



HP Pavilion¹⁰ TouchSmart Notebook PC

Maintenance and Service Guide

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Product notice

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

Important Notice about Customer Self-Repair Parts

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

Safety warning notice

 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer 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 computer and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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1 Product description

Category	Description
Product Name	HP Pavilion ¹⁰ TouchSmart Notebook PC
Processors	Dual-Core Processor (1.0 GHz), 1 MB L2, Dual 3.9W
Chipset	AMD® Integrated SoC FCH
Graphics	AMD Radeon™ HD 8180 Supports HD Decode, DX11, and HDMI
Panel	16:9 Ultra Wide Aspect Ratio 25.6-cm (10.1-inch) HD, LED, antiglare SVA flat1366x768, 220 nits, 3.6 mm Touchscreen, Multitouch enabled Display assemblies include 1 WLAN antennas
Memory	Supports up to 2 GB max on-board system memory DDR3L-1066 MHz @ 1.35V Single Channel Support (DDR3L-1600 MHz downgrade to DDR3L-1066MHz) Non- accessible / non-upgradeable 2048 MB (256MX16 x4pcs)
Hard drives	Supports 7-mm, 2.5-in SATA hard drive Supports the following drives: <ul style="list-style-type: none">• 500-GB, 5400-rpm
Fixed optical drives	No internal optical drive support
Audio/Visual	HP TrueVision HD: HD camera Fixed (no tilt) + activity LED, 1PC, USB 2.0, M-JPEG 1280x720 by 30 frames per second Single digital microphone with software - echo cancellation, Fixed Integrated VGA camera (select models only) 640x480 by 30 frames per second Single microphone Stereo speakers (2) Headphone and microphone jacks HD audio with DTS Sound+
Ethernet	Integrated 10/100 NIC Ethernet cable not included
Wireless	Integrated WLAN options by way of wireless module:

Category	Description
	One WLAN antenna built into display assembly
	Supports the following WLAN formats: <ul style="list-style-type: none"> • Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter • Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter
External media card	Media Reader Slot Support SD/SDHC/SDXC Push-Push insertion/removal
Ports	Audio-in/Audio-out (mic-in/stereo headphone) RJ-45 (Ethernet, includes link and activity lights) USB 3.0 (1) USB 2.0 (2) HDMI 1.4 supporting: up to 1920x1080 @ 60 Hz Smart-pin AC port
Keyboard/pointing devices	91% Keyboard size textured island-style Keyboard No numerical Keypad Touchpad includes: <ul style="list-style-type: none"> • Clickpad with image sensor • Multitouch gestures enabled • Support Win8 Modern Trackpad Gestures • Taps enabled as default
Power requirements	65W Smart nPFC 4.5mm connector with localized cable plug support (3-wire plug with ground pin) 45w Smart nPFC 3 pin RC 4.5 mm connector - non slim with 26.5mm z-height with localized cable plug support (3-wire plug with ground pin) 3-cell, 28-Wh, 2.55Ah, Li-ion battery (HP Fast Charge technology)
Security	Security lock
Operating system	Preinstalled: Windows 8.1 small screen touch with Office Home and Student 2013
Restore Media	Restore Media (DRDVD/SRDVD): SSRU (System Recovery USB)
Serviceability	End-user replaceable parts: AC adapter Battery (system)

2 External component identification

Finding your hardware and software information

Locating hardware

To find out what hardware is installed on your computer:

1. From the Start screen, type `control panel`, and then select **Control Panel**.
2. Select **System and Security**, select **System**, and then click **Device Manager** in the left column.

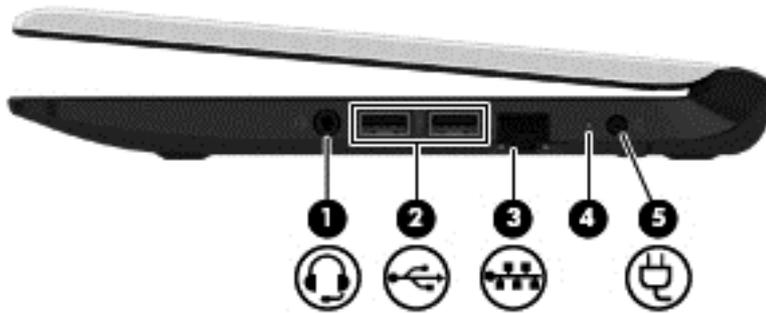
A list reveals all the devices installed on your computer.

Locating software

To find out what software is installed on your computer:

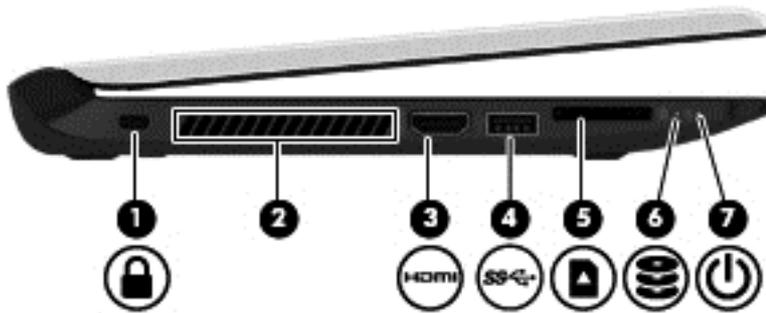
- ▲ From the Start screen, click the down arrow in the lower-left corner of the screen.

Right side



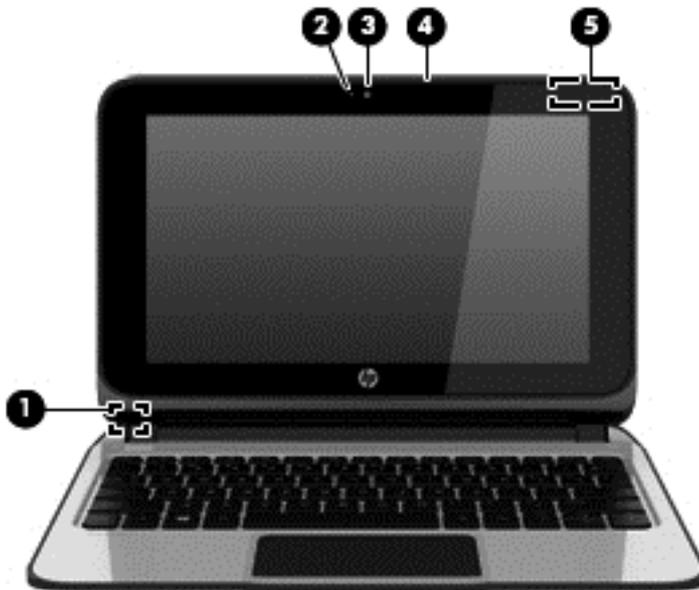
Component	Description
(1) 	<p>Audio-out (headphone)/Audio-in (microphone) jack</p> <p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional microphone-only devices.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i>. To access this guide, from the Start screen, type <code>support</code>, select it and then select the HP Support Assistant app.</p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>
(2) 	<p>USB 2.0 ports (2)</p> <p>Connect an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.</p>
(3) 	<p>RJ-45 (network) jack</p> <p>RJ-45 (network) status light</p> <p>Connects a network cable.</p> <p>White: The network is connected.</p> <p>Amber: Activity is occurring on the network.</p>
(4)	<p>AC adapter light</p> <ul style="list-style-type: none"> White: The AC adapter is connected and the battery is charged. Amber: The AC adapter is connected and the battery is charging Off: The computer is using battery power.
(5) 	<p>Power connector</p> <p>Connects an AC adapter.</p>

Left side



Component	Description
(1) 	<p>Security cable slot</p> <p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p>
(2)	<p>Vent (1)</p> <p>Enables airflow to cool internal components.</p>
(3) 	<p>HDMI port</p> <p>Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.</p>
(4) 	<p>USB 3.0 port</p> <p>Each USB 3.0 port connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.</p>
(5) 	<p>Memory card reader</p> <p>Reads optional memory cards that store, manage, share, or access information.</p> <p>To insert a card:</p> <p>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.</p> <p>To remove a card:</p> <p>Press in on the card it until it pops out.</p>
(6) 	<p>Hard drive light</p> <ul style="list-style-type: none"> Blinking white: The hard drive is being accessed.
(7) 	<p>Power light</p> <ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.

Display

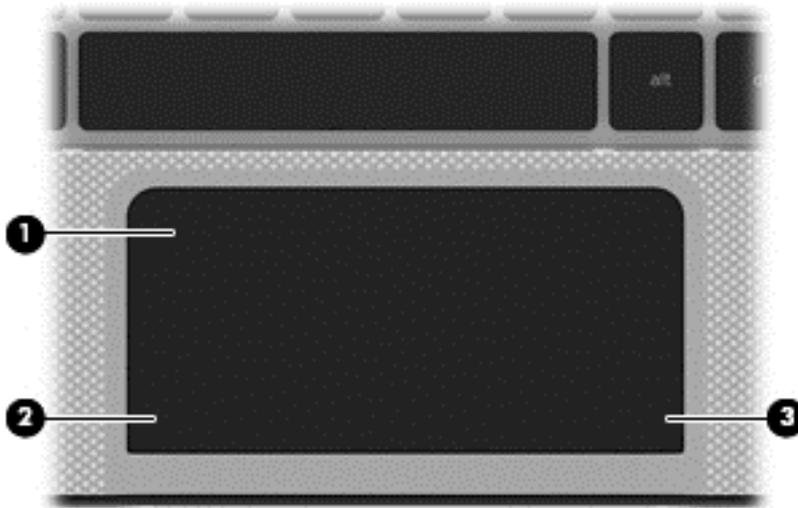


Component	Description
(1) Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on. NOTE: The internal display switch is not visible from the outside of the computer.
(2) Webcam light	On: The webcam is in use.
(3) Webcam	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video. To use the webcam, from the Start screen, type <i>camera</i> , and then select Camera from the list of applications.
(4) Internal microphone (1)	Records sound.
(5) WLAN antenna*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

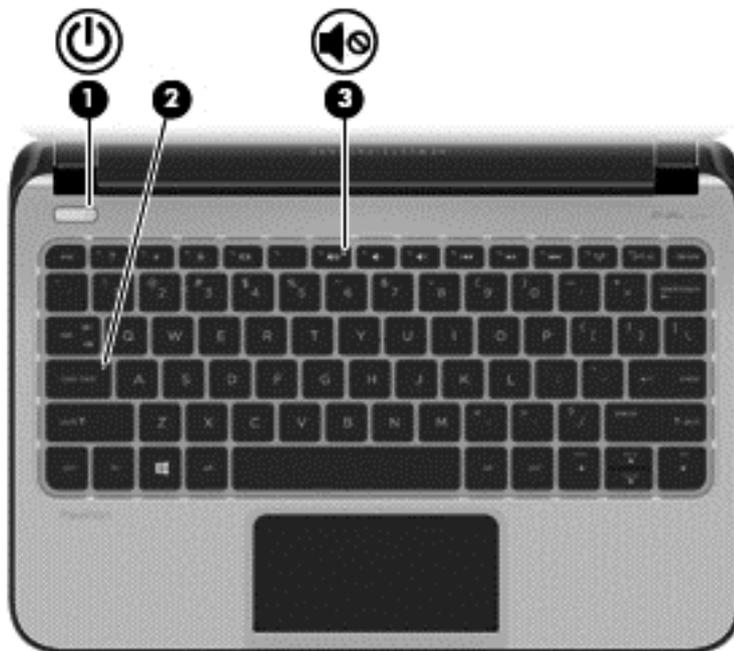
Top

TouchPad



Component	Description
(1) TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.
(2) Left TouchPad button	Functions like the left button on an external mouse.
(3) Right TouchPad button	Functions like the right button on an external mouse.

