HP ENVY 14 Notebook PC

Maintenance and Service Guide

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 http://www.microsoft.com for details.

First Edition: November 2014

Document Part Number: 798687-001

Important Notice about Customer Self-Repair Parts

⚠ **CAUTION:** Your computer includes Customer Self-Repair parts and parts that should only be accessed by an authorized service provider. See Chapter 5, "Removal and replacement procedures for Customer Self-Repair parts," for details. Accessing parts described in Chapter 6, "Removal and replacement procedures for Authorized Service Provider only parts," can damage the computer or void your warranty.

Safety warning notice

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

Table of contents

1 Product description

Category	Description
Product Name	HP ENVY 14 Notebook PC
Processors	Processors are attached to the system board. **Intel 5th generation processors:**® Intel Core™ i7-5500U 2.4 GHz processor, SC turbo up to 3.0 GHz, 1600 MHz (4 MB L3 cache, dual core, 15 W) Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz, 1600 MHz (3 MB L3 cache, dual core, 15 W) **Intel 4th generation processors:** Intel Core i7-4510U 2.0 GHz processor, SC turbo up to 3.1 GHz, 1600 MHz (4 MB L3 cache, dual core, 15 W) Intel Core i5-4210U 1.7 GHz processor, SC turbo up to 2.7 GHz, 1600 MHz (3 MB L3 cache, dual core, 15 W)
Chipset	Intel Lynx Point-LP PCH, for use with 4th Generation Intel Core processors
Graphics	**Internal graphics:** Intel HD Graphics 4400, for use with 4th Generation Intel Core processors
	Switchable discrete graphics: HD decode, DX11, and HDMI Optimus GPS (GPU Performance Scaling) NVIDIA GeForce GTX 850M with up to 4096 MB of dedicated video memory (256 M x16 DDR3 900 MHz x 8 PCs, 1 GHz downgrade to 900 MHz), 128 bit NVIDIA GeForce 840M with up to 2048 MB of dedicated video memory (256 M x16 DDR3 900 MHz x 4 PCs, 1 GHz downgrade to 900 MHz), 64 bit
Panel	**35.56 cm** (14 in), high-definition (HD), white light-emitting diode (WLED), BrightView (1366×768) flat display, 3.6 mm, SVA, typical brightness: 200 cd/m² (nits) **35.56 cm** (14 in), HD, WLED, Antiglare (1366×768) flat display, 3.6 mm, SVA, typical brightness: 200 cd/m² (nits) **35.56 cm** (14 in), FHD, WLED, Antiglare (1920x1080) slim display, 3.0 mm, typical brightness: 300 cd/m² (nits) – touch and non-touch 16:9 Ultra Wide Aspect Ratio
Memory	Supports the following configurations: • 16384 MB (8192 MB×2) • 12288 MB (8192 MB×1+ 4096 MB×1) • 8192 MB (8192 MB×1 or 4096 MB×2) • 4096 MB (4096 MB×1) Two SODIMM memory module slots DDR3L-1600 MHz dual channel support

Category	Description
Hard drive	Supports **6.35 cm** (2.5 in) hard drives in **9.5 mm** (.37 in) and **7.0 mm** (.28 in) thicknesses (all hard drives use the same bracket) Supports the following hard drives: • 1.5 TB, 5400 rpm, 9.5 mm • 1 TB, 5400 rpm, 9.5 mm • 750 GB, 5400 rpm, 9.5 mm • 500 GB, 5400 rpm, 7.0 mm or 9.5 mm • 750 GB, 5400 rpm, + 8 GB NAND Hybrid HDD; 9.5 mm • 1 TB, 5400 rpm, + 8 GB NAND Hybrid HDD; 9.5 mm Serial ATA HP 3D DriveGuard
Optical drive	Supports DVD±RW Double-Layer SuperMulti Drive Fixed, serial ATA, 9.5 mm tray load Zero power optical drive
Audio and video	Beats Audio Dual speakers Subwoofer HP TrueVision HD webcam (fixed, no tilt with activity LED; 1280×720 by 30 frames per second, USB 2.0, M-jpeg) Two dual array, digital microphones with appropriate beam-forming, echo-cancellation, noise-reduction software
Ethernet	Integrated 10/100/1000 NIC
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module One half-size mini card slot for WLAN Two WLAN antennas built into display assembly Intel Widi support with Intel WLAN modules only Compatible with Miracast-certified devices Support for the following WLAN formats: • Intel Dual Band Wireless-aC 3160 802.11 ac 1x1 Wi-Fi + BT 4.0 combo adapter • Qualcomm Atheros AR9485 802.11 bgn 1x1 Wi-Fi adapter • Realtek RTL8188EE 802.11 bgn 1x1 Wi-Fi adapter • Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT 4.0 combo adapter • QCA 9565 802.11 bgn 1x1 Wi-Fi + BT 4.0 combo adapter
External media cards	HP Multi-Format Memory Card Reader slot with push-push technology, supporting the following digital card formats: • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Secure Digital eXtended Capacity (SDXC) Memory Card

Category	Description
Ports	AC Smart Pin adapter plug (4.5 mm barrel) Combination audio-out (stereo headphone)/audio-in (mono microphone) RJ-45 (Ethernet) USB 3.0 (3 ports) HDMI version 1.4 output supporting 1920 x 1080 @ 60 Hz Hot Plug / Unplug and auto detect for correct output to wide-aspect versus standard aspect video
Keyboard/ pointing devices	Full-size black Dura Coat island-style Full-size black backlit painted island-style HP ControlZone Trackpad Multitouch gestures enabled Supports Windows® 8 Modern Trackpad Gestures
Power requirements	Supports the following AC adapters: • 90 W HP Smart AC adapter (PFC, RC, 3-wire, 4.5 mm) • 90 W HP Smart AC adapter (PFC, 3-wire, 4.5 mm, EM) • 65 W HP Smart AC adapter (nPFC, 3-wire, 4.5 mm) • 65 W HP Smart AC adapter (nPFC, 3-wire, 4.5 mm, EM) • 45 W HP Smart AC adapter (nPFC, 3-wire, 4.5 mm, nslim) Supports battery fast charge Supports the following batteries (battery is user-removable) • 4 cell battery - 48 Whr (3.2 AH) • 4 cell battery - 41 Whr (2.8 AH)
Security	Security cable lock Fingerprint reader HP SimplePass support
Operating system	**Preinstalled:** Windows 8.1 Standard, 64 bit Windows 8.1 Professional, 64 bit Ubuntu Linux
Serviceability	**End-user replaceable parts:** AC adapter Battery Optical drive

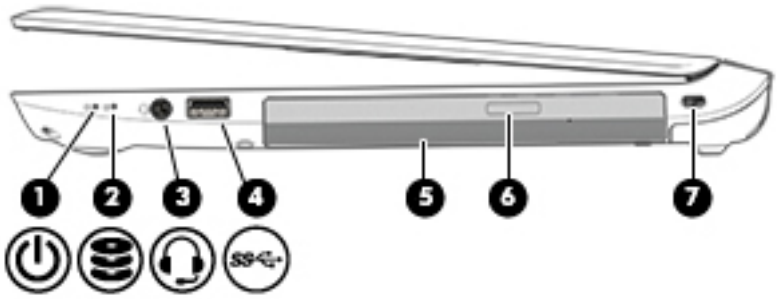
2 External component identification

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)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(3)	Internal microphones	Record sound.
(4)	Webcam light	On: The webcam is in use.
(5)	Webcam	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video. To use the webcam, from the Start screen, type `camera`, and then select **Camera** from the list of applications.

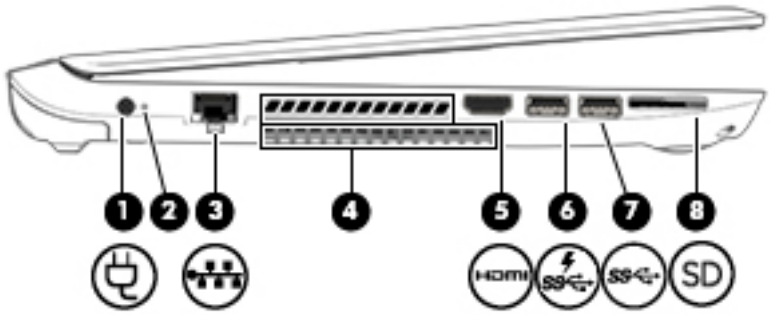
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. To access this guide, from the Start screen, type `support`, and then select the **HP Support Assistant** app.

Right side



Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Hard drive light	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(3)		Audio-out (headphone)/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional microphone-only devices. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this guide, from the Start screen, type `support`, and then select the **HP Support Assistant** app. **NOTE:** When a device is connected to the jack, the computer speakers are disabled. **NOTE:** Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).
(4)		USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(5)		Optical drive	Depending on your computer model, reads an optical disc or reads and writes to an optical disc.
(6)		Optical drive eject button	Releases the disc tray.
(7)		Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

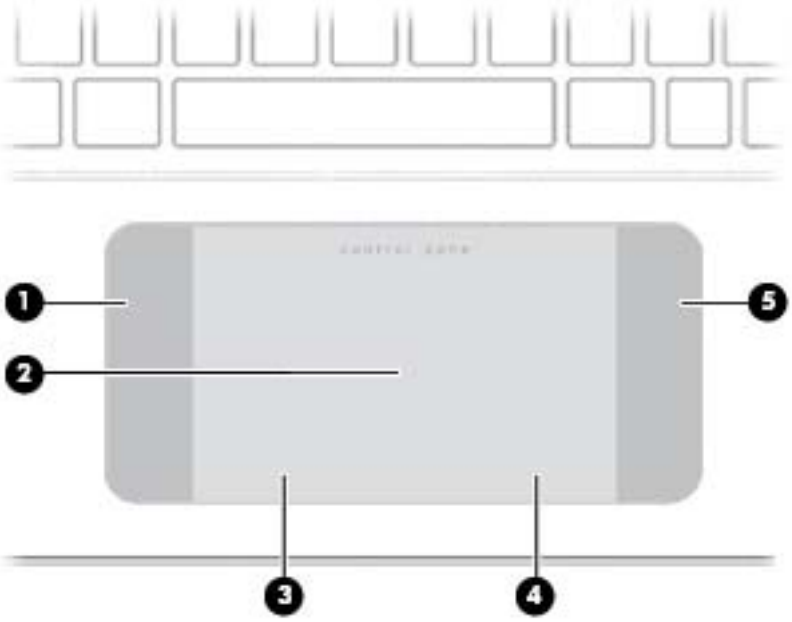
Left side



Component			Description
(1)		Power connector	Connects an AC adapter.
(2)		AC adapter light	• On: The AC adapter is connected and the battery is charged. • Off: The computer is using battery power.
(3)		RJ-45 (network) jack	Connects a network cable.
(4)		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.
(5)		HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.
(6)		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.
(7)		USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(8)	SD	Memory card reader	Reads optional memory cards that store, manage, share, or access information. To insert a card: 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: Press in on the card it until it pops out.

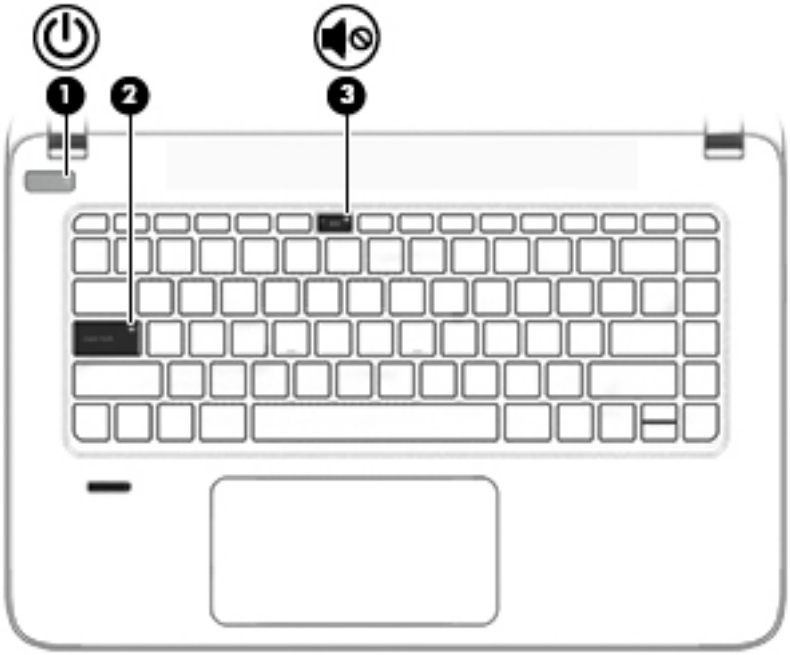
Top

TouchPad



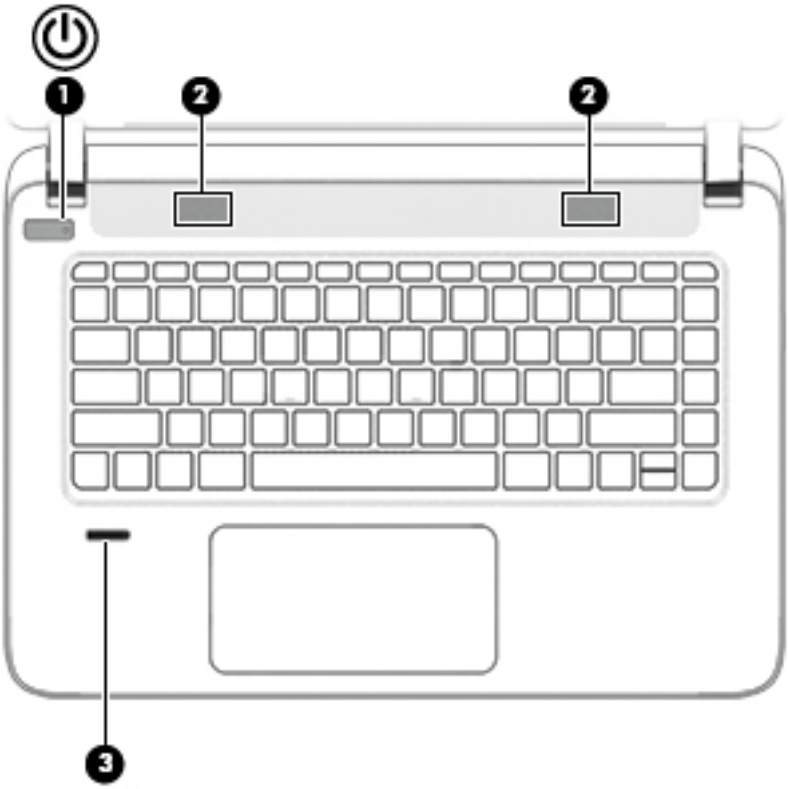
Component		Description
(1)	Left control zone	Textured area that allows you to perform additional gestures.
(2)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen. **NOTE:** The TouchPad also supports edge-swipe gestures.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	Right TouchPad button	Functions like the right button on an external mouse.
(5)	Right control zone	Textured area that allows you to perform additional gestures.

Lights



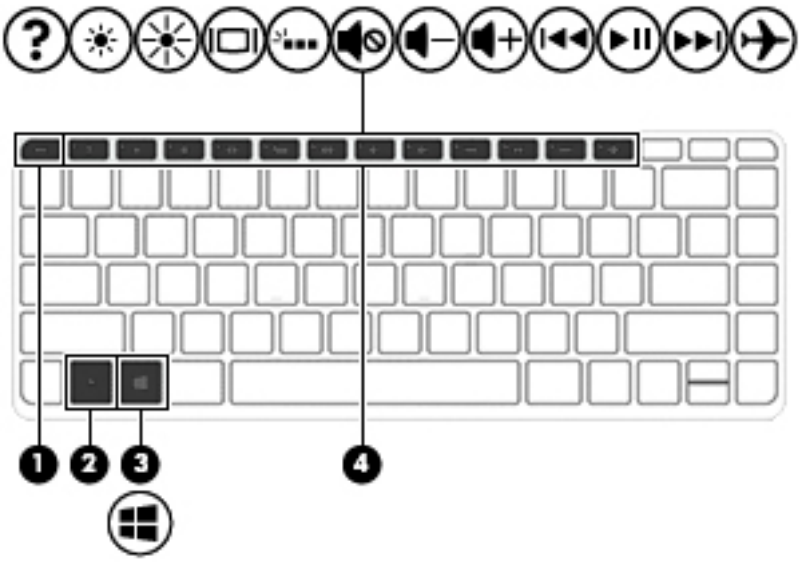
Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(3)		Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.

