



Maintenance and Service Guide

HP Pavilion Notebook PC

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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 or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. Go to <http://www.microsoft.com> for details.

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By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

For any further information or to request a full refund of the price of the computer, please contact your seller.

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 60950-1).

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1 Product description

Model numbers: 15-bc300~15-bc399

| Category | Description |
|---------------------|---|
| Product Name | HP Pavilion Notebook PC Model numbers: 15-bc300~15-bc399 CTO Model: 15t-bc300 |
| Processors | Intel Core i7-7500U (2.7 GHz, turbo up to 3.5 GHz), 2133 MHz/4 MB L3, Dual, 15 W Intel Core i5-7200U (2.5 GHz, turbo up to 3.1 GHz), 2133 MHz/3 MB L3, Dual, 15 W |
| Chipset | Intel SoC |
| Graphics | Internal graphics: Intel HD Graphics 620 Hybrid graphics: Nvidia GeForce GTX 950M with up to 2 GB of dedicated video memory Nvidia GeForce GTX 950M with up to 4 GB of dedicated video memory Supports HD Decode, DX12, and HDMI Supports Optimus Supports GPS (GPU Performance Scaling) |
| Panels | 16:9 Aspect Ratio 15.6-inch, FHD (1920 × 1080), WLED, AntiGlare, slim-flat (3.2 mm), SVA, eDP, 220 nits |
| Memory | Two SODIMM slots - customer non-accessible/non-upgradeable DDR4-2133 Dual Channel Support (DDR4-2400 bridge to DDR4-2133) (for 4 GB/6 GB memory) DDR4-2133 Dual Channel Support (DDR4-2400/2666 bridge to DDR4-2133) (for 8 GB memory) Supports up to 8 GB max system memory 4 GB (4 GB × 1) 6 GB (2 GB × 1 + 4 GB × 1) 8 GB (8 GB × 1) |
| Hard drive | Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives Supports M.2 SATA storage Accelerometer/Hard drive protection support Single hard drive configurations 1 TB, 5400 rpm, 9.5 mm/7.2 mm Dual storage configurations |

| Category | Description |
|-------------------------------------|---|
| | 1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive |
| Optical drive (External USB) | 9.5 mm tray load, SATA, external USB optical drive (aluminium material) DVD+/-RW Double-Layer SuperMulti |
| Camera and Microphone | HP Wide Vision HD Camera HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV 720p by 30 frames per second Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression HP Noise Cancellation |
| Audio | Audio Brand: B&O Play Audio control panel: B&O Play Audio Control Supports HP Audio Boost Dual speakers |
| Ethernet | Integrated 10/100/1000 NIC |
| Wireless | Integrated Wireless options with dual antennas (M.2/PCIe) Intel Dual Band Wireless-AC 7265 802.11ac 2 × 2 WiFi + Bluetooth 4.2 Combo Adapter (non vPRO) Compatible with Miracast-certified devices |
| External media cards | HP Multi-Format Digital Media Card Reader Support SD/SDHC/SDXC Push-push insertion/removal |
| Internal card expansion | One M.2 slot for WLAN module One M.2 slot for solid-state drives |
| Ports | Hot Plug/Unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected) HDMI v2.0 supporting: up to 4096 × 2160 @ 60Hz Headphone/Microphone combo jack USB 2.0 port: 1 (left side) USB 3.0 ports: 2 (1 on the left side; 1 on the right side) RJ-45/Ethernet AC Smart Pin adapter plug |
| Keyboard/pointing devices | Keyboard Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black) TouchPad requirements |

| Category | Description |
|---------------------------|---|
| | TouchPad with image sensor |
| | Multitouch gestures enabled |
| | Support Modern Trackpad Gestures |
| | Taps enabled as default |
| Power requirements | Battery |
| | 3-cell prismatic battery - 61.5 Whr (5360 mAh) |
| | Battery life enhancement |
| | Supports battery fast charge (90 minutes = 90% charged) |
| | AC adapter |
| | 120 W with power cords |
| | 1 meter conventional power cord with sticker label (C5) |
| Security | TPM 2.0 (firmware) |
| | Kensington Mini Security Slot |
| Operating system | Preinstalled |
| | Windows 10 |
| | Windows 10 Professional |
| | For Developed Market (ML) |
| | Windows 10 Home ML |
| | Windows 10 Home Plus ML |
| | For Emerging Market (EM/SL) |
| | Windows 10 Home EM/SL |
| | Windows 10 Home Plus EM/SL |
| | For the People's Republic of China market |
| | CPPP Windows 10 Home High End China Language Edition |
| | CPPP Windows 10 Home China Language Edition |
| | For Indonesia Market |
| | Windows 10 Home Plus EM/SL Indonesia PPP |
| | Windows 10 Home EM/SL Indonesia PPP |
| | For APAC Market |
| | Windows 10 Home Plus EM/SL APAC PPP |
| | Windows 10 Home EM/SL APAC PPP |
| | FreeDOS 2.0 (select products only) |
| Serviceability | End user replaceable parts: |
| | AC adapter |

Model numbers: 15-bc400~15-bc499

| Category | Description |
|---------------------|---|
| Product Name | <p>HP Pavilion Notebook PC</p> <p>Model numbers: 15-bc400~15-bc499</p> <p>CTO Model: 15t-bc400</p> |
| Processors | <p>8th generation Intel Core processors</p> <p>Intel Core i7-8750H (2.2 GHz, turbo up to 4.1 GHz), 2666 MHz/9 MB L3, Hexa core, 45 W</p> <p>Intel Core i7-8550U (1.8 GHz, turbo up to 4.0 GHz), 2400 MHz/8 MB L3, Quad, 15 W</p> <p>Intel Core i5-8300H (2.3 GHz, turbo up to 4.0 GHz), 2666 MHz/8 MB L3, Hexa core, 45 W</p> <p>Intel Core i5-8250U (1.6 GHz, turbo up to 3.4 GHz), 2400 MHz/6 MB L3, Quad, 15 W</p> |
| Chipset | <p>Intel SoC</p> <p>Intel HM370</p> |
| Graphics | <p>Internal graphics:</p> <p>Intel UHD Graphics 630</p> <p>Intel UHD Graphics 620</p> <p>Hybrid graphics:</p> <p>Nvidia GeForce GTX 1050 with up to 2 GB of dedicated video memory</p> <p>Nvidia GeForce GTX 1050 with up to 4 GB of dedicated video memory</p> <p>Nvidia GeForce GTX 1050 Ti with up to 4 GB of dedicated video memory</p> <p>Supports HD Decode, DX12, and HDMI</p> <p>Supports Optimus</p> <p>Supports FPS (GPU Performance Scaling)</p> <p>MR ready</p> |
| Panels | <p>16:9 Aspect Ratio</p> <p>15.6-inch, FHD (1920 × 1080), WLED, AntiGlare, slim-flat (3.2 mm), SVA, eDP, 220 nits</p> <p>15.6-inch, FHD (1920 × 1080), WLED, AntiGlare, slim-flat (3.2 mm), UWVA, eDP, 220 nits</p> |
| Memory | <p>Two SODIMM slots - customer non-accessible/non-upgradeable</p> <p>DDR4-2400 Dual Channel Support (DDR4-2666 bridge to DDR4-2400)</p> <p>Supports up to 8 GB max system memory</p> <p>4 GB (4 GB × 1)</p> <p>6 GB (2 GB × 1 + 4 GB × 1)</p> <p>8 GB (8 GB × 1)</p> |
| Hard drive | <p>Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives</p> <p>Supports M.2 SATA storage</p> <p>Accelerometer/Hard drive protection support</p> |

| Category | Description |
|-------------------------------------|--|
| | <p>Single hard drive configurations</p> <p>1 TB, 5400 rpm, 9.5 mm/7.2 mm</p> |
| | <p>Dual storage configurations</p> <p>1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive</p> |
| | <p>Intel Optane (3D Xpoint) Solution PCIe Gen3x2 M.2</p> <p>16 GB (Optane memory) + 1 TB (5400) 9.5mm/7.2mm</p> |
| Optical drive (External USB) | <p>9.5 mm tray load, SATA, external USB optical drive (aluminium material)</p> <p>DVD+/-RW Double-Layer SuperMulti</p> |
| Camera and Microphone | <p>HP Wide Vision HD Camera</p> <p>HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV</p> <p>720p by 30 frames per second</p> <p>Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression</p> <p>HP Noise Cancellation</p> |
| Audio | <p>Audio brand: B&O Play</p> <p>Audio control panel: B&O Play Audio Control</p> <p>Supports HP Audio Boost</p> <p>Dual speakers</p> |
| Ethernet | <p>Integrated 10/100/1000 NIC</p> |
| Wireless | <p>Integrated Wireless options with dual antennas (M.2/PCIe)</p> <p>Realtek RTL8822BE 802.11ac 2 x 2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)</p> <p>Compatible with Miracast-certified devices</p> |
| External media cards | <p>HP Multi-Format Digital Media Card Reader</p> <p>Support SD/SDHC/SDXC</p> <p>Push-push insertion/removal</p> |
| Internal card expansion | <p>One M.2 slot for WLAN module</p> <p>One M.2 slot for solid-state drives</p> |
| Ports | <p>Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video</p> <p>HDMI v2.0 supporting: up to 4096 × 2160 @ 60Hz</p> <p>Headphone/microphone combo jack</p> <p>USB 2.0 port:</p> <p>1 (left side)</p> <p>USB 3.0 ports:</p> <p>2 (1 on the left side; 1 on the right side)</p> <p>RJ-45/Ethernet</p> |

| Category | Description |
|----------------------------------|---|
| | AC Smart Pin adapter plug |
| Keyboard/pointing devices | Keyboard |
| | Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black, acid green) |
| | Backlit, full size, 3-coat paint, island-style keyboard with numeric keypad (acid green) |
| | TouchPad requirements |
| | TouchPad with image sensor |
| | Multitouch gestures enabled |
| | Support Modern Trackpad Gestures |
| | Taps enabled as default |
| Power requirements | Battery |
| | 3-cell prismatic battery - 52.2 Whr (5360 mAh) |
| | Battery life enhancement |
| | Supports battery fast charge |
| | AC adapter |
| | 120 W with power cords |
| | 135 W with power cords |
| | 150 W with power cords |
| | Power cord |
| | 1 meter conventional power cord with sticker label (C5) |
| Security | TPM 2.0 (firmware) |
| | Kensington Mini Security Slot |
| Operating system | Preinstalled |
| | Windows 10 |
| | Windows 10 Professional |
| | FreeDOS 2.0 (select products only) |
| | For Developed Market (ML) |
| | Windows 10 Home ML |
| | Windows 10 Home Plus ML |
| | Windows 10 Home Advanced |
| | For Emerging Market (EM/SL) |
| | Windows 10 Home EM/SL |
| | Windows 10 Home Plus EM/SL |
| | Windows 10 Home Advanced SL |
| | For the People's Republic of China market |

| Category | Description |
|-----------------------|---|
| | <p>CPPP Windows 10 Home High End China Language Edition</p> <p>CPPP Windows 10 Home China Language Edition</p> <p>For Indonesia Market</p> <p>Windows 10 Home Plus EM/SL Indonesia PPP</p> <p>Windows 10 Home EM/SL Indonesia PPP</p> <p>For APAC Market</p> <p>Windows 10 Home Plus EM/SL APAC PPP</p> <p>Windows 10 Home EM/SL APAC PPP</p> |
| Serviceability | <p>End user replaceable parts:</p> <p>AC adapter</p> |

Model numbers: 15-dp0000~15-dp0099

| Category | Description |
|---------------------|--|
| Product Name | <p>HP Pavilion Notebook PC</p> <p>Model numbers: 15-dp0000~15-dp0099</p> <p>CTO model: 15t-dp0000</p> |
| Processors | <p>8th generation Intel Core processors</p> <p>Intel Core i7-8750H (2.2 GHz, turbo up to 4.1 GHz), 2666 MHz/9 MB L3, Hexa core, 45 W</p> <p>Intel Core i5-8300H (2.3 GHz, turbo up to 4.0 GHz), 2666 MHz/8 MB L3, Hexa core, 45 W</p> |
| Chipset | <p>Intel SoC</p> <p>Intel HM370</p> |
| Graphics | <p>Internal graphics:</p> <p>Intel UHD Graphics 630</p> <p>Hybrid graphics:</p> <p>Nvidia GeForce GTX 1060 with up to 6 GB MB of dedicated video memory</p> <p>Nvidia GeForce GTX 1060 with up to 3 GB of dedicated video memory</p> <p>Supports HD Decode, DX12, and HDMI</p> <p>Supports Optimus</p> <p>Supports GPS (GPU Performance Scaling)</p> <p>MR ready (only on models with > 128 GB of memory)</p> |
| Panels | <p>16:9 Aspect Ratio</p> <p>15.6-inch, FHD (1920 × 1080), WLED, AntiGlare, slim-flat (3.2 mm), SVA, eDP, 220 nits</p> <p>15.6-inch, FHD (1920 × 1080), WLED, AntiGlare, slim-flat (3.2 mm), UWVA, eDP, 220 nits</p> |

| Category | Description |
|-------------------------------------|---|
| Memory | Two SODIMM slots - customer non-accessible/non-upgradeable |
| | DDR4-2666 Dual Channel Support |
| | Supports up to 16 GB max system memory |
| | 16 GB (8 GB × 2) 8 GB (8 GB × 1) |
| Hard drive | Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives |
| | Supports M.2 SATA storage |
| | Accelerometer/Hard drive protection support |
| | Single hard drive configurations |
| | 1 TB, 5400 rpm, 9.5 mm/7.2 mm |
| | Dual storage configurations |
| | 1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 256 GB PCIe, M.2 solid-state drive |
| | 1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive |
| | Intel Optane (3D Xpoint) Solution PCIe Gen3 × 2 M.2 |
| | 16 GB (Optane memory) + 1 TB (5400) 9.5mm/7.2mm |
| Optical drive (External USB) | 9.5 mm tray load, SATA, external USB optical drive (aluminium material) |
| | DVD+/-RW Double-Layer SuperMulti |
| Camera and Microphone | HP Wide Vision HD Camera |
| | HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV |
| | 720p by 30 frames per second |
| | Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression |
| | HP Noise Cancellation |
| Audio | Audio brand: B&O Play |
| | Audio control panel: B&O Play Audio Control |
| | Supports HP Audio Boost |
| | Dual speakers |
| Ethernet | Integrated 10/100/1000 NIC |
| Wireless | Integrated Wireless options with dual antennas (M.2/PCIe) |
| | Realtek RTL8822BE 802.11ac 2 × 2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported) |
| | Compatible with Miracast-certified devices |
| External media cards | HP Multi-Format Digital Media Card Reader |
| | Support SD/SDHC/SDXC |
| | Push-push insertion/removal |

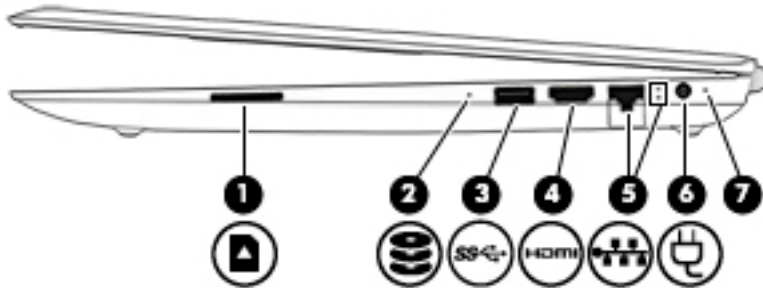
| Category | Description |
|------------------------------------|--|
| Internal card expansion | One M.2 slot for WLAN module |
| | One M.2 slot for solid-state drives |
| Ports | Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video |
| | HDMI v2.0 supporting: up to 4096 × 2160 @ 60Hz |
| | Headphone/microphone combo jack |
| | USB 2.0 port: |
| | 1 (left side) |
| | USB 3.0 ports: |
| | 2 (1 on the left side; 1 on the right side) |
| | RJ-45/Ethernet AC Smart Pin adapter plug |
| Keyboard/pointing devices | Keyboard |
| | Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black and acid green) |
| | Backlit, full size, 3-coat paint, island-style keyboard with numeric keypad (acid green) |
| | TouchPad requirements |
| | TouchPad with image sensor |
| | Multitouch gestures enabled |
| | Support Modern Trackpad Gestures Taps enabled as default |
| Power requirements | Battery |
| | 4-cell prismatic battery - 63.3 Whr (4175 mAh) |
| | Battery life enhancement |
| | Supports battery fast charge |
| | AC adapter |
| | 200 W Smart, PFC, slim barrel, 4.5 mm |
| Security | Power cord |
| | 1 meter power cord with sticker label (C13) |
| | Security |
| Operating system | TPM 2.0 (firmware) |
| | Kensington Mini Security Slot |
| | Preinstalled |
| | Windows 10 |
| | Windows 10 Professional |
| FreeDOS 2.0 (select products only) | |
| For Developed Market (ML) | |







| Category | Description |
|-----------------------|--|
| | Windows 10 Home ML |
| | Windows 10 Home Plus ML |
| | Windows 10 Home Advanced |
| | For Emerging Market (EM/SL) |
| | Windows 10 Home EM/SL |
| | Windows 10 Home Plus EM/SL |
| | Windows 10 Home Advanced SL |
| | For the People's Republic of China market |
| | CPPP Windows 10 Home High End China Language Edition |
| | CPPP Windows 10 Home China Language Edition |
| | For Indonesia Market |
| | Windows 10 Home Plus EM/SL Indonesia PPP |
| | Windows 10 Home EM/SL Indonesia PPP |
| | For APAC Market |
| | Windows 10 Home Plus EM/SL APAC PPP |
| | Windows 10 Home EM/SL APAC PPP |
| Serviceability | End user replaceable parts: |
| | AC adapter |

2 Getting to know your computer

Your computer features top-rated components. This chapter provides details about your components, where they are located, and how they work.

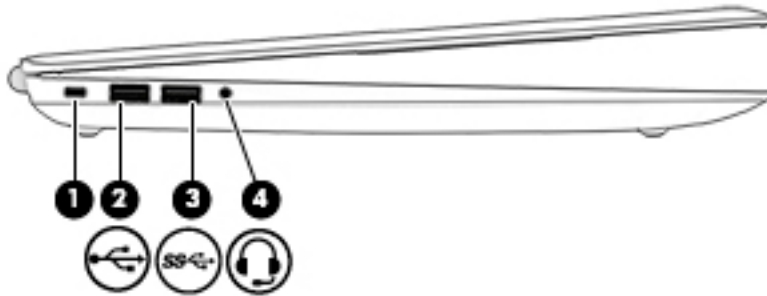
Right side






| Component | Description |
|--|--|
| (1)  Memory card reader | <p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none">1. Hold the card label-side up, with connectors facing the computer.2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none">▲ Press in on the card, and then remove it from the memory card reader. |
| (2)  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)  USB SuperSpeed port | Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer. |
| (4)  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 High-Definition Multimedia Interface (HDMI) device. |
| (5)  RJ-45 (network) jack/status lights | Connects a network cable. <ul style="list-style-type: none">• White: The network is connected.• Amber: Activity is occurring on the network. |
| (6)  Power connector | Connects an AC adapter. |
| (7) AC adapter and battery light | <ul style="list-style-type: none">• White: The AC adapter is connected and the battery is fully charged. |

| Component | Description |
|-----------|---|
| | <ul style="list-style-type: none"> Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. Amber: The AC adapter is connected and the battery is charging. Off: The battery is not charging. |

Left side



| Component | Description |
|-----------|---|
| (1) | <p>Security cable slot</p> <p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p> |
| (2) | <p> USB port</p> <p>Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.</p> |
| (3) | <p> USB SuperSpeed port</p> <p>Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.</p> |
| (4) | <p> Audio-out (headphone)/Audio-in (microphone) combo jack</p> <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 standalone microphones.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> Select the Start button, select HP Help and Support, and then select HP Documentation. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p> |

Display



| Component | Description |
|--------------------------|---|
| (1) Internal microphones | Record sound. |
| (2) Camera light | On: The camera is in use. |
| (3) Camera | Allows you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. NOTE: Camera functions vary depending on the camera hardware and software installed on your product. |
| (4) WLAN antennas* | Send and receive wireless signals to communicate with wireless local area networks (WLANs). |

*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

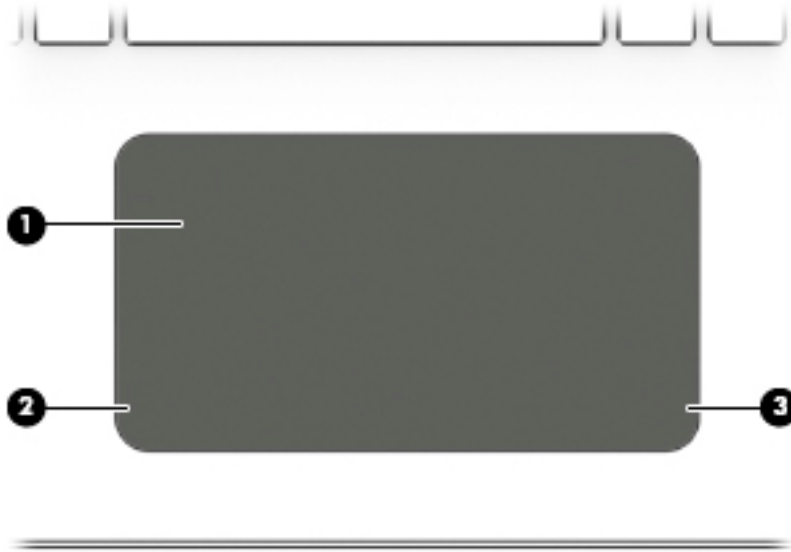
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

- ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.

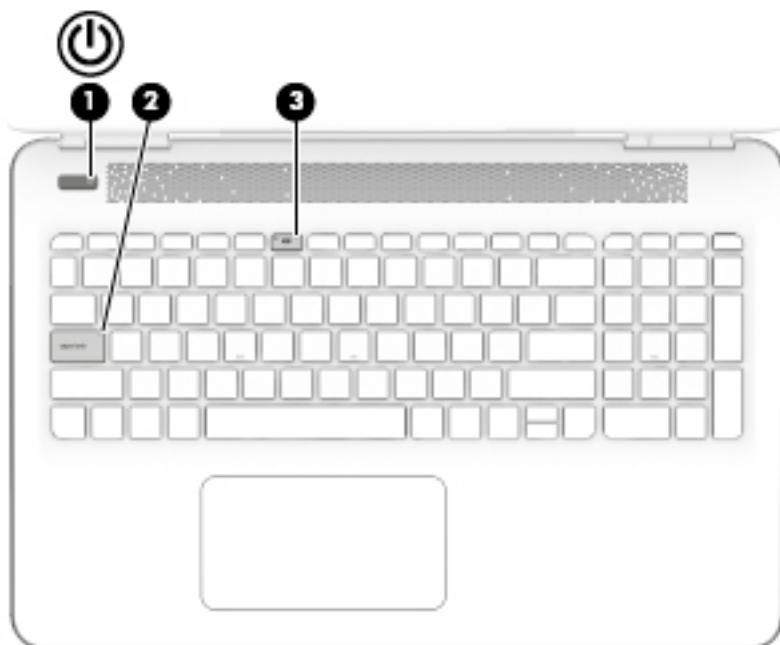
Keyboard area



TouchPad



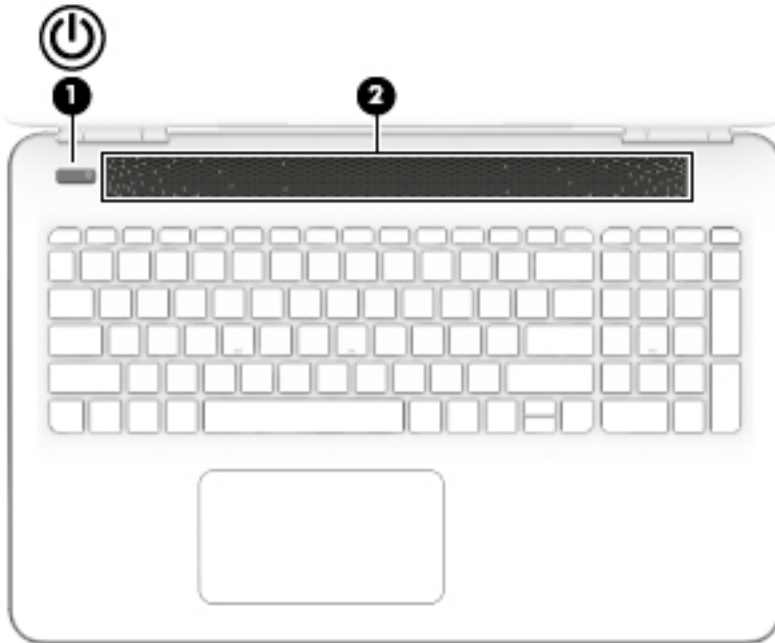
| Component | | Description |
|-----------|--------------------|---|
| (1) | TouchPad zone | Reads your finger gestures to move the pointer or activate items on the screen. |
| (2) | Left control zone | Textured area that allows you to perform additional gestures. |
| (3) | Right control zone | Textured area that allows you to perform additional gestures. |



Lights



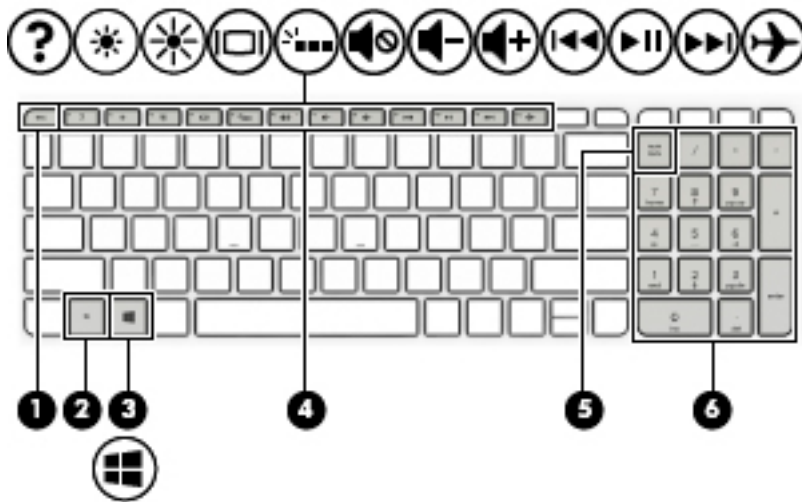
| Component | Description |
|--|---|
| (1)  Power light | <ul style="list-style-type: none">• On: The computer is on.• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power. |
| (2) Caps lock light | On: Caps lock is on, which switches the key input to all capital letters. |
| (3)  Mute light | <ul style="list-style-type: none">• On: Computer sound is off.• Off: Computer sound is on. |


Button and speaker



| Component | Description |
|--|---|
| <p>(1)  Power button</p> | <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 (select products only).• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>CAUTION: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options:</p> <ul style="list-style-type: none">▲ Right-click the Power icon , and then select Power Options. |
| <p>(2) Speaker</p> | <p>Produces sound.</p> |

Special keys


















| Component | Description |
|--|--|
| (1) <code>esc</code> key | Displays system information when pressed in combination with the <code>fn</code> key. |
| (2) <code>fn</code> key | Executes specific functions when pressed in combination with another key. |
| (3)  Windows key | Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu. |
| (4) Action keys | Execute frequently used system functions. NOTE: On select products, the <code>f5</code> action key turns the keyboard backlight feature off or on. |
| (5) <code>num lock</code> key | Alternates between the navigational and numeric functions on the integrated numeric keypad. |
| (6) Integrated numeric keypad | A separate keypad to the right of the alphabet keyboard. When <code>num lock</code> is pressed, the keypad can be used like an external numeric keypad. NOTE: If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on. |

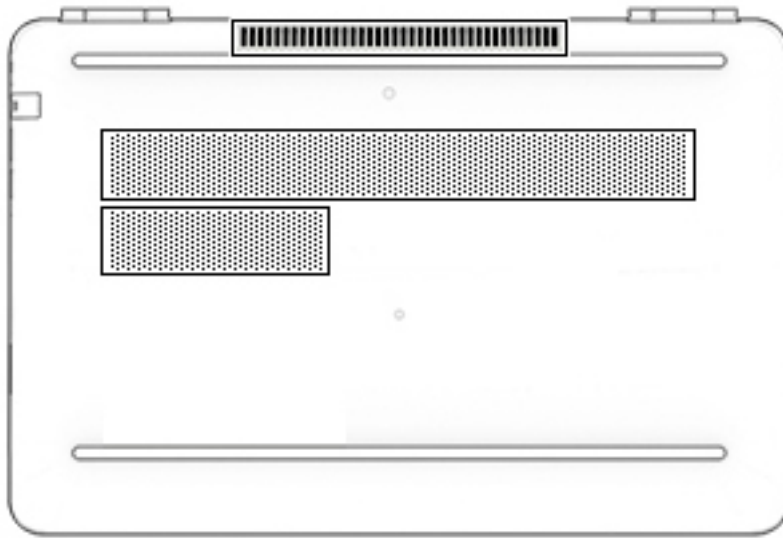
Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see [Special keys on page 17](#).

▲ To use an action key, press and hold the key.

| Icon | Description |
|---|---|
|  | Helps prevent side-angle viewing from onlookers. If needed, decrease or increase brightness for well-lit or darker environments. Press the key again to turn off the privacy screen. |
|  | |
|  | Decreases the screen brightness incrementally as long as you hold down the key. |
|  | Increases the screen brightness incrementally as long as you hold down the key. |
|  | Opens the “How to get help in Windows 10” webpage. |
|  | Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor. |
|  | Turns the keyboard backlight off or on. On select products, you can adjust the brightness of the keyboard backlight. Press the key repeatedly to adjust the brightness from high (when you first start up the computer), to low, to off. After you adjust the keyboard backlight setting, the backlight will revert to your previous setting each time you turn on the computer. The keyboard backlight will turn off after 30 seconds of inactivity. To turn the keyboard backlight back on, press any key or tap the TouchPad (select products only). To conserve battery power, turn off this feature. |
|  | Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD). |
|  | Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD. |
|  | Plays the next track of an audio CD or the next section of a DVD or a BD. |
|  | Stops audio or video playback of a CD, a DVD, or a BD. |
|  | Decreases speaker volume incrementally while you hold down the key. |
|  | Increases speaker volume incrementally while you hold down the key. |
|  | Mutes or restores speaker sound. |
|  | Turns the airplane mode and wireless feature on or off. NOTE: The airplane mode key is also referred to as the wireless button. NOTE: A wireless network must be set up before a wireless connection is possible. |

Bottom



| Component | Description |
|-----------|---|
| Vents (3) | 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. |


Rear



| Component | Description |
|-----------|--|
| Vent | Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation. |

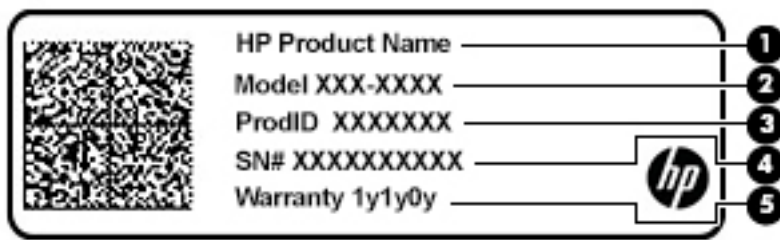
Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer. Labels may be in paper form or imprinted on the product.

 **IMPORTANT:** Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, on the back of the display, or on the bottom of a tablet kickstand.

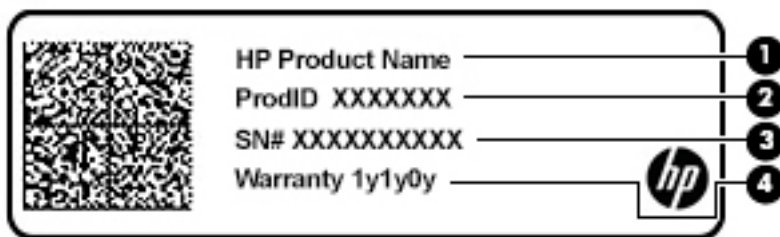
- Service label—Provides important information to identify your computer. When contacting support, you may be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

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



Component

- (1) HP product name
- (2) Model number
- (3) Product ID
- (4) Serial number
- (5) Warranty period



Component

- (1) HP product name
- (2) Product ID

Component

(3) Serial number


(4) Warranty period

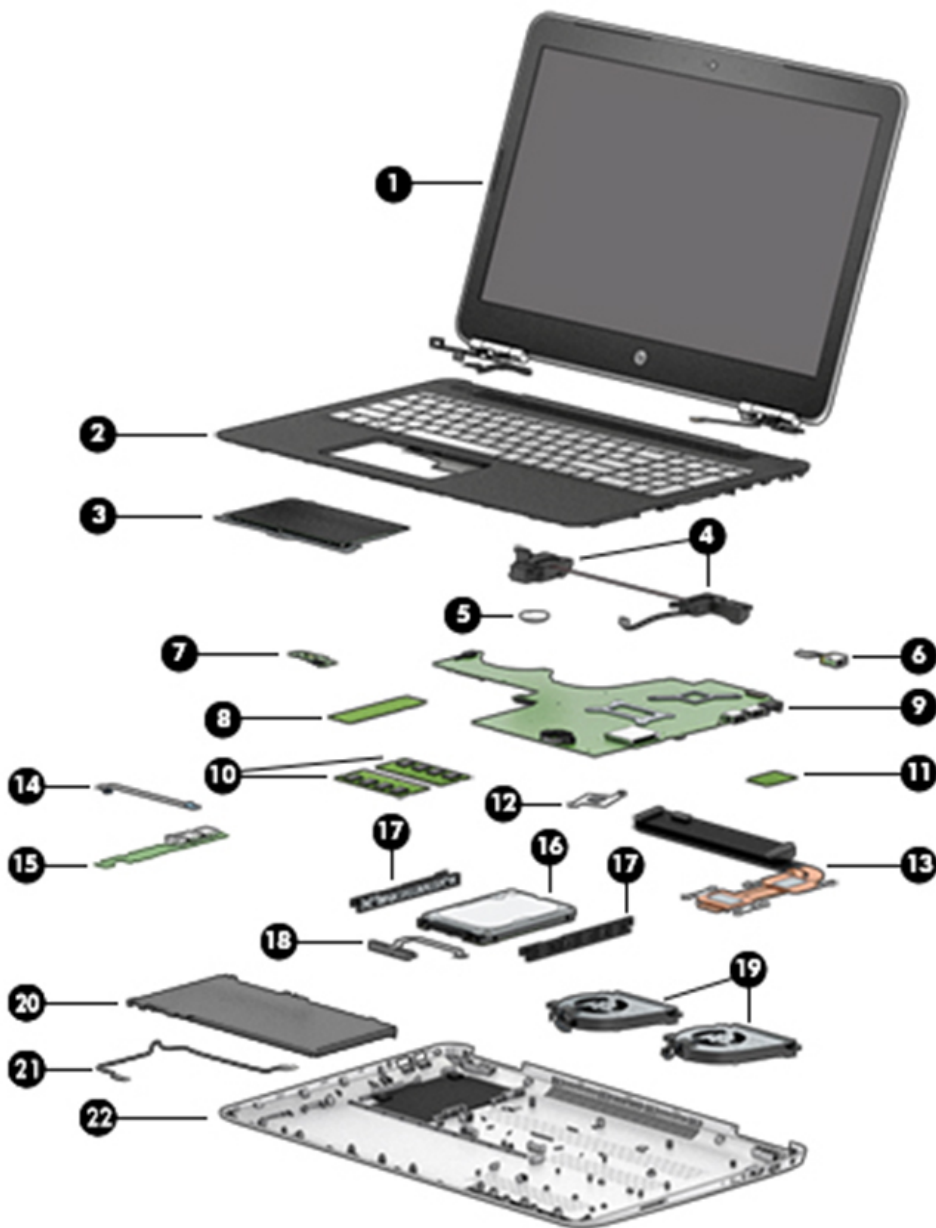
- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3 Illustrated parts catalog

Computer major components

 **NOTE:** HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to <http://partsurfer.hp.com>, select your country or region, and then follow the on-screen instructions.

 **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 20](#) for details.

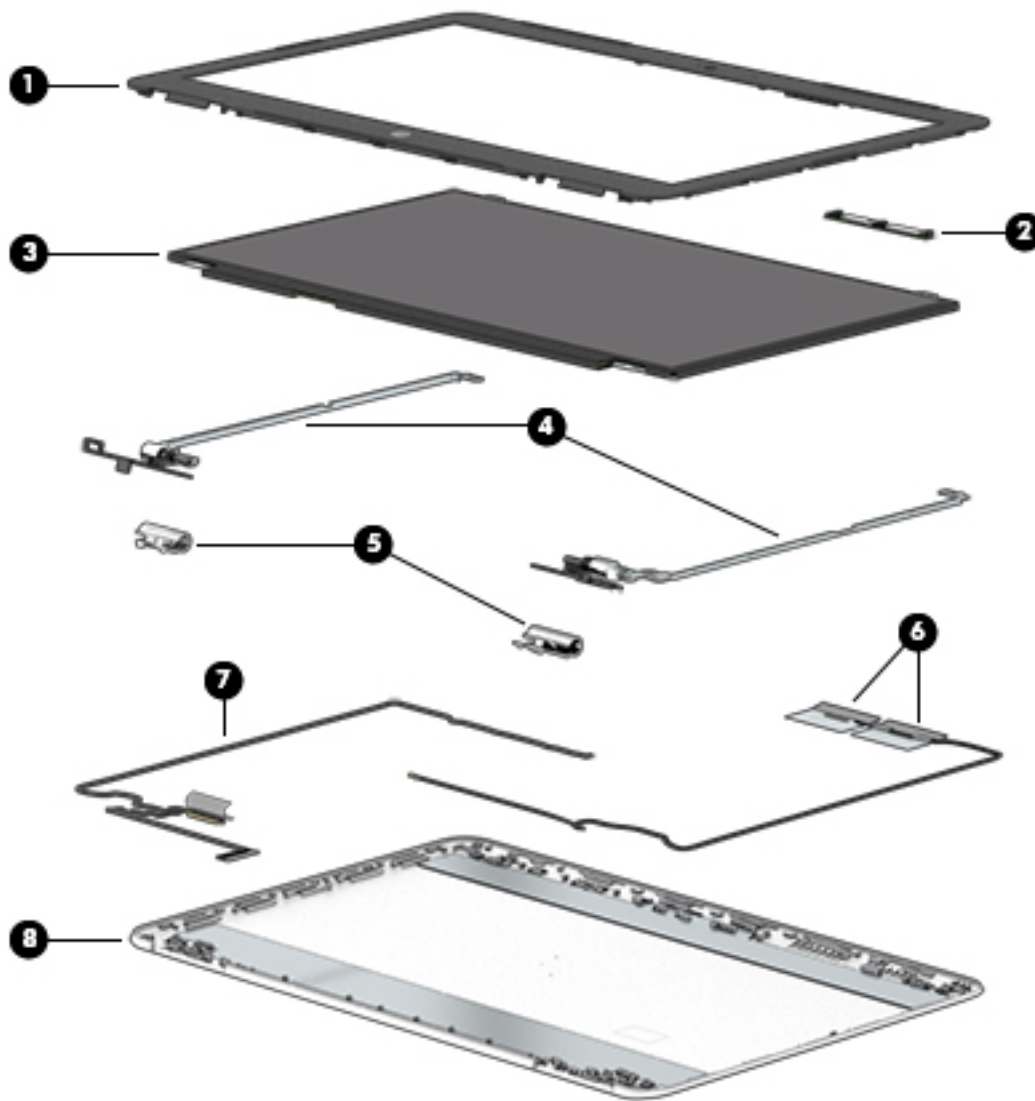


| Item | Component | Spare part number |
|------|--|-------------------|
| (1) | Display panel (see Display assembly on page 58) | not spared |
| (2) | Top cover with TouchPad and keyboard (see TouchPad on page 50 for a detailed list of country codes) | |
| | For use in the following models: 15-dp000~0999 | |
| | <ul style="list-style-type: none"> Shadow black | L43008-xx1 |
| | <ul style="list-style-type: none"> Acid green | L43007-xx1 |
| | <ul style="list-style-type: none"> Acid green, backlit | L43006-xx1 |
| | For use in the following models: 15-bc300~399, 15-bc400~499 | |
| | <ul style="list-style-type: none"> Natural silver, backlit | 858971-xx1 |
| | <ul style="list-style-type: none"> Shadow black | L03595-xx1 |
| | <ul style="list-style-type: none"> Acid green | L22937-xx1 |
| | <ul style="list-style-type: none"> Acid green, backlit | L22938-xx1 |
| (3) | TouchPad (included with top cover) | |
| | For use in model numbers: 15-dp0000~15-dp0999 | 860364-001 |
| | For use in model numbers: 15-bc300~15-bc399 and 15-bc400~15-bc499 | L06001-001 |
| | TouchPad cable for use in models: 15-dp0000~15-dp0999 (not illustrated) | L42995-001 |
| | TouchPad cable for use in models: 15-bc300~15-bc399 and 15-bc400~15-bc499 (not illustrated) | 858967-001 |
| (4) | Speaker Kit | |
| | For use in model numbers: 15-dp0000~15-dp0999 | L43001-001 |
| | For use in model numbers: 15-bc300~15-bc399 and 15-bc400~15-bc499 | 858976-001 |
| (5) | RTC battery | 741976-001 |
| (6) | Power connector (includes cable) | |
| | For use in model numbers: 15-dp0000~15-dp0999 | L42996-001 |
| | For use in model numbers: 15-bc300~15-bc399 and 15-bc400~15-bc499 | 858021-001 |
| (7) | Power button board | |
| | For use in model numbers: 15-dp0000~15-dp0999 | L42998-001 |
| | For use in model numbers: 15-bc300~15-bc399 and 15-bc400~15-bc499 | 858974-001 |
| | Power button board cable (not illustrated) | 858966-001 |
| (8) | Solid-state drive (M.2) | |
| | For use in model numbers: 15-dp0000~15-dp0999 | |
| | <ul style="list-style-type: none"> Optane memory module, 16 GB, PCIe | L43005-001 |
| | <ul style="list-style-type: none"> 128 GB, SATA-3 | L43004-001 |
| | <ul style="list-style-type: none"> 256 GB, PCIe | L44430-001 |
| | For use in model numbers: 15-bc300~15-bc399 and 15-bc400~15-bc499 | |

| Item | Component | Spare part number |
|-------------|---|-------------------|
| | <ul style="list-style-type: none"> Optane memory module, 16 GB, PCIe | L27067-001 |
| | <ul style="list-style-type: none"> 128 GB, SATA-3, TLC | 759848-032 |
| | <ul style="list-style-type: none"> 128 GB, SATA-3, Value | 827560-017 |
| | <ul style="list-style-type: none"> 256 GB, PCIe 3 × 4 SS, TLC | 847109-005 |
| | <ul style="list-style-type: none"> 512 GB, PCIe 3 × 4 SS, TLC | 847110-002 |
| (9) | System board (see System board on page 53) | |
| (10) | Memory module | |
| | DDR4, 2133 MHz (15-bc300~399, 400~499 models) | |
| | <ul style="list-style-type: none"> 4 GB | 820569-005 |
| | <ul style="list-style-type: none"> 8 GB | 820570-005 |
| | <ul style="list-style-type: none"> 2 GB | 851379-005 |
| | DDR4, 2400 MHz (15-bc300~399, 400~499 models) | |
| | <ul style="list-style-type: none"> 4 GB | 862397-855 |
| | <ul style="list-style-type: none"> 8 GB | 862398-855 |
| | <ul style="list-style-type: none"> 2 GB | 864271-855 |
| | DDR4, 2666 MHz (15-dp0000~0999 models) | |
| | <ul style="list-style-type: none"> 8 GB | 937236-855 |
| (11) | WLAN module | |
| | Intel Dual Band wireless-AC 7265 802.11ac, 2 × 2, WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) | 793840-005 |
| | Realtek RTL8822BE 802.11ac 2 × 2 WiFi + Bluetooth 4.2 Combo Adapter | 924813-855 |
| (12) | PCH heat sink | 725625-001 |
| (13) | Heat sink | |
| | For use in models with GeForce 950M/960M/965M graphics (only for 15-bc300~399, 15-bc400~499 models) | 856668-001 |
| | For use in models with GeForce GTX1050M graphics (only for 15-bc300~399, 15-bc400~499 models) | 920563-001 |
| | For use in models with GeForce GTX 950M graphics (only for 15-bc300~399, 15-bc400~499 models) | L03383-001 |
| | For use in models with GeForce GTX 1050 graphics (only for 15-bc300~399, 15-bc400~499 models) | L22941-001 |
| | For use in models with GeForce GTX 1060 graphics (only for 15-dp0000~0999 models) | L43000-001 |
| (14) | USB board cable | |
| | For use in model numbers: 15-dp0000~15-dp0999 | L42994-001 |
| | For use in model numbers: 15-bc300~15-bc399 and 15-bc400~15-bc499 | 856729-001 |
| (15) | USB board | |

| Item | Component | Spare part number |
|-------------|--|-------------------|
| | For use in models: 15-dp0000~15-dp0999 | L42997-001 |
| | For use in models: 15-bc300~bc399 and 15-bc400~bc499 | L06098-001 |
| (16) | Hard drive | |
| | 1 TB, 5400 rpm, 2.5 in | 778192-005 |
| | 1 TB, 5400 rpm, 7.0 mm | L30422-005 |
| | 1 TB, 7200 rpm, 9.5 mm | 766644-005 |
| | 2 TB, 5400 rpm 7.0 mm | 912487-855 |
| (17) | Hard drive bracket | 913937-001 |
| (18) | Hard drive cable | 858969-001 |
| (19) | Fans | |
| | For use in models: 15-dp0000~15-dp0999 | L42999-001 |
| | For use in models: 15-bc300~bc399 and 15-bc400~bc499 | L18458-001 |
| (20) | Battery | |
| | 3 cell, 61 Wh, 5.37 Ah | 849910-850 |
| | 4 cell, 63 Wh, 4.11 Ah | 905277-855 |
| (21) | Battery cable | 858968-001 |
| (22) | Base enclosure | |
| | For use in models: 15-dp0000~15-dp0999 | |
| | <ul style="list-style-type: none"> Shadow black | L42993-001 |
| | <ul style="list-style-type: none"> Acid green | L42992-001 |
| | For use in models: 15-bc300~bc399 and 15-bc400~bc499 | |
| | <ul style="list-style-type: none"> Natural silver | 858963-001 |
| | <ul style="list-style-type: none"> Shadow black | L03593-001 |
| | <ul style="list-style-type: none"> Acid green | L22940-001 |

Display assembly subcomponents



| Item | Component | Spare part number |
|------|--|-------------------|
| (1) | Bezel | |
| | For non-touch screens | 856725-001 |
| | For non-touch 3D screens | 856726-001 |
| (2) | Camera | |
| | NM USB 3.0 1080p Intel 3D (only for 15-bc300~399, 15-bc400~499 models) | 781624-005 |
| | DM USB 2.0 Mjpeg 720p VDHC PA (only for 15-bc300~399, 15-bc400~499 models) | 833962-011 |
| | DM USB 2.0 Mjpeg 720p VDH SF (only for 15-bc300~399, 15-bc400~499 models) | 846006-003 |
| | DM USB 2.0, HD, Mjpeg, VDHC, TL (used in all models) | L02666-001 |
| | Microphone board | 857471-001 |

| Item | Component | Spare part number |
|------------|--|-------------------|
| | 3D camera cable (not illustrated) | 859445-001 |
| (3) | Raw display panel | |
| | Non-touch for use in the following models: 15-bc300~399, 15-bc400~499 | |
| | • FHD, UWVA | 752920-012 |
| | • FHD, SVA | 798933-015 |
| | • UHD | 842484-003 |
| | Non-touch for use in the following models: 15-dp0000~0999 | |
| | FHD, SVA | L43002-001 |
| | FHD, UWVA | L43003-001 |
| | Touch models: | |
| | • FHD | 859098-001 |
| | • UHD | 859099-001 |
| (4) | Hinge assembly | |
| | For non-touch screens | 856741-001 |
| | For touch screens | 856742-001 |
| (5) | Hinge cap assembly for touch screens | 856748-001 |
| (6) | Hinge cap assembly for non-touch screen models | 859737-001 |
| (7) | WLAN antenna | 856923-001 |
| (8) | Display cable | |
| | Full high-definition (FHD) display cable for products not equipped with a touch screen | 856733-001 |
| | Full high-definition (FHD) display cable for products with a 3D non-touch screen | 856734-001 |
| | High-definition (HD) display cable for products with a non-touch screen | 856735-001 |
| | High-definition (HD) display cable for products with a 3D non-touch screen | 856736-001 |
| | Full high-definition (FHD) display cable for products with a touch screen | 856737-001 |
| | High-definition (HD) display cable for products with a touch screen | 856738-001 |
| (9) | Back cover (includes antenna) | |
| | In natural silver finish for non-touch screen | 856713-001 |
| | In natural silver finish for non-touch 3D screens | 856716-001 |
| | In natural silver finish for touch screens | 856719-001 |
| | In shadow black finish for non-touch screens | L03594-001 |
| | In acid green finish for non-touch screens | L22939-001 |

Miscellaneous parts

| Component | Spare part number |
|---|-------------------|
| AC adapter for use in the following models: 15-dp000~0999 | |
| 200 W adapter, PFC, SMART, 4.5 mm, slim | L00818-850 |
| AC adapter for use in the following models: 15-bc300~399 and 15bc400~499 | |
| 120 W adapter, PFC S-3P, 4.5 mm, slim | 710415-001 |
| 150 W adapter, PFC, SMART, 4.5 mm, slim | 776620-001 |
| | 917649-850 |
| 135 W adapter, PFC, SMART, 4.5 mm, slim | L15534-001 |
| 135 W adapter, PFC, SMART, 4.5 mm, slim (for LA MERC0 only) | L15534-101 |
| Hard drive bracket | 913937-001 |
| HP HDMI to VGA adapter | 701943-001 |
| HP USB external DVD/RW optical drive | 747080-001 |
| Power cord (C5, 1.0 m) for use in the following models: 15-bc300~399, 15-bc400~499 | |
| For use in Argentina | 401300-007 |
| For use in Australia | 213356-008 |
| For use in Denmark | 213353-008 |
| For use in Europe | 213350-009 |
| For use in India | 404827-003 |
| For use in Israel | 398063-003 |
| For use in Italy | 213352-008 |
| For use in North America | 213349-009 |
| For use in the People's Republic of China | 286497-008 |
| For use in South Africa | 361240-002 |
| For use in South Korea | 267836-008 |
| For use in Switzerland | 213354-008 |
| For use in Taiwan | 393313-003 |
| For use in Thailand | 285096-006 |
| For use in the United Kingdom | 213351-008 |
| Power cord (C13, 1.0 m) for use in the following models: 15-dp0000~0999 | |
| For use in Australia | L22339-001 |
| For use in Denmark | L22334-001 |
| For use in Europe | L22333-001 |
| For use in India | L22343-001 |
| For use in Israel | L22335-001 |

| Component | Spare part number |
|---|--------------------------|
| For use in the People's Republic of China | L22341-001 |
| For use in South Africa | L22337-001 |
| For use in Switzerland | L22336-001 |
| For use in Taiwan | L22342-001 |
| For use in Thailand | L22338-001 |
| For use in the United Kingdom | L22332-001 |
| Screw Kit | 856752-001 |

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Non-conductive, non-marking pry tool
- Magnetic Phillips P1 screwdriver

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 an optical drive, be sure that a disc is not in the drive and be sure that the optical drive tray is closed.

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

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 tablet 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.

5 Removal and replacement procedures for authorized service provider parts

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

CAUTION: This computer does not have user-replaceable parts. Only HP authorized service providers should perform the removal and replacement procedures described here. Accessing the internal part could 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 20](#) for details.

NOTE: HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to <http://partsurfer.hp.com>, select your country or region, and then follow the on-screen instructions.

There are as many as 58 screws that must be removed, replaced, and/or loosened when servicing the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

See [Removal and replacement procedures preliminary requirements on page 30](#) for initial safety procedures.

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

Base enclosure

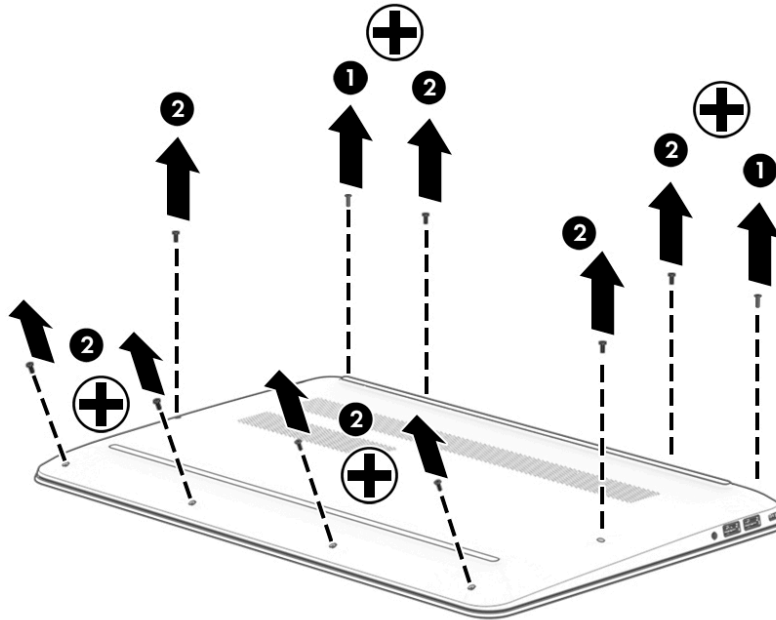
| Description | Spare part number |
|--|-------------------|
| Base enclosure for use in the following models: 15-dp0000~0999 | |
| • Shadow black finish | L42993-001 |
| • Acid green finish | L42992-001 |
| Base enclosure for use in the following models: 15-bc300~399, 15-bc400~499 | |
| • Natural silver finish | 858963-001 |
| • Shadow black finish | L03593-001 |
| • Acid green finish | L22940-001 |

Before disassembling the computer, follow these steps:

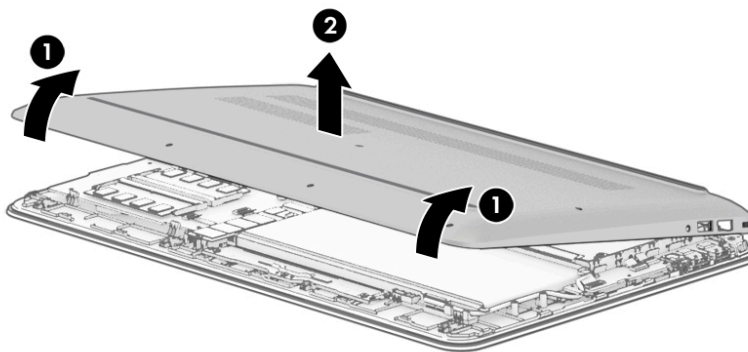
- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).

Remove the base enclosure:

1. Position the computer upside down on a flat surface.
2. Remove the two Phillips M2.5 × 6.0 screws (1) and the eight Phillips M2.0 × 5.0 screws (2) that secure the base enclosure to the computer.





3. Slide a non-marking, non-conductive pry tool around the edge of the base enclosure to loosen it (1), taking care not to damage the internal clips, and then remove the base enclosure (2).



Battery

| Description | Spare part number |
|---------------------------------|-------------------|
| Battery, 3 cell, 61 Wh, 5.37 Ah | 849910-850 |
| Battery, 4 cell, 63 Wh, 4.11 Ah | 905277-855 |
| Battery cable | 858968-001 |

 **WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

 **CAUTION:** Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

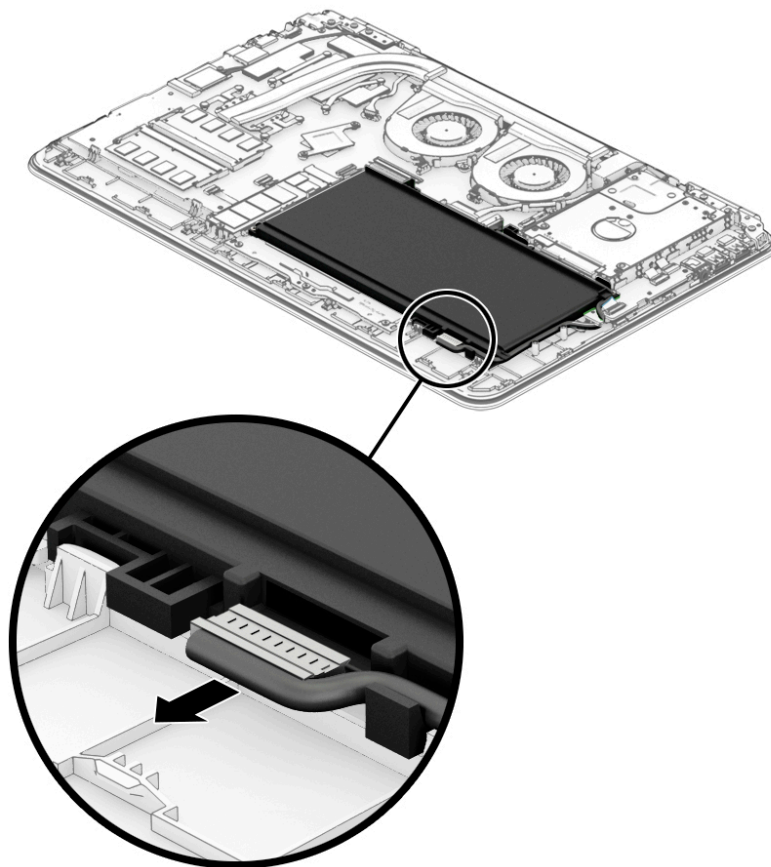
Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).

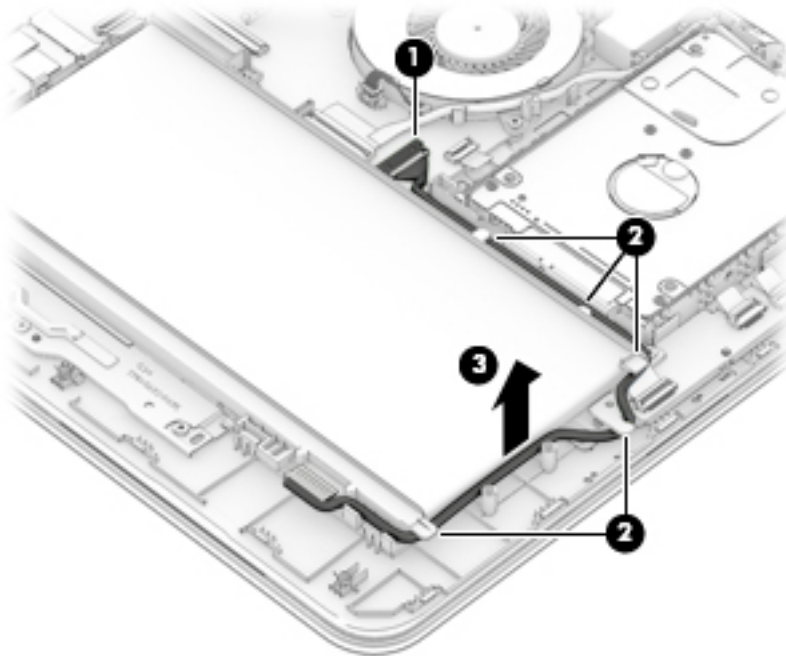
Remove the battery:

1. Disconnect the cable from the battery.

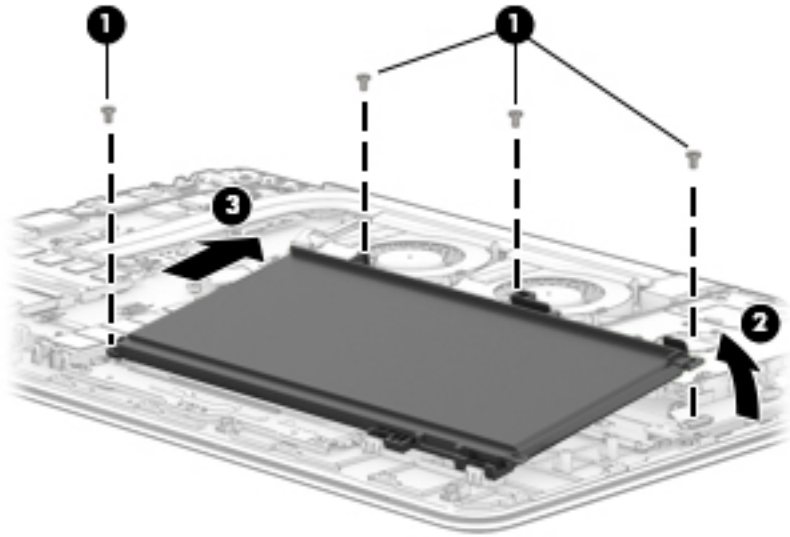
 **IMPORTANT:** Be sure to disconnect the cable from the battery before removing any internal components.



2. To remove the battery, disconnect the battery cable from the system board **(1)**, release the battery cable from the routing channels **(2)**, and then lift the battery cable to remove it **(3)**.




3. Remove four Phillips M2.0 × 4.0 screws (1) that secure the battery to the computer, lift the front of the battery (2), and then slide the battery up and away to remove it from the computer (3).



To insert the battery, reverse the removal procedures.

Hard drive

| Description | Spare part number |
|------------------------------------|-------------------|
| Hard drive, 1 TB, 5400 rpm, 2.5 in | 778192-005 |
| Hard drive, 1 TB, 5400 rpm, 7.0 mm | L30422-005 |
| Hard drive, 1 TB, 7200 rpm, 9.5 mm | 766644-005 |
| Hard drive, 2 TB, 5400 rpm, 7.0 mm | 912487-855 |
| Hard drive bracket | 913937-001 |
| Hard drive cable | 858969-001 |

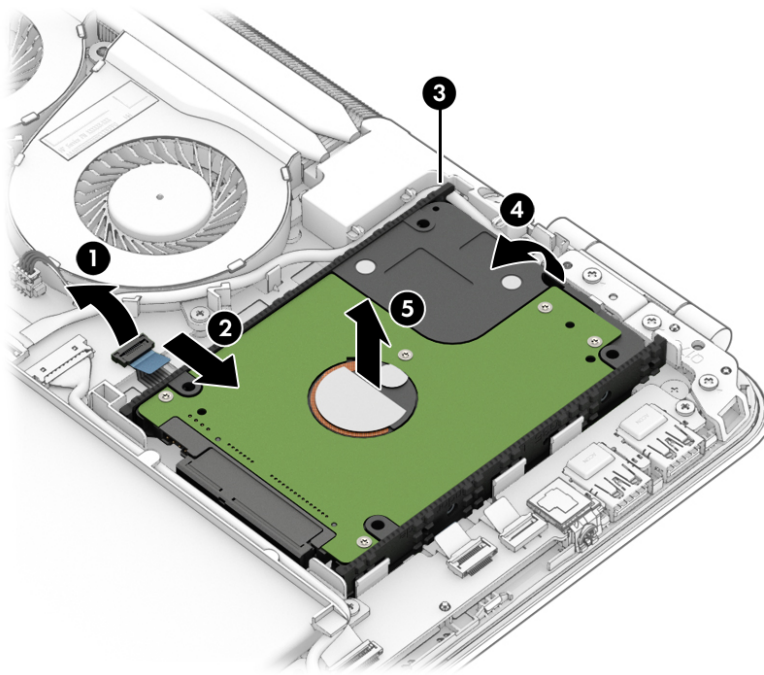
 **IMPORTANT:** Make special note of each screw and screw lock size and location during removal and replacement.

Before removing the hard drive, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

Remove the hard drive:

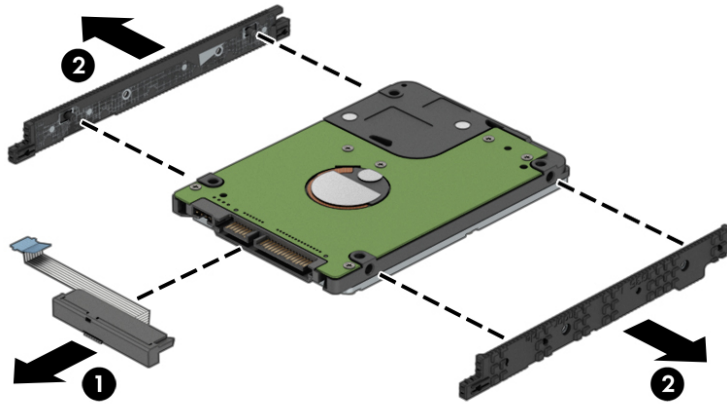
1. Open the ZIF connector latch on the system board **(1)**, and then disconnect the hard drive cable **(2)**.
2. Loosen the side brackets **(3)**, lift the front of the hard drive upward **(4)**, and then lift the hard drive from the computer **(5)**.



Reverse this procedure to install the hard drive.

If it is necessary to disassemble the hard drive, follow these steps:

- ▲ Remove the hard drive connector **(1)**, and then remove the side brackets **(2)**.



Reverse this procedure to reassemble the hard drive.

Solid-state drive (M.2)

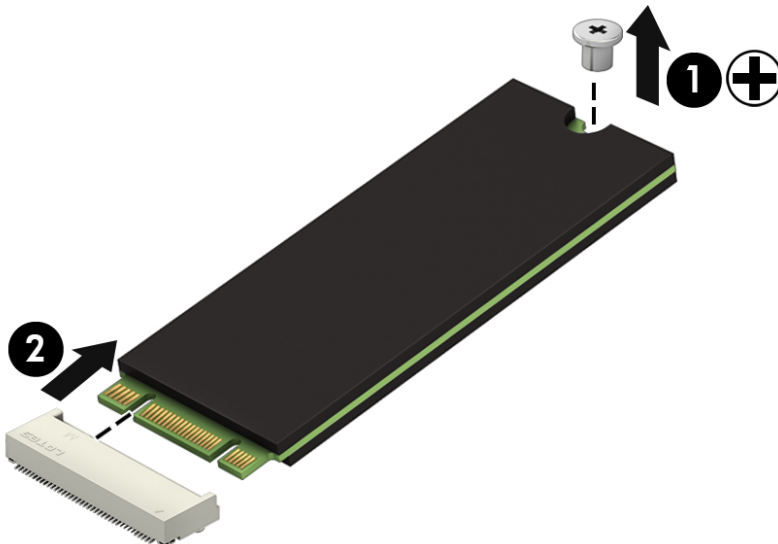
| Description | Spare part number |
|---|-------------------|
| Solid state drive for use in the following models: 15-dp0000~0999 | |
| <ul style="list-style-type: none">• Optane memory module, 16 GB, PCIe | L43005-001 |
| <ul style="list-style-type: none">• 256 GB, PCIe | L44430-001 |
| <ul style="list-style-type: none">• 128 GB, SATA-3 | L43004-001 |
| Solid state drive for use in the following models: 15-bc300~399, 15-bc400~499 | |
| <ul style="list-style-type: none">• Optane memory module, 16 GB, PCIe | L27067-001 |
| <ul style="list-style-type: none">• 128 GB, SATA-3, TLC | 759848-032 |
| <ul style="list-style-type: none">• 128 GB, SATA-3, Value | 827560-017 |
| <ul style="list-style-type: none">• 256 GB, PCIe 3 × 4 SS, TLC | 847109-005 |
| <ul style="list-style-type: none">• 512 GB, PCIe 3 × 4 SS, TLC | 847110-002 |

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

Remove the solid-state drive:

- ▲ Remove the Phillips M2.0 × 3.0 screw **(1)**, and then pull the solid-state drive away from the connector **(2)**.



Reverse this procedure to install the solid-state drive.

Memory

| Description | Spare part number |
|--|-------------------|
| Memory module, DDR4, 2133 MHz (15-bc300~399, 400~499 models) | |
| <ul style="list-style-type: none">• 8 GB | 820570-005 |
| <ul style="list-style-type: none">• 4 GB | 820569-005 |
| <ul style="list-style-type: none">• 2 GB | 851379-005 |
| Memory module, DDR4, 2400 MHz (15-bc300~399, 400~499 models) | |
| <ul style="list-style-type: none">• 8 GB | 862398-855 |
| <ul style="list-style-type: none">• 4 GB | 862397-855 |
| <ul style="list-style-type: none">• 2 GB | 864271-855 |
| Memory module, DDR4, 2666 MHz (15-dp0000~0999 models) | |
| <ul style="list-style-type: none">• 8 GB | 937236-855 |

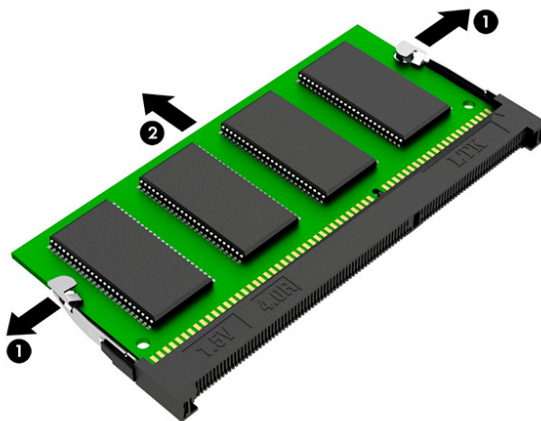
Before removing the memory, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

If you are replacing a memory module, remove the existing memory module:

1. Lift the clear film covering the memory module.
2. Spread the two retention clips outward (**1**) until the memory module tilts up at a 45-degree angle, and then remove the module (**2**). Use the same procedure to remove all memory modules.

CAUTION: To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

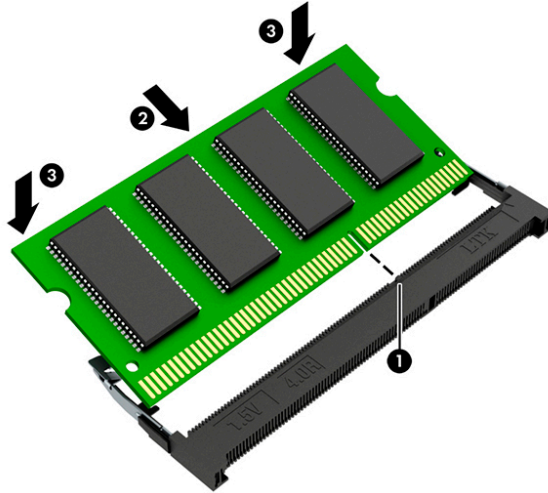


To protect a memory module after removal, place it in an electrostatic-safe container.

To install a memory module:

⚠ CAUTION: To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

1. Align the notched edge of the module with the tab in the slot **(1)**, and then press the module into the slot at an angle until it is seated **(2)**.
2. Press down on the module until the side retention clips snap into place **(3)**.



WLAN module

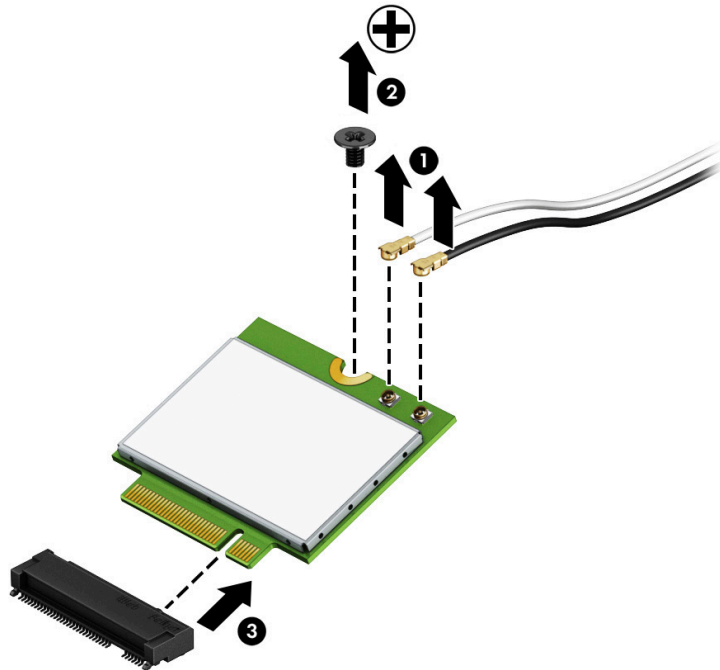
| Description | Spare part number |
|---|-------------------|
| Intel Dual Band wireless-AC 7265 802.11ac, 2 × 2, WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) | 793840-005 |
| Realtek RTL8822BE 802.11ac 2 × 2 WiFi + Bluetooth 4.2 Combo Adapter | 924813-855 |

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

Remove the WLAN module:

1. Carefully disconnect the two antenna cables from the module **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)**, and then remove the WLAN module from the socket **(3)**.



Reverse this procedure to install the WLAN module.

Heat sink

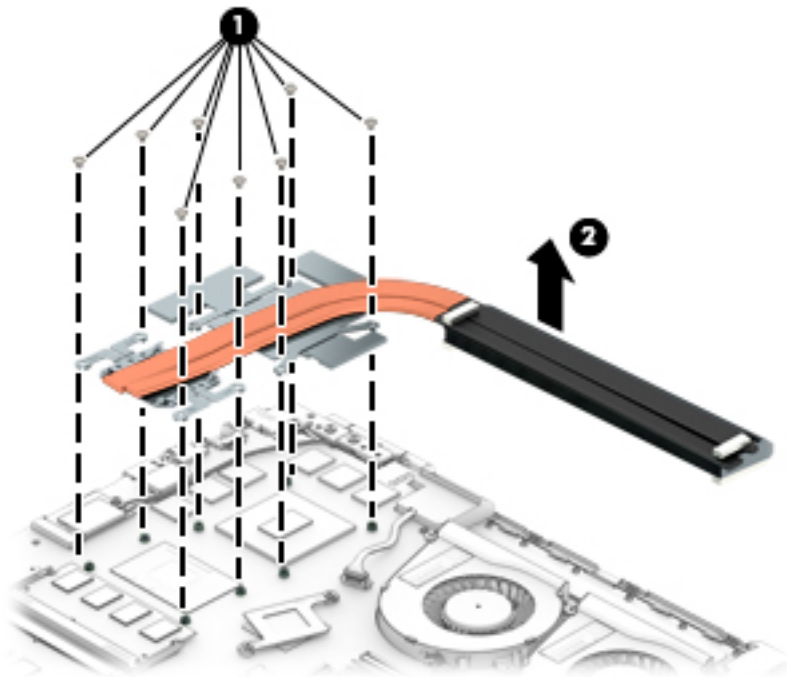
| Description | Spare part number |
|--|-------------------|
| Heat sink for use in products with GeForce 950M/960M/965M graphics (15-bc300~399, 15-bc400~499 models) | 856668-001 |
| Heat sink for use in products with GeForce GTX1050M graphics (15-bc300~399, 15-bc400~499 models) | 920563-001 |
| Heat sink for use in products with GeForce GTX 950M graphics (15-bc300~399, 15-bc400~499 models) | L03383-001 |
| Heat sink for use in products with GeForce GTX 1050 graphics (15-bc300~399, 15-bc400~499 models) | L22941-001 |
| Heat sink for use in products with GeForce GTX 1060 graphics (15-dp0000~0999 models) | L43000-001 |

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

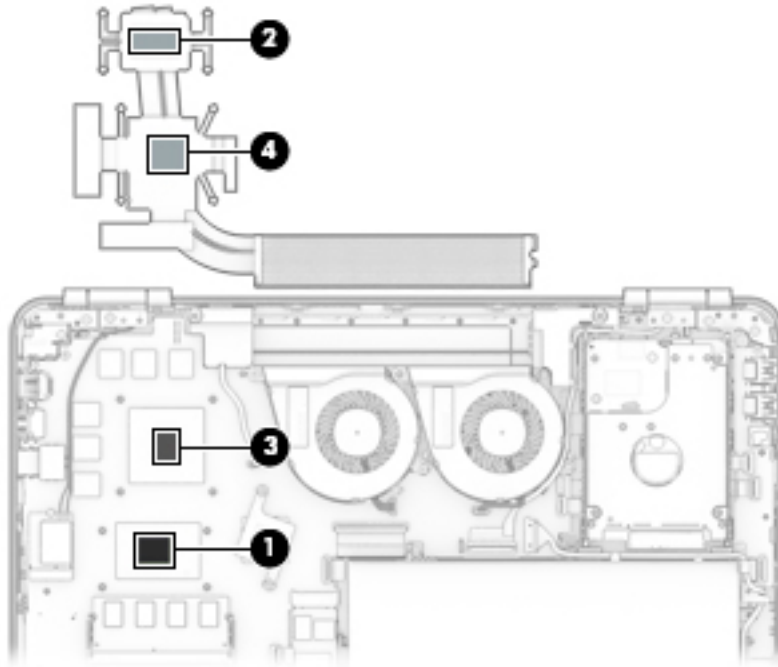
Remove the heat sink:

1. Remove the eight Phillips M2.0 × 2.5 screws **(1)** and then carefully lift the heat sink **(2)** to remove it from the system board.



2. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. The following illustration shows the replacement thermal material locations.

Thermal paste is used on the system board components **(1)**, **(3)** and on the heat sink areas **(2)**, **(4)** that service them.



Reverse this procedure to install the heat sink.

PCH heat sink

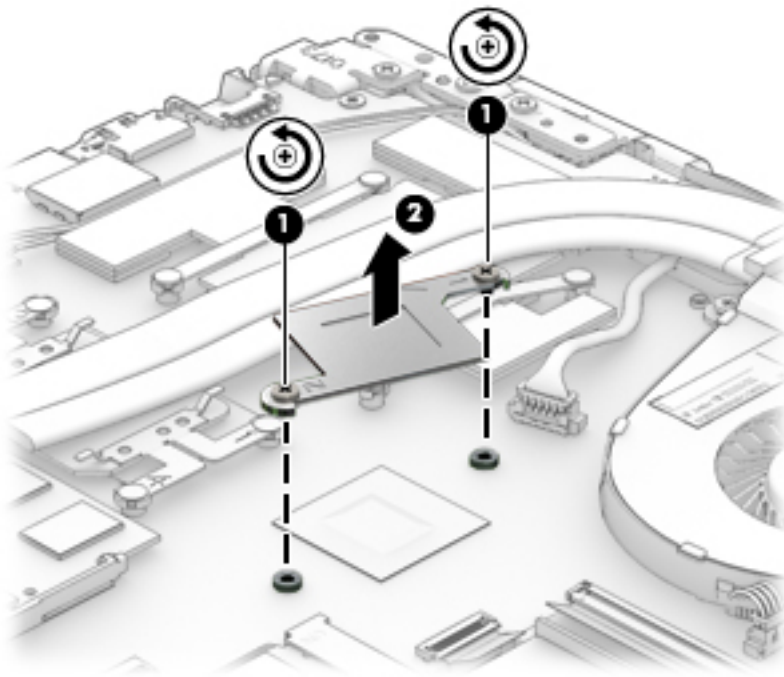
| Heat sink | Spare part number |
|---------------|-------------------|
| PCH heat sink | 725625-001 |

Before removing the platform controller hub (PCH) heat sink, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

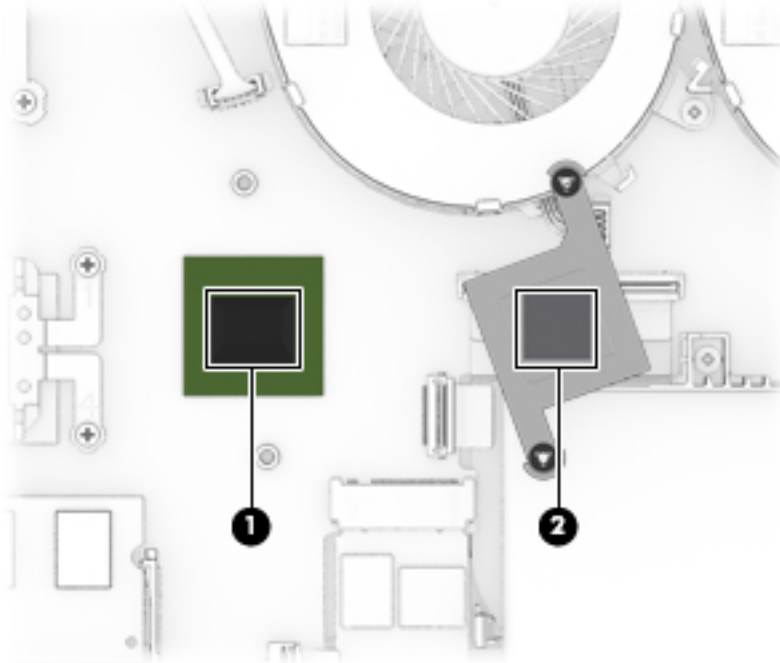
Remove the PCH heat sink:

1. Loosen the two captive Phillips screws **(1)**, and then remove the heat sink from the system board **(2)**.



2. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. The following illustration shows the replacement thermal material locations.


Thermal paste is used on the system board PCH component **(1)** and on the heat sink **(2)**.



Reverse this procedure to install the PCH heat sink.

USB board

| Description | Spare part number |
|--|-------------------|
| USB board for use in models 15-dp0000~15-dp0999 | L42997-001 |
| USB board for use in models 15-bc300~bc399, 15-bc400~bc499 | L06098-001 |
| USB board cable for use in models 15-dp0000~15-dp0999 | L42994-001 |
| USB board cable for use in models 15-bc300~bc399, 15-bc400~bc499 | 856729-001 |

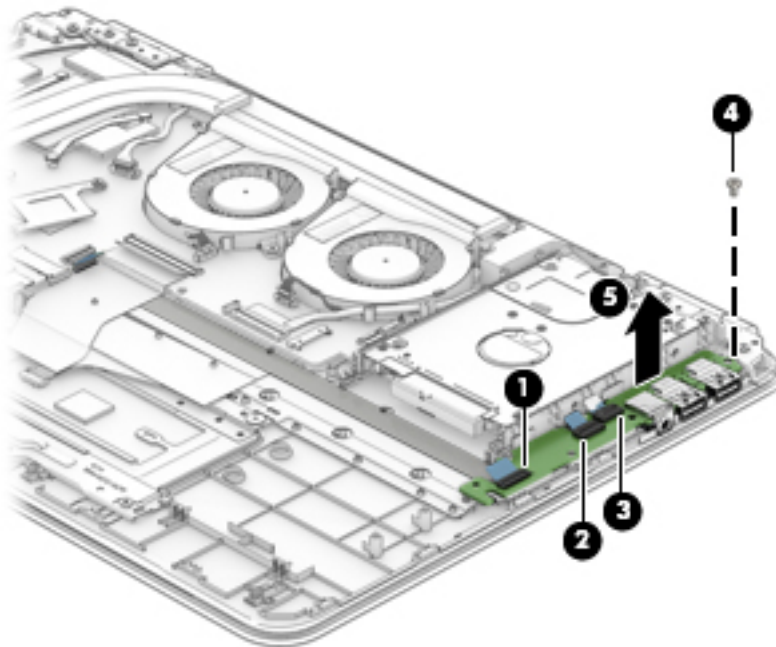
 **IMPORTANT:** Make special note of each screw and screw lock size and location during removal and replacement

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

Remove the USB board:

1. Disconnect the USB board cable from the zero-insertion force (ZIF) connector **(1)** on the USB board.
2. Disconnect the cables from the two ZIF connectors on the USB board **(2)** and **(3)**.
3. Remove the Phillips M2.0 × 4.0 screw **(4)**, and then lift the USB board to remove it **(5)**.



Reverse this procedure to install the USB board.

TouchPad

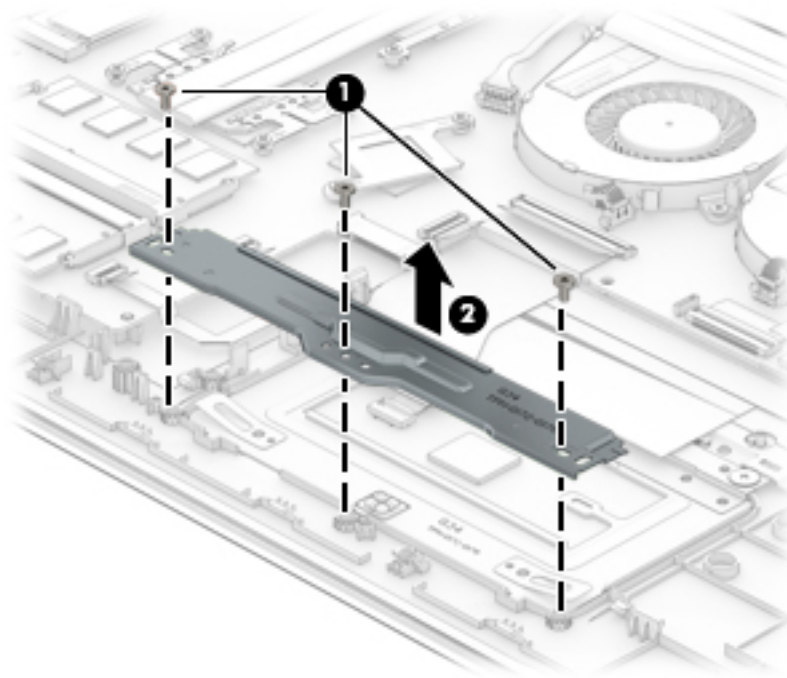
| Description | Spare part number |
|--|-------------------|
| TouchPad board for use in models 15-dp0000~15-dp0999 | 860364-001 |
| TouchPad board for use in models 15-bc300~15-bc399 and 15-bc400~15-bc499 | L06001-001 |
| TouchPad cable for use in models 15-dp0000~0999 | L42995-001 |
| TouchPad cable for use in models 15-bc300~15-bc399 and 15-bc400~15-bc499 | 858967-001 |

Before removing the TouchPad, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Remove the battery (see [Battery on page 36](#)).

