



HP ENVY m6 Notebook PC

Maintenance and Service Guide

IMPORTANT! This document is intended for HP authorized service providers only.

© Copyright 2013 Hewlett-Packard
Development Company, L.P.

AMD, the AMD Arrow logo, and combinations thereof, are trademarks of Advanced Micro Devices, Inc. Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel and Core are U.S. registered trademarks of Intel Corporation. Microsoft, Windows, and Windows Vista are U.S. registered trademarks of Microsoft Corporation. SD Logo is a trademark of its proprietor.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: February 2013

Document Part Number: 692771-002

Safety warning notice

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

Table of contents

1 Product description	1
2 External component identification	10
Locating hardware	10
Locating software	10
Display	11
Button, speakers, and fingerprint reader	12
Keys	13
Lights	14
TouchPad	15
Front	16
Left side	17
Right side	18
Bottom	19
3 Illustrated parts catalog	21
Service tag	22
Computer major components	23
Display assembly subcomponents	29
Mass storage devices	30
Miscellaneous parts	32
Sequential part number listing	33
4 Removal and replacement procedures	41
Preliminary replacement requirements	41
Tools required	41
Service considerations	41
Plastic parts	41
Cables and connectors	42
Drive handling	42
Grounding guidelines	43

Electrostatic discharge damage	43
Packaging and transporting guidelines	44
Component replacement procedures	46
Service tag	46
Battery	47
Hard drive	48
RTC battery	51
Optical drive	52
Memory module	55
Keyboard	56
WLAN module	61
Solid-state drive	64
Top cover	65
Power button board	69
Fingerprint reader board	70
TouchPad button board	72
Fan	73
System board	75
Heat sink	78
Processor	81
Optical drive connector board	83
Speakers	84
USB board	86
Subwoofer	87
Power connector cable	88
Display assembly	90
5 Using Setup Utility (BIOS) and System Diagnostics	98
Starting Setup Utility (BIOS)	98
Updating the BIOS	98
Determining the BIOS version	98
Downloading a BIOS update	99
Using System Diagnostics	100
6 Specifications	101
Computer specifications	101
15.6-inch WGA display specifications	102
Hard drive specifications	103

7 Backing up, restoring, and recovering	104
Creating recovery media and backups	104
Creating HP Recovery media	105
Restore and recovery	106
Using Windows Refresh for quick and easy recovery	107
Remove everything and reinstall Windows	108
Recovering using HP Recovery Manager	108
What you need to know	109
Using the HP Recovery partition to recover a minimized image (select models only)	109
Using HP Recovery media to recover	110
Changing the computer boot order	110
Removing the HP Recovery partition	110
 8 Power cord set requirements	 111
Requirements for all countries	111
Requirements for specific countries and regions	112
 9 Recycling	 113
 Index	 114

1 Product description

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Product Name	HP ENVY m6 Notebook PC	√	√
Processors	<ul style="list-style-type: none">• AMD® A10-5750M 2.50-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)• AMD A10-4600M 3.20-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)• AMD A8-5550M 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)• AMD A8-4500M 2.80-GHz processor (1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)• AMD A6-5350M 2.90-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)• AMD A6-4400M 3.20-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)• AMD A4-5150M 2.70-GHz processor (turbo up to 3.30-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)• AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	√	

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Processors <i>(continued)</i>	<ul style="list-style-type: none"> Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W) 		√
	<ul style="list-style-type: none"> Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Quad Core i7-3520M 2.90-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 4.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Dual Core i5-3210M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W) 		
	<ul style="list-style-type: none"> Intel Core i3-2350M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W) 		
Chipset	AMD A70M fusion controller hub (FCH)	√	
	Intel HM77 Express Chipset		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Graphics	<p>Switchable discrete graphics: AMD Radeon™ HD 7670M with 2048-MB of dedicated video memory (128-MB × 16 DDR3 900-MHz × 8 pcs)</p> <p>Internal graphics:</p> <ul style="list-style-type: none"> • AMD Radeon HD 7660G graphics on computer models equipped with an AMD A10-4600M processor • AMD Radeon HD 7640G graphics on computer models equipped with an AMD A8-4500M processor • AMD Radeon HD 7520G graphics on computer models equipped with an AMD A6-4400M processor <p>Support for HD decode, HDMI, and DX11</p>	√	
	<p>Switchable discrete graphics:</p> <ul style="list-style-type: none"> • AMD Radeon HD 7670M with 2048-MB of dedicated video memory (128-MB×16 DDR3 @ 900-MHz × 8 pieces), 128-bit M2 package • AMD Radeon HD 7670M with 1024-MB of dedicated video memory (64-MB×16 DDR3 @ 900-MHz × 8 pieces), 128-bit M2 package <p>Internal graphics:</p> <ul style="list-style-type: none"> • UMA with shared video memory • Intel HD Graphics 4000 on computer models equipped with an Intel Core i7, Intel Core i5, or Intel Core i3-3110M processor • Intel HD Graphics 3000 (GT2) on computer models equipped with an Intel Intel Core i3-2370M or Intel Core i3-2350M processor <p>Support for HD decode, HDMI, and DX11 on all computer models</p> <p>Support for PX 5.0 on computer models equipped with a graphics subsystem with discrete memory</p>	√	

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Panel	<p>15.6-in, white light-emitting diode (WLED), SVA, HD, slim (3.2-mm), BrightView (1366x768) display; typical brightness: 200 nits</p> <p>All display assemblies include one or two wireless local area network (WLAN) antenna cables</p> <p>Supports low voltage differential signalling (LVDS)</p>	√	√
Memory	<p>Two customer-accessible/upgradable memory module slots</p> <p>DDR3-1600-MHz dual channel support on computer models equipped with an AMD processor or an Intel Core i7, Intel Core i5, or Intel Core i3-3110M processor</p> <p>DDR3-1333-MHz dual channel support (DDR3-1600 downgrade to DDR3-1333) on computer models equipped with an Intel Intel Core i3-2370M or Intel Core i3-2350M processor</p> <p>Supports 8192-MB of system RAM in the following configurations:</p> <ul style="list-style-type: none"> • 16384-MB (8192-MB×2; not supported on computer models equipped with a 32-bit operating system or with Windows Home Basic) • 12288-MB (8192-MB+4096-MB; not supported on computer models equipped with a 32-bit operating system or with Windows Home Basic) • 8192-MB (8192-MB×1 or 4096×2; not supported on computer models equipped with a 32-bit operating system) • 6144-MB (4096-MB+2048-MB; not supported on computer models equipped with a 32-bit operating system) • 4096-MB (4096-MB×1 or 2048-MB×2) • 2048-MB (2048×1) 	√	√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Hard drive	<p>Supports 6.35-cm (2.5-in) hard drives in 9.5-mm (.37-in) and 7.0-mm (.28-in) thicknesses (all hard drives use the same bracket)</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> • 1-TB, 5400-rpm, 9.5-mm (not supported on computer models equipped with Windows 7 Starter, 32-bit operating system) • 750-GB, 7200-rpm and 5400-rpm, 9.5-mm (not supported on computer models equipped with Windows 7 Starter, 32-bit operating system) • 640-GB, 5400-rpm, 9.5-mm (not supported on computer models equipped with Windows 7 Starter, 32-bit operating system) • 500-GB, 7200-rpm and 5400-rpm, 9.5-mm • 320-GB, 7200-rpm and 5400-rpm, 9.5- and 7.0-mm 	√	√
Solid-state drive	32-GB mSATA		√
Optical drive	<p>Fixed</p> <p>Serial ATA</p> <p>12.7-mm tray load, 9.5-mm thickness</p> <p>Supports DVD±RW Double-Layer with SuperMulti Drive</p> <p>Supports zero power optical drive</p>	√	√
Audio and video	Two speakers and subwoofer	√	√
	HD Beats audio	√	√
	Supports Microsoft premium requirements	√	√
	HP TrueVision HD camera (fixed, no tilt with activity LED; 1280×720 by 30 frames per second)	√	√
	Two dual array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software	√	√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Ethernet	Integrated 10/100/1000 network interface card (NIC)	√	√
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module	√	√
	One or two WLAN antennas built into display assembly, varying by computer model	√	√
	Support for the following WLAN formats:	√	√
	<ul style="list-style-type: none"> Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter Intel Centrino Advanced-N 6230 WLAN module Mediatek MT7630E 802.11bgn Wi-Fi Adapter and Mediatek Bluetooth 4.0 Adapter Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter 		
	<ul style="list-style-type: none"> Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter 690020-001 Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter Intel Centrino Advanced-N 6235 WLAN module for use only in Japan 		√
External media cards	HP Multi-Format Digital Media reader with push-push technology, supporting the following digital card formats:	√	√
	<ul style="list-style-type: none"> Secure Digital (SD) Memory Card Secure Digital Extended Capacity (SDxC) Memory Card Secure Digital High Capacity (SDHC) Memory Card Ultra High Speed MultiMediaCard (UHS/MMC) 		

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Ports	<ul style="list-style-type: none"> • Combination audio-out (stereo headphone)/audio-in (mono microphone) • HDMI v1.4 supporting: up to 1920×1200 @ 60Hz • HP Smart AC adapter • RJ-45 (Ethernet Gigabit support with LED indicators) • USB 3.0 ports on computer: 2 on left side, 1 on right side • USB 2.0 ports on computer: 1 on right side • USB port allocation: <ul style="list-style-type: none"> ◦ One for the computer ◦ One for the fingerprint reader ◦ One for the MiniCard ◦ One for the webcam/microphone module • VGA (Dsub 15 pin) supporting: 1920×1600 external resolution @ 60 Hz, hot plug and unplug and autodetection for correct output to wide-aspect vs. standard aspect video 	√	
	<ul style="list-style-type: none"> • Combination audio-out (stereo headphone)/audio-in (mono microphone) • HDMI v1.4 supporting: up to 1920×1200 @ 60Hz • HP Smart AC adapter • RJ-45 (Ethernet Gigabit support with LED indicators) • USB 3.0 ports on computer: 2 on left side, 1 on right side • USB 2.0 ports on computer: 1 on right side • USB port allocation: <ul style="list-style-type: none"> ◦ One for the computer ◦ One for the fingerprint reader 		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
	<ul style="list-style-type: none"> ◦ One for the MiniCard ◦ One for the webcam/microphone module <p>VGA (Dsub 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</p>		
Keyboard/pointing devices	Full-size (15.6-in.), duracoat, island-style keyboard with numeric keypad	√	√
	Gesture support: MultiTouch gestures enabled, two-finger scrolling, and pinch-zoom as default	√	√
	Taps enabled by default	√	√
	Support for TouchPad with image sensor	√	√
Power requirements	Supports the following HP Smart AC adapters:		
	<ul style="list-style-type: none"> • 90-W HP Smart AC adapter (PFC, RC, V, 3-wire) 	√	√
	<ul style="list-style-type: none"> • 65-W HP Smart AC adapter (non-PFC, 3-wire) 	√	
	<ul style="list-style-type: none"> • 90-W HP Smart AC adapter (PFC, RC, V, EM, 3-wire) 		√
	<ul style="list-style-type: none"> • 65-W HP Smart AC adapter (RC, V, EM, 3-wire) 		√
	<ul style="list-style-type: none"> • 65-W HP Smart AC adapter (RC, V, 3-wire) 		√
	Supports the following batteries:	√	√
	<ul style="list-style-type: none"> • 9-cell, 100-Wh, 3.00-Ah, Li-ion battery • 6-cell, 62-Wh, 2.80-Ah, Li-ion battery 		
Security	Supports security cable lock	√	√
	Supports fingerprint reader with Digital Persona software	√	√
	Supports HP SimplePass	√	√
	Supports Intel AT-p Ready		√

Category	Description	Computer model equipped with AMD processor	Computer model equipped with Intel processor
Operating system	Preinstalled: <ul style="list-style-type: none"> • Windows® 8 Professional 64-bit • Windows 8 Standard 64-bit 	√	√
Serviceability	End user replaceable parts: <ul style="list-style-type: none"> • AC adapter • Battery • Hard drive • Memory module • Optical drive • WLAN module 	√	√

2 External component identification

Locating hardware

To find out what hardware is installed on your computer:

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

A list reveals all the devices installed in your computer.

Locating software

- ▲ To find out what software is installed on your computer, from the Start screen, right-click using the mouse or swipe from the top of the TouchPad to reveal the apps, and then select the **All apps** icon.

Display



Item	Component	Description
(1)	Internal microphones (2)	Record sound.
(2)	Webcam light	On: The webcam is in use.
(3)	HP TrueVision HD webcam	Records video, captures still photographs, and provides access to video conferences and online chat by means of streaming video. To use the webcam, from the Start screen, type <i>c</i> , and then select CyberLink YouCam from the list of applications.
(4)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs.

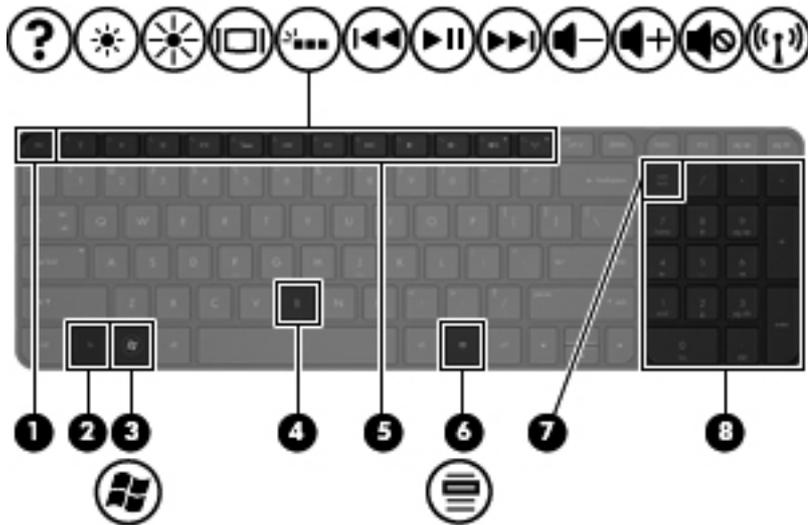
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.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

Button, speakers, and fingerprint reader



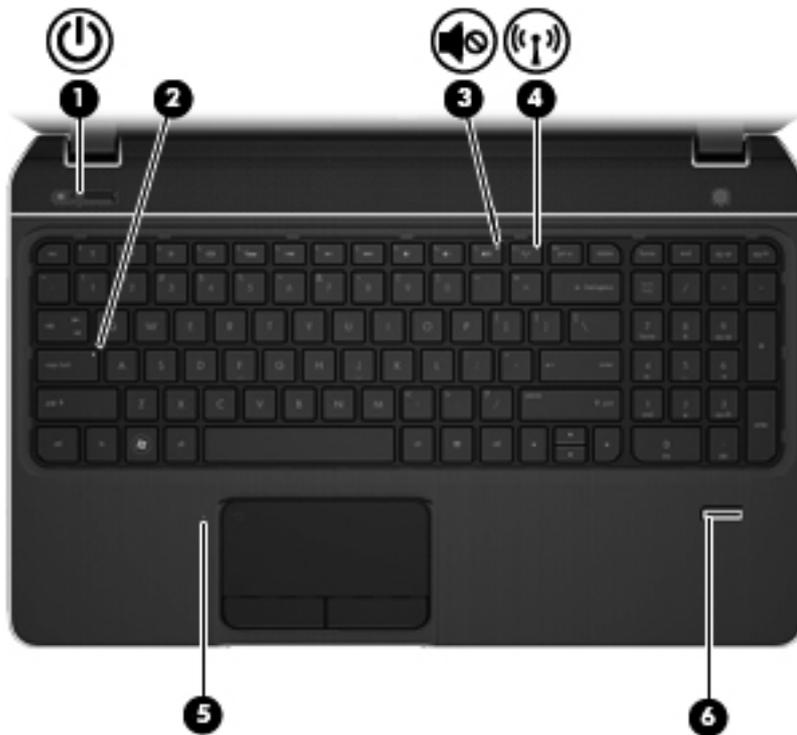
Item	Component	Description
(1)	Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding the power button will result in the loss of unsaved information.</p> <p>If the computer has stopped responding and Microsoft Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options. From the Start screen, type <code>power</code>, select Settings, and then select Power Options from the list of applications.</p>
(2)	Speakers (2)	Produce sound.
(3)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon.

Keys



Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with the b key or the esc key.
(3)	Windows logo key	Displays the Windows Start menu.
(4)	b key	Enables or disables Beats Audio when pressed in combination with the fn key. Beats Audio is an enhanced audio feature that provides a deep, controlled bass while maintaining a clear sound. Beats Audio is enabled by default.
(5)	Action keys	Execute frequently used system functions.
(6)	Windows applications key	Displays a shortcut menu for items beneath the pointer.
(7)	num lock key	Controls the function of the integrated numeric keypad. Press the key to alternate between the standard numeric function of an external keypad (enabled at the factory) and the navigational function (indicated by the directional arrows on the keys). NOTE: The keypad function that is active when the computer is turned off is reinstated when the computer is turned back on.
(8)	Integrated numeric keypad	Set at the factory to function like an external numeric keypad. To alternate between this numeric function and the navigational function (indicated by the directional arrows on the keys), press the num lock key.

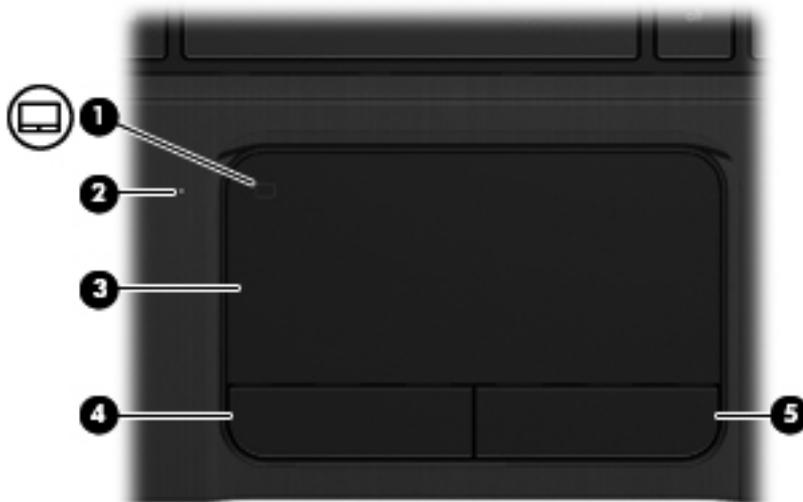
Lights



Item	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, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components.• Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode 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)	Caps lock light	On: Caps lock is on, which switches the keys to all capital letters.
(3)	Mute light	<ul style="list-style-type: none">• Amber: Computer sound is off.• Off: Computer sound is on.
(4)	Wireless light	<ul style="list-style-type: none">• White: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on.• Amber: All wireless devices are off.

Item	Component	Description
(5)	TouchPad light	<ul style="list-style-type: none"> On: The TouchPad is off. Off: The TouchPad is on.
(6)	Fingerprint reader light	<ul style="list-style-type: none"> White: The fingerprint was read. Amber: The fingerprint was not read.

TouchPad



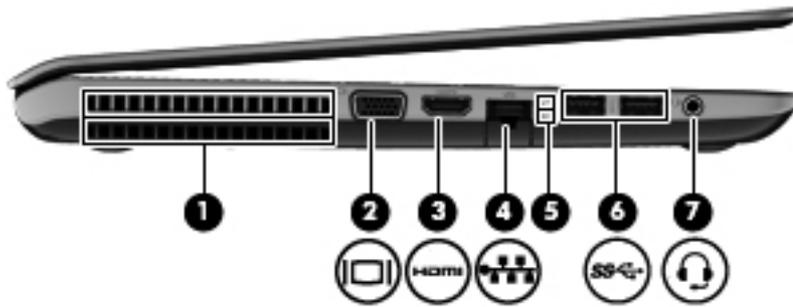
Item	Component	Description
(1)	TouchPad on/off button	Turns the TouchPad on or off.
(2)	TouchPad light	<ul style="list-style-type: none"> On: The TouchPad is off. Off: The TouchPad is on.
(3)	TouchPad zone	Moves the on-screen pointer and selects or activates items on the screen.
(4)	Left TouchPad button	Functions like the left button on an external mouse.
(5)	Right TouchPad button	Functions like the right button on an external mouse.

Front



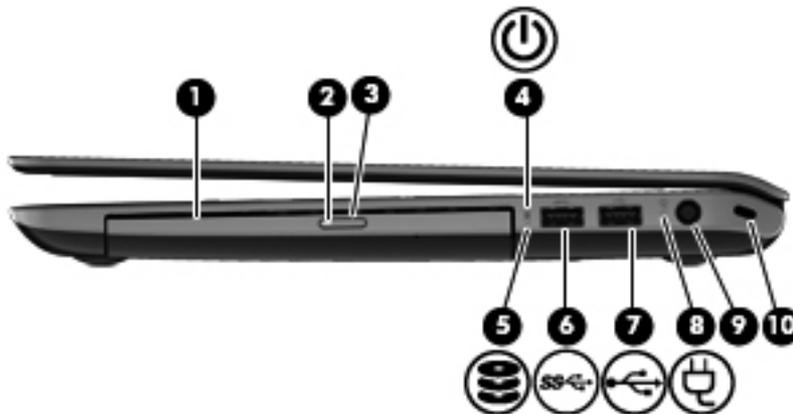
Component	Description
Digital Media Slot	Supports the following digital card formats: <ul style="list-style-type: none">• Secure Digital (SD) Memory Card• Secure Digital Extended Capacity (SDxC) Memory Card• Secure Digital High Capacity (SDHC) Memory Card• Ultra High Speed MultiMediaCard (UHS/MMC)

Left side



Item	Component	Description
(1)	Vent	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	External monitor port	Connects an external VGA monitor or projector.
(3)	HDMI port	Connects an optional video or audio device, such as a high-definition television, or any compatible digital or audio device.
(4)	RJ-45 (network) jack	Connects a network cable.
(5)	RJ-45 (network) jack lights	<ul style="list-style-type: none"> White (top): The network is connected. Amber (bottom): Activity is occurring on the network.
(6)	USB 3.0 ports (2)	Connect an optional USB 3.0 device and provide enhanced USB power performance. NOTE: For details about different types of USB ports, see the <i>HP Notebook Reference Guide</i> .
(7)	Audio-out (headphone) jack/ Audio-in (microphone) jack	Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone. NOTE: This jack does not support optional microphone-only devices. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i> . NOTE: When a device is connected to the jack, the computer speakers are disabled.