Buttons, speakers, and fingerprint reader



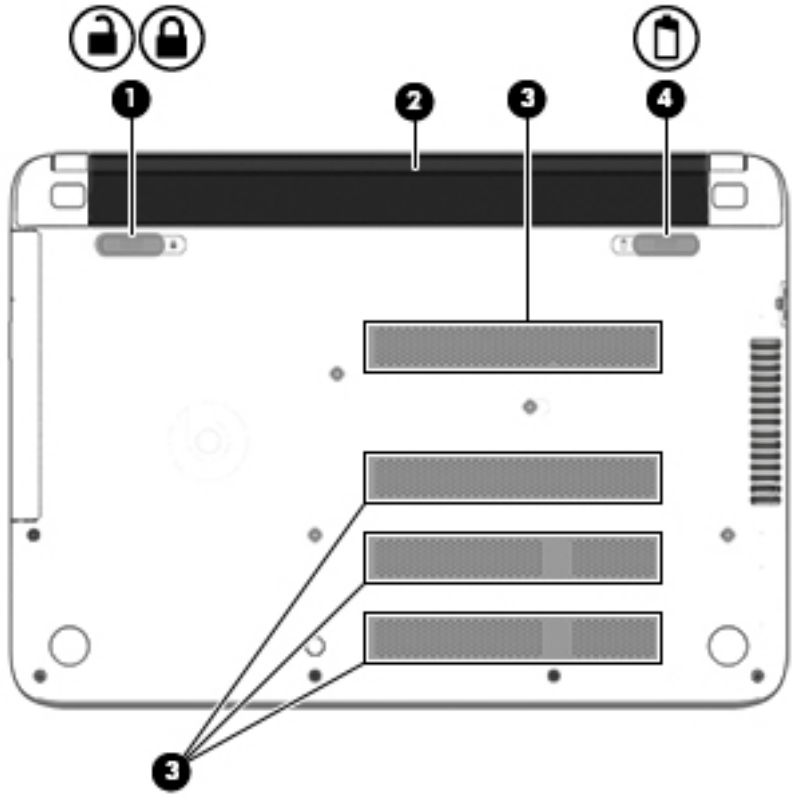
Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button will result in the loss of unsaved information. If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. To learn more about your power settings, see your power options. From the Start screen, type `power`, select **Power and sleep settings**, and then select **Power and sleep** from the list of applications.
(2)	Speakers	Produce sound.
(3)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon.

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 b key or the spacebar.
(3)	Windows key	Returns you to the Start screen from an open app or the Windows desktop. **NOTE:** Pressing the Windows key again will return you to the previous screen.
(4)	Action keys	Execute frequently used system functions. **NOTE:** On select models, the f5 action key turns the radiance backlight keyboard feature off or on.

Bottom



Component			Description
(1)		Battery lock	Locks the battery in the battery bay.
(2)		Battery bay	Holds the battery.
(3)		Vents (4)	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.
(4)		Battery release latch	Releases the battery.

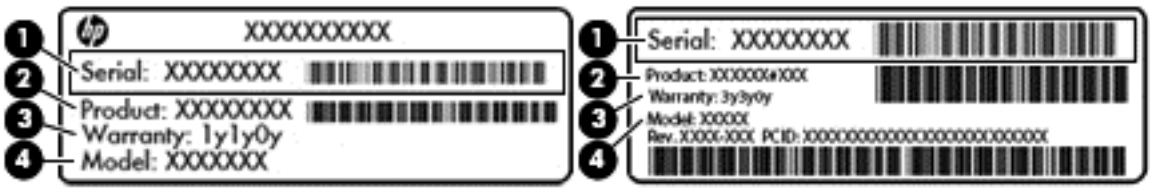
Labels

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

IMPORTANT: All labels described in this section will be located in one of the following places depending on your computer model: affixed to the bottom of the computer or located in the battery bay.

- 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 preinstalled with Windows 8 or Windows 8.1 do not have the physical label, but have a Digital Product Key electronically installed.

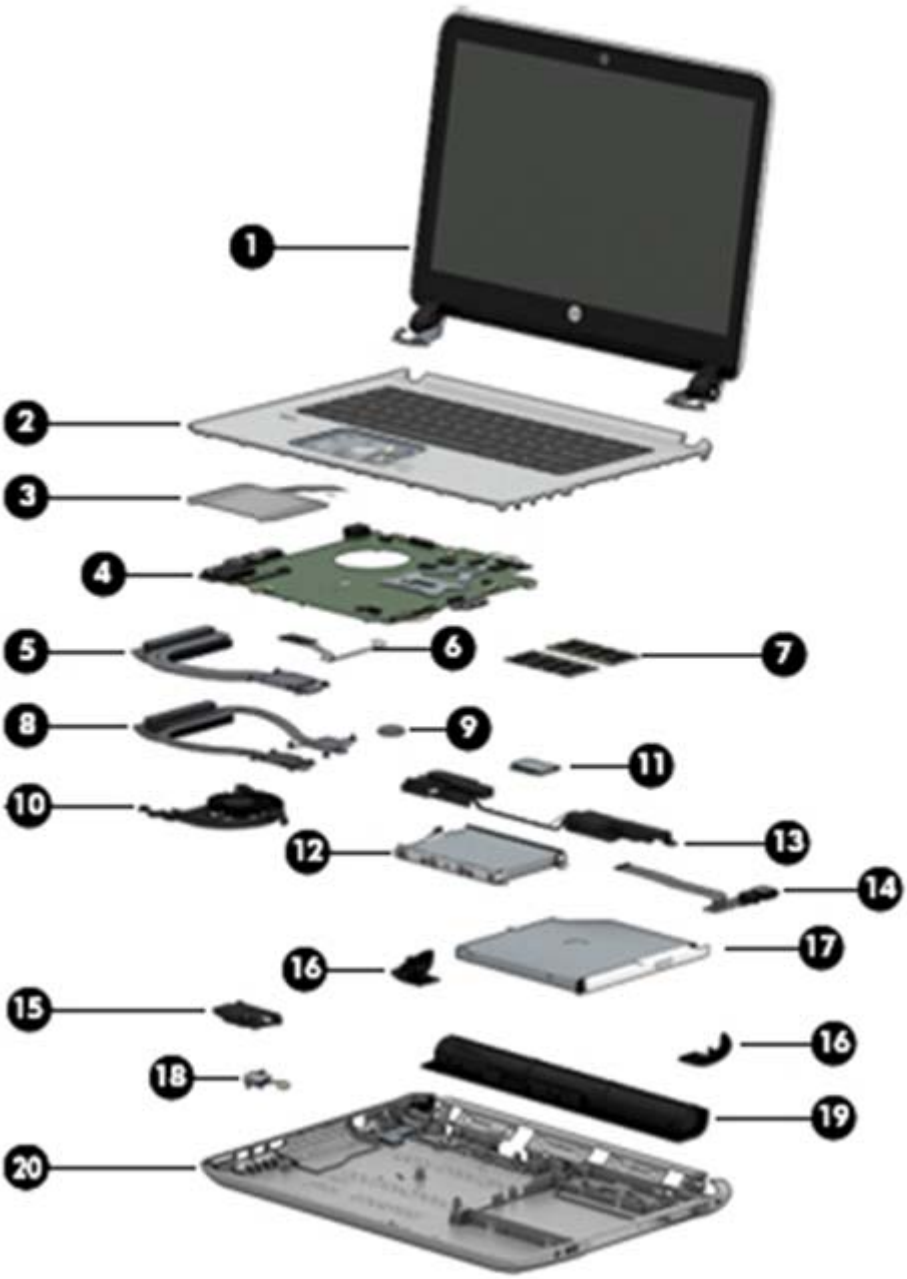
  NOTE: This Digital Product Key is automatically recognized and activated by Microsoft Operating Systems on a reinstall of the Windows 8 or Windows 8.1 operating system with HP-approved recovery methods.

- 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

Computer major components

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 Labels on page 12 for details.



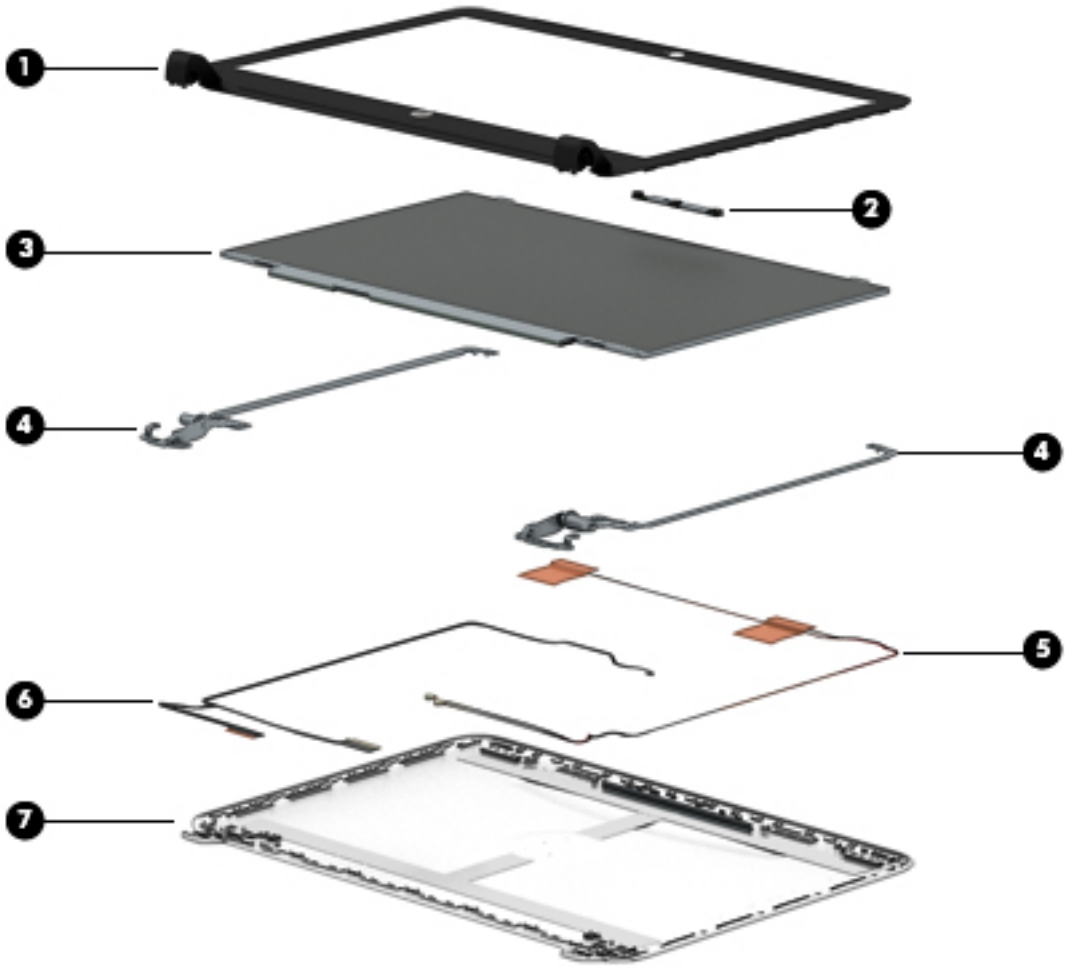
Item	Component	Spare part number
(1)	**Display assembly, 14.0 in** (35.56 cm), high definition (HD), WLED, SVA BrightView **Display assembly, 14.0 in** (35.56 cm), full high definition (HD), WLED, SVA Antiglare	
	This display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 18 and Display assembly on page 66.	
(2)	**Top cover** (includes keyboard and cable):	
	Backlit keyboard and black finish for use in:	
	• Latin America	786464-161
	• South Korea	786464-AD1
	• Taiwan	786464-AB1
	• United States	786464-001
	Black finish for use in:	
	• Latin America	767376-161
	• South Korea	767376-AD1
	• Taiwan	767376-AB1
	• United States	767376-001
(3)	**TouchPad button board** (includes cable)	767369-001
(4)	**System board** (includes replacement thermal material):	
	For computer models equipped with Intel processors and UMA graphics	
	5th generation	
	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux in models with HD displays	782300-001
	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard in models with HD displays	782300-501
	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional in models with HD displays	782300-601
	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux in models with FHD displays	797197-001
	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard in models with FHD displays	797197-501
	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional in models with FHD displays	797197-601
	4th generation	
	Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux	763747-001
	Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard	763747-501
	Intel Core i5-4210U 1.9 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional	763747-601

Item	Component	Spare part number
	For computer models equipped with Intel processors and discrete graphics	
	5th generation	
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	782304-001
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	782304-501
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	782304-601
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	782303-001
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	782303-501
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	782303-601
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and HD panel	782302-001
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and HD panel	782302-501
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and HD panel	782302-601
	NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and HD panel	782301-001
	NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and HD panel	782301-501
	NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and HD panel	782301-601
	4th generation	
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	768005-001
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	768005-501
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	768005-601

Item	Component	Spare part number
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	781103-001
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	781103-501
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	781103-601
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	781102-001
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	781102-501
	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	781102-601
	NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux	763749-001
	NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard	763749-501
	NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional	763749-601
(5)	**Heat sink assembly** for use only on computer models equipped with UMA graphics (includes replacement thermal material)	763701-001
(6)	**Subwoofer**	767375-001
(7)	**Memory modules** (2), (PC3L, 12800, 1600 MHz):	
	4 GB memory module	691740-005
	8 GB memory module	693374-005
(8)	**Heat sink assembly** for use only on computer models equipped with switchable discrete graphics (includes replacement thermal material)	763703-001
(9)	**RTC battery**	697917-001
(10)	**Fan**	763700-001
(11)	**WLAN module:**	
	Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT4.0 HMC combo adapter, for use only on computer models equipped with Intel processors	753076-005
	Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 combo adapter, for use only on computer models equipped with Intel processors	710662-005
	Qualcomm Atheros AR9485 802.11 bgn 1x1 Wi-Fi adapter	675794-005
	Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 Combo Adapter	784638-005
(12)	**Hard drive** (does not include the hard drive rubber bracket, hard drive connector cable, or screws)	
	1.5 TB, 5400 rpm, 9.5 mm	747375-005

Item	Component	Spare part number
	1 TB, 5400 rpm, 9.5 mm	778192-005
	750 GB, 5400 rpm, 9.5 mm	778190-005
	500 GB 5400 rpm 9.5 mm	778188-005
	1 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm	731999-005
	750 GB 5400 rpm + 8 GB NAND hybrid, 9.5 mm	732001-005
	Hard Drive Hardware Kit, includes:	767247-001
	Hard drive rubber bracket, left and right	
	Hard drive connector cable	
(13)	**Speakers** (includes speaker cables and rubber isolators)	767262-001
(14)	**USB/audio board** (includes cable)	767370-001
(15)	**Fingerprint reader** (includes cable and bracket)	763711-001
(16)	**Rear corner covers** are available with the plastics kit, spare part number 767371-001.	
(17)	**Optical drive, DVD+/-RW DL SuperMulti** (includes optical drive hardware kit with optical drive bezel and bracket)	767368-001
(18)	**Power connector cable** (includes bracket)	767246-001
(19)	**Battery**	
	4 cell, 48 Whr, 3.2 Ah, Li-ion battery	756745-001
	4 cell, 41 Whr, 2.8 Ah, Li-ion battery	756743-001
(20)	**Base enclosure** (includes battery release latch mechanism, RJ45 cover, and screws)	763750-001

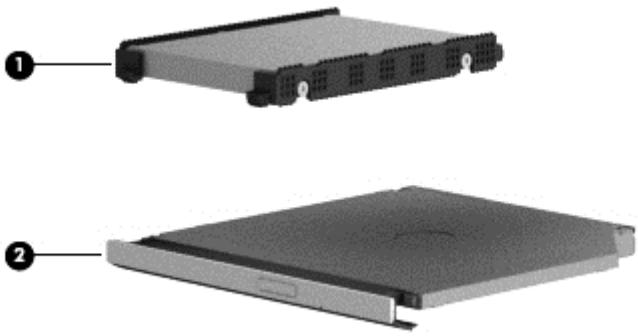
Display assembly subcomponents



Item	Component	Spare part number
(1)	**Display bezel** (includes screws)	767365-001
(2)	**Webcamera/microphone module** (includes adhesive and screws)	
	For use in models without a touch screen	762521-001
	For use in touch screen models	762545-001
(3)	**Raw display panel**	
	35.56 cm (14.0 in), BrightView, HD, WLED, SVA flat display panel – non-touch screen (includes screws)	763566-001
	35.56 cm (14.0 in), Antiglare, FHD, WLED, SVA slim display panel – non-touch screen (includes screws)	767373-001
	35.56 cm (14.0 in), full high definition (FHD), WLED, SVA Antiglare slim display assembly – touch screen (includes screws)	767374-001
(4)	**Display Hinge Kit** (includes left and right hinges and screws)	
	For use in models without a touch screen	767248-001
	For use in touch screen models	767249-001

