



HP 14 Notebook PC

Maintenance and Service Guide

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Product notice

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


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

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

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Important Notice about Customer Self-Repair Parts

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

Safety warning notice


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

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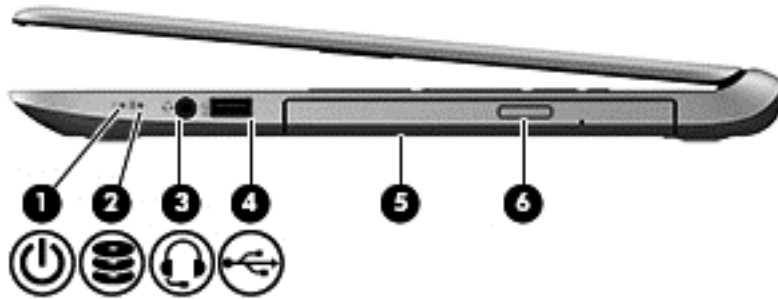
1 Product description





| Category | Description |
|------------------------|---|
| Product Name | HP 14 Notebook PC |
| Processors | Processors are attached to the system board. AMD A4-PRO 3340B (2.2 GHz, 2 MB L2, 1600 MHz DDR3L), quad core, 25 W AMD A4-5000 (1.5 GHz, 2 MB L2, 1600 MHz DDR3L), quad core, 15 W AMD E1-2100 (1.0 GHz, 1 MB L2, 1333 MHz DDR3L), dual core, 9 W |
| Chipset | AMD Integrated SOC FCH |
| Graphics | Internal graphics: <ul style="list-style-type: none">• AMD Radeon HD 8330, for use with computer models with A4 processors• AMD Radeon HD 8210, for use with computer models with E1 processors HD decode, DX11.1, and HDMI |
| Panel | 14 in (35.56 cm), high-definition (HD), white light-emitting diode (WLED), BrightView (1366×768) flat display, 3.6 mm, SVA, typical brightness: 200 nits 16:9 Ultra Wide Aspect Ratio Single channel LVDS support |
| Memory | Two SODIMM customer-accessible/upgradable memory module slots DDR3L-1600 MHz single channel support Supports up to 4 GB in the following configurations: <ul style="list-style-type: none">• 4096 MB (4096 MB×1)• 2048 MB (2048 MB×1) |
| Hard drive | Supports 6.35 cm (2.5 in) hard drives in 9.5 mm (.37 in) and 7.0 mm (.28 in) thicknesses (all hard drives use the same bracket): <ul style="list-style-type: none">• 1 TB, 5400 rpm, 9.5 mm• 500 GB, 5400 rpm, 7.0 mm/9.5 mm• 320 GB, 5400 rpm, 7.0 mm Accelerometer/HP protection support |
| Optical drive | DVD±RW Double-Layer SuperMulti Drive 9.5 mm tray load, fixed, serial ATA Zero power optical drive |
| Audio and video | HD Audio Dual speakers HP Webcam (VGA camera, fixed (no tilt) with activity LED; 640×480 by 24 frames per second Single digital microphone |
| Ethernet | Integrated 10/100 NIC |

| Category | Description |
|-----------------------------------|---|
| Wireless | <p>Integrated wireless local area network (WLAN) options with single antenna (HMC/PCIe)</p> <p>Compatible with Miracast-certified devices</p> <p>Support for the following WLAN formats:</p> <ul style="list-style-type: none"> • Realtek RT8723BE 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter • Realtek RTL8188EE 802.11 bgn 1x1 Wi-Fi adapter |
| External media cards | <p>HP Multi-Format Memory Card Reader slot with push-push technology, supporting the following digital card formats:</p> <ul style="list-style-type: none"> • Secure Digital (SD) Memory Card • Secure Digital High Capacity (SDHC) Memory Card • Secure Digital eXtended Capacity (SDXC) Memory Card |
| Ports | <p>AC Smart Pin adapter plug (4.5 mm barrel)</p> <p>Combination audio-out (stereo headphone)/audio-in (mono microphone)</p> <p>RJ-45 (Ethernet)</p> <p>USB 3.0 (2 ports), USB 2.0 (1 port)</p> <p>HDMI version 1.4 output supporting 1920 x 1080 @ 60 Hz</p> <p>(1) USB 2.0 port (right side)</p> <p>(2) USB 3.0 ports (left side)</p> |
| Keyboard/ pointing devices | <p>Full-size black textured island-style, with black keyboard frame</p> <p>Multitouch gestures enabled (2-finger scroll, pinch/zoom, edge swipe)</p> <p>Supports Windows® 8 Modern Trackpad Gestures</p> <p>Supports PS/2 interface</p> |
| Power requirements | <p>45 W AC adapter (4.5 mm)</p> <p>1 meter power cord</p> <p>Supports the following batteries:</p> <ul style="list-style-type: none"> • 4 cell battery - 41 Whr (2.8 AH) • 3 cell battery - 31 Whr (2.8 AH) <p>Supports battery fast charge, battery life enhancement</p> |
| Security | Security cable lock |
| Operating system | Windows 8.1 with Bing image (64 bit) |
| Serviceability | <p>End-user replaceable parts:</p> <ul style="list-style-type: none"> • AC adapter • Battery • Keyboard • Memory module • Optical drive • WLAN module |

2 External component identification

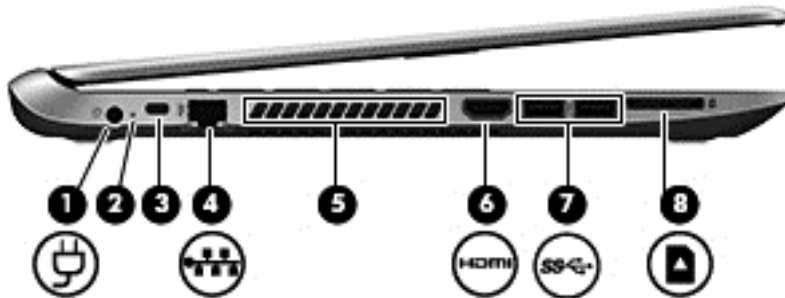
Right side








| Component | Description |
|--|--|
| (1)  Power light | <ul style="list-style-type: none">On: The computer is on.Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. <p>NOTE: For select models, the Intel Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p> |
| (2)  Hard drive light | <ul style="list-style-type: none">Blinking white: The hard drive is being accessed.Amber: HP 3D DriveGuard has temporarily parked the hard drive. |
| (3)  Audio-out (headphone) / Audio-in (microphone) jack | <p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional microphone-only devices.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before using the headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety and Environmental Notices</i>.</p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p> <p>NOTE: Be sure that the device cable has a 4-conductor connector that supports both audio-out (headphone) and audio-in (microphone).</p> |
| (4)  USB 2.0 port | <p>Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner, or USB hub.</p> |
| (5) Optical drive | <p>Reads and/or writes, depending on your computer model, to an optical disc.</p> |

| Component | Description |
|-----------|---|
| | NOTE: For disc compatibility information, navigate to the Help and Support webpage. Follow the web page instructions to select your computer model. Select Support & Drivers , and then select Product Information . |
| (6) | Optical drive eject button Releases the disc tray. |

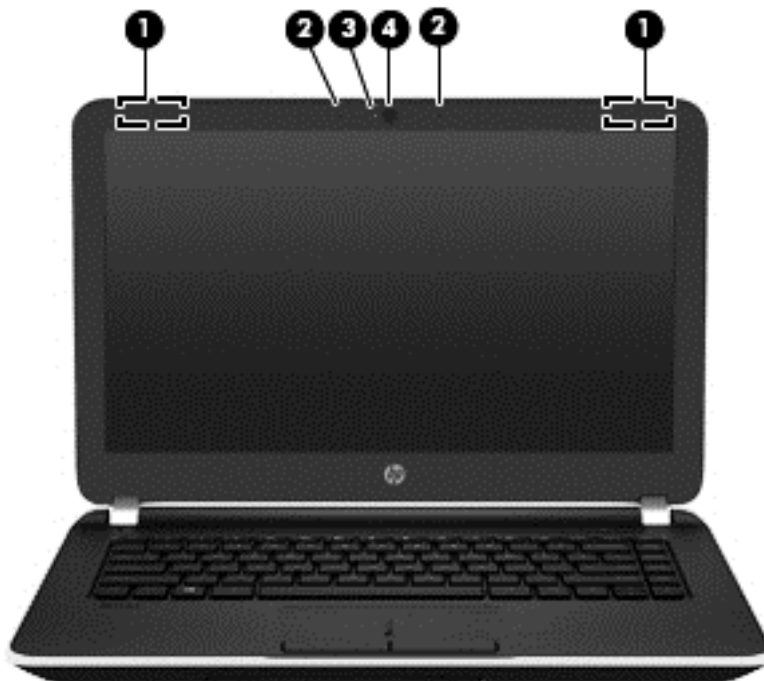
Left side



| Component | Description |
|---|--|
| (1) | Power connector Connects an AC adapter. |
| (2)  | AC adapter adapter/battery light <ul style="list-style-type: none"> White: The AC adapter is connected and the battery is charged. Amber: The AC adapter is connected and the battery is charging. Off: The computer is using DC power. |
| (3) | Security cable slot Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen. |
| (4)  | RJ-45 (network) jack Connects a network cable. RJ-45 (network) status lights (2) White: The network is connected. Amber: Activity is occurring on the network. |
| (5) | Vents (2) Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| (6)  | HDMI port Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device. |
| (7)  | USB 3.0 ports (2) Connect optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub. |
| (8)  | Memory card reader Reads data from and writes data to memory cards such as Secure Digital (SD). To insert: |

| Component | Description |
|-----------|---|
| | <ul style="list-style-type: none"> ▲ Hold the card, label side up, with connectors facing the slot and push in the card until it is firmly seated. |
| | To remove: |
| | <ul style="list-style-type: none"> ▲ Press in on the card and quickly release it until it pops out. |

Display

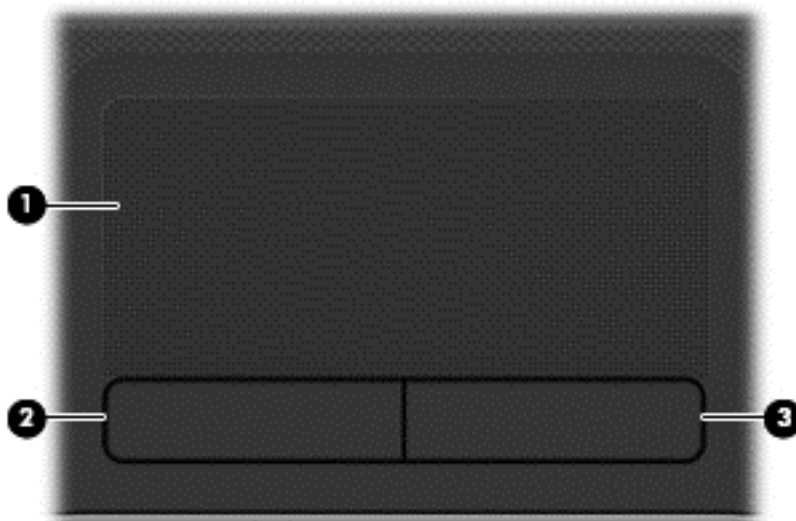


| Component | Description |
|------------------------------|--|
| (1) WLAN antennas (2)* | <p>Send and receive wireless signals to communicate with wireless local area networks (WLANs).</p> <p>NOTE: To set up a WLAN and connect to the Internet, you need a broadband modem (either DSL or cable) (purchased separately), high-speed internet service purchased from an Internet service provider, and a wireless router (purchased separately).</p> |
| (2) Internal microphones (2) | Record sound. |
| (3) Webcam light | On: The webcam is in use. |
| (4) Webcam | Records video and captures photographs. Some models may allow you to video conference and chat online using streaming video. |

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions. For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

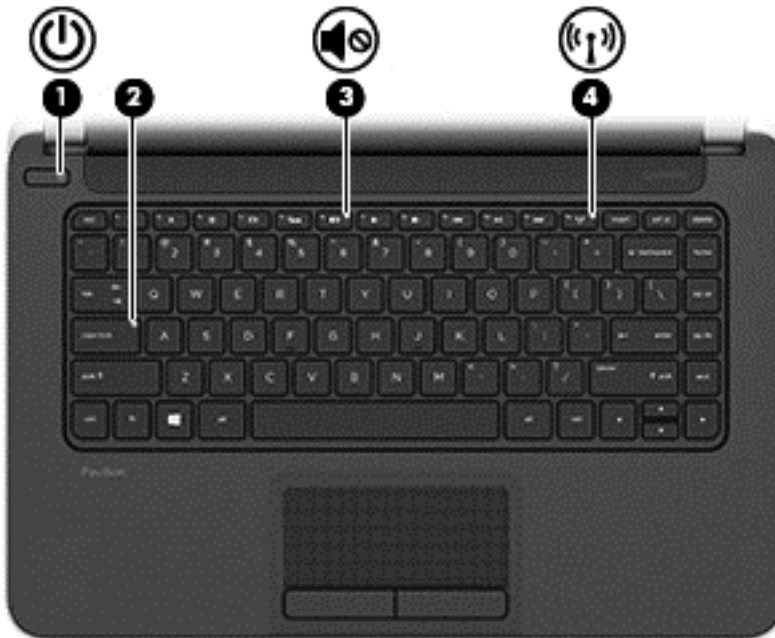
Top




TouchPad



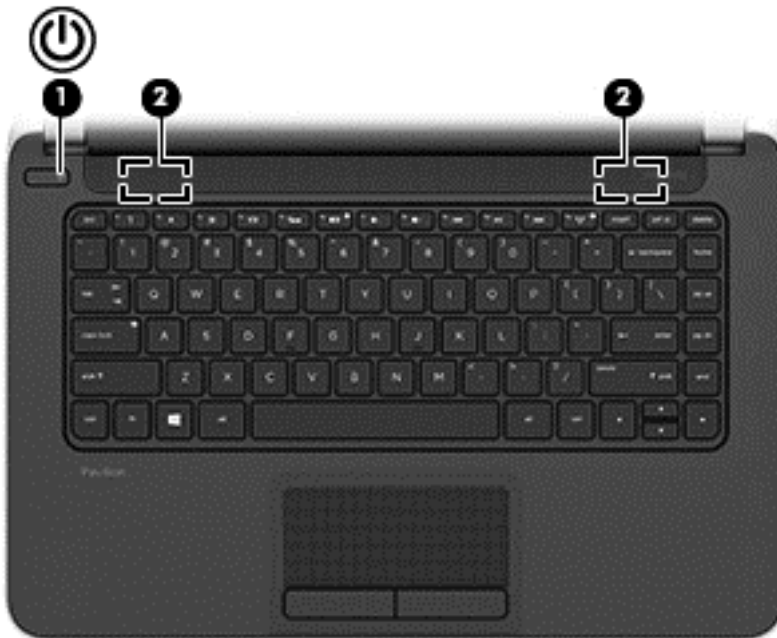
| Component | Description |
|---------------------------|---|
| (1) TouchPad zone | Moves the on-screen pointer and selects or activates items on the screen. NOTE: The TouchPad also supports edge-swipe gestures. |
| (2) Left TouchPad button | Functions like the left button on an external mouse. |
| (3)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


Lights



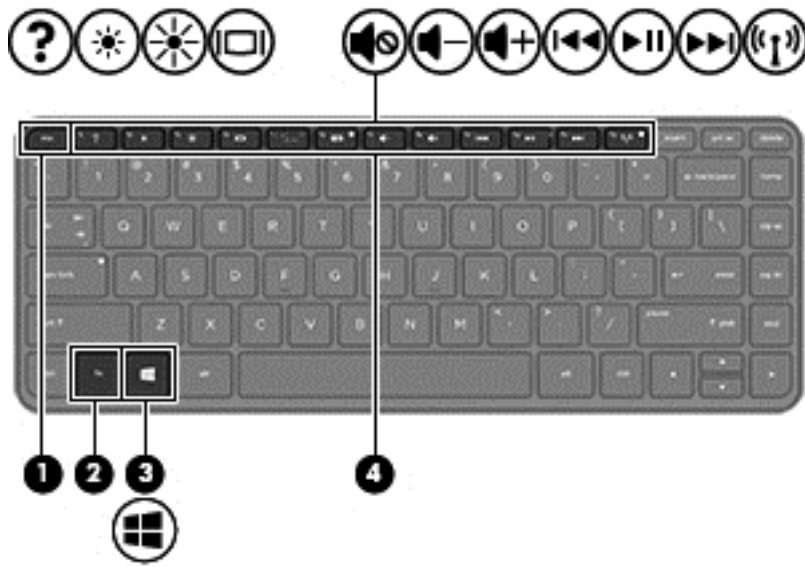
| Component | Description |
|--|---|
| (1)  Power light | <ul style="list-style-type: none">• On: The computer is on.• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. <p>NOTE: For select models, the Intel Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p> |
| (2) Caps lock light | On: Caps lock is on, which switches the keys to all capital letters. |
| (3)  Mute light | <ul style="list-style-type: none">• Amber: Computer sound is off.• Off: Computer sound is on. |
| (4)  Wireless light | On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth device, is on. <p>NOTE: On some models, the wireless light is amber when all wireless devices are off.</p> |