Right side

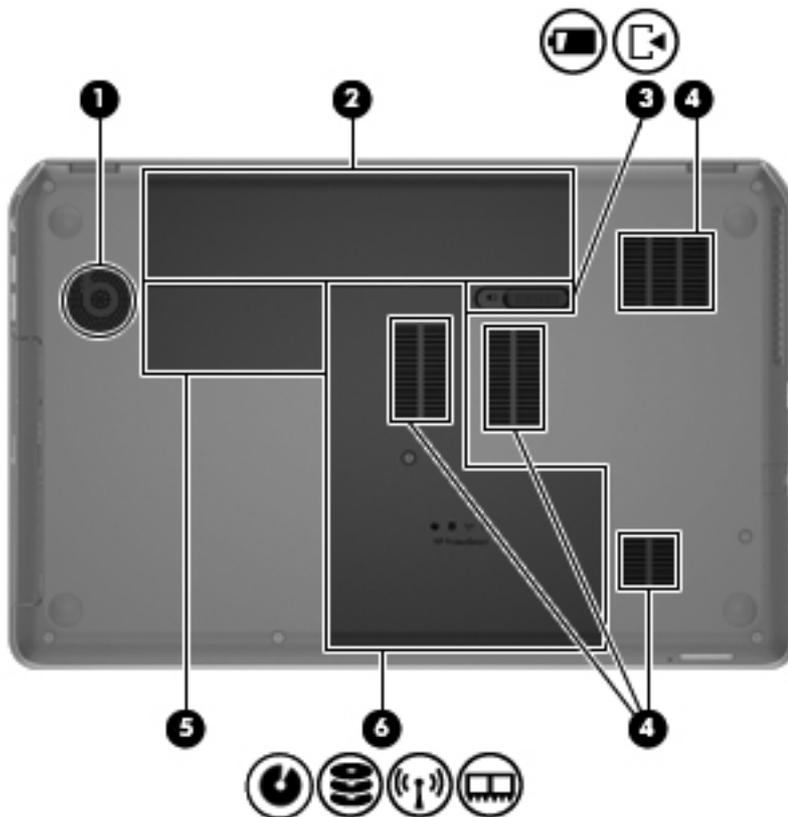


Item	Component	Description
(1)	Optical drive	Reads and writes (select models only) to an optical disc.
(2)	Optical drive light	<ul style="list-style-type: none"> Green: The optical drive is being accessed. Off: The optical drive is idle.
(3)	Optical drive eject button	Releases the disc tray.
(4)	Power light	<ul style="list-style-type: none"> White: The computer is on. Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components. Off: The computer is off or in Hibernation. Hibernation is an energy-saving mode 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>
(5)	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. <p>NOTE: For information about HP 3D DriveGuard, see the <i>HP Notebook Reference Guide</i>.</p>
(6)	USB 3.0 port	<p>Connects an optional USB 3.0 device and provides enhanced USB power performance.</p> <p>NOTE: For details about different types of USB ports, see the <i>HP Notebook Reference Guide</i>.</p>
(7)	USB 2.0 port	Connects an optional USB device.

Item	Component	Description
(8)	AC adapter light	<ul style="list-style-type: none"> White: The AC adapter is connected and the battery is charged. Amber: The AC adapter is connected and the battery is charging. Off: The computer is using DC power.
(9)	Power connector	Connects an AC adapter.
(10)	Security cable slot	Attaches an optional security cable to the computer.

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

Bottom



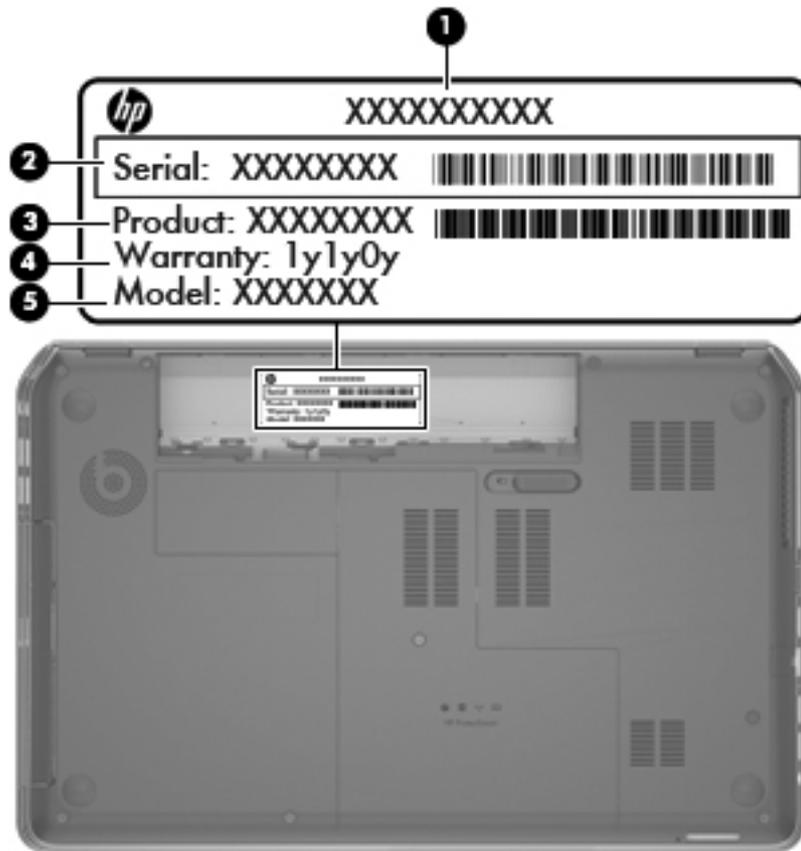
Item	Component	Description
(1)	Integrated subwoofer	Provides superior bass sound.
(2)	Battery bay	Holds the battery.
(3)	Battery release latch	Releases the battery from the battery bay and opens the service cover.

Item	Component	Description
(4)	Vents (4)	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(5)	Wireless module compartment	Holds the WLAN device and the solid-state drive. CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact support through Help and Support.
(6)	Service cover	The service cover provides access to the optical drive retention screw, hard drive bay, wireless module compartment, and memory module compartment.

3 Illustrated parts catalog

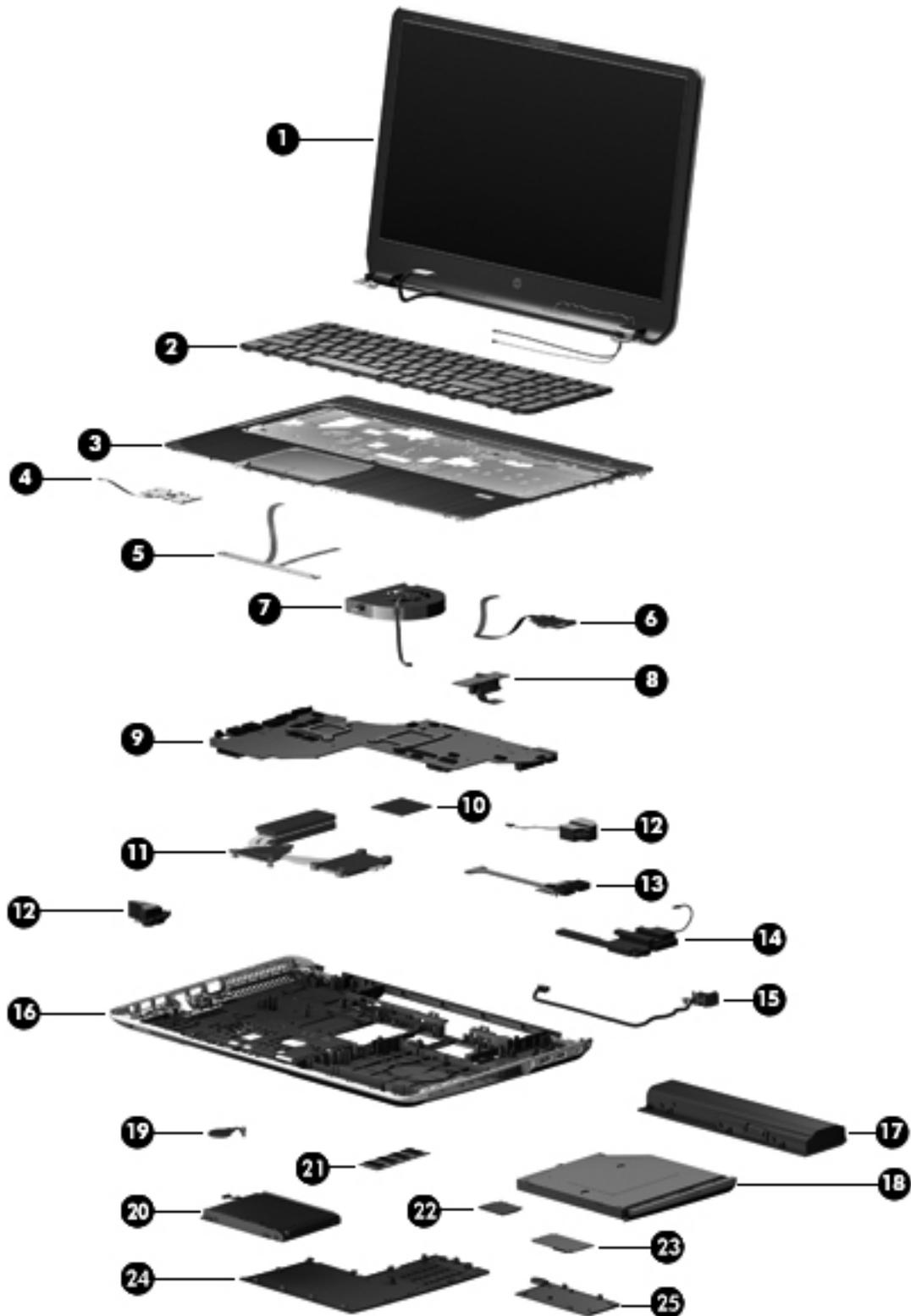
Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag. It is necessary to remove the battery to obtain these numbers. See [Battery on page 47](#) for battery removal instructions.



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.
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support 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 29 .	
(2)	Keyboard with backlight in midnight black finish (includes backlight cable and keyboard cable):	
	For use on all computer models in Belgium	698403-A41
	For use on all computer models in Canada	698403-DB1
	For use on all computer models in Denmark, Finland, and Norway	698403-DH1
	For use only on computer models equipped with an Intel processor in France	698403-051
	For use only on computer models equipped with an Intel processor in Germany	698403-041
	For use only on computer models equipped with an Intel processor in Greece	698403-151
	For use on all computer models in Latin America	698403-161
	For use on all computer models in the Netherlands	698403-B31
	For use on all computer models in Portugal	698403-131
	For use on all computer models in Saudi Arabia	698403-171
	For use on all computer models in Switzerland	698403-BG1
	For use on all computer models in Turkey	698403-141
	For use on all computer models in the United States	698403-001
	Keyboard with backlight in natural silver finish (includes backlight cable and keyboard cable):	
	For use on all computer models in Belgium	698404-A41
	For use on all computer models in Canada	698404-DB1
	For use on all computer models in Denmark, Finland, and Norway	698404-DH1
	For use only on computer models equipped with an Intel processor in France	698404-051
	For use only on computer models equipped with an Intel processor in Germany	698404-041
	For use only on computer models equipped with an Intel processor in Greece	698404-151
	For use on all computer models in Latin America	698404-161
	For use on all computer models in the Netherlands	698404-B31
	For use on all computer models in Portugal	698404-131
	For use on all computer models in Saudi Arabia	698404-171
	For use on all computer models in Switzerland	698404-BG1
	For use on all computer models in Turkey	698404-141
	For use on all computer models in the United States	698404-001
	Keyboard without backlight in midnight black finish (includes keyboard cable):	
	For use only on computer models equipped with an Intel processor in Bulgaria	698401-261
	For use on all computer models in the Czech Republic and Slovakia	698401-FL1

Item	Component	Spare part number
	For use on all computer models in France	698401-051
	For use only on computer models equipped with an Intel processor in Italy	698401-061
	For use only on computer models equipped with an Intel processor in Latin America	698401-161
	For use only on computer models equipped with an Intel processor in the Netherlands	698401-B31
	For use on all computer models in Russia	698401-251
	For use only on computer models equipped with an AMD processor in Saudi Arabia	698401-171
	For use on all computer models in South Korea	698401-AD1
	For use on all computer models in Spain	698401-071
	For use only on computer models equipped with an Intel processor in Taiwan	698401-AB1
	For use only on computer models equipped with an Intel processor in Thailand	698401-281
	For use on all computer models in the United Kingdom and Singapore	698401-031
	For use on all computer models in the United States	698401-001
	Keyboard without backlight in natural silver finish (includes keyboard cable):	
	For use only on computer models equipped with an Intel processor in Bulgaria	698402-261
	For use on all computer models in the Czech Republic and Slovakia	698402-FL1
	For use on all computer models in France	698402-051
	For use only on computer models equipped with an Intel processor in Italy	698402-061
	For use only on computer models equipped with an Intel processor in Latin America	698402-161
	For use only on computer models equipped with an Intel processor in the Netherlands	698402-B31
	For use on all computer models in Russia	698402-251
	For use only on computer models equipped with an AMD processor in Saudi Arabia	698402-171
	For use on all computer models in South Korea	698402-AD1
	For use on all computer models in Spain	698402-071
	For use only on computer models equipped with an Intel processor in Taiwan	698402-AB1
	For use only on computer models equipped with an Intel processor in Thailand	698402-281
	For use on all computer models in the United Kingdom and Singapore	698402-031
	For use on all computer models in the United States	698402-001
(3)	Top cover (includes TouchPad):	
	In midnight black finish	705195-001
	In natural silver finish	705196-001
(4)	Power button board (includes cable)	686917-001
(5)	TouchPad button board (includes TouchPad button board cable and TouchPad cable)	686919-001

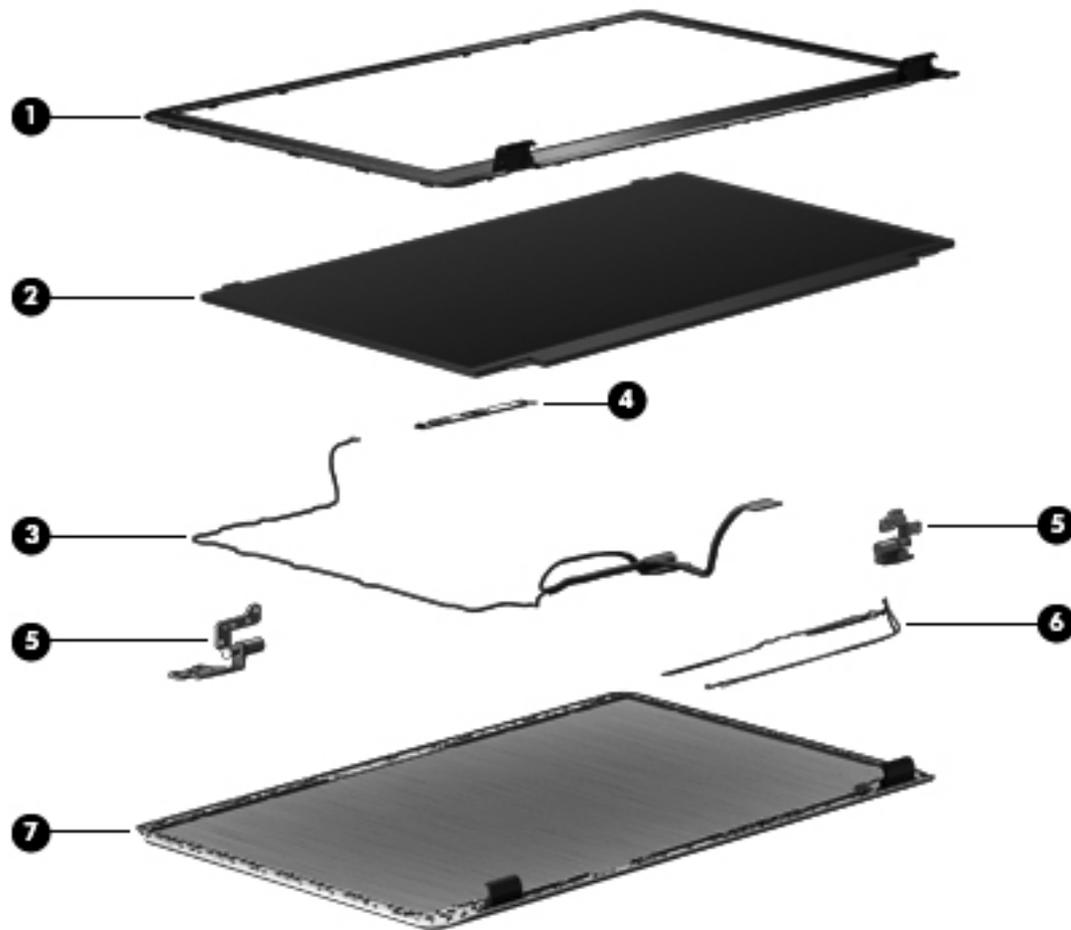
Item	Component	Spare part number
(6)	Fingerprint reader board (includes bracket and cable)	686906-001
(7)	Fan (includes cable)	686901-001
(8)	Optical drive connector board (includes cable)	686899-001
(9)	System board (includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Professional operating system	702177-601
	For use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Standard operating system	725064-501 and 702177-501
	For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 2048-MB discrete memory, and the Windows 8 Professional operating system	698399-601
	For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 2048-MB discrete memory, and the Windows 8 Standard operating system	698399-501
	For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 1024-MB discrete memory, and the Windows 8 Professional operating system	698397-601
	For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 1024-MB discrete memory, and the Windows 8 Standard operating system	698397-501
	For use only on computer models equipped with an Intel processor, a graphics subsystem with UMA memory, and the Windows 8 Professional operating system	698395-601
	For use only on computer models equipped with an Intel processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system	698395-501
(10)	Processor (includes replacement thermal material):	
	AMD A10-5750M 2.50-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	713548-001
	AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683046-001
	AMD A8-5550M 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	713551-001
	AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683048-001
	AMD A6-5350M 2.90-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	713550-001
	AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	683047-001
	AMD A4-5150M 2.70-GHz processor (turbo up to 3.30-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	713549-001
	AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	685990-001

Item	Component	Spare part number
	Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	701658-001
	Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	680647-001
	Intel Quad Core i7-3520M 2.90-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 4.0-MB L3 cache, 35 W)	681954-001
	Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	711903-001
	Intel Dual Core i5-3210M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	680645-001
	Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	713163-001
	Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	700627-001
	Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	682417-001
	Intel Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	677152-001
	Intel Core i3-2350M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	653340-001
(11)	Heat sink (includes replacement thermal material):	
	For use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory	687231-001
	For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	687230-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory	686905-001
	For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	686904-001
(12)	Speakers (include cables and 4 rubber isolators)	686925-001
(13)	USB board	686918-001
(14)	Subwoofer (includes cables and 2 rubber isolators)	686926-001
(15)	Power connector cable (includes bracket)	686900-001
(16)	Base enclosure (includes battery release latch assembly)	707886-001
(17)	Battery:	
	9-cell, 100-Wh, 3.0-Ah, Li-ion battery	672412-001
	6-cell, 62-Wh, 2.8-Ah, Li-ion battery	671731-001
(18)	DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)	686916-001

Item	Component	Spare part number
(19)	RTC battery (includes cable and double-sided tape)	672349-001
(20)	Hard drive (does not include hard drive bracket, hard drive connector cable, or screws):	
	1-TB, 5400-rpm, 9.5-mm	676521-001
	750-GB, 7200-rpm, 9.5-mm	633252-001
	750-GB, 5400-rpm, 9.5-mm	634250-001
	640-GB, 5400-rpm, 9.5-mm	669300-001
	500-GB, 7200-rpm, 9.5-mm	634925-001
	500-GB, 5400-rpm, 9.5-mm	669299-001
	320-GB, 7200-rpm, 9.5-mm	641672-001
	320-GB, 5400-rpm, 9.5-mm	622643-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive bracket, hard drive connector cable, and screws)	686907-001
(21)	Memory modules (2, PC3, 12800, 1600-MHz):	
	8-GB memory module	670034-001
	4-GB memory module	641369-001
	2-GB memory module	652972-001
(22)	WLAN module:	
	For use on all computer models:	
	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
	Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter	675794-001
	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
	Intel Centrino Advanced-N 6230 WLAN module	670691-001
	Mediatek MT7630E 802.11bgn Wi-Fi Adapter and Mediatek Bluetooth 4.0 Adapter	710418-001
	Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter	691415-001
	Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
	Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor	690019-001
	Intel Centrino Advanced-N 6235 WLAN module for use only on computer models equipped with an Intel processor in Japan	670290-001
(23)	32-GB solid-state drive (for use only on computer models equipped with an Intel processor)	686927-001
	Service Cover Kit , includes:	686920-001

Item	Component	Spare part number
(24)	Service cover (includes one captive screw, secured by an O-ring)	
(25)	Wireless module compartment cover (includes one captive screw, secured by an O-ring)	

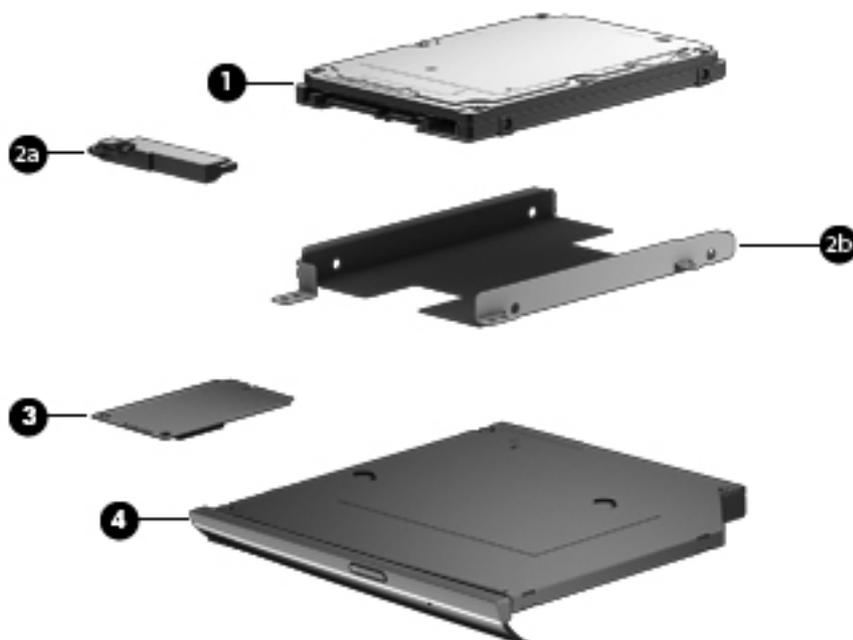
Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel	
	For use only on computer models equipped with an AMD processor	686897-001
	For use only on computer models equipped with an Intel processor	698405-001
(2)	15.6-in, LED, SVA, HD, BrightView display panel	686921-001
(3)	Display panel cable (includes webcam/microphone module cable)	686898-001
(4)	Webcam/microphone module	
	Nuance webcam/microphone module	716350-001

Item	Component	Spare part number
	Webcam/microphone module	686587-001
(5)	Display Hinge Kit (includes left and right hinges)	686913-001
(6)	Wireless Antenna Kit (includes left and right wireless antenna cables and transceivers)	686894-001
(7)	Display enclosure:	
	In midnight black finish	686895-001
	In natural finish	690231-001

Mass storage devices



Item	Description	Spare part number
(1)	Hard drive (does not include hard drive bracket, hard drive connector cable, or screws):	
	1-TB, 5400-rpm, 9.5-mm	676521-001
	750-GB, 7200-rpm, 9.5-mm	633252-001
	750-GB, 5400-rpm, 9.5-mm	634250-001
	640-GB, 5400-rpm, 9.5-mm	669300-001
	500-GB, 7200-rpm, 9.5-mm	634925-001
	500-GB, 5400-rpm, 9.5-mm	669299-001
	320-GB, 7200-rpm, 9.5-mm	641672-001