Item	Component	Spare part number
(5)	**Antenna Kit** (includes left and right wireless antenna cables and transceivers and screws)	
	For use in models without a touch screen	767237-001
	For use in touch screen models	767238-001
(6)	**Display panel cable** (includes webcamera/microphone module cable and screws)	
	For use in HD models without a touch screen	767244-001
	For use in HD models with a touch screen	767245-001
	For use in FHD models without a touch screen	767366-001
	For use in FHD models with a touch screen	767367-001
(7)	**Display back cover** (includes screws):	
	For use in models without a touch screen	763751-001
	For use in touch screen models	767364-001

Mass storage devices



Item	Component	Spare part number
(1)	**Hard drive** (does not include the hard drive rubber bracket, hard drive connector cable, or screws)	
	1.5 TB, 5400 rpm, 9.5 mm	747375-005
	1 TB, 5400 rpm, 9.5 mm	778192-005
	750 GB, 5400 rpm, 9.5 mm	778190-005
	500 GB 5400 rpm 9.5 mm	778188-005
	1 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm	731999-005
	750 GB 5400 rpm + 8 GB NAND hybrid, 9.5 mm	732001-005
	Hard Drive Hardware Kit, includes:	767247-001
	Hard drive rubber bracket, left and right	
	Hard drive connector cable	
(2)	**Optical drive, DVD+/-RW DL SuperMulti** (includes optical drive hardware kit with optical drive bezel and bracket):	767368-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
45 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm, nslim)	741727-001
65 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm, EM)	714657-001
65 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm)	710412-001
90 W HP Smart AC adapter (PFC, RC, 3-wire, 4.5 mm)	710413-001
90 W HP Smart AC adapter (PFC, RC, 3-wire, 4.5 mm, EM)	710414-001
Power cord (3 pin, black, 1.0 m):	
For use in North America	755530-001
For use in Europe	755530-021
For use in India	755530-D61
For use in the People's Republic of China	755530-AA1
For use in South Korea	755530-AD1
For use in Taiwan	755530-AB1
For use in the United Kingdom and Singapore	755530-031
Screw Kit	763715-001
HDMI to VGA Adapter	701943-001

Sequential part number listing

Spare part number	Description
675794-005	Qualcomm Atheros AR9485 802.11 bgn Wi-Fi Adapter
691740-001	4 GB memory module (PC3, 12800, 1600 MHz)
693374-005	8 GB memory module (PC3, 12800, 1600 MHz)
697917-001	RTC battery
701943-001	HDMI to VGA adapter
710412-001	65 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm)
710413-001	90 W HP Smart AC adapter (PFC, RC, 3-wire, 4.5 mm)
710414-001	90 W HP Smart AC adapter (PFC, RC, 3-wire, 4.5 mm, EM)
710662-005	Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 combo adapter for use with computer models with Intel processors
714657-001	65 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm, EM)
731999-005	Hard drive, 1 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm
732001-005	Hard drive, 750 GB 5400 rpm + 8 GB NAND hybrid, 9.5 mm

Spare part number	Description
741727-001	45 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm), nslim
747375-005	Hard drive, 1.5 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm
753076-005	Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT 4.0 HMC combo adapter
755530-001	Power cord for use in North America (3 pin, black, 1.0 m)
755530-021	Power cord for use in Europe (3 pin, black, 1.0 m), for use with computer models with Intel processors
755530-031	Power cord for use in the United Kingdom and Singapore (3 pin, black, 1.0 m), for use with computer models with Intel processors
755530-AA1	Power cord for use in People's Republic of China (3 pin, black, 1.0 m), for use with computer models with Intel processors
755530-AB1	Power cord for use in Taiwan (3 pin, black, 1.0 m), for use with computer models with Intel processors
755530-AD1	Power cord for use in South Korea (3 pin, black, 1.0 m), for use with computer models with Intel processors
755530-D61	Power cord for use in India (3 pin, black, 1.0 m), for use with computer models with Intel processors
756743-001	4 cell, 41 Whr, 2.8 Ah, Li-ion battery
756745-001	4 cell, 48 Whr, 3.2 Ah, Li-ion battery
762521-001	Webcamera/microphone module for use in models without a touch screen (includes adhesive)
762545-001	Webcamera/microphone module for use in touch screen models (includes adhesive)
763566-001	Raw display panel, **35.56 cm** (14 in), WLED, HD, BrightView, flat – non-touch screen
763700-001	Fan
763701-001	Heat sink for use only on computer models equipped with Intel processors and UMA graphics, 19 W
763703-001	Heat sink for use only on computer models equipped with Intel processors and switchable discrete graphics, 19 W
763711-001	Fingerprint reader (includes bracket and cable)
763715-001	Screw kit
763747-001	System board for use with computer models with UMA graphics, Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux (includes replacement thermal material)
763747-501	System board for use with computer models with UMA graphics, Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard (includes replacement thermal material)
763747-601	System board for use with computer models with UMA graphics, Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional (includes replacement thermal material)
763749-001	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux (includes replacement thermal material)
763749-501	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard (includes replacement thermal material)

Spare part number	Description
763749-601	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional (includes replacement thermal material)
763750-001	Base enclosure
763751-001	Display back cover for use in models without a touch screen
767237-001	Antenna Kit for use in models without a touch screen (includes left and right wireless antenna cables and transceivers and screws)
767238-001	Antenna Kit for use in touch screen models (includes left and right wireless antenna cables and transceivers and screws)
767244-001	Display panel cable for use in HD models without a touch screen (includes webcamera/microphone module cable and screws)
767245-001	Display panel cable for use in HD models with a touch screen (includes webcamera/microphone module cable and screws)
767246-001	Power connector cable (includes bracket)
767247-001	Hard Drive Hardware Kit (includes left and right hard drive rubber brackets and hard drive connector cable)
767248-001	Display Hinge Kit for use in models without a touch screen (includes left and right hinges and screws)
767249-001	Display Hinge Kit for use in touch screen models (includes left and right hinges and screws)
767254-001	Power button board (includes cable)
767260-001	Rubber Kit (includes base rear rubber)
767262-001	Speakers (include speaker cable)
767364-001	Display back cover for use in touch screen models
767365-001	Display bezel (includes 2 rubber screw covers and rubber bumpers)
767366-001	Display panel cable for use in FHD models without a touch screen (includes webcamera/microphone module cable and screws)
767367-001	Display panel cable for use in FHD models with a touch screen (includes webcamera/microphone module cable and screws)
767368-001	Optical drive, DVD±RW Double-Layer SuperMulti Drive, (includes bezel and bracket)
767369-001	TouchPad button board (includes cable)
767370-001	USB/audio board (includes cable)
767371-001	Plastics Kit (includes left and right rear corner covers)
767373-001	**35.56 cm** (14 in), WLED, FHD, Antiglare, slim – non-touch screen
767374-001	Raw display panel, **35.56 cm** (14.0 in), full high definition (FHD), WLED, SVA Antiglare, slim – touch screen
767375-001	Subwoofer (includes cable)
767376-001	Top cover in black finish for use in the United States (includes keyboard and keyboard cable)
767376-161	Top cover in black finish for use in Latin America (includes keyboard and keyboard cable)
767376-AB1	Top cover in black finish for use in Taiwan (includes keyboard and keyboard cable) for use with computer models with Intel processors

Spare part number	Description
767376-AD1	Top cover in black finish for use in South Korea (includes keyboard and keyboard cable) for use with computer models with Intel processors
768005-001	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel (includes replacement thermal material)
768005-501	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel (includes replacement thermal material)
768005-601	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel (includes replacement thermal material)
778188-005	500 GB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, hard drive connector cable, or screws) **NOTE:** The hard drive rubber bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 767247-001.
778190-005	750 GB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, hard drive connector cable, or screws) **NOTE:** The hard drive rubber bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 767247-001.
778192-005	1 TB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, hard drive connector cable, or screws) **NOTE:** The hard drive rubber bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 767247-001.
781102-001	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux (includes replacement thermal material)
781102-501	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard (includes replacement thermal material)
781102-601	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional (includes replacement thermal material)
781103-001	System board for use with computer models with switchable discrete graphics, NVIDIA GeForceGTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel (includes replacement thermal material)
781103-501	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel (includes replacement thermal material)
781103-601	System board for use with computer models with switchable discrete graphics, NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel (includes replacement thermal material)
782300-001	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux in models with HD displays
782300-501	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard in models with HD displays
782300-601	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional in models with HD displays

Spare part number	Description
782301-001	NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and HD panel
782301-501	NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and HD panel
782301-601	NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and HD panel
782302-001	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and HD panel
782302-501	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and HD panel
782302-601	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and HD panel
782303-001	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel
782303-501	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel
782303-601	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel
782304-001	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel
782304-501	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel
782304-601	NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel
784638-005	Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 Combo Adapter
786464-001	Top cover with backlit keyboard in black finish for use in the United States (includes keyboard and keyboard cable)
786464-161	Top cover with backlit keyboard in black finish for use in Latin America (includes keyboard and keyboard cable)
786464-AB1	Top cover with backlit keyboard in black finish for use in Taiwan (includes keyboard and keyboard cable) for use with computer models with Intel processors
786464-AD1	Top cover with backlit keyboard in black finish for use in South Korea (includes keyboard and keyboard cable) for use with computer models with Intel processors
797197-001	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux in models with FHD displays
797197-501	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard in models with FHD displays
797197-601	Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional in models with FHD displays

4 Removal and replacement procedures preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic

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.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures for Customer Self-Repair parts

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

Component replacement procedures

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

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Labels on page 12 for details.

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

There may be as many as five 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

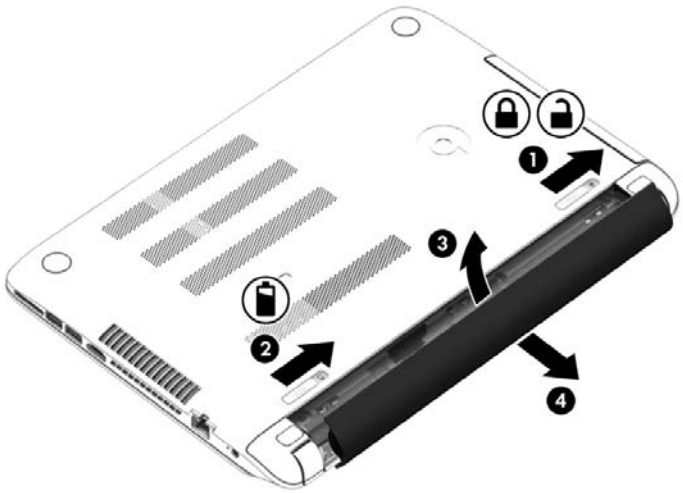
Description	Spare part number
4 cell, 48 Whr, 3.2 Ah, Li-ion battery	756745-001
4 cell, 41 Whr, 2.8 Ah, Li-ion battery	756743-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Firmly slide the battery lock latch **(1)** to unlock the battery and slide the battery release latch **(2)** to release the battery.
3. Slide the battery **(3)** up and then out from the middle **(4)** to remove it from the computer.



Reverse this procedure to insert the battery.

Optical drive

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

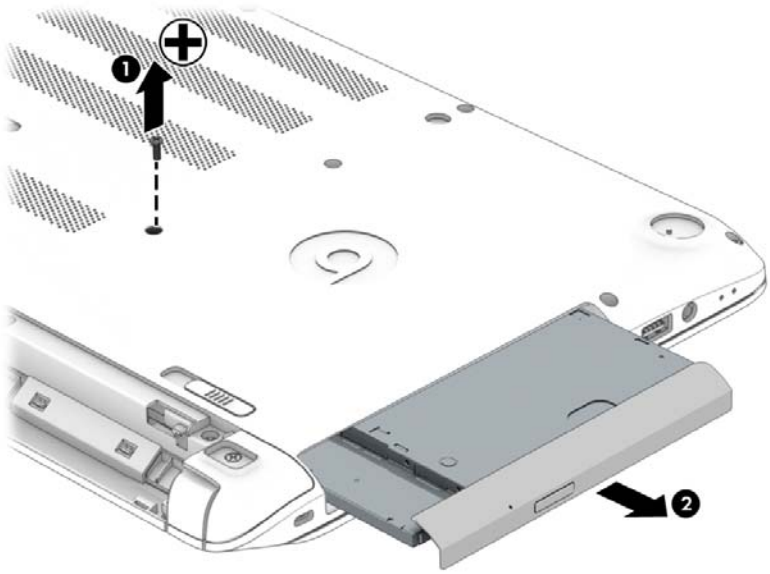
Description	Spare part number
SuperMulti DVD±R/RW Double-Layer Drive	767368-001

Before removing the optical drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31).

Remove the optical drive:

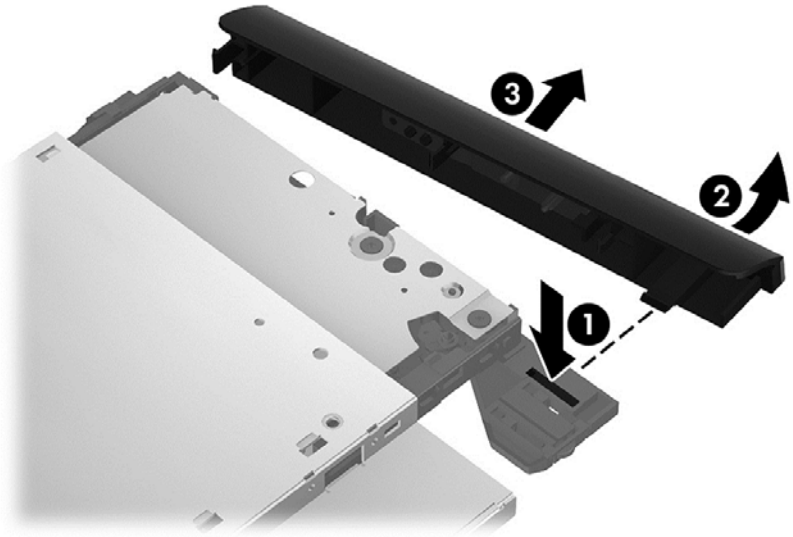
1. Using a small Phillips screwdriver, remove the Phillips M2.5×6.5 screw that secures the optical drive to the computer **(1)**.
2. Pull the tray **(2)** out from the front until the optical drive is completely removed from the computer.



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

1. Remove the two Phillips screws from the optical drive **(1)** and remove the bracket **(2)**.

2. Remove the tab from the drive **(1)**. Rotate the left side of the bezel outward **(2)**, and then remove the bezel **(3)**.



Reverse this procedure to reassemble and install the optical drive.

6 Removal and replacement procedures for Authorized Service Provider parts

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

Component replacement procedures

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 Labels on page 12 for details.

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

There may be as many as 51 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Display subcomponents (bezel, webcamera, panel)

This section describes removing display subcomponents that do not require that you remove the entire display assembly from the computer. You can remove the display bezel, webcam/microphone module, and display panel while the display assembly is still attached to the computer.

To remove the remaining display subcomponents, you must remove the entire display assembly from the computer. See Display assembly on page 66 for more information about removing the display assembly in its entirety.

Description	Spare part number
Display bezel for use in models without a touch screen (includes screws)	767365-001
Raw display panel, **35.56 cm** (14 in), WLED, HD, BrightView, flat for use in models without a touch screen	763566-001
Raw display panel, **35.56 cm** (14 in), FHD, WLED, SVA, Antiglare slim for use in models without a touch screen	767373-001
Webcamera/microphone module for use in models without a touch screen	762521-001
Webcamera/microphone module for use in touch screen models	762545-001

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the display panel, follow these steps:

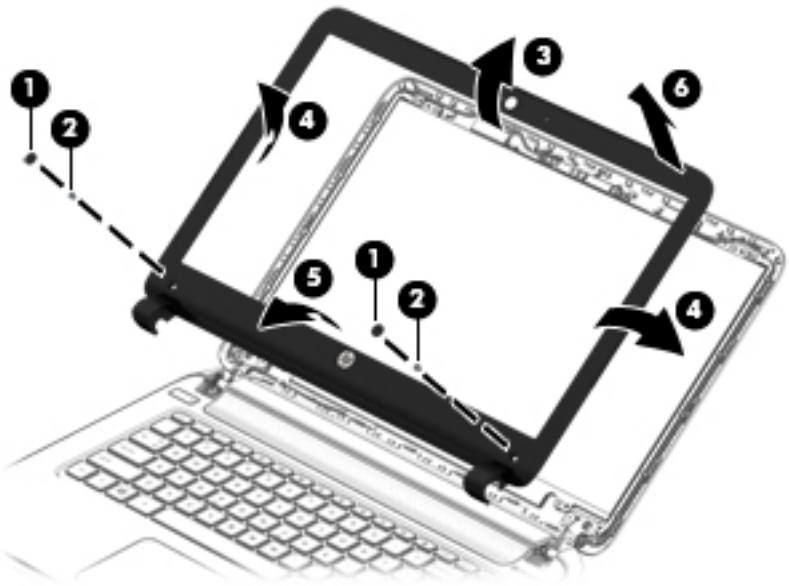
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31).

