



HP 242 G2 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.

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

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

Important Notice about Customer Self-Repair Parts

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

Safety warning notice


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

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1 Product description

Category	Description	Discrete models	UMA models
Product Name	HP 242 G2 Notebook PC	✓	✓
Processors	<ul style="list-style-type: none"> Intel® Core® i7-4600M 2.90-GHz processor (turbo up to 3.60-GHz; 1600-MHz FSB, 4.0-MB L3 cache, 37 W) Intel Core i5-4200M 2.50-GHz processor (turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 37 W) Intel Core i3-4100M 2.50-GHz processor (1600-MHz FSB, 3.0-MB L3 cache, 37 W) Intel Core i3-4000M 2.40-GHz processor (1600-MHz FSB, 3.0-MB L3 cache, 37 W) Intel Pentium 3550M 2.30-GHz processor (1600-MHz FSB, 2.0-MB L3 cache, 37 W) Intel Celeron 2950M 2.00-GHz processor (1600-MHz FSB, 2.0-MB L3 cache, 37 W) 	✓	✓
Chipset	Intel HM87 Express chipset	✓	✓
Graphics	Internal graphics: <ul style="list-style-type: none"> Intel HD Graphics 4600 (Core i processors) Intel HD Graphics (Pentium/Celeron processors) Switchable Discrete Graphics: AMD Radeon HD 8570M, 1 GB or 2 GB dedicated video memory	✓	✓
Panel	14.0-in high-definition (HD), LED, SVA, anti-glare, 1366×768, 16:9 aspect ratio, 5.2-mm display Support for low-voltage differential signalling (LVDS)	✓	✓
Memory	Two customer-accessible/upgradable memory module slots Support for 1600-MHz, 12800 DDR3L memory modules Support for 16 -GB of system RAM in the following configurations: <ul style="list-style-type: none"> 16348-MB (8192-MB × 1; not supported for 32-bit operating system) 8192-MB (4096-MB × 2; dual channel; not supported for 32-bit operating system) 4096-MB (2048-MB × 2; dual channel) 2048-MB (2048-MB × 1) 	✓	✓
Flash	32-GB mSATA	✓	✓
Primary storage	Support for 6.35-cm (2.5-in) hard drives in 7.0-mm (.28-in) and 9.5-mm (.37-in) thickness Support for mSATA Support Intel Smart Response Technology	✓	✓

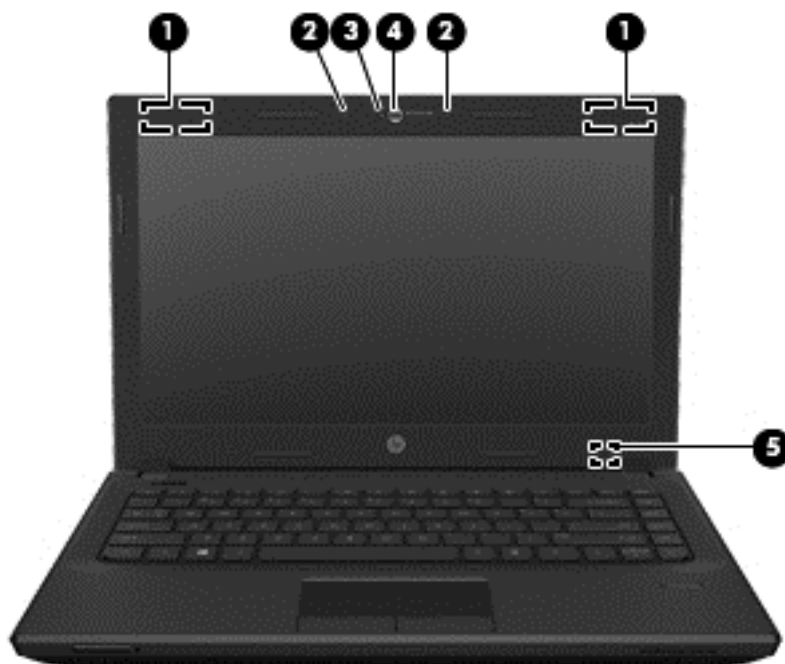
Category	Description	Discrete models	UMA models
	Support for Accelerometer hard drive protection Support for the following single hard drive configurations: <ul style="list-style-type: none"> • 1-TB, 5400-rpm, 9.5-mm • 750-GB, 5400-rpm, 9.5-mm • 500-GB, 7200-rpm, 7.0-mm or 9.5-mm • 500-GB, 5400-rpm, 7.0-mm • 320-GB, 5400-rpm, 7.0-mm 		
Optical drive	DVD±RW Double-Layer SuperMulti Drive Fixed (not modular), 9.5-mm tray load, SATA Support for zero power optical drive function Supports “no drive” option	√	√
Audio and video	Two speakers Dual digital microphone DTS Sound + Integrated HP TrueVision HD webcam (fixed [no tilt], activity LED, 1 PC, USB 2.0, M-JPEG, 1280×720 by 30 frames per second) Supports no webcam option	√	√
Ethernet	Integrated 10/100/1000 network interface card (NIC)	√	√
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module Support for the following WLAN formats: <ul style="list-style-type: none"> • Broadcom BCM943228 802.11abgn 2x2 Wi-Fi + Bluetooth 4.0 Combo Adapter • Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter • Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter 	√	√
External media cards	HP Multi-Format Digital Media Reader Supports SD/SDHC/SDXC Push-push insertion/removal	√	√
Internal Card Expansion	One half-size mini-card slot for WLAN; mSATA flash cache 24G/32G slot	√	√
Ports	<ul style="list-style-type: none"> • Smart Pin adapter • Audio-in (microphone)/audio-out (headphone) combo jack • HDMI v1.4 supporting up to 1920×1080 @ 60Hz • RJ-45 (Ethernet) • USB: two USB 3.0 ports on one side, one USB 2.0 port on the other side • VGA (D-Sub 15 pin) supporting: 2048×1536 external resolution @ 75 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video 	√	√

Category	Description	Discrete models	UMA models
Keyboard/pointing devices	Full-size, island-style, water-resistant keyboard (no numeric keypad) Gesture support: MultiTouch gestures enabled, two-finger scrolling, and pinch-zoom as default Taps enabled by default	√	√
Power requirements	Support for the following AC adapters with 4.5-mm smart connectors: <ul style="list-style-type: none"> 90-W Smart Pin AC adapter (not for China/India) 90-W EM Smart Pin AC adapter (for China/India) 	√	
	Support for the following AC adapters with 4.5-mm smart connectors: <ul style="list-style-type: none"> 65-W Smart Pin AC adapter (not for China/India) 65-W EM Smart Pin AC adapter (for China/India) 		√
	3-wire plug (with ground pin), 1.0 m	√	√
	Support for the following batteries with battery life enhancement and battery fast charge: <ul style="list-style-type: none"> 4-cell, 48-Wh, 3.20-Ah, Li-ion battery 4-cell, 41-Wh, 2.80-Ah, Li-ion battery 	√	√
Security	Support for: <ul style="list-style-type: none"> Kensington security lock Fingerprint reader Supports no fingerprint reader option 	√	√
Operating system	Preinstalled: <ul style="list-style-type: none"> Windows 7 Professional 64 Windows 7 Professional 64 – MSNA (China only) Windows 7 Professional 32 Windows 7 Professional 32 – MSNA (China only) Windows 7 Home Basic 32 Windows 8.1 Chinese Market 64 Windows 8.1 Emerging Markets 64 Windows 8.1 Multilingual 64 Windows 8.1 Professional 64 Windows 8.1 Professional 64 DPK with Windows 7 Professional 64 Ubuntu Linux FreeDOS 2.0 Restore Media: <ul style="list-style-type: none"> SSRD (System Recovery Disc) Drivers support: <ul style="list-style-type: none"> Windows 8 drivers (64-bit) 	√	√

Category	Description	Discrete models	UMA models
	<ul style="list-style-type: none"> Windows 7 drivers (32- and 64-bit) 		
Serviceability	End user replaceable parts: <ul style="list-style-type: none"> AC adapter Battery (system) Hard drive Memory modules (expansion and primary) Optical drive WLAN module 	√	√

2 External component identification

Display



Component	Description
(1) WLAN antennas (2)* (select models only)	Send and receive wireless signals to communicate with wireless local area networks (WLAN).
(2) Internal microphones (2) (select models only)	Record sound.
(3) Webcam light (select models only)	On: The webcam is in use.
(4) Webcam (select models only)	<p>Records video and captures photographs. Some models allow you to video conference and chat online using streaming video.</p> <p>For information on using the webcam, in Windows 8 access HP Support Assistant. To access HP Support Assistant, from the Start screen, select the HP Support Assistant app.</p> <p>For information on using the webcam in Windows 7, select Start > All Programs > Communication and Chat > HP WebCam.</p>
(5) Internal display switch	<p>Turns off the display or initiates Sleep if the display is closed while the power is on.</p> <p>NOTE: The display switch is not visible from the outside of the computer.</p>

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. To access this guide in Windows 8, from the Start screen, type `support`, and then select the **HP Support Assistant** app. To access the user guides in Windows 7, select **Start > Help and Support > User Guides**.

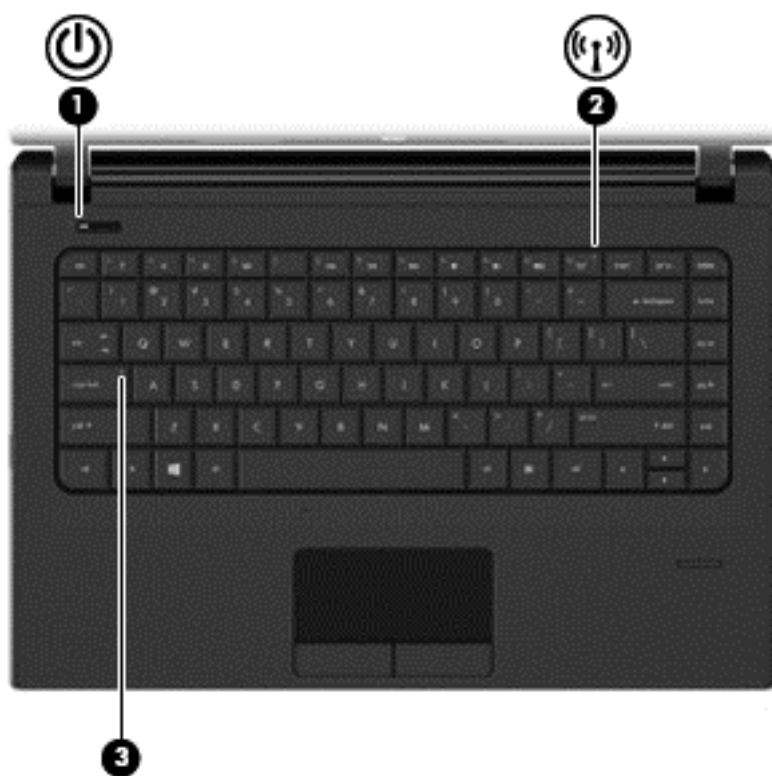
Top



TouchPad



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


Lights



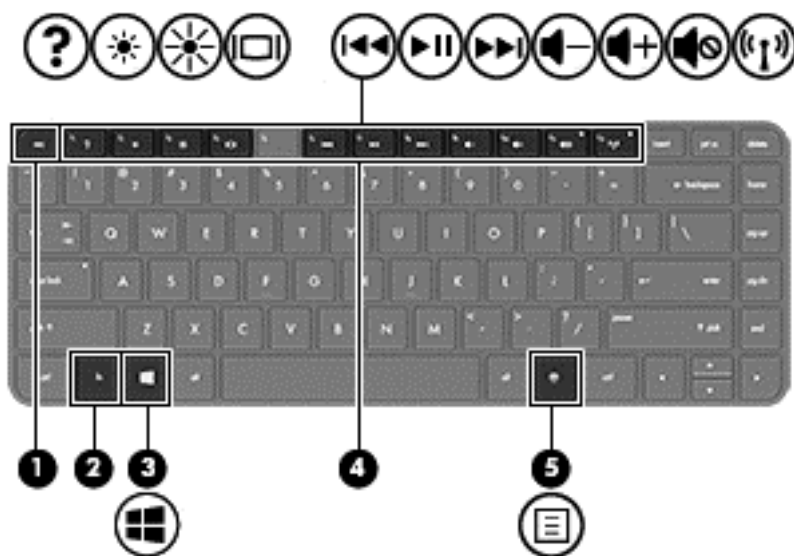
Component	Description
(1)  Power light	<ul style="list-style-type: none"> • White: The computer is on. • Blinking white: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. <p>NOTE: For select models, the Intel® Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p>
(2)  Wireless light	<p>On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on.</p> <p>NOTE: On some models, the wireless light is amber when all wireless devices are off.</p>
(3) Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.



Buttons, speakers, and fingerprint reader (select models only)

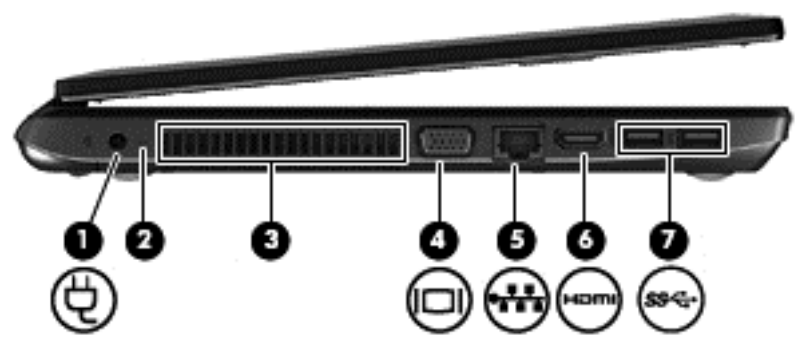







Component		Description
(1)	 Power button	<ul style="list-style-type: none">When the computer is off, press the button to turn on the computer.When the computer is on, press the button briefly to initiate Sleep.When the computer is in the Sleep state, press the button briefly to exit Sleep.When the computer 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> <p>If the computer has stopped responding and Windows® shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer.</p> <p>NOTE: For select models, the Intel® Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p> <p>To learn more about your power settings in Windows 8, see your power options. From the Start screen, type <code>power</code>, select Power and sleep settings, and then select Power and sleep.</p> <p>To learn more about your power settings in Windows 7: Select Start > Control Panel > System and Security > Power Options.</p>
(2)	Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

Keys

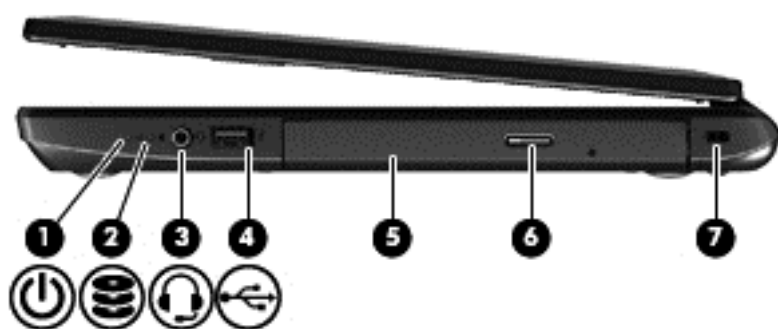







Component	Description
(1) esc key	Displays system information when pressed in combination with the fn key.
(2) fn key	Executes frequently used system functions when pressed in combination with a function key, the num lk key, the esc key, or the b key.
(3)  Windows button	<p>Windows 8: Returns you to the Start screen from an open app or the Windows desktop.</p> <p>NOTE: Pressing the Windows button again will return you to the previous screen.</p> <p>Windows 7: Displays the Windows Start menu.</p>
(4) Function keys	Execute frequently used system functions when pressed in combination with the fn key.
(5)  Windows applications key	<p>Windows 8: Displays options for a selected object.</p> <p>Windows 7: Displays a shortcut menu for items beneath the cursor.</p>



Component		Description
(1)		Power connector Connects an AC adapter.
(2)		AC adapter/Battery light <ul style="list-style-type: none">White: The computer is connected to external power and the battery is fully charged.Amber: The computer is connected to external power and the battery is charged from 0 to 99 percent.Blinking amber: A battery that is the only available power source has reached a low battery level. When the battery reaches a critical battery level, the battery light begins blinking rapidly.
(3)		Vent NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)		External monitor port Connects an external VGA monitor or projector.
(5)		RJ-45 (network) jack/lights Connects a network cable. <ul style="list-style-type: none">White (left): The network is connected.Amber (right): Activity is occurring on the network.
(6)		HDMI port Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.
(7)		USB 3.0 ports (2) Each USB 3.0 port connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.

Right



Component	Description
(1)  Power light	<ul style="list-style-type: none"> • White: The computer is on. • Blinking white: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. <p>NOTE: For select models, the Intel® Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p>
(2)  Hard drive light	<ul style="list-style-type: none"> • Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(3)  Audio-out (headphone)/Audio-in (microphone) jack	<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, see the <i>Regulatory, Safety, and Environmental Notices</i>. To access this guide in Windows 8, from the Start screen, type <i>support</i>, and then select the HP Support Assistant app. To access the user guides in Windows 7, select Start > Help and Support > User Guides.</p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p> <p>NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).</p>
(4)  USB 2.0 port	<p>Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.</p>
(5) Optical drive (select models only)	<p>Depending on your computer model, reads an optical disc or reads and writes to an optical disc.</p>
(6) Optical drive eject button (select models only)	<p>Releases the optical drive disc tray.</p>
(7)  Security cable slot	<p>Attaches an optional security cable to the computer.</p>

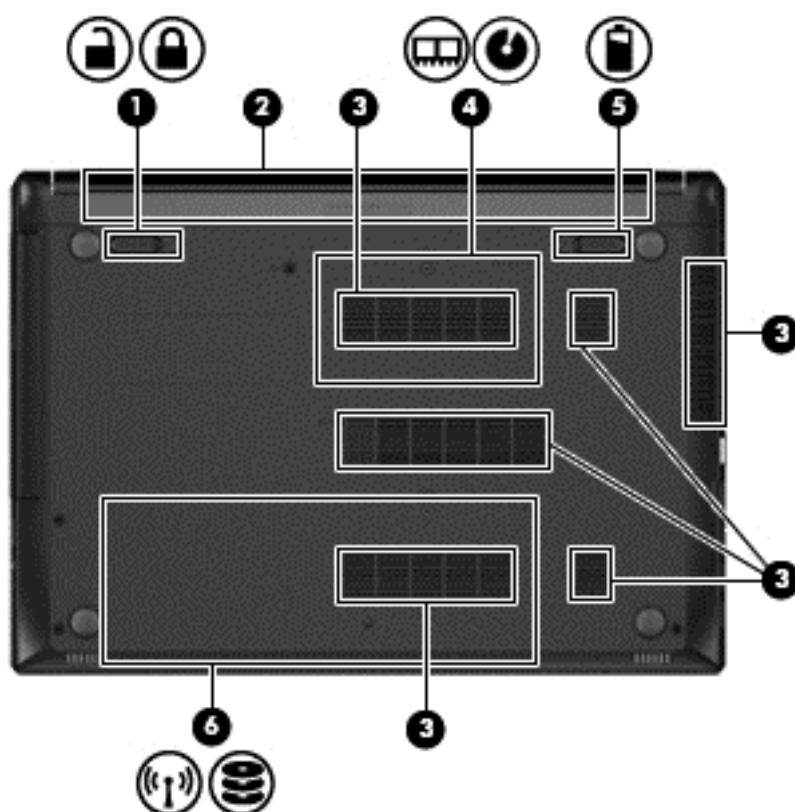
Component	Description
	NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.







Front




Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Memory card reader	Reads optional memory cards that store, manage, share, or access information.

