



HP ENVY Notebook

Maintenance and Service Guide

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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.

Software terms

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a refund subject to the refund policy of your place of purchase.

For any further information or to request a full refund of the computer, please contact your local point of sale (the seller).

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 60950-1).

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1 Product description

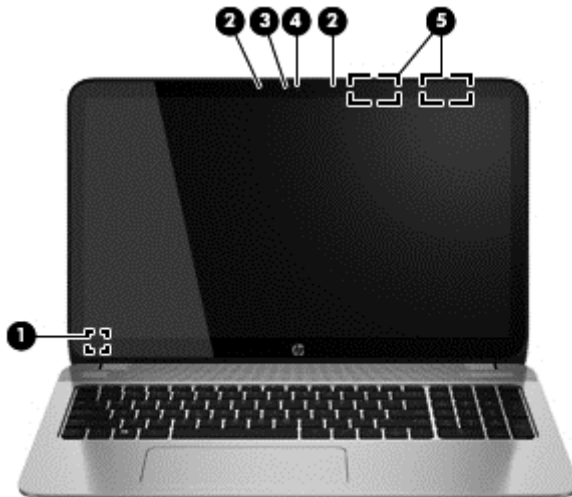
Category	Description	Touch models	Non-touch models
Product Name	HP ENVY Notebook	x	x
Processors	Intel Core i7-4722HQ 2.4-GHz (5C turbo up to 3.4-GHz) processor (1600-MHz FSB, 6.0-MB L3 cache, quad, 37 W)	x	x
Chipset	Intel HM87 express chipset	x	x
Graphics	Intel graphics: Intel HD Graphics 4600	x	x
	Discrete graphics: Nvidia N16P-GT (GTX 950M) with 4 GB of dedicated video memory	x	x
	Support for HD decode, DX11, and HDMI		
	Supports Optimus		
	Supports GPS (GPU performance scaling)		
Panel	Support for low-voltage differential signalling LVDS, co-layout with eDP1.2 without PSR	x	x
	Touch solution with flush glass and multitouch enabled		
	15.6-in, full high-definition (FHD), white light-emitting diode (WLED), AntiGlare (1920×1080), slim (3.2-mm), SVA, typical brightness 220 nits, 16:9 aspect ratio	x	x
	15.6-in, high-definition (HD), white light-emitting diode (WLED), BrightView (1366×768), flat (3.8-mm), SVA, typical brightness 220 nits, 16:9 aspect ratio		x
	15.6-in, high-definition (HD), white light-emitting diode (WLED), AntiGlare (1366×768), flat (3.8-mm), SVA, typical brightness 220 nits, 16:9 aspect ratio	x	
Memory	Two customer-accessible/upgradable memory module slots	x	x
	Support for DDR3L-1600-MHz dual channel		
	Support for 16834-MB of system RAM in the following configurations:		
	<ul style="list-style-type: none"> 16834-MB (8192-MB×2) 12288-MB (8192-MB+4096-MB) 8192-MB (8192-MB×1, 4096-MB×2) 6144-MB (4096-MB+2048-MB) 		
Hard drive	Support for 6.35-cm (2.5-in) hard drives in 7.0-mm (.28-in) and 9.5-mm (.37-in) thickness	x	x
	Support for Accelerometer hard drive protection		
	<ul style="list-style-type: none"> 2.0-TB, 5400-rpm, 9.5-mm 1.0-TB, 5400-rpm, 9.5-mm 1.0-TB, 5400-rpm, 9.5-mm, 8-GB Hybrid 750-GB, 5400-rpm, 9.5-mm 	x	x
Audio and video	Dual speakers	x	x

Category	Description	Touch models	Non-touch models
	Subwoofer		
	Dual array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software		
	HD Audio		
	BANG & OLUFSEN		
	Integrated HP TrueVision HD webcam (fixed [no tilt], activity LED, 1280×720 by 30 frames per second)		
Ethernet	Integrated 10/100/1000 network interface card (NIC)	x	x
Sensor	Accelerometer	x	x
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module	x	x
	Two WLAN antennas built into display assembly		
	Intel WiDi 5.1 support		
	Compatible with Miracast-certified devices		
	Antenna support for 802.11a/b/g/n – MIMO support 2×2		
	Support for the following WLAN module:	x	x
	<ul style="list-style-type: none"> Intel Dual Band Wireless-AC 3160 802.11ac 1×1 WiFi + BT 4.0 Combo Adapter 		
External media cards	HP Multi-Format Digital Media Card Reader	x	x
	Supports SD/SDHC/SDXC		
	Push-Push Insertion/Removal		
Internal card expansion	One half-size mini-card slot for WLAN	x	x
Ports	AC Smart Pin adapter plug	x	x
	Audio-in (mono microphone)/audio-out (stereo headphone) combo jack		
	HDMI v1.4 supporting up to 1920×1080 @ 60Hz		
	RJ-45 (Ethernet)		
	USB: two USB 3.0 ports, two USB 2.0 ports		
	One USB 3.0 port supports USB Boost.		
Keyboard/pointing devices	Full-size, backlit, island-style keyboard with numeric keypad and DuraCoat, Clickpad with image sensor	x	x
	HP Control Zone Trackpad		
	Gesture support: MultiTouch gestures enabled, two-finger scrolling, and pinch-zoom as default		
	Taps enabled by default		
	Support for Microsoft Windows 8 modern trackpad		
Power requirements	Support for the following AC adapters:		
	<ul style="list-style-type: none"> 120-W HP Slim AC adapter (PFC, S, 4.5-mm) 	x	x

Category	Description	Touch models	Non-touch models
	Support for the following batteries <ul style="list-style-type: none"> 6-cell, 62-Wh, 2.80-Ah, Li-ion battery 6-cell, 47-Wh, 2.20-Ah, Li-ion battery 	x	x
Security	Support for the following: <ul style="list-style-type: none"> Kensington Security Lock Trusted Platform Module (TPM) HP SimplePass support 	x	x
Operating system	Preinstalled: <p>Microsoft Windows 8.1 Professional</p> <p>Microsoft Windows 8.1</p> <p>Microsoft Windows 7 Professional</p>	x	x
Serviceability	End user replaceable parts: <p>AC adapter</p> <p>Battery (system)</p> <p>Hard drive</p> <p>Memory modules (expansion and primary)</p> <p>WLAN module</p>	x	x

2 External component identification

Display



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)	Internal microphones (2)	Record sound.
(3)	Webcam light	On: The webcam is in use.
(4)	Webcam	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video. To use the webcam: ▲ In Windows 8.1, from the Start screen, type <code>camera</code> , and then select Camera from the list of applications. In Windows 7, select Start > All Programs > Communication and Chat > CyberLink YouCam .
(5)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (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.

To access this document in Windows 8.1:

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

— or —

Component	Description
From the Windows desktop, click the question mark icon in the taskbar.	
To access this document in Windows 7:	
Select Start > HP Support Assistant > Next > My computer > User Guides .	

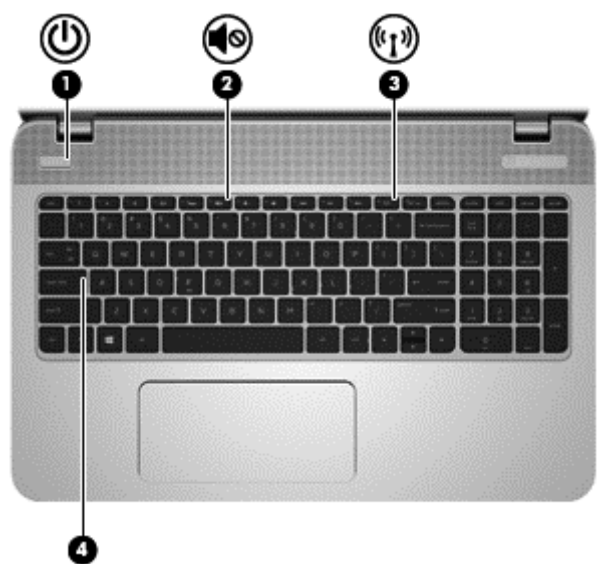
Top




TouchPad



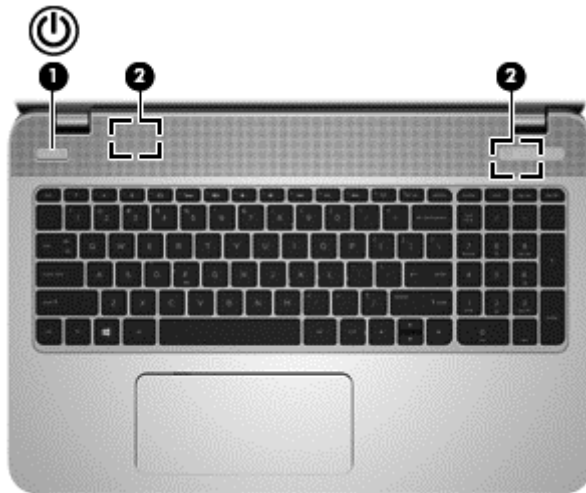
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.


Lights



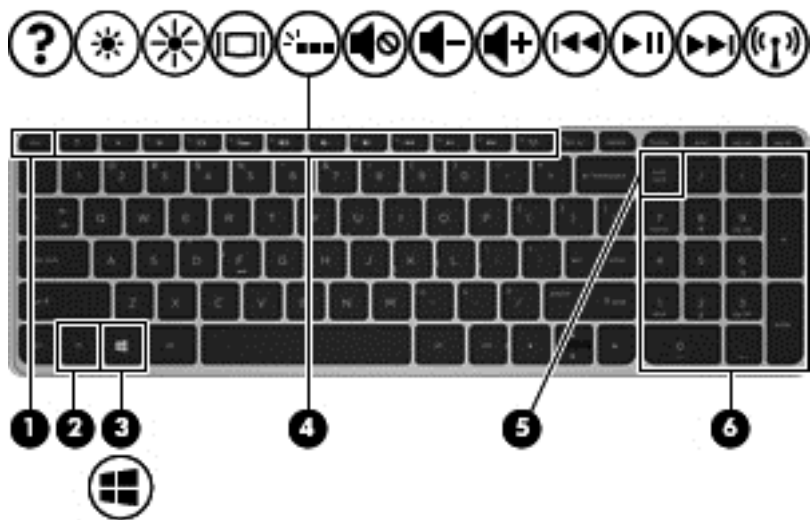
Component		Description
(1)	 Power light	<ul style="list-style-type: none">On: The computer is on.Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. <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)	 Mute light	<ul style="list-style-type: none">Amber: Computer sound is off.Off: Computer sound is on.
(3)	 Wireless light	<p>On: An integrated wireless device, such as a wireless local area network (WLAN) device, is on.</p> <p>NOTE: On some models, the wireless light is amber when all wireless devices are off.</p>
(4)	Caps lock light	<p>On: Caps lock is on, which switches the keys to all capital letters.</p>



Buttons and speakers



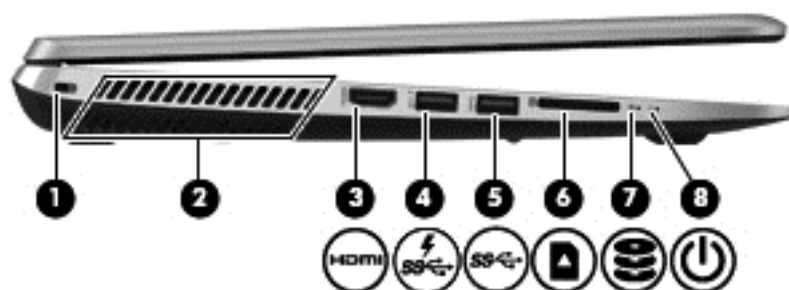
Component		Description
(1)	 Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>Windows 8.1: To learn more about your power settings, see your power options.</p> <p>▲ From the Start screen, type <code>power</code>, select Power and sleep settings, and then select Power and sleep from the list of applications.</p> <p>– or –</p> <p>From the Windows desktop, right-click the Start button, and then select Power Options.</p> <p>Windows 7: To learn more about your power settings:</p> <p>Select Start > Control Panel > System and Security > Power Options.</p>
(2)	Speakers (2)	Produce sound.






Keys



Component		Description
(1)	esc key	Displays 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, or on select models, the spacebar.
(3)	  Windows key	Windows 8.1: 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. Windows 7: Displays the Windows Start menu.
(4)	Action keys	Execute frequently used system functions. NOTE: On select models, the f5 action key turns the radiance backlight keyboard feature off or on.
(5)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keypad	When num lock is on, it can be used like an external numeric keypad.

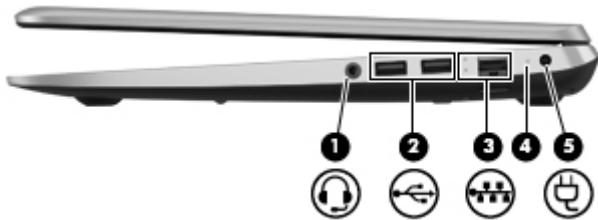
Left side







Component		Description
		Attaches an optional security cable to the computer.
(1)	Security cable slot	NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Vents (2)	Enable 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.
(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 High-Definition Multimedia Interface (HDMI) device.
(4)	 USB 3.0 charging (powered) port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. Standard USB ports will not charge all USB devices or will charge using a low current. Some USB devices require power and require you to use a powered port. NOTE: USB charging ports can also charge select models of cell phones and MP3 players, even when the computer is off.
(5)	 USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(6)	 Memory card reader	Reads optional memory cards that enable you to store, manage, share or access information. To insert a card: <ul style="list-style-type: none"> ▲ Hold the card label-side up, with connectors facing the slot, insert the card into the slot, and then push in on the card until it is firmly seated. To remove a card: <ul style="list-style-type: none"> ▲ Press in on the card it until it pops out.
(7)	 Hard drive light	<ul style="list-style-type: none"> Blinking white: The hard drive is being accessed. Amber: The accelerometer is being accessed.
(8)	 Power light	<ul style="list-style-type: none"> 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 components.

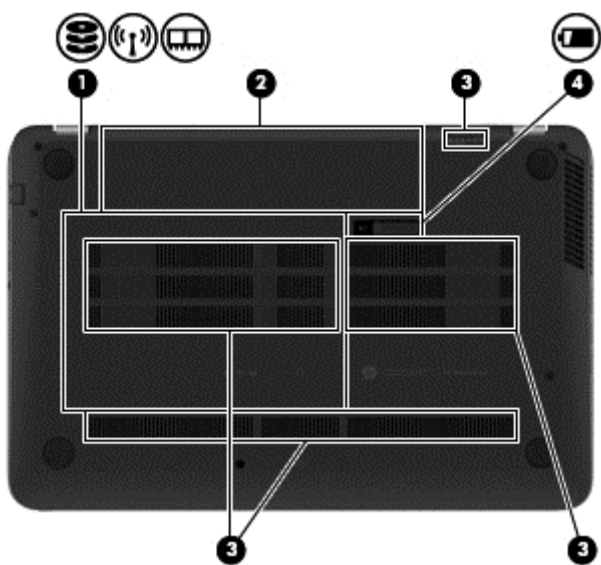
Component	Description
	<ul style="list-style-type: none"> Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.



