HP Pavilion TouchSmart 11 Notebook PC

Maintenance and Service Guide

First Edition: June 2013

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Product notice

This guide describes features that are
common to most models. Some features may
not be available on your computer.

Not all features are available in all editions
of Windows 8. This computer may require
upgraded and/or separately purchased
hardware, drivers, and/or software to take
full advantage of Windows 8 functionality.
See for http://www.microsoft.com details.

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
Product Name	HP Pavilion TouchSmart 11 Notebook PC
Processor	AMD® A6-1450 1.40-GHz processor (1.00-GHz front-side bus (FSB), 2.00-MB L2 cache, DDR3L-1066-MHz, quad core, 8 W, with dynamic configurable TDP) AMD A4-1250 1.00-GHz processor (1.00-GHz FSB, 1.00-MB L2 cache, DDR3L-1333-MHz, dual core, 8 W)
Chipset	AMD system on chip (SoC) fusion controller hub (FCH) integrated in accelerated processing unit (APU)
Graphics	**Internal graphics:** ● AMD Radeon™ HD 8250 Graphics on computer models equipped with an AMD A6-1450 processor ● AMD Radeon HD 8210 Graphics on computer models equipped with an AMD A4-1250 processor Support for DX11, HD decode, and HDMI
Panel	11.6-in (1366×768), high-definition (HD), white light emitting diode (WLED), AntiGlare, TouchScreen with MultiTouch enabled; 16:9 ultra-wide aspect ratio; typical brightness: 200 nits; slim (3.6-mm) Supports low-voltage differential signaling (LVDS)
Memory	One customer-accessible/upgradable memory module slots Support for DDR3L-1066-MHz at 1.35-V single channel (DDR3L-1600-MHz downgrade to DDR3L-1066-MHz) Support for 8192-MB of system RAM in the following configurations: ● 8192 MB × 1 ● 4096 MB × 1

Category	Description
Hard drive	Support for 6.35-cm (2.5-in) hard drives in 7.0-mm (.28-in) thickness
	Support for Serial ATA
	Support for Accelerometer hard drive protection
	Support for the following hard drives:
	• 500-GB, 5400-rpm, 7.0-mm
	• 320-GB, 5400-rpm, 7.0-mm
Optical drive	Support for external DVD±RW Double-Layer with SuperMulti Drive only
Audio and video	Integrated HP TrueVision webcamera: HD (1280×720 by 30 frames per second), fixed (no tilt), with activity light
	Single digital microphone with appropriate echo-cancellation and noise-suppression software
	dts Sound+ (uses Realtek ALC3227-GR audio codec)
	Two speakers
Ethernet	Integrated 10/100 network interface card (NIC)
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module
	Two WLAN antennas built into display assembly
	Support for the following WLAN formats:
	• Atheros AR9485 802.11b/g/n WiFi Adapter
	• Broadcom BCM943228HMB 802.11abgn 2x2 Wi-Fi Adapter, Broadcom Bluetooth 4.0 Adapter
	• Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter
	• Realtek RTL8188EE 802.11bgn Wi-Fi Adapter
External media cards	HP multiformat Micro Digital Media Reader Slot with push-push technology. Reads data from and writes data to digital memory cards such as Secure Digital (SD).
Ports	• AC adapter: HP Smart pin plug (4.5-mm barrel)
	• Audio: one combo audio-out (headphone)/audio-in (microphone) jack, supports jack auto-detection
	• HDMI: v. 1.4, supporting up to 1080p, 1920×1080 at 60 Hz
	• RJ45/Ethernet
	• USB: USB 3.0 = 2, USB 2.0 = 1
	• Video: VGA (Dsub 15-pin) supporting 1920×1200 external resolution at 60 Hz, hot plug/unplug and auto-detection for correct output to wide-aspect vs. standard aspect video

Category	Description
Keyboard/pointing devices	91%-size, textured, island-style keyboard (no numerical keypad)
	Touchpad requirements:
	• 2013 Touchpad
	• Taps enabled as default
	◦ 2-finger scroll
	◦ Pinch/zoom
	◦ Edge swipe
	Support for PS/2 interface
	Support for Multi Gestures, with ability to turn on and off
	Support for Windows 8 Modern TouchPad Gestures
Power requirements	Support for the following AC adapters:
	• 65-W HP Smart AC adapter (non-PFC, 4.5-mm)
	• 65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm)
	Support for a 3-cell, 36-Wh, 3.20-Ah, Li-ion battery
Security	Support for security cable lock
Operating system	**Preinstalled**: Windows 8
Serviceability	**End user replaceable parts:**
	• AC adapter
	• Battery (system)
	• Hard drive
	• Memory
	• Service cover
	• WLAN module

2 External component identification

Display

Item	Component	Description
(1)	Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on. **NOTE:** The internal display switch is not visible from the outside of the computer.
(2)	WLAN antennas (2)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs). **NOTE:** To set up a WLAN and connect to the Internet, you need a broadband modem (either DSL or cable, purchased separately), high-speed Internet service purchased from an Internet service provider, and a wireless router (purchased separately).
(3)	Webcamera light	On: The webcamera is in use.

Item	Component	Description
(4)	HP TrueVision HD Webcamera	Records video, captures still photographs, and provides access to video conferences and online chat by means of streaming video. To use the webcamera, from the Start screen, type c, and then select **CyberLink YouCam** from the list of applications.
(5)	Internal microphone	Records sound.
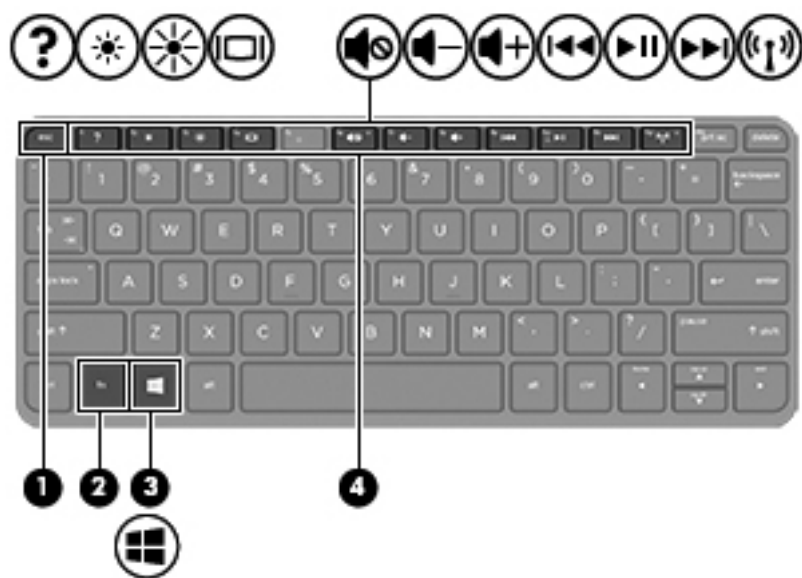
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. To access this guide, from the Start screen, type support, select the **HP Support Assistant** app, select **My computer**, and then select **User guides**.

Buttons and speakers

Item	Component	Description
(1)	Power button	• 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.
		CAUTION: Pressing and holding down the power button will result in the loss of unsaved information. 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. To learn more about your power settings, see your power options. From the Start screen, type `power`, select **Settings**, and then select **Power Options** from the list of applications.
(2)	Speakers (2)	Produce sound.

Keys

Item	Component	Description
(1)	esc key	Reveals system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with the esc key.
(3)	Windows key	Returns you to the Start screen from an open app or the Windows desktop. **NOTE:** Pressing the Windows key again will return you to the previous screen.
(4)	Action keys	Execute frequently used system functions.

Lights

Item	Component	Description
(1)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(3)	Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.
(4)	Wireless light	On: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on. **NOTE:** On some models, the wireless light is amber when all wireless devices are off.

TouchPad
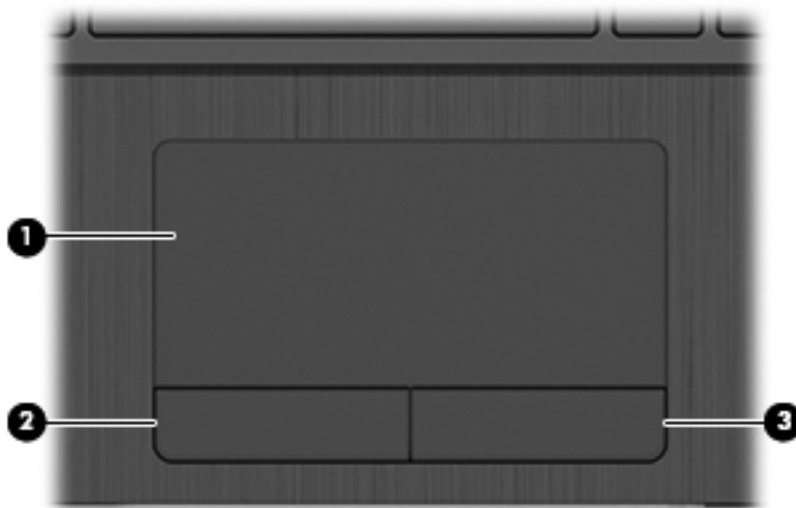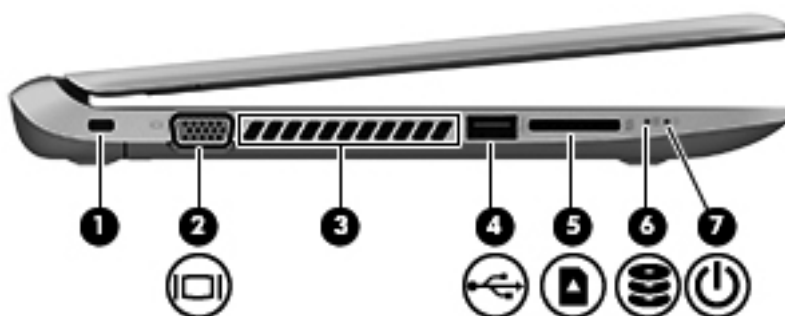
Item	Component	Description
(1)	TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen. **NOTE:** The TouchPad also supports edge-swipe gestures.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Left side

Item	Component	Description
(1)	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.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	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.
(4)	USB 2.0 port	Connects an optional USB device.
(5)	Memory card reader	Reads data from and writes data to memory cards such as Secure Digital (SD) memory cards.
(6)	Hard drive light	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(7)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.

Right side

Item	Component	Description
(1)	Audio-out (headphone) jack/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. 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 *Regulatory, Safety, and Environmental Notices*. To access this guide, from the Start screen, type `support`, select the **HP Support Assistant** app, select **My computer**, and then select **User guides**.
		NOTE: When a device is connected to the jack, the computer speakers are disabled.
		NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(2)	USB 3.0 port	Connect optional USB devices.
(3)	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	AC adapter light	• 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 battery power.
(6)	Power connector	Connects an AC adapter.

Bottom

Item	Component	Description
(1)	Service cover	Provides access to the hard drive bay, the WLAN module slot, and the memory module slot.
		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. From the Start screen, type h, and then select Help and Support.
(2)	Battery lock latch	Locks the battery into the battery bay.
(3)	Battery bay	Holds the battery.
(4)	Battery release latch	Releases the battery from the battery bay.

