



HP Pavilion m6 Entertainment PC

Maintenance and Service Guide

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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).

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1 Product description

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Product Name	HP Pavilion m6 Entertainment PC	√	√
Processors	<ul style="list-style-type: none">• AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W)• AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W)• AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 1.0-MB L2 cache, dual core, 35 W)	√	

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
	<ul style="list-style-type: none"> Intel® Core® i7-3612QM 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 6.0-MB L3 cache, quad core, 35 W) Intel Core i7-3520M 2.90-GHz processor (turbo up to 3.60-GHz; 1600-MHz, 4.0-MB L3 cache, dual core, 35 W) Intel Core i5-3360M 2.80-GHz processor (turbo up to 3.50-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W) Intel Core i5-3320M 2.60-GHz processor (turbo up to 3.30GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W) Intel Core i5-3210M 2.50-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W) Intel Core i3-3110M 2.40-GHz processor (1333-MHz, 4.0-MB L3 cache, dual core, 35 W) Intel Core i3-2370M 2.40-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W) Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W) 		√
Chipset	AMD A70M fusion controller hub (FCH)	√	
	Intel HM77 Express Chipset		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Graphics	<p>Switchable discrete graphics: AMD Radeon™ HD 7670M with 2048-MB of dedicated video memory (128-MB × 16 DDR3 900-MHz × 8 pcs)</p> <p>Internal graphics:</p> <ul style="list-style-type: none"> • Universal memory architecture (UMA) with shared video memory • AMD Radeon HD 7660G graphics on computer models equipped with an AMD A10-4600M processor • AMD Radeon HD 7640G graphics on computer models equipped with an AMD A8-4500M processor • AMD Radeon HD 7520G graphics on computer models equipped with an AMD A6-4400M processor <p>Support for HD decode, HDMI, and DX11</p>	√	
	<p>Switchable discrete graphics:</p> <ul style="list-style-type: none"> • AMD Radeon HD 7670M with 2048-MB of dedicated video memory (128-MB×16 DDR3 @ 900-MHz × 8 pieces), 128-bit M2 package • AMD Radeon HD 7670M with 1024-MB of dedicated video memory (64-MB×16 DDR3 @ 900-MHz × 8 pieces), 128-bit M2 package <p>Internal graphics:</p> <ul style="list-style-type: none"> • UMA with shared video memory • Intel HD Graphics 4000 on computer models equipped with an Intel Core i7, Intel Core i5, or Intel Core i3-3110M processor • Intel HD Graphics 3000 (GT2) on computer models equipped with an Intel Intel Core i3-2370M or Intel Core i3-2350M processor <p>Support for HD decode, HDMI, and DX11 on all computer models</p> <p>Support for PX 5.0 on computer models equipped with a graphics subsystem with discrete memory</p>		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Panel	<p>15.6-in, white light-emitting diode (WLED), SVA, HD, slim (3.2-mm), BrightView (1366x768) display; typical brightness: 200 nits</p> <p>All display assemblies include one or two wireless local area network (WLAN) antenna cables</p> <p>Supports low voltage differential signalling (LVDS)</p>	√	√
Memory	<p>Two customer-accessible/upgradable memory module slots</p> <p>DDR3-1600-MHz dual channel support on computer models equipped with an AMD processor or an Intel Core i7, Intel Core i5, or Intel Core i3-3110M processor</p> <p>DDR3-1333-MHz dual channel support (DDR3-1600 downgrade to DDR3-1333) on computer models equipped with an Intel Intel Core i3-2370M or Intel Core i3-2350M processor</p> <p>Supports 8192-MB of system RAM in the following configurations:</p> <ul style="list-style-type: none"> • 16384-MB (8192-MB×2; not supported on computer models equipped with a 32-bit operating system or with Windows Home Basic) • 12288-MB (8192-MB+4096-MB; not supported on computer models equipped with a 32-bit operating system or with Windows Home Basic) • 8192-MB (8192-MB×1 or 4096×2; not supported on computer models equipped with a 32-bit operating system) • 6144-MB (4096-MB+2048-MB; not supported on computer models equipped with a 32-bit operating system) • 4096-MB (4096-MB×1 or 2048-MB×2) • 2048-MB (2048×1) 	√	√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Hard drive	<p>Supports 6.35-cm (2.5-in) hard drives in 9.5-mm (.37-in) and 7.0-mm (.28-in) thicknesses (all hard drives use the same bracket)</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> • 1-TB, 5400-rpm, 9.5-mm (not supported on computer models equipped with Windows 7 Starter, 32-bit operating system) • 750-GB, 7200-rpm and 5400-rpm, 9.5-mm (not supported on computer models equipped with Windows 7 Starter, 32-bit operating system) • 640-GB, 5400-rpm, 9.5-mm (not supported on computer models equipped with Windows 7 Starter, 32-bit operating system) • 500-GB, 7200-rpm and 5400-rpm, 9.5-mm • 320-GB, 7200-rpm and 5400-rpm, 9.5- and 7.0-mm 	√	√
Solid-state drive	32-GB mSATA		√
Optical drive	<p>Fixed</p> <p>Serial ATA</p> <p>12.7-mm tray load, 9.5-mm thickness</p> <p>Supports DVD±RW Double-Layer with SuperMulti Drive</p> <p>Supports zero power optical drive</p>	√	√
Audio and video	Two speakers and subwoofer	√	√
	HD Beats audio	√	√
	Supports Microsoft premium requirements	√	√
	HP TrueVision HD camera (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-suppression software	√	√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Ethernet	Integrated 10/100/1000 network interface card (NIC)	√	√
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module	√	√
	One or two WLAN antennas built into display assembly, varying by computer model	√	√
	Support for the following WLAN formats:	√	√
	<ul style="list-style-type: none"> Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter Atheros WB225 1×1 802.11b/g/n Bluetooth Combo Adapter Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter Ralink RT5390F 802.11b/g/n 1×1 WLAN module 		
	<ul style="list-style-type: none"> Intel Centrino Wireless-N 2230 WLAN module for use only on computer models equipped with an Intel processor 		√
External media cards	HP Multi-Format Digital Media reader with push-push technology, supporting the following digital card formats:	√	√
	<ul style="list-style-type: none"> Secure Digital (SD) Memory Card Secure Digital Extended Capacity (SDxC) Memory Card Secure Digital High Capacity (SDHC) Memory Card Ultra High Speed MultiMediaCard (UHS/MMC) 		

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Ports	<ul style="list-style-type: none"> • Combination audio-out (stereo headphone)/audio-in (mono microphone) • HDMI v1.4 supporting: up to 1920×1200 @ 60Hz • HP Smart AC adapter • RJ-45 (Ethernet Gigabit support with LED indicators) • USB 3.0 ports on computer: 2 on left side, 1 on right side • USB 2.0 ports on computer: 1 on right side • USB port allocation: <ul style="list-style-type: none"> ◦ One for the computer ◦ One for the fingerprint reader ◦ One for the MiniCard ◦ One for the webcam/microphone module • VGA (Dsub 15 pin) supporting: 1920×1600 external resolution @ 60 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video 	√	
	<ul style="list-style-type: none"> • Combination audio-out (stereo headphone)/audio-in (mono microphone) • HDMI v1.4 supporting: up to 1920×1200 @ 60Hz • HP Smart AC adapter • RJ-45 (Ethernet Gigabit support with LED indicators) • USB 3.0 ports on computer: 2 on left side, 1 on right side • USB 2.0 ports on computer: 1 on right side • USB port allocation: <ul style="list-style-type: none"> ◦ One for the computer ◦ One for the fingerprint reader 		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
	<ul style="list-style-type: none"> ◦ One for the MiniCard ◦ One for the webcam/microphone module • VGA (Dsub 15 pin) supporting: 2048×1536 external resolution @ 75 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video 		
Keyboard/pointing devices	Full-size (15.6-in.), duracoat, island-style keyboard with numeric keypad	√	√
	Gesture support: MultiTouch gestures enabled, two-finger scrolling, and pinch-zoom as default	√	√
	Taps enabled by default	√	√
	Support for TouchPad with image sensor	√	√
Power requirements	Supports the following HP Smart AC adapters:		
	<ul style="list-style-type: none"> • 90-W HP Smart AC adapter (PFC, RC, V, 3-wire) 	√	√
	<ul style="list-style-type: none"> • 65-W HP Smart AC adapter (non-PFC, 3-wire) 	√	
	<ul style="list-style-type: none"> • 90-W HP Smart AC adapter (PFC, RC, V, EM, 3-wire) 		√
	<ul style="list-style-type: none"> • 65-W HP Smart AC adapter (RC, V, EM, 3-wire) 		√
	<ul style="list-style-type: none"> • 65-W HP Smart AC adapter (RC, V, 3-wire) 		√
	Supports the following batteries:	√	√
	<ul style="list-style-type: none"> • 9-cell, 100-Wh, 3.00-Ah, Li-ion battery • 6-cell, 62-Wh, 2.80-Ah, Li-ion battery 		
Security	Supports security cable lock	√	√
	Supports fingerprint reader with Digital Persona software	√	√
	Supports HP SimplePass	√	√
	Supports Intel AT-p Ready		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Operating system	Preinstalled: <ul style="list-style-type: none"> • Windows® 7 Home Basic, 64-bit • Windows 7 Home Premium, 64-bit • Windows 7 Professional, 64-bit 	√	√
Serviceability	End user replaceable parts: <ul style="list-style-type: none"> • AC adapter • Battery • Hard drive • Memory module • Optical drive • WLAN module 	√	√

2 External component identification

Finding your hardware and software information

- ▲ Select **Start > Computer**.

A list displays all the devices installed in your computer, including hard drive, optical drives, or a secondary hard drive.

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

Display



Item	Component	Description
(1)	Internal microphones (2)	Record sound.
(2)	Webcam light	On: The webcam is in use.

Item	Component	Description
(3)	HP TrueVision HD webcam	<p>Records video, captures still photographs, and allows video conferences and online chat by means of streaming video.</p> <p>To use the webcam, select Start > All Programs > Communication and Chat > CyberLink YouCam.</p>
(4)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs.

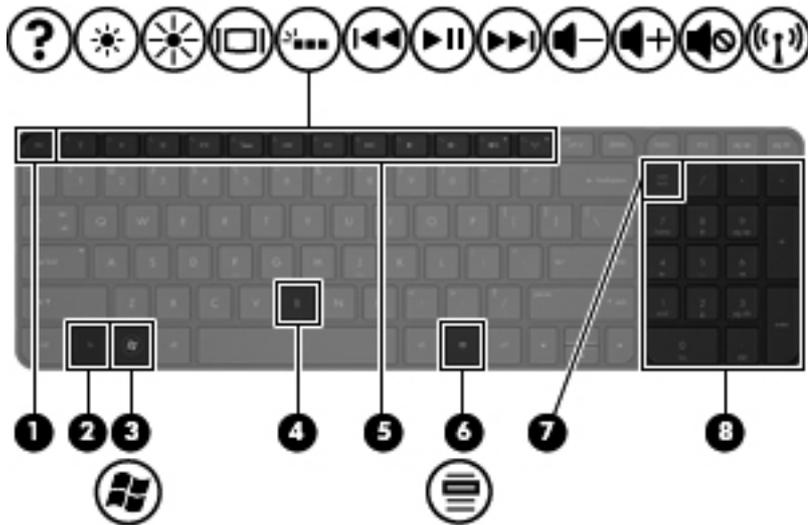
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.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

Button, speakers, and fingerprint reader



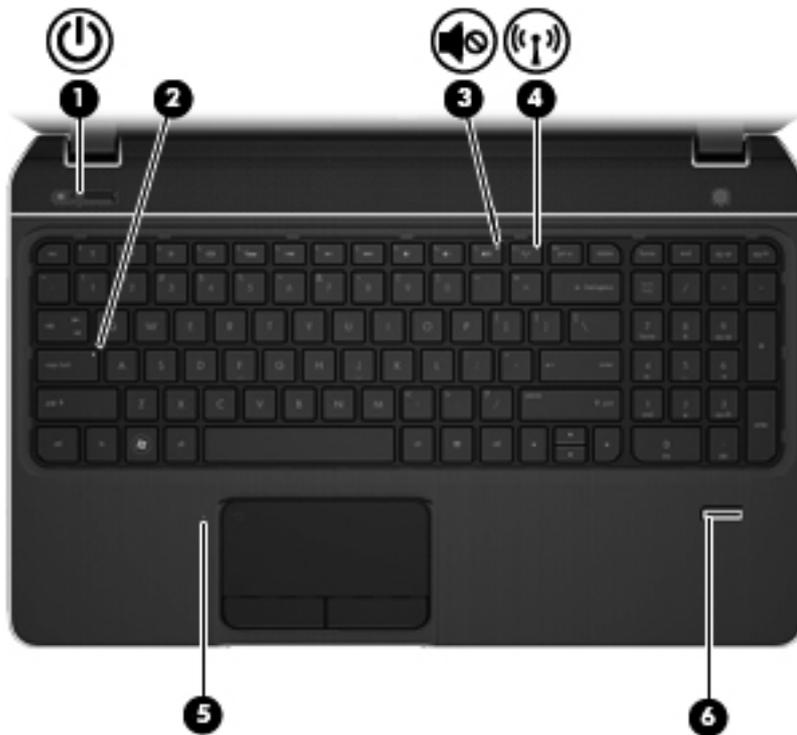
Item	Component	Description
(1)	Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.•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

Keys



Item	Component	Description
(1)	<code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2)	<code>fn</code> key	Executes frequently used system functions when pressed in combination with the <code>b</code> key or the <code>esc</code> key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	<code>b</code> key	Enables or disables Beats Audio when pressed in combination with the <code>fn</code> 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. NOTE: You can open the Beats Audio Control Panel by selecting Start > Control Panel > Hardware and Sound > Beats Audio Control Panel .
(5)	Action keys	Execute frequently used system functions.
(6)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(7)	<code>num lock</code> key	Controls the function of the integrated numeric keypad. Press the key to alternate between the standard numeric function of an external keypad (enabled at the factory) and the navigational function (indicated by the directional arrows on the keys). NOTE: The keypad function that is active when the computer is turned off is reinstated when the computer is turned back on.
(8)	Integrated numeric keypad	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 <code>num lock</code> key.

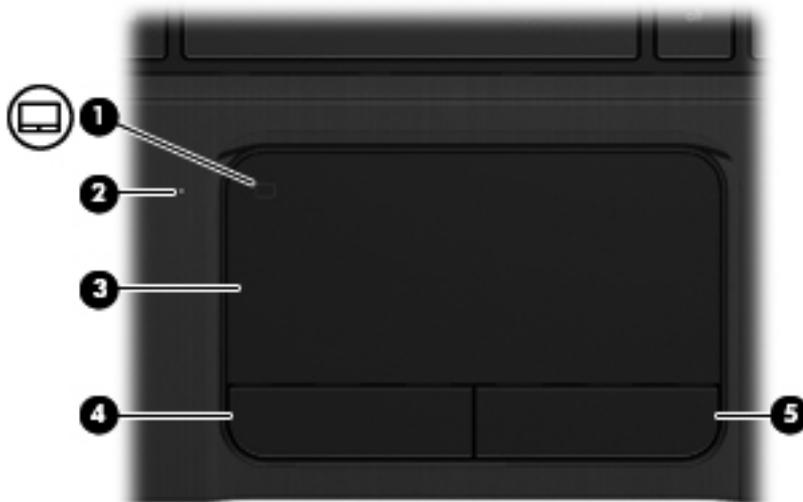
Lights



Item	Component	Description
(1)	Power light	<ul style="list-style-type: none">• White: The computer is on.• 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.• Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power. <p>NOTE: 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)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(3)	Mute light	<ul style="list-style-type: none">• Amber: Computer sound is off.• Off: Computer sound is on.
(4)	Wireless light	<ul style="list-style-type: none">• White: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on.• Amber: All wireless devices are off.

Item	Component	Description
(5)	TouchPad light	<ul style="list-style-type: none"> On: The TouchPad is off. Off: The TouchPad is on.
(6)	Fingerprint reader light	<ul style="list-style-type: none"> White: The fingerprint was read. Amber: The fingerprint was not read.

TouchPad



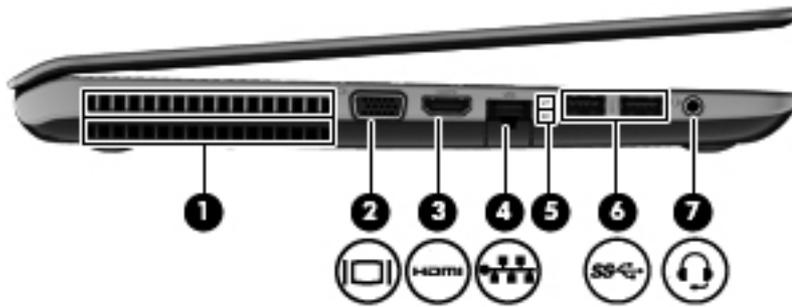
Item	Component	Description
(1)	TouchPad on/off button	Turns the TouchPad on or off.
(2)	TouchPad light	<ul style="list-style-type: none"> On: The TouchPad is off. Off: The TouchPad is on.
(3)	TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.
(4)	Left TouchPad button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

Front



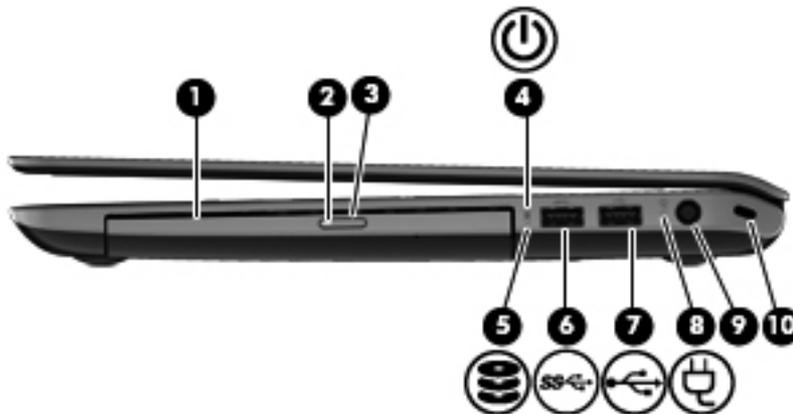
Component	Description
Digital Media Slot	Supports the following digital card formats: <ul style="list-style-type: none">• Secure Digital (SD) Memory Card• Secure Digital Extended Capacity (SDxC) Memory Card• Secure Digital High Capacity (SDHC) Memory Card• Ultra High Speed MultiMediaCard (UHS/MMC)

Left side



Item	Component	Description
(1)	Vent	Enables airflow to cool internal components. NOTE: 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)	RJ-45 (network) jack lights	<ul style="list-style-type: none"> White (top): The network is connected. Amber (bottom): Activity is occurring on the network.
(6)	USB 3.0 ports (2)	Connect an optional USB 3.0 device and provide enhanced USB power performance. NOTE: For details about different types of USB ports, see the <i>HP Notebook Reference Guide</i> .
(7)	Audio-out (headphone) jack/ Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. NOTE: This jack does not support optional microphone-only devices. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i> . NOTE: When a device is connected to the jack, the computer speakers are disabled.

Right side

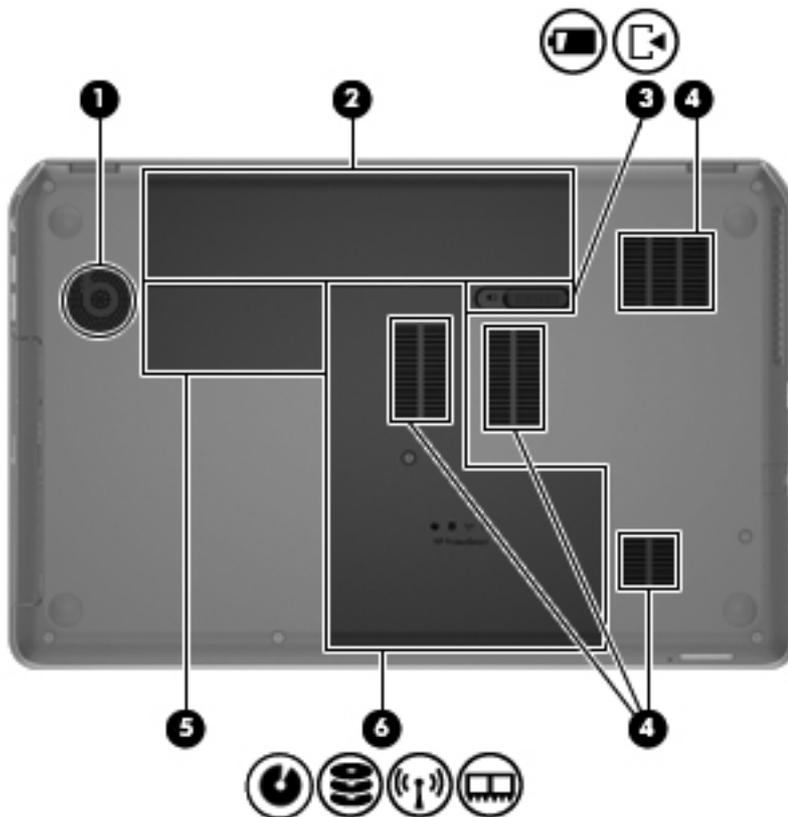


Item	Component	Description
(1)	Optical drive	Reads and writes (select models only) to an optical disc.
(2)	Optical drive light	<ul style="list-style-type: none"> Green: The optical drive is being accessed. Off: The optical drive is idle.
(3)	Optical drive eject button	Releases the disc tray.
(4)	Power light	<ul style="list-style-type: none"> White: The computer is on. 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. Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode that uses the least amount of power. <p>NOTE: 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>
(5)	Hard drive light	<ul style="list-style-type: none"> Blinking white: The hard drive is being accessed. Amber: HP 3D DriveGuard has temporarily parked the hard drive. <p>NOTE: For information about HP 3D DriveGuard, 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>NOTE: For details about different types of USB ports, see the <i>HP Notebook Reference Guide</i>.</p>
(7)	USB 2.0 port	Connects an optional USB device.