Right side



(1)	 Audio-out (headphone)/Audio-in (microphone) jack	<p>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.</p> <p>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>.</p> <p>To access this document:</p> <ul style="list-style-type: none"> ▲ From the Start screen, type support, and then select the HP Support Assistant app. – or – From the Windows desktop, click the question mark icon in the taskbar. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p> <p>NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).</p>
(2)	 USB 2.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(3)	 RJ-45 (network) jack/status lights	<p>Connects a network cable.</p> <ul style="list-style-type: none"> White: The network is connected. Amber: Activity is occurring on the network.
(4)	AC adapter light	<ul style="list-style-type: none"> White: The computer is connected to external power and the battery is charged from 90 to 99 percent. Amber: The computer is connected to external power and the battery is charged from 0 to 90 percent. Off: The battery is using battery power.
(5)	 Power connector	Connects an AC adapter.


Bottom



Component		Description
(1)	 Service door	<p>Provides access to the hard drive bay, the wireless local area network (WLAN) module slot, the wireless wide area network (WWAN) module slot, and the memory module slots.</p> <p>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.</p> <p>Windows 8.1:</p> <ul style="list-style-type: none">▲ From the Start screen, type <code>help</code>, and then select Help and Support.- or -From the Windows desktop, click the question mark icon in the taskbar. <p>Windows 7:</p> <ul style="list-style-type: none">▲ Select Start > Help and Support.
(2)	Battery bay	Holds the battery.
(3)	Vents (4)	<p>Enable airflow to cool internal components.</p> <p>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.</p>
(4)	 Battery release latch	Releases the battery.

Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

 **IMPORTANT:** Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, or on the back of the display.


- Service label—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

Your service label will resemble one of the examples shown below. Refer to the illustration that most closely matches the service label on your computer.



Component	
(1)	Serial number
(2)	Product number
(3)	Warranty period
(4)	Model number (select models only)

- Microsoft® Certificate of Authenticity label (select models only prior to Windows 8)—Contains the Windows Product Key. You may need the Product Key to update or troubleshoot the operating system. HP platforms with Windows 8 or Windows 8.x preinstalled do not have the physical label. Instead a Digital Product Key is electronically installed.

 **NOTE:** The Digital Product Key is automatically recognized and activated by Microsoft operating systems when a Windows 8 or Windows 8.x operating system is reinstalled using HP-approved recovery methods.

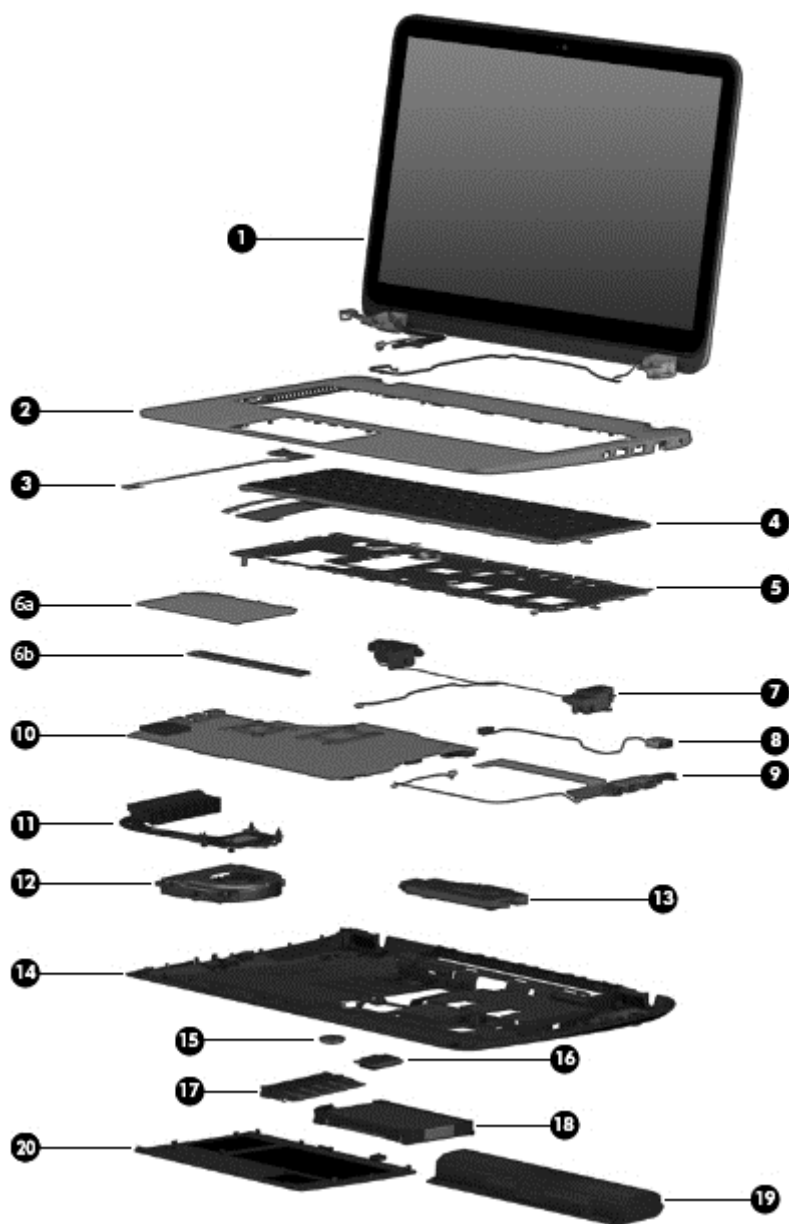
- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3 Illustrated parts catalog



NOTE: HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to <http://partsurfer.hp.com>, select your country or region, and then follow the on-screen instructions.

Computer major components




Item	Component	Spare part number
(1)	Display assembly (includes webcam/microphone module and wireless antenna cables):	
	15.6-in, BrightView, FHD, LED, touch screen display assembly	812534-001
	15.6-in, BrightView, HD, LED, touch screen display assembly for use only on computer models equipped with an Intel processor	812186-001
	Touch displays are spared only as the entire hinge-up. Non-touch displays are spared only at the subcomponent level. Entire hinge-ups are not spared for non-touch displays.	
	The subcomponents for the non-touch screen display assembly are available as spare part kits. For more display assembly spare part information, see Display assembly subcomponents on page 16 .	
(2)	Top cover	812188-001
(3)	Power button board (includes cable)	720553-001
(4)	Keyboard (includes keyboard cable and backlight cable):	
	For use in Canada	760743-DB1
	For use in the United States	760743-001
(5)	Keyboard shield	734817-001
	TouchPad assembly , includes:	812189-001
(6a)	TouchPad	
(6b)	TouchPad button board	
	TouchPad bracket and cables (not illustrated)	
(7)	Speakers (include left and right speakers, 2 cables, and 4 isolators)	720561-001
(8)	Power connector cable	720538-001
(9)	Connector board (includes audio jack, RJ-45 jack, USB port, and 2 cables)	765146-001
(10)	System board , includes an Intel Core i7-4722HQ processor and a graphics subsystem with discrete memory; includes replacement thermal material):	
	Windows 8 Professional operating system	812190-601
	Windows 8 Professional Standard system	812190-501
	Non-Windows 8 operating system	812190-001
(11)	Heat sink (includes replacement thermal material):	765737-001
(12)	Fan (includes cable)	720235-001
(13)	Subwoofer (includes cable and 3 isolators)	720563-001
(14)	Base enclosure (includes 4 rubber feet, battery lock latch, battery release latch, and RJ-45 cover):	774152-001
	Rubber Kit (not illustrated, includes front and rear rubber feet, base enclosure screw cover, and display bezel rubber screw covers)	720559-001
(15)	RTC battery:	718440-001
(16)	WLAN module:	
	Intel Dual Band Wireless-AC 3160 802.11ac 1×1 WiFi + BT 4.0 Combo Adapter	710662-001
(17)	Memory module (DDR3L-1600):	

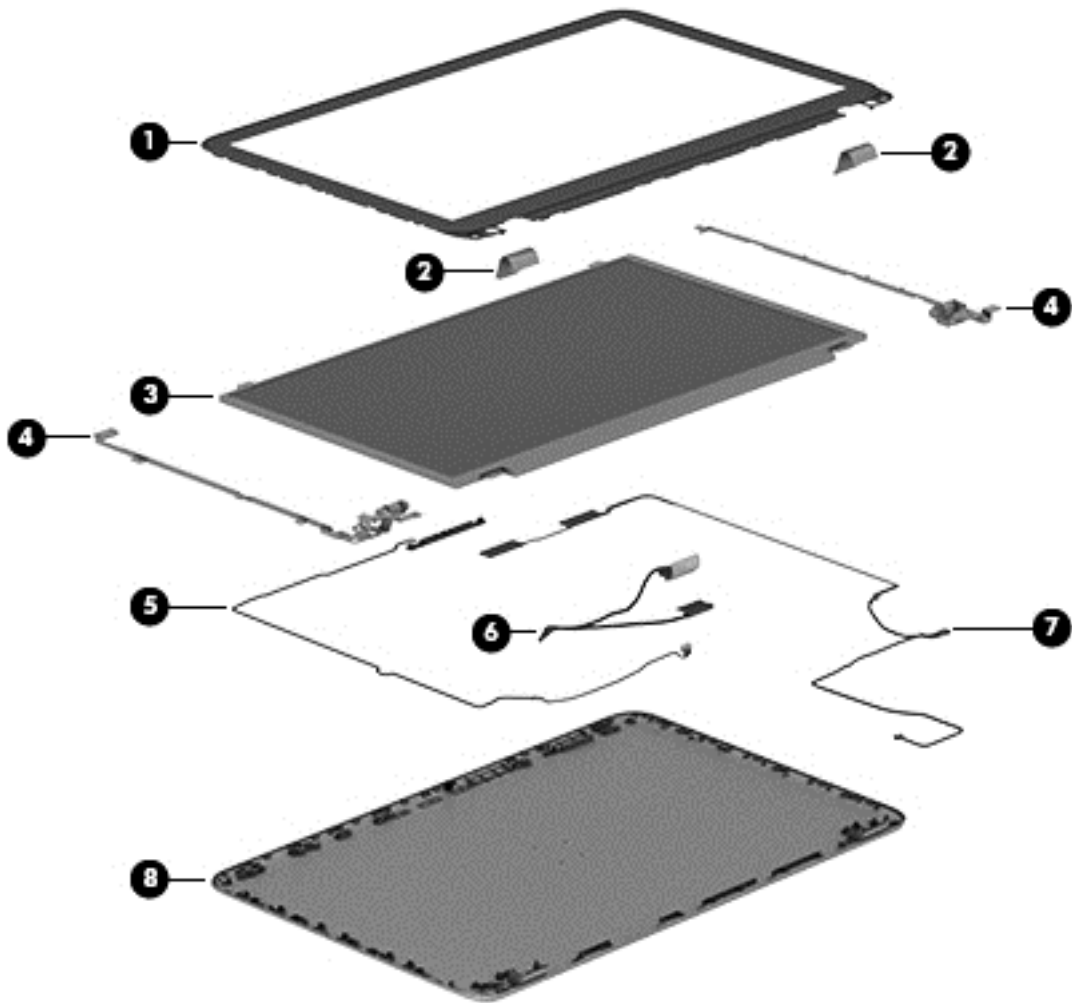
Item	Component	Spare part number
	8-GB	693374-001
	4-GB	691740-001
	2-GB	691739-001
(18)	Hard drive (does not include hard drive bracket or hard drive connector cable):	
	2.0-TB, 5400-rpm, 9.5-mm	801808-001
	1.0-TB, 5400-rpm, 9.5-mm	778192-001
	1.0-TB, 5400-rpm, SATA, 7.0-mm, hybrid 8-GB	731999-001
	750-GB, 5400-rpm, 9.5-mm	778190-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and hard drive connector cable)	720545-001
(19)	Battery:	
	6-cell, 62-Wh, 2.80-Ah, Li-ion battery	710417-001
	6-cell, 47-Wh, 2.20-Ah, Li-ion battery	710416-001
(20)	Service cover	812187-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
120-W HP Slim AC adapter (PFC, S, 4.5-mm)	710415-001
HDMI-to-VGA adapter	701943-001
Power cord (3-pin, black, 1.00-m):	
For use in North America	755530-001
Screw Kit	720560-001

Display assembly subcomponents

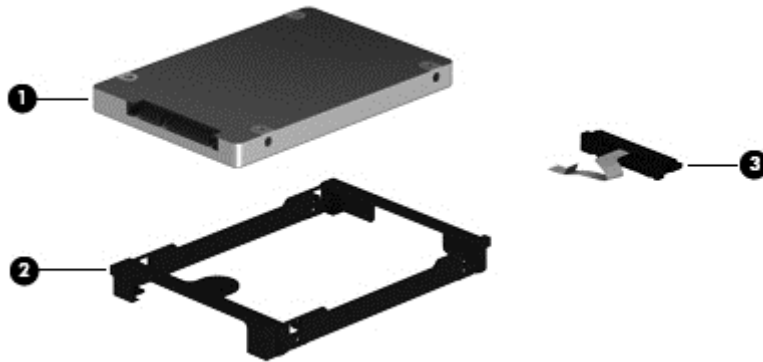
 **NOTE:** The information in this section applies only to computer models equipped with an Intel processor.



Item	Description	Spare part number
(1)	Display bezel	815681-001
	Display hinges, includes:	720548-001
(2)	Left and right hinge covers	
(3)	Left and right hinges and brackets	
(4)	Display panel:	
	15.6-in, BrightView, FHD, LED, non-touch screen display panel	812538-001
	15.6-in, BrightView, HD, LED, non-touch screen display panel	812537-001
(5)	Webcam/microphone module (includes webcam/microphone module cable and double-sided adhesive)	813551-001
(6)	Display panel cable (includes display panel cable and webcam/microphone module cable)	812185-001

Item	Description	Spare part number
(7)	Antenna Kit (includes left and right wireless antenna cables and transceivers)	720532-001
(8)	Display enclosure	720533-001

Mass storage devices



Item	Component	Spare part number
(1)	Hard drive (does not include hard drive bracket or hard drive connector cable):	
	2-TB, 5400-rpm, SATA, 9.5-mm	801808-001
	1.0-TB, 5400-rpm, 9.5-mm	778192-001
	1.0-TB, 5400-rpm, SATA, 7.0-mm, hybrid 8-GB	731999-001
	750-GB, 5400-rpm, 9.5-mm	778190-001
	Hard Drive Hardware Kit , includes:	720545-001
(2)	Hard drive bracket	
(3)	Hard drive connector cable	

Sequential part number listing

Spare part number	Description
691739-001	2-GB memory module (DDR3L-1600)
691740-001	4-GB memory module (DDR3L-1600)
693374-001	8-GB memory module (DDR3L-1600)
701943-001	HDMI-to-VGA adapter
710415-001	120-W HP Slim AC adapter (PFC, S, 4.5-mm)
710416-001	6-cell, 47-Wh, 2.20-Ah, Li-ion battery
710417-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
710662-001	Intel Dual Band Wireless-AC 3160 802.11ac 1×1 WiFi + BT 4.0 Combo Adapter

Spare part number	Description
718440-001	RTC battery
720235-001	Fan (includes cable)
720532-001	Antenna Kit (includes left and right wireless antenna cables and transceivers)
720533-001	Display enclosure
720538-001	Power connector cable
720545-001	Hard Drive Hardware Kit (includes hard drive bracket and hard drive connector cable)
720547-001	Counterbalance weight
720548-001	Display Hinge Kit (includes left and right display hinges and hinge brackets)
720553-001	Power button board (includes cable)
720559-001	Rubber Kit (includes front and rear rubber feet, base enclosure screw cover, and display bezel rubber screw covers)
720560-001	Screw Kit
720561-001	Speakers (include left and right speakers, 2 cables, and 4 isolators)
720563-001	Subwoofer (includes cable and 3 rubber isolators)
731999-001	1-TB, 5400-rpm, SATA, 7.0-mm, hybrid 8-GB hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 720545-001.
734817-001	Keyboard shield
755530-001	Power cord (3-pin, black, 1.00-m) for use in North America
760743-001	Keyboard in natural silver finish with backlight for use in the United States (includes backlight cable and keyboard cable)
760743-DB1	Keyboard in natural silver finish with backlight for use in Canada (includes backlight cable and keyboard cable)
765146-001	Connector board (includes audio jack, RJ-45 jack, USB port, and 2 cables)
765737-001	Heat sink
774152-001	Base enclosure (includes 4 rubber feet, battery lock latch, battery release latch, and RJ-45 cover)
778190-001	750-GB, 5400-rpm, SATA, 9.5-mm hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 720545-001.
778192-001	1.0-TB, 5400-rpm, SATA, 9.5-mm hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 720545-001.
801808-001	2-TB, 5400-rpm, SATA, 9.5-mm hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 720545-001.