Lights



Component		Description
(1)	 Power light	<ul style="list-style-type: none"> • On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(3)	 Mute light	<ul style="list-style-type: none"> • Amber: Computer sound is off. • Off: Computer sound is on.

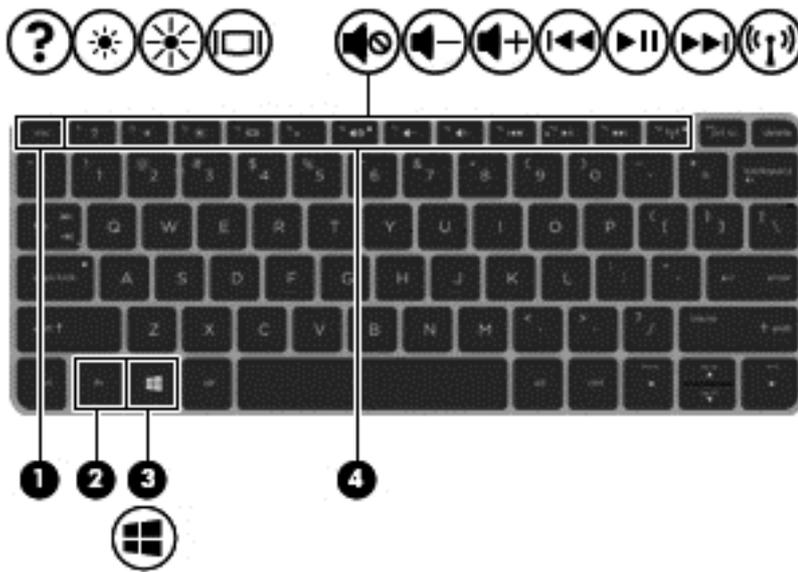
Buttons



Component		Description
(1)	 Power button	<ul style="list-style-type: none"> • When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding down the power button will result in the loss of unsaved information.</p>

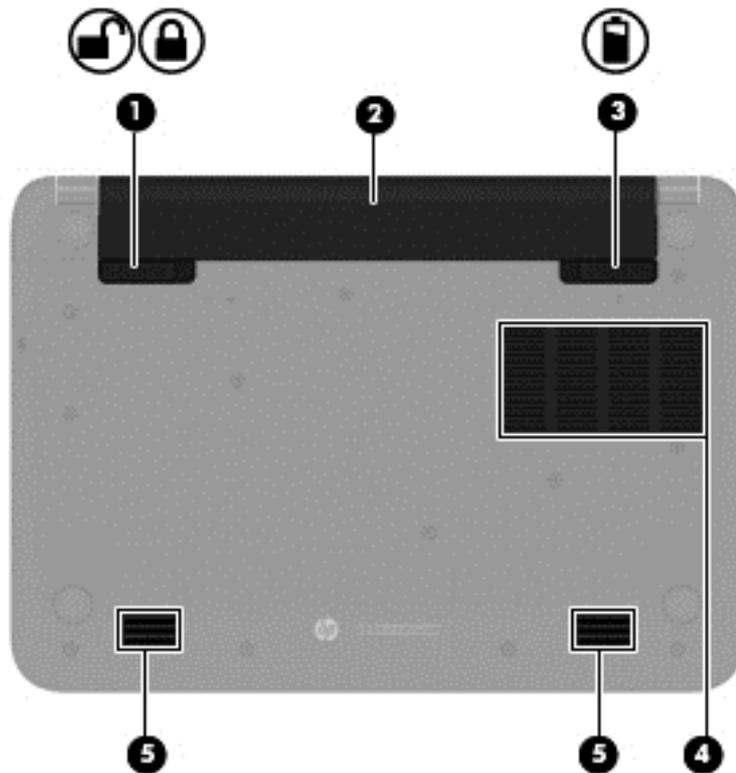
Component	Description
	<p data-bbox="892 218 1455 323">If the computer has stopped responding and Microsoft® Windows® shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p data-bbox="892 344 1455 449">To learn more about your power settings, see your power options. From the Start screen, type <code>power</code>, select Power and sleep settings, and then select Power and sleep from the list of applications.</p>

Keys



Component	Description
(1) esc key	Reveals system information when pressed in combination with the fn key.
(2) fn key	Executes frequently used system functions when pressed in combination with the spacebar , or the esc key.
(3)  Windows key	Returns you to the Start screen from an open app or the Windows desktop. NOTE: Pressing the Windows key again will return you to the previous screen.
(4) Action keys	Execute frequently used system functions. NOTE: The wireless button f12 turns the wireless devices on and off.

Bottom



Component	Description
(1) 	Battery lock latch Unlocks the battery.
(2)	Battery bay Holds the battery.
(3) 	Battery release latch Releases the battery.
(4)	Vents (4) Enable airflow to cool internal components.
(5)	Speakers (2) Produce sound.

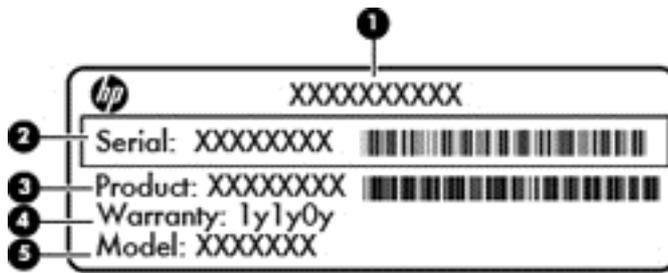
Labels

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

 **IMPORTANT:** All labels described in this section will be located in one of 3 places depending on your computer model: Affixed to the bottom of the computer, located in the battery bay, or under the service door.

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

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



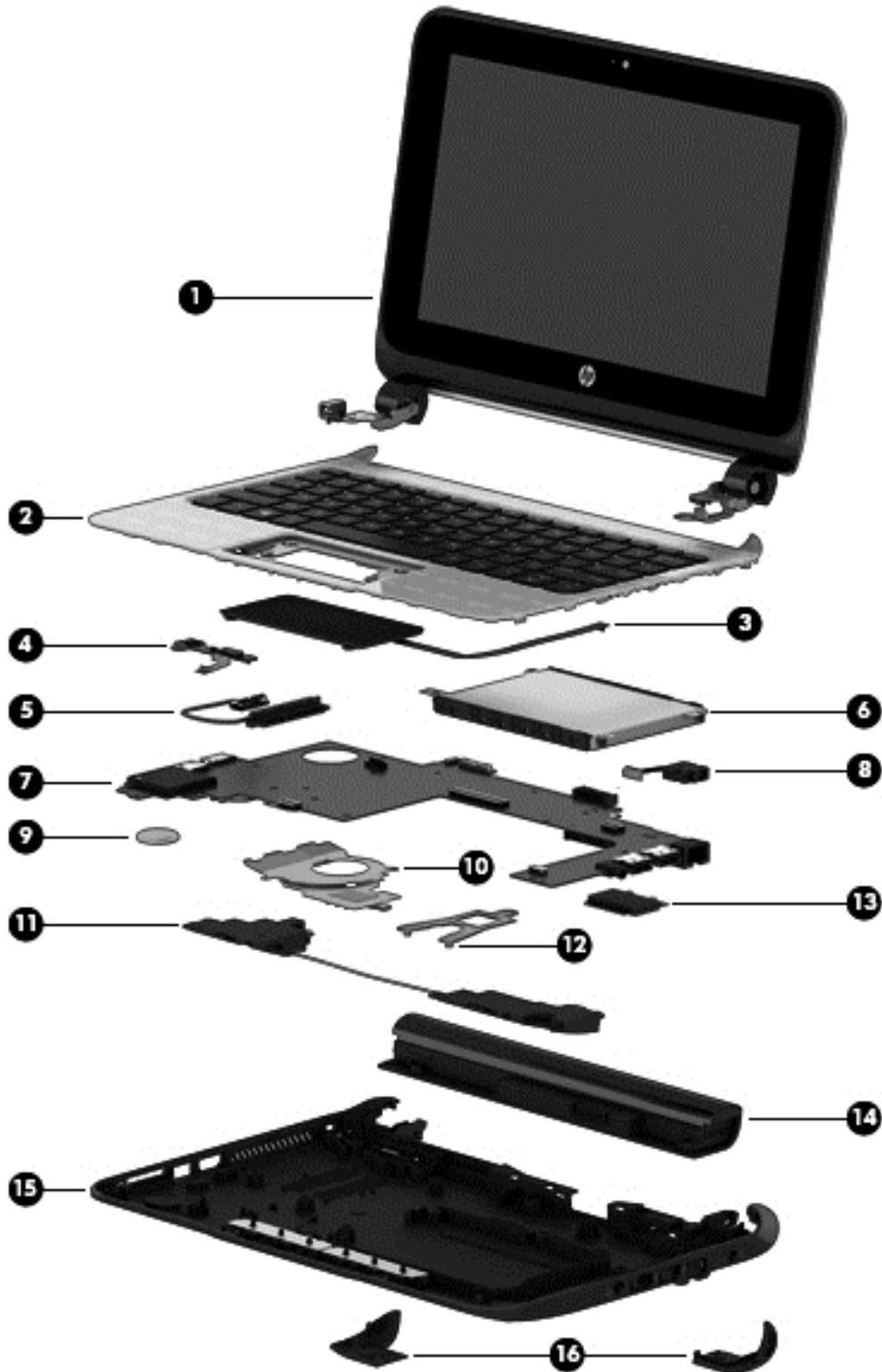
Component

-
- | | |
|-----|-----------------------------------|
| (1) | Product name |
| (2) | Serial number |
| (3) | Product number |
| (4) | Warranty period |
| (5) | Model number (select models only) |
-

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

3 Illustrated parts catalog

Computer major components



Item	Description	Spare part number
(1)	Display panel 25.6-cm (10.1-inch) HD, LED, antiglare SVA flat1366x768, 220 nits, 3.6 mm	
	Hinge up, 10.1 with HD LED Touchscreen with webcam in pearl white	742315-001
	Hinge up, 10.1 with HD LED Touchscreen with webcam in ano silver	745026-001
(2)	Top cover with TouchPad and Keyboard in ano silver (includes touchpad assembly)	741981-xx1
	Top cover with TouchPad and Keyboard in pearl white (includes touchpad assembly)	745421-xx1
	NOTE: For a detailed list of available top covers with keyboard, see Removing Top Covers	
(3)	TouchPad board in ano silver (includes cable).	741975-001
	TouchPad board in pearl white (includes cable).	750721-001
(4)	Power button board assembly	741973-001
(5)	Hard drive cable (included in hard drive hardware kit)	741972-001
(6)	Hard drive	
	500-GB, 5400-rpm	683802-005
(7)	System board (includes replacement thermal material)	
	UMA A4-1200 2GB Win 8.1 Small Screen Touch	741980-001
	UMA A4-1200 2GB Win 8.1 Small Screen Touch	741980-501
(8)	Power connector	741969-001
(9)	RTC battery	741976-001
(10)	Heat sink assembly (includes replacement thermal material)	741971-001
(11)	Speaker assembly	741979-001
(12)	Heat sink assembly support bracket (included with heat sink assembly)	
(13)	WLAN module	
	Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter	709848-005
	Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + BT 4.0 Combo Adapter	690020-005
(14)	Battery, Li-ion	
	3-cell (28 WHr, 2.55 Ah)	740722-001
(15)	Base enclosure	
	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in North America and Latin America	741968-001
	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Europe	752119-001
	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Asia Pacific	752120-001
	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Taiwan, Korea 45 W	752121-001
Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Taiwan, Korea 65 W	752129-001	