Item	Component	Description
(8)	AC adapter light	<ul style="list-style-type: none"> White: The AC adapter is connected and the battery is charged. Amber: The AC adapter is connected and the battery is charging. Off: The computer is using DC power.
(9)	Power connector	Connects an AC adapter.
(10)	Security cable slot	Attaches an optional security cable to the computer.

NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Bottom



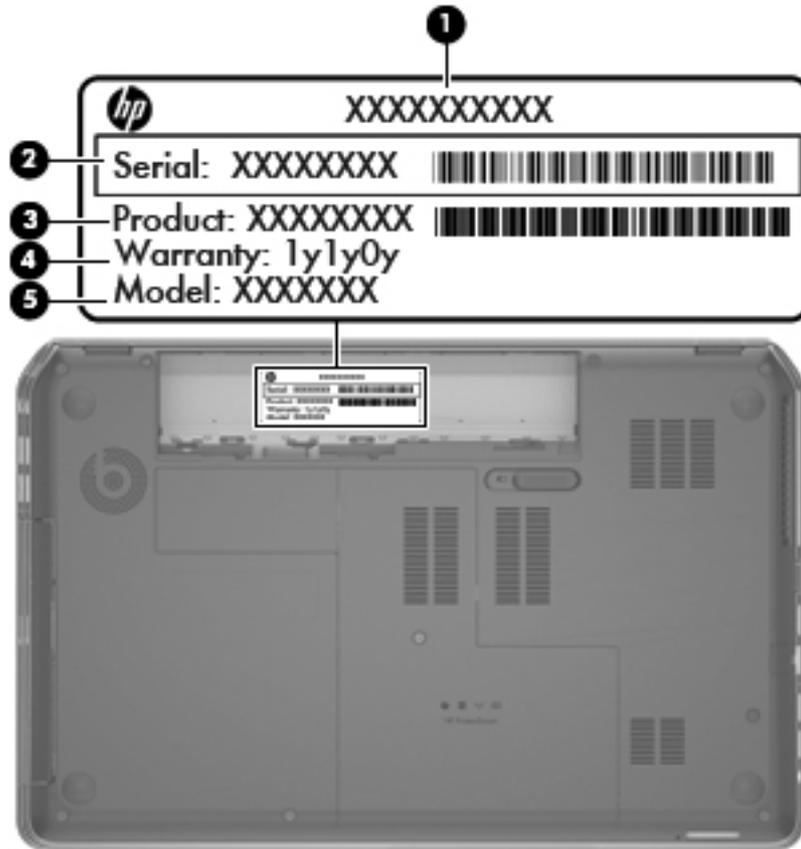
Item	Component	Description
(1)	Integrated subwoofer	Provides superior bass sound.
(2)	Battery bay	Holds the battery.
(3)	Battery release latch	Releases the battery from the battery bay and opens the service cover.

Item	Component	Description
(4)	Vents (4)	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	Wireless module compartment	Holds the WLAN device and the solid-state drive. CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact support through Help and Support.
(6)	Service cover	The service cover provides access to the optical drive retention screw, hard drive bay, wireless module compartment, and memory module compartment.

3 Illustrated parts catalog

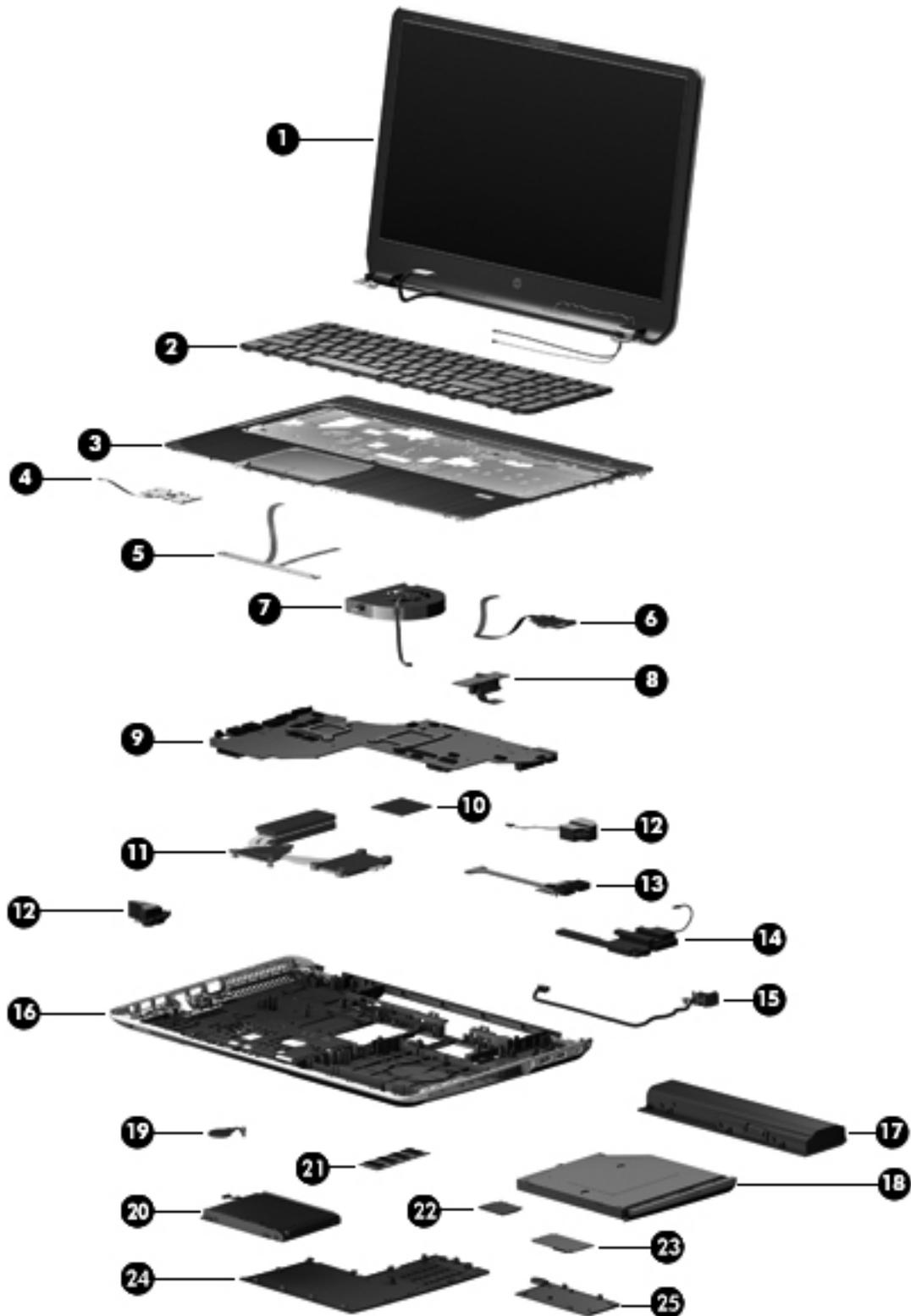
Service tag

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 48](#) for battery removal instructions.



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
(1)	Display assembly: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 29 .	
(2)	Keyboard with backlight (includes keyboard cable and keyboard backlight cable):	
	In midnight black finish for use on all computer models in Belgium	686915-A41
	In midnight black finish for use only on computer models equipped with an Intel processor in Canada	686915-DB1
	In midnight black finish for use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	686915-FL1
	In midnight black finish for use on all computer models in Denmark, Finland, and Norway	686915-DH1
	In midnight black finish for use only on computer models equipped with an Intel processor in France	686915-051
	In midnight black finish for use only on computer models equipped with an Intel processor in Greece	686915-151
	In midnight black finish for use on all computer models in the Netherlands	686915-B31
	In midnight black finish for use on all computer models in Saudi Arabia	686915-171
	In midnight black finish for use on all computer models in Switzerland	686915-BG1
	In midnight black finish for use on all computer models in the United States	686915-001
	In natural silver finish for use on all computer models in Belgium	690534-A41
	In natural silver finish for use only on computer models equipped with an Intel processor in Canada	690534-DB1
	In natural silver finish for use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	690534-FL1
	In natural silver finish for use on all computer models in Denmark, Finland, and Norway	690534-DH1
	In natural silver finish for use only on computer models equipped with an Intel processor in France	690534-051
	In natural silver finish for use only on computer models equipped with an Intel processor in Greece	690534-151
	In natural silver finish for use on all computer models in the Netherlands	690534-B31
	In natural silver finish for use on all computer models in Saudi Arabia	690534-171
	In natural silver finish for use on all computer models in Switzerland	690534-BG1
	In natural silver finish for use on all computer models in the United States	690534-001
	Keyboard without backlight (includes keyboard cable):	
	In midnight black finish for use on all computer models in Bulgaria	686914-261
	In midnight black finish for use on all computer models in Canada	686914-DB1

Item	Component	Spare part number
	In midnight black finish for use only on computer models equipped with an AMD processor in the Czech Republic and Slovakia	686914-FL1
	In midnight black finish for use on all computer models in France	686914-051
	In midnight black finish for use on all computer models in Germany	686914-041
	In midnight black finish for use on all computer models in Greece	686914-151
	In midnight black finish for use on all computer models in Hungary	686914-211
	In midnight black finish for use only on computer models equipped with an Intel processor in India	686914-D61
	In midnight black finish for use on all computer models in Israel	686914-BB1
	In midnight black finish for use on all computer models in Italy	686914-061
	In midnight black finish for use on all computer models in Japan	686914-291
	In midnight black finish for use on all computer models in Latin America	686914-161
	In midnight black finish for use on all computer models in the Netherlands	686914-B31
	In midnight black finish for use on all computer models in Portugal	686914-131
	In midnight black finish for use on all computer models in Romania	686914-271
	In midnight black finish for use on all computer models in Russia	686914-251
	In midnight black finish for use only on computer models equipped with an AMD processor in Saudi Arabia	686914-171
	In midnight black finish for use on all computer models in Slovenia	686914-BA1
	In midnight black finish for use on all computer models in South Korea	686914-AD1
	In midnight black finish for use on all computer models in Spain	686914-071
	In midnight black finish for use only on computer models equipped with an Intel processor in Taiwan	686914-AB1
	In midnight black finish for use only on computer models equipped with an Intel processor in Thailand	686914-281
	In midnight black finish for use on all computer models in Turkey	686914-141
	In midnight black finish for use on all computer models in the United Kingdom and Singapore	686914-031
	In midnight black finish for use on all computer models in the United States	686914-001
	In natural silver finish for use on all computer models in Bulgaria	691923-261
	In natural silver finish for use on all computer models in Canada	691923-DB1
	In natural silver finish for use only on computer models equipped with an AMD processor in the Czech Republic and Slovakia	691923-FL1
	In natural silver finish for use on all computer models in France	691923-051
	In natural silver finish for use on all computer models in Germany	691923-041

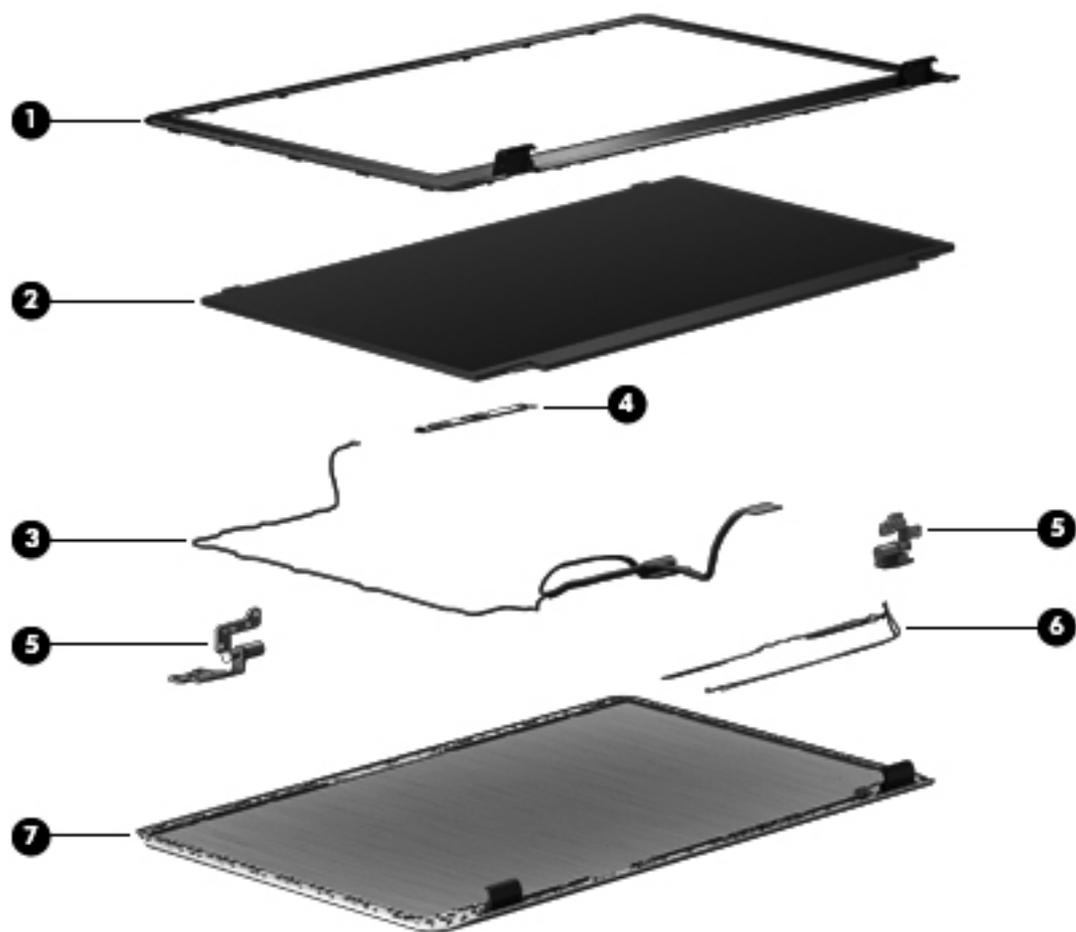
Item	Component	Spare part number
	In natural silver finish for use on all computer models in Greece	691923-151
	In natural silver finish for use on all computer models in Hungary	691923-211
	In natural silver finish for use only on computer models equipped with an Intel processor in India	691923-D61
	In natural silver finish for use on all computer models in Israel	691923-BB1
	In natural silver finish for use on all computer models in Italy	691923-061
	In natural silver finish for use on all computer models in Japan	691923-291
	In natural silver finish for use on all computer models in Latin America	691923-161
	In natural silver finish for use on all computer models in the Netherlands	691923-B31
	In natural silver finish for use on all computer models in Portugal	691923-131
	In natural silver finish for use on all computer models in Romania	691923-271
	In natural silver finish for use on all computer models in Russia	691923-251
	In natural silver finish for use only on computer models equipped with an AMD processor in Saudi Arabia	691923-171
	In natural silver finish for use on all computer models in Slovenia	691923-BA1
	In natural silver finish for use on all computer models in South Korea	691923-AD1
	In natural silver finish for use on all computer models in Spain	691923-071
	In natural silver finish for use only on computer models equipped with an Intel processor in Taiwan	691923-AB1
	In natural silver finish for use only on computer models equipped with an Intel processor in Thailand	691923-281
	In natural silver finish for use on all computer models in Turkey	691923-141
	In natural silver finish for use on all computer models in the United Kingdom and Singapore	691923-031
	In natural silver finish for use on all computer models in the United States	691923-001
(3)	Top cover (includes TouchPad):	
	In midnight black finish	686931-001
	In natural silver finish	690232-001
(4)	Power button board (includes cable)	686917-001
(5)	TouchPad button board (includes TouchPad button board cable and TouchPad cable)	686919-001
(6)	Fingerprint reader board (includes bracket and cable)	686906-001
(7)	Fan (includes cable)	686901-001
(8)	Optical drive connector board (includes cable)	686899-001
(9)	System board (includes replacement thermal material):	

Item	Component	Spare part number
	For use only on computer models equipped with an AMD processor and an HD7670M graphics subsystem with 2048-MB discrete memory	687229-001
	For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	687227-001
	For use only on computer models equipped with an Intel processor and a 7670M graphics subsystem with 2048-MB discrete memory	686930-001
	For use only on computer models equipped with an Intel processor and a 7670M graphics subsystem with 1024-MB discrete memory	686929-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	686928-001
(10)	Processor (includes replacement thermal material):	
	AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W)	683046-001
	AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W)	683048-001
	AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 1.0-MB L2 cache, dual core, 35 W)	683047-001
	Intel Core i7-3612QM 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 6.0-MB L3 cache, quad core, 35 W)	680647-001
	Intel Core i7-3520M 2.90-GHz processor (turbo up to 3.60-GHz; 1600-MHz, 4.0-MB L3 cache, dual core, 35 W)	681954-001
	Intel Core i5-3360M 2.80-GHz processor (turbo up to 3.50-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	681953-001
	Intel Core i5-3320M 2.60-GHz processor (turbo up to 3.30-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	681952-001
	Intel Core i5-3210M 2.50-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	680645-001
	Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W)	682417-001
	Intel Core i3-2370M 2.40-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W)	677152-001
	Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W)	653340-001
(11)	Heat sink (includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory	687231-001
	For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	687230-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory	686905-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	686904-001

Item	Component	Spare part number
(12)	Speakers (include cables and 4 rubber isolators)	686925-001
(13)	USB board	686918-001
(14)	Subwoofer (includes cables and 2 rubber isolators)	686926-001
(15)	Power connector cable (includes bracket)	686900-001
(16)	Base enclosure (includes battery release latch assembly)	686896-001
(17)	Battery:	
	9-cell, 100-Wh, 3.0-Ah, Li-ion battery	672412-001
	6-cell, 62-Wh, 2.8-Ah, Li-ion battery	671731-001
(18)	DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)	686916-001
(19)	RTC battery (includes cable and double-sided tape)	672349-001
(20)	Hard drive (does not include hard drive bracket, hard drive connector cable, or screws):	
	1-TB, 5400-rpm, 9.5-mm	676521-001
	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
	320-GB, 5400-rpm, 9.5-mm	622643-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, hard drive connector cable, and screws)	686907-001
(21)	Memory modules (2, PC3, 12800, 1600-MHz):	
	8-GB memory module	670034-001
	4-GB memory module	641369-001
	2-GB memory module	652972-001
(22)	WLAN module:	
	For use on all computer models:	
	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
	Atheros WB225 1×1 802.11b/g/n Bluetooth Combo Adapter	675794-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
	Ralink RT5390F 802.11b/g/n 1×1 WLAN module	670691-001

Item	Component	Spare part number
	Intel Centrino Wireless-N 2230 WLAN module for use only on computer models equipped with an Intel processor	670290-001
(23)	32-GB solid-state drive (for use only on computer models equipped with an Intel processor)	686927-001
	Service Cover Kit , includes:	686920-001
(24)	Service cover (includes one captive screw, secured by a On-ring)	
(25)	Wireless module compartment cover (includes one captive screw, secured by an O-ring)	

