HP x360 310 G1 PC

Maintenance and Service Guide
IMPORTANT! This document is intended for HP authorized service providers only.

First Edition: December 2014

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Product notice

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

Not all features are available on 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.

This computer may require upgraded and/ or separately purchased hardware and/or a DVD drive to install the Windows 7 software and take full advantage of Windows 7 functionality. See http://windows.microsoft.com/en-us/windows7/get-know-windows-7 for details.

Safety warning notice

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

Table of contents

1 Product description

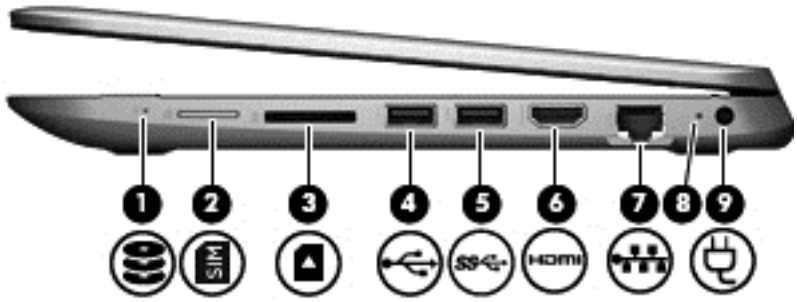
Category	Description
Product Name	HP x360 310 G1 PC
Processor	Intel Pentium N3540 processor (2.16 GHz/2.66 GHz, 2 MB L2, 1333 MHz), quad core Intel Pentium N3530 processor (2.16 GHz/2.58 GHz, 2 MB L2, 1333 MHz), quad core Intel Celeron N2840 processor (2.16 GHz/2.58 GHz, 1 MB L2, 1333 MHz), dual core Intel Celeron N2830 processor (1.83 GHz/2.41 GHz, 1 MB L2, 1333 MHz), dual core
Chipset	Intel Bay Trail-M SoC
Graphics	**Internal graphics:** Intel HD Graphics Support for DX11 Support for HD playback, streaming, and recording @ 720p 30fps
Panel	11.6-in [29.5-cm] (1366×768), high-definition (HD), white light emitting diode (WLED), AntiGlare, TouchScreen with MultiTouch enabled; 16:9 ultra-wide aspect ratio; typical brightness: 200 nits; slim (3.6-mm) Supports low-voltage differential signaling (LVDS) (co-layout with eDP1.3+PSR)
Memory	One customer-accessible/upgradable memory module slot Support for DDR3L-1333-MHz (DDR3L-1600-MHz downgrade to DDR3L-1333-MHz) – for use with Pentium processors Support for DDR3L-1066-MHz (DDR3L-1600-MHz downgrade to DDR3L-1066-MHz) – for use with Celeron processors Support for 8192-MB of system RAM in the following configurations: • 8192 MB × 1 • 4096 MB × 1
Hard drive	Support for 6.35-cm (2.5-in) hard drives in 7.0-mm (.28-in) thickness Support for Serial ATA Support for Accelerometer hard drive protection Support for the following hard drives: • 750-GB, 5400-rpm, 7.2-mm • 500-GB, 5400-rpm, 7.0-mm • 500-GB, 5400-rpm + 8 GB NAND Hybrid, 7.0-mm • 320-GB, 5400-rpm, 7.0-mm
Solid-state drives	Support for the following SSD M.2 SATA configurations: • 128 GB 2280 M2 SATA-3 TLC • 256 GB SATA-3 TLC
Optical drive	Support for external 9.5 mm tray load, SATA, DVD+/-RW DL SuperMulti drive only

Category	Description
Audio and video	Fixed, integrated HD web camera with one microphone Realtek ALC3227-CG audio codec Beats Audio Dual Speakers support 25 mm x 14 mm speaker Formats: MP3, AAC,AAC+, EAAC+ OGG, MIDI
Ethernet	Integrated 10/100 network interface card (NIC)
Sensor	Sensor Hub (Accelerometer + Gyroscope + e-Compass)
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module Support for the following WLAN formats: • Atheros AR9485 802.11b/g/n WiFi Adapter with 1 antenna • Qualcomm QCA9565 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter with 1 antenna • Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter with 1 antenna • Realtek RTL8188EE 802.11bgn Wi-Fi Adapter with 1 antenna Compatible with Miracast-certified devices
External media cards	HP Multi-Format Digital Media Card Reader with push-push technology. Supports SD/SDHC/SDXC.
Internal Expansion	One half-size mini card slot - support for WLAN
Ports	AC adapter: HP Smart pin plug (4.5-mm barrel) Audio: one combo audio-out (headphone)/audio-in (microphone) jack, supports jack auto-detection HDMI: v. 1.4, supporting up to 1080p, 1920×1080 at 60 Hz RJ-45/Ethernet (1) USB 3.0 (on right side) (2) USB 2.0 (on left and right sides) Video: VGA (Dsub 15-pin) supporting 1920×1200 external resolution at 60 Hz, hot plug/unplug and auto-detection for correct output to wide-aspect vs. standard aspect video
Keyboard/pointing devices	97%-size, textured, island-style keyboard (no numerical keypad) **Touchpad requirements:** HP Imagepad - Clickpad with image sensor Taps enabled as default Multitouch gestures enabled: 2-finger scroll, pinch Support for PS/2 and SMB interface Support for Windows 8.1 Modern TouchPad Gestures
Power requirements	Support for the following AC adapter: • 45-W HP Smart AC adapter (non-PFC, with 26.5 mm z-height adapter [non-slim]) with localized cable plug support Support for the following batteries: • Embedded 2-cell, 29-Wh, Li-ion battery • Embedded 3-cell, 43-Wh, Li-ion battery

Category	Description
	Supports battery fast charge
	1.0 m power cord
Security	Lock slot
	TPM (Trusted Platform Module)
Operating system	**Preinstalled**:
	Windows 8.1 Professional 64
	Windows 8.1 Small Screen Touch
	Windows 8.1 Professional Education 64
	Windows 8.1 Core for Higher Education (ML) 64
	Web support:
	Windows 8.1 64
Serviceability	**End user replaceable parts:**
	AC adapter

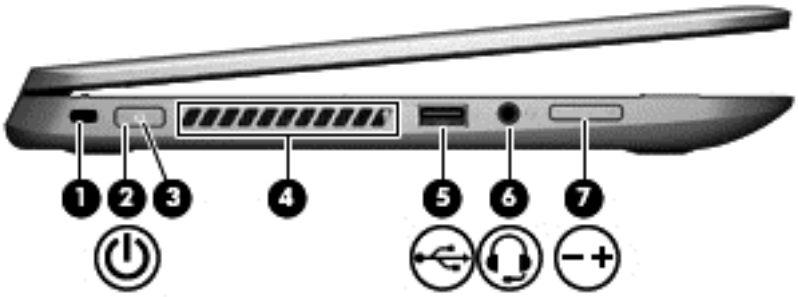
2 External component identification

Right side



Component			Description
(1)		Hard drive light	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	SIM	SIM slot (select models only)	Supports a wireless subscriber identity module (SIM).
(3)		Memory card reader	Reads optional memory cards that enable you to 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.
(4)		USB 2.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(5)	SS	USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(6)	HDMI	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High-Definition Multimedia Interface (HDMI) device.
(7)		RJ-45 (network) jack/status lights	Connects a network cable. • White: The network is connected. • Amber: Activity is occurring on the network.
(8)		AC adapter light	• On: The AC adapter is connected and the battery is charged. • Off: The computer is using battery power.
(9)		Power connector	Connects an AC adapter.

Left side



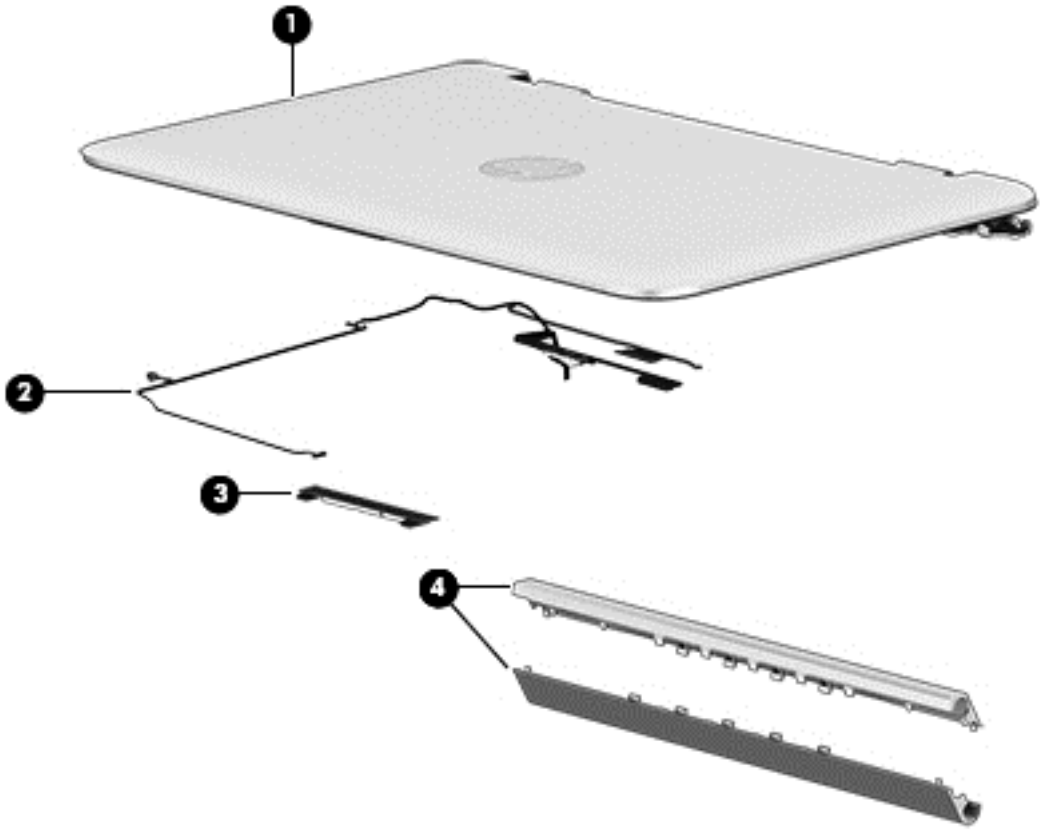
Component		Description
(1)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	Power button	• When the computer is off, press the button to turn 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.
(3)	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.
(4)	Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	USB 2.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(6)	Audio-out (headphone)/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an

Component	Description
	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 document: • From the Start screen, type `support`, and then select the **HP Support Assistant** app. – or — • From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar. **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).
(7) − + Volume button	Controls speaker volume. To decrease speaker volume, press the **–** edge of the button. To increase speaker volume, press the **+** edge of the button.

Speakers

Component	Description
Speakers (2)	Produce sound.

Display



Component		Description
(1)	Webcam light	On: The webcam is in use.
(2)	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.
(3)	Internal microphone	Records sound.
(4)	WLAN antenna*	Sends and receives wireless signals to communicate with wireless local area networks (WLANs).
(5)	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.

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

To access this document:

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

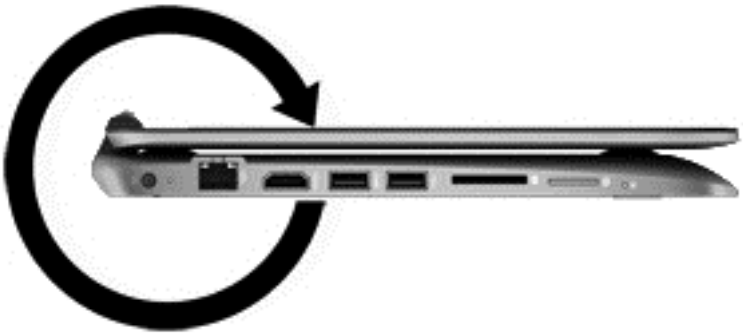
Your computer can function as a classic notebook, and in addition, the display can be rotated so that the computer transforms into an entertainment stand or a tablet.

Changing your notebook to an entertainment stand

To change your notebook to an entertainment stand, raise the display, and then rotate the display backward to a stand position (about 315 degrees).

Changing your notebook to a tablet

To change your notebook to a tablet, raise the display, and then rotate the display backward until it is flush with the computer bottom (360 degrees).

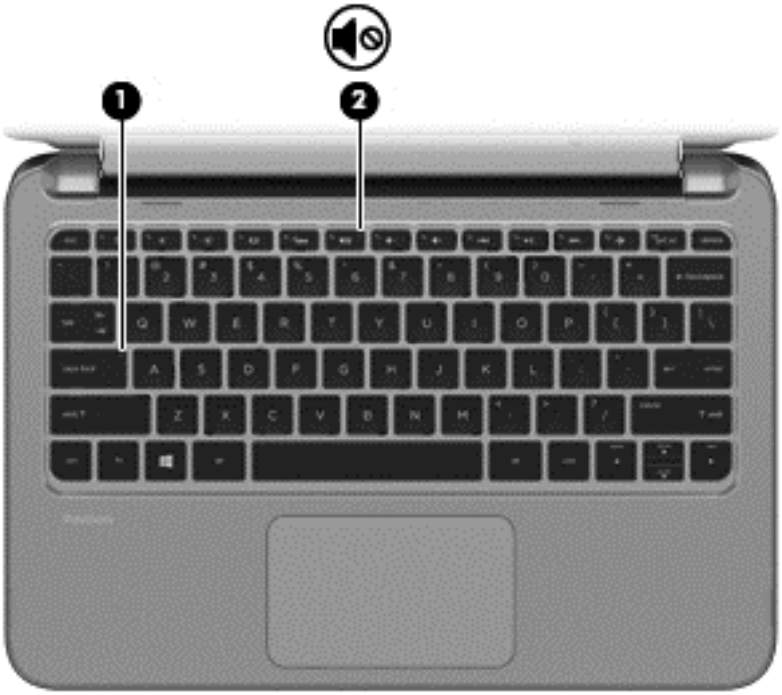


Top

TouchPad

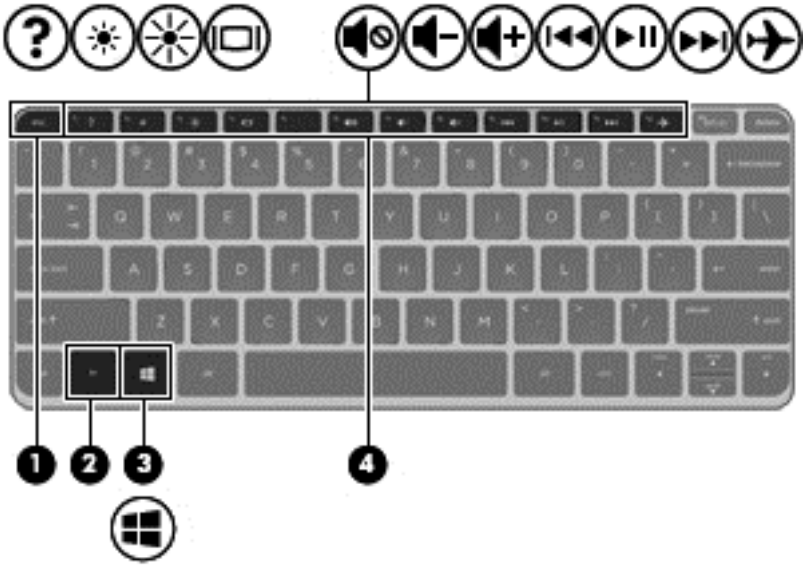
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen. **NOTE:** The TouchPad also supports edge-swipe gestures.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the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

Lights



Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(2)	Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.

