



## HP Spectre Ultrabook PC

Maintenance and Service Guide

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## Safety warning notice

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

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# 1 Product description

Category	Description
<b>Product Name</b>	HP Spectre Ultrabook PC
<b>Processors</b>	<ul style="list-style-type: none"><li>Intel® Core® i7-3517U 1.9-GHz processor (4.0-MB L3 cache, 17 W)</li><li>Intel Core i5-3317U 1.7-GHz processor (4.0-MB L3 cache, 17 W)</li></ul> Processor is soldered to the system board
<b>Chipset</b>	Intel HM76 Express chipset Intel HM65 Express chipset
<b>Graphics</b>	<b>Internal graphics:</b> <ul style="list-style-type: none"><li>Universal memory architecture (UMA) with shared video memory</li><li>Intel HD Graphics 4000 on computer models equipped with the Intel HM76 Express chipset (supports HD decode, DX11, and HDMI)</li><li>Intel HD Graphics 3000 on computer models equipped with the Intel HM65 Express chipset (supports HD decode, DX10, and HDMI)</li></ul>
<b>Panel</b>	14.0-in, slim light-emitting diode (LED), WVA, HD+, AntiGlare (1600×900) display; typical brightness: 250 nits  All display assemblies include 2 wireless local area network (WLAN) antenna cables  Supports low voltage differential signalling (LVDS), LCD interface, flush glass panel cover support  Lighted logo on top bezel
<b>Memory</b>	One customer-accessible/upgradable memory module slot  DDR3-1333-MHz single channel support (DDR3-1333 and DDR3-1666 downgrade to DDR3-800/1066)  Supports 8-GB (8192×1) or 4-GB (4096×1) of system RAM
<b>Solid-state drives</b>	Customer-accessible  Supports 256-GB (128-GB×2) or 128-GB (128-GB×1)
<b>Audio and video</b>	Beats Signature audio profile applied to both the headphones and external speakers  Supports wireless Beats audio via SMSC (not supported in Europe or Turkey)

Category	Description
	High-performance ENVY-branded speakers mounted in bass reflex enclosures
<b>Audio and video</b> <i>(continued)</i>	Separate amplifiers for headphone
	HP TrueVision HD webcam (fixed, no tilt with activity LED; 3-element lens with fixed focus (50-cm), F/2.0, 1280×720 by 24 frames per second)
	Two omnidirectional, dual array, digital microphones with appropriate beam-forming, echo-cancellation, noise-reduction software
<b>Ethernet</b>	Integrated 10/100/1000
<b>Wireless</b>	Integrated wireless local area network (WLAN) options by way of wireless module
	Two WLAN antennas built into display assembly
	Support for the Intel Centrino Advanced-N 6235 WLAN module and Intel Centrino Advanced-N 6230 WLAN module
	Support for NFC wireless data communication
<b>External media cards</b>	2-in-1 Digital Media Slot with push-push technology, supporting: <ul style="list-style-type: none"> <li>• MultiMediaCard</li> <li>• Secure Digital (SD) Memory Card</li> <li>• Secure Digital High Capacity Memory Card</li> </ul> Supports mini versions by use of an adapter (adapter is not included).
<b>Ports</b>	<ul style="list-style-type: none"> <li>• AC power</li> <li>• Combination audio-out (stereo headphone)/audio-in (mono microphone)</li> <li>• HDMI 1.4a output supporting stereoscopic 3D</li> <li>• mini DisplayPort supporting 2560×1600 resolution</li> <li>• RJ-45 (Ethernet Gigabit support with LED indicators)</li> <li>• USB 3.0 (1 port), USB 2.0 (1 port)</li> </ul> <p><b>NOTE:</b> All USB ports support USB sleep and charge.</p>
<b>Keyboard/pointing devices</b>	Full-size (14.0-in.), Island-style, no numeric keypad
	Radiance backlight (f5 to toggle backlight on/off)
	Clickpad with imaging sensor, multi-touch gestures enabled
	Taps enabled by default
<b>Power requirements</b>	65-W non-PFC (non-BFR/PV Free) HP Smart travel AC adapter with localized cable plug support (3-wire plug with ground pin, supports 3-pin DC connector)
	Supports 4-cell, 58-Wh, 4.1-Ah, Li-ion battery (battery is not user-removable)
<b>Security</b>	Supports security cable lock
	Supports Intel AT-p ready

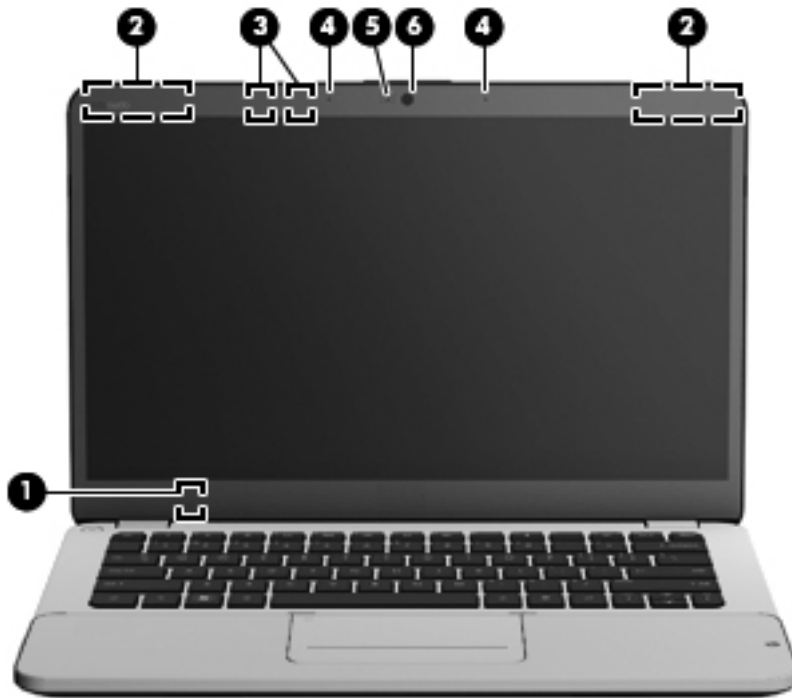
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<b>Category</b>	<b>Description</b>
<b>Operating system</b>	<b>Preinstalled:</b> <ul style="list-style-type: none"><li>• Windows® 8 Professional</li><li>• Windows 8 Standard</li></ul>
<b>Serviceability</b>	<b>End-user replaceable part:</b> AC adapter

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## 2 External component identification

### Display



Item	Component	Description
(1)	Internal display switch	Turns off the display and initiates Sleep if the display is closed while the power is on. <b>NOTE:</b> The internal display switch is not visible from the outside of the computer.
(2)	WLAN antennas (2)*	Send and receive wireless signals.
(3)	Proximity sensors (2)*	Detect your presence in front of the computer and turn on the radiance backlight keyboard feature.
(4)	Internal microphones (2)	Record audio, automatically reducing ambient noise and providing echo cancellation.
(5)	Webcam light	On: The webcam is active.

Item	Component	Description
(6)	HP TrueVision HD webcam	Records video and captures still photographs.  To access the webcam, select <b>Start &gt; All Programs &gt; CyberLink &gt; CyberLink YouCam</b> .

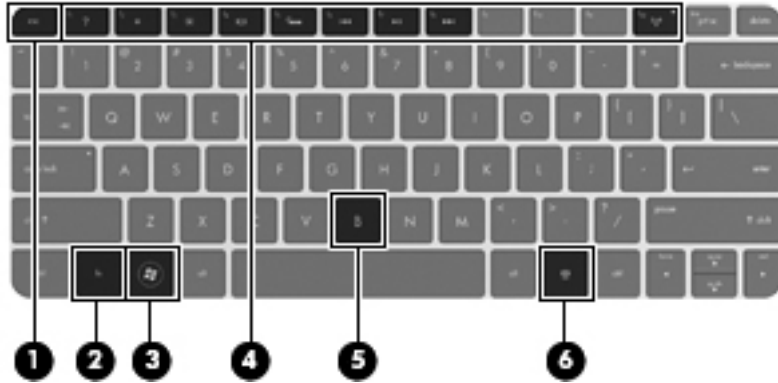
\*The antennas and proximity sensors are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas and proximity sensors free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental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

# Button



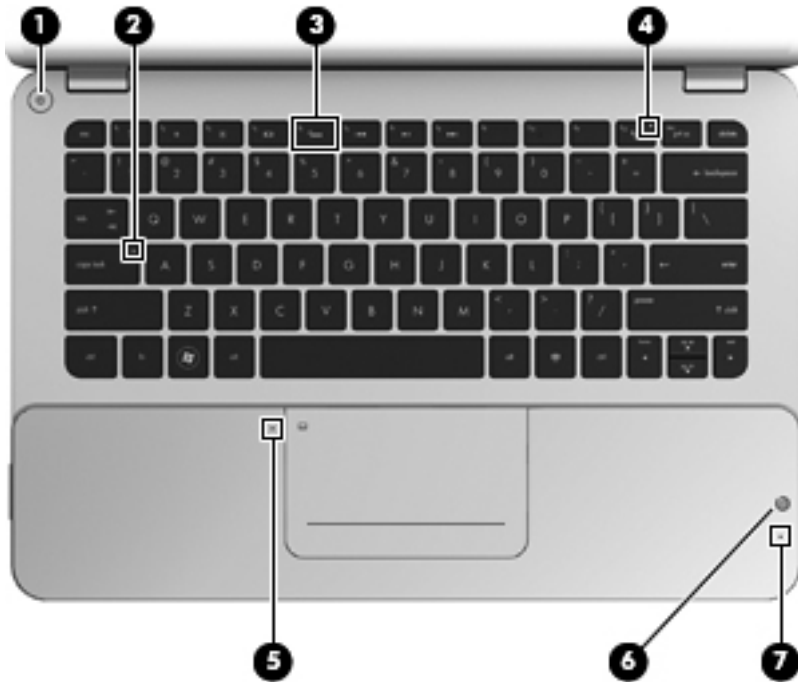
Component	Description
Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button to turn on the computer.</li><li>• When the computer is on, press the button briefly to initiate Sleep.</li><li>• When the computer is in the Sleep state, press the button briefly to exit Sleep.</li><li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li></ul> <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, simultaneously press and hold the power button and the mute button on the right side of the computer for at least 5 seconds to turn off the computer.</p> <p>To learn more about power settings, follow these steps:</p> <ol style="list-style-type: none"><li>1. From the Start screen, type <code>p</code>.</li><li>2. In the search box, type <code>power</code>.</li><li>3. Select <b>Settings</b>, and then select <b>Power options</b>.</li></ol>

# Keys



Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the <b>fn</b> key.
(2)	fn key	Executes the following functions: <ul style="list-style-type: none"><li>• When the key is pressed in combination with the <b>esc</b> key, system information is displayed.</li><li>• When the key is pressed in combination with the <b>b</b> key, Beats Audio is enabled or disabled.</li></ul>
(3)	Windows logo key	Displays the Windows Start menu.
(4)	Action keys	Execute frequently used system functions.
(5)	b key	Enables or disables Beats Audio when pressed in combination with the <b>fn</b> key.
(6)	Windows applications key	Displays a shortcut menu for items beneath the pointer.

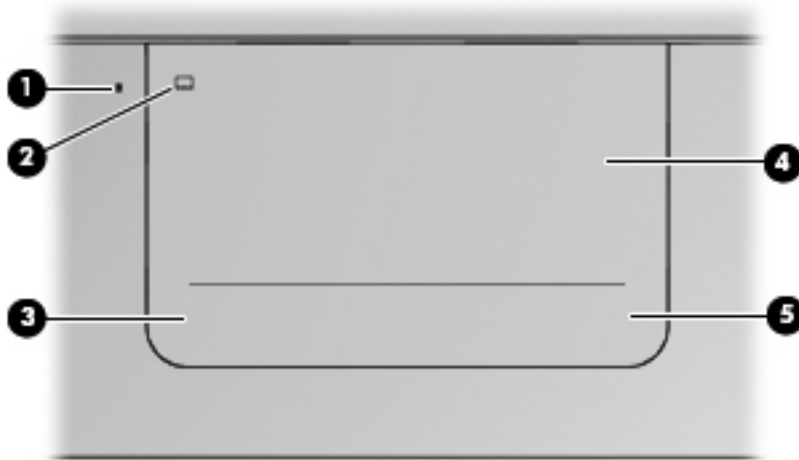
# Lights



Item	Component	Description
(1)	Power light	<ul style="list-style-type: none"> <li>• White: The computer is on.</li> <li>• Blinking white: The computer is in the Sleep state.</li> <li>• Off: The computer is off or in Hibernation.</li> </ul>
(2)	Caps lock light	<ul style="list-style-type: none"> <li>• White: Caps lock is on.</li> <li>• Off: Caps lock is off.</li> </ul>
(3)	Keyboard backlight light	<p>White: Identifies the keyboard backlight action key.</p> <p>Press the key to turn the keyboard backlight on or off.</p>
(4)	Wireless light	<ul style="list-style-type: none"> <li>• White: An integrated wireless device, such as a WLAN device, is enabled.</li> </ul> <p><b>NOTE:</b> Wireless devices are enabled at the factory.</p> <ul style="list-style-type: none"> <li>• Amber: All wireless devices are disabled.</li> </ul>
(5)	Imagepad light	<ul style="list-style-type: none"> <li>• Amber: The Imagepad is off.</li> <li>• Off: The Imagepad is on.</li> </ul>
(6)	Beats Audio light	<ul style="list-style-type: none"> <li>• Red: Beats Audio is enabled.</li> <li>• Off: Beats Audio is disabled.</li> </ul>
(7)	Mute light	<ul style="list-style-type: none"> <li>• Amber: Speaker sound is off.</li> <li>• Off: Speaker sound is on.</li> </ul>



# Imagepad



Item	Component	Description
(1)	Imagepad light	<ul style="list-style-type: none"><li>• Amber: The Imagepad is off.</li><li>• On: The Imagepad is on.</li></ul>
(2)	Imagepad on/off button	Quickly double-tap this button to turn the Imagepad off or on.
(3)	Left Imagepad button	The bottom left corner of the Imagepad functions like the left button on an external mouse.
(4)	Imagepad zone	Moves the pointer and selects or activates items on the screen.
(5)	Right Imagepad button	The bottom right corner of the Imagepad functions like the right button on an external mouse.

## Left side



Item	Component	Description
(1)	DisplayPort	Connects an optional digital display device, such as a high-performance monitor or projector.
(2)	HDMI port	Connects an optional video or audio device, such as a highdefinition television, any compatible digital or audio component, or a high-speed HDMI 1.4 device.
(3)	RJ-45 (network) jack	Connects a network cable.
(4)	USB 3.0 charging port	Connects an optional USB 1.0, USB 2.0, or USB 3.0 device and provides enhanced USB power performance. The USB 3.0 charging port can also charge select models of cell phones and MP3 players, even when the computer is off.
(5)	USB 2.0 charging port	Connects an optional USB 1.0 or USB 2.0 device. The USB 2.0 charging port can also charge select models of cell phones and MP3 players, even when the computer is off.