Bottom



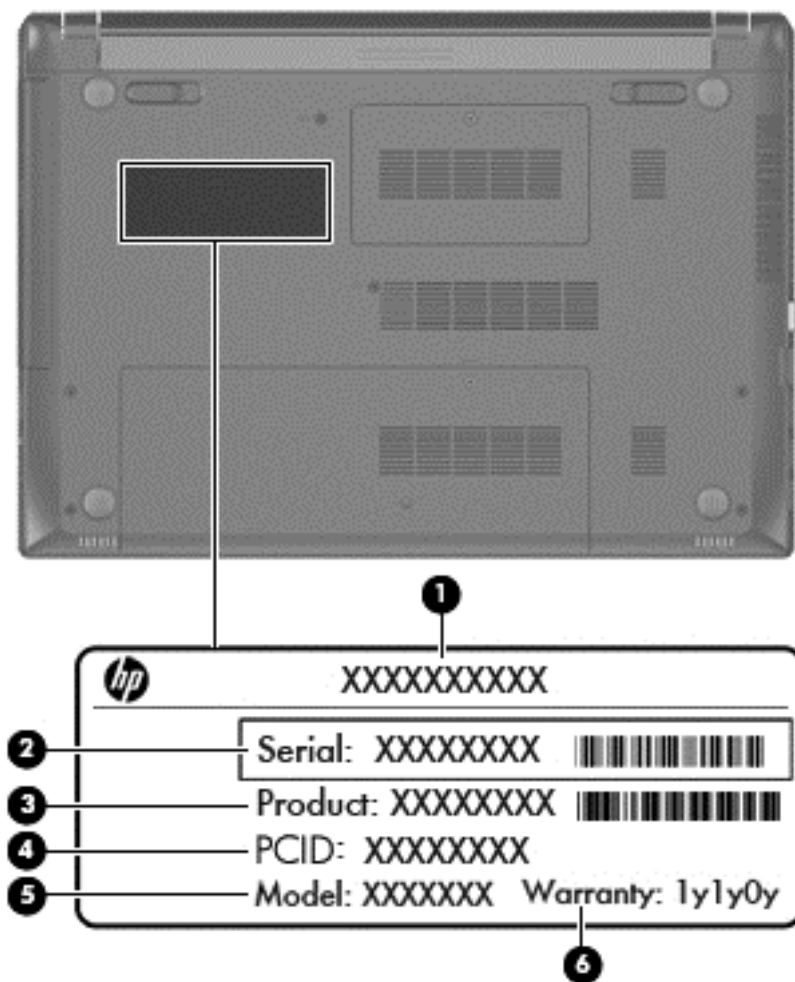
Component	Description
(1)  	Battery lock latch Locks the battery in the battery bay.
(2)	Battery bay Holds the battery.
(3)	Vents (6) Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(4)  	Memory module service door Provides access to the memory module compartments and the optical drive bay.
(5) 	Battery release latch Releases the battery from the battery bay.
(6) 	Hard drive service door Provides access to the hard drive bay and the wireless LAN (WLAN) module slot.

Component	Description
	<p>CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact support through HP Support Assistant. To access HP Support Assistant in Windows 8, from the Start screen, select the HP Support Assistant app. To access Help and Support in Windows 7, select Start > Help and Support.</p>

3 Illustrated parts catalog

Service tag

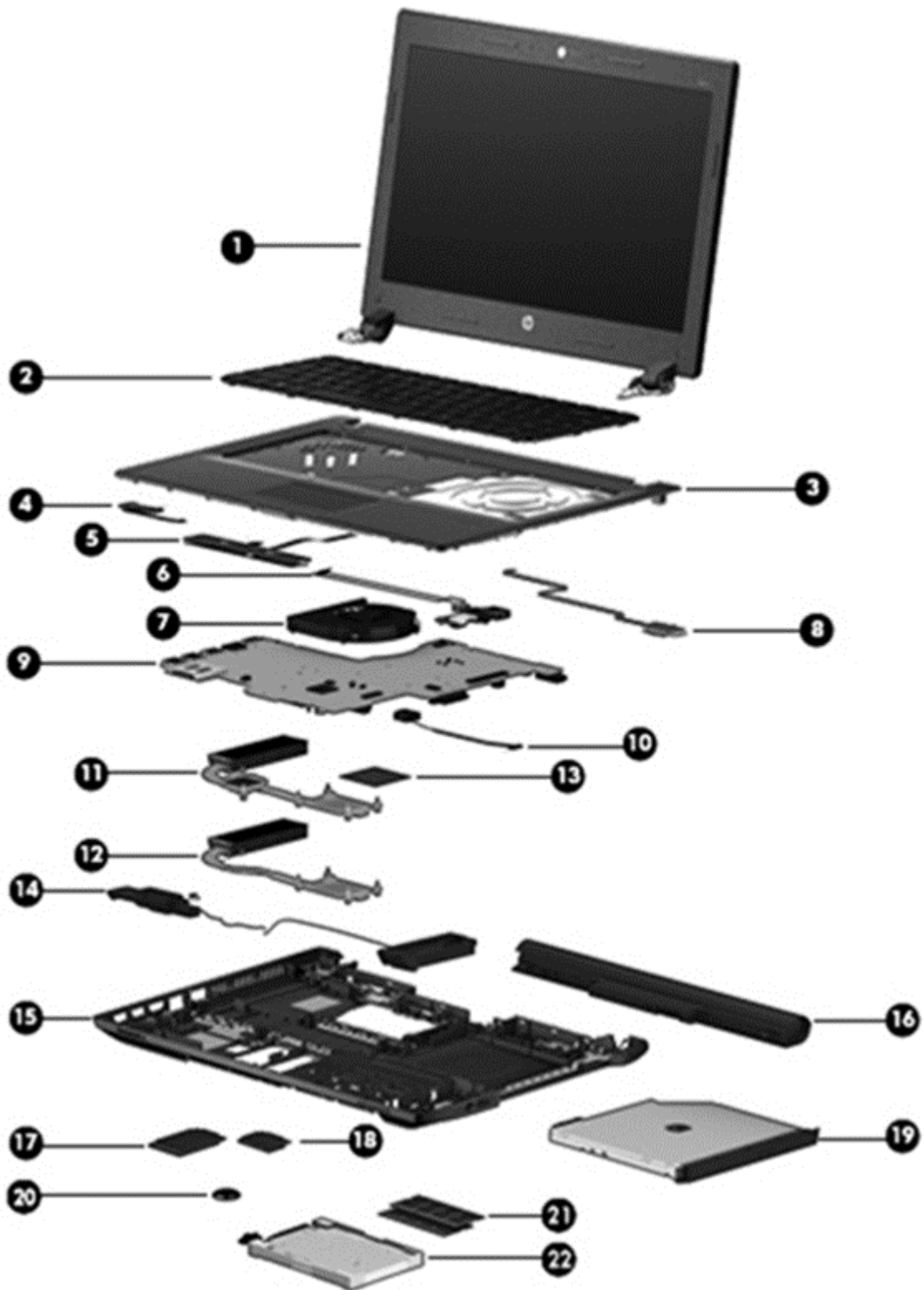
When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



Item	Description	Function
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.

Item	Description	Function
(4)	PCID number	The PCID label provides the information required to properly reset the notebook firmware (BIOS) back to factory shipped specifications when replacing the system board. The label may have a different number of characters depending on the operating system on the computer.
(5)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.
(6)	Warranty period	This number describes the duration of the warranty period for the computer.

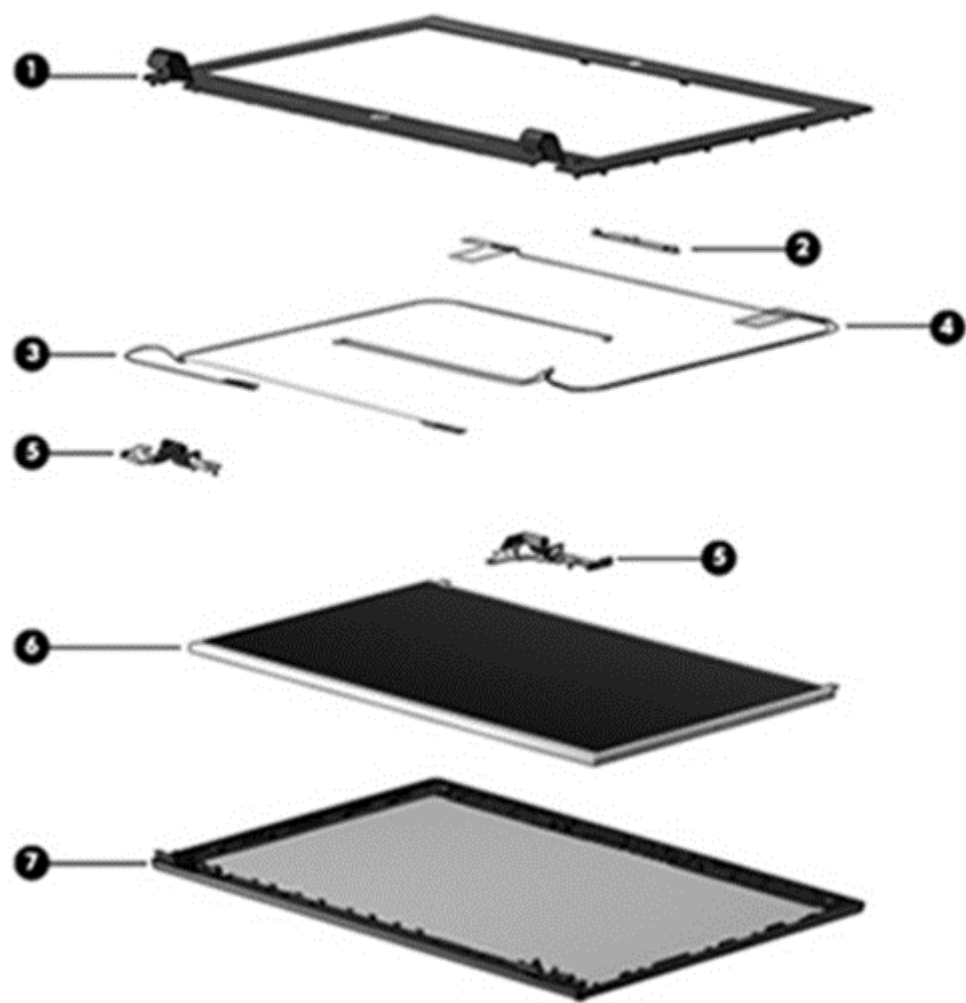
Computer major components



Item	Component	Spare part number
(1)	Display assembly: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 20 .	
(2)	Keyboard (includes keyboard cable):	
	For use in Indonesia	728127-D61
	For use in Taiwan	728127-AB1
	For use in Thailand	728127-281
	For use in the United States	728127-001
(3)	Top cover (includes TouchPad)	745152-001
(4)	Power button board (includes cable)	
	For use in models with discrete graphics	718436-001
	For use in models with UMA graphics	753197-001
(5)	TouchPad button board (includes bracket and cable)	
	For use in models with discrete graphics	728410-001
	For use in models with UMA graphics	753198-001
(6)	Audio/USB board (includes cable)	
	For use in models with discrete graphics	718435-001
	For use in models with UMA graphics	753196-001
(7)	Fan (includes cable)	718430-001
(8)	Fingerprint reader board (includes bracket and cable)	725239-001
(9)	System board (includes replacement thermal material):	
	For use in models without Windows 8 and with 2-GB of discrete graphics memory	743705-001
	For use in models with Windows 8 Standard and with 2-GB of discrete graphics memory	743705-501
	For use in models with Windows 8 Professional and with 2-GB of discrete graphics memory	743705-601
	For use in models without Windows 8 and with 1-GB of discrete graphics memory	743704-001
	For use in models with Windows 8 Standard and with 1-GB of discrete graphics memory	743704-501
	For use in models with Windows 8 Professional and with 1-GB of discrete graphics memory	743704-601
	For use in models without Windows 8 and with UMA graphics	743703-001
	For use in models with Windows 8 Standard and with UMA graphics	743703-501
	For use in models with Windows 8 Professional and with UMA graphics	743703-601
(10)	Power connector cable	732625-001
	Heat sink (includes replacement thermal material)	
(11)	For use in models with discrete graphics	753089-001
(12)	For use in models with UMA graphics	753090-001
(13)	Processor (includes replacement thermal material):	

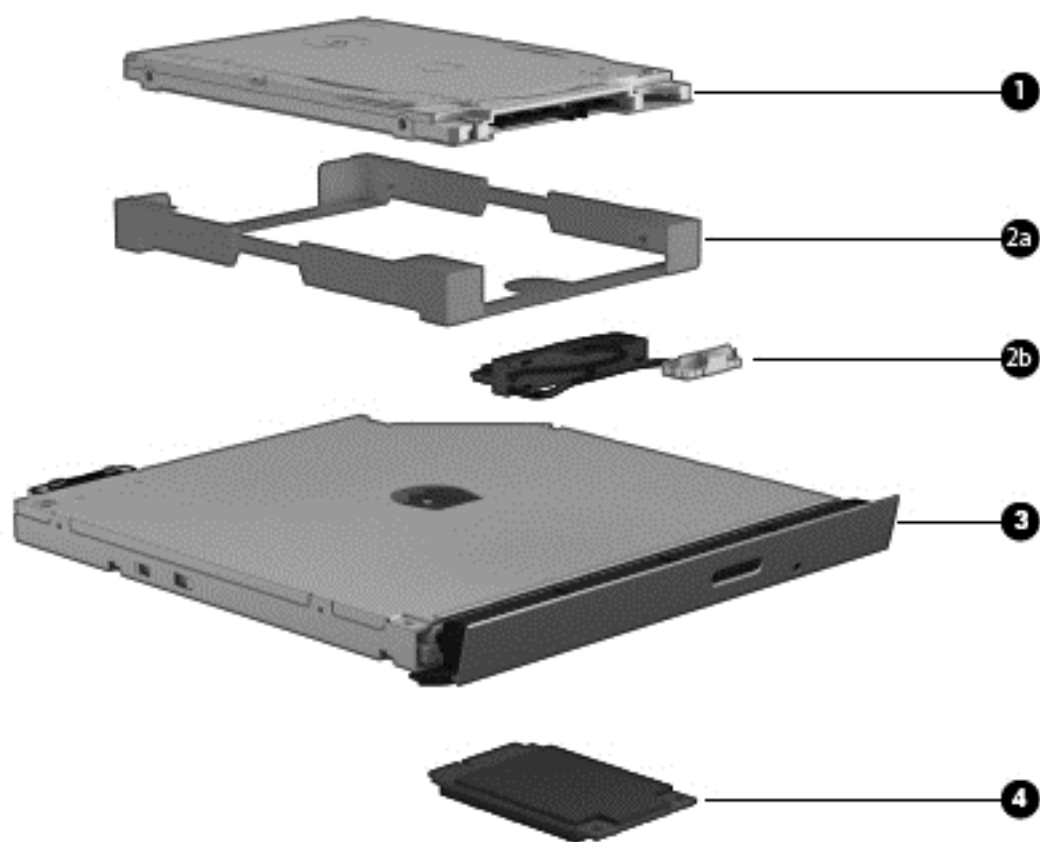
Item	Component	Spare part number
	Intel Core i3-4100M processor (2.50-GHz, 3-MB L3 cache, 37 W)	737328-001
	Intel Core i3-4100M processor (2.50-GHz, 3-MB L3 cache, 37 W)	737474-001
	Intel Core i3-4000M processor (2.40-GHz, 3-MB L3 cache, 37 W)	737327-001
	Intel Pentium 3550M processor (2.40-GHz, 2-MB L3 cache, 35 W)	737329-001
	Intel Celeron 2950M processor (2.0-GHz, 2-MB L3 cache, 35 W)	737326-001
(14)	Speakers (include left and right speakers and cables)	718443-001
(15)	Base enclosure (includes 4 rubber feet, battery lock latch, and battery release latch)	724296-001
(16)	Battery	
	4-cell, 41-Wh, 2.80-Ah, Li-ion battery	708462-001
	4-cell, 48-Wh, 3.20-Ah, Li-ion battery	724933-001
(17)	32-GB mSATA drive	728857-001
(18)	WLAN module:	
	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
	Broadcom BCM943228 802.11abgn 2x2 Wi-Fi + Bluetooth 4.0 Combo Adapter	730668-001
	Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
(19)	DVD±RW Double-Layer with SuperMulti Drive (includes bezel and bracket)	728285-001
(20)	RTC battery	718440-001
(21)	Memory module (PC3L, 12800, 1600-MHz):	
	8-GB	693374-001
	4-GB	691740-001
	2-GB	691739-001
(22)	Hard drive (does not include hard drive bracket or hard drive connector cable):	
	1-TB, 5400-rpm, 2.5-in	676521-001
	750-GB, 5400-rpm, 2.5-in	634250-001
	500-GB, 7200-rpm, 9.5-mm	678101-001
	500-GB, 7200-rpm, 7.0-mm	703267-001
	500-GB, 5400-rpm, 7.0-mm	683802-001
	320-GB, 5400-rpm, 7.0-mm	645193-005
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket and hard drive connector cable)	718432-001

Display assembly subcomponents



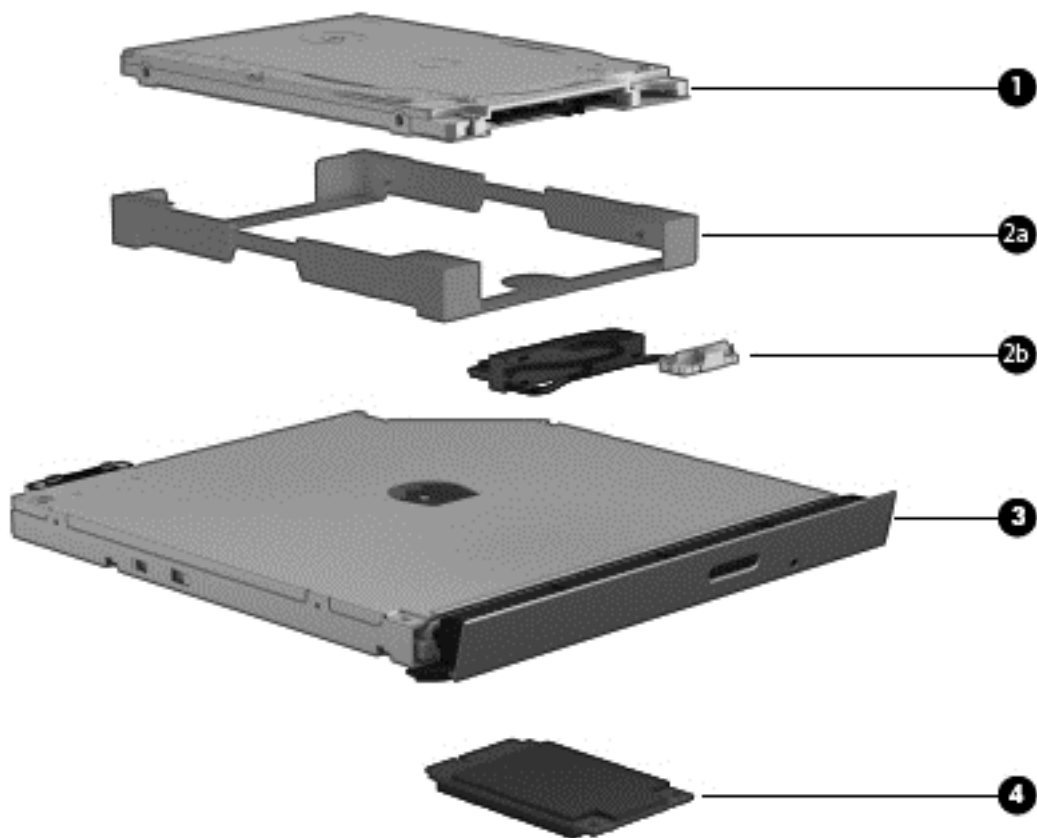
Item	Component	Spare part number
(1)	Display bezel	
	For use in models with a webcam	724297-001
	For use in models without a webcam	728281-001
(2)	Webcam/microphone module (includes double-sided adhesive)	728284-001
(3)	Display panel cable (includes webcam/microphone module cable)	724298-001
(4)	Antenna Kit (includes left and right wireless antenna cables and transceivers)	728280-001
(5)	Display hinges	728282-001
(6)	Display panel (14.0-in, anti-glare, 1366×768, HD)	725240-001
(7)	Display enclosure	724295-001
	Raw display panel support kit	724299-001

Plastics kit



Item	Component	Spare part number
Plastics kit		728283-001
(1)	Top cover corner covers	
(2)	Memory cover door	
(3)	Hard drive cover door	