Keys

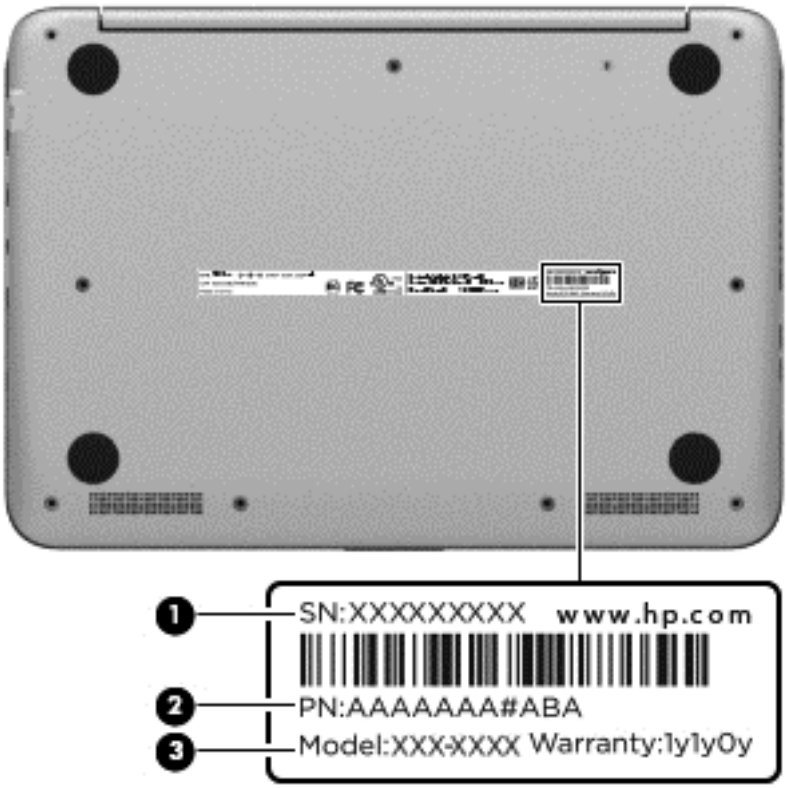


Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with the esc key, or on select models, the b key or the spacebar.
(3)	Windows key	Returns you to the Start screen 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 keybard feature off or on.

Service tag and PCID label

Service tag

When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag.



- Serial number (s/n) **(1)**. This is an alphanumeric identifier that is unique to each product.
- Part number/Product number (p/n) **(2)**. This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
- Model/Warranty period **(3)**.

  Model is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

  Warranty describes the duration (in years) of the warranty period for the computer.

PCID label

The PCID label provides the information required to properly reset the notebook firmware (BIOS) back to factory shipped specifications when replacing the system board. The label may have a different number of characters depending on the operating system on the computer.

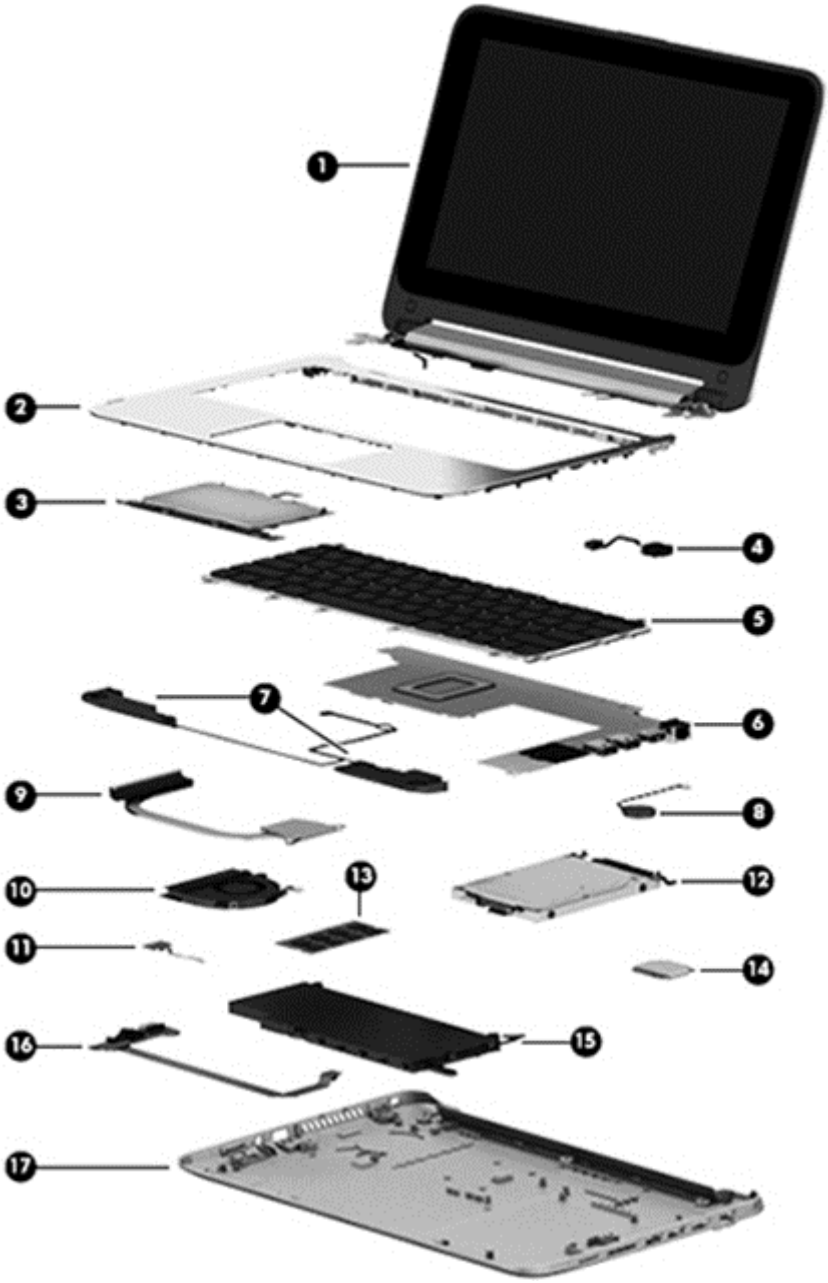
Windows 8 models

Non-Windows 8 models

3 Illustrated parts catalog

Computer major components

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



Item	Component	Spare part number
(1)	**Display assembly (11.6-in [29.5-cm], AG, SVA, LED TouchScreen)** (includes webcam/ microphone module)	755730-001
(2)	**Top cover** (includes TouchPad)	
	Silver	781865-001
	Red	790943-001
(3)	**TouchPad button board** (includes bracket and cable)	not spared
(4)	**Power connector cable**	755727-001
(5)	**Keyboard** **NOTE:** For a detailed list of available keyboards, see Sequential part number listing on page 19.	
	For use in Brazil	755896-201
	For use in Canada	755896-DB1
	For use in Japan	755896-291
	For use in Latin America	755896-161
	For use in the United States	755896-001
	For use in Russia	785454-251
(6)	**System board** (includes replacement thermal material):	
	Intel Pentium N3540 processor and the Windows 8.1 Professional operating system on models with a 3 cell battery	794721-601
	Intel Pentium N3540 processor and the Windows 8.1 Standard operating system on models with a 3 cell battery	794721-501
	Intel Pentium N3540 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	793104-601
	Intel Pentium N3540 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	793104-501
	Intel Pentium N3540 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	793104-001
	Intel Pentium N3530 processor and the Windows 8.1 Professional operating system on models with a 3 cell battery	793103-601
	Intel Pentium N3530 processor and the Windows 8.1 Standard operating system on models with a 3 cell battery	793103-501
	Intel Pentium N3530 processor and a non-Windows 8.1 operating system on models with a 3 cell battery	793103-001
	Intel Pentium N3530 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	774996-601
	Intel Pentium N3530 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	774996-501
	Intel Pentium N3530 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	774996-001
	Intel Pentium N2840 processor and the Windows 8.1 Professional operating system on models with a 3 cell battery	794722-601

Item	Component	Spare part number
	Intel Pentium N2840 processor and the Windows 8.1 Standard operating system on models with a 3 cell battery	794722-501
	Intel Pentium N2840 processor and a non-Windows 8.1 operating system on models with a 3 cell battery	794722-001
	Intel Pentium N2840 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	793105-601
	Intel Pentium N2840 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	793105-501
	Intel Pentium N2840 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	793105-001
	Intel Pentium N2830 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	774997-601
	Intel Pentium N2830 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	774997-501
	Intel Pentium N2830 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	774997-001
(7)	**Speaker Kit** (includes left and right speakers and cable)	755738-001
(8)	**RTC battery** (includes cable)	755735-001
(9)	**Heat sink** (includes replacement thermal material)	755728-001
(10)	**Fan**	755729-001
(11)	**Power button board** (includes cable)	755733-001
(12)	**Hard drive** (does not include hard drive bracket, hard drive connector cable, or screws):	
	750-GB, 5400-rpm, 7.0-mm	752099-001
	500-GB, 5400-rpm, 8 GB hybrid SSD, 7.0-mm	732000-005
	500-GB, 5400-rpm, 7.0-mm	683802-005
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, hard drive connector cable, and screws)	755740-001
	Solid-State Drives	
	256 GB solid-state drive (SSD), M.2	788297-001
	128 GB solid-state drive (SSD), M.2, TLC	777774-001
(13)	**Memory module** (PC3L, 12800, 1600-MHz):	
	8-GB	693374-005
	4-GB	691740-005
(14)	**WLAN module:**	
	Realtek RTL8188EE 802.11bgn Wi-Fi Adapter	709848-005
	Qualcomm QCA9565 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter	733476-005
(15)	**Li-ion battery**	
	2-cell, 29-Wh, 3.82-Ah	751875-005

Item	Component	Spare part number
	3-cell, 43-Wh, 3.82-Ah	778956-005
(16)	**USB board** (includes cable)	755734-001
(17)	**Bottom cover**	
	Red models with 3 cell battery	784782-001
	Red models with 2 cell battery	755725-001
	Silver models with 3 cell battery	790944-001
	Silver models with 2 cell battery	755726-001

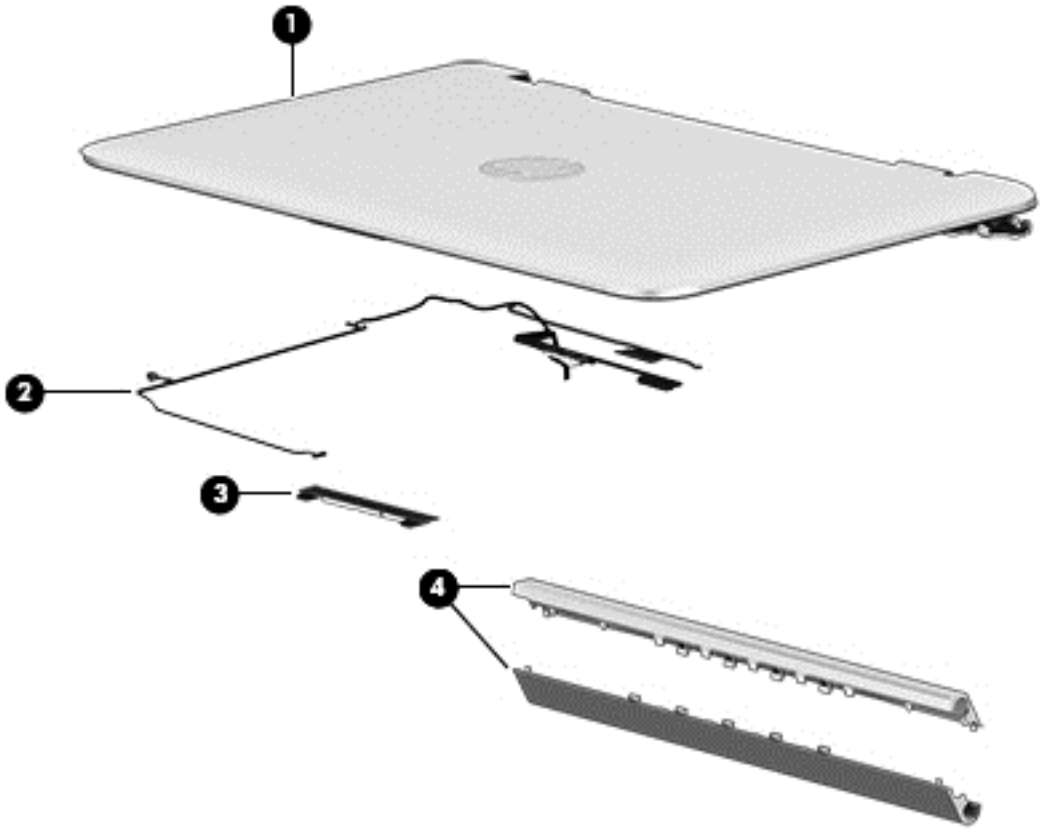
Mass storage devices

Component	Spare part number
Hard drive (does not include hard drive bracket, hard drive connector cable, or screws):	
750-GB, 5400-rpm, 7.0-mm	752099-001
500-GB, 5400-rpm, 8 GB hybrid SSD, 7.0-mm	732000-005
500-GB, 5400-rpm, 7.0-mm	683802-005
Hard Drive Hardware Kit (includes hard drive bracket, connector cable, and screws)	755740-001
Solid-State Drives	
256 GB solid-state drive (SSD), M.2	788297-001
128 GB solid-state drive (SSD), M.2, TLC	777774-001

Miscellaneous parts

Component	Spare part number
AC adapter	
45-W HP Smart AC adapter (non-PFC, 4.5-mm, non-slim)	741727-001
Power cord (3-pin, black, 1.0-m):	
For use in Europe	755530-021
For use in Israel	755530-BB1
For use in North America	755530-001
For use in South Africa	755530-AR1
For use in the United Kingdom and Singapore	755530-031
Rubber Feet Kit (includes 2 rear rubber feet)	755736-001
Screw Kit	755737-001

Display assembly subcomponents



Item	Component	Spare part number
(1)	**Display enclosure**	
	Silver models	758845-001
	Red models	758846-001
(2)	**Display cable**	761350-001
(3)	**Webcam**	758848-001
(4)	**Display hinge covers**	
	For use in red models	758847-001
	For use in silver models	759503-001
	Sensor board (not illustrated)	788218-001