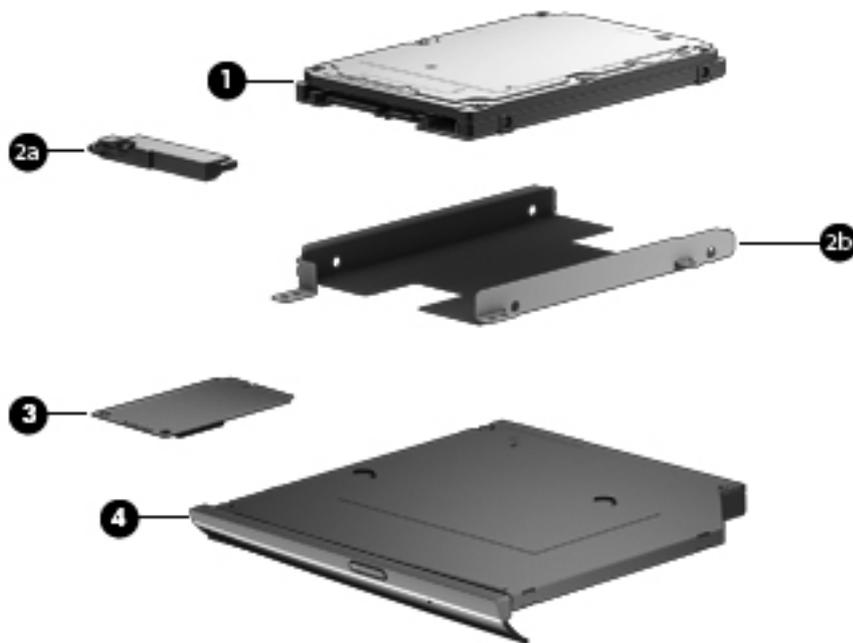
Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel	686897-001
(2)	15.6-in, LED, SVA, HD, BrightView display panel	686921-001
(3)	Display panel cable (includes webcam/microphone module cable)	686898-001

Item	Component	Spare part number
(4)	Webcam/microphone module	686587-001
(5)	Display Hinge Kit (includes left and right hinges)	686913-001
(6)	Wireless Antenna Kit (includes left and right wireless antenna cables and transceivers)	686894-001
(7)	Display enclosure:	
	In midnight black finish	686895-001
	In natural finish	690231-001

Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (does not include hard drive bracket, hard drive connector cable, or screws):	
	1-TB, 5400-rpm, 9.5-mm	676521-001
	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

Item	Description	Spare part number
	320-GB, 5400-rpm, 9.5-mm	622643-001
	Hard Drive Hardware Kit , includes:	686907-001
(2a)	Hard drive connector cable	
(2b)	Hard drive bracket	
	Hard drive bracket screws (not illustrated)	
(3)	32-GB solid-state drive (for use only on computer models equipped with an Intel processor)	686927-001
(4)	DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)	686916-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
90-W HP Smart AC adapter for use on all computer models (PFC, RC, V, 3-wire)	609940-001
65-W HP Smart AC adapter for use only on computer models equipped with an AMD processor (non-PFC, 3-wire)	693711-001
For use only on computer models equipped with an Intel processor:	
90-W HP Smart AC adapter (PFC, RC, V, EM, 3-wire)	609947-001
65-W HP Smart AC adapter (RC, V, EM, 3-wire)	609948-001
65-W HP Smart AC adapter (RC, V, 3-wire)	609939-001
Power cord (3-pin, black, 1.83-m):	
For use in Argentina	490371-D01
For use in Australia	490371-011
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 Italy	490371-061
For use in Japan	490371-291
For use in North America	490371-001
For use in the People's Republic of China	490371-AA1
For use in South Africa	490371-AR1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in Thailand	490371-201
For use in the United Kingdom and Singapore	490371-031
Screw Kit	686924-001

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 on all computer models in Europe (3-pin, black, 1.83-m)
490371-031	Power cord for use on all computer models 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 on all computer models in Denmark (3-pin, black, 1.83-m)
490371-111	Power cord for use on all computer models 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)
490371-291	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 on all computer models in South Korea (3-pin, black, 1.83-m)
490371-AR1	Power cord for use on all computer models in South Africa (3-pin, black, 1.83-m)
490371-BB1	Power cord for use on all computer models 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)
609939-001	65-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC, V, 3-wire)
609940-001	90-W HP Smart AC adapter for use on all computer models (PFC, RC, V, 3-wire)
609947-001	90-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (PFC, RC, V, EM, 3-wire)
609948-001	65-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC, V, EM, 3-wire)
622643-001	320-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws)
	NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
633252-001	750-GB, 7200-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws)
	NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.

Spare part number	Description
634250-001	750-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
634925-001	500-GB, 7200-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
641369-001	4-GB memory module (PC3, 12800, 1600-MHz)
641672-001	320-GB, 7200-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
652972-001	2-GB memory module (PC3, 12800, 1600-MHz)
653340-001	Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
655795-001	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter for use on all computer models
657325-001	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter for use on all computer models
669299-001	500-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
669300-001	640-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
670034-001	8-GB memory module (PC3, 12800, 1600-MHz)
670290-001	Intel Centrino Wireless-N 2230 WLAN module for use only on computer models equipped with an Intel processor
670691-001	Ralink RT5390F 802.11b/g/n 1×1 WLAN module for use on all computer models
671731-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
672349-001	RTC battery (includes cable and double-sided tape)
672412-001	9-cell, 100-Wh, 3.00-Ah, Li-ion battery
675794-001	Atheros WB225 1×1 802.11b/g/n Bluetooth Combo Adapter for use on all computer models

Spare part number	Description
676521-001	1-TB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
677152-001	Intel Core i3-2370M 2.40-GHz processor (1.333-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
680645-001	Intel Core i5-3210M 2.50-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
680647-001	Intel Core i7-3612QM 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 6.0-MB L3 cache, quad core, 35 W; includes replacement thermal material)
681952-001	Intel Core i5-3320M 2.60-GHz processor (turbo up to 3.30-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
681953-001	Intel Core i5-3360M 2.80-GHz processor (turbo up to 3.50-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
681954-001	Intel Core i7-3520M 2.90-GHz processor (turbo up to 3.60-GHz; 1600-MHz, 4.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
682417-001	Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
683046-001	AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W; includes replacement thermal material)
683047-001	AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 1.0-MB L2 cache, dual core, 35 W; includes replacement thermal material)
683048-001	AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W; includes replacement thermal material)
686587-001	Webcam/microphone module
686894-001	Wireless Antenna Kit (includes left and right wireless antenna cables and transceivers)
686895-001	Display enclosure in midnight black finish
686896-001	Base enclosure (includes battery release latch assembly)
686897-001	Display bezel
686898-001	Display panel cable (includes webcam/microphone module cable)
686899-001	Optical drive connector board (includes cable)
686900-001	Power connector cable (includes bracket)
686901-001	Fan (includes cable)
686904-001	Heat sink for use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
686905-001	Heat sink for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes replacement thermal material)
686906-001	Fingerprint reader board (includes bracket and cable)

Spare part number	Description
686907-001	Hard Drive Hardware Kit (includes bracket, connector cable, and screws)
686913-001	Display Hinge Kit (includes left and right hinges)
686914-001	Keyboard in midnight black finish without backlight for use on all computer models in the United States (includes keyboard cable)
686914-031	Keyboard in midnight black finish without backlight for use on all computer models in the United Kingdom and Singapore (includes keyboard cable)
686914-041	Keyboard in midnight black finish without backlight for use on all computer models in Germany (includes keyboard cable)
686914-051	Keyboard in midnight black finish without backlight for use on all computer models in France (includes keyboard cable)
686914-061	Keyboard in midnight black finish without backlight for use on all computer models in Italy (includes keyboard cable)
686914-071	Keyboard in midnight black finish without backlight for use on all computer models in Spain (includes keyboard cable)
686914-131	Keyboard in midnight black finish without backlight for use on all computer models in Portugal (includes keyboard cable)
686914-141	Keyboard in midnight black finish without backlight for use on all computer models in Turkey (includes keyboard cable)
686914-151	Keyboard in midnight black finish without backlight for use only on computer models equipped with an AMD processor in Greece (includes keyboard cable)
686914-161	Keyboard in midnight black finish without backlight for use on all computer models in Latin America (includes keyboard cable)
686914-171	Keyboard in midnight black finish without backlight for use only on computer models equipped with an AMD processor in Saudi Arabia (includes keyboard cable)
686914-211	Keyboard in midnight black finish without backlight for use on all computer models in Hungary (includes keyboard cable)
686914-251	Keyboard in midnight black finish without backlight for use on all computer models in Russia (includes keyboard cable)
686914-261	Keyboard in midnight black finish without backlight for use on all computer models in Bulgaria (includes keyboard cable)
686914-271	Keyboard in midnight black finish without backlight for use on all computer models in Romania (includes keyboard cable)
686914-281	Keyboard in midnight black finish without backlight for use only on computer models equipped with an Intel processor in Thailand (includes keyboard cable)
686914-291	Keyboard in midnight black finish without backlight for use on all computer models in Japan (includes keyboard cable)
686914-AB1	Keyboard in midnight black finish without backlight for use only on computer models equipped with an Intel processor in South Korea (includes keyboard cable)
686914-AD1	Keyboard in midnight black finish without backlight for use on all computer models in Taiwan (includes keyboard cable)

Spare part number	Description
686914-B31	Keyboard in midnight black finish without backlight for use on all computer models in the Netherlands (includes keyboard cable)
686914-BA1	Keyboard in midnight black finish without backlight for use on all computer models in Slovenia (includes keyboard cable)
686914-BB1	Keyboard in midnight black finish without backlight for use on all computer models in Israel (includes keyboard cable)
686914-D61	Keyboard in midnight black finish without backlight for use only on computer models equipped with an Intel processor in India (includes keyboard cable)
686914-DB1	Keyboard in midnight black finish without backlight for use on all computer models in Canada (includes keyboard cable)
686914-FL1	Keyboard in midnight black finish without backlight for use only on computer models equipped with an AMD processor in the Czech Republic and Slovakia (includes keyboard cable)
686915-001	Keyboard in midnight black finish with backlight for use on all computer models in the United States (includes keyboard cable and keyboard backlight cable)
686915-051	Keyboard in midnight black finish with backlight for use only on computer models equipped with an Intel processor in France (includes keyboard cable and keyboard backlight cable)
686915-151	Keyboard in midnight black finish with backlight for use only on computer models equipped with an Intel processor in Greece (includes keyboard cable and keyboard backlight cable)
686915-171	Keyboard in midnight black finish with backlight for use on all computer models in Saudi Arabia (includes keyboard cable and keyboard backlight cable)
686915-A41	Keyboard in midnight black finish with backlight for use on all computer models in Belgium (includes keyboard cable and keyboard backlight cable)
686915-B31	Keyboard in midnight black finish with backlight for use on all computer models in the Netherlands (includes keyboard cable and keyboard backlight cable)
686915-BG1	Keyboard in midnight black finish with backlight for use on all computer models in Switzerland (includes keyboard cable and keyboard backlight cable)
686915-DB1	Keyboard in midnight black finish with backlight for use only on computer models equipped with an Intel processor in Canada (includes keyboard cable and keyboard backlight cable)
686915-DH1	Keyboard in midnight black finish with backlight for use on all computer models in Denmark, Finland, and Norway (includes keyboard cable and keyboard backlight cable)
686915-FL1	Keyboard in midnight black finish with backlight for use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia (includes keyboard cable and keyboard backlight cable)
686916-001	DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)
686917-001	Power button board (includes cable)
686918-001	USB board
686919-001	TouchPad button board (includes cable)
686920-001	Service Cover Kit (includes service cover and wireless module compartment cover)
686921-001	15.6-in, LED, SVA, HD, BrightView display panel

Spare part number	Description
686924-001	Screw Kit
686925-001	Speakers (include cables and rubber isolators)
686926-001	Subwoofer (includes cables and rubber isolators)
686927-001	32-GB solid-state drive (for use only on computer models equipped with an Intel processor)
686928-001	System board for use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
686929-001	System board for use only on computer models equipped with an Intel processor and a 7670M graphics subsystem with 1024-MB discrete memory (includes replacement thermal material)
686930-001	System board for use only on computer models equipped with an Intel processor and a 7670M graphics subsystem with 2048-MB discrete memory (includes replacement thermal material)
686931-001	Top cover in midnight black finish (includes TouchPad)
687227-001	System board for use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
687229-001	System board for use only on computer models equipped with an AMD processor and an HD7670M graphics subsystem with 2048-MB discrete memory (includes replacement thermal material)
687230-001	Heat sink for use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
687231-001	Heat sink for use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
690231-001	Display enclosure in natural silver finish
690232-001	Top cover in natural silver finish (includes TouchPad)
690534-001	Keyboard in natural silver finish with backlight for use on all computer models in the United States (includes keyboard cable and keyboard backlight cable)
690534-051	Keyboard in natural silver finish with backlight for use only on computer models equipped with an Intel processor in France (includes keyboard cable and keyboard backlight cable)
690534-151	Keyboard in natural silver finish with backlight for use only on computer models equipped with an Intel processor in Greece (includes keyboard cable and keyboard backlight cable)
690534-171	Keyboard in natural silver finish with backlight for use on all computer models in Saudi Arabia (includes keyboard cable and keyboard backlight cable)
690534-A41	Keyboard in natural silver finish with backlight for use on all computer models in Belgium (includes keyboard cable and keyboard backlight cable)
690534-B31	Keyboard in natural silver finish with backlight for use on all computer models in the Netherlands (includes keyboard cable and keyboard backlight cable)
690534-BG1	Keyboard in natural silver finish with backlight for use on all computer models in Switzerland (includes keyboard cable and keyboard backlight cable)
690534-DB1	Keyboard in natural silver finish with backlight for use only on computer models equipped with an Intel processor in Canada (includes keyboard cable and keyboard backlight cable)
690534-DH1	Keyboard in natural silver finish with backlight for use on all computer models in Denmark, Finland, and Norway (includes keyboard cable and keyboard backlight cable)

Spare part number	Description
690534-FL1	Keyboard in natural silver finish with backlight for use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia (includes keyboard cable and keyboard backlight cable)
691923-001	Keyboard in natural silver finish with backlight for use on all computer models in the United States (includes keyboard cable and keyboard backlight cable)
691923-031	Keyboard in natural silver finish with backlight for use on all computer models in the United Kingdom and Singapore (includes keyboard cable and keyboard backlight cable)
691923-041	Keyboard in natural silver finish with backlight for use on all computer models in Germany (includes keyboard cable and keyboard backlight cable)
691923-051	Keyboard in natural silver finish with backlight for use on all computer models in France (includes keyboard cable and keyboard backlight cable)
691923-061	Keyboard in natural silver finish with backlight for use on all computer models in Italy (includes keyboard cable and keyboard backlight cable)
691923-071	Keyboard in natural silver finish with backlight for use on all computer models in Spain (includes keyboard cable and keyboard backlight cable)
691923-131	Keyboard in natural silver finish with backlight for use on all computer models in Portugal (includes keyboard cable and keyboard backlight cable)
691923-141	Keyboard in natural silver finish with backlight for use on all computer models in Turkey (includes keyboard cable and keyboard backlight cable)
691923-151	Keyboard in natural silver finish with backlight for use only on computer models equipped with an AMD processor in Greece (includes keyboard cable and keyboard backlight cable)
691923-161	Keyboard in natural silver finish with backlight for use only on computer models equipped with an Intel processor in Latin America (includes keyboard cable and keyboard backlight cable)
691923-171	Keyboard in natural silver finish with backlight for use only on computer models equipped with an AMD processor in Saudi Arabia (includes keyboard cable and keyboard backlight cable)
691923-211	Keyboard in natural silver finish with backlight for use on all computer models in Hungary (includes keyboard cable and keyboard backlight cable)
691923-251	Keyboard in natural silver finish with backlight for use on all computer models in Russia (includes keyboard cable and keyboard backlight cable)
691923-261	Keyboard in natural silver finish with backlight for use on all computer models in Bulgaria (includes keyboard cable and keyboard backlight cable)
691923-271	Keyboard in natural silver finish with backlight for use on all computer models in Romania (includes keyboard cable and keyboard backlight cable)
691923-B31	Keyboard in natural silver finish with backlight for use on all computer models in the Netherlands (includes keyboard cable and keyboard backlight cable)
691923-BA1	Keyboard in natural silver finish with backlight for use on all computer models in Slovenia (includes keyboard cable and keyboard backlight cable)
691923-BB1	Keyboard in natural silver finish with backlight for use on all computer models in Israel (includes keyboard cable and keyboard backlight cable)
691923-DB1	Keyboard in natural silver finish with backlight for use on all computer models in Canada (includes keyboard cable and keyboard backlight cable)

Spare part number	Description
691923-FL1	Keyboard in natural silver finish with backlight for use only on computer models equipped with an AMD processor in the Czech Republic and Slovakia (includes keyboard cable and keyboard backlight cable)
693711-001	65-W HP Smart AC adapter for use only on computer models equipped with an AMD processor (non-PFC, 3-wire)

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

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

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

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.

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

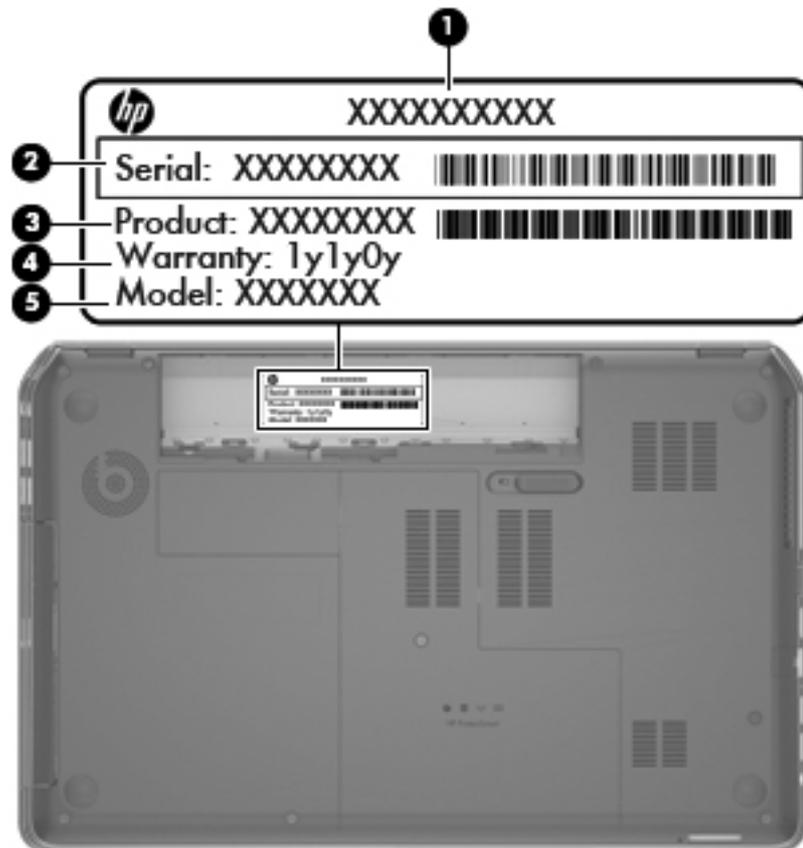
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 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 48](#) 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.

Item	Component	Description
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Battery

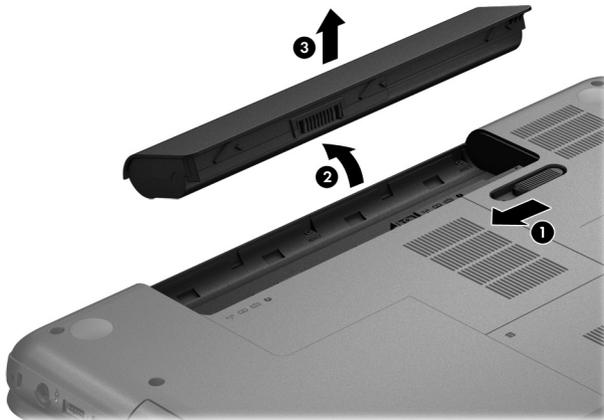
Description	Spare part number
9-cell, 100-Wh, 3.0-Ah, Li-ion battery	672412-001
6-cell, 62-Wh, 2.8-Ah, Li-ion battery	671731-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

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



To insert the battery:

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

Hard drive



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

Description	Spare part number
1-TB, 5400-rpm, 9.5-mm	676521-001
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
320-GB, 5400-rpm, 9.5-mm	622643-001
Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector cable, and screws)	686907-001

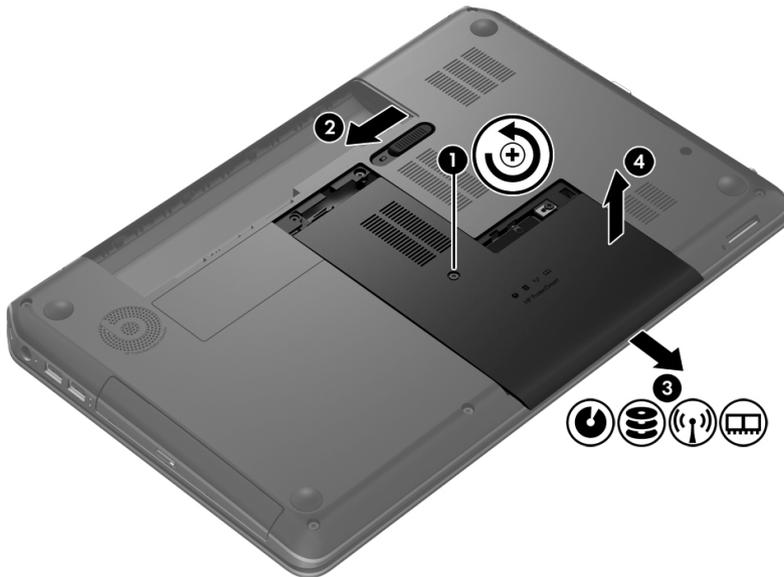
Before removing the hard drive, follow these steps:

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 48](#)).