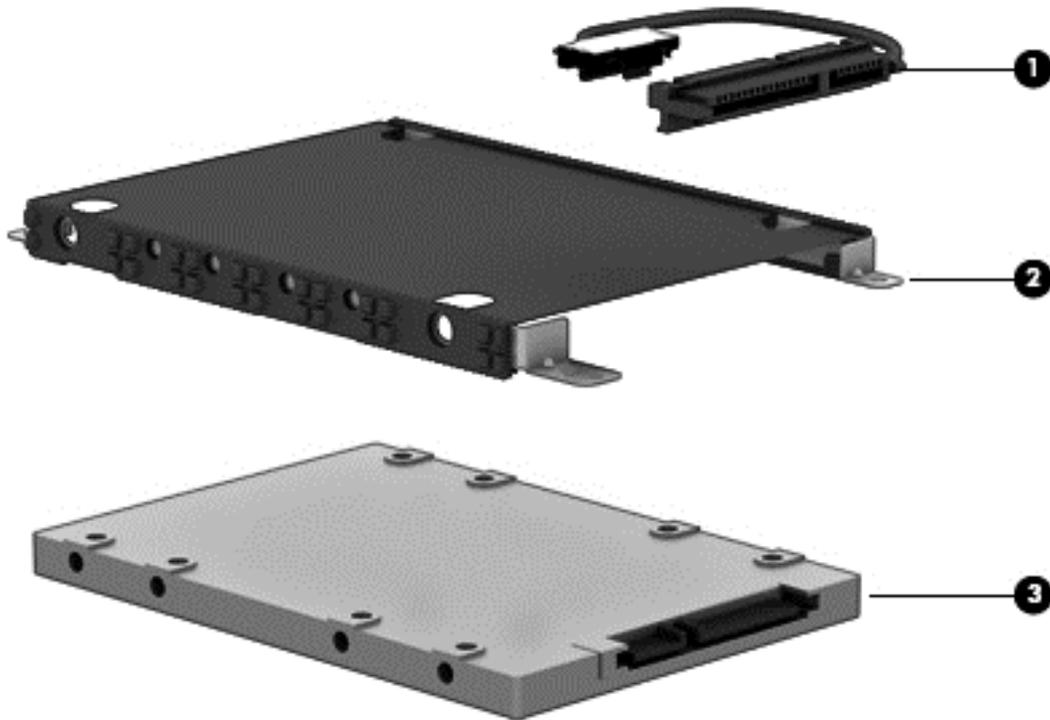
Item	Description	Spare part number
	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in North America, Latin America	752130-001
	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Europe	752131-001
	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Asia Pacific	752132-001
	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Taiwan, Korea 45 W	752133-001
	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Taiwan, Korea 65 W	752134-001
(16)	Corner caps (included in plastics kit)	745420-001

Display components



Description	Spare part number
Display panel 25.6-cm (10.1-inch) HD, LED, antiglare SVA flat1366x768, 220 nits, 3.6 mm	
For use in pearl white models	742315-001
For use in ano silver models	745026-001

Mass storage devices



Description	Spare part number
Hard Drive Hardware Kit (includes hard drive bracket, hard drive cable and screws; not illustrated)	741972-001
(1) Hard drive cable	
(2) Hard drive bracket	
(3) Hard drives	
500-GB, 5400-rpm	683802-005

Miscellaneous parts

Description	Spare part number
AC adapters	
65 W Smart nPFC 4.5 mm connector with localized cable plug support (3- wire plug with ground pin)	710412-001
65 W Smart nPFC 4.5 mm connector with localized cable plug support (3- wire plug with ground pin)	714657-001
45 W NPFC Smart RC 4.5 mm NSLIM	741727-001
Power cords: (3-pin, black, 1.83-m):	
For use in North America	490371-001
For use in Australia	490371-011
For use in Europe	490371-021
For use in the United Kingdom and Singapore	490371-031
Power cord for use in Italy	490371-061
Power cord for use in Thailand	490371-201
Power cord for use in Japan	490371-291
Power cord for use in People's Republic of China	490371-AA1
Power cord for use in Taiwan	490371-AB1
Power cord for use in South Korea	490371-AD1
Power cord for use in Argentina	490371-D01
Power cord for use in India	490371-D61
Rubber Kit (includes rubber base enclosure screw covers)	741977-001
Bottom caps (included in plastics kit)	745420-001
Screw Kit	741978-001

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
490371-001	A	Power cord for use in North America
490371-011	A	Power cord for use in Australia

Spare part number	CSR flag	Description
490371-021	A	Power cord for use in Europe
490371-031	A	Power cord for use in the United Kingdom
490371-061	A	Power cord for use in Italy
490371-201	A	Power cord for use in Thailand
490371-291	A	Power cord for use in Japan
490371-AA1	A	Power cord for use in People's Republic of China
490371-AB1	A	Power cord for use in Taiwan
490371-AD1	A	Power cord for use in South Korea
490371-D01	A	Power cord for use in Argentina
490371-D61	A	Power cord for use in India
683802-005	N	500 GB 5400 RPM SATA RAW 7mm
690020-005	N	WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter
709848-001	N	WLAN Realtek RTL8188EE 802.11bgn Wi-Fi Adapter
710412-001	N	65W Adapter nPFC SMART S-3P 4.5 mm
714657-001	A	65W Adapter nPFC SMART 4.5mm EM
740722-001	A	3 Cell 28 WHr 2.55 AH LI MR03028-CL
741727-001	A	45W Adapter NPFC SMART RC 4.5mm NSLIM
741968-001	N	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in North America and Latin America
741969-001	N	Power connector
741971-001	N	Heat sink assembly
741972-001	N	Hard drive hardware kit
741973-001	N	Power button board with cable
741975-001	N	TouchPad board in ano silver (includes cable)
741976-001	N	RTC battery
741977-001	N	Rubber Kit (includes rubber base enclosure screw covers)
741978-001	N	Screw kit
741979-001	N	Speaker kit
741980-001	N	Windows 8.1 small screen touch with Office Home and Student 2013
741980-501	N	Windows 8.1 small screen touch with Office Home and Student 2013 Standard
741981-001	N	Top cover with keyboard and TouchPad ano silver for use in the United States
741981-031	N	Top cover with keyboard and TouchPad ano silver for use in the United Kingdom
741981-051	N	Top cover with keyboard and TouchPad ano silver for use in France
741981-061	N	Top cover with keyboard and TouchPad ano silver for use in Italy

Spare part number	CSR flag	Description
741981-071	N	Top cover with keyboard and TouchPad ano silver for use in Spain
741981-141	N	Top cover with keyboard and TouchPad ano silver for use in Turkey
741981-161	N	Top cover with keyboard and TouchPad ano silver for use in Latin America
741981-171	N	Top cover with keyboard and TouchPad ano silver for use in Saudi Arabia
741981-211	N	Top cover with keyboard and TouchPad ano silver for use in Hungary
741981-251	N	Top cover with keyboard and TouchPad ano silver for use in Russia
741981-281	N	Top cover with keyboard and TouchPad ano silver for use in Thailand
741981-291	N	Top cover with keyboard and TouchPad ano silver for use in Japan
741981-AB1	N	Top cover with keyboard and TouchPad ano silver for use in Taiwan
741981-AD1	N	Top cover with keyboard and TouchPad ano silver for use in South Korea
741981-B31	N	Top cover with keyboard and TouchPad ano silver for use in Europe
741981-BA1	N	Top cover with keyboard and TouchPad ano silver for use in Adriatics
741981-DB1	N	Top cover with keyboard and TouchPad ano silver for use in English/French
741981-FL1	N	Top cover with keyboard and TouchPad ano silver for use in Czech/Slovic regions
742315-001	N	Hinge up, 10.1 with HD LED Touchscreen with webcam in pearl white
745026-001	N	Hinge up, 10.1 with HD LED Touchscreen with webcam in ano silver
745420-001	N	Plastics kit, bottom caps
745421-001	N	Top cover with keyboard and TouchPad pearl white for use in the United States
745421-031	N	Top cover with keyboard and TouchPad pearl white for use in the United Kingdom
745421-051	N	Top cover with keyboard and TouchPad pearl white for use in France
745421-061	N	Top cover with keyboard and TouchPad pearl white for use in Italy
745421-071	N	Top cover with keyboard and TouchPad pearl white for use in Spain
745421-141	N	Top cover with keyboard and TouchPad pearl white for use in Turkey
745421-161	N	Top cover with keyboard and TouchPad pearl white for use in Latin America
745421-171	N	Top cover with keyboard and TouchPad pearl white for use in Saudi Arabia
745421-211	N	Top cover with keyboard and TouchPad pearl white for use in Hungary
745421-251	N	Top cover with keyboard and TouchPad pearl white for use in Russia
745421-281	N	Top cover with keyboard and TouchPad pearl white for use in Thailand
745421-291	N	Top cover with keyboard and TouchPad pearl white for use in Japan
745421-AB1	N	Top cover with keyboard and TouchPad pearl white for use in Taiwan
745421-AD1	N	Top cover with keyboard and TouchPad pearl white for use in South Korea
745421-B31	N	Top cover with keyboard and TouchPad pearl white for use in Europe
745421-BA1	N	Top cover with keyboard and TouchPad pearl white for use in the Adriatics
745421-DB1	N	Top cover with keyboard and TouchPad pearl white for use in English/French

Spare part number	CSR flag	Description
745421-FL1	N	Top cover with keyboard and TouchPad pearl white for use in Czech/Slovic regions
745422-BA1	N	Top cover with keyboard and TouchPad ano silver for use in Adriatics
750721-001	N	TouchPad board pearl white with cable
752119-001	N	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Europe
752120-001	N	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Asia Pacific
752121-001	N	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Taiwan, Korea 45 W
752129-001	N	Base Enclosure for use with WLAN Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter in Taiwan, Korea 65 W
752130-001	N	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in North America, Latin America
752131-001	N	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Europe
752132-001	N	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Asia Pacific
752133-001	N	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Taiwan, Korea 45 W
752134-001	N	Base Enclosure for use with WLAN Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + Bluetooth 4.0 Combo Adapter in Taiwan, Korea 65 W

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screwdriver
- Phillips P0 and P1 screwdrivers

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

Avoid exposing a 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, and 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.

Use nonmagnetic tools.

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tapes
- 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 plastic	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

5 Removal and replacement procedures for Customer Self-Repair parts

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

Component replacement procedures

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

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

Battery

Description	Spare part number
3-cell, 27 WHr, 2.55 Ah Li-ion battery	740722-001

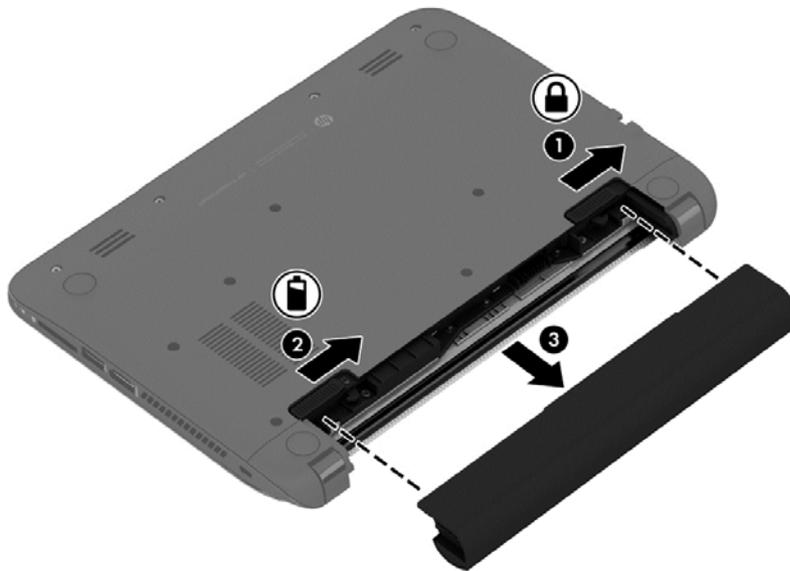
Before removing the battery, follow these steps:

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.