Mass storage devices



Item	Component	Spare part number
(1)	Hard drive (does not include hard drive bracket or hard drive connector cable):	
	1-TB, 5400-rpm, 2.5-in	676521-001
	750-GB, 5400-rpm, 2.5-in	634250-001
	500-GB, 7200-rpm, 9.5-mm	678101-001
	500-GB, 7200-rpm, 7.0-mm	703267-001
	500-GB, 5400-rpm, 7.0-mm	683802-001
	320-GB, 5400-rpm, 7.0-mm	645193-005
	Hard Drive Hardware Kit , includes:	718432-001
(2a)	Hard drive bracket	
(2b)	Hard drive connector cable	
(3)	DVD±RW Double-Layer with SuperMulti Drive (includes bezel and bracket)	728285-001
(4)	32-GB mSATA drive	728857-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
90-W AC adapter for use in all countries and regions except the People's Republic of China and India	710413-001
90-W AC adapter for use in the People's Republic of China and India	710414-001
65-W AC adapter for use in all countries and regions except the People's Republic of China and India	710412-001
65-W AC adapter for use in the People's Republic of China and India	714657-001
Mouse , laser	674318-001
HP Ultralim Keyed Cable Lock	703372-001
HP Business Case	718550-001
Power cord (3-pin, black, 1.83-m):	
For use in Europe	490371-021
For use in India	490371-D61
For use in the People's Republic China	490371-AA1
For use in Taiwan	490371-AB1
For use in Thailand	490371-201
For use in the United Kingdom and Singapore	490371-031
Rubber Kit (includes rubber feet)	718441-001
Screw Kit	730320-001

Sequential part number listing

Spare part number	CSR flag	Description
490371-021	A	Power cord for use in Europe (3-pin, black, 1.83-m)
490371-031	A	Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.83-m)
490371-201	A	Power cord for use in Thailand (3-pin, black, 1.83-m)
490371-AA1	A	Power cord for use in the People's Republic of China (3-pin, black, 1.83-m)
490371-AB1	A	Power cord for use in Taiwan (3-pin, black, 1.83-m)
490371-D61	A	Power cord for use in India (3-pin, black, 1.83-m)
634250-001	A	750-GB, 5400-rpm, SATA, 2.5-in hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 718432-001.
645193-005	A	320-GB, 5400-rpm, SATA, 7.0-mm hard drive (does not include hard drive bracket or hard drive connector cable)

Spare part number	CSR flag	Description
674318-001	A	Mouse, laser
675794-001	A	Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter
676521-001	A	1-TB, 5400-rpm, SATA, 2.5-in hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 718432-001.
678101-001	A	500-GB, 7200-rpm, SATA, 9.5-mm hard drive (does not include hard drive bracket or hard drive connector cable)
683802-001	A	500-GB, 5400-rpm, SATA, 7.0-mm hard drive (does not include hard drive bracket or hard drive connector cable) NOTE: The hard drive bracket and screws are included in the Hard Drive Hardware Kit, spare part number 718432-001.
690020-001	A	Ralink RT3290LE 802.11b/g/n 1x1 WiFi and Bluetooth 4.0 Combo Adapter
691739-001	A	2-GB memory module (PC3L, 12800, 1600-MHz)
691740-001	A	4-GB memory module (PC3L, 12800, 1600-MHz)
693374-001	A	8-GB memory module (PC3L, 12800, 1600-MHz)
703267-001	A	500-GB, 7200-rpm, SATA, 7.0-mm hard drive (does not include hard drive bracket or hard drive connector cable)
703372-001	A	HP Ultrastim Keyed Cable Lock
708462-001	A	4-cell, 41-Wh, 2.80-Ah, Li-ion battery
710412-001	A	65-W AC adapter for use in all countries and regions except the People's Republic of China and India
710413-001	A	90-W AC adapter for use in all countries and regions except the People's Republic of China and India
710414-001	A	90-W AC adapter for use in the People's Republic of China and India
714657-001	A	65-W AC adapter for use in the People's Republic of China and India
718430-001	N	Fan (includes cable)
718432-001	N	Hard Drive Hardware Kit (includes hard drive bracket and hard drive connector cable)
718435-001	N	Audio/USB board for use in models with discrete graphics (includes cable)
718436-001	N	Power button board for use in models with discrete graphics (includes cable)
718440-001	N	RTC battery
718441-001	N	Rubber Kit (includes rubber feet)
718443-001	N	Speakers (includes left and right speakers and cables)
718550-001	A	HP Business Case
724295-001	N	Display enclosure
724296-001	N	Base enclosure (includes 4 rubber feet, battery lock latch, and battery release latch)
724297-001	N	Display bezel for use in models with a webcam
724298-001	N	Display panel cable (includes webcam/microphone module cable)

Spare part number	CSR flag	Description
724299-001	N	Raw display panel support kit
724933-001	A	4-cell, 48-Wh, 3.20-Ah, Li-ion battery
725239-001	N	Fingerprint reader board (includes bracket and cable)
725240-001	N	14.0-in, anti-glare, 1366×768, HD, LED display panel
728127-001	B	Keyboard for use in the United States (includes keyboard cable)
728127-281	B	Keyboard for use in Taiwan (includes keyboard cable)
728127-AB1	B	Keyboard for use in Thailand (includes keyboard cable)
728127-D61	B	Keyboard for use in Indonesia (includes keyboard cable)
728280-001	N	Antenna Kit (includes left and right wireless antenna cables and transceivers)
728281-001	N	Display bezel for use in models without a webcam
728282-001	N	Display hinges (includes left and right hinges)
728283-001	A	Plastics kit, includes memory cover, hard drive cover, and service cover
728284-001	N	Webcam/microphone module (includes double-sided adhesive)
728285-001	A	DVD±RW Double-Layer with SuperMulti Drive (includes bezel and bracket)
728410-001	N	TouchPad button board for use in models with discrete graphics (includes bracket and cable)
728857-001	A	32-GB mSATA drive
730320-001	N	Screw Kit
730668-001	A	Broadcom BCM943228 802.11abgn 2x2 Wi-Fi + Bluetooth 4.0 Combo Adapter
732625-001	N	Power connector cable
737326-001	N	Intel Celeron 2950M processor (2.0-GHz, 2-MB L3 cache, 35 W; includes replacement thermal material)
737327-001	N	Intel Core i3-4000M processor (2.40-GHz, 3-MB L3 cache, 37 W; includes replacement thermal material)
737328-001	N	Intel Core i3-4100M processor (2.50-GHz, 3-MB L3 cache, 37 W; includes replacement thermal material)
737329-001	N	Intel Pentium 3550M processor (2.40-GHz, 2-MB L3 cache, 35 W; includes replacement thermal material)
737474-001	N	Intel Core i3-4100M processor (2.50-GHz, 3-MB L3 cache, 37 W; includes replacement thermal material)
743703-001	N	System board for use in models without Windows 8 and with UMA graphics
743703-501	N	System board for use in models with Windows 8 Standard and with UMA graphics (includes thermal material)
743703-601	N	System board for use in models with Windows 8 Professional and with UMA graphics (includes thermal material)
743704-001	N	System board for use in models without Windows 8 and with 1-GB graphics (includes thermal material)
743704-501	N	System board for use in models with Windows 8 Standard and with 1-GB graphics (includes thermal material)

Spare part number	CSR flag	Description
743704-601	N	System board for use in models with Windows 8 Professional and with 1-GB graphics (includes thermal material)
743705-001	N	System board for use in models without Windows 8 and with 2-GB of discrete graphics memory (includes thermal material)
743705-501	N	System board for use in models with Windows 8 Standard and with 2-GB of discrete graphics memory (includes thermal material)
743705-601	N	System board for use in models with Windows 8 Professional and with 2-GB of discrete graphics memory (includes thermal material)
745152-001	N	Top cover (includes TouchPad)
753089-001	N	Heat sink for use in models with discrete graphics (includes replacement thermal material)
753090-001	N	Heat sink for use in models with UMA graphics (includes replacement thermal material)
753196-001	N	Audio/USB board for use in models with UMA graphics (includes cable)
753197-001	N	Power button board for use in models with UMA graphics (includes cable)
753197-001	N	Touchpad button board for use in models with UMA graphics (includes bracket and cable)

4 Removal and replacement procedures preliminary requirements

Tools required

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

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

Service considerations

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




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

Plastic parts




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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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


The following grounding equipment is recommended to prevent electrostatic damage:

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


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


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

5 Removal and replacement procedures for Customer Self-Repair parts

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

Component replacement procedures

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Service tag on page 16 for details.

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

There are as many as 6 screws that must be removed, replaced, and/or loosened when servicing Customer Self-Repair parts. Make special note of each screw size and location during removal and replacement.

Battery

Description	Spare part number
4-cell, 41-Wh, 2.80-Ah, Li-ion battery	708462-001
4-cell, 48-Wh, 3.20-Ah, Li-ion battery	724933-001

Before removing the battery, follow these steps:

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

Remove the battery:


- WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.
- CAUTION:** Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

1. Turn the computer upside down, with the rear toward you.
2. Place the computer on a flat surface, free of obstacles, with ample work space.
3. Slide the battery lock latch **(1)**, and then slide the battery release latch **(2)** to release the battery.
4. Remove the battery **(3)** from the computer.



Reverse this procedure to install the battery.

Hard drive

 **NOTE:** The hard drive spare part kit does not include the hard drive bracket or hard drive connector cable. These components are included in the Hard Drive Hardware Kit, spare part number 718432-001.

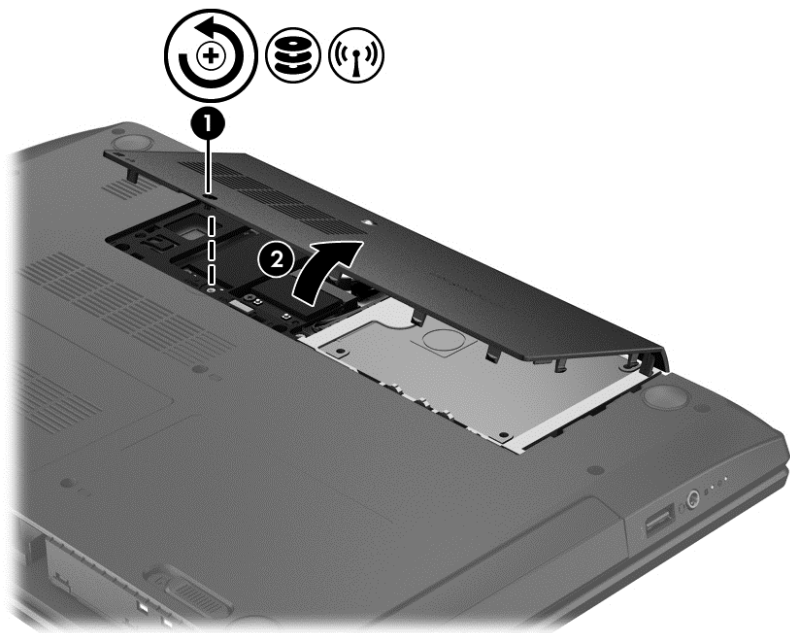
Description	Spare part number
1-TB, 5400-rpm, 2.5-in	676521-001
750-GB, 5400-rpm, 2.5-in	634250-001
500-GB, 7200-rpm, 9.5-mm	678101-001
500-GB, 7200-rpm, 7.0-mm	703267-001
500-GB, 5400-rpm, 7.0-mm	683802-001
320-GB, 5400-rpm, 7.0-mm	645193-005

Before removing the hard drive, follow these steps:

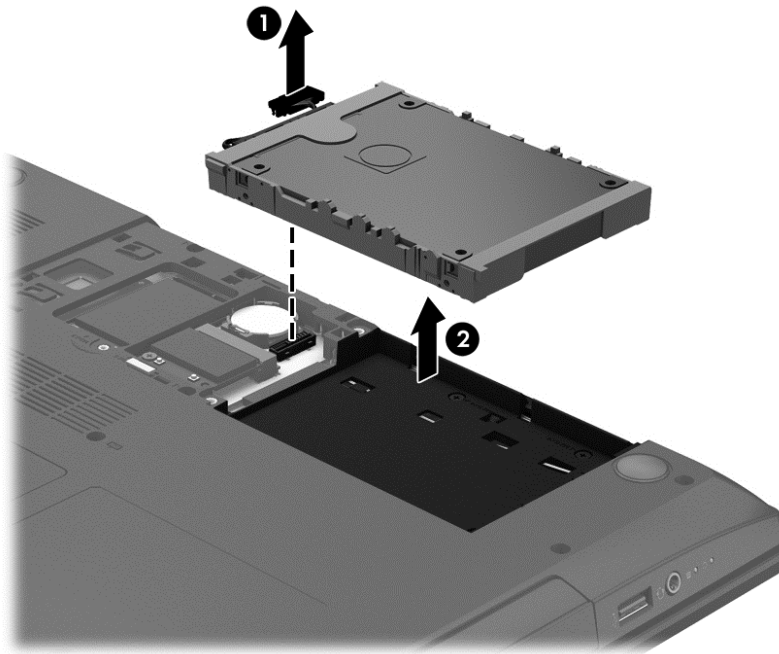
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).

Remove the hard drive:

1. Loosen the Phillips PM2.5×4.5 captive screw **(1)** that secures the hard drive service cover to the computer.
2. Lift the rear edge of the hard drive service cover **(2)** and swing it up and forward until it disengages from the computer.

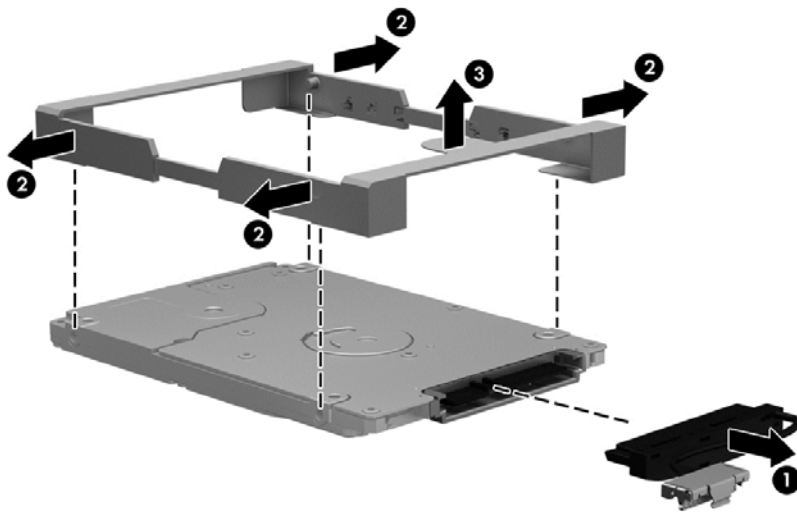


3. Remove the hard drive service cover. The hard drive service cover is included in the Plastics Kit, spare part number 718432-001.
4. Disconnect the hard drive connector cable **(1)** from the system board.
5. Lift the hard drive to remove it from the hard drive bay **(2)**.



6. If it is necessary to disassemble the hard drive, perform the following steps:
 - a. Position the hard drive with the connector toward you.
 - b. Disconnect the hard drive connector cable **(1)** from the hard drive.
 - c. Spread the left and right sides **(2)** of the hard drive bracket outward to separate the bracket from the hard drive.
 - d. Remove the hard drive bracket **(3)** from the hard drive.


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



Reverse this procedure to reassemble and install the hard drive.

WLAN module

Description	Spare part number
Atheros AR9485 802.11b/g/n 1x1 WiFi Adapter	675794-001
Broadcom BCM943228 802.11abgn 2x2 Wi-Fi + Bluetooth 4.0 Combo Adapter	730668-001
Ralink RT3290LE 802.11b/g/n 1x1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001

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

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the hard drive service cover (see [Hard drive on page 34](#)).

Remove the WLAN module:

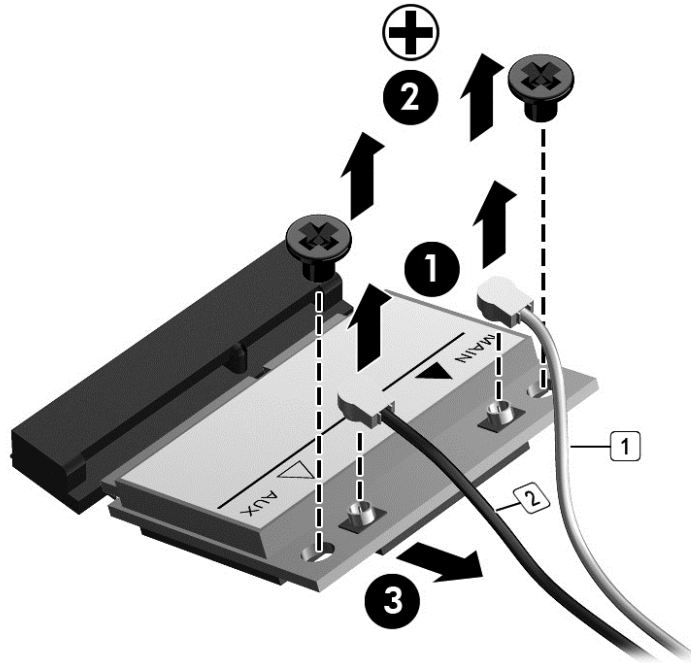
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.



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

2. Remove the two Phillips PM2.0×2.0 screws **(2)** that secure the WLAN module to the system board. (The WLAN module tilts up.)

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



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



Reverse this procedure to install the WLAN module.

mSATA drive

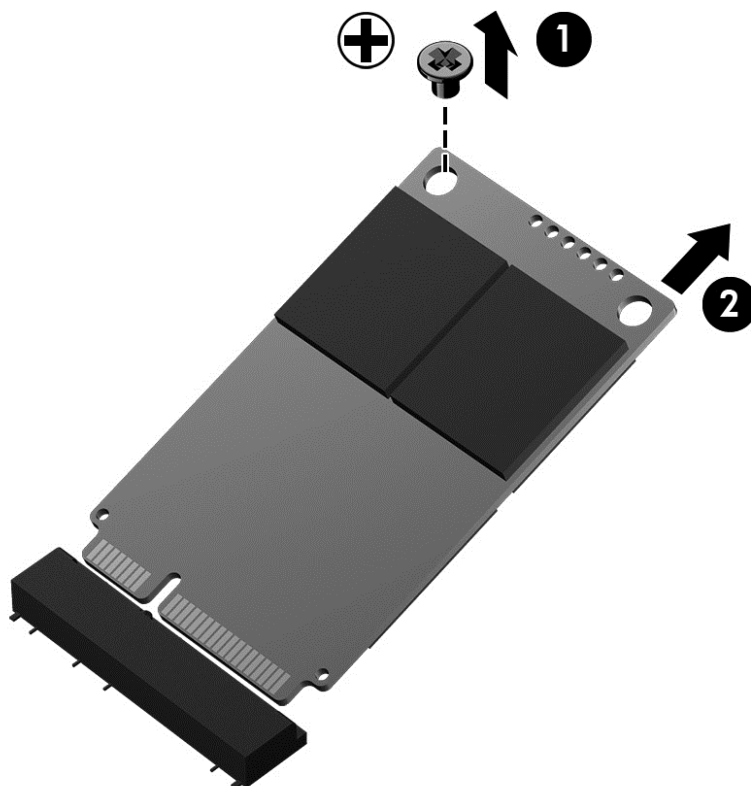
Description	Spare part number
32-GB mSATA drive	728857-001

Before removing the mSATA drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the hard drive service cover (see [Hard drive on page 34](#)).

Remove the mSATA drive:

1. Remove the Phillips PM2.0×2.0 screw **(1)** that secures the mSATA drive to the system board. (The mSATA drive tilts up.)
2. Remove the mSATA drive **(2)** by pulling the module away from the slot at an angle.




Reverse this procedure to install the mSATA drive.