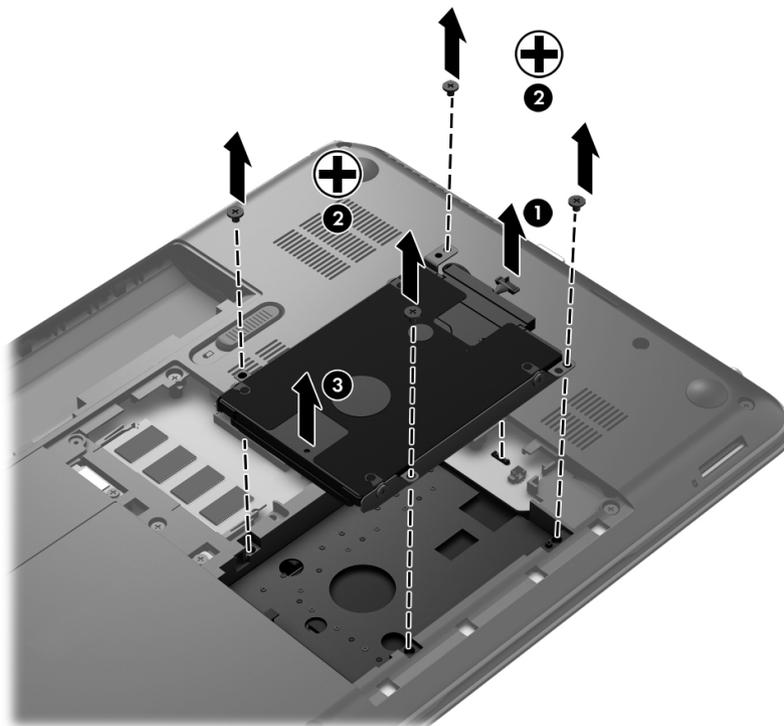
Remove the hard drive:

1. Loosen the captive screw **(1)** that secures the service cover to the computer.
2. Slide the battery release latch **(2)** to release the service cover. (The service cover releases **(3)** forward.)

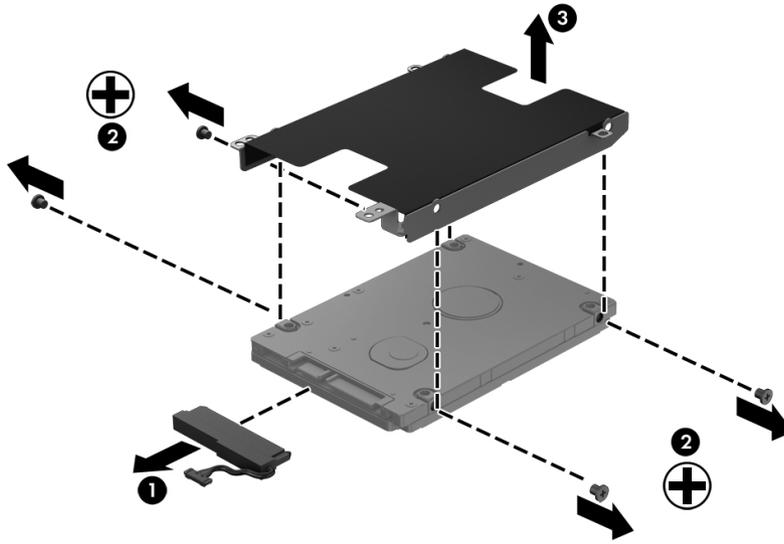
3. Remove the service cover **(4)** by lifting it straight up. The service cover is available in the Service Cover Kit, spare part number 686920-001.



4. Disconnect the hard drive connector cable **(1)** from the system board, and then release the cable from the space between the hard drive and the right side of the hard drive bay.
5. Remove the four Phillips PM2.5×3.5 screws **(2)** that secure the hard drive to the computer.
6. Remove the hard drive **(3)** from the hard drive bay.



7. If it is necessary to disassemble the hard drive, perform the following steps:
 - a. Disconnect the hard drive connector cable **(1)** from the hard drive.
 - b. Remove the four Phillips PM3.0×3.0 screws **(2)** that secure the hard drive bracket to the hard drive.
 - c. Remove the hard drive bracket **(3)** from the hard drive. The hard drive bracket, hard drive connector cable, and screws are available in the Hard Drive Hardware Kit, spare part number 686907-001.



Reverse this procedure to reassemble and install the hard drive.

RTC battery

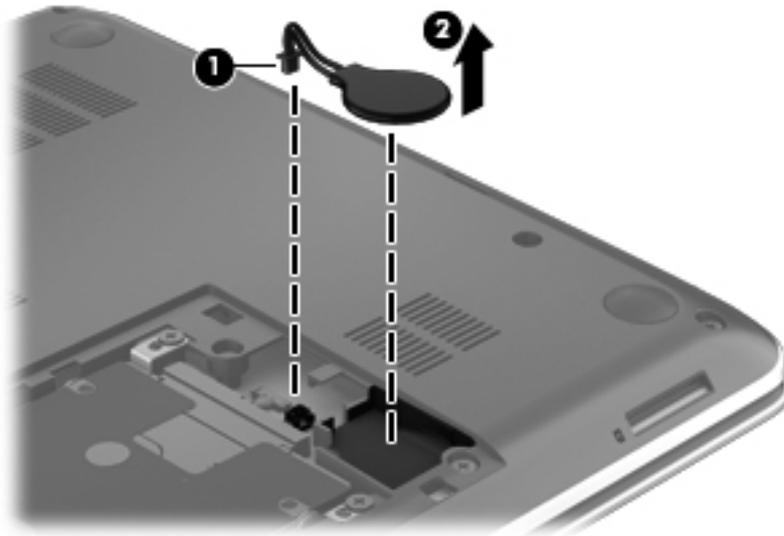
Description	Spare part number
RTC battery (includes cable and double-sided tape)	672349-001

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 48](#)).
5. Remove the service cover (see [Hard drive on page 49](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Detach the RTC battery **(2)** from the base enclosure. (The RTC battery is attached to the base enclosure with double-sided tape.)



3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Optical drive

Description	Spare part number
DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)	686916-001

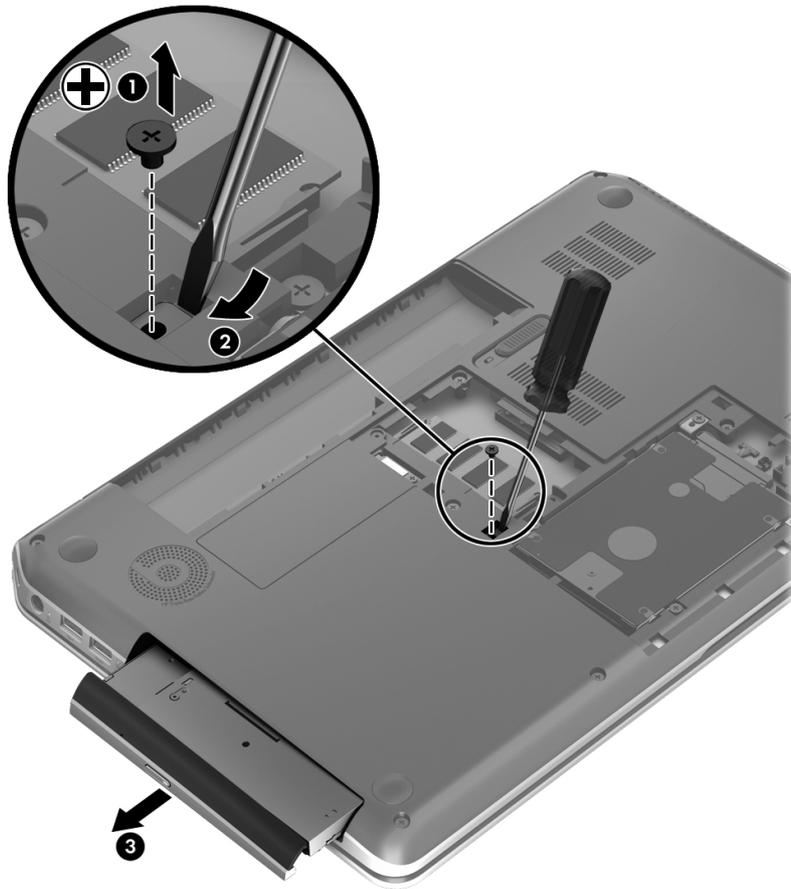
Before removing the optical drive, follow these steps:

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 48](#)).
5. Remove the service cover (see [Hard drive on page 49](#)).

Remove the optical drive:

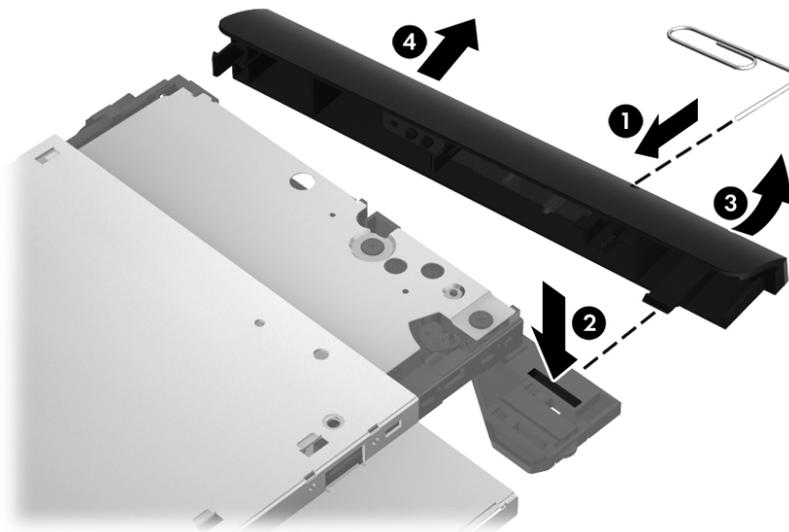
1. Remove the Phillips PM2.5×3.5 screw **(1)** that secures the optical drive the computer.
2. Use a flat-blade screw driver or similar tool to press on the optical drive bracket tab **(2)** to release the optical drive.

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

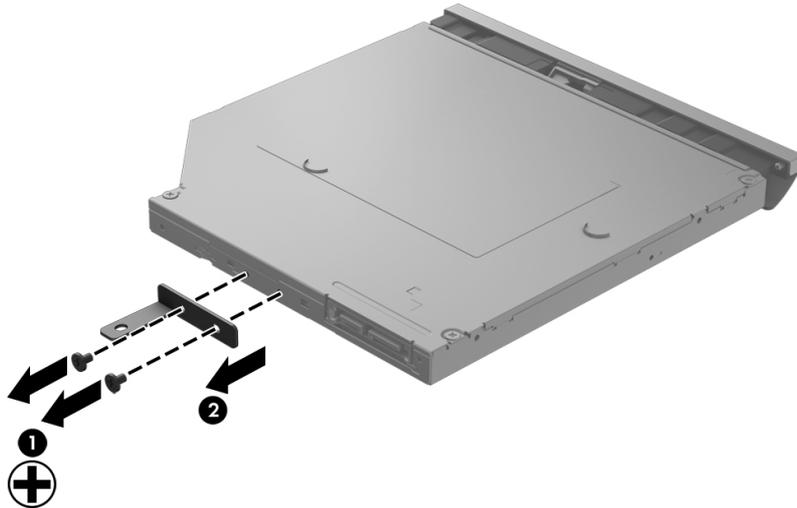


4. If it is necessary to replace the optical drive bezel, use a thin tool or an unbent paper clip **(1)** to release the optical drive tray.
5. Use a flat-blade screw driver or similar tool to press on the optical drive bezel tab **(2)**, and then release the left side of the optical drive bezel **(3)**.

6. Remove the optical drive bezel **(4)**.



7. If it is necessary to replace the optical drive bracket, position the optical drive with the rear panel toward you.
8. Remove the two Phillips PM2.0x3.3 screws **(1)** that secure the optical drive bracket to the optical drive.
9. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Memory module

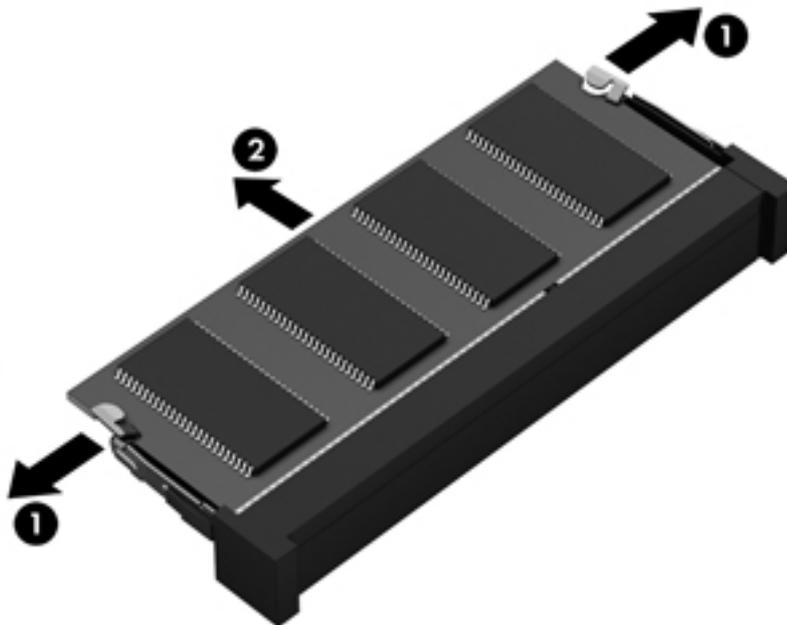
Description	Spare part number
8-GB memory module (PC3, 12800, 1600-MHz)	670034-001
4-GB memory module (PC3, 12800, 1600-MHz)	641369-001
2-GB memory module (PC3, 12800, 1600-MHz)	652972-001

Before removing a 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 48](#)).
5. Remove the service cover (see [Hard drive on page 49](#)).

Remove the memory module:

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



Reverse this procedure to install a memory module.

Keyboard

For use in country/region	Spare part number	For use in country/region	Spare part number
Keyboard with backlight in midnight black finish (includes keyboard cable and keyboard backlight cable):			
For use on all computer models in Belgium	686915-A41	Finish for use only on computer models equipped with an Intel processor in Greece	686915-151
For use only on computer models equipped with an Intel processor in Canada	686915-DB1	For use on all computer models in the Netherlands	686915-B31
For use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	686915-FL1	For use on all computer models in Saudi Arabia	686915-171
For use on all computer models in Denmark, Finland, and Norway	686915-DH1	For use on all computer models in Switzerland	686915-BG1
For use only on computer models equipped with an Intel processor in France	686915-051	For use on all computer models in the United States	686915-001
Keyboard with backlight in natural silver finish (includes keyboard cable and keyboard backlight cable):			
For use on all computer models in Belgium	690534-A41	For use only on computer models equipped with an Intel processor in Greece	690534-151
For use only on computer models equipped with an Intel processor in Canada	690534-DB1	For use on all computer models in the Netherlands	690534-B31
For use only on computer models equipped with an Intel processor in the Czech Republic and Slovakia	690534-FL1	For use on all computer models in Saudi Arabia	690534-171
For use on all computer models in Denmark, Finland, and Norway	690534-DH1	For use on all computer models in Switzerland	690534-BG1
For use only on computer models equipped with an Intel processor in France	690534-051	For use on all computer models in the United States	690534-001
Keyboard without backlight in midnight black finish (includes keyboard cable):			
For use on all computer models in Bulgaria	686914-261	For use on all computer models in Portugal	686914-131
For use on all computer models in Canada	686914-DB1	For use on all computer models in Romania	686914-271
For use only on computer models equipped with an AMD processor in the Czech Republic and Slovakia	686914-FL1	For use on all computer models in Russia	686914-251
For use on all computer models in France	686914-051	For use only on computer models equipped with an AMD processor in Saudi Arabia	686914-171

For use in country/region	Spare part number	For use in country/region	Spare part number
For use on all computer models in Germany	686914-041	For use on all computer models in Slovenia	686914-BA1
For use on all computer models in Greece	686914-151	For use on all computer models in South Korea	686914-AD1
For use on all computer models in Hungary	686914-211	For use on all computer models in Spain	686914-071
For use only on computer models equipped with an Intel processor in India	686914-D61	For use only on computer models equipped with an Intel processor in Taiwan	686914-AB1
For use on all computer models in Israel	686914-BB1	For use only on computer models equipped with an Intel processor in Thailand	686914-281
For use on all computer models in Italy	686914-061	For use on all computer models in Turkey	686914-141
For use on all computer models in Japan	686914-291	For use on all computer models in the United Kingdom and Singapore	686914-031
For use on all computer models in Latin America	686914-161	For use on all computer models in the United States	686914-001
For use on all computer models in the Netherlands	686914-B31		
Keyboard without backlight in natural silver finish (includes keyboard cable):			
For use on all computer models in Bulgaria	691923-261	For use on all computer models in Portugal	691923-131
For use on all computer models in Canada	691923-DB1	For use on all computer models in Romania	691923-271
For use only on computer models equipped with an AMD processor in the Czech Republic and Slovakia	691923-FL1	For use on all computer models in Russia	691923-251
For use on all computer models in France	691923-051	For use only on computer models equipped with an AMD processor in Saudi Arabia	691923-171
For use on all computer models in Germany	691923-041	For use on all computer models in Slovenia	691923-BA1
For use on all computer models in Greece	691923-151	For use on all computer models in South Korea	691923-AD1
For use on all computer models in Hungary	691923-211	For use on all computer models in Spain	691923-071
For use only on computer models equipped with an Intel processor in India	691923-D61	For use only on computer models equipped with an Intel processor in Taiwan	691923-AB1
For use on all computer models in Israel	691923-BB1	For use only on computer models equipped with an Intel processor in Thailand	691923-281

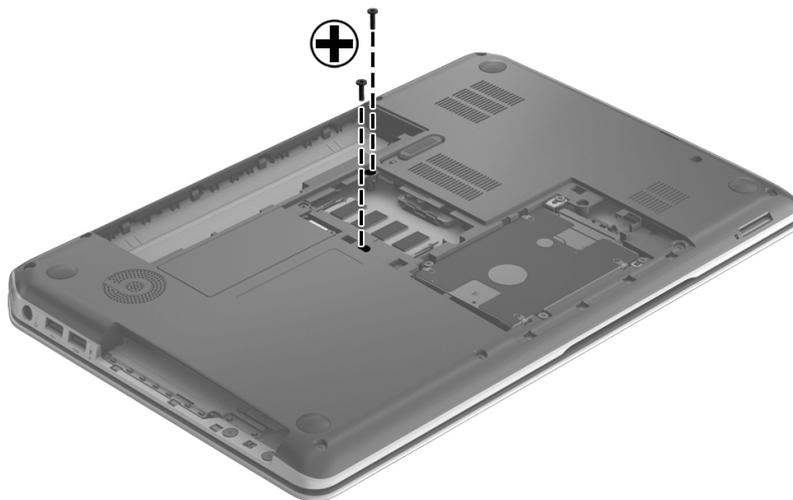
For use in country/region	Spare part number	For use in country/region	Spare part number
For use on all computer models in Italy	691923-061	For use on all computer models in Turkey	691923-141
For use on all computer models in Japan	691923-291	For use on all computer models in the United Kingdom and Singapore	691923-031
For use on all computer models in Latin America	691923-161	For use on all computer models in the United States	691923-001
For use on all computer models in the Netherlands	691923-B31		

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 48](#)).
5. Remove the service cover (see [Hard drive on page 49](#)).

