



HP Envy dv4

Maintenance and Service Guide

© Copyright 2012 Hewlett-Packard
Development Company, L.P.

Bluetooth is a trademark owned by its proprietor and used by Hewlett-Packard Company under license. Intel and Intel Core are trademarks of Intel Corporation in the U.S. and other countries. Microsoft and Windows 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: October 2012

Document Part Number: 705025-001

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	4
Finding your hardware and software information	4
Locating hardware	4
Locating software	4
Front	5
Right side	6
Left side	7
Display	8
Top	9
TouchPad	9
Lights	10
Buttons and speakers	11
Keys	12
Bottom	13
3 Illustrated parts catalog	15
Service tag	15
Computer major components	16
Display assembly subcomponents	18
Mass storage devices	20
Miscellaneous parts	21
Sequential part number listing	21
4 Removal and replacement procedures	24
Preliminary replacement requirements	24
Tools required	24
Service considerations	24
Plastic parts	24
Cables and connectors	24
Drive handling	25
Grounding guidelines	25
Electrostatic discharge damage	25
Packaging and transporting guidelines	27
Component replacement procedures	28

Service tag	29
Computer feet	30
Battery	30
Service door	32
Hard drive	33
Optical drive	36
Memory module	37
WLAN module	39
RTC battery	41
Keyboard	42
Top cover	45
Power button board	48
TouchPad button board	50
Optical drive connector cable	51
System board	52
Fan/heat sink assembly	55
Processor	58
Power connector cable	59
Speakers	61
Display assembly	62

5 Using Setup Utility (BIOS) and System Diagnostics 69

Starting Setup Utility (BIOS)	69
Updating the BIOS	69
Determining the BIOS version	69
Downloading a BIOS update	70
Using System Diagnostics	71

6 Specifications 72

Computer specifications	72
35.6 cm (14.0 in) display specifications	72
Hard drive specifications	73
DVD±RW SuperMulti Double-Layer Combination Drive specifications	74

7 Backing up, restoring, and recovering 75

Creating recovery media and backups	75
Creating HP Recovery media	76
Restore and recovery	77
Using Windows Refresh for quick and easy recovery	78
Remove everything and reinstall Windows	78

Recovering using HP Recovery Manager	79
What you need to know	79
Using the HP Recovery partition to recover a minimized image (select models only)	79
Using HP Recovery media to recover	80
Changing the computer boot order	80
Removing the HP Recovery partition	80
8 Power cord set requirements	81
Requirements for all countries	81
Requirements for specific countries and regions	82
9 Recycling	84
Index	85

1 Product description

Category	Description
Product Name	HP Envy dv4
Processor	<ul style="list-style-type: none">• Intel® Core™ i5-3210M 2.5 GHz processor (SC turbo up to 3.1 GHz, 1600 MHz/3.0 MB L3 cache, dual core, 35 W)• Intel Core i3-3120M 2.5 GHz processor (1600MHz/3M L3 cache, dual core, 35 W)• Intel Core i3-3110M 2.4 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W)• Intel Core i3-2370M 2.4 GHz processor (1333 MHz/3.0 MB L3 cache, dual core, 35 W)
Chipset	Intel HM77 Express chipset
Graphics	<p>Internal graphics:</p> <p>Intel HD Graphics 4000</p> <p>Switchable Discrete Graphics:</p> <p>AMD Radeon HD7670M with up to 1024 MB of dedicated video memory (64 MB x 16 DDR3 900 MHz x 8 PCs); 128 bit M2 29 mm x 29 mm</p> <p>Support HD decode, DX11, HDMI, and PX5.0</p>
Display Panel	<p>35.6 cm (14.0 in), light-emitting diode (LED), SVA, high-definition (HD), BrightView (1366×768) display, 3.6 mm; typical brightness: 200 cd/m² (nits)</p> <p>All display assemblies include two wireless local area network (WLAN) antenna cables</p> <p>16:9 Ultra Wide Aspect Ratio</p>
Memory	<p>Two customer-accessible/upgradable SODIMM memory module slots</p> <p>Supports the following:</p> <ul style="list-style-type: none">• DDR3-1600 MHz dual channel support• DDR3L-1600 MHz dual channel support <p>Supports up to 8192 MB system RAM</p> <p>Supports the following system RAM configurations:</p> <ul style="list-style-type: none">• 8192 MB (4096 MB×2)• 6144 MB (4096 MB×1 + 2048 MB×1)• 4096 MB (4096 MB×1 or 2048 MB×2)• 2048 MB (2048 MB×1)

Category	Description
Hard drive	<p>Supports 6.35 cm (2.5 in) hard drives in 9.5 mm (.37 in) thickness</p> <p>Customer-accessible</p> <p>Serial ATA</p> <p>Intel Smart Response Technology support</p> <p>HP 3D DriveGuard support</p> <p>Supports the following hard drives:</p> <ul style="list-style-type: none"> • 1 TB, 5400 rpm, 9.5 mm • 750 GB, 7200 rpm and 5400 rpm, 9.5 mm • 500 GB, 7200 rpm and 5400 rpm, 9.5 mm
Optical drive	<p>Fixed</p> <p>Serial ATA</p> <p>12.7 mm tray load</p> <p>Supports DVD±RW Double-Layer SuperMulti Drive</p> <p>Supports Zero-Power optical disk drive</p>
Audio and video	<p>HD audio</p> <p>Beats audio</p> <p>Dual speakers</p> <p>Subwoofer</p> <p>Supports Microsoft® Premium requirements</p> <p>HP TrueVision HD webcam (fixed, no tilt with activity LED; 1280×800 by 30 frames per second)</p> <p>Two dual array, digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software</p>
Ethernet	Integrated 10/100 NIC
Wireless	<p>Integrated wireless local area network (WLAN) options by way of wireless module</p> <p>Two WLAN antennas built into display assembly</p> <p>Support for the following WLAN formats:</p> <ul style="list-style-type: none"> • Broadcom 4313 802.11 b/g/n 1×1 WiFi and 20702 Bluetooth® 4.0 Combo Adapter • Qualcomm Atheros AR9485 802.11 b/g/n 1×1 WiFi and AR3012 Bluetooth 4.0 Combo Adapter (select models only)
External media cards	<p>HP Multi-Format Digital Media Reader slot with push-push technology, supporting the following digital card formats:</p> <ul style="list-style-type: none"> • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Secure Digital Extended Capacity (SDxC) Memory Card • MultiMediaCard (MMC)
Internal media card	One half-size mini card slot for WLAN

Category	Description
Ports	<ul style="list-style-type: none"> • AC Smart Pin adapter plug • Audio-in (microphone) • Audio-out (stereo headphone) • HDMI 1.4 output supporting: 1920×1200 external resolution @ 60 Hz • VGA (Dsub 15 pin) supporting: 2048 x 1536 external resolution @ 75Hz, hot plug and unplug and autodetection for correct output to wide-aspect versus standard aspect video • RJ-45 (Ethernet) • USB 3.0 (2 ports), USB 2.0 (1 port)
Keyboard/pointing devices	<p>Full-size, island-style</p> <p>TouchPad with two buttons:</p> <ul style="list-style-type: none"> • Multitouch gesture support enabled as default • Taps enabled by default • Supports edge-swipe gestures
Power requirements	<p>90 W HP Smart AC adapter (RC, V, PFC, EM, 3-wire)</p> <p>Supports 6-cell, 62 Wh, 2.8 Ah, Li-ion battery (battery is user-removable)</p> <p>Supports Fast Charge</p>
Security	<p>Security cable lock</p> <p>Intel/VeriSign support</p> <p>Intel AT-p Ready support</p>
Operating system	<p>Preinstalled:</p> <ul style="list-style-type: none"> • Windows® 8 Standard 64 bit
Serviceability	<p>End-user replaceable parts:</p> <ul style="list-style-type: none"> • AC adapter • Battery • Hard drive • Memory module • Optical drive • WLAN module

2 External component identification

Finding your hardware and software information

Locating hardware

To find out what hardware is installed on your computer:

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


A list displays all the devices installed in your computer.

Locating software

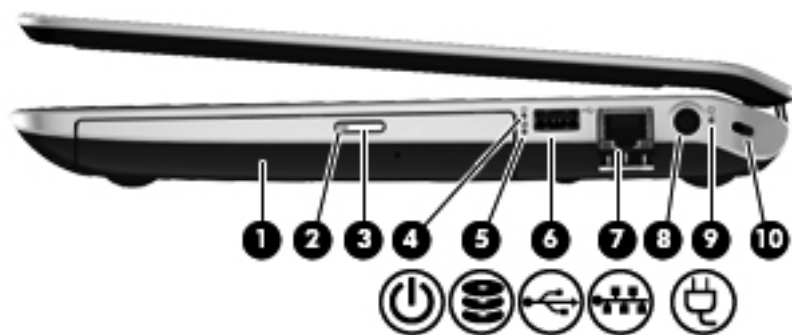
- ▲ To find out what software is included on your computer, from the Start screen, right-click using the mouse to display the apps, and select the **All apps** icon.






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 High Capacity (SDHC) Memory Card• Secure Digital Extended Capacity (SDxC) Memory Card• MultiMediaCard (MMC)

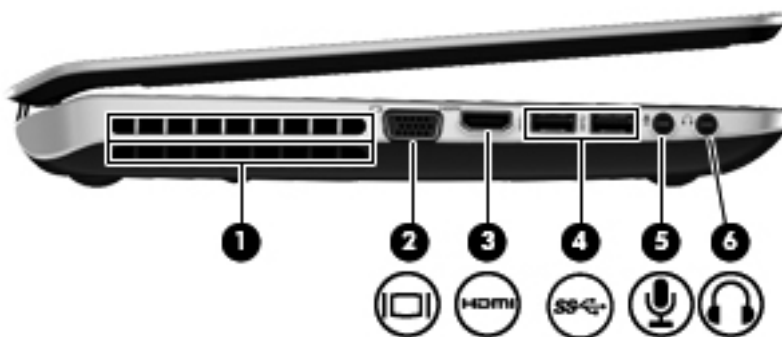
Right side








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.
(6)  USB 2.0 port	Connects an optional USB device.
(7)  RJ-45 (network) jack	Connects a network cable.
(8)  Power connector	Connects an AC adapter.

Component	Description
(9) 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.
(10) Security cable slot	<p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p>

Left side



Component	Description
(1) Vent	<p>Enables airflow to cool internal components.</p> <p>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.</p>
(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)  USB 3.0 ports (2)	Connect optional USB 3.0 devices and provide enhanced USB power performance.
(5)  Audio-in (microphone) jack	Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.
(6)  Audio-out (headphone) jack	<p>Connect optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety and Environmental Notices</i>.</p> <p>NOTE: When a device is connected to a headphone jack, the computer speakers are disabled.</p>

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, allows you to video conference and chat online using streaming video. To use the webcam, from the Start screen type c , and then select CyberLink YouCam .
(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. To see wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region. To access this guide, select the **HP Support Assistant** app on the Start screen, select **My computer**, and then select **User guides**.

Top




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. The TouchPad also supports edge-swipe gestures.
(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.


Lights



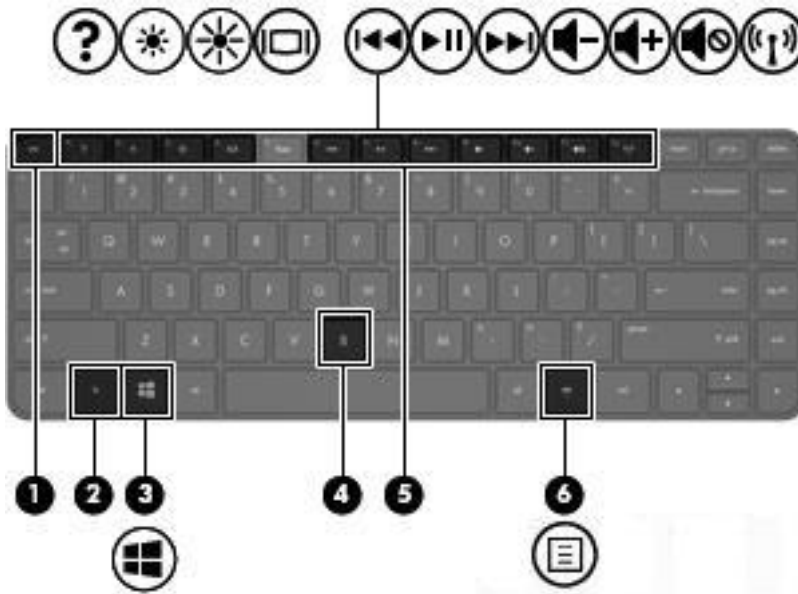
Component	Description
<p>(1)  Power light</p>	<ul style="list-style-type: none"> • White: The computer is on. • Blinking white: The computer is in the Sleep state, which is an energy-saving mode. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or 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>
<p>(2)  Mute light</p>	<ul style="list-style-type: none"> • Amber: Computer sound is off. • Off: Computer sound is on.
<p>(3)  Wireless light</p>	<ul style="list-style-type: none"> • White: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on. • Amber: All wireless devices are off.
<p>(4) Caps lock light</p>	<p>On: Caps lock is on, which switches the keys to all capital letters.</p>
<p>(5) TouchPad light</p>	<ul style="list-style-type: none"> • Amber: The TouchPad is off. • Off: The TouchPad is on.



Buttons and speakers



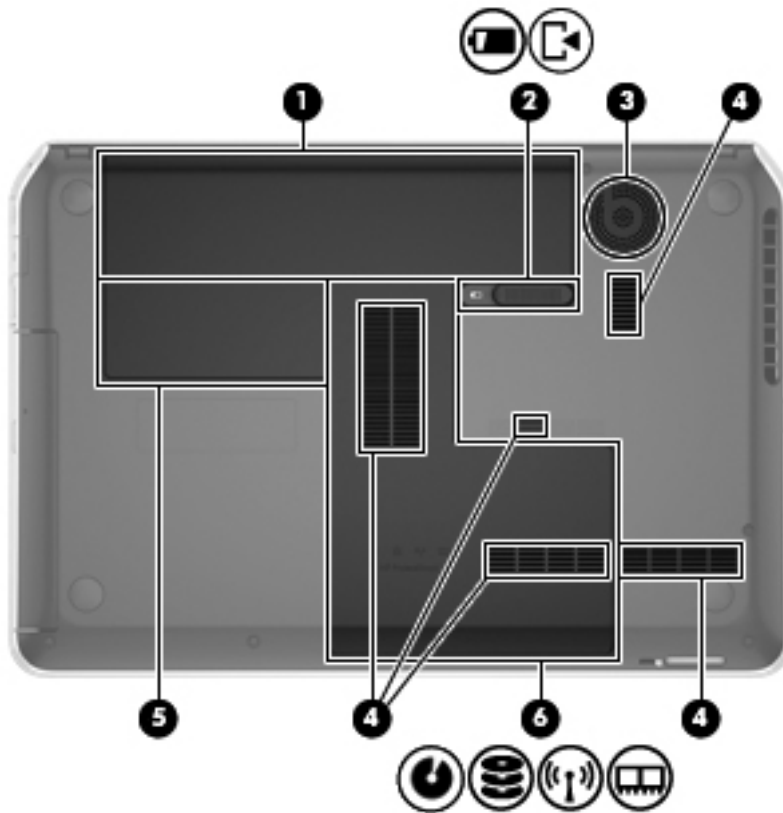
Component	Description
(1)  Power button	<ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to exit Hibernation.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


Keys




Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes frequently used system functions when pressed in combination with the <code>esc</code> key or the <code>b</code> key.
(3)  Windows key	Returns you to the Start screen from an open app or the Desktop. NOTE: Pressing the Windows logo key again will return you to the previous screen.
(4) <code>b</code> key	Enables or disables Beats Audio when pressed in combination with the <code>fn</code> key. Opens Beats Audio Control Panel, which allows you to view and control all audio settings. Beats Audio is an enhanced audio feature that provides a deep, controlled bass while maintaining a clear sound. Beats audio is enabled by default. NOTE: You can also open the Beats Audio Control Panel from the Start screen: type <code>c</code> , select Control Panel , select Hardware and Sound and then Beats Audio Control Panel .
(5) Action keys	Execute frequently used system functions.
(6)  Windows applications key	Displays options for a selected object.