**NOTE:** NOTE: If a USB device is charging while the computer is in the Sleep state, exiting Sleep through the USB 2.0 port is disabled at the factory. You must enable this feature in Setup Utility. For information on enabling features in Setup utility, see the “Setup Utility (BIOS) and System Diagnostics” chapter in the *HP Notebook Reference Guide*.

Item	Component	Description
(6)	Audio-out (headphone) jack/ Audio-in (microphone) jack	<p data-bbox="924 226 1458 338">Produces sound when connected to optional powered stereo speakers, headphones, earbuds, a headset, or television audio. Also connects an optional headset microphone.</p> <p data-bbox="924 369 1458 506"><b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the Regulatory, Safety, and Environmental Notices.</p> <p data-bbox="924 537 1458 592"><b>NOTE:</b> When a device is connected to the jack, the computer speakers are disabled.</p> <p data-bbox="924 623 1458 701"><b>NOTE:</b> Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).</p>
(7)	Digital Media slot	<p data-bbox="924 730 1385 753">Supports the following digital card formats:</p> <ul data-bbox="924 785 1385 911" style="list-style-type: none"> <li data-bbox="924 785 1126 808">• MultiMediaCard</li> <li data-bbox="924 837 1286 861">• Secure Digital (SD) Memory Card</li> <li data-bbox="924 890 1385 911">• Secure Digital High Capacity Memory Card</li> </ul>

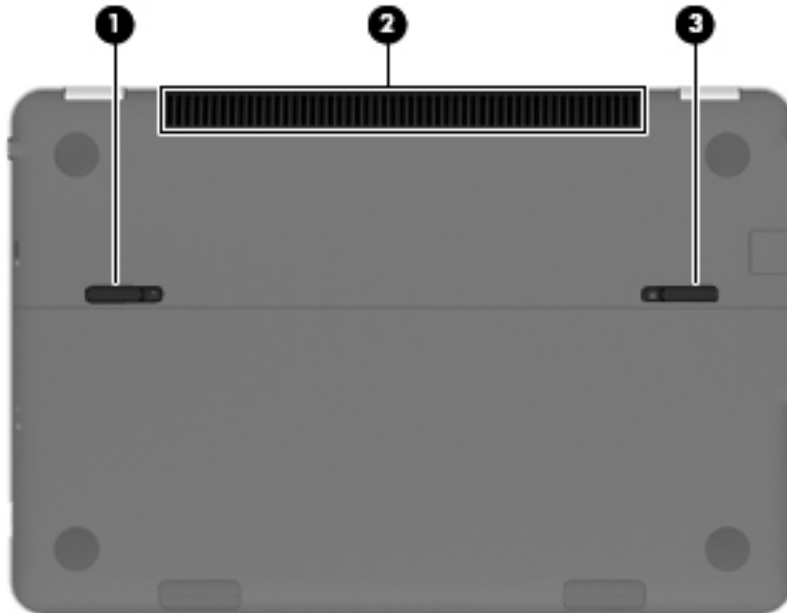
## Right side



Item	Component	Description
(1)	Mute button	Mutes or restores speaker sound.
(2)	Volume dial	Adjusts the speaker volume. To increase the volume, rotate the dial clockwise. To decrease the volume, rotate the dial counter-clockwise.
(3)	Beats Audio button	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. <b>NOTE:</b> To open Beats Audio Control Panel, from the Start screen, type <b>h</b> , select <b>HP Utility Center</b> , and then select <b>HP Beats Audio</b> .
(4)	Hard drive light	<ul style="list-style-type: none"><li>Blinking white: The hard drive is being accessed.</li><li>Amber: HP ProtectSmart Hard Drive Protection has temporarily parked the hard drive.</li></ul> <b>NOTE:</b> For information about HP ProtectSmart Hard Drive Protection, see the <i>HP Notebook Reference Guide</i> .
(5)	Power light	<ul style="list-style-type: none"><li>White: The computer is on.</li><li>Blinking white: The computer is in the Sleep state.</li><li>Off: The computer is off or in Hibernation.</li></ul>
(6)	Security cable slot	Attaches an optional security cable to the computer. <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Item	Component	Description
(7)	AC adapter light	<ul style="list-style-type: none"> <li>• White: The computer is connected to external power, and the battery is fully charged.</li> <li>• Amber: The computer is connected to external power, and the battery is charging.</li> <li>• Blinking amber: The computer is connected to external power and there is a battery error or the battery has reached a low or critical battery level.</li> <li>• Off: The computer is running on battery power.</li> </ul>
(8)	Power connector	Connects an AC adapter.

## Bottom



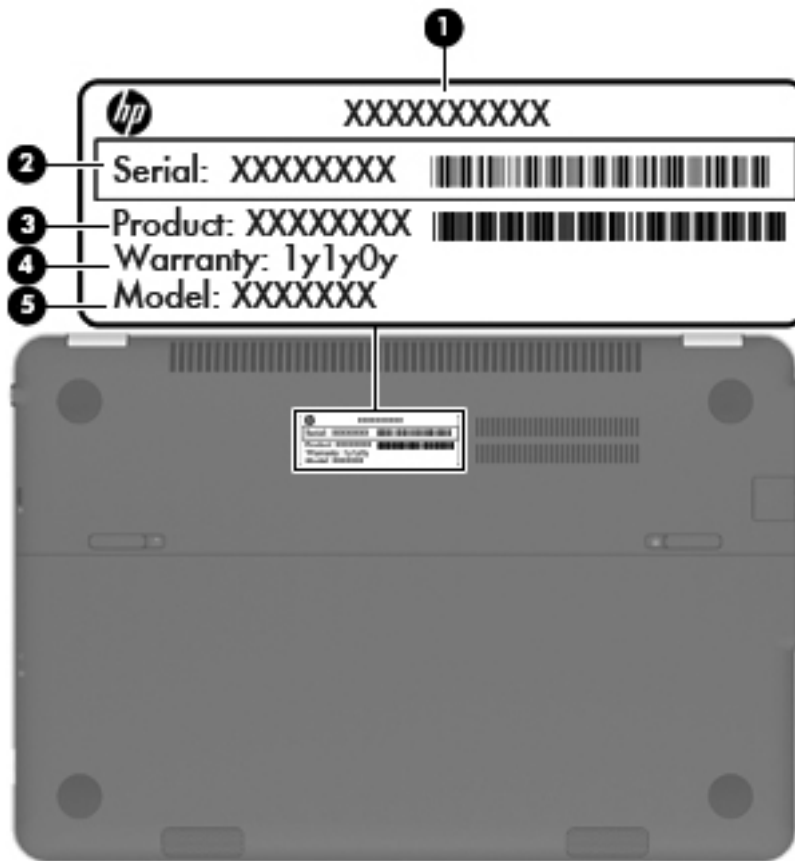
Item	Component	Description
(1)	Battery cover release latch	Releases the battery cover.
(2)	Vent	<p>Enables airflow to cool internal components.</p> <p><b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.</p>
(3)	Battery cover lock latch	Locks the battery cover into place.

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# 3 Illustrated parts catalog

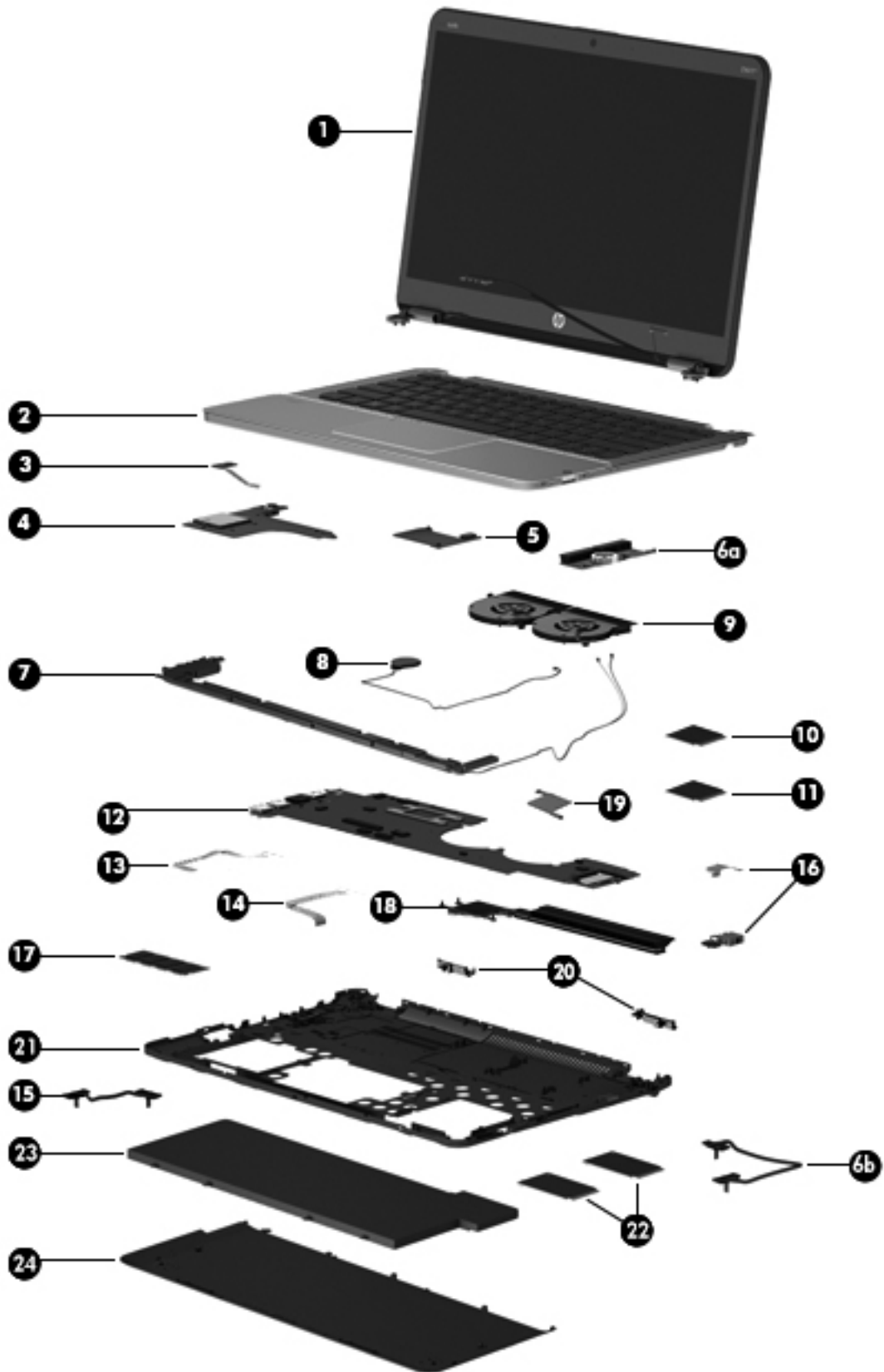
# Service tag

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



Item	Description	Function
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
(4)	Warranty period	This number describes the duration of the warranty period for the computer.
(5)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.

# Computer major components



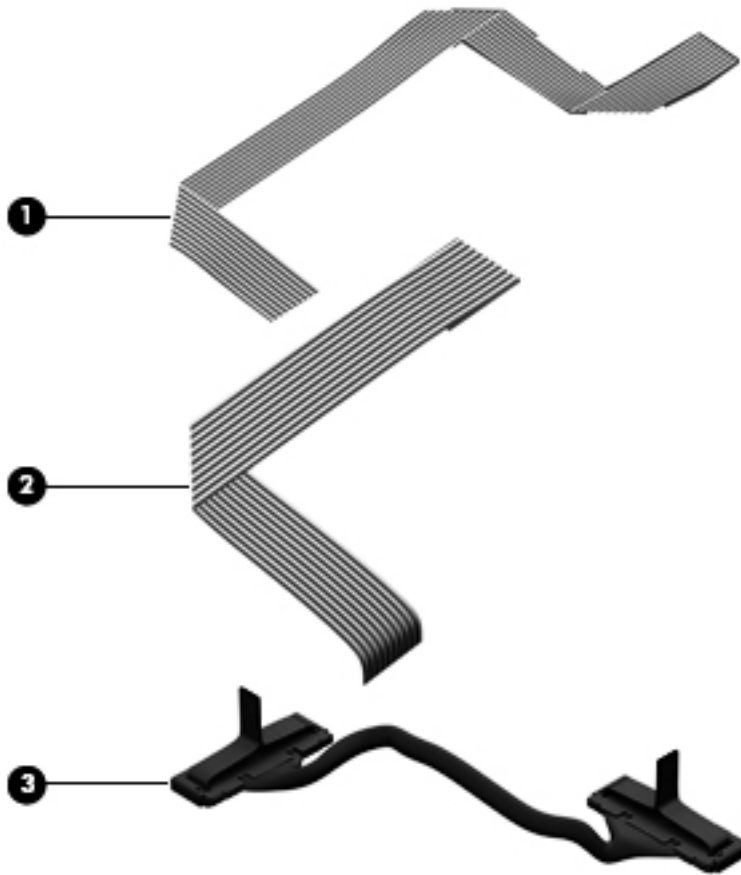


Item	Component	Spare part number
(1)	<b>Display assembly</b> , 14.0-in, AntiGlare, high-definition (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)	675507-001
(2)	<b>Top cover</b> with keyboard (includes backlight cable, keyboard cable, TouchPad, and TouchPad button board and cable):	
	For use in Belgium	698632-A41
	For use in Canada	698632-DB1
	For use in Denmark, Finland, and Norway	698632-DH1
	For use in France	698632-051
	For use in Germany	698632-041
	For use in Greece	698632-151
	For use in Israel	698632-BB1
	For use in Italy	698632-061
	For use in Latin America	698632-161
	For use in the Netherlands	698632-B31
	For use in Portugal	698632-131
	For use in Russia	698632-251
	For use in Saudi Arabia	698632-171
	For use in South Korea	698632-AD1
	For use in Spain	698632-071
	For use in Switzerland	698632-BG1
	For use in Taiwan	698632-AB1
	For use in Thailand	698632-281
	For use in Turkey	698632-141
	For use in the United Kingdom and Singapore	698632-031
	For use in the United States	698632-001
(3)	<b>Power button board</b> (includes cable)	672010-001
(4)	<b>Card Reader board:</b>	
	<b>NOTE:</b> The Card Reader board spare part kit does not include the Card Reader board cable. The Card Reader board cable is included in the Cable Kit, spare part number 672006-001.	
	For use only on computer models equipped with the HM76 chipset	696482-001
	For use only on computer models equipped with the HM65 chipset	675511-001