Spare part number	Description
812185-001	Display panel cable (includes display panel cable and webcam/microphone module cable)
812186-001	Hinge-up, 15.6-in, BrightView, HD, LED, non-TouchScreen display assembly for use only on computer models equipped with an Intel processor (includes webcam/microphone module and wireless antenna cables)
812187-001	Service cover
812188-001	Top cover
812189-001	TouchPad assembly (includes TouchPad, TouchPad bracket, TouchPad button board, and cables)
812190-001	System board for use only on computer models equipped with an Intel Core i7-4722HQ processor, a graphics subsystem with discrete memory, and a non-Windows 8 operating system (includes replacement thermal material)
812190-501	System board for use only on computer models equipped with an Intel Core i7-4722HQ processor, a graphics subsystem with discrete memory, and the Windows 8 Standard operating system (includes replacement thermal material)
812190-601	System board for use only on computer models equipped with an Intel Core i7-4722HQ processor, a graphics subsystem with discrete memory, and the Windows 8 Professional operating system (includes replacement thermal material)
812534-001	Hinge-up, 15.6-in, BrightView, FHD, LED, touch screen display assembly (includes webcam/microphone module and wireless antenna cables)
812537-001	15.6-in, BrightView, HD, LED, non-TouchScreen display panel
812538-001	15.6-in, BrightView, FHD, LED, non-TouchScreen display panel
813551-001	Webcam/microphone module
815681-001	Display bezel

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			
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, 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 $\pm 10\%$ 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


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.

 **NOTE:** HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to <http://partsurfer.hp.com>, select your country or region, and then follow the on-screen instructions.

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 Service tag on page 16 for details.

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

There are as many as 4 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
6-cell, 62-Wh, 2.80-Ah, Li-ion battery	710417-001
6-cell, 47-Wh, 2.20-Ah, Li-ion battery	710416-001

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.

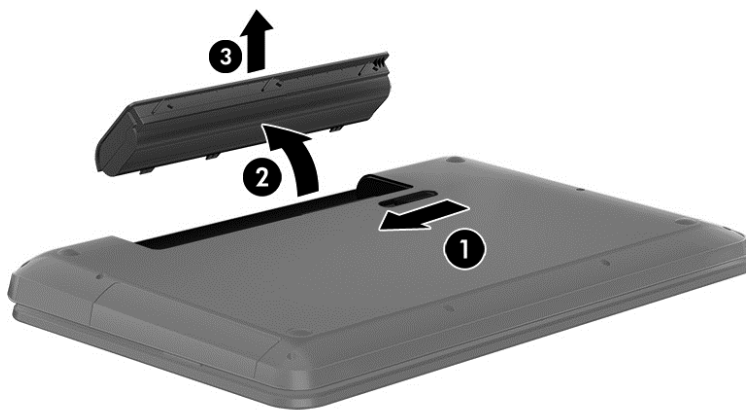
CAUTION: Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.



NOTE: The battery release latch automatically returns to its original position.

3. Pivot the battery **(2)** upward.
4. Remove the battery **(3)** from the computer.



Reverse this procedure to install the battery.

WLAN module

Description	Spare part number
Intel Dual Band Wireless-AC 3160 802.11ac 1×1 WiFi + BT 4.0 Combo Adapter	710662-001

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.

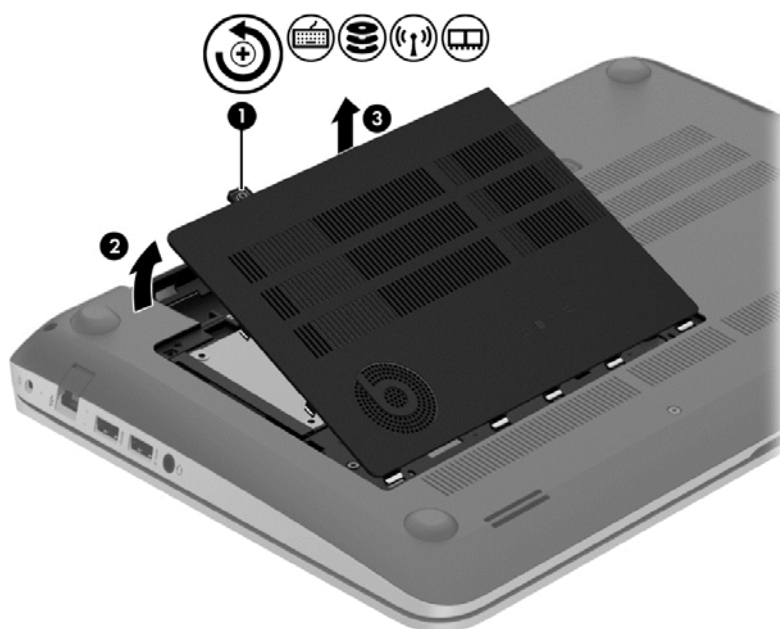
Before removing the WLAN module, follow these steps:

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 26](#)).


Remove the WLAN module:

1. Close the computer.
2. Turn the computer upside down with the front toward you.
3. Loosen the Phillips PM2.5×5.0 captive screw **(1)** that secures the service cover to the computer.
4. Lift the back edge of the service cover **(2)** until it detaches from the computer.
5. Remove the service cover **(3)**.

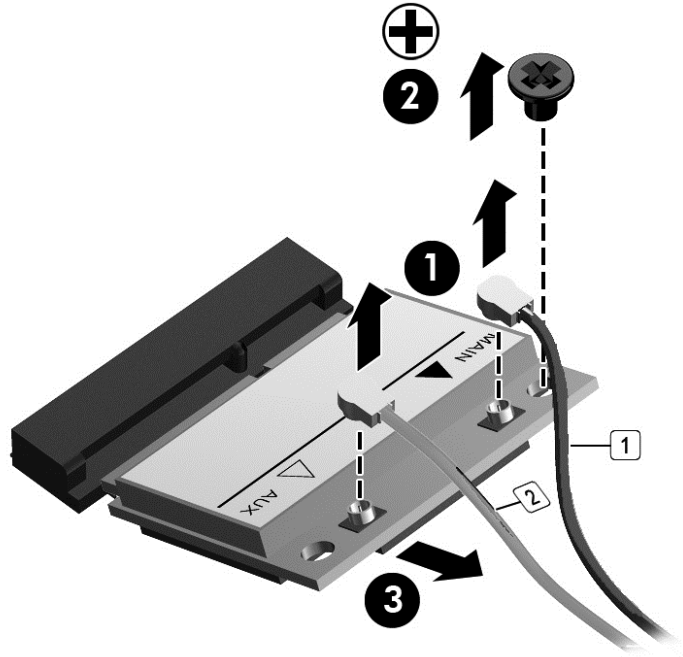
The service cover is available using spare part number 812187-001.




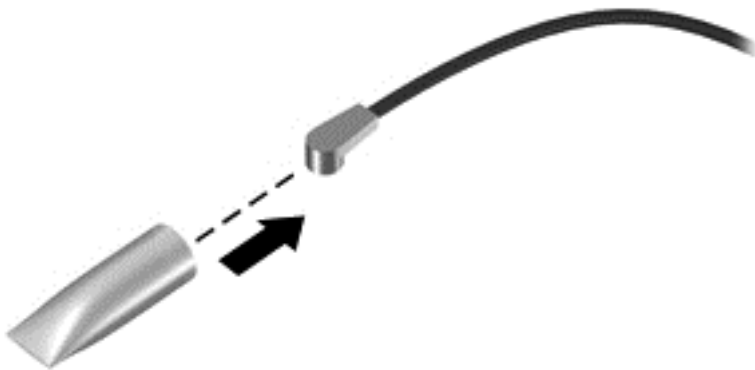
6. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

 **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”.

7. Remove the Phillips PM2.0×2.5 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)
8. 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.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive bracket or hard drive connector cable. The hard drive bracket and hard drive connector cable are included in the Hard Drive Hardware Kit, spare part number 720545-001.

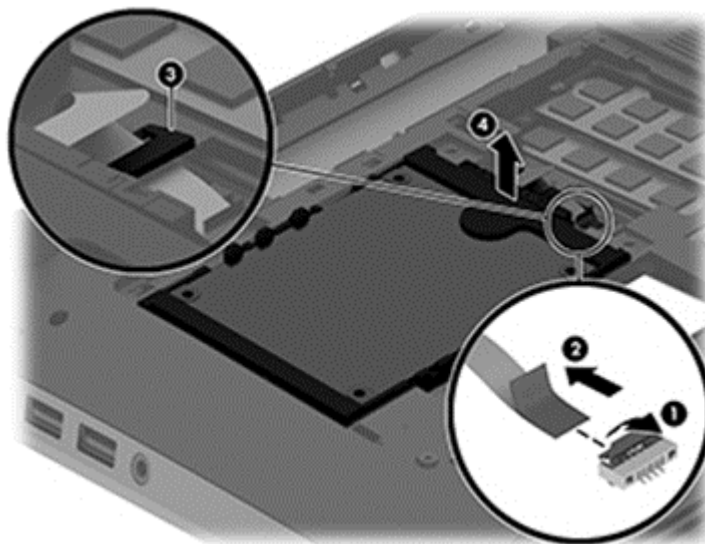
Description	Spare part number
2.0-TB, 5400-rpm, 9.5-mm	801808-001
1.0-TB, 5400-rpm, 9.5-mm	778192-001
1.0-TB, 5400-rpm, SATA, 7.0-mm, hybrid 8-GB	731999-001
750-GB, 5400-rpm, 9.5-mm	778190-001

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 26](#)).
5. Remove the service cover (see [WLAN module on page 27](#)).

Remove the hard drive:

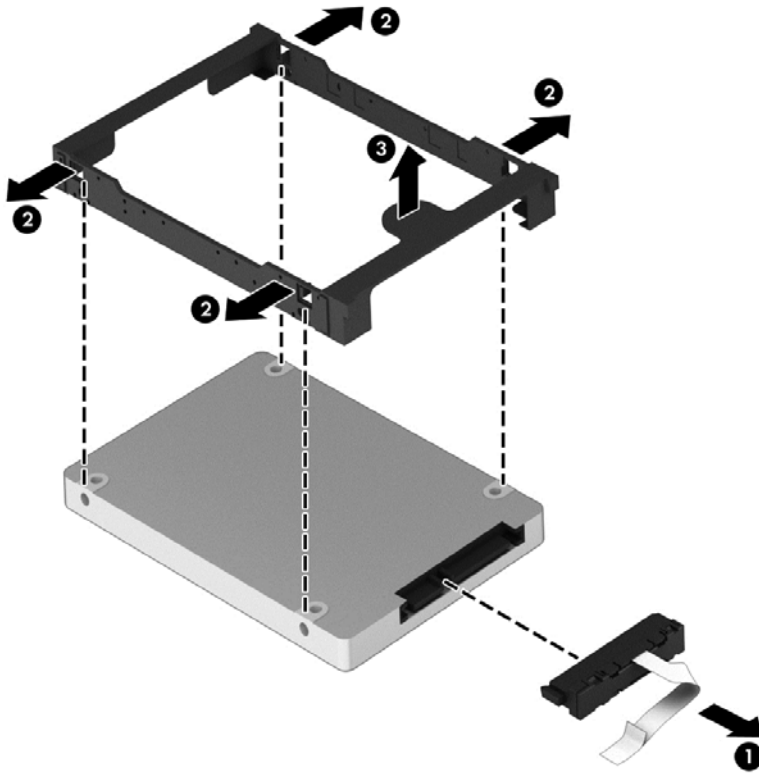
1. Release the zero insertion force (ZIF) connector **(1)** to which the hard drive connector cable is attached, and then disconnect the hard drive connector cable **(2)** from the system board.
2. Release the hard drive connector cable from the tab **(3)** in the base enclosure.
3. Lift up on the hard drive tab **(4)** to remove the hard drive from the hard drive bay.



4. 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. Spread the left and right sides (2) of the hard drive bracket outward to separate the bracket from the hard drive.
- d. Remove the hard drive bracket (3) from the hard drive.

The hard drive bracket and hard drive connector cable are available in the Hard Drive Hardware Kit, spare part number 718432-001.




Reverse this procedure to install the RTC battery.