Sequential part number listing

CSR flag designations:

A = Mandatory

B = Optional

C = Service technician recommended

N = Non-user replaceable

Spare part number	CSR flag	Description
683802-005	N	Hard drive, 500-GB, 5400-rpm, 7.0-mm
691740-005	N	4-GB memory module (PC3L, 12800, 1600-MHz)
693374-005	N	8-GB memory module (PC3L, 12800, 1600-MHz)
709848-005	N	Realtek RTL8188EE 802.11bgn Wi-Fi Adapter
732000-005	N	500-GB, 5400-rpm, 8 GB hybrid SSD, 7.0-mm **NOTE:** The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 755740-001.
733476-005	N	Qualcomm QCA9565 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter
741727-001	A	45-W HP Smart AC adapter (non-PFC, 4.5-mm, non-slim)
751875-005	N	2-cell, 29-Wh, 3.82-Ah, Li-ion battery for use in all models
752099-001	A	750-GB, 5400-rpm, 8 GB hybrid SSD, 7.0-mm **NOTE:** The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 755740-001.
755530-001	A	Power cord for use in North America (3-pin, black, 1.0-m)
755530-021	A	Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.0-m)
755530-031	A	Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.0-m)
755530-AR1	A	Power cord for use in South Africa (3-pin, black, 1.0-m)
755530-BB1	A	Power cord for use in Israel (3-pin, black, 1.0-m)
755725-001	N	Bottom cover for use in red models with a 2 cell battery
755726-001	N	Bottom cover for use in silver models with a 2 cell battery
755727-001	N	Power connector cable
755728-001	N	Heat sink (includes replacement thermal material)
755729-001	N	Fan
755730-001	N	11.6-in [29.5-cm], AG, SVA, LED TouchScreen display assembly
755733-001	N	Power button board (includes cable)
755734-001	N	USB board (includes cable)
755735-001	N	RTC battery (includes cable)
755736-001	N	Rubber Feet Kit (includes 2 rubber feet)

Spare part number	CSR flag	Description
755737-001	N	Screw Kit
755738-001	N	Speaker Kit (includes left and right speakers and cable)
755740-001	N	Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector cable, and screws)
755896-001	N	Keyboard for use in the United States (includes keyboard cable and TouchPad)
755896-161	N	Keyboard for use in Latin America (includes keyboard cable and TouchPad)
755896-201	N	Keyboard for use in Brazil (includes keyboard cable and TouchPad)
755896-291	N	Keyboard for use in Japan (includes keyboard cable and TouchPad)
755896-DB1	N	Keyboard for use in Canada (includes keyboard cable and TouchPad)
758845-001	N	Display rear cover for use in silver models
758846-001	N	Display rear cover for use in red models
758847-001	N	Display hinge covers for use in all red models
758848-001	N	Webcam
759503-001	N	Display hinge covers for use in all silver models
761350-001	N	Display cable
774996-001	N	System board equipped with an Intel Pentium N3530 processor and a non-Windows 8.1 operating system for use in models with a 2 cell battery
774996-501	N	System board equipped with an Intel Pentium N3530 processor and the Windows 8.1 Standard operating system for use in models with a 2 cell battery
774996-601	N	System board equipped with an Intel Pentium N3530 processor and the Windows 8.1 Professional operating system for use in models with a 2 cell battery
774997-001	N	System board equipped with an Intel Pentium N2830 processor and a non-Windows 8.1 operating system for use in models with a 2 cell battery
774997-501	N	System board equipped with an Intel Pentium N2830 processor and the Windows 8.1 Standard operating system for use in models with a 2 cell battery
774997-601	N	System board equipped with an Intel Pentium N2830 processor and the Windows 8.1 Professional operating system for use in models with a 2 cell battery
777774-001	N	128 GB Solid-state drive (SSD), M.2, TLC
778956-005	N	3-cell, 43-Wh, 3.82-Ah, Li-ion battery
781865-001	C	Top cover for use in silver models (includes TouchPad)
784782-001	N	Bottom cover for use in red models with a 3 cell battery
785454-251	B	Keyboard for use in Russia (includes keyboard cable and TouchPad)
788218-001	N	Sensor board
788297-001	N	256 GB Solid-state drive (SSD), M.2
790943-001	N	Top cover for use in red models (includes TouchPad)
790944-001	N	Bottom cover for use in silver models with a 3 cell battery
793103-001	N	System board equipped with an Intel Pentium N3530 processor and a non-Windows 8.1 operating system for use in models with a 3 cell battery

Spare part number	CSR flag	Description
793103-501	N	System board equipped with an Intel Pentium N3530 processor and the Windows 8.1 Standard operating system for use in models with a 3 cell battery
793103-601	N	System board equipped with an Intel Pentium N3530 processor and the Windows 8.1 Professional operating system for use in models with a 3 cell battery
793104-001	N	System board equipped with an Intel Pentium N3540 processor and a non-Windows 8.1 operating system for use in models with a 2 cell battery
793104-501	N	System board equipped with an Intel Pentium N3540 processor and the Windows 8.1 Standard operating system for use in models with a 2 cell battery
793104-601	N	System board equipped with an Intel Pentium N3540 processor and the Windows 8.1 Professional operating system for use in models with a 2 cell battery
793105-001	N	System board equipped with an Intel Pentium N2840 processor and a non-Windows 8.1 operating system for use in models with a 2 cell battery
793105-501	N	System board equipped with an Intel Pentium N2840 processor and the Windows 8.1 Standard operating system for use in models with a 2 cell battery
793105-601	N	System board equipped with an Intel Pentium N2840 processor and the Windows 8.1 Professional operating system for use in models with a 2 cell battery
794721-001	N	System board equipped with an Intel Pentium N3540 processor and a non-Windows 8.1 operating system for use in models with a 3 cell battery
794721-501	N	System board equipped with an Intel Pentium N3540 processor and the Windows 8.1 Standard operating system for use in models with a 3 cell battery
794721-601	N	System board equipped with an Intel Pentium N3540 processor and the Windows 8.1 Professional operating system for use in models with a 3 cell battery
794722-001	N	System board equipped with an Intel Pentium N2840 processor and a non-Windows 8.1 operating system for use in models with a 3 cell battery
794722-501	N	System board equipped with an Intel Pentium N2840 processor and the Windows 8.1 Standard operating system for use in models with a 3 cell battery
794722-601	N	System board equipped with an Intel Pentium N2840 processor and the Windows 8.1 Professional operating system for use in models with a 3 cell battery

4 Removal and replacement procedures preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures for Authorized Service Provider parts

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

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

Component replacement procedures

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

There are as many as 76 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Bottom cover

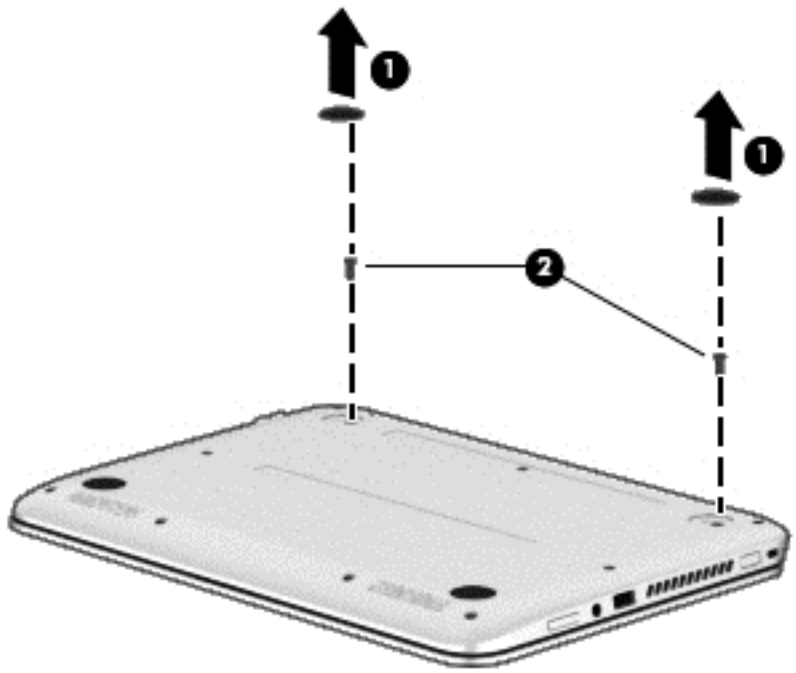
Description	Spare part number
Bottom cover for use in:	
Red models with a 3 cell battery	784782-001
Red models with a 2 cell battery	755725-001
Silver models with a 3 cell battery	790944-001
Silver models with a 2 cell battery	755726-001
Rubber Kit (includes rear feet)	755736-001

Before removing the bottom cover, follow these steps:

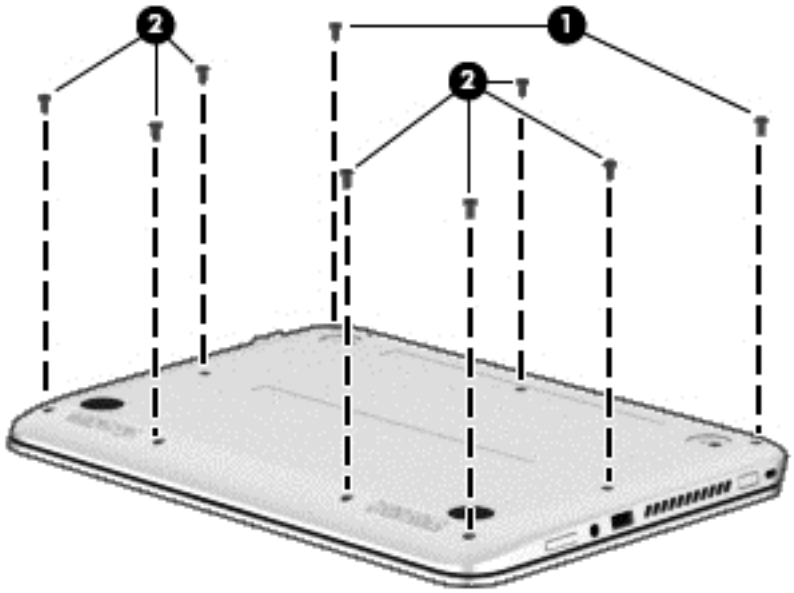
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

Remove the bottom cover:

1. Position the computer upside-down.
2. Pry the two rear rubber feet off the bottom cover **(1)**.
3. Remove the two Phillips PM2.5×8.0 screws **(2)** that secure the bottom cover to the computer.

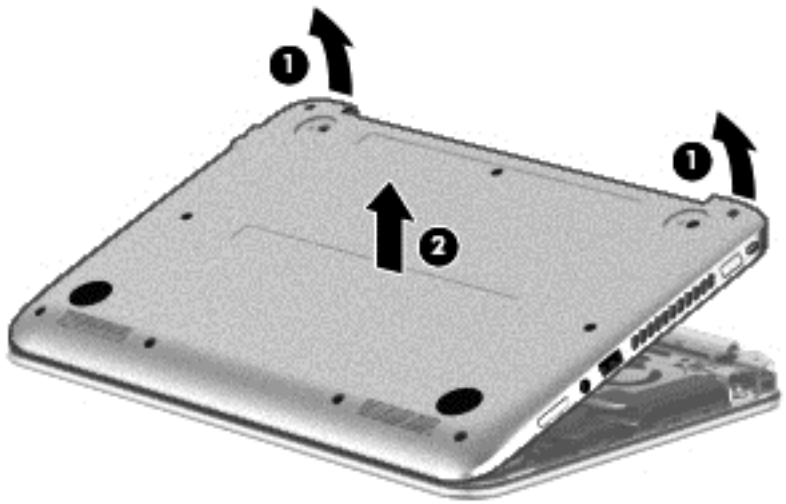


4. Remove the two Phillips PM2.5×8.0 screws **(1)** and the seven Phillips PM2.0×7.0 screws **(2)** that secure the bottom cover to the computer.

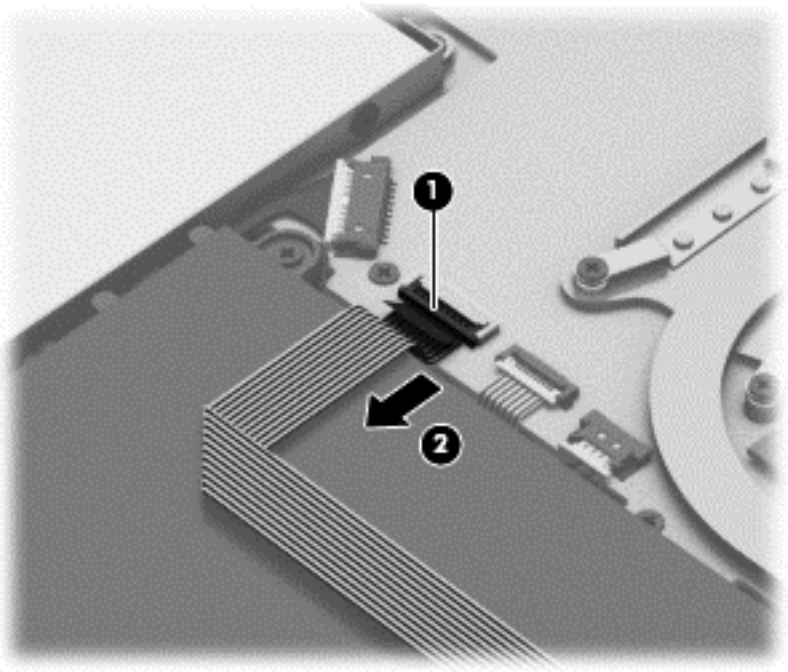


5. Separate the bottom cover from the computer by lifting up at the seam near the display hinges **(1)**, and then lift the cover up and off the computer **(2)** far enough to access the USB/audio board connector on the system board.

NOTE: When you lift the bottom cover, a cable is connected from the USB/audio board (installed on the inside of the bottom cover) to the system board. Be sure not to pull the cable loose when lifting the bottom cover.



6. Disconnect the USB/audio board cable from the system board by lifting the ZIF connector **(1)**, and then removing the USB/audio board cable from the system board connector **(2)**.



Reverse this procedure to install the bottom cover.