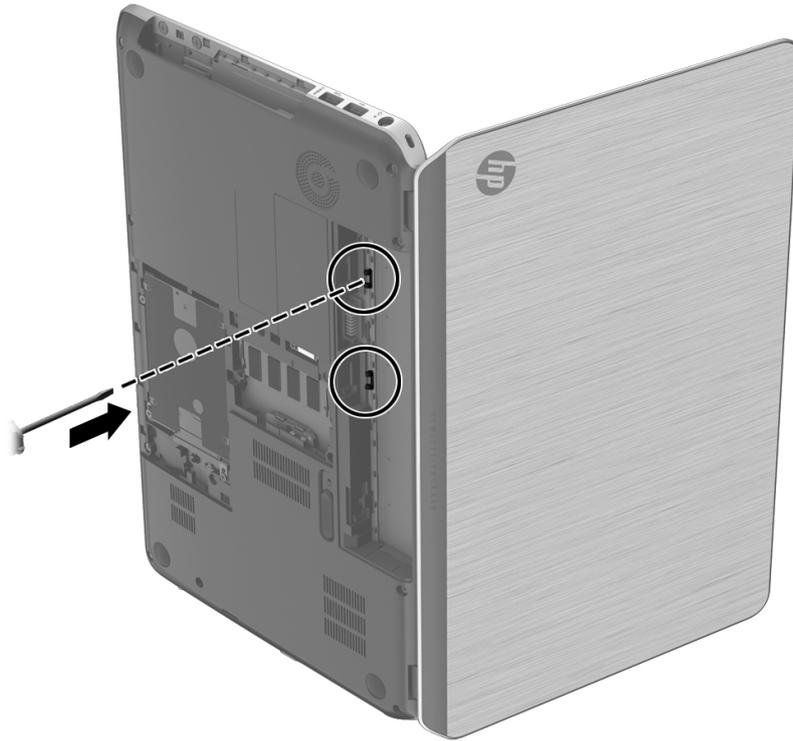
Remove the keyboard:

1. Remove the two Phillips PM2.5×10.0 screws that secure the keyboard to the computer.



2. Rest and secure the computer on its right side.
3. Partially open the computer.

4. Insert a screw driver or similar thin tool into the keyboard release holes, and then press on the back of the keyboard until the keyboard disengages from the computer.



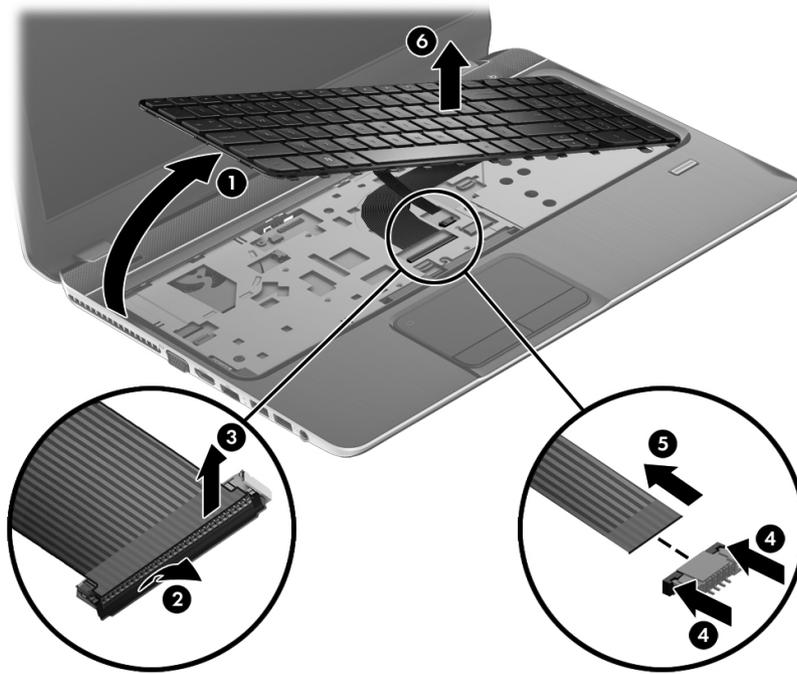
5. Turn the computer right-side up with the front toward you.
6. Lift the rear edge of the keyboard **(1)**, and then swing the keyboard up and forward **(2)** until it rests at an angle.



7. Lift the left side of the keyboard **(1)** until the keyboard cable and the keyboard backlight cable are accessible.

 **NOTE:** The keyboard backlight cable is present on select models only.

8. Release the zero insertion force (ZIF) connector **(2)** to which the keyboard cable is attached, and then disconnect the keyboard cable **(3)** from the system board.
9. Release the ZIF connector **(4)** to which the keyboard backlight cable is attached, and then disconnect the keyboard backlight cable **(5)** from the system board.
10. Remove the keyboard **(6)**.



Reverse this procedure to install the keyboard.

WLAN module

Description	Spare part number
For use on all computer models:	
Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
Atheros WB225 1×1 802.11b/g/n Bluetooth Combo Adapter	675794-001
Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
Ralink RT5390F 802.11b/g/n 1×1 WLAN module	670691-001
Intel Centrino Wireless-N 2230 WLAN module for use only on computer models equipped with an Intel processor	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.

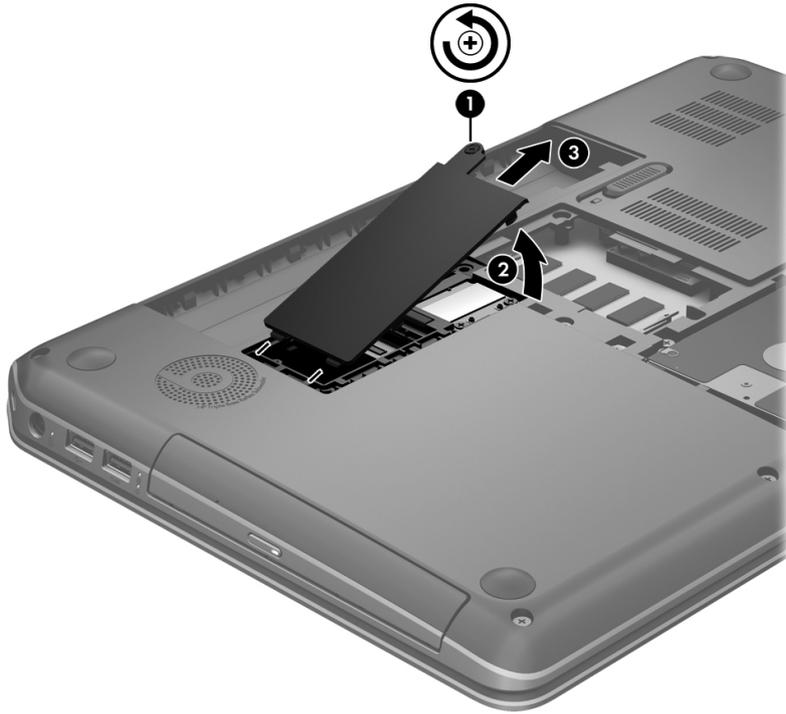
Before removing the WLAN module, follow these steps:

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 48](#)).
5. Remove the service cover (see [Hard drive on page 49](#)).

Remove the WLAN module:

1. Loosen the captive screw **(1)** that secures the wireless module compartment cover to the computer.
2. Lift the right side of the wireless module compartment cover **(2)** until it rests at an angle.

3. Remove the wireless module compartment cover **(3)** by sliding it away from the computer at an angle. The wireless module compartment cover is available in the Service Cover Kit, spare part number 686920-001.

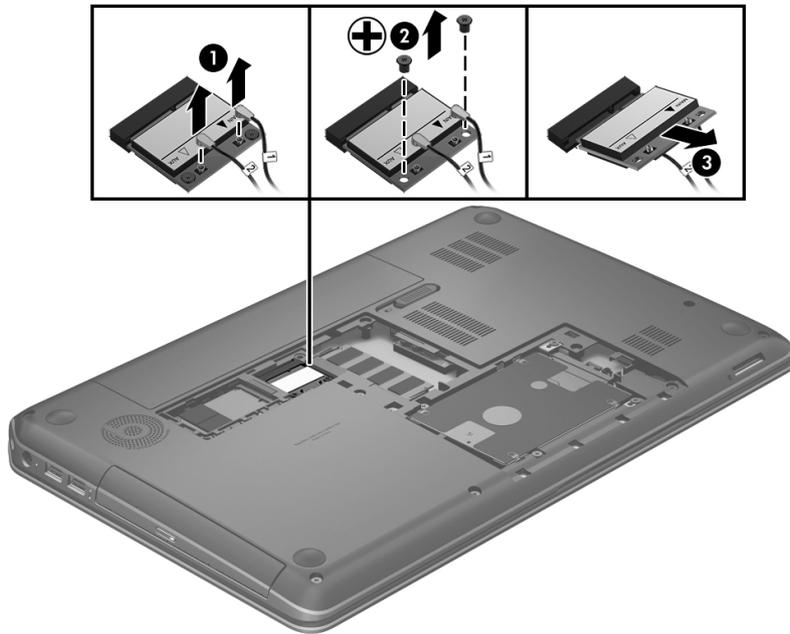


4. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

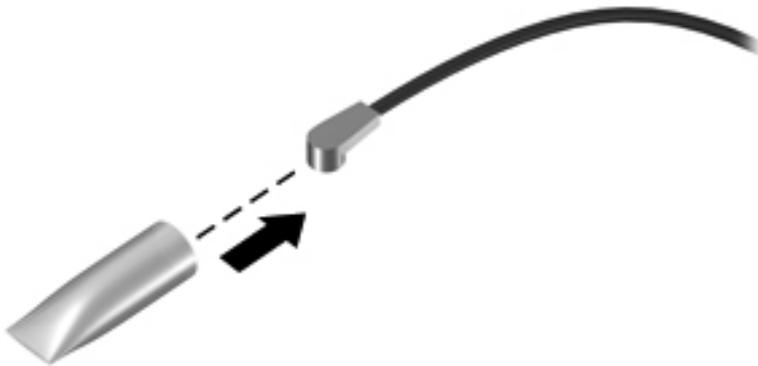
 **NOTE:** The #1 WLAN antenna cable is connected to the WLAN module #1 terminal. The #2 WLAN antenna cable is connected to the WLAN module #2 terminal.

5. Remove the two Phillips PM2.0x3.0 screws **(2)** that secure the WLAN module to the base enclosure. (The WLAN module tilts up.)

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



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



Reverse this procedure to install the WLAN module.

Solid-state drive

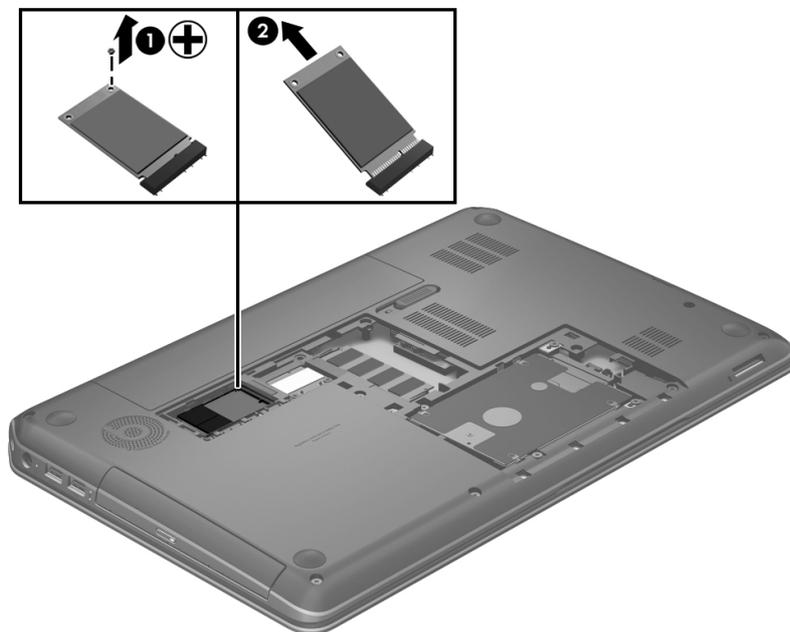
Description	Spare part number
32-GB solid-state drive (for use only on computer models equipped with an Intel processor)	686927-001

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 48](#)).
5. Remove the service cover (see [Hard drive on page 49](#)).
6. Remove the wireless module compartment cover (see [WLAN module on page 62](#)).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the solid-state drive to the base enclosure. (The solid-state drive tilts up.)
2. Remove the solid-state drive by pulling the drive away from the slot at an angle **(2)**.



Reverse this procedure to install the solid-state drive.

Top cover

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

Description	Spare part number
In midnight black finish	686931-001
In natural silver finish	690232-001

Before removing the top cover, follow these steps:

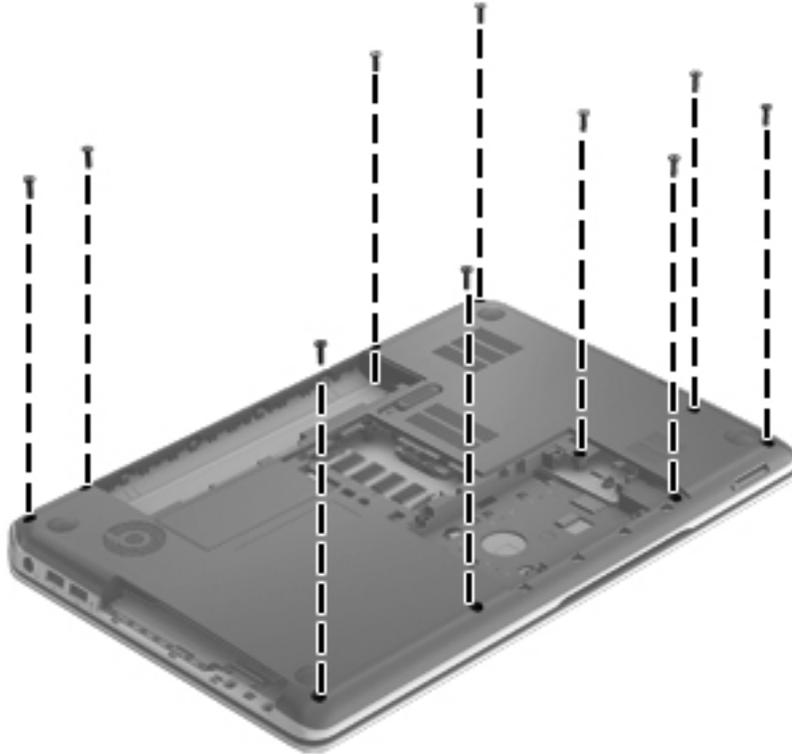
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))

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

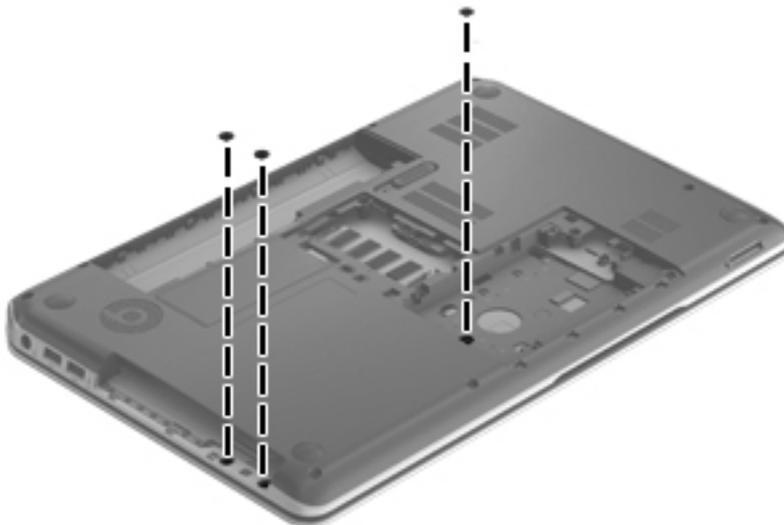
- Power button board (see [Power button board on page 70](#))
- Fingerprint reader board (see [Fingerprint reader board on page 72](#))
- TouchPad button board (see [TouchPad button board on page 74](#))

Remove the top cover:

1. Remove the ten Phillips PM2.5×10.0 screws that secure the top cover to the computer.

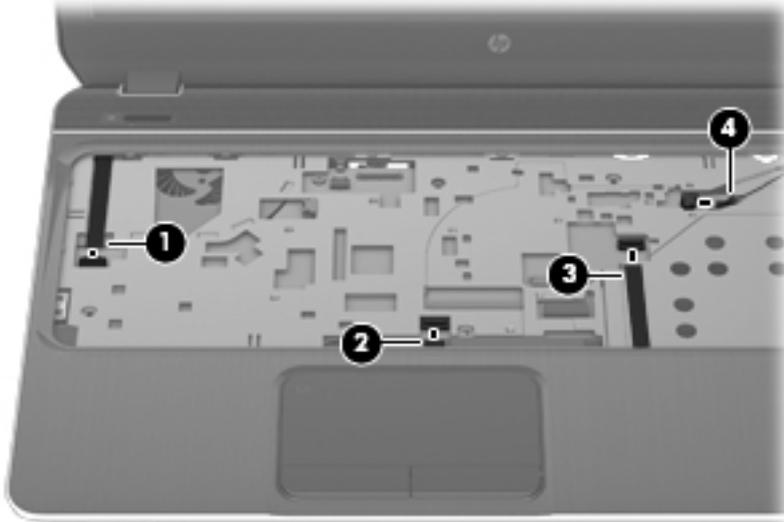


2. Remove the three Phillips PM2.0×2.0 broad head screws that secure the top cover to the computer.

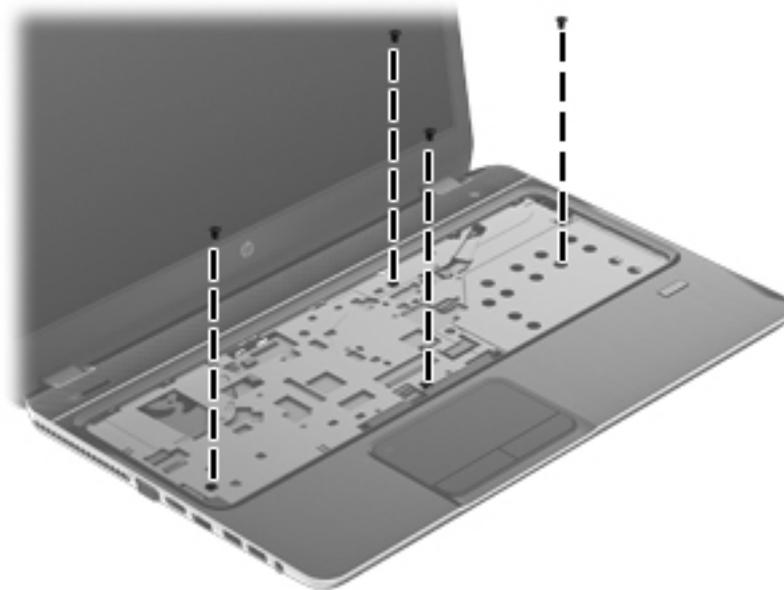


3. Turn the computer right side up, with the front toward you.
4. Open the computer.

5. Disconnect the following cables from the system board:
- (1) Power button board ZIF cable
 - (2) TouchPad button board ZIF cable
 - (3) Fingerprint reader board ZIF cable
 - (4) Right speaker cable



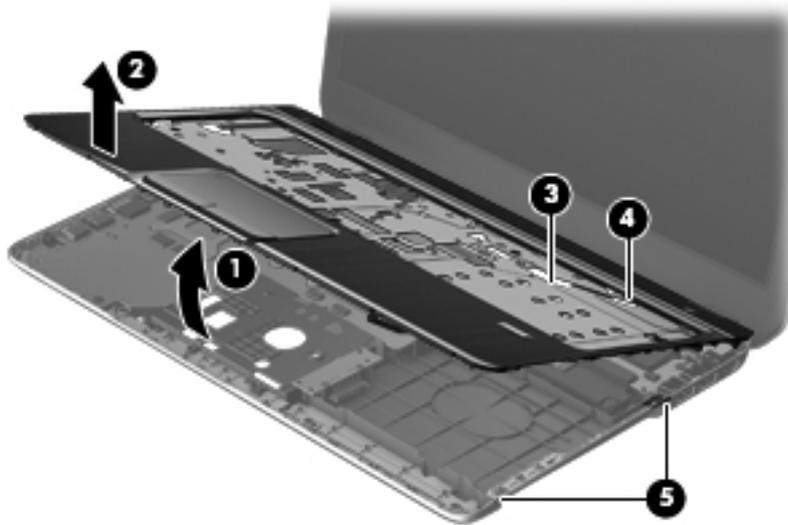
6. Remove the four Phillips PM2.5×5.0 screws that secure the top cover to the computer.



7. Lift the front edge of the top cover **(1)** and swing it up and back until the left and right sides and the rear edge **(2)** of the top cover detach from the base enclosure.

⚠ CAUTION: When removing the top cover, make sure the right speaker cable **(3)** routes cleanly through the opening **(4)** in the top cover. If the right speaker cable snags in this opening, it can be damaged.

CAUTION: When removing the top cover, make sure the thin plastic edges **(5)** of the base enclosure around the optical drive bay are adequately supported. The base enclosure can be damaged when removing the top cover if precautions are not taken.



Reverse this procedure to install the top cover.