3 Illustrated parts catalog

Locating the serial number, product number, and model number

You may need the information shown in the following illustration when you travel internationally or when you contact support.
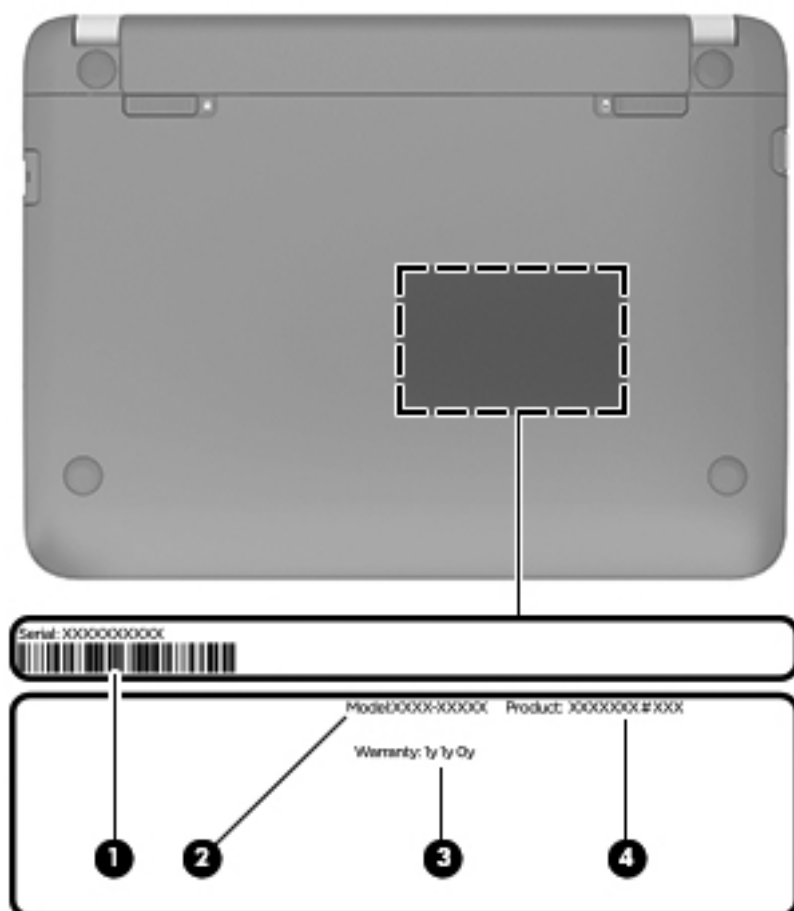
Computer major components

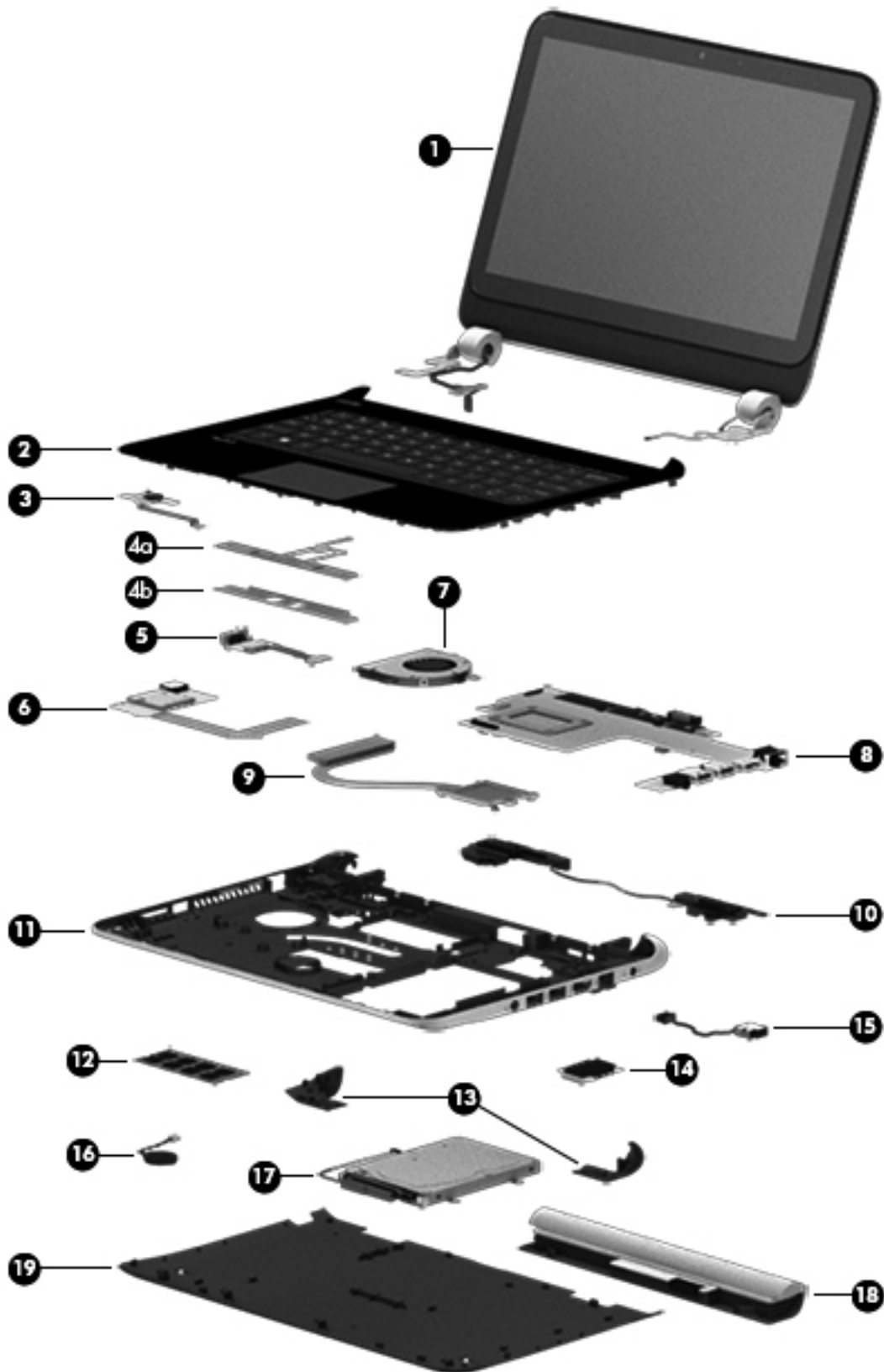| Item	Component	Spare part number
(1)	**11.6-inch, AG, SVA, LED TouchScreen display assembly** (includes webcamera/microphone module and wireless antenna cables)	730892-001
(2)	**Keyboard/top cover** (includes keyboard cable and TouchPad):	
	For use in Belgium	730895-A41
	For use in Bulgaria	730895-BA1
	For use in Canada	730895-DB1
	For use in the Czech Republic and Slovakia	730895-FL1
	For use in Denmark, Finland, and Norway	730895-DH1
	For use in France	730895-051
	For use in Germany	730895-041
	For use in Israel	730895-BB1
	For use in Japan	730895-291
	For use in Latin America	730895-161
	For use in the Netherlands	730895-B31
	For use in Portugal	730895-131
	For use in Russia	730895-251
	For use in Saudi Arabia	730895-171
	For use in South Korea	730895-AD1
	For use in Spain	730895-071
	For use in Switzerland	730895-BG1
	For use in Taiwan	730895-AB1
	For use in Thailand	730895-281
	For use in the United Kingdom and Singapore	730895-031
	For use in the United States	730895-001
(3)	**Power button board** (includes cable)	730899-001
	TouchPad button board, includes:	730898-001
(4a)	TouchPad button board (includes TouchPad cable and TouchPad button board cable)	
(4b)	TouchPad button board bracket	
(5)	**Monitor connector board** (includes cable)	730897-001
(6)	**Media card reader board** (includes cable and USB connector)	730901-001
(7)	**Fan** (includes cable and cowling)	730903-001
(8)	**System board** (includes replacement thermal material):	

Item	Component	Spare part number
	Equipped with an AMD A6-1450 processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system	730894-501
	Equipped with an AMD A6-1450 processor, a graphics subsystem with UMA memory, and the Linux operating system	730894-001
	Equipped with an AMD A4-1250 processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system	730893-501
	Equipped with an AMD A4-1250 processor, a graphics subsystem with UMA memory, and the Linux operating system	730893-001
(9)	**Heat sink** (includes 4 captive screws and replacement thermal material)	730902-001
(10)	**Speaker Kit** (includes left and right speakers and cables)	730890-001
(11)	**Bottom cover** (includes left and right corner covers, items 13)	730887-001
(12)	**Memory module** (PC3L, 12800, 1600-MHz):	
	8-GB	693374-001
	4-GB	691740-001
(13)	**Rear corner covers** (2, included with the bottom cover, spare part number 730887-001)	
(14)	**WLAN module:**	
	Atheros AR9485 802.11b/g/n WiFi Adapter	675794-001
	Broadcom BCM943228HMB 802.11abgn 2x2 Wi-Fi Adapter, Broadcom Bluetooth 4.0 Adapter	730668-001
	Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
	Realtek RTL8188EE 802.11bgn Wi-Fi Adapter	709848-001
(15)	**Power connector cable** (includes bracket)	730900-001
(16)	**RTC battery** (includes cable and double-sided adhesive)	738824-001
(17)	**Hard drive** (does not include hard drive bracket, hard drive connector cable, or screws):	
	500-GB, 5400-rpm, 7.0-mm	683802-001
	320-GB, 5400-rpm, 7.0-mm	645193-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, hard drive connector cable, and screws)	731424-001
(18)	**3-cell, 36-Wh, 3.20-Ah, Li-ion battery**	729892-001
(19)	**Service cover**	737253-001

Mass storage devices

Item	Component	Spare part number
(1)	**Hard drive** (does not include hard drive bracket, hard drive connector cable, or screws):	
	500-GB, 5400-rpm, 7.0-mm	683802-001
	320-GB, 5400-rpm, 7.0-mm	645193-001
	Hard Drive Hardware Kit, includes:	731424-001
(2a)	Hard drive bracket	
(2b)	Hard drive connector cable	
	Screws (not illustrated)	
(3)	**External DVD±RW Double-Layer with SuperMulti Drive**	659940-001

Miscellaneous parts

Component	Spare part number
AC adapter	
65-W HP Smart AC adapter (non-PFC, 4.5-mm)	710412-001
65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm)	714657-001
Power cord (3-pin, black, 1.83-m):	
For use in Argentina	490371-D01
For use in Denmark	490371-081
For use in Europe	490371-021
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 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
Rubber Feet Kit (includes 2 rear rubber feet)	730888-001
Screw Kit	730889-001

Sequential part number listing

Spare part number	Description
490371-001	Power cord for use in North America (3-pin, black, 1.83-m)
490371-021	Power cord for use in Europe (3-pin, black, 1.83-m)
490371-031	Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.83-m)
490371-061	Power cord for use in Italy (3-pin, black, 1.83-m)
490371-081	Power cord for use in Denmark (3-pin, black, 1.83-m)
490371-111	Power cord for use in Switzerland (3-pin, black, 1.83-m)
490371-201	Power cord for use in Thailand (3-pin, black, 1.83-m)
490371-291	Power cord for use in Japan (3-pin, black, 1.83-m)