Memory module

Description	Spare part number
8-GB (DDR3L-1600)	693374-001
4-GB (DDR3L-1600)	691740-001
2-GB (DDR3L-1600)	691739-001

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:

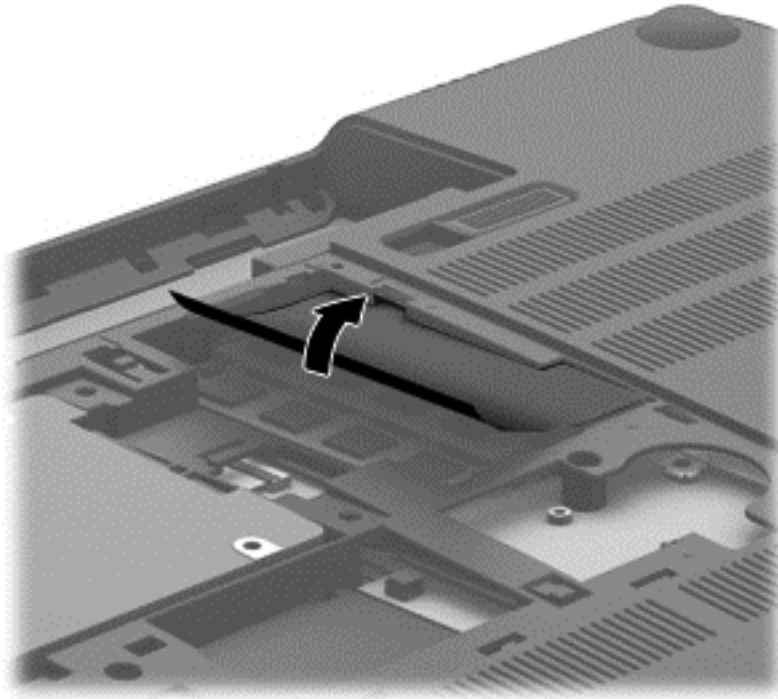
1. Navigate to www.hp.com.
2. Click **Support & Drivers** > **click Drivers & Software**.
3. In the **Enter a product name/number box**, type the computer model information, and then click **Search**.
4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. 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:

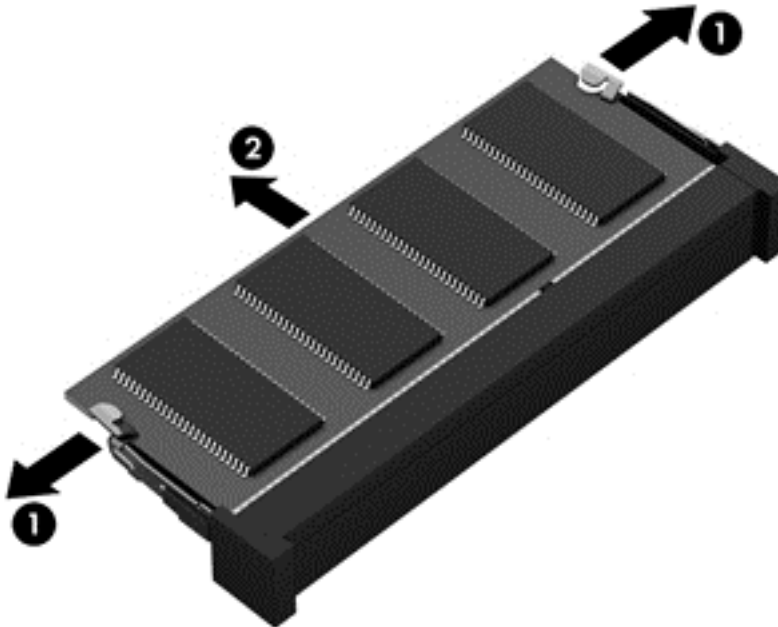
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)).
5. Remove the service cover (see [WLAN module on page 27](#)).

Remove the memory module:

1. Lift the left edge of the memory module shield and swing it up and to the right until the memory modules are accessible.





2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)
3. Remove the memory module **(2)** by pulling 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.

 **NOTE:** HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to <http://partsurfer.hp.com>, select your country or region, and then follow the on-screen instructions.

Component replacement procedures

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

There are as many as 94 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

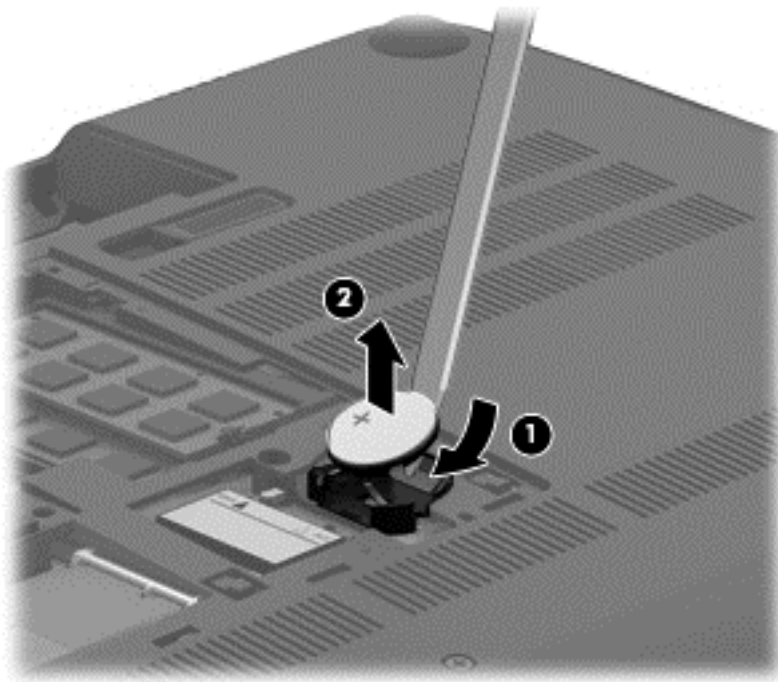
Description	Spare part number
RTC battery	718440-001

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 26](#)).
5. Remove the service cover (see [WLAN module on page 27](#)).

Remove the RTC battery:

- ▲ Use a thin, non-conductive tool **(1)** to remove the disc cell RTC battery **(2)** from the socket on the system board.



Reverse this procedure to install the RTC battery. When installing the disc cell RTC battery, make sure the “+” sign faces up.

Base enclosure

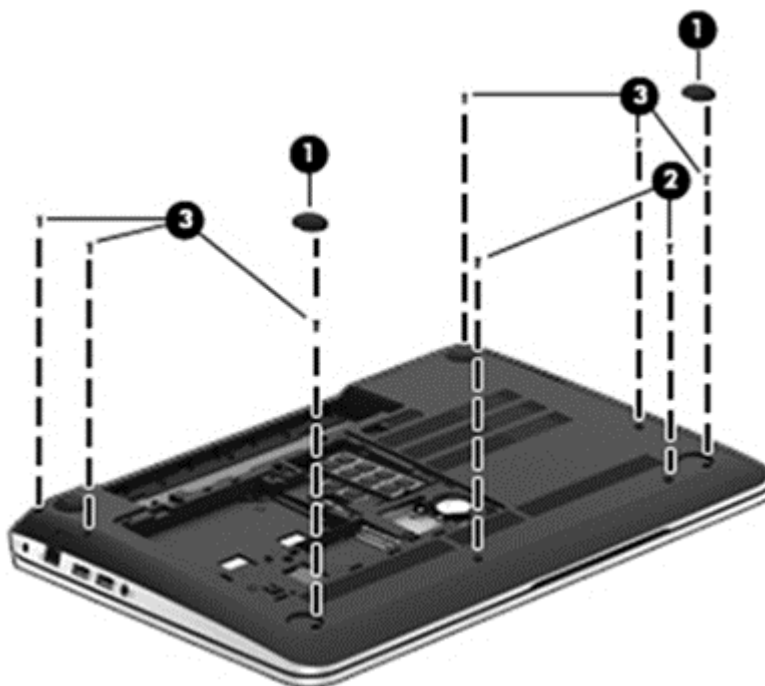
Description	Spare part number
Base enclosure	774152-001

Before removing the base enclosure, follow these steps:

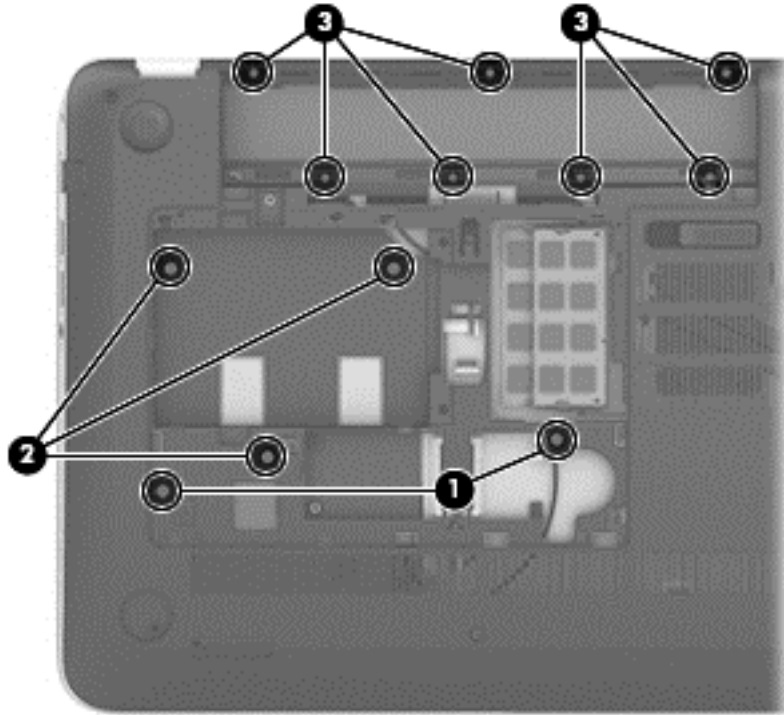
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)).
5. Remove the solid-state drive (see [WLAN module on page 27](#)).
6. Remove the hard drive (see [Hard drive on page 29](#)).

Remove the base enclosure:

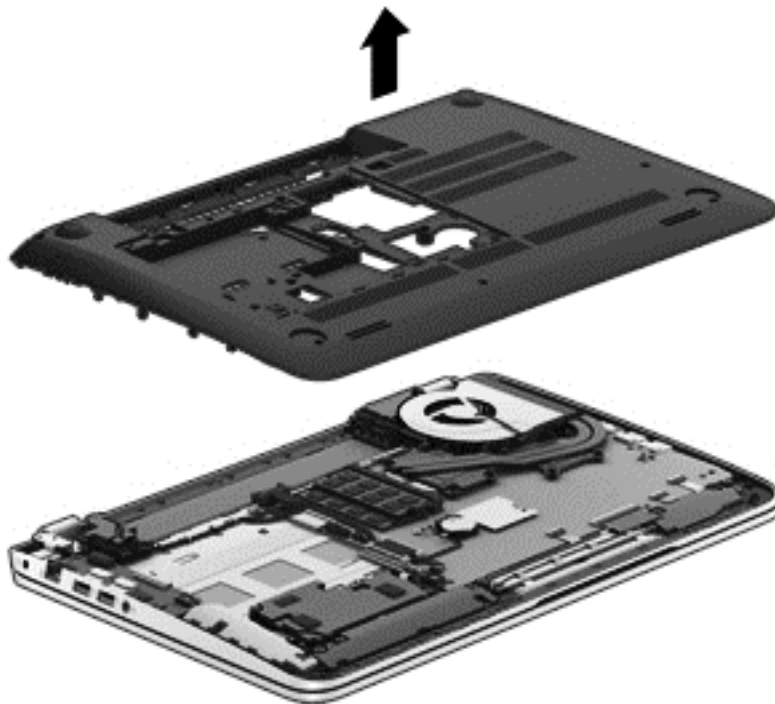
1. Remove the front rubber feet **(1)** and any additional screw covers.
The front rubber feet and the screw cover are included in the Rubber Kit, spare part number 720559-001.
2. Remove the two Phillips PM2.5×3.5 screws **(2)** and the six Phillips PM2.5×5.5 screws **(3)** that secure the base enclosure to the computer.



3. Remove the following screws:
- (1) Two Phillips PM2.5×5.5 screws under the front edge of the service cover
 - (2) Three Phillips PM2.5×3.0 screws in the hard drive bay
 - (3) Seven Phillips PM1.5×2.0 screws in the battery bay



4. Remove the base enclosure.



Reverse this procedure to install the base enclosure.

Display assembly

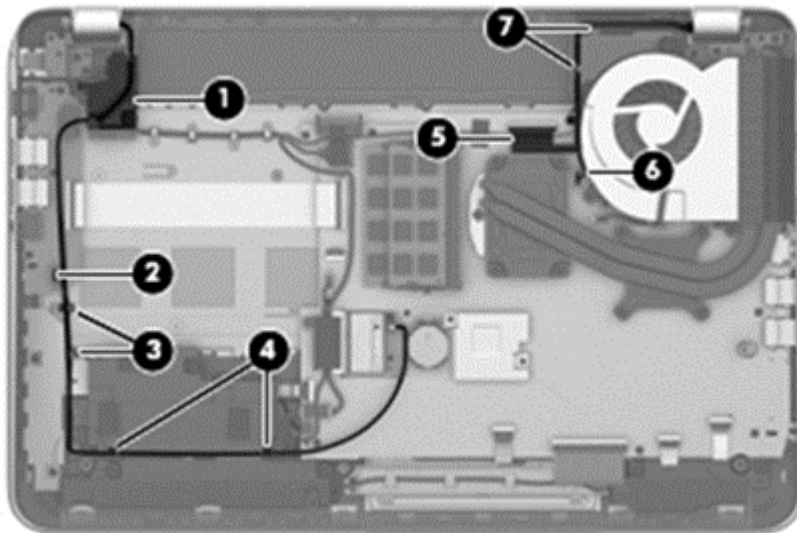
Description	Spare part number
15.6-in, BrightView, FHD, LED, touch screen display assembly (full hinge-up)	812534-001
15.6-in, BrightView, HD, LED, touch screen display assembly (full hinge-up)	812186-001

To remove the display assembly and access the display assembly subcomponents, follow these steps:

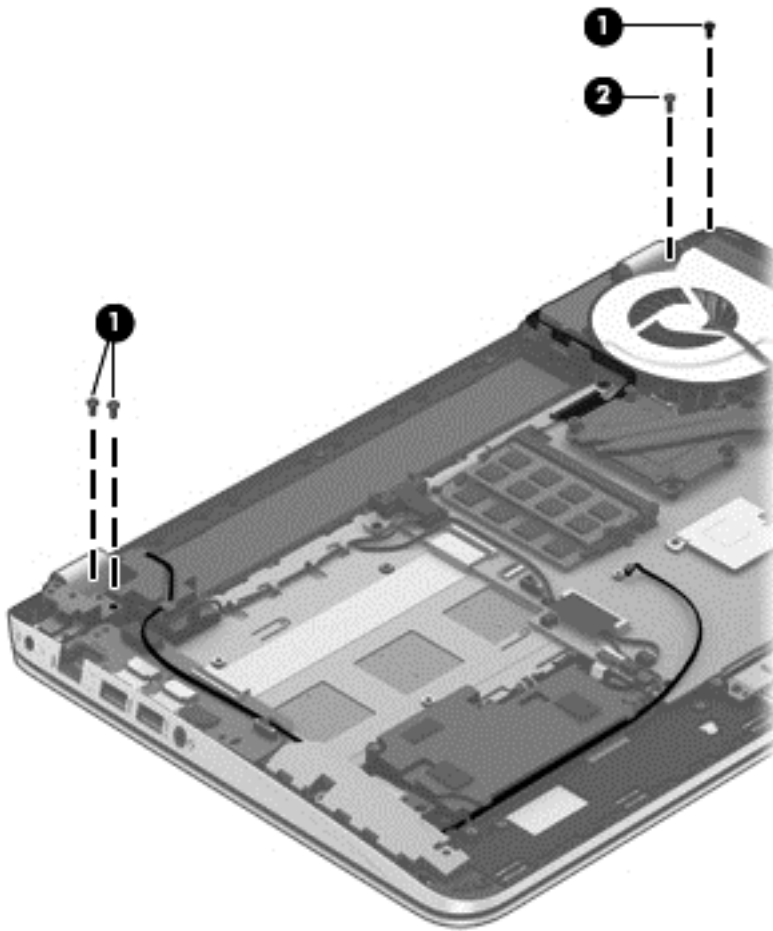
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)).
5. Disconnect the wireless antenna cables from the WLAN module (see [WLAN module on page 27](#)).
6. Remove the hard drive (see [Hard drive on page 29](#)).
7. Remove the base enclosure (see [Base enclosure on page 35](#)).