Power button board

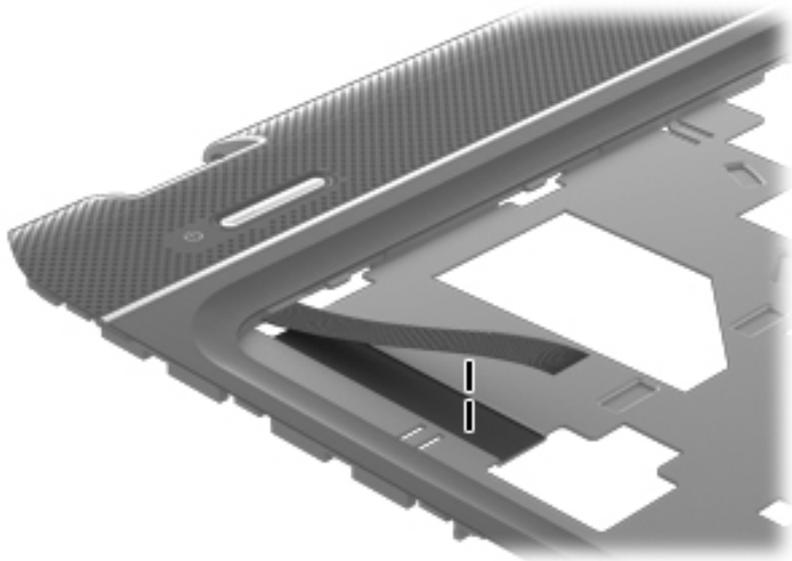
Description	Spare part number
Power button board (includes cable)	686917-001

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))

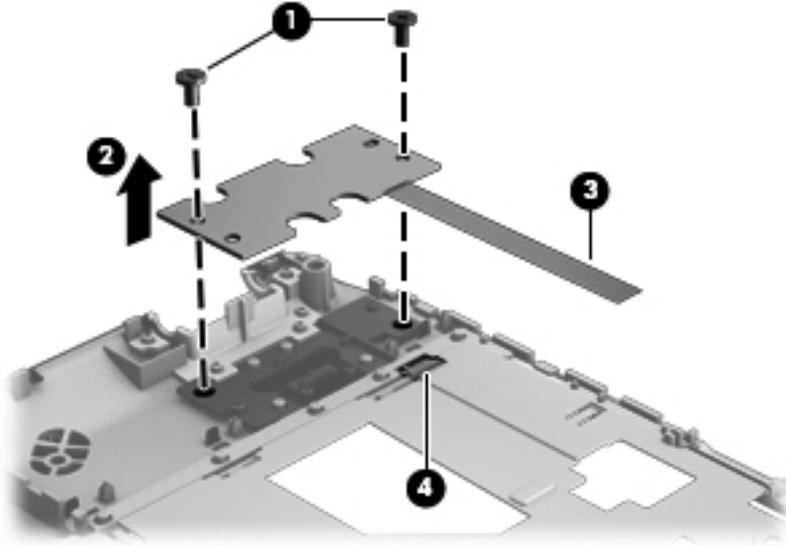
Remove the power button board:

1. Detach the power button board cable from the top cover. (The power button board cable is attached to the top cover with double-sided tape.)



2. Turn the top cover upside down, with the front toward you.
3. Remove the two Phillips PM2.5×3.5 screws **(1)** that secure the power button board to the top cover.

4. Remove the power button board (2), making sure to route the power button board cable (3) through the opening in the top cover (4).



Reverse this procedure to install the power button board.

Fingerprint reader board

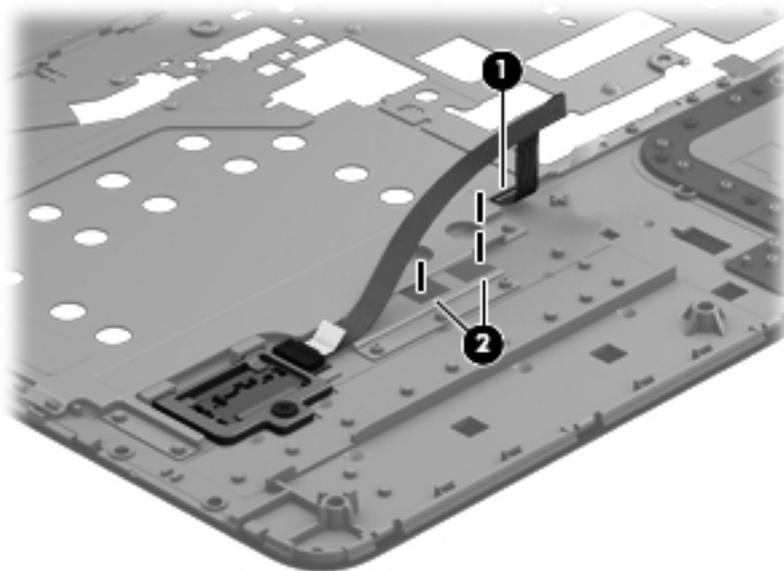
Description	Spare part number
Fingerprint reader board (includes bracket and cable)	686906-001

Before removing the fingerprint reader board, follow these steps:

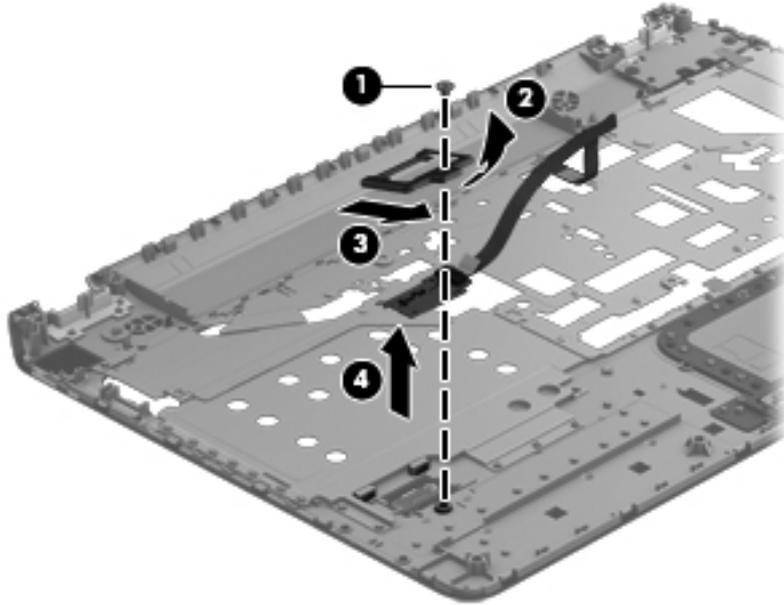
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - 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. Release the fingerprint reader board cable from the opening **(1)** in the top cover.
3. Detach the fingerprint reader board cable **(2)** from the top cover. (The fingerprint reader board cable is attached to the top cover with double-sided tape.)



4. Remove the Phillips PM2.5×3.5 screw **(1)** that secures the fingerprint reader board and bracket to the top cover.
5. Lift the front edge of the fingerprint reader board bracket **(2)** until it rests at an angle, and then remove the bracket **(3)** by sliding it up and forward at an angle.
6. 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 TouchPad button board cable and TouchPad cable)	686919-001

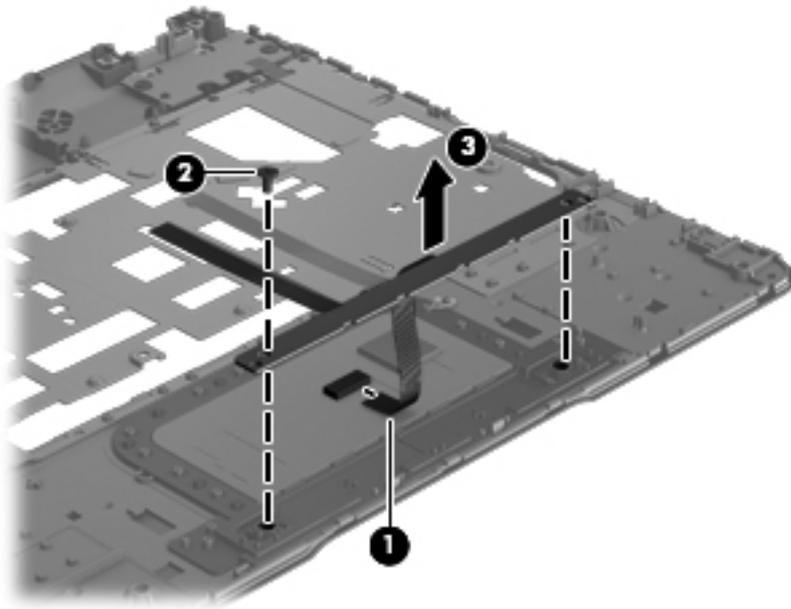
Before removing the TouchPad button board, follow these steps:

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - 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 ZIF connector to which the TouchPad board cable is attached, and then disconnect the TouchPad board cable **(1)** from the TouchPad board.
3. Remove the Phillips PM2.5×3.5 screw **(2)** that secures the TouchPad button board to the top cover.

4. Remove the TouchPad button board (3).



Reverse this procedure to install the TouchPad button board.

Fan

Description	Spare part number
Fan (includes cable)	686901-001



NOTE: To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left side and rear panel of the computer.

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

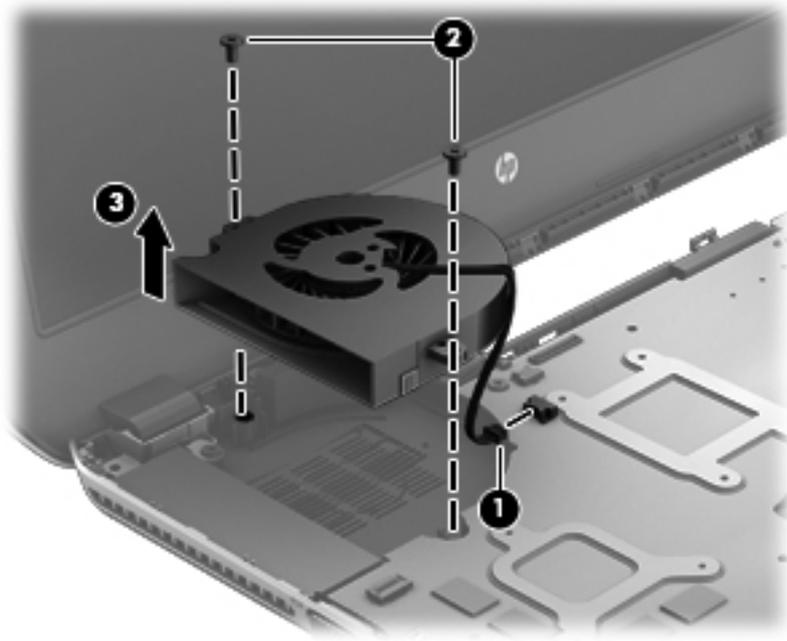
Before removing the fan, follow these steps:

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the fan to the base enclosure.

3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

System board



NOTE: The system board spare part kit includes replacement thermal material.

Description	Spare part number
For use only on computer models equipped with an AMD processor and an HD7670M graphics subsystem with 2048-MB discrete memory	687229-001
For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	687227-001
For use only on computer models equipped with an Intel processor and a 7670M graphics subsystem with 2048-MB discrete memory	686930-001
For use only on computer models equipped with an Intel processor and a 7670M graphics subsystem with 1024-MB discrete memory	686929-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	686928-001

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. WLAN module (see [WLAN module on page 62](#))
 - e. Solid-state drive (see [Solid-state drive on page 65](#))
 - f. Top cover (see [Top cover on page 66](#))
 - g. Fan (see [Fan on page 76](#))

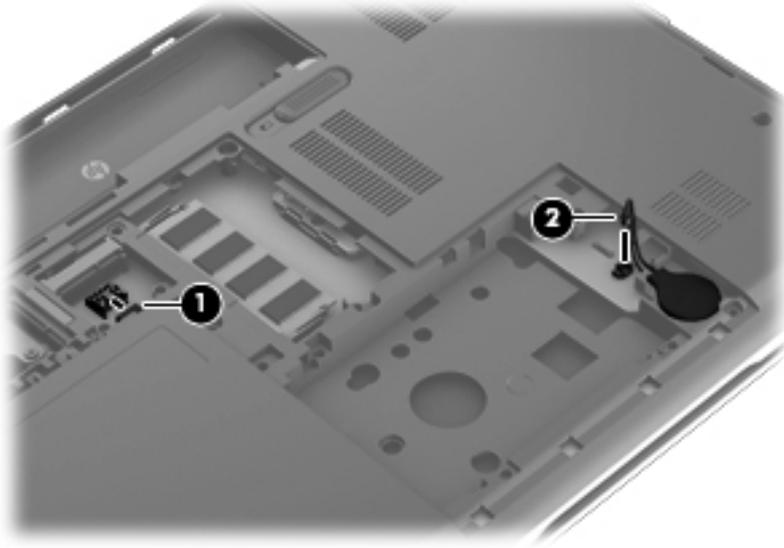


NOTE: When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

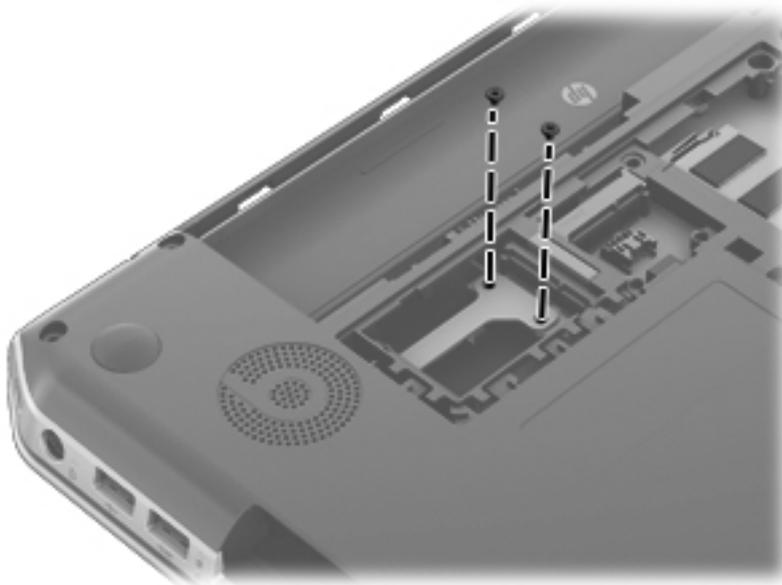
- Memory module (see [Memory module on page 56](#))
- Heat sink (see [Heat sink on page 81](#))
- Processor (see [Processor on page 84](#))

Remove the system board:

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

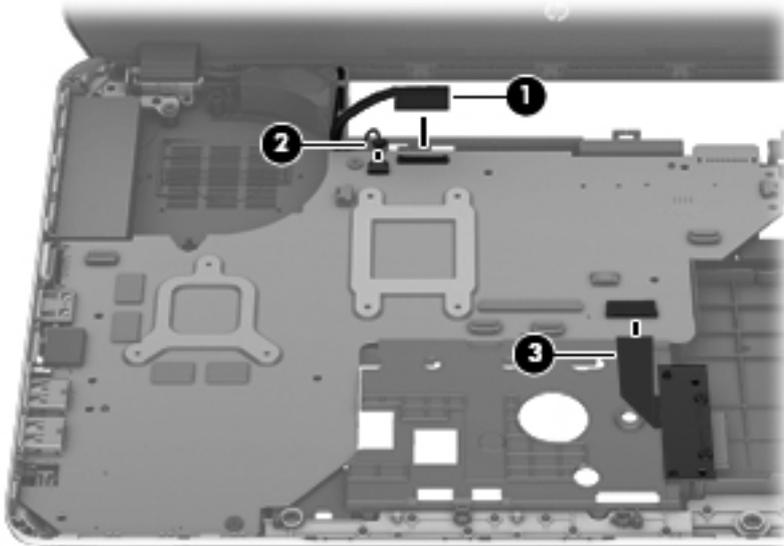


4. Remove the two Phillips PM2.0×3.0 screws that secure the USB board to the system board.

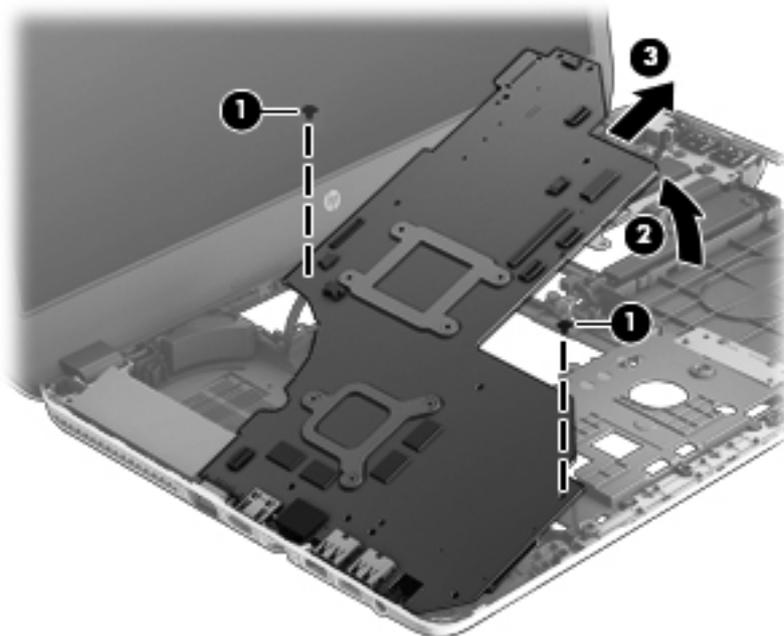


5. Turn the computer right side up, with the front toward you.
6. Open the computer.

7. Disconnect the following cables from the system board:
 - (1) Display panel cable
 - (2) Left speaker cable
 - (3) Optical drive connector board ZIF cable



8. Remove the two Phillips PM2.5×3.5 screws (1) that secure the system board to the base enclosure.
9. Lift the right side of the system board (2) until it rests at an angle.
10. Remove the system board (3) by sliding it up and to the right at an angle.



Reverse this procedure to install the system board.

Heat sink

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

Description	Spare part number
For use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory	687231-001
For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	687230-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory	686905-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	686904-001

Before removing the heat sink, 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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))
 - e. Fan (see [Fan on page 76](#))
 - f. System board (see [System board on page 78](#))

Remove the heat sink:

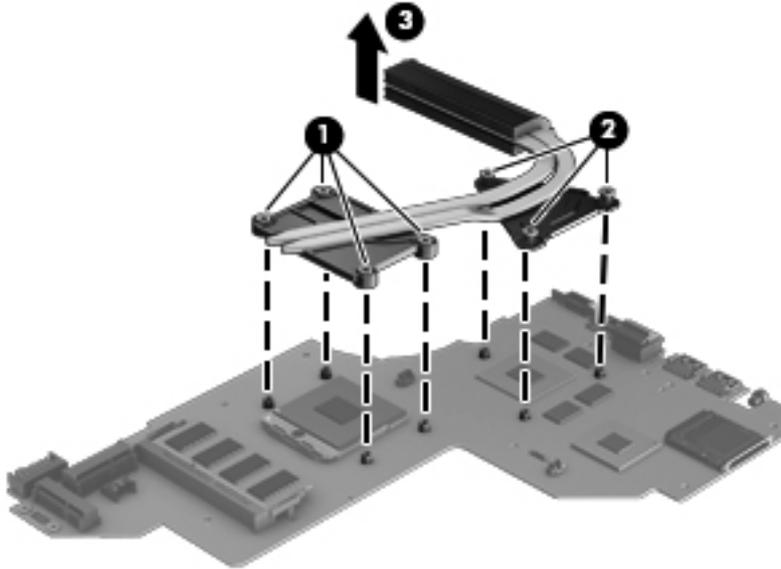
1. Turn the system board upside down, with the front toward you.

 **NOTE:** Step 2 applies to computer models equipped with a graphics subsystem with discrete memory. See step 3 for heat sink removal information for computer models equipped with a graphics subsystem with UMA memory.

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

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

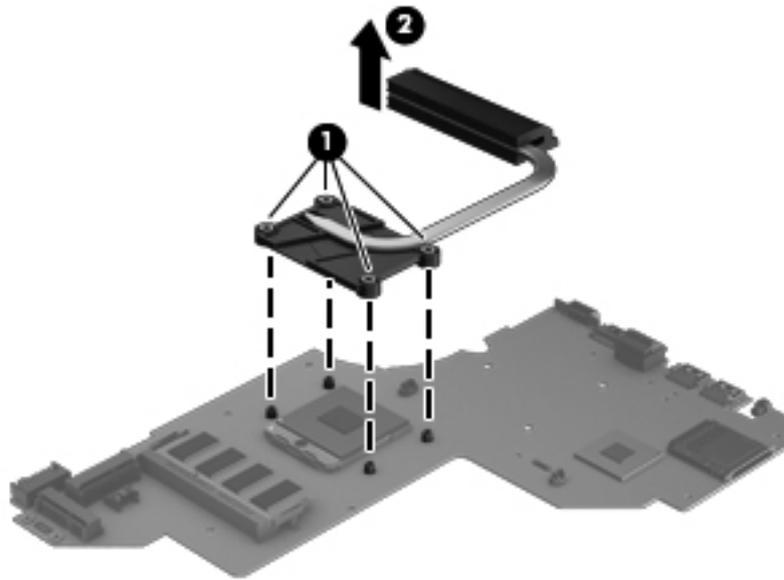
 **NOTE:** The following illustration shows the heat sink removal process for a computer model equipped with an AMD processor. The process for removing the heat sink on a computer model equipped with an Intel processor is identical.