Bottom



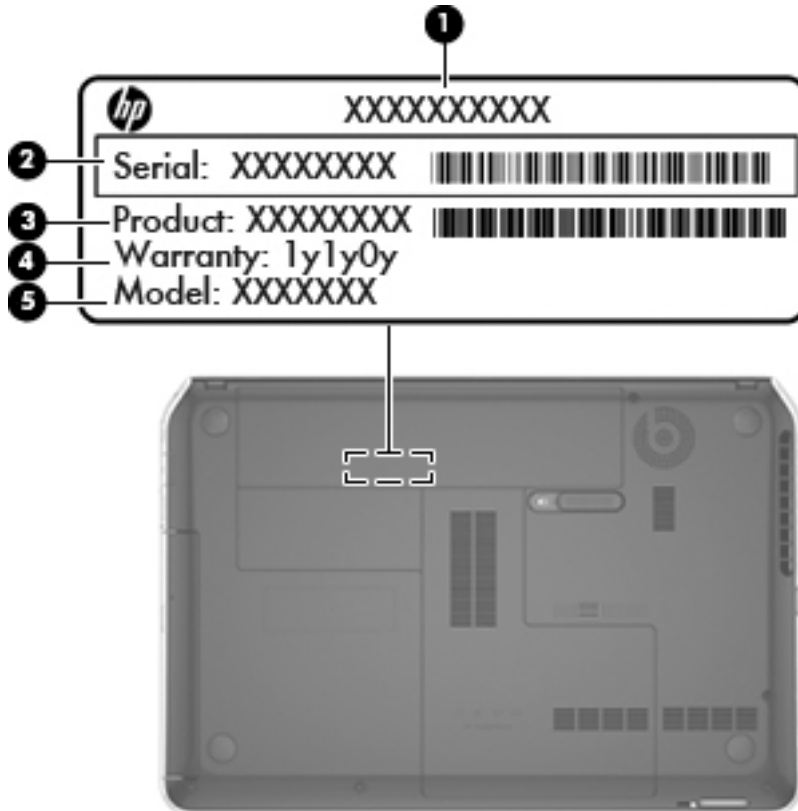
Item	Component	Description
(1)	Battery bay	Holds the battery.
(2)	 Battery release latch	Releases the battery from the battery bay and opens the service door.
(3)	Integrated subwoofer	Provides superior bass sound.
(4)	Vents (5)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Item	Component	Description
(5)	Wireless module compartment	<p>Holds the WLAN device.</p> <p>CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact support through Help and Support. From the Start screen, type <code>h</code>, and then select Help and Support.</p>
(6)	 <p>Hard drive bay and memory module compartment</p>	The service door provides access to the hard drive bay and memory module compartment.

3 Illustrated parts catalog

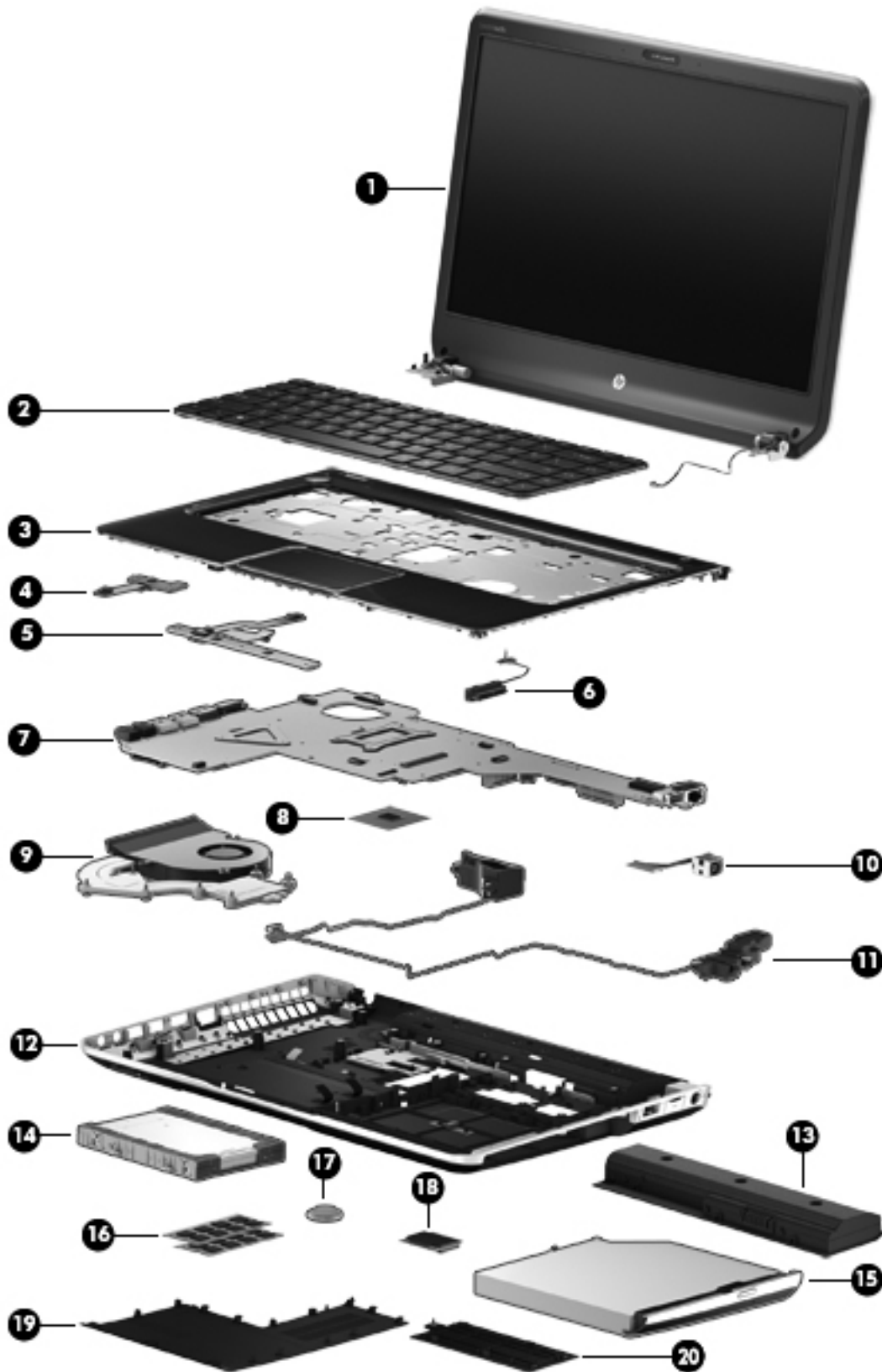
Service tag

When ordering parts or requesting information, provide the computer serial number and model description provided on the service tag. The service tag is located inside the battery bay. See [Battery on page 30](#) 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 (select models only)	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

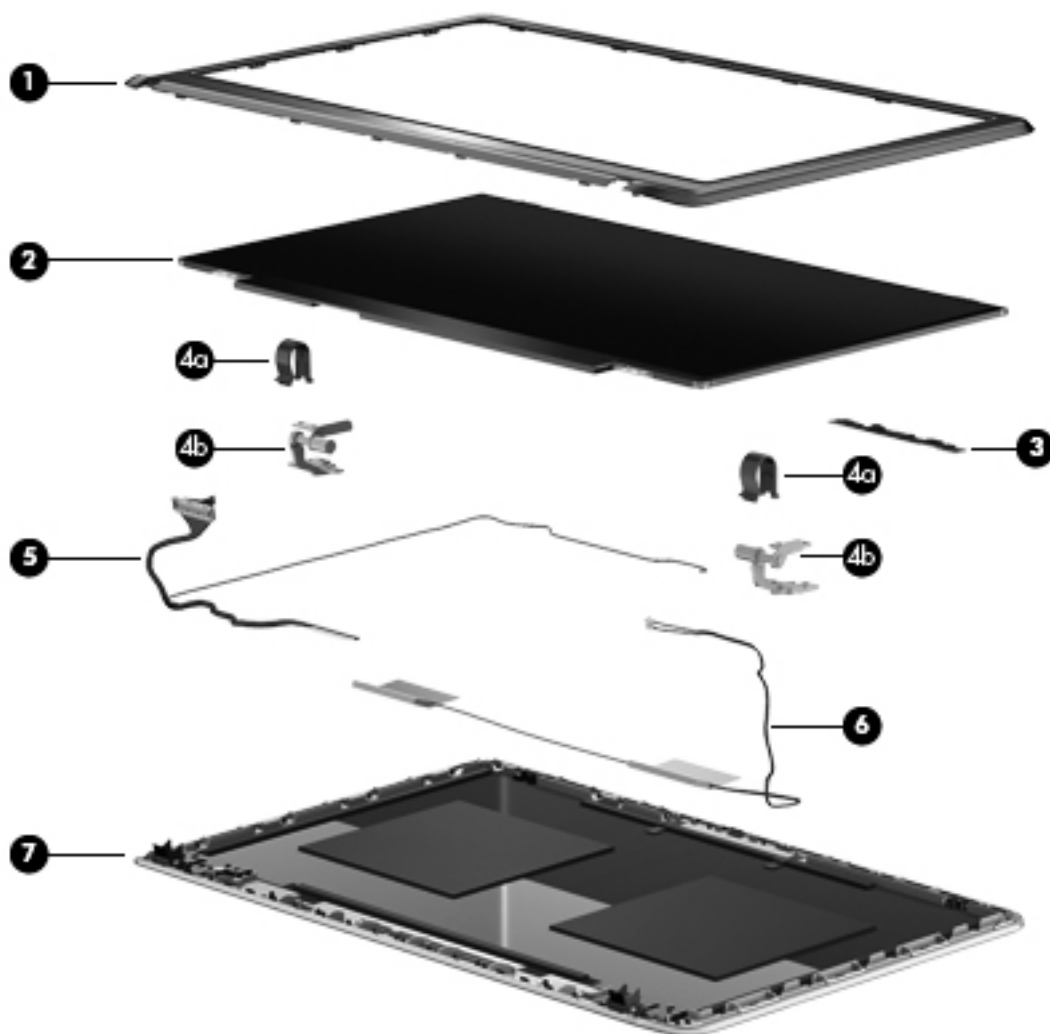
Computer major components



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 18 .	
(2)	Keyboard In black finish for use in the United States (includes keyboard cable):	699285-001
(3)	Top cover (includes TouchPad and cable):	
	In black licorice finish	694771-001
	In carmine red finish	694772-001
(4)	Power button board (includes cable)	676651-001
(5)	TouchPad button board (includes cable)	682488-001
(6)	Optical drive connector cable (included in the Optical Drive Hardware Kit, spare part number 681227-001)	
(7)	System board (includes replacement thermal material)	694763-501
(8)	Processor (includes replacement thermal material):	
	Intel Core i5-3210M 2.5 GHz processor (SC turbo up 3.1 GHz, 1600 MHz/3.0 MB L3 cache, dual core, 35 W)	680645-001
	Intel Core i3-3120M 2.5 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W)	700627-001
	Intel Core i3-3110M 2.4 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W)	682417-001
	Intel Core i3-2370M 2.4 GHz processor (1333 MHz/3.0 MB L3 cache, dual core, 35 W)	677152-001
(9)	Fan/heat sink assembly (includes replacement thermal material)	681226-001
(10)	Power connector cable (includes bracket)	676645-001
(11)	Speakers (include subwoofer, speaker cables, and 4 rubber isolators)	676655-001
(12)	Base enclosure (includes battery release latch mechanism and RJ45 cover)	703248-001
	Rubber Feet Kit (includes 2 base enclosure rear rubber feet, not illustrated)	689843-001
(13)	6-cell, 62 Wh, 2.8 Ah, Li-ion battery	671731-001
(14)	Hard drive (does not include hard drive connector cable or hard drive rubber bracket):	
	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
	500 GB, 7200 rpm, 9.5 mm	634925-001
	500 GB, 5400 rpm, 9.5 mm	669299-001
	Hard Drive Hardware Kit (not illustrated, includes hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, and 2 screws)	676647-001
(15)	DVD±RW Double-Layer SuperMulti optical drive (includes bezel and bracket)	676661-001
	Optical Drive Hardware Kit (not illustrated, includes optical drive bezel, optical drive bracket, and optical drive connector cable)	681227-001
(16)	Memory modules (2, PC3, 12800, 1600 MHz):	