To remove the battery:

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

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



6 Removal and replacement procedures for Authorized Service Provider parts

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

Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer.

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

There are as many as 61 screws that must be removed, replaced, or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Top cover



NOTE: Top cover spare part kits include the touchpad assembly.

Description	Spare part number
Ano silver for use in the United States	741981-001
Ano silver for use in the United Kingdom	741981-031
Ano silver for use in France	741981-051
Ano silver for use in Italy	741981-061
Ano silver for use in Spain	741981-071
Ano silver for use in Turkey	741981-141
Ano silver for use in Latin America	741981-161
Ano silver for use in Saudi Arabia	741981-171
Ano silver for use in Hungary	741981-211
Ano silver for use in Russia	741981-251
Ano silver for use in Thailand	741981-281
Ano silver for use in Japan	741981-291
Ano silver for use in South Korea	741981-AD1
Ano silver for use in Europe	741981-B31
Ano silver for use in the Adriatics	741981-BA1
Ano silver for use in English/French	741981-DB1
Ano silver for use in the Czech/Slovic regions	741981-FL1
Pearl white for use in the United States	745421-001
Pearl white for use in the United Kingdom	745421-031
Pearl white for use in France	745421-051
Pearl white for use in Italy	745421-061
Pearl white for use in Spain	745421-071
Pearl white for use in Turkey	745421-141
Pearl white for use in Latin America	745421-161
Pearl white for use in Saudi Arabia	745421-171
Pearl white for use in Hungary	745421-211
Pearl white for use in Russia	745421-251
Pearl white for use in Thailand	745421-281
Pearl white for use in Japan	745421-291
Pearl white for use in Taiwan	745421-AB1
Pearl white for use in South Korea	745421-AD1

Description	Spare part number
Pearl white for use in Europe	745421-B31
Pearl white for use in the Adriatics	745421-BA1
Pearl white for use in English/French	745421-DB1
Pearl white for use in the Czech/Slovic regions	745421-FL1

Before removing the top cover, 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 battery (see [Battery on page 27](#)).

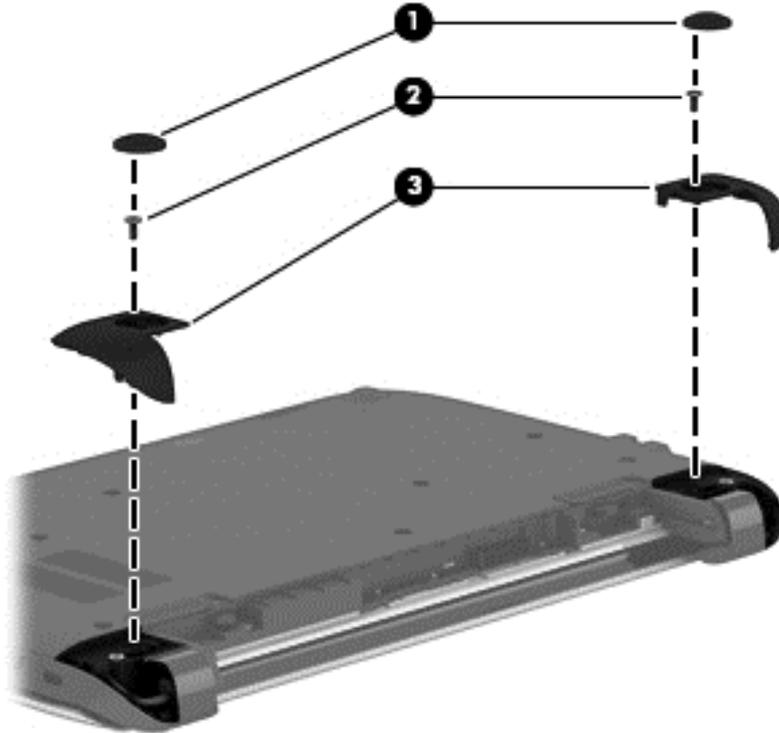
Remove the top cover:

1. Position the computer upside-down with the front toward you.

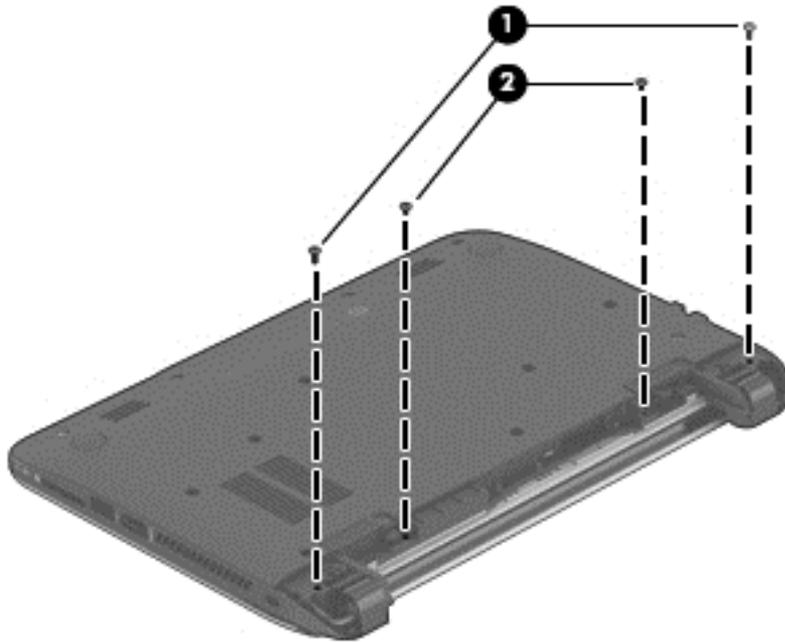
2. Remove the following covers and screws that secure the top cover to the computer:

 **NOTE:** Rubber screw covers are available in the Rubber Kit, spare part number 741977-001.

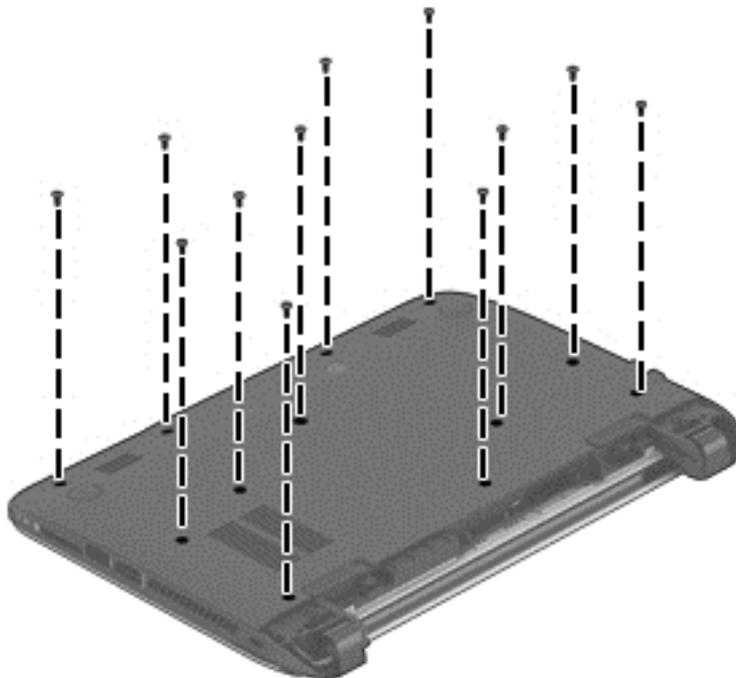
- (1) 2 rubber screw covers from the corner caps
- (2) 2 screws from the corner caps
- (3) Both corner caps



3. Remove the following covers and screws that secure the top cover to the computer:
 - (1) 2 screws under removed corner caps
 - (2) 2 screws inside the battery bay



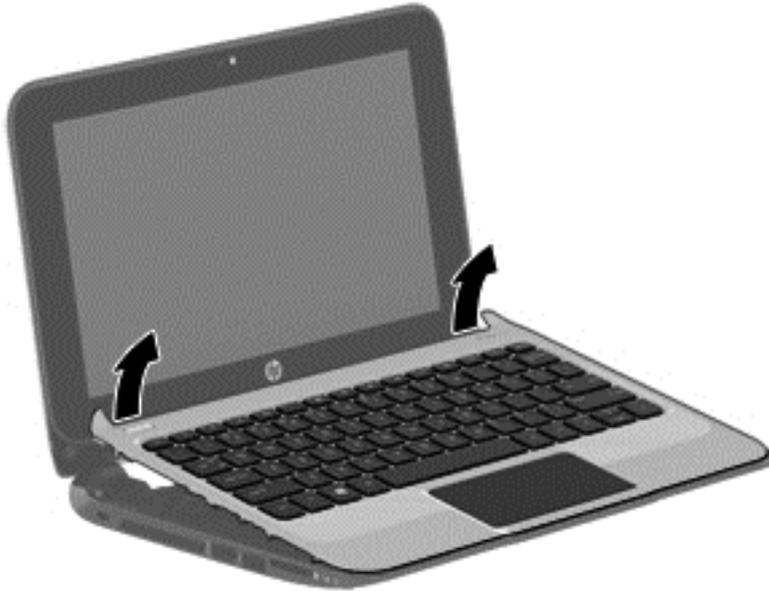
4. Remove 12 screws from the bottom of the computer.



5. Position the computer upright and open it as far as possible.

6. Pry the top cover off the computer to disengage it.

 **NOTE:** Begin by attempting to pry the top cover loose near the display hinges.

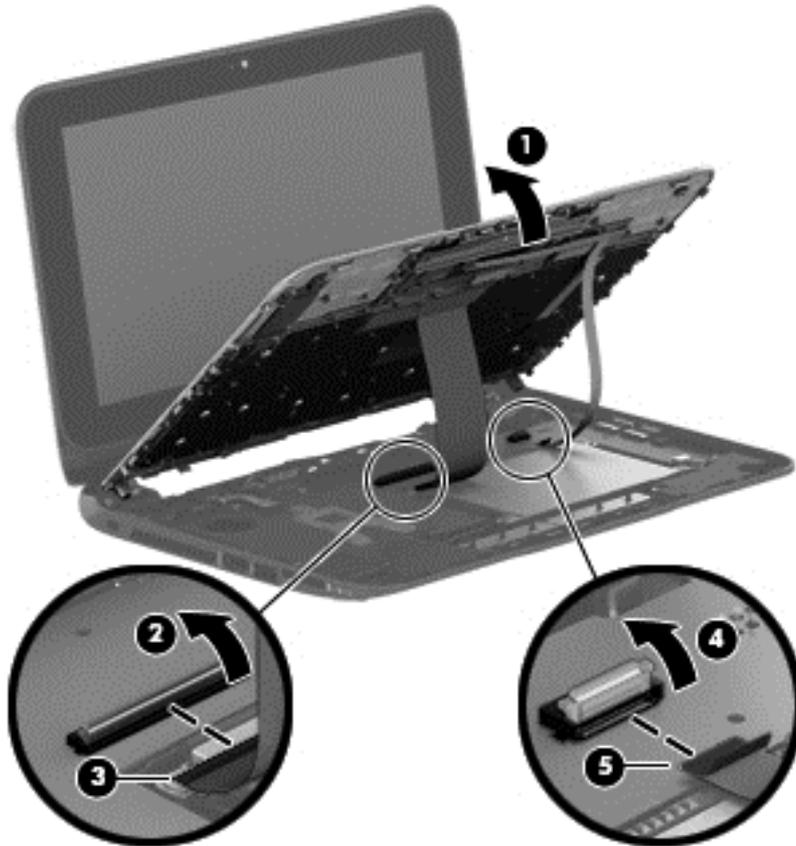


7. Lift the top of the top cover (1), and lift the top cover up slightly to gain access to the connected keyboard and touchpad cables and connectors underneath.