Spare part number	Description
490371-AB1	Power cord for use in Taiwan (3-pin, black, 1.83-m)
490371-AD1	Power cord for use in South Korea (3-pin, black, 1.83-m)
490371-BB1	Power cord for use in Israel (3-pin, black, 1.83-m)
490371-D01	Power cord for use in Argentina (3-pin, black, 1.83-m)
645193-001	320-GB, 5400-rpm, SATA, 7.0-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 731424-001.
659940-001	External DVD±RW Double-Layer with SuperMulti Drive
675794-001	Atheros AR9485 802.11b/g/n WiFi Adapter
683802-001	500-GB, 5400-rpm, SATA, 7.0-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 731424-001.
690020-001	Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter
691740-001	4-GB memory module (PC3L, 12800, 1600-MHz)
693374-001	8-GB memory module (PC3L, 12800, 1600-MHz)
709848-001	Realtek RTL8188EE 802.11bgn Wi-Fi Adapter
710412-001	65-W HP Smart AC adapter (non-PFC, 4.5-mm)
714657-001	65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm)
729892-001	3-cell, 36-Wh, 3.20-Ah, Li-ion battery
730668-001	Broadcom BCM943228HMB 802.11abgn 2x2 Wi-Fi Adapter, Broadcom Bluetooth 4.0 Adapter
730887-001	Bottom cover (includes left and right corner covers)
730888-001	Rubber Feet Kit (includes 2 rubber feet)
730889-001	Screw Kit
730890-001	Speaker Kit (includes left and right speakers and cables)
730892-001	11.6-inch, AG, SVA, LED TouchScreen display assembly
730893-001	System board equipped with an AMD A4-1250 processor, a graphics subsystem with UMA memory, and the Linux operating system (includes replacement thermal material)
730893-501	System board equipped with an AMD A4-1250 processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system (includes replacement thermal material)
730894-001	System board equipped with an AMD A6-1450 processor, a graphics subsystem with UMA memory, and the Linux operating system (includes replacement thermal material)
730894-501	System board equipped with an AMD A6-1450 processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system (includes replacement thermal material)
730895-001	Keyboard/top cover for use in the United States (includes keyboard cable and TouchPad)

Spare part number	Description
730895-031	Keyboard/top cover for use in the United Kingdom and Singapore (includes keyboard cable and TouchPad)
730895-041	Keyboard/top cover for use in Germany (includes keyboard cable and TouchPad)
730895-051	Keyboard/top cover for use in France (includes keyboard cable and TouchPad)
730895-071	Keyboard/top cover for use in Spain (includes keyboard cable and TouchPad)
730895-131	Keyboard/top cover for use in Portugal (includes keyboard cable and TouchPad)
730895-161	Keyboard/top cover for use in Latin America (includes keyboard cable and TouchPad)
730895-171	Keyboard/top cover for use in Saudi Arabia (includes keyboard cable and TouchPad)
730895-251	Keyboard/top cover for use in Russia (includes keyboard cable and TouchPad)
730895-281	Keyboard/top cover for use in Thailand (includes keyboard cable and TouchPad)
730895-291	Keyboard/top cover for use in Japan (includes keyboard cable and TouchPad)
730895-A41	Keyboard/top cover for use in Belgium (includes keyboard cable and TouchPad)
730895-AB1	Keyboard/top cover for use in Taiwan (includes keyboard cable and TouchPad)
730895-AD1	Keyboard/top cover for use in South Korea (includes keyboard cable and TouchPad)
730895-B31	Keyboard/top cover for use in the Netherlands (includes keyboard cable and TouchPad)
730895-BA1	Keyboard/top cover for use in Bulgaria (includes keyboard cable and TouchPad)
730895-BB1	Keyboard/top cover for use in Israel (includes keyboard cable and TouchPad)
730895-BG1	Keyboard/top cover for use in Switzerland (includes keyboard cable and TouchPad)
730895-DB1	Keyboard/top cover for use in Canada (includes keyboard cable and TouchPad)
730895-DH1	Keyboard/top cover for use in Denmark, Finland, and Norway (includes keyboard cable and TouchPad)
730895-FL1	Keyboard/top cover for use in the Czech Republic and Slovakia (includes keyboard cable and TouchPad)
730897-001	Monitor connector board (includes cable)
730898-001	TouchPad button board (includes bracket, TouchPad cable, and TouchPad button board cable)
730899-001	Power button board (includes cable)
730900-001	Power connector cable (includes bracket)
730901-001	Media card reader board (includes cable and USB connector)
730902-001	Heat sink (includes 4 captive screws and replacement thermal material)
730903-001	Fan (includes cable and cowling)
731424-001	Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector cable, and screws)
737253-001	Service cover (includes 2 rubber feet)
738824-001	RTC battery (includes cable and double-sided adhesive)

4 Removal and replacement procedures preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

Before touching an electronic component, discharge static electricity by using the guidelines described in this section.

Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

If you remove a component, place it in an electrostatic-safe container.

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

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

Typical electrostatic voltage levels			
	Relative humidity		
Event	**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, screw drivers, 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 ±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

5 Removal and replacement procedures for Customer Self-Repair parts

NOTE: The Customer Self-Repair program is not available in all locations. Installing a part not supported by the Customer Self-Repair program may void your warranty. Check your warranty to determine if Customer Self-Repair is supported in your location.

Component replacement procedures

NOTE: Please read and follow the procedures described here to access and replace Customer Self-Repair parts successfully.

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Locating the serial number, product number, and model number on page 13 for details.

This chapter provides removal and replacement procedures for Customer Self-Repair parts.

There are as many as 9 screws that must be removed, replaced, and/or loosened when servicing Customer Self-Repair parts. Make special note of each screw size and location during removal and replacement.

Battery

Description	Spare part number
3-cell, 36-Wh, 3.20-Ah, Li-ion battery	729892-001

Before removing the 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.

Remove the battery:

⚠ **WARNING!**   To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

⚠ **CAUTION:**   Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

1. Turn the computer upside down on a flat surface.

2. Position the computer with the rear toward you.

3. Slide the battery lock latch **(1)** to the unlocked position.

📝 **NOTE:**   The battery lock latch automatically returns to its original position when the battery is removed.

4. Slide the battery release latch **(2)** to release the battery.

5. Remove the battery **(3)**.

Reverse this procedure to install the battery.

Service cover

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

Description	Spare part number
Service cover	737253-001

Before removing the service 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 27).

Remove the service cover:

1.   Lift up on the rear edge of the service cover **(1)** until the left and right sides detach from the computer.

2.   Remove the service cover **(2)**.

Reverse this procedure to install the service cover.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive bracket, hard drive connector cable, and screws. These components are included in the Hard Drive Hardware Kit, spare part number 731424-001.

Description	Spare part number
500-GB, 5400-rpm, 7.0-mm	683802-001
320-GB, 5400-rpm, 7.0-mm	645193-001

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 27).

5. Remove the service cover (see Service cover on page 28).

Remove the hard drive:

1. Disconnect the hard drive connector cable **(1)** from the system board.

2. Release the hard drive connector cable from the routing channel **(2)** built into the base enclosure.

3. Remove the four Phillips PM2.0×2.75 screws **(3)** that secure the hard drive to the computer.
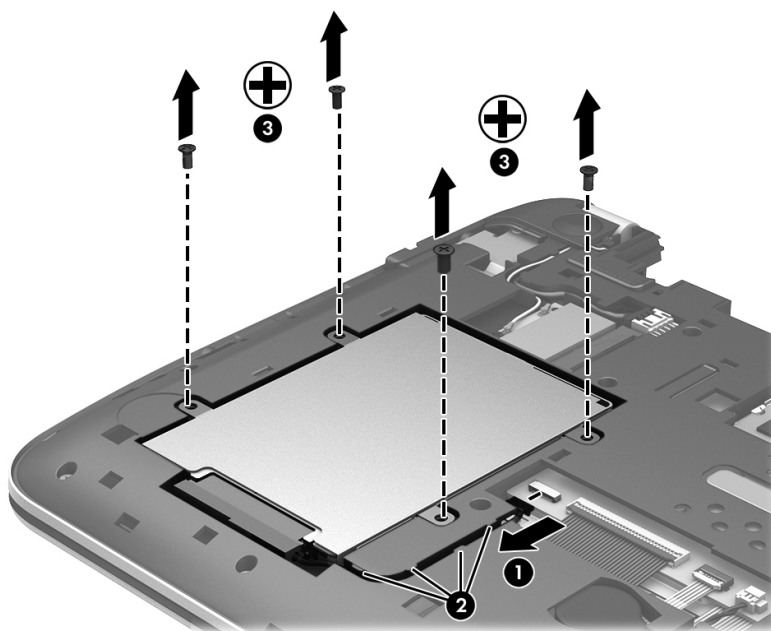
4. Remove the hard drive.
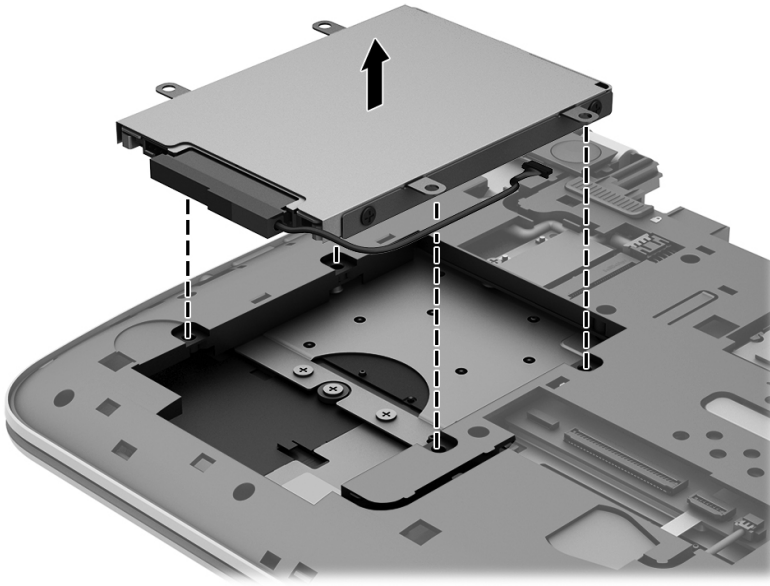
5. If it is necessary to disassemble the hard drive, perform the following steps:

    a. Position the hard drive with the connector toward you.

    b. Disconnect the hard drive connector cable **(1)** from the hard drive.

    c. Remove the four Phillips PM3.0×3.25 screws **(2)** that secure the hard drive bracket to the hard drive.

    d. 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 731424-001.
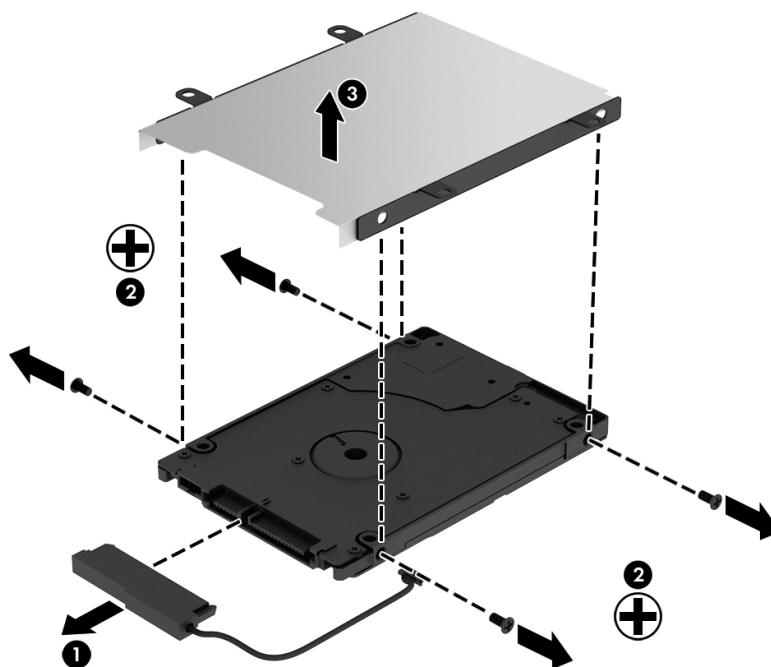
Reverse this procedure to install the hard drive.