USB/audio board

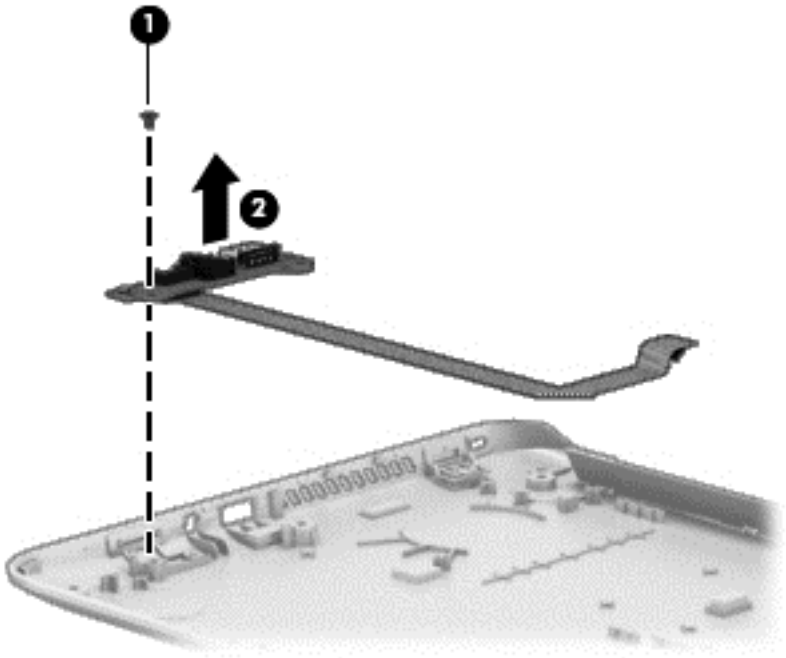
Description	Spare part number
USB/audio board (includes cable)	755734-001

Before removing the USB/audio board, follow these steps:

1. 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.
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 bottom cover (see Bottom cover on page 28).

To remove the USB/audio board:

1. Position the bottom cover upside-down.
2. Remove the Phillips PM2.0×3.0 screw **(1)**.
3. Lift up on the rear of the board and lift the board off the bottom cover **(2)**.



Reverse this procedure to install the USB/audio board.

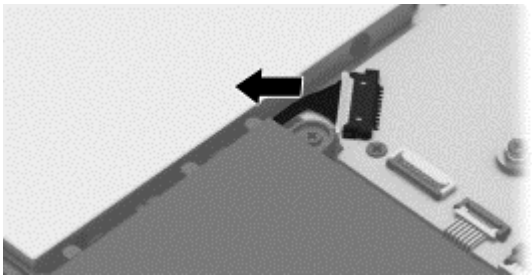
WLAN module

Description	Spare part number
Realtek RTL8188EE 802.11bgn Wi-Fi Adapter	709848-005
Qualcomm QCA9565 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter	733476-005

CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore device functionality, and then contact technical support.

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



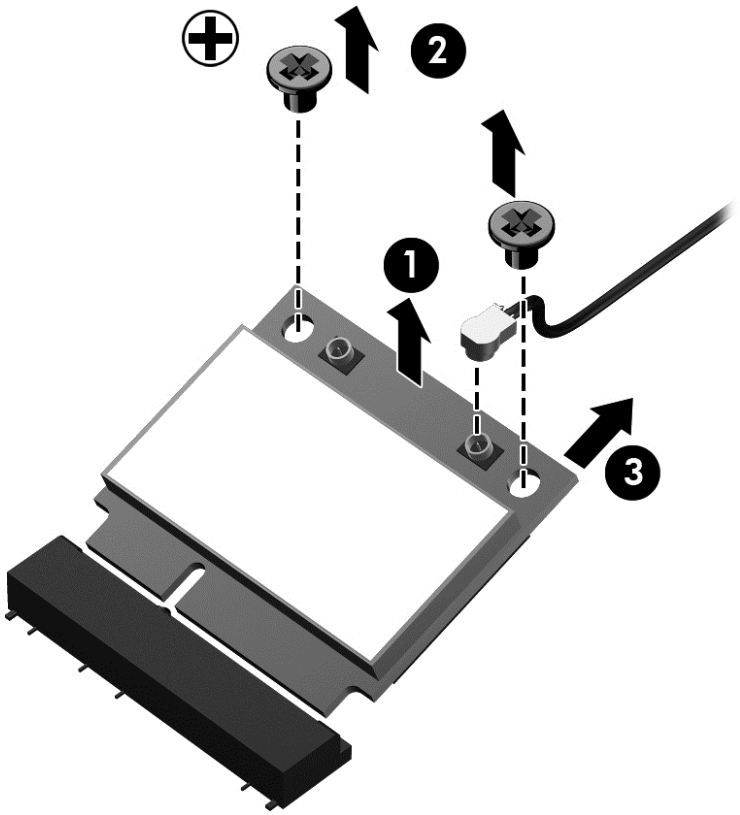
Remove the WLAN module:

1. Disconnect the WLAN antenna cable **(1)** from the terminal on the WLAN module.

NOTE: The WLAN antenna cable connects to the WLAN module “Main” terminal labeled “1”.

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

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



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

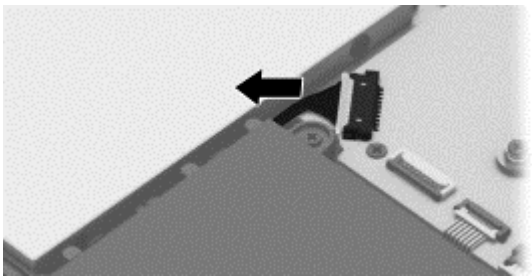
Reverse this procedure to install the WLAN module.

Solid-state drive (M.2)

Description	Spare part number
256 GB Solid-state drive (SSD), M.2	788297-001
128 GB solid-state drive (SSD), M.2, TLC	777774-001

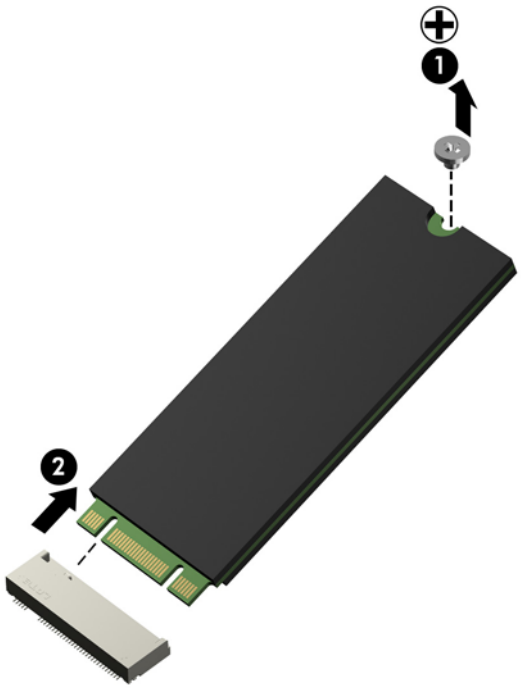
Before removing the solid-state drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



Remove the solid-state drive:

1. Remove the Phillips PM2.0×3.5 screw **(1)** that secures the solid-state drive to the system board.
2. Remove the solid-state drive **(2)** by pulling the drive away from the slot at an angle.



Reverse this procedure to install the solid-state drive.

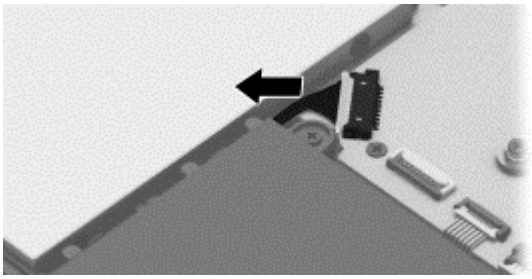
Hard drive

NOTE: The Hard Drive Hardware Kit, spare part number 755740-001, includes the hard drive bracket, hard drive connector cable, and screws.

Description	Spare part number
750-GB, 5400-rpm, 7.0-mm	752099-001
500-GB, 5400-rpm, 8 GB hybrid SSD, 7.0-mm	732000-005
500-GB, 5400-rpm, 7.0-mm	683802-005

Before removing the hard drive, follow these steps:

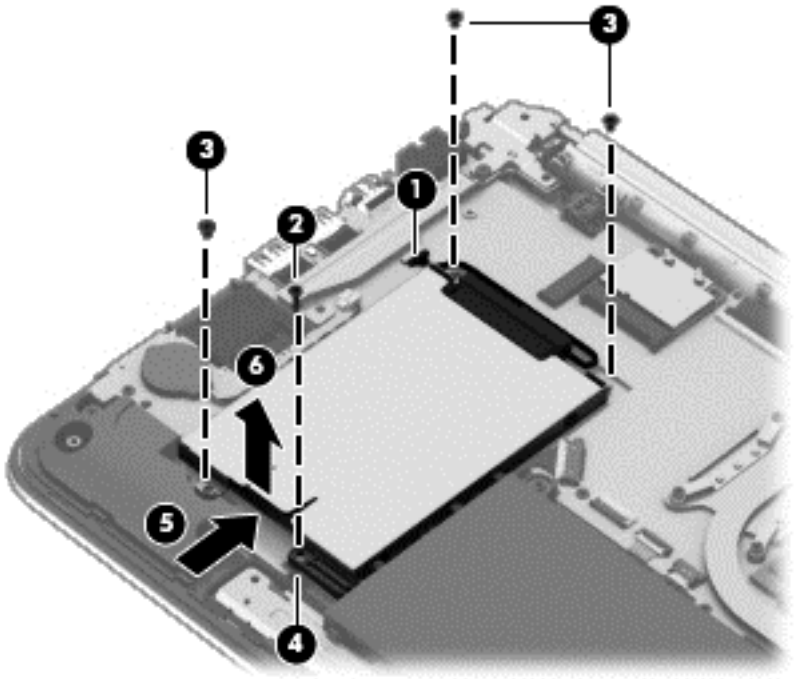
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



Remove the hard drive:

1. Disconnect the hard drive connector cable **(1)** from the system board.
2. Remove the Phillips PM2.0×7.0 screw **(2)** that secures the hard drive and battery to the computer.
3. Remove the three Phillips PM2.0×3.0 screws **(3)** that secure the hard drive to the computer.

4. A small part of the hard drive sits under one of the battery screw tabs **(4)**. To remove it, slide the hard drive toward the top of the computer **(5)**, and then lift it out of the computer **(6)**.



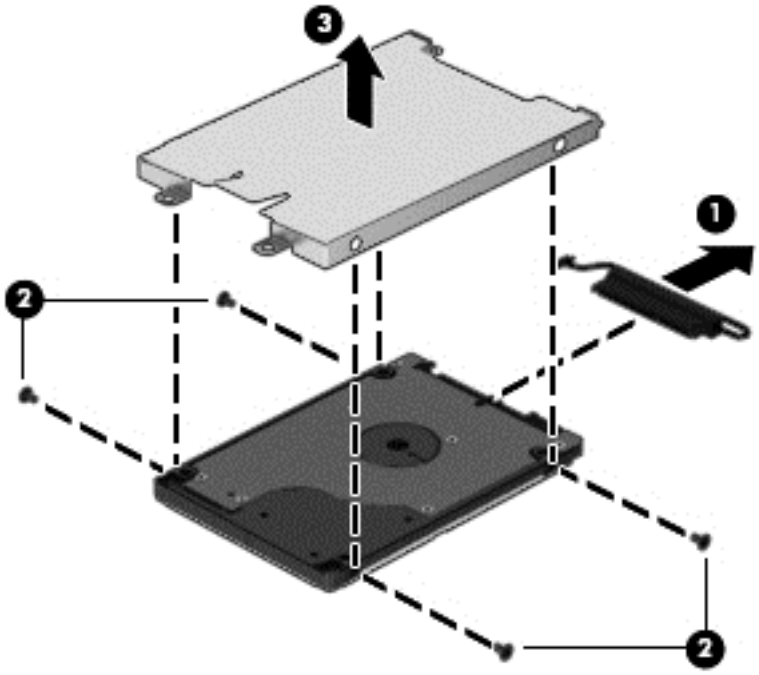
5. If it is necessary to disassemble the hard drive, perform the following steps:

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

   b. Remove the four Phillips PM3.0×3.0 screws **(2)** that secure the hard drive bracket to the hard drive.

   c. Remove the hard drive bracket **(3)** from the hard drive.

      The hard drive bracket, hard drive connector cable, and screws are available in the Hard Drive Hardware Kit, spare part number 755740-001.



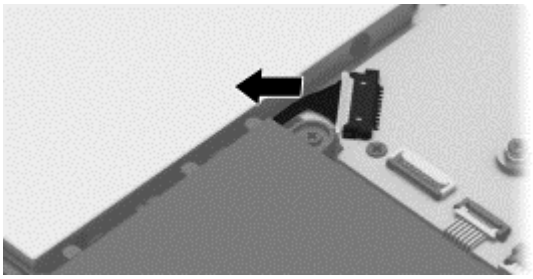
Reverse this procedure to install the hard drive.

RTC battery

Description	Spare part number
RTC battery (includes cable)	755735-001

Before removing the RTC battery, follow these steps:

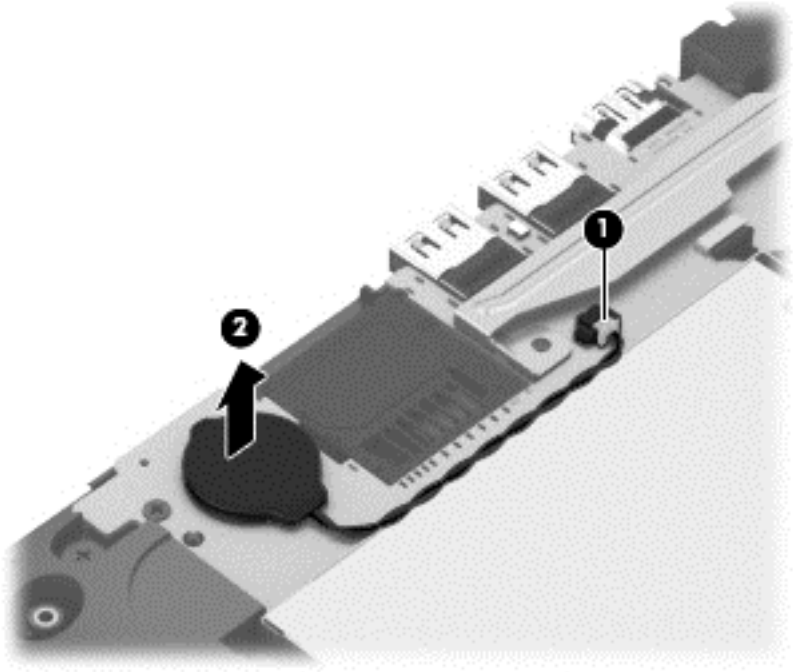
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



Remove the RTC battery:

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

2. Detach the RTC battery **(2)** from the system board. (The RTC battery is secured with double-sided tape.)



3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Memory module

Description	Spare part number
8-GB (PC3L, 12800, 1600-MHz)	693374-005
4-GB (PC3L, 12800, 1600-MHz)	691740-005

Update BIOS before adding memory modules

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

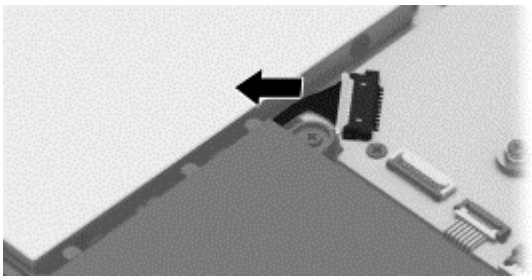
⚠ **CAUTION:** Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to www.hp.com.
2. Click **Support & Drivers > click Drivers & Software**.
3. In the **Enter a product name/number box**, type the computer model information, and then click **Search**.
4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. Under **Step 2: Select a Download**, click the **BIOS** link.
7. Click the link for the most recent BIOS.
8. Click the **Download** button, and then follow the on-screen instructions.