 **CAUTION:** To avoid damage to the cable and connector, make sure not to disconnect the cable when you lift the top cover from the computer.

8. Lift the keyboard cable connector (2) and disconnect the keyboard cable (3) from the system board.

9. Lift the touchpad cable connector (4) disconnect the touchpad cable (5) from the system board, and then remove the top cover from the computer.



Reverse this procedure to install the top cover.

Touchpad

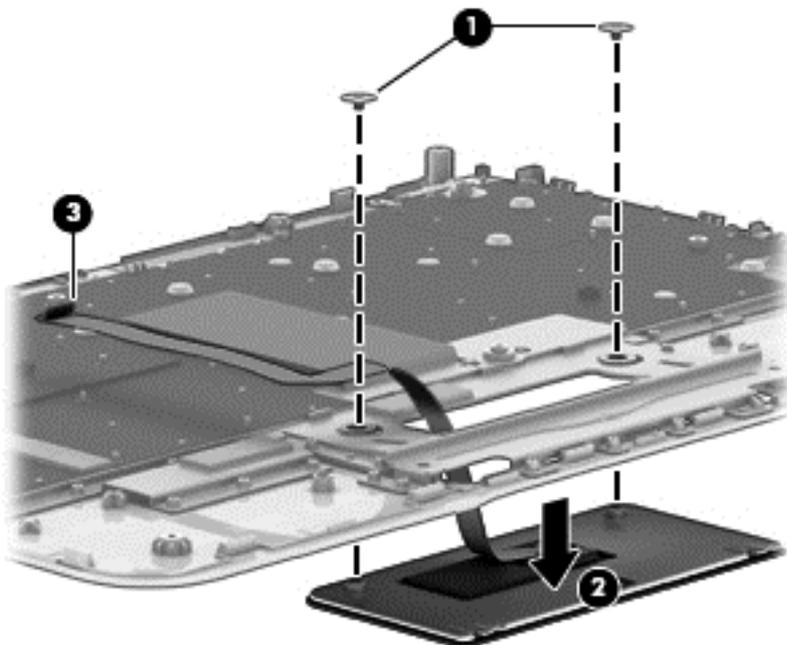
Description	Spare part number
Touchpad	721518-001

Before removing the touchpad, 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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - ▲ Top cover (see [Top cover on page 29](#))

Remove the function board:

1. Position the top cover upside-down.
2. Remove the 2 Phillips screws (1) that secure the touchpad to the top cover.
3. Remove the touchpad from the top cover (2).
4. Guide the cable (3) through the opening in the top cover.



Reverse this procedure to install the touchpad.

Power button board

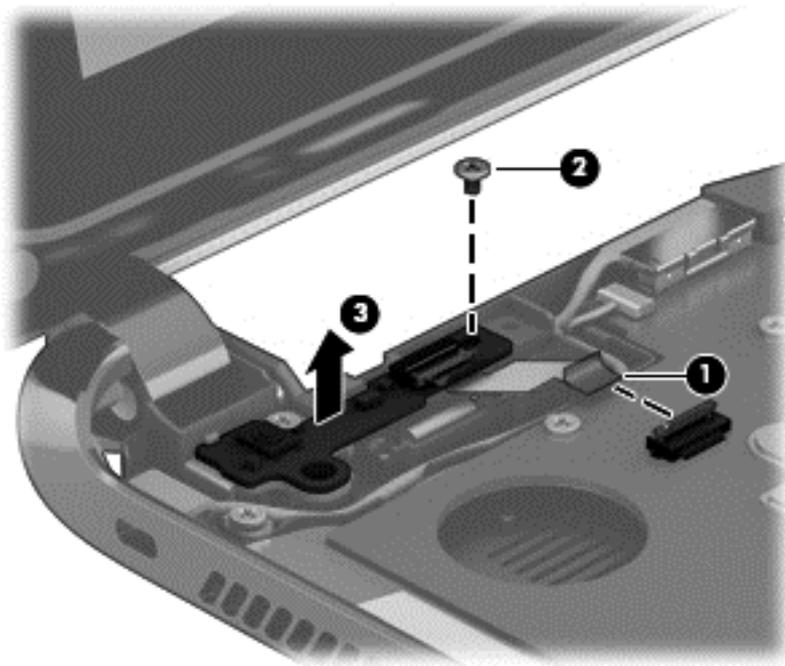
Description	Spare part number
Power button board assembly	721531-001

Before removing the power button 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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - ▲ Top cover (see [Top cover on page 29](#))

Remove the power button board:

1. Position the top cover upside-down.
2. Disconnect the cable from the system board (1).
3. Remove the Phillips screw (2) that secures the power button board to the base enclosure.
4. Lift the top side of the board up at an angle, and then lift board out from under the tab to remove it from the top cover (3).



Reverse this procedure to install the power button board.

Display assembly

All display assemblies include WLAN antenna transceivers and cables.

Description	Spare part number
Display assembly 25.6-cm (10.1-inch) HD, LED, antiglare SVA flat1366x768, 220 nits, 3.6 mm 742315	
For use in pearl white models	742315-001
For use in ano silver models	745026-001

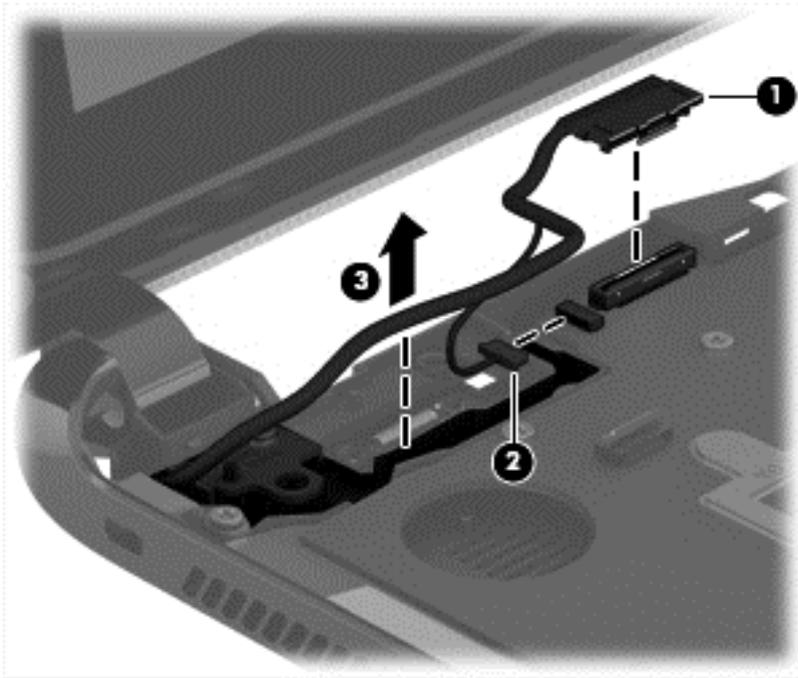
Before removing the display assembly, follow these steps:

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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board

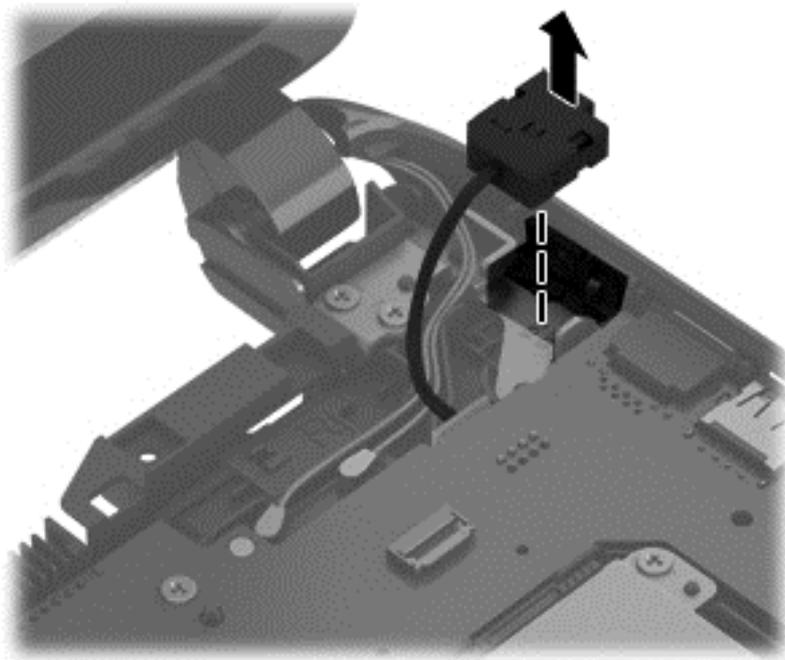
Remove the display assembly:

1. Place the computer upright and open as far as possible.
2. Lift the video cable connector from the system board (1).

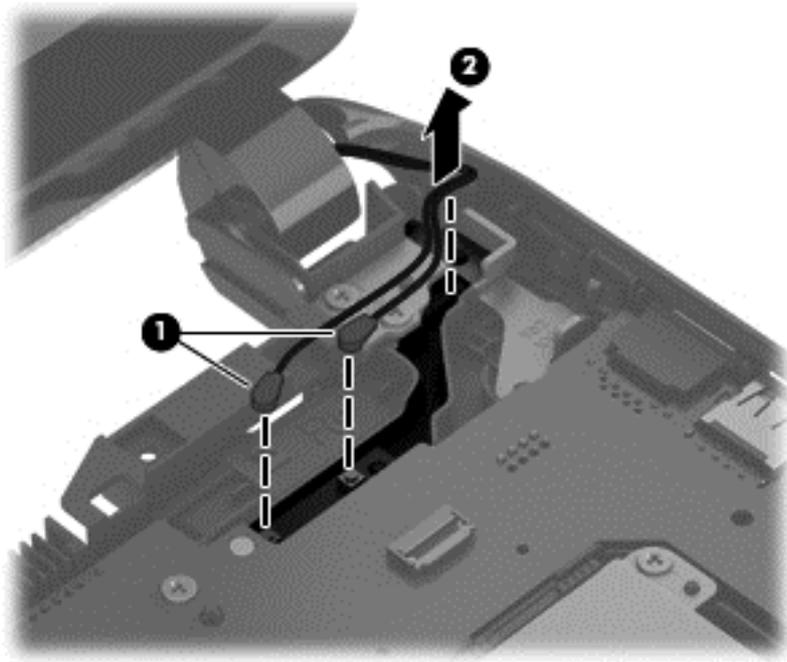
3. Disconnect the webcam cable from the system board (2) and remove the video cable from the base enclosure (3).