WLAN module

Description	Spare part number
Atheros AR9485 802.11b/g/n WiFi Adapter	675794-001
Broadcom BCM943228HMB 802.11abgn 2x2 Wi-Fi Adapter, Broadcom Bluetooth 4.0 Adapter	730668-001
Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
Realtek RTL8188EE 802.11bgn Wi-Fi Adapter	709848-001

⚠ **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 27).

5. Remove the service cover (see Service cover on page 28).
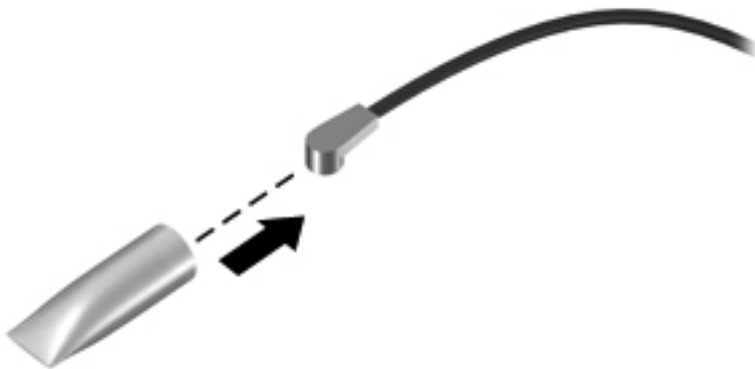
Remove the WLAN module:

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

   NOTE: The WLAN antenna cable labeled "1" connects to the WLAN module "Main" terminal labeled "1". The WLAN antenna cable labeled "2" connects to the WLAN module "Aux" terminal labeled "2".

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

3. Remove the WLAN module **(3)** by pulling the module away from the slot at an angle.
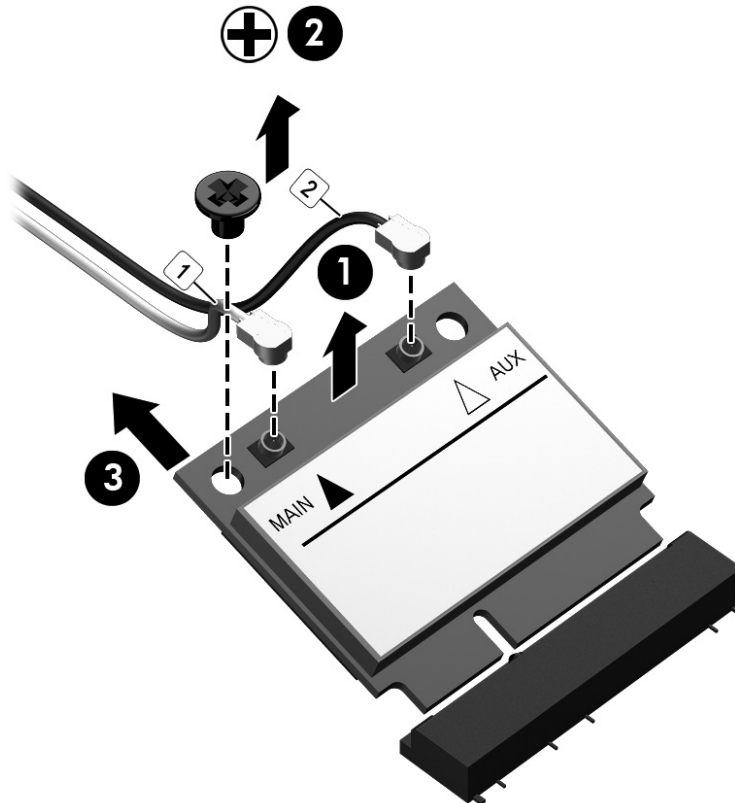
NOTE: If the WLAN antenna cables are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.

Reverse this procedure to install the WLAN module.

Memory module

Description	Spare part number
8-GB (PC3L, 12800, 1600-MHz)	693374-001
4-GB (PC3L, 12800, 1600-MHz)	691740-001

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.

⚠ **CAUTION:** Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to www.hp.com.

2. Click **Support & Drivers > click Drivers & Software**.

3. In the **Enter a product name/number box**, type the computer model information, and then click **Search**.

4. Click the link for the computer model.

5. Select the operating system, and then click **Next**.

6. Under **Step 2: Select a Download**, click the **BIOS** link.

7. Click the link for the most recent BIOS.

8. Click the **Download** button, and then follow the on-screen instructions.
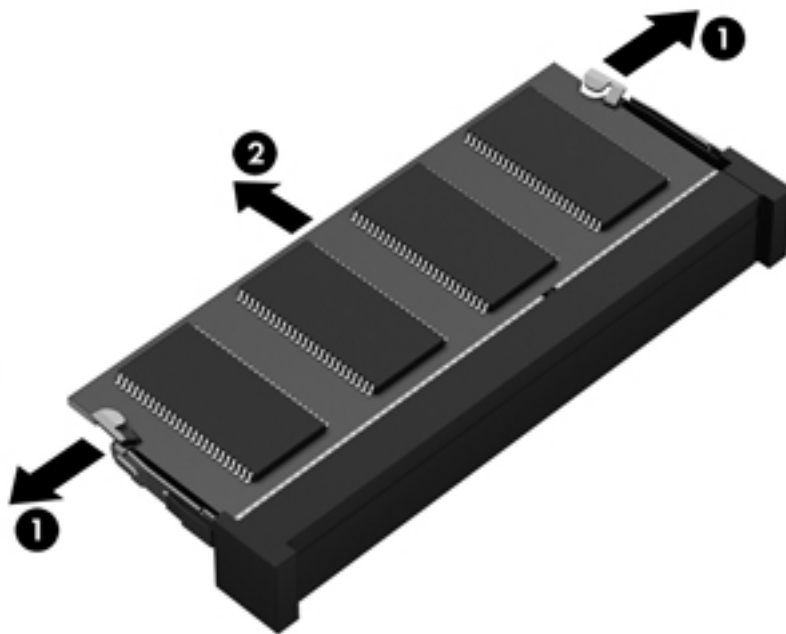
Before removing a memory module, follow these steps:

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 27).

5. Remove the service cover (see Service cover on page 28).

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 the module away from the slot at an angle.

Reverse this procedure to install a memory module.

6   Removal and replacement procedures for Authorized Service Provider parts

⚠ **CAUTION:**   Components described in this chapter should only be accessed by an authorized service provider. Accessing these parts can damage the computer or void the warranty.

Component replacement procedures

This chapter provides removal and replacement procedures for Authorized Service Provider only parts.

There are as many as 44 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.

RTC battery

Description	Spare part number
RTC battery (includes double-sided tape)	738824-001

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 27).

5. Remove the service cover (see Service cover on page 28).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.

2. Release the RTC battery cable **(2)** from the routing channel built into the bottom cover.

3. Detach the RTC battery **(3)** from the bottom cover. (The RTC battery is attached to the bottom cover by double-sided tape.)
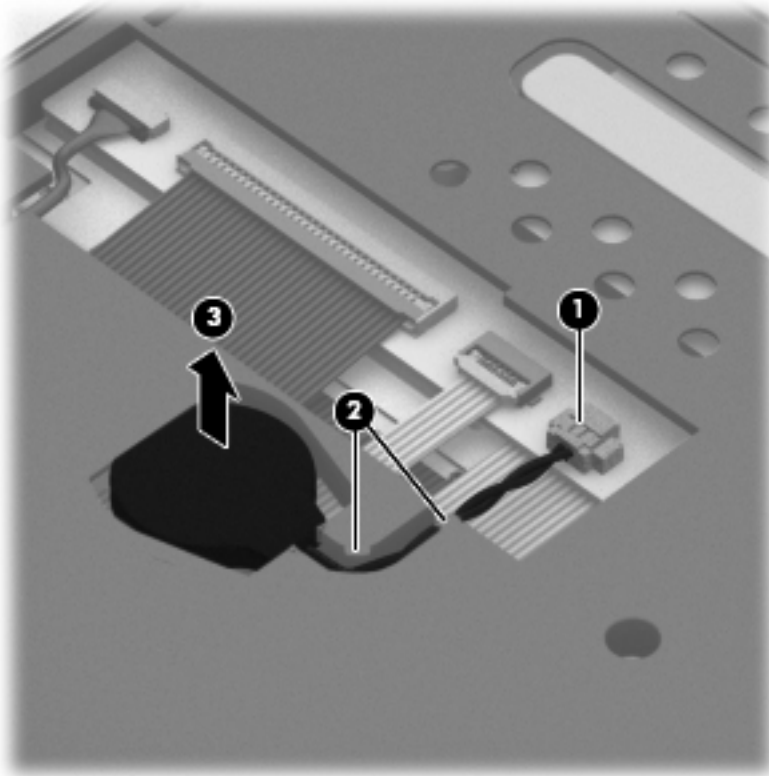
4. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Display assembly

Description	Spare part number
11.6-inch, AG, SVA, LED TouchScreen display assembly (includes webcamera/microphone module and wireless antenna cables)	730892-001

Before removing the display assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the battery (see Battery on page 27).

5. Remove the service cover (see Service cover on page 28).

Remove the display assembly:

1. Remove the rear rubber feet **(1)**.

    The rear rubber feet are included in the Rubber Feet Kit, spare part number 730888-001.

2. Remove the two Phillips PM2.2×5.5 screws **(2)** that secure the rear corner covers to the computer.

3. Remove the left and right rear corner covers **(3)**.

The rear corner covers are included in the bottom cover spare part kit, spare part number 730887-001.
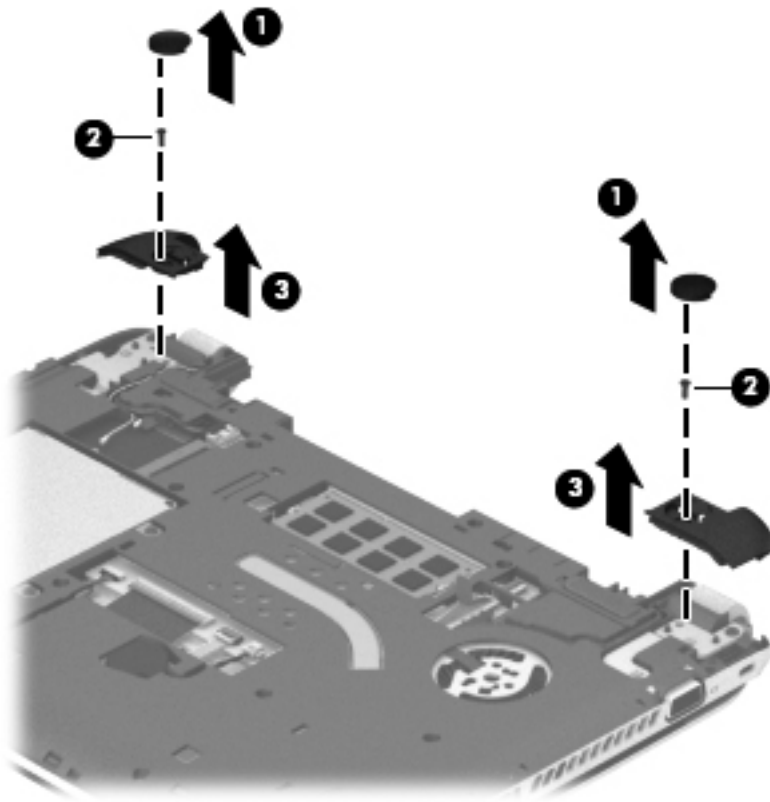
4. Disconnect the wireless antenna cables **(1)** from the WLAN module.