Remove the display assembly:

1. Release the wireless antenna cables from the retention clips built into the left rear speaker **(1)**, connector board **(2)**, and top cover **(3)**.
2. Release the wireless antenna cables from the retention clips **(4)** built into the subwoofer.
3. Release the ZIF connector to which the display panel cable is attached, and then disconnect the display panel cable **(5)** from the system board.
4. Disconnect the the webcam/microphone module cable **(6)** from the system board.
5. Release the display panel cable and the webcam/microphone module cable from the clips and routing channel built into the right rear speaker **(7)**.

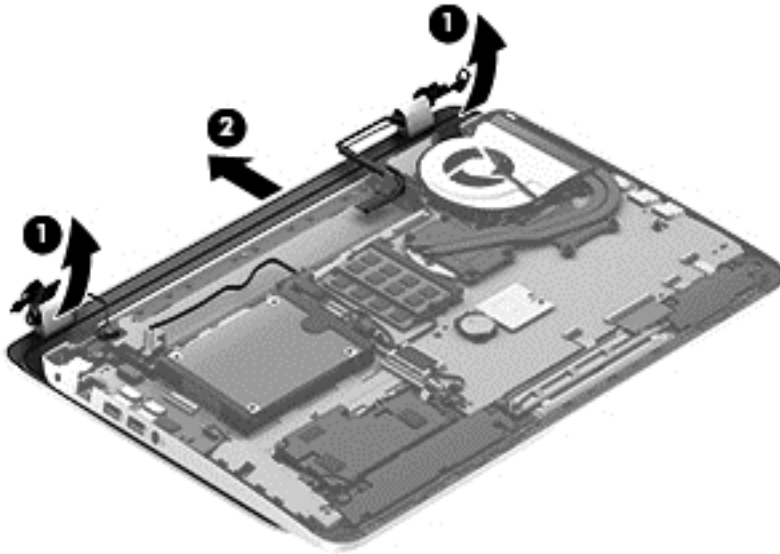



6. Remove the three Phillips PM2.5×4.5 screws **(1)** (two on the left hinge, one on the right hinge) that secure the display assembly to the top cover.
7. Remove the Phillips PM2.5×6.5 screw **(2)** on the right hinge that secures the display assembly to the top cover.



8. Open the display hinges **(1)** as far as they will open.

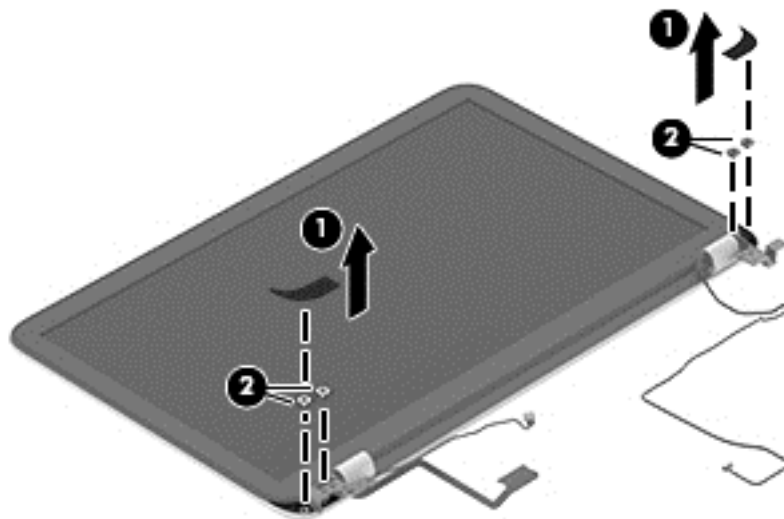
9. Remove the display assembly (2) from the computer.



 **NOTE:** Steps 10 through 16 apply only to computer models equipped with an Intel processor.

10. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
- Remove the two screw covers (1) and the four Phillips PM2.5×3.2 broad head screws (2) that secure the display bezel to the display assembly.

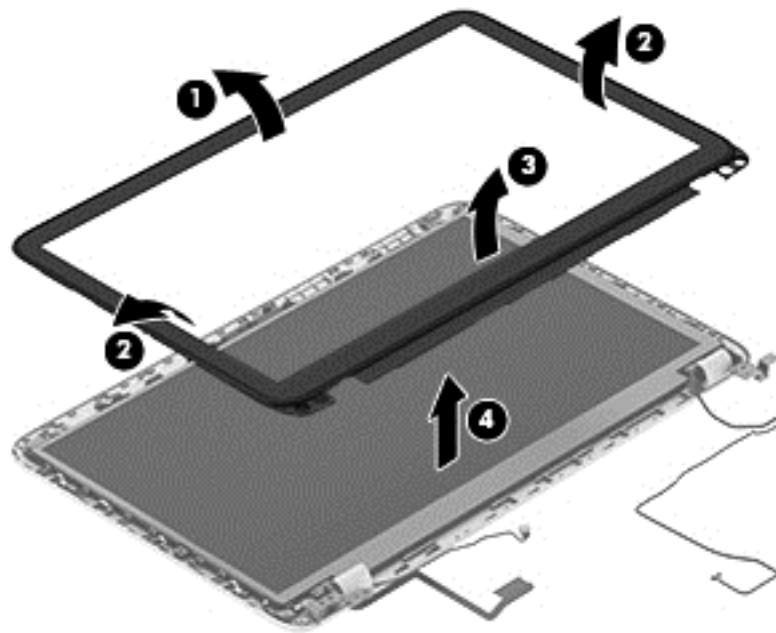
The screw covers are available in the Rubber Kit, spare part number 720559-001.



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

- c. Remove the display bezel **(4)**.

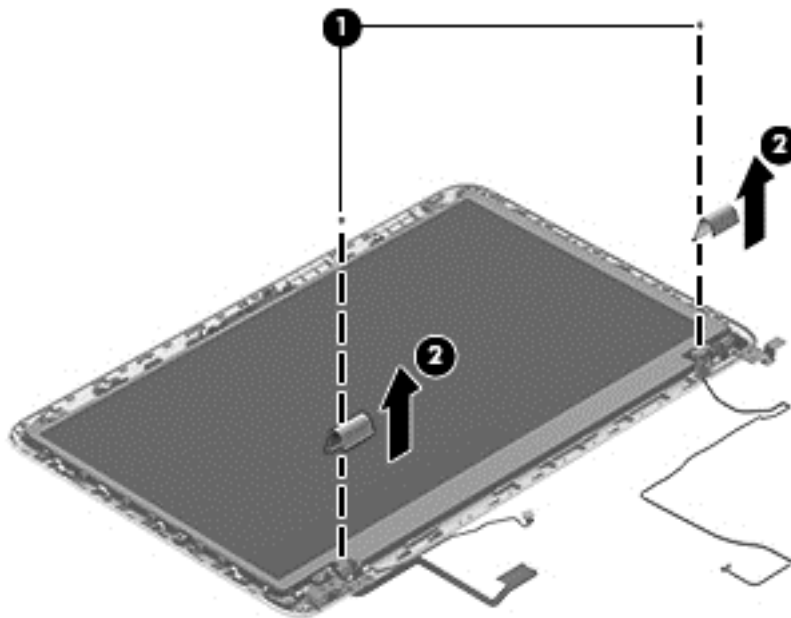
The display bezel is available using spare part number 815681-001.



11. If it is necessary to replace the display hinge covers:

- a. Remove the four Phillips PM2.0×2.9 screws **(1)** that secure the display hinge covers to the display enclosure.
- b. Remove the display hinge covers **(2)**.

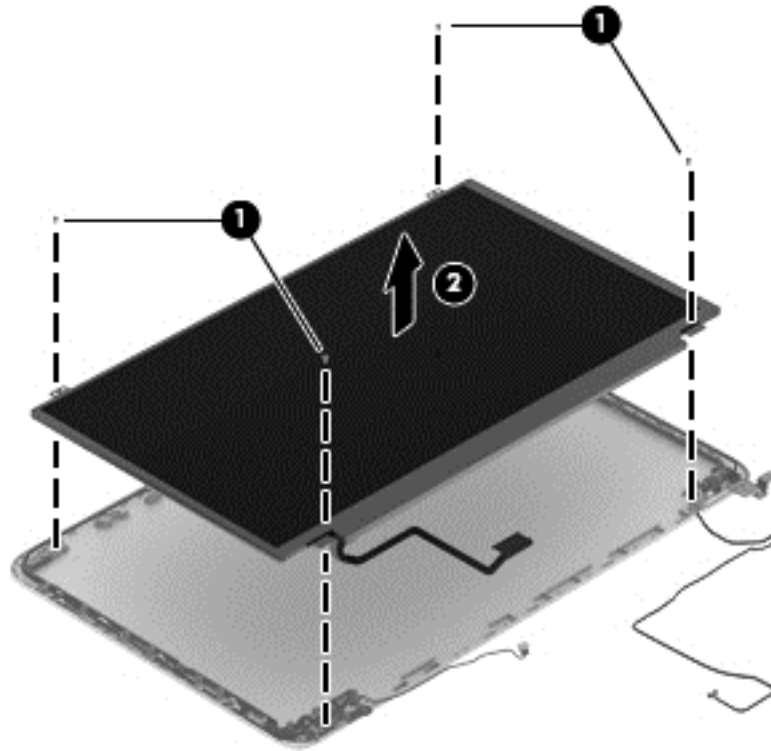
The display hinge covers are available using spare part number 720548-001.



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

- a. Remove the four Phillips PM2.0×2.9 screws **(1)** that secure the display panel to the display enclosure.
- b. Lift the display panel **(2)** straight up and remove it from the display enclosure.

The display panel is available using spare part numbers 812538-001 (15.6-in, BrightView, FHD, LED, non-TouchScreen display panel) and 812537-001 (15.6-in, BrightView, HD, LED, non-TouchScreen display panel).

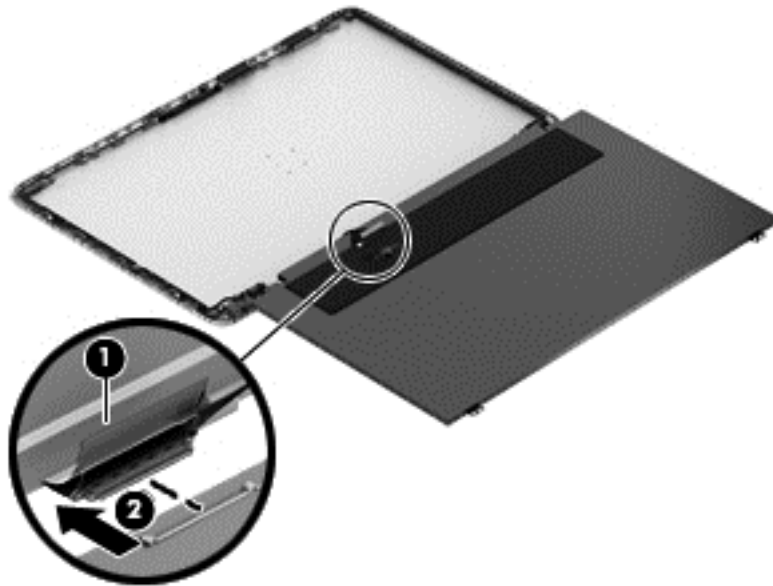


13. If it is necessary to replace the display panel cable:

⚠ CAUTION: Before turning the display panel upside down, make sure the work surface is clear of tools, screws, and any other foreign objects. Failure to follow this caution can result in damage to the display panel.

- a. Turn the display panel upside down with the bottom edge toward you.

- b. Release the adhesive strip **(1)** that secures the display panel cable to the display panel, and then disconnect the display panel cable **(2)** from the display panel.



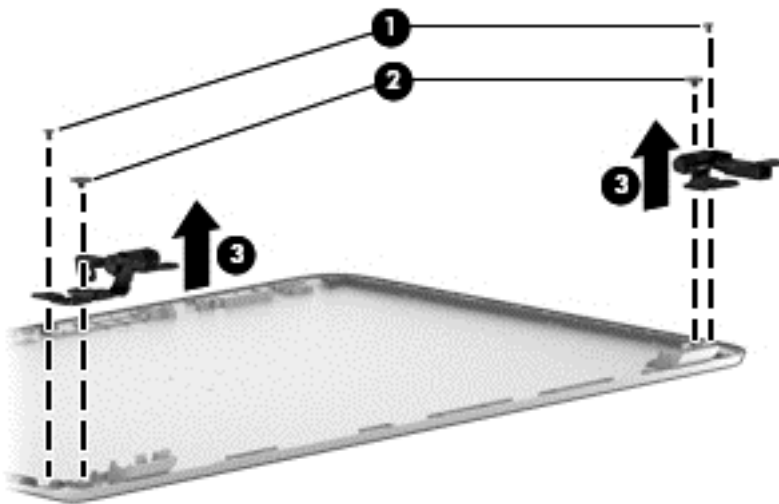
- c. Remove the display panel cable.

The display panel cable is available using spare part number 812185-001.

14. If it is necessary to replace the display hinges and brackets:

- a. Remove the two Phillips PM2.0×2.9 screws **(1)** and the two Phillips PM2.5×3.2 broad head screws **(2)** that secure the display hinges to the display enclosure.
- b. Remove the display hinges **(3)**.

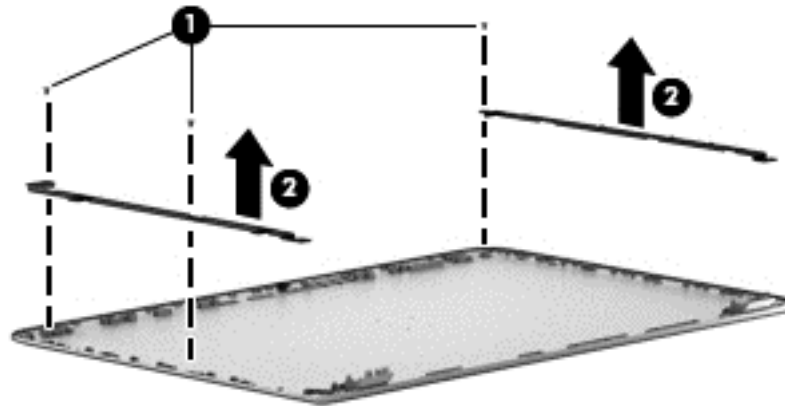
The display hinges are available using spare part number 720548-001.



- c. Remove the three Phillips PM2.0×2.9 screws **(1)** that secure the left and right display hinge brackets to the display enclosure.

- d. Remove the left and right display hinge brackets **(2)**.

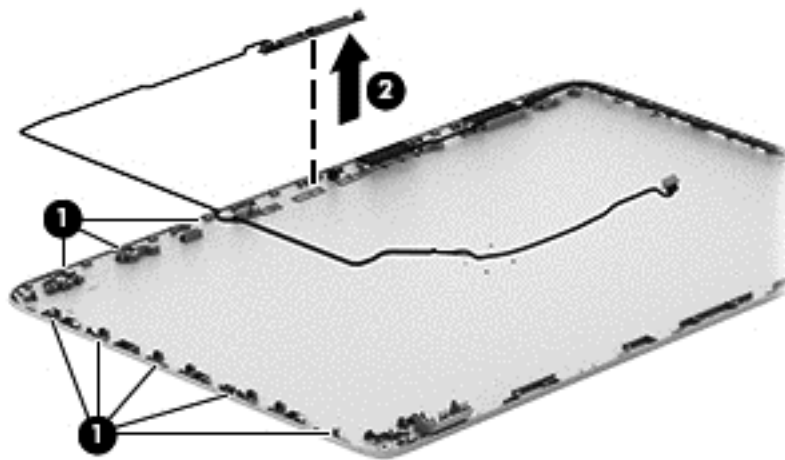
The display hinge brackets are available using spare part number 720548-001.