Memory module

Description	Spare part number
8-GB (PC3L, 12800, 1600-MHz)	693374-001
4-GB (PC3L, 12800, 1600-MHz)	691740-001
2-GB (PC3L, 12800, 1600-MHz)	691739-001

Update BIOS before adding memory modules

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

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

To update BIOS:

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

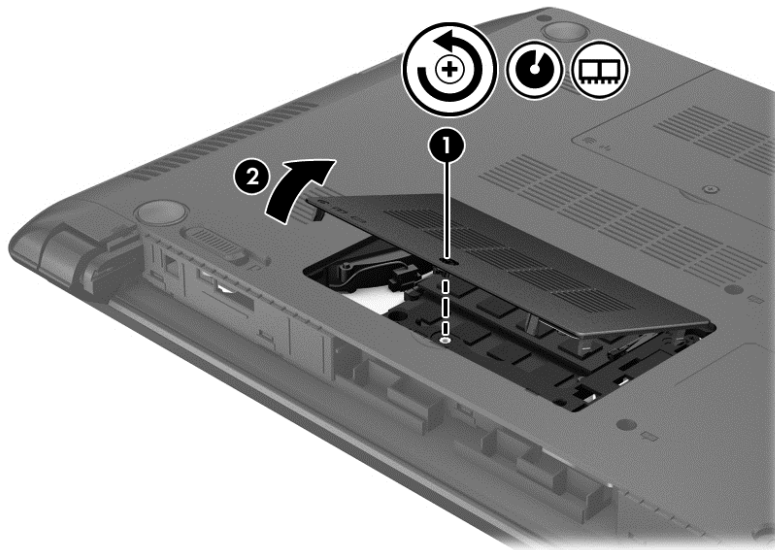
Before removing a memory module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).

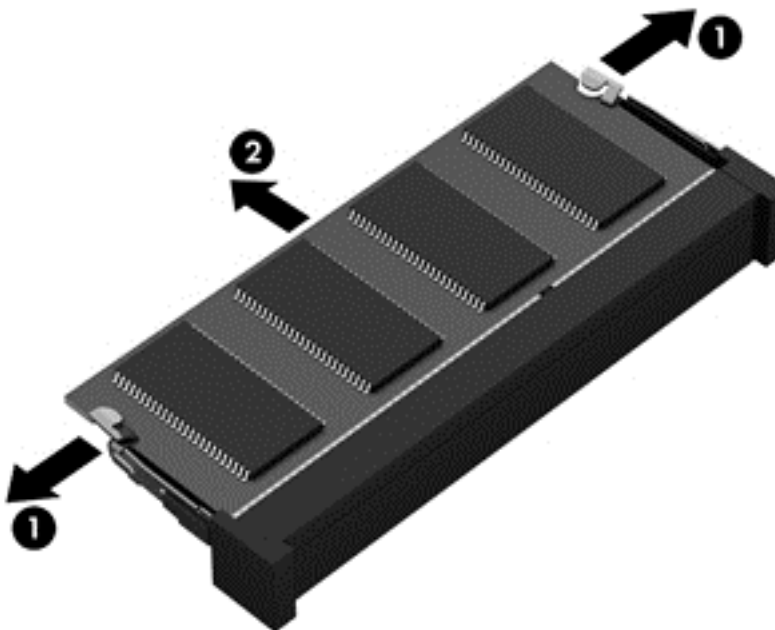
Remove the memory module:

1. Loosen the Phillips PM2.5×4.5 captive screw **(1)** that secures the memory module service cover to the computer.

2. Lift the rear edge of the memory module service cover **(2)** and swing it up and forward until it disengages from the computer.



3. Remove the memory module service cover.
The memory module service cover is included in the Plastics Kit, spare part number 728283-001.
4. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)
5. Remove the memory module **(2)** by pulling the module away from the slot at an angle.



Reverse this procedure to install a memory module.

Optical drive

All optical drive spare part kits contain a bezel and bracket.

Description	Spare part number
DVD±RW Double-Layer with SuperMulti Drive	728285-001

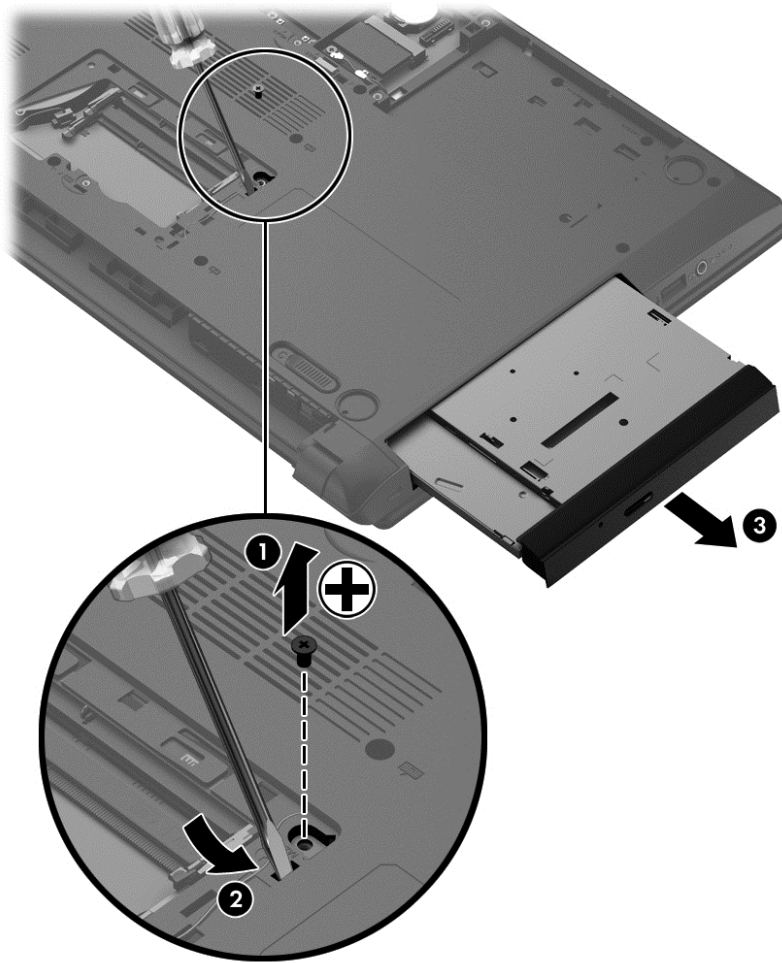
Before removing the optical drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the memory module service cover (see [Memory module on page 40](#)).

Remove the optical drive:

1. Remove the Phillips PM2.5×4.5 screw **(1)** that secures the optical drive to the computer.
2. Push the optical drive tab **(2)** to release the optical drive from the computer.

3. Remove the optical drive **(3)**.



4. If it is necessary to replace the optical drive bracket, position the optical drive with the rear toward you.
5. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the optical drive bracket to the optical drive.
6. Remove the optical drive bracket **(2)**.

Reverse this procedure to install the optical drive.

RTC battery

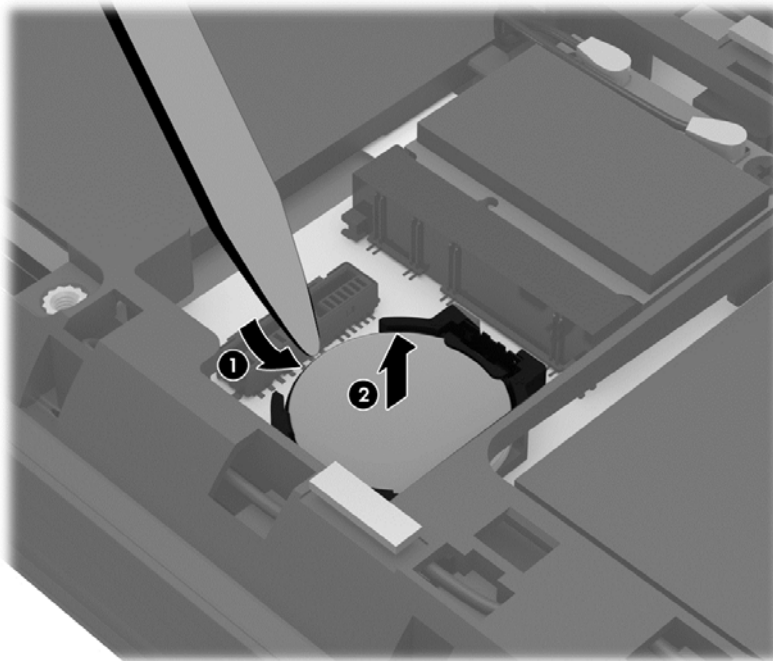
Description	Spare part number
RTC battery	718440-001

Before removing the RTC battery, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the hard drive service cover (see [Hard drive on page 34](#)).


Remove the RTC battery:

1. Use a thin screwdriver or similar tool to pry the battery out of the socket **(1)**.
2. Remove the RTC battery from the socket **(2)**.




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

6 Removal and replacement procedures for Authorized Service Provider parts

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

Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Service tag on page 15](#) for details.

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

There are as many as 47 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Keyboard



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

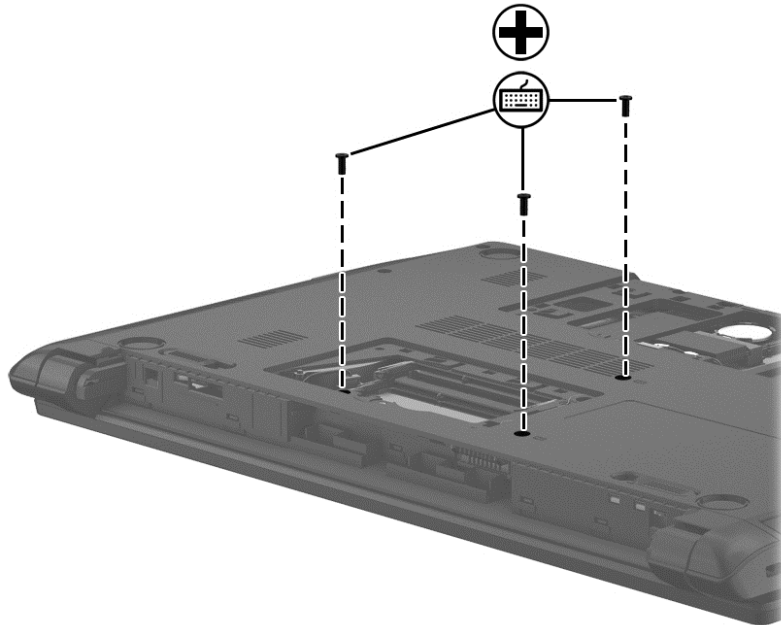
For use in country/region	Spare part number
For use in Indonesia	728127-D61
For use in Taiwan	728127-AB1
For use in Thailand	728127-281
For use in the United States	728127-001

Before removing the keyboard, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the memory module service cover (see [Memory module on page 40](#)).

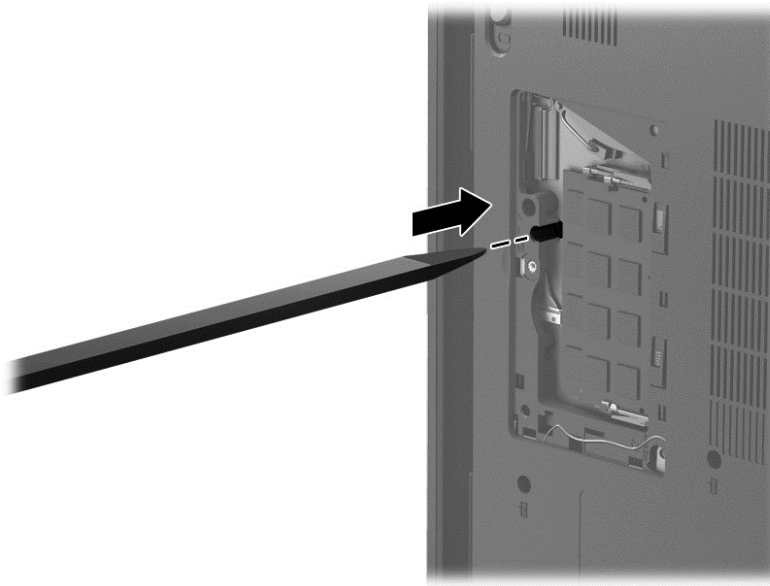
Remove the keyboard:

1. Remove the three Phillips PM2.5×6.5 screws that secure the keyboard to the computer.



2. Rest and secure the computer on its left side.
3. Partially open the computer.

4. Insert a thin tool into the keyboard release hole in the memory module compartment, and then press on the back of the keyboard until the keyboard disengages from the computer.

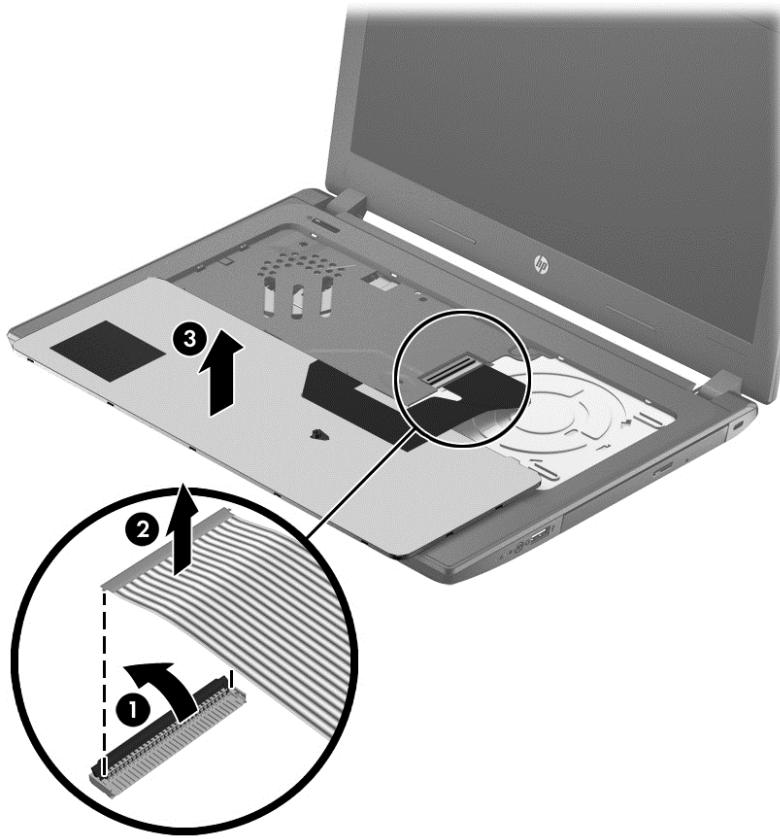


5. Turn the computer right-side up with the front toward you.
6. Lift the rear edge of the keyboard, and then swing the keyboard up and forward until it rests upside down on the palm rest.



7. Release the zero insertion force (ZIF) connector **(1)** to which the keyboard cable is attached, and then disconnect the keyboard cable **(2)** from the system board.

8. Remove the keyboard (3).



Reverse this procedure to install the keyboard.

Top cover

Description	Spare part number
Top cover (includes TouchPad)	745152-001

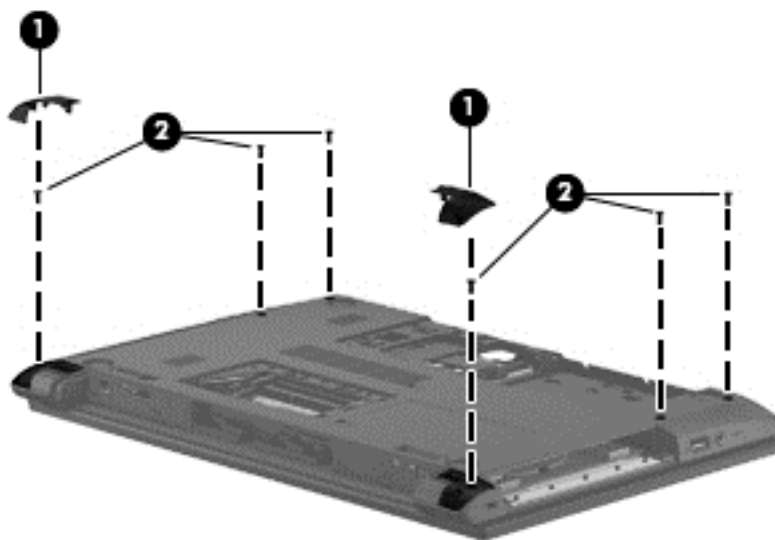
Before removing the top cover, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. Memory module service cover (see [Memory module on page 40](#))
 - c. Optical drive (see [Optical drive on page 42](#))
 - d. Keyboard (see [Keyboard on page 46](#))

When replacing the top cover, be sure that the power button board (see [Power button board on page 53](#)) and TouchPad button board (see [TouchPad button board on page 54](#)) are removed from the defective top cover and installed on the replacement top cover.

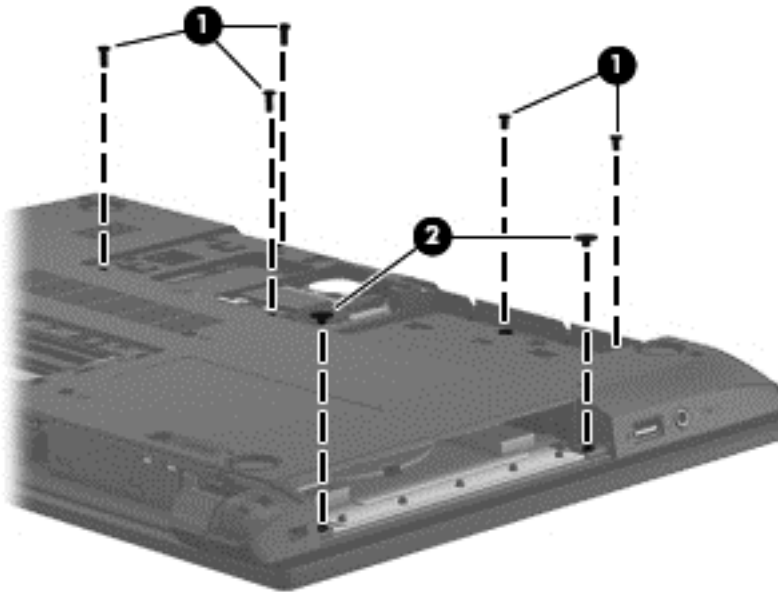
Remove the top cover:

1. Remove the rear corner covers (1).
2. Remove the six Phillips PM2.5×6.5 screws (2) that secure the top cover to the computer.

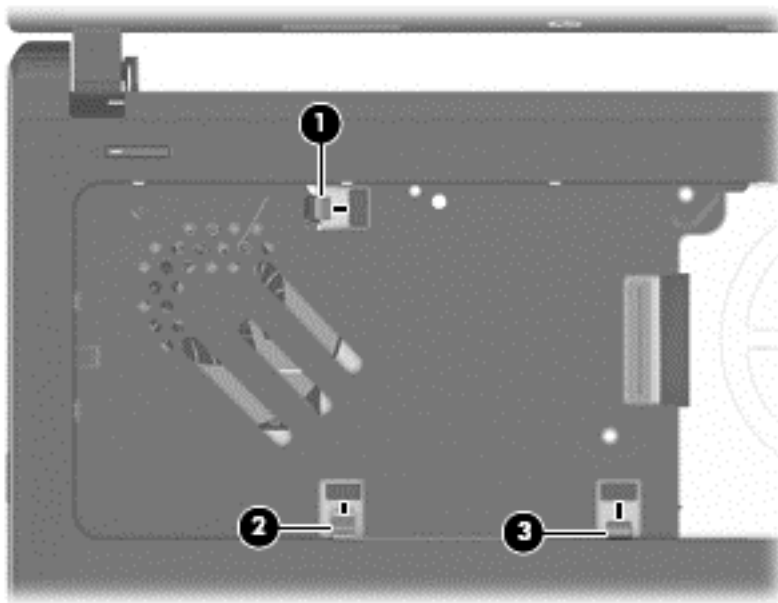


3. Remove the five Phillips PM2.5×4.0 screws (1) that secure the top cover to the computer.

4. Remove the two Phillips PM2.0×2.0 broad head screws **(2)** in the optical drive bay that secure the top cover to the computer.

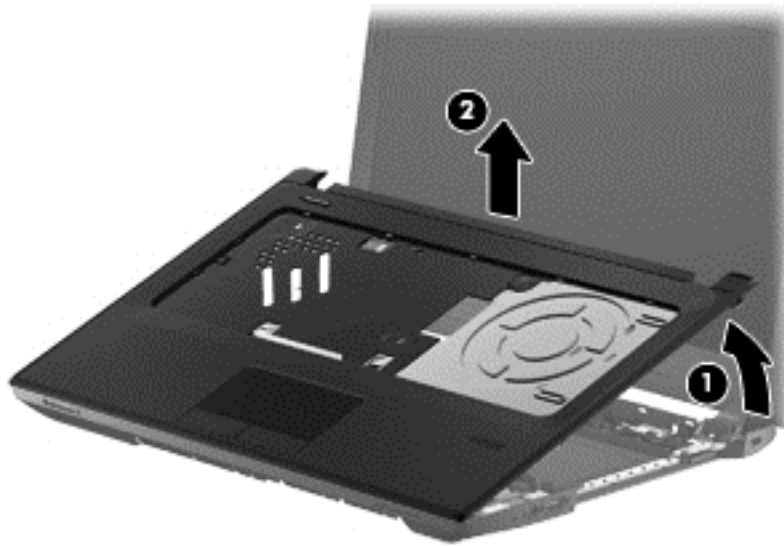


5. Turn the computer upright with the front toward you and open it.
6. Release the following ZIF connectors on the system board:
- **(1):** Power button board cable
 - **(2):** TouchPad button board cable
 - **(3):** Fingerprint board cable



7. Lift the rear edge of the top cover **(1)** and swing it up and forward until it detaches from the computer.

8. Remove the top cover **(2)**.



Reverse this procedure to install the top cover.