Before removing a memory module, follow these steps:

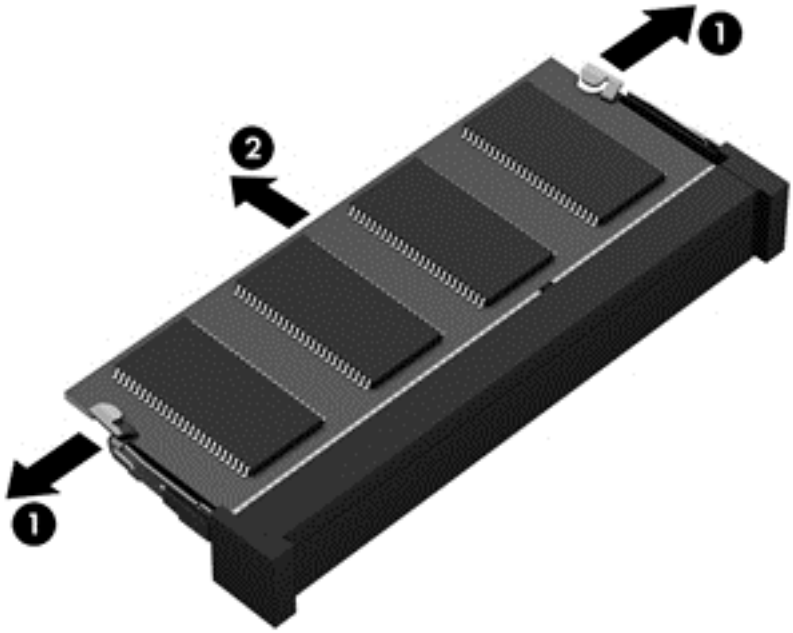
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



Remove the memory module:

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

2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.



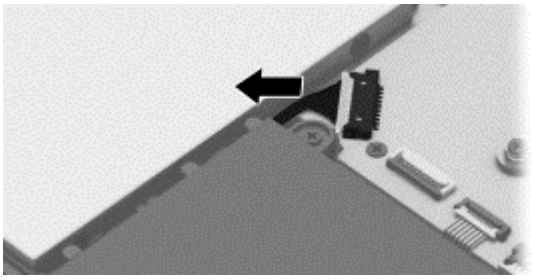
Reverse this procedure to install a memory module.

Power button board

Description	Spare part number
Power button board (includes cable)	755733-001

Before removing the power button board, follow these steps:

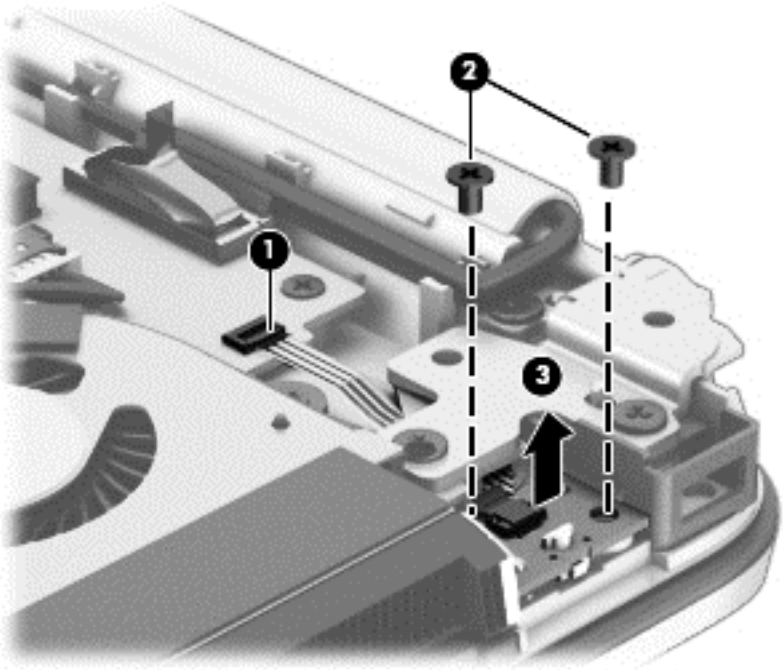
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



Remove the power button board:

1. Disconnect the power button board cable **(1)** from the system board.
2. Remove the two Phillips PM2.0×3.0 screws **(2)** that secure the power button board to the computer.

3. Remove the power button board and cable **(3)**.



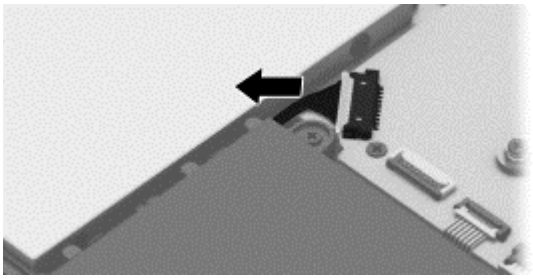
Reverse this procedure to install the power button board.

Fan

Description	Spare part number
Fan	755729-001

Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



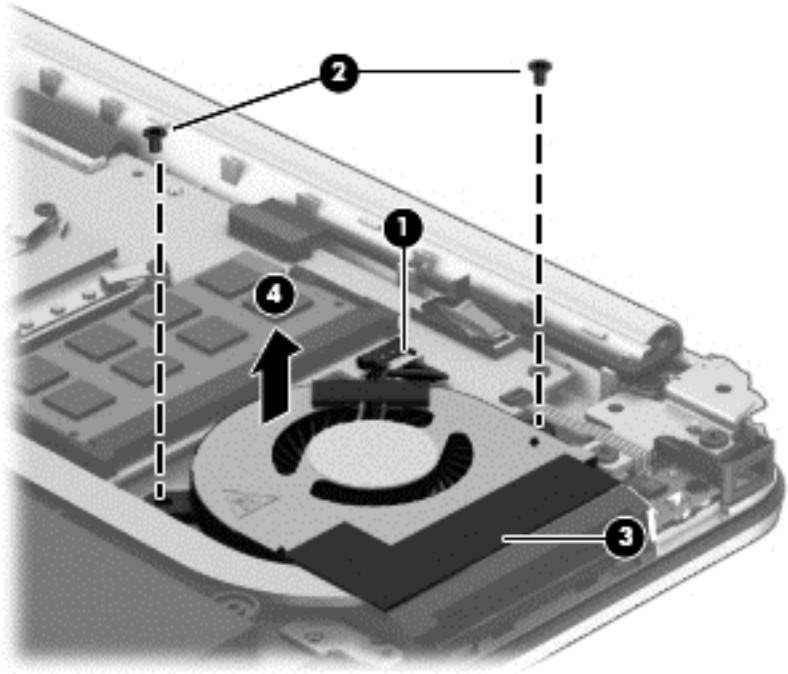
Remove the fan:

NOTE: You do not have to remove the heat sink to remove the fan. You must disengage the tape that secures the fan to the heat sink.

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the two Phillips PM2.0×3.0 screws **(2)** that secure the fan to the system board.
3. Detach the tape **(3)** from the heat sink.

NOTE: You do not need to remove the tape from the fan.

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



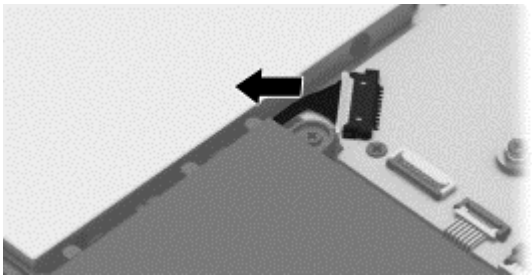
Reverse this procedure to install the fan.

Heat sink

Description	Spare part number
Heat sink (includes replacement thermal material)	755728-001

Before removing the heat sink, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery.



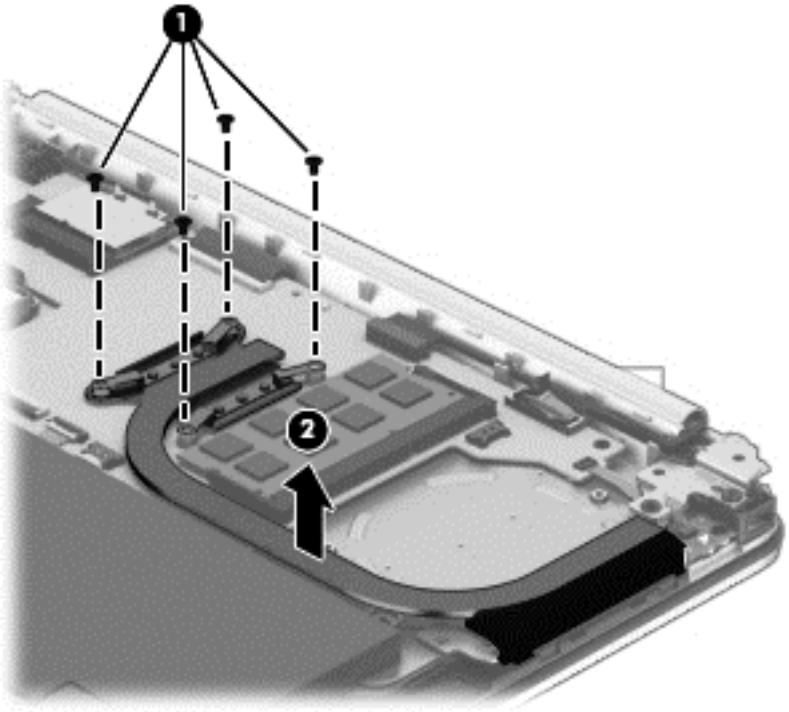
6. Remove the fan (see Fan on page 45).

Remove the heat sink:

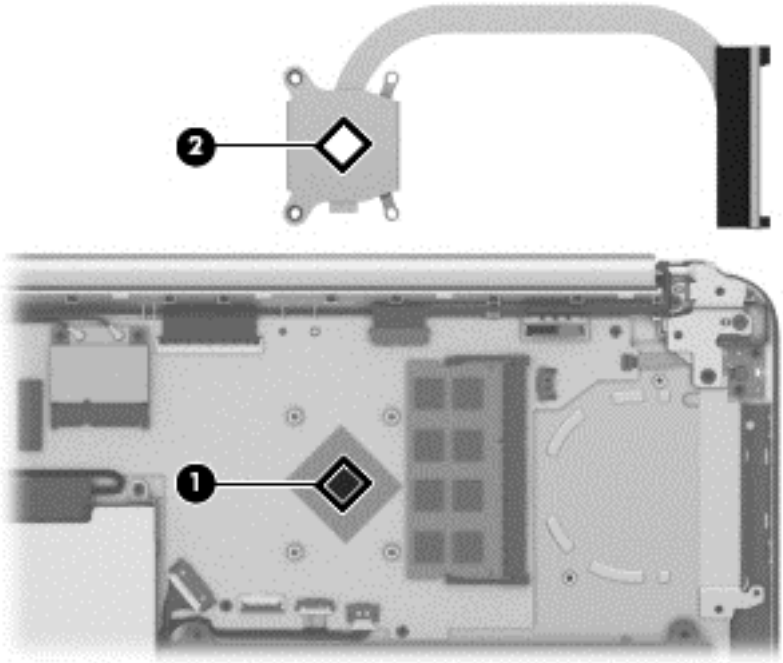
NOTE: You do not have to remove the fan to remove the heat sink. You must disengage the tape that secures the heat sink to the fan.

1. Following the 1 through 4 sequence stamped into the heat sink, remove the four Phillips PM2.0×3.0 screws **(1)** that secure the heat sink to the system board.
2. Detach the tape **(2)** that secures the heat sink to the fan.
3. Remove the heat sink **(3)**.

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



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it



Reverse this procedure to install the heat sink.

Battery

Description	Spare part number
2-cell, 29-Wh, 3.82-Ah, Li-ion battery	751875-005
3-cell, 43-Wh, 3.82-Ah, Li-ion battery	778956-005

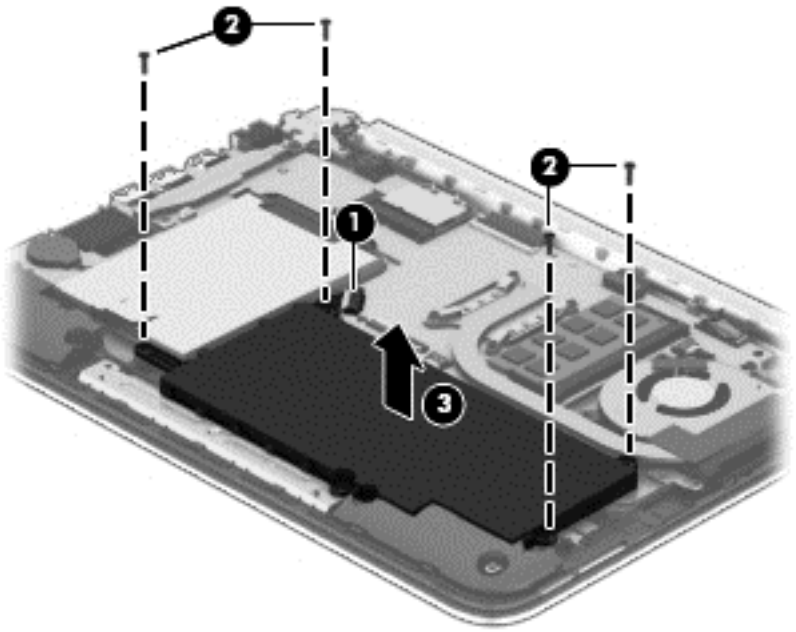
Before removing the battery, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).

Remove the battery:

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

1. Disconnect the battery cable from the system board **(1)**.
2. Remove the four Phillips PM2.0×7.0 screws **(2)** that secure the battery to the computer.
3. Remove the battery **(3)**.



Reverse this procedure to install the battery.