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

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

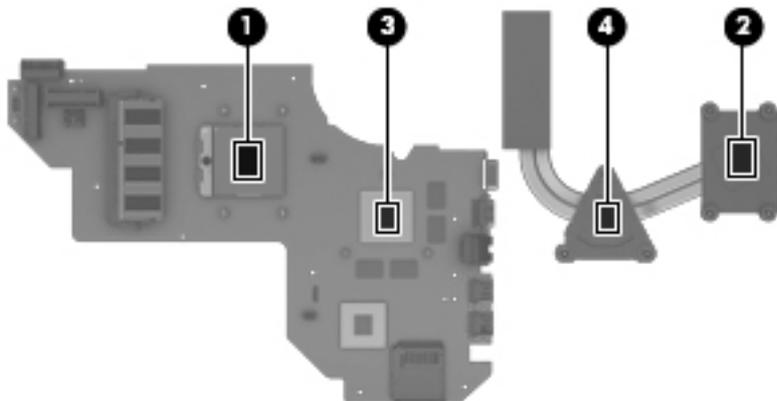
 **NOTE:** The following illustration shows the heat sink removal process for a computer model equipped with an AMD processor. The process for removing the heat sink on a computer model equipped with an Intel processor is identical.



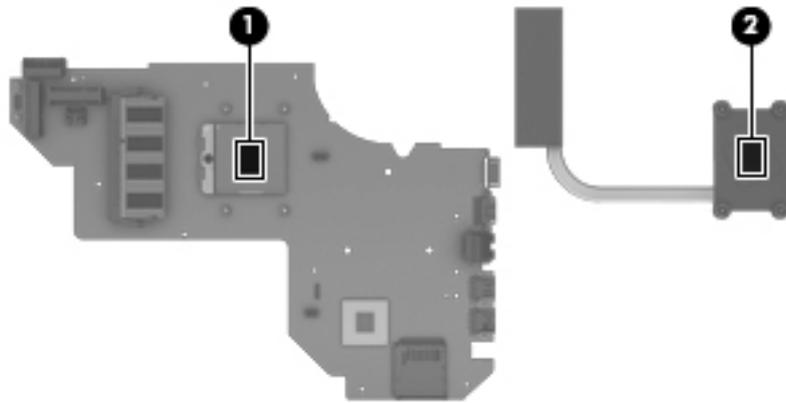
NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink, processor, and system board spare part kits.

The following illustration shows the replacement thermal material locations on a computer model equipped with 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



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



Reverse this procedure to install the heat sink.

Processor

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

Description	Spare part number
AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W)	683046-001
AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz, 4.0-MB L2 cache, quad core, 35 W)	683048-001
AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz, 1.0-MB L2 cache, dual core, 35 W)	683047-001
Intel Core i7-3612QM 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 6.0-MB L3 cache, quad core, 35 W)	680647-001
Intel Core i7-33520M 2.90-GHz processor (turbo up to 3.60-GHz; 1600-MHz, 4.0-MB L3 cache, dual core, 35 W)	681954-001
Intel Core i5-3360M 2.80-GHz processor (turbo up to 3.50-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	681953-001
Intel Core i5-3320M 2.60-GHz processor (turbo up to 3.30-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	681952-001
Intel Core i5-3210M 2.50-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W)	680645-001
Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W)	682417-001
Intel Core i3-2370M 2.40-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W)	677152-001
Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W)	653340-001

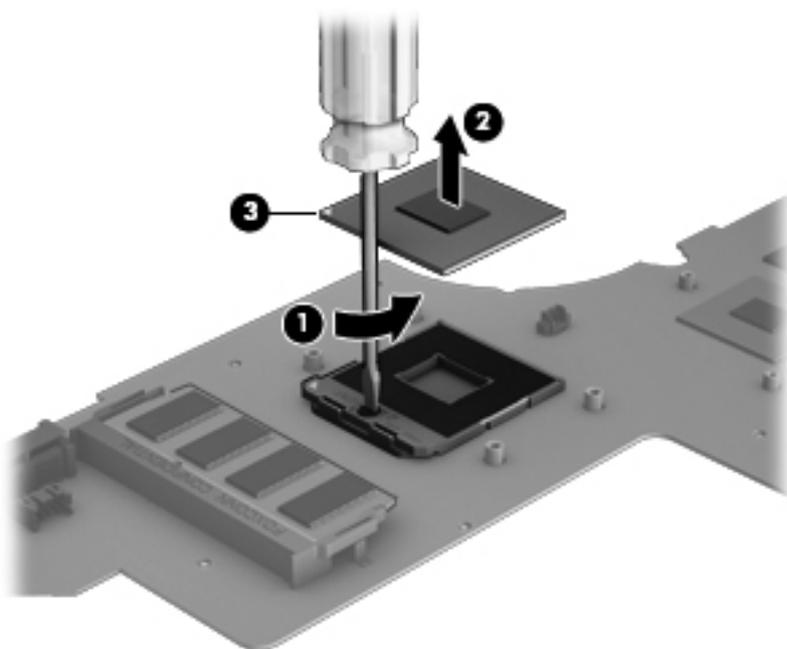
Before removing the processor, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))
 - e. Fan (see [Fan on page 76](#))
 - f. System board (see [System board on page 78](#))
 - g. Heat sink (see [Heat sink on page 81](#))

Remove the processor:

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

 **NOTE:** The gold triangle **(3)** 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.

Optical drive connector board

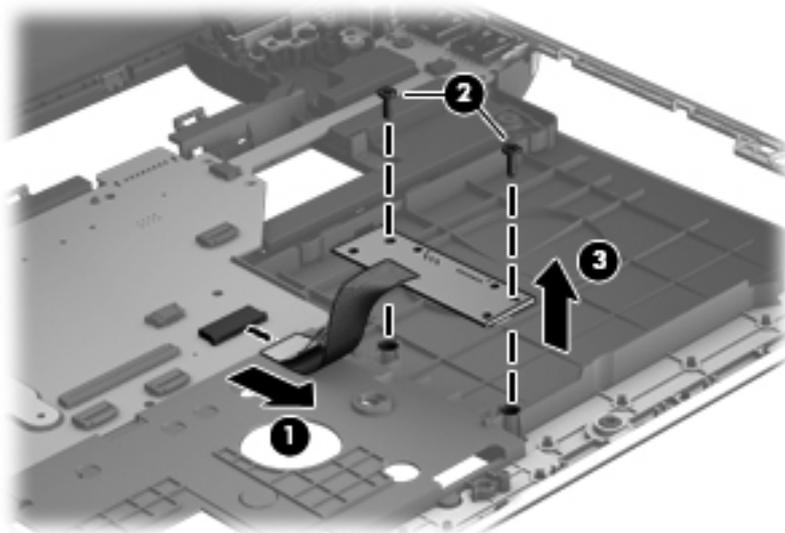
Description	Spare part number
Optical drive connector board (includes cable)	686899-001

Before removing the optical drive connector 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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))

Remove the optical drive connector board:

1. Release the ZIF connector to which the optical drive connector board cable is attached, and then disconnect the optical drive connector board cable **(1)** from the system board.
2. Remove the two Phillips PM2.5×3.5 screws **(2)** that secure the optical drive connector board to the base enclosure.
3. Remove the optical drive connector board **(3)** from the base enclosure.



Reverse this procedure to install the optical drive connector board.

Speakers

Description	Spare part number
Speakers (include cables and 4 rubber isolators)	686925-001

Before removing the speakers, follow these steps:

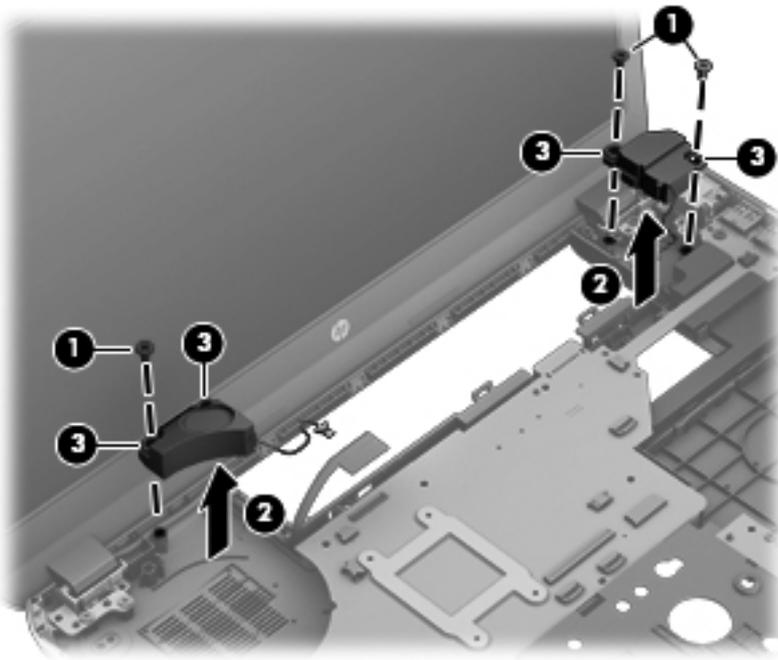
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))
 - e. Fan (see [Fan on page 76](#))

Remove the speakers:

1. Remove the three Phillips PM2.0×2.0 broad head screws **(1)** that secure the speakers to the base enclosure.

2. Remove the speakers (2) from the base enclosure.

 **NOTE:** The speakers includes four rubber isolators (3). These isolators are crucial to the performance of the speakers.



Reverse this procedure to install the speakers.

USB board

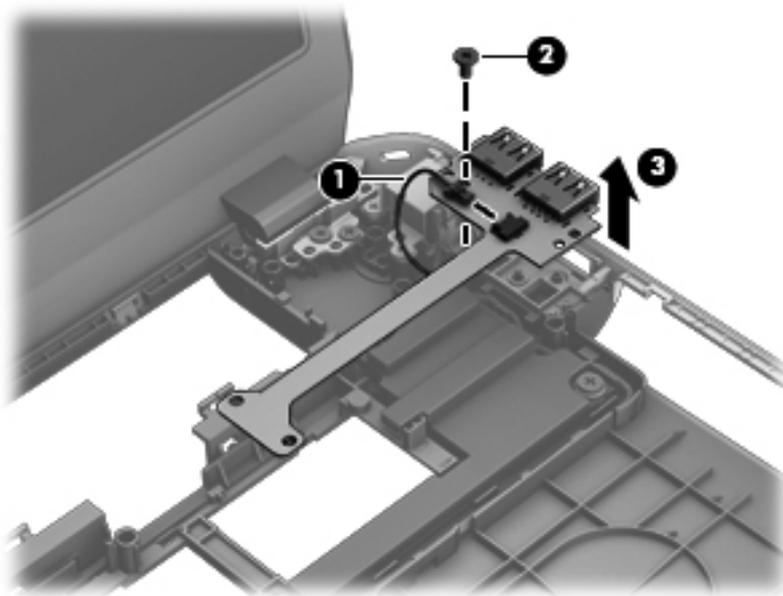
Description	Spare part number
USB board	686918-001

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))
 - e. Speakers (see [Speakers on page 87](#))

Remove the USB board:

1. Disconnect the subwoofer cable **(1)** from the USB board.
2. Remove the Phillips PM2.5×3.5 screw **(2)** that secures the USB board to the base enclosure.
3. Remove the USB board **(3)** from the base enclosure.



Reverse this procedure to install the USB board.

Subwoofer

Description	Spare part number
Subwoofer (includes cables and 2 rubber isolators)	686926-001

Before removing the subwoofer, follow these steps:

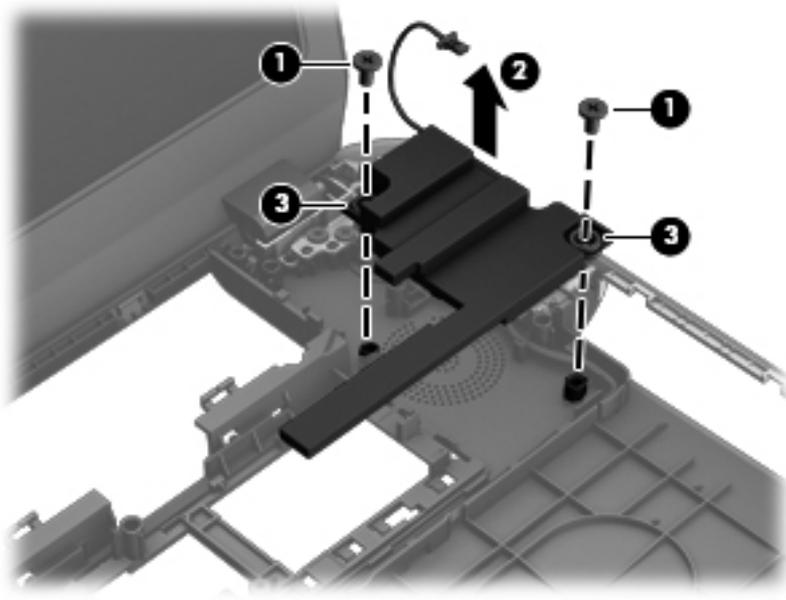
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))
 - e. Speakers (see [Speakers on page 87](#))
 - f. USB board (see [USB board on page 89](#))

Remove the subwoofer:

1. Remove the two Phillips PM2.0×2.0 broad head screws **(1)** that secure the subwoofer to the base enclosure.

2. Remove the subwoofer **(2)** from the base enclosure.

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



Reverse this procedure to install the subwoofer.

Power connector cable

Description	Spare part number
Power connector cable (includes bracket)	686900-001

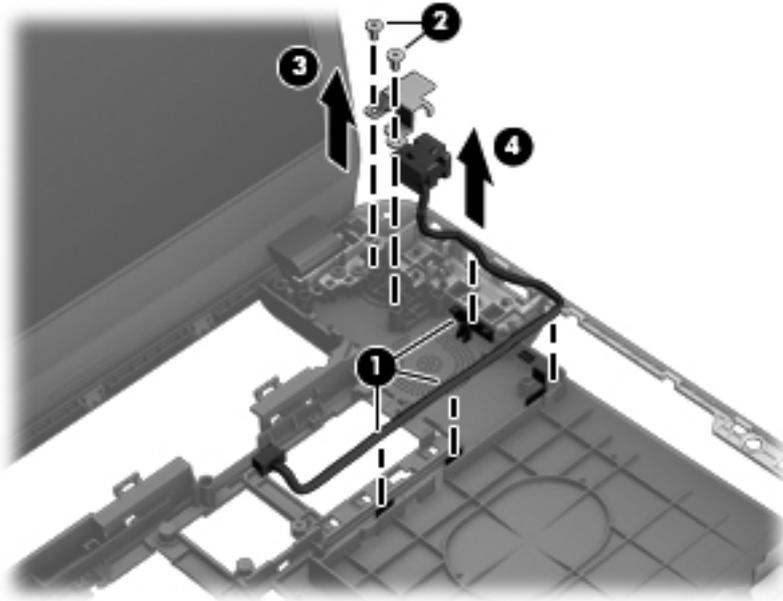
Before removing the power connector cable, follow these steps:

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))

- e. Speakers (see [Speakers on page 87](#))
- f. USB board (see [USB board on page 89](#))

Remove the power connector cable:

1. Release the power connector cable **(1)** from the clips and routing channel built into the base enclosure.
2. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the power connector and power connector bracket to the base enclosure.
3. Remove the power connector bracket **(3)**.
4. Release the power connector **(4)** from the clip built into the base enclosure.



5. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Display assembly

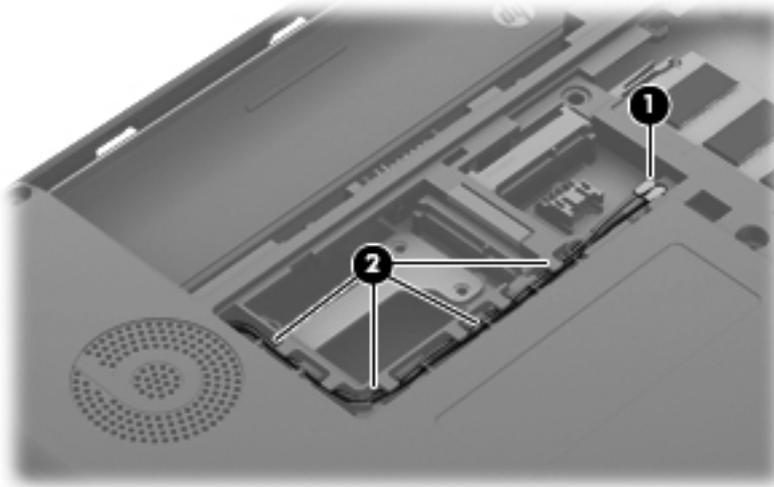
 **NOTE:** The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

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 48](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 49](#))
 - b. Optical drive (see [Optical drive on page 53](#))
 - c. Keyboard (see [Keyboard on page 57](#))
 - d. Top cover (see [Top cover on page 66](#))

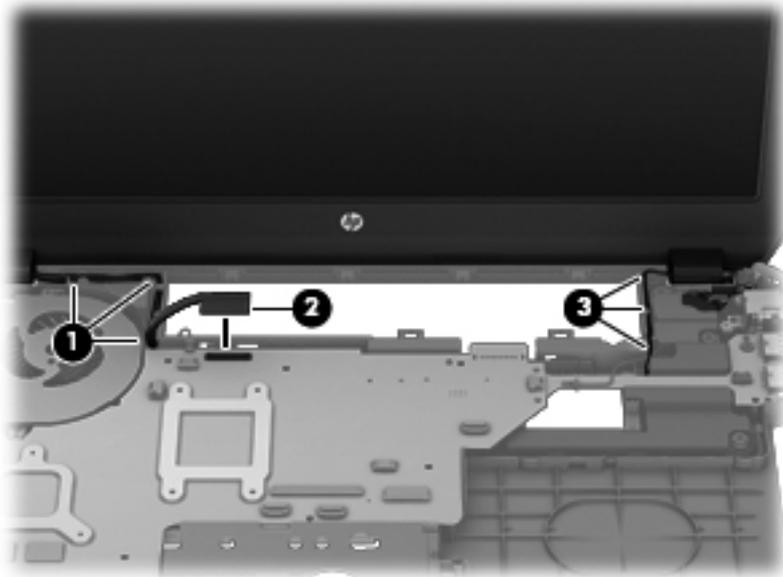
Remove the display assembly:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Release the wireless antenna cables **(1)** from the clips **(2)** and routing channel built into the base enclosure.



4. Turn the computer right side up, with the front toward you.
5. Open the computer.
6. Release the display panel cable from the clips **(1)** and routing channel built into the base enclosure.

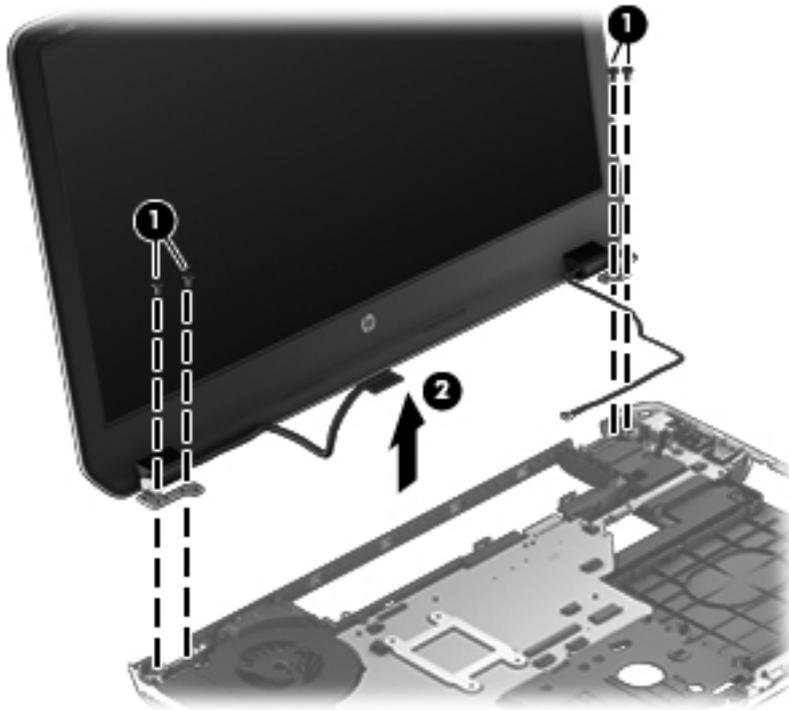
7. Disconnect the display panel cable **(2)** from the system board.
8. Release the wireless antenna cables from the clips **(3)** and routing channel built into the base enclosure.



⚠ 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.