Buttons and speakers



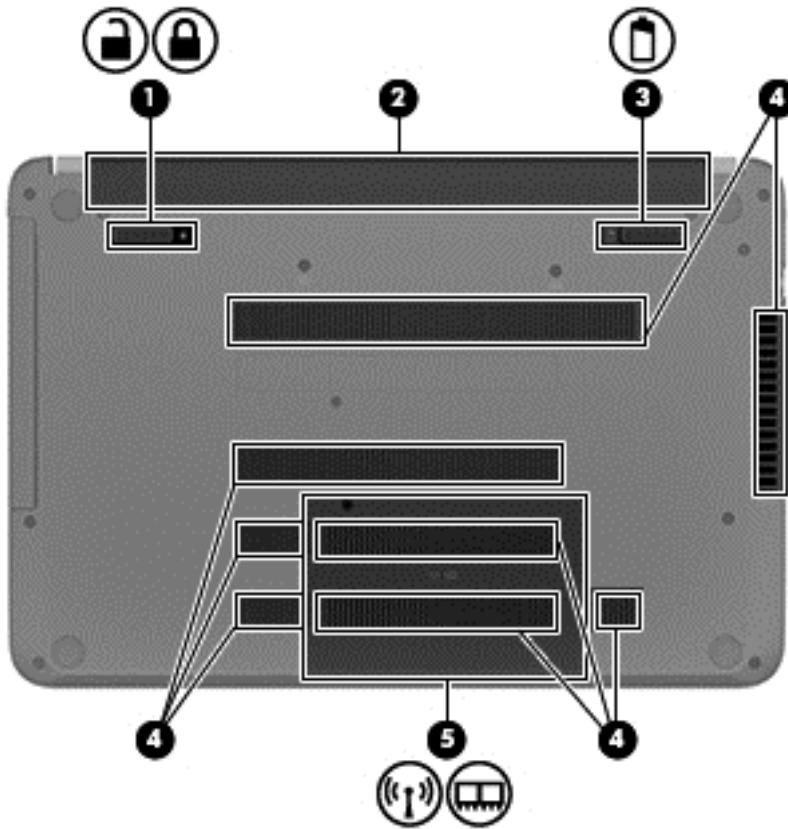
| Component | Description |
|---|---|
| (1)  Power button | <ul style="list-style-type: none">• When the computer is off, press the button to turn on the computer.• When the computer is on, press the button briefly to initiate Sleep.• When the computer is in the Sleep state, press the button briefly to exit Sleep.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding down the power button will result in the loss of unsaved information.</p> <p>If the computer has stopped responding and Windows shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>NOTE: For select models, the Intel Rapid Start Technology feature is enabled at the factory. Rapid Start Technology allows your computer to resume quickly from inactivity.</p> |
| (2) Speakers (2) | Produce sound. |




Keys



| Component | Description |
|---|---|
| (1) <code>esc</code> key | Reveals system information when pressed in combination with the <code>fn</code> key. |
| (2) <code>fn</code> key | Executes frequently used system functions when pressed in combination with the <code>esc</code> key. |
| (3)  Windows key | Returns you to the Start screen from an open app or the Windows desktop. NOTE: Pressing the Windows key again will return you to the previous screen. |
| (4) Action keys | Execute frequently used system functions. |

Bottom



| Component | Description |
|---|--|
| (1)  | Battery lock latch Unlocks the battery. |
| (2) | Battery bay Holds the battery. |
| (3)  | Battery release latch Releases the battery from the battery bay, after the battery lock latch has been released. |
| (4) | Vents (8) Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |
| (5)  | Service door Provides access to the wireless LAN (WLAN) module slot and the memory module slots. CAUTION: To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module to restore computer functionality, and then contact support through Help and Support. |

Labels

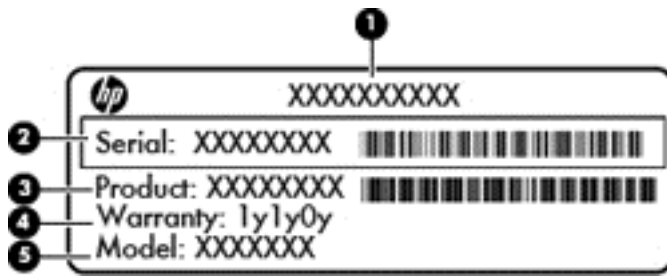
The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

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

For help finding these locations, refer to [Bottom on page 10](#).

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

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



Component

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



Component

- (1) Serial number
- (2) Product number
- (3) Warranty period

Component


(4) Model number (select models only)

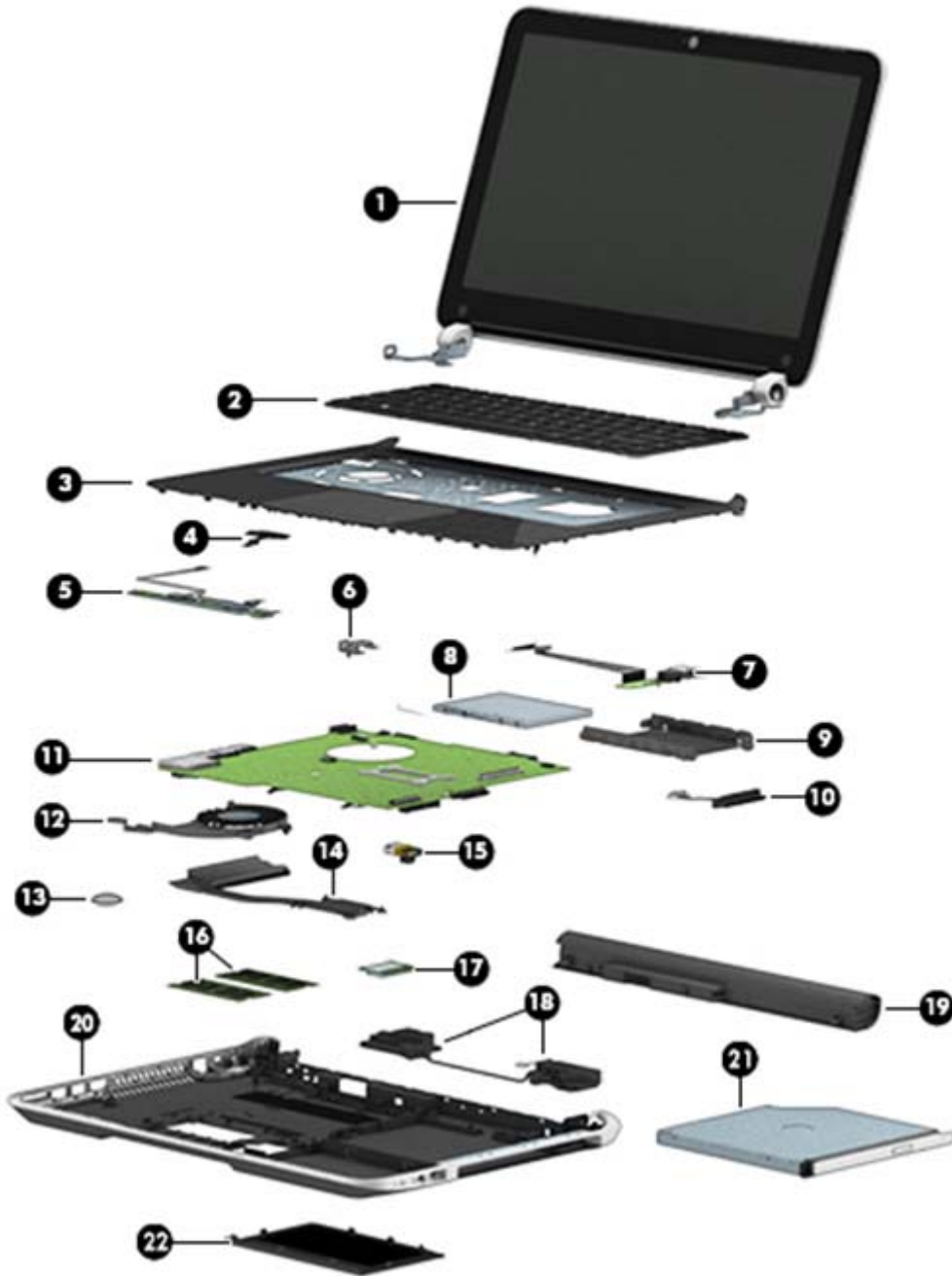
(5) Revision number

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

3 Illustrated parts catalog

Computer major components

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 11](#) for details.



| Item | Component | Spare part number |
|------|--|-------------------|
| (1) | Display assembly, 14.0 in (35.56 cm), high definition (HD), WLED, SVA BrightView | not spared |
| | NOTE: The display assembly is spared at the subcomponent level only. | |
| (2) | Keyboard (includes keyboard cable): | |
| | Latin America | 785871-161 |
| | United States | 785871-001 |
| (3) | Top cover (includes TouchPad and cable): | 785295-001 |
| (4) | Power button board (includes cable) | 785287-001 |
| (5) | TouchPad button board (includes cable) | 734418-001 |
| (6) | Power connector bracket is available with the power connector cable, spare part number 732067-001 | |
| (7) | USB/audio board (includes cable) | 734417-001 |
| (8) | Hard drive (does not include hard drive rubber bracket, hard drive connector cable, or screws): | |
| | 1 TB, 5400 rpm, 9.5 mm | 778192-005 |
| | 500 GB, 5400 rpm, 7.0 mm | 669299-005 |
| | Hard Drive Hardware Kit , includes: | 740706-001 |
| (9) | Rubber bracket | |
| (10) | Hard drive connector | |
| (11) | System board (includes replacement thermal material): | |
| | AMD A4-5000 for use in models without the Windows operating system | 785293-001 |
| | AMD A4-5000 for use with Windows 8.1 Standard | 785293-501 |
| | AMD E1-2100 processor for use in models without the Windows operating system | 785292-001 |
| | AMD E1-2100 processor for use with Windows 8.1 Standard | 785292-501 |
| (12) | Fan | 732068-001 |
| (13) | RTC battery | 697917-001 |
| (14) | Heat sink assembly (includes replacement thermal material): | 776776-001 |
| (15) | Power connector cable (includes bracket): | 732067-001 |
| (16) | Memory modules (2), (PC3L, 12800, 1600 MHz): | |
| | 2 GB memory module | 691739-001 |
| | 4 GB memory module | 691740-001 |
| (17) | WLAN module: | |
| | Realtek RT8723BE 802.11 bgn 1x1 Wi-Fi + BT4.0 Combo Adapter | 753077-001 |
| | Realtek RTL8188EE 802.11 bgn Wi-Fi adapter | 709848-001 |
| (18) | Speakers (include subwoofer, speaker cables, and rubber isolators) | 734422-001 |
| (19) | Battery | |
| | 4 cell, 41 Whr, 2.8 Ah, Li-ion battery | 752237-001 |


| Item | Component | Spare part number |
|------|--|-------------------|
| | 3 cell, 31 Whr, 2.8 Ah, Li-ion battery | 776906-001 |
| (20) | Base enclosure (includes battery release latch mechanism, RJ45 cover, and screws) | 785283-001 |
| (21) | DVD+/-RW DL SuperMulti Drive (includes bezel, bracket, and screws) | 785286-001 |
| (22) | Service door | 785288-001 |

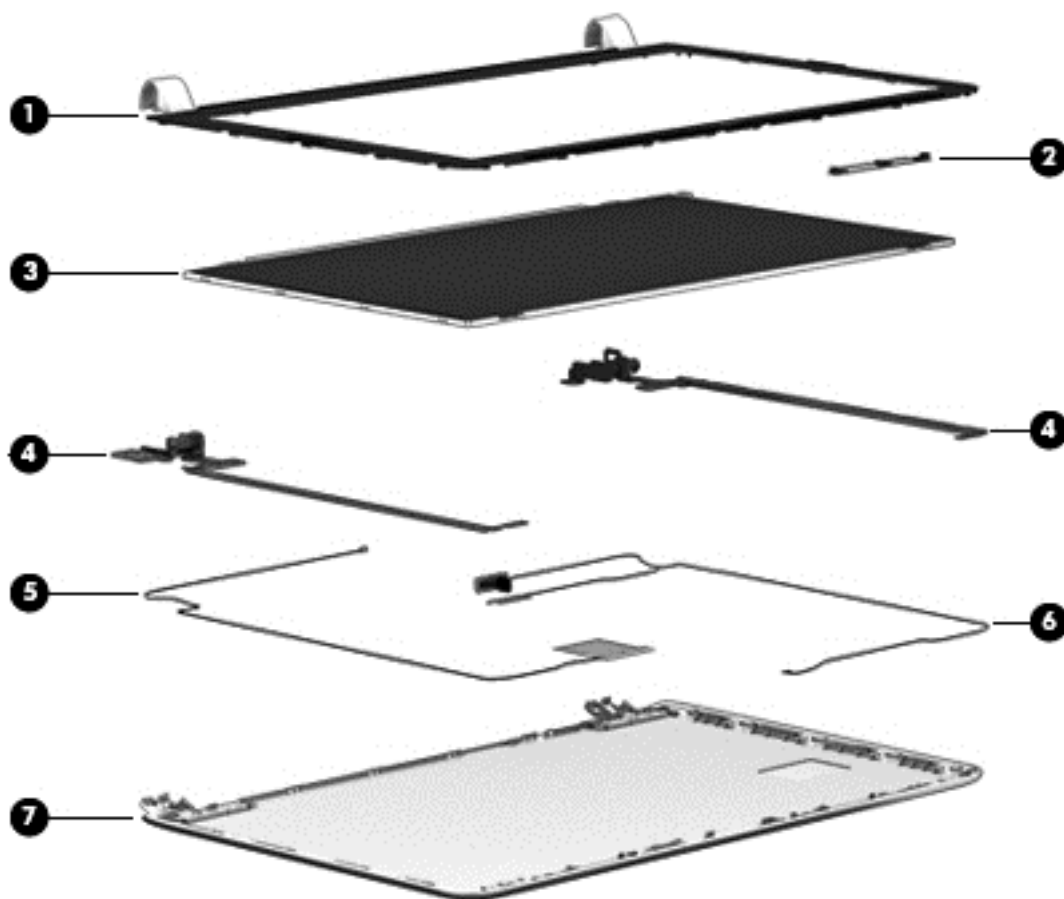
Mass storage devices



| Item | Component | Spare part number |
|------|---|-------------------|
| (1) | Hard drive (does not include the hard drive rubber bracket, hard drive connector cable, or screws) | |
| | 1 TB, 5400 rpm, 9.5 mm | 778192-005 |
| | 500 GB 5400 rpm 7 mm | 669299-005 |
| | Hard Drive Hardware Kit , includes: | 740706-001 |
| | Hard drive rubber bracket | |
| | Hard drive connector cable | |
| | Hard drive screws | |
| (2) | DVD+/-RW DL SuperMulti Drive (includes bezel, bracket, and screws) | 785286-001 |

Display assembly subcomponents

 **NOTE:** The display assembly subcomponents are for the HP Pavilion flat display models only. TouchSmart models are spared at the display assembly only.



| Item | Component | Spare part number |
|------|--|-------------------|
| (1) | Display bezel (includes screws) | 785285-001 |
| (2) | 14 in (35.56 cm), BrightView, HD, WLED, SVA flat display panel (Screws included in the screw kit, spare part number 785291-001) | 785289-001 |
| (3) | Webcamera/microphone module (includes adhesive and screws) | 776787-001 |
| (4) | Display panel cable (includes webcam/microphone module cable and screws) | 734407-001 |
| (5) | Antenna Kit (includes screw and Mylar tape) | 788630-001 |
| (6) | Display Hinge Kit (includes left and right hinges and screws) | 734408-001 |
| (7) | Display back cover (includes screws): | 785282-001 |

Miscellaneous parts

| Component | Spare part number |
|--|-------------------|
| 45 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm) | 741727-001 |
| Power cord (3 pin, black, 1.83 m): | |
| For use in the United States | 755530-001 |
| For use in Argentina | 755530-D01 |
| For use in India | 755530-D61 |
| For use in Italy | 755530-061 |
| Screw Kit | 785291-001 |