Speakers

Description	Spare part number
Speaker Kit (includes left and right speakers and cable)	755738-001

Before removing the speakers, follow these steps:

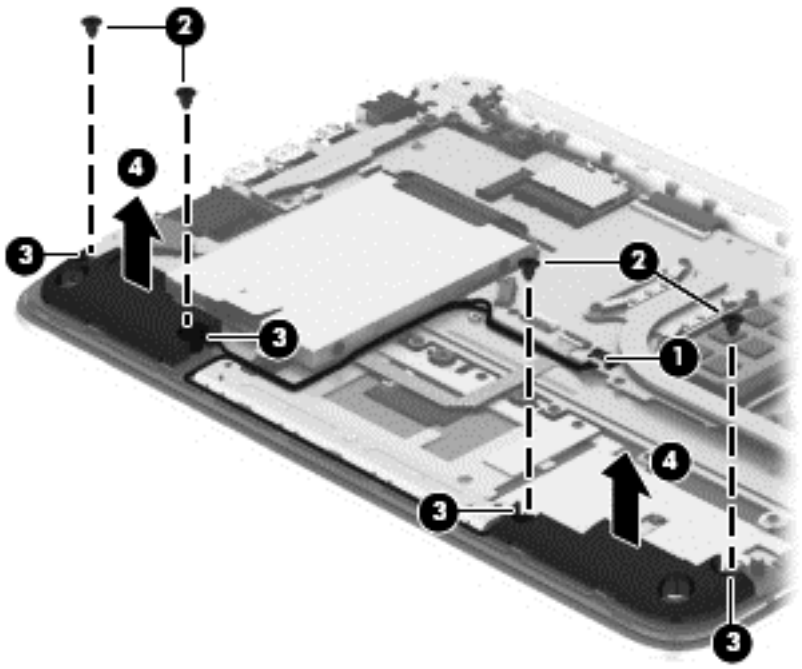
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 49).

Remove the speakers:

1. Disconnect the speaker cable from the system board **(1)**.
2. Remove the four Phillips PM2.0×6.0 broadhead screws **(2)** that secure the speakers to the computer.

NOTE: Make note of the rubber gaskets **(3)** that fit around each screw. For installation, make sure the gaskets are properly installed.

3. Remove the speakers **(4)**.



Reverse this procedure to install the speakers.

TouchPad button board

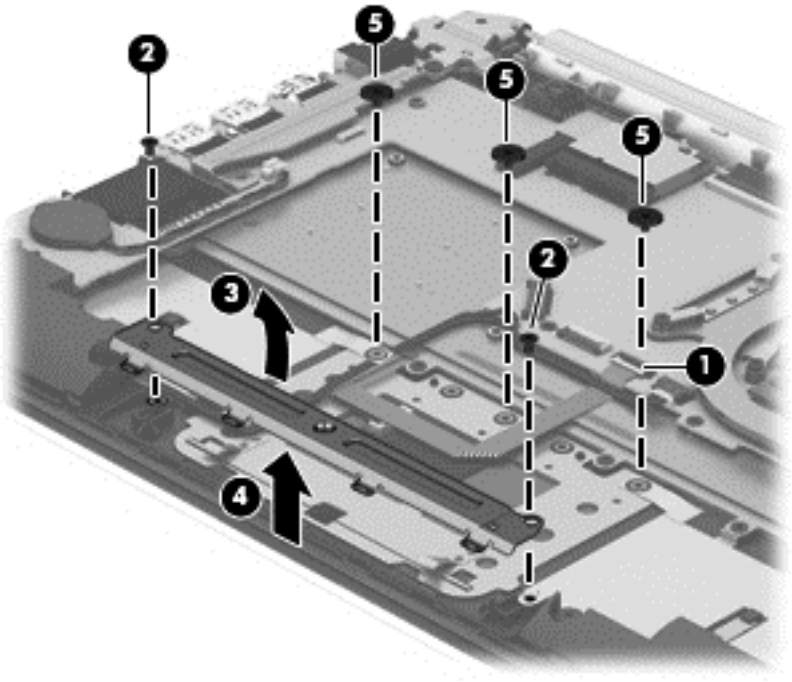
Description	Spare part number
TouchPad button board (includes bracket and cable)	not spared

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 bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 49).

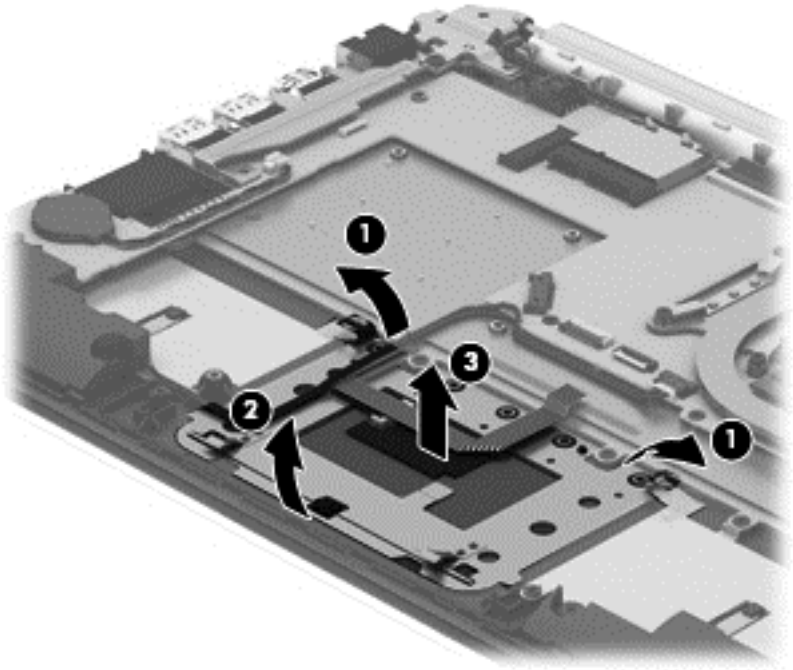
Remove the TouchPad button board:

1. Disconnect the TouchPad board cable from the system board **(1)**.
2. Remove the two Phillips PM2.0×3.0 screws **(2)** that secure the bracket, and then rotate the front of the bracket up and lift it off the computer **(4)**.
3. Remove the three Phillips PM2.0×2.0 broadhead screws **(5)** that secure the TouchPad button board to the computer.



4. Lift the foil and rubber gaskets from atop the left and right broadhead screw holes **(1)**.

5. Lift the bottom of the touchpad upward **(2)**, and then lift it off the computer **(3)**.



Reverse this procedure to install the TouchPad button board.

Display assembly

Description	Spare part number
Display assembly (11.6-in [29.5-cm], AG, SVA, LED TouchScreen) (includes webcam/microphone module)	755730-001

Before removing the display assembly, follow these steps:

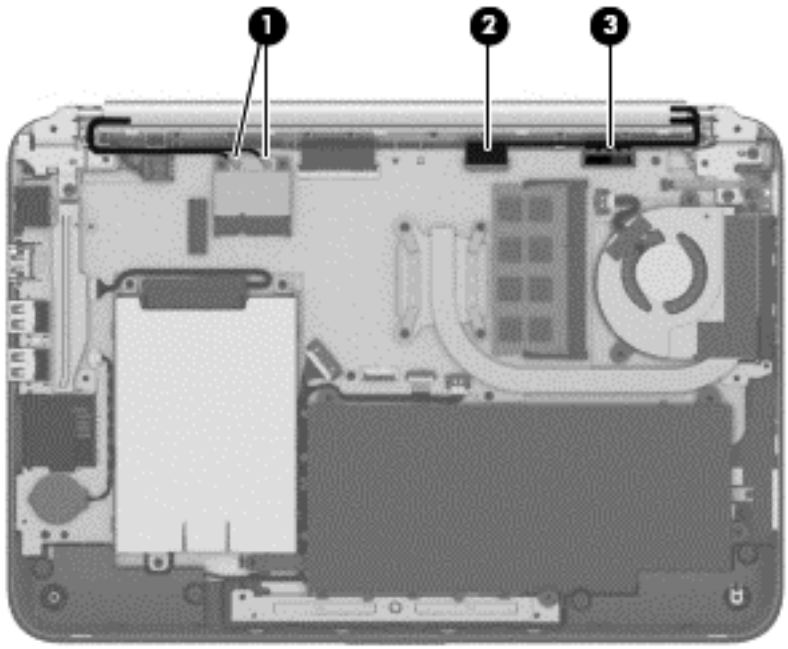
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 49).

To remove the display assembly:

1. Release the wireless antenna cables from the clips **(1)** built into the base enclosure.

NOTE: The number of antenna cables may vary.

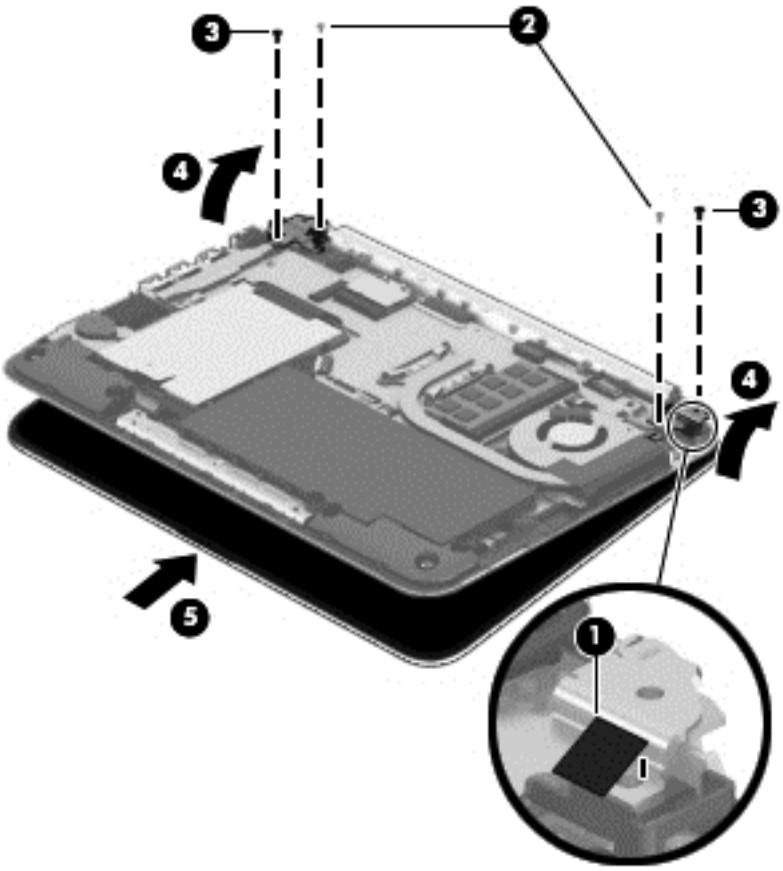
2. Disconnect the webcam cable **(2)** from the system board.
3. Disconnect the display panel cable **(3)** from the system board.



4. Lift the black foam piece that covers the right screw on the right hinge **(1)**.
5. Remove the two silver Phillips PM2.5×4.0 screws **(2)** and the two black Phillips PM2.5×5.0 screws **(3)** that secure the display assembly and bracket to the computer.

⚠ **CAUTION:** Support the display assembly when removing the screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

6. Lift the computer to force the hinges to rotate upward to an angle **(4)**.
7. Separate the display assembly from the computer **(5)**.



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

1. To remove the display enclosure:

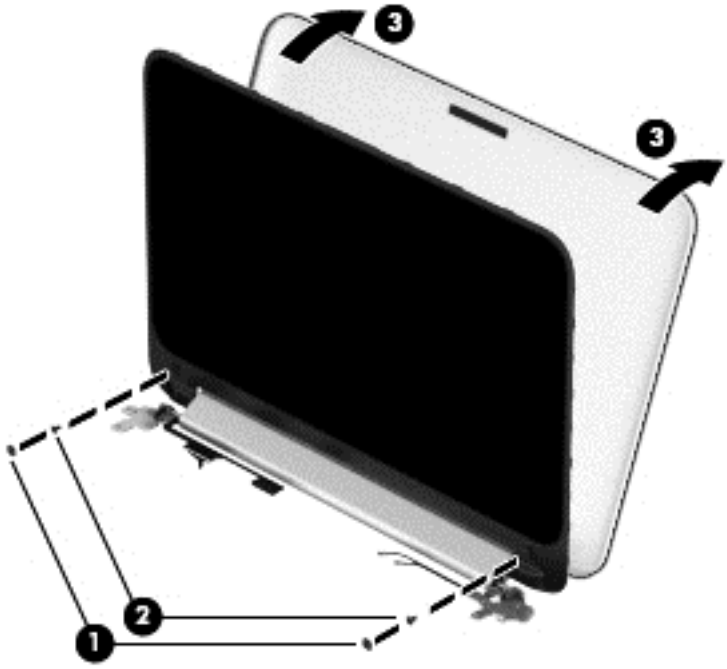
NOTE: The display enclosure is available using the following spare part numbers:

758846-001 for use in red models

758845-001 for use in silver models

   a. Remove the two screw covers **(1)**.
   b. Remove the two Phillips PM2.5×4.0 screws **(2)** that secure the enclosure to the display.

c. Pry from the side to separate the enclosure from the display **(3)**.

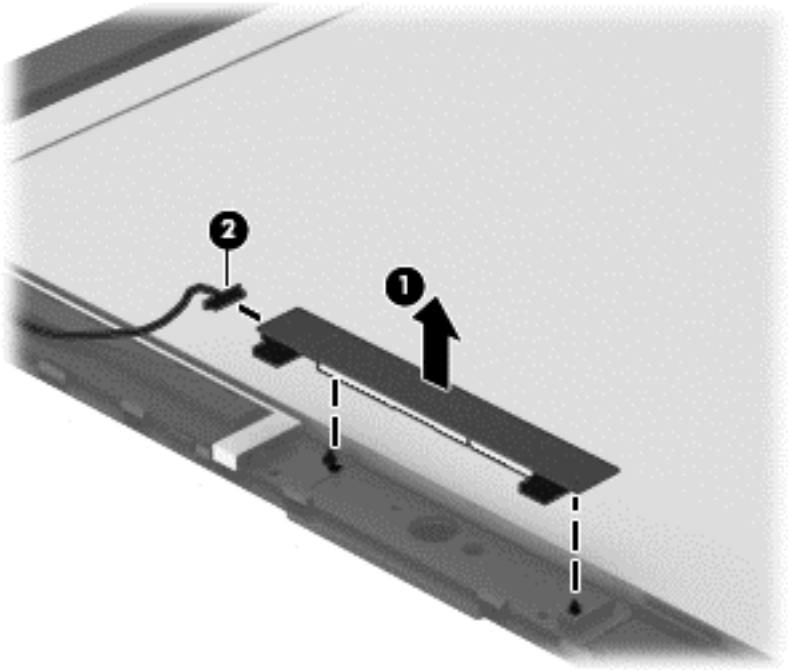


2. To remove the webcam module:

NOTE: The webcam is available using spare part number 758848-001.

a. Lift the webcam module **(1)** enough to gain access to the cable.

b. Disconnect the cable **(2)** from the module.