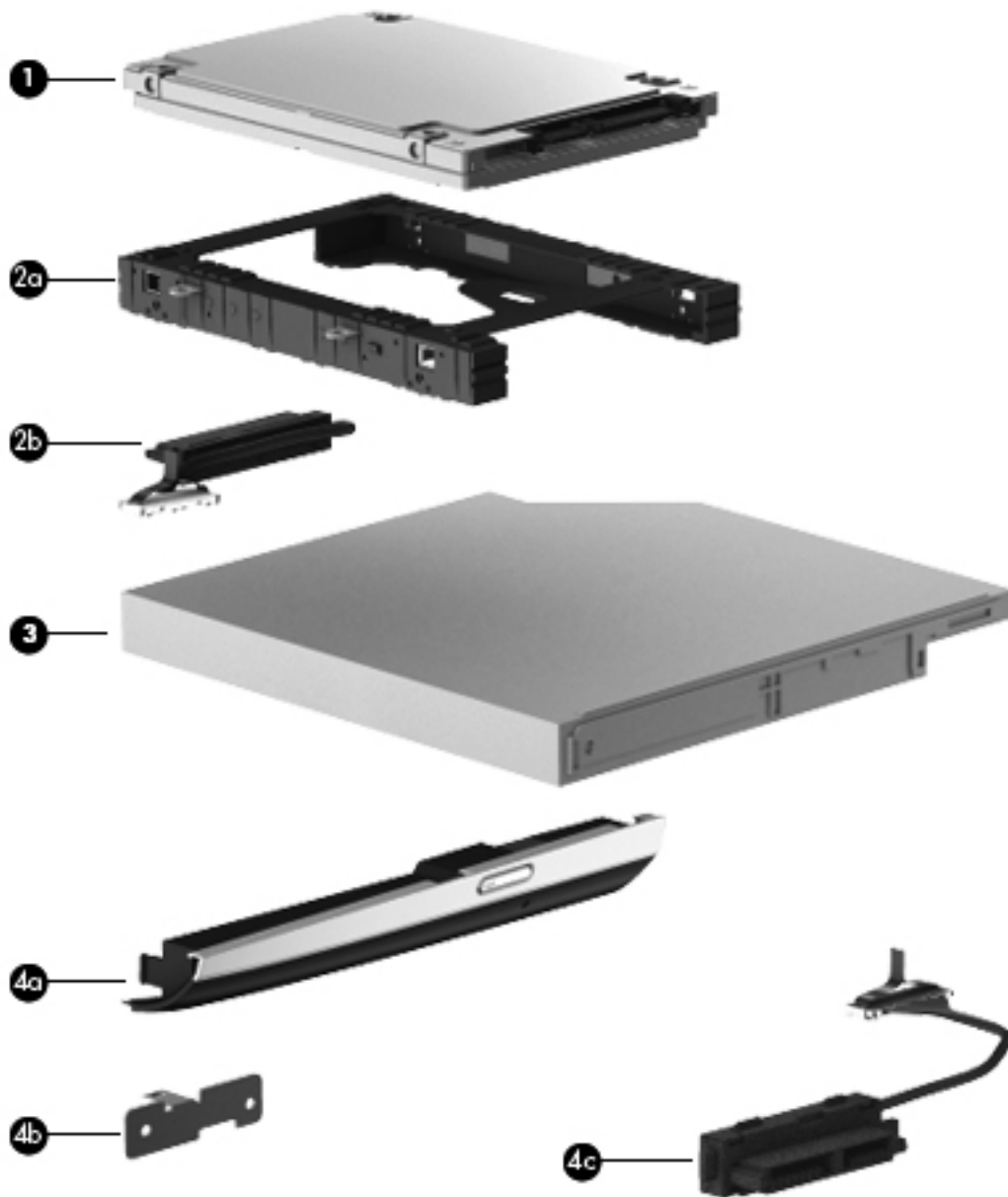
Item	Component	Spare part number
	4 GB memory module	641369-001
	2 GB memory module	652972-001
(17)	RTC battery	676654-001
(18)	WLAN module:	
	Broadcom 4313 802.11 b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-005
	Qualcomm Atheros AR9485 802.11 b/g/n 1×1 WiFi and AR3012 Bluetooth 4.0 Combo Adapter (select models only)	655795-005
	Plastics Kit , includes:	676652-001
(19)	Service door	
(20)	Wireless cover (includes one captive retention screw, secured by a C-ring)	

Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel (includes 2 rubber screw covers)	700547-001
(2)	35.6 cm (14.0 in), LED. HD, BrightView display panel (includes 2 rubber screw covers)	676653-001
(3)	Webcamera/microphone module (includes 2 rubber screw covers)	676659-001
	Display Hinge Kit (includes 2 rubber screw covers, and):	676648-001
(4a)	Left and right hinge covers	
(4b)	Left and right hinges	
(5)	Display panel cable (includes webcamera/microphone module cable and 2 rubber screw covers)	676646-001
(6)	Antenna Kit (includes left and right wireless antenna cables and transceivers and 2 rubber screw covers)	676640-001
(7)	Display enclosure (includes 2 rubber screw covers):	
	In black licorice finish	676641-001
	In carmine red finish	678260-001

Mass storage devices



Item	Component	Spare part number
(1)	Hard drive (does not include the hard drive rubber bracket, hard drive connector cable, or screws)	
	1 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
	500 GB, 7200 rpm, 9.5 mm	634925-001
	500 GB, 5400 rpm, 9.5 mm	669299-001
	Hard Drive Hardware Kit , includes:	676647-001

Item	Component	Spare part number
(2a)	Hard drive rubber bracket	
(2b)	Hard drive connector cable	
	Hard drive retention brackets (2, not illustrated)	
	Hard drive retention screws (2, not illustrated)	
(3)	DVD±RW Double-Layer SuperMulti optical drive (includes bezel and bracket)	676661-001
	Optical Drive Hardware Kit , includes:	681227-001
(4a)	Optical drive bezel	
(4b)	Optical drive bracket	
(4c)	Optical drive connector cable	

Miscellaneous parts

Component	Spare part number
HP Smart AC adapter (90 W, RC, V, PFC, EM, 3-wire)	693713-001
Power cord (3-pin, black, 1.83-m) for use in the People's Republic of China	490371-AA1
Screw Kit	681228-001

Sequential part number listing

Spare part number	Description
490371-AA1	Power cord for use in the People's Republic of China (3-pin, black, 1.83-m)
633252-001	750 GB, 7200 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 676647-001.
634250-001	750 GB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 676647-001.
634925-001	500 GB, 7200 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 676647-001.
641369-001	4 GB memory module (PC3, 12800, 1600 MHz)
652972-001	2 GB memory module (PC3, 12800, 1600 MHz)
655795-001	Qualcomm Atheros AR9485 802.11 b/g/n 1×1 WiFi and AR3012 Bluetooth 4.0 Combo Adapter (select models only)
657325-001	Broadcom 4313 802.11 b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter

Spare part number	Description
669299-001	500 GB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 676647-001.
671731-001	6-cell, 62 Wh, 2.8 Ah, Li-ion battery
676521-001	1 TB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 676647-001.
676640-001	Antenna Kit (includes left and right wireless antenna cables and transceivers and 2 rubber screw covers)
676641-001	Display enclosure in black licorice finish (includes 2 rubber screw covers)
676645-001	Power connector cable (includes bracket)
676646-001	Display panel cable (includes (includes webcamera/microphone module cable and 2 rubber screw covers)
676647-001	Hard Drive Hardware Kit (includes hard drive rubber bracket, 2 hard drive retention brackets, 2 hard drive retention screws, and hard drive connector cable)
676648-001	Display Hinge Kit (includes left and right hinges and 2 rubber screw covers)
676651-001	Power button board (includes cable)
676652-001	Plastics Kit (includes service door and wireless module compartment cover)
676653-001	35.6 cm (14.0 in), LED, HD, BrightView display panel (includes 2 rubber screw covers)
676654-001	RTC battery
676655-001	Speakers (include subwoofer, speaker cables, and 4 rubber isolators)
676659-001	Webcamera/microphone module
676661-001	DVD±RW Double-Layer SuperMulti optical drive (includes bezel and bracket)
677152-001	Intel Core i3-2370M 2.4 GHz processor (1333 MHz/3.0 MB L3 cache, dual core, 35 W), includes replacement thermal material
678260-001	Display enclosure in carmine red finish (includes 2 rubber screw covers)
680645-001	Intel Core i5-3210M 2.5 GHz processor (SC turbo up 3.1 GHz, 1600 MHz/3.0 MB L3 cache, dual core, 35 W); includes replacement thermal material
681226-001	Fan/heat sink assembly (includes replacement thermal material)
681227-001	Optical Drive Hardware Kit (includes optical drive bezel, optical drive bracket, and optical drive connector cable)
681228-001	Screw Kit
682417-001	Intel Core i3-3110M 2.4 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W; includes replacement thermal material)
682488-001	TouchPad button board (includes cable)
689843-001	Rubber Feet Kit (includes 2 base enclosure rear rubber feet)
693713-001	90 W HP Smart AC adapter (RC, V, PFC, EM, 3-wire)

Spare part number	Description
694763-501	System board (includes replacement thermal material)
694771-001	Top cover in black licorice finish (includes TouchPad and cable)
694772-001	Top cover in carmine red finish (includes TouchPad and cable)
699285-001	Keyboard in black finish for use in the United States (includes keyboard cable)
700547-001	Display bezel (includes 2 rubber screw covers and rubber bumpers)
700627-001	Intel Core i3-3120M 2.5 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W); includes replacement thermal material
703248-001	Base enclosure (includes battery release latch mechanism and RJ45 cover)

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.

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

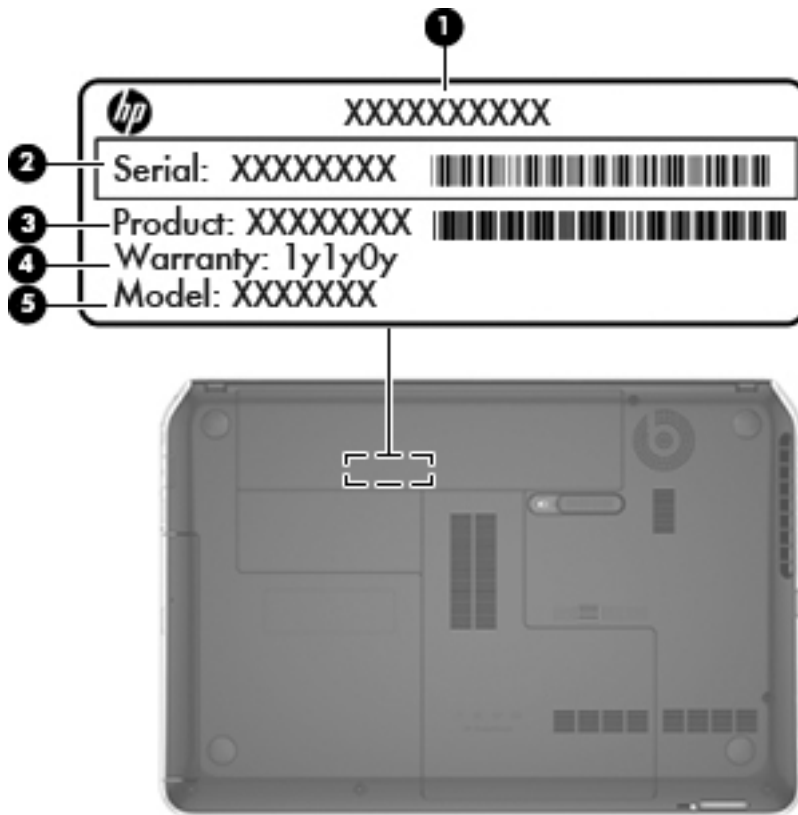
This chapter provides removal and replacement procedures.



IMPORTANT: There may be as many as 75 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 30](#) 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.
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description (select models only)	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

Computer feet

Description	Spare part number
Rubber Feet Kit	689843-001

The computer feet are adhesive-backed rubber pads. There are two rubber feet that attach to the base enclosure in the locations illustrated below.



Battery

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

Before disassembling the computer, follow these steps:

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



Service door

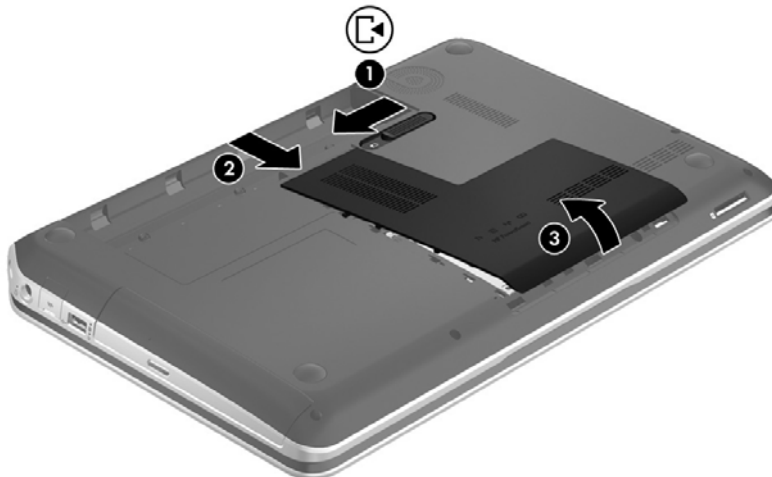
Description	Spare part number
Plastics Kit (contains the service door)	676652-001

Before removing the service door, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 30](#)).

Remove the service door:

1. Slide the battery release latch **(1)** to release the service door.
2. Slide the service door **(2)** toward the front of the computer.
3. Lift up and remove the service door **(3)**.



Reverse this procedure to replace the service door.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive rubber bracket, 2 hard drive retention brackets, hard drive connector cable, or screws. These components are included in the Hard Drive Hardware Kit, spare part number 676647-001.

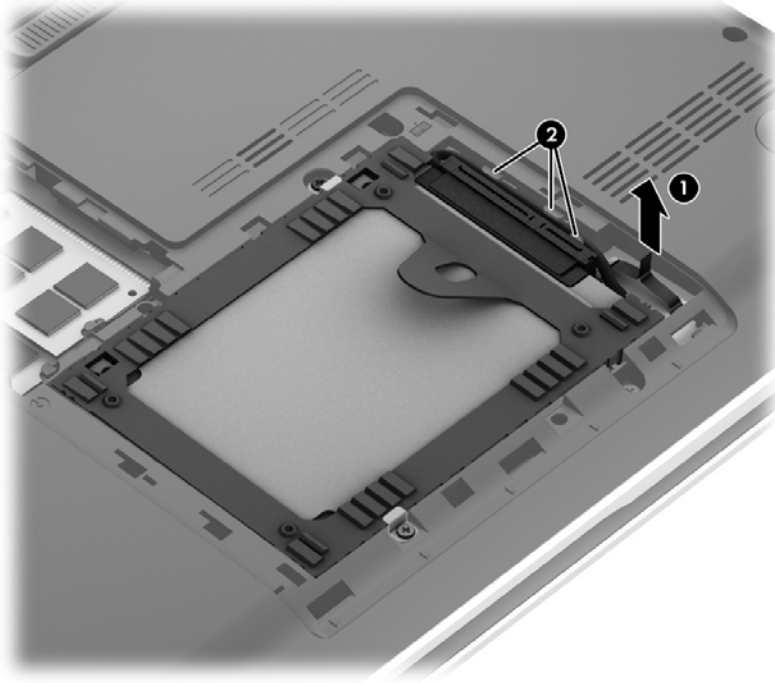
Description	Spare part number
1 TB, 5400 rpm, 9.5 mm	676521-001
750 GB, 7200 rpm, 9.5 mm	633252-001
750 GB, 5400 rpm, 9.5 mm	634250-001
500 GB, 7200 rpm, 9.5 mm	634925-001
500 GB, 5400 rpm, 9.5 mm	669299-001

Before removing the hard drive, follow these steps:


1. Shut down the computer.
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 30](#)).
5. Remove the service door (see [Service door on page 32](#)).

Remove the hard drive:

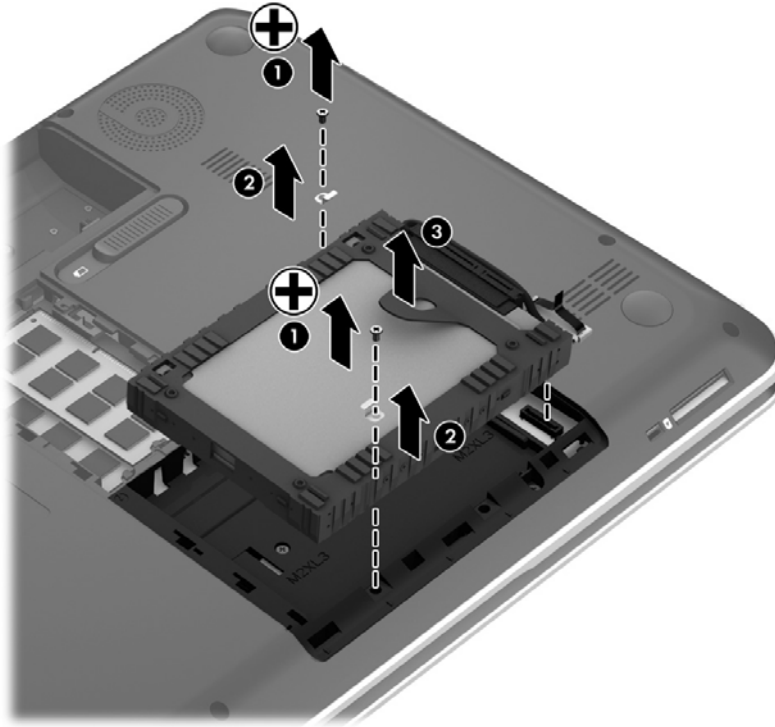
1. Using the cable tab (1), carefully lift up and disconnect the hard drive cable from the computer, and then pull the cable out from the routing clips (2).