4. Lift the power connector from the base enclosure.

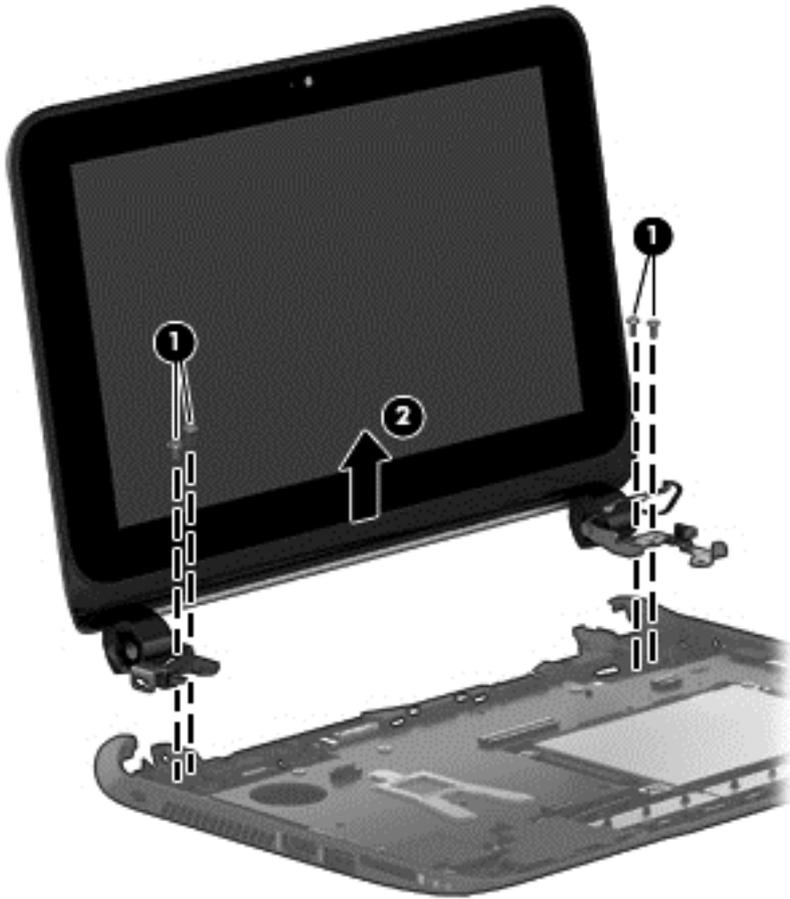


5. Remove the WLAN antenna cables from the tabs (1) and the routing path (2) in the base enclosure.



6. Remove the 4 screws (1) from the display hinges.

7. Lift the display assembly straight up and remove it (2).



⚠ CAUTION: When installing the display assembly, be sure that the wireless antenna cables are routed and arranged properly.

Failure to properly route the antennas can result in degradation of the computer's wireless performance.

Reverse this procedure to install the display assembly.

Speaker assembly

Description	Spare part number
Speaker assembly	741979-001

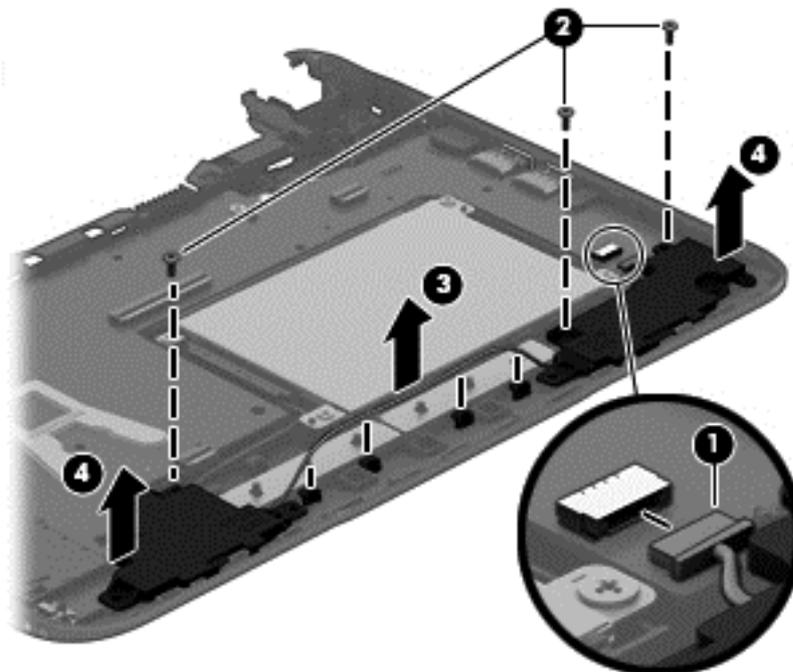
 **NOTE:** You must remove the left speaker to remove to function board cable.

Before removing the speaker 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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - ▲ Top cover (see [Top cover on page 29](#))

Remove the speaker assembly:

1. Position the base enclosure with the speakers in front..
2. Disconnect the speaker cable from the system board (1).
3. Remove the 3 Phillips screws that secure the speakers to the base enclosure (2).
4. Remove the speaker cables from the clips built into the base enclosure (3).
5. Remove the speakers from the computer (4).



Reverse this procedure to install the speaker assembly.

Hard drive

Description	Spare part number
500-GB, 5400-rpm	683802-005

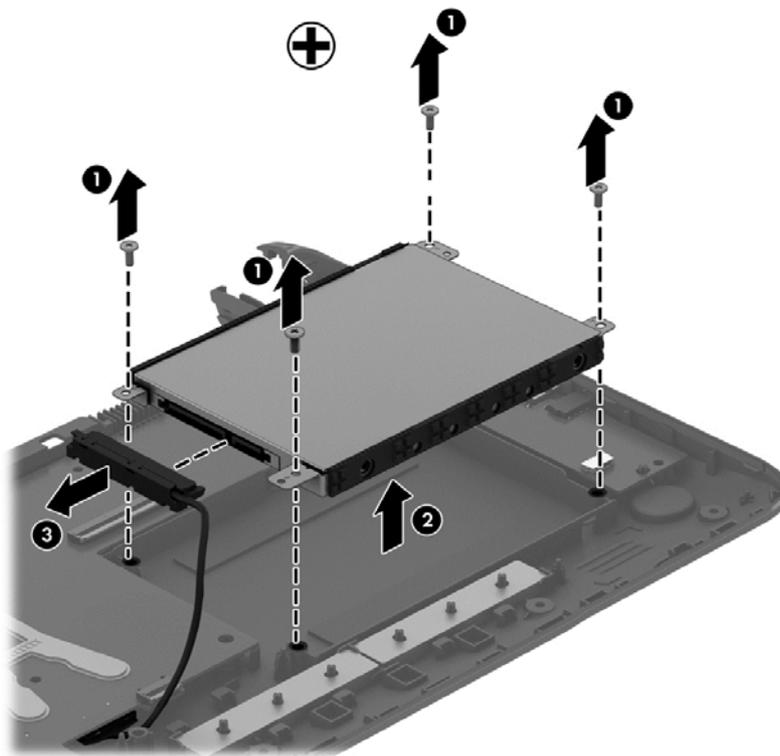
Before removing the hard drive, follow these steps:

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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Speaker assembly

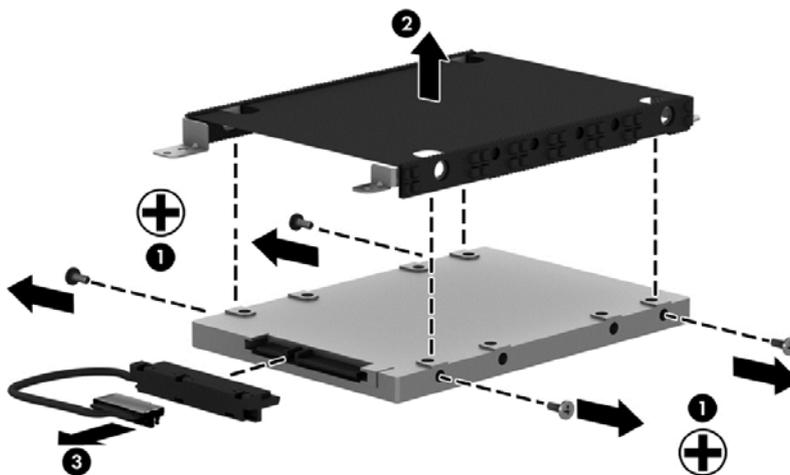
To remove a hard drive:

1. Position the computer upside down on a flat surface.
Remove the 4 Phillips screws that secure the hard drive to the chassis **(1)**.
2. Lift the hard drive **(2)** out of the hard drive bay.

3. Disconnect the hard drive cable (3).



4. To remove the hard drive from the hard drive cover, remove the 4 Phillips PM3.0×4.0 screws (1) that secure the cover to the drive, and then lift the cover straight up and off the hard drive (2).



Reverse this procedure to install a hard drive.

System board

Description	Spare part number
Windows 8.1 small screen touch with Office Home and Student 2013	741980-001
Windows 8.1 small screen touch with Office Home and Student 2013 Standard	741980-501

Before removing the system board, follow these steps:

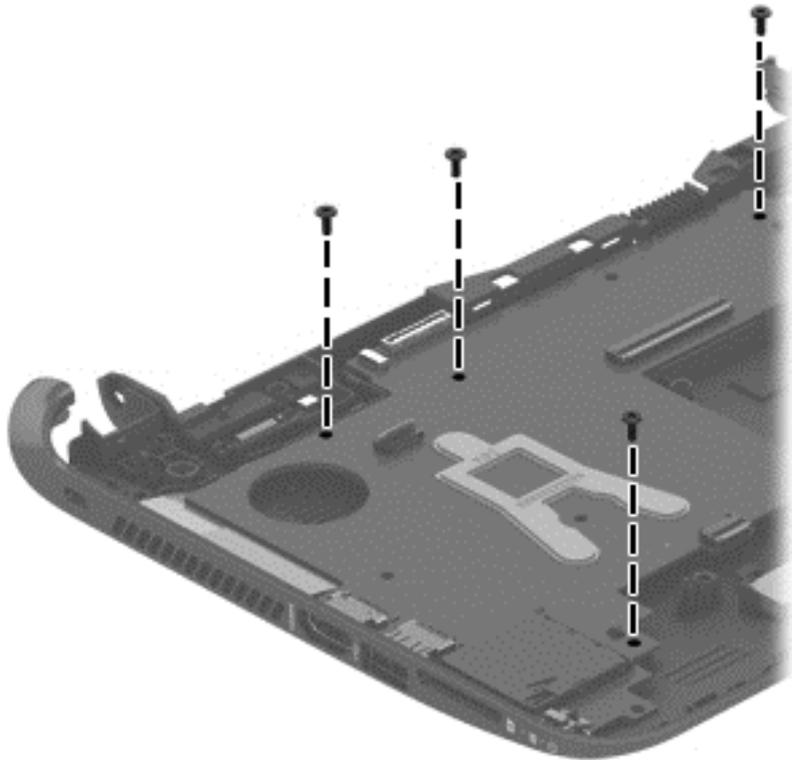
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board
 - c. Display assembly
 - d. Speaker assembly
 - e. Hard drive (see [Hard drive on page 42](#))

When replacing the system board, be sure to remove the following components from the defective system board and install on the replacement system board:

- WLAN/Bluetooth module (see [WLAN/Bluetooth combo card on page 50](#))

Remove the system board:

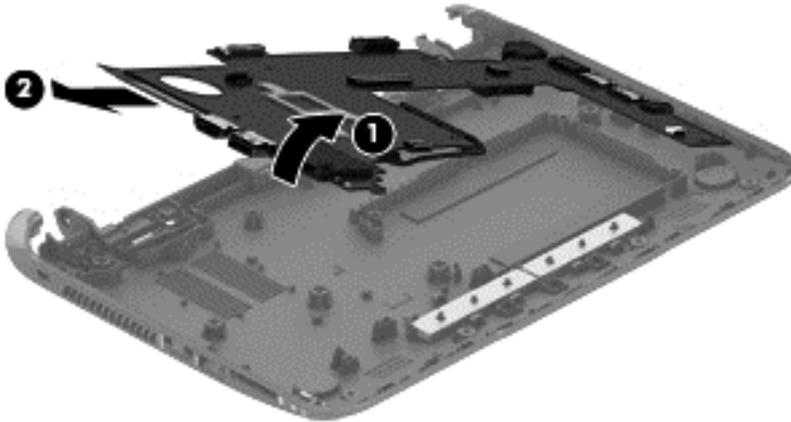
1. Position the computer upright with the front toward you.
2. Remove the 4 Phillips screws that secure the system board to the computer.



3. Lift the left side of the system board up at an angle (1).

4. Pull the system board up and toward the left to remove it from the computer (2).

 **NOTE:** The power cable and hard drive cable connect to connectors on the bottom of the system board. When you remove the system board, the power cable will be removed from its routing path and both cables will remain connected to the system board.



Reverse this procedure to install the system board.