Sequential part number listing

| Spare part number | Description |
|-------------------|--|
| 669299-005 | 500 GB, 5400 rpm hard drive (SATA, 7.0 mm, does not include hard drive rubber bracket, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 740706-001. |
| 691739-001 | 2 GB memory module (PC3, 12800, 1600 MHz) |
| 691740-001 | 4 GB memory module (PC3, 12800, 1600 MHz) |
| 697917-001 | RTC battery |
| 709848-001 | Realtek RTL8188EE 802.11 bgn Wi-Fi Adapter |
| 732067-001 | Power connector cable (includes bracket) |
| 732068-001 | Fan |
| 734407-001 | Display panel cable (includes (includes webcam/microphone module cable and screws) |
| 734408-001 | Display Hinge Kit (includes left and right hinges and screws) |
| 734417-001 | USB/audio board (includes cable) |
| 734418-001 | TouchPad button board (includes cable) |
| 734422-001 | Speakers (include subwoofer, speaker cables, and rubber isolators) |
| 740706-001 | Hard Drive Hardware Kit (includes hard drive rubber bracket, hard drive connector cable, and screws) |
| 741727-001 | 45 W HP Smart AC adapter (nPFC, RC, 3-wire, 4.5 mm), nslim |
| 752237-001 | 4 cell, 41 Whr, 2.8 Ah, Li-ion battery |
| 753077-001 | Realtek RT8723BE 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter |
| 755530-001 | Power cord for use in North America (3 pin, black, 1.83 m) |
| 755530-061 | Power cord for use in Italy (3 pin, black, 1.83 m) |
| 755530-D01 | Power cord for use in Argentina (3 pin, black, 1.83 m) |

| Spare part number | Description |
|-------------------|--|
| 755530-D61 | Power cord for use in India (3 pin, black, 1.83 m) |
| 776776-001 | Heat sink for use only on computer models equipped with Intel processors and switchable discrete graphics |
| 776787-001 | Webcamera/microphone module (includes adhesive and screws) |
| 776906-001 | 3 cell, 31 Whr, 2.8 Ah, Li-ion battery |
| 778192-005 | 1 TB, 5400 rpm hard drive (SATA, 9.5 mm, does not include hard drive rubber bracket, hard drive connector cable, or screws) NOTE: The hard drive rubber bracket, hard drive connector cable, and screws are included in the Hard Drive Hardware Kit, spare part number 740706-001. |
| 785282-001 | Display back cover |
| 785283-001 | Base enclosure (includes battery release latch mechanism , RJ-45 cover, and screws) |
| 785286-001 | DVD+/-RW DL SuperMulti Drive (includes bezel, bracket, and screws) |
| 785287-001 | Power button board (includes cable) |
| 785288-001 | Service door |
| 785289-001 | 14 in (35.56 cm), WLED, HD, BrightView flat display panel for use with HP Pavilion Notebooks only |
| 785291-001 | Screw Kit |
| 785292-001 | System board with AMD E1-2100 processor for use in models without the Windows operating system (includes replacement thermal material) |
| 785292-501 | System board with AMD E1-2100 processor for use in models with Windows 8.1 Standard (includes replacement thermal material) |
| 785293-001 | System board for use with computer models with an AMD A4-5000 processor and without the Windows operating system (includes replacement thermal material) |
| 785293-501 | System board for use with computer models with an AMD A4-5000 processor and Windows 8.1 Standard (includes replacement thermal material) |
| 785295-001 | Top cover (includes TouchPad and cable) |
| 785285-001 | Display bezel (includes 2 rubber screw covers and rubber bumpers), for the HP Pavilion flat display models only |
| 785871-001 | Keyboard in black finish for use in the United States (includes keyboard cable) |
| 785871-161 | Keyboard in black finish for use in Latin America (includes keyboard cable) |
| 788630-001 | Antenna Kit (includes screw and Mylar tape) |

4 Removal and replacement procedures preliminary requirements


Tools required

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


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

Service considerations

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

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

Plastic parts

 **CAUTION:** Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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


The following grounding equipment is recommended to prevent electrostatic damage:

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


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


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

5 Removal and replacement procedures for Customer Self-Repair parts

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

Component replacement procedures

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 11](#) for details.

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

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

Battery

| Description | Spare part number |
|--|-------------------|
| 4 cell, 41 Whr, 2.8 Ah, Li-ion battery | 752237-001 |
| 3 cell, 31 Whr, 2.8 Ah, Li-ion battery | 776906-001 |

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. Position the computer upside down on a flat surface.
2. Firmly slide the battery lock latch **(1)** to unlock the battery and slide the battery release latch **(2)** to release the battery.
3. Slide the battery **(3)** from the middle to remove it from the computer.

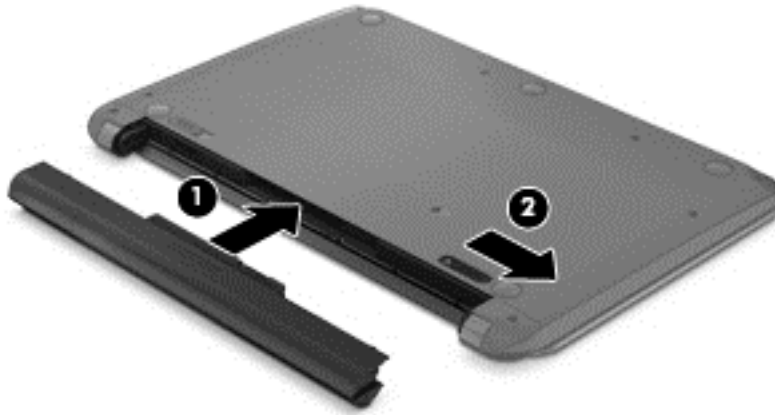


To insert the battery:

CAUTION: Do not slant the battery as you insert it. Slide the battery in straight.

1. Holding the battery in the middle, slide the battery **(1)** straight into the computer until the battery release latch locks into place.

2. Reset the battery lock latch **(2)** to the locked position.



Service door

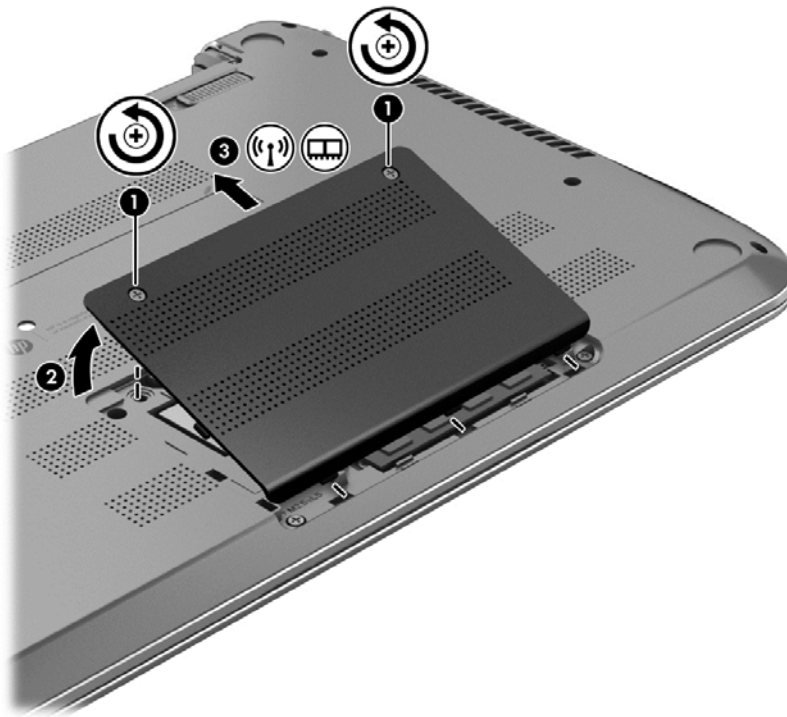
| Description | Spare part number |
|--------------|-------------------|
| Service door | 785288-001 |

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 25](#)).

Remove the service door:


1. Using a small Phillips screwdriver, loosen the two captive Phillips screws **(1)**.
2. Lift the door **(2)**.

3. Slide the service door **(3)** forward to remove.



Memory module


| Description | Spare part number |
|---|-------------------|
| 4 GB memory module (PC3, 12800, 1600 MHz) | 691740-001 |
| 2 GB memory module (PC3, 12800, 1600 MHz) | 691739-001 |

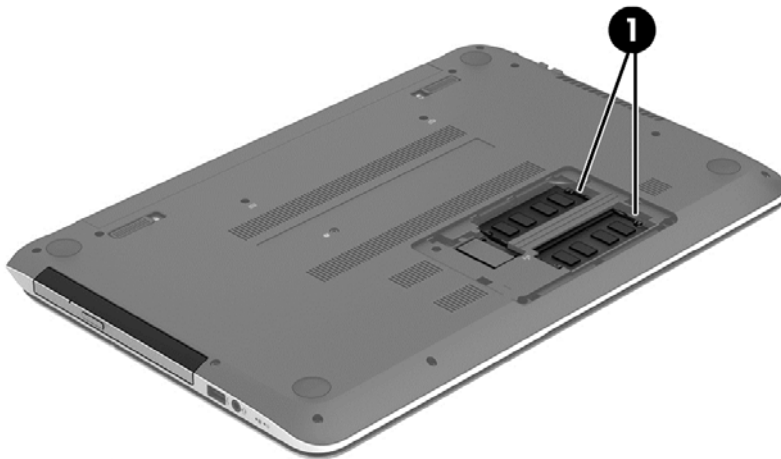
 **NOTE:** Before adding memory modules, make sure the computer has the most recent BIOS version, and update the BIOS if needed.

Before removing a memory module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)).
5. Remove the service door (see [Service door on page 26](#)).

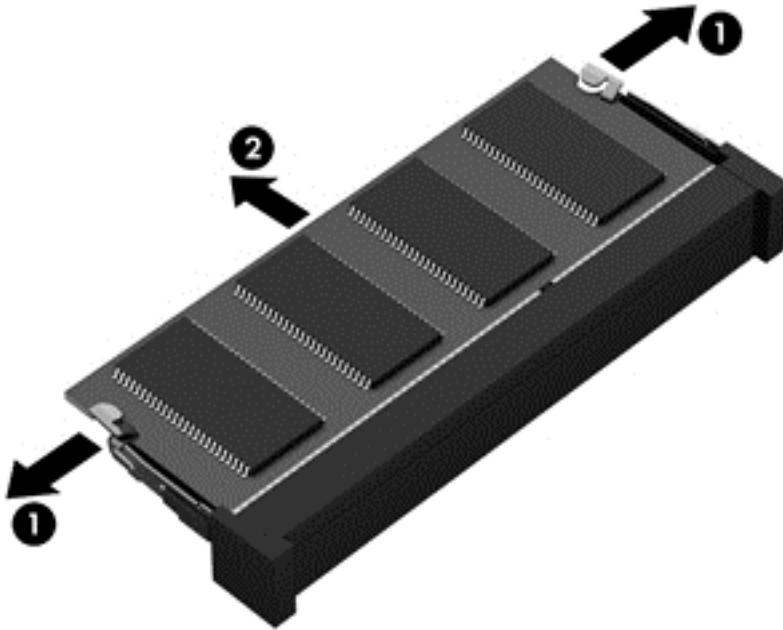
Remove the memory module:

 **NOTE:** Note the location of the memory module **(1)** you are removing. If you are replacing it, install the new memory module in the same slot.



1. Spread the two retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

2. Remove the memory module **(2)** by pulling it away from the slot at a 45 degree angle.



Reverse this procedure to install the memory module.

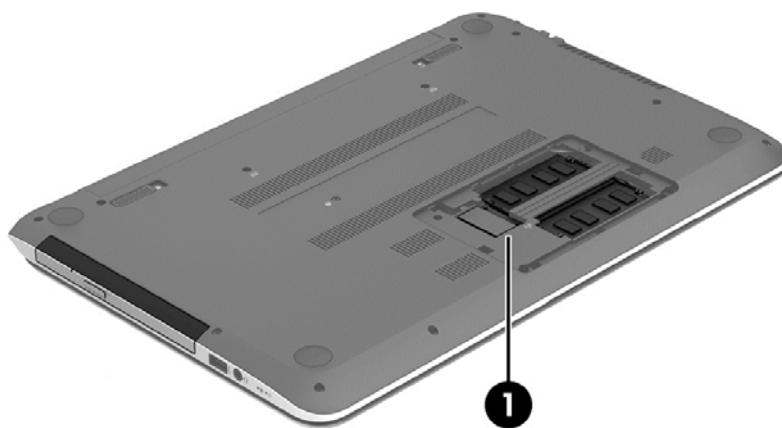
WLAN module

| Description | Spare part number |
|--|-------------------|
| Realtek RT8723BE 802.11bgn 1x1 Wi-Fi + BT4.0 Combo Adapter | 753077-001 |
| Realtek RTL8188EE 802.11 bgn Wi-Fi adapter | 709848-001 |

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

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)).
5. Remove the service door (see [Service door on page 26](#)).
6. Locate the WLAN module **(1)**.



Remove the WLAN module:

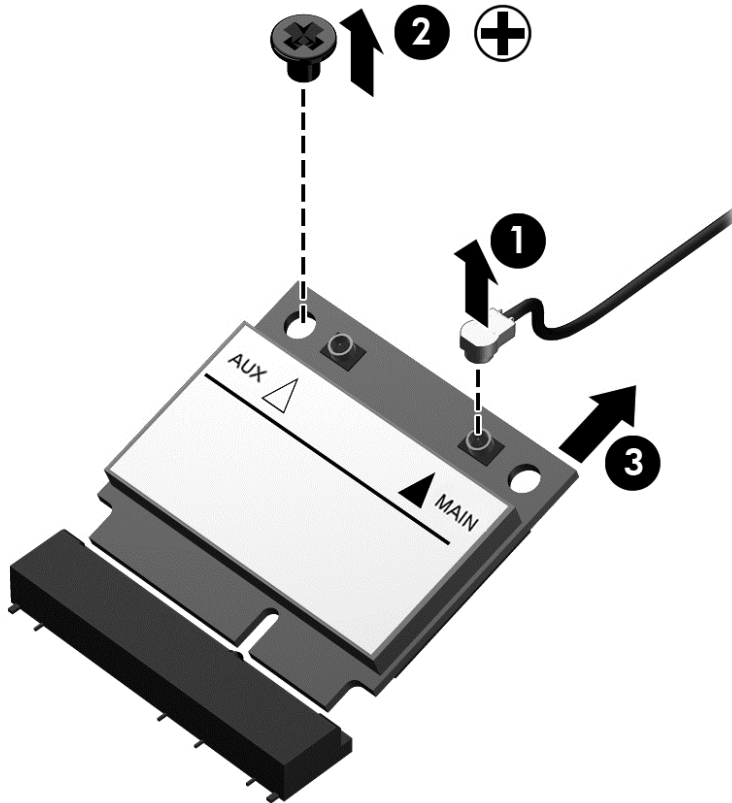
1. Disconnect the WLAN antenna cable **(1)** from the terminal on the WLAN module.



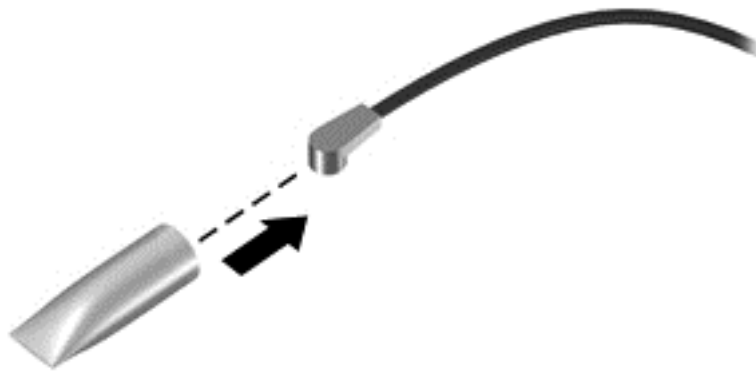
NOTE: The #1 WLAN antenna cable is connected to the WLAN module “Main” terminal.