Fingerprint reader board

Description	Spare part number
Fingerprint reader board (includes bracket and cable)	725239-001

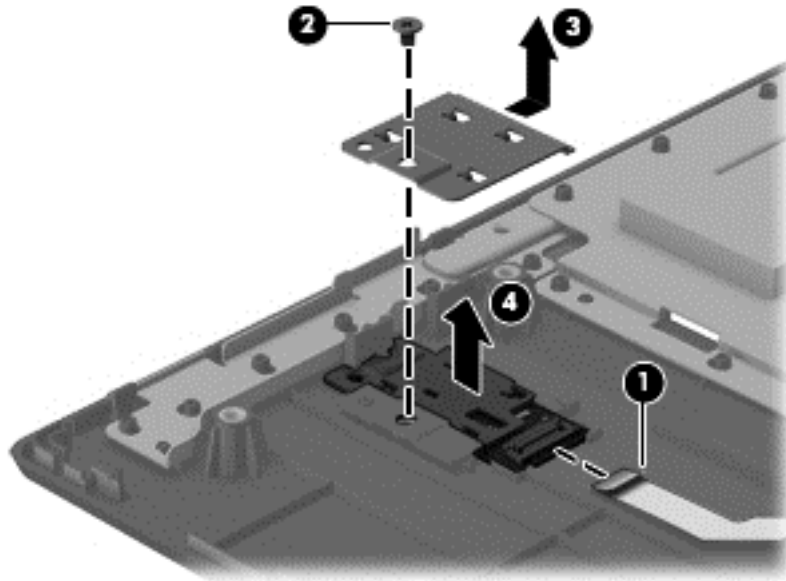
Before removing the power button board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. Memory module service cover (see [Memory module on page 40](#))
 - c. Optical drive (see [Optical drive on page 42](#))
 - d. Keyboard (see [Keyboard on page 46](#))
 - e. Top cover (see [Top cover on page 49](#))

Remove the fingerprint reader board:

1. Disconnect the fingerprint reader ribbon cable from the board **(1)**.
2. Remove the Phillips PM2.0×4.0 screw **(2)** that secures the fingerprint reader bracket to the top cover.
3. Lift the fingerprint reader bracket up off of its alignment pins and out of its slot in the top cover **(3)**.

4. The fingerprint reader is held in place with double-sided adhesive. Carefully pry the fingerprint reader up off of the top cover (4).



Reverse this procedure to install the fingerprint reader board.

Power button board

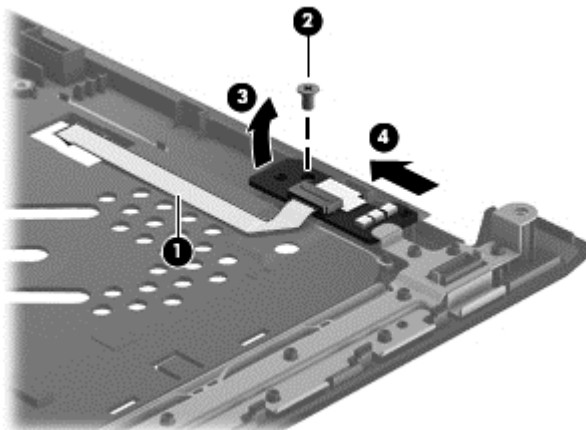
Description	Spare part number
Power button board for use in models with discrete graphics (includes cable)	718436-001
Power button board for use in models with UMA graphics (includes cable)	753197-001

Before removing the power button board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. Memory module service cover (see [Memory module on page 40](#))
 - c. Optical drive (see [Optical drive on page 42](#))
 - d. Keyboard (see [Keyboard on page 46](#))
 - e. Top cover (see [Top cover on page 49](#))

Remove the power button board:

1. Detach the power button board cable (1) from the top cover. (The power button board cable is attached to the top cover with double-sided tape.)
2. Remove the Phillips PM2.5×4.0 screw (2) that secures the power button board to the top cover.
3. Lift the left side of the power button board (3) until it rests at an angle, and then remove the power button board by sliding it up and to the left (4).



Reverse this procedure to install the power button board.

TouchPad button board

Description	Spare part number
TouchPad button board for use in models with discrete graphics (includes bracket and cable)	728410-001
TouchPad button board for use in models with UMA graphics (includes bracket and cable)	753198-001

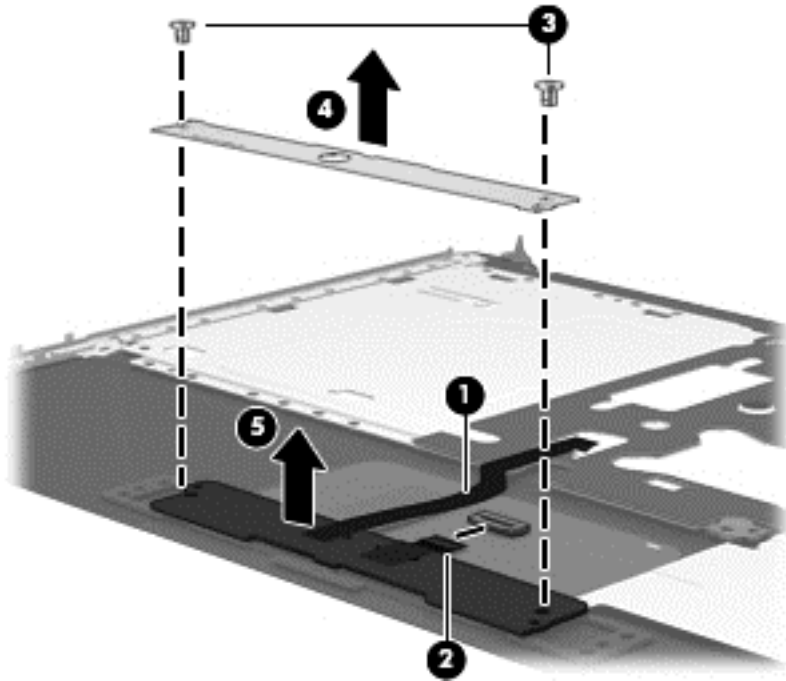
Before removing the TouchPad button board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. Memory module service cover (see [Memory module on page 40](#))
 - c. Optical drive (see [Optical drive on page 42](#))
 - d. Keyboard (see [Keyboard on page 46](#))
 - e. Top cover (see [Top cover on page 49](#))

Remove the TouchPad button board:

1. Detach the TouchPad button board cable **(1)** from the TouchPad. (The TouchPad button board cable is attached to the TouchPad with double-sided tape.)
2. Release the ZIF connector **(2)** to which the TouchPad cable is attached, and then disconnect the TouchPad cable from the TouchPad board.
3. Remove the two Phillips PM2.5×4.0 screws **(3)** that secure the TouchPad button board to the top cover.
4. Remove the TouchPad button board bracket **(4)**.

5. Remove the TouchPad button board (5).



Reverse this procedure to install the TouchPad button board.

Fan

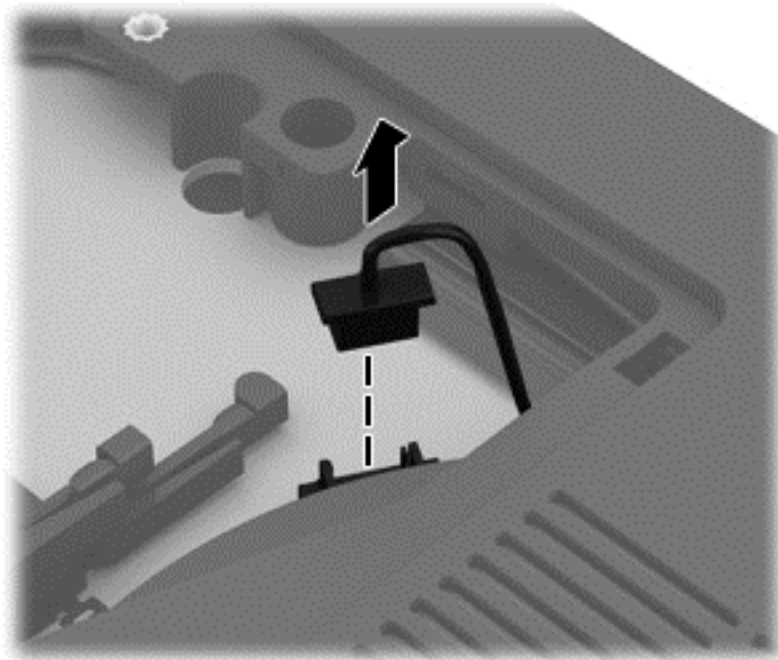
Description	Spare part number
Fan (includes cable)	718430-001

Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. Memory module service cover (see [Memory module on page 40](#))
 - c. Optical drive (see [Optical drive on page 42](#))
 - d. Keyboard (see [Keyboard on page 46](#))
 - e. Top cover (see [Top cover on page 49](#))

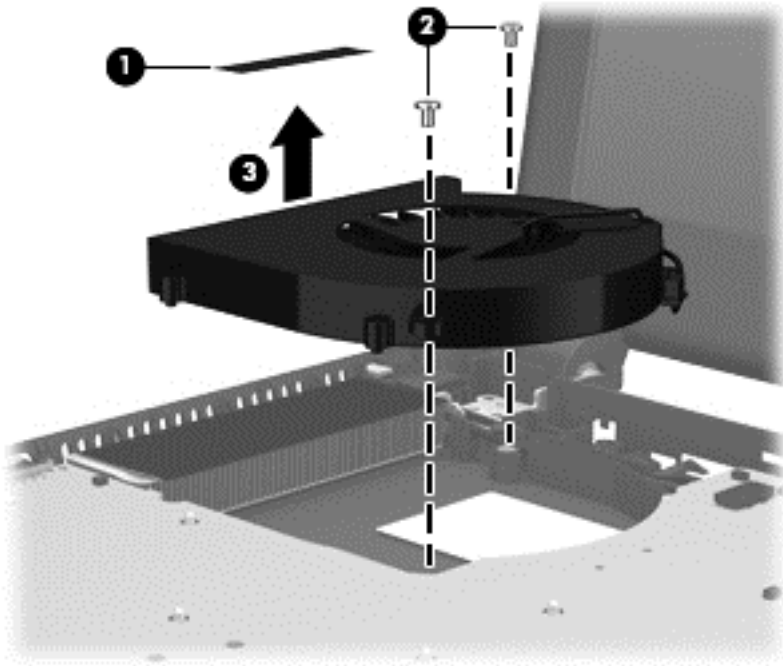
Remove the fan:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the fan cable from the system board.



4. Turn the computer right side up, with the front toward you.

5. Open the computer.
6. Remove the tape **(1)** that attaches the fan to the heat sink.
7. Remove the two Phillips PM2.0×4.5 screws **(2)** that secure the fan to the base enclosure.
8. Remove the fan **(3)** from the base enclosure.



Reverse this procedure to install the fan.

Audio/USB board

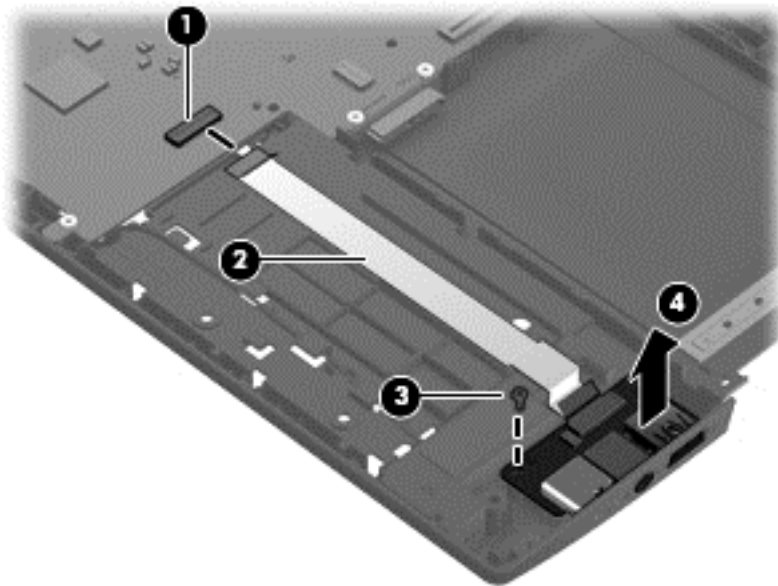
Description	Spare part number
Audio/USB board (includes cable)	718435-001

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

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. Memory module service cover (see [Memory module on page 40](#))
 - c. Optical drive (see [Optical drive on page 42](#))
 - d. Keyboard (see [Keyboard on page 46](#))
 - e. Top cover (see [Top cover on page 49](#))

Remove the audio/USB board:

1. Release the ZIF connector **(1)** to which the audio/USB board cable is attached, and then disconnect the audio/USB board cable from the system board.
2. Detach the audio/USB board cable **(2)** from the base enclosure. (The audio/USB board cable is attached to the base enclosure with double-sided tape.)
3. Remove the Phillips PM2.5×4.0 screw **(3)** that secures the audio/USB board to the base enclosure.
4. Remove the audio/USB **(4)** from the base enclosure.



Reverse this procedure to install the audio/USB board.

System board



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

Description	Spare part number
System board for use in models without Windows 8 and with 2-GB of discrete graphics memory	743705-001
System board for use in models with Windows 8 Standard and with 2-GB of discrete graphics memory	743705-501
System board for use in models with Windows 8 Professional and with 2-GB of discrete graphics memory	743705-601
System board for use in models without Windows 8 and with 1-GB of discrete graphics memory	743704-001
System board for use in models with Windows 8 Standard and with 1-GB of discrete graphics memory	743704-501
System board for use in models with Windows 8 Professional and with 1-GB of discrete graphics memory	743704-601
System board for use in models without Windows 8 and with UMA graphics	743703-001
System board for use in models with Windows 8 Standard and with UMA graphics	743703-501
System board for use in models with Windows 8 Professional and with UMA graphics	743703-601

Before removing the system board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Solid-state drive (see [mSATA drive on page 39](#))
 - d. Memory module service cover (see [Memory module on page 40](#))
 - e. Optical drive (see [Optical drive on page 42](#))
 - f. Keyboard (see [Keyboard on page 46](#))
 - g. Top cover (see [Top cover on page 49](#))
 - h. Fan (see [Fan on page 56](#))

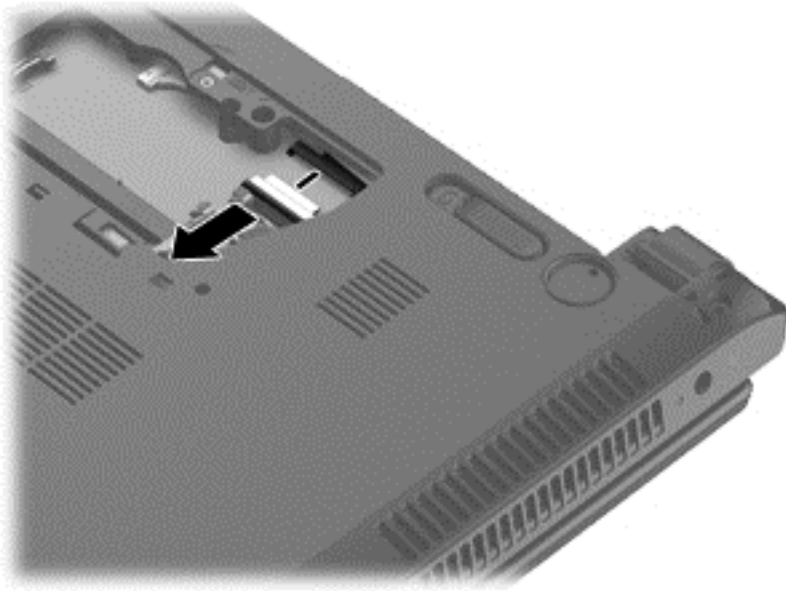


NOTE: When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

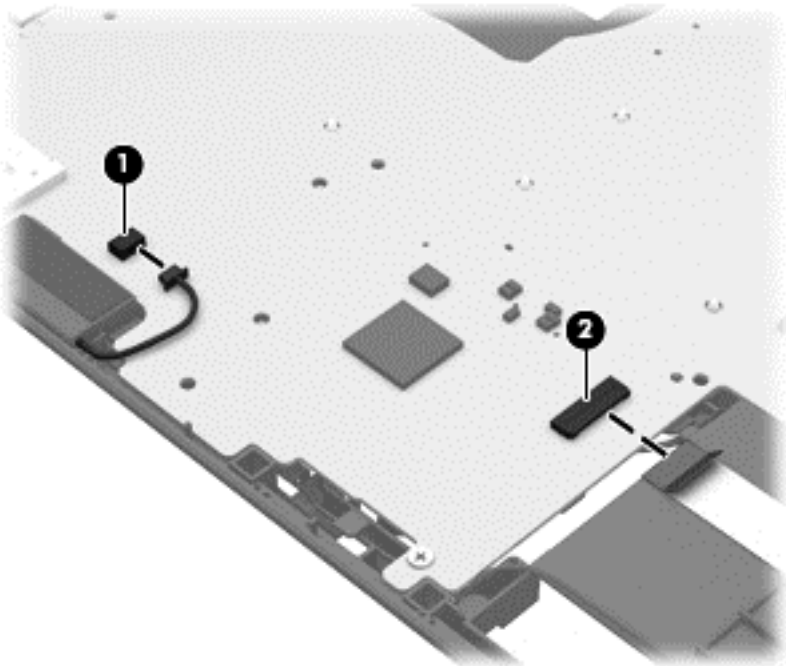
- Memory module (see [Memory module on page 40](#))
- Heat sink (see [Heat sink on page 63](#))
- Processor (see [Processor on page 66](#))

Remove the system board:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the display panel cable from the system board.

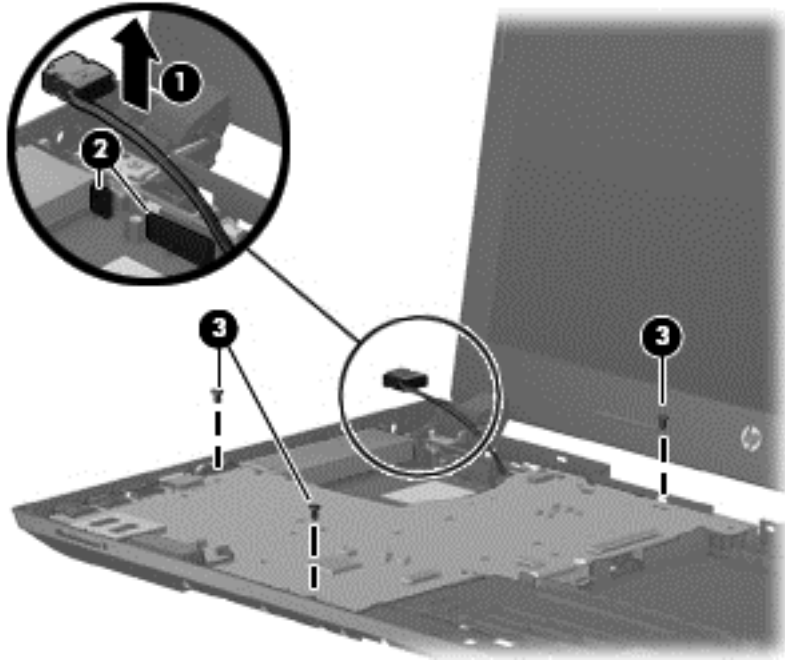


4. Turn the computer right side up, with the front toward you.
5. Open the computer.
6. Disconnect the speaker cable **(1)** from the system board.
7. Release the ZIF connector **(2)** to which the audio/USB board cable is attached, and then disconnect the audio/USB board cable from the system board.