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
<b>(5)</b>	<b>NFC board</b>	675510-001
	<b>NOTE:</b> The NFC board spare part kit does not include the NFC board cable. The NFC board cable is included in the Cable Kit, spare part number 672006-001.	
<b>(6a)</b>	<b>Solid-state drive connector board</b> , includes:	675509-001
<b>(6b)</b>	<b>Solid-state drive connector board cable</b>	
<b>(7)</b>	<b>Speakers</b> (include speaker cables and wireless audio module antenna cables)	672015-001
<b>(8)</b>	<b>RTC battery</b> (includes double-sided tape and cable)	672013-001
<b>(9)</b>	<b>Fans</b> (2, include cable and tape)	672008-001
<b>(10)</b>	<b>Wireless audio module</b>	672011-001
<b>(11)</b>	<b>WLAN module:</b>	
	Intel Centrino Advanced-N 6235 WLAN module	670292-005
	Intel Centrino Advanced-N 6230 WLAN module	636672-005
<b>(12)</b>	<b>System board</b> (includes processor and replacement thermal material):	
	Equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with the Windows 8 Professional operating system in all countries and regions except the People's Republic of China (4.0-MB L3 cache, 17 W)	698466-601
	Equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system in all countries and regions except the People's Republic of China (4.0-MB L3 cache, 17 W)	698466-501
	Equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system only in the People's Republic of China (4.0-MB L3 cache, 17 W)	698467-501
	Equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.7-GHz processor for use only on computer models equipped with the Windows 8 Professional operating system in all countries and regions except the People's Republic of China (3.0-MB L3 cache, 17 W)	685367-601
	Equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.7-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system in all countries and regions except the People's Republic of China (3.0-MB L3 cache, 17 W)	685367-501
	Equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.7-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system only in the People's Republic of China (3.0-MB L3 cache, 17 W)	689486-501
	<b>Cable Kit</b> , includes:	672006-001
<b>(13)</b>	NFC board cable	
<b>(14)</b>	TouchPad cable	
<b>(15)</b>	Card Reader board cable	
<b>(16)</b>	<b>Power connector cable</b> (includes bracket)	687530-001

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
<b>(17)</b>	<b>Memory module</b> (PC3, 12800, 1333-MHz):	
	8-GB memory module	670034-005
	4-GB memory module	641369-005
	<b>Heat sink</b> (includes replacement thermal material):	
<b>(18)</b>	Processor heat sink	675514-001
<b>(19)</b>	Post controller hub heat sink	685662-001
<b>(20)</b>	<b>Display hinge covers</b> (includes left and right hinge covers)	672009-001
<b>(21)</b>	<b>Base enclosure</b> (includes battery cover lock latch, battery cover release latch, power connector barrel, and RJ45 cover)	700019-001
	<b>Rubber Feet Kit</b> (not illustrated, includes front and rear rubber feet)	672016-001
<b>(22)</b>	<b>Solid-state drive</b> (up to 2)	
	256-GB SATA III solid-state drive	698645-001
	128-GB SATA III solid-state drive	697235-001
	128-GB SATA II solid-state drive	675508-001
<b>(23)</b>	<b>4-cell, 58-Wh, 4.1-Ah, Li-ion battery</b>	665460-001
<b>(24)</b>	<b>Battery cover</b> (includes speaker grilles and front rubber feet)	672012-001

# Cable Kit



Item	Component	Spare part number
	<b>Cable Kit</b> , includes:	672006-001
(1)	TouchPad cable	
(2)	NFC board cable	
(3)	Card Reader board cable	

## Miscellaneous parts

<b>Component</b>	<b>Spare part number</b>
<b>65-W HP Smart travel AC adapter</b>	574638-001
<b>HDMI-to-VGA adapter</b>	530607-001
<b>HP 14.0-in protective cover</b>	674766-001
<b>USB external DVD±RW DL SuperMulti Drive</b>	659940-001
<b>Power cord</b> (3-pin, black, 1.83-m):	
For use in Australia	490371-011
For use in Denmark	490371-081
For use in Europe	490371-021
For use in India	490371-D61
For use in Israel	490371-BB1
For use in Italy	490371-061
For use in Japan	490371-291
For use in North America	490371-001
For use in the People's Republic of China	490371-AA1
For use in South Korea	490371-AD1
For use in Switzerland	490371-111
For use in Taiwan	490371-AB1
For use in Thailand	490371-281
For use in the United Kingdom and Singapore	490371-031
<b>Screw Kit</b>	672007-001

# Sequential part number listing

Spare part number	Description
490371-001	Power cord for use in North America (3-pin, black, 1.83-m)
490371-011	Power cord for use in Australia (3-pin, black, 1.83-m)
490371-021	Power cord for use in Europe (3-pin, black, 1.83-m)
490371-031	Power cord for use in the United Kingdom and Singapore (3-pin, black, 1.83-m)
490371-061	Power cord for use in Italy (3-pin, black, 1.83-m)
490371-081	Power cord for use in Denmark (3-pin, black, 1.83-m)
490371-111	Power cord for use in Switzerland (3-pin, black, 1.83-m)
490371-201	Power cord for use in Thailand (3-pin, black, 1.83-m)
490371-291	Power cord for use in Japan (3-pin, black, 1.83-m)
490371-AA1	Power cord for use in the People's Republic of China (3-pin, black, 1.83-m)
490371-AB1	Power cord for use in Taiwan (3-pin, black, 1.83-m)
490371-AD1	Power cord for use in South Korea (3-pin, black, 1.83-m)
490371-BB1	Power cord for use in Israel (3-pin, black, 1.83-m)
490371-D61	Power cord for use in India (3-pin, black, 1.83-m)
530607-001	HDMI-to-VGA adapter
574638-001	65-W HP Smart travel AC adapter
636672-005	Intel Centrino Advanced-N 6230 WLAN module
641369-005	4-GB memory module (PC3, 12800, 1600-MHz)
659940-001	USB external DVD±RW DL SuperMulti Drive
665460-001	4-cell, 58-Wh, 4.1-Ah, Li-ion battery
670034-005	8-GB memory module (PC3, 12800, 1600-MHz)
670292-005	Intel Centrino Advanced-N 6235 WLAN module
672006-001	Cable Kit (includes the NFC board cable, the TouchPad cable, and the Card Reader board cable)
672007-001	Screw Kit
672008-001	Fan (includes cable and tape)
672009-001	Display hinge covers (includes left and right hinges covers)
672010-001	Power button board (includes cable)
672011-001	Wireless audio module
672012-001	Battery cover (includes speaker grilles and front rubber feet)
672013-001	RTC battery (includes double-sided tape and cable)

Spare part number	Description
672015-001	Speakers (include speaker cables and wireless audio module antenna cables)
672016-001	Rubber Feet Kit (includes front and rear rubber feet)
674766-001	HP 14.0-in protective cover
675507-001	14.0-in, AntiGlare, high-definition display assembly (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)
675508-001	128-GB solid-state drive
675509-001	Solid-state drive connector board (includes cable)
675510-001	NFC board  <b>NOTE:</b> The NFC board spare part kit does not include the NFC board cable. The NFC board cable is included in the Cable Kit, spare part number 672006-001.
675511-001	Card Reader board for use only on computer models equipped with the HM65 chipset  <b>NOTE:</b> The Card Reader board spare part kit does not include the Card Reader board cable. The Card Reader board cable is included in the Cable Kit, spare part number 672006-001.
675513-001	Base enclosure (includes battery cover lock latch, battery cover release latch, power connector barrel, and RJ45 cover)
675514-001	Processor heat sink (includes replacement thermal material)
685367-501	System board equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.70-GHz processor for use only on computer models equipped with Windows 8 Standard in all countries and regions except the People's Republic of China (3.0-MB L3 cache, 17 W; includes replacement thermal material)
685367-601	System board equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.70-GHz processor for use only on computer models equipped with Windows 8 Professional in all countries and regions except the People's Republic of China (3.0-MB L3 cache, 17 W; includes replacement thermal material)
685662-001	Post controller hub heat sink (includes replacement thermal material)
687530-001	Power connector cable for use only on computer models equipped with the HM76 chipset (includes bracket)
689486-501	System board equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.70-GHz processor for use only on computer models equipped with Windows 8 Standard only in the People's Republic of China (3.0-MB L3 cache, 17 W; includes replacement thermal material)
696482-001	Card Reader board for use only on computer models equipped with the HM76 chipset  <b>NOTE:</b> The Card Reader board spare part kit does not include the Card Reader board cable. The Card Reader board cable is included in the Cable Kit, spare part number 672006-001.
697235-001	128-GB SATA III solid-state drive (includes cable)
698466-501	System board equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with Windows 8 in all countries and regions except the People's Republic of China (4.0-MB L3 cache, 17 W; includes replacement thermal material)

<b>Spare part number</b>	<b>Description</b>
698466-601	System board equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with Windows 8 Professional in all countries and regions except the People's Republic of China (4.0-MB L3 cache, 17 W; includes replacement thermal material)
698467-501	System board equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with Windows 8 only in the People's Republic of China (4.0-MB L3 cache, 17 W; includes replacement thermal material)
698632-001	Top cover with keyboard for use only on computer models equipped with Windows 8 in the United States (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-031	Top cover with keyboard for use only on computer models equipped with Windows 8 in the United Kingdom and Singapore (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-041	Top cover with keyboard for use only on computer models equipped with Windows 8 in Germany (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-051	Top cover with keyboard for use only on computer models equipped with Windows 8 in France (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-061	Top cover with keyboard for use only on computer models equipped with Windows 8 in Italy (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-071	Top cover with keyboard for use only on computer models equipped with Windows 8 in Spain (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-131	Top cover with keyboard for use only on computer models equipped with Windows 8 in Portugal (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-141	Top cover with keyboard for use only on computer models equipped with Windows 8 in Turkey (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-161	Top cover with keyboard for use only on computer models equipped with Windows 8 in Latin America (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-171	Top cover with keyboard for use only on computer models equipped with Windows 8 in Saudi Arabia (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-251	Top cover with keyboard for use only on computer models equipped with Windows 8 in Russia (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-281	Top cover with keyboard for use only on computer models equipped with Windows 8 in Thailand (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-A41	Top cover with keyboard for use only on computer models equipped with Windows 8 in Belgium (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-AB1	Top cover with keyboard for use only on computer models equipped with Windows 8 in Taiwan (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-AD1	Top cover with keyboard for use only on computer models equipped with Windows 8 in South Korea (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-B31	Top cover with keyboard for use only on computer models equipped with Windows 8 in the Netherlands (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-BB1	Top cover with keyboard for use only on computer models equipped with Windows 8 in Israel (includes keyboard cable, TouchPad, and TouchPad button board and cable)



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<b>Spare part number</b>	<b>Description</b>
698632-BG1	Top cover with keyboard for use only on computer models equipped with Windows 8 in Switzerland (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-DB1	Top cover with keyboard for use only on computer models equipped with Windows 8 in Canada (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698632-DH1	Top cover with keyboard for use only on computer models equipped with Windows 8 in Denmark, Finland, and Norway (includes keyboard cable, TouchPad, and TouchPad button board and cable)
698645-001	256-GB SATA III solid-state drive (includes cable)
700019-001	Base enclosure (includes battery cover lock latch, battery cover release latch, power connector barrel, and RJ45 cover)

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# 4 Removal and replacement procedures

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**⚠ CAUTION:** This computer does not have user-replaceable parts. Only HP authorized service providers should perform the removal and replacement procedures described here. Accessing the internal parts could damage the computer or void the warranty.

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## 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.

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

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### Plastic parts

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**⚠ 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.

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### Cables and connectors

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**⚠ 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.

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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

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

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## 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.

<b>Typical electrostatic voltage levels</b>			
<b>Event</b>	<b>Relative humidity</b>		
	<b>10%</b>	<b>40%</b>	<b>55%</b>
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.

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

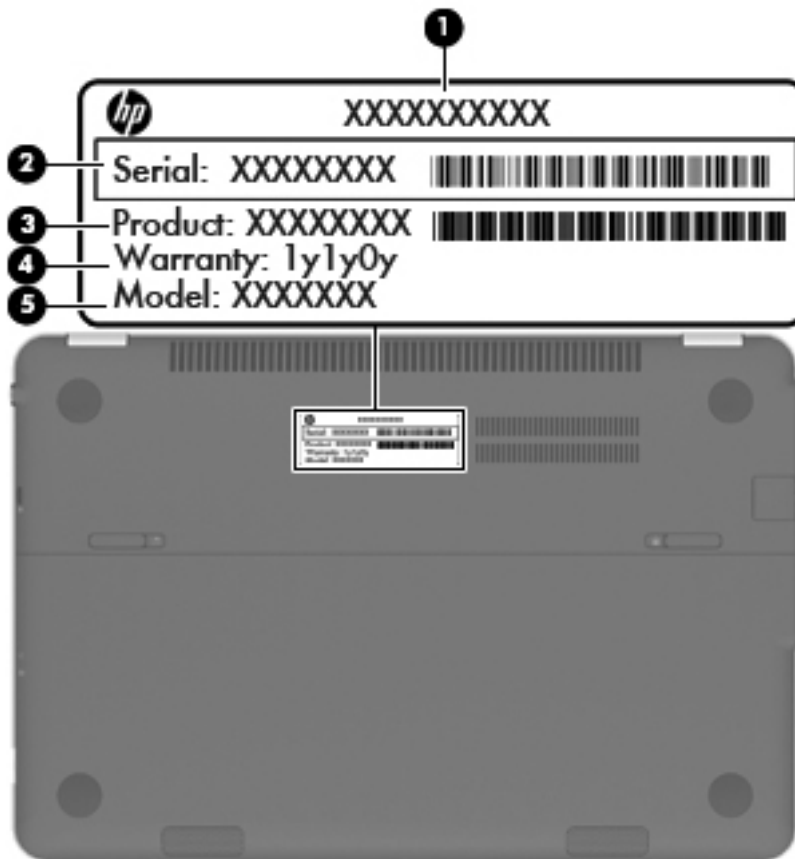
# Component replacement procedures

This chapter provides removal and replacement procedures.

There are as many as 57 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 33](#) for battery removal instructions.

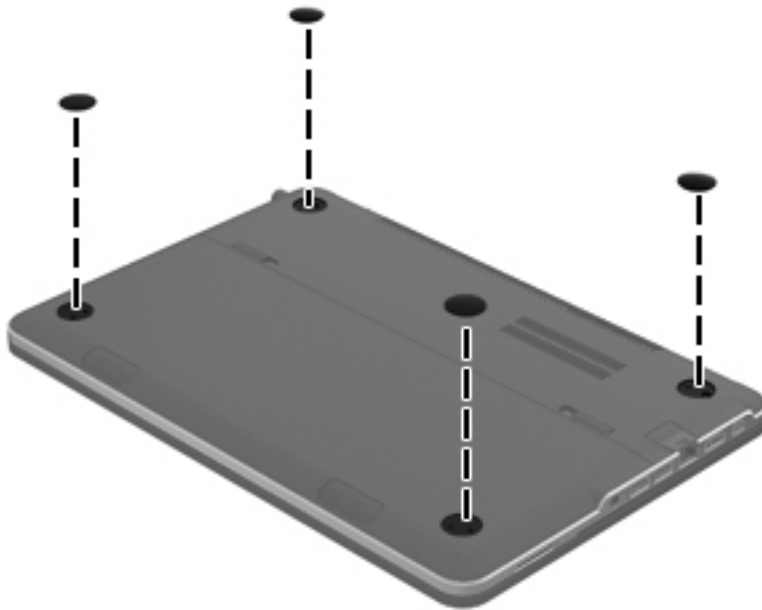


Item	Component	Description
(1)	Product name	This is the product name affixed to the front of the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware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

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

## Computer feet

The computer feet are adhesive-backed rubber pads. There are 2 rubber feet that attach to the battery cover, and 2 rubber feet that attach to the base enclosure, as indicated in the illustration below. These rubber feet are available in the Rubber Feet Kit, spare part number 672016-001.