2. Remove the Phillips M2.0×2.5 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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



NOTE: If the WLAN antenna is not connected to the terminal on the WLAN module, the protective sleeve should be installed on the antenna connector, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

Optical drive

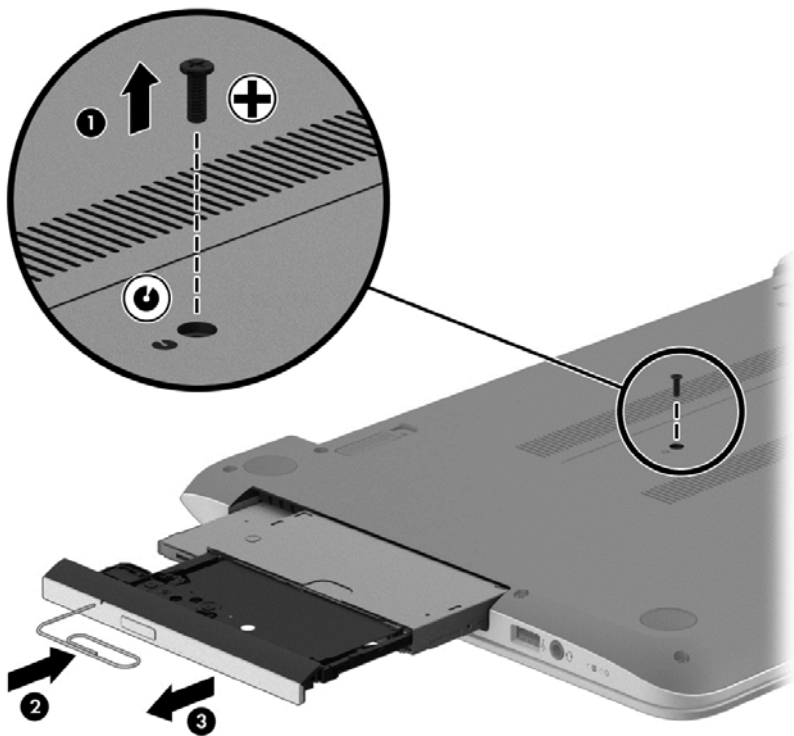
| Description | Spare part number |
|---|-------------------|
| DVD+/-RW DL SuperMulti Drive (includes bezel, bracket, and screws)) | 785286-001 |

Before removing the optical drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)).

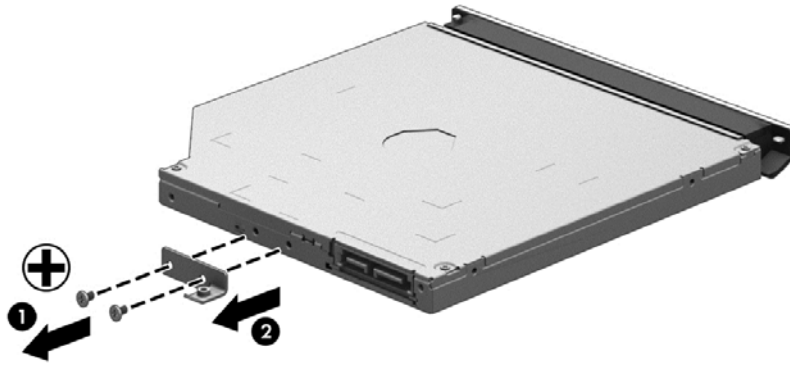
Remove the optical drive:

1. Using a small Phillips screwdriver, remove the Phillips M2.5×6.5 screw that secures the optical drive to the computer **(1)**.
2. Using the screwdriver, push on the rear of the optical drive to disconnect it from the computer
3. If necessary, use a straightened paperclip and press gently in the release hole **(2)** until the disc tray releases. Pull the tray **(3)** out from the front until the optical drive is completely removed from the computer.

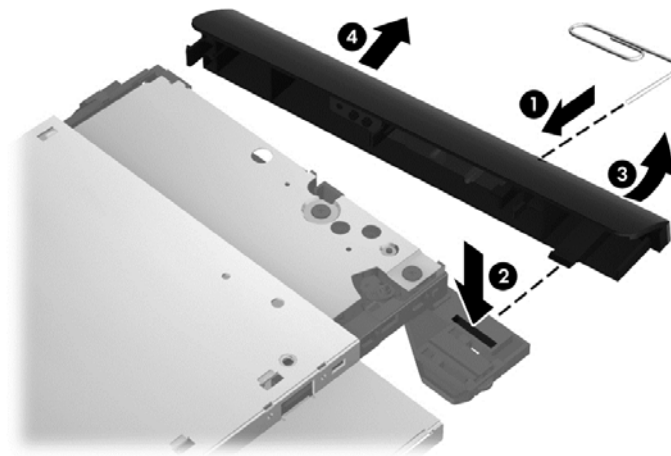


If it is necessary to replace the optical drive bracket and bezel, position the optical drive with the rear panel toward you.

1. Remove the two Phillips screws from the optical drive **(1)** and remove the bracket **(2)**.




2. Use a straightened paperclip to press in gently on the release hole **(1)** and release from the tab **(2)** until the disc tray releases. Tilt the tray **(3)** and pull the bezel **(4)** to remove it.



Reverse this procedure to reassemble and install the optical drive.

Keyboard

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

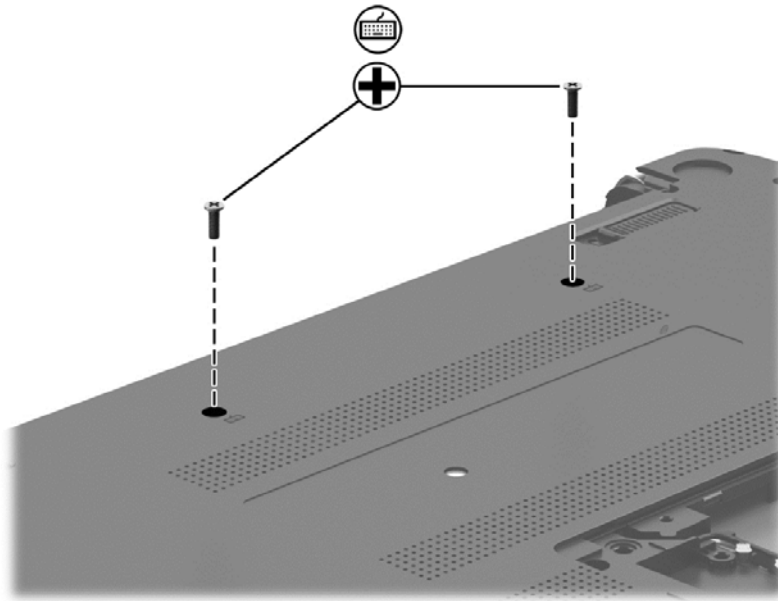
| Description | Spare part number |
|---------------|-------------------|
| Latin America | 785871-161 |
| United States | 785871-001 |

Before removing the keyboard, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)).

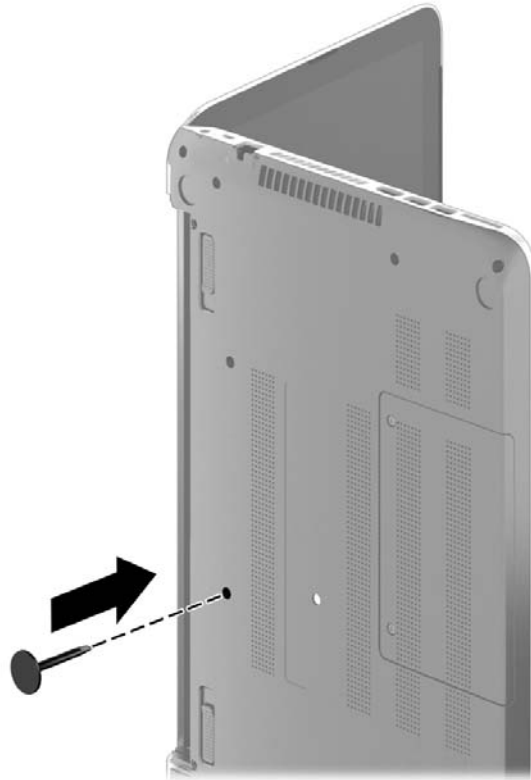
Remove the keyboard:

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



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

4. Insert a thin tool or a keyboard push tool into the left retention screw hole, and then press on the back of the keyboard until the keyboard disengages from the computer.

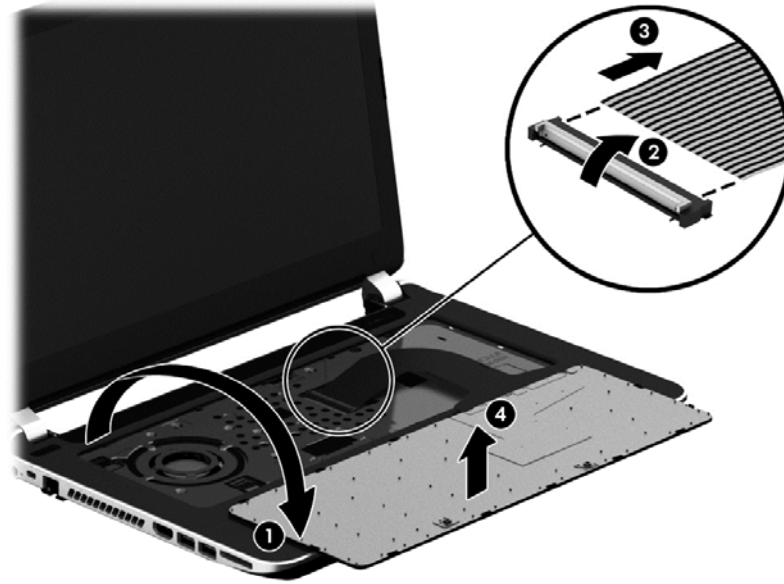


5. Position the computer right-side up with the front toward you.
6. Gently slide your finger along the top edge of the keyboard to release the keyboard clips **(1)**. Lift up the rear edge of the keyboard **(2)**.




7. Swing the keyboard **(1)** up and forward until it rests upside down on the palm rest. Release the ZIF connector **(2)** by lifting connector tab and then disconnecting the keyboard cable **(3)** from the system board.

8. Remove the keyboard (4).




Reverse this procedure to install the keyboard.

6 Removal and replacement procedures for Authorized Service Provider parts

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


Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 11](#) for details.


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

There may be as many as 51 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Display panel

 **NOTE:** Use these procedures to replace the bezel and raw display panel with the display assembly connected to the computer. For procedures to replace the remaining subcomponents that require that you remove the entire display assembly, see [Display assembly subcomponents on page 66](#).

| Description | Spare part number |
|--|-------------------|
| Display bezel (includes screws) | 785285-001 |
| Display panel (raw), 14 in (35.56 cm), WLED, HD, BrightView flat display panel | 785289-001 |

 **IMPORTANT:** Make special note of each screw and screw lock size and location during removal and replacement

Before removing the display panel, follow these steps:

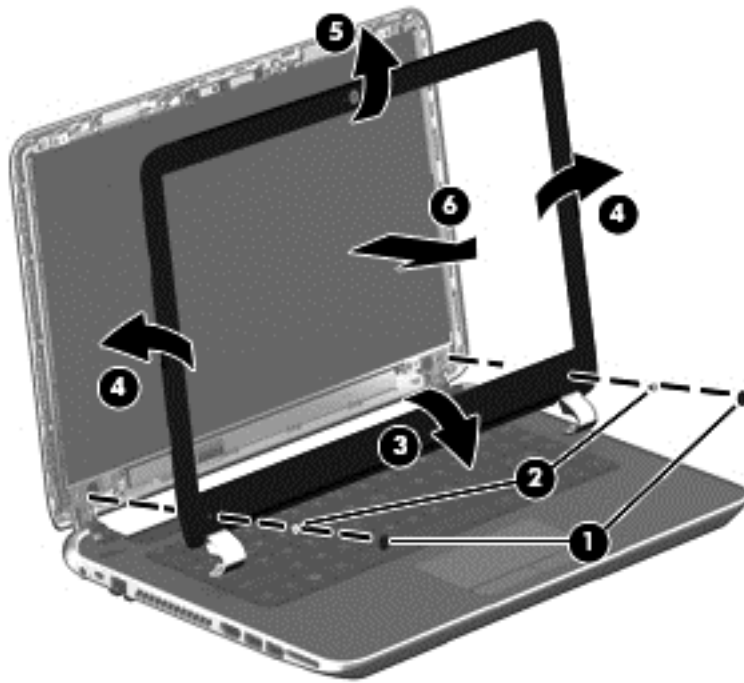
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)).

Remove the panel:

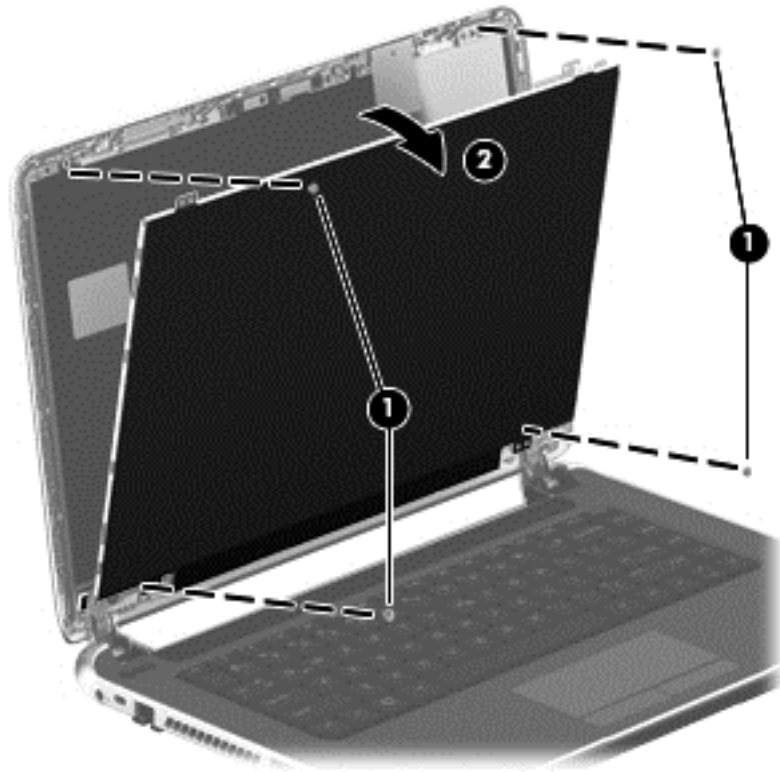
If it is necessary to replace the display bezel:

1. Remove the plastic screw covers **(1)** and the two Phillips M2.5×3.0 screws **(2)** that secure the display bezel to the display assembly.
2. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
 - a. Flex the inside edges of the bottom edge **(3)**, the left and right sides **(4)**, and the top edge **(5)** of the display bezel until the bezel disengages from the display enclosure.

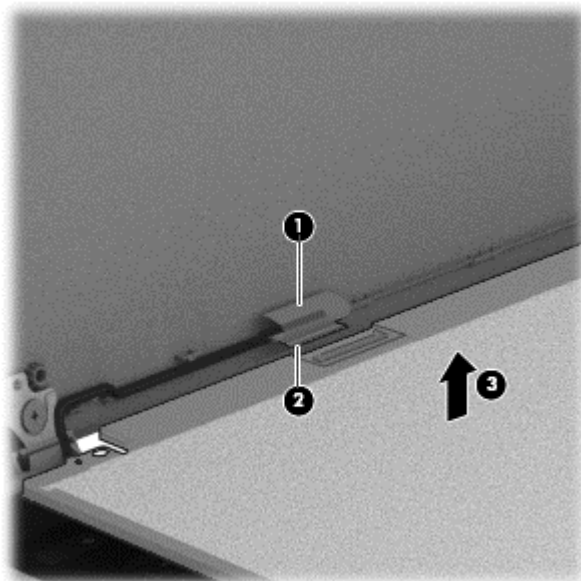
- b. Remove the display bezel (6).



- c. Remove the four Phillips M2.0×2.5 screws (1) and carefully rotate the display panel (2) onto the keyboard.




Release the tab (1) and disconnect the display panel cable connector (2). Lift the panel (3) to remove it.



Reverse this procedure to replace the panel.