5. Release the wireless antenna cables from the retention clips **(2)** and routing channel built into the bottom cover.

6. Disconnect the display panel cable **(3)** from the system board.

7. Release the display panel cable from the retention clips **(4)** and routing channel built into the bottom cover.
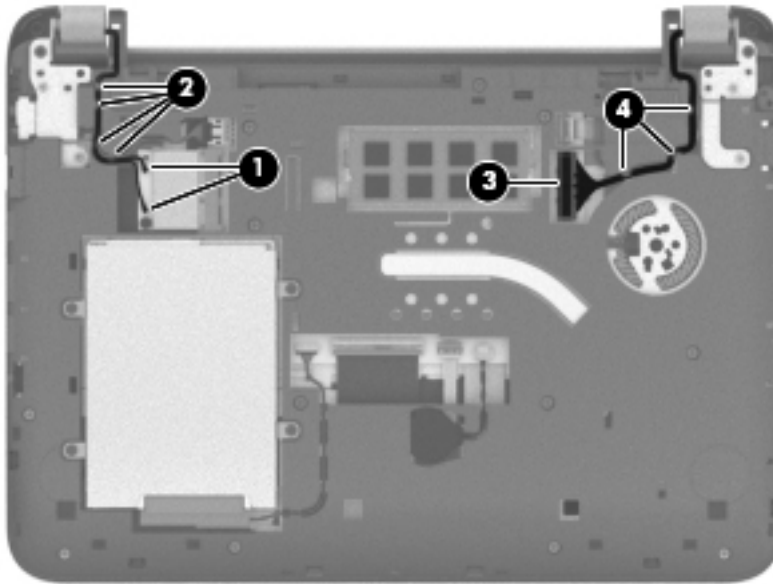
8. Remove the four Phillips PM2.0×5.5 screws **(1)** and the two Phillips PM2.5×10.5 screws **(2)** that secure the display assembly to the computer.

9. Open the display hinges **(3)** as far as they will open.

10. Separate the display assembly **(4)** from the computer.
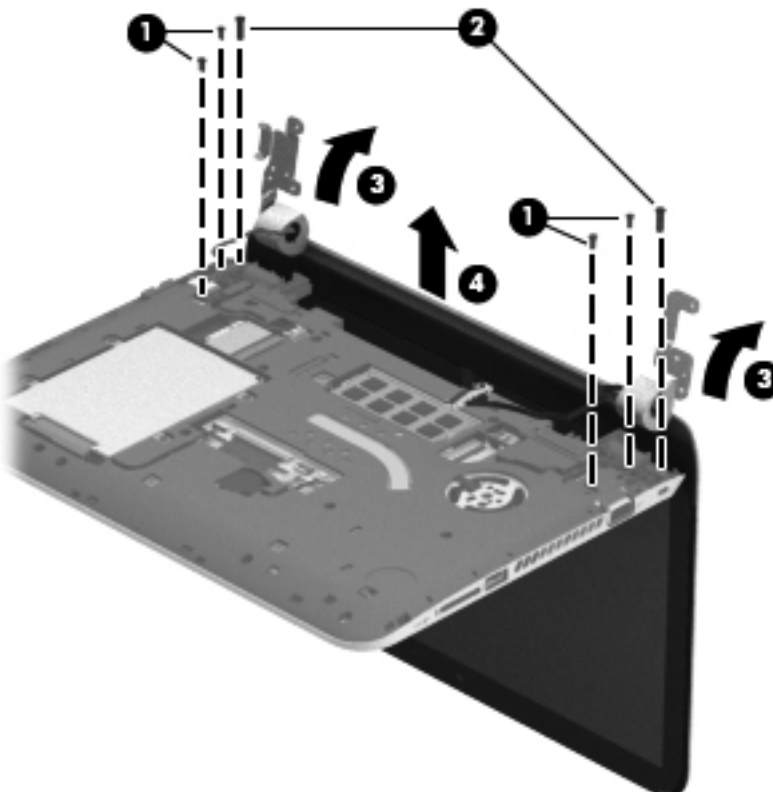
Reverse this procedure to install the display assembly.

Power connector cable

Description	Spare part number
Power connector cable (includes bracket)	730900-001

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 27).

5. Remove the service cover (see Service cover on page 28).

Remove the power connector cable:

1. Remove the two Phillips PM2.0×5.5 screws **(1)** and the two Phillips PM2.5×10.5 screws **(2)** that secure the display assembly right hinge to the computer.

2. Open the display assembly right hinge **(3)** as far as it will open.

3. Disconnect the power connector cable **(4)** from the system board.

4. Release the power connector cable from the retention clips **(2)** and routing channel built into the bottom cover.

5. Release the power connector **(6)** from the clips and mold built into the bottom cover.
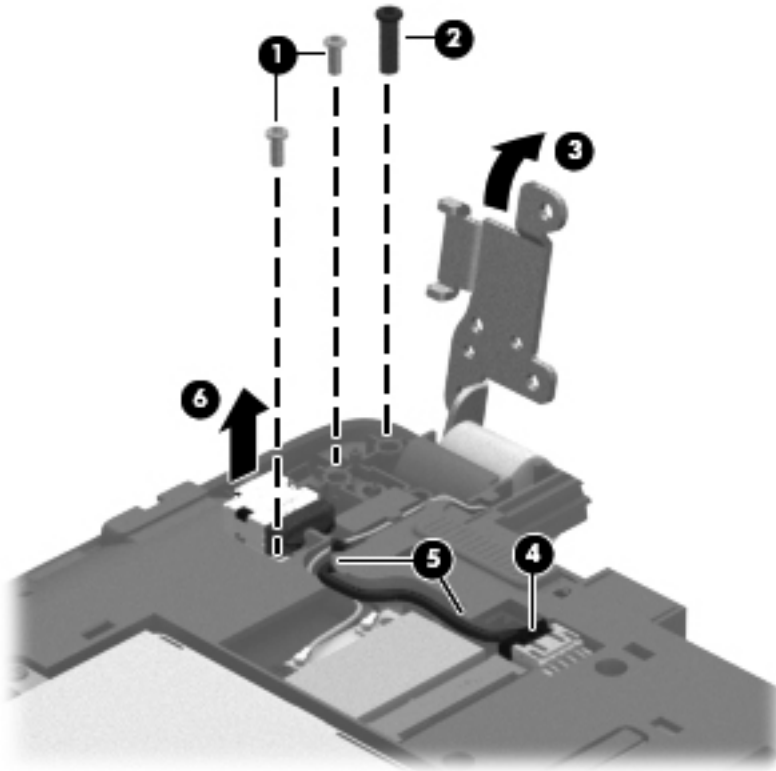
6. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Bottom cover

Description	Spare part number
Bottom cover (includes left and right corner covers)	730887-001

Before removing the bottom 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 27).

5. Remove the service cover (see Service cover on page 28).

6. Disconnect the RTC battery cable from the system board (see RTC battery on page 35).

7. Remove the display assembly (see Display assembly on page 37).

> **NOTE:** When replacing the bottom cover, be sure that the RTC battery is removed from the defective bottom cover and installed in the replacement bottomcover.
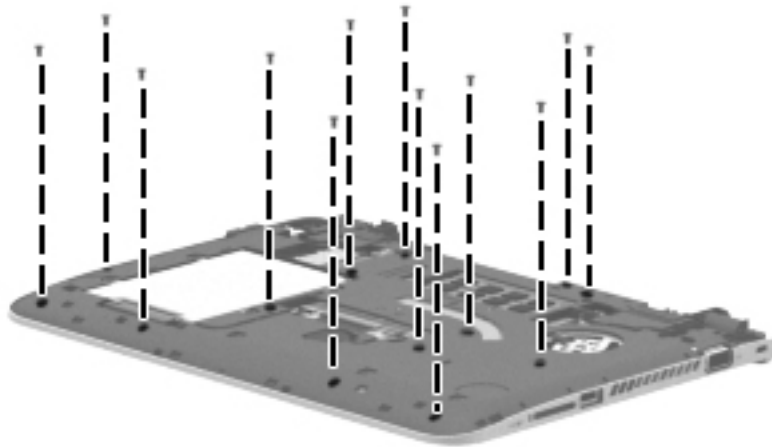
Remove the bottom cover:

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

2. Release the ZIF connector **(2)** to which the TouchPad button board cable is attached, and then disconnect the TouchPad button board cable from the system board.
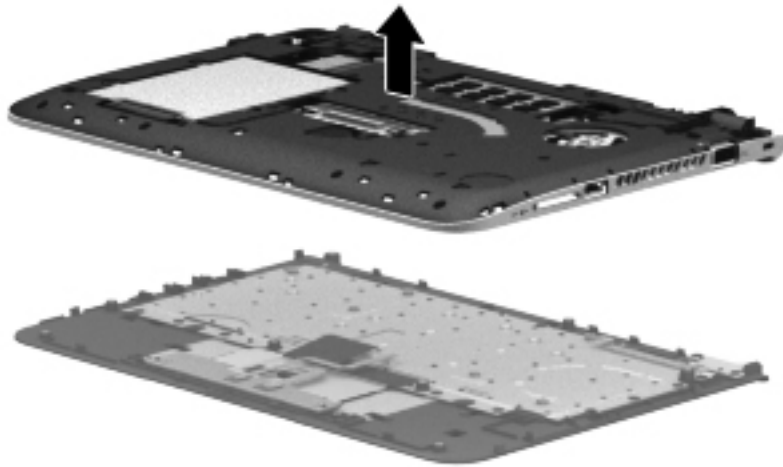
3. Release the ZIF connector **(3)** to which the power button board ribbon cable is attached, and then disconnect the power button board ribbon cable from the system board.
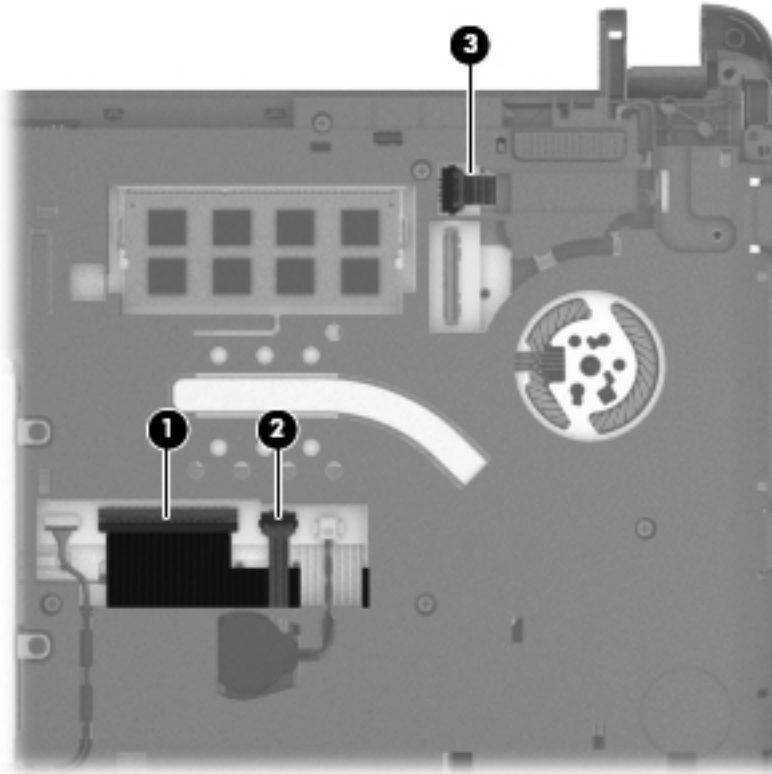
4. Remove the thirteen Phillips PM2.0×4.5 screws that secure the bottom cover to the top cover.