Power cable

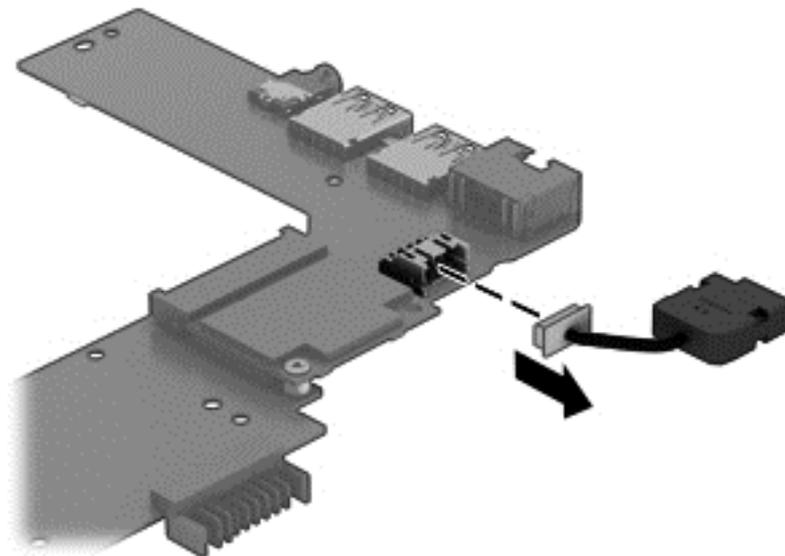
The power cable spare part number is 741969-001.

Before removing the power cable, 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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board
 - c. Display assembly
 - d. Speaker assembly
 - e. Hard drive (see [Hard drive on page 42](#))
 - f. System board

Remove the power cable:

1. Position the system board upside-down.
2. Disconnect the power cable from the bottom of the system board.



Reverse this procedure to install the power cable.

RTC battery

Description	Spare part number
RTC battery	741976-001

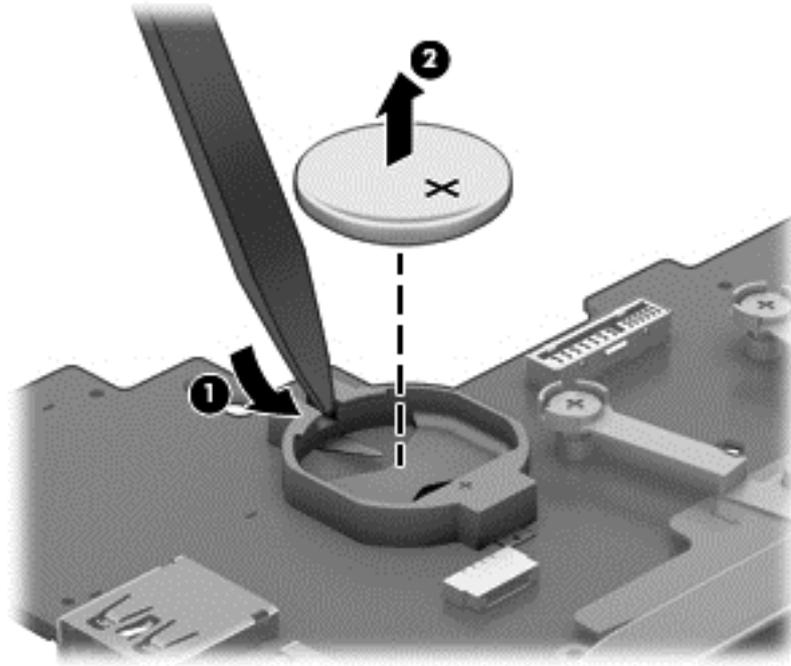
Before removing the RTC battery, follow these steps:

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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board
 - c. Display assembly
 - d. Speaker assembly
 - e. Hard drive (see [Hard drive on page 42](#))
 - f. System board

Remove the RTC battery:

1. Position the system board upside-down.
2. Use a thin screwdriver or similar tool to pry the battery out of the socket (1).

3. Remove the battery from the socket (2).



Reverse this procedure to install the RTC battery.

Hard drive cable

The hard drive cable spare part number is 721510-001.

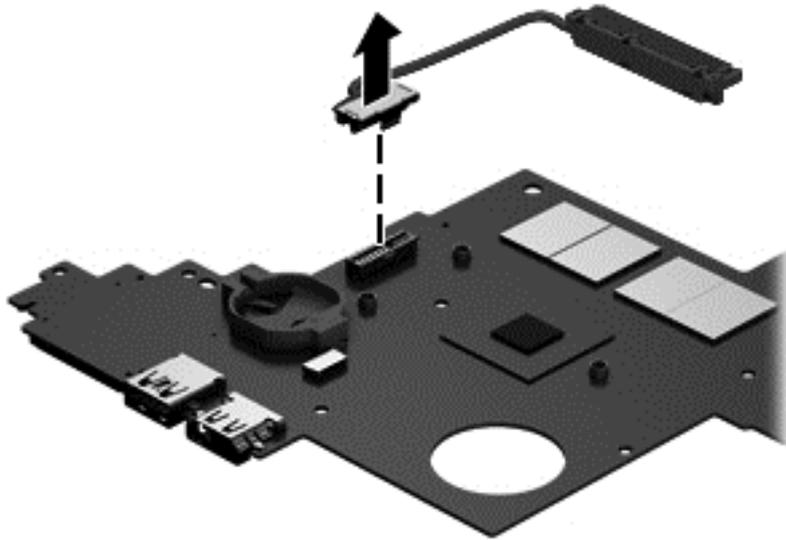
Before removing the hard drive cable, follow these steps:

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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board
 - c. Display assembly
 - d. Speaker assembly
 - e. Hard drive (see [Hard drive on page 42](#))
 - f. System board

Remove the hard drive cable:

1. Position the system board upside-down.

2. Disconnect the hard drive cable from the bottom of the system board.



Reverse this procedure to install the hard drive cable.

WLAN/Bluetooth combo card

Select models use a card that provides both WLAN and Bluetooth functionality.

Description	Spare part number
Realtek RTL8188EE 802.11bgn 1x1 Wi-Fi Adapter	709848-005
Ralink RT3290LE 802.11bgn 1x1 Wi-Fi + BT 4.0 Combo Adapter	690020-005

Before removing the WLAN module, follow these steps:

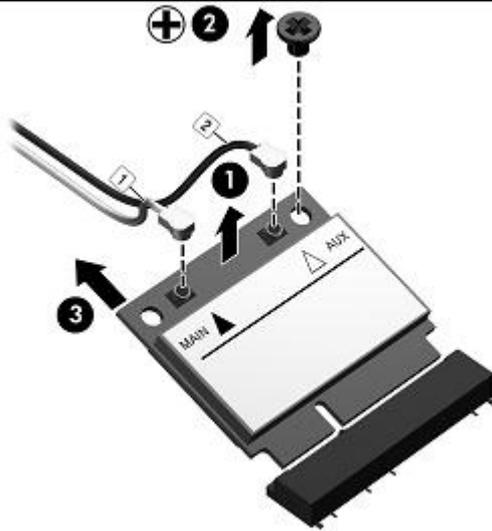
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board
 - c. Display assembly
 - d. Speaker assembly
 - e. Hard drive (see [Hard drive on page 42](#))
 - f. System board

Remove the WLAN module:

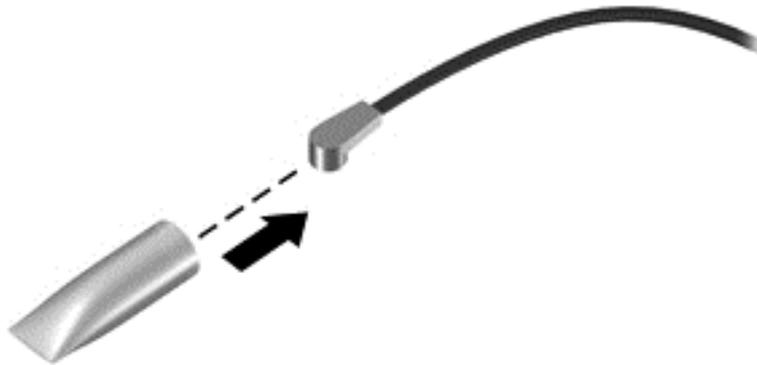
1. Position the system board upside-down.
2. The WLAN antenna cables **(1)** were disconnected from the terminals on the WLAN module during the display assembly removal.
3. Remove the Phillips screw **(2)** that secures the WLAN module to the computer. (The edge of the module opposite the slot rises away from the computer.)

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

 **NOTE:** WLAN modules are designed with a notch to prevent incorrect insertion.



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



Reverse this procedure to install the WLAN module.

Heat sink assembly

Description	Spare part number
Heat sink assembly	741971-001

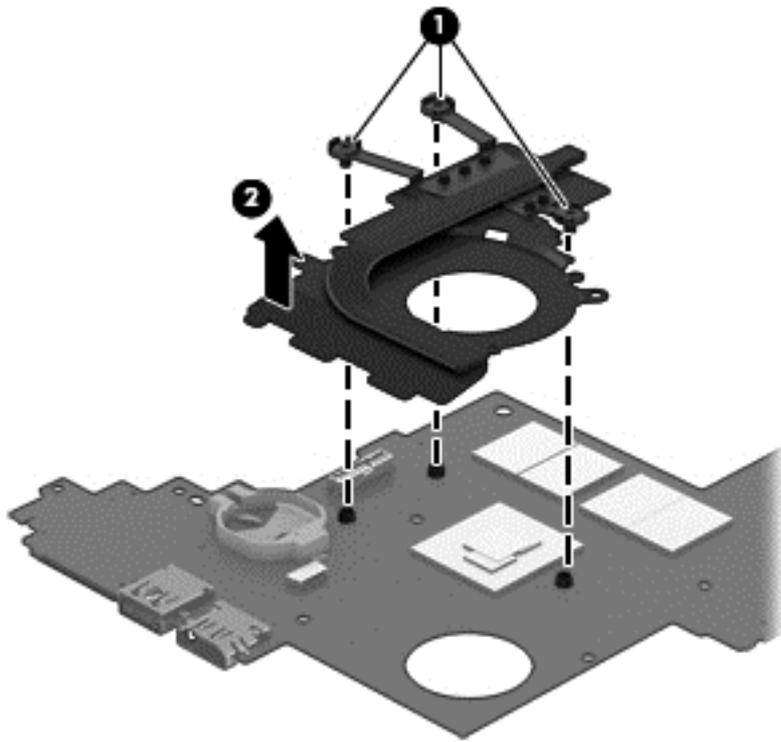
Before removing the heat sink assembly, follow these steps:

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 battery (see [Battery on page 27](#)).
5. Remove the following components:
 - a. Top cover (see [Top cover on page 29](#))
 - b. Power button board
 - c. Display assembly
 - d. Speaker assembly
 - e. Hard drive (see [Hard drive on page 42](#))
 - f. System board

Remove the heat sink assembly:

1. Position the system board upside-down.
2. Loosen the 3 capture screws (1) securing the heat sink to the system board.

3. Lift the heat sink from the system board (2).



Reverse this procedure to install the heat sink assembly.

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

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

Starting Setup Utility (BIOS)

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



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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 54](#)).
2. Use the arrow keys to select **Main**.
3. To exit Setup Utility (BIOS) without saving your changes, use the arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press **enter**.
4. Select **Yes**.

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

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

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

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

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

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

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

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

Using HP PC Hardware Diagnostics (UEFI)

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

To start HP PC Hardware Diagnostics UEFI:

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

The BIOS searches three places for the diagnostic tools, in the following order:

- a. Connected USB drive



NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 56](#).

- b. Hard drive

- c. BIOS

2. When the diagnostic tool opens, click the type of diagnostic test you want to run, and then follow the on-screen instructions.