## Battery

Description	Spare part number
4-cell, 58-Wh, 4.1-Ah, Li-ion battery	665460-001

Before disassembling the computer, follow these steps:

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

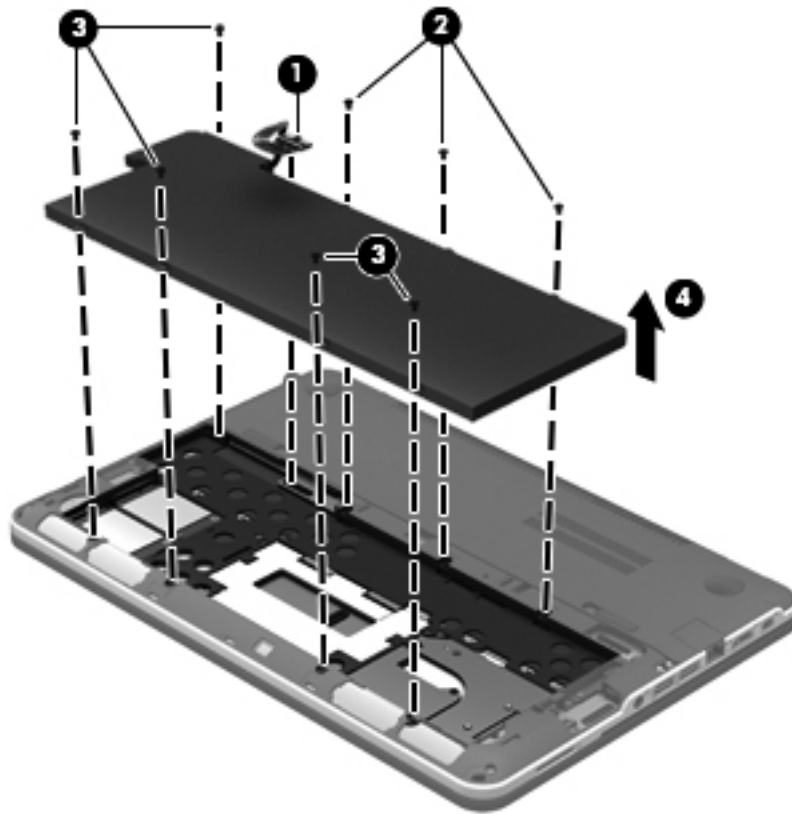
Remove the battery:

1. Turn the computer upside down on a flat surface.
2. Slide the battery cover lock latch to the left **(1)** to unlock the batter cover.
3. Firmly slide the battery cover release latch to the right **(2)** to release the battery cover.
4. Slide the battery cover **(3)** away from the computer.



5. Remove the battery cover. The battery cover is available using spare part number 672012-001.
6. Disconnect the battery cable **(1)** from the system board.
7. Remove the three Torx T8M2.0x5.4 screws **(2)** and the five Torx T8M2.0x3.6 screws **(3)** that secure the battery to the computer.

8. Remove the battery (4) from the computer.



Reverse this procedure to install the battery and battery cover.

## Solid-state drive


Description	Spare part number
256-GB SATA III solid-state drive	698645-001
128-GB SATA III solid-state drive	697235-001
128-GB SATA II solid-state drive	675508-001

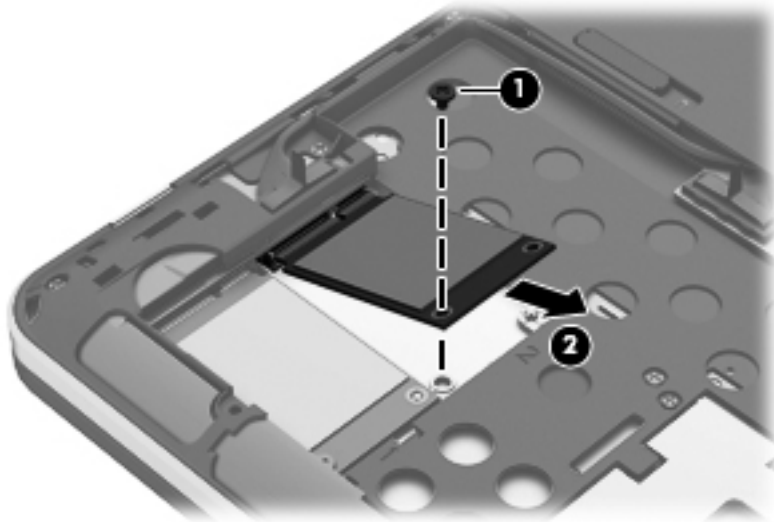
Before removing the solid-state drive and cable, follow these steps:

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

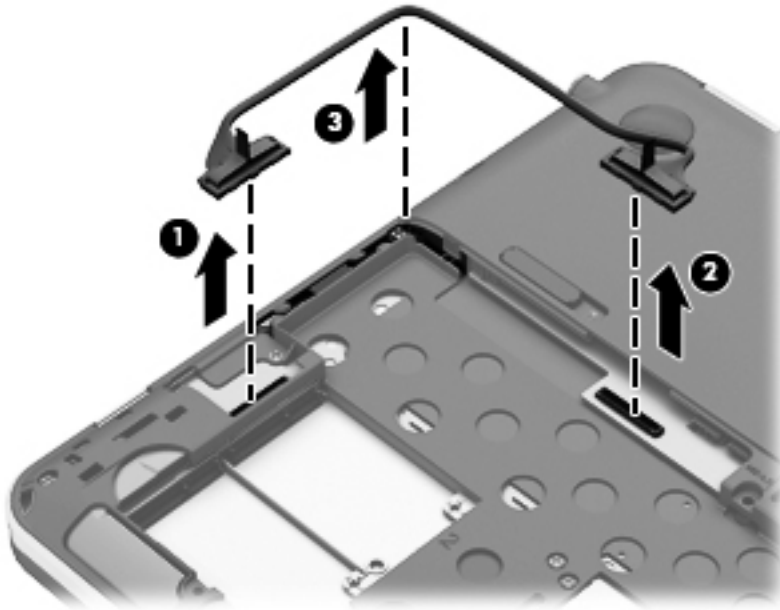
Remove the solid-state drive:

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

 **NOTE:** The solid-state drive is designed with a notch to prevent incorrect installation into the solid-state drive slot.




3. If it is necessary to replace the solid-state drive connector board cable, disconnect both ends of the cable **(1)** and **(2)** from the system board, and then release the cable from the clips **(3)** and channel built into the base enclosure. The solid-state drive connector board cable is included in the solid-state drive connector board spare part kit, spare part number 675509-001.



Reverse this procedure to install the solid-state drive and solid-state drive connector board cable.

## Card Reader board cable

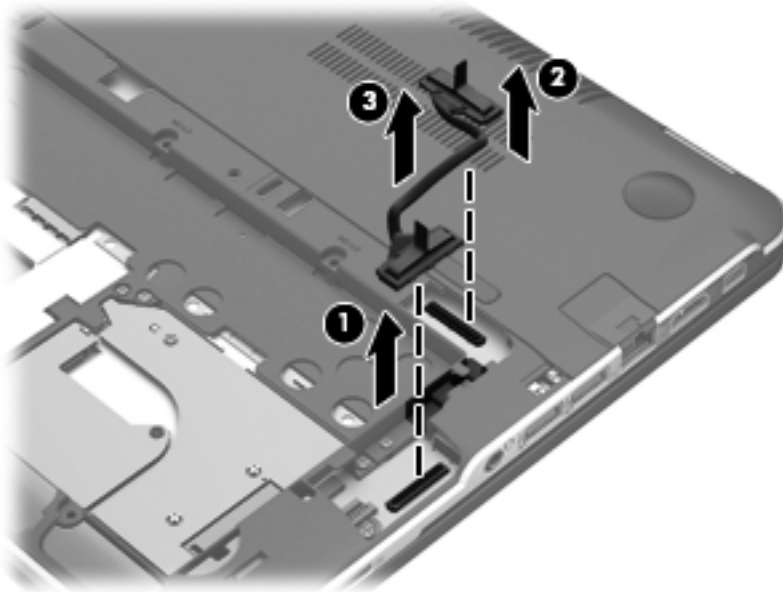
 **NOTE:** The Card Reader board cable is included in the Cable Kit, spare part number 672006-001.

Before removing the Card Reader board cable, follow these steps:

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

Remove the Card Reader board cable:

- ▲ Disconnect both ends of the Card Reader board cable **(1)** and **(2)** from the system board, and then release the cable **(3)** from the clips and channel built into the base enclosure.



Reverse this procedure to install the Card Reader board cable.

## NFC board

Description	Spare part number
NFC board	675510-001

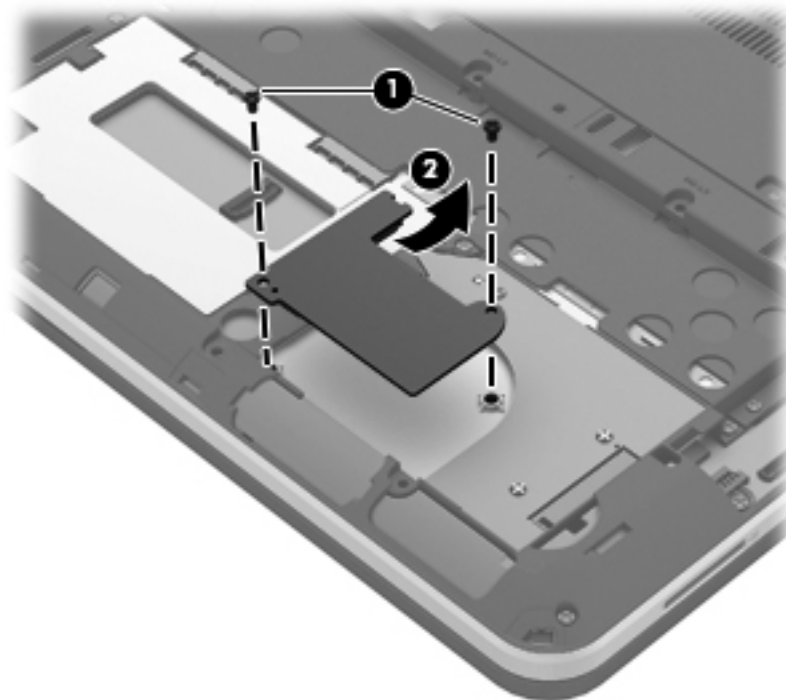
**NOTE:** The NFC board spare part kit does not include the NFC board cable. The NFC board cable is included in the Cable Kit, spare part number 672006-001.

Before removing the NFC board, follow these steps:

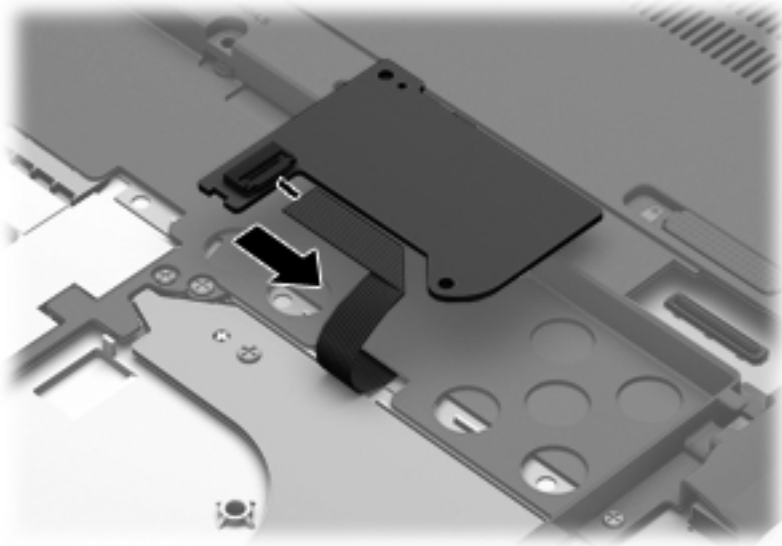
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.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

Remove the NFC board:

1. Remove the two Phillips PM2.0×3.0 screws **(1)** that secure the NFC board to the system board.
2. Turn the NFC board upside down, with the zero insertion force (ZIF) connector and cable toward you.



3. Release the ZIF connector to which the NFC board cable is attached, and then disconnect the NFC board cable from the system board.



4. Remove the NFC board.

Reverse this procedure to install the NFC board.

## Top cover



**NOTE:** The top cover spare part kit includes the keyboard, the keyboard cable, the TouchPad board cable, and the TouchPad button board cable.


Description	Spare part number
For use in Belgium	698632-A41
For use in Canada	698632-121
For use in Denmark, Finland, and Norway	698632-DH1
For use in France	698632-051
For use in Germany	698632-041
For use in Greece	698632-151
For use in Israel	698632-BB1
For use in Italy	698632-061
For use in Latin America	698632-161
For use in the Netherlands	698632-B31
For use in Portugal	698632-131
For use in Russia	698632-251
For use in Saudi Arabia	698632-171
For use in South Korea	698632-AD1
For use in Spain	698632-071
For use in Switzerland	698632-BG1
For use in Taiwan	698632-AB1
For use in Thailand	698632-281
For use in Turkey	698632-141
For use in the United Kingdom and Singapore	698632-031
For use in the United States	698632-001

Before removing the top cover, follow these steps:

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



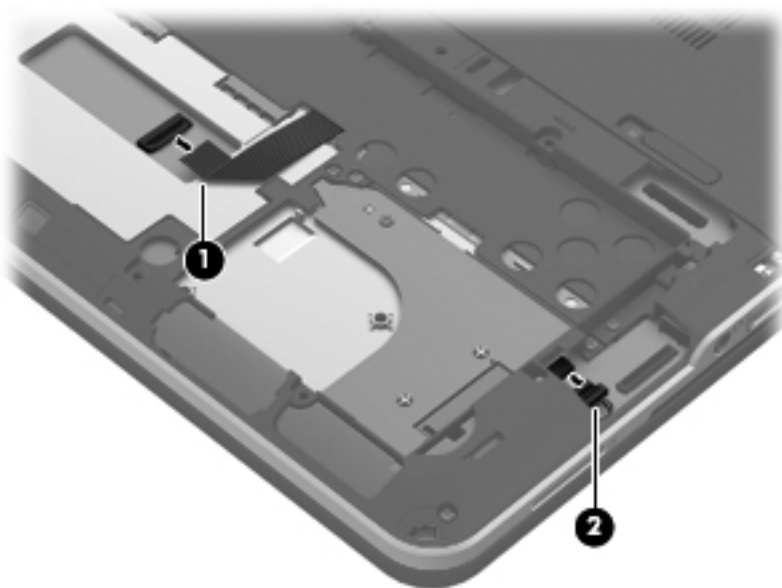
5. Remove the solid-state drive connector board cable (see [Solid-state drive on page 35](#)).
6. Remove the Card Reader board cable (see [Card Reader board cable on page 37](#)).