Top cover

| Description | Spare part number |
|---|-------------------|
| Top cover (includes the TouchPad and cable) | 785295-001 |

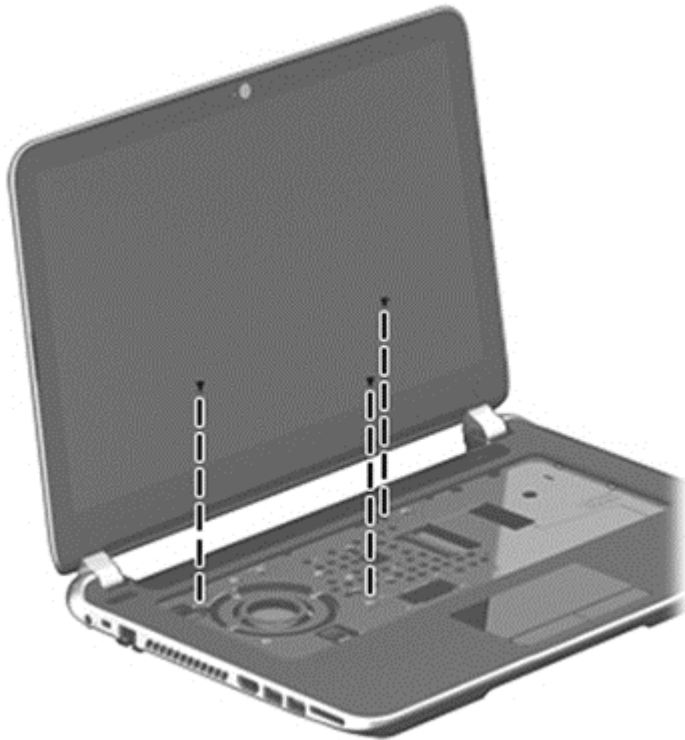
 **IMPORTANT:** Make special note of each screw and screw lock size and location during removal and replacement

Before removing the top cover, follow these steps:

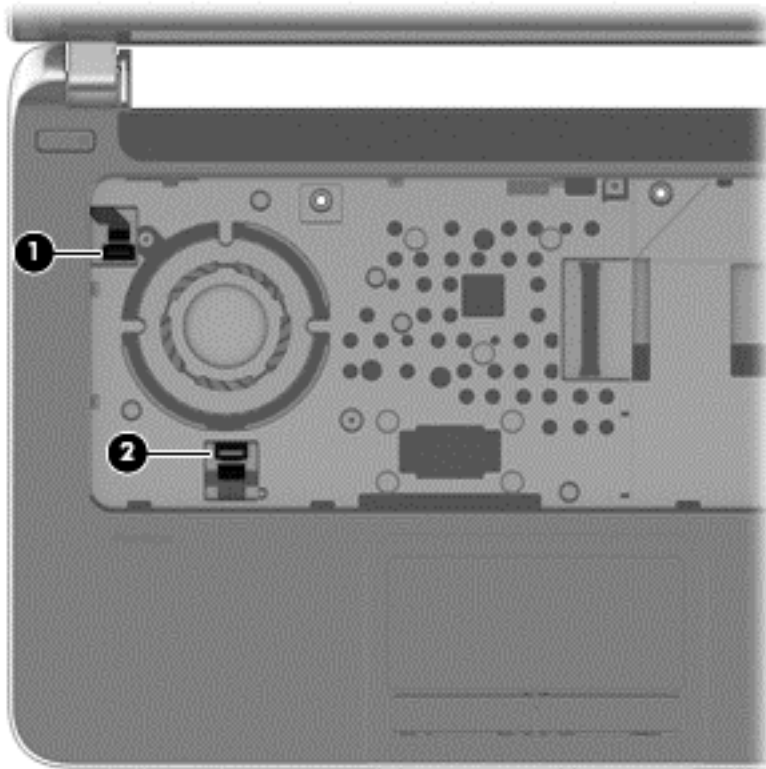
1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))

Remove the top cover:

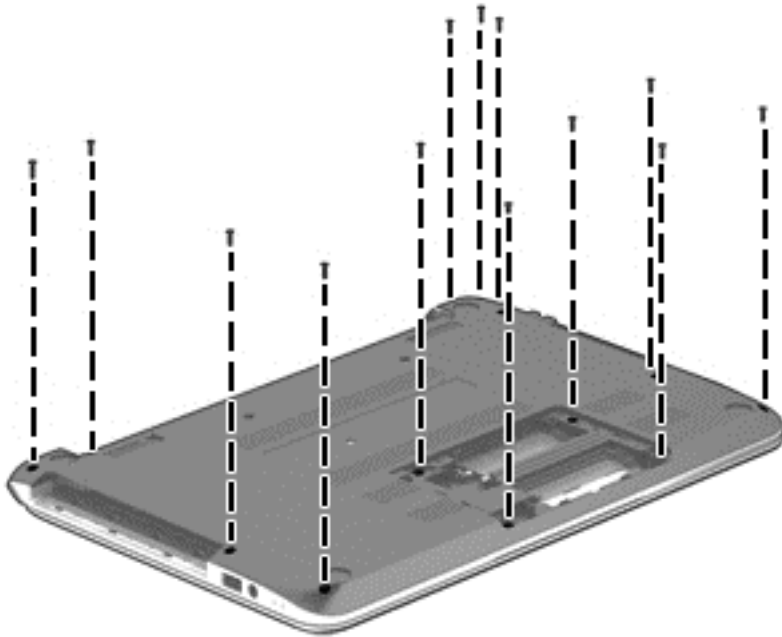
1. Remove the three Phillips M2.5×3.0 screws that secure the top cover to the base enclosure.



2. Disconnect the power button cable **(1)** and the TouchPad cable **(2)**.

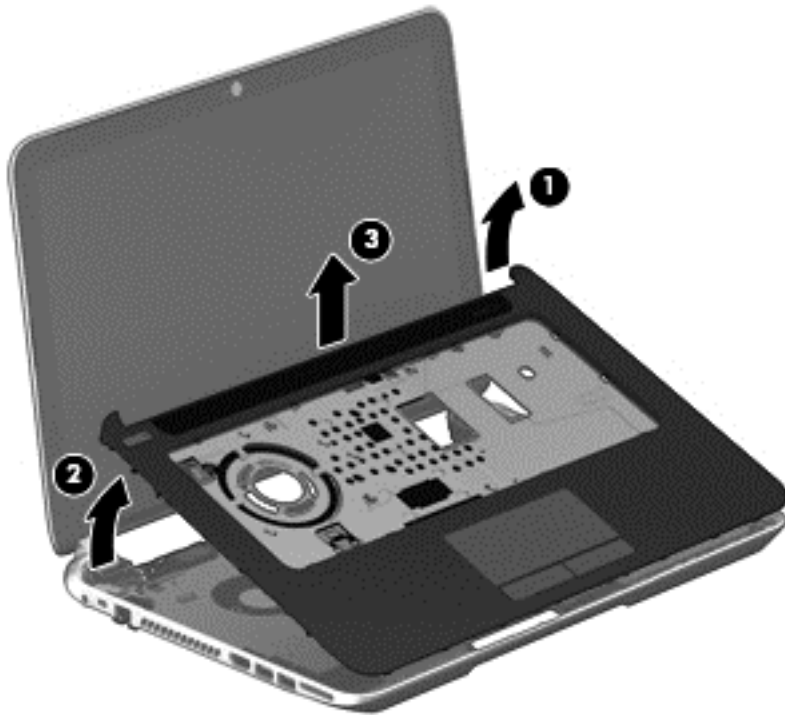


3. Close the display and position the computer upside down.
4. Remove the 13 Phillips M2.5×6.5 screws from the bottom of the computer.



5. Turn the computer over and open the display.

6. Gently pull on the right upper corner **(1)** and lift around the edges of the top cover **(2)**. Lift to remove the top cover **(3)**.



When replacing the top cover, be sure that the following components are removed from the defective top cover and installed on the replacement top cover:

- Power button board and cable (see [Power button board on page 47](#))
- Touchpad button board (includes cable and buttons), (see [TouchPad button board on page 49](#))
- USB/audio board (instructions are included in the steps for removing the hard drive; see [Hard drive on page 44](#))

Reverse this procedure to install the top cover.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive rubber bracket, hard drive connector cable, or screws. These components are included in the Hard Drive Hardware Kit, spare part number 740706-001.

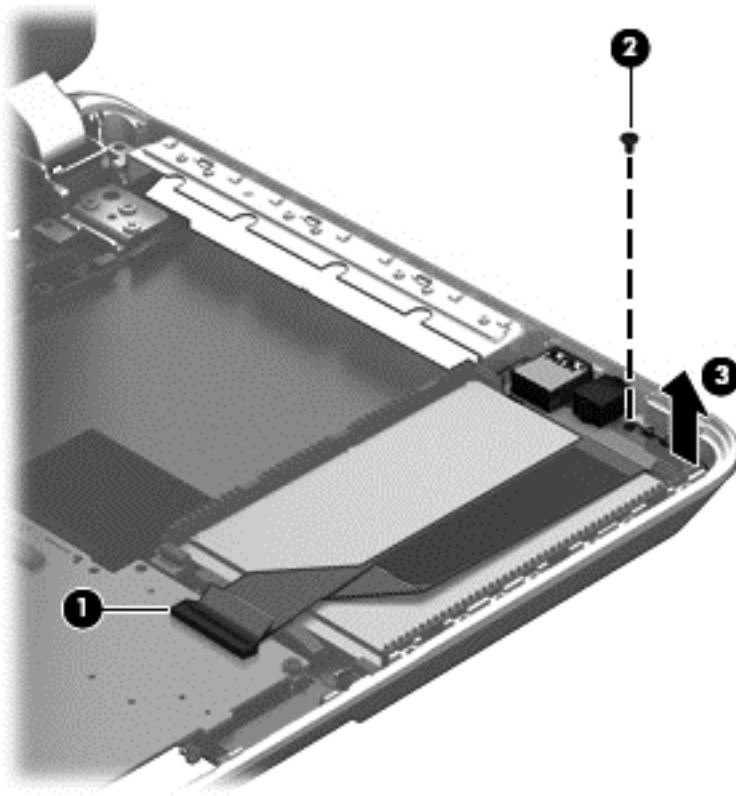
| Description | Spare part number |
|--------------------------|-------------------|
| 1 TB, 5400 rpm, 9.5 mm | 778192-005 |
| 500 GB, 5400 rpm, 7.0 mm | 669299-005 |

Before removing the hard drive, follow these steps:

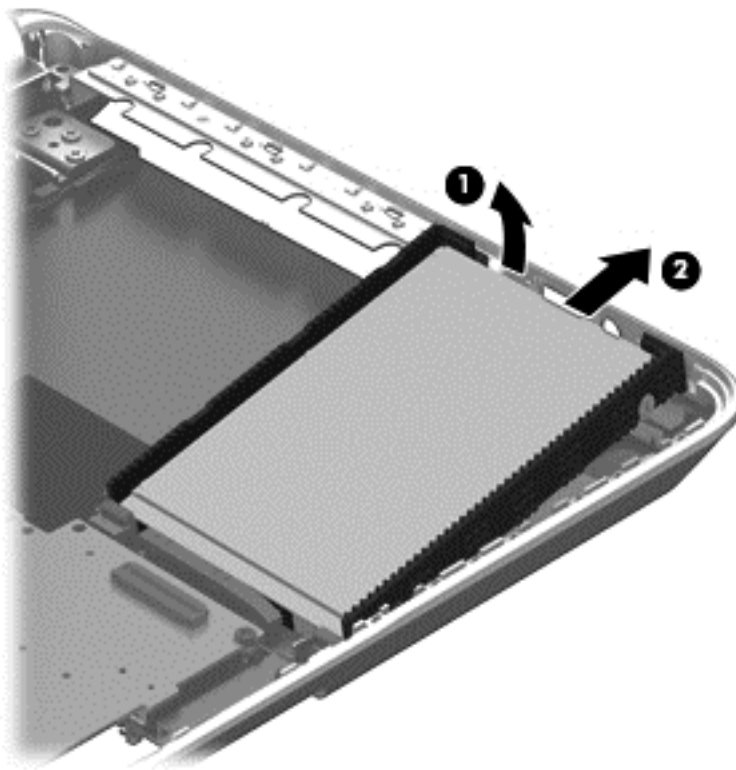
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))

Remove the hard drive:

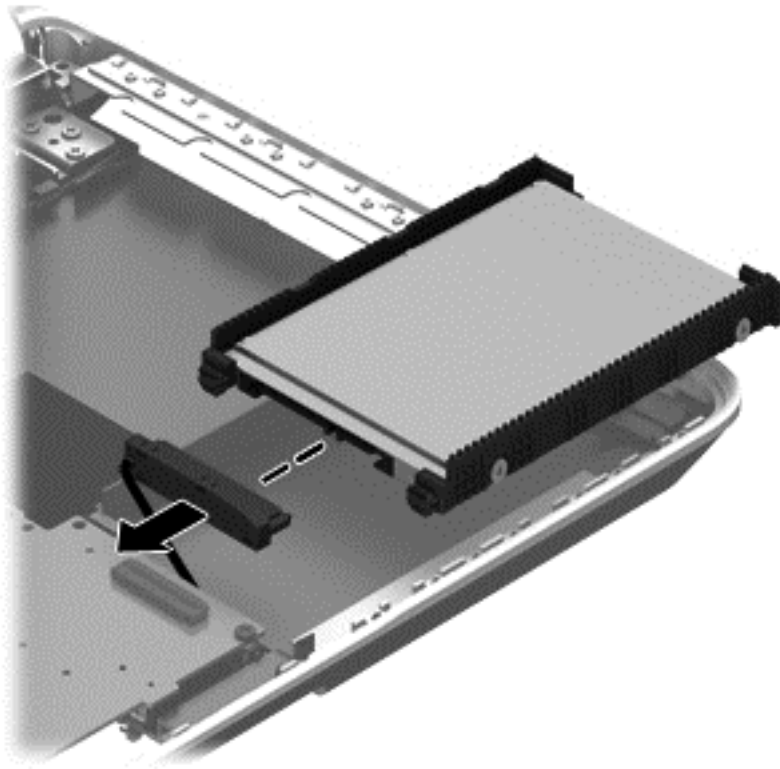
1. Disconnect the USB/audio cable **(1)** by flipping open the connector and lifting the cable. Remove the USB/audio cable Phillips M 2.5×3.0 screw **(2)** and then lift the USB/audio board **(3)**. The USB/audio board spare part number is 734417-001.



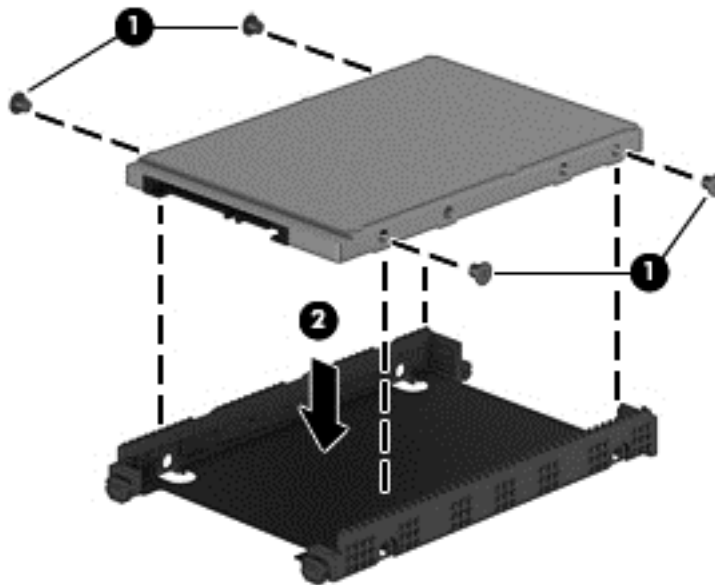
2. Lift up the front of the hard drive **(1)**, and then move the hard drive **(2)** forward.



3. Disconnect the hard drive connector cable from the hard drive, and then remove the hard drive.



4. If it is necessary to disassemble the hard drive, perform the following steps:
 - a. Remove the four Phillips M3.0×3.5 screws (1) from the bracket.
 - b. Remove the bracket (2) from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

Power button board

| Description | Spare part number |
|-------------------------------------|-------------------|
| Power button board (includes cable) | 785287-001 |

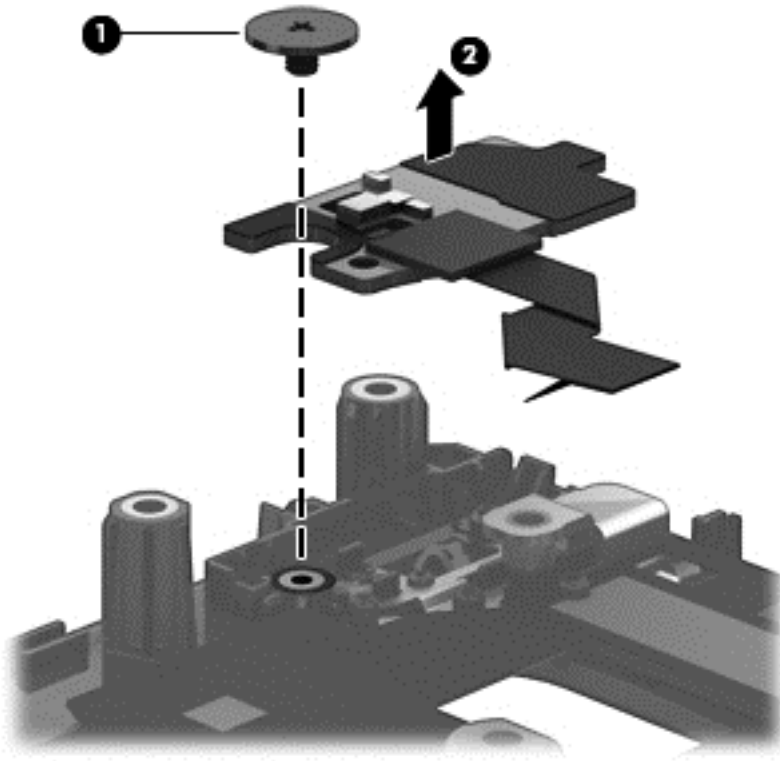
Before removing the power button board, follow these steps:

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 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))

Remove the power button board:

1. Position the top cover upside down with the front toward you.
2. Remove the Phillips PM2.5×2.5 screw **(1)** that secures the power button board to the top cover.