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

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



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

1. Go to <http://www.hp.com>.
2. Click **Support & Drivers**, and then click the **Drivers & Downloads** tab.
3. Enter the product name in the text box, and then click **Go**.
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:

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

Creating recovery media and backups

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

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

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

See [Creating HP Recovery media on page 57](#).

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

Creating HP Recovery media

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

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

separately) to create recovery discs, or you can obtain recovery discs for your computer from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take up to an hour or more. Do not interrupt the creation process.
- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue, and the remaining discs will be burned.

To create HP Recovery media:



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

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

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 59](#).

Restore and recovery

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

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

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

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

For more information, see [Recovering using HP Recovery Manager on page 59](#).

- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery partition (select models only) or use the HP Recovery media that you have created. For more information, see [Recovering using HP Recovery Manager on page 59](#). If you have not already created recovery media, see [Creating HP Recovery media on page 57](#).

- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see [Recovering using HP Recovery Manager on page 59](#).
- If you wish to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see [Removing the HP Recovery partition on page 60](#).

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you created or by using the HP Recovery partition (select models only). If you have not already created recovery media, see [Creating HP Recovery media on page 57](#).

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

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

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.
- Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.
- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see [Creating HP Recovery media on page 57](#).
- To use the Factory Reset option, you must use HP Recovery media. If you have not already created recovery media, see [Creating HP Recovery media on page 57](#).
- If the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.



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

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:



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

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

Using HP Recovery media to recover

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

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



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 60](#).

3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

1. Insert the HP Recovery media you created.
2. Restart the computer, quickly press **esc**, and then press **f9** for boot options.
3. Select the optical drive or USB flash drive you want to boot from.
4. Follow the on-screen instructions.

Removing the HP Recovery partition

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



IMPORTANT: After you remove the HP Recovery partition, you can no longer use the Windows Refresh option, the Windows option to remove everything and reinstall Windows, or the HP Recovery Manager option. So before you remove the Recovery partition, create HP Recovery media; see [Creating HP Recovery media on page 57](#).

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		
Length	19.45 cm	9.4 in
Width	27.28 cm	13.4 in
Height (front to rear)	2.245 cm	0.9 to 1.1 in
Weight		
Equipped with no optical drive, 1 DIMM, hard drive, WLAN module, webcam, 3 cell battery	1.451 kg	3.2 lbs
Input power		
Operating voltage	18.5 V dc @ 3.5 A – 65 W or 19.5 V dc @ 3.33 A – 65 W or 19.5 V dc @ 2.31 A – 45 W	
Operating current	3.5 A or 3.33 A or 2.31 A	
Temperature		
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating (14.7 to 10.1 psia)	-15 m to 3,048 m	50 ft to 10,000 ft
Nonoperating (14.7 to 4.4 psia)	-15 m to 12,192 m	-50 ft to 40,000 ft
Shock		
Operating	125 g, 2 ms, half-sine	
Nonoperating	200 g, 2 ms, half-sine	
Random vibration		
Operating	0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate	
Nonoperating	1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate	

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

35.6-cm (10.1-in), HD+ display specifications

	Metric	U.S.
Active diagonal size	35.6-cm	10.1-in
Resolution	1600x900 (HD+)	
Active area	309.399x173.952	
PPI	112	
Surface treatment	Anti-glare	
Contrast ratio	300:1 (typical)	
Response time	8 ms	
Brightness	220 nits (typical)	
Viewing angle	SVA	
Backlight	LED	
Luminance uniformity @ 13 points	1.4 (typ), 1.6 (max)	
Lifetime (1/2 luminance)	12,000 hours	
Color coordinate (white)	(0.313, 0.329)	
Color tolerance (White)	+/- 0.02	
Color tolerance (W, R, G, B)	+/- 0.03	
Color gamut	45% typical	

Hard drive specifications

500-GB*		
Dimensions		
Height	7 mm	
Width	70 mm	
Weight	101 g	
Interface type		SATA
Transfer rate		100 MB/sec
Security		ATA security
Seek times (typical read, including setting)		
Single track	3 ms	
Average	13 ms	
Maximum	24 ms	
Logical blocks		1,048,576,000
Disc rotational speed		5400 rpm
Operating temperature		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.		
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.		

Specification information in Device Manager

Device Manager allows you to view and control the hardware attached to the computer, as well as provides hardware specification information.

You can also add hardware or modify device configurations using Device Manager.



NOTE: Windows 7 and Windows Vista include the User Account Control feature to improve the security of your computer. You may be prompted for your permission or password for tasks such as installing software, running utilities, or changing Windows settings. Refer to Windows Help and Support for more information.

After you open Device Manager, drill-down to a device and double-click it to access its properties.

To access Device Manager in Windows 8:

1. From the Start screen, type `control`, and then select **Control Panel**.
2. Select **System and Security**, and then in the System area, click **Device Manager**.

A list display all the devices installed in your computer.

To access Device Manager in Windows 7:

1. Select **Start > Computer > System properties**.
2. In the left pane, click **Device Manager**.

10 Statement of Volatility

The purpose of this document is to provide general information regarding non-volatile memory in industry-standards based HP Business Notebook PC systems and provide 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 Notebook 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 Notebook PC system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. The steps below will remove personal data from the notebook PC, including the nonvolatile memory found in Intel-based and AMD-based system boards. Some of these steps are disclosed in the Maintenance & Service Guides available for HP PC products available on the product support pages at www.hp.com.

1. Follow steps (a) through (i) 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. Enter BIOS (F10) Setup by powering on the system and pressing **F10** when prompted near the bottom of the display, or press the **ESC** key to display the start up menu, then press **F10** . If the system has a BIOS administrator password, enter the password at the prompt.
 - b. Select the **File** menu, then **Restore Defaults**.
 - c. Select the **System Configuration** menu, then **Restore Security 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 the tag that has been set. Press the spacebar once to clear the tag, then press **Enter** to return to the prior menu.
 - e. If a DriveLock password is set, select the **Security** menu, scroll down to **DriveLock**, then select **DriveLock password**. Select the desired hard drive. Click **Disable protection**, enter the existing master DriveLock password, then press **Enter** to confirm and return to the prior menu. Repeat this procedure if more than one hard drive has a DriveLock password.
 - f. If an Automatic DriveLock password is set, select the **Security** menu, scroll down to **Automatic DriveLock**, then select the desired hard drive and disable protection. Repeat this procedure if more than one hard drive has an Automatic DriveLock password.
 - g. Select the **File** menu, then **Reset BIOS Security to factory default**. Click **yes** at the warning message.
 - h. Select the **File** menu, then **Save Changes and Exit**.
 - i. Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint sensor, one or two prompts will appear. One to clear the TPM and the other to Reset Fingerprint Sensor; press **F1** to accept or **F2** to reject.

If the HP notebook model number ends in a 'p' or 'w' and includes Intel® Centrino with VPro™, reboot the PC and enter BIOS Setup by pressing **F10** when prompted. Select **System Configuration**, then **AMT Options**. Then select **Unconfigure AMT** on next boot. Select **Save** then **Yes**. Select the **File** menu, and then select **Save Changes and Exit**. Reboot the system and confirm that you want to unconfigure AMT.

- j. If the optional Intel® Anti-Theft Technology (AT) was activated, contact the provider to deactivate it.
 - k. If the optional Absolute® Software Computrace® management and tracking service was activated on the notebook PC, contact the provider to deactivate it.
 - l. Remove all power and system batteries for at least 24 hours.
2. Remove and retain the storage drive or clear the contents of the drive.

a. **Hard Disk Drive (HDD)**

Clear the HDD contents by using the HP Disk Sanitizer® utility or a third party application that, ideally, is U.S. Department of Defense (DOD) 5220.22-M approved.

To run HP Disk Sanitizer, enter BIOS Setup by powering on the system and pressing **F10** when prompted near the bottom of the display, or press **ESC** to display the start up menu, then press **F10**. Select the **Security** menu and scroll down to the **Utilities** menu. Select **Disk Sanitizer** and select the desired drive. For a higher level of protection, select **Optimum**.



NOTE: This process will take a long time, and the amount of time varies based on the hard drive capacity.

b. **Solid State Drive (SSD)**

Clear the SSD contents by using the BIOS Setup Secure Erase command option, or by using a third party utility designed to erase data from an SSD. To run Secure Erase, enter BIOS Setup by powering on the system and pressing **F10** when prompted near the bottom of the display. Select the **Security** menu and scroll down to the **Utilities** menu. Select **Secure Erase** and select the desired hard drive.

Non-volatile memory usage

Non Volatile 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?
Real Time Clock (RTC) battery backed-up CMOS configuration memory (CMOS)	256 Bytes	No	Yes	Stores system date and time and limited keyboard controller data.	Using the F10 Setup utility or changing the Microsoft® Windows® date & time.	This memory is not write-protected. HP recommends password protecting the F10 Setup utility.
Controller (NIC) EEPROM	64 Kbytes (not customer accessible)	No	Yes	Store NIC configuration and NIC firmware.	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 NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC nonfunctional.
Keyboard ROM	64 Kbytes (not customer accessible)	No	Yes	Stores firmware code (keyboard, mouse, & battery management)	Programmed at the factory. Code is updated when the system BIOS is updated.	A utility is required for writing data to this memory and is available on the HP website. Writing data to this ROM in an inappropriate manner can render the PC nonfunctional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	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 to 5 MBytes	Yes	Yes	Store 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 F10 setup utility or a custom utility.	A utility is required for writing data to this memory and is available on the HP website. Writing data to this ROM in an inappropriate manner can render the PC nonfunctional.
Intel Management Engine Firmware	1.5 or 5MByte	Yes	Yes	Stores Management Engine Code, Settings,	Management Engine Code is programmed at the factory. Code is updated via Intel secure	The Intel chipset is configured to enforce HW protection to block all direct read/

(present only in models ending in a 'p' or 'w' or with Intel Centrino Pro technology)				Provisioning Data and iAMT third party data store.	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 registered by an administrator to have access to the space.	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	2Mbit	No	Yes	Stores Bluetooth configuration and firmware.	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 if the flash requires an upgrade.
802.11 WLAN EEPROM	4kb to 8kb	No	Yes	Stores configuration and calibration data.	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	64K bit	No	Yes	Store Web Cam configuration and firmware.	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	512kByte Flash	Yes	Yes	Stores fingerprint templates.	By enrolling 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)?**
 - a. Turn on or restart the computer and press **F10** when prompted near the bottom of the display.
 - b. Select **File**, then select **Restore defaults**.
 - c. Follow the on-screen instructions.
 - d. Select **File**, save changes and exit, then press **Enter**.
2. **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. There are various third party tools available to read SPD memory.

3. **Does the “Firmware Hub for System BIOS” contain the BIOS program? Is this chip writable, and if so how?**

The Firmware Hub does contain the BIOS program and is writable. A utility is required to perform the write function.

4. **In some PC systems, the Firmware Hub for System BIOS is a flash memory chip so that updates can be written by the customer. Is this true for these BIOS chips?**

Yes, they are flash memory chips.

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

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

6. **Does resetting the CMOS configuration memory return the PC back to factory defaults?**

The process of resetting the CMOS will return certain system settings to factory default but will not reset many of the system data and configuration defaults to their factory settings. To return these system data and configuration defaults to factory settings, refer to question and answer 1 and follow the instructions for returning the BIOS settings to factory defaults.

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 and regions

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	ISI	1
Israel	SII	1
Italy	IMQ	1

Country/region	Accredited agency	Applicable note number
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1
The United States	UL	2

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75mm² 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 SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75mm² or 1.25mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
5. The flexible cord must be Type H05VV-F 3X0.75mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF 3X1.25mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
7. For 127 V ac, the flexible cord must be Type SVT or SJT 3 x 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3X0.75/1.00mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.

12 Recycling

Battery

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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