting of your computer, or you want to remove personal information before you give away or recycle your computer. The process described in this section provides a speedy, simple way to return the computer to its original state. This option removes all personal data, apps, and settings from your computer, and reinstalls Windows.

 **IMPORTANT:** This option does not provide backups of your information. Before using this option, back up any personal information you wish to retain.

You can initiate this option by using the **f11** key or from the Start screen.

To use the **f11** key:

1. Press **f11** while the computer boots.  
– or –  
Press and hold **f11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Reset your PC**, and follow the on-screen instructions.

To use the Start screen:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

## Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state. Using the HP Recovery media you created, you can choose from one of the following recovery options:

- **System Recovery**—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- **Minimized Image Recovery**—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.
- **Factory Reset**—Restores the computer to the state its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select models only) allows Minimized Image Recovery.

## 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 media provided by the manufacturer.
- Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.
- HP Recovery media must be used if the computer hard drive fails.
- To use the Factory Reset or System Recovery options, you must use HP Recovery media.
- If the HP Recovery media do not work, you can obtain recovery media for your system from the HP website. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to [http://welcome.hp.com/country/us/en/wwcontact\\_us.html](http://welcome.hp.com/country/us/en/wwcontact_us.html).



**IMPORTANT:** HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you wish to retain.

## Using the HP Recovery partition to recover a minimized image (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

1. Press **f11** while the computer boots.  
– or –  
Press and hold **f11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **HP Recovery Manager**, and follow the on-screen instructions.

## Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

1. If possible, back up all personal files.
2. Insert the first HP Recovery disc you created into the optical drive on your computer or into an optional external optical drive, and then restart the computer.

– or –

Insert the HP Recovery USB flash drive you created into a USB port on your computer, and then restart the computer.

---

 **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 115](#).

---

3. Follow the on-screen instructions.

## Changing the computer boot order

If computer does not restart in HP Recovery Manager, you can change the computer boot order, which is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection for an optical drive or a USB flash drive.

To change the boot order:

1. Insert the HP Recovery media you created.
2. Restart the computer.
3. Press and hold **esc** while the computer is restarting, and then press **f9** for boot options.
4. Select the optical drive or USB flash drive you want to boot from.
5. Follow the on-screen instructions.

## Removing the HP Recovery partition

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.

---

 **IMPORTANT:** Removing the HP Recovery partition means you can no longer use Windows Refresh, the Windows Remove everything and reinstall Windows option, or the HP Recovery Manager option for minimized image recovery. Create HP Recovery media before removing the Recovery partition to ensure you have recovery options; see [Creating HP Recovery media on page 110](#).

---

Follow these steps to remove the HP Recovery partition:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and follow the on-screen instructions to continue.

---

## 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>.

---

# Index

## A

- AC adapter light 19
  - AC adapter, spare part numbers 34, 41, 42
  - Action keys 13
  - antenna
    - locations 11
    - removal 102
    - spare part number 32, 38, 102
  - Antenna Kit, spare part number 32, 102
  - audio, product description 6
  - audio-in jack 18
  - audio-out jack 18
- ## B
- b key 13
  - base enclosure, spare part numbers 30, 43
  - battery
    - removal 51
    - spare part numbers 30, 38, 43, 51
  - battery bay 21
  - battery release latch 21
  - Blu-ray Disc R/RW with SuperMulti Drive
    - precautions 46
    - removal 59
    - spare part number 29, 34, 39, 59
  - Blu-ray Disc ROM with SuperMulti DVD±R/RW Double-Layer Drive
    - precautions 46
    - removal 59
    - spare part number 29, 34, 39, 59
  - bottom components 21

- button components 12
- buttons
  - optical drive eject button 19
  - power 12
  - TouchPad 16
  - TouchPad on/off 16

## C

- cables, service considerations 45
  - caps lock light 16
  - chipset, product description 3
  - components
    - bottom 21
    - button 12
    - display 11
    - front 17
    - keys 13
    - left-side 18
    - lights 15
    - rear 20
    - right-side 19
    - TouchPad 16
  - computer
    - major components 24
    - part number 50
    - specifications 106
  - connectors, service considerations 45
- ## D
- Digital Media slot 17
  - display
    - components 11
    - specifications 107
  - display assembly
    - removal 95
    - spare part numbers 25, 43, 95
    - subcomponents 32

- display bezel
    - removal 97
    - spare part number 32, 98
    - spare part numbers 43
  - display enclosure, spare part number 33
  - display enclosure, spare part numbers 38
  - display hinge
    - removal 101
    - spare part number 32, 39, 101
  - Display Hinge Kit, spare part number 32, 39, 101
  - display panel
    - product description 4
    - removal 98
    - spare part numbers 32, 39, 99, 100
  - display panel cable
    - removal 100
    - spare part numbers 32, 38
  - Display Screw Kit, spare part number 33, 39
  - display speakers
    - removal 101
    - spare part number 32, 39, 102
  - drives, preventing damage 46
  - DVD±RW Double-Layer with SuperMulti Drive
    - precautions 46
    - removal 59
    - spare part number 29, 34, 39, 59
- ## E
- electrostatic discharge 46
  - equipment guidelines 49

esc key 13  
Ethernet, product description 6  
external monitor port 18

**F**  
fan/heat sink assembly  
    removal 82  
    spare part numbers 29, 38,  
    39, 40, 82  
fingerprint reader board  
    removal 71  
    spare part number 26, 39, 71  
fingerprint reader light 16  
fingerprint reader, location 12  
fn key 13  
front components 17