2. Remove the two Phillips M2.0×3.0 screws (1) that secure the hard drive to the computer.

 **NOTE:** When removing the hard drive retention screws, make note of the location and orientation of the hard drive retention brackets (2). The hard drive retention brackets are included in the Hard Drive Hardware Kit, spare part number 676647-001.

3. Use the tab (3) to lift and remove the hard drive from the hard drive bay.



4. If it is necessary to disassemble the hard drive, perform the following steps:
 - a. Separate the front edges of the hard drive rubber bracket (1) from the hard drive
 - b. Remove the hard drive (2) from the bracket.
 - c. If necessary, disconnect the hard drive connector cable (3) from the hard drive. The hard drive rubber bracket and hard drive connector cable are available in the Hard Drive Hardware Kit, spare part number 676647-001.



To install a hard drive, reverse the removal procedure.

Optical drive

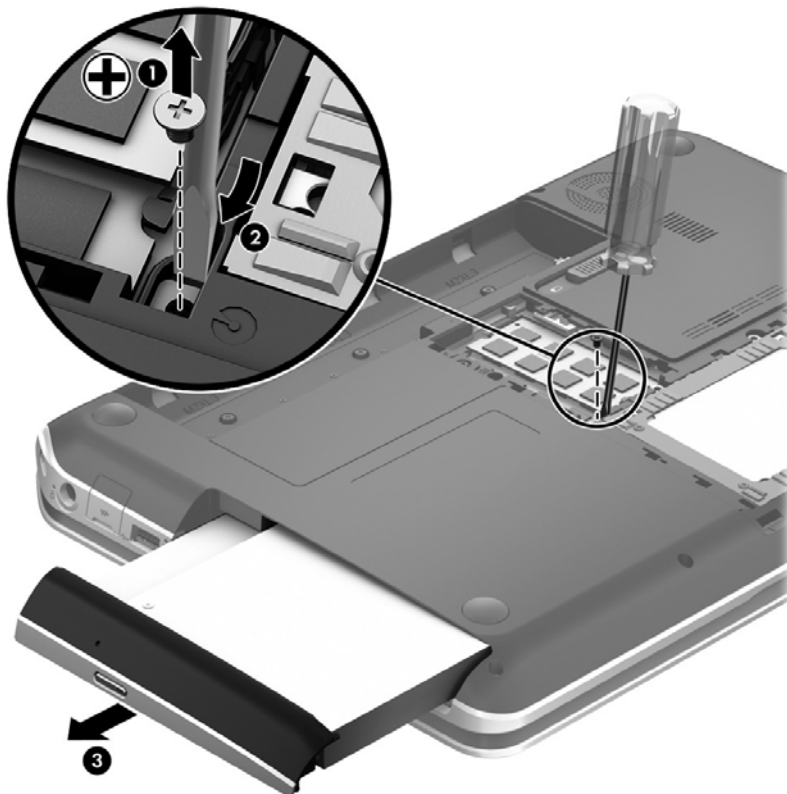
Description	Spare part number
DVD±RW Double-Layer SuperMulti optical drive (includes bezel and bracket)	676661-001
Optical Drive Hardware Kit (includes optical drive bezel, optical drive bracket, and optical drive connector cable)	681227-001

Before removing the optical drive, follow these steps:

1. Shut down the computer.
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 30](#)).
5. Remove the service door (see [Service door on page 32](#)).

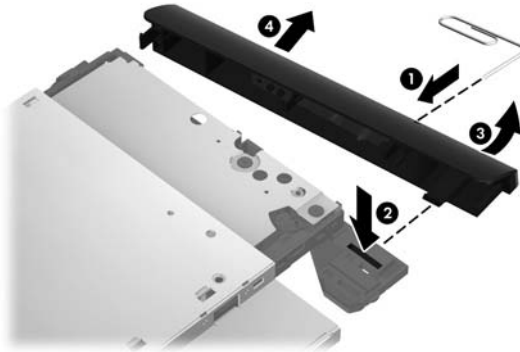
Remove the optical drive:

1. Remove the Phillips M2.5×7.0 screw **(1)** that secures the optical drive to 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.

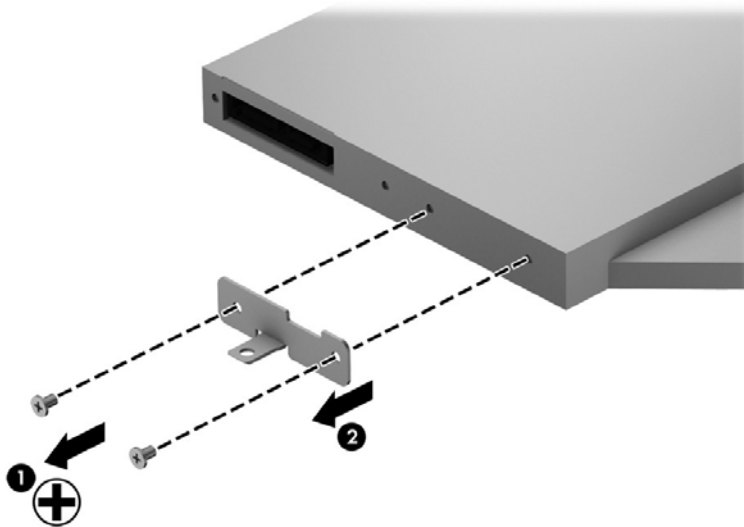


4. If it is necessary to replace the optical drive bezel, use a thin tool or an unbent paper clip to release the optical drive tray **(1)**.

5. Use a flat-blade screw driver or similar tool to press on the optical drive bezel tab (2) to release the optical drive bezel.
6. Release the left side of the optical drive bezel (3).
7. Remove the optical drive bezel (4).



8. If it is necessary to replace the optical drive bracket, position the optical drive with the rear panel toward you.
9. Remove the two Phillips M2.0×3.0 screws (1) that secure the optical drive bracket to the optical drive.
10. Remove the optical drive bracket (2).



Reverse this procedure to reassemble and install the optical drive.

Memory module

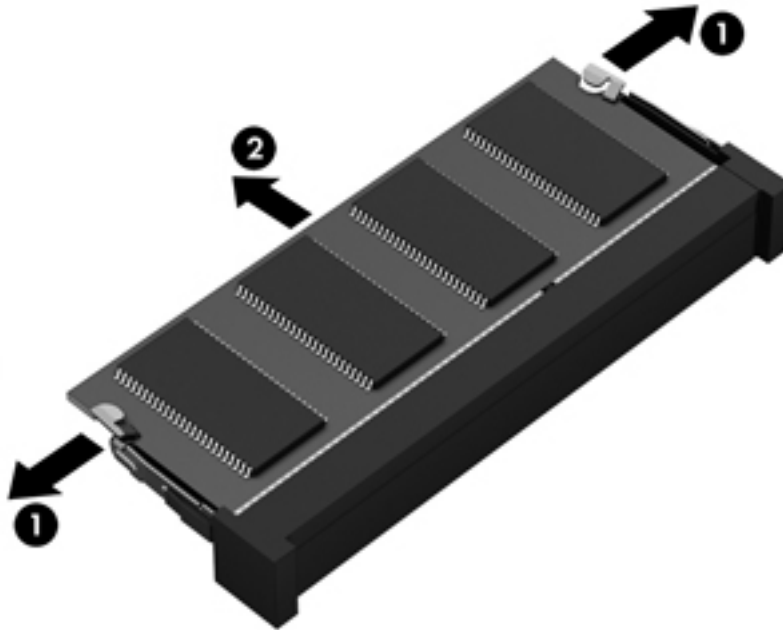
Description	Spare part number
4 GB memory module (PC3, 12800, 1600 MHz)	641369-001
2 GB memory module (PC3, 12800, 1600 MHz)	652972-001

Before removing a memory module, follow these steps:

1. Shut down the computer.
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 30](#)).
5. Remove the service door (see [Service door on page 32](#)).

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 the memory module.

WLAN module

Description	Spare part number
Broadcom 4313 802.11 b/g/n 1×1 WiFi and 20702 Bluetooth 4.0 Combo Adapter	657325-005
Qualcomm Atheros AR9485 802.11 b/g/n 1×1 WiFi and AR3012 Bluetooth 4.0 Combo Adapter (select models only)	655795-005

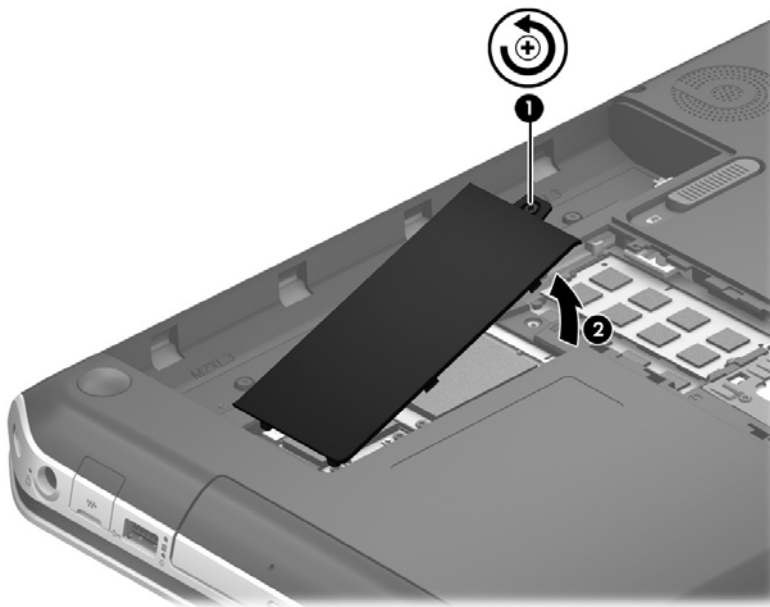
⚠ CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

Before removing the WLAN module, follow these steps:

1. Shut down the computer.
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 30](#)).
5. Remove the service door (see [Service door on page 32](#)).


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.

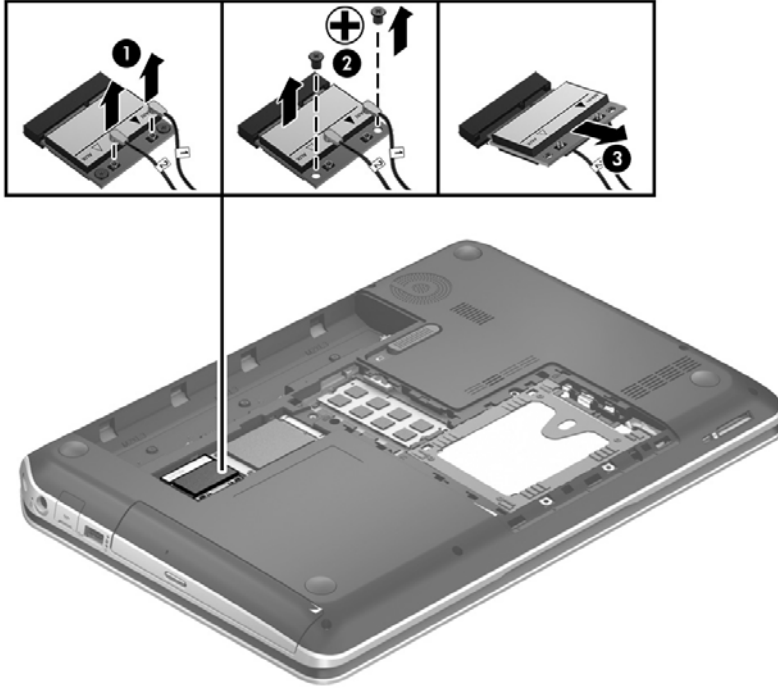



3. Remove the wireless module compartment cover. The wireless module compartment cover is available in the Plastics Kit, spare part number 676652-001.

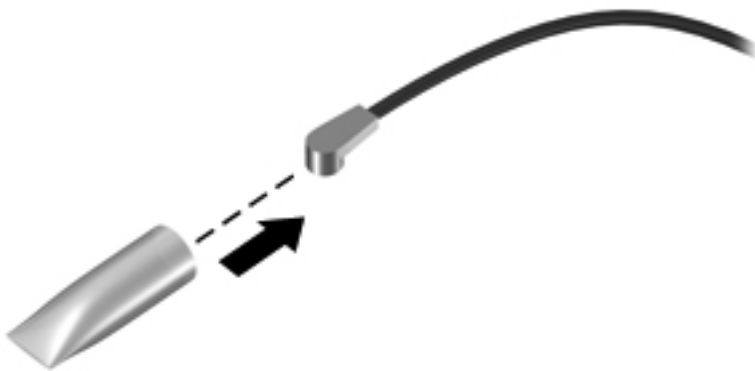
4. Disconnect the WLAN antenna cables (1) from the terminals on the WLAN module.

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

5. Remove the two Phillips M2.0×3.5 screws (2) that secure the WLAN module to the system board. (The WLAN module tilts up.)
6. Remove the WLAN module (3) by pulling the module away from the slot at an angle.



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



Reverse this procedure to install the WLAN module.

RTC battery

Description	Spare part number
RTC battery	676654-001

Before removing the RTC battery, follow these steps:

1. Shut down the computer.
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 30](#)).
5. Remove the service door (see [Service door on page 32](#)).
6. Remove the wireless module compartment cover (see [WLAN module on page 39](#)).

Remove the RTC battery:

1. Use a flat-bladed, non-metallic tool (1) to release the RTC battery from the socket on the system board.
2. Remove the RTC battery (2).



3. Remove the RTC battery.

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

Keyboard



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

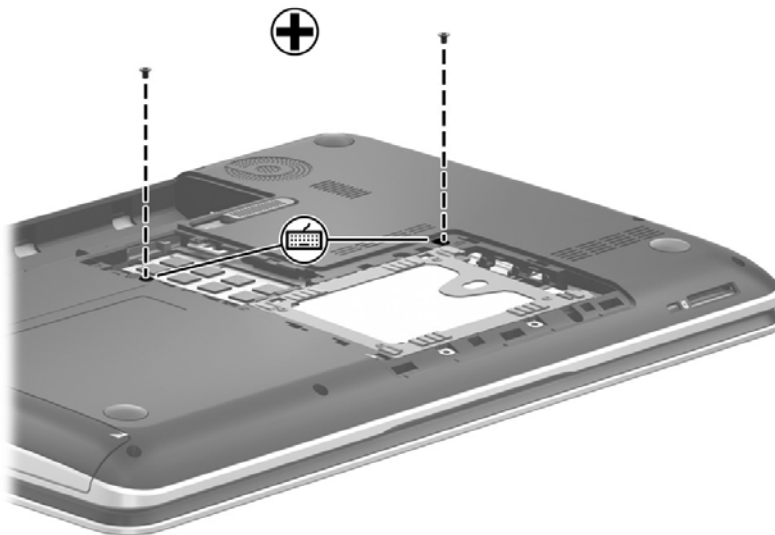
Description	Spare part number
In black finish for use in the United States	699285-001

Before removing the keyboard, follow these steps:

1. Shut down the computer.
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 30](#)).
5. Remove the service door (see [Service door on page 32](#)).