5. Remove the bottom cover from the top cover.

Reverse this procedure to install the bottom cover.

Power button board

Description	Spare part number
Power button board (includes cable)	730899-001

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 27), and then remove the following components:

   a. Service cover (see Service cover on page 28)

   b. Display assembly (see Display assembly on page 37)

   c. Bottom cover (see Bottom cover on page 42)

Remove the power button board:

1. Remove the two Phillips PM2.0×2.75 screws **(1)** that secure the power button board to the top cover.

2. Detach the power button board cable **(2)** from the top cover. (The power button board cable is attached to the top cover with double-sided tape.)

3. Remove the power button board **(3)** and cable.
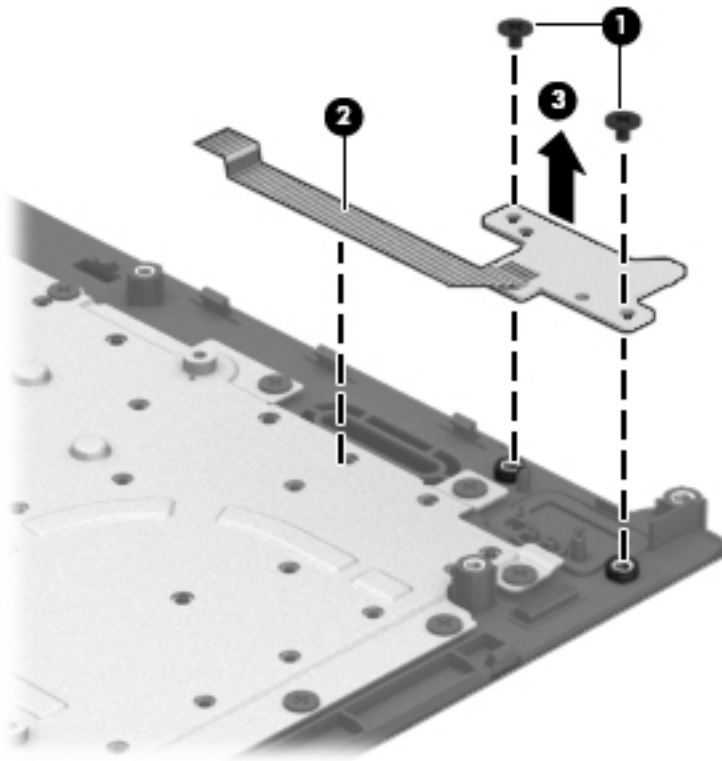
Reverse this procedure to install the power button board.

TouchPad button board

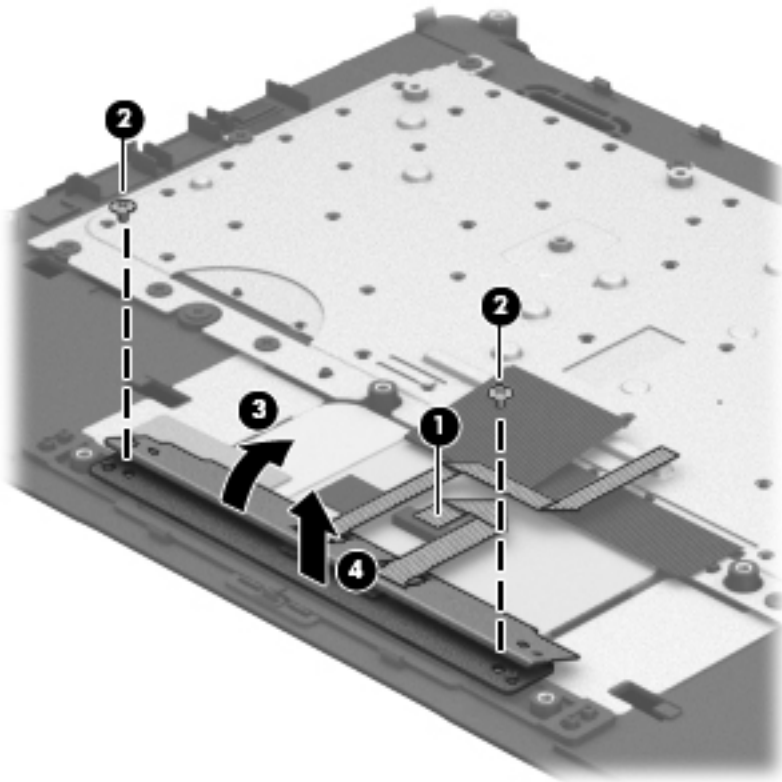| Description	Spare part number
TouchPad button board (includes TouchPad cable, TouchPad button board cable, and TouchPad button board bracket)	730898-001

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 27), and then remove the following components:

   a. Service cover (see Service cover on page 28)

   b. Display assembly (see Display assembly on page 37)

   c. Bottom cover (see Bottom cover on page 42)

Remove the TouchPad button board:

1. Release the ZIF connector **(1)** to which the TouchPad board cable is attached, and then disconnect the TouchPad board cable from the TouchPad board.

2. Remove the two Phillips PM2.0×4.5 screws **(2)** that secure the TouchPad button board to the top cover.

3. Remove the TouchPad button board bracket **(3)**.

4. Remove the TouchPad button board **(4)** and cables.

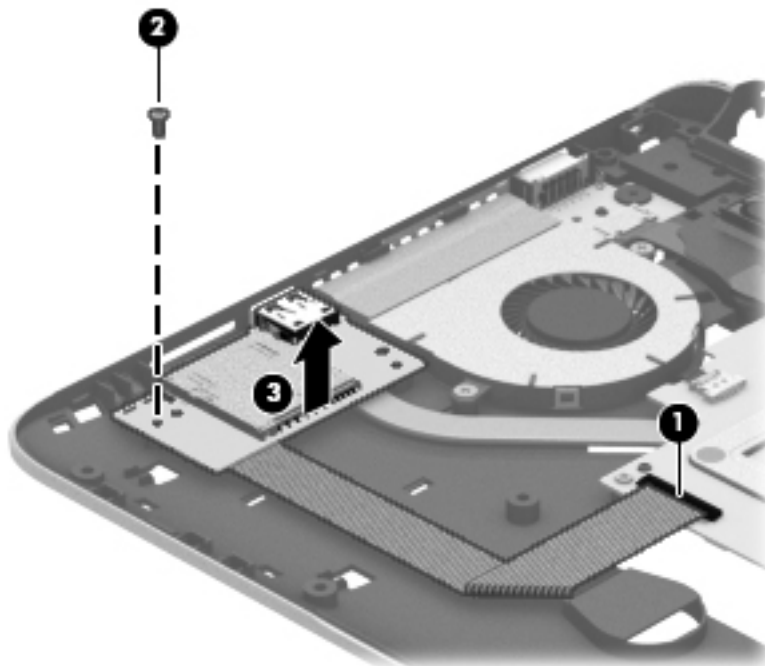Reverse this procedure to install the TouchPad button board.

Media card reader board

Description	Spare part number
Media card reader board (includes cable)	730901-001

Before removing the media card 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 27), and then remove the following components:

   a. Service cover (see Service cover on page 28)

   b. Display assembly (see Display assembly on page 37)

   c. Bottom cover (see Bottom cover on page 42)

Remove the media card reader board:

1. Release the ZIF connector **(1)** to which the media card reader board cable is attached, and then disconnect the media card reader board cable from the system board.

2. Remove the Phillips PM2.0×4.5 screw **(2)** that secures the media card reader board to the top cover.

3. Remove the media card reader board **(4)** and cable.

Reverse this procedure to install the media card reader board.

Fan

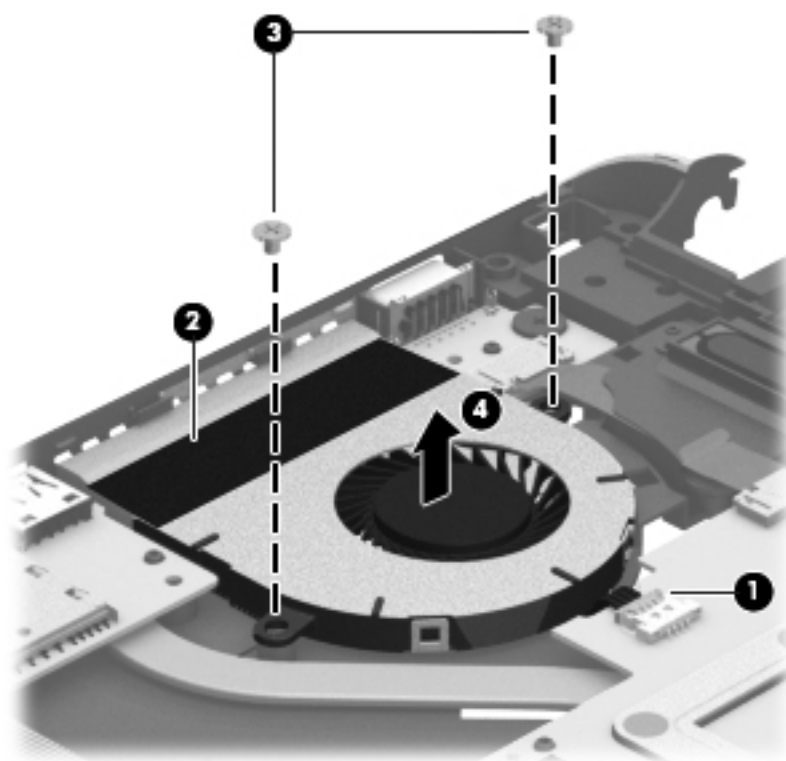| Description	Spare part number
Fan (includes cable and cowling)	730903-001

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), and then remove the following components:

    a. Service cover (see)

    b. Display assembly (see)

    c. Bottom cover (see)

Remove the fan:

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

2. Detach the cowling tape **(2)** that secures the fan to the heat sink.

3. Remove the two Phillips PM2.0×4.5 screws **(3)** that secure the fan to the system board.

4. Remove the fan **(4)**.

Reverse this procedure to install the fan.