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

- NFC board (see [NFC board on page 38](#))
- Solid-state drive connector board (see [Card Reader board cable on page 37](#))
- Card Reader board (see [Card Reader board on page 45](#))
- Power button board (see [Power button board on page 46](#))

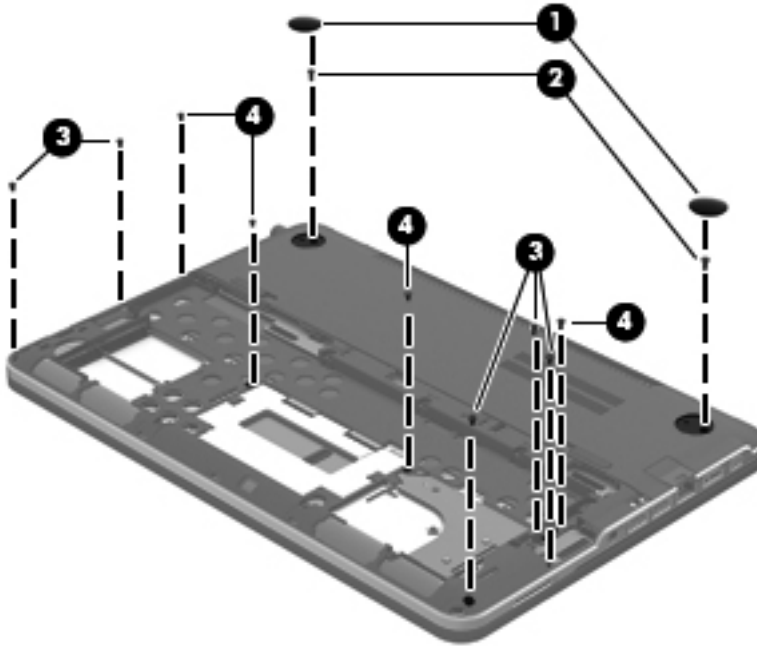
Remove the top cover:

1. Release the ZIF connector to which the TouchPad cable is connected, and then disconnect the TouchPad cable **(1)** from the TouchPad.
2. Disconnect the speaker cable **(2)** from the system board.

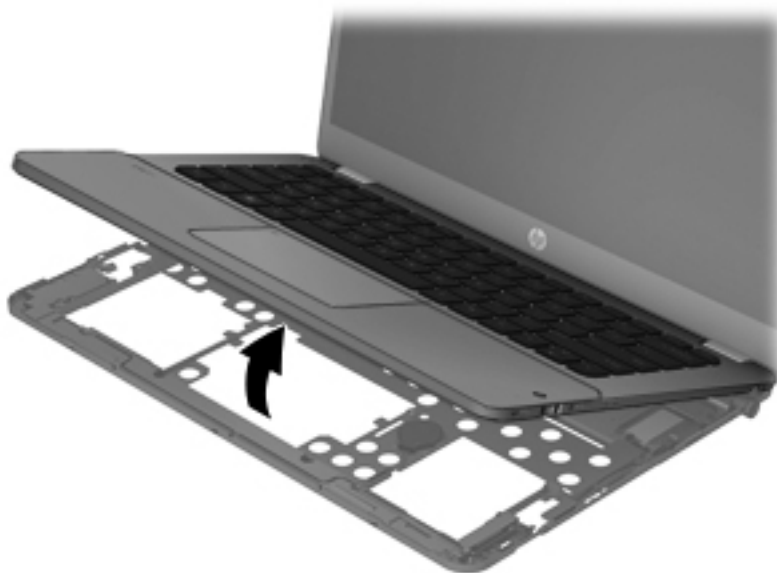


3. Remove the two rear rubber feet **(1)**.

4. Remove the following screws that secure the top cover to the base enclosure:
  - (2) Two Phillips PM2.0×5.5
  - (3) Five Phillips PM2.0×4.5
  - (4) Four Phillips PM2.0×4.0




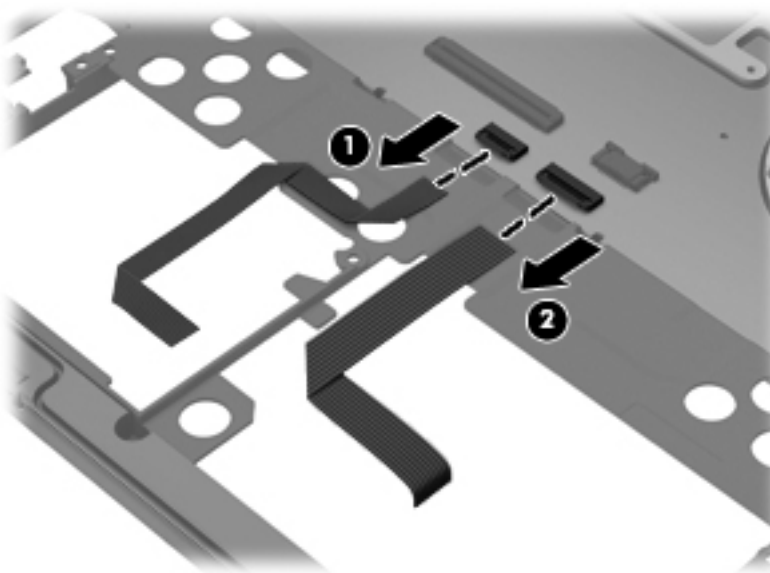
5. Turn the computer right side up, with the front toward you.
6. Open the computer.
7. Lift the front edge of the top cover slightly, until the power button board and keyboard cables are accessible.



8. Release the ZIF connector **(1)** to which the power button board cable is connected, and then disconnect the power button board cable **(2)** from the system board.
9. Release the ZIF connector **(3)** to which the keyboard cable is connected, and then disconnect the keyboard cable **(4)** from the system board.
10. Remove the top cover **(5)**.



 **NOTE:** If it is necessary to replace the NFC board cable **(1)** or the TouchPad cable **(2)**, release the ZIF connector to which the respective cable is attached, and then disconnect the cable from the system board.



Reverse this procedure to install the top cover.

## Solid-state drive connector board

Description	Spare part number
Solid-state drive connector board (includes cable)	675509-001

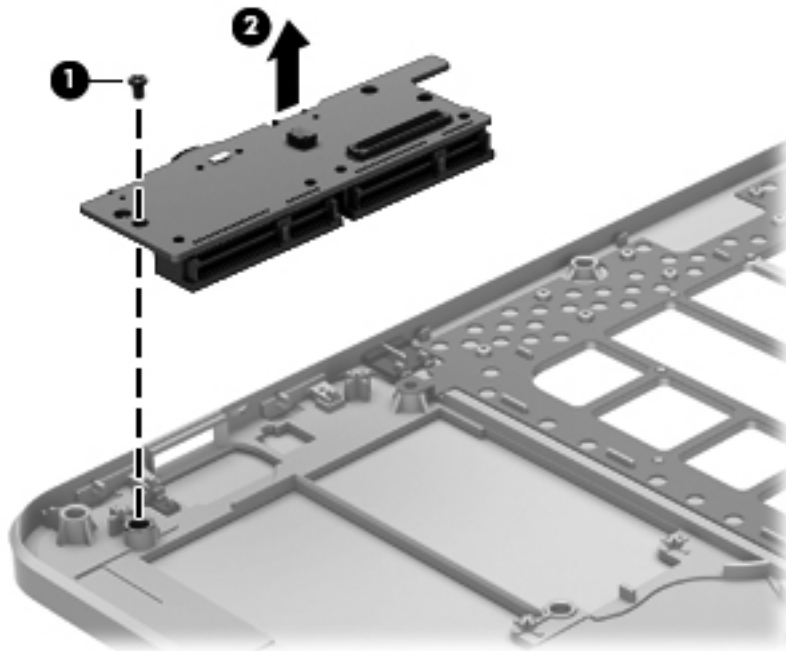
Before removing the solid-state drive connector board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))

Remove the solid-state drive connector board:


1. Turn the top cover upside down, with the front toward you.
2. Remove the Phillips PM2.0×3.6 screw **(1)** that secures the solid-state drive connector board to the top cover.

3. Remove the solid-state drive connector board (2).



Reverse this procedure to install the solid-state drive connector board.

## Card Reader board

 **NOTE:** The Card Reader board spare part kit does not include the Card Reader board cable. The Card Reader board cable is included in the Cable Kit, spare part number 672006-001.

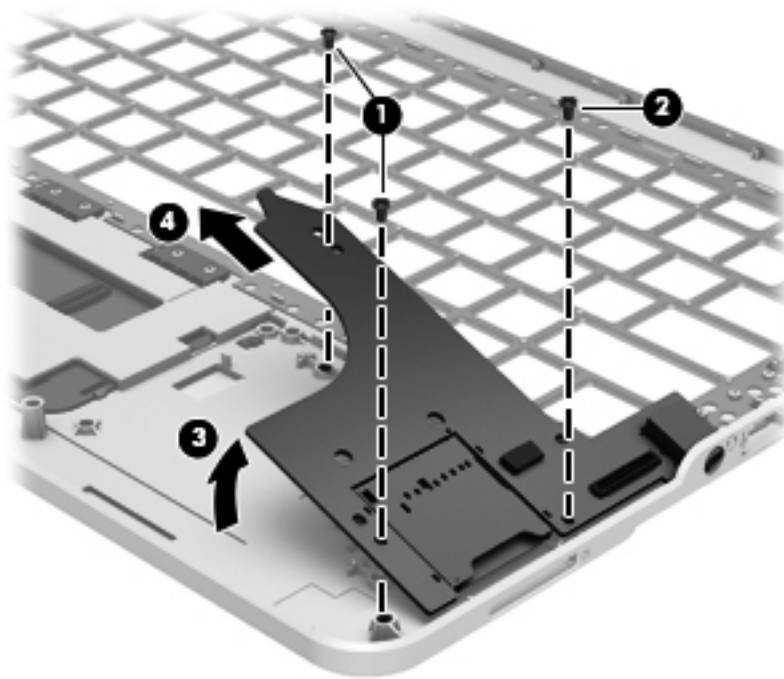
Description	Spare part number
Card Reader board	696482-001

Before removing the Card Reader board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))

Remove the Card Reader board:

1. Turn the top cover upside down, with the front toward you.
2. Remove the two Phillips PM2.0×3.6 screws **(1)** and the Phillips PM2.0×3.2 screw **(2)** that secure the Card Reader board to the top cover.
3. Lift the left side of the Card Reader board **(3)** until it rests at an angle.
4. Remove the Card Reader board **(4)** by sliding it up and to the left at an angle.



Reverse this procedure to install the Card Reader board.

## Power button board

Description	Spare part number
Power button board (includes cable)	675510-001

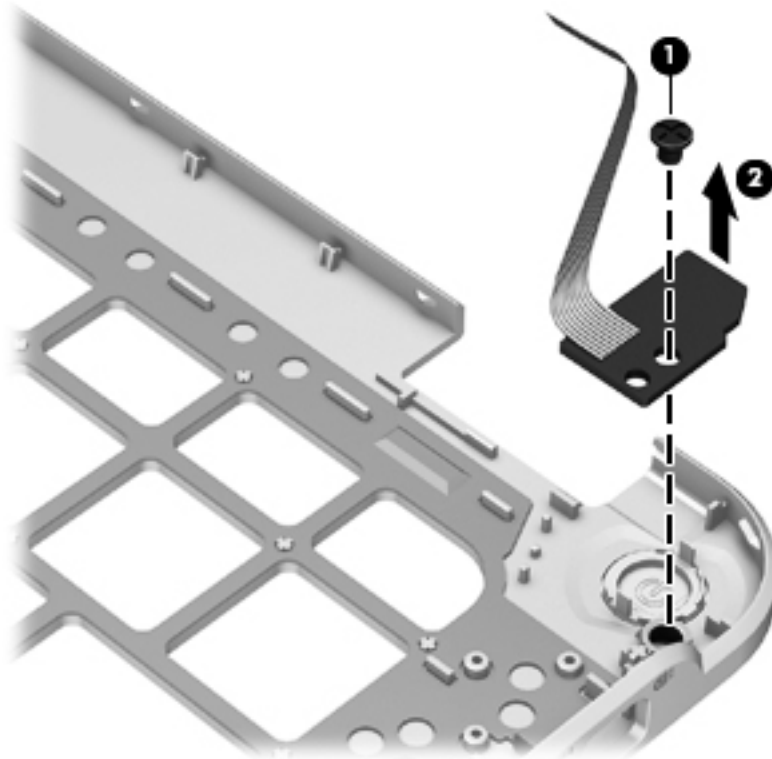
Before removing the power button board, follow these steps:

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

3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))

Remove the power button board:

1. Turn the top cover upside down, with the front toward you.
2. Remove the Phillips PM2.0×3.6 screw **(1)** that secures the power button board to the top cover.
3. Remove the power button board **(2)** and cable.



Reverse this procedure to install the power button board.

# Speakers


Description	Spare part number
Speakers (include speaker cables and wireless audio module antenna cables)	672013-001

Before removing the speakers, follow these steps:

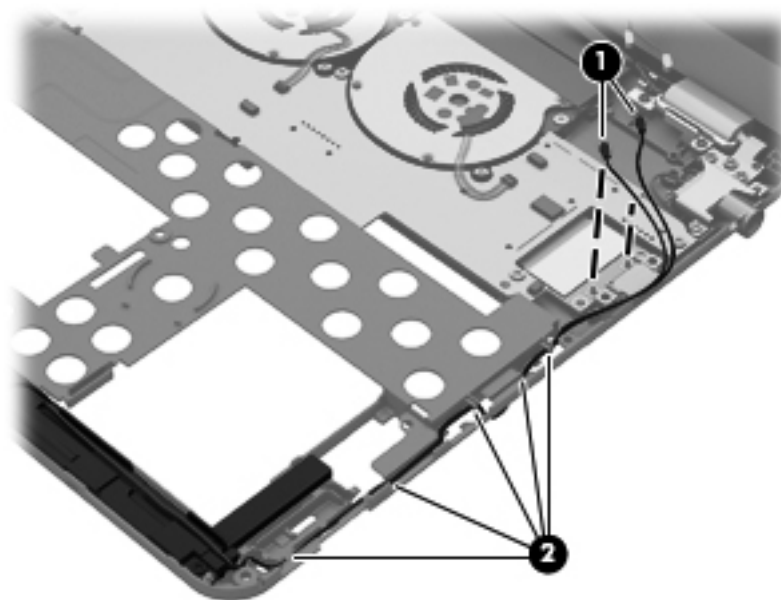
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))

Remove the speakers:

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

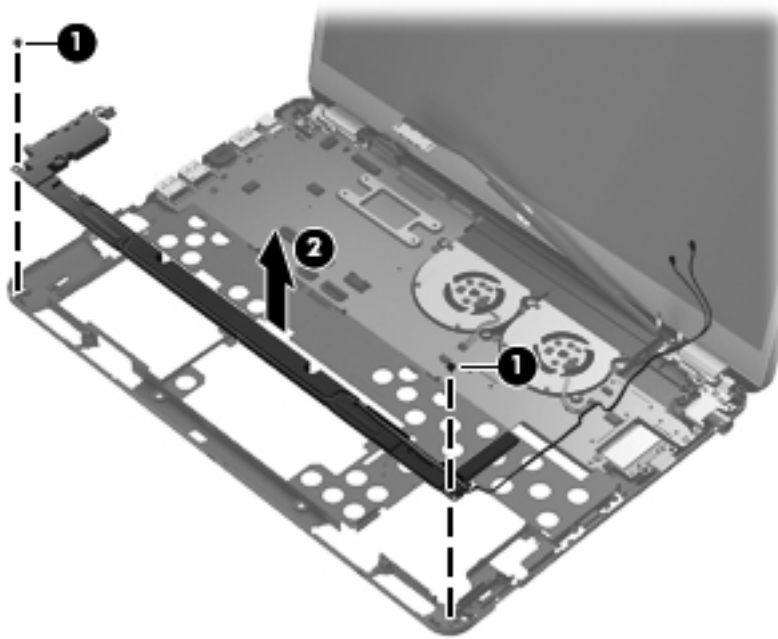
 **NOTE:** The #7/Main wireless audio module antenna cable is connected to the wireless audio module module "Main" terminal. The #8/Aux wireless audio module antenna cable is connected to the wireless audio module module "Aux" terminal.