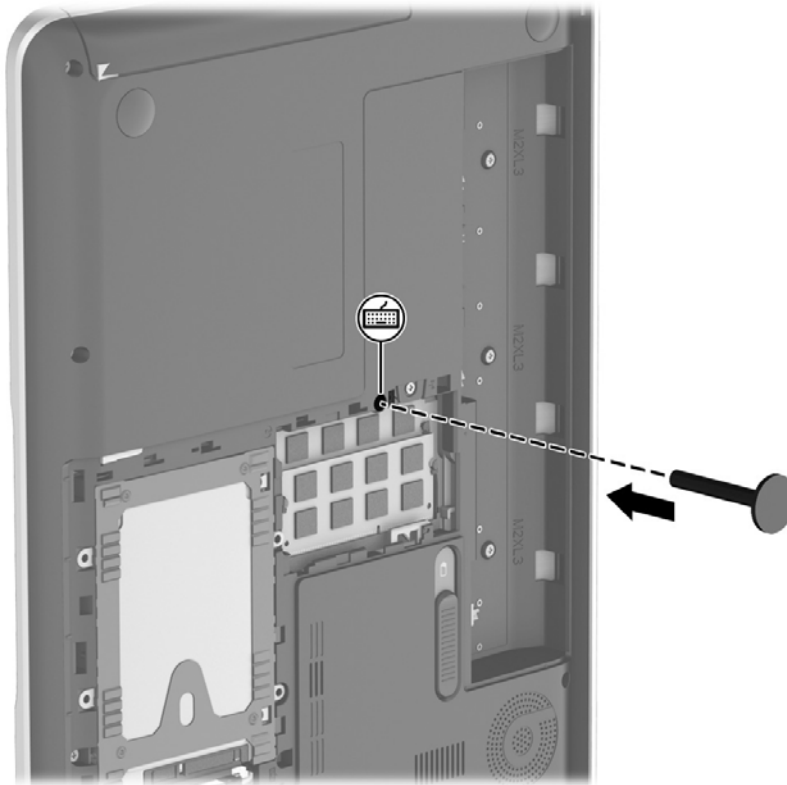
Remove the keyboard:

1. Remove the two Phillips M2.5×6.5 screws that secure the keyboard to the computer.



2. Rest the computer on its left side.
3. Open the computer.

4. Insert a thin tool into the left retention screw hole, 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 (2) up and forward until it rests upside down on the palm rest.




7. Release the ZIF connector (1) to which the keyboard cable is connected, and then disconnect the keyboard cable (2) from the system board.

8. Remove the keyboard (3).



Reverse this procedure to install the keyboard.


Top cover

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

Description	Spare part number
In black licorice finish	694771-001
In carmine red finish	694772-001

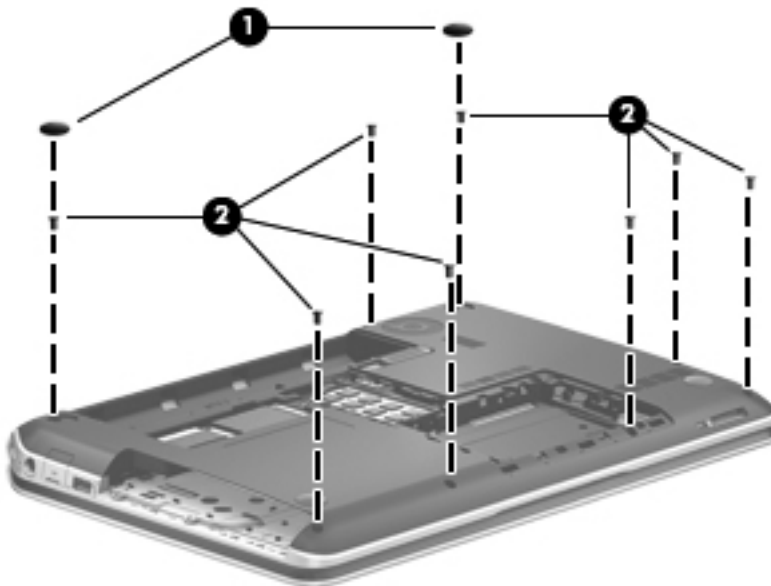
Before removing the top cover, follow these steps:

1. Shut down the computer.
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 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. Keyboard (see [Keyboard on page 42](#))

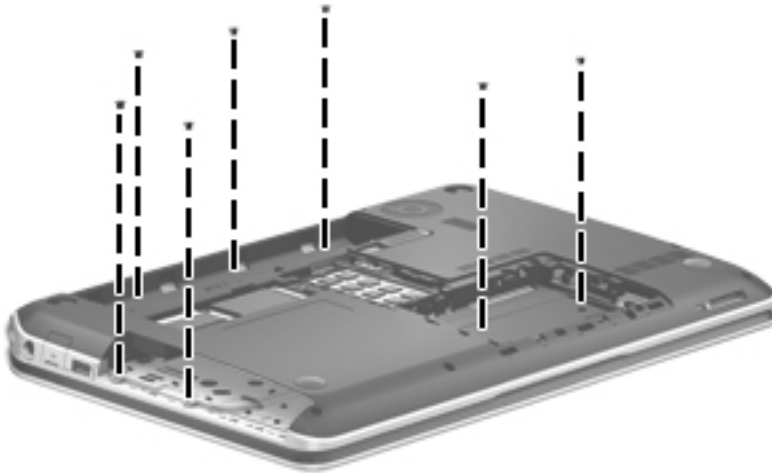
 **NOTE:** When replacing the top cover, be sure to remove the power button board and TouchPad button board from the defective top cover and install them on the replacement top cover. See [Power button board on page 48](#) and [TouchPad button board on page 50](#) for removal and replacement instructions for these components.

Remove the top cover:

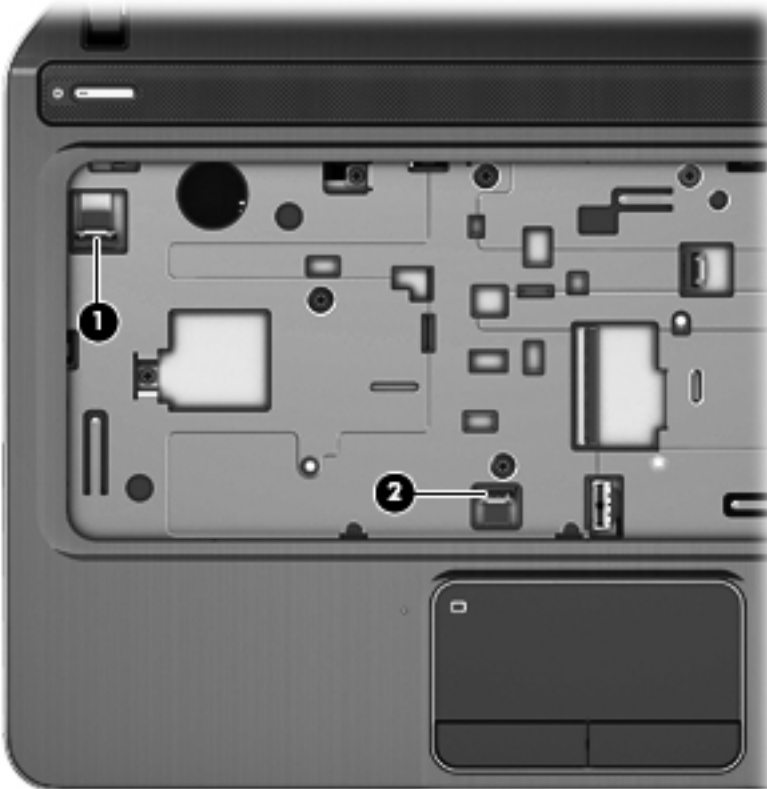
1. Remove the two rear rubber feet (1). The rubber feet are included in the Rubber Feet Kit, spare part number 689843-001.
2. Remove the eight Phillips M2.5×6.5 screws (2) that secure the top cover to the computer.



3. Remove the seven Phillips M2.0×3.5 screws that secure the top cover to the computer.

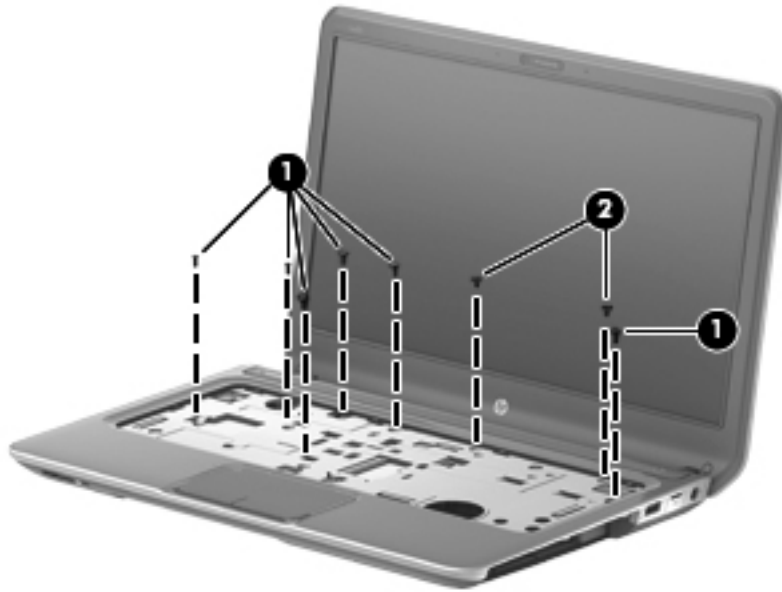


4. Turn the computer right side up, with the front toward you.
5. Open the computer.
6. Release the ZIF connector to which the power button board cable is connected, and then disconnect the power button board (1) cable from the system board.
7. Release the ZIF connector to which the TouchPad button board cable is connected, and then disconnect the TouchPad button board (2) cable from the system board.



8. Remove the six Phillips M2.5×6.5 screws (1) that secure the top cover to the computer.

9. Remove the two Phillips M2.0×3.5 screws (2) that secure the top cover to the computer.



10. Use a thin plastic tool to release the top cover. Insert the tool between the top cover and base enclosure and slide the tool as shown from the following points:
 - a. Between the VGA and HDMI connectors (1)
 - b. Under the TouchPad area (2)
 - c. Before the optical drive bay (3)
 - d. From the rear left and right edges (4)
 11. Lift the rear edge of the top cover (5).
- CAUTION:** Be careful not to damage the thin section of the base enclosure around the optical drive bay when releasing the top cover.

12. Remove the top cover (6).



Reverse this procedure to install the top cover.

Power button board

Description	Spare part number
Power button board (includes cable)	676651-001

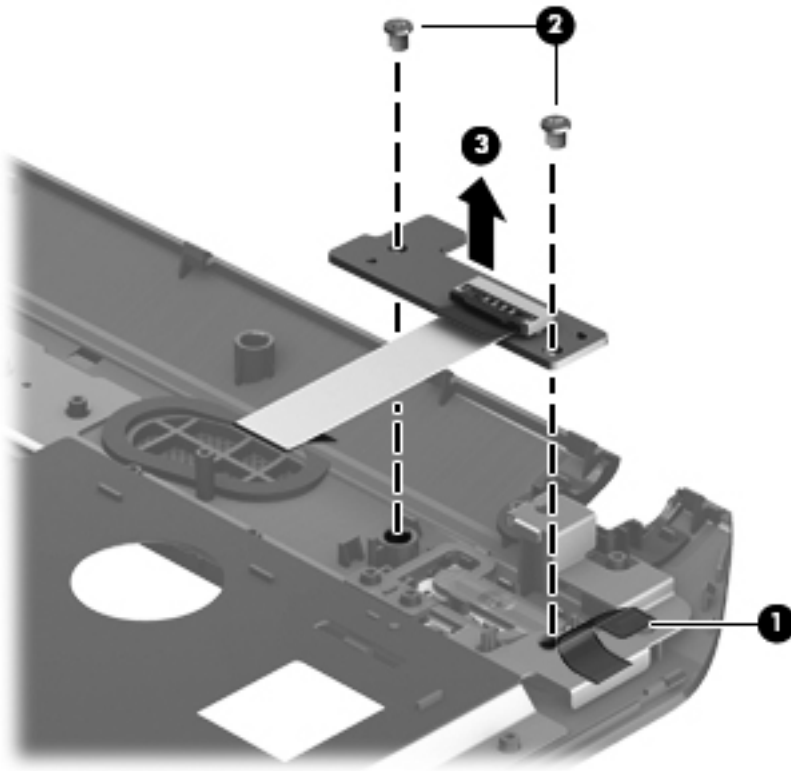
Before removing the power button board, follow these steps:

1. Shut down the computer.
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 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. Keyboard (see [Keyboard on page 42](#))
 - e. Top cover (see [Top cover on page 45](#))

Remove the power button board:

1. Turn the top cover upside down, with the front toward you.
2. Release the shield (1) that covers the power button board.
3. Remove the two Phillips M2.0×4.5 screws (2) that secure the power button board to the top cover.

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



Reverse this procedure to install the power button board.

TouchPad button board

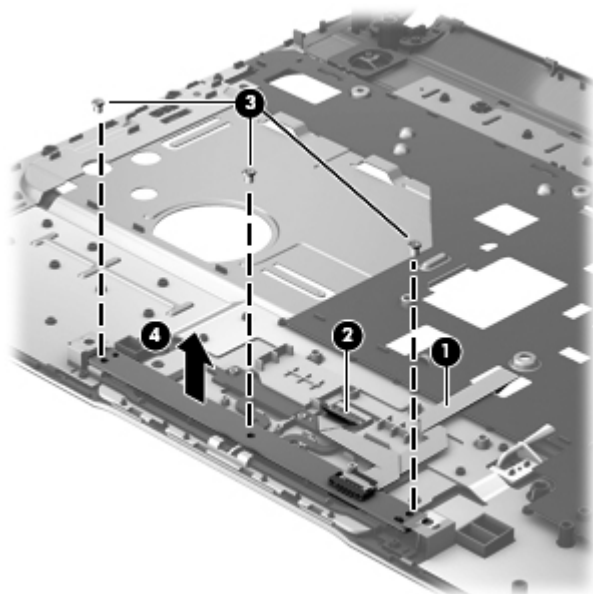
Description	Spare part number
TouchPad button board (includes cable)	682488-001

Before removing the TouchPad button board, follow these steps:

1. Shut down the computer.
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 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. Keyboard (see [Keyboard on page 42](#))
 - e. Top cover (see [Top cover on page 45](#))


Remove the TouchPad button board:

1. Turn the top cover upside down, with the front toward you.
2. Release the TouchPad button board cable (1) from the top cover. (The TouchPad button board cable is attached to the top cover by double-sided tape.)
3. Release the TouchPad ZIF connector to which the TouchPad button board cable is connected, and then disconnect the TouchPad button board cable (2) from the TouchPad board.
4. Remove the three Phillips M2.0×3.5 screws (3) that secure the TouchPad button board bracket to the top cover.
5. Remove the TouchPad button board (4).