Monitor connector board

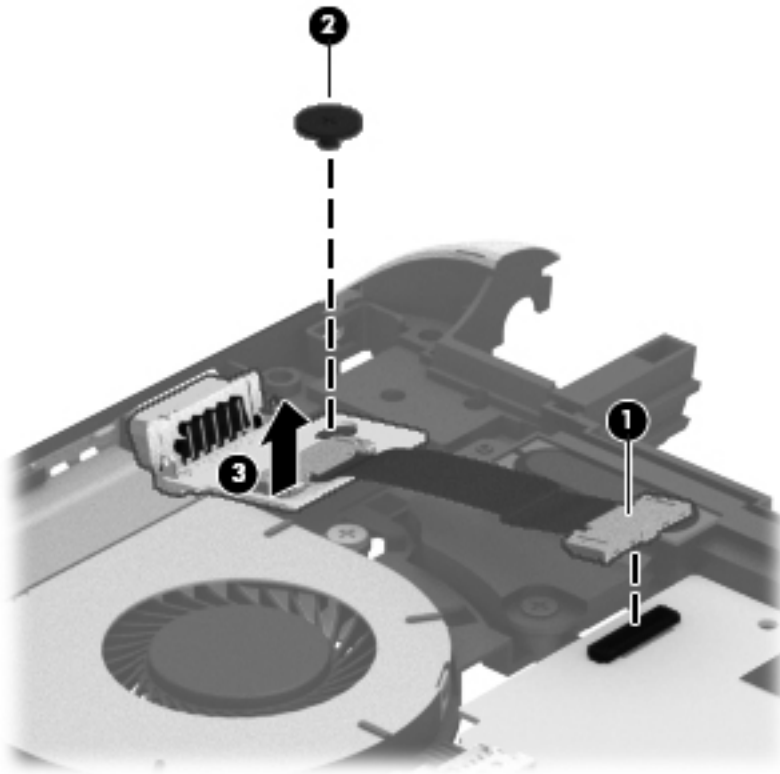| Description	Spare part number
Monitor connector board (includes cable)	730897-001

Before removing the monitor 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 27), and then remove the following components:

    a. Service cover (see Service cover on page 28)

    b. Display assembly (see Display assembly on page 37)

    c. Bottom cover (see Bottom cover on page 42)

Remove the monitor connector board:

1. Disconnect the monitor connector board cable **(1)** from the system board.

2. Remove the Phillips PM2.0×2.25 broad head screw **(2)** that secures the monitor connector board to the top cover.

3. Remove the monitor connector board **(3)** and cable.

Reverse this procedure to install the monitor connector board.

System board

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

Description	Spare part number
Equipped with an AMD A6-1450 processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system	730894-501
Equipped with an AMD A6-1450 processor, a graphics subsystem with UMA memory, and the Linux operating system	730894-001
Equipped with an AMD A4-1250 processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system	730893-501
Equipped with an AMD A4-1250 processor, a graphics subsystem with UMA memory, and the Linux operating system	730893-001

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 27), and then remove the following components:

    a. Service cover (see Service cover on page 28)

    b. Hard drive (see Hard drive on page 29)

    c. Display assembly (see Display assembly on page 37)

    d. Bottom cover (see Bottom cover on page 42)

    e. Media card reader board (see Media card reader board on page 48)

   f. Fan (see Fan on page 49)

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:

*   WLAN module (see WLAN module on page 31)

*   Memory module (see Memory module on page 33)

*   Heat sink (see Heat sink on page 55)
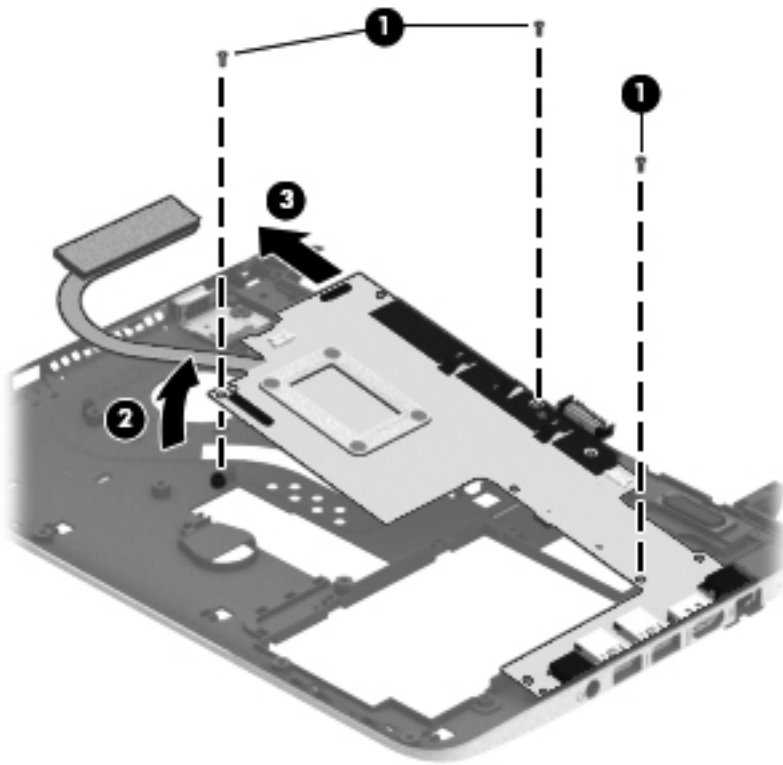
Remove the system board:

1. Disconnect the monitor connector board cable **(1)** from the system board.

2. Disconnect the speaker cable **(2)** from the system board.

3. Release the speaker cable from the tabs **(3)** built into the system board.
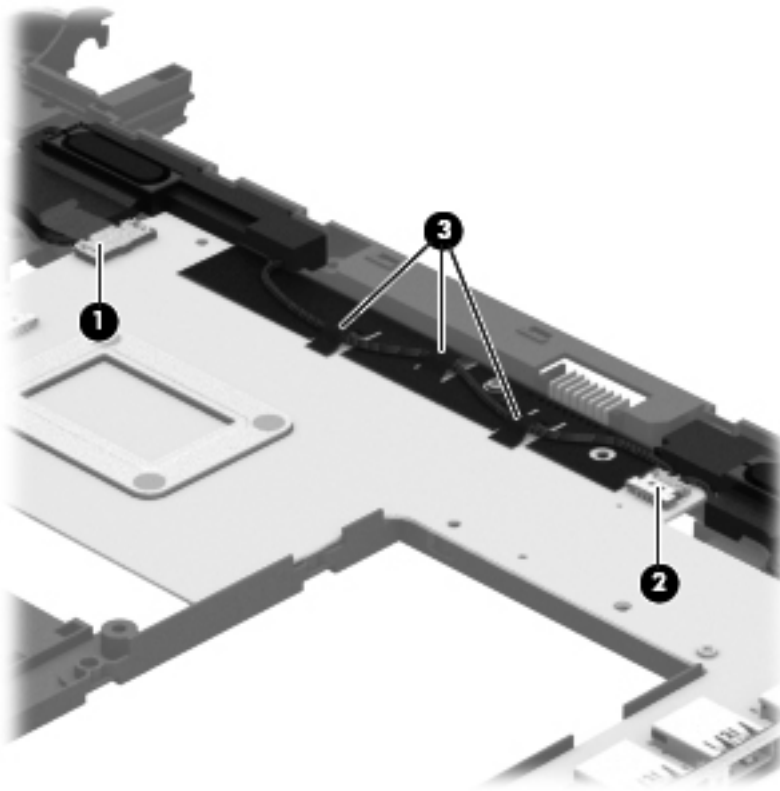
4. Remove the three Phillips PM2.0×4.5 screws **(1)** that secure the system board to the top cover.

5. Lift the left side of the system board **(2)** until it rests at an angle.

6. Remove the system board **(3)** by sliding it up and to the left an angle.

Reverse this procedure to install the system board.

Heat sink

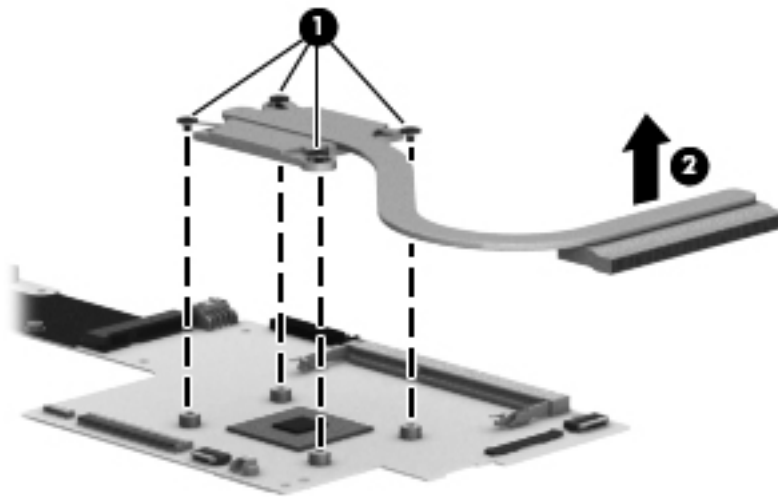| Description	Spare part number
Heat sink (includes 4 captive screws and replacement thermal material)	730902-001

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), and then remove the following components:

    a. Service cover (see)

    b. Hard drive (see)

    c. Display assembly (see)

    d. Bottom cover (see)

e. Media card reader board (see Media card reader board on page 48)

f. Fan (see Fan on page 49)

**g.** System board (see System board on page 53)

Remove the heat sink:

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

2. Following the 1 through 4 sequence stamped into the heat sink, loosen the four captive Phillips PM2.0×2.5 screws **(1)** that secure the heat sink to the system board.

3. 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 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. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it
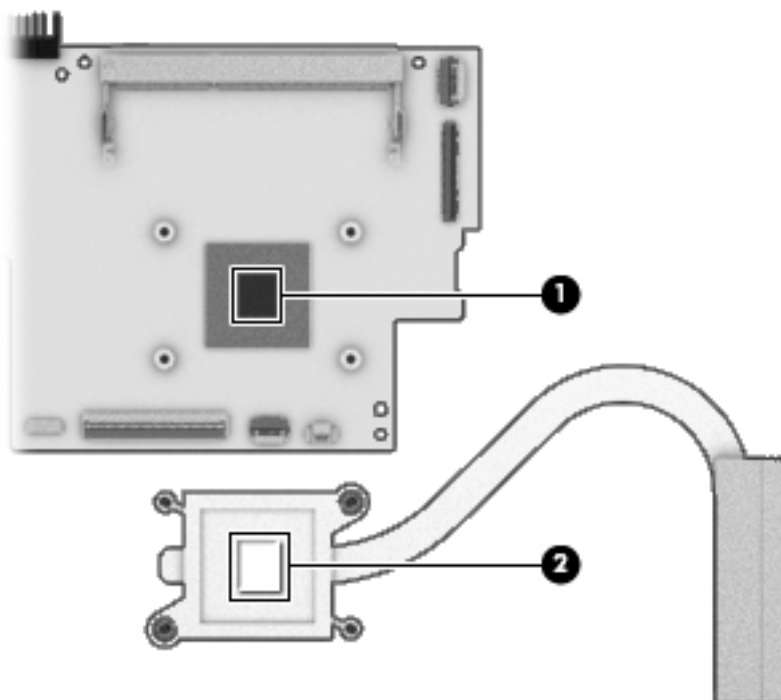
Reverse this procedure to install the heat sink.