2. Release the wireless audio module antenna cables from the clips **(2)** and routing channels built into the base enclosure.





3. Remove the two Phillips PM2.0×3.8 screws **(1)** that secure the speakers to the base enclosure.
4. Remove the speakers **(2)**.



Reverse this procedure to install the speakers.

## RTC battery

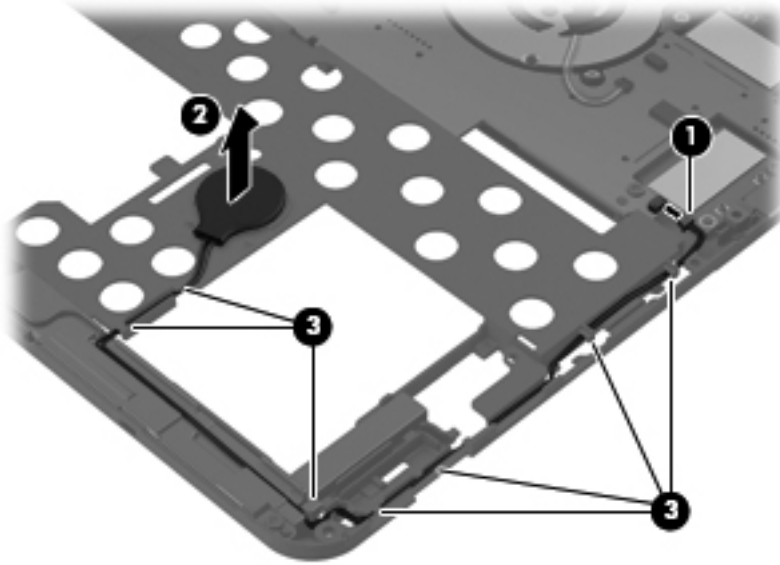
Description	Spare part number
RTC battery (double-sided tape and cable)	672013-001

Before removing the RTC battery, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))
  - d. Speakers (see [Speakers on page 48](#))

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Detach the RTC battery **(2)** from the base enclosure. (The RTC battery is attached to the base enclosure with double-sided tape).
3. Release the RTC battery cable from the clips **(3)** and routing channel built into the base enclosure.



4. Remove the RTC battery and cable.

Reverse this procedure to install the RTC battery.

## Wireless audio module

Description	Spare part number
Wireless audio module	672011-001

Before removing the wireless audio module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))

Remove the wireless audio module:


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

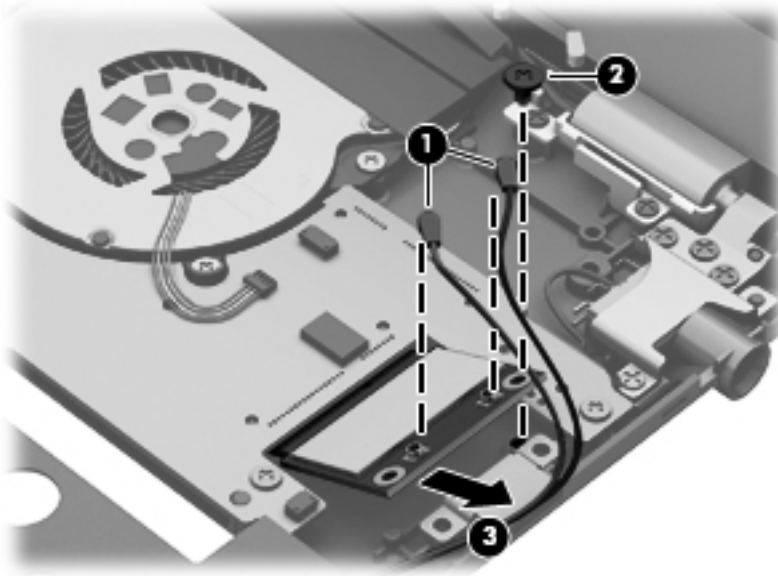



**NOTE:** The #7 wireless audio module antenna cable is connected to the wireless audio module "Main" terminal. The #8 wireless audio module antenna cable is connected to the wireless audio module "Aux" terminal.

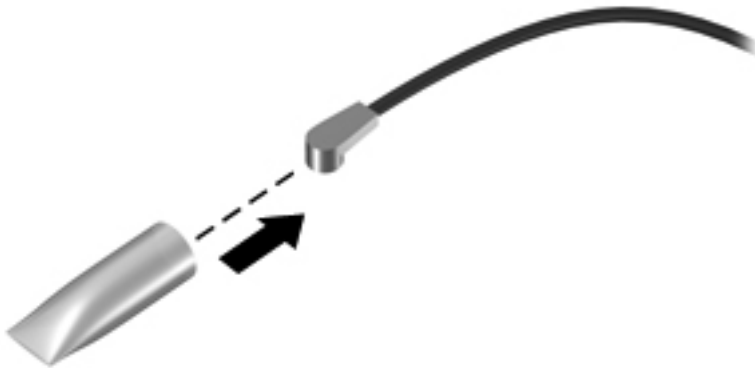
2. Remove the Phillips PM2.0×3.8 screw **(2)** that secures the wireless audio module to the system board. (The wireless audio module tilts up.)

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

 **NOTE:** The wireless audio module is designed with a notch to prevent incorrect installation into the wireless audio module slot.



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



Reverse this procedure to install the wireless audio module.

## WLAN module

Description	Spare part number
Intel Centrino Advanced-N 6235 WLAN module	670292-005
Intel Centrino Advanced-N 6230 WLAN module	636672-005


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

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))


Remove the WLAN module:

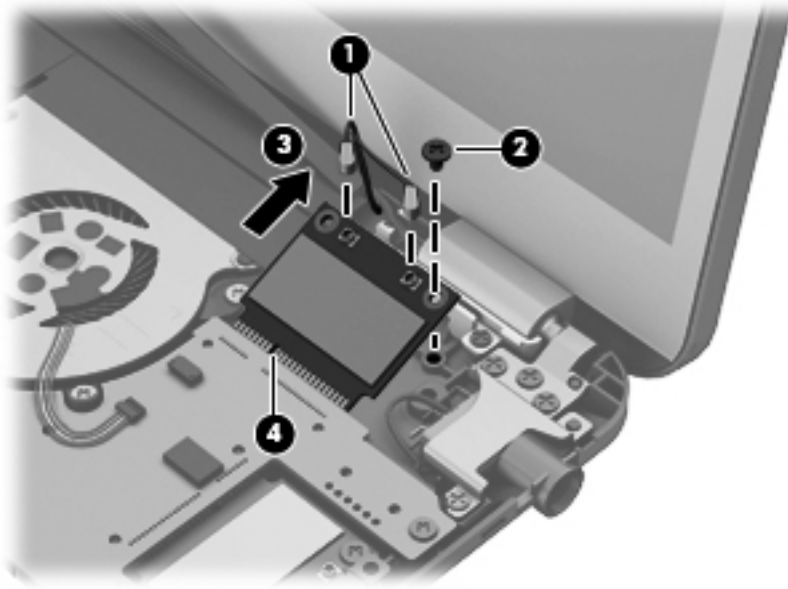
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.


 **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.

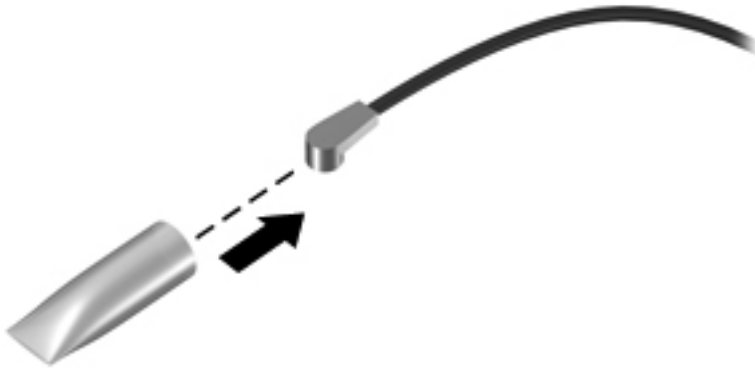
2. Remove the Phillips PM2.0×3.8 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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

 **NOTE:** The WLAN module is designed with a notch **(4)** to prevent incorrect installation into the WLAN module slot.




 **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.

## Fan


Description	Spare part number
Fan (includes cable)	672008-001

 **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 either of the fans, follow these steps:

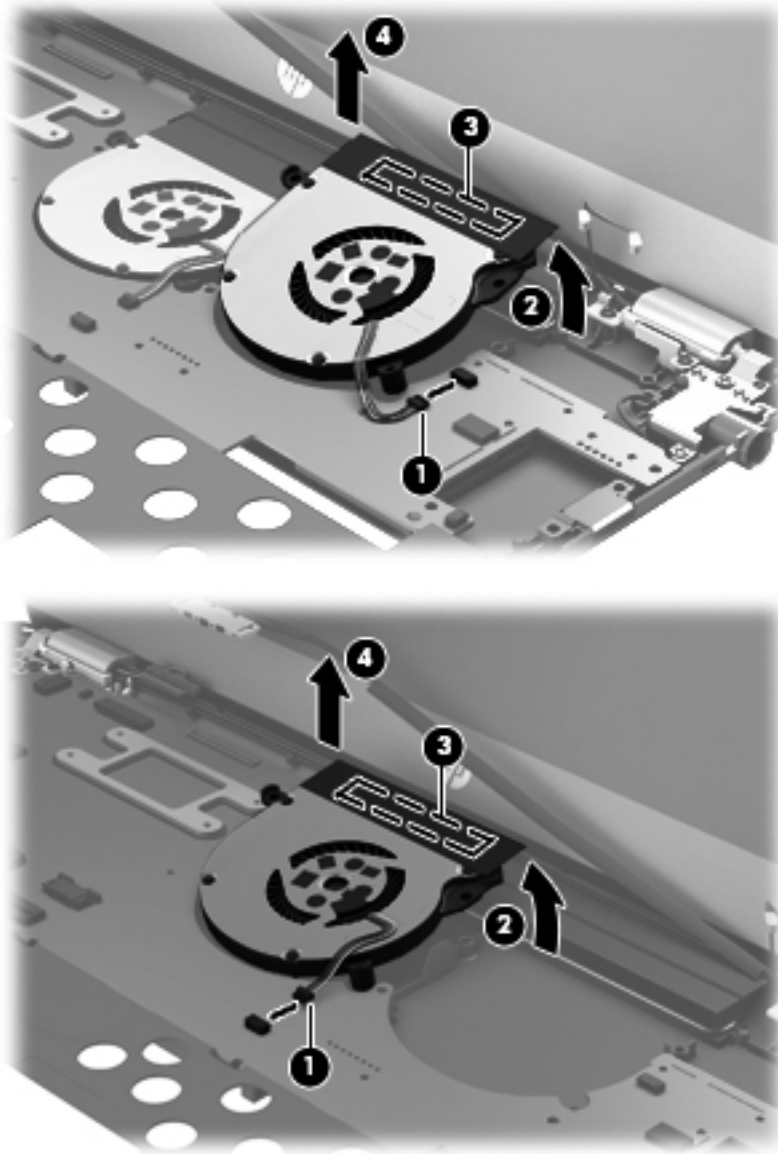
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))

Remove the fan:

 **NOTE:** The right fan must be removed before the left fan.

1. Disconnect the fan cable **(1)** from the system board.
2. Lift the rear edge of the fan **(2)** until the tape **(3)** attaching the fan to the heat sink detaches.

3. Remove the fan (4).



Reverse this procedure to install the fan.



## System board



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

Description	Spare part number
Equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with the Windows 8 Professional operating system in all countries and regions except the People's Republic of China (4.0-MB L3 cache, 17 W)	698466-601
Equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system in all countries and regions except the People's Republic of China (4.0-MB L3 cache, 17 W)	698466-501
Equipped with the Intel HM76 chipset and Intel Core i7-3517U 1.9-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system only in the People's Republic of China (4.0-MB L3 cache, 17 W)	698467-501
Equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.7-GHz processor for use only on computer models equipped with the Windows 8 Professional operating system in all countries and regions except the People's Republic of China (3.0-MB L3 cache, 17 W)	685367-601
Equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.7-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system in all countries and regions except the People's Republic of China (3.0-MB L3 cache, 17 W)	685367-501
Equipped with the Intel HM76 chipset and Intel Core i5-3317U 1.7-GHz processor for use only on computer models equipped with the Windows 8 Standard operating system only in the People's Republic of China (3.0-MB L3 cache, 17 W)	689486-501

Before removing the system board, follow these steps:

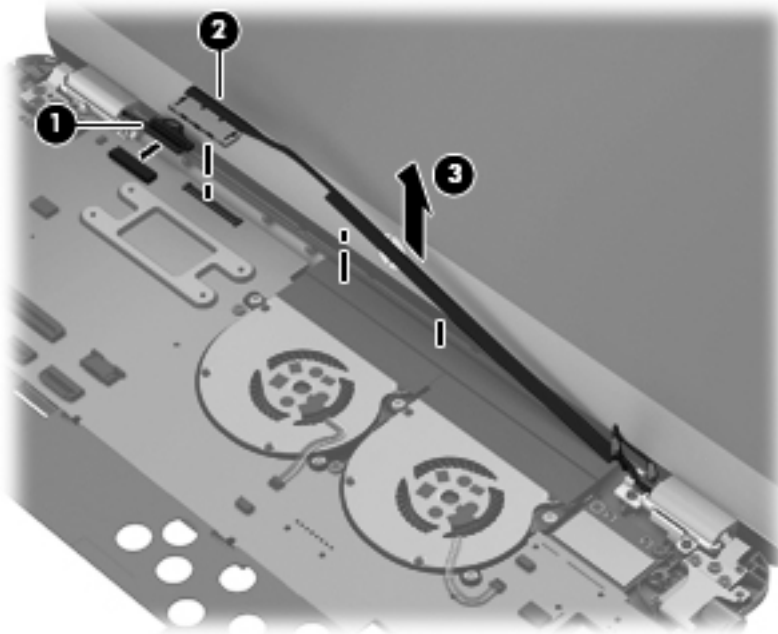
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the solid-state drive connector board cable (see [Solid-state drive on page 35](#)).
6. Remove the Card Reader board cable (see [Card Reader board cable on page 37](#)).
7. Remove the top cover (see [Top cover on page 40](#)).
8. Disconnect the RTC battery cable from the system board (see [RTC battery on page 49](#)).
9. Remove the wireless audio module (see [Wireless audio module on page 51](#)).
10. Remove the WLAN module (see [WLAN module on page 53](#)).