Reverse this procedure to install the TouchPad button board.

Optical drive connector cable

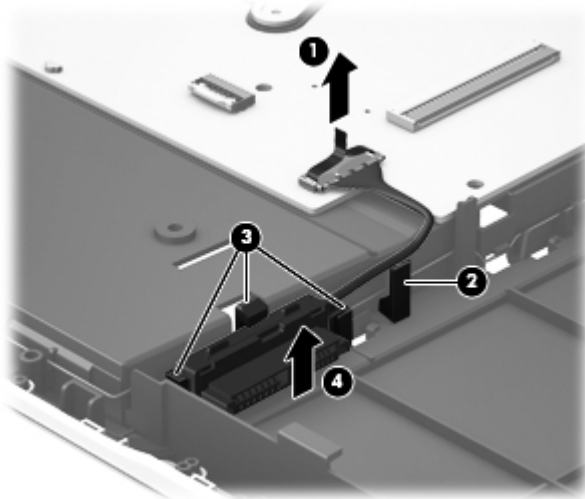
 **NOTE:** The optical drive connector cable is included in the Optical Drive Hardware Kit, spare part number 681227-001.

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

1. Shut down the computer.
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 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. Keyboard (see [Keyboard on page 42](#))
 - e. Top cover (see [Top cover on page 45](#))

Remove the optical drive connector cable:

1. Disconnect the optical drive connector cable **(1)** from the system board.
2. Release the optical drive connector cable from the clip **(2)** built into the base enclosure.
3. Release the clip **(3)** built into the base enclosure that secures the optical drive connector to the base enclosure.
4. Remove the optical drive connector cable **(4)**.



Reverse this procedure to install the optical drive connector cable.

System board



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

Description	Spare part number
System board (the system board spare part kit includes replacement thermal material)	694763-501

Before removing the system board, follow these steps:

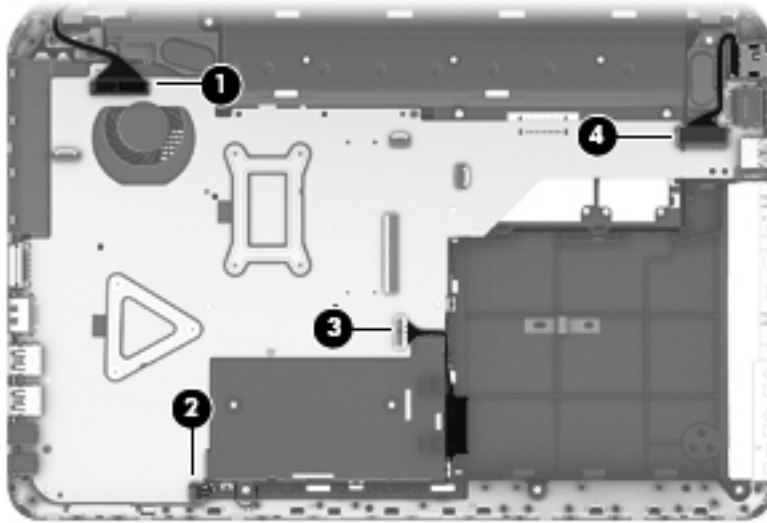
1. Shut down the computer.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. WLAN module (see [WLAN module on page 39](#))
 - e. Keyboard (see [Keyboard on page 42](#))
 - f. Top cover (see [Top cover on page 45](#))

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 37](#))
- RTC battery (see [RTC battery on page 41](#))
- Fan/heat sink assembly (see [Fan/heat sink assembly on page 55](#))
- Processor (see [Processor on page 58](#))

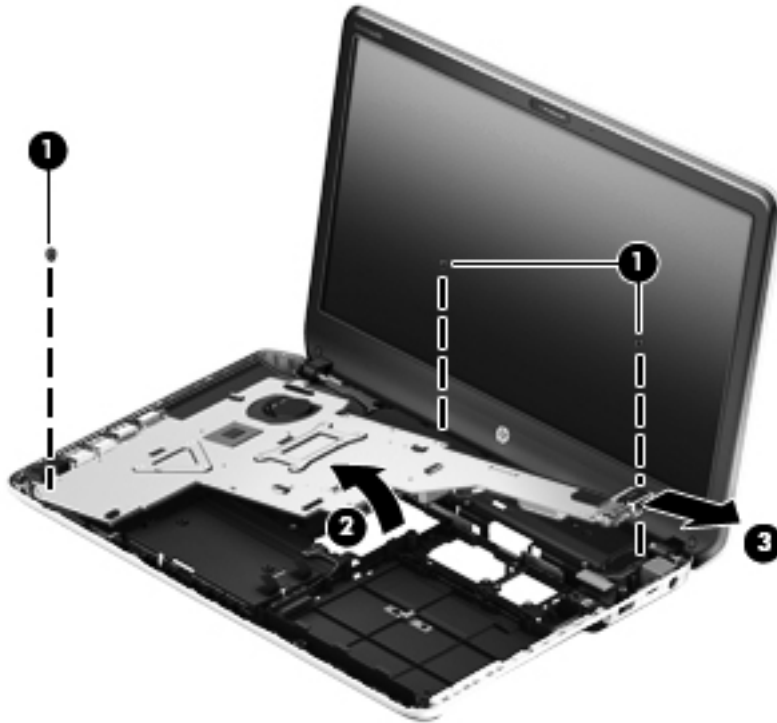
Remove the system board:

1. Disconnect the following cables from the system board:
 - (1) Display panel cable
 - (2) Speaker cable
 - (3) Optical drive connector cable
 - (4) Power connector cable




2. Remove the three Phillips M2.0×5.0 screws (1) that secure the system board to the base enclosure.
3. Lift the right side of the system board (2) until it rests at an angle.

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




Reverse this procedure to install the system board.

Fan/heat sink assembly

 **NOTE:** The fan/heat sink assembly spare part kit include replacement thermal material.

Description	Spare part number
Fan/heat sink assembly	681226-001

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


Before removing the fan/heat sink assembly, follow these steps:

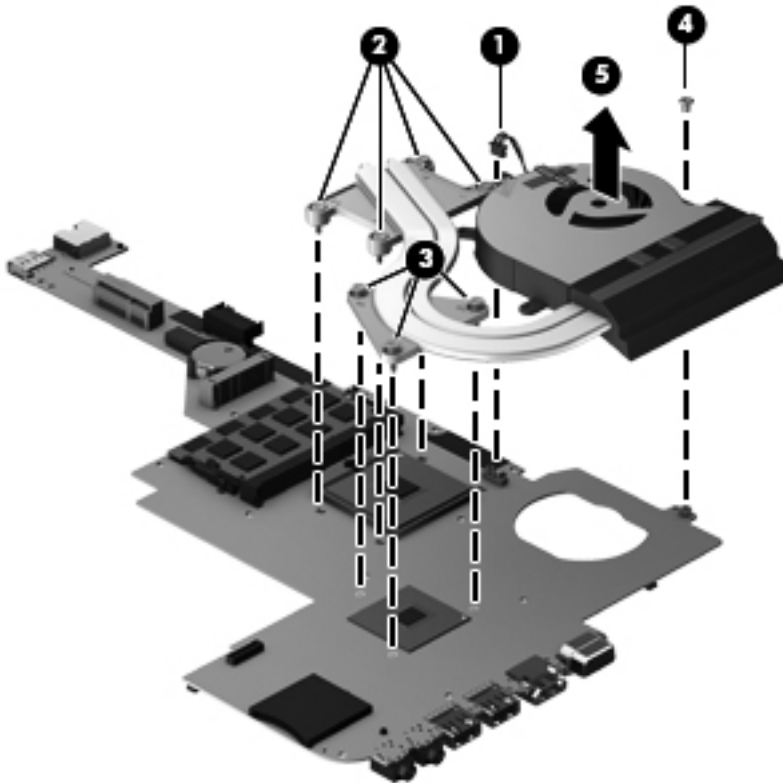
1. Shut down the computer.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. WLAN module (see [WLAN module on page 39](#))
 - e. Keyboard (see [Keyboard on page 42](#))
 - f. Top cover (see [Top cover on page 45](#))
 - g. System board (see [System board on page 52](#))


Remove the fan/heat sink assembly:

1. Turn the system board upside down, with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Following the 1, 2, 3, 4, 5, 6, 7 sequence stamped into the fan/heat sink assembly, loosen the four captive screws **(2)** and the three captive screws **(3)** that secure the fan/heat sink assembly to the system board.
4. Remove the Phillips M2.0×5.0 screw **(4)** that secures the fan/heat sink assembly to the system board.

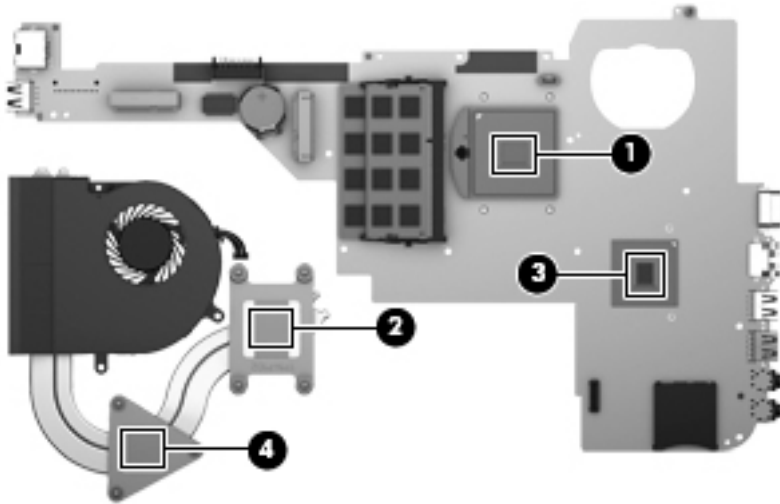
5. Remove the fan/heat sink assembly (5).

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



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

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



Reverse this procedure to install the fan/heat sink assembly.

Processor



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

Description	Spare part number
Intel Core i5-3210M 2.5 GHz processor (SC turbo up to 3.1 GHz, 1600 MHz/3.0 MB L3 cache, dual core, 35 W)	680645-001
Intel Core i3-3120M 2.5 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W)	700627-001
Intel Core i3-3110M 2.4 GHz processor (1600 MHz/3.0 MB L3 cache, dual core, 35 W)	682417-001
Intel Core i3-2370M 2.4 GHz processor (1333 MHz/3.0 MB L3 cache, dual core, 35 W)	677152-001


Before removing the processor, follow these steps:

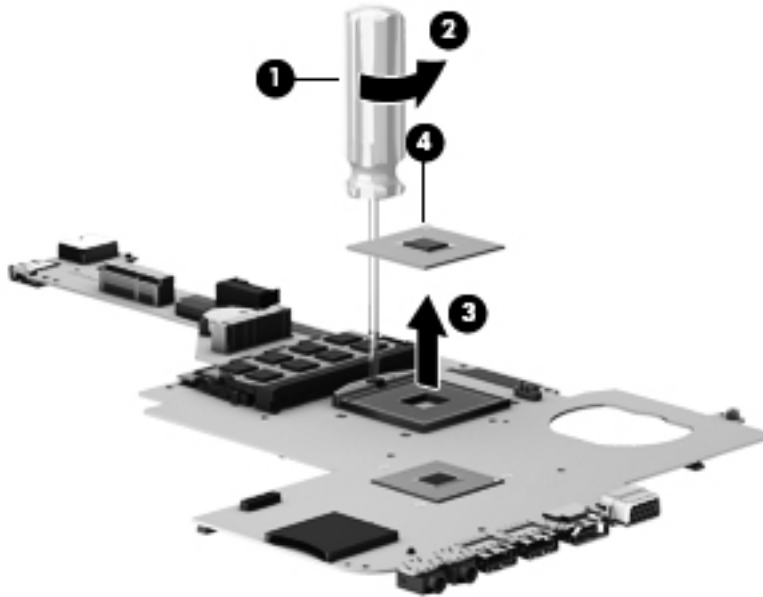
1. Shut down the computer.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. WLAN module (see [WLAN module on page 39](#))
 - e. Keyboard (see [Keyboard on page 42](#))
 - f. Top cover (see [Top cover on page 45](#))
 - g. System board (see [System board on page 52](#))
 - h. Fan/heat sink assembly (see [Fan/heat sink assembly on page 55](#))

Remove the processor:

1. Use a flat-bladed screw driver **(1)** to turn the processor locking screw one-half turn counterclockwise **(2)**, until you hear a click.

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

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



Reverse this procedure to install the processor.

Power connector cable

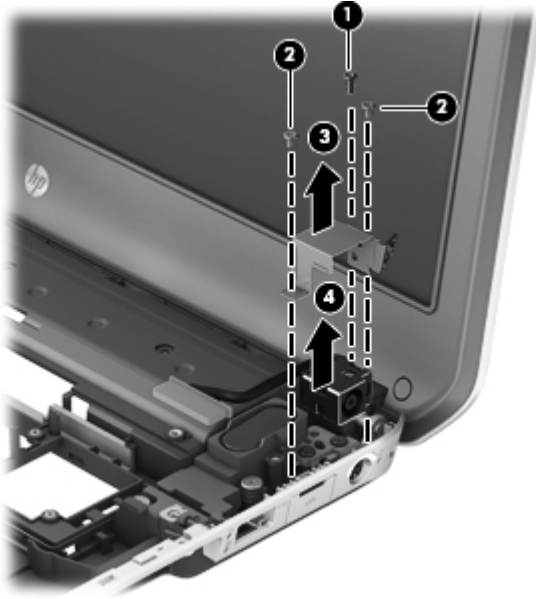
Description	Spare part number
Power connector cable (includes bracket)	676645-001

Before removing the power connector cable, follow these steps:

- Shut down the computer.
- Disconnect the power from the computer by unplugging the power cord from the computer.
- Disconnect all external devices from the computer.
- Remove the battery (see [Battery on page 30](#)), and then remove the following components:
 - Service door (see [Service door on page 32](#))
 - Hard drive (see [Hard drive on page 33](#))
 - Optical drive (see [Optical drive on page 36](#))
 - WLAN module (see [WLAN module on page 39](#))
 - Keyboard (see [Keyboard on page 42](#))
 - Top cover (see [Top cover on page 45](#))
 - System board (see [System board on page 52](#))

Remove the power connector cable:

1. Remove the Phillips M2.5×6.5 screw **(1)** and the two Phillips M2.0×5.0 screws **(2)** that secure the power connector bracket to the base enclosure.
2. Remove the power connector bracket **(3)**.
3. Release the power connector **(4)** from the clip built into the base enclosure.



4. Remove the power connector cable.

Reverse this procedure to install the power connector cable.