Speakers

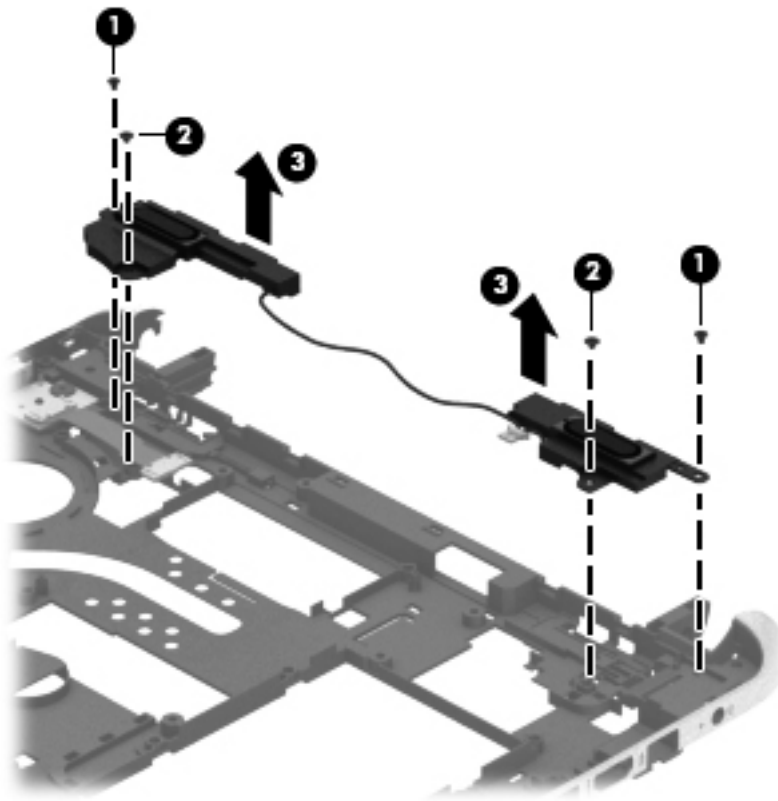| Description	Spare part number
Speaker Kit (includes left and right speakers and cables)	730890-001

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 27), and then remove the following components:

   a. Service cover (see Service cover on page 28)

   b. Hard drive (see Hard drive on page 29)

   c. Display assembly (see Display assembly on page 37)

   d. Bottom cover (see Bottom cover on page 42)

   e. Media card reader board (see Media card reader board on page 48)

f. Fan (see Fan on page 49)

g. System board (see System board on page 53)

Remove the speakers:

1. Remove the two Phillips PM2.0×3.75 screws **(1)** and the two Phillips PM2.0×2.75 screws **(2)** that secure the speakers to the bottom cover.

2. Remove the speakers **(3)**.

Reverse this procedure to install the speakers.

7 Using Setup Utility (BIOS) and HP PC Hardware Diagnostics (UEFI)

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

Starting Setup Utility (BIOS)

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

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

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Setup Utility (BIOS) (see).

2. Use the arrow keys to select **Main**.

3. To exit Setup Utility (BIOS) without saving your changes, use the arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press **enter**.

4. Select **Yes**.

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.

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

1. From the Start screen, type support, and then select the **HP Support Assistant** app.

2. Click **Updates and tune-ups**, and then click **Check for HP updates** now.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS, 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.

   If the update is more recent than your BIOS, 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 revealed on the screen after the download is complete. If no instructions are revealed, follow these steps:

1. From the Start screen, type e, and then select **File Explorer**.

2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.

4. Double-click the file that has an .exe extension (for example, *filename.exe*).

   The BIOS installation begins.

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

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

Using HP PC Hardware Diagnostics (UEFI)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

To start HP PC Hardware Diagnostics UEFI:

1. Turn on or restart the computer, quickly press esc, and then press f2.

   The BIOS searches three places for the HP PC Hardware Diagnostics (UEFI) tools in the following order:

   a. Connected USB drive

   NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 61.

   b. Hard drive

   c. BIOS

2. Click the type of diagnostic test you want to run, and then follow the on-screen instructions.

   NOTE: If you need to stop a diagnostic test, press esc.

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

NOTE: The HP PC Hardware Diagnostics (UEFI) download instructions are provided in English only.

1. Go to http://www.hp.com.

2. Click **Support & Drivers**, and then click the **Drivers & Software** tab.

3. Enter the product name in the text box, and then click **Search**.

4. Select your computer model, and then select your operating system.

5. In the **Diagnostic** section, click **HP UEFI Support Environment**.

   – or –

   Click **Download**, and then select **Run**.

8 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**29.0 cm**	11.4 in
Depth	**21.7 cm**	8.5 in
Height	**2.2 cm**	0.9 in
Weight	**1.5 kg**	3.7 lbs
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 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.

Hard drive specifications

	500-GB, 5400-rpm*	320-GB, 5400-rpm*
Dimensions		
Height	7.0 mm	7.0 mm
Length	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm
Weight	110 g	110 g
Interface type	SATA	SATA
Transfer rate (synchronous, maximum)	1.1 GB/sec	1.1 GB/sec
Security	ATA security	ATA security
Seek times (typical read, including setting)		
Single track	1.5 ms	1.5 ms
Average (read/write)	11/13 ms	11/13 ms
Maximum	22 ms	22 ms
Logical blocks	976,773,168	628,142,448
Disk rotational speed	5400 rpm	5400 rpm
Operating temperature	0°C to 60°C (32°F to 140°F)	0°C to 60°C (32°F to 140°F)

*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.

9 Backing up, restoring, and recovering

Your computer includes tools provided by HP and the operating system to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your computer to a proper working state or even back to the original factory state, all with simple steps.

This chapter provides information about the following processes:

- Creating recovery media and backups

- Restoring and recovering your system

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

Creating recovery media and backups

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

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

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

    *   System Recovery—Reinstalls the original operating system and the programs that were installed at the factory.

    *   Minimized Image Recovery—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.

    *   Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows creates a system restore point for you automatically during a Windows update and during other system maintenance (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Help and Support. From the Start screen, type h, and then select **Help and Support**.

3. As you add photos, video, music, and other personal files, create a backup of your personal information. Windows File History can be set to regularly and automatically back up files from libraries, desktop, contacts, and favorites. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can restore the files that you backed up using File History. Restoring files is also useful if you ever choose to reset the computer by reinstalling Windows or choose to recover using HP Recovery Manager.

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

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

Creating HP Recovery media

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

- Only one set of HP Recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.

- HP Recovery Manager examines the computer and determines the required storage capacity for the blank USB flash drive or the number of blank DVD discs that will be required.

- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or instead you can use a high-quality blank USB flash drive.

- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from the HP website. For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.

- The creation process can take up to an hour or more. Do not interrupt the creation process.

- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.

2. Select **Recovery Media Creation**, and then follow the on-screen instructions.

If you ever need to recover the system, see .

Restore and recovery

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

- If you need to restore your personal files and data, you can use Windows File History to restore your information from the backups you created. For more information and steps for using File History, see Help and Support. From the Start screen, type h, and then select **Help and Support**.

- If you need to correct a problem with a preinstalled application or driver, use the Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.

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

- If you want to restore the system to a previous state without losing any personal information, Windows System Restore is an option. System Restore allows you to restore without the requirements of Windows Refresh or a reinstallation. Windows creates system restore points automatically during a Windows update and other system maintenance events. Even if you did not manually create a restore point, you can choose to restore to a previous point, automatically created. For more information and steps for using Windows System Restore, see Help and Support. From the Start screen, type h, and then select **Help and Support**.

- If you want a quick and easy way to recover the system without losing your personal information, settings, or apps that came preinstalled on your computer or were purchased from the Windows Store, consider using Windows Refresh. This option does not require backing up data to another drive. See Using Windows Refresh for quick and easy recovery on page 68.

- If you want to reset your computer to its original state, Windows provides an easy way to remove all personal data, apps, and settings, and reinstall Windows.

    For more information, see Remove everything and reinstall Windows on page 68.

- If you want to reset your computer using a minimized image, you can choose the HP Minimized Image Recovery option from the HP Recovery partition (select models only) or HP Recovery media. Minimized Image Recovery installs only drivers and hardware-enabling applications. Other applications included in the image continue to be available for installation through the Drivers and Applications Reinstall option in HP Recovery Manager.

    For more information, see Recovering using HP Recovery Manager on page 69.

- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 69.

- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see Recovering using HP Recovery Manager on page 69.

- If you wish to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see [Removing the HP Recovery partition on page 71](#).

Using Windows Refresh for quick and easy recovery

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

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

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

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

To start Refresh:

1. From the Start screen, point to the upper-right or lower-right corner of the screen to reveal the charms.

2. Click **Settings**.

3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.

4. Scroll the right-side choices down to display **Refresh your PC without affecting your files**.

5. Under **Refresh your PC without affecting your files**, select **Get started**, and then follow the on-screen instructions.

Remove everything and reinstall Windows

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

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

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

To use the f11 key:

1. Press f11 while the computer boots.

    – or –

    Press and hold f11 as you press the power button.

2. Choose your keyboard layout.

3. Select **Troubleshoot** from the boot options menu.

4. Select **Reset your PC**, and then follow the on-screen instructions.

To use the Start screen:

1. From the Start screen, point to the upper-right or lower-right corner of the screen to reveal the charms.

2. Click **Settings**.

3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.

4. Scroll the right-side choices down to display **Remove everything and reinstall Windows**.

5. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

Recovering using HP Recovery Manager

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

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.

- Minimized Image Recovery—Reinstalls the operating system and all hardware-related drivers and software, but not other software applications.

- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.

- Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media must be used if the computer hard drive fails.

- To use the Factory Reset or System Recovery options, you must use HP Recovery media.

- If the HP Recovery media do not work, you can obtain recovery media for your system from the HP website. For U.S. support, go to http://www.hp.com/go/contactHP. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.

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

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

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

To start HP Recovery Manager from the HP Recovery partition:

1. Press f11 while the computer boots.

   – or –

   Press and hold f11 as you press the power button.

2. Choose your keyboard layout.

3. Select **Troubleshoot** from the boot options menu.

4. Select **HP Recovery Manager**, and follow the on-screen instructions.

Using HP Recovery media to recover

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

1. If possible, back up all personal files.

2. Insert the first HP Recovery disc you created into the optical drive on your computer or into an optional external optical drive, and then restart the computer.

   – or –

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

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See .

3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

1. Insert the HP Recovery media you created.

2. Restart the computer, quickly press esc, and then press f9 for boot options.

3. Select the optical drive or USB flash drive you want to boot from.

4. Follow the on-screen instructions.

Removing the HP Recovery partition

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

IMPORTANT: Removing the HP Recovery partition means you can no longer use Windows Refresh, the Windows Remove everything and reinstall Windows option, or the HP Recovery Manager option for minimized image recovery. Create HP Recovery media before removing the Recovery partition to ensure you have recovery options; see Creating HP Recovery media on page 66.

Follow these steps to remove the HP Recovery partition:

1. From the Start screen, type recovery, and then select **HP Recovery Manager**.

2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

10 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 volts AC, or from 220 to 240 volts AC.

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).

- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.

- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.

- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer. Requirements for all countries 113

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

Country/region	Accredited agency	Applicable note number
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	CEMKO	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.

11 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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