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:

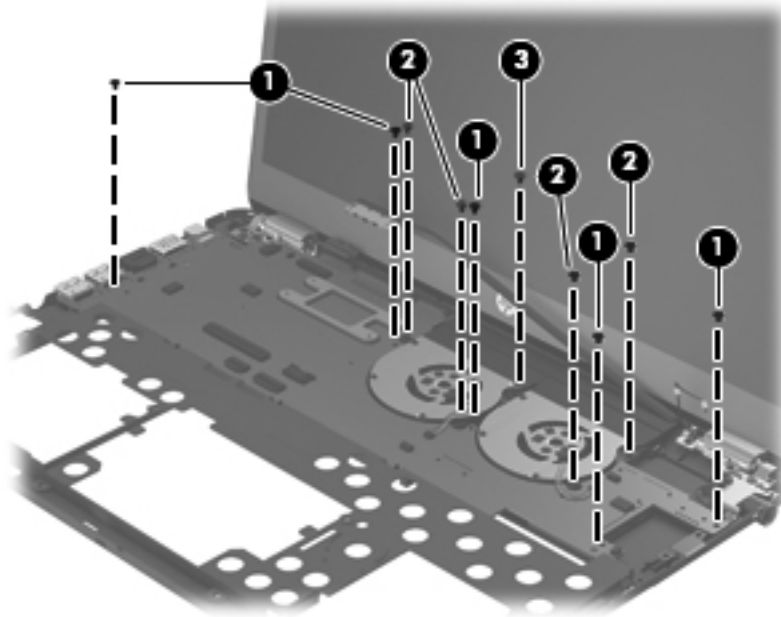
- Fans (see [Fan on page 55](#))
- Memory module (see [Memory module on page 60](#))
- Heat sink (see [Heat sink on page 61](#))

Remove the system board:

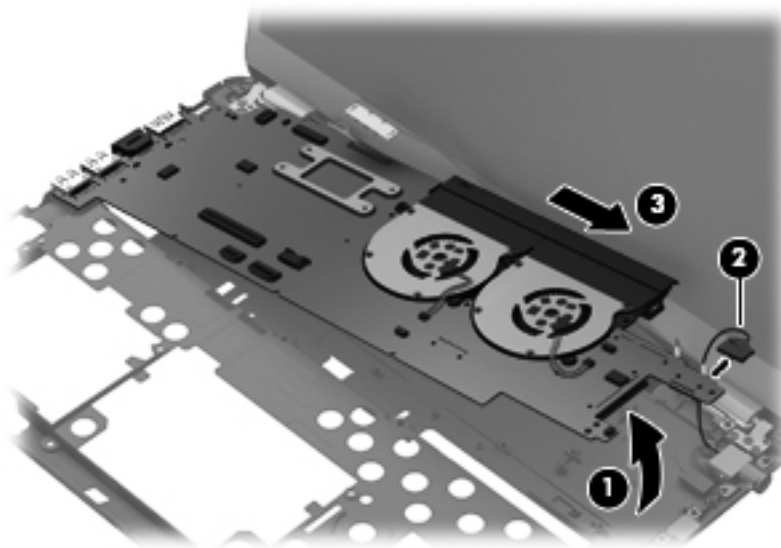
- 1.** Disconnect the webcam/microphone module cable **(1)** from the system board.
- 2.** Disconnect the display panel cable **(2)** from the system board.
- 3.** Release the display panel cable **(3)** from the heat sink. (The display panel cable is attached to the heat sink with double-sided tape.)



4. Remove the following screws that secure the system board to the base enclosure:
  - (1) Five Phillips PM2.0×3.8
  - (2) Four Phillips PM2.0×4.6
  - (3) One Phillips PM2.0×5.7



5. Lift the right side of the system board (1) until it rests at an angle.
6. Disconnect the power connector cable (2) from the system board.
7. Remove the system board (3) by sliding it up and to the right at an angle.



Reverse this procedure to install the system board.

## Memory module

Description	Spare part number
8-GB memory module (PC3, 12800, 1333-MHz)	670034-005
4-GB memory module (PC3, 12800, 1333-MHz)	641 369-005

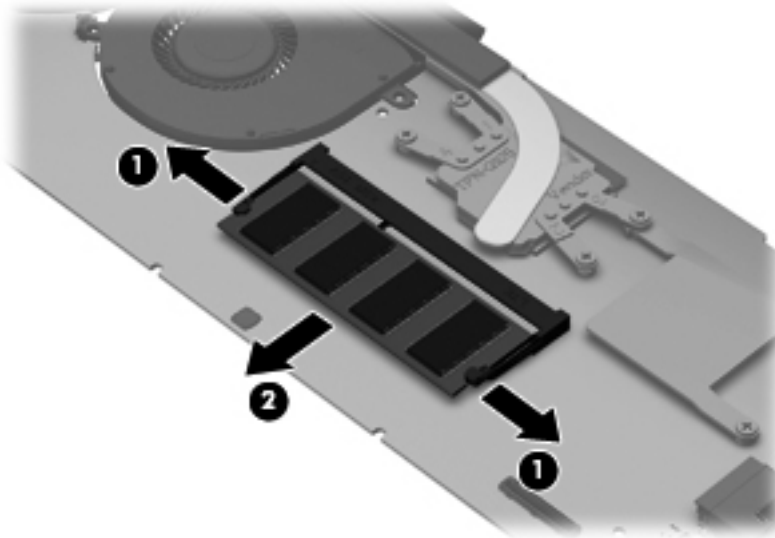
Before removing the memory module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))
  - d. WLAN module (see [WLAN module on page 53](#))
  - e. Wireless audio module (see [Wireless audio module on page 51](#))
  - f. System board (see [System board on page 57](#))

Remove the memory module:

1. Turn the system board upside down, with the front toward you.
2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

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



Reverse this procedure to install the memory module.

## Heat sink


 **NOTE:** The heat sink spare part kits include replacement thermal material.

Description	Spare part number
Processor heat sink	675514-001
Post controller hub heat sink	685662-001

Before removing the heat sink, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))
  - d. WLAN module (see [WLAN module on page 53](#))
  - e. Wireless audio module (see [Wireless audio module on page 51](#))
  - f. System board (see [System board on page 57](#))

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 **NOTE:** When replacing the heat sink, be sure to remove the fans from the defective heat sink and replace them on the replacement heat sink. See [Fan on page 55](#) for fan removal and replacement instructions.

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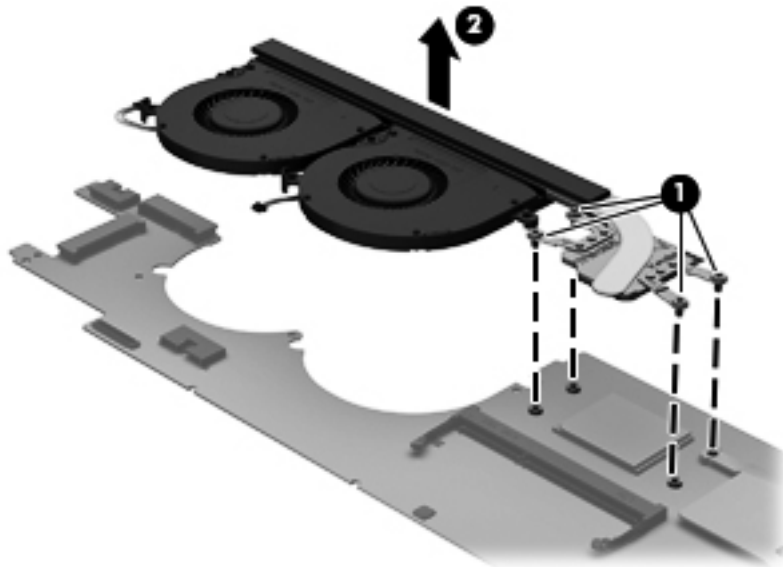
Remove the processor heat sink:

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

---


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

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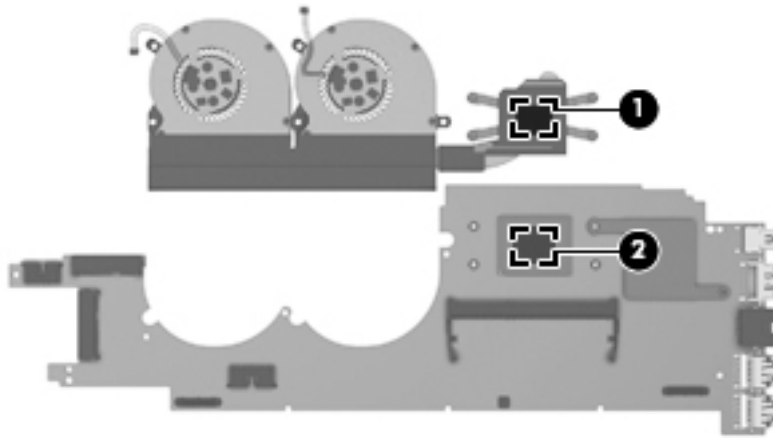


The thermal material must be thoroughly cleaned from the surfaces of the processor heat sink and the processor each time the processor heat sink is removed. Replacement thermal material is included with the processor heat sink and system board spare part kits.

---

 **NOTE:** The following illustration shows the replacement thermal material locations. Thermal paste is used on the processor **(1)** and the processor heat sink section **(2)** that services it.

---




Reverse this procedure to install the processor heat sink.

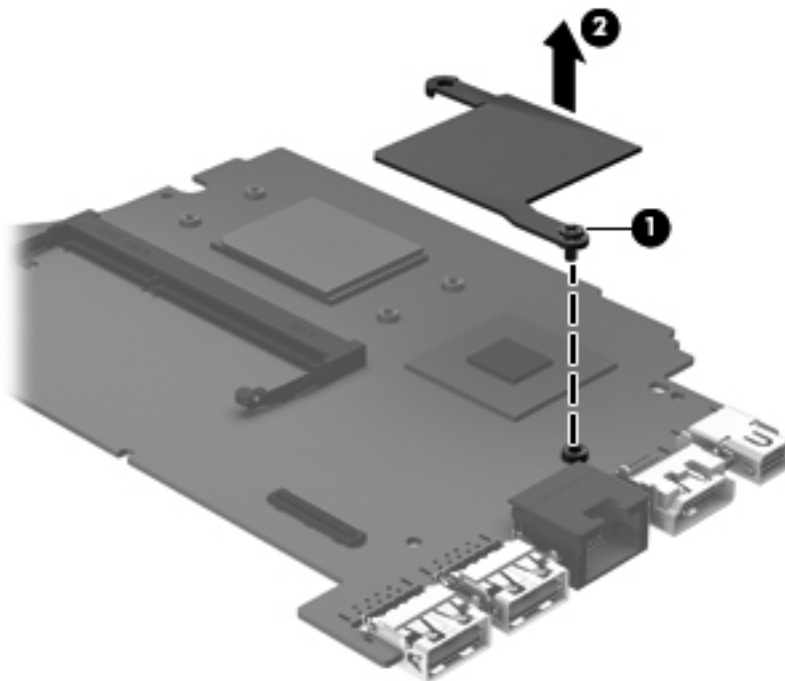
Remove the post controller hub heat sink:

1. Loosen the captive Phillips screw **(1)** that secures the post controller hub heat sink to the system board.
2. Remove the post controller hub heat sink **(2)**.


---

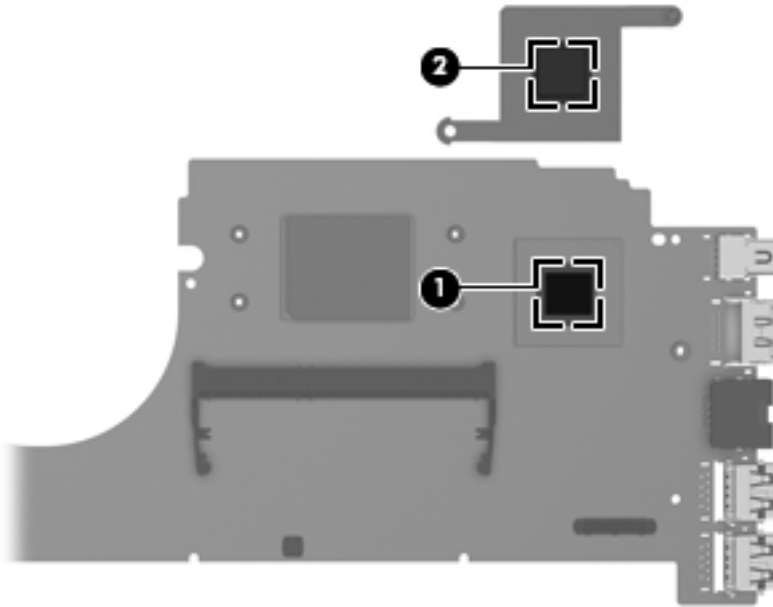
 **NOTE:** Due to the adhesive quality of the thermal material located between the post controller hub heat sink and system board, it may be necessary to move the post controller hub heat sink from side to side to detach it.

---



The thermal material must be thoroughly cleaned from the surfaces of the post controller hub heat sink and the post controller hub each time the post controller hub heat sink is removed. Replacement thermal material is included with the post controller hub heat sink and system board spare part kits.

 **NOTE:** The following illustration shows the replacement thermal material locations. A thermal pad is used on the post controller hub **(1)** and the post controller hub heat sink **(2)**.



Reverse this procedure to install the post controller hub heat sink.