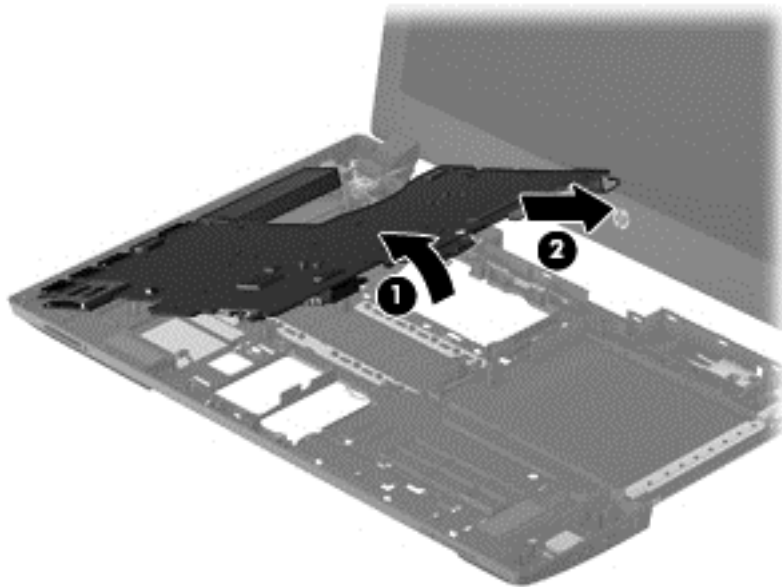


8. Release the power connector **(1)** from the clips and molding built into the base enclosure.

9. Release the power connector cable **(2)** from the routing channel built into the base enclosure.
10. Remove the three Phillips PM2.5×4.5 screws **(3)** that secure the system board to the base enclosure.



11. Lift the right side of the system board **(1)** until it rests at an angle.
12. Remove the system board by sliding it up and to the right an angle **(2)**.



Reverse this procedure to install the system board.

Power connector cable

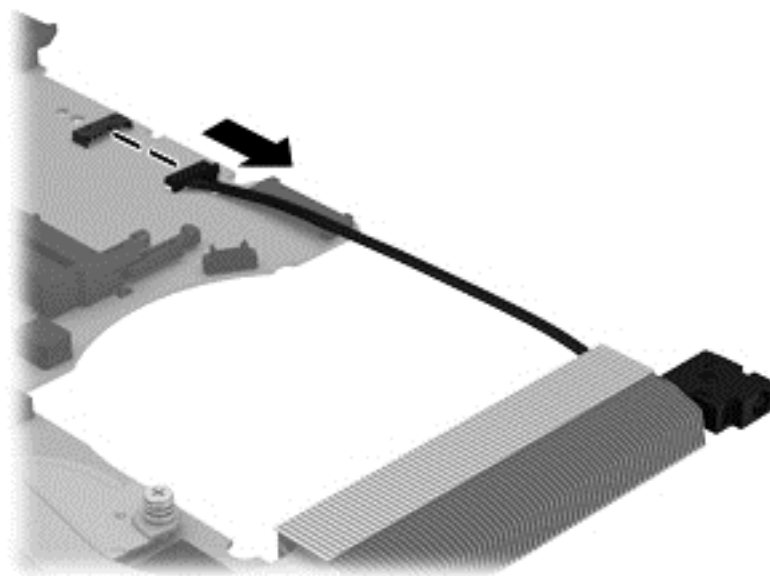
Description	Spare part number
Power connector cable	732625-001

Before removing the power connector cable, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Solid-state drive (see [mSATA drive on page 39](#))
 - d. Memory module service cover (see [Memory module on page 40](#))
 - e. Optical drive (see [Optical drive on page 42](#))
 - f. Keyboard (see [Keyboard on page 46](#))
 - g. Top cover (see [Top cover on page 49](#))
 - h. Fan (see [Fan on page 56](#))
 - i. System board (see [System board on page 59](#))

Remove the power connector cable:

1. Turn the system board upside down, with the front toward you.
2. Disconnect the power cable from the system board.



Reverse this procedure to install the power connector cable.

Heat sink

Description	Spare part number
Heat sink for use in models with discrete graphics (includes replacement thermal material)	753089-001
Heat sink for use in models with UMA graphics (includes replacement thermal material)	753090-001

Before removing the heat sink, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Solid-state drive (see [mSATA drive on page 39](#))
 - d. Memory module service cover (see [Memory module on page 40](#))
 - e. Optical drive (see [Optical drive on page 42](#))
 - f. Keyboard (see [Keyboard on page 46](#))
 - g. Top cover (see [Top cover on page 49](#))
 - h. Fan (see [Fan on page 56](#))
 - i. System board (see [System board on page 59](#))


Remove the heat sink:

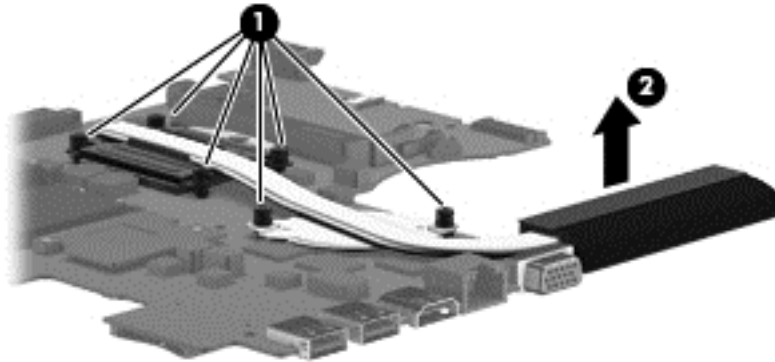
1. Turn the system board upside down, with the front toward you.
2. Models are available with either UMA or discrete graphics. The heat sink on discrete models includes two additional screws. Refer to the following steps that match your model:


Discrete models:


- a. Following the 1, 2, 3, 4, 5, 6 sequence stamped into the heat sink, loosen the six Phillips PM2.0×4.5 screws **(1)** that secure the heat sink to the system board.

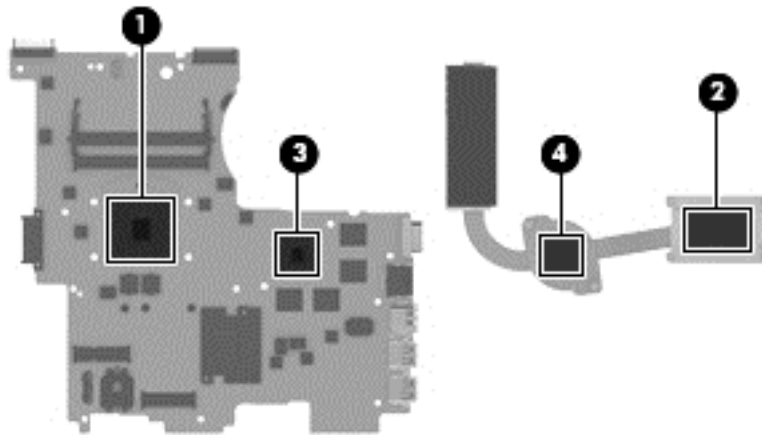
- b. Remove the heat sink **(2)**.

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



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink, processor, and system board spare part kits.


 **NOTE:** For discrete models, thoroughly clean thermal material from the surfaces of the system board components each time you remove the heat sink. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it. A thermal pad is used on the Northbridge chip **(3)** and the heat sink section **(4)** that services it. All heat sink and processor spare part kits include thermal material.

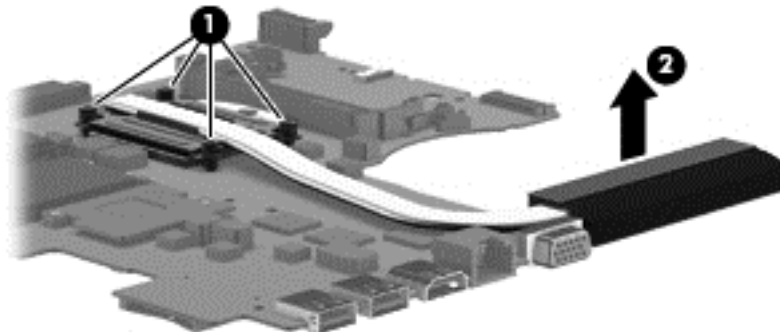



UMA models:


- a. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the four Phillips PM2.0×4.5 screws **(1)** that secure the heat sink to the system board.

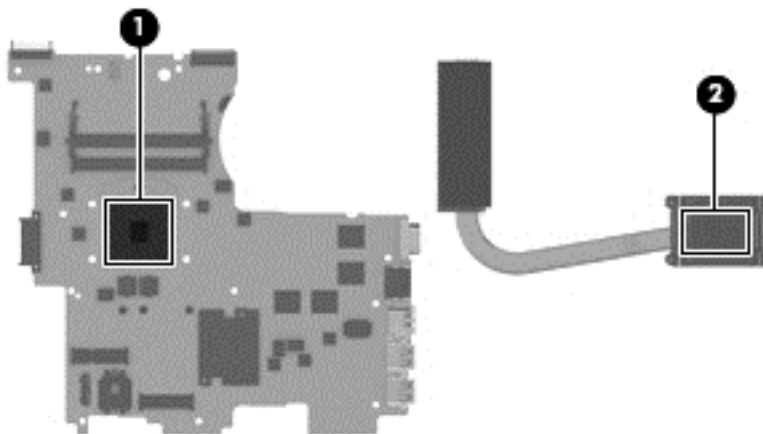
b. Remove the heat sink (2).

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



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink, processor, and system board spare part kits.

 **NOTE:** For UMA models, thoroughly clean thermal material from the surfaces of the system board components each time you remove the heat sink. Thermal paste is used on the processor (1) and the heat sink section (2) that services it. All heat sink and processor spare part kits include thermal material.



Reverse this procedure to install the heat sink.

Processor



NOTE: The processor spare part kit includes replacement thermal material.

Description	Spare part number
Intel Core i7-4600M 2.90-GHz processor, 4.0-MB L3 cache, 37 W	737330-002
Intel Core i5-4200M processor (2.50-GHz, 3-MB L3 cache, 37 W)	737328-001
Intel Core i3-4100M processor (2.50-GHz, 3-MB L3 cache, 37 W)	737474-001
Intel Core i3-4000M processor (2.40-GHz, 3-MB L3 cache, 37 W)	737327-001
Intel Pentium 3550M processor (2.40-GHz, 2-MB L3 cache, 35 W)	737329-001
Intel Celeron 2950M processor (2.0-GHz, 2-MB L3 cache, 35 W)	737326-001


Before removing the processor, follow these steps:

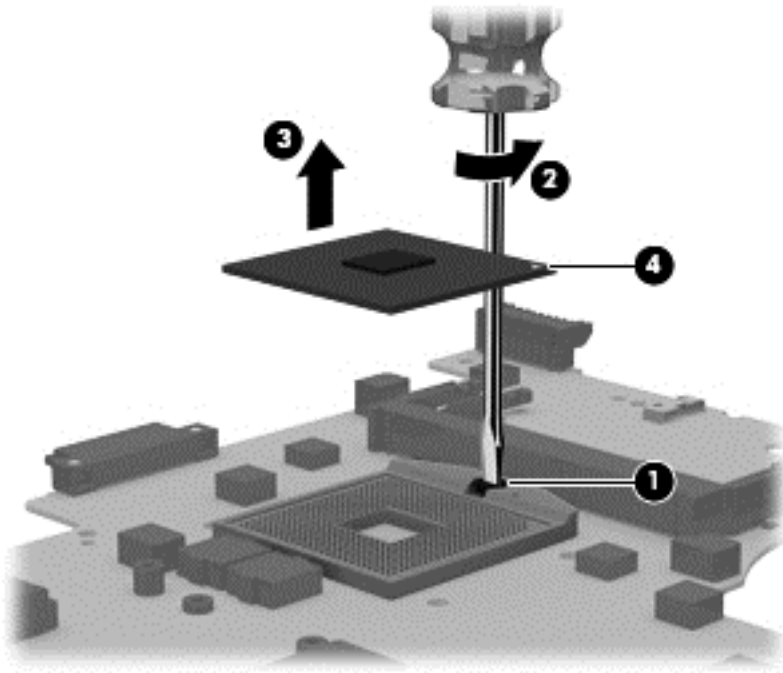
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Solid-state drive (see [mSATA drive on page 39](#))
 - d. Memory module service cover (see [Memory module on page 40](#))
 - e. Optical drive (see [Optical drive on page 42](#))
 - f. Keyboard (see [Keyboard on page 46](#))
 - g. Top cover (see [Top cover on page 49](#))
 - h. Fan (see [Fan on page 56](#))
 - i. System board (see [System board on page 59](#))
 - j. Heat sink (see [Heat sink on page 63](#))

Remove the processor:

1. Turn the system board upside down, with the front toward you.
2. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise **(2)**, until you hear a click.

3. Lift the processor **(3)** straight up, and remove it.

 **NOTE:** The gold triangle **(4)** on the processor must be aligned with the triangle icon embossed on the processor socket when you install the processor.



Reverse this procedure to install the processor.

Speakers

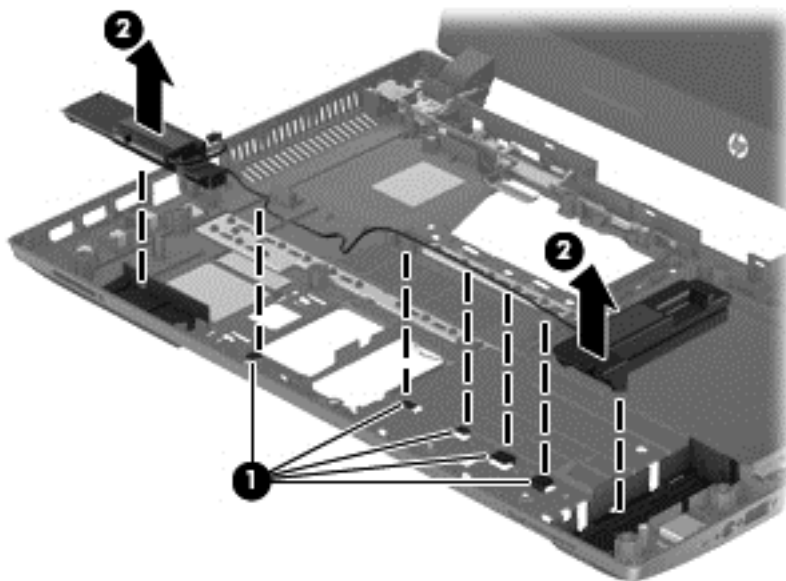
Description	Spare part number
Speakers (include left and right speakers and cables)	718443-001

Before removing the speakers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Solid-state drive (see [mSATA drive on page 39](#))
 - d. Memory module service cover (see [Memory module on page 40](#))
 - e. Optical drive (see [Optical drive on page 42](#))
 - f. Keyboard (see [Keyboard on page 46](#))
 - g. Top cover (see [Top cover on page 49](#))
 - h. Fan (see [Fan on page 56](#))
 - i. System board (see [System board on page 59](#))

Remove the speakers:

1. Release the front speaker cables (1) from the clips built into the base enclosure.
2. Remove the speakers (2).



Reverse this procedure to install the speakers.

Display assembly subcomponents



NOTE: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

A Raw panel support kit is available using spare part number 724299-001.

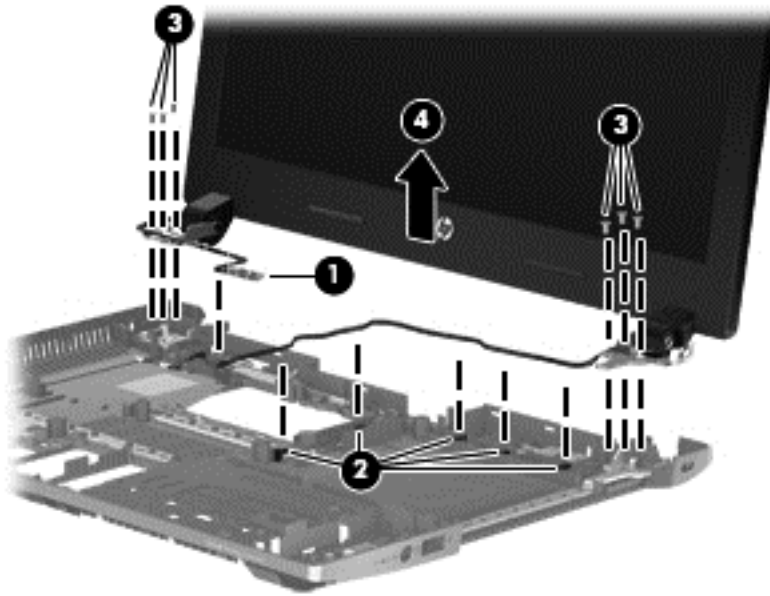
To remove the display assembly and access the display assembly subcomponents, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)) and then remove the following components:
 - a. Hard drive (see [Hard drive on page 34](#))
 - b. WLAN module (see [WLAN module on page 37](#))
 - c. Solid-state drive (see [mSATA drive on page 39](#))
 - d. Memory module service cover (see [Memory module on page 40](#))
 - e. Optical drive (see [Optical drive on page 42](#))
 - f. Keyboard (see [Keyboard on page 46](#))
 - g. Top cover (see [Top cover on page 49](#))
 - h. Fan (see [Fan on page 56](#))
 - i. System board (see [System board on page 59](#))

Remove the display assembly:

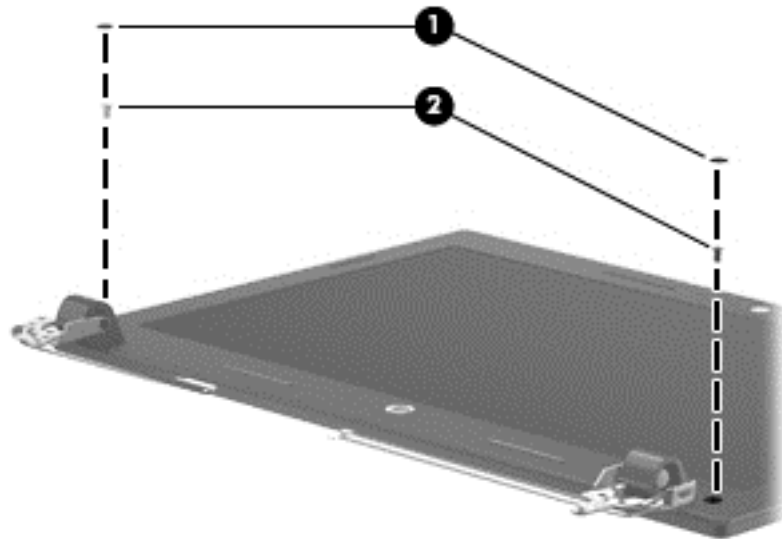
1. Release the display panel cable **(1)** from the clips and routing channel built into the base enclosure.
2. Release the wireless antenna cables **(2)** from the clips and routing channel built into the base enclosure and right display hinge.
3. Remove the six Phillips PM2.5×4.5 screws **(3)** that secure the display assembly to the top cover.

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



5. If it is necessary to replace the display bezel or any of the display assembly subcomponents:

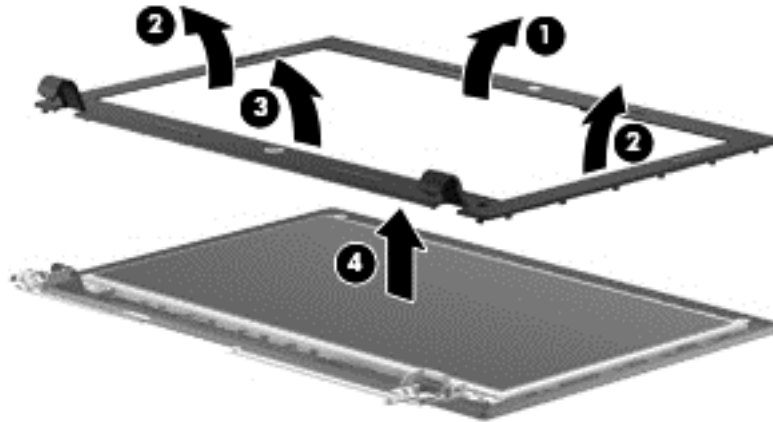
- a. Remove the two crew covers **(1)** and the two Phillips PM2.5×3.5 screws **(2)** that secure the display bezel to the display assembly.