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

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

- Release the webcam/microphone module cable **(1)** from the clips and routing channel built into the left and top edges of the display enclosure.
- Detach the webcam/microphone module **(2)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided adhesive.)



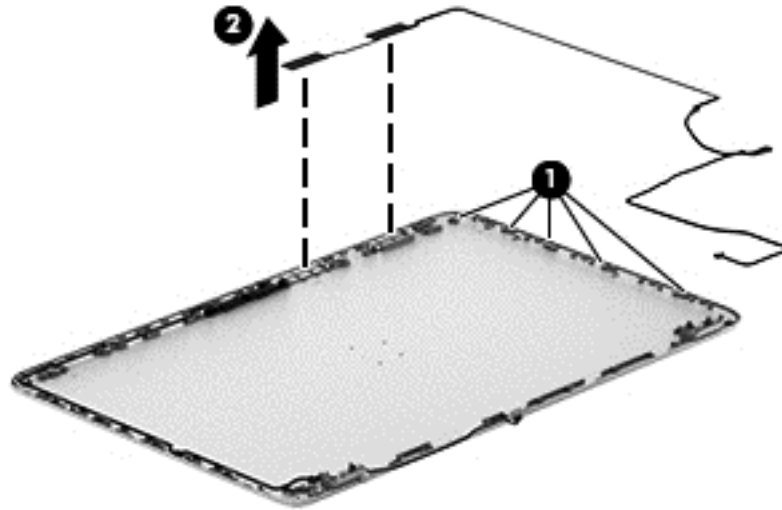
- c. Remove the webcam/microphone module.

The webcam/microphone module is available using spare part number 813551-001, and includes the webcam/microphone module cable.

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

- Release the wireless antenna cables from the clips **(1)** and routing channel built into the right edge of 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 adhesive.)



- c.** Remove the wireless antenna.

The wireless antenna are available using spare part number 720532-001.

Reverse this procedure to reassemble and install the display assembly.

Fan

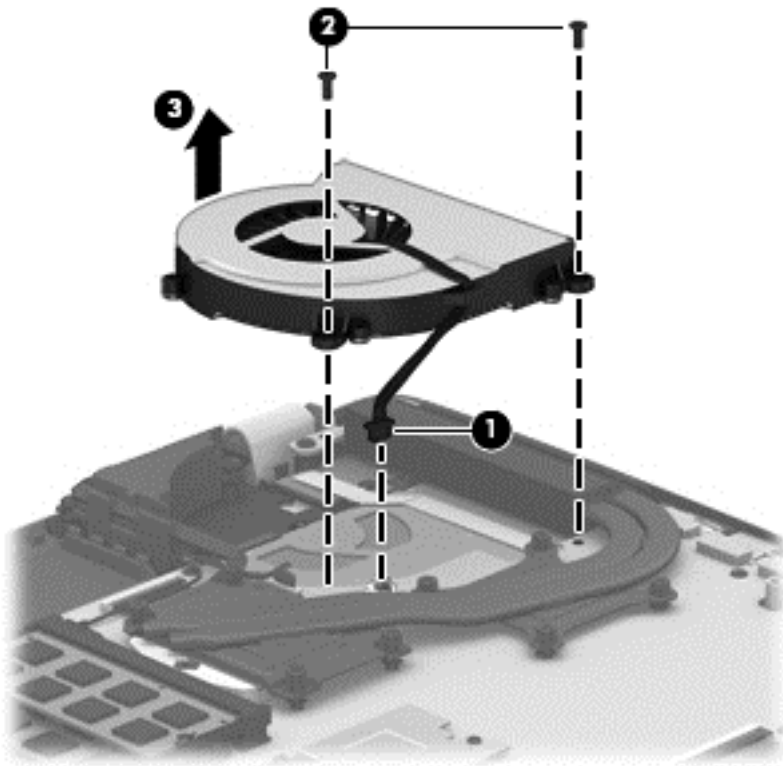
Description	Spare part number
Fan (includes cable)	720235-001

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 [Battery on page 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))
 - d. Display assembly (see [Display assembly on page 37](#))

Remove the fan:

1. Disconnect the fan cable (1) from the system board.
2. Remove the two Phillips PM2.5×4.5 screws (2) that secure the fan to the top cover.
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 Intel Core i7-4722HQ processor, a graphics subsystem with discrete memory, and the Windows 8 Professional operating system	812190-601
For use only on computer models equipped with an Intel Core i7-4722HQ processor, a graphics subsystem with discrete memory, and the Windows 8 Professional Standard system	812190-501
For use only on computer models equipped with an Intel Core i7-4722HQ processor, a graphics subsystem with discrete memory, and a non-Windows 8 operating system	812190-001

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 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))
 - d. Display assembly (see [Display assembly on page 37](#))
 - e. Fan (see [Fan on page 45](#))

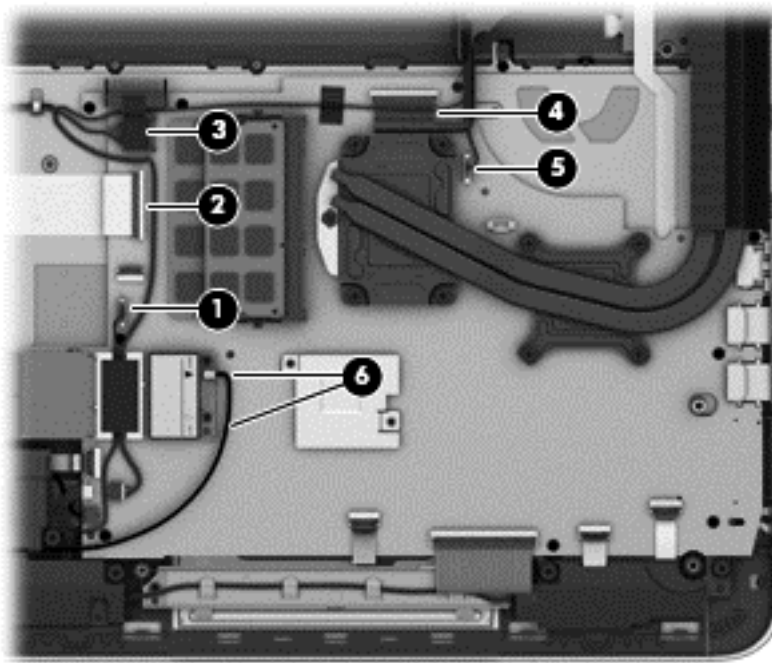


NOTE: When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- Memory module (see [Memory module on page 31](#))
- Heat sink (see [Heat sink on page 49](#))

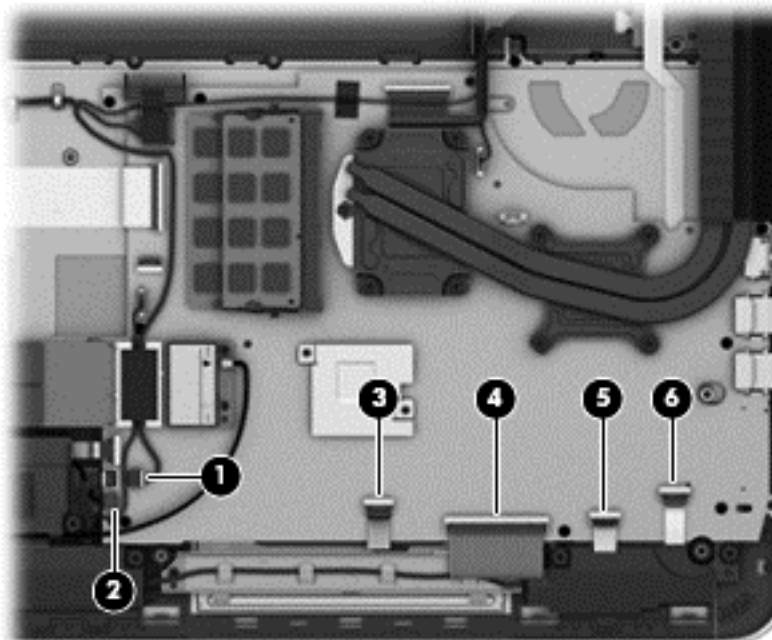
Remove the system board:

1. Disconnect the following cables from the system board:
 - (1) Connector board cable
 - (2) Connector board ribbon cable
 - (3) Power connector cable
 - (4) Display panel cable
 - (5) Webcam/microphone module cable
 - (6) Wireless antenna cables

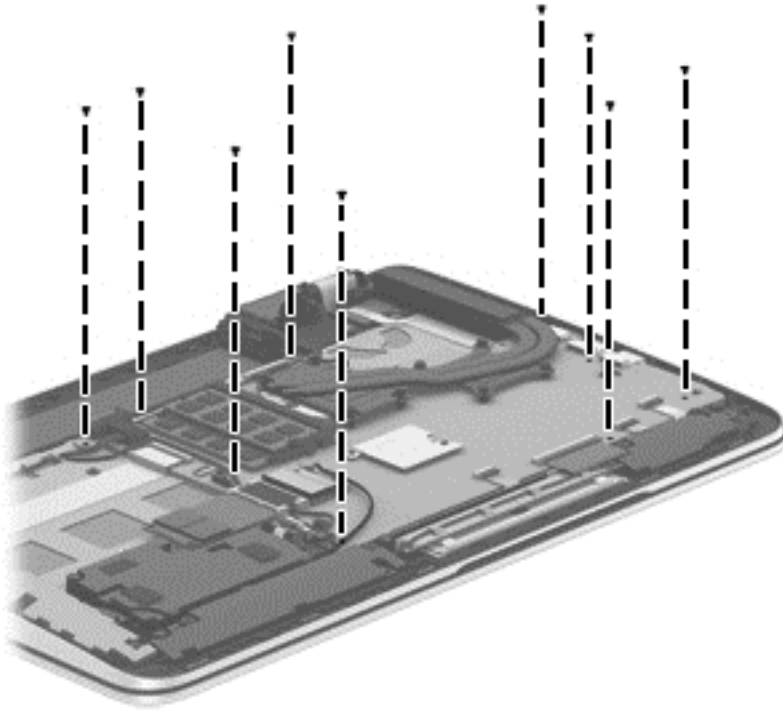


2. Disconnect the following cables from the system board:

- (1) Speaker cable
- (2) Subwoofer cable
- (3) TouchPad cable
- (4) Keyboard cable
- (5) Keyboard backlight cable
- (6) Power button board cable



3. Remove the nine Phillips PM2.0×2.9 screws that secure the system board to the top cover.



4. Lift the left side of the system board **(1)** until it rests at an angle.
5. Remove the system board **(2)** by sliding it up and to the left 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
Heat sink	765737-001


Before removing the heat sink, follow these steps:

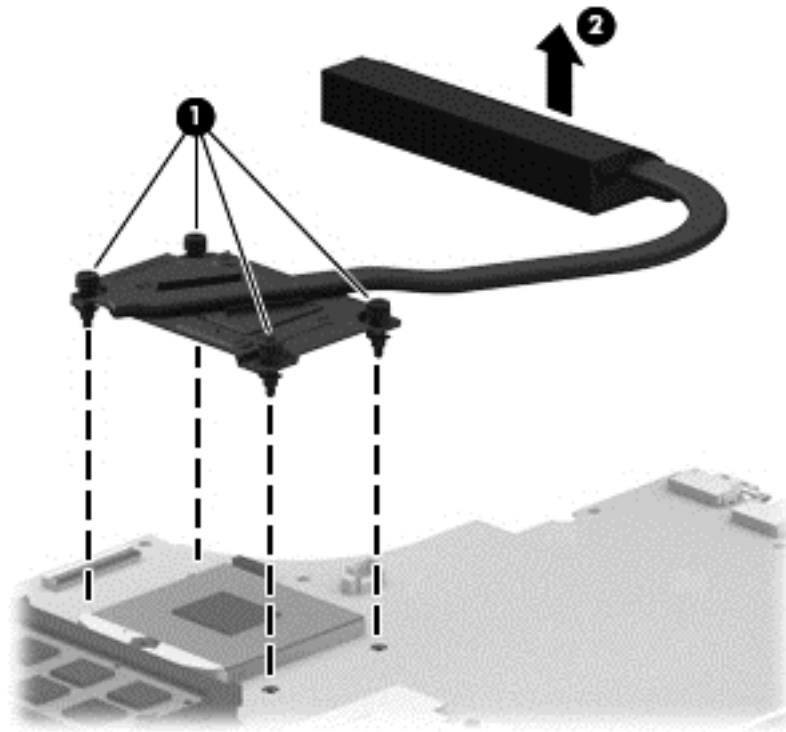
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))
 - d. Display assembly (see [Display assembly on page 37](#))
 - e. Fan (see [Fan on page 45](#))
 - f. System board (see [System board on page 46](#))


Remove the heat sink:

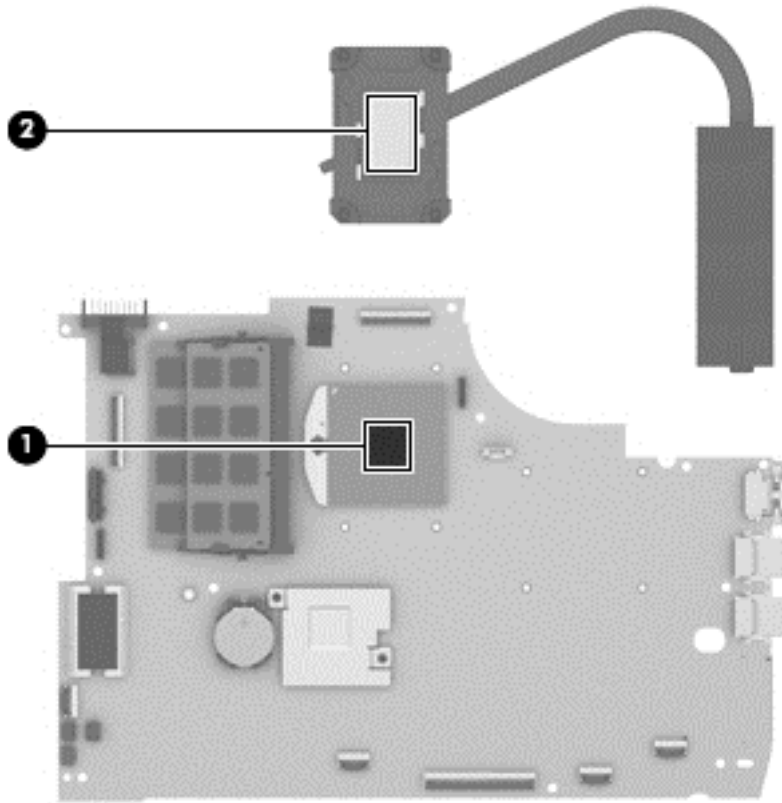
1. Turn the system board upside down, with the front toward you.
2. Following the 1 through 4 sequence stamped into the heat sink, loosen the four Phillips PM2.0×11.0 captive screws **(1)** that secure the heat sink to the system board.