3. Remove the power button board (2) with cable (the cable was disconnected from the system board when removing the top cover).



Reverse this procedure to install the power button board.

TouchPad button board

| Description | Spare part number |
|--|-------------------|
| TouchPad button board (includes cable) | 734418-001 |

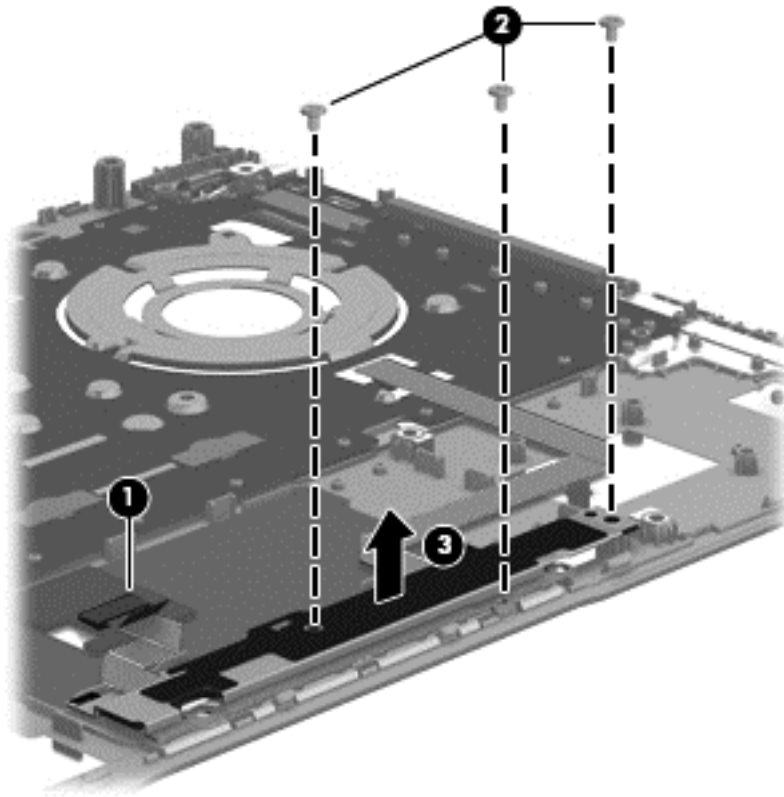
Before removing the TouchPad button board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))

Remove the TouchPad button board:

1. Position the top cover upside down with the front toward you.
2. Release the TouchPad button board ZIF connector, and then disconnect the TouchPad button board cable **(1)** from the TouchPad board.
3. Remove the three Phillips PM2.0×3.5 screws **(2)** that secure the TouchPad button board bracket to the top cover.

4. Remove the TouchPad button board while carefully lifting the cable from the guides **(3)** (the cable was disconnected when removing the top cover).



Reverse this procedure to install the TouchPad button board.

Optical drive connector cable

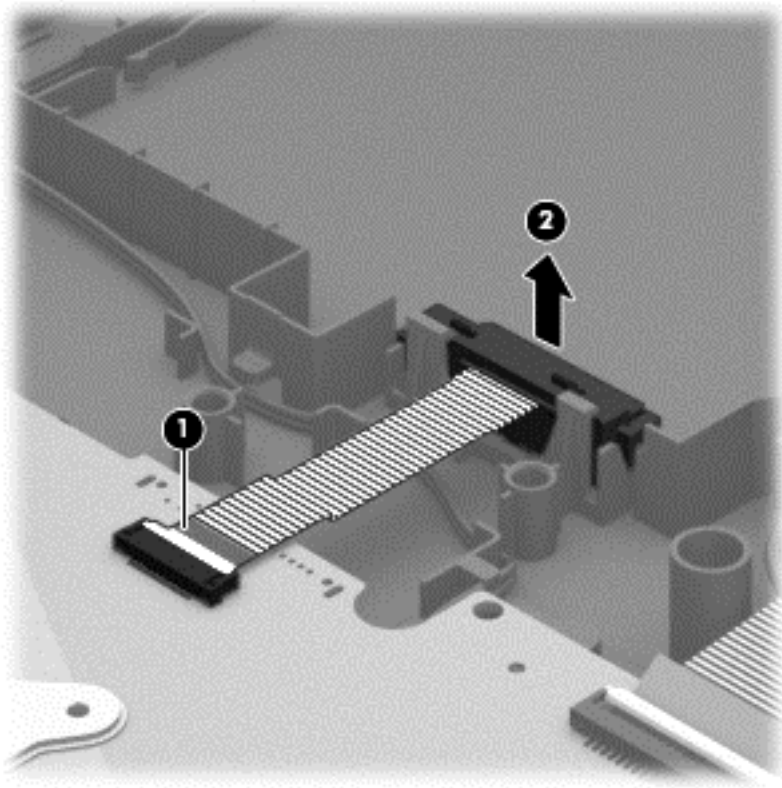
Before removing the optical drive connector cable, follow these steps:

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 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))

Remove the optical drive connector cable:

1. Disconnect the optical drive connector cable **(1)** from the system board.
2. Release the optical drive connector cable from the clip **(2)** built into the base enclosure.

3. Remove the optical drive connector cable.



Reverse this procedure to install the optical drive connector cable.

System board



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

| Description | Spare part number |
|--|-------------------|
| System board with AMD A4-5000 processor for use in models without the Windows operating system | 785293-001 |
| System board with AMD A4-5000 processor for use in models with Windows 8.1 Standard | 785293-501 |
| System board with AMD E1-2100 processor for use in models without the Windows operating system | 785292-001 |
| System board with AMD E1-2100 processor for use in models with Windows 8.1 Standard | 785292-501 |

Before removing the system board, follow these steps:

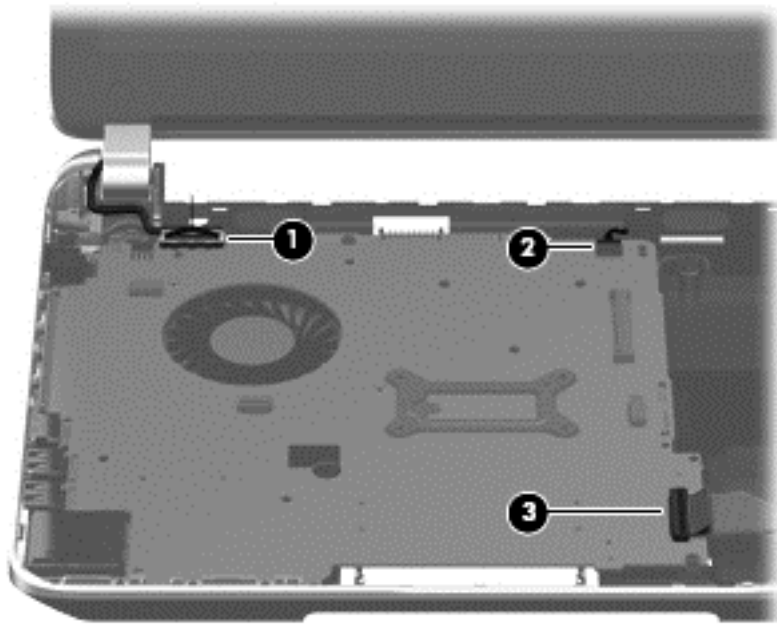
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))

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:

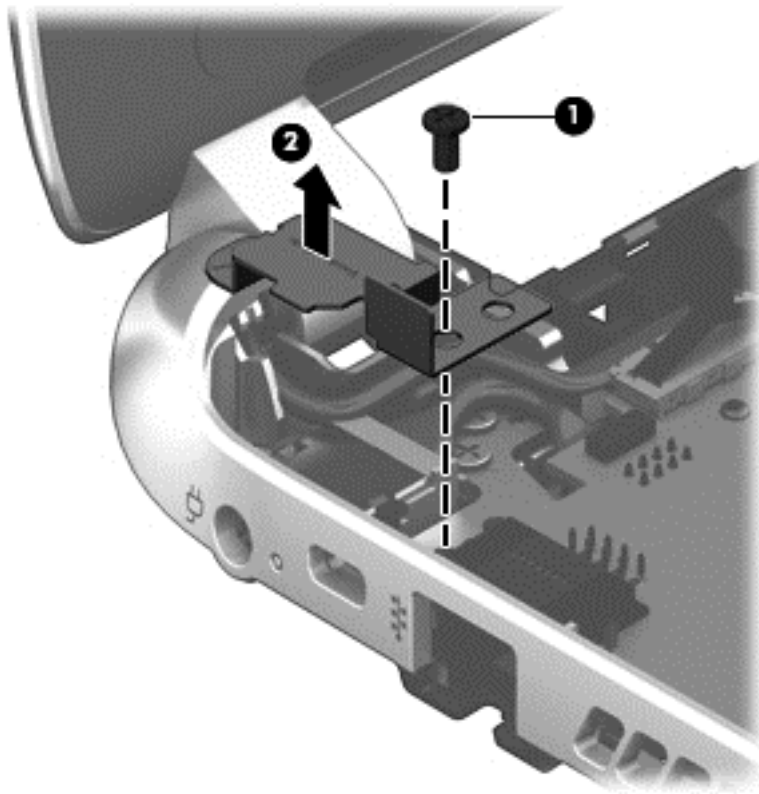
- Hard drive connector cable
- Power connector cable (see [Power connector cable on page 62](#))
- RTC battery (see [RTC battery on page 56](#))
- Fan (see [Fan on page 58](#))
- Heat sink assembly (see [Heat sink assembly on page 60](#))

Remove the system board:

1. Disconnect the following cables from the system board:
 - Display panel cable **(1)**
 - Speaker cable **(2)**
 - USB/audio cable **(3)**

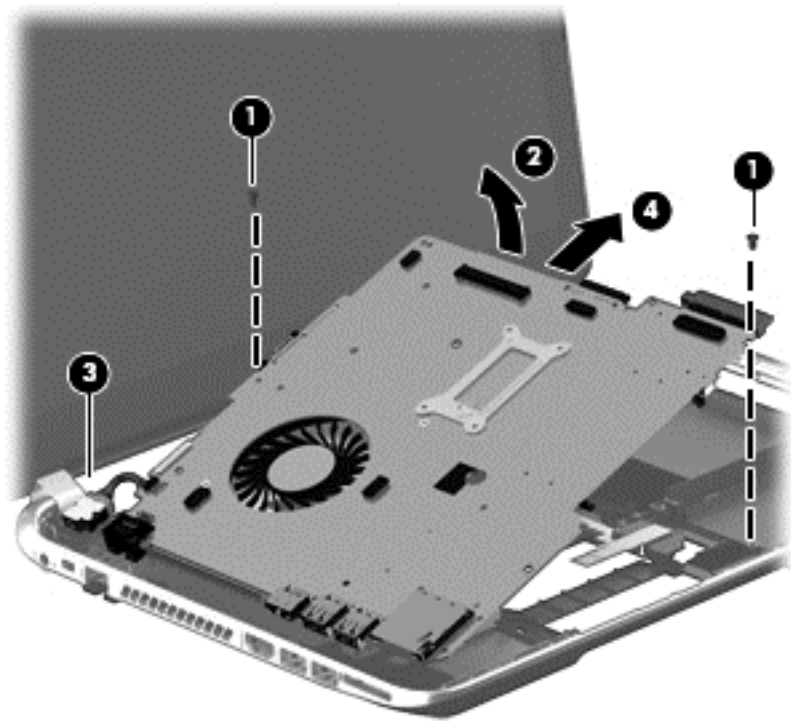


2. Remove the Phillips PM2.5×6.5 screw **(1)** that secures the power connector bracket to the base enclosure. Remove the power connector bracket **(2)**.



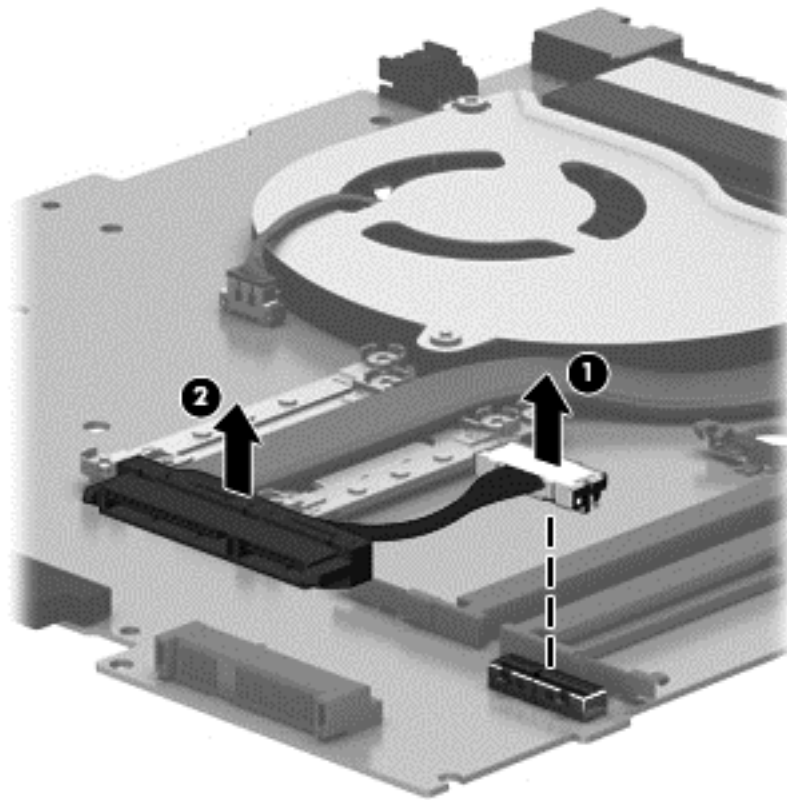
3. Remove the two Phillips M2.5×5.0 screws **(1)** that secure the system board to the base enclosure.
4. Lift the right side of the system board **(2)** until it rests at an angle.

5. Carefully remove from the power connector **(3)**. Remove the system board **(4)** by lifting it up and to the right at an angle.



6. Remove the hard drive connector cable:
 - a. Position the system board upside down with the front toward you.

- b. Disconnect the hard drive connector cable from the system board **(1)**, and then remove the cable **(2)**. The hard drive connector cable is part of the Hard Drive Hardware Kit, spare part number 740706-001.



Reverse this procedure to install the system board.

RTC battery

| Description | Spare part number |
|-------------|-------------------|
| RTC battery | 697917-001 |

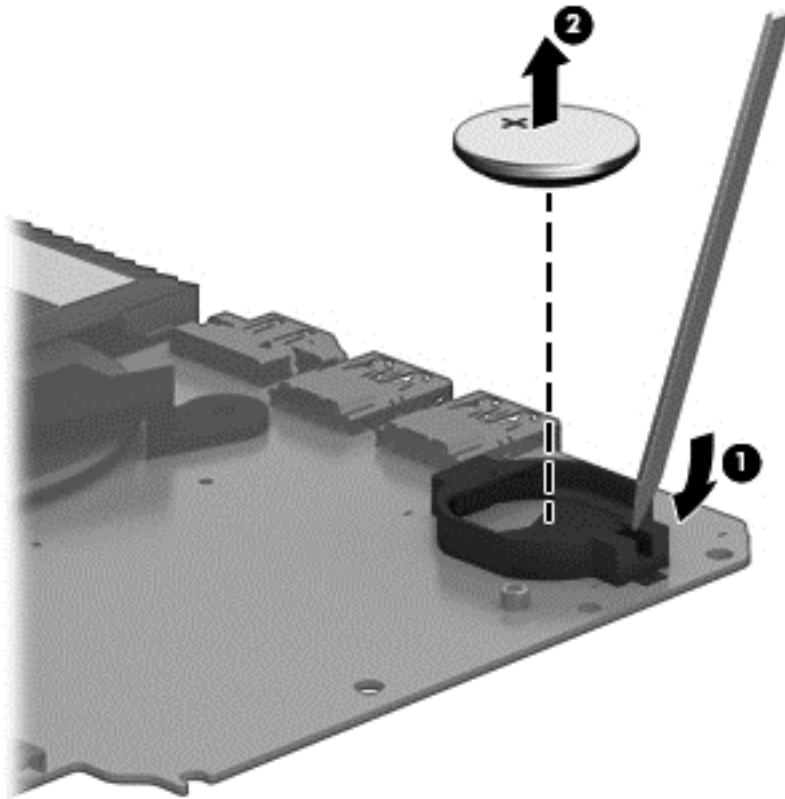
Before removing the RTC battery, follow these steps:

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 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))
 - h. System board (see [System board on page 52](#))

Remove the RTC battery:

1. Position the system board upside down with the front toward you.
2. Use a flat-bladed, non-metallic tool to release the RTC battery from the socket on the system board **(1)**. The battery is spring loaded and will pop up.