## Hinge covers

Description	Spare part number
Hinge covers	672009-001

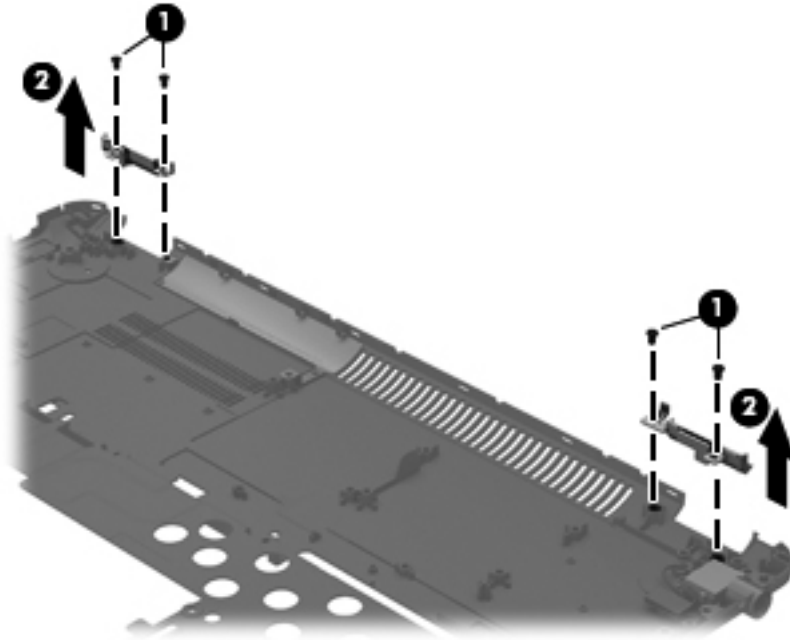
Before removing the hinge covers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))
  - d. WLAN module (see [WLAN module on page 53](#))
  - e. Wireless audio module (see [Wireless audio module on page 51](#))
  - f. System board (see [System board on page 57](#))

Remove the hinge covers:

1. Remove the four Phillips PM2.0×3.8 screws **(1)** that secure the hinge covers to the base enclosure.

2. Remove the hinge covers **(2)** from the base enclosure.



Reverse this procedure to install the hinge covers.

## Display assembly

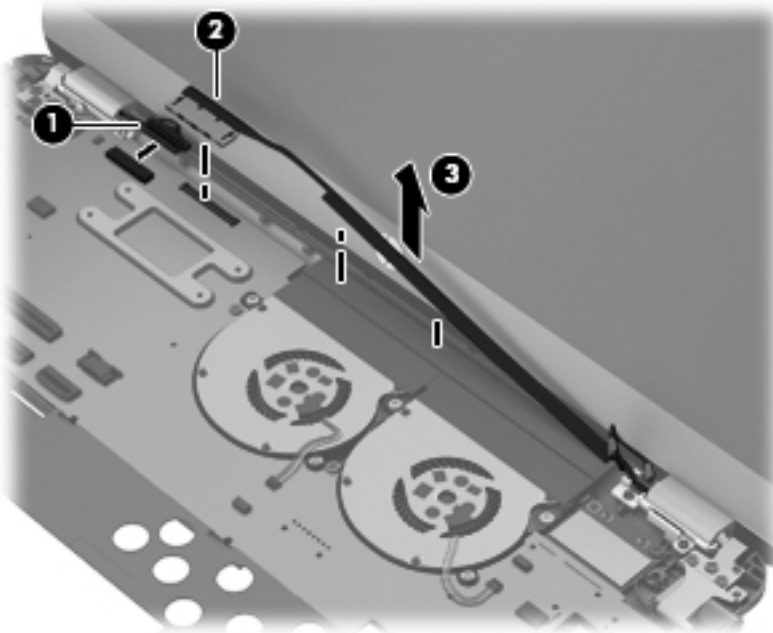
Description	Spare part number
Display assembly, 14.0-in, AntiGlare, high-definition (includes display panel cable, 2 WLAN antenna transceivers and cables, and webcam/microphone module and cable)	675507-001

Before removing the display assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)).
5. Remove the solid-state drive connector board cable (see [Solid-state drive on page 35](#)).
6. Remove the Card Reader board cable (see [Card Reader board cable on page 37](#)).
7. Remove the top cover (see [Top cover on page 40](#)).
8. Disconnect the wireless antenna cables from the wireless audio module (see [Wireless audio module on page 51](#)).

Remove the display assembly:

1. Disconnect the webcam/microphone module cable **(1)** from the system board.
2. Disconnect the display panel cable **(2)** from the system board.
3. Release the display panel cable **(3)** from the heat sink. (The display panel cable is attached to the heat sink with double-sided tape.)



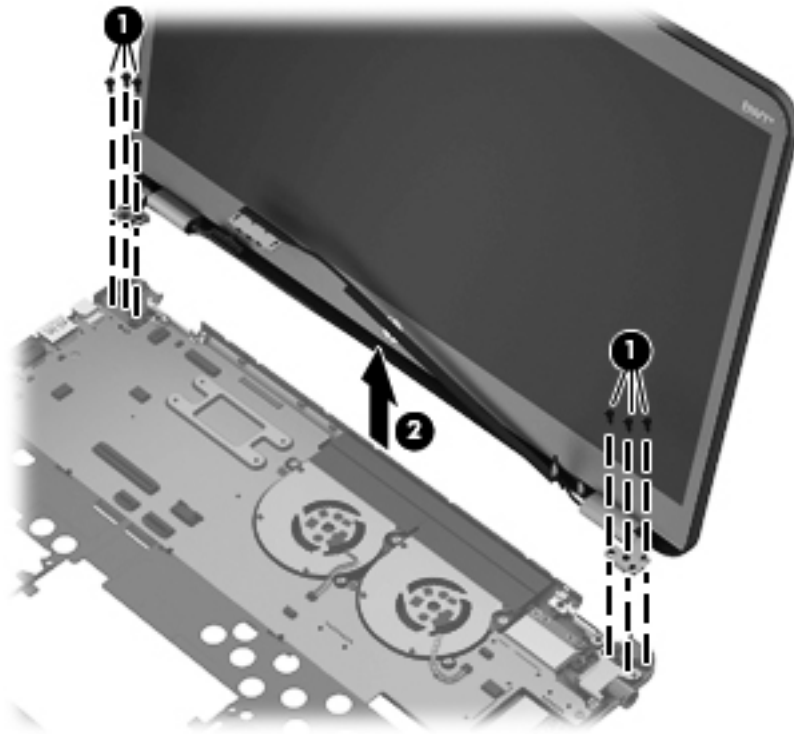
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**⚠ CAUTION:** Support the display assembly when removing the following screws. Failure to support the display assembly can result in damage to the display assembly and other computer components.

---

4. Remove the six Phillips PM2.5×5.6 screws **(1)** that secure the display assembly to the base enclosure.

5. Remove the display assembly (2).



Reverse this procedure to install the display assembly.

## Power connector cable

Description	Spare part number
Power connector cable	687530-001

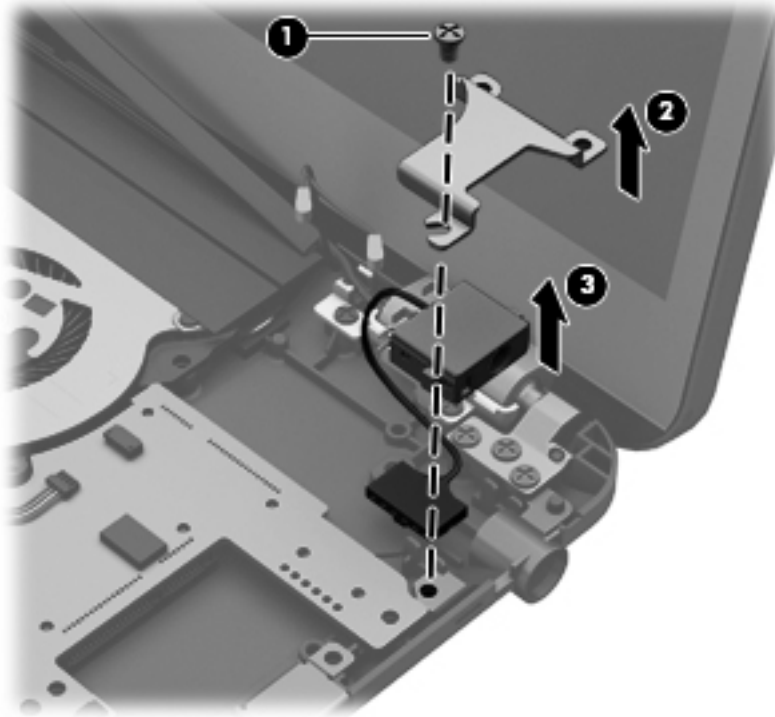
Before removing the power connector cable, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 33](#)), and then remove the following components:
  - a. Solid-state drive connector board cable (see [Solid-state drive on page 35](#))
  - b. Card Reader board cable (see [Card Reader board cable on page 37](#))
  - c. Top cover (see [Top cover on page 40](#))
  - d. WLAN module (see [WLAN module on page 53](#))
  - e. Wireless audio module (see [Wireless audio module on page 51](#))

- f. System board (see [System board on page 57](#))
- g. Display assembly (see [Display assembly on page 66](#))

Remove the power connector cable:

1. Remove the Phillips PM2.0×3.8 screw **(1)** that secures the power connector and bracket to the base enclosure.
2. Remove the power connector bracket **(2)**.
3. Remove the power connector cable **(3)**.




Reverse this procedure to install the power connector cable.

---

# 5 Setup Utility (BIOS) and System Diagnostics


## Using Setup Utility

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

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

---

## Starting Setup Utility

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

---

To start Setup Utility, follow these steps:

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

## Changing the language of Setup Utility

1. Start Setup Utility.
2. Use the arrow keys to select **System Configuration > Language**, and then press **enter**.
3. Use the arrow keys to select a language, and then press **enter**.
4. When a confirmation prompt with your language selected is displayed, press **enter**.
5. To save your change and exit Setup Utility, use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.

Your change takes effect immediately.

## Navigating and selecting in Setup Utility

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

1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
  - To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press **enter**, or use a pointing device to click the item.
  - To scroll up and down, click the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key.
  - To close open dialog boxes and return to the main Setup Utility screen, press **esc**, and then follow the on-screen instructions.
2. Press **f10** to enter Setup Utility.

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

- To exit Setup Utility menus without saving your changes, press the **esc** key, and then follow the on-screen instructions.  
  
– or –  
  
Use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.
- To save your changes and exit Setup Utility menus, press **f10**, and then follow the on-screen instructions.  
  
– or –  
  
Use the tab key and the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.


Your changes go into effect when the computer restarts.

## Displaying system information

1. Start Setup Utility.
2. Select the **Main menu**. System information such as the system time and date, and identification information about the computer is displayed.
3. To exit Setup Utility without changing any settings, use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## Restoring factory settings in Setup Utility

---

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

---

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


1. Turn on or restart the computer, and then press **esc** while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.
2. Press **f10** to enter Setup Utility.
3. Use the arrow keys to select **Exit > Load Setup Defaults**.
4. Follow the on-screen instructions.
5. To save your changes and exit, press **f10**, and then follow the on-screen instructions.

– or –

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

Your changes go into effect when the computer restarts.

---

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

---

## Exiting Setup Utility

- To exit Setup Utility and save your changes from the current session:  
If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Saving Changes**, and then press **enter**.
- To exit Setup Utility without saving your changes from the current session:  
If the Setup Utility menus are not visible, press **esc** to return to the menu display. Then use the arrow keys to select **Exit > Exit Discarding Changes**, and then press **enter**.

## Updating the BIOS

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

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

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



## Determining the BIOS version


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

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

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 tab key and the arrow keys to select **Exit > 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 or Hibernation.

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


---

1. **Windows 7**—Select **Start > Help and Support > Maintain**.

**Windows XP**—Select **Start > Help and Support**, and then select the software and drivers update.

2. Follow the on-screen instructions to identify your computer and access the BIOS update you want to download.
3. At the download area, follow these steps:
  - a. Identify the BIOS update that is later than the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
  - b. Follow the on-screen instructions to download your selection to the hard drive. Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

---


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

---

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

1. **Windows 7**—Open Windows Explorer by selecting **Start > Computer**.  
**Windows XP**—Open Windows Explorer by selecting Start > **My Computer**.
2. Double-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. The following diagnostic tests are available in System Diagnostics:


- Start-up test—This test analyzes the main computer components that are required to start the computer.
- Run-in test—This test repeats the start-up test and checks for intermittent problems that the start-up test does not detect.
- Hard disk test—This test analyzes the physical condition of the hard drive, and then checks all data in every sector of the hard drive. If the test detects a damaged sector, it attempts to move the data to a good sector.
- Memory test—This test analyzes the physical condition of the memory modules. If it reports an error, replace the memory modules immediately.
- Battery test—This test analyzes the condition of the battery. If the battery fails the test, contact HP support to report the issue and purchase a replacement battery.

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

To start System Diagnostics:

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

---

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

---

# 6 Specifications

## Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Width	<b>32.72 cm</b>	12.88 in
Depth	<b>22.10 cm</b>	8.70 in
Height	<b>2.05 cm</b>	0.81 in
<b>Weight</b>	<b>1.80 kg</b>	3.97 lb
<b>Input power</b>		
Operating voltage and current	19.5 V dc @ 3.33 A - 65W	
<b>Temperature</b>		
Operating	<b>5°C to 35°C</b>	41°F to 95°F
Nonoperating	<b>-20°C to 60°C</b>	-4°F to 140°F
<b>Relative humidity</b> (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		
Operating	<b>-15 m to 3,048 m</b>	-50 ft to 10,000 ft
Nonoperating	<b>-15 m to 12,192 m</b>	-50 ft to 40,000 ft
<b>NOTE:</b> Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

## 14.0-inch WGA display specifications

	<b>Metric</b>	<b>U.S.</b>
<b>Dimensions</b>		
Height	<b>17.4 cm</b>	6.85 in
Width	<b>31.3 cm</b>	12.32 in
Diagonal	<b>35.4 cm</b>	13.94 in
<b>Number of colors</b>	262,144	
<b>Contrast ratio</b>	500:1 (typical)	
<b>Brightness</b>	250 nits (typical)	
<b>Pixel resolution</b>		
Pitch	<b>0.2175 × 0.2088 mm</b>	
Format	1600 × 900	
Configuration	RGB vertical stripe	
<b>Backlight</b>	LED	
<b>Character display</b>	80 × 25	
<b>Total power consumption</b>	3.46 W	
<b>Viewing angle</b>	±45° horizontal, +15/−35° vertical (typical)	

---

# 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 the “Creating HP Recovery media” section.

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](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 the “Recovering using HP Recovery Manager” section.

## 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. For more information, see the “Using Windows Refresh for quick and easy recovery” section.
- 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 the “Remove everything and reinstall Windows” section.
- 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 the “Recovering using HP Recovery Manager” section.


- 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 the “Recovering using HP Recovery Manager” section.
- 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 the “Recovering using HP Recovery Manager” section.
- 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 the “Removing the HP Recovery partition” section.


## 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. From 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 on 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. From 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](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 the “Changing the computer boot order” section.

---

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 the “Creating HP Recovery media ” section.

---

Follow these steps to remove the HP Recovery partition:

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

---

## 8 Power cord set requirements

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

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

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

### Requirements for all countries

The following requirements are applicable to all countries and regions:

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

## Requirements for specific countries and regions

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

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

---

## 9 Recycling

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

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

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