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. Replacement thermal material is included with the heat sink, processor, and system board spare part kits. Thermal paste is used on the processor (1) and the heat sink section (2) that services it.



Reverse this procedure to install the heat sink.

Connector board



NOTE: The connector board spare part kit includes the audio jack, RJ-45 jack, USB port, and 2 cables.

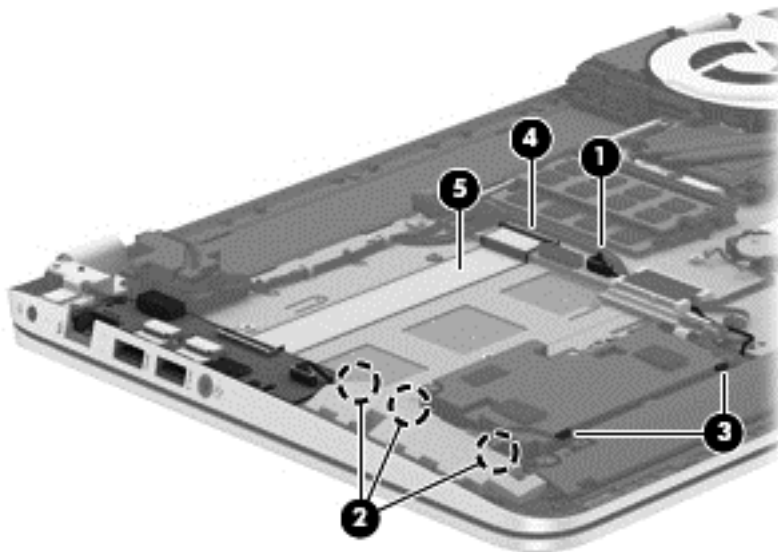
Description	Spare part number
Connector board	765146-001

Before removing the 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 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))

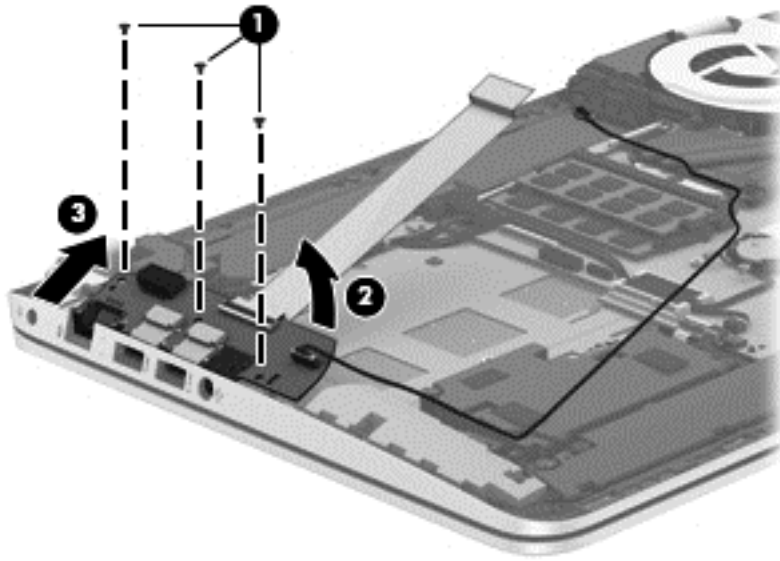
Remove the connector board:

1. Disconnect the connector board cable **(1)** from the system board.
2. Release the connector board cable from the retention clips built into the top cover **(2)** and the subwoofer **(3)**.
3. Release the ZIF connector **(4)** to which the connector board ribbon cable is attached, and then disconnect the connector board ribbon cable from the system board.
4. Detach the connector board ribbon cable **(5)** from the base enclosure. (The connector board ribbon cable is attached to the top cover with double-sided tape.)



5. Remove the three Phillips PM2.0×2.9 screws **(1)** that secure the connector board to the top cover.

6. Lift the right side of the connector board **(2)** until it rests at an angle.
7. Remove the connector board **(3)** by sliding it up and to the right at an angle.



Reverse this procedure to install the connector board.

Power connector cable

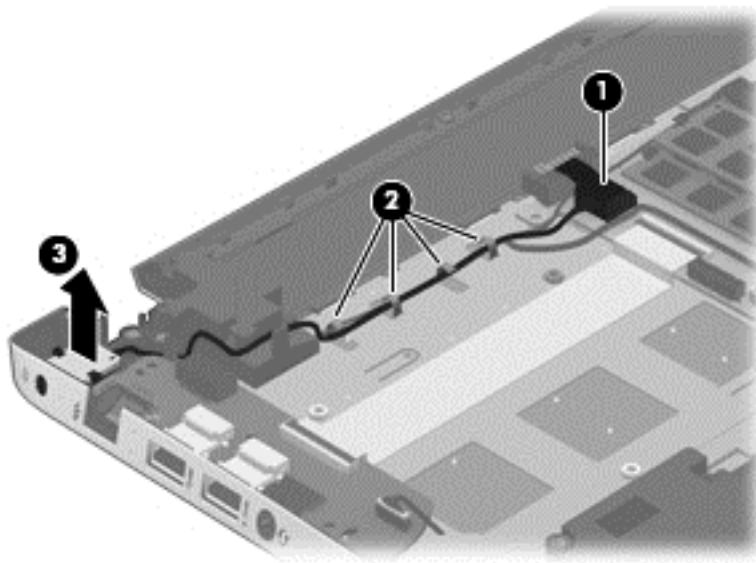
Description	Spare part number
Power connector cable	720538-001

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 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))

Remove the power connector cable:

1. Disconnect the power cable **(1)** from the system board.
2. Release the power connector cable from the clips **(2)** built into the keyboard shield.
3. Release the power connector **(3)** from the clips and mold built into the top cover.



4. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Subwoofer

Description	Spare part number
Subwoofer (includes cable and 3 isolators)	720563-001


Before removing the subwoofer, follow these steps:

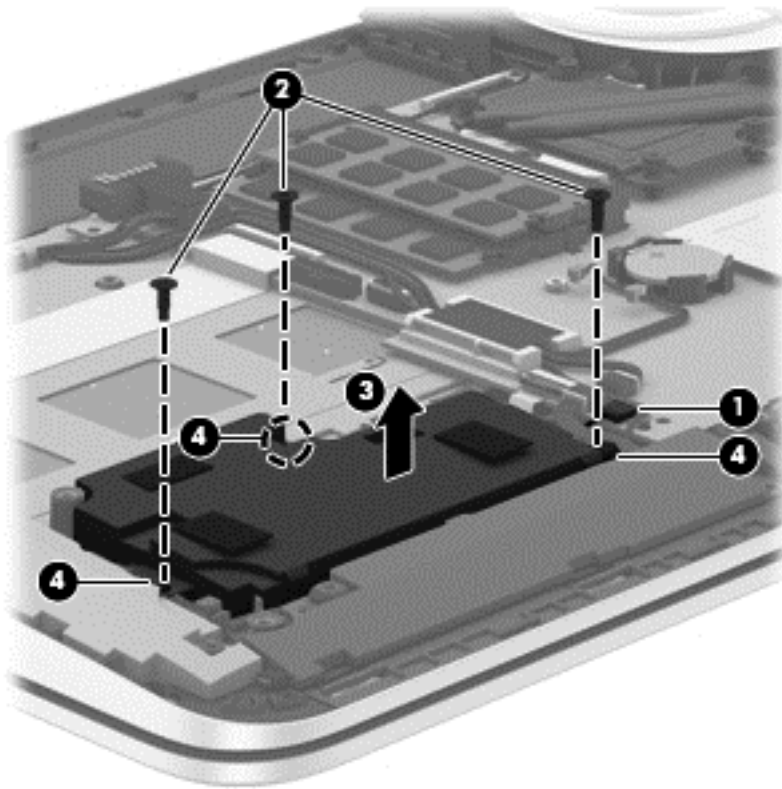
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))

Remove the subwoofer:

1. Disconnect the subwoofer cable **(1)** from the system board.
2. Remove the three Phillips PM2.5×6.2 screws **(2)** that secure the subwoofer to the top cover.

3. Remove the subwoofer (3).

 **NOTE:** The subwoofer includes three rubber isolators (4). These isolators are crucial to the performance of the subwoofer.



Reverse this procedure to install the subwoofer.

Speakers

Description	Spare part number
Speakers (include left and right speakers, 2 cables, and 4 isolators)	720561-001


Before removing the speakers, follow these steps:

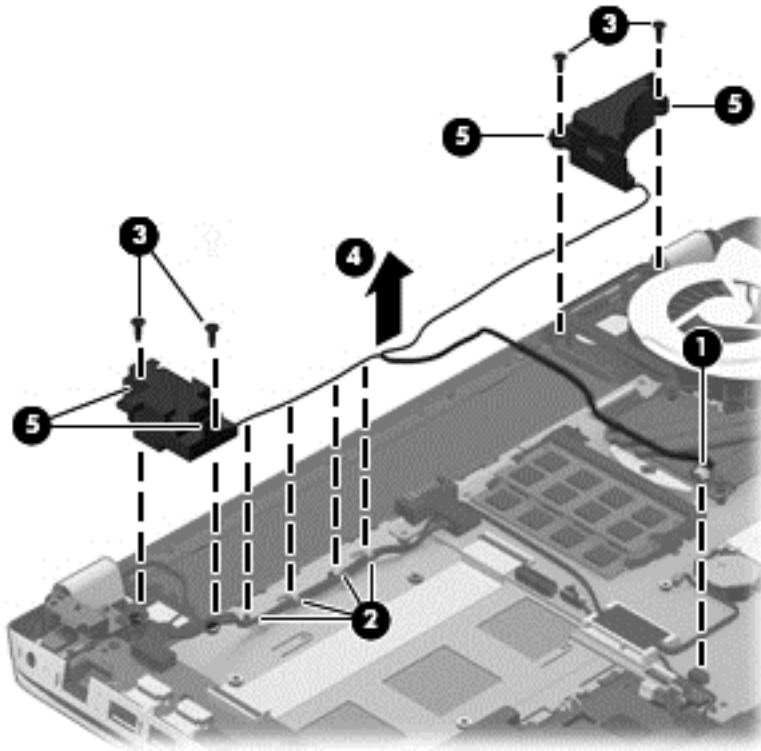
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the system board.
2. Release the speaker cables from the clips **(2)** and routing channel built into the top cover.
3. Remove the four Phillips PM2.5×6.2 screws **(3)** that secure the speakers to the top cover.

4. Remove the speakers (4).

 **NOTE:** The speakers includes four rubber isolators (5). These isolators are crucial to the performance of the speakers.



Reverse this procedure to install the speakers.

TouchPad assembly

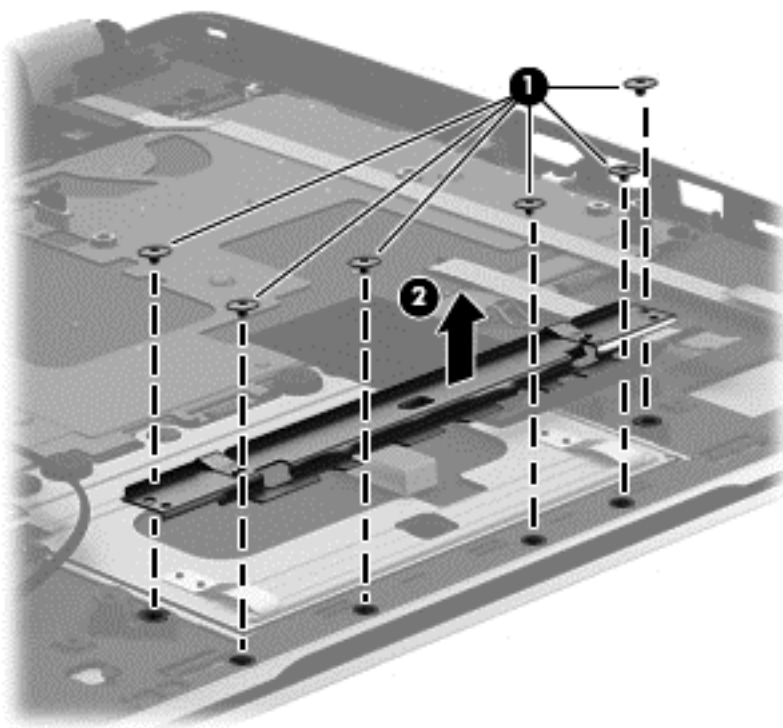
Description	Spare part number
TouchPad assembly (includes TouchPad bracket, TouchPad button board, TouchPad, and cables)	812189-001

Before removing the TouchPad, 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 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))
 - d. System board (see [System board on page 46](#))

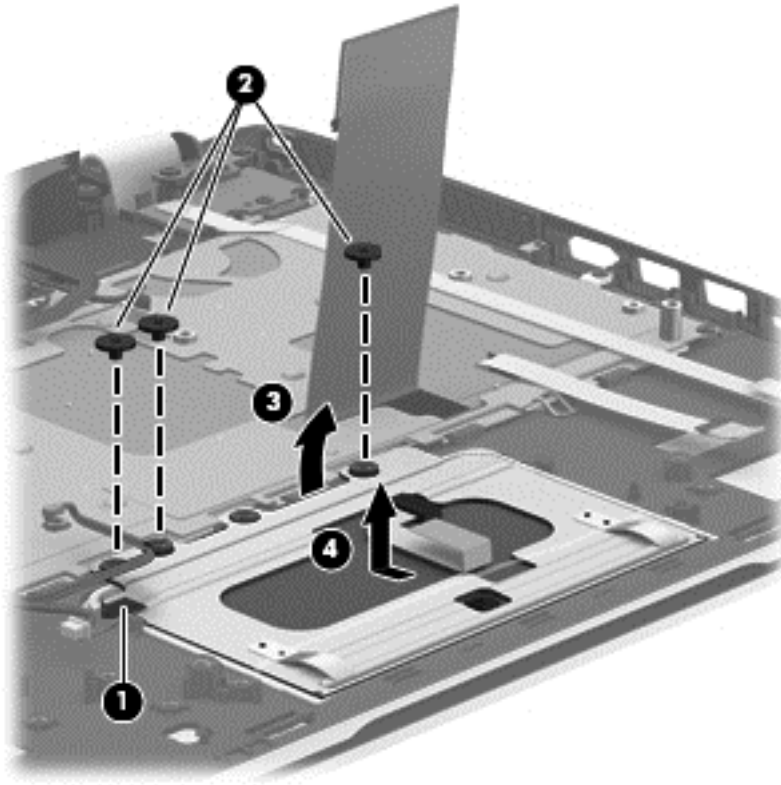
Remove the TouchPad:

1. Remove the six Phillips PM2.0×2.9 screws **(1)** that secure the TouchPad bracket to the top cover.
2. Remove the TouchPad bracket **(2)**.