Speakers

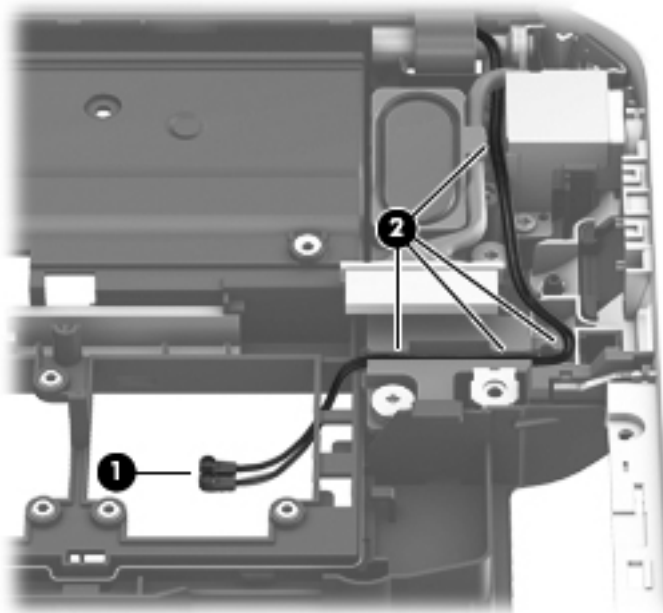
Description	Spare part number
Speakers (include subwoofer, speaker cable, and 4 rubber isolators)	676655-001

Before removing the speakers, follow these steps:

1. Shut down the computer.
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 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. WLAN module (see [WLAN module on page 39](#))
 - e. Keyboard (see [Keyboard on page 42](#))
 - f. Top cover (see [Top cover on page 45](#))
 - g. System board (see [System board on page 52](#))


Remove the speakers:

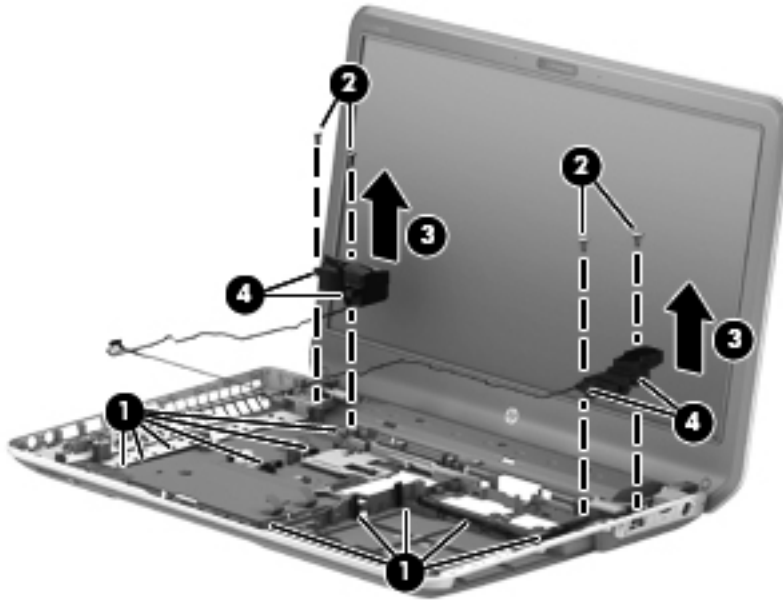
1. Release the wireless antenna cables (1) from the clip (2) built into the right speaker.



2. Release the speaker cables (1) from the clips and routing channel built into the base enclosure.
3. Remove the four Phillips M3.0×7.0 screws (2) that secure the speakers to the base enclosure.


4. Remove the speakers (3).

 **NOTE:** The speakers include four rubber isolators that are installed in the screw holes (4). These isolators are crucial to the performance of the speakers.



Reverse this procedure to install the speakers.

Display assembly

 **NOTE:** The display assembly is spared at the subcomponent level only.

Description	Spare part number
35.6 cm (14.0 in), LED, HD, BrightView display panel (includes 2 rubber screw covers)	676653-001
Antenna Kit (includes left and right wireless antenna cables and transceivers and 2 rubber screw covers)	676640-001
Display bezel (includes 2 rubber screw covers)	700547-001
Display enclosure (includes 2 rubber screw covers):	
In black licorice finish	676641-001
In carmine red finish	678260-001
Display Hinge Kit (includes left and right hinges and 2 rubber screw covers)	676648-001
Display panel cable (includes webcam/microphone module cable and 2 rubber screw covers)	676646-001
Webcamera/microphone module (includes 2 rubber screw covers)	676659-001

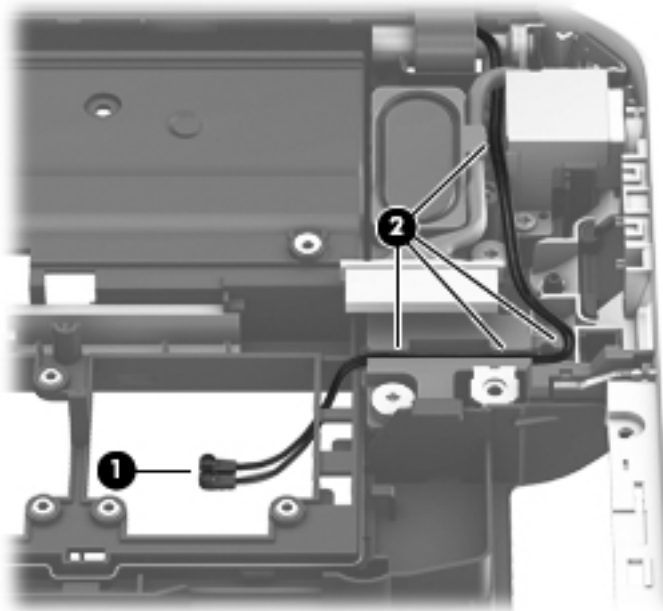
Before removing the display assembly, follow these steps:

1. Shut down the computer.
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 30](#)), and then remove the following components:
 - a. Service door (see [Service door on page 32](#))
 - b. Hard drive (see [Hard drive on page 33](#))
 - c. Optical drive (see [Optical drive on page 36](#))
 - d. WLAN module (see [WLAN module on page 39](#))
 - e. Keyboard (see [Keyboard on page 42](#))
 - f. Top cover (see [Top cover on page 45](#))
 - g. System board (see [System board on page 52](#))
 - h. Power connector cable (see [Power connector cable on page 59](#))

Remove the display assembly:

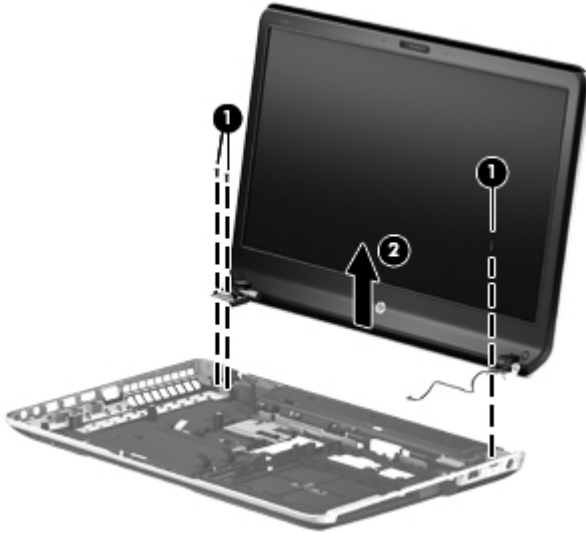
1. Release the wireless antenna cables (1) from the clips (2) built into the right speaker.



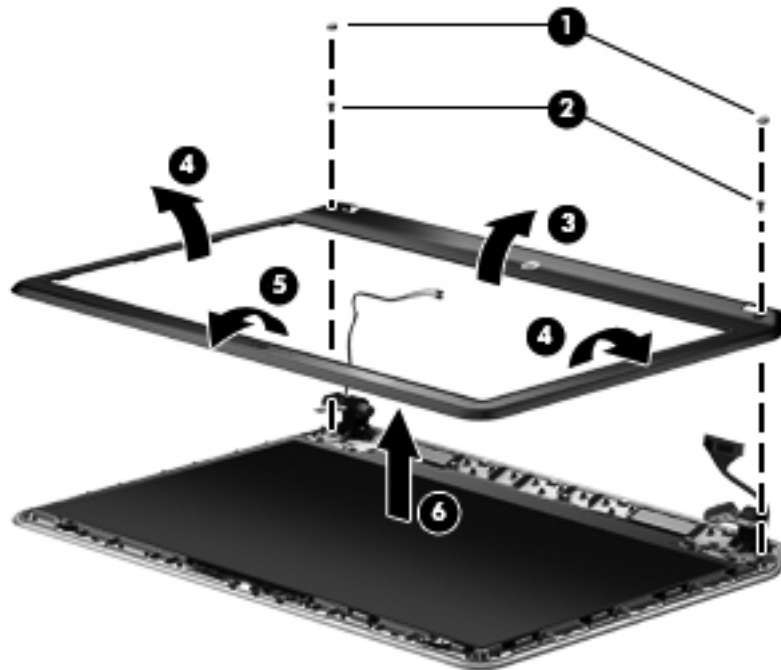
⚠ CAUTION: Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

2. Remove the three Phillips M2.5×6.5 screws (1) that secure the display assembly to the base enclosure.

3. Remove the display assembly (2).

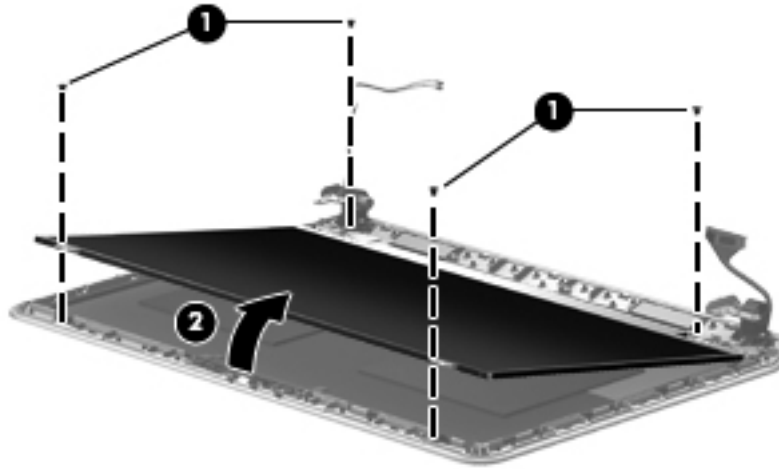


4. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
 - a. Remove the two display bezel screw covers (1) and the two Phillips M2.5×5.0 screws (2) that secure the display bezel to the display assembly.
 - b. Flex the inside edges of the bottom edge (3), the left and right sides (4), and the top edge (5) of the display bezel until the bezel disengages from the display enclosure.
 - c. Remove the display bezel (6).

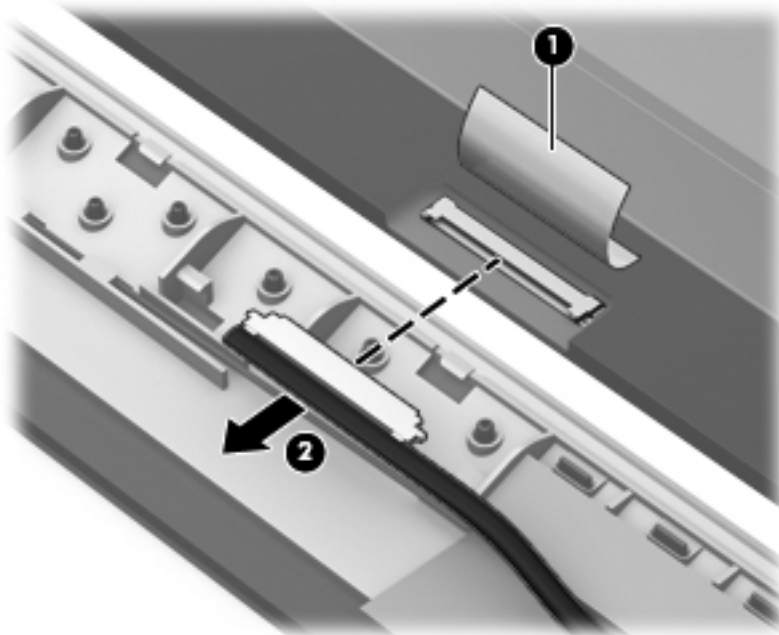


CAUTION: Be sure the work surface is clear of all tools, screws, and computer components before turning the display panel upside down on the work surface.

5. If it is necessary to replace the display panel:
- Remove the four Phillips M2.0×3.5 screws (1) that secure the display panel to the display enclosure.
 - Lift the top edge of the display panel (2) and turn the display panel upside down.

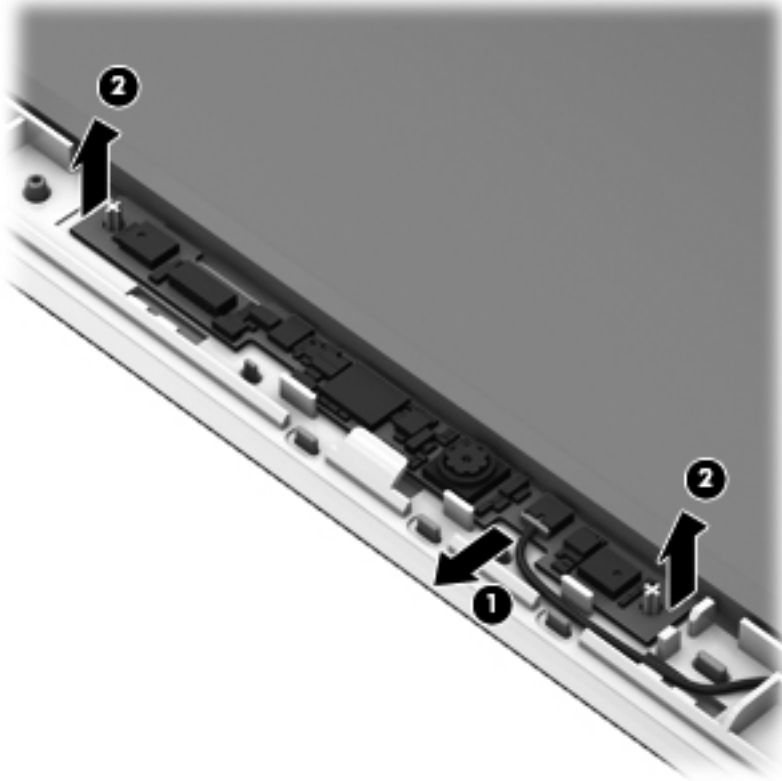


- Release the adhesive support strip (1) that secures the display panel cable connector to the display panel.
- Disconnect the display panel cable (2) from the display panel.



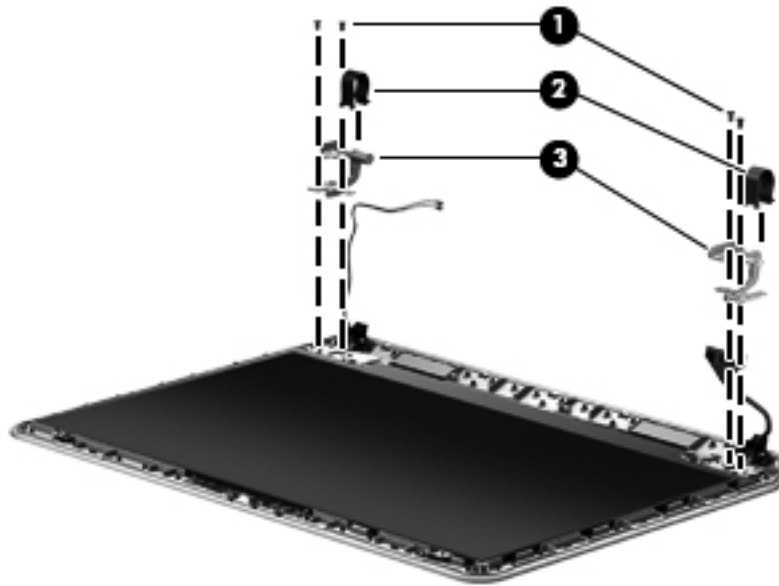
- Remove the display panel from the display enclosure.
6. If it is necessary to replace the webcam/microphone module:
- Disconnect the webcam/microphone module cable (1) from the webcam/microphone module. (The webcam/microphone module cable is part of the display panel cable.)