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

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

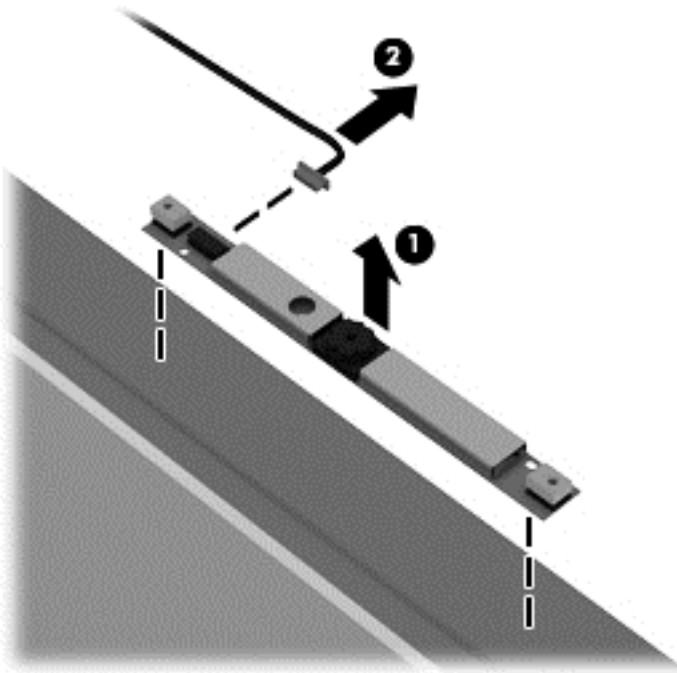
The display bezel is available using spare part number 724297-001 for models with a webcam and 728281-001 for models without a webcam.



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

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

- Detach the webcam/microphone module **(1)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided adhesive.)
- Disconnect the webcam/microphone module cable **(2)** from the webcam/microphone module.



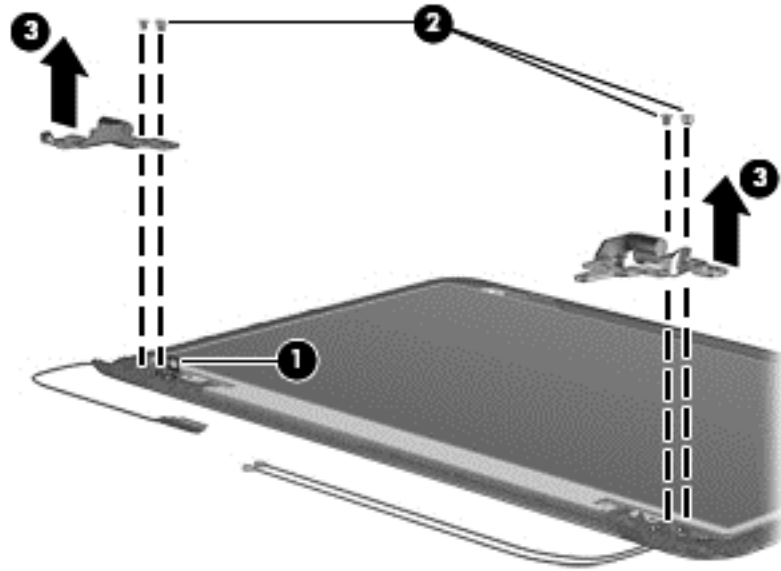
- c. Remove the webcam/microphone module.

The webcam/microphone module is available using spare part number 728284-001.

7. If it is necessary to replace the display hinges:


- a. Release the grounding tape **(1)** that secures the left display hinge to the display enclosure.
- b. Remove the four Phillips PM2.5×3.0 screws **(2)** that secure the display hinges to the display enclosure.
- c. Remove the display hinges **(3)**.

The display hinges are available using spare part number 728282-001.

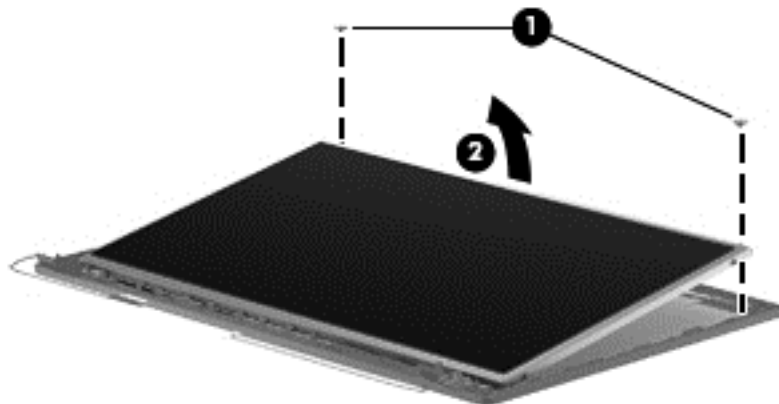


8. If it is necessary to replace the display panel:

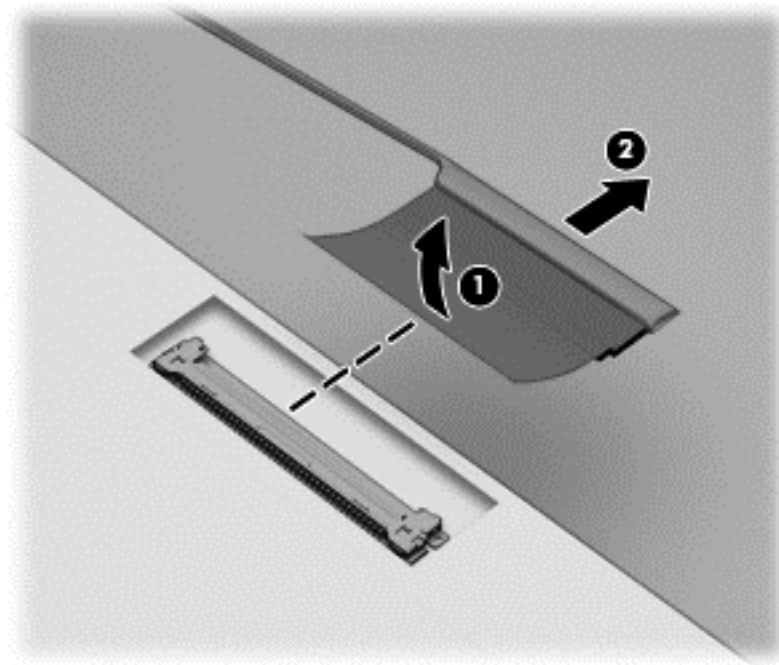
- a. Remove the eight Phillips PM2.0×2.5 screws **(1)** that secure the display panel to the display enclosure.

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

- b. Lift the top edge of the display panel **(2)**, and then swing it up and forward until it rests upside down in front of the display enclosure.



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



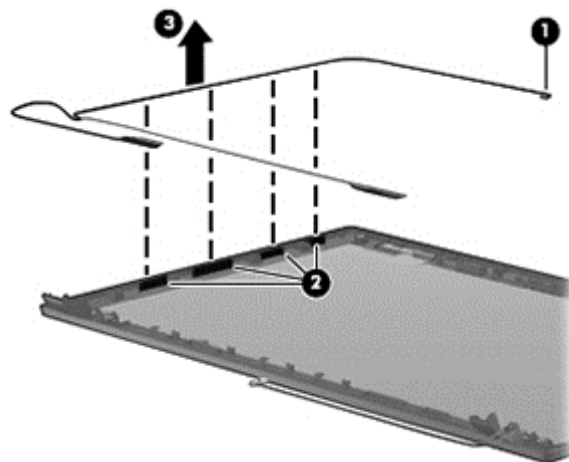
- d. Remove the display panel.

The display panel is available using spare part number 725240-001.

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

- a. Disconnect the webcam/microphone module cable **(1)** from the webcam/microphone module.
- b. Release the display panel cable from the clips **(2)** and routing channel built into the top edge and left side of the display enclosure.
- c. Remove the display panel cable **(3)**.

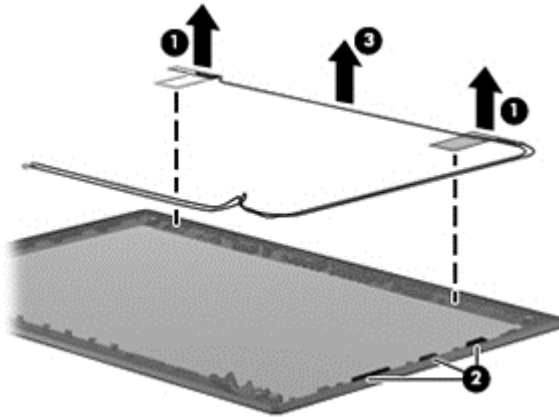
The display panel cable is available using spare part number 724298-001.



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

- a. Detach the wireless antenna transceivers **(1)** from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided adhesive.)
- b. Release the wireless antenna cables from the clips **(2)** and routing channel built into the top edge and right side of the display enclosure.
- c. Remove the wireless antenna **(3)**.

The wireless antenna are available using spare part number 728280-001.



Reverse this procedure to reassemble and install the display assembly.

7 Computer Setup (BIOS), MultiBoot, and HP PC Hardware Diagnostics (UEFI) in Windows 8

Using Computer Setup

Computer Setup, 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). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.



NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup



NOTE: An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.

Navigating and selecting in Computer Setup

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.



NOTE: You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter Computer Setup.
 - To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
 - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
 - To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes:
Click the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Ignore Changes and Exit**, and then press [enter](#).

- To save your changes and exit Computer Setup menus:

Click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Save Changes and Exit**, and then press [enter](#).

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup



NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press [esc](#) while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press [f10](#) to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **Main > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Save Changes and Exit**, and then press [enter](#).

Your changes go into effect when the computer restarts.



NOTE: Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

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

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

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

Determining the BIOS version

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


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

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **Main > System Information**.
3. To exit Computer Setup without saving your changes, click the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Ignore Changes and Exit**, and then press [enter](#).

Downloading a BIOS update

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


Do not disconnect power on 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. 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 displayed on the screen after the download is complete. If no instructions are displayed, 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 MultiBoot

About the boot device order

As the computer starts, the system attempts to boot from enabled devices. The MultiBoot utility, which is enabled at the factory, controls the order in which the system selects a boot device. Boot devices can include optical drives, diskette drives, a network interface card (NIC), hard drives, and USB devices. Boot devices contain bootable media or files that the computer needs to start and operate properly.



NOTE: Some boot devices must be enabled in Computer Setup before they can be included in the boot order.

You can change the order in which the computer searches for a boot device by changing the boot order in Computer Setup. You can also press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then press **f9**. Pressing **f9** displays a menu that shows the current boot devices and allows you to select a boot device. Or, you can use MultiBoot Express to set the computer to prompt you for a boot location each time the computer turns on or restarts.

Choosing MultiBoot preferences

You can use MultiBoot in the following ways:

- To set a new boot order that the computer uses each time it is turned on, by changing the boot order in Computer Setup.
- To dynamically choose the boot device, by pressing **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then pressing **f9** to enter the Boot Device Options menu.
- To use MultiBoot Express to set variable boot orders. This feature prompts you for a boot device each time the computer is turned on or restarted.

Setting a new boot order in Computer Setup

To start Computer Setup and set a boot device order that the computer uses each time it is turned on or restarted, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **Advanced > Boot Options > UEFI Boot Order for UEFI Hybrid** or **UEFI Native Boot mode**, or select **Advanced > Boot Options > Legacy Boot Order** for Legacy Boot Mode, and then press **enter**.
4. To move the device up in the boot order, use a pointing device to click the up arrow, or press the **+** key.
– or –
To move the device down in the boot order, use a pointing device to click the down arrow, or press the **-** key.
5. To save your changes and exit Computer Setup, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.
– or –
Use the arrow keys to select **Main > Save Changes and Exit**, and then press **enter**.

Dynamically choosing a boot device using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Open the Select Boot Device menu by turning on or restarting the computer, and then pressing **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f9**.
3. Use a pointing device or the arrow keys to select a boot device, then press **enter**.

Setting a MultiBoot Express prompt

To start Computer Setup and set the computer to display the MultiBoot startup location menu each time the computer is started or restarted, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **Advanced > Boot Options > MultiBoot Express Boot Popup Delay (Sec)**, and then press **enter**.
4. In the **MultiBoot Express Popup Delay (Sec)** field, enter the length of time in seconds that you want the computer to display the startup location menu before it defaults to the current MultiBoot setting. (When 0 is selected, the Express Boot startup location menu is not displayed.)
5. To save your changes and exit Computer Setup, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Entering MultiBoot Express preferences

When the Express Boot menu is displayed during startup, you have the following choices:

- To specify a boot device from the Express Boot menu, select your preference within the allotted time, and then press **enter**.
- To prevent the computer from defaulting to the current MultiBoot setting, press any key before the allotted time expires. The computer will not start until you select a boot device and press **enter**.
- To allow the computer to start according to the current MultiBoot settings, wait for the allotted time to expire.

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 80](#).

- 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 Computer Setup (BIOS), MultiBoot, and HP PC Hardware Diagnostics (UEFI) in Windows 7

Using Computer Setup

Computer Setup, 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). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

 **NOTE:** Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

 **NOTE:** An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.


To start Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.

Navigating and selecting in Computer Setup

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

 **NOTE:** You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter Computer Setup.
 - To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
 - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
 - To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes:
Click the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Ignore Changes and Exit**, and then press [enter](#).

- To save your changes and exit Computer Setup menus:

Click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Save Changes and Exit**, and then press [enter](#).

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup



NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press [esc](#) while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press [f10](#) to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **Main > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Save Changes and Exit**, and then press [enter](#).

Your changes go into effect when the computer restarts.



NOTE: Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

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

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

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

Determining the BIOS version

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


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

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **Main > System Information**.
3. To exit Computer Setup without saving your changes, click the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Ignore Changes and Exit**, and then press [enter](#).

Downloading a BIOS update

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

Do not disconnect power on 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. Access Help and Support by selecting **Start > Help and Support**.
2. Select **Updates and tune-ups**, and then select **Check for HP updates now**.
3. 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. 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 displayed on the screen after the download is complete. If no instructions are displayed, follow these steps:

1. Select **Start > Computer**.
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 MultiBoot

About the boot device order

As the computer starts, the system attempts to boot from enabled devices. The MultiBoot utility, which is enabled at the factory, controls the order in which the system selects a boot device. Boot devices can include optical drives, diskette drives, a network interface card (NIC), hard drives, and USB devices. Boot devices contain bootable media or files that the computer needs to start and operate properly.



NOTE: Some boot devices must be enabled in Computer Setup before they can be included in the boot order.

You can change the order in which the computer searches for a boot device by changing the boot order in Computer Setup. You can also press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then press **f9**. Pressing **f9** displays a menu that shows the current boot devices and allows you to select a boot device. Or, you can use MultiBoot Express to set the computer to prompt you for a boot location each time the computer turns on or restarts.

Choosing MultiBoot preferences

You can use MultiBoot in the following ways:

- To set a new boot order that the computer uses each time it is turned on, by changing the boot order in Computer Setup.
- To dynamically choose the boot device, by pressing **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then pressing **f9** to enter the Boot Device Options menu.
- To use MultiBoot Express to set variable boot orders. This feature prompts you for a boot device each time the computer is turned on or restarted.

Setting a new boot order in Computer Setup

To start Computer Setup and set a boot device order that the computer uses each time it is turned on or restarted, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.
3. Use a pointing device or the arrow keys to select the **Advanced > Boot Options > UEFI Boot Order for UEFI Hybrid** or **UEFI Native Boot mode**, or select **Advanced > Boot Options > Legacy Boot Order** for Legacy Boot Mode, and then press **enter**.
4. To move the device up in the boot order, use a pointing device to click the up arrow, or press the **+** key.
– or –
To move the device down in the boot order, use a pointing device to click the down arrow, or press the **-** key.
5. To save your changes and exit Computer Setup, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.
– or –
Use the arrow keys to select **Main > Save Changes and Exit**, and then press **enter**.

Dynamically choosing a boot device using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Open the Select Boot Device menu by turning on or restarting the computer, and then pressing **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f9**.
3. Use a pointing device or the arrow keys to select a boot device, then press **enter**.

Setting a MultiBoot Express prompt

To start Computer Setup and set the computer to display the MultiBoot startup location menu each time the computer is started or restarted, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **Advanced > Boot Options > MultiBoot Express Boot Popup Delay (Sec)**, and then press **enter**.
4. In the **MultiBoot Express Popup Delay (Sec)** field, enter the length of time in seconds that you want the computer to display the startup location menu before it defaults to the current MultiBoot setting. (When 0 is selected, the Express Boot startup location menu is not displayed.)
5. To save your changes and exit Computer Setup, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **Main > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Entering MultiBoot Express preferences

When the Express Boot menu is displayed during startup, you have the following choices:

- To specify a boot device from the Express Boot menu, select your preference within the allotted time, and then press **enter**.
- To prevent the computer from defaulting to the current MultiBoot setting, press any key before the allotted time expires. The computer will not start until you select a boot device and press **enter**.
- To allow the computer to start according to the current MultiBoot settings, wait for the allotted time to expire.

Using HP PC Hardware Diagnostics (UEFI) (select models only)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The tool runs outside of the operating system to isolate hardware failures from issues that may be 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**.

After pressing **f2**, the BIOS searches three places for the HP PC Hardware Diagnostics (UEFI) tools in the following order:

- a. Connected USB drive



NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 86](#).

- b. Hard drive
- c. BIOS

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



NOTE: If you need to stop a diagnostic test while it is running, press **esc**.

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



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


1. Go to <http://www.hp.com>.
2. Click **Support & Drivers**, and then click the **Drivers & Software** tab.
3. Enter the product name in the text box, and then click **Search**.
4. Select your computer model, and then select your operating system.
5. In the Diagnostic section, click **HP UEFI Support Environment**.

– or –


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

9 Computer Setup (BIOS) and Advanced System Diagnostics in SUSE Linux

Computer Setup, 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). Computer Setup includes settings for the types of peripherals installed, the startup sequence of the computer, and the amount of system and extended memory.

 **NOTE:** Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

 **NOTE:** An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:


1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.

Using Computer Setup

Navigating and selecting in Computer Setup

To navigate and select in Computer Setup, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
 - To select a menu or a menu item, use the **tab** key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
 - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
 - To close open dialog boxes and return to the main Computer Setup screen, press **esc**, and then follow the on-screen instructions.

 **NOTE:** You can use either a pointing device (TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make selections in Computer Setup.

2. Press **f10** to enter Computer Setup.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.

– or –

- To save your changes and exit Computer Setup menus, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the **tab** key and the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup



NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Computer Setup.
3. Use a pointing device or the arrow keys to select **File > Restore Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, click the **Save** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the arrow keys to select **File > Save Changes and Exit**, and then press **enter**.

Your changes go into effect when the computer restarts.



NOTE: Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

Updated versions of the BIOS may be available on the HP Web site.

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

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

Determining the BIOS version

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

BIOS version information (also known as *ROM date* and *System BIOS*) can be displayed as follows:

1. Start Computer Setup.
2. Use a pointing device or the arrow keys to select **File > System Information**.
3. To exit Computer Setup without saving your changes, click the **Exit** icon in the lower-left corner of the screen, and then follow the on-screen instructions.

– or –

Use the **tab** key and the arrow keys to select **File > Ignore Changes and Exit**, and then press **enter**.



NOTE: You can also determine the BIOS version by turning on or restarting the computer, pressing the **esc** key while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen, and then pressing the **f1** key. Follow the on-screen instructions to exit this screen.

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 Suspend or Hibernation.

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

1. Open your web browser. For U.S. support, go to <http://www.hp.com/go/contactHP>. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html.
2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. Click the option for software and driver downloads, type your computer model number in the product box, and then press **enter**. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
4. Click your specific product from the models listed.
5. Click the appropriate operating system.
6. Go to the BIOS section and download the BIOS software package.
7. Follow the installation instructions as provided with the downloaded BIOS software package.



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

Using Advanced System Diagnostics

Advanced System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly. The following diagnostic tests are available in Advanced System Diagnostics:

- Start-up test—This test analyzes the main computer components that are required to start the computer.
- Run-in test—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.