3. Release the grounding tape **(1)** that connects the TouchPad to the top cover.
4. Remove the three Phillips PM2.5×2.5 broad head screws **(2)** that secure the TouchPad to the top cover.

5. Lift the rear edge of the TouchPad **(3)** until it rests at an angle.
6. Slide the TouchPad **(4)** toward the back of the top cover, and then lift the TouchPad straight up and remove it.



Reverse this procedure to install the TouchPad.

Power button board

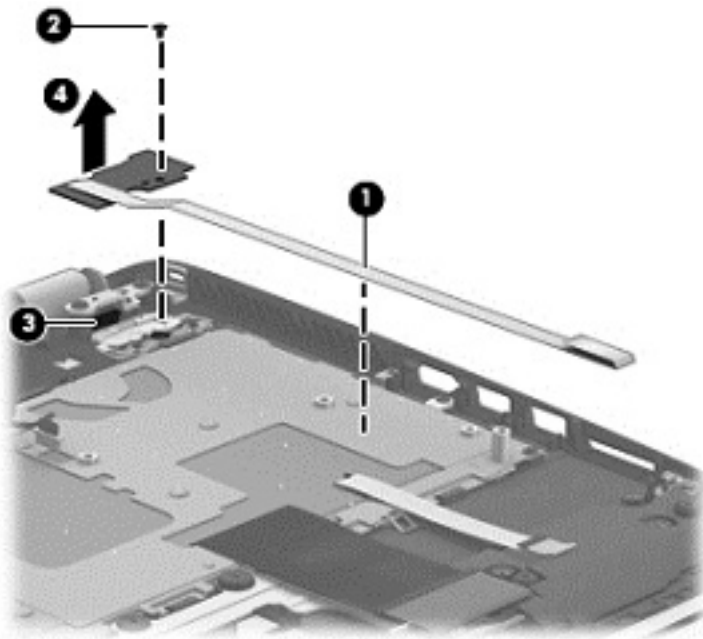
Description	Spare part number
Power button board (includes cable)	720553-001

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 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))
 - d. System board (see [System board on page 46](#))

Remove the power button board:

1. Detach the power button board cable (1) from the top cover. (The power button board cable is attached to the top cover with double-sided tape.)
2. Remove the Phillips PM2.0×2.9 screw (2) that secures the power button board to the top cover.
3. Release the clip (3) that secures the power button board to the top cover.
4. Remove the power button board (4).



Reverse this procedure to install the power button board.

Keyboard



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

For use in country/region	Spare part number
Keyboard with backlight for use in Canada (includes keyboard cable and backlight cable)	760743-DB1
Keyboard with backlight for use in the United States (includes keyboard cable and backlight cable)	760743-001

Before removing the keyboard, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 26](#)), and then remove the following components:
 - a. Service cover (see [WLAN module on page 27](#))
 - b. Hard drive (see [Hard drive on page 29](#))
 - c. Base enclosure (see [Base enclosure on page 35](#))
 - d. System board (see [System board on page 46](#))
 - e. Connector board (see [Connector board on page 52](#))
 - f. Subwoofer (see [Subwoofer on page 55](#))
 - g. Rear speaker (see [Speakers on page 57](#))
 - h. Power button board (see [Power button board on page 61](#))

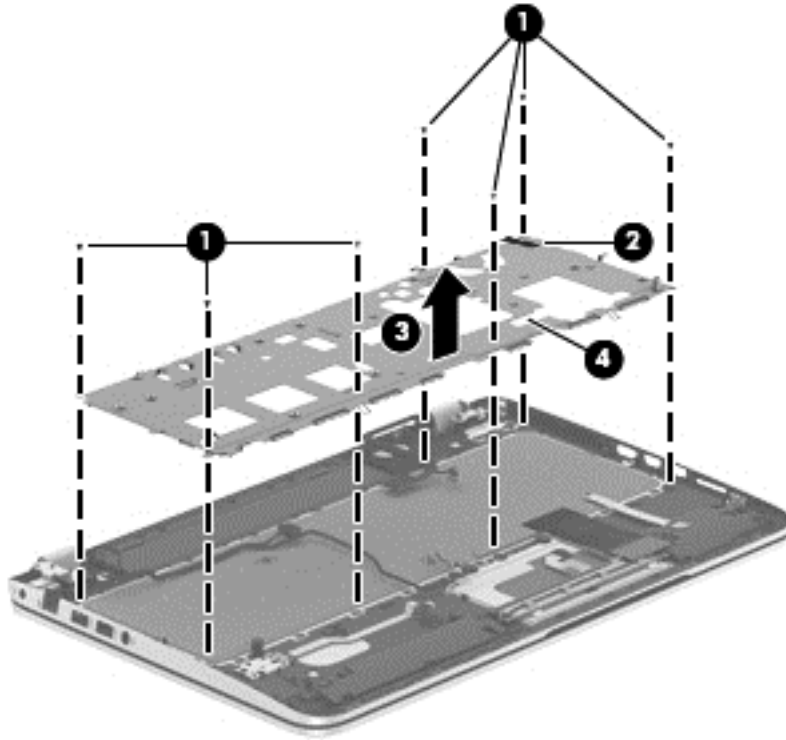
Remove the keyboard:

1. Remove the seven Phillips PM2.0×2.9 screws **(1)** that secure the keyboard shield to the computer.
2. Release the ground loop tape **(2)**.

3. Remove the keyboard shield (3).

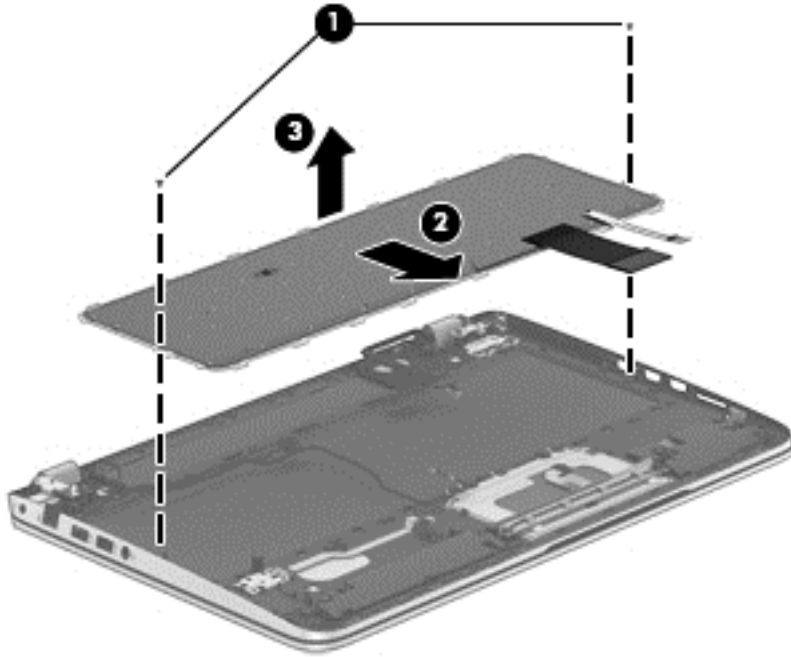
CAUTION: When removing the keyboard shield, make sure the keyboard cable and backlight cable are not damaged when being released through the opening (4) in the keyboard shield.

The keyboard shield is available using spare part number 734817-001.



4. Partially open the computer.
5. Insert a thin tool into the keyboard release hole in the memory module compartment, and then press on the back of the keyboard until the keyboard disengages from the computer.
6. Turn the computer right-side up with the front toward you.
7. Remove the two Phillips PM2.0×2.9 screws (1) that secure the keyboard to the top cover.
8. Release the keyboard (2) by sliding it toward the TouchPad.

9. Remove the keyboard (3).




Reverse this procedure to install the keyboard.

7 Using Setup Utility (BIOS) in Windows 8

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)

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

- Computers or tablets with keyboards:
 - ▲ Turn on or restart the computer, quickly press [esc](#), and then press [f10](#).

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (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 decide whether you need to update Setup Utility (BIOS), first determine the BIOS version on your computer.


BIOS version information (also known as *ROM date* and *System BIOS*) can be accessed from the Start screen by typing [support](#), selecting the **HP Support Assistant** app, selecting **My computer**, and then selecting **System Information**, or by using Setup Utility (BIOS).

To use Setup Utility (BIOS):


1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 65](#)).
2. Select **Main**, and then make note of the BIOS version.
3. Select **Exit**, select **Exit Discarding Changes**, and then follow the on-screen instructions.

To check for later BIOS versions, see [Downloading a BIOS update on page 66](#).

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.

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

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

– or –

From the Windows desktop, click the question mark icon in the taskbar.

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 version, 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.

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

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


– or –

From the Windows desktop, right-click the **Start** button, 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 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.

8 Using Setup Utility (BIOS) in Windows 7

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**.



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**, and then make note of your current BIOS version.
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**, type `hp support assistant`, and then select the **HP Support Assistant** program.
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.

9 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. Start Setup Utility:

- Computers or tablets with keyboards:
 - ▲ Turn on or restart the computer, quickly press **esc**.

2. Press or tap **f2**.

The BIOS searches three places for the diagnostic 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 69](#).

b. Hard drive

c. Setup Utility (BIOS)

3. When the diagnostic tool opens, use the keyboard arrow keys to select 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 or tap **esc**.

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

There are two options to download HP PC Hardware Diagnostics to a USB device:

Download the latest UEFI version:

- 1.** Go to <http://hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
- 2.** In the HP PC Hardware Diagnostics section, click the **Download** link, and then select **Run**.

Download any version of UEFI for a specific product:

- 1.** Go to <http://www.hp.com/support>, and then select your country. The HP Support page is displayed.
- 2.** Click **Drivers & Downloads**.
- 3.** In the text box, enter the product name, and then click **Go**.

– or –

Click **Find now** to let HP automatically detect your product.

4. Select your computer model, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.
 - or –
 - Click **Download**, and then select **Run**.

10 Backing up, restoring, and recovering in Windows 8.1

This chapter provides information about the following processes. The information in the chapter is standard procedure for most models.

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

For additional information, refer to Help and Support.

- ▲ From the Start screen, type `help`, and then select **Help and Support**.

Creating recovery media and backups

The following methods of creating recovery media and backups are available on select models only. Choose the available method according to your computer model.

- Use HP Recovery Manager after you successfully set up the computer. 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. For information on creating recovery media, see [Creating HP Recovery media \(select models only\) on page 71](#). For information on the recovery options that are available using the recovery media, see [Recovering using HP Recovery Manager on page 73](#).
- Use Windows tools to create system restore points and create backups of personal information.

For more information, see [Using Windows tools on page 72](#).



NOTE: If storage is 32 GB or less, Microsoft System Restore is disabled by default.

Creating HP Recovery media (select models only)



IMPORTANT: If your computer does not list a Create Recovery Media option, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.

HP Recovery Manager is a software program that allows you to create recovery media (using either a flash drive or set of DVDs) 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 restore the factory image if you replace the hard drive.

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the media 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. 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. If you cannot create the DVD media yourself, you can obtain recovery discs for your computer from HP. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take 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.

To create HP Recovery media:

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

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 73](#).

Using Windows tools

You can use Windows tools to create system restore points and create backups of personal information.



NOTE: If storage is 32 GB or less, Microsoft System Restore is disabled by default.

For more information and steps, see Help and Support.

- ▲ From the Start screen, type `help`, and then select **Help and Support**.

Restore and recovery

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



IMPORTANT: Not all methods are available on all models.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see Help and Support.
 - ▲ From the Start screen, type `help`, and then select **Help and Support**.
- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option of HP Recovery Manager to reinstall the individual application or driver.
 - ▲ From the Start screen, type `recovery`, select **HP Recovery Manager**, select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.

- On select models, 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 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 Reinstall drivers and/or applications option in HP Recovery Manager.

For more information, see [Recovering using HP Recovery Manager on page 73](#).

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 73](#). If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 71](#).
- On select models, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 73](#).
- On select models, if you want 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 \(select models only\) on page 75](#).

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select models only). If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 71](#).

What you need to know before you get started

- 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.



IMPORTANT: 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. If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 71](#).
- To use the Factory Reset option (select models only), you must use HP Recovery media. If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 71](#).
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.



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

Using HP Recovery media, you can choose from one of the following recovery options:



NOTE: Only the options available for your computer display when you start the recovery process.

- **System Recovery**—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- **Minimized Image Recovery (select models only)**—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 System Recovery and Minimized Image Recovery (select models only).

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

1. From the Start screen, type `recovery`, select **Recovery Manager**, and then select **HP Recovery Environment**.
- or -
Press **f11** while the computer boots, or press and hold **f11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then 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 HP Recovery media, and then restart the computer.



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 74](#).

3. Follow the on-screen instructions.

Changing the computer boot order

If your 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 to an optical drive or a USB flash drive.

To change the boot order:

1. Insert the HP Recovery media.
2. Start Computer Setup:
 - ▲ Turn on or restart the computer or tablet, quickly press **esc**, and then press **f9** for boot options.
3. Select the optical drive or USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

Removing the HP Recovery partition (select models only)

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



IMPORTANT: After you remove the HP Recovery partition, you can no longer use the Windows Refresh option or the Windows option to remove everything and reinstall Windows. In addition, you will not be able to perform System Recovery or Minimized Image Recovery from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see [Creating HP Recovery media \(select models only\) on page 71](#).

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.

11 Backing up, restoring, and recovering in Windows 7

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

Creating backups

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

Creating recovery media to recover the original system

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

What you need to know

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the flash drive or the number of blank DVD discs that will be required.

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

Creating the recovery media

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

To recover, see [Recovering the original system using HP Recovery Manager on page 79](#).

Creating system restore points

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

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

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

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

What you need to know

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

Creating a system restore point

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

To restore, see [Restoring to a previous system restore point on page 79](#).

Backing up system and personal information

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

Tips for a successful backup

- Number backup discs before inserting them into the optical drive.
- Store personal files in the Documents, Music, Pictures, and Videos libraries, and back up these folders periodically.
- Save customized settings in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to re-enter your preferences.

To create a screen shot:

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

What you need to know

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

Creating a backup using Windows Backup and Restore

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

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



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

To restore, see [Restoring specific files using Windows Backup and Restore on page 79](#).

Restore and recovery

Restoring to a previous system restore point

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

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

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

Restoring specific files

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

Restoring specific files using Windows Backup and Restore

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

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



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

Recovering the original system using HP Recovery Manager

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the disc provided by the manufacturer.
- A system recovery should be used as a final attempt to correct computer issues. If you have not already tried restore points (see [Restoring to a previous system restore point on page 79](#)) and partial restores (see [Restoring specific files on page 79](#)), try them before using HP Recovery Manager to recover your system.
- A system recovery must be performed if the computer hard drive fails or if all attempts to correct any functional computer issues fail.

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

Recovering using HP Recovery partition (select models only)

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

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



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

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

Recovering using the recovery media

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

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



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 80](#).

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.

12 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	37.95 cm	14.94 in
Depth	25.07 cm	9.87 in
Height (front to rear)	1.89 to 2.99 cm	0.74 to 1.18 in
Weight	2.76 kg	6.08 lbs
Input power		
Operating voltage and current	19.5 V dc @ 6.15 A – 120 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.		

13 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

Country/region	Accredited agency	Applicable note number
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 H05VV-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.

14 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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