3. Remove the RTC battery (2).



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

Fan

| Description | Spare part number |
|-------------|-------------------|
| Fan | 732068-001 |

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

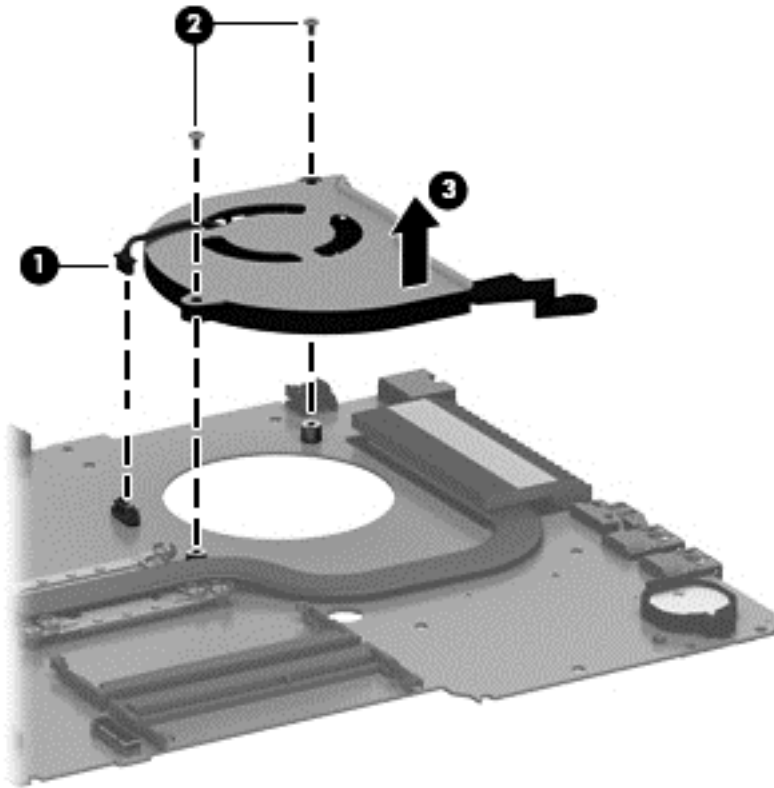
Before removing the fan, follow these steps:

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 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))
 - h. System board (see [System board on page 52](#))

Remove the fan:

1. Position the system board upside down with the front toward you.
2. Disconnect the fan cable **(1)** from the system board.
3. Remove the two screws **(2)** that secure the fan to the system board.

4. Remove the fan (3) from the system board.



Reverse this procedure to install the fan.

Heat sink assembly

| Description | Spare part number |
|-------------|-------------------|
| Heat sink | 776776-001 |


Before removing the heat sink assembly, follow these steps:

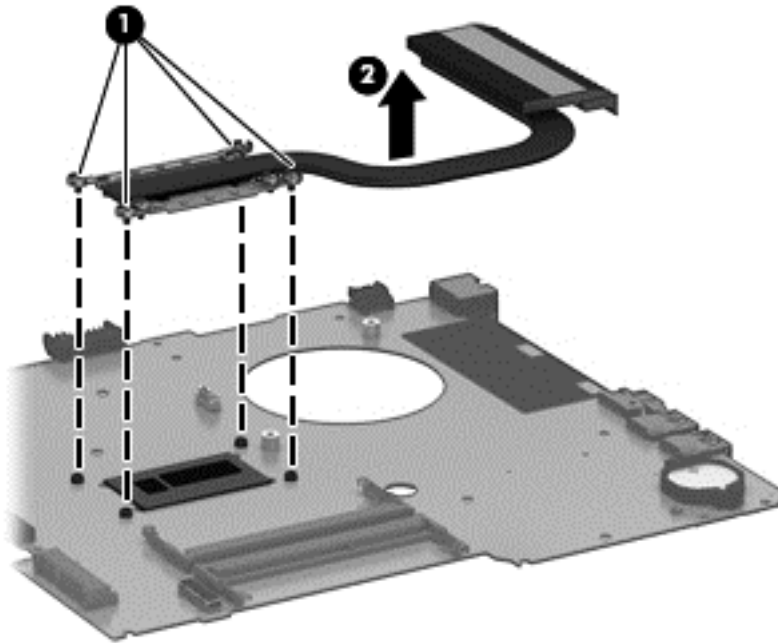
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))
 - h. System board (see [System board on page 52](#))
 - i. Fan (see [Fan on page 58](#))

Remove the heat sink assembly:

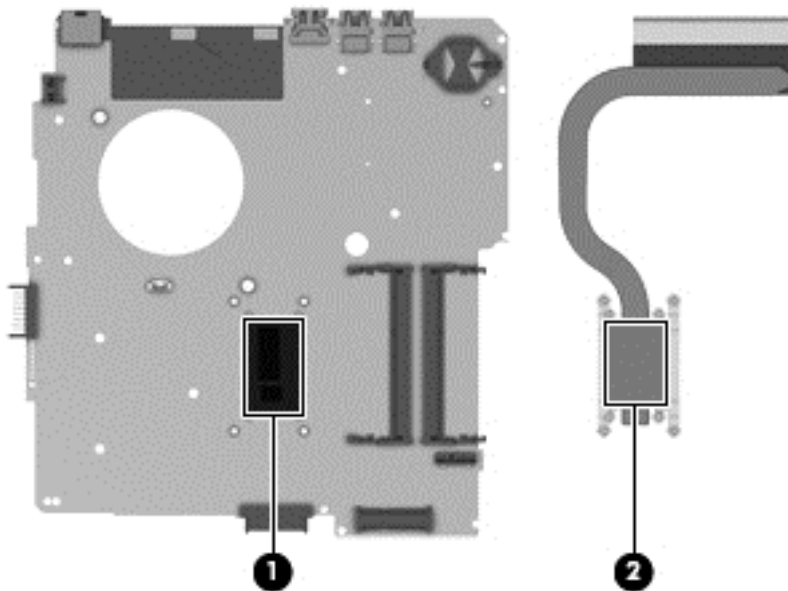
1. Position the system board upside down with the front toward you.
2. Following the 1, 2, 3, 4 sequence stamped into the heat sink assembly, loosen the four Phillips PM2.0×10.0 captive screws (**1**) that secure the heat sink assembly to the system board.

3. Remove the heat sink assembly (2).

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



4. Remove the thermal material. The thermal material must be thoroughly cleaned from the surfaces of the heat sink assembly and the system board components each time the heat sink assembly is removed. Replacement thermal material is included with the heat sink assembly and system board spare part kits. Thermal paste is used on the processor (1) and the heat sink assembly section (2) that services it.



Reverse this procedure to install the heat sink assembly.

Power connector cable

| Description | Spare part number |
|--|-------------------|
| Power connector cable (includes bracket) | 732067-001 |

Before removing the power connector cable, follow these steps:

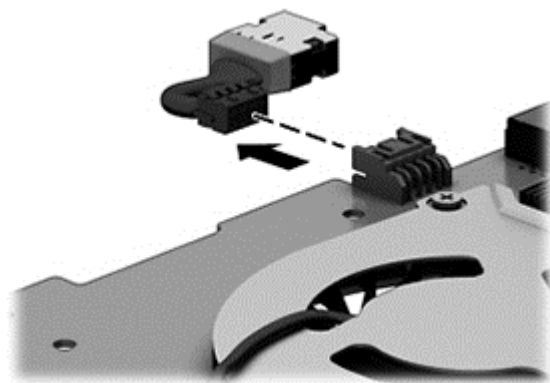
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Optical drive (see [Optical drive on page 32](#))
 - c. Memory module (see [Memory module on page 28](#))
 - d. WLAN module (see [WLAN module on page 30](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))
 - h. System board (see [System board on page 52](#))

Remove the power connector board:



NOTE: The power connector bracket was disconnected when removing the system board.

1. Position the system board upside down with the front toward you.
2. Release the power connector from the clip built into the system board.



Reverse this procedure to install the power connector cable.

Speakers

| Description | Spare part number |
|---|-------------------|
| Speakers (include subwoofer, speaker cable, and rubber isolators) | 734422-001 |


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 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))
 - h. System board (see [System board on page 52](#))

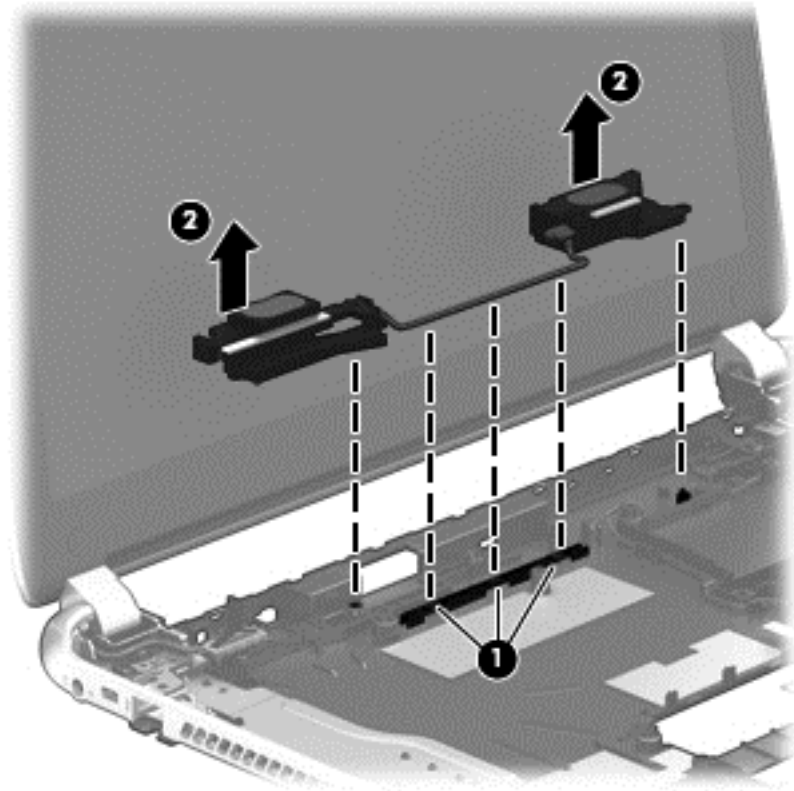
Remove the speakers:

1. Remove the cable from the routing path between the speakers **(1)**.

2. Remove the speakers by lifting up on the clip on the right side speaker, and then lifting both speakers from the computer **(2)**.

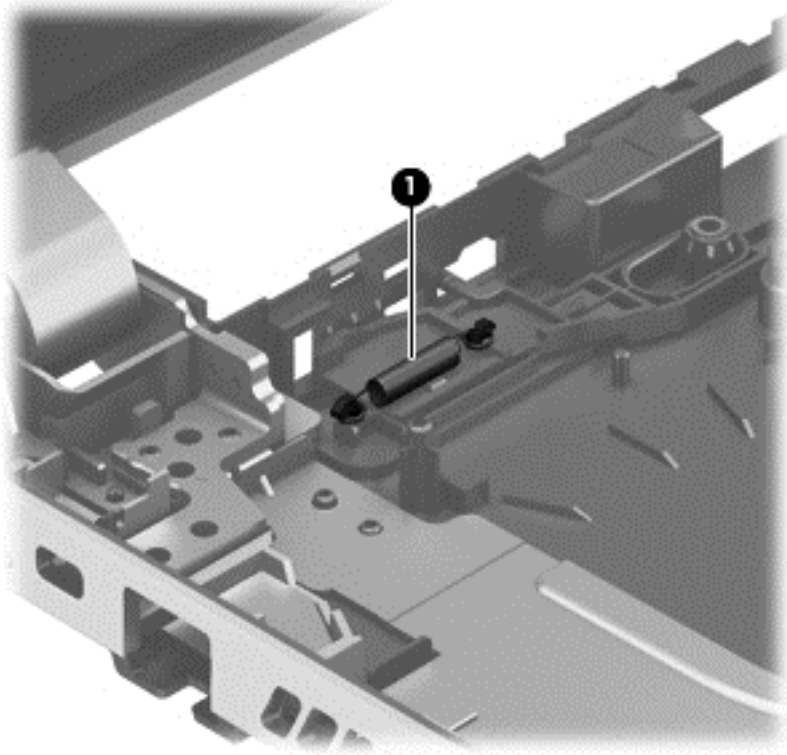
 **NOTE:** The speaker cable was disconnected when removing the system board.

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



Reverse this procedure to install the speakers.

Note the location of the spring **(1)** under the left speaker if it requires reinstallation.



Display assembly subcomponents



NOTE: These procedures are for replacing the display assembly internal components. The display is spared only at the subcomponent level.

| Component | Spare part number |
|---|-------------------|
| Webcamera/microphone module (includes adhesive and screws) | 776787-001 |
| Display panel cable (includes webcamera/microphone module cable and screws) | 734407-001 |
| Antenna Kit (includes screw and Mylar tape) | 788630-001 |
| Display Hinge Kit (includes left and right hinges and screws) | 734408-001 |
| Display back cover (includes screws): | 785282-001 |

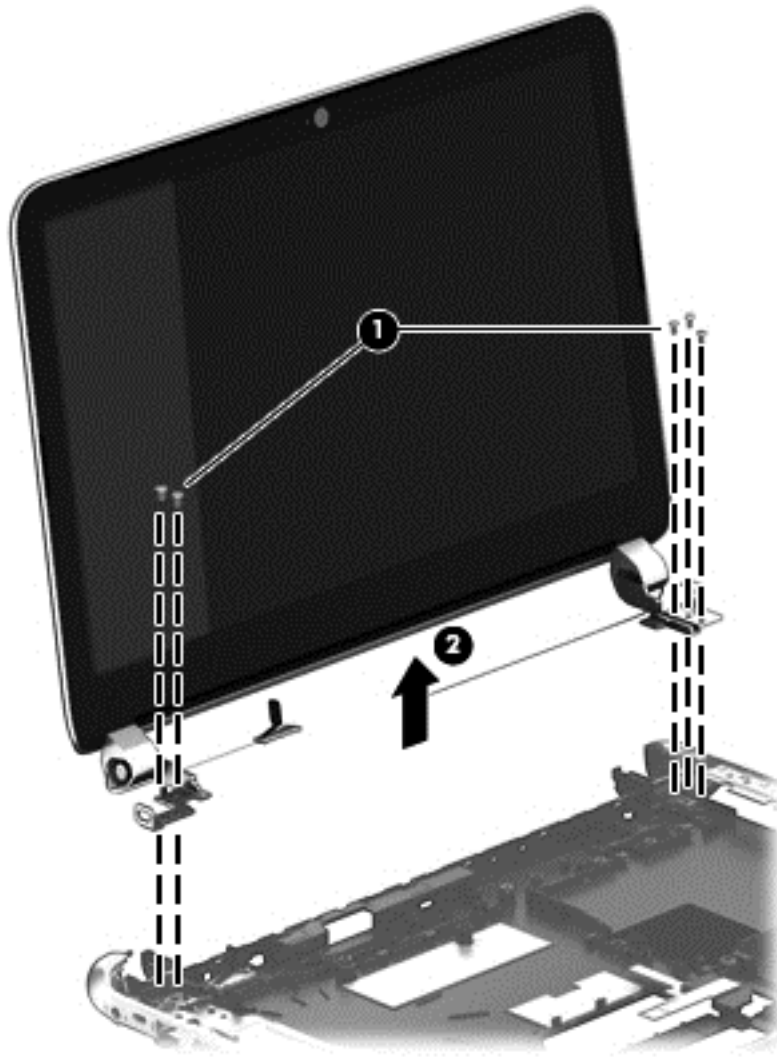
Before removing the display assembly subcomponents, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the battery (see [Battery on page 25](#)), and then remove the following components:
 - a. Service door (see [Service door on page 26](#))
 - b. Memory module (see [Memory module on page 28](#))
 - c. WLAN module (see [WLAN module on page 30](#))
 - d. Optical drive (see [Optical drive on page 32](#))
 - e. Keyboard (see [Keyboard on page 34](#))
 - f. Top cover (see [Top cover on page 41](#))
 - g. Hard drive (see [Hard drive on page 44](#))
 - h. System board (see [System board on page 52](#))