- **Hard disk test**—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.
- **Memory test**—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.
- **Battery test**—This test analyzes the condition of the battery and calibrates the battery if necessary. If the battery fails the test, contact support to report the issue and purchase a replacement battery.
- **System Tune-Up**—This group of additional tests checks your computer to make sure that the main components are functioning correctly. System Tune-Up runs longer and more comprehensive tests on memory modules, hard drive SMART attributes, the hard drive surface, the battery (and battery calibration), video memory, and the WLAN module status.

You can view system information and error logs in the Advanced System Diagnostics window.

To start Advanced System Diagnostics:

1. Turn on or restart the computer. While the “Press the ESC key for Startup Menu” message is displayed in the lower-left corner of the screen, press **esc**. When the Startup Menu is displayed, press **f2**.
2. Click the diagnostic test you want to run, and then follow the on-screen instructions.



NOTE: If you need to stop a diagnostics test while it is running, press **esc**.

10 Specifications

Computer specifications

34.7cm, 24.5cm, 2.45cm, and 2.0kg	Metric	U.S.
Dimensions		
Width	34.7 cm	13.66 in
Depth	24.5 cm	9.66 in
Height (front to rear)	3.1 cm	1.22 in
Weight	2.2 kg	4.85 lbs
Input power		
Operating voltage and current	19.5 Vdc @ 3.33 A – 65 W 19.5 V dc @ 4.62 A – 90 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

35.6 cm (14.0-in) display specifications

	Metric	U.S.
Dimensions		
Height	17.60 cm	6.93 in
Width	31.20 cm	12.28 in
Diagonal	35.70 cm	14.06 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	

	Metric	U.S.
Brightness	200 nits (typical)	
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1366 × 768	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	2.00 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

Hard drive specifications

	1-TB*	750-GB**	500-GB**	320-GB**
Dimensions				
Height	2.5 in	2.5 in	9.5 and 7.0 mm	7.0 mm
Length	100.4 mm	100.4 mm	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm	69.9 mm
Weight	110 g	110 g	95 g	95 g
Interface type	SATA	SATA	SATA	SATA
Transfer rate	up to 300 MB/sec	up to 300 MB/sec	up to 300 MB/sec	up to 300 MB/sec
Security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)				
Single track	1.5 ms	1.5 ms	1.1 ms	3 ms
Average (read/write)	11/13 ms	11/13 ms	13 ms	13 ms
Maximum	22 ms	22 ms	25 ms	24 ms
Logical blocks	1,953,525,168	1,465,149,168	976,773,168	625,141,400
Disk rotational speed	5400 rpm	5400 rpm	5400 rpm or 7200 rpm	5400 rpm
Operating temperature	0°C to 60°C (32°F to 140°F)			
*1 TB = 1 trillion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.				
**1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.				
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.				


DVD±RW Double-Layer with SuperMulti Drive

Applicable disc	Read:	Write:
	CD-DA, CD+(E)G, CD-MIDI, CD-TEXT, CD-ROM, CD-ROM XA, MIXED MODE CD, CD-I, CD-I Bridge (Photo-CD, Video CD), Multisession CD, CD-EXTRA, Portfolio, CD-R, CD-RW), CD-R, CD-RW, DVD-ROM (DVD-5, DVD-9, DVD-10, DVD-18), DVD-R, DVD-RW, DVD+R, DVD+RW, DVD-RAM	CD-R and CD-RW DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-RAM
Access time	CD	DVD
Random	< 175 ms	< 230 ms
Cache buffer	2.5 MB	
Data transfer rate		
24X CD-ROM	3,600 KB/sec	
8X DVD	10,800 KB/sec	
24X CD-R	3,600 KB/sec	
16X CD-RW	2,400 KB/sec	
8X DVD+R	10,800 KB/sec	
4X DVD+RW	5,400 KB/sec	
8X DVD-R	10,800 KB/sec	
4X DVD-RW	5,400 KB/sec	
2.4X DVD+R(9)	2,700 KB/sec	
5X DVD-RAM	6,750 KB/sec	
Transfer mode	Multiword DMA Mode	


11 Backup and recovery in Windows 8

To protect your information, use Windows backup and restore utilities to back up individual files and folders, back up your entire hard drive, create system repair media (select models only) by using the installed optical drive (select models only) or an optional external optical drive, or create system restore points. In case of system failure, you can use the backup files to restore the contents of your computer.

From the Start screen, type `restore`, click **Settings**, and then select from the list of displayed options.

 **NOTE:** For detailed instructions on various backup and restore options, perform a search for these topics in HP Support Assistant. To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

In case of system instability, HP recommends that you print the recovery procedures and save them for later use.

 **NOTE:** Windows includes 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. For more information, see HP Support Assistant. To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

Backing up your information


Recovery after a system failure is as good as your most recent backup. You should create system repair media and your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

For more information on the Windows backup features, see HP Support Assistant. To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

Performing a system recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use Windows Backup and Restore to recover information you have previously backed up. You can also use Windows Automatic Repair to fix problems that might prevent Windows from starting correctly.
- f11 recovery tools: You can use the [f11](#) recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.

 **NOTE:** If you are unable to boot (start up) your computer and you cannot use the system repair media you previously created (select models only), you must purchase Windows operating system media to reboot the computer and repair the operating system. For additional information, see [Using Windows operating system media \(purchased separately\) on page 96](#).


Using the Windows recovery tools

To recover information you previously backed up:

1. Access HP Support Assistant.

- ▲ To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.
- 2. Click **Storage**.
- 3. Click **Backup and Recovery**.

To recover your information using Automatic Repair, follow these steps:


 **CAUTION:** Some Startup Repair options will completely erase and reformat the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Recovery Image partition and the Windows partition.


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

– or –


From the Start screen, type *pc*, and then select **This PC**.

 **NOTE:** If the Windows partition and the Recovery Image partition are not listed, you must recover your operating system and programs using the Windows operating system DVD and the *Driver Recovery* media (both purchased separately). For additional information, see [Using Windows operating system media \(purchased separately\) on page 96](#).

3. If the Windows partition and the Recovery Image partition are listed, restart the computer by pressing and holding the *shift* key while clicking **Restart**.
4. Select **Troubleshoot**, then select **Advanced Options**, and then select **Startup Repair**.
5. Follow the on-screen instructions.


 **NOTE:** For additional information on recovering information using the Windows tools, perform a search for these topics in HP Support Assistant. To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

Using f11 recovery tools

 **CAUTION:** Using *f11* completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. The *f11* recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

To recover the original hard drive image using *f11*:

1. If possible, back up all personal files.
2. If possible, check for the presence of the Recovery Image partition: From the Start screen, type *pc*, and then select **This PC**.


 **NOTE:** If the Recovery Image partition is not listed, you must recover your operating system and programs using the Windows operating system media and the *Driver Recovery* media (both purchased separately). For additional information, see [Using Windows operating system media \(purchased separately\) on page 96](#).

3. If the Recovery Image partition is listed, restart the computer, and then press *esc* while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.


4. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

Using Windows operating system media (purchased separately)

To order a Windows operating system DVD, contact 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.

 **CAUTION:** Using a Windows operating system media completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows operating system DVD:

 **NOTE:** This process takes several minutes.

1. If possible, back up all personal files.
2. Insert the Windows operating system DVD into the optical drive, and then restart the computer.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.

After the repair is completed:

1. Eject the Windows operating system media and then insert the *Driver Recovery* media.
2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.

Using Windows Refresh or Windows Reset

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

The Windows Reset option allows you to perform detailed reformatting of your computer, or remove personal information before you give away or recycle your computer. For more information on these features, see HP Support Assistant. To access HP Support Assistant, from the Start screen, select the **HP Support Assistant** app.

Using HP Software Setup

HP Software Setup can be used to reinstall drivers or select software that has been corrupted or deleted from the system.

1. From the Start screen, type `HP Software Setup`.
2. Open HP Software Setup.
3. Follow the on-screen directions to reinstall drivers or select software.

12 Backup and recovery in Windows 7

Your computer includes HP and Windows tools to help you safeguard your information and retrieve it if you ever need to. These tools will help you return your computer to a proper working state, all with simple steps. This section provides information about the following processes:

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

Creating recovery media and backups

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

1. After you successfully set up the computer, create HP Recovery media. This step creates a Windows 7 operating system DVD and a *Driver Recovery* DVD. The Windows DVD can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. The *Driver Recovery* DVD installs specific drivers and applications. See [Creating recovery media with HP Recovery Disc Creator on page 98](#).
2. Use Windows Backup and Recovery tools to perform the following:
 - Back up individual files and folders
 - Back up your entire hard drive (select models only)
 - Create system repair discs (select models only) with the installed optical drive (select models only) or an optional external optical drive
 - Create system restore points



NOTE: This guide describes an overview of backing up, restoring, and recovering options. For more details about the tools provided, see Help and Support. To access Help and Support, select **Start > Help and Support**.



NOTE: HP recommends that you print the recovery procedures and save them for later use, in case of system instability.

In case of system failure, you can use the backup files to restore the contents of your computer. See [Backing up your information on page 99](#).

Guidelines

- When creating recovery media or backing up to discs, use any of the following types of discs (purchased separately): DVD+R, DVD+R DL, DVD-R, DVD-R DL, or DVD±RW. The discs you use will depend on the type of optical drive you are using.
- Be sure that the computer is connected to AC power before you start the recovery media creation process or the backup process.


Creating recovery media with HP Recovery Disc Creator

HP Recovery Disc Creator is a software program that offers an alternative way to create recovery media. After you successfully set up the computer, you can create recovery media using HP Recovery Disc Creator. This recovery media allows you to reinstall your original operating system as well as select drivers and

applications if the hard drive becomes corrupted. HP Recovery Disc Creator can create two kinds of recovery DVDs:

- Windows 7 operating system DVD—Installs the operating system without additional drivers or applications.
- *Driver Recovery* DVD—Installs specific drivers and applications only, in the same way that the HP Software Setup utility installs drivers and applications.

Creating recovery media

 **NOTE:** The Windows 7 operating system DVD can be created only once. Thereafter, the option to create that media will not be available after you create a Windows DVD.

To create the Windows DVD:

1. Select **Start > All Programs > Productivity and Tools > HP Recovery Disc Creator**.
2. Select **Windows disk**.
3. From the drop-down menu, select the drive for burning the recovery media.
4. Click the **Create** button to start the burning process.

After the Windows 7 operating system DVD has been created, create the *Driver Recovery* DVD:

1. Select **Start > All Programs > Productivity and Tools > HP Recovery Disc Creator**.
2. Select **Driver disk**.
3. From the drop-down menu, select the drive for burning the recovery media.
4. Click the **Create** button to start the burning process.


Backing up your information


You should create system repair media and your initial backup immediately after initial system setup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup. You should also create Windows system repair media (select models only) which can be used to start up (boot) the computer and repair the operating system in case of system instability or failure. Your initial and subsequent backups allow you to restore your data and settings if a failure occurs.

You can back up your information to an optional external hard drive, a network drive, or discs.

Note the following when backing up:

- Store personal files in the Documents library, and back it up regularly.
- Back up templates that are stored in their associated directories.
- Save customized settings that appear in a window, toolbar, or menu bar by taking a screen shot of your settings. The screen shot can be a time-saver if you have to reset your preferences.
- When backing up to discs, number each disc after removing it from the drive.

 **NOTE:** For detailed instructions on various backup and restore options, perform a search for these topics in Help and Support. To access Help and Support, select **Start > Help and Support**.

 **NOTE:** Windows includes 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 Help and Support. To access Help and Support, select **Start > Help and Support**.

To create a backup using Windows Backup and Restore:



NOTE: The backup process may take over an hour, depending on file size and the speed of the computer.

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to set up your backup, create a system image (select models only), or create system repair media (select models only).

Performing a system recovery

In case of system failure or instability, the computer provides the following tools to recover your files:

- Windows recovery tools: You can use Windows Backup and Restore to recover information you have previously backed up. You can also use Windows Startup Repair to fix problems that might prevent Windows from starting correctly.
- f11 recovery tools (select models only): You can use the f11 recovery tools to recover your original hard drive image. The image includes the Windows operating system and software programs installed at the factory.



NOTE: If you are unable to boot (start up) your computer and you cannot use the system repair media you previously created (select models only), you must purchase Windows 7 operating system media to reboot the computer and repair the operating system. For additional information, see [Using Windows 7 operating system media on page 101](#).

Using the Windows recovery tools

Using the Windows recovery tools, you can:

- Recover individual files
- Restore the computer to a previous system restore point
- Recover information using recovery tools



NOTE: For detailed instructions on various recovery and restore options, perform a search for these topics in Help and Support. To access Help and Support, select **Start > Help and Support**.



NOTE: Windows includes 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 Help and Support. To access Help and Support, select **Start > Help and Support**.

To recover information you previously backed up:

1. Select **Start > All Programs > Maintenance > Backup and Restore**.
2. Follow the on-screen instructions to recover your system settings, your computer (select models only), or your files.

To recover your information using Startup Repair, follow these steps:



CAUTION: Some Startup Repair options will completely erase and reformat the hard drive. All files you have created and any software installed on the computer are permanently removed. When reformatting is complete, the recovery process restores the operating system, as well as the drivers, software, and utilities from the backup used for recovery.

1. If possible, back up all personal files.
2. If possible, check for the presence of the Windows partition.

To check for the Windows partition, select **Start > Computer**.



NOTE: If the Windows partition is not listed, you must recover your operating system and programs using the Windows 7 operating system DVD and the *Driver Recovery* media. For additional information, see [Using Windows 7 operating system media on page 101](#).

3. If the Windows partition is listed, restart the computer, and then press **f8** before the Windows operating system loads.
4. Select **Startup Repair**.
5. Follow the on-screen instructions.



NOTE: For additional information on recovering information using the Windows tools, select **Start > Help and Support**.

Using f11 recovery tools (select models only)



CAUTION: Using **f11** completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. The **f11** recovery tool reinstalls the operating system and HP programs and drivers that were installed at the factory. Software not installed at the factory must be reinstalled.

To recover the original hard drive image using **f11**:

1. If possible, back up all personal files.
2. If possible, check for the presence of the HP Recovery partition: click **Start**, right-click **Computer**, click **Manage**, and then click **Disk Management**.



NOTE: If the HP Recovery partition is not listed, you must recover your operating system and programs using the Windows 7 operating system media and the *Driver Recovery* media. For additional information, see [Using Windows 7 operating system media on page 101](#).

3. If the HP Recovery partition is listed, restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
4. Press **f11** while the “Press <F11> for recovery” message is displayed on the screen.
5. Follow the on-screen instructions.

Using Windows 7 operating system media

If you cannot use the recovery media you previously created using the HP Recovery Disc Creator (select models only), you must purchase a Windows 7 operating system DVD to reboot the computer and repair the operating system.

To order a Windows 7 operating system DVD, go to the HP website. For U.S. support, go to <http://www.hp.com/support>. For worldwide support, go to http://welcome.hp.com/country/us/en/wwcontact_us.html. You can also order the DVD by calling support. For contact information, see the *Worldwide Telephone Numbers* booklet included with the computer.



CAUTION: Using a Windows 7 operating system DVD completely erases hard drive contents and reformats the hard drive. All files that you have created and any software that you have installed on the computer are permanently removed. When reformatting is complete, the recovery process helps you restore the operating system, as well as drivers, software, and utilities.

To initiate recovery using a Windows 7 operating system DVD:



NOTE: This process takes several minutes.

1. If possible, back up all personal files.
2. Restart the computer, and then insert the Windows 7 operating system DVD into the optical drive before the Windows operating system loads.
3. When prompted, press any keyboard key.
4. Follow the on-screen instructions.
5. Click **Next**.
6. Select **Repair your computer**.
7. Follow the on-screen instructions.

After the repair is completed:

1. Eject the Windows 7 operating system DVD and then insert the *Driver Recovery* DVD.
2. Install the Hardware Enabling Drivers first, and then install Recommended Applications.

13 Backup and Recovery in SUSE Linux

Recovery after a system failure is as good as your most recent backup. As you add new software and data files, you should continue to back up your system on a regular basis to maintain a reasonably current backup.

Backing up your information

You should back up your computer files on a regular schedule to maintain a current backup. You can manually back up your information to an optional external drive, a network drive, or discs. Back up your system at the following times:

- At regularly scheduled times
- Before the computer is repaired or restored
- Before you add or modify hardware or software

To back up your home directory files using **Backup Manager Settings**:

1. Select **Computer > More Applications > Tools > Backup Manager Settings**, and click **Backup my home directory**.
2. Click **Storage Destination Location**, and then select a location to back up your information.
3. Click **Schedule**, and then select a time schedule to perform backups at a regularly scheduled time.

To immediately back up your information, click the **Backup Now** check box.



NOTE: Before you back up your information, be sure you have designated a location to save the backup files.

4. Click **Save and Backup** to start the backup and to save the backup settings.

To restore backup files:

1. Select **Computer > More Applications > Tools > Backup Manager Restore**.
2. Click **Backup Source**, and then select the location of the backup files.
3. Click **Restore Destination**, and then select the destination to restore the files.
4. Select the **Optical Disk** option.
5. Under **Restore Point**, click the time and date of the backup.




NOTE: If multiple backups have been performed, click **Use the latest version** to restore the latest version.


6. Click **Restore** to start restoring the files, or click **Cancel** to cancel the operation.

Performing a system recovery

Recovery allows you to repair or restore the computer to its original factory state. You can create an HP Factory Image Restore DVD, using an installed or an external DVD±RW optical drive. You can also restore the computer to its factory condition from the HP dedicated recovery partition on the hard drive.

 **CAUTION:** Using Recovery completely erases hard drive contents and reformats the hard drive. All files you have created and any software installed on the computer are permanently removed. The recovery tool reinstalls the original operating system and HP programs and drivers that were installed at the factory. Software, drivers, and updates not installed by HP must be manually reinstalled. Personal files must be restored from a backup.


To restore the computer using the HP Factory Image Restore DVD, you must first create the recovery disc. To create the recovery disc:

 **NOTE:** HP recommends that you create the HP Factory Image Restore DVD in the event of a system failure.

1. Select **Computer > More Applications**.
2. In the left pane, click **Tools**, and then click **Create HP Factory Image Restore DVD** in the right pane.
3. Follow the on-screen instructions to create an image file to burn a recovery disc.

To restore the computer from the recovery disc, follow these steps:

1. If possible, back up all personal files.
2. Insert the HP Factory Image Restore DVD into the optical drive and restart the computer.
3. As the computer is restarting, press **f9** to open the Computer Setup boot option menu.
4. Press the down arrow to select **Restore SLED HP-BNB preload image** from the **Linux boot** menu, and then press **enter**.
5. Using the arrow keys, select **Yes** when prompted: **Do you want to start the System-Restore?**
6. Follow the on-screen instructions.

 **NOTE:** You can also restore the computer from the partition by restarting the computer, and then pressing the **f11** key.

If you are unable to boot (start up) your computer from the hard drive partition with the primary operating system or from the recovery partition, and you did not create a system recovery disc, you must purchase a *SUSE Linux Enterprise Desktop Operating System DVD* to reinstall the operating system. For additional information, see the *Worldwide Telephone Numbers* booklet.

14 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 re-programming 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 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 **Un-configure 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 un-configure AMT.

- j. If the optional Intel® Anti-Theft Technology (AT) was activated, contact the provider to de-activate 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?
HP Sure Start	2 MB	No	Yes	Only in platforms that support Sure Start to provide protected backup of critical System BIOS code, EC firmware, and critical PC configuration data.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	Protected by the HP Sure Start Embedded Controller.
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.

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?
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 non-functional.
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 non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	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 non-functional.
Intel Management Engine Firmware (present only in models ending in a 'p' or 'w' or with Intel Centrino Pro technology)	1.5 or 5MByte	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third party data store contents can be populated by a remote management console or local applications registered by an administrator to have access to the space.	The Intel chipset is configured to enforce HW protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash	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.

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?
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)?

- Turn on or restart the computer and press **F10** when prompted near the bottom of the display.
- Select **File**, then select **Restore defaults**.
- Follow the on-screen instructions.
- 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.

15 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

1. The flexible cord must be Type H05VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

16 Recycling

When a non-rechargeable or rechargeable battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for battery disposal.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP Web site at <http://www.hp.com/recycle>.

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