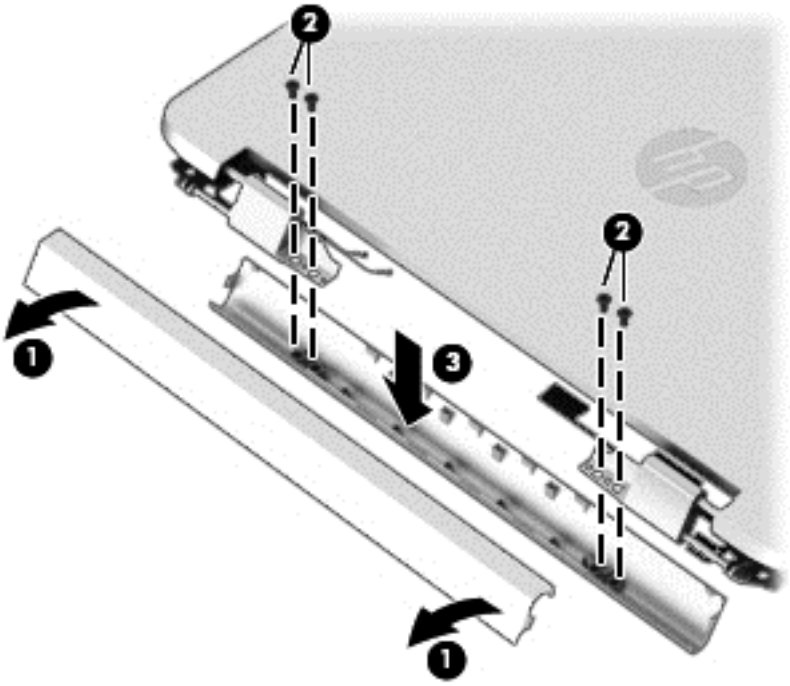
3. To remove the display hinge covers:

NOTE: The display hinge covers are available using spare part number 758847-001 for red models, 759503-001 for silver models.

a. Separate the top hinge cover by prying and rotating it off **(1)**.

b. Remove the four Phillips PM2.5×5.0 screws **(2)** that secure the bottom hinge cover to the display.

c. Remove the bottom display hinge cover from the display **(3)**.



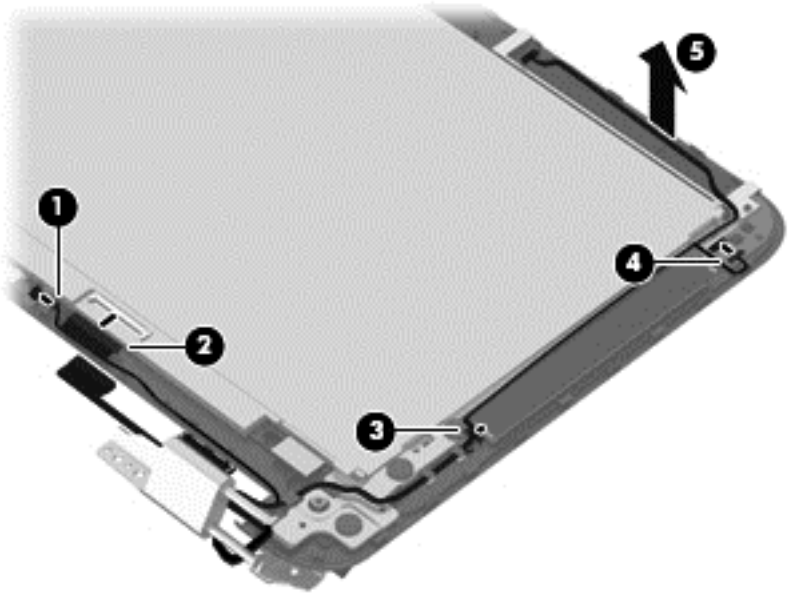
4. To remove the display cable:

NOTE: The display cable is available using spare part number 761350-001.

a. Disconnect the end of the display cable from the small connector at the bottom of the display panel **(1)**.

b. Disconnect the display cable from the large connector on the bottom of the display panel **(2)**.

c. Remove the cable from the tape **(3)** and clips **(4)** that secure it to the display enclosure , and then lift the display cable from the display enclosure **(5)**.



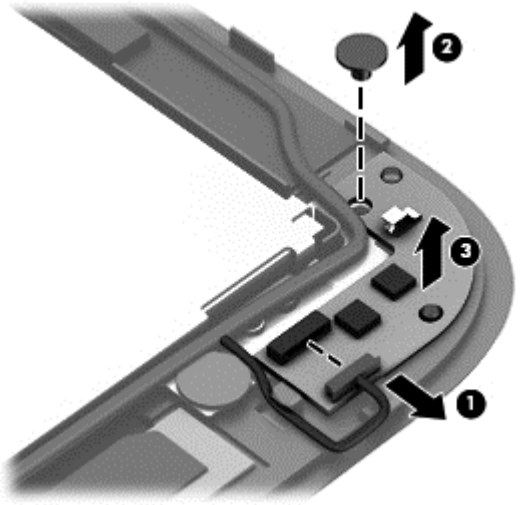
5. To remove the sensor board:

NOTE: The sensor board is available using spare part number 788218-001.

a. Disconnect the cable from the board **(1)**.

b. Remove the Phillips PM2.0×3.0 screw that secures the board to the display enclosure **(2)**.

c. Remove the sensor board from the display **(3)**.



Reverse this procedure to reassemble and install the display assembly.

Power connector cable

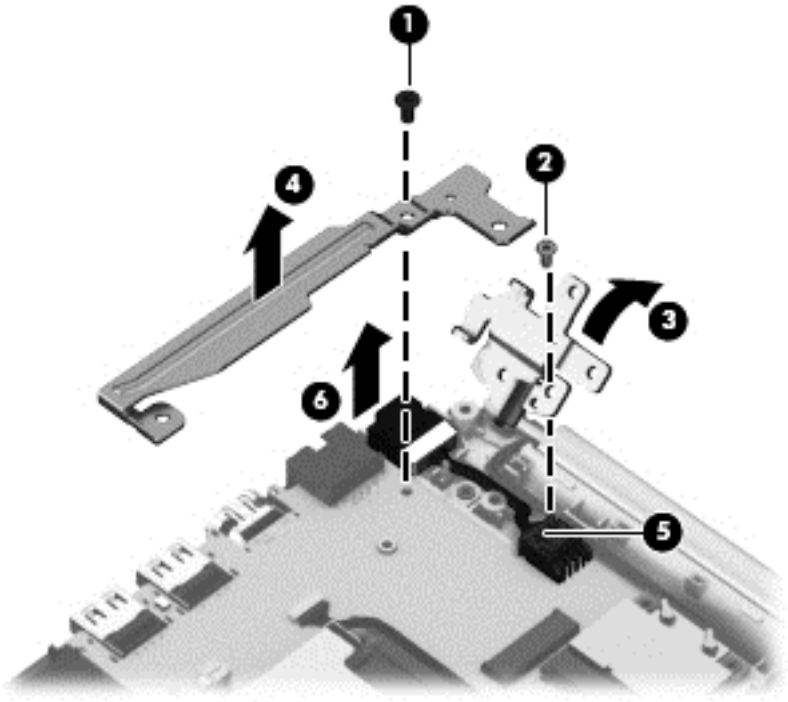
Description	Spare part number
Power connector cable	755727-001

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 bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 49).

Remove the power connector cable:

1. Remove the black Phillips PM2.5×6.0 screw **(1)** that secures the bracket to the computer and the silver Phillips PM3.0×5.0 screw **(2)** that secures the right display hinge.
2. Open the display assembly right hinge **(3)** as far as it will open.
3. Remove the bracket from the computer **(4)**.
4. Disconnect the power connector cable **(5)** from the system board.
5. Remove the power connector **(6)** from the computer.



6. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

System board

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

Description	Spare part number
System board for use in models equipped with:	
Intel Pentium N3540 processor and the Windows 8.1 Professional operating system on models with a 3 cell battery	794721-601
Intel Pentium N3540 processor and the Windows 8.1 Standard operating system on models with a 3 cell battery	794721-501
Intel Pentium N3540 processor and a non-Windows 8.1 operating system on models with a 3 cell battery	794721-001
Intel Pentium N3540 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	793104-601
Intel Pentium N3540 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	793104-501
Intel Pentium N3540 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	793104-001
Intel Pentium N3530 processor and the Windows 8.1 Professional operating system on models with a 3 cell battery	793103-601
Intel Pentium N3530 processor and the Windows 8.1 Standard operating system on models with a 3 cell battery	793103-501
Intel Pentium N3530 processor and a non-Windows 8.1 operating system on models with a 3 cell battery	793103-001
Intel Pentium N3530 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	774996-601
Intel Pentium N3530 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	774996-501
Intel Pentium N3530 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	774996-001
Intel Pentium N2840 processor and the Windows 8.1 Professional operating system on models with a 3 cell battery	794722-601
Intel Pentium N2840 processor and the Windows 8.1 Standard operating system on models with a 3 cell battery	794722-501
Intel Pentium N2840 processor and a non-Windows 8.1 operating system on models with a 3 cell battery	794722-001
Intel Pentium N2840 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	793105-601
Intel Pentium N2840 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	793105-501
Intel Pentium N2840 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	793105-001
Intel Pentium N2830 processor and the Windows 8.1 Professional operating system on models with a 2 cell battery	774997-601
Intel Pentium N2830 processor and the Windows 8.1 Standard operating system on models with a 2 cell battery	774997-501
Intel Pentium N2830 processor and a non-Windows 8.1 operating system on models with a 2 cell battery	774997-001

Before removing the system board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 49).

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

- WLAN module (see WLAN module on page 32)
- Memory module (see Memory module on page 41)
- Solid-state drive (see Solid-state drive (M.2) on page 34)
- Heat sink (see Heat sink on page 46)
- Fan (see Fan on page 45)

Remove the system board:

1. Disconnect the following cables from the system board:

   (1): Power connector cable

   (2): Wireless antennas (may include one or two antennas)

   (3): Keyboard cable

   (4): Webcam cable

   (5): Display cable

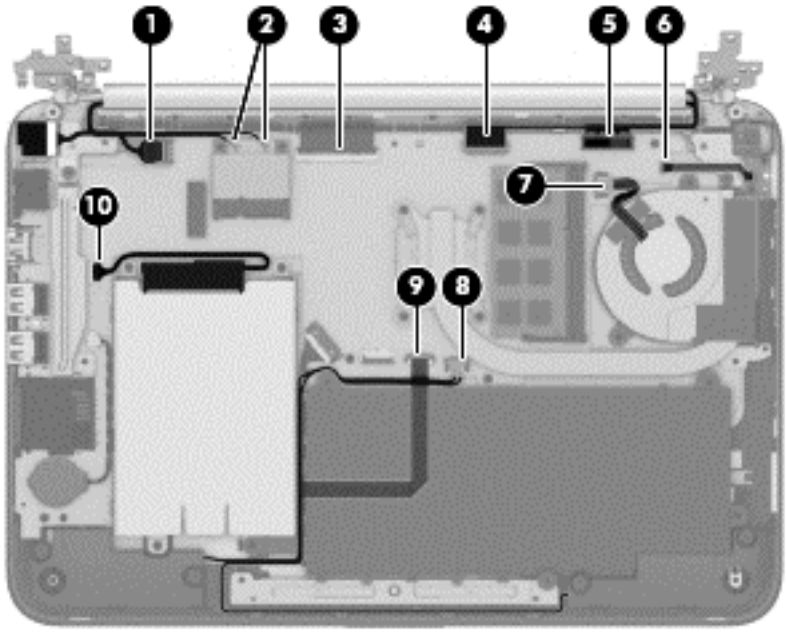
   (6): Power button board cable

   (7): Fan cable

   (8): Speaker cable

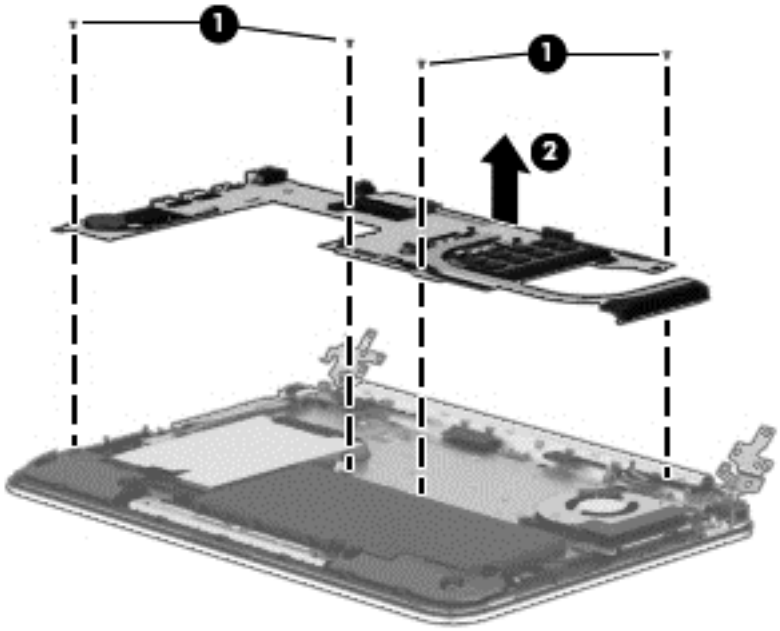
   (9): Touchpad board cable

   (10): Hard drive cable



2. Remove the four Phillips PM2.0×3.0 screws **(1)** that secure the system board to the computer.

3. Remove the system board **(2)** from the computer.



Reverse this procedure to install the system board.

Keyboard

Description	Spare part number
Keyboard for use in Brazil (includes cable)	755896-201
Keyboard for use in Canada (includes cable)	755896-DB1
Keyboard for use in Japan (includes cable)	755896-291
Keyboard for use in Latin America (includes cable)	755896-161
Keyboard for use in the United States (includes cable)	755896-001
Keyboard for use in Russia (includes cable)	785454-251

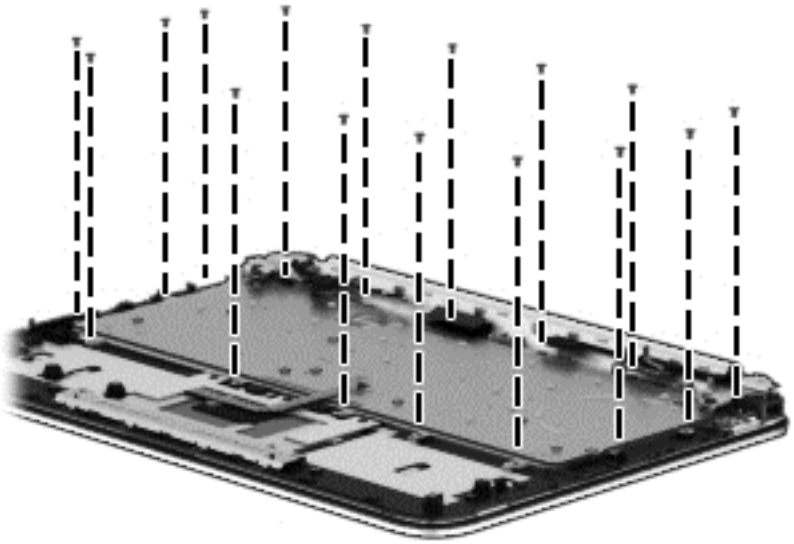
NOTE: For a detailed list of available keyboards, see Sequential part number listing on page 19.