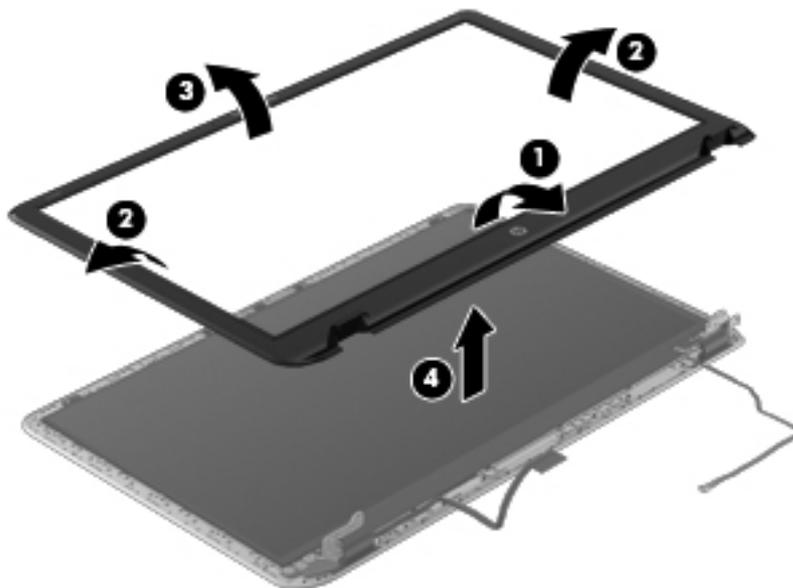
9. Remove the four Phillips PM2.5×5.0 screws **(1)** that secure the display assembly to the base enclosure.

- 10.** Remove the display assembly **(2)**.



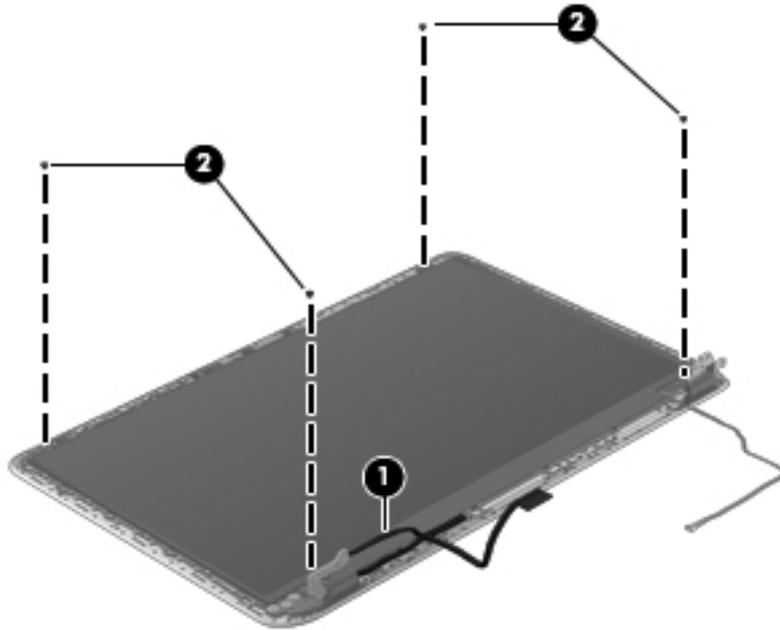
- 11.** If it is necessary to replace the display bezel or any of the display assembly subcomponents:

- a.** Flex the inside edges of the bottom edge **(1)**, the left and right sides **(2)**, and the top edge **(3)** of the display bezel until the bezel disengages from the display enclosure.
- b.** Remove the display bezel **(4)**. The display bezel is available using spare part number 686897-001.



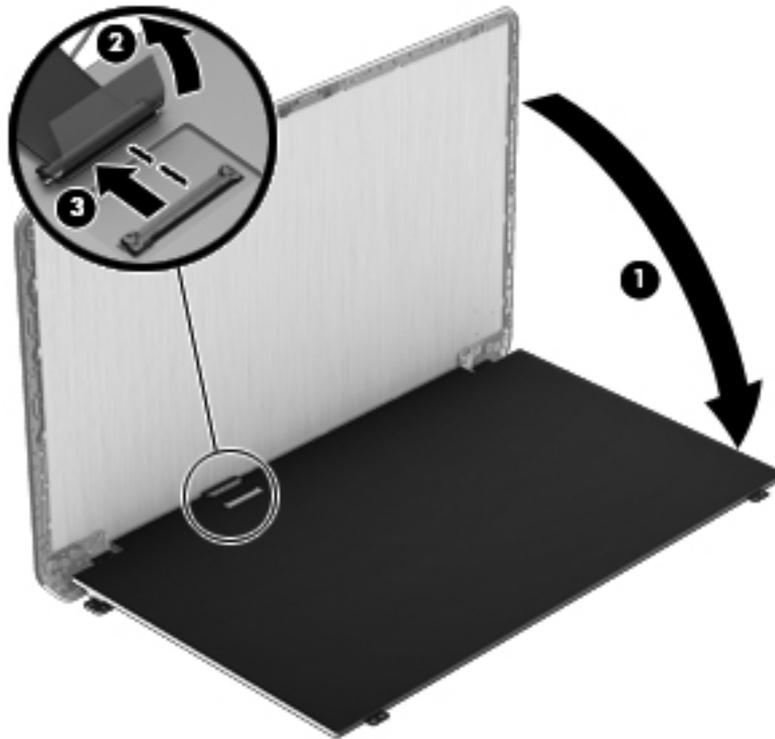
12. If it is necessary to replace the display panel:

- a.** Detach the display panel cable **(1)** from the display enclosure. (The display panel cable is attached to the display enclosure with double-sided tape.)
- b.** Remove the four Phillips PM2.0×2.0 screws **(2)** that secure the display panel to the display enclosure.



- c.** Lift the top edge of the display panel **(1)**, and then swing it up and forward until it rests upside down in front of the display enclosure.
- d.** Release the adhesive support strip **(2)** that secures the display panel cable to the display panel.

- e. Disconnect the display panel cable **(3)** from the display panel.



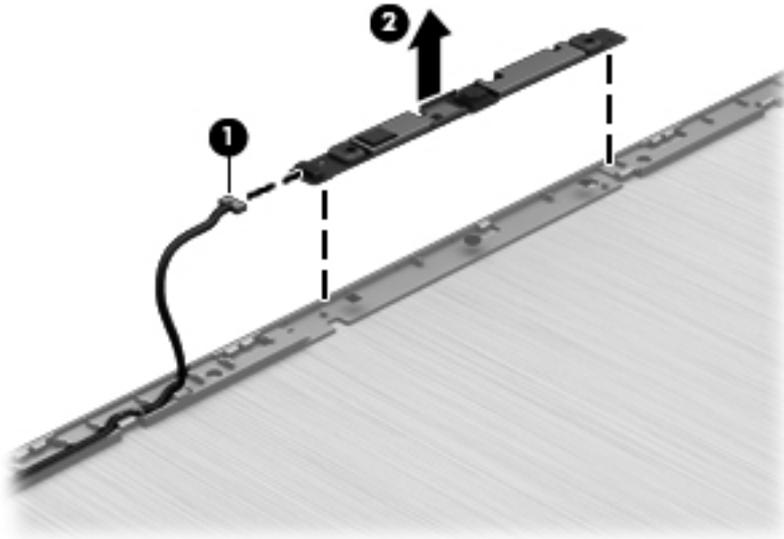
- f. Remove the display panel. The display panel is available using spare part number 686921-001.

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

- a. Disconnect the webcam/microphone module cable **(1)** from the webcam/microphone module.

⚠ CAUTION: Handle the webcam/microphone module with caution. The module has a thin profile and is susceptible to damage when not handled carefully.

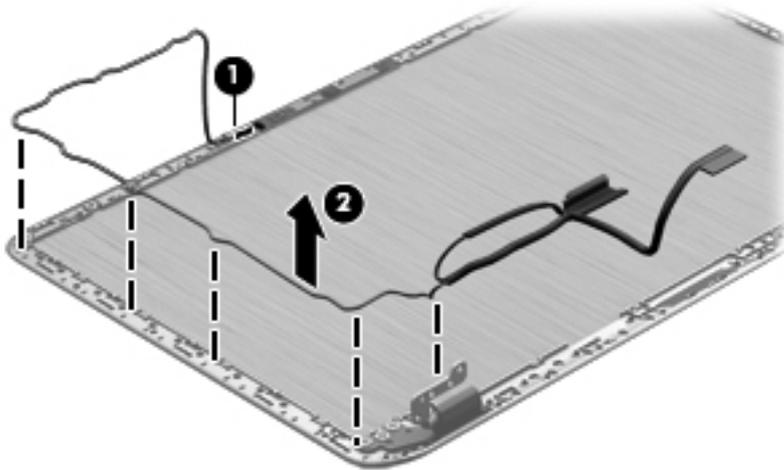
- b.** Detach the webcam/microphone module **(2)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided tape.)



- c.** Remove the webcam/microphone module. The webcam/microphone module is available using spare part number 686587-001.

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

- a.** Disconnect the webcam/microphone module cable **(1)** from the webcam/microphone module.
- b.** Release the display panel cable **(2)** from the clips and routing channel built into display enclosure.

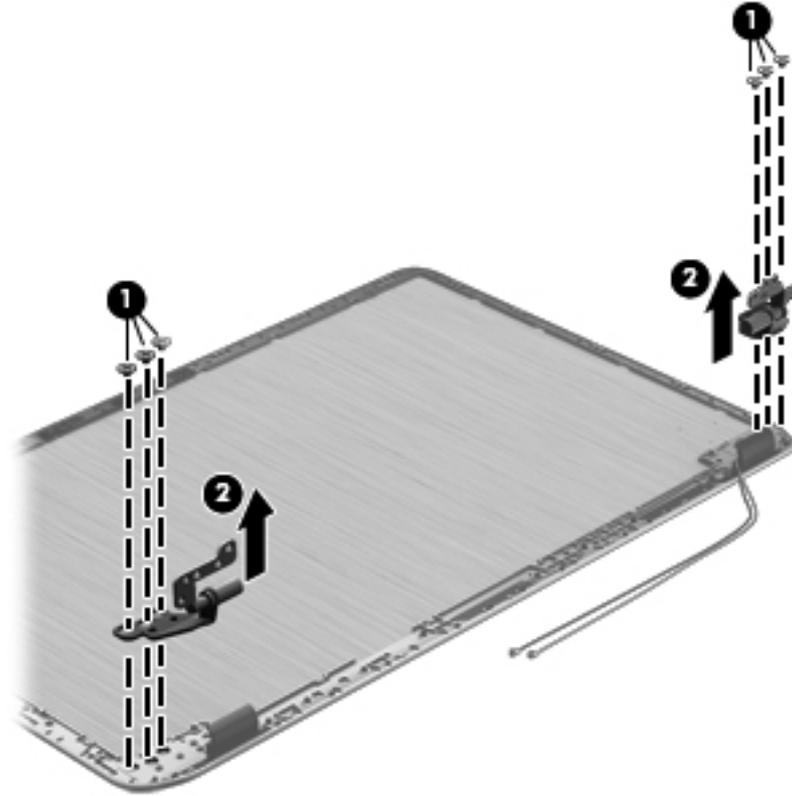


- c.** Remove the display panel cable. The display panel cable is available using spare part number 686898-001.

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

- a.** Remove the six Phillips 2.5×3.0 broad head screws **(1)** that secure the display hinges to the display enclosure.

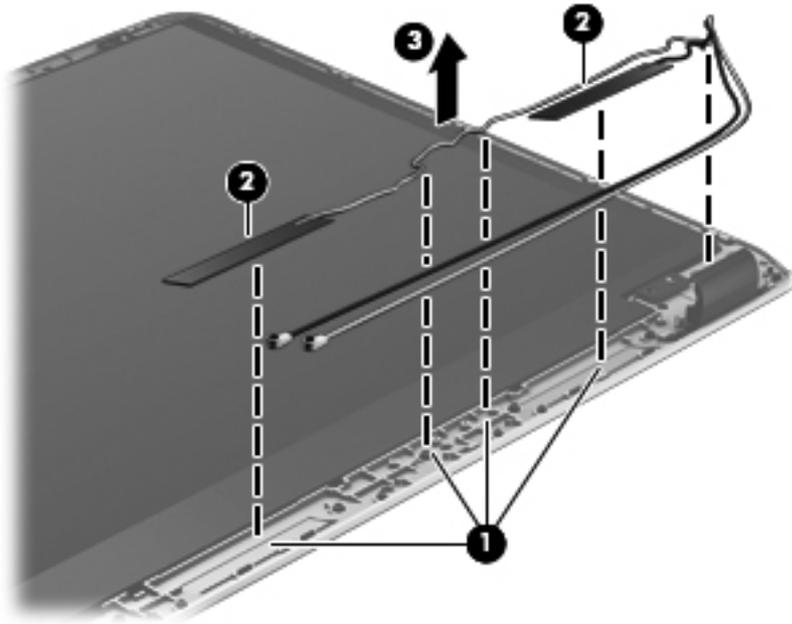
- b.** Remove the display hinges (**2**). The display hinges are available using spare part number 686913-001.



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

- a.** Release the wireless antenna cables from the clips (**1**) and routing channel built into the display enclosure.
- b.** Detach the wireless antenna transceivers (**2**) from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)

- c. Remove the wireless antenna cables and transceivers **(3)**. The wireless antenna cables and transceivers are available using spare part number 686894-001.



Reverse this procedure to reassemble and 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), follow these steps:

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

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

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

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

Downloading a BIOS update

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

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

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

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

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

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

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

1. Open Windows Explorer by selecting **Start > Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, filename.exe). The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

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

Using System Diagnostics

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

To start System Diagnostics:

1. Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.

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

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	37.95 cm	14.94 in
Depth	25.07 cm	9.87 in
Height (front to back)	2.21 to 2.65 cm	0.87 to 1.04 in
Weight	2.40 kg	5.28 lb
Input power		
Operating voltage and current	Operating voltage and current 18.5 V dc @ 3.5 A – 65 W 19.5 V dc @ 3.33 A – 65 W 19 V dc @ 4.74 A – 90 W 19.5 V dc @ 4.62 A – 90 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

15.6-inch WGA display specifications

	Metric	U.S.
Dimensions		
Height	19.6 cm	7.72 in
Width	34.7 cm	13.66 in
Diagonal	39.8 cm	15.67 in
Number of colors	up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	250 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	3.46 W	
Viewing angle	±65° horizontal, +50° vertical (typical)	

Hard drive specifications

	1-TB*	750-GB**	640-GB**	500-GB**	320-GB**
Dimensions					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 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
Interface type	SATA	SATA	SATA	SATA	
Transfer rate					
Synchronous (maximum)	1.1 GB/sec	1.1 GB/sec	1.1 GB/sec	1.1 GB/sec	1.1 GB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)					
Single track	2.0 ms	2.0 ms	1.5 ms	1.5 ms	1.5 ms
Average (read/write)	12/16 ms	12/16 ms	11/13 ms	11/13 ms	11/13 ms
Maximum	21 ms	22 ms	22 ms	22 ms	22 ms
Logical blocks	1,953,525,168	1,465,149,168	1,282,009,226	976,773,168	628,142,448
Disk rotational speed	5400 rpm	7200 and 5400 rpm	5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm
Operating temperature	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.					
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.					

7 Backup and recovery

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

This chapter provides information about the following topics:

- Creating a set of recovery discs or a recovery flash drive (HP Recovery Manager software feature)
- Performing a system restore (from the recovery partition, recovery discs, or a recovery flash drive)
- Backing up your information
- Recovering a program or driver

Restore

In the event of hard drive failure, to restore your system to its factory image you must use a set of recovery discs or a recovery flash drive that you have created using HP Recovery Manager. HP recommends that you use HP Recovery Manager immediately after software setup to create either a set of recovery discs or a recovery flash drive.

If you need to restore your system for some other reason than hard drive failure, you can use the HP Recovery partition (select models only), without the need for recovery discs or a recovery flash drive. To check for the presence of a recovery partition, click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**. If the recovery partition is present, a Recovery drive is listed in the window.

 **CAUTION:** HP Recovery Manager (partition or discs/flash drive) restores only the software that was installed at the factory. Software not provided with this computer must be reinstalled manually.

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

Creating recovering media

HP recommends that you create either a set of recovery discs or a recovery flash drive to be sure that you can restore your computer to its original factory state if the hard drive fails, or if for any reason you cannot restore using the recovery partition tools. Create these discs or the flash drive after setting up the computer for the first time.

 **NOTE:** HP Recovery Manager allows the creation of only one set of recovery discs or one recovery flash drive. Handle these discs or the flash drive carefully and keep them in a safe place.

 **NOTE:** If your computer does not include an integrated optical drive, you can use an optional external optical drive (purchased separately) to create recovery discs, or you can purchase recovery discs for your computer from the HP website. If you use an external optical drive, it must be connected directly to a USB port on the computer, not to a USB port on an external device, such as a USB hub.

Guidelines:

- Purchase high-quality DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs.

 **NOTE:** Read-write discs, such as CD-RW, DVD±RW, double-layer DVD±RW, and BD-RE (rewritable Blu-ray) discs, are not compatible with the HP Recovery Manager software.

- The computer must be connected to AC power during this process.
- Only one set of recovery discs or one recovery flash drive can be created per computer.

 **NOTE:** If you are creating recovery discs, number each disc before inserting it into the optical drive.

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

To create a set of recovery discs or a recovery flash drive:

1. Select **Start > All Programs > HP Help and Support > HP Recovery Manager > HP Recovery Media Creation**.
2. Follow the on-screen instructions.

Performing a system restore

HP Recovery Manager software allows you to repair or restore the computer to its original factory state. HP Recovery Manager works from recovery discs or a recovery flash drive, or from a dedicated recovery partition (select models only) on the hard drive.

 **NOTE:** A system restore must be performed if the computer hard drive has failed or if all attempts to correct any functional computer issues fail. A system restore should be used only as a final attempt to correct computer issues.

Note the following when performing a system restore:

- You can restore the system only if you have previously backed it up. HP recommends that as soon as you set up the computer you use HP Recovery Manager to create either a set of recovery discs or a recovery flash drive.
- Windows has its own built-in repair features, such as System Restore. If you have not already tried these features, try them before using HP Recovery Manager.
- HP Recovery Manager restores only software that was installed at the factory. Software not provided with this computer must be downloaded from the manufacturer's website or reinstalled from the disc provided by the manufacturer.

Restoring using the dedicated recovery partition (select models only)

When using the dedicated recovery partition, you can back up pictures, music and other audio, videos and movies, recorded TV shows, documents, spreadsheets and presentations, email, and Internet favorites and settings during this process.

To restore the computer from the recovery partition, follow these steps:

1. Access HP Recovery Manager in either of the following ways:
 - Select **Start > All Programs > HP Help and Support > HP Recovery Manager > HP Recovery Manager**.
 - or –
 - Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen. Then, press **f11** while the “F11 (System Recovery)” message is displayed on the screen.
2. Click **System Recovery** in the HP Recovery Manager window.
3. Follow the on-screen instructions.

Restoring using the recovery media

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

– or –

Insert the recovery flash drive into a USB port on your computer, and then restart the computer.

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

Changing the computer boot order

To change the boot order for recovery discs:

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

To change the boot order for a recovery flash drive:

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

Backing up and recovering your information

It is very important to back up your files and keep any new software in a safe place. As you add new software and data files, continue to create backups on a regular basis.

How completely you are able to recover your system depends on how recent your backup is.

 **NOTE:** A recovery from your most recent backup should be performed if the computer is attacked by a virus or if any major system components fail. In order to correct computer issues, attempt a recovery before you attempt a system restore.

You can back up your information to an optional external hard drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times

 **TIP:** TIP: Set reminders to back up your information periodically.

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

Guidelines:

- Create system restore points using the Windows System Restore feature, and periodically copy them to an optical disc or an external hard drive. For more information about using system restore points, see the “Using Windows system restore points” section.
- Store personal files in the Documents library and back up this folder periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reenter your preferences.

To create a screen shot:

1. Display the screen you want to save.
2. Copy the screen image.

To copy only the active window, press **alt+prt sc**.

To copy the entire screen, press **prt sc**.

3. Open a word-processing document, and then select **Edit > Paste**. The screen image is added to the document.
4. Save and print the document.

Using Windows Backup and Restore

Guidelines

- Connect the computer to AC power before you start the backup process.
- Allow enough time to complete the backup process. Depending on file sizes, it may take over an hour.

To create a backup:

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



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

Using Windows system restore points

A system restore point allows you to save and name a snapshot of your hard drive at a specific point in time. You can then recover back to that point if you want to reverse subsequent changes.



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

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

When to create restore points

- Before you add or modify software or hardware
- Periodically, whenever the computer is functioning optimally

Create a system restore point

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

Restore to a previous date and time

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

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

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

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

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	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-mm² 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-mm² 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-mm² 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-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

9 Recycling

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

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP Web site at <http://www.hp.com/recycle>.

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