**G**  
graphics, product description 3  
grounding guidelines 46  
guidelines  
    equipment 49  
    grounding 46  
    packaging 48  
    transporting 48  
    workstation 48

**H**  
hard drive  
    precautions 46  
    product description 5  
    removal 52  
    spare part numbers 30, 33,  
    36, 37, 38, 41, 52  
hard drive bracket  
    illustrated 34  
    removal 54  
hard drive connector cable  
    illustrated 34  
    removal 54  
Hard Drive Hardware Kit  
    contents 34  
    spare part number 34, 39, 52  
hard drive light 19  
HDMI port 18  
headphone jack 18

**I**  
integrated numeric keypad 14

**J**  
jacks  
    audio-in 18  
    audio-out 18  
    headphone 18  
    microphone 18  
    network 18  
    RJ-45 18

**K**  
key components 13  
keyboard  
    product description 8  
    removal 61  
    spare part numbers 25, 42,  
    43, 61  
keys  
    Action 13  
    b 13  
    esc 13  
    fn 13  
    integrated numeric keypad 14  
    num lock 14  
    Windows applications 13  
    Windows logo 13

**L**  
left-side components 18  
light components 15  
lights  
    AC adapter 19  
    caps lock 16  
    fingerprint reader 16  
    hard drive 19  
    mute 15  
    optical drive 19  
    power 15, 19  
    TouchPad 16  
    webcam 11  
    wireless 15

**M**  
mass storage device  
    precautions 46  
    spare part numbers 33  
memory module  
    product description 5  
    removal 56  
    spare part numbers 30, 37,  
    56

microphone  
    location 11  
    product description 6  
microphone jack 18  
model description 50  
model name 1  
monitor port 18  
mute light 15

**N**  
network jack 18  
num lock key 14

**O**  
operating system, product  
    description 9  
optical drive  
    location 19  
    precautions 46  
    product description 6  
    removal 59  
    spare part numbers 29, 34,  
    39, 59  
optical drive bezel  
    illustrated 34  
    removal 60  
optical drive bracket  
    illustrated 34  
    removal 60  
optical drive connector cable  
    removal 94  
    spare part number 94  
optical drive eject button 19  
optical drive light 19

**P**  
packaging guidelines 48  
plastic parts, service  
    considerations 45  
pointing device, product  
    description 8  
ports  
    external monitor 18  
    HDMI 18  
    monitor 18  
    product description 8  
    USB 18, 19  
power button 12  
power button board  
    removal 70  
    spare part number 26, 39, 70

- power connector 20
- power connector cable
  - removal 93
  - spare part numbers 30, 38, 93
- power cord
  - set requirements 116
  - spare part numbers 35, 36
- power light 15, 19
- power requirements, product description 8
- processor
  - product description 1
  - removal 88
  - spare part numbers 28, 37, 38, 41, 43, 44, 88
- product description
  - audio 6
  - chipset 3
  - display panel 4
  - Ethernet 6
  - external media cards 7
  - graphics 3
  - hard drive 5
  - keyboard 8
  - memory module 5
  - microphone 6
  - operating system 9
  - optical drive 6
  - pointing device 8
  - ports 8
  - power requirements 8
  - processors 1
  - product name 1
  - security 8
  - serviceability 9
  - solid-state drives 5
  - video 6
  - wireless 6
- product name 1, 50
- product number 50

## R

- rear component 20
- removal/replacement
  - preliminaries 45
  - procedures 50
- right-side components 19
- RJ-45 jack 18

- RTC battery
  - removal 55
  - spare part number 30, 39, 55

## S

- Screw Kit, spare part number 35, 39
- security cable slot 20
- security, product description 8
- serial number 50
- service considerations
  - cables 45
  - connectors 45
  - plastic parts 45
- service cover
  - location 21
  - removal 53
  - spare part number 31, 39, 53
- service tag 23, 50
- serviceability, product description 9
- solid-state drive
  - product description 5
  - removal 75
  - spare part numbers 26, 34, 39, 41, 75
- speakers
  - location 11, 12
  - removal 69, 91, 101
  - spare part numbers 26, 29, 32, 39, 69, 91, 102
- specifications
  - computer 106
  - display 107
- subwoofer
  - location 21
  - removal 91
  - spare part number 29, 39, 91
- system board
  - removal 77
  - spare part numbers 26, 39, 40, 41, 44, 77

## T

- Thermal Material Kit, spare part numbers 28, 39, 78
- tools required 45
- top cover
  - removal 66
  - spare part number 26, 43, 66

- top speakers
  - removal 69
  - spare part number 26, 39, 69
- TouchPad button 16
- TouchPad button board
  - removal 73
  - spare part number 26, 41, 73
- TouchPad components 16
- TouchPad light 16
- TouchPad on/off button 16
- TouchPad zone 16
- transporting guidelines 48

## U

- USB board
  - removal 90
  - spare part number 29, 39, 90
- USB port 18, 19

## V

- vents 18, 20, 21
- video, product description 6

## W

- warranty period 50
- webcam 11
- webcam light 11
- webcamera/microphone module
  - removal 100
  - spare part number 32, 39, 101
- Windows applications key 13
- Windows logo key 13
- wireless antenna
  - locations 11
  - removal 102
  - spare part number 32, 38, 102
- Wireless Antenna Kit, spare part number 38
- wireless light 15
- wireless, product description 6
- WLAN module
  - removal 57
  - spare part number 57
  - spare part numbers 31, 37, 38, 41
- workstation guidelines 48