Item	Description	Spare part number
	320-GB, 5400-rpm, 9.5-mm	622643-001
	Hard Drive Hardware Kit , includes:	686907-001
(2a)	Hard drive connector cable	
(2b)	Hard drive bracket	
	Hard drive bracket screws (not illustrated)	
(3)	32-GB solid-state drive (for use only on computer models equipped with an Intel processor)	686927-001
(4)	DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)	686916-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
90-W HP Smart AC adapter for use on all on computer models (PFC, 3-wire)	693712-001
90-W HP Smart AC adapter for use on all on computer models (PFC, EM, 3-wire)	693713-001
65-W HP Smart AC adapter for use on all computer models (non-PFC, 3-wire)	693711-001
65-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC/V, EM, 3-wire)	693710-001
Power cord (3-pin, black, 1.83-m):	
For use on all computer models in Argentina	490371-D01
For use on all computer models in Australia	490371-011
For use on all computer models in Denmark	490371-081
For use on all computer models in Europe	490371-021
For use only on computer models equipped with an Intel processor in India	490371-D61
For use on all computer models in Israel	490371-BB1
For use on all computer models in Italy	490371-061
For use on all computer models in Japan	490371-291
For use on all computer models in North America	490371-001
For use only on computer models equipped with an Intel processor in the People's Republic of China	490371-AA1
For use on all computer models in South Africa	490371-AR1
For use on all computer models in South Korea	490371-AD1
For use on all computer models in Switzerland	490371-111
For use only on computer models equipped with an Intel processor in Taiwan	490371-AB1
For use only on computer models equipped with an Intel processor in Thailand	490371-201
For use on all computer models the United Kingdom and Singapore	490371-031
Screw Kit	686924-001

Sequential part number listing

Spare part number	Description
490371-001	Power cord for use on all computer models in North America (3-pin, black, 1.83-m)
490371-011	Power cord for use on all computer models in Australia (3-pin, black, 1.83-m)
490371-021	Power cord for use on all computer models in Europe (3-pin, black, 1.83-m)
490371-031	Power cord for use on all computer models in the United Kingdom and Singapore (3-pin, black, 1.83-m)
490371-061	Power cord for use on all computer models in Italy (3-pin, black, 1.83-m)
490371-081	Power cord for use on all computer models in Denmark (3-pin, black, 1.83-m)
490371-111	Power cord for use on all computer models in Switzerland (3-pin, black, 1.83-m)
490371-201	Power cord for use only on computer models equipped with an Intel processor in Thailand (3-pin, black, 1.83-m)
490371-291	Power cord for use on all computer models in Japan (3-pin, black, 1.83-m)
490371-AA1	Power cord for use only on computer models equipped with an Intel processor in the People's Republic of China (3-pin, black, 1.83-m)
490371-AB1	Power cord for use only on computer models equipped with an Intel processor in Taiwan (3-pin, black, 1.83-m)
490371-AD1	Power cord for use on all computer models in South Korea (3-pin, black, 1.83-m)
490371-AR1	Power cord for use on all computer models in South Africa (3-pin, black, 1.83-m)
490371-BB1	Power cord for use on all computer models in Israel (3-pin, black, 1.83-m)
490371-D01	Power cord for use on all computer models in Argentina (3-pin, black, 1.83-m)
490371-D61	Power cord for use only on computer models equipped with an Intel processor in India (3-pin, black, 1.83-m)
622643-001	320-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
633252-001	750-GB, 7200-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
634250-001	750-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.

Spare part number	Description
634925-001	500-GB, 7200-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
641369-001	4-GB memory module (PC3, 12800, 1600-MHz)
641672-001	320-GB, 7200-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
652972-001	2-GB memory module (PC3, 12800, 1600-MHz)
653340-001	Intel Core i3-2350M 2.30-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
655795-001	Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter for use on all computer models
657325-001	Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter for use on all computer models
669299-001	500-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
669300-001	640-GB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
670034-001	8-GB memory module (PC3, 12800, 1600-MHz)
670290-001	Intel Centrino Wireless-N 2230 WLAN module for use only on computer models equipped with an Intel processor
670691-001	Ralink RT5390F 802.11b/g/n 1×1 WLAN module for use on all computer models
671731-001	6-cell, 62-Wh, 2.80-Ah, Li-ion battery
672349-001	RTC battery (includes cable and double-sided tape)
672412-001	9-cell, 100-Wh, 3.00-Ah, Li-ion battery
675794-001	Atheros WB225 1×1 802.11b/g/n Bluetooth Combo Adapter for use on all computer models
676521-001	1-TB, 5400-rpm, 9.5-mm hard drive (does not include hard drive bracket, hard drive connector cable, or screws) NOTE: The hard drive bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 686907-001.
677152-001	Intel Core i3-2370M 2.40-GHz processor (1333-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)

Spare part number	Description
680645-001	Intel Core i5-3210M 2.50-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
680647-001	Intel Core i7-3612QM 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz, 6.0-MB L3 cache, quad core, 35 W; includes replacement thermal material)
681954-001	Intel Core i7-3520M 2.90-GHz processor (turbo up to 3.60-GHz; 1600-MHz, 4.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
682417-001	Intel Core i3-3110M 2.30-GHz processor (3.0-MB L3 cache, dual core, 35 W; includes replacement thermal material)
683046-001	AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W; includes replacement thermal material)
683047-001	AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W; includes replacement thermal material)
683048-001	AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W; includes replacement thermal material)
685990-001	AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W; includes replacement thermal material)
686587-001	Webcam/microphone module
686894-001	Wireless Antenna Kit (includes left and right wireless antenna cables and transceivers)
686895-001	Display enclosure in midnight black finish
686897-001	Display bezel for use only on computer models equipped with an AMD processor
686898-001	Display panel cable (includes webcam/microphone module cable)
686899-001	Optical drive connector board (includes cable)
686900-001	Power connector cable (includes bracket)
686901-001	Fan (includes cable)
686904-001	Heat sink for use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory (includes replacement thermal material)
686905-001	Heat sink for use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory (includes replacement thermal material)
686906-001	Fingerprint reader board (includes bracket and cable)
686907-001	Hard Drive Hardware Kit (includes bracket, connector cable, and screws)
686913-001	Display Hinge Kit (includes left and right hinges)
686916-001	DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)
686917-001	Power button board (includes cable)
686918-001	USB board
686919-001	TouchPad button board (includes cable)
686920-001	Service Cover Kit (includes service cover and wireless module compartment cover)

Spare part number	Description
686921-001	15.6-in, LED, SVA, HD, BrightView display panel
686924-001	Screw Kit
686925-001	Speakers (include cables and rubber isolators)
686926-001	Subwoofer (includes cables and rubber isolators)
686927-001	32-GB solid-state drive (for use only on computer models equipped with an Intel processor)
687230-001	Heat sink for use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory (includes replacement thermal material)
687231-001	Heat sink for use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory (includes replacement thermal material)
690019-001	Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor
690020-001	Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter for use on all computer models
690231-001	Display enclosure in natural silver finish
690232-001	Top cover in natural silver finish (includes TouchPad)
691415-001	Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter for use on all computer models
693710-001	65-W HP Smart AC adapter for use only on computer models equipped with an Intel processor (RC/V, EM, 3-wire)
693711-001	65-W HP Smart AC adapter for use on all computer models (non-PFC, 3-wire)
693712-001	90-W HP Smart AC adapter for use on all on computer models (PFC, 3-wire)
693713-001	90-W HP Smart AC adapter for use on all on computer models (PFC, EM, 3-wire)
698395-501	System board for use only on computer models equipped with an Intel processor, graphics subsystem with UMA memory, and the Windows 8 Standard operating system (includes replacement thermal material)
698395-601	System board for use only on computer models equipped with an Intel processor, graphics subsystem with UMA memory, and the Windows 8 Professional operating system (includes replacement thermal material)
698397-501	System board for use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 1024-MB discrete memory, and the Windows 8 Standard operating system (includes replacement thermal material)
698397-601	System board for use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 1024-MB discrete memory, and the Windows 8 Professional operating system (includes replacement thermal material)
698399-501	System board for use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 2048-MB discrete memory, and the Windows 8 Standard operating system (includes replacement thermal material)
698399-601	System board for use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 2048-MB discrete memory, and the Windows 8 Professional operating system (includes replacement thermal material)

Spare part number	Description
698401-001	Keyboard in midnight black finish for use on all computer models in the United States (includes keyboard cable)
698401-031	Keyboard in midnight black finish for use on all computer models in the United Kingdom and Singapore (includes keyboard cable)
698401-051	Keyboard in midnight black finish for use on all computer models in France (includes keyboard cable)
698401-061	Keyboard in midnight black finish for use only on computer models equipped with an Intel processor in Italy (includes keyboard cable)
698401-071	Keyboard in midnight black finish for use on all computer models in Spain (includes keyboard cable)
698401-161	Keyboard in midnight black finish for use only on computer models equipped with an Intel processor in Latin America (includes keyboard cable)
698401-171	Keyboard in midnight black finish for use only on computer models equipped with an AMD processor in Saudi Arabia (includes keyboard cable)
698401-251	Keyboard in midnight black finish for use on all computer models in Russia (includes keyboard cable)
698401-261	Keyboard in midnight black finish for use only on computer models equipped with an Intel processor in Bulgaria (includes keyboard cable)
698401-281	Keyboard in midnight black finish for use only on computer models equipped with an Intel processor in Thailand (includes keyboard cable)
698401-AB1	Keyboard in midnight black finish for use only on computer models equipped with an Intel processor in Taiwan (includes keyboard cable)
698401-AD1	Keyboard in midnight black finish for use on all computer models in South Korea (includes keyboard cable)
698401-B31	Keyboard in midnight black finish for use only on computer models equipped with an Intel processor in the Netherlands (includes keyboard cable)
698401-FL1	Keyboard in midnight black finish for use on all computer models in the Czech Republic and Slovakia (includes keyboard cable)
698402-001	Keyboard in natural silver finish for use on all computer models in the United States (includes keyboard cable)
698402-031	Keyboard in natural silver finish for use on all computer models in the United Kingdom and Singapore (includes keyboard cable)
698402-051	Keyboard in natural silver finish for use on all computer models in France (includes keyboard cable)
698402-061	Keyboard in natural silver finish for use only on computer models equipped with an Intel processor in Italy (includes keyboard cable)
698402-071	Keyboard in natural silver finish for use on all computer models in Spain (includes keyboard cable)
698402-161	Keyboard in natural silver finish for use only on computer models equipped with an Intel processor in Latin America (includes keyboard cable)
698402-171	Keyboard in natural silver finish for use only on computer models equipped with an AMD processor in Saudi Arabia (includes keyboard cable)
698402-251	Keyboard in natural silver finish for use on all computer models in Russia (includes keyboard cable)

Spare part number	Description
698402-261	Keyboard in natural silver finish for use only on computer models equipped with an Intel processor in Bulgaria (includes keyboard cable)
698402-281	Keyboard in natural silver finish for use only on computer models equipped with an Intel processor in Thailand (includes keyboard cable)
698402-AB1	Keyboard in natural silver finish for use only on computer models equipped with an Intel processor in Taiwan (includes keyboard cable)
698402-AD1	Keyboard in natural silver finish for use on all computer models in South Korea (includes keyboard cable)
698402-B31	Keyboard in natural silver finish for use only on computer models equipped with an Intel processor in the Netherlands (includes keyboard cable)
698402-FL1	Keyboard in natural silver finish for use on all computer models in the Czech Republic and Slovakia (includes keyboard cable)
698403-001	Keyboard with backlight in midnight black finish for use on all computer models in the United States (includes backlight cable and keyboard cable)
698403-041	Keyboard with backlight in midnight black finish for use only on computer models equipped with an Intel processor in Germany (includes backlight cable and keyboard cable)
698403-051	Keyboard with backlight in midnight black finish for use only on computer models equipped with an Intel processor in France (includes backlight cable and keyboard cable)
698403-131	Keyboard with backlight in midnight black finish for use on all computer models in Portugal (includes backlight cable and keyboard cable)
698403-141	Keyboard with backlight in midnight black finish for use on all computer models in Turkey (includes backlight cable and keyboard cable)
698403-151	Keyboard with backlight in midnight black finish for use only on computer models equipped with an Intel processor in Greece (includes backlight cable and keyboard cable)
698403-161	Keyboard with backlight in midnight black finish for use on all computer models in Latin America (includes backlight cable and keyboard cable)
698403-171	Keyboard with backlight in midnight black finish for use on all computer models in Saudi Arabia (includes backlight cable and keyboard cable)
698403-A41	Keyboard with backlight in midnight black finish for use on all computer models in Belgium (includes backlight cable and keyboard cable)
698403-B31	Keyboard with backlight in midnight black finish for use on all computer models in the Netherlands (includes backlight cable and keyboard cable)
698403-BG1	Keyboard with backlight in midnight black finish for use on all computer models in Switzerland (includes backlight cable and keyboard cable)
698403-DB1	Keyboard with backlight in midnight black finish for use on all computer models in Canada (includes backlight cable and keyboard cable)
698403-DH1	Keyboard with backlight in midnight black finish for use on all computer models in Denmark, Finland, and Norway (includes backlight cable and keyboard cable)
698404-001	Keyboard with backlight in natural silver finish for use on all computer models in the United States (includes backlight cable and keyboard cable)

Spare part number	Description
698404-041	Keyboard with backlight in natural silver finish for use only on computer models equipped with an Intel processor in Germany (includes backlight cable and keyboard cable)
698404-051	Keyboard with backlight in natural silver finish for use only on computer models equipped with an Intel processor in France (includes backlight cable and keyboard cable)
698404-131	Keyboard with backlight in natural silver finish for use on all computer models in Portugal (includes backlight cable and keyboard cable)
698404-141	Keyboard with backlight in natural silver finish for use on all computer models in Turkey (includes backlight cable and keyboard cable)
698404-151	Keyboard with backlight in natural silver finish for use only on computer models equipped with an Intel processor in Greece (includes backlight cable and keyboard cable)
698404-161	Keyboard with backlight in natural silver finish for use on all computer models in Latin America (includes backlight cable and keyboard cable)
698404-171	Keyboard with backlight in natural silver finish for use on all computer models in Saudi Arabia (includes backlight cable and keyboard cable)
698404-A41	Keyboard with backlight in natural silver finish for use on all computer models in Belgium (includes backlight cable and keyboard cable)
698404-B31	Keyboard with backlight in natural silver finish for use on all computer models in the Netherlands (includes backlight cable and keyboard cable)
698404-BG1	Keyboard with backlight in natural silver finish for use on all computer models in Switzerland (includes backlight cable and keyboard cable)
698404-DB1	Keyboard with backlight in natural silver finish for use on all computer models in Canada (includes backlight cable and keyboard cable)
698404-DH1	Keyboard with backlight in natural silver finish for use on all computer models in Denmark, Finland, and Norway (includes backlight cable and keyboard cable)
698405-001	Display bezel for use only on computer models equipped with an Intel processor
700627-001	Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
701658-001	Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W; includes replacement thermal material)
702177-501	System board for use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Standard operating system (includes replacement thermal material)
702177-601	System board for use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Professional operating system (includes replacement thermal material)
705195-001	Top cover in midnight black finish (includes TouchPad)
705196-001	Top cover in natural silver finish (includes TouchPad)
707886-001	Base enclosure (includes battery release latch assembly)
710418-001	Mediatek MT7630E 802.11bgn Wi-Fi Adapter and Mediatek Bluetooth 4.0 Adapter
713548-001	AMD A10-5750M 2.50-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W; includes replacement thermal material)

Spare part number	Description
713549-001	AMD A4-5150M 2.70-GHz processor (turbo up to 3.30-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W; includes replacement thermal material)
713550-001	AMD A6-5350M 2.90-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W; includes replacement thermal material)
713551-001	AMD A8-5550M 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W; includes replacement thermal material)
711903-001	Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
713163-001	Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W; includes replacement thermal material)
716350-001	Nuance webcam/microphone module
725064-501	System board for use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Standard operating system (includes replacement thermal material)

4 Removal and replacement procedures

Preliminary replacement requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

 **CAUTION:** Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic 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, screwdrivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

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

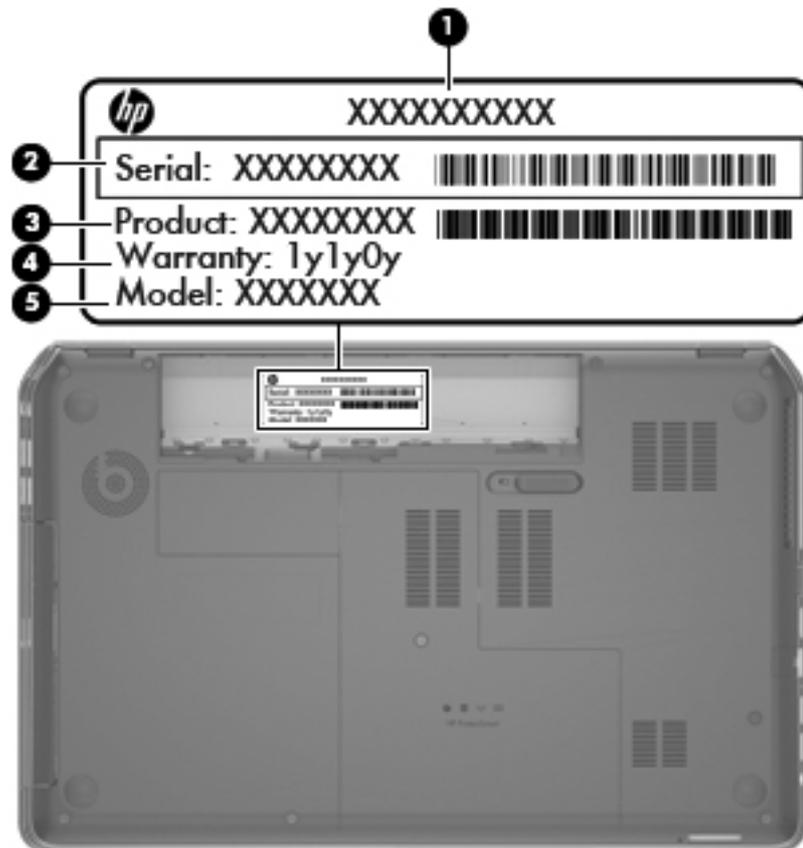
Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 77 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag. It is necessary to remove the battery to obtain these numbers. See [Battery on page 47](#) for battery removal instructions.



Item	Component	Description
(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 determine what components and parts are needed.

Item	Component	Description
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Battery

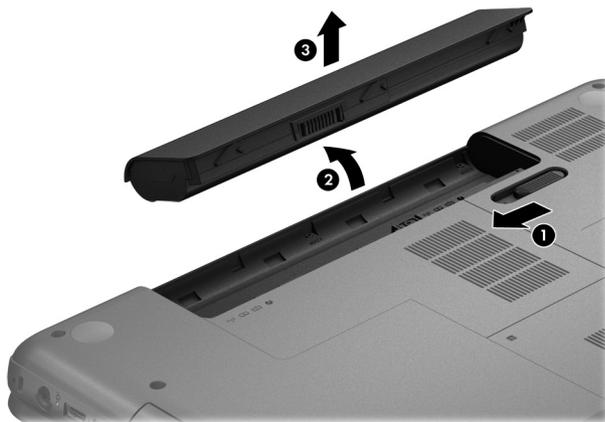
Description	Spare part number
9-cell, 100-Wh, 3.0-Ah, Li-ion battery	672412-001
6-cell, 62-Wh, 2.8-Ah, Li-ion battery	671731-001

Before disassembling the computer, follow these steps:

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

Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery release latch **(1)** to release the battery.
3. Pivot the front edge of the battery **(2)** up and back.
4. Remove the battery **(3)** from the computer.



To insert the battery:

1. Align the tabs on the rear edge of the battery with the notches on the rear edge of the battery bay.
2. Pivot the front edge of the battery down into the battery bay until it is seated. (The battery release latch will automatically lock into place.)

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive bracket, hard drive connector cable, or screws.

Description	Spare part number
1-TB, 5400-rpm, 9.5-mm	676521-001
750-GB, 7200-rpm, 9.5-mm	633252-001
750-GB, 5400-rpm, 9.5-mm	634250-001
640-GB, 5400-rpm, 9.5-mm	669300-001
500-GB, 7200-rpm, 9.5-mm	634925-001
500-GB, 5400-rpm, 9.5-mm	669299-001
320-GB, 7200-rpm, 9.5-mm	641672-001
320-GB, 5400-rpm, 9.5-mm	622643-001
Hard Drive Hardware Kit (includes hard drive bracket, hard drive connector cable, and screws)	686907-001

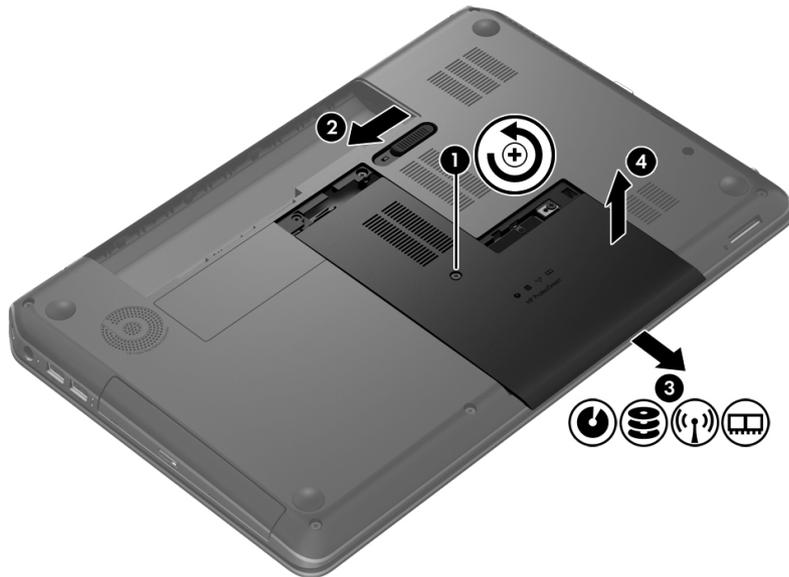
Before removing the hard drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)).

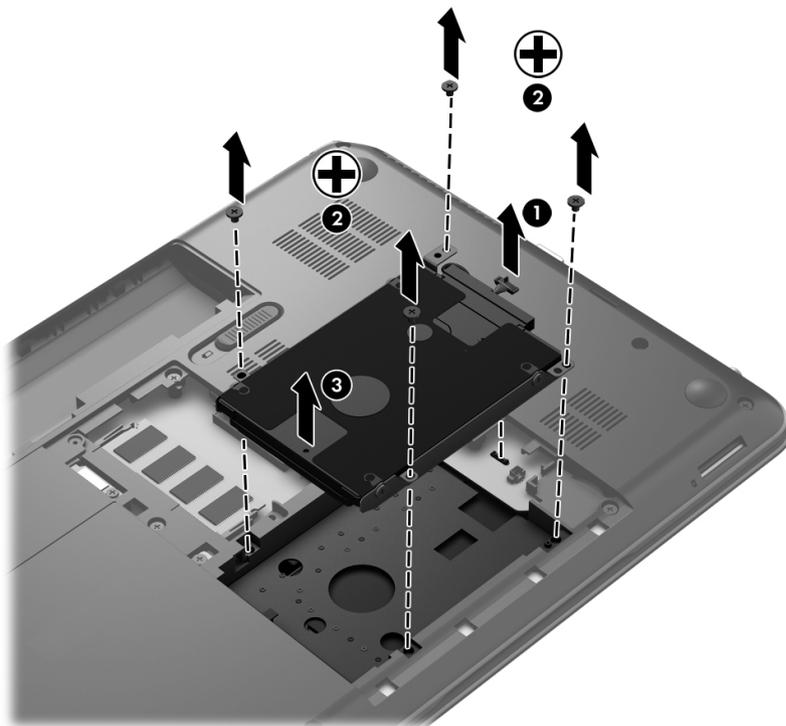
Remove the hard drive:

1. Loosen the captive screw **(1)** that secures the service cover to the computer.
2. Slide the battery release latch **(2)** to release the service cover. (The service cover releases **(3)** forward.)

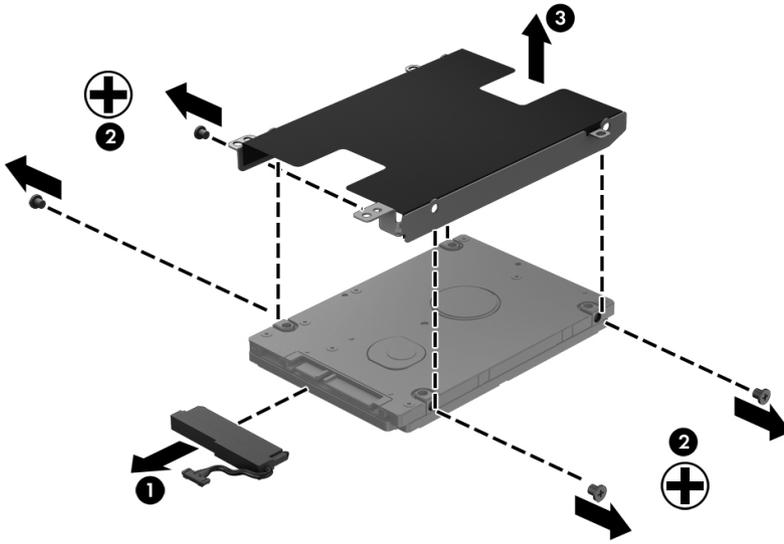
3. Remove the service cover **(4)** by lifting it straight up. The service cover is available in the Service Cover Kit, spare part number 686920-001.



4. Disconnect the hard drive connector cable **(1)** from the system board, and then release the cable from the space between the hard drive and the right side of the hard drive bay.
5. Remove the four Phillips PM2.5x3.5 screws **(2)** that secure the hard drive to the computer.
6. Remove the hard drive **(3)** from the hard drive bay.



7. If it is necessary to disassemble the hard drive, perform the following steps:
- Disconnect the hard drive connector cable **(1)** from the hard drive.
 - Remove the four Phillips PM3.0×3.0 screws **(2)** that secure the hard drive bracket to the hard drive.
 - Remove the hard drive bracket **(3)** from the hard drive. The hard drive bracket, hard drive connector cable, and screws are available in the Hard Drive Hardware Kit, spare part number 686907-001.



Reverse this procedure to reassemble and install the hard drive.

RTC battery

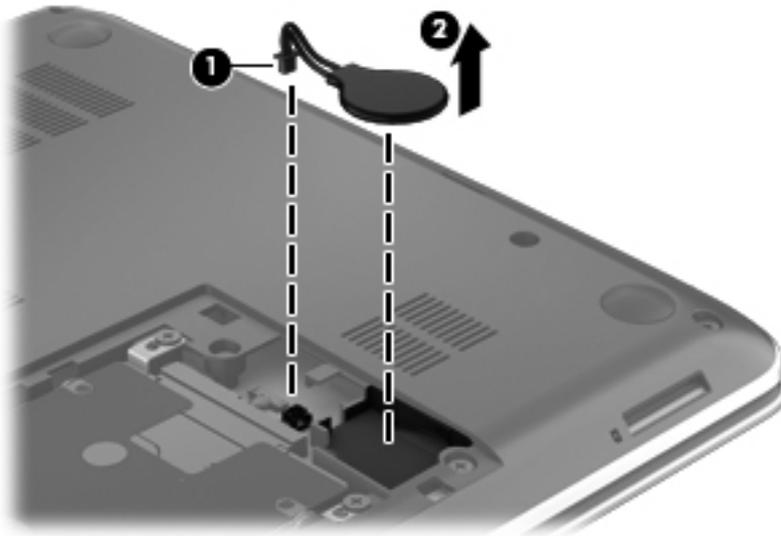
Description	Spare part number
RTC battery (includes cable and double-sided tape)	672349-001

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 47](#)).
5. Remove the service cover (see [Hard drive on page 48](#)).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Detach the RTC battery **(2)** from the base enclosure. (The RTC battery is attached to the base enclosure with double-sided tape.)



3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Optical drive

Description	Spare part number
DVD±RW Double-Layer with SuperMulti Drive (includes optical drive bezel and optical drive bracket)	686916-001

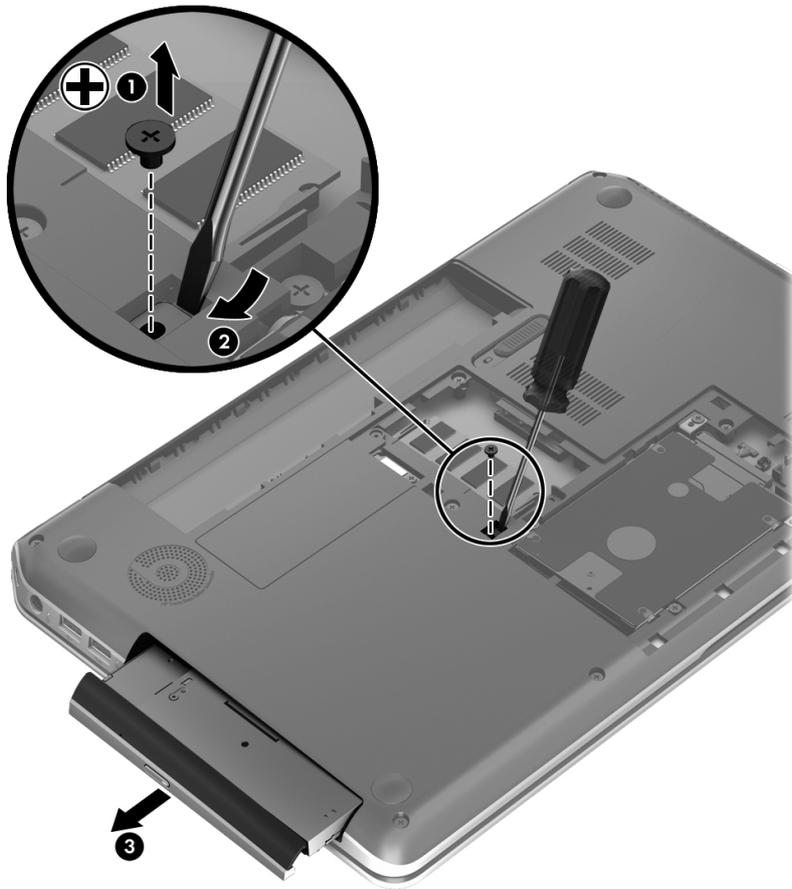
Before removing the optical drive, follow these steps:

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 47](#)).
5. Remove the service cover (see [Hard drive on page 48](#)).

Remove the optical drive:

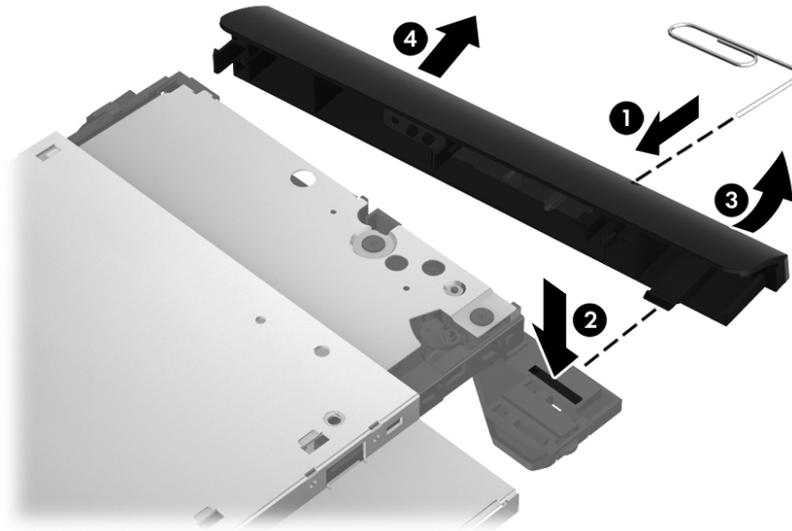
1. Remove the Phillips PM2.5×3.5 screw **(1)** that secures the optical drive the computer.
2. Use a flat-blade screw driver or similar tool to press on the optical drive bracket tab **(2)** to release the optical drive.

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

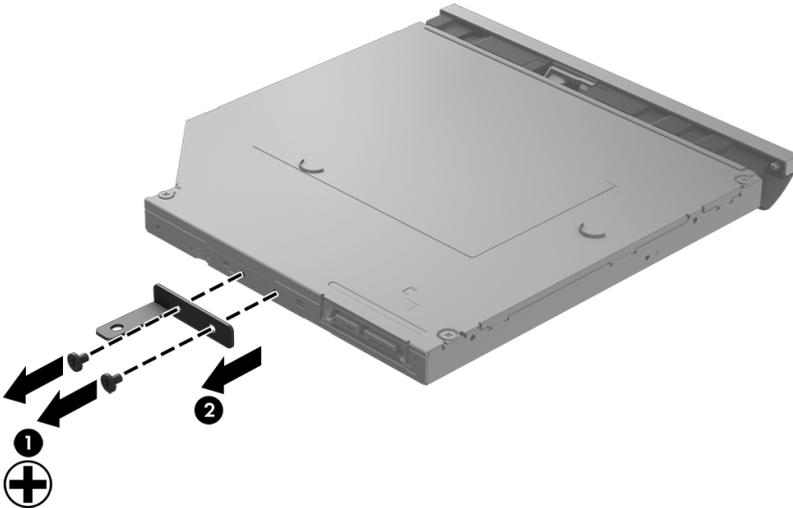


4. If it is necessary to replace the optical drive bezel, use a thin tool or an unbent paper clip **(1)** to release the optical drive tray.
5. Use a flat-blade screw driver or similar tool to press on the optical drive bezel tab **(2)**, and then release the left side of the optical drive bezel **(3)**.

6. Remove the optical drive bezel **(4)**.



7. If it is necessary to replace the optical drive bracket, position the optical drive with the rear panel toward you.
8. Remove the two Phillips PM2.0×3.3 screws **(1)** that secure the optical drive bracket to the optical drive.
9. Remove the optical drive bracket **(2)**.



Reverse this procedure to reassemble and install the optical drive.

Memory module

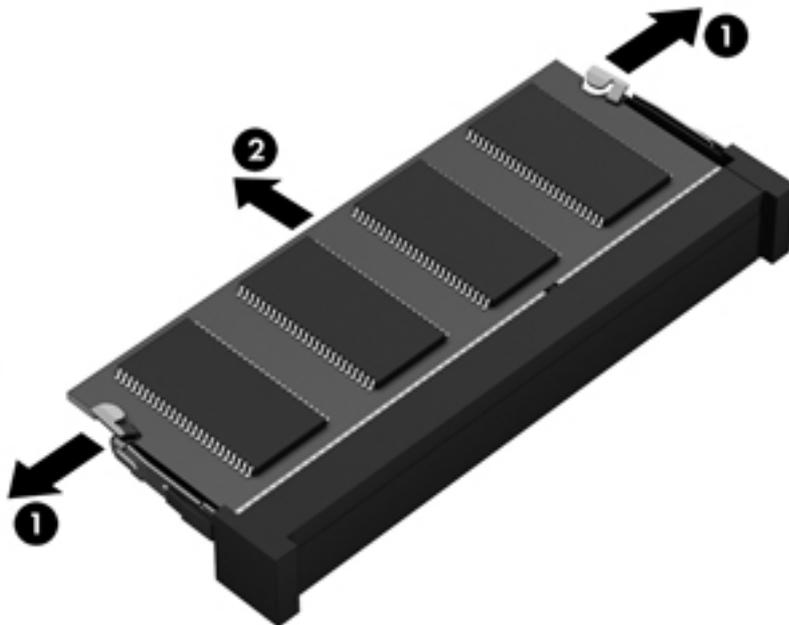
Description	Spare part number
8-GB memory module (PC3, 12800, 1600-MHz)	670034-001
4-GB memory module (PC3, 12800, 1600-MHz)	641369-001
2-GB memory module (PC3, 12800, 1600-MHz)	652972-001

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 47](#)).
5. Remove the service cover (see [Hard drive on page 48](#)).

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)
2. Remove the memory module **(2)** by pulling it away from the slot at an angle.



Reverse this procedure to install a memory module.

Keyboard

For use in country/region	Spare part number	For use in country/region	Spare part number
Keyboard with backlight in midnight black finish (includes backlight cable and keyboard cable):		For use on all computer models in Latin America	698403-161
For use on all computer models in Belgium	698403-A41	For use on all computer models in the Netherlands	698403-B31
For use on all computer models in Canada	698403-DB1	For use on all computer models in Portugal	698403-131
For use on all computer models in Denmark, Finland, and Norway	698403-DH1	For use on all computer models in Saudi Arabia	698403-171
For use only on computer models equipped with an Intel processor in France	698403-051	For use on all computer models in Switzerland	698403-BG1
For use only on computer models equipped with an Intel processor in Germany	698403-041	For use on all computer models in Turkey	698403-141
For use only on computer models equipped with an Intel processor in Greece	698403-151	For use on all computer models in the United States	698403-001
Keyboard with backlight in natural silver finish (includes backlight cable and keyboard cable):		For use on all computer models in Latin America	698404-161
For use on all computer models in Belgium	698404-A41	For use on all computer models in the Netherlands	698404-B31
For use on all computer models in Canada	698404-DB1	For use on all computer models in Portugal	698404-131
For use on all computer models in Denmark, Finland, and Norway	698404-DH1	For use on all computer models in Saudi Arabia	698404-171
For use only on computer models equipped with an Intel processor in France	698404-051	For use on all computer models in Switzerland	698404-BG1
For use only on computer models equipped with an Intel processor in Germany	698404-041	For use on all computer models in Turkey	698404-141
For use only on computer models equipped with an Intel processor in Greece	698404-151	For use on all computer models in the United States	698404-001
Keyboard without backlight in midnight black finish (includes keyboard cable):			
For use only on computer models equipped with an Intel processor in Bulgaria	698401-261	For use only on computer models equipped with an AMD processor in Saudi Arabia	698401-171
For use on all computer models in the Czech Republic and Slovakia	698401-FL1	For use on all computer models in South Korea	698401-AD1

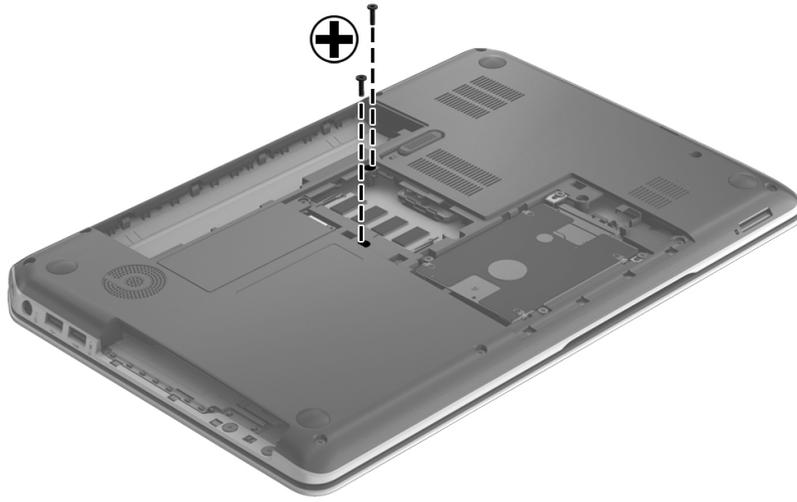
For use in country/region	Spare part number	For use in country/region	Spare part number
For use on all computer models in France	698401-051	For use on all computer models in Spain	698401-071
For use only on computer models equipped with an Intel processor in Italy	698401-061	For use only on computer models equipped with an Intel processor in Taiwan	698401-AB1
For use only on computer models equipped with an Intel processor in Latin America	698401-161	For use only on computer models equipped with an Intel processor in Thailand	698401-281
For use only on computer models equipped with an Intel processor in the Netherlands	698401-B31	For use on all computer models in the United Kingdom and Singapore	698401-031
For use on all computer models in Russia	698401-251	For use on all computer models in the United States	698401-001
Keyboard without backlight in natural silver finish (includes keyboard cable):			
For use only on computer models equipped with an Intel processor in Bulgaria	698402-261	For use only on computer models equipped with an AMD processor in Saudi Arabia	698402-171
For use on all computer models in the Czech Republic and Slovakia	698402-FL1	For use on all computer models in South Korea	698402-AD1
For use on all computer models in France	698402-051	For use on all computer models in Spain	698402-071
For use only on computer models equipped with an Intel processor in Italy	698402-061	For use only on computer models equipped with an Intel processor in Taiwan	698402-AB1
For use only on computer models equipped with an Intel processor in Latin America	698402-161	For use only on computer models equipped with an Intel processor in Thailand	698402-281
For use only on computer models equipped with an Intel processor in the Netherlands	698402-B31	For use on all computer models in the United Kingdom and Singapore	698402-031
For use on all computer models in Russia	698402-251	For use on all computer models in the United States	698402-001

Before removing the keyboard, follow these steps:

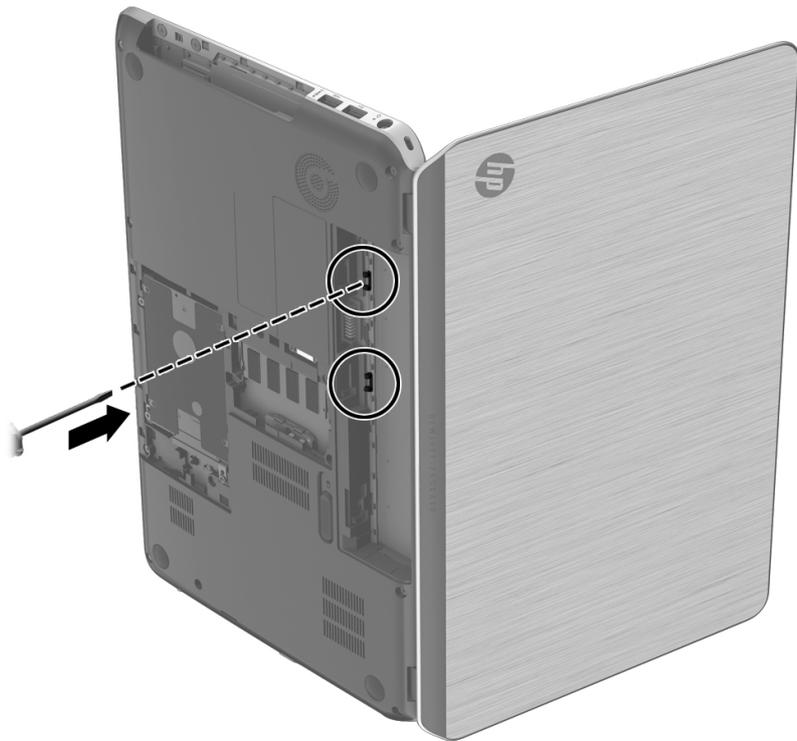
- 1.** Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2.** Disconnect the power from the computer by unplugging the power cord from the computer.
- 3.** Disconnect all external devices from the computer.
- 4.** Remove the battery (see [Battery on page 47](#)).
- 5.** Remove the service cover (see [Hard drive on page 48](#)).

Remove the keyboard:

1. Remove the two Phillips PM2.5×10.0 screws that secure the keyboard to the computer.



2. Rest and secure the computer on its right side.
3. Partially open the computer.
4. Insert a screw driver or similar thin tool into the keyboard release holes, 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 **(1)**, and then swing the keyboard up and forward **(2)** until it rests at an angle.



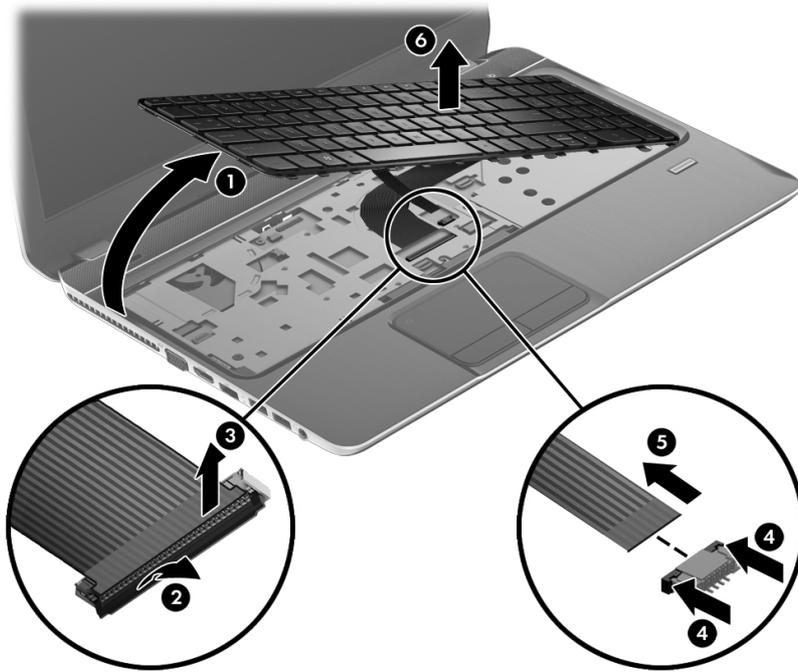
7. Lift the left side of the keyboard **(1)** until the keyboard cable and the keyboard backlight cable are accessible.



NOTE: The keyboard backlight cable is present on select models only.

8. Release the zero insertion force (ZIF) connector **(2)** to which the keyboard cable is attached, and then disconnect the keyboard cable **(3)** from the system board.
9. Release the ZIF connector **(4)** to which the keyboard backlight cable is attached, and then disconnect the keyboard backlight cable **(5)** from the system board.

10. Remove the keyboard **(6)**.



Reverse this procedure to install the keyboard.

WLAN module

Description	Spare part number
For use on all computer models:	
Atheros 9485GN 802.11b/g/n 1×1 WiFi and 3012 Bluetooth 4.0 Combo Adapter	655795-001
Atheros WB225 802.11b/g/n 1×1 Bluetooth Combo Adapter	675794-001
Broadcom 4313GN 802.11b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-001
Intel Centrino Advanced-N 6230 WLAN module	670691-001
Mediatek MT7630E 802.11bgn Wi-Fi Adapter and Mediatek Bluetooth 4.0 Adapter	710418-001
Ralink RT5390R 802.11b/g/n 1×1 WiFi Adapter	691415-001
Ralink RT3290LE 802.11b/g/n 1×1 WiFi and Bluetooth 4.0 Combo Adapter	690020-001
Atheros AR9565 802.11b/g/n 1×1 WiFi + Bluetooth 4.0 Combo Adapter for use only on computer models equipped with an Intel processor	690019-001
Intel Centrino Advanced-N 6235 WLAN module for use only on computer models equipped with an Intel processor in Japan	670290-001

⚠ 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.

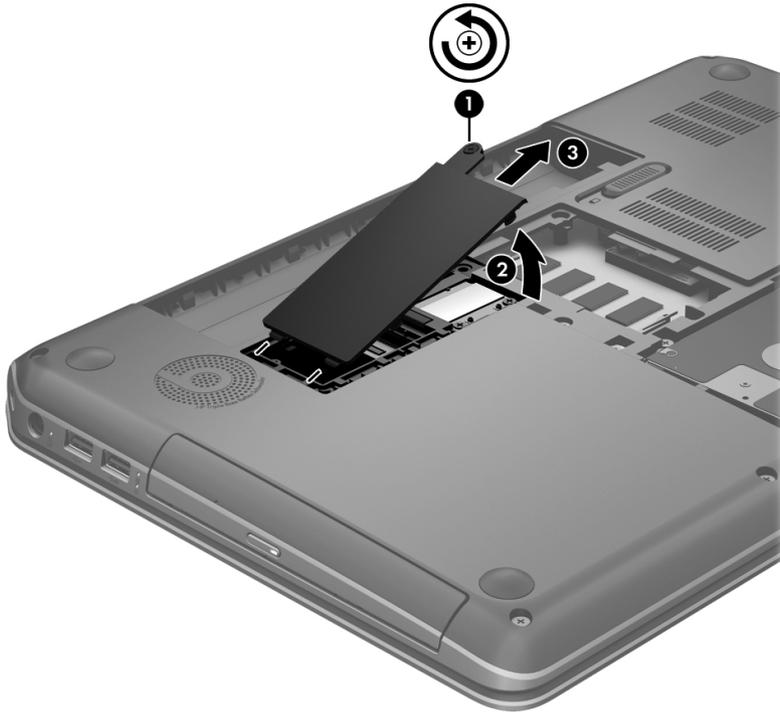
Before removing the WLAN module, follow these steps:

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 47](#)).
5. Remove the service cover (see [Hard drive on page 48](#)).

Remove the WLAN module:

1. Loosen the captive screw **(1)** that secures the wireless module compartment cover to the computer.
2. Lift the right side of the wireless module compartment cover **(2)** until it rests at an angle.

3. Remove the wireless module compartment cover **(3)** by sliding it away from the computer at an angle. The wireless module compartment cover is available in the Service Cover Kit, spare part number 686920-001.

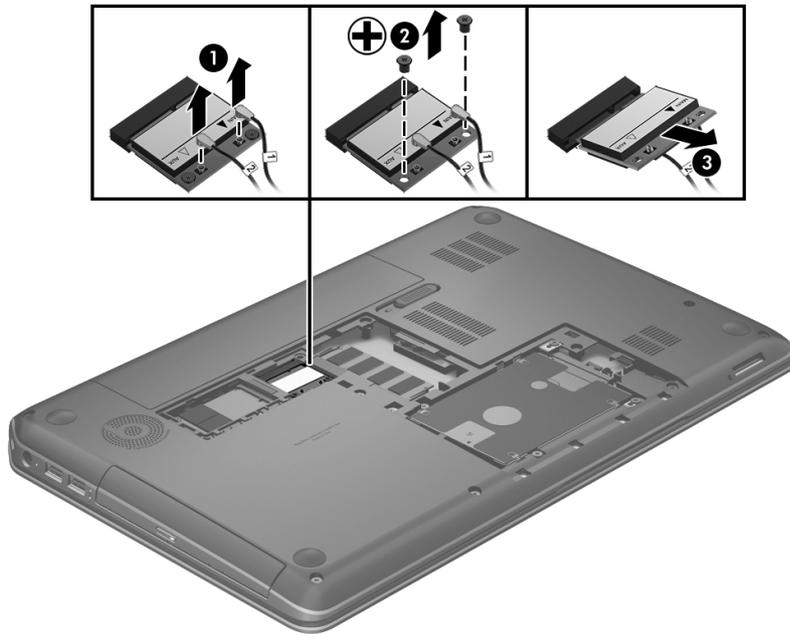


4. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

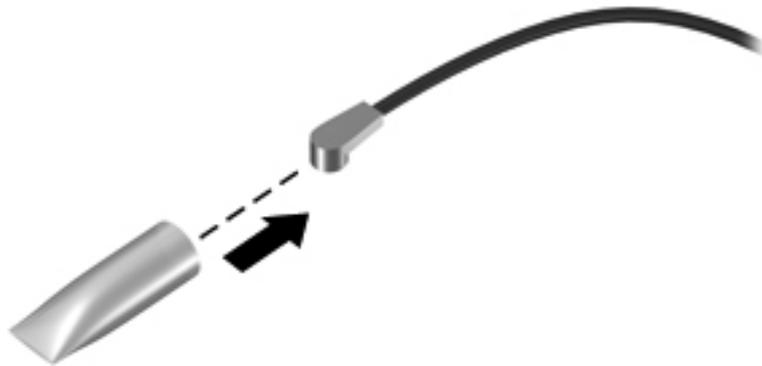
 **NOTE:** The #1 WLAN antenna cable is connected to the WLAN module #1 terminal. The #2 WLAN antenna cable is connected to the WLAN module #2 terminal.

5. Remove the two Phillips PM2.0×3.0 screws **(2)** that secure the WLAN module to the base enclosure. (The WLAN module tilts up.)

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



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



Reverse this procedure to install the WLAN module.

Solid-state drive

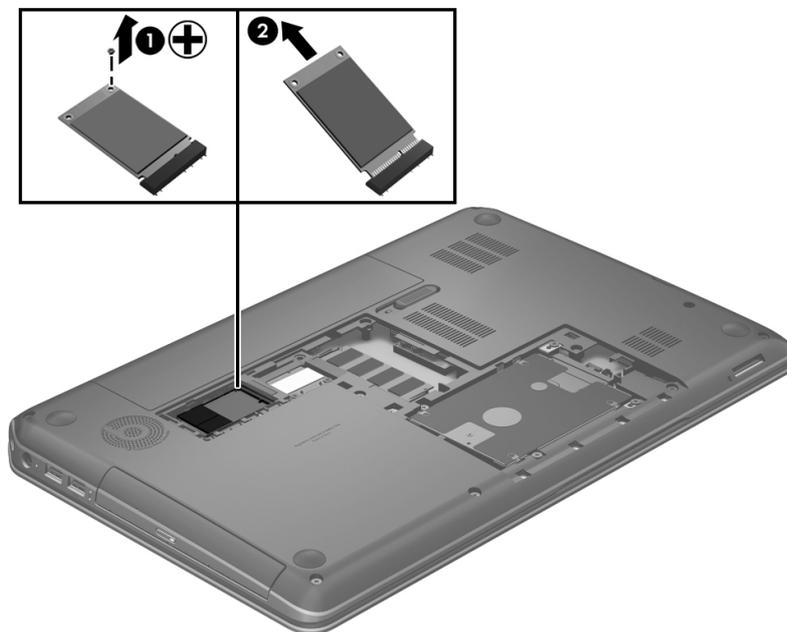
Description	Spare part number
32-GB solid-state drive (for use only on computer models equipped with an Intel processor)	686927-001

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

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)).
5. Remove the service cover (see [Hard drive on page 48](#)).
6. Remove the wireless module compartment cover (see [WLAN module on page 61](#)).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×3.0 screw **(1)** that secures the solid-state drive to the base enclosure. (The solid-state drive tilts up.)
2. Remove the solid-state drive by pulling the drive away from the slot at an angle **(2)**.



Reverse this procedure to install the solid-state drive.

Top cover



NOTE: The top cover spare part kit includes a TouchPad.

Description	Spare part number
In midnight black finish	686931-001
In natural silver finish	690232-001

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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))

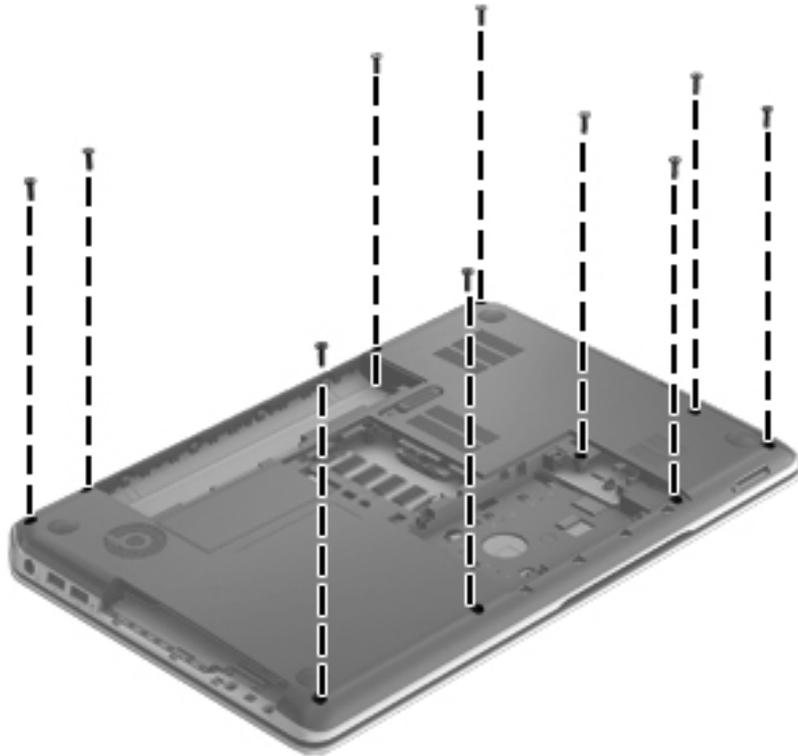


NOTE: When replacing the top cover, be sure to remove the following components from the defective top cover and install them on the replacement top cover:

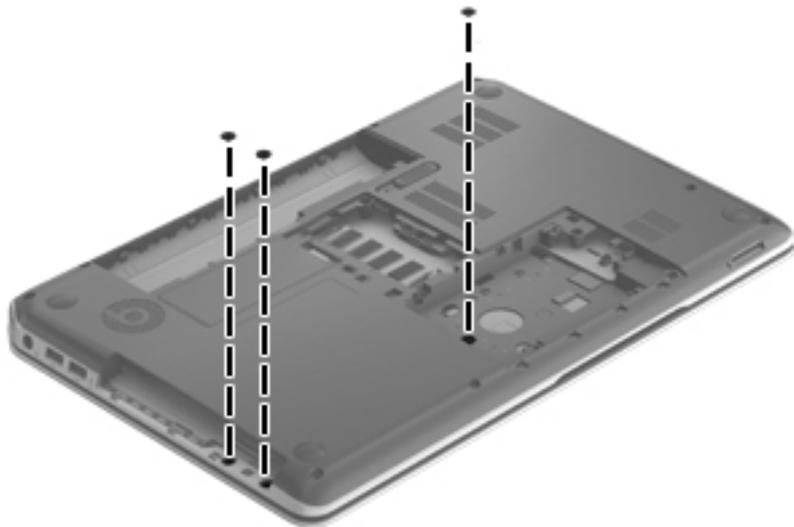
- Power button board (see [Power button board on page 69](#))
- Fingerprint reader board (see [Fingerprint reader board on page 70](#))
- TouchPad button board (see [TouchPad button board on page 72](#))

Remove the top cover:

1. Remove the ten Phillips PM2.5×10.0 screws that secure the top cover to the computer.

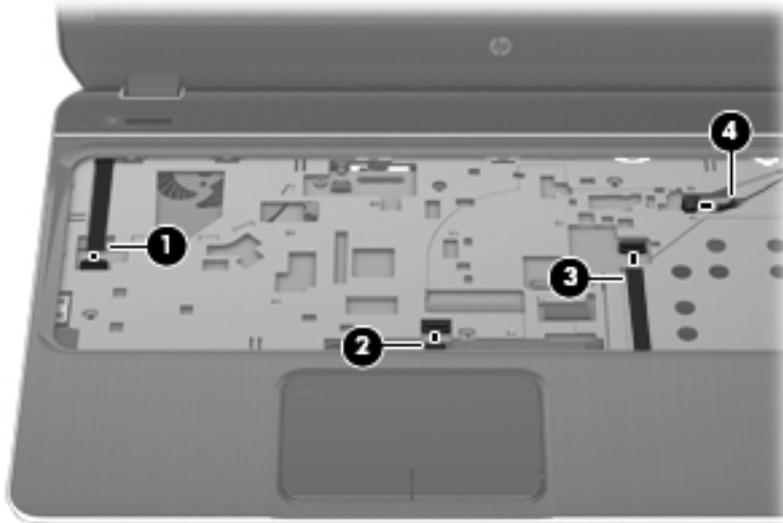


2. Remove the three Phillips PM2.0×2.0 broad head screws that secure the top cover to the computer.

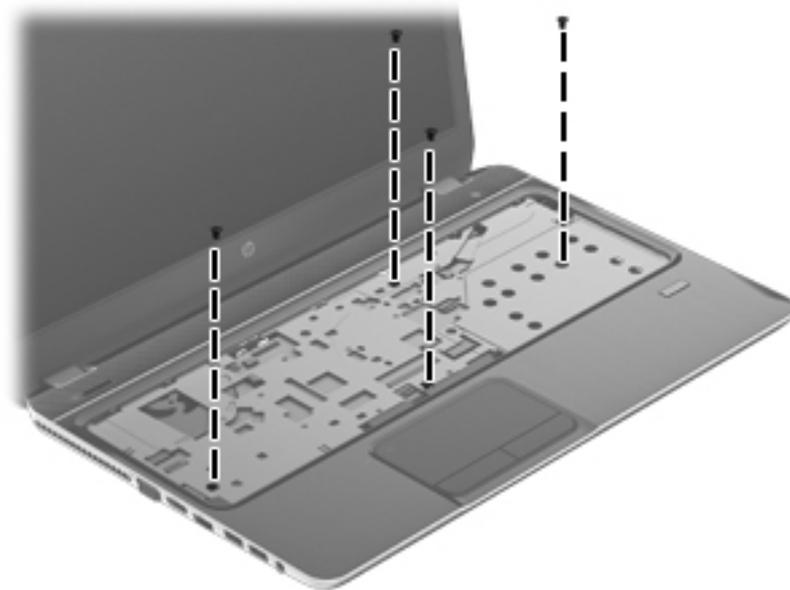


3. Turn the computer right side up, with the front toward you.
4. Open the computer.

5. Disconnect the following cables from the system board:
 - (1) Power button board ZIF cable
 - (2) TouchPad button board ZIF cable
 - (3) Fingerprint reader board ZIF cable
 - (4) Right speaker cable



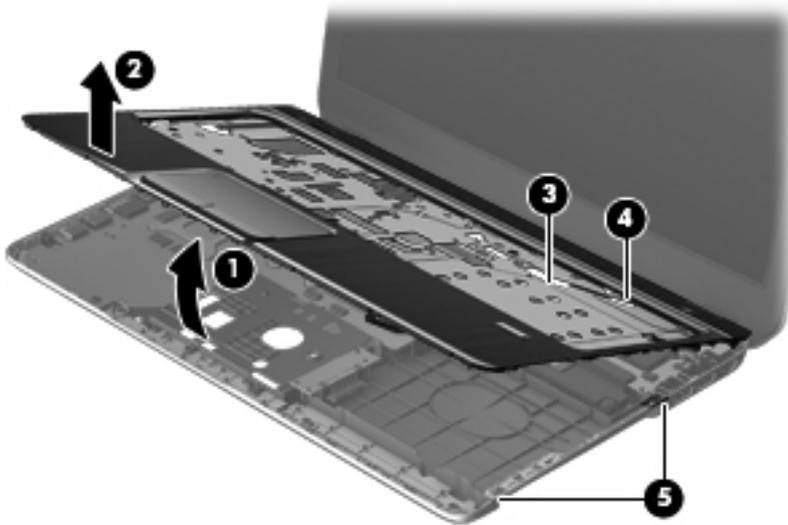
6. Remove the four Phillips PM2.5x5.0 screws that secure the top cover to the computer.



7. Lift the front edge of the top cover **(1)** and swing it up and back until the left and right sides and the rear edge **(2)** of the top cover detach from the base enclosure.

⚠ CAUTION: When removing the top cover, make sure the right speaker cable **(3)** routes cleanly through the opening **(4)** in the top cover. If the right speaker cable snags in this opening, it can be damaged.

CAUTION: When removing the top cover, make sure the thin plastic edges **(5)** of the base enclosure around the optical drive bay are adequately supported. The base enclosure can be damaged when removing the top cover if precautions are not taken.



Reverse this procedure to install the top cover.

Power button board

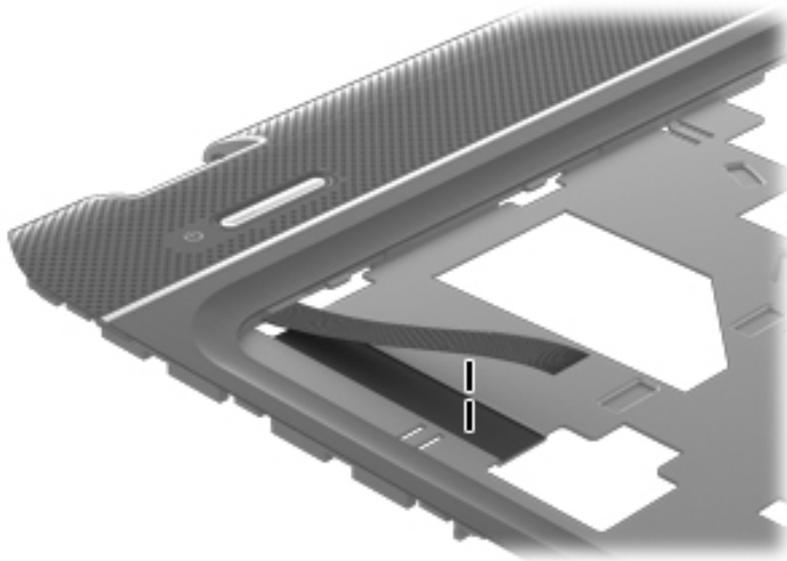
Description	Spare part number
Power button board (includes cable)	686917-001

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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))

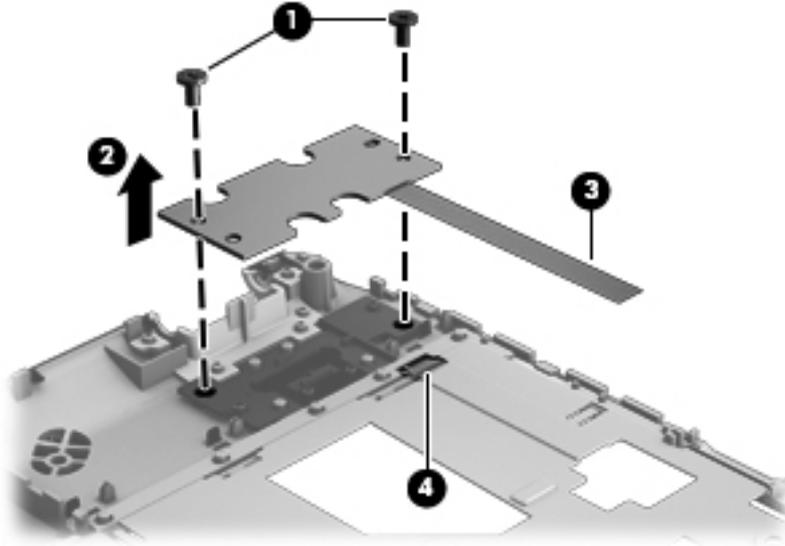
Remove the power button board:

1. Detach the power button board cable from the top cover. (The power button board cable is attached to the top cover with double-sided tape.)



2. Turn the top cover upside down, with the front toward you.
3. Remove the two Phillips PM2.5×3.5 screws **(1)** that secure the power button board to the top cover.

4. Remove the power button board (2), making sure to route the power button board cable (3) through the opening in the top cover (4).



Reverse this procedure to install the power button board.

Fingerprint reader board

Description	Spare part number
Fingerprint reader board (includes bracket and cable)	686906-001

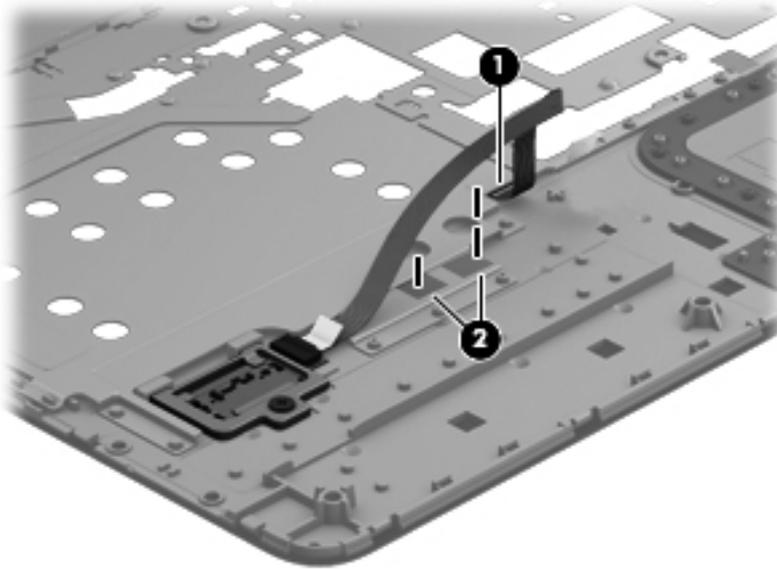
Before removing the fingerprint reader board, follow these steps:

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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))

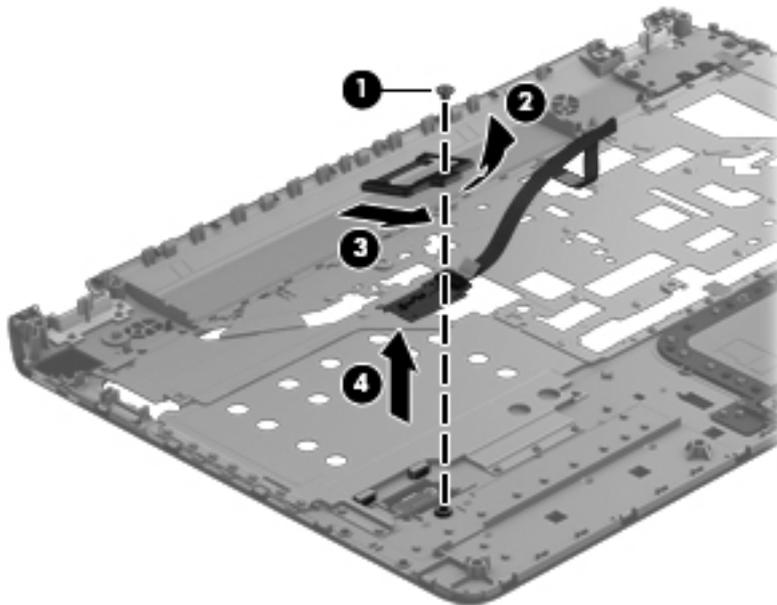
Remove the fingerprint reader board:

1. Turn the top cover upside down, with the front toward you.
2. Release the fingerprint reader board cable from the opening (1) in the top cover.

3. Detach the fingerprint reader board cable **(2)** from the top cover. (The fingerprint reader board cable is attached to the top cover with double-sided tape.)



4. Remove the Phillips PM2.5×3.5 screw **(1)** that secures the fingerprint reader board and bracket to the top cover.
5. Lift the front edge of the fingerprint reader board bracket **(2)** until it rests at an angle, and then remove the bracket **(3)** by sliding it up and forward at an angle.
6. Remove the fingerprint reader board **(4)**.



Reverse this procedure to install the fingerprint reader board.

TouchPad button board

Description	Spare part number
TouchPad button board (includes TouchPad button board cable and TouchPad cable)	686919-001

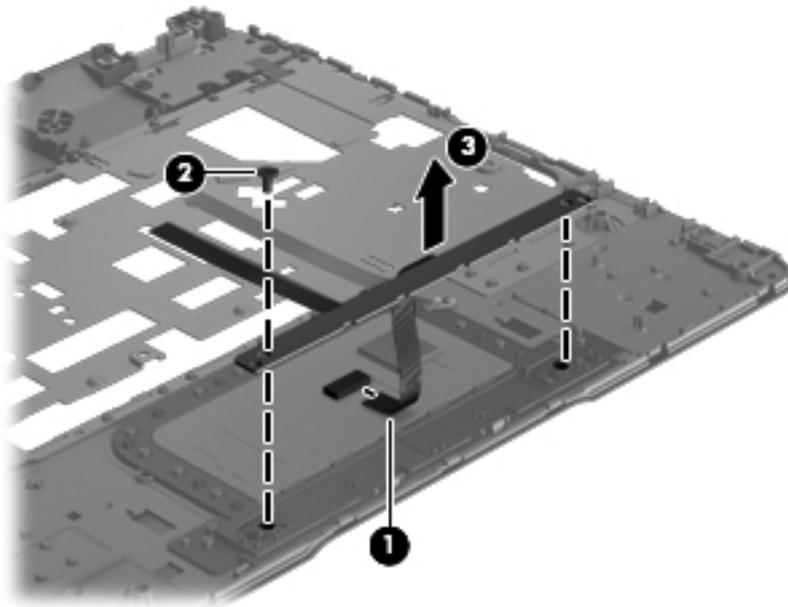
Before removing the TouchPad button board, follow these steps:

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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))

Remove the TouchPad button board:

1. Turn the top cover upside down, with the front toward you.
2. Release the ZIF connector to which the TouchPad board cable is attached, and then disconnect the TouchPad board cable **(1)** from the TouchPad board.
3. Remove the Phillips PM2.5×3.5 screw **(2)** that secures the TouchPad button board to the top cover.

4. Remove the TouchPad button board (3).



Reverse this procedure to install the TouchPad button board.

Fan

Description	Spare part number
Fan (includes cable)	686901-001

 **NOTE:** To properly ventilate the computer, allow at least a 7.6-cm (3-inch) clearance on the left side and rear panel of the computer.

The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

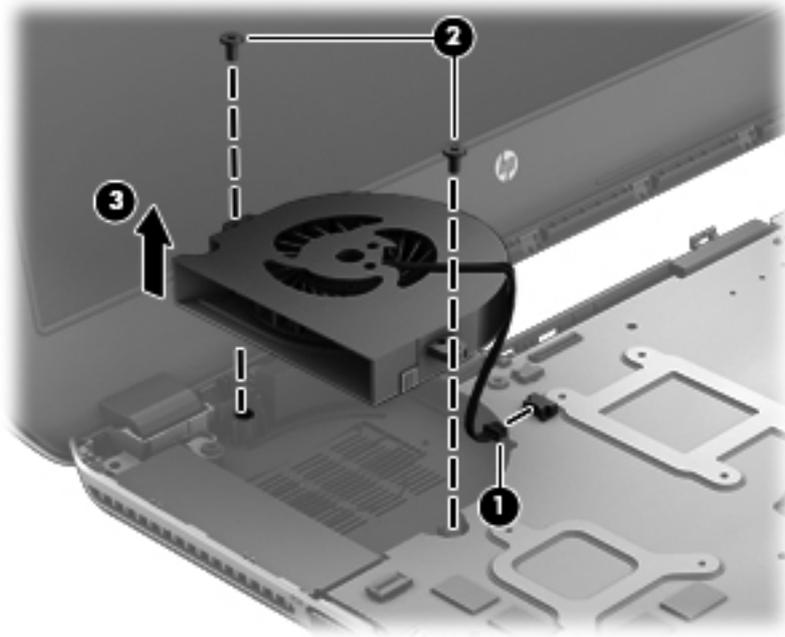
Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))

- c. Keyboard (see [Keyboard on page 56](#))
- d. Top cover (see [Top cover on page 65](#))

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the fan to the base enclosure.
3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

System board



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

Description	Spare part number
For use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Professional operating system	702177-601
For use only on computer models equipped with an AMD processor, a graphics subsystem with discrete memory, and the Windows 8 Standard operating system	725064-501 and 702177-501
For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 2048-MB discrete memory, and the Windows 8 Professional operating system	698399-601
For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 2048-MB discrete memory, and the Windows 8 Standard operating system	698399-501
For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 1024-MB discrete memory, and the Windows 8 Professional operating system	698397-601
For use only on computer models equipped with an Intel processor, a 7670M graphics subsystem with 1024-MB discrete memory, and the Windows 8 Standard operating system	698397-501
For use only on computer models equipped with an Intel processor, a graphics subsystem with UMA memory, and the Windows 8 Professional operating system	698395-601
For use only on computer models equipped with an Intel processor, a graphics subsystem with UMA memory, and the Windows 8 Standard operating system	698395-501

Before removing the system board, follow these steps:

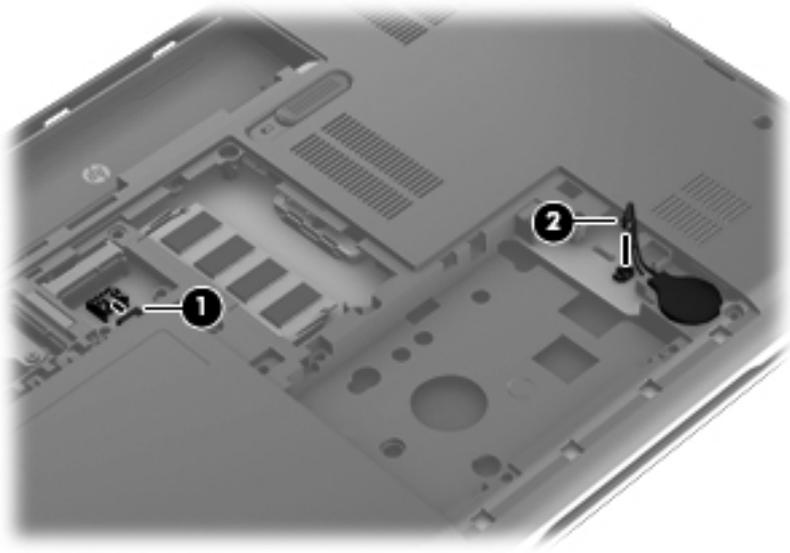
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. WLAN module (see [WLAN module on page 61](#))
 - e. Solid-state drive (see [Solid-state drive on page 64](#))
 - f. Top cover (see [Top cover on page 65](#))
 - g. Fan (see [Fan on page 73](#))

 **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:

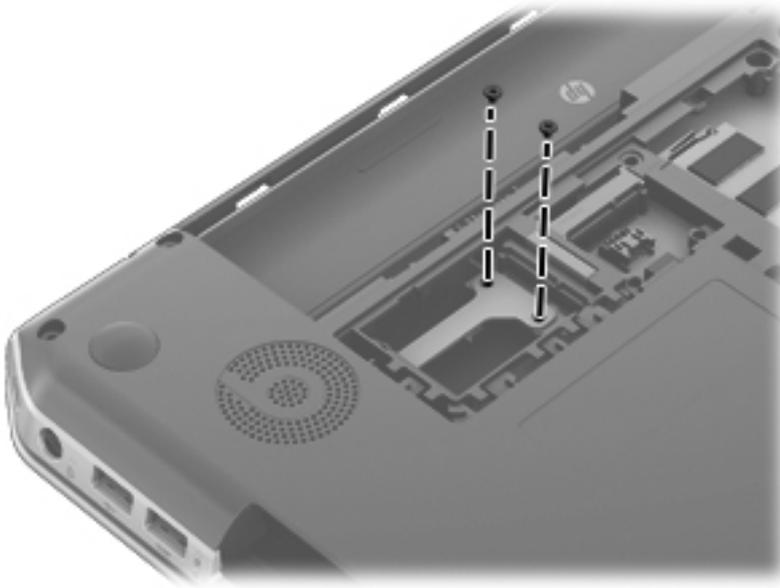
- Memory module (see [Memory module on page 55](#))
- Heat sink (see [Heat sink on page 78](#))
- Processor (see [Processor on page 81](#))

Remove the system board:

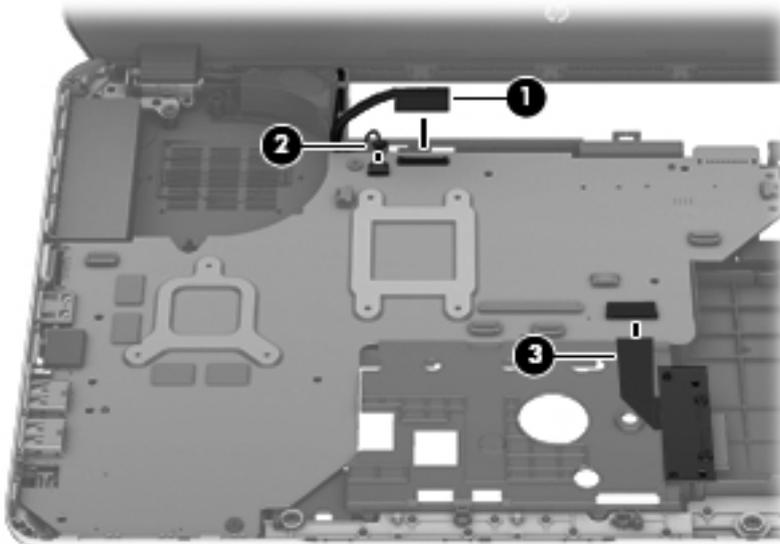
1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Disconnect the power connector cable **(1)** and the RTC battery **(2)** cable from the system board.



4. Remove the two Phillips PM2.0×3.0 screws that secure the USB board to the system board.

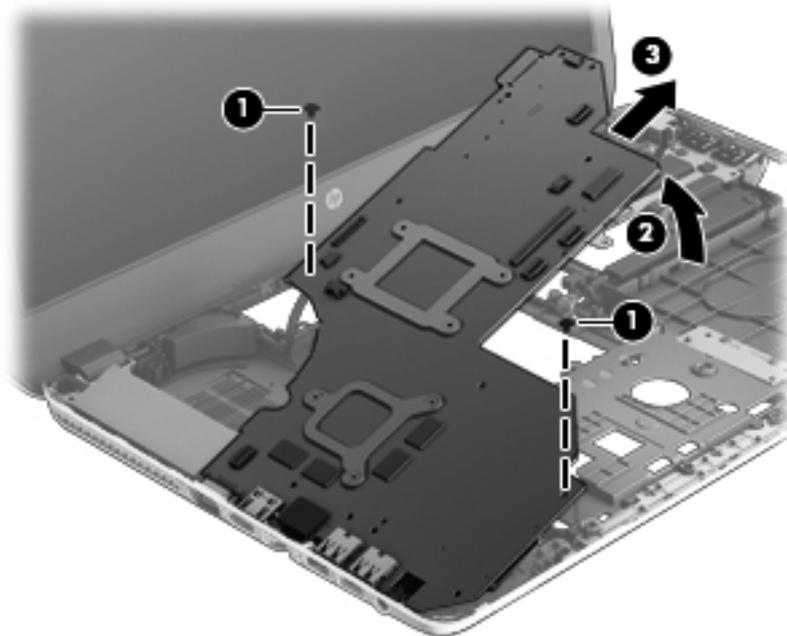


5. Turn the computer right side up, with the front toward you.
6. Open the computer.
7. Disconnect the following cables from the system board:
 - (1) Display panel cable
 - (2) Left speaker cable
 - (3) Optical drive connector board ZIF cable



8. Remove the two Phillips PM2.5×3.5 screws (1) that secure the system board to the base enclosure.

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



Reverse this procedure to install the system board.

Heat sink



NOTE: The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
For use only on computer models equipped with an AMD processor and a graphics subsystem with discrete memory	687231-001
For use only on computer models equipped with an AMD processor and a graphics subsystem with UMA memory	687230-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with discrete memory	686905-001
For use only on computer models equipped with an Intel processor and a graphics subsystem with UMA memory	686904-001

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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Fan (see [Fan on page 73](#))
 - f. System board (see [System board on page 75](#))

Remove the heat sink:

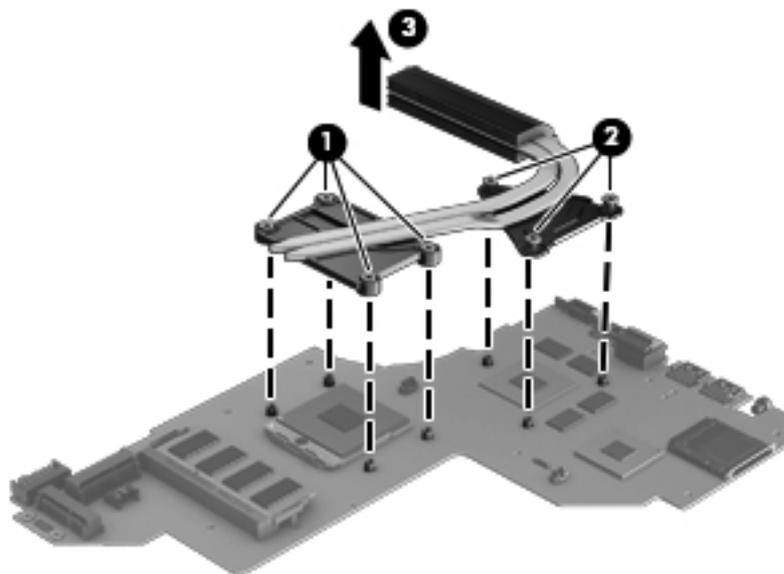
1. Turn the system board upside down, with the front toward you.

 **NOTE:** Step 2 applies to computer models equipped with a graphics subsystem with discrete memory. See step 3 for heat sink removal information for computer models equipped with a graphics subsystem with UMA memory.

2. Following the 1, 2, 3, 4, 5, 6, 7 sequence stamped into the heat sink, loosen the seven captive Phillips screws **(1)** and **(2)** that secure the heat sink to the system board, and then remove the heat sink **(3)**.

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

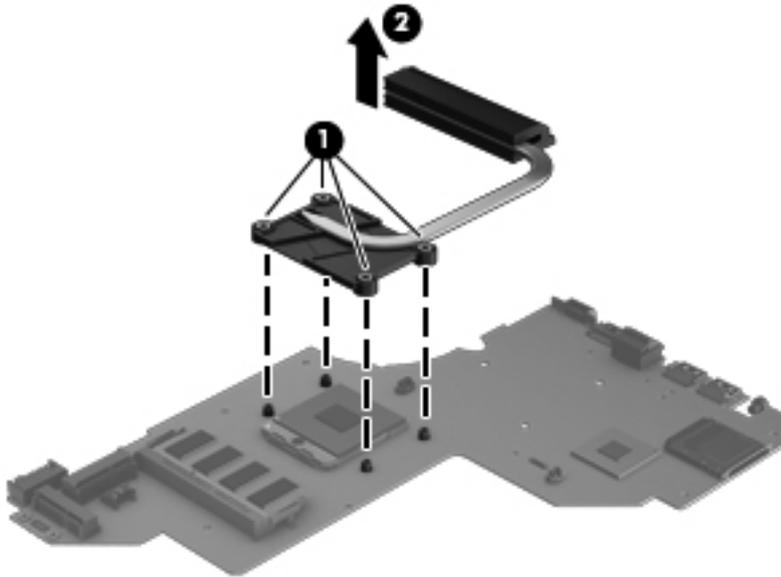
 **NOTE:** The following illustration shows the heat sink removal process for a computer model equipped with an AMD processor. The process for removing the heat sink on a computer model equipped with an Intel processor is identical.



3. Following the 1, 2, 3, 4 sequence stamped into the heat sink, loosen the four captive Phillips screws **(1)** that secure the heat sink to the system board, and then 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.

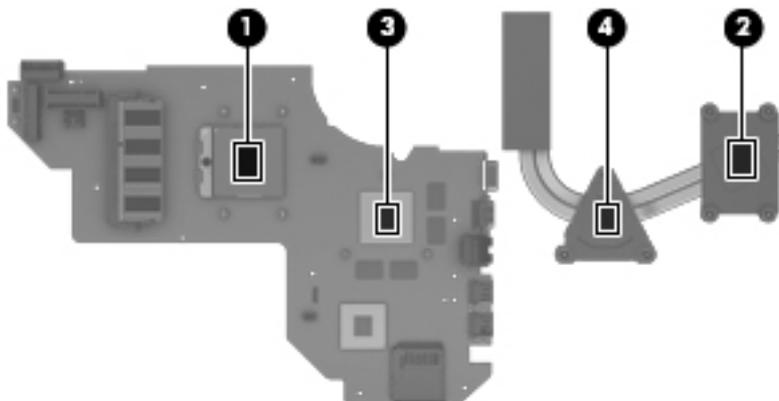
 **NOTE:** The following illustration shows the heat sink removal process for a computer model equipped with an AMD processor. The process for removing the heat sink on a computer model equipped with an Intel processor is identical.



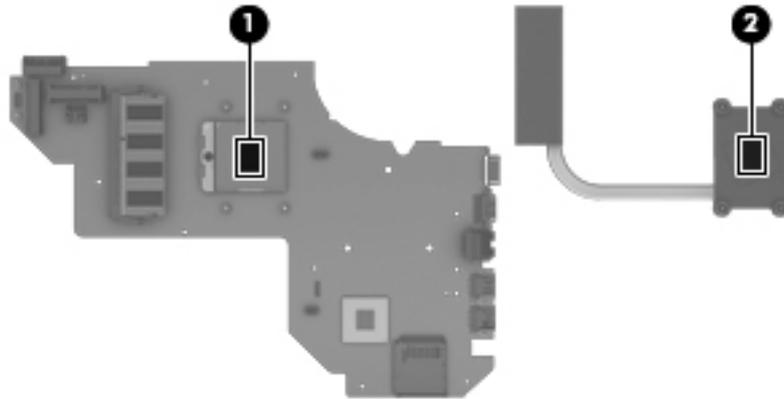
 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink, processor, and system board spare part kits.

The following illustration shows the replacement thermal material locations on a computer model equipped with a graphics subsystem with discrete memory.

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



The following illustration shows the replacement thermal material locations on a computer model equipped with a graphics subsystem with discrete memory. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



Reverse this procedure to install the heat sink.

Processor

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

Description	Spare part number
AMD A10-5750M 2.50-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	713548-001
AMD A10-4600M 2.30-GHz processor (turbo up to 3.20-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683046-001
AMD A8-5550M 2.10-GHz processor (turbo up to 3.10-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	713551-001
AMD A8-4500M 1.90-GHz processor (turbo up to 2.80-GHz; 1600-MHz FSB, 4.0-MB L2 cache, DDR3, quad core, 35 W)	683048-001
AMD A6-5350M 2.90-GHz processor (turbo up to 3.50-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	713550-001
AMD A6-4400M 2.70-GHz processor (turbo up to 3.20-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	683047-001
AMD A4-5150M 2.70-GHz processor (turbo up to 3.30-GHz; 1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	713549-001
AMD A4-4300M 2.50-GHz processor (1600-MHz FSB, 1.0-MB L2 cache, DDR3, dual core, 35 W)	685990-001
Intel Quad Core i7-3632QM 2.20-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	701658-001
Intel Quad Core i7-3612QM 2.10-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 6.0-MB L3 cache, 35 W)	680647-001
Intel Quad Core i7-3520M 2.90-GHz processor (SC turbo up to 3.60-GHz, 1600-MHz FSB, 4.0-MB L3 cache, 35 W)	681954-001

Description	Spare part number
Intel Dual Core i5-3230M 2.60-GHz processor (SC turbo up to 3.20-GHz; 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	711903-001
Intel Dual Core i5-3210M 2.50-GHz processor (SC turbo up to 3.10-GHz, 1600-MHz FSB, 3.0-MB L3 cache, 35 W)	680645-001
Intel Dual Core i3-3130M 2.60-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	713163-001
Intel Dual Core i3-3120M 2.50-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	700627-001
Intel Dual Core i3-3110M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	682417-001
Intel Dual Core i3-2370M 2.40-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	677152-001
Intel Core i3-2350M 2.30-GHz processor (1333-MHz FSB, 3.0-MB L3 cache, 35 W)	653340-001

Before removing the processor, follow these steps:

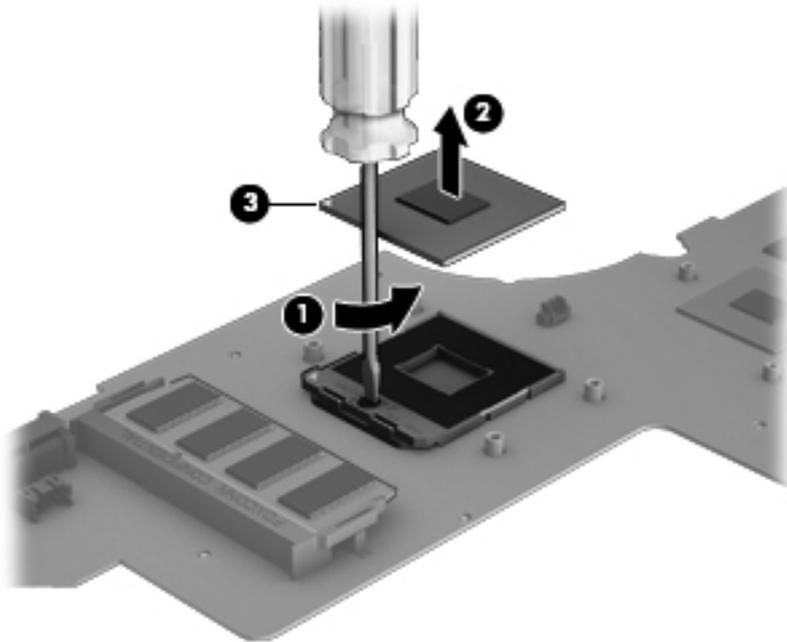
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Fan (see [Fan on page 73](#))
 - f. System board (see [System board on page 75](#))
 - g. Heat sink (see [Heat sink on page 78](#))

Remove the processor:

1. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise, until you hear a click.

2. Lift the processor **(2)** straight up, and remove it.

 **NOTE:** The gold triangle **(3)** 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.

Optical drive connector board

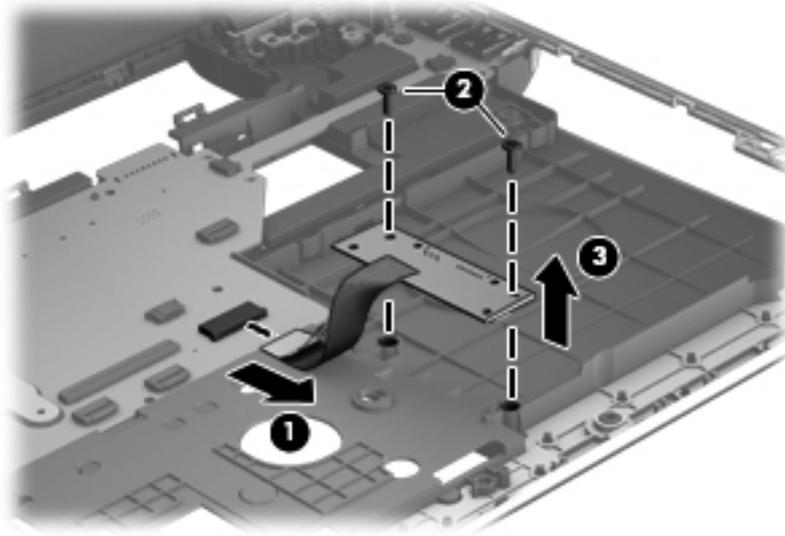
Description	Spare part number
Optical drive connector board (includes cable)	686899-001

Before removing the optical drive connector board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))

Remove the optical drive connector board:

1. Release the ZIF connector to which the optical drive connector board cable is attached, and then disconnect the optical drive connector board cable **(1)** from the system board.
2. Remove the two Phillips PM2.5×3.5 screws **(2)** that secure the optical drive connector board to the base enclosure.
3. Remove the optical drive connector board **(3)** from the base enclosure.



Reverse this procedure to install the optical drive connector board.

Speakers

Description	Spare part number
Speakers (include cables and 4 rubber isolators)	686925-001

Before removing the speakers, follow these steps:

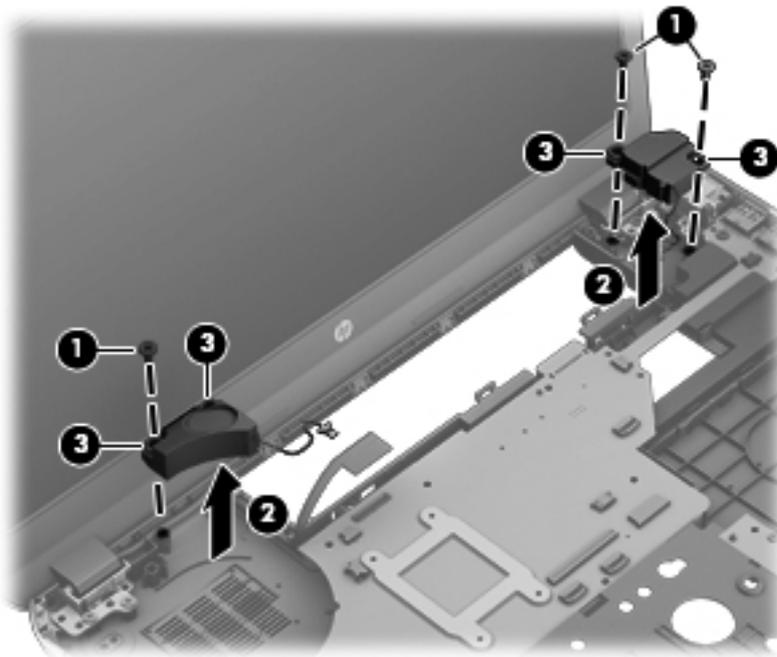
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))

- d. Top cover (see [Top cover on page 65](#))
- e. Fan (see [Fan on page 73](#))

Remove the speakers:

1. Remove the three Phillips PM2.0×2.0 broad head screws **(1)** that secure the speakers to the base enclosure.
2. Remove the speakers **(2)** from the base enclosure.

 **NOTE:** The speakers includes four rubber isolators **(3)**. These isolators are crucial to the performance of the speakers.



Reverse this procedure to install the speakers.

USB board

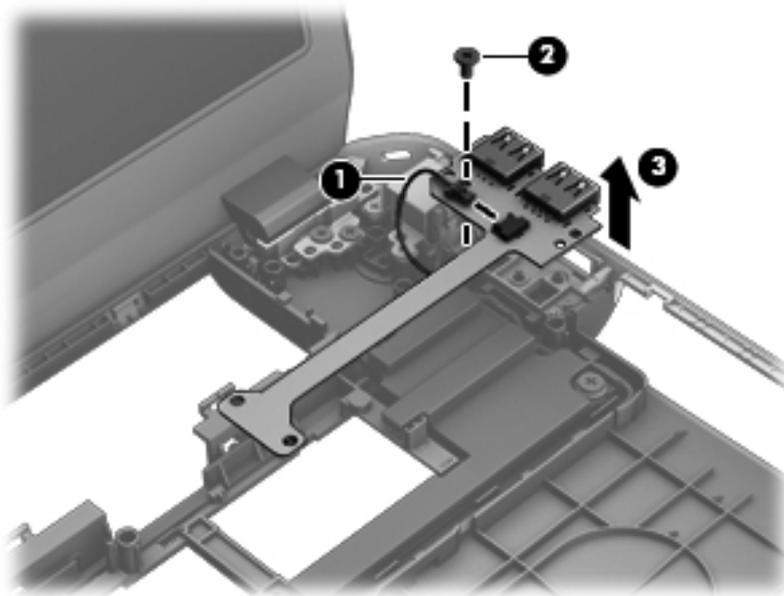
Description	Spare part number
USB board	686918-001

Before removing the 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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Speakers (see [Speakers on page 84](#))

Remove the USB board:

1. Disconnect the subwoofer cable **(1)** from the USB board.
2. Remove the Phillips PM2.5×3.5 screw **(2)** that secures the USB board to the base enclosure.
3. Remove the USB board **(3)** from the base enclosure.



Reverse this procedure to install the USB board.

Subwoofer

Description	Spare part number
Subwoofer (includes cables and 2 rubber isolators)	686926-001

Before removing the subwoofer, follow these steps:

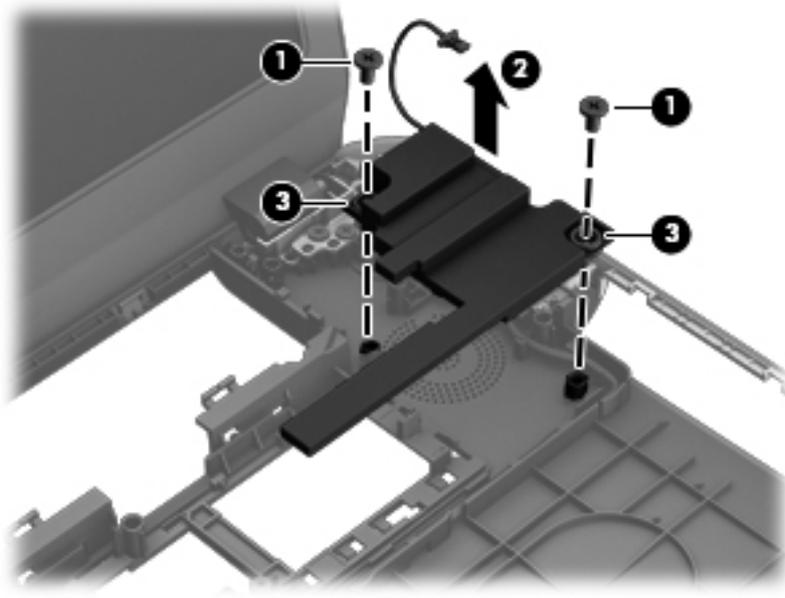
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))
 - e. Speakers (see [Speakers on page 84](#))
 - f. USB board (see [USB board on page 86](#))

Remove the subwoofer:

1. Remove the two Phillips PM2.0x2.0 broad head screws **(1)** that secure the subwoofer to the base enclosure.

2. Remove the subwoofer **(2)** from the base enclosure.

 **NOTE:** The subwoofer includes two rubber isolators **(3)**. These isolators are crucial to the performance of the subwoofer.



Reverse this procedure to install the subwoofer.

Power connector cable

Description	Spare part number
Power connector cable (includes bracket)	686900-001

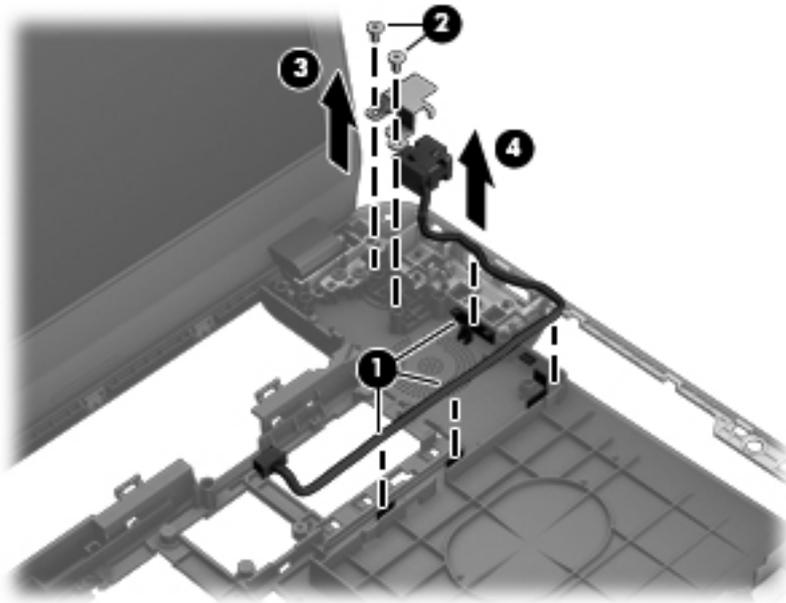
Before removing the power connector cable, follow these steps:

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 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))

- e. Speakers (see [Speakers on page 84](#))
- f. USB board (see [USB board on page 86](#))

Remove the power connector cable:

1. Release the power connector cable **(1)** from the clips and routing channel built into the base enclosure.
2. Remove the two Phillips PM2.5×5.0 screws **(2)** that secure the power connector and power connector bracket to the base enclosure.
3. Remove the power connector bracket **(3)**.
4. Release the power connector **(4)** from the clip built into the base enclosure.



5. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Display assembly

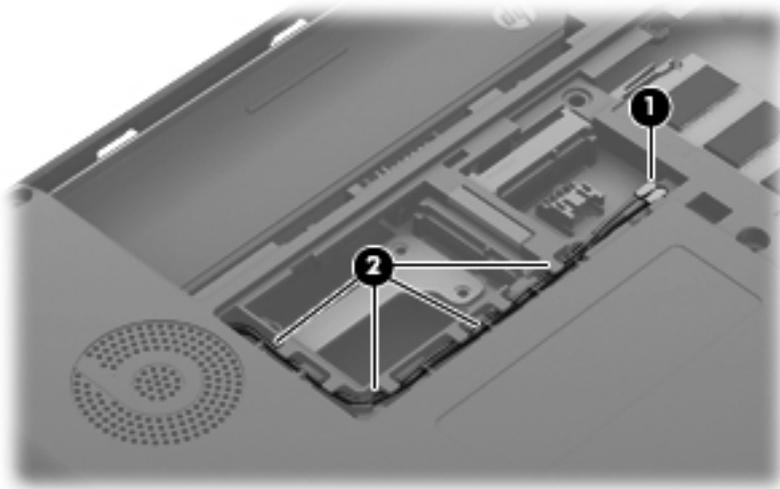
 **NOTE:** The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 47](#)), and then remove the following components:
 - a. Hard drive (see [Hard drive on page 48](#))
 - b. Optical drive (see [Optical drive on page 52](#))
 - c. Keyboard (see [Keyboard on page 56](#))
 - d. Top cover (see [Top cover on page 65](#))

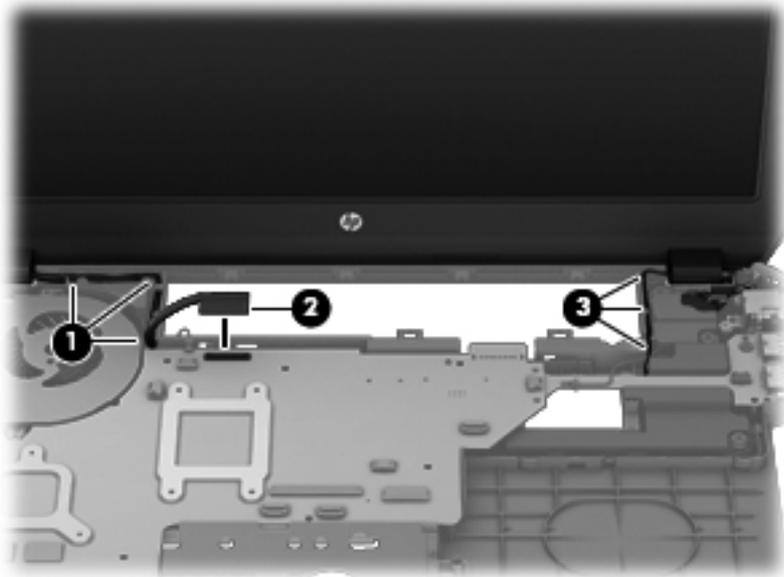
Remove the display assembly:

1. Close the computer.
2. Turn the computer upside down, with the front toward you.
3. Release the wireless antenna cables **(1)** from the clips **(2)** and routing channel built into the base enclosure.



4. Turn the computer right side up, with the front toward you.
5. Open the computer.
6. Release the display panel cable from the clips **(1)** and routing channel built into the base enclosure.

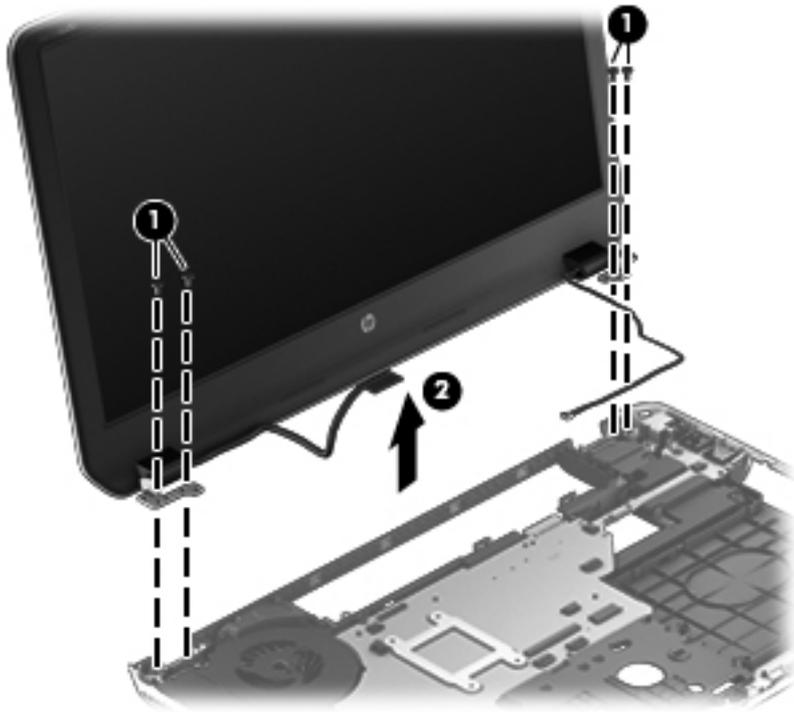
7. Disconnect the display panel cable **(2)** from the system board.
8. Release the wireless antenna cables from the clips **(3)** and routing channel built into the base enclosure.



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

9. Remove the four Phillips PM2.5×5.0 screws **(1)** that secure the display assembly to the base enclosure.

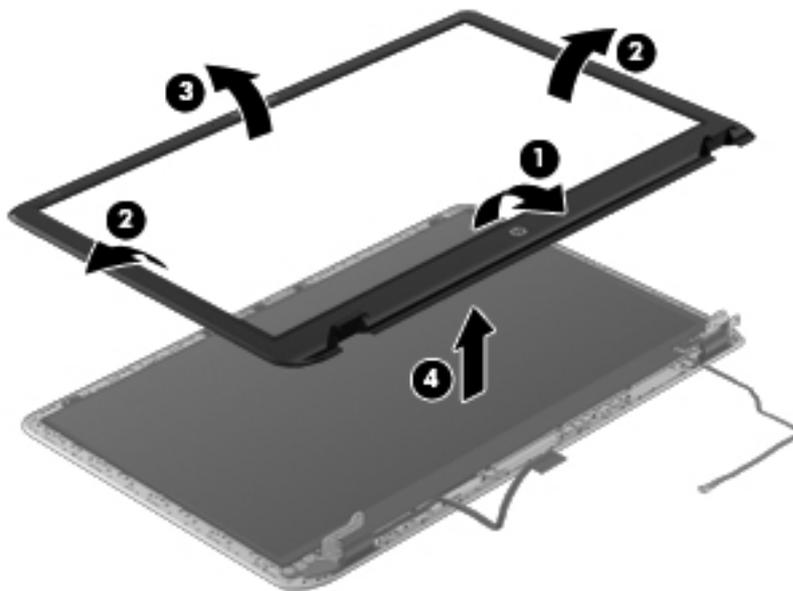
- 10.** Remove the display assembly **(2)**.



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

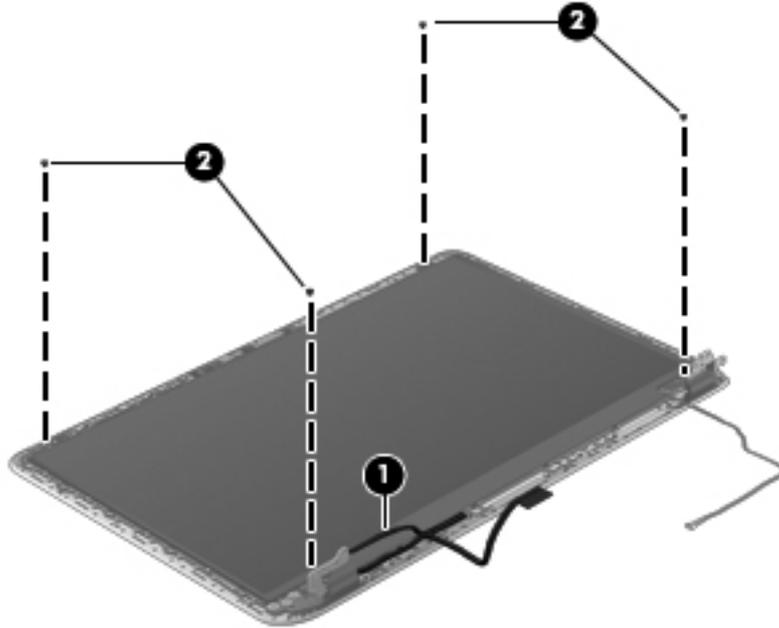
- a.** Flex the inside edges of the bottom edge **(1)**, the left and right sides **(2)**, and the top edge **(3)** of the display bezel until the bezel disengages from the display enclosure.
- b.** Remove the display bezel **(4)**.

The display bezel is available using spare part numbers 686897-001 (for use only on computer models equipped with an AMD processor) and 698405-001 (for use only on computer models equipped with an Intel processor).



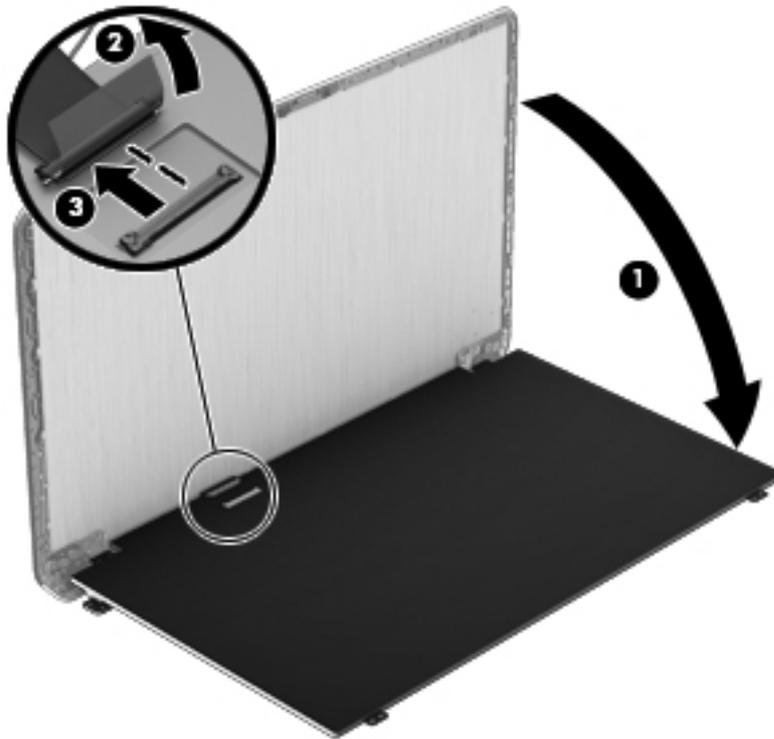
12. If it is necessary to replace the display panel:

- a.** Detach the display panel cable **(1)** from the display enclosure. (The display panel cable is attached to the display enclosure with double-sided tape.)
- b.** Remove the four Phillips PM2.0×2.0 screws **(2)** that secure the display panel to the display enclosure.



- c.** Lift the top edge of the display panel **(1)**, and then swing it up and forward until it rests upside down in front of the display enclosure.
- d.** Release the adhesive support strip **(2)** that secures the display panel cable to the display panel.

- e. Disconnect the display panel cable **(3)** from the display panel.



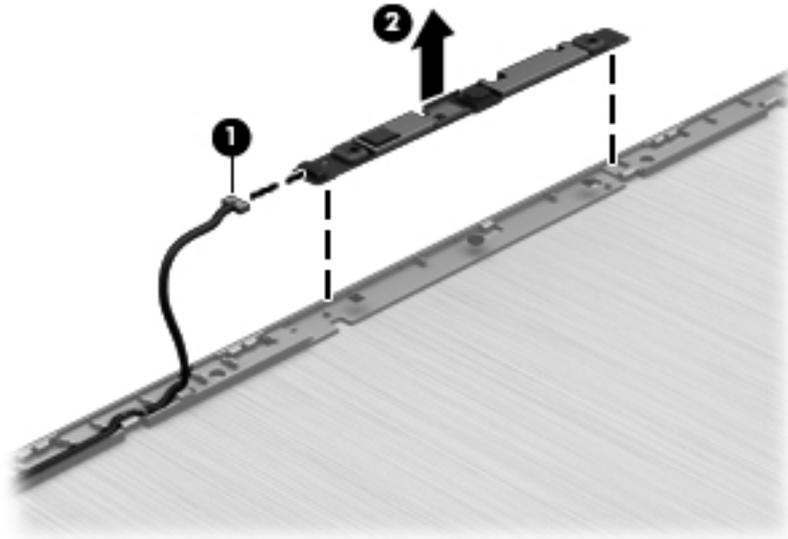
- f. Remove the display panel. The display panel is available using spare part number 686921-001.

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

- a. Disconnect the webcam/microphone module cable **(1)** from the webcam/microphone module.

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

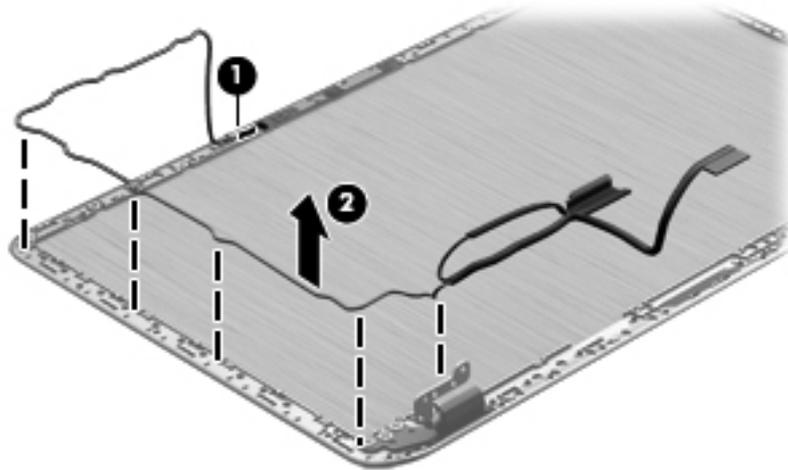
- b. Detach the webcam/microphone module **(2)** from the display enclosure. (The webcam/microphone module is attached to the display enclosure with double-sided tape.)



- c. Remove the webcam/microphone module. The webcam/microphone module is available using spare part number 686587-001.

14. 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 **(2)** from the clips and routing channel built into display enclosure.

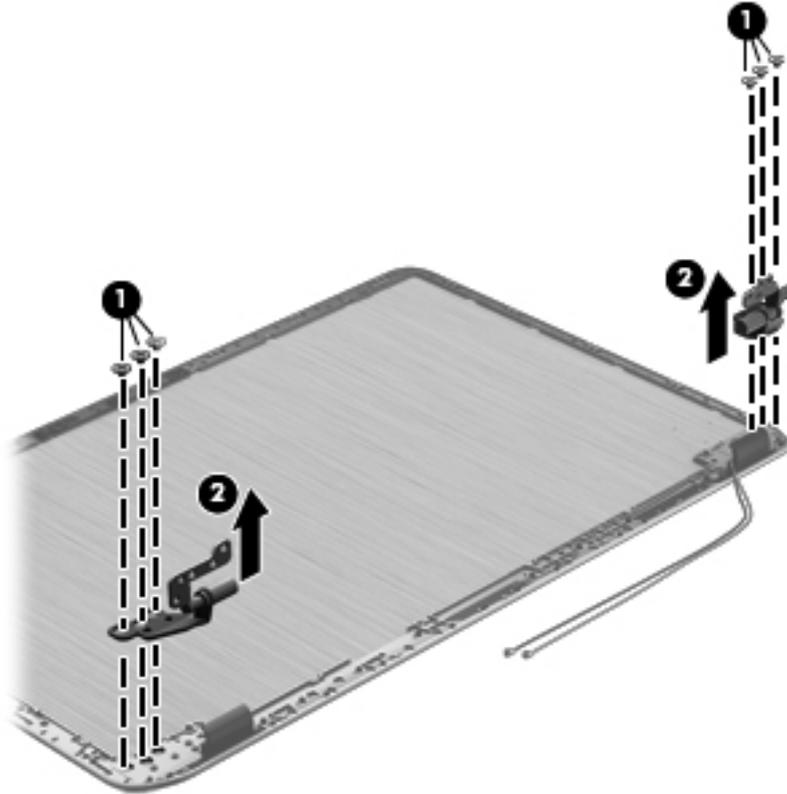


- c. Remove the display panel cable. The display panel cable is available using spare part number 686898-001.

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

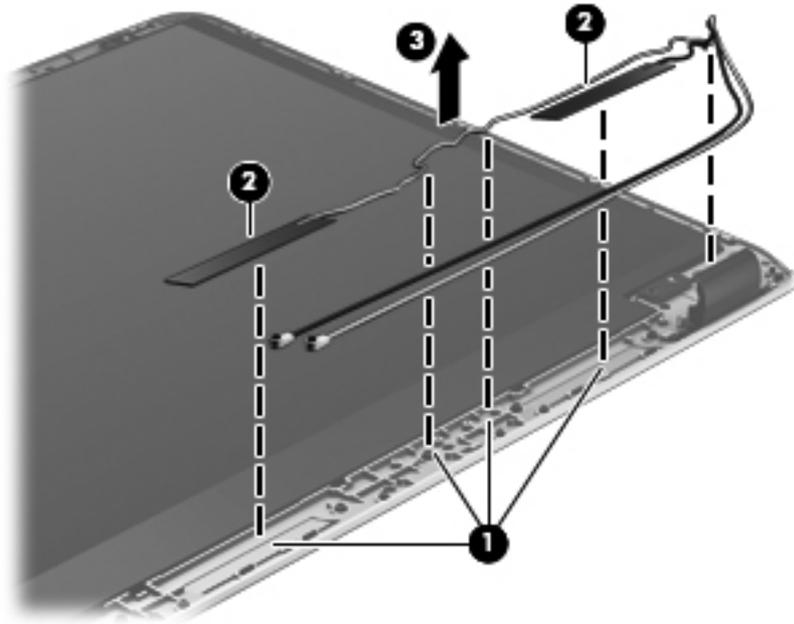
- a. Remove the six Phillips 2.5×3.0 broad head screws **(1)** that secure the display hinges to the display enclosure.

- b.** Remove the display hinges (**2**). The display hinges are available using spare part number 686913-001.



- 16.** If it is necessary to replace the wireless antenna cables and transceivers:
 - a.** Release the wireless antenna cables from the clips (**1**) and routing channel built into the display enclosure.
 - b.** Detach the wireless antenna transceivers (**2**) from the display enclosure. (The wireless antenna transceivers are attached to the display enclosure with double-sided tape.)

- c. Remove the wireless antenna cables and transceivers **(3)**. The wireless antenna cables and transceivers are available using spare part number 686894-001.



Reverse this procedure to reassemble and install the display assembly.

5 Using Setup Utility (BIOS) and System Diagnostics

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

Starting Setup Utility (BIOS)

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

Information about how to navigate in Setup Utility (BIOS) is located at the bottom of the screen.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Setup Utility (BIOS).
2. Use the arrow keys to select **Main**.
3. To exit Setup Utility (BIOS) without saving your changes, use the arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press **enter**.

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

1. From the Start screen, select the **HP Support Assistant** app.
2. Select **Updates and tune-ups**, and then select **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.

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 *e*, 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 System Diagnostics

System Diagnostics allows you to run diagnostic tests to determine if the computer hardware is functioning properly.

To start System Diagnostics:

1. Turn on or restart the computer, quickly press `esc`, and then 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 diagnostic test while it is running, press `esc`.

6 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	37.95 cm	14.94 in
Depth	25.07 cm	9.87 in
Height (front to back)	2.21 to 2.65 cm	0.87 to 1.04 in
Weight	2.40 kg	5.28 lb
Input power		
Operating voltage and current	Operating voltage and current 18.5 V dc @ 3.5 A – 65 W 19.5 V dc @ 3.33 A – 65 W 19 V dc @ 4.74 A – 90 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.		

15.6-inch WGA display specifications

	Metric	U.S.
Dimensions		
Height	19.6 cm	7.72 in
Width	34.7 cm	13.66 in
Diagonal	39.8 cm	15.67 in
Number of colors	up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	250 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	3.46 W	
Viewing angle	±65° horizontal, +50° vertical (typical)	

Hard drive specifications

	1-TB*	750-GB**	640-GB**	500-GB**	320-GB**
Dimensions					
Height	9.5 mm	9.5 mm	9.5 mm	9.5 mm	9.5 mm
Length	100.2 mm	100.2 mm	100.4 mm	100.4 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm	69.9 mm	69.9 mm
Weight	152 g	110 g	110 g	110 g	110 g
Interface type	SATA	SATA	SATA	SATA	
Transfer rate					
Synchronous (maximum)	1.1 GB/sec	1.1 GB/sec	1.1 GB/sec	1.1 GB/sec	1.1 GB/sec
Security	ATA security	ATA security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)					
Single track	2.0 ms	2.0 ms	1.5 ms	1.5 ms	1.5 ms
Average (read/write)	12/16 ms	12/16 ms	11/13 ms	11/13 ms	11/13 ms
Maximum	21 ms	22 ms	22 ms	22 ms	22 ms
Logical blocks	1,953,525,168	1,465,149,168	1,282,009,226	976,773,168	628,142,448
Disk rotational speed	5400 rpm	7200 and 5400 rpm	5400 rpm	7200 and 5400 rpm	7200 and 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.					

7 Backing up, restoring, and recovering

Your computer includes tools provided by HP and the operating system 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 or even back to the original factory state, all with simple steps.

This chapter provides information about the following processes:

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



NOTE: This guide describes an overview of backing up, restoring and recovering options. For more details about the tools provided, see Help and Support. From the Start screen, type **h**, and then select **Help and Support**.

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 backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced.

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

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

See [Creating HP Recovery media on page 105](#).

2. As you add hardware and software programs, create system restore points. A system restore point is a snapshot of certain hard drive contents saved by Windows System Restore at a specific time. A system restore point contains information that Windows uses, such as registry settings. Windows creates a system restore point for you automatically during a Windows update and during other system maintenance (such as a software update, security scanning, or system diagnostics). You can also manually create a system restore point at any time. For more information and steps for creating specific system restore points, see Windows Help and Support. From the Start screen, type **h**, and then select **Help and Support**.
3. As you add photos, video, music, and other personal files, create a backup of your personal information. Windows File History can be set to regularly and automatically back up files from libraries, Desktop, contacts, and favorites. If files are accidentally deleted from the hard drive and they can no longer be restored from the Recycle Bin, or if files become corrupted, you can restore the files that you backed up using File History. Restoring files is also useful if you ever choose to reset the computer by reinstalling Windows or choose to recover using HP Recovery Manager.



NOTE: File History is not enabled by default, so you must turn it on.

For more information and steps for enabling Windows File History, see Windows Help and Support. From the Start screen, type **h**, and then select **Help and Support**.

Creating HP Recovery media

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

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

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

To create HP Recovery media:

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

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 108](#).

Restore and recovery

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

- If you need to restore your personal files and data, you can use Windows File History to restore your information from the backups you created. For more information and steps for using File History, see Windows Help and Support. From the Start screen, type `h`, and then select **Help and Support**.
- If you need to correct a problem with a preinstalled application or driver, use the Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.

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

- If you want to restore the system to a previous state without losing any personal information, Windows System Restore is an option. System Restore allows you to restore without the requirements of Windows Refresh or a reinstallation. Windows creates system restore points automatically during a Windows update and other system maintenance events. Even if you did not manually create a restore point, you can choose to restore to a previous point, automatically created. For more information and steps for using Windows System Restore, see Windows Help and Support. From the Start screen, type `h`, and then select **Help and Support**.
- If you want a quick and easy way to recover the system without losing your personal information, settings, or apps that came preinstalled on your computer or were purchased from the Windows Store, consider using Windows Refresh. This option does not require backing up data to another drive. See [Using Windows Refresh for quick and easy recovery on page 107](#).
- If you want to reset your computer to its original state, Windows provides an easy way to remove all personal data, apps, and settings, and reinstall Windows.

For more information, see [Remove everything and reinstall Windows on page 108](#).

- If you want to reset your computer using a minimized image, you can choose the HP Minimized Image Recovery option from the HP Recovery partition (select models only) or HP Recovery media.

Minimized Image Recovery installs only drivers and hardware-enabling applications. Other applications included in the image continue to be available for installation through the Drivers and Applications Reinstall option in HP Recovery Manager.

For more information, see [Recovering using HP Recovery Manager on page 108](#).

- If you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 108](#).
- If you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see [Recovering using HP Recovery Manager on page 108](#).
- If you wish to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see [Removing the HP Recovery partition on page 110](#).

Using Windows Refresh for quick and easy recovery

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.

 **IMPORTANT:** Refresh removes any traditional applications that were not originally installed on the system at the factory.

 **NOTE:** During Refresh, a list of removed traditional applications will be saved so that you have a quick way to see what you might need to reinstall. See Help and Support for instructions on reinstalling traditional applications. From the Start screen, type **h**, and then select **Help and Support**.

 **NOTE:** You may be prompted for your permission or password when using Refresh. See Windows Help and Support for more information. From the Start screen, type **h**, and then select **Help and Support**.

To start Refresh:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Refresh your PC without affecting your files**, select **Get started**, and follow the on-screen instructions.

Remove everything and reinstall Windows

Sometimes you want to perform detailed reformatting of your computer, or you want to remove personal information before you give away or recycle your computer. The process described in this section provides a speedy, simple way to return the computer to its original state. This option removes all personal data, apps, and settings from your computer, and reinstalls Windows.



IMPORTANT: This option does not provide backups of your information. Before using this option, back up any personal information you wish to retain.

You can initiate this option by using the **F11** key or from the Start screen.

To use the **F11** key:

1. Press **F11** while the computer boots.
– or –
Press and hold **F11** as you press the power button.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Reset your PC**, and follow the on-screen instructions.

To use the Start screen:

1. On the Start screen, point to the far-right upper or lower corner of the screen to display the charms.
2. Click **Settings**.
3. Click **Change PC settings** in the bottom-right corner of the screen, and then select **General** from the PC settings screen.
4. Under **Remove everything and reinstall Windows**, select **Get started**, and follow the on-screen instructions.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state. Using the HP Recovery media you created, you can choose from one of the following recovery options:

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

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.
- Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.
- HP Recovery media must be used if the computer hard drive fails.
- To use the Factory Reset or System Recovery options, you must use HP Recovery media.
- If the HP Recovery media do not work, you can obtain recovery media for your system from the HP website. 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.



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

Using the HP Recovery partition to recover a minimized image (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

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

Using HP Recovery media to recover

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

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

– or –

Insert the HP Recovery USB flash drive you created into a USB port on your computer, and then restart the computer.

 **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 110](#).

3. Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

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

Removing the HP Recovery partition

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

 **IMPORTANT:** Removing the HP Recovery partition means you can no longer use Windows Refresh, the Windows Remove everything and reinstall Windows option, or the HP Recovery Manager option for minimized image recovery. Create HP Recovery media before removing the Recovery partition to ensure you have recovery options; see [Creating HP Recovery media on page 105](#).

Follow these steps to remove the HP Recovery partition:

1. From the Start screen, type `recovery`, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and follow the on-screen instructions to continue.

8 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
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 HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

9 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>.

Index

- A**
 - AC adapter light 19
 - AC adapter, spare part numbers 32, 36
 - Action keys 13
 - antenna
 - locations 11
 - removal 96
 - spare part number 30, 35, 97
 - audio, product description 5
 - audio-in jack 17
 - audio-out jack 17
- B**
 - b key 13
 - base enclosure, spare part number 27, 39
 - battery
 - removal 47
 - spare part numbers 27, 34, 47
 - battery bay 19
 - battery release latch 19
 - bottom components 19
 - button component 12
 - buttons
 - optical drive eject 18
 - power 12
 - TouchPad 15
 - TouchPad on/off 15
- C**
 - cables, service considerations 42
 - caps lock light 14
 - chipset, product description 2
 - components
 - bottom 19
 - button 12
 - display 11
 - fingerprint reader 12
 - front 16
 - keys 13
 - left-side 17
 - lights 14
 - right-side 18
 - speakers 12
 - TouchPad 15
 - computer major components 23
 - computer part number 46
 - computer specifications 101
 - connectors, service considerations 42
- D**
 - Digital Media Slot, location 16
 - display
 - components 11
 - specifications 102
 - display assembly
 - removal 90
 - subcomponents 29
 - display bezel
 - removal 92
 - spare part number 39
 - spare part numbers 29, 35, 92
 - display enclosure, spare part numbers 30, 35, 36
 - display hinge
 - removal 95
 - spare part number 30, 35, 96
 - Display Hinge Kit, spare part number 30, 35, 96
 - display panel
 - product description 4
 - removal 93
 - spare part number 29, 36, 94
 - display panel cable
 - removal 95
 - spare part number 29, 35, 95
 - drives, preventing damage 42
 - DVD±RW Double-Layer with SuperMulti Drive
 - precautions 42
 - removal 52
 - spare part number 27, 31, 35, 52
- E**
 - electrostatic discharge 43
 - equipment guidelines 45
 - esc key 13
 - Ethernet, product description 6
 - external monitor port 17
- F**
 - fan
 - removal 73
 - spare part number 26, 35, 73
 - fingerprint reader board
 - removal 70
 - spare part number 26, 35, 70
 - fingerprint reader light, location 15
 - fingerprint reader, location 12
 - fn key 13
 - front component 16
- G**
 - graphics, product description 3
 - grounding guidelines 43
 - guidelines
 - equipment 45
 - grounding 43
 - packaging 44

- transporting 44
 - workstation 44
- H**
- hard drive
 - product description 5
 - removal 48
 - spare part numbers 28, 30, 33, 34, 48
 - specifications 103
 - hard drive bracket
 - illustrated 31
 - removal 50
 - hard drive connector cable
 - illustrated 31
 - removal 50
 - Hard Drive Hardware Kit
 - contents 31
 - spare part number 28, 31, 35, 48
 - hard drive light 18
 - HDMI port 17
 - headphone jack 17
 - heat sink
 - removal 78
 - spare part numbers 27, 35, 36, 78
- J**
- jacks
 - audio-in 17
 - audio-out 17
 - headphone 17
 - microphone 17
 - network 17
 - RJ-45 17
- K**
- key components 13
 - keyboard
 - product description 8
 - removal 56
 - spare part numbers 24, 25, 37, 38, 39, 56
 - keys
 - Action 13
 - b 13
 - esc 13
 - fn 13
 - num lock 13
- L**
- left-side components 17
 - light components 14
 - lights
 - AC adapter 19
 - caps lock 14
 - fingerprint reader 15
 - hard drive 18
 - mute 14
 - network jack 17
 - optical drive 18
 - power 14, 18
 - RJ-45 jack 17
 - TouchPad 15
 - webcam 11
 - wireless 14
- M**
- mass storage device
 - precautions 42
 - spare part numbers 30
 - memory module
 - product description 4
 - removal 55
 - spare part numbers 28, 34, 55
 - microphone
 - location 11
 - product description 5
 - microphone jack 17
 - model description 47
 - model name 1
 - monitor port 17
 - mute light 14
- N**
- network jack
 - lights 17
 - location 17
 - num lock key 13
 - numeric keypad 13
- O**
- operating system, product description 9
 - optical drive
 - location 18
 - precautions 42
 - product description 5
 - removal 52
 - spare part number 27, 31, 35, 52
 - optical drive connector board
 - removal 83
 - spare part number 26, 35, 83
 - optical drive eject button 18
 - optical drive light 18
- P**
- packaging guidelines 44
 - plastic parts, service considerations 41
 - pointing device, product description 8
 - ports
 - external monitor 17
 - HDMI 17
 - monitor 17
 - product description 7
 - USB 17, 18
 - power button 12
 - power button board
 - removal 69
 - spare part number 25, 35, 69
 - power connector 19
 - power connector cable
 - removal 88
 - spare part number 27, 35, 88
 - power cord
 - set requirements 111
 - spare part numbers 32, 33
 - power light 14, 18
 - power requirements, product description 8
 - processor
 - product description 1
 - removal 81
 - spare part numbers 26, 34, 35, 39, 40, 81
 - product description
 - audio 5
 - chipset 2
 - display panel 4
 - Ethernet 6
 - external media cards 6
 - graphics 3
 - hard drive 5
 - keyboard 8

- memory module 4
 - microphone 5
 - operating system 9
 - optical drive 5
 - pointing device 8
 - ports 7
 - power requirements 8
 - processors 1
 - product name 1
 - security 8
 - serviceability 9
 - solid-state drive 5
 - video 5
 - wireless 6
 - product name 1, 46
 - product number 46
- R**
- removal/replacement
 - preliminaries 41
 - procedures 46
 - right-side components 18
 - RJ-45 jack
 - lights 17
 - location 17
 - RTC battery
 - removal 51
 - spare part number 28, 34, 51
- S**
- Screw Kit, spare part number 32, 36
 - security cable slot 19
 - security, product description 8
 - serial number 46
 - service considerations
 - cables 42
 - connectors 42
 - plastic parts 41
 - service cover
 - location 20
 - removal 48
 - spare part number 28, 49
 - Service Cover Kit, spare part number 28, 35
 - service tag 22, 46
 - serviceability, product description 9
 - solid-state drive
 - precautions 42
 - product description 5
 - removal 64
 - spare part number 28, 31, 36, 64
 - speaker component 12
 - speakers
 - location 12
 - removal 84
 - spare part number 27, 36, 84
 - specifications
 - computer 101
 - display 102
 - hard drive 103
 - subwoofer
 - location 19
 - removal 87
 - spare part number 27, 36, 87
 - system board
 - removal 75
 - spare part numbers 26, 36, 39, 40, 75
- T**
- tools required 41
 - top cover
 - removal 65
 - spare part numbers 25, 36, 39, 65
 - TouchPad button 15
 - TouchPad button board
 - removal 72
 - spare part number 25, 35, 72
 - TouchPad components 15
 - TouchPad light 15
 - TouchPad on/off button 15
 - TouchPad zone 15
 - transporting guidelines 44
- U**
- USB board
 - removal 86
 - spare part number 27, 35, 86
 - USB port 17, 18
- V**
- vents 17, 20
 - video, product description 5
- W**
- warranty period 47
 - webcam 11
 - webcam light 11
 - webcam/microphone module
 - removal 94
 - spare part number 95
 - spare part numbers 29, 35, 40
 - Windows applications key 13
 - Windows logo key 13
 - wireless antenna
 - locations 11
 - removal 96
 - spare part number 30, 35, 97
 - Wireless Antenna Kit, spare part number 30, 35, 97
 - wireless light 14
 - wireless module compartment 20
 - wireless module compartment cover
 - removal 61
 - spare part number 28, 62
 - wireless, product description 6
 - WLAN module
 - removal 61
 - spare part numbers 28, 34, 36, 39, 61
 - workstation guidelines 44