Remove the display assembly subcomponents:

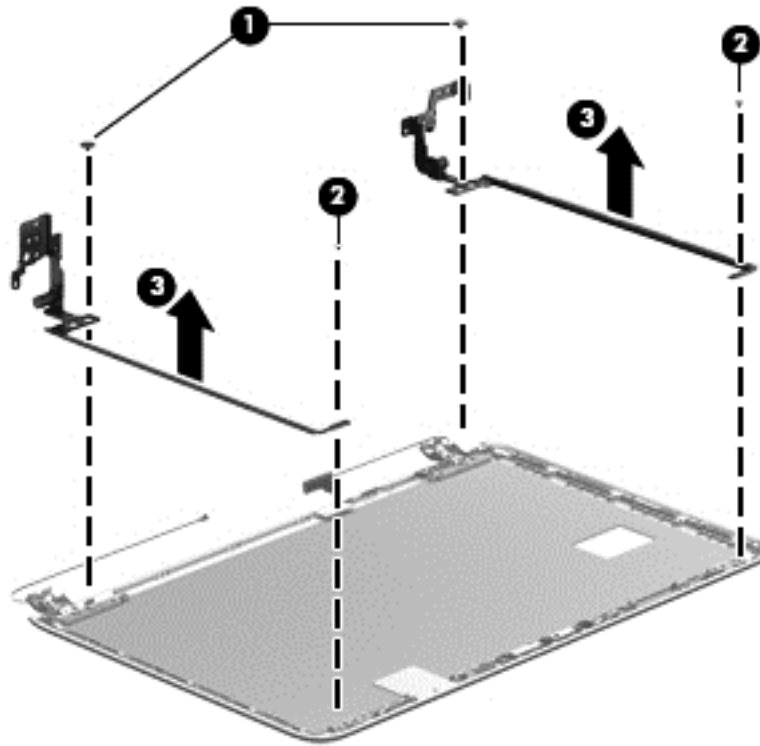
1. Remove the display by removing the five Phillips PM2.5×6.5 screws **(1)** that secure the display assembly to the base enclosure.

2. Remove the display assembly (2).



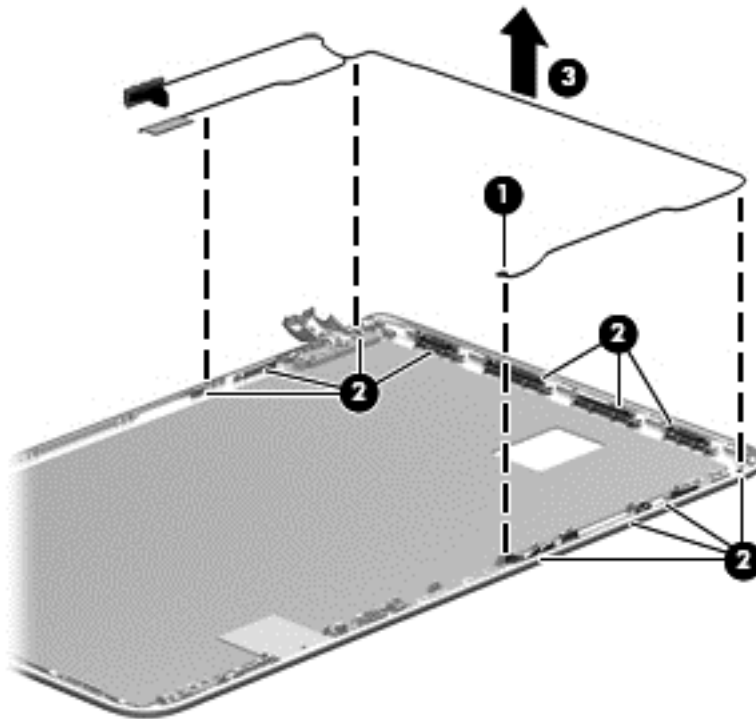
3. If it is necessary to replace the webcam/microphone module:
 - a. Disconnect the webcam/microphone module cable (1) from the webcam/microphone module. (The webcam/microphone module cable is part of the display panel cable.)

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



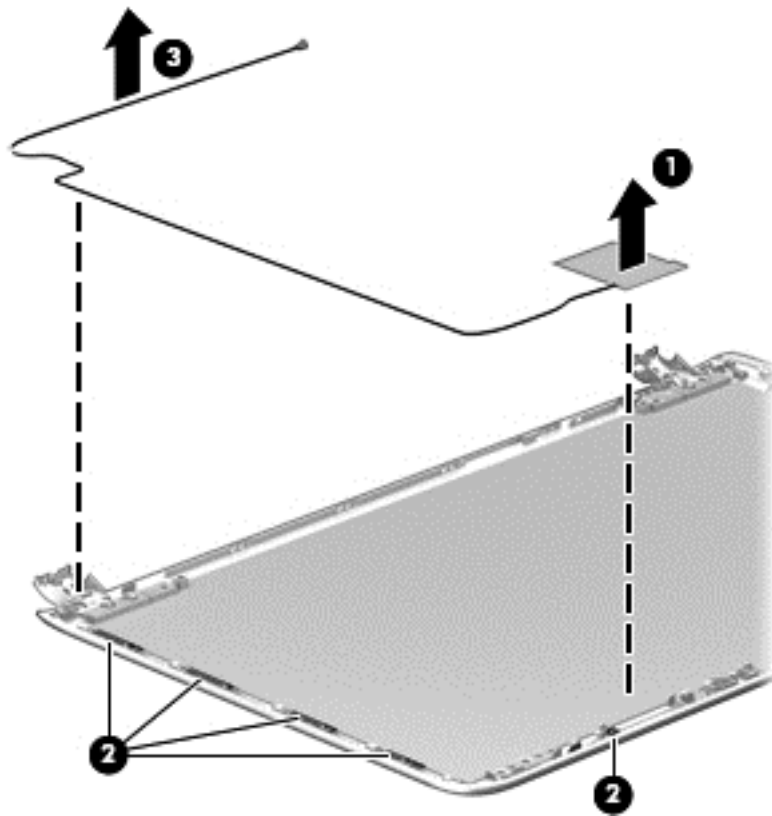
- 5. If it is necessary to replace the display panel cable:
 - a. Release the display panel cable from the clips **(1)** and routing channel built into the display enclosure.

- b. Carefully release the cable from the channel guides **(2)**, and remove the display panel cable **(3)**.



6. If it is necessary to replace the wireless antenna cables and transceivers:
- a. Release the wireless antenna transceiver **(1)** from the display back cover. (The wireless antenna transceiver is attached to the display back cover with double-sided tape.)
 - b. Release the wireless antenna cable from the clips **(2)** built into the display back cover.

- c. Remove the wireless antenna cable and transceiver (3).





Reverse this procedure to install the display assembly subcomponents.

7 Using Setup Utility (BIOS)

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

Starting Setup Utility (BIOS)

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

 **NOTE:** If you have tablet with a detachable keyboard or keyboard dock, attach it before beginning these steps.

- ▲ Turn on or restart the computer, quickly press **esc**, and then press **f10**.

Updating the BIOS

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

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

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

Determining the BIOS version

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


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

1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 72](#)).
2. Use the arrow keys to select **Main**, and then make note of your BIOS version.


To exit Setup Utility (BIOS):

1. Use the arrow keys to select **Exit**, select **Exit Discarding Changes**, and then press **enter**.
2. Select **Yes**.

Downloading a BIOS update

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

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
- Do not shut down the computer or initiate Sleep.
- Do not insert, remove, connect, or disconnect any device, cable, or cord.

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


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

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

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

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

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

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

8 Using HP PC Hardware Diagnostics (UEFI)


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

To start HP PC Hardware Diagnostics (UEFI):

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

The BIOS searches 3 places for the diagnostic tools, in the following order:

- a. Connected USB drive

 **NOTE:** To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 74](#).


- b. Hard drive

- c. BIOS

2. When the diagnostic tool opens, use the keyboard arrow keys to select the type of diagnostic test you want to run, and then follow the on-screen instructions.

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

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

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

There are two options to download HP PC Hardware Diagnostics to a USB device:

Option 1: HP PC Diagnostics homepage— Provides access to the latest UEFI version

1. Go to <http://hp.com/go/techcenter/pcdiags>.
2. Click the **UEFI Download** link, and then select **Run**.

Option 2: Support and Drivers pages—Provide downloads for a specific product for earlier and later versions

1. Go to <http://www.hp.com>.
2. Point to **Support**, located at the top of the page, and then click **Download Drivers**.
3. In the text box, enter the product name, and then click **Go**.

– or –

Click **Find Now** to let HP automatically detect your product.

4. Select your computer model, and then select your operating system.
5. In the **Diagnostic** section, click **HP UEFI Support Environment**.

– or –

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

9 Backing up, restoring, and recovering

This chapter provides information about the following processes. The information in the chapter is standard procedure for most models.

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

For additional information, refer to the HP Support Assistant.

- ▲ From the Start screen, type `support`, and then select the **HP Support Assistant** app.

- or -

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

Creating recovery media and backups (select models only)

- Use HP Recovery Manager after you successfully set up the computer, to 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.

For information on creating recovery media, see [Creating HP Recovery media \(select models only\) on page 75](#). For information on the recovery options that are available using the recovery media, see [Recovering using HP Recovery Manager \(select models only\) on page 77](#).

- Use Windows tools to create system restore points and create backups of personal information.

Creating HP Recovery media (select models only)

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

- Only one set of HP Recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the blank USB flash drive or the number of blank DVD discs that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs, or you can obtain recovery discs for your computer from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and

follow the on-screen instructions. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take 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 then follow the on-screen instructions.

If you ever need to recover the system, see [Recovering using HP Recovery Manager \(select models only\) on page 77](#).

Using Windows tools

You can create system restore points and create backups of personal information using Windows tools.

- ▲ From the Start screen, type `help`, and then select **Help and Support**.

– or –

From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.

For more information and steps, see Help and Support.

Restore and recover (select models only)

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

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information and steps, see Help and Support.
 - ▲ From the Start screen, type `help`, and then select **Help and Support**.
- or –
 - From the Windows desktop, click the question mark icon in the notification area, at the far right of the taskbar.
- On select models, if you need to correct a problem with a preinstalled application or driver, use the Drivers and Applications Reinstall option of HP Recovery Manager to reinstall the individual application or driver.
 - ▲ From the Start screen, type `recovery`, select **HP Recovery Manager**, select **Drivers and Applications Reinstall**, and then follow the on-screen instructions.
- On select models, 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 or HP Recovery media. Minimized Image Recovery installs only drivers and hardware-enabling applications. Other applications included in the image continue to be available for installation through the Drivers and Applications Reinstall option in HP Recovery Manager.

For more information, see [Recovering using HP Recovery Manager \(select models only\) on page 77](#).

- On select models, if you want to recover the computer's original factory partitioning and content, you can choose the System Recovery option from the HP Recovery partition or use the HP Recovery media that you have created. For more information, see [Recovering using HP Recovery Manager \(select models only\) on page 77](#). If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 75](#).
- On select models, if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media to restore the factory image to the replacement drive. For more information, see [Recovering using HP Recovery Manager \(select models only\) on page 77](#).

Recovering using HP Recovery Manager (select models only)

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you created or by using the HP Recovery partition (select models only). If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 75](#).

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

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

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

What you need to know

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with the computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.



IMPORTANT: Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media (select models only) must be used if the computer hard drive fails. If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 75](#).
- To use the Factory Reset option, you must use HP Recovery media (select models only). If you have not already created recovery media, see [Creating HP Recovery media \(select models only\) on page 75](#).
- If the HP Recovery media (select models only) does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.



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

Using the HP Recovery partition (select models only)

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

To start HP Recovery Manager from the HP Recovery partition:

1. From the Start screen, type `recovery`, select **Recovery Manager**, and then select **HP Recovery Environment**.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

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

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



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 78](#).

3. Follow the on-screen instructions.

Changing the computer boot order

If the computer does not restart in HP Recovery Manager, you can change the computer boot order, which is the order of devices where the computer searches for startup information. You can specify that an optical drive or a USB flash drive should be checked first.

To change the boot order:

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

10 Specifications

Computer specifications

| | Metric | U.S. |
|---|---|---------------------|
| Dimensions: | | |
| Width | 34.70 cm | 13.67 in |
| Depth | ≤ 23.90 cm | ≤ 9.42 in |
| Height | ≤ 2.30 cm | ≤ .91 in |
| Weight: | | |
| For TouchSmart computer models with Intel processors | 2.10 kg | 4.61 lbs |
| For computer models with flat display panels and Intel processors | 2.03 kg | 4.48 lbs |
| For TouchSmart computer models with AMD processors | 2.07 kg | 4.56 lbs |
| For computer models with flat display panels and AMD processors | 2.01 kg | 4.42 lbs |
| Input power | | |
| Operating voltage and current | 19.5 V dc @ 3.33 A – 65 W | |
| | 19.5 V dc @ 4.62 A – 90 W | |
| | 19.5 V dc @ 2.31 A – 45 W | |
| Temperature | | |
| Operating (writing to optical disc) | 5°C to 35°C | 41°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Relative humidity | | |
| Operating | 10% to 90% | |
| Nonoperating | 5% to 95% | |
| Maximum altitude (unpressurized) | | |
| Operating (14.7 to 10.1 psia) | -15 m to 3,048 m | -50 ft to 10,000 ft |
| Nonoperating (14.7 to 4.4 psia) | -15 m to 12,192 m | -50 ft to 40,000 ft |
| Shock | | |
| Operating | 125 g, 2 ms, half-sine | |
| Nonoperating | 200 g, 2 ms, half-sine | |
| Random vibration | | |
| Operating | 0.75 g zero-to-peak, 10 Hz to 500 Hz, 0.25 oct/min sweep rate | |

| | Metric | U.S. |
|--------------|--|-------------|
| Nonoperating | 1.50 g zero-to-peak, 10 Hz to 500 Hz, 0.5 oct/min sweep rate | |

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

Display specifications

| | Metric | U.S. |
|--------------------------------|---|-------------|
| Dimensions | | |
| Width | 32.4 cm | 12.8 in |
| Height | 19.3 cm | 7.6 in |
| Diagonal | 35.56 cm | 14.0 in |
| Number of colors | 262K (6 bit) | |
| Contrast ratio | 500:1 (typical) | |
| Brightness | 200 cd/m ² (nits) (typical) | |
| Backlight | WLED | |
| Total power consumption | 3.2 W (max) | |
| Viewing angle | ±45° horizontal, +15° up & -35° down vertical (typical) | |

Hard drive specifications

| | 1 TB* | 500 GB* |
|---|-----------------------------|-------------------|
| Dimensions | | |
| Height | 9.5 mm | 7 mm |
| Width | 70 mm | 70 mm |
| Weight | 107 g max | 107 g max |
| Interface type | | |
| | SATA | SATA |
| Transfer rate | | |
| | 300 MB/sec | 300 MB/sec |
| Security | | |
| | ATA security | ATA security |
| Seek times (typical read, including setting) | | |
| Single track | 1.5 ms | 1.5 ms |
| Average | 11.0 ms | 12.0 ms |
| Maximum | 22.0 ms | 22.0 ms |
| Logical blocks | | |
| | 1,953,525,168 | 976,752,240 |
| Disk rotational speed | | |
| | 5400 rpm | 7200 and 5400 rpm |
| Operating temperature | | |
| | 5°C to 55°C (41°F to 131°F) | |
| *Size refers to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly. | | |
| NOTE: Certain restrictions and exclusions apply. Contact support for details. | | |

DVD±RW SuperMulti Double-Layer Combination Drive specifications

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

11 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

| Country/region | Accredited agency | Applicable note number |
|----------------|-------------------|---|
| | | <p>2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.</p> |
| | | <p>3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.</p> |
| | | <p>4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.</p> |
| | | <p>5. The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.</p> |
| | | <p>6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.</p> |
| | | <p>7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.</p> |

12 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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