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

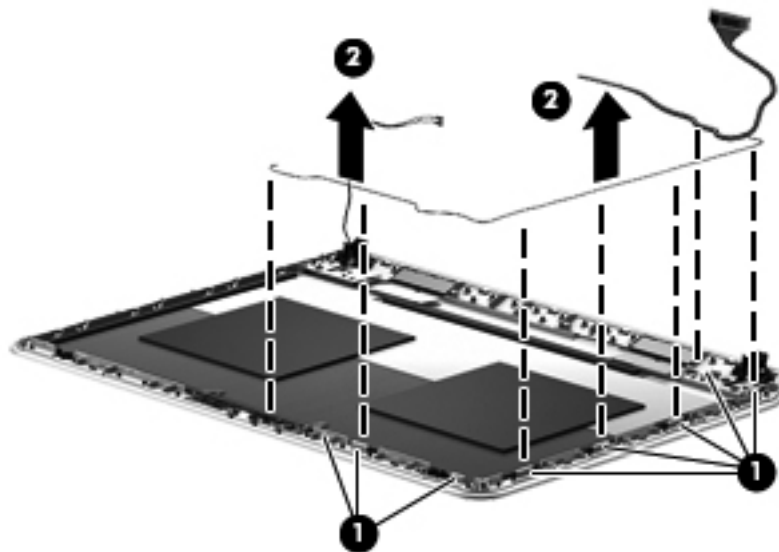


- c. Remove the webcam/microphone module from the display enclosure.
7. If it is necessary to replace the hinges:
- a. Remove the four Phillips M2.5×4.0 screws (1) that secure the hinges to the display enclosure.
 - b. Remove the display hinge covers (2).

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

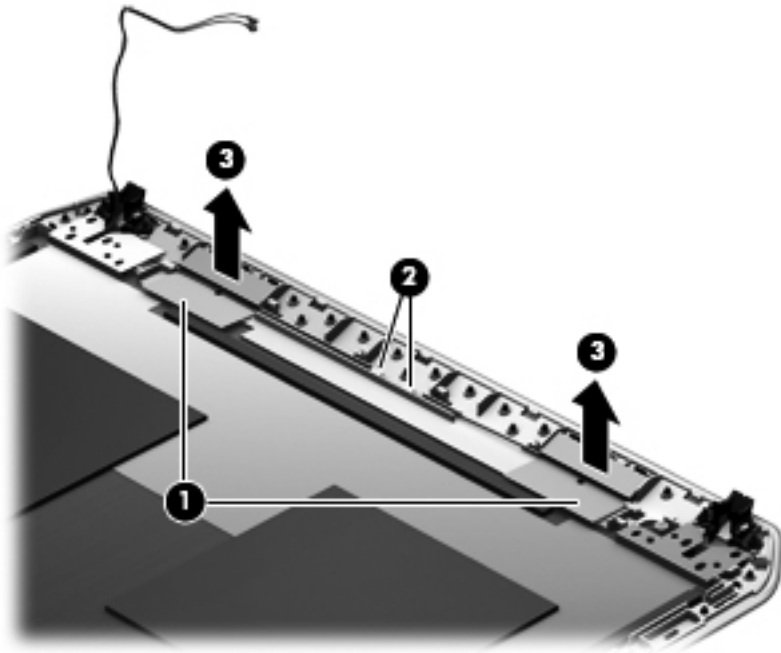


8. If it is necessary to replace the display panel cable:
- Release the display panel cable from the clips (1) and routing channel built into the display enclosure.
 - Remove the display panel cable (2).



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

- c. Remove the wireless antenna cables and transceivers (3).



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

- b. Follow the on-screen instructions to download your selection to the hard drive.

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	34.4 cm	13.54 in
Depth	23.4 cm	9.21 in
Height (front to back)	2.93 to 3.35 cm	1.15 to 1.32 in
Weight		
	2.17 kg	4.79 lb
Input power		
Operating voltage and current	19 V @ 4.74 A or 19.5 V @ 4.62 A – 90 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

35.6 cm (14.0 in) display specifications

	Metric	U.S.
Dimensions		
Height	17.6 cm	6.93 in
Width	31.2 cm	12.28 in
Diagonal	35.7 cm	14.06 in
Number of colors	Up to 16.8 million	
Contrast ratio	200:1 (typical)	
Brightness	200 cd/m ² (nits), typical	

	Metric	U.S.
Pixel resolution		
Pitch	0.197 × 0.197 mm	
Format	1366×768	
Configuration	RGB vertical stripe	
Backlight	LED	
Character display	80 × 25	
Total power consumption	2.0 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

Hard drive specifications

	1 TB*	750 GB**	500 GB**
Dimensions			
Height	9.5 mm	9.5 mm	9.5 mm
Length	100.2 mm	100.2 mm	100.4 mm
Width	69.9 mm	69.9 mm	69.9 mm
Weight	152 g	110 g	110 g
Interface type	SATA	SATA	SATA
Transfer rate			
Synchronous (maximum)	97 MB/sec	97 MB/sec	97 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	2.0 ms	2.0 ms	1.5 ms
Average (read/write)	12/16 ms	12/16 ms	11/13 ms
Maximum	21 ms	22 ms	22 ms
Logical blocks	1,953,525,168	1,465,149,168	976,773,168
Disk rotational speed	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.

DVD±RW SuperMulti Double-Layer Combination Drive specifications


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

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 76](#).

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 79](#).

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 78](#).
- 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 78](#).

- 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 79](#).


- 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 79](#).
- 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 79](#).
- 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 80](#).

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 80](#).

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 76](#).

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 or regions must meet the requirements of the country and region where the computer is used.

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	ISI	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1

Country/region	Accredited agency	Applicable note number
The United States	UL	2
<ol style="list-style-type: none"> 1. The flexible cord must be Type HO5VV-F, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used. 2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element. 3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration. 4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark. 5. The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label. 6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark. 7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks. 		

9 Recycling

When a 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 website at www.hp.com/recycle.

Index

A

- AC adapter 7
- AC adapter, spare part numbers 21, 22
- action keys
 - identifying 12
- antenna
 - locations 8
 - removal 67
 - spare part number 19, 22, 62
- Antenna Kit, spare part number 19, 22, 62
- audio, product description 2
- audio-in (microphone) jack 7
- audio-out (headphone) jack 7

B

- b key 12
- back up
 - personal files 76
- backups 75
- base enclosure, spare part number 17, 23
- battery
 - removal 30
 - spare part number 17, 22, 30
- battery bay 13
- battery release latch 13
- BIOS
 - determining version 69
 - downloading an update 70
 - updating 69
- boot order
 - changing HP Recovery Manager 80
- bottom components 13
- buttons
 - optical drive eject 6
 - power 11
 - TouchPad 9
 - TouchPad on/off 9

C

- cables, service considerations 24
- caps lock light, identifying 10

- chipset, product description 1
- components
 - bottom 13
 - display 8
 - front 5
 - left side 7
 - right side 6
 - top 9
- computer feet
 - locations 30
 - spare part number 30
- computer major components 16
- computer reset 78
- computer specifications 72
- connector, power 6
- connectors, service considerations 24

D

- deleted files
 - restoring 77
- Digital Media Slot, identifying 5
- display
 - components 8
 - specifications 72
- display assembly
 - removal 62
 - spare part numbers 62
 - subcomponents 18
- display bezel
 - removal 64
 - spare part number 19, 23, 62
- display enclosure, spare part numbers 19, 22, 62
- display hinge
 - removal 66
 - spare part number 19, 22, 62
- Display Hinge Kit, spare part number 19, 22, 62
- display panel
 - product description 1
 - removal 65
 - spare part number 19, 22, 62

- display panel cable
 - removal 67
 - spare part number 19, 22, 62
- drives, preventing damage 25
- DVD±RW and CD-RW SuperMulti Double-Layer Combination Drive
 - specifications 74
- DVD±RW Double-Layer SuperMulti Drive
 - precautions 25
 - removal 36
 - spare part number 17, 21, 22, 36

E

- electrostatic discharge 25
- equipment guidelines 28
- esc key, identifying 12
- Ethernet, product description 2
- external monitor port 7

F

- fan/heat sink assembly
 - removal 55
 - spare part numbers 17, 22, 55
- feet
 - locations 30
 - spare part number 30
- fn key, identifying 12

G

- graphics, product description 1
- grounding guidelines 25
- guidelines
 - equipment 28
 - grounding 25
 - packaging 27
 - transporting 27
 - workstation 27

H

- hard drive
 - precautions 25
 - product description 2

- removal 33
- spare part numbers 17, 20, 21, 22, 33
- hard drive bay 14
- hard drive connector cable
 - illustrated 21
 - removal 35
- Hard Drive Hardware Kit
 - contents 20
 - spare part number 17, 20, 22, 33
- hard drive light 6
- hard drive rubber bracket
 - illustrated 21
 - removal 35
- HDMI port, identifying 7
- HP Recovery Manager 79
 - correcting boot problems 80
 - starting 79
- HP Recovery media
 - creating 76
 - recovery 80
- HP Recovery partition 79
 - recovery 79
 - removing 80

I

- internal media card, product description 2

J

- jacks
 - audio-in (microphone) 7
 - audio-out (headphone) 7
 - network 6
 - RJ-45 (network) 6

K

- keyboard
 - product description 3
 - removal 42
 - spare part numbers 17, 23, 42
- keys
 - action 12
 - b 12
 - esc 12
 - fn 12
 - Windows 12
 - Windows applications 12

L

- lights
 - AC adapter 7
 - caps lock 10
 - hard drive 6
 - mute 10
 - optical drive 6
 - power 6, 10
 - TouchPad 9, 10
 - webcam 8
 - wireless 10

M

- mass storage device
 - precautions 25
 - removal 33
 - spare part numbers 33
- mass storage devices 20
- memory module
 - product description 1
 - removal 37
 - spare part numbers 17, 21, 37
- memory module compartment 14
- microphone
 - location 8
 - product description 2
- minimized image
 - creating 79
- minimized image recovery 79
- model description 29
 - location 15
- model name 1
- mute light, identifying 10

N

- network jack, identifying 6

O

- operating system, product description 3
- optical drive
 - precautions 25
 - product description 2
 - removal 36
 - spare part numbers 17, 21, 22, 36
 - specifications 74
- optical drive bezel
 - illustrated 21
 - removal 36

- optical drive bracket
 - illustrated 21
 - removal 37
- optical drive connector cable
 - illustrated 21
 - removal 51
 - spare part number 17, 51
- optical drive eject button, identifying 6
- Optical Drive Hardware Kit
 - contents 21
 - spare part number 17, 21, 22, 36
- optical drive light, identifying 6
- optical drive, identifying 6
- original system recovery 79

P

- packaging guidelines 27
- part number 29
 - location 15
- plastic parts, service considerations 24
- Plastics Kit 32
 - spare part number 18, 22, 32, 39
- pointing device, product description 3
- ports
 - external monitor 7
 - HDMI 7
 - product description 3
 - USB 2.0 6
 - USB 3.0 7
- power button board
 - removal 48
 - spare part number 17, 22, 48
- power button, identifying 11
- power connector cable
 - removal 59
 - spare part number 17, 22, 59
- power connector, identifying 6
- power cord
 - requirements for all countries 81
 - requirements for specific countries and regions 82
 - set requirements 81
 - spare part numbers 21
- power lights, identifying 6, 10

- power requirements, product description 3
- power settings 11
- processor
 - product description 1
 - removal 58
 - spare part numbers 17, 22, 23, 58
- product description
 - audio 2
 - chipset 1
 - display panel 1
 - Ethernet 2
 - external media cards 2
 - graphics 1
 - hard drive 2
 - internal media card 2
 - keyboard 3
 - memory module 1
 - microphone 2
 - operating system 3
 - optical drive 2
 - pointing device 3
 - ports 3
 - power requirements 3
 - processors 1
 - product name 1
 - security 3
 - serviceability 3
 - video 2
 - wireless 2
- product name 1, 29
 - location 15
- product number 29
 - location 15
- R**
- recovery 77, 78
 - discs 76, 80
 - HP Recovery Manager 79
 - media 80
 - starting 79
 - supported discs 76
 - system 79
 - USB flash drive 80
 - using HP Recovery media 76
- recovery media
 - creating 76
 - creating using HP Recovery Manager 76
- recovery partition 79
 - removing 80
- recycle
 - computer 77, 78
- recycling 84
- refresh 78
 - computer 77
- removal/replacement
 - preliminaries 24
 - procedures 28
- remove everything and reinstall Windows 78
- reset
 - computer 77, 78
 - steps 78
- restore
 - Windows File History 77
- RJ-45 (network) jack, identifying 6
- RTC battery
 - removal 41
 - spare part number 18, 22, 41
- Rubber Feet Kit, spare part number 17, 22, 30
- S**
- Screw Kit, spare part number 21, 22
- security cable slot, identifying 7
- security, product description 3
- serial number 29
 - location 15
- service considerations
 - cables 24
 - connectors 24
 - plastic parts 24
- service door
 - removal 32
 - spare part number 22, 32
- service tag 15, 29
- serviceability, product description 3
- slots
 - Digital Media 5
 - security cable 7
- speakers
 - removal 61
 - spare part number 17, 22, 61
- specifications
 - computer 72
 - display 72
 - DVD±RW and CD-RW SuperMulti Double-Layer Combination Drive 74
 - optical drive 74
 - subwoofer, location 13
 - supported discs
 - recovery 76
 - system board
 - removal 52
 - spare part numbers 17, 23, 52
 - system recovery 79
 - system restore point
 - creating 75
 - restoring 77
- T**
- tools required 24
- top cover
 - removal 45
 - spare part numbers 17, 23, 45
- TouchPad button 9
- TouchPad button board
 - removal 50
 - spare part number 17, 22, 50
- TouchPad light 9, 10
- TouchPad on/off button 9
- TouchPad zone 9
- transporting guidelines 27
- U**
- USB 3.0 ports, identifying 7
- USB ports, identifying 6
- user guides
 - accessing 8
- V**
- vents, identifying 7, 13
- video, product description 2
- W**
- warranty period 29
 - location 15
- webcam 8
- webcam light 8
- webcamera/microphone module
 - removal 65
 - spare part number 19, 22, 62
- Windows
 - backup 76
 - File History 76, 77

- Refresh 77, 78
- reinstall 77, 78
- remove everything and reinstall
 - option 78
- reset 78
- restoring files 77
- system restore point 75, 77
- Windows applications key,
 - identifying 12
- Windows key, identifying 12
- wireless antenna
 - locations 8
 - removal 67
 - spare part number 19, 22, 62
- wireless light 10
- wireless module compartment 14
- wireless module compartment
 - cover
 - removal 39
 - spare part number 22, 39
- wireless regulatory notices 8
- wireless, product description 2
- WLAN module
 - removal 39
 - spare part numbers 18, 21, 39
- workstation guidelines 27