Before removing the keyboard, follow these steps:

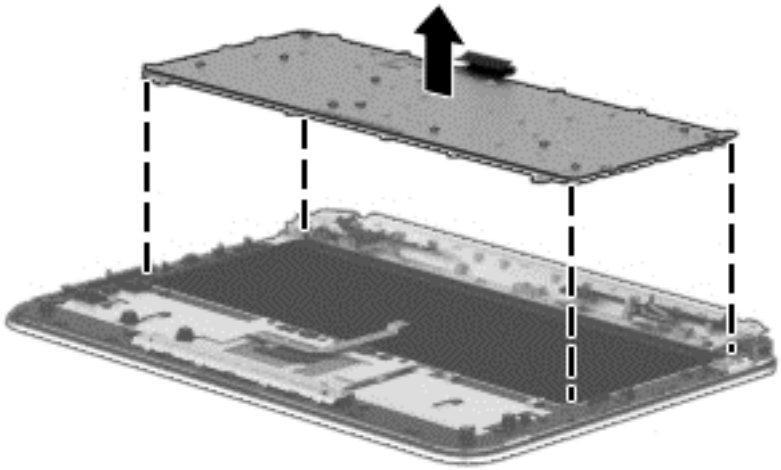
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Remove the hard drive (see Hard drive on page 36).
6. Remove the fan (see Fan on page 45).
7. Remove the heat sink (see Heat sink on page 46).
8. Remove the battery (see Battery on page 49).
9. Remove the system board (see System board on page 59).

Remove the keyboard:

1. Remove the 16 Phillips PM2.0×3.0 screws that secure the keyboard to the top cover.



2. Remove the keyboard from the top cover.



Top covers are available using spare part number 790943-001 for red models and 781865-001 for silver models.

Reverse this procedure to install the keyboard.

6 Using Setup Utility (BIOS)

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

Starting Setup Utility (BIOS)

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

NOTE: If your tablet has a keyboard base, connect the tablet to the keyboard base before beginning the steps in this chapter.

- Computers or tablets with keyboards:

  ▲ Turn on or restart the computer, quickly press esc, and then press f10.

- Tablets without keyboards:

  1. Turn on or restart the tablet, and then quickly hold down the volume down button.

     - or -

     Turn on or restart the tablet, and then quickly hold down the Windows button.

  2. Tap **f10**.

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 the one currently installed on the computer, you need to know the version of the system BIOS that is installed.

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

1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 64).
2. Select **Main**, and then make note of your BIOS version.
3. Select **Exit**, select **Exit Discarding Changes**, and then follow the on-screen instructions.

Downloading a BIOS update

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

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
- Do not shut down the computer or initiate Sleep.
- Do not insert, remove, connect, or disconnect any device, cable, or cord.

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

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

   – or –

   From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

2. Click **Updates and tune-ups**, and then click **Check for HP updates now**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:

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

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

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

   – or –

   From the Windows desktop, right-click the **Start** button, and then select **File Explorer**.

2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder on 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.

Synchronizing a tablet and keyboard (select models only)

When you attach a tablet to the keyboard and restart the computer, the BIOS checks to see if the Embedded Controller firmware on the keyboard needs to be synchronized. If so, BIOS will start the synchronization. If the synchronization is interrupted, a notification screen displays for 10 seconds before the tablet restarts and attempts to synchronize again.

NOTE: The Embedded Controller firmware will synchronize ONLY if the tablet or keyboard battery is more than 50% charged, or if your tablet is connected to AC power.

7 Using HP PC Hardware Diagnostics (UEFI)

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

To start HP PC Hardware Diagnostics (UEFI):

1. Start Setup Utility:
   - Computers or tablets with keyboards:
     - ▲ Turn on or restart the computer, quickly press esc.
2. Press or tap f2.

   The BIOS searches 3 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 67.

   b. Hard drive

   c. BIOS
3. When the diagnostic tool opens, use the keyboard arrow keys to select the type of diagnostic test you want to run, and then follow the on-screen instructions.

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

NOTE: To start the Setup Utility, your computer must be in notebook mode and you must use the keyboard attached to your notebook. The on-screen keyboard which displays in tablet mode cannot access the Setup Utility.

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 pages—Provide 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 Backing up, restoring, and recovering

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

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

For additional information, refer to the HP Support Assistant.

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

- or -

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

IMPORTANT: If you will be using F11 startup recovery or USB media recovery to recover your system, the tablet battery must have at least 70% battery power remaining before starting the recovery process.

Creating recovery media and backups

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

- Use HP Recovery Manager after you successfully set up the computer to 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. For information on creating recovery media, see Creating HP Recovery media (select models only) on page 69. For information on the recovery options that are available using the recovery media, see Recovering using HP Recovery Manager on page 71.
- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Using Windows tools on page 70.

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

Creating HP Recovery media (select models only)

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

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

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, 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 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 with a detachable keyboard, connect the keyboard 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 71.

Using Windows tools

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

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

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

– or –

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

For more information and steps, see Help and Support.

Restore and recovery

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

IMPORTANT: Not all methods are available on all models.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see Help and Support.

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

  - or -

  From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

- 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.

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

  For more information, see Recovering using HP Recovery Manager on page 71.

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 71. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 69.

- On select models, if you want to recover the computer's original factory partition and content , or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 71.

- On select models, if you want to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

  For more information, see Removing the HP Recovery partition (select models only) on page 73.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from support, or by using the HP Recovery partition (select models only). If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 69.

What you need to know before you get started

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

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

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 69.

- To use the Factory Reset option (select models only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select models only) on page 69.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

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

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

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

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

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

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

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

   - or-

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

Using HP Recovery media to recover

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

1. If possible, back up all personal files.
2. Insert the HP Recovery media, and then restart the computer.

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 73.

3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

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

1. Insert the HP Recovery media.
2. Start Computer Setup:

   For computers or tablets with keyboards attached:

   ▲ Turn on or restart the computer or tablet, quickly press esc, and then press f9 for boot options.

   For computers or tablets without keyboards attached:

   ▲ Turn on or restart the computer, quickly press the volume down button, and then tap **f9** for boot options.

   - or -

   Turn on or restart the computer, quickly press the Windows button, and then tap **f9** for boot options.

3. Select the optical drive or USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

Removing the HP Recovery partition (select models only)

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

IMPORTANT: After you remove the HP Recovery partition, you can no longer use the Windows Refresh option or the Windows option to remove everything and reinstall Windows. In addition, you will not be able to perform System Recovery or Minimized Image Recovery from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Creating HP Recovery media (select models only) on page 69.

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.

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**308 mm**	12.13 in
Depth	**215.1 mm**	8.47 in
Height	**21.9 mm**	0.86 in
Weight	**1.4 kg**	3.08 lbs
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W	
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

Hard drive specifications

	750-GB, 5400-rpm*	500-GB, 5400-rpm*	320-GB, 5400-rpm*
Dimensions			
Height	7.0 mm	7.0 mm	7.0 mm
Length	100.4 mm	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm
Weight	110 g	110 g	110 g
Interface type	SATA	SATA	SATA
Transfer rate (synchronous, maximum)	1.2 GB/sec	1.1 GB/sec	1.1 GB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.1 ms	1.5 ms	1.5 ms
Average (read/write)	11 ms	11/13 ms	11/13 ms
Maximum	18 ms	22 ms	22 ms
Logical blocks	1,285,971	976,773,168	628,142,448
Disk rotational speed	5400 rpm	5400 rpm	5400 rpm
Operating temperature	0°C to 60°C (32°F to 140°F)	0°C to 60°C (32°F to 140°F)	0°C to 60°C (32°F to 140°F)
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.			

10 Statement of memory volatility

The purpose of this chapter is to provide general information regarding nonvolatile memory in HP Business PCs. This chapter also provides general instructions for restoring nonvolatile memory that can contain personal data after the system has been powered off and the hard drive has been removed.

HP Business PC products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP, assuming that no subsequent modifications have been made to the system and assuming that no applications, features, or functionality have been added to or installed on the system.

Following system shutdown and removal of all power sources from an HP Business PC system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. Use the steps below to remove personal data from the PC, including the nonvolatile memory found in Intel-based and AMD-based system boards.

1. Follow steps (a) through (j) below to restore the nonvolatile memory that can contain personal data. Restoring or reprogramming nonvolatile memory that does not store personal data is neither necessary nor recommended.

   a. 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.

   NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

   b. Select **Main**, select **Restore Defaults**, and then select **Yes** to load defaults.

   c. Select the **Security** menu, select **Restore Security Level Defaults**, and then select **Yes** to restore security level defaults.

   d. If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select **Asset Tracking Number**. Clear the tag, and then make the selection to return to the prior menu.

   e. If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Tools** under the **Utilities** menu. Select **Hard Drive Tools**, select **DriveLock**, then uncheck the checkbox for **DriveLock password on restart**. Select **OK** to proceed.

   f. If an Automatic DriveLock password is set, select the **Security** menu, scroll down to **Hard Drive Tools** under the **Utilities** menu. Select **Hard Drive Tools**, scroll down to **Automatic DriveLock**, then select the desired hard drive and disable protection. At the automatic drive lock warning screen, select **Yes** to continue. Repeat this procedure if more than one hard drive has an Automatic DriveLock password.

   g. Select the **Main** menu, and then select **Reset BIOS Security to factory default**. Click **Yes** at the warning message.

   h. Select the **Main** menu, select **Save Changes and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.

i. Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint reader, one or two prompts will appear—one to clear the TPM and the other to Reset Fingerprint Sensor; press or tap F1 to accept or F2 to reject.

j. Remove all power and system batteries for at least 24 hours.

2. Complete one of the following:

- Remove and retain the storage drive.

– or –

- Clear the drive contents by using a third party utility designed to erase data from an SSD.

– or –

- Clear the contents of the drive by using the following BIOS Setup Secure Erase command option steps:

IMPORTANT: If you clear data using Secure Erase, it cannot be recovered.

a. 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.

b. Select the **Security** menu and scroll down to the **Utilities** menu.

c. Select **Hard Drive Tools**.

d. Under **Utilities**, select **Secure Erase**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

– or –

- Clear the contents of the drive by using the following Disk Sanitizer command steps:

IMPORTANT: If you clear data using Disk Sanitizer, it cannot be recovered.

NOTE: The amount of time it takes for Disk Sanitizer to run can take several hours. Plug the computer into an AC outlet before starting.

a. 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.

b. Select the **Security** menu and scroll down to the **Utilities** menu.

c. Select **Hard Drive Tools**.

d. Under **Utilities**, select **Disk Sanitizer**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

Nonvolatile memory usage

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	2 MBytes	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical PC configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select models only) on page 81.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 Bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using the Computer Setup (BIOS), or changing the Microsoft Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KBytes (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility is required to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a PC. The specific write-protection method varies by memory vendor.
System BIOS	4 MBytes to 5 MBytes	Yes	Yes	Stores system BIOS code and PC configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are input using the Computer Setup (BIOS) or a custom utility.	**NOTE:** Writing data to this ROM in an inappropriate manner can render the PC non-functional. A utility is required for writing data to this memory and is available on the HP website; go to http://www.hp.com/support, and select your country. Select **Drivers &**

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
						Downloads, and then follow the on-screen instructions.
Intel Management Engine Firmware (present in only specific ZBook and EliteBook models. For more information, go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then follow the on-screen instructions.)	1.5 MBytes or 5 MBytes	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	The Intel chipset is configured to enforce hardware protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash	2 Mbit	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility is required for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 Kbit to 8 Kbit	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Web camera	64 Kbit	No	Yes	Stores webcam configuration and firmware.	Webcam memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader	512 KByte flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

1. **How can the BIOS settings be restored (returned to factory settings)?**

   IMPORTANT: Restore defaults does not securely erase any data on your hard drive. See question and answer 6 for steps to securely erase data.

   Restore defaults does not reset the Custom Secure Boot keys. See question and answer 7 for information about resetting the keys.

   a. 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.

   b. Select **Main**, and then select **Restore defaults**.

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

2. **What is a UEFI BIOS, and how is it different from a legacy BIOS?**

   The Unified Extensible Firmware Interface (UEFI) BIOS is an industry-standard software interface between the platform firmware and an operating system (OS). It is a replacement for the older BIOS architecture, but supports much of the legacy BIOS functionality.

   Like the legacy BIOS, the UEFI BIOS provides an interface to display the system information and configuration settings and to change the configuration of your computer before an OS is loaded. BIOS provides a secure run-time environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (Touchscreen, TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make menu and configuration selections. The UEFI BIOS also contains basic system diagnostics.

   The UEFI BIOS provides functionality beyond that of the legacy BIOS. In addition, the UEFI BIOS works to initialize the computer's hardware before loading and executing the OS; the run-time environment allows the loading and execution of software programs from storage devices to provide more functionality, such as advanced hardware diagnostics (with the ability to display more detailed system information) and advanced firmware management and recovery software.

   HP has provided options in Computer Setup (BIOS) to allow you to run in legacy BIOS, if required by the operating system. Examples of this requirement would be if you upgrade or downgrade the OS.

3. **Where does the UEFI BIOS reside?**

   The UEFI BIOS resides on a flash memory chip. A utility is required to write to the chip.

4. **What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory module? How would this data be written?**

   The DIMM SPD memory contains information about the memory module, such as size, serial number, data width, speed/timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. This EEPROM cannot be written to when the memory module is installed in a PC. Third-party tools do exist that can write to the EEPROM when the memory module is not installed in a PC. Various third-party tools are available to read SPD memory.

5. **What is meant by "Restore the nonvolatile memory found in Intel-based system boards"?**

   This message relates to clearing the Real Time Clock (RTC) CMOS memory that contains PC configuration data.

6. **How can the BIOS security be reset to factory defaults and data erased?**

IMPORTANT: Resetting will result in the loss of information.

These steps will not reset Custom Secure Boot Keys. See question and answer 7 for information about resetting the keys.

a. 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.

b. Select **Main**, and then select **Reset BIOS Security to Factory Default**.

c. Follow the on-screen instructions.

d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

7. **How can the Custom Secure Boot Keys be reset?**

Secure Boot is a feature to ensure that only authenticated code can start on a platform. If you enabled Secure Boot and created Custom Secure Boot Keys, simply disabling Secure Boot will not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure you used to create the Custom Secure Boot Keys, but make the selection to clear or delete all Secure Boot Keys.

a. 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.

b. Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.

c. At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select models only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors your computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start restores the BIOS to its previously safe state, without user intervention. Those select computer models ship with HP Sure Start configured and enabled. HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then follow the on-screen instructions.

11 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer. Requirements for all countries 113

Requirements for specific countries and regions

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

Country/region	Accredited agency	Applicable note number
South Korea	EK	4
Sweden	CEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

12 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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