Remove the panel:

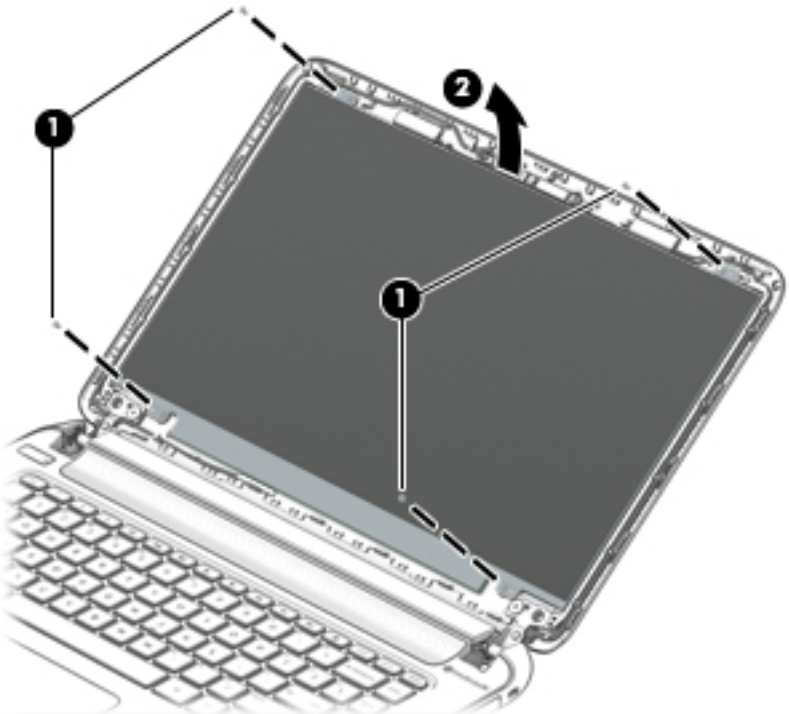
If it is necessary to replace the display bezel:

1. Remove the plastic screw covers **(1)** and the two Phillips M2.5×3.0 screws **(2)** that secure the display bezel to the display assembly.
2. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
   a. Flex the inside edges of the top edge **(3)**, the left and right sides **(4)**, and the bottom edge **(5)** of the display bezel until the bezel disengages from the display enclosure.

b. Remove the display bezel **(6)**.

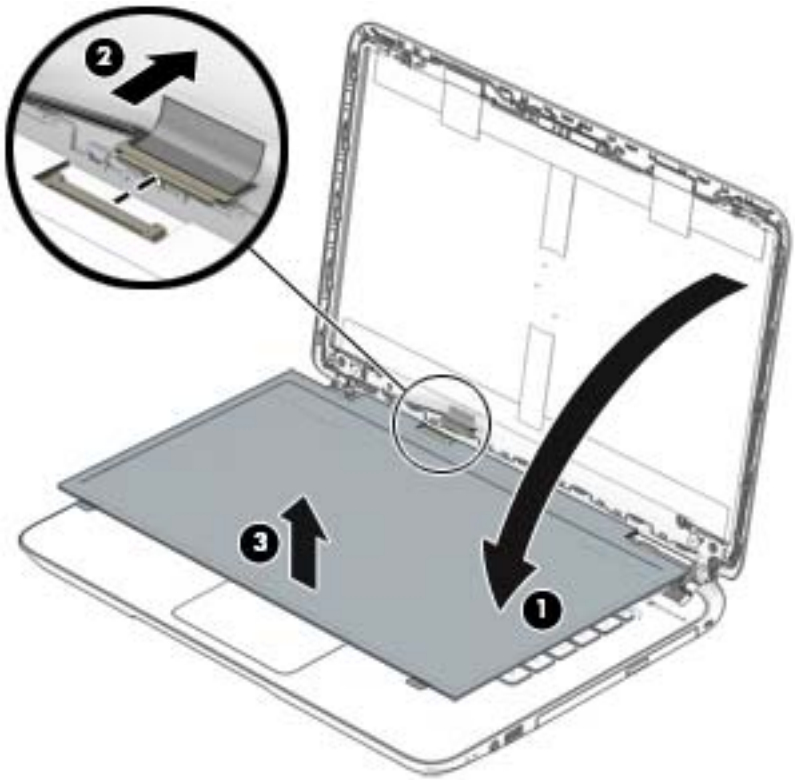


c. Remove the four Phillips M2.0×2.5 screws **(1)** and lift the top edge of the display panel **(2)**.



d. Carefully move the display panel **(1)** to the keyboard.

e. Release the tab and disconnect the display panel cable connector **(2)**. Lift the panel **(3)** to remove it.

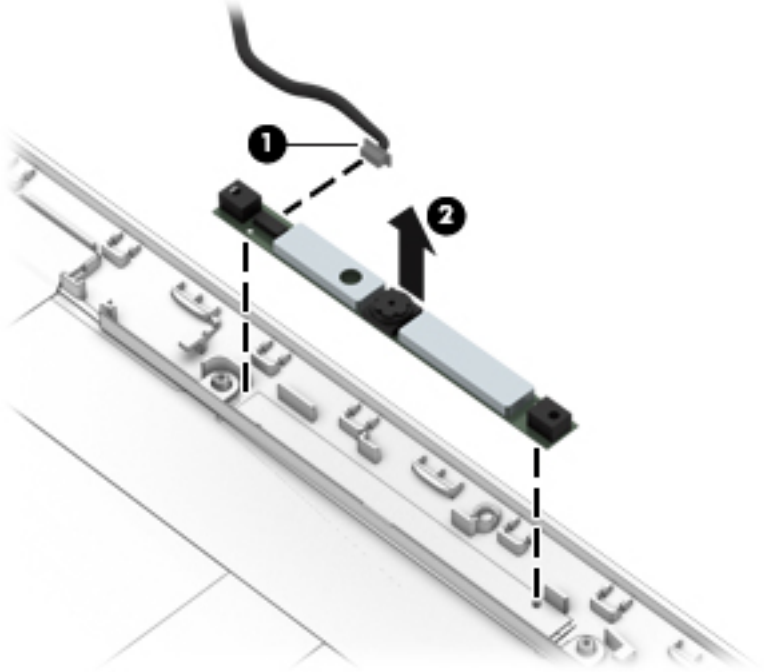


3. To remove the webcamera/microphone module:

   a. Position the display assembly with the top edge toward you.

   b. Disconnect the cable **(1)** from the module.

c. Lift to disengage the adhesive that secures the webcamera/microphone module to the display **(2)**.



Reverse this procedure to replace the display assembly subcomponents.

Top cover

NOTE: The top cover spare part kit includes the keyboard and cable.

Description	Spare part number
Top cover in black finish (includes keyboard and keyboard cable):	
For use in the United States	767376-001
For use in Latin America	767376-161
For use in Taiwan	767376-AB1
For use in South Korea	767376-AD1
Top cover with backlit keyboard in black finish (includes keyboard and keyboard cable):	
For use in the United States	786464-001
For use in Latin America	786464-161
For use in Taiwan	786464-AB1
For use in South Korea	786464-AD1

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

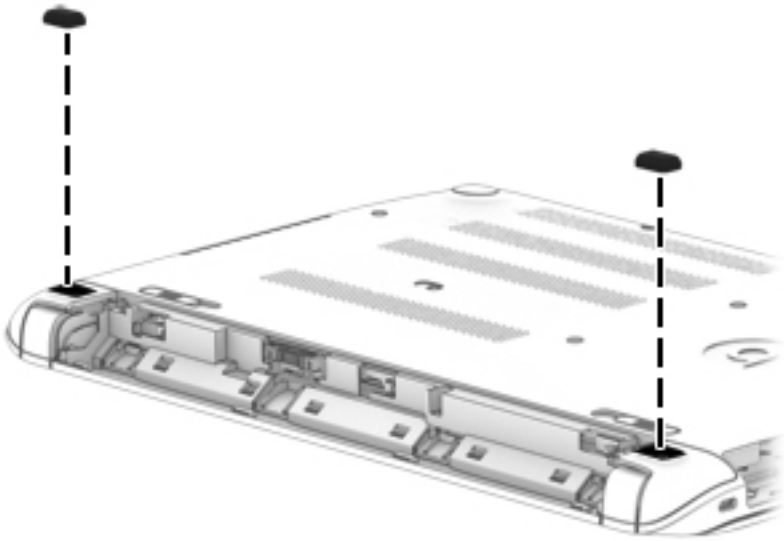
Before removing the top cover, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   - ▲ Optical drive (see Optical drive on page 32)

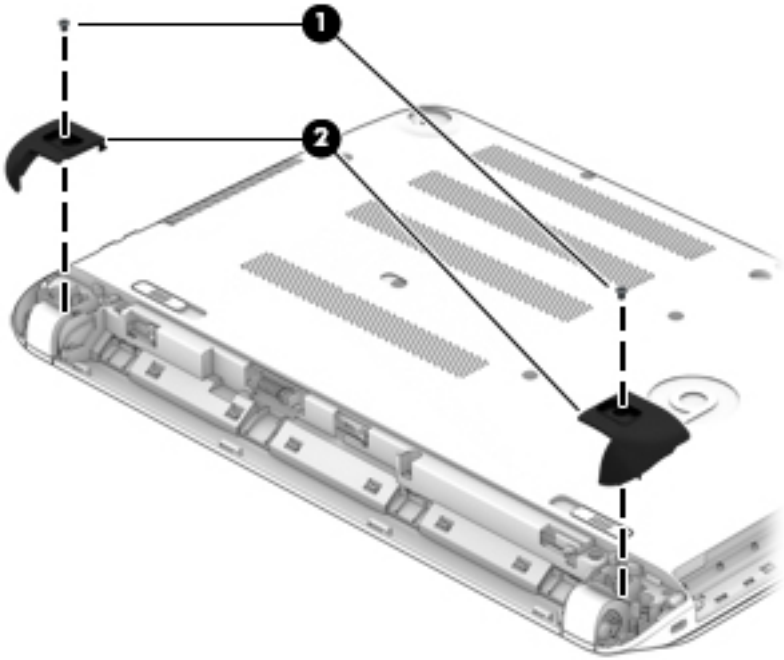
Remove the top cover:

1. Close the display and turn the computer upside down.

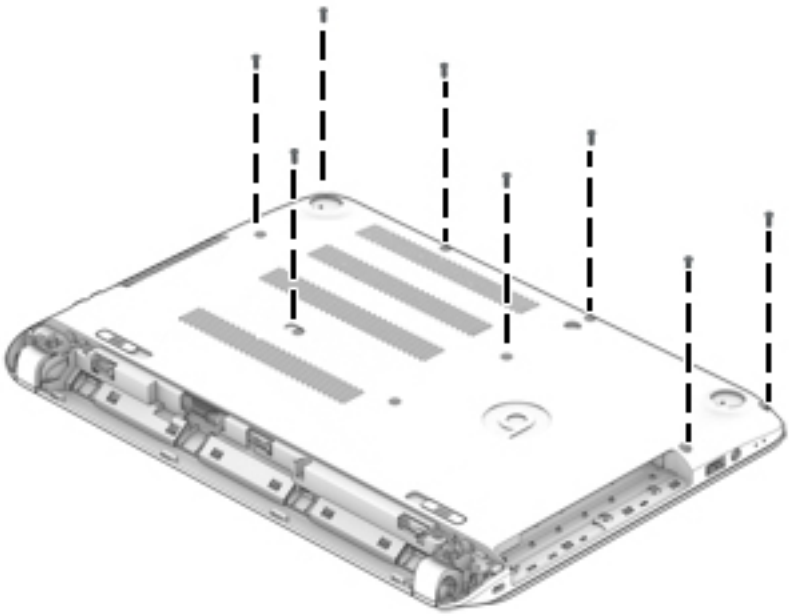
2. Pry the feet up to remove the adhesive that secures them to the computer.



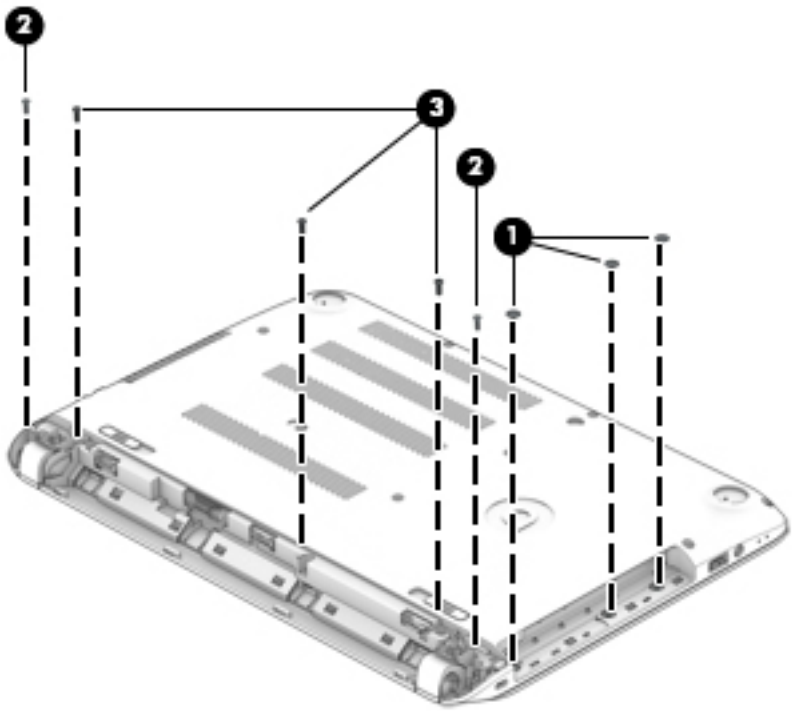
3. Remove the two Phillips M2.5x1.5 screws that secure the rear corner covers **(1)**. Remove the rear corner covers **(2)**. The rear corner covers are included in the Plastics Kit, spare part number 767371-001.



4. Remove the eight Phillips M2.5×4.0 screws that secure the top cover to the base enclosure.

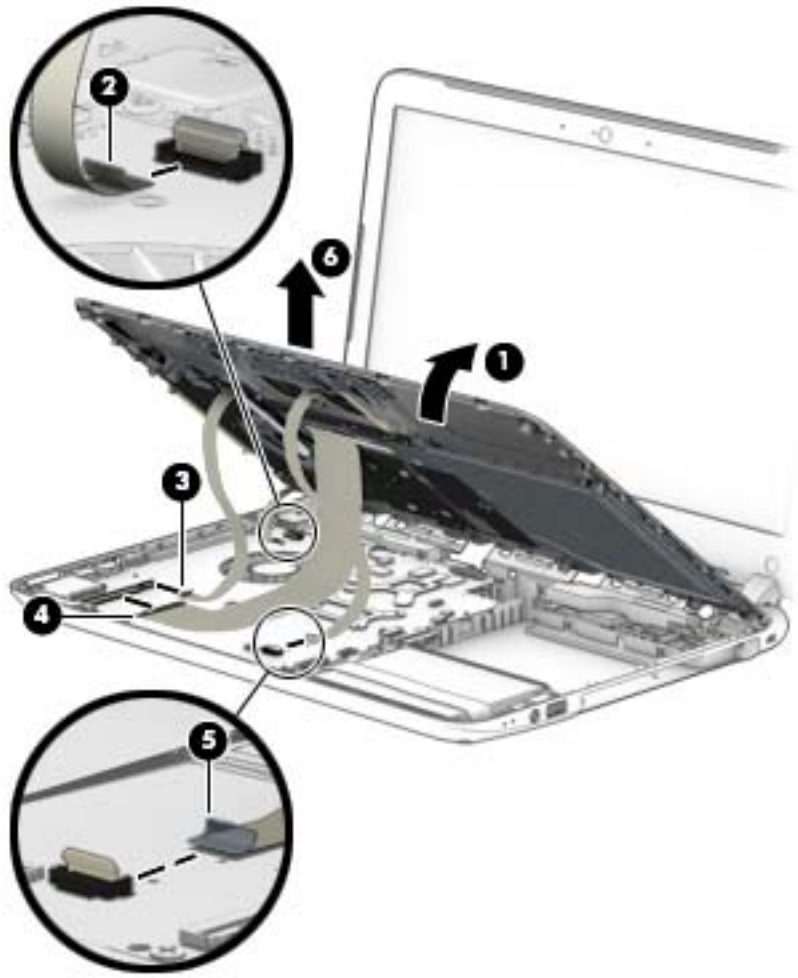


5. Remove the three Phillips PM4.5×2.0 broad head screws **(1)** in the optical drive bay that secure the top cover to the computer.
6. Remove the two Phillips M2.5x4.0 screws **(2)** in the corners that secure the top cover to the computer.
7. Remove the three Phillips PM2.5×4.0 screws **(3)** in the battery bay that secure the top cover to the computer.



8. Turn the computer over and open the display.
9. Gently pull on the lower left corner **(1)** and lift around the edges of the top cover.

10. Disconnect the power button cable **(2)**, the fingerprint reader cable **(3)**, the keyboard cable **(4)** and the TouchPad cable **(5)**. Lift to remove the top cover **(6)**.



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

- Power button board and cable (see Power button board on page 46)
- Touchpad button board (includes cable and buttons), (see TouchPad button board on page 47)
- Fingerprint reader (includes bracket and cable), (see Fingerprint reader on page 49)

Reverse this procedure to install the top cover.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive rubber bracket, hard drive connector cable, or screws. These components are included in the Hard Drive Hardware Kit, spare part number 767247-001.

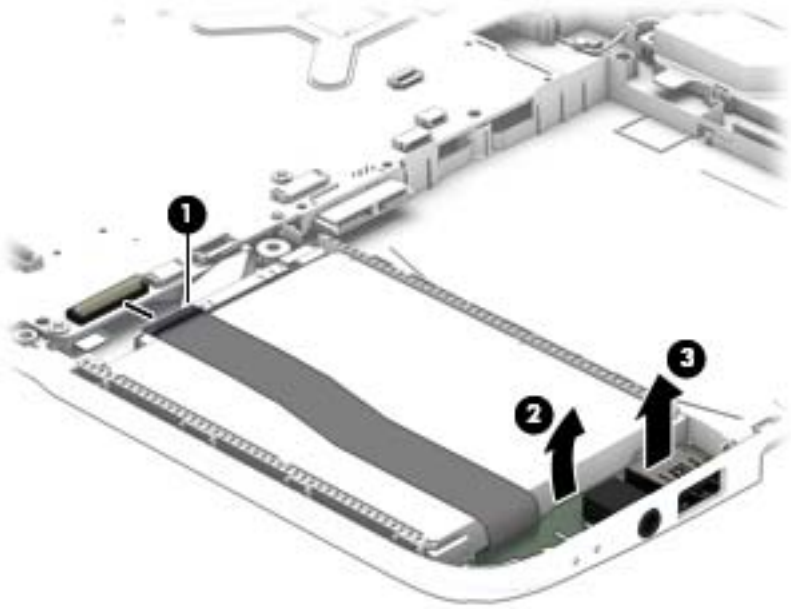
Description	Spare part number
500 GB, 5400 rpm, 9.5 mm	778188-005
750 GB, 5400 rpm, 9.5 mm	778190-005
1 TB, 5400 rpm, 9.5 mm	778192-005
1.5 TB, 5400 rpm, 9.5 mm	747375-005
1 TB, 5400 rpm + 8 GB NAND hybrid, 9.5 mm	731999-005
750 GB 5400 rpm + 8 GB NAND hybrid, 9.5 mm	732001-005

Before removing the hard drive, follow these steps:

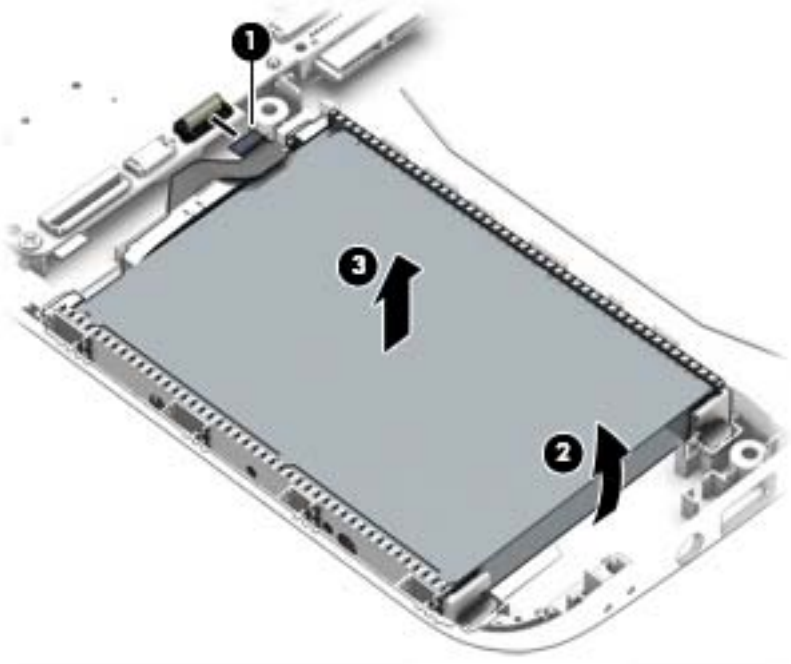
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

Remove the hard drive:

1. Disconnect the USB/audio cable **(1)** by flipping open the connector and lifting the cable. Lift up front of the USB/audio board **(2)**, and then remove the USB/audio board **(3)**. The USB/audio board spare part number is 767370-001.

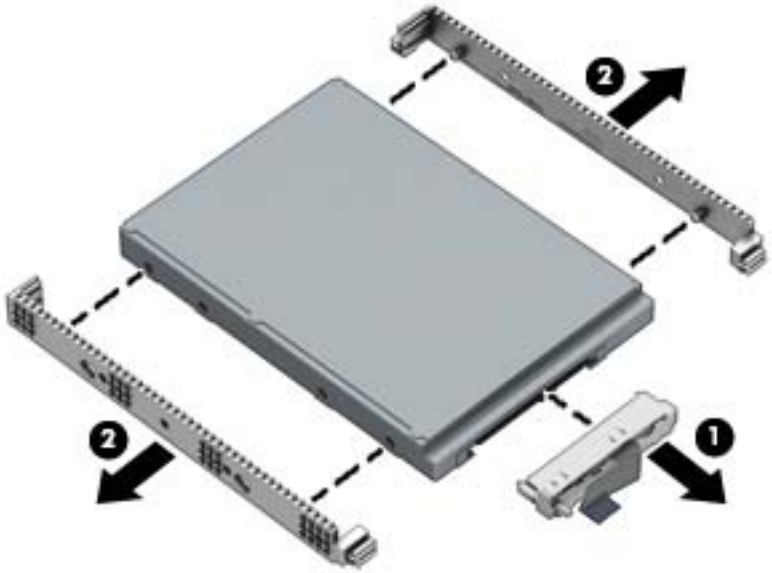


2. Disconnect the hard drive cable from the system board **(1)**.
3. Lift up the front of the hard drive **(2)**, and then remove the hard drive **(3)**.



4. If it is necessary to disassemble the hard drive, perform the following steps:
   a. Disconnect the hard drive cable connector from the hard drive **(1)**.

b. Remove the brackets **(2)** from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

Power button board

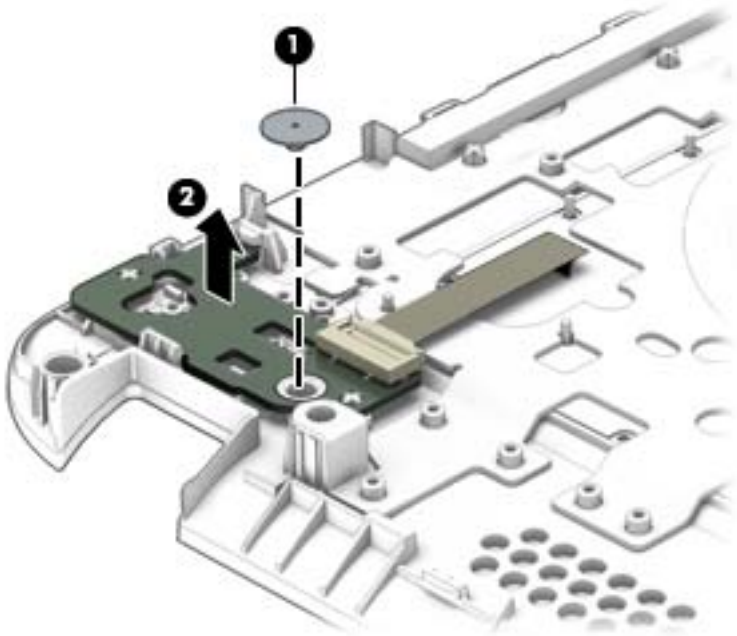
Description	Spare part number
Power button board (includes cable)	767254-001

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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

Remove the power button board:

1. Turn the top cover upside down, with the front toward you.
2. Remove the Phillips PM4.5×2 broadhead screw **(1)** that secures the power button board to the top cover.
3. Remove the power button board **(2)** with cable (the cable was disconnected from the system board when removing the top cover).



Reverse this procedure to install the power button board.

TouchPad button board

Description	Spare part number
TouchPad button board (includes cable)	767369-001

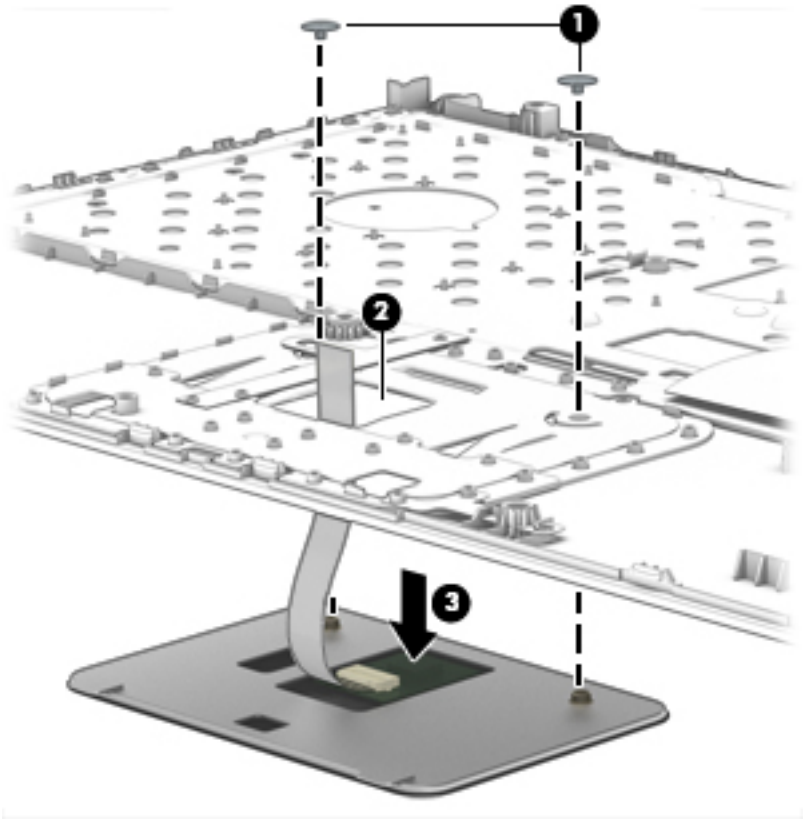
Before removing the TouchPad button board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

Remove the TouchPad button board:

1. Turn the top cover upside down, with the front toward you.
2. Remove the two Phillips PM4.5x2.0 broadhead screws **(1)** that secure the TouchPad button board bracket to the top cover.
3. Remove the TouchPad button board, carefully lifting the cable through the top cover **(2)** (the cable was disconnected from the system board when removing the top cover).

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



Reverse this procedure to install the TouchPad button board.

Fingerprint reader

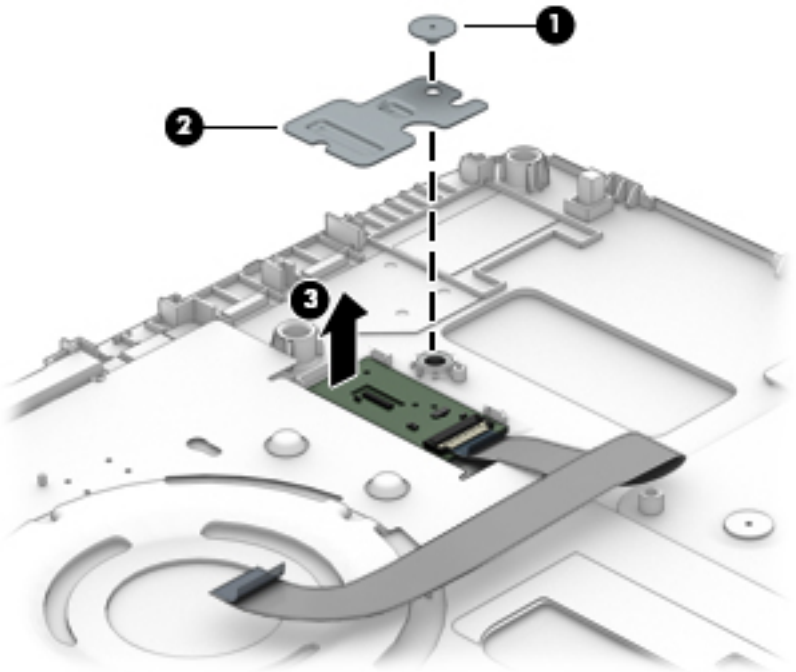
Description	Spare part number
Fingerprint reader (includes bracket and cable)	763711-001

Before removing the fingerprint reader, 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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

Remove the fingerprint reader:

1. Turn the top cover upside down, with the front toward you.
2. Remove the Phillips PM4.5x2.0 broadhead screw **(1)** that secures the fingerprint reader bracket to the top cover. Remove the bracket **(2)**, and then remove the fingerprint reader **(3)** (the cable was disconnected from the system board when removing the top cover).



Reverse this procedure to install the fingerprint reader.

WLAN module

Description	Spare part number
Broadcom BCM43142 802.11 bgn 1x1 Wi-Fi + BT 4.0 HMC combo adapter	753076-005
Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 combo adapter	710662-005
Qualcomm Atheros AR9485 802.11 bgn 1x1 Wi-Fi adapter	675794-005
Intel Dual Band Wireless-AC 3160 802.11 ac 1x1 WiFi + BT 4.0 Combo Adapter	784638-005

Before removing the WLAN module, follow these steps:

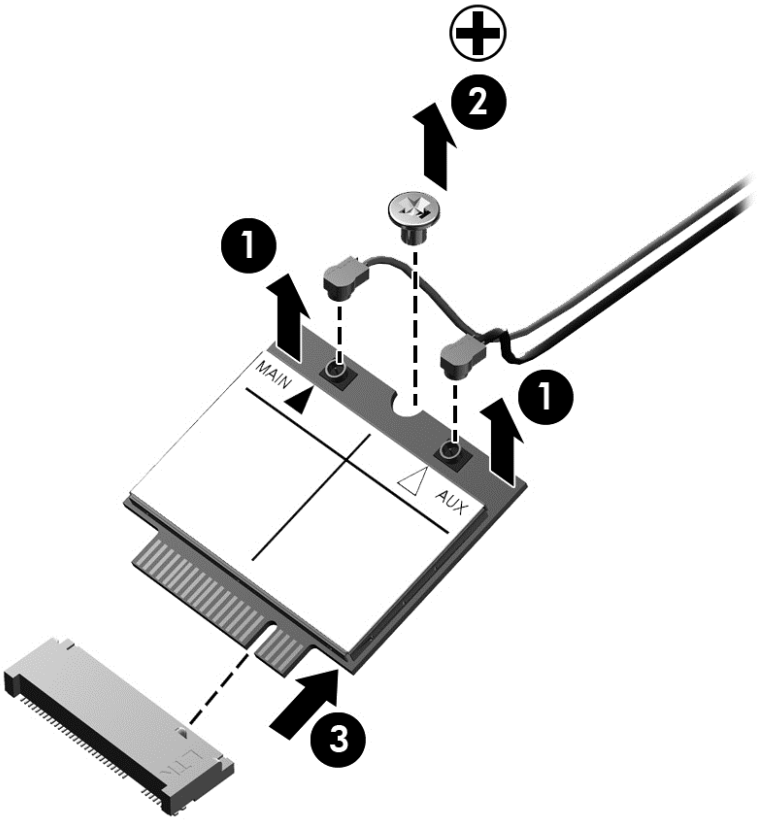
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

⚠ **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.

Remove the WLAN module:

1. Remove the antenna cables from the WLAN module **(1)**.
2. Remove the Phillips M2.5x4.0 screw **(2)**.

3. Lift the WLAN module toward the display **(3)**. Remove the WLAN module.



Reverse this procedure to install the WLAN module.

System board

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

Description	Spare part number
For computer models equipped with Intel processors and UMA graphics	
5th generation	
Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux in models with HD displays	782300-001
Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard in models with HD displays	782300-501
Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional in models with HD displays	782300-601
Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux in models with FHD displays	797197-001
Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard in models with FHD displays	797197-501
Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional in models with FHD displays	797197-601
4th generation	
Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux	763747-001
Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard	763747-501
Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional	763747-601
For computer models equipped with Intel processors and switchable discrete graphics	
5th generation	
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	782304-001
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	782304-501
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-5500U 2.4 GHz processor, SC turbo up to 3.06 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	782304-601
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	782303-001
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	782303-501
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	782303-601
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and HD panel	782302-001
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and HD panel	782302-501

Description	Spare part number
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and HD panel	782302-601
NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and HD panel	782301-001
NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and HD panel	782301-501
NVIDIA GeForce GTX 840M 2 GB dedicated video memory and Intel Core i5-5200U 2.2 GHz processor, SC turbo up to 2.7 GHz (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and HD panel	782301-601
4th generation	
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	768005-001
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	768005-501
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i7-4510U 2.0 GHz processor, SC turbo (4 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	768005-601
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux and FHD panel	781103-001
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard and FHD panel	781103-501
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional and FHD panel	781103-601
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux	781102-001
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard	781102-501
NVIDIA GeForce GTX 850M 4 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional	781102-601
NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Ubuntu Linux	763749-001
NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Standard	763749-501
NVIDIA GeForce 840M 2 GB dedicated video memory and Intel Core i5-4210U 1.7 GHz processor, SC turbo (3.0 MB L3 cache, dual core, 15 W) for use with Windows Professional	763749-601

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 31), and then remove the following components:

a. Optical drive (see Optical drive on page 32)

b. Top cover (see Top cover on page 39)

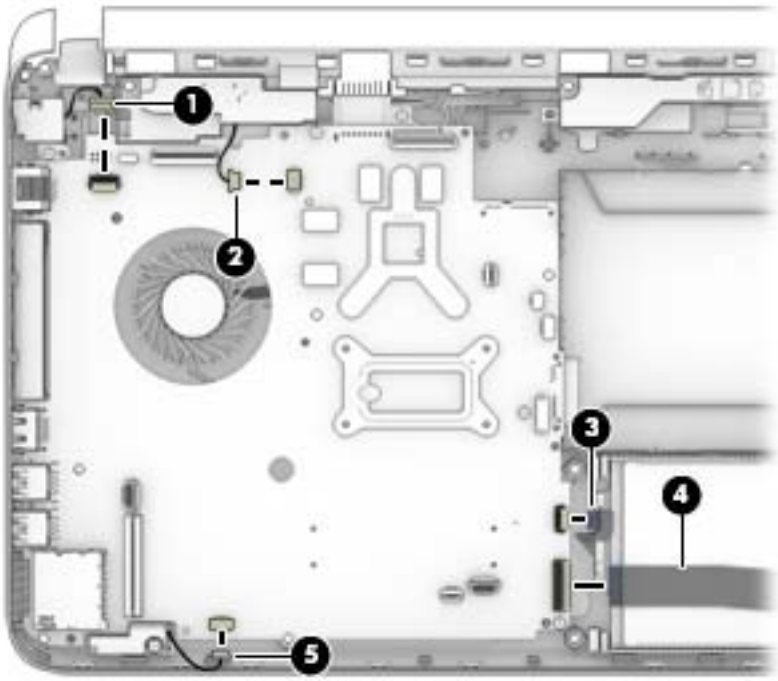
c. Power connector cable (see Power connector cable on page 63)

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:

- Hard drive connector cable
- RTC battery (see RTC battery on page 56)
- Memory modules (see Memory module on page 57)
- Fan (see Fan on page 58)
- Heat sink assembly (see Heat sink assembly on page 60)

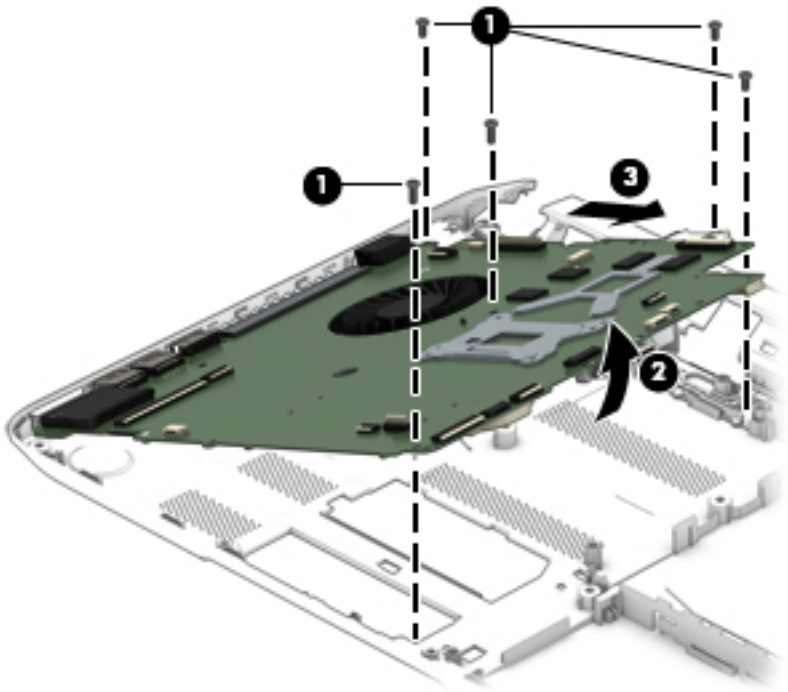
Remove the system board:

1. Disconnect the following cables from the system board:
   - Display panel cable **(1)**
   - Speaker cable **(2)**
   - Hard drive cable **(3)**
   - USB/audio board cable **(4)**
   - Subwoofer cable **(5)**.



2. Remove the five Phillips M2.5x4.0 screws **(1)** that secure the system board to the base enclosure.
3. Lift the right side of the system board **(2)** until it rests at an angle.

4. Remove the system board **(3)** by sliding it up and to the right at an angle.



Reverse this procedure to install the system board.

RTC battery

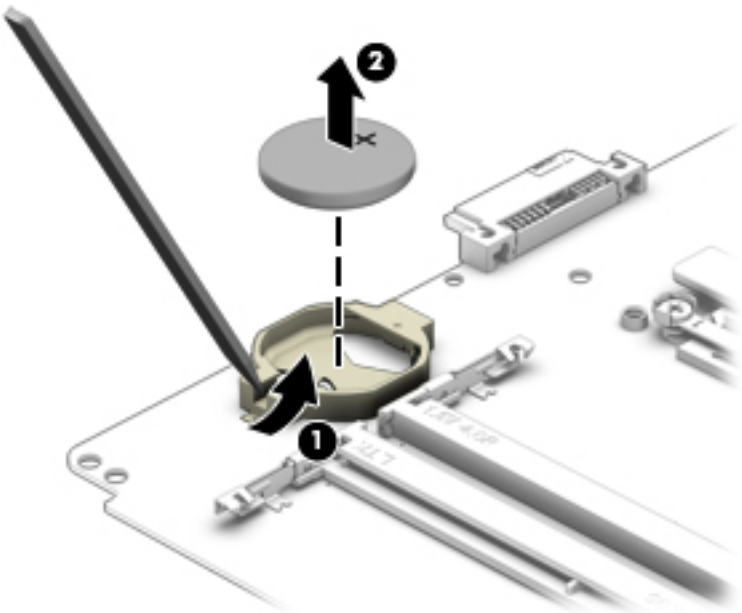
Description	Spare part number
RTC battery	697917-001

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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)
   c. Power connector cable (see Power connector cable on page 63)
   d. System board (see System board on page 52)

Remove the RTC battery:

1. Turn the system board upside down, with the front toward you.
2. Use a flat-bladed, non-metallic tool **(1)** to release the RTC battery from the socket on the system board. The battery is spring loaded and will pop up.
3. Remove the RTC battery **(2)**.



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

Memory module

Description	Spare part number
4 GB memory module (PC3, 12800, 1600 MHz)	691740-005
8 GB memory module (PC3, 12800, 1600 MHz)	693374-005

NOTE: Before adding memory modules, make sure the computer has the most recent BIOS version, and update the BIOS if needed. For Windows operating systems, see Updating the BIOS on page 74.

Before removing a memory module, follow these steps:

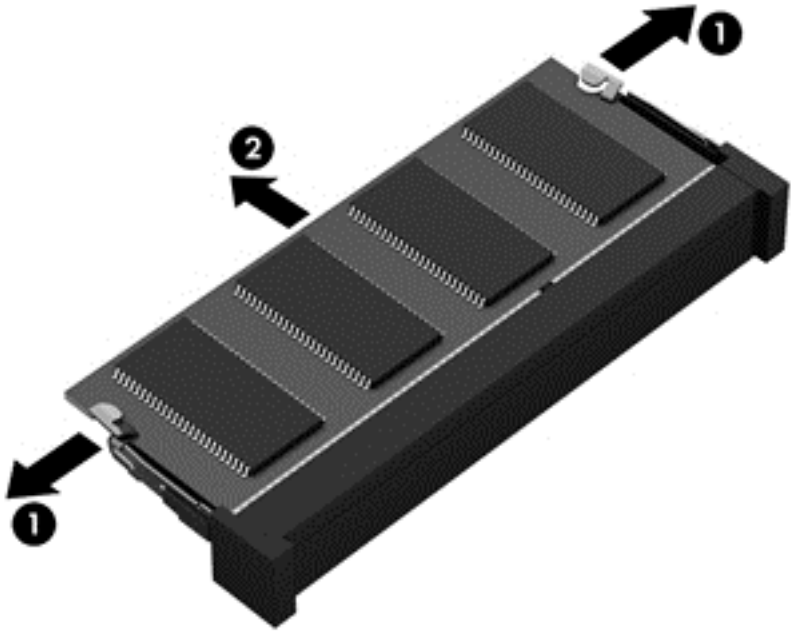
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)
   c. Power connector cable (see Power connector cable on page 63)
   d. System board (see System board on page 52)

Remove the memory module, located on the bottom of the system board:

NOTE: Note the location of the memory module you are removing. If you are replacing it, install the new memory module in the same slot.

1. Spread the two retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

2. Remove the memory module **(2)** by pulling it away from the slot at a 45 degree angle.



Reverse this procedure to install the memory module.

Fan

Description	Spare part number
Fan	763700-001

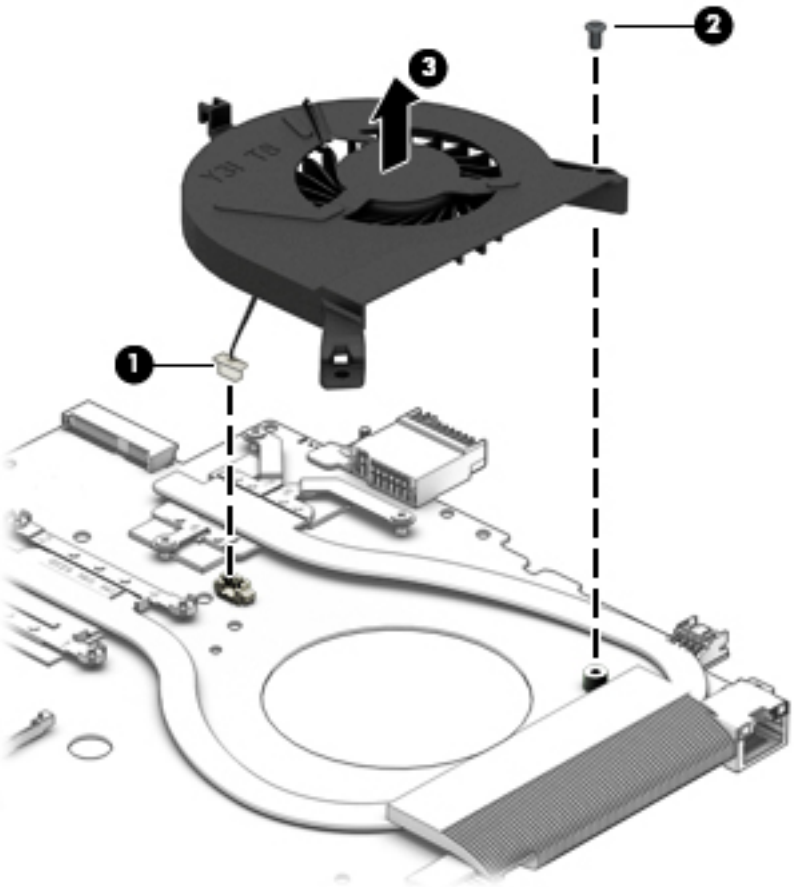
NOTE: To properly ventilate the computer, allow at least 7.6 cm (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Before removing the fan, 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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)
   c. Power connector cable (see Power connector cable on page 63)
   d. System board (see System board on page 52)

Remove the fan:

1. Turn the system board upside down, with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Remove the Phillips P2.5x4.0 screw **(2)** that secures the fan to the system board.
4. Remove the fan **(3)** from the system board.



Reverse this procedure to install the fan.

Heat sink assembly

Description	Spare part number
Heat sink for use only on computer models equipped with Intel processors and UMA graphics 19 W	763701-001
Heat sink for use only on computer models equipped with Intel processors and switchable discrete graphics 19 W	763703-001

Before removing the heat sink assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)
   c. Power connector cable (see Power connector cable on page 63)
   d. System board (see System board on page 52)
   e. Fan (see Fan on page 58)

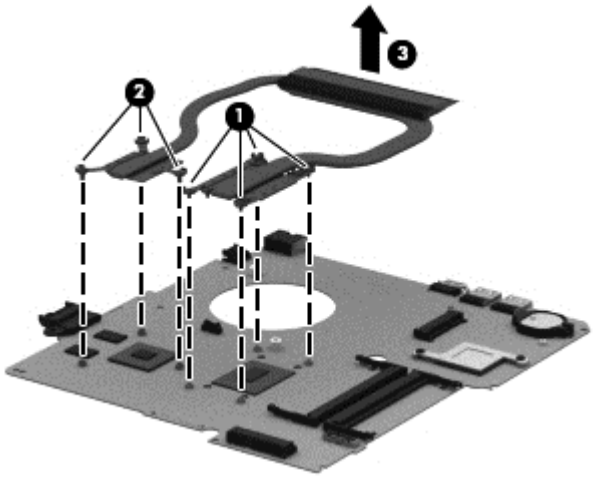
Remove the heat sink assembly:

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

NOTE: Steps 2 through 4 apply to computer models equipped with switchable discrete graphics. See steps 5 through 7 for heat sink assembly removal information for computer models equipped with UMA graphics.

2. Remove the four Phillips M2.5x4.0 screws **(1)** and the three Phillips PM2.5x4.0 screws **(2)** that secure the heat sink assembly to the system board.

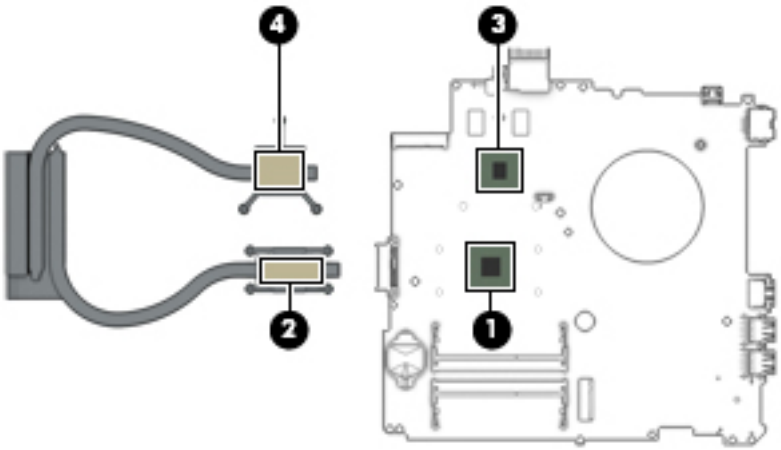
3. Remove the heat sink assembly **(3)** from the system board.



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

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

   - Thermal paste is used on the processor **(1)** and the heat sink assembly section **(2)** that services it
   - Thermal paste is used on the graphics subsystem chip **(3)** and the heat sink assembly section **(4)** that services it

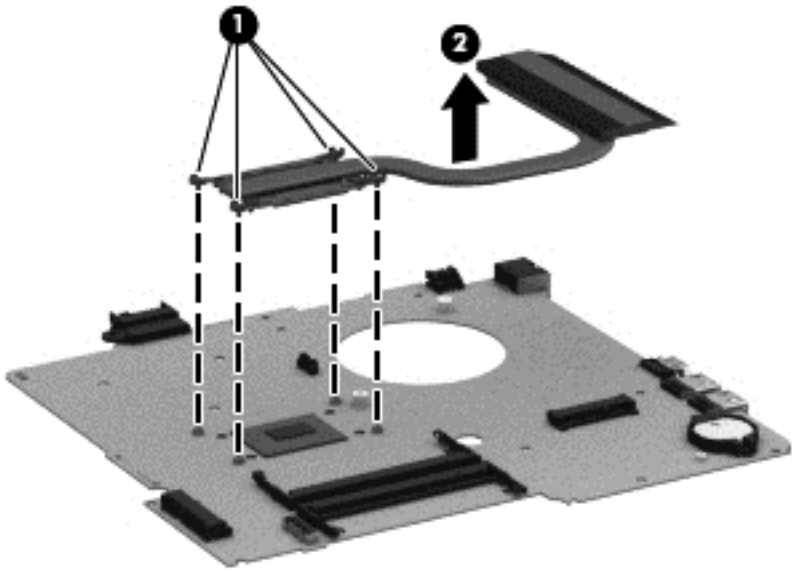


Reverse this procedure to install the heat sink assembly on computer models equipped with switchable discrete graphics.

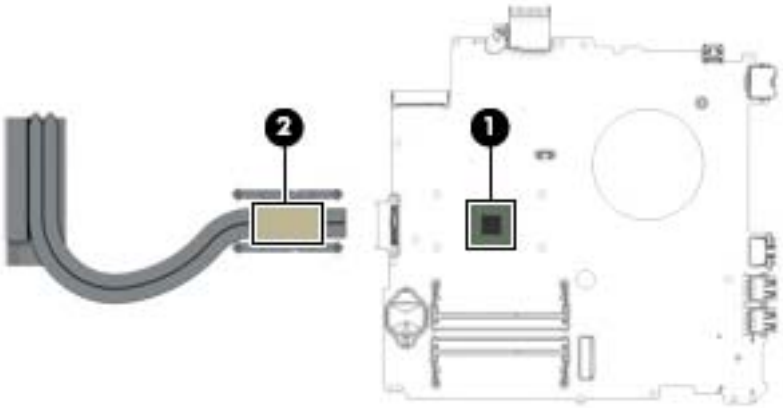
5. Remove the four Phillips PM2.5x4.0 screws **(1)** that secure the heat sink assembly to the system board.

6. Remove the heat sink assembly **(2)**.

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



7. Remove the thermal material. The thermal material must be thoroughly cleaned from the surfaces of the heat sink assembly and the system board components each time the heat sink assembly is removed. Replacement thermal material is included with the heat sink assembly and system board spare part kits. Thermal paste is used on the processor **(1)** and the heat sink assembly section **(2)** that services it.



Reverse this procedure to install the heat sink assembly on computer models equipped with UMA graphics.

Power connector cable

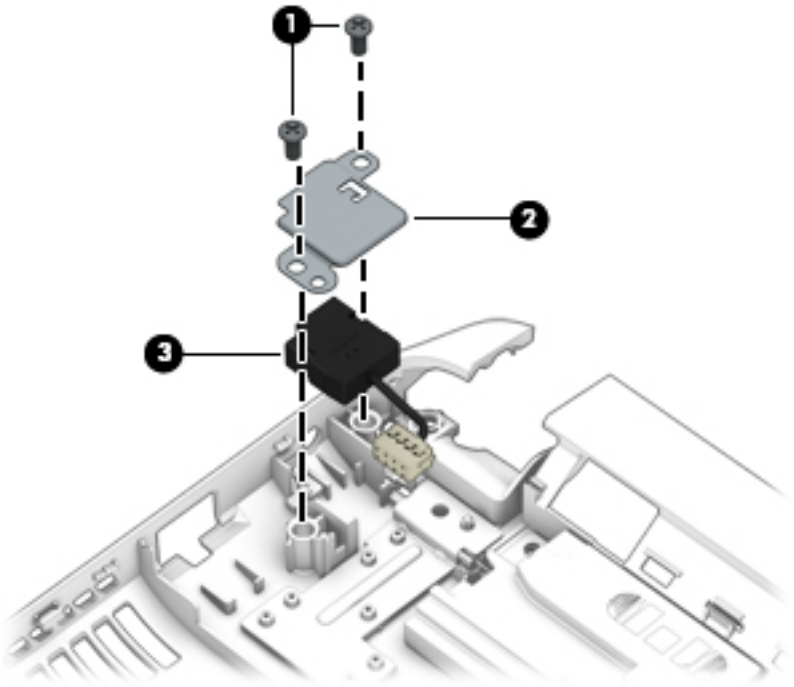
Description	Spare part number
Power connector cable (includes bracket)	767246-001

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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

Remove the power connector board:

1. Turn the system board upside down, with the front toward you.
2. Remove the two Phillips P2.5x4.0 screws from the power bracket **(1)**.
3. Remove the power bracket **(2)**.
4. Release the power connector from the clip built into the system board **(3)**.



Reverse this procedure to install the power connector cable.

Speakers

Description	Spare part number
Speakers	767262-001

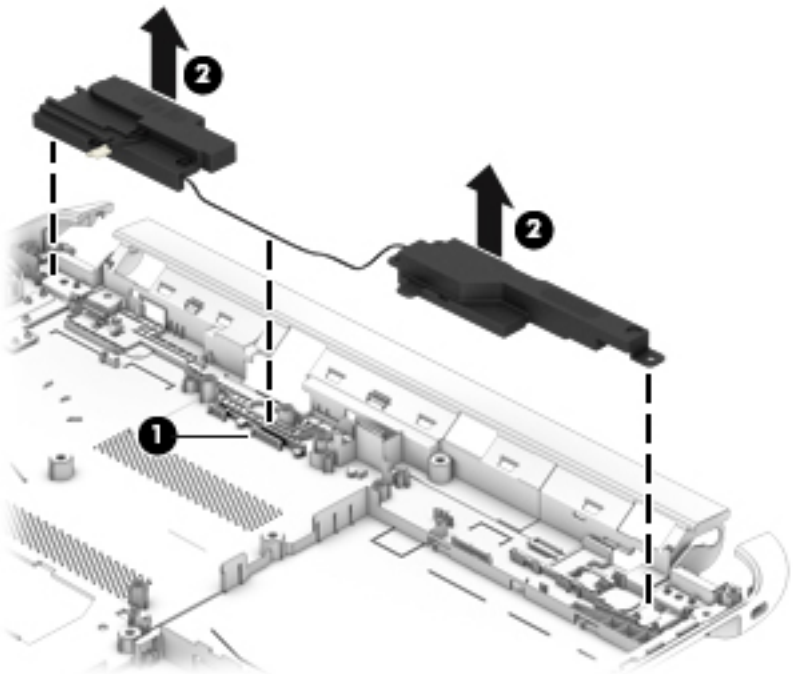
Before removing the speakers, follow these steps:

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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)
   c. Power connector cable (see Power connector cable on page 63)
   d. System board (see System board on page 52)

Remove the speakers:

▲ Lift the speaker cable **(1)** and then remove the speakers **(2)**.

NOTE: The speaker connection cable was removed when removing the system board.



Reverse this procedure to install the speakers.

Subwoofer

Description	Spare part number
Subwoofer	767375-001

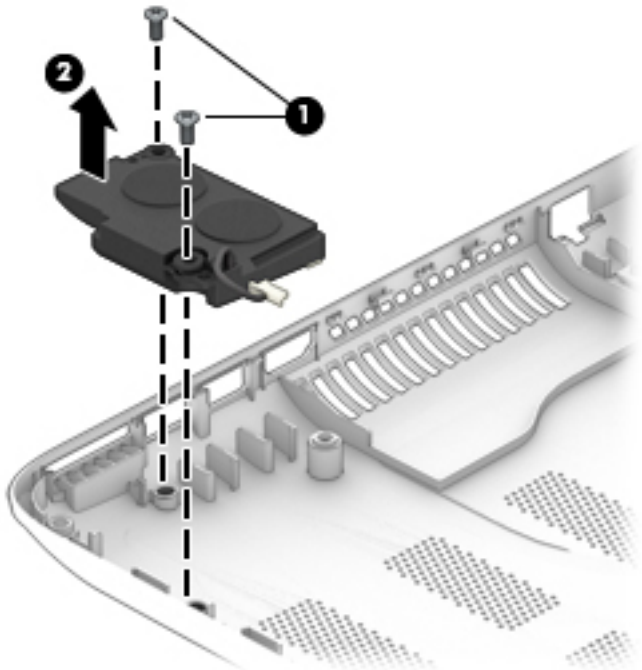
Before removing the subwoofer, follow these steps:

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 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)
   c. Power connector cable (see Power connector cable on page 63)
   d. System board (see System board on page 52)

Remove the subwoofer:

▲ Remove the two Phillips PM2.5×4.0 screws **(1)** and then remove the subwoofer **(2)**.

NOTE: The subwoofer connection cable was removed when removing the system board.



Reverse this procedure to install the subwoofer.

Display assembly

This section describes removing the display assembly in its entirety and disassembling all the display subcomponents.

If you only need to remove the display bezel, webcamera/microphone module, or display panel, you do not need to remove the entire display assembly from the computer. See Display subcomponents (bezel, webcam, panel) on page 34 for more information about removing the display subcomponents that do not require that you remove the entire display assembly from the computer.

Before removing the display assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see Battery on page 31), and then remove the following components:
   a. Optical drive (see Optical drive on page 32)
   b. Top cover (see Top cover on page 39)

Remove the display assembly:

1. Disconnect the display cable **(1)** by flipping open the connector and lifting the cable.
2. Release the wireless antenna cables from the clips **(2)** built into the base enclosure.
3. Remove the three Phillips PM2.5×4.0 screws **(3)** that secure the display assembly to the base enclosure.

4. Remove the display assembly **(4)**.

If it is necessary to replace any of the display assembly subcomponents:

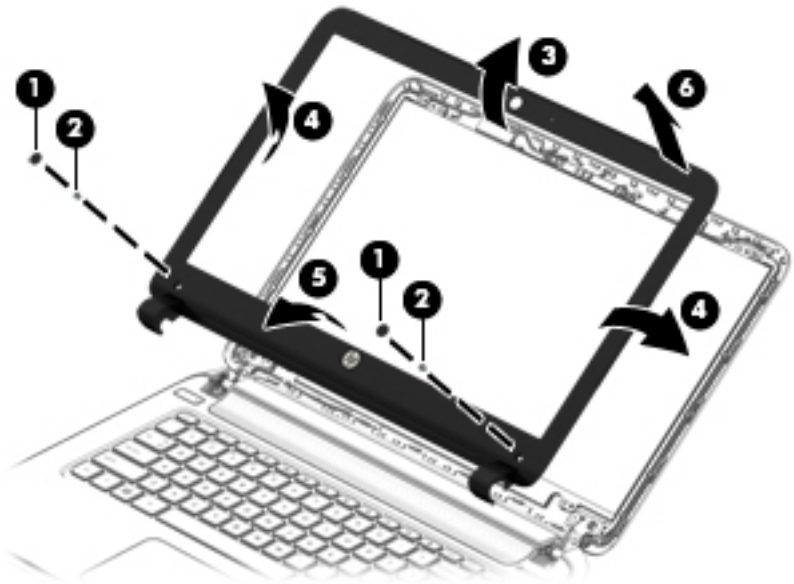
1. To remove the bezel on non-touch screen models:

   The display bezel for non-touch models is available using spare part number 767365-001.

   a. Remove the plastic screw covers **(1)** and the two Phillips M2.5×3.0 screws **(2)** that secure the display bezel to the display assembly.

   b. Flex the inside edges of the top edge **(3)**, the left and right sides **(4)**, and the bottom edge **(5)** of the display bezel until the bezel disengages from the display enclosure.

c. Remove the display bezel **(6)**.



2. To remove the bezel on touch screen models:

   a. Lift to separate and then rotate the top of the display bezel upward **(1)**.

   b. Remove the display bezel from the display enclosure **(2)**.

3. If it is necessary to remove the display panel from non-touch models:

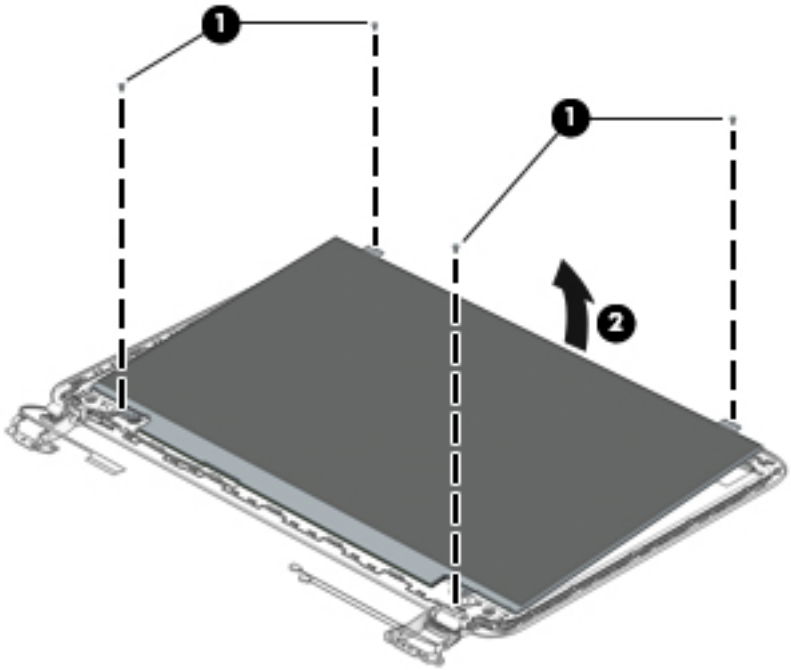
   The display panel is available using the following spare part numbers:

   763566-001: HD non-touch screen models

   767373-001: FHD non-touch screen models

   767374-001: FHD touch screen models

   a. Remove the four Phillips M2.0×2.5 screws **(1)** and lift the top edge of the display panel **(2)**.



b. Carefully move the display panel **(1)** to the keyboard.

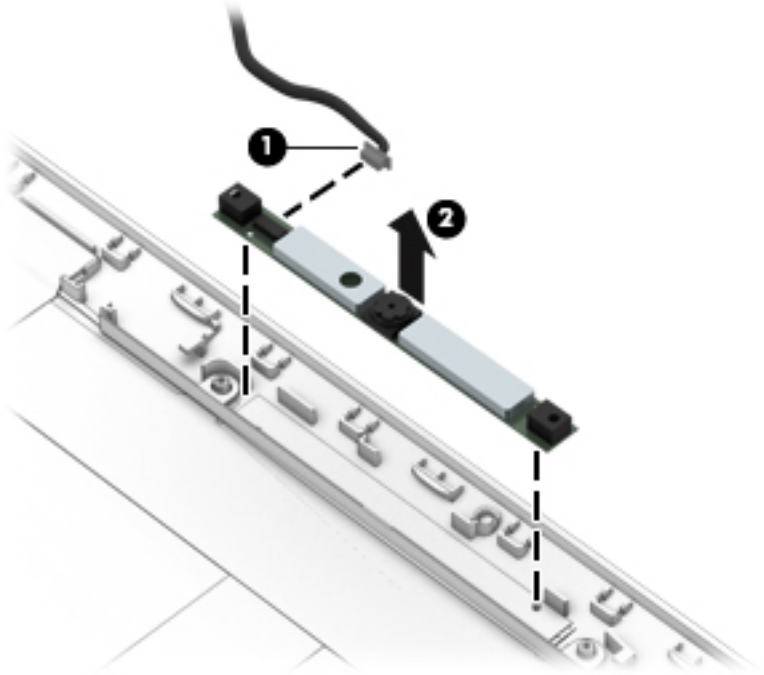
c. Release the tab and disconnect the display panel cable connector **(2)**. Lift the panel **(3)** to remove it.

4. If it is necessary to replace the webcamera/microphone module:

   The webcam is available using spare part number 762521-001 for non-touch models and 767545-001 for touch models.

   a. Disconnect the webcamera/microphone module cable **(1)** from the webcamera/microphone module. (The webcamera/microphone module cable is part of the display panel cable.)

   b. Detach the webcamera/microphone module **(2)** from the display back cover.



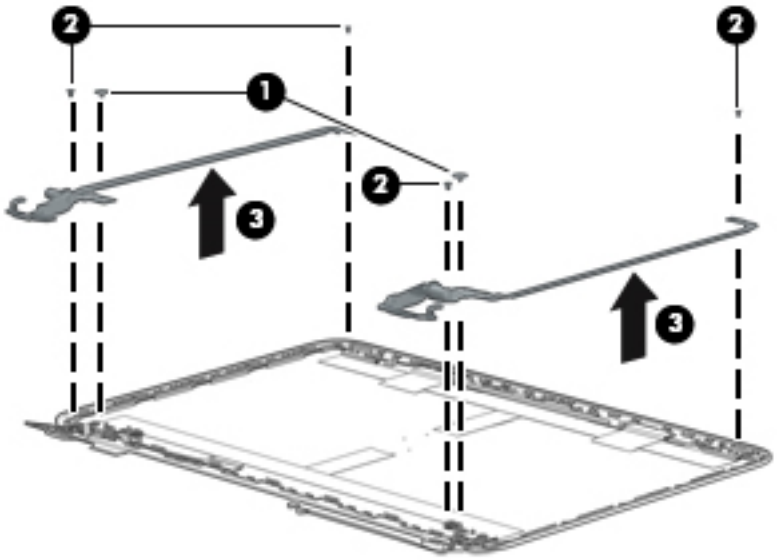
5. If it is necessary to replace the hinges:

   The hinges are available using spare part number 767248-001 for non-touch models.

   a. Remove the two top screws **(1)** from the display hinges.

   b. Remove the four bottom screws **(2)** from the display hinges.

c. Remove the hinges **(3)** from the display enclosure.



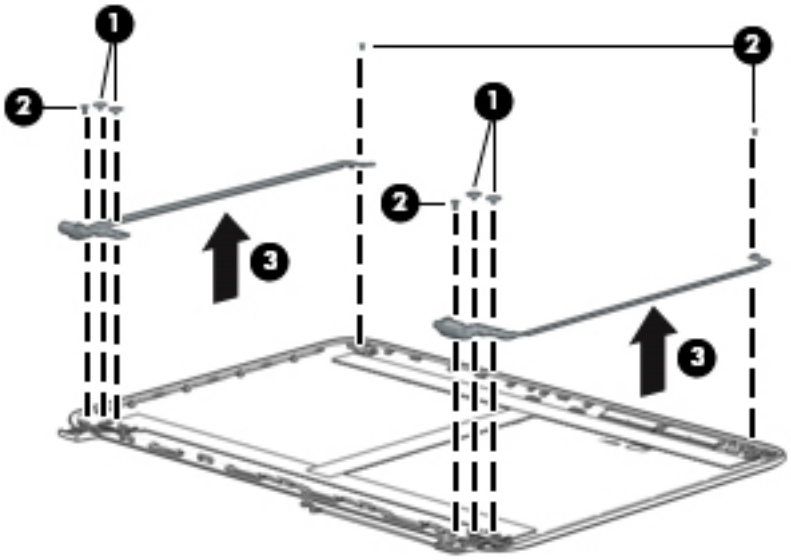
6. If it is necessary to replace the hinges on a touch panel:

   The hinges are available using spare part number 767249-001 for touch models.

   a. Remove the four top screws **(1)** from the display hinges.

   b. Remove the four bottom screws **(2)** from the display hinges.

   c. Remove the hinges **(3)** from the display enclosure.



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

   The display panel cable is available using the following spare part numbers:

   767244-001: HD non-touch screen models

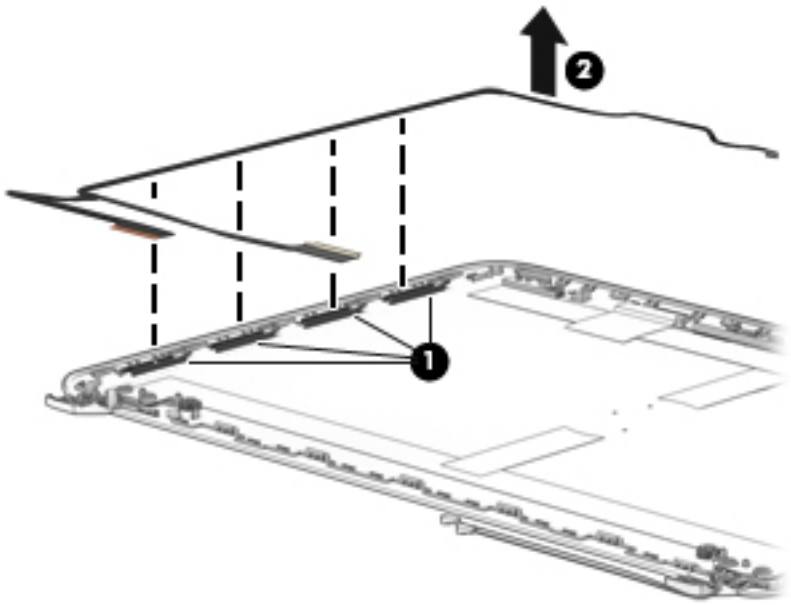
   767245-001: HD touch screen models

   767366-001: FHD non-touch screen models

767367-001: FHD touch screen models

a. Release the display panel cable from the clips **(1)** and routing channel built into the display enclosure.

b. Carefully release the cable from the channel guides, and remove the display panel cable **(2)**.

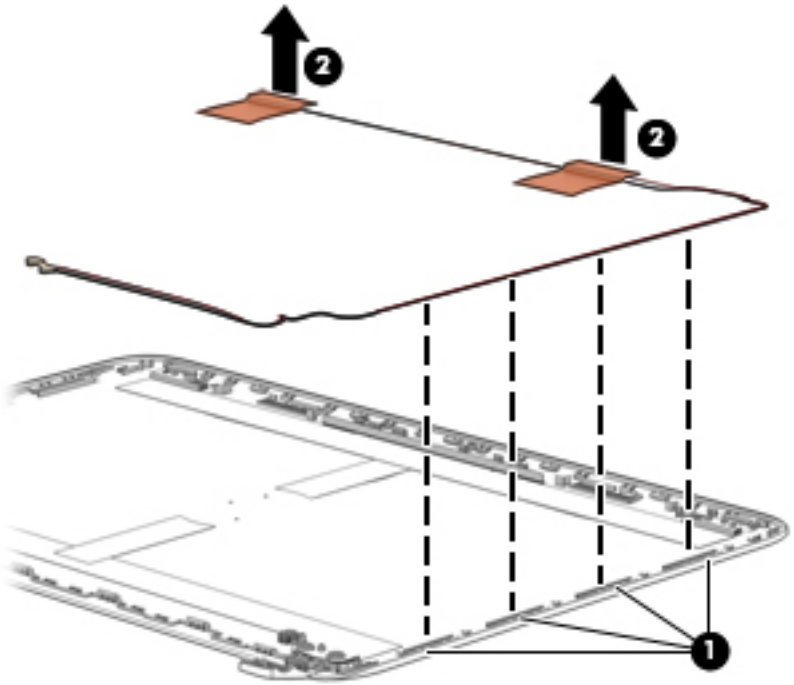


8. If it is necessary to replace the wireless antenna cables and transceivers:

   The antennas are available using spare part number 767237-001 for non-touch models and 767238-001 for touch models.

   a. Release the wireless antenna transceivers **(1)** from the display back cover. (The wireless antenna transceivers are attached to the display back cover with double-sided tape.)

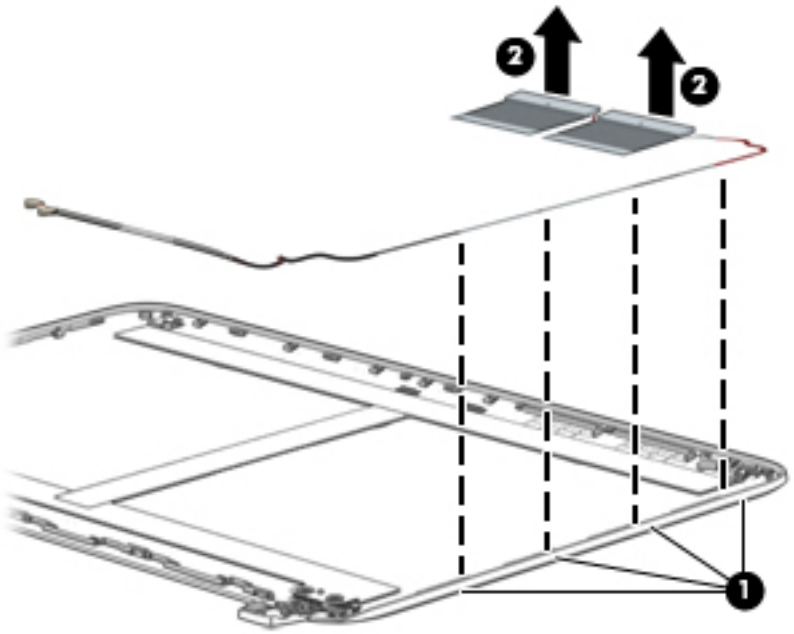
b. Remove the wireless antenna cables and transceivers **(2)**.



9. If it is necessary to replace the wireless antenna cables and transceivers on a touch panel:

   a. Release the wireless antenna transceivers **(1)** from the display back cover. (The wireless antenna transceivers are attached to the display back cover with double-sided tape.)

   b. Remove the wireless antenna cables and transceivers **(2)**.



Reverse this procedure to install the display assembly.

7 Using Setup Utility (BIOS) and HP PC Hardware Diagnostics (UEFI) in Windows 8.1

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 revealed by pressing fn+esc (if you are already in Windows) or by using Setup Utility (BIOS).

1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 74).
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 arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press **enter**.
4. Select **Yes**.

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

1. From the Start screen, type `support`, and then select the **HP Support Assistant** app.
2. Click **Updates and tune-ups**, and then click **Check for HP updates now**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS, make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
   b. Follow the on-screen instructions to download your selection to the hard drive.

      If the update is more recent than your BIOS, make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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

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

1. From the Start screen, type `file`, and then select **File Explorer**.
2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

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

Using HP PC Hardware Diagnostics (UEFI)

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

To start HP PC Hardware Diagnostics UEFI:

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

   The BIOS searches three places for the 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 76.

   b. Hard drive

   c. BIOS

2. 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 esc.

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

NOTE: Instructions for downloading HP PC Hardware Diagnostics (UEFI) are provided in English only.

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

Option 1: HP PC Diagnostics homepage— Provides access to the latest UEFI version

1. Go to http://hp.com/go/techcenter/pcdiags.
2. Click the **UEFI Download** link, and then select **Run**.

Option 2: Support and Drivers page—Provides downloads for a specific product for earlier and later versions

1. Go to http://www.hp.com.
2. Point to **Support**, located at the top of the page, and then click **Download Drivers**.
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, click **HP UEFI Support Environment**.

   – or –

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

8 Using Setup Utility (BIOS) and HP PC Hardware Diagnostics (UEFI) 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 > Help and Support > Maintain**.
2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
   a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
   b. Follow the on-screen instructions to download your selection to the hard drive.

      Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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

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

1. Open Windows Explorer by selecting **Start > Computer**.
2. Double-click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on your hard drive that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

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

Using HP PC Hardware Diagnostics (UEFI)

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

To start HP PC Hardware Diagnostics UEFI:

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

   The BIOS searches three places for the 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 76.
   b. Hard drive
   c. BIOS
2. 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 esc.

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

NOTE: Instructions for downloading HP PC Hardware Diagnostics (UEFI) are provided in English only.

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

Option 1: HP PC Diagnostics homepage— Provides access to the latest UEFI version

1. Go to http://hp.com/go/techcenter/pcdiags.
2. Click the **UEFI Download** link, and then select **Run**.

Option 2: Support and Drivers page—Provides downloads for a specific product for earlier and later versions

1. Go to http://www.hp.com.
2. Point to **Support**, located at the top of the page, and then click **Download Drivers**.
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, click **HP UEFI Support Environment**.

   – or –

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

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions:		
Width	**34.60 cm**	13.62 in
Depth	**24.60 cm**	≤ 9.68 in
Height	**2.55 cm** (TouchSmart), 2.445 cm (Non-touch)	≤ 1.00 in (TouchSmart), 0.96 in (Non-touch)
Weight:		
For TouchSmart computer models with Intel processors	**2.10 kg**	4.61 lbs
For computer models with flat display panels and Intel processors	**2.03 kg**	4.48 lbs
For TouchSmart computer models with AMD processors	**2.10 kg**	4.61 lbs
For computer models with flat display panels and AMD processors	**2.00 kg**	4.41 lbs
Input power		
Operating voltage and current	19.5 V dc @ 2.31 A – 45 W 19.5 V dc @ 3.33 A – 65 W 19.5 V dc @ 2.31 A – 45 W	
Temperature		
Operating (writing to optical disc)	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	**-15 m to 12,192 m**	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	

	Metric	U.S.
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

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

Display specifications

	Metric	U.S.
Dimensions		
Width	**32.4 cm**	12.8 in
Height	**19.3 cm**	7.6 in
Diagonal	**35.56 cm**	14.0 in
Number of colors	262K (6 bit)	
Contrast ratio	500:1 (typical)	
Brightness	200 cd/m² (nits) (typical)	
Backlight	WLED	
Total power consumption	3.2 W (max)	
Viewing angle	±45° horizontal, +15° up & -35° down vertical (typical)	

Hard drive specifications

	1 TB*	750 GB*	500 GB*
Dimensions			
Height	9.5 mm	9.5 mm	7 mm
Width	70 mm	70 mm	70 mm
Weight	107 g max	107 g max	107 g max
Interface type	SATA	SATA	SATA
Transfer rate	300 MB/sec	300 MB/sec	300 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.5 ms	1.0 ms	1.5 ms
Average	11.0 ms	14.0 ms	12.0 ms
Maximum	22.0 ms	24.0 ms	22.0 ms
Logical blocks	1,953,525,168	1,465,128,359	976,752,240
Disk rotational speed	5400 rpm	7200 and 5400 rpm	7200 and 5400 rpm
Operating temperature	**5°C to 55°C** (41°F to 131°F)		

	1 TB*	750 GB*	500 GB*
*Size refers to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.			
NOTE: Certain restrictions and exclusions apply. Contact support for details.			

DVD±RW SuperMulti Double-Layer Combination Drive specifications

Applicable disc	
Read	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD (Photo-CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM
Write	CD-R and CD-RW, DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Random access time	
DVD	< 230 ms
CD	< 175 ms
Cache buffer	2 MB
Data transfer rate	
24X CD-ROM	3,600 KB/sec
8X DVD-ROM	10,800 KB/sec
24X CD-R	3,600 KB/sec
16X CD-RW	2,400 KB/sec
8X DVD+R	10,800 KB/sec
4X DVD+RW	5,400 KB/sec
8X DVD-R	10,800 KB/sec
4X DVD-RW	5,400 KB/sec
2.4X DVD+R(9)	2,700 KB/sec
5X DVD-RAM	6,750 KB/sec
Transfer mode	Multiword DMA Mode

10 Backing up, restoring, and recovering in Windows 8.1

This chapter provides information about the following processes:

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

Creating recovery media and backups

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

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

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

   See Creating HP Recovery media on page 83.

2. Use the Windows tools to create system restore points and create backups of personal information. For more information and steps, see Help and Support. From the Start screen, type `help`, and then select **Help and Support**.

Creating HP Recovery media

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

- Only one set of HP Recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the blank USB flash drive or the number of blank DVD discs that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or instead you can use a high-quality blank USB flash drive.

- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from 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. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.
- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:

IMPORTANT: For tablets, connect to the keyboard dock before beginning these steps (select models only).

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

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 85.

Restore and recovery

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

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information and steps, 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 Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.

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

  For more information, see Recovering using HP Recovery Manager on page 85.
- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media that you have created. For more information, see Recovering using HP Recovery Manager on page 85. If you have not already created recovery media, see Creating HP Recovery media on page 83.

- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see Recovering using HP Recovery Manager on page 85.
- If you wish to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

  For more information, see Removing the HP Recovery partition (select models only) on page 86.

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 created or by using the HP Recovery partition (select models only). If you have not already created recovery media, see Creating HP Recovery media on page 83.

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

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.
- Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.
- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media on page 83.
- To use the Factory Reset option, you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media on page 83.
- 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 wish to retain.

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

IMPORTANT: For tablets, connect to the keyboard dock before beginning these steps (select models only).

1. Press f11 while the computer boots.

   – or –

   Press and hold f11 as you press the power button.

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

3. Select **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 that you created, 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 86.

3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

1. Insert the HP Recovery media you created.

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

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

4. Follow the on-screen instructions.

Removing the HP Recovery partition (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 on page 83.

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 90.

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 90.

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 90.

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 90) and partial restores (see Restoring specific files on page 90), 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 91.
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 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 V ac, or from 220 to 240 V 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 or regions must meet the requirements of the country and 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 A 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
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	ISI	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 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.

Country/region	Accredited agency	Applicable note number

2. The flexible cord must be Type SVT/SJT 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 ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.
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 VCTF, 3-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) 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 CCC certification mark.
5. The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² or 1.00 mm2 conductor size, with plug BS 1363/A with BSI or ASTA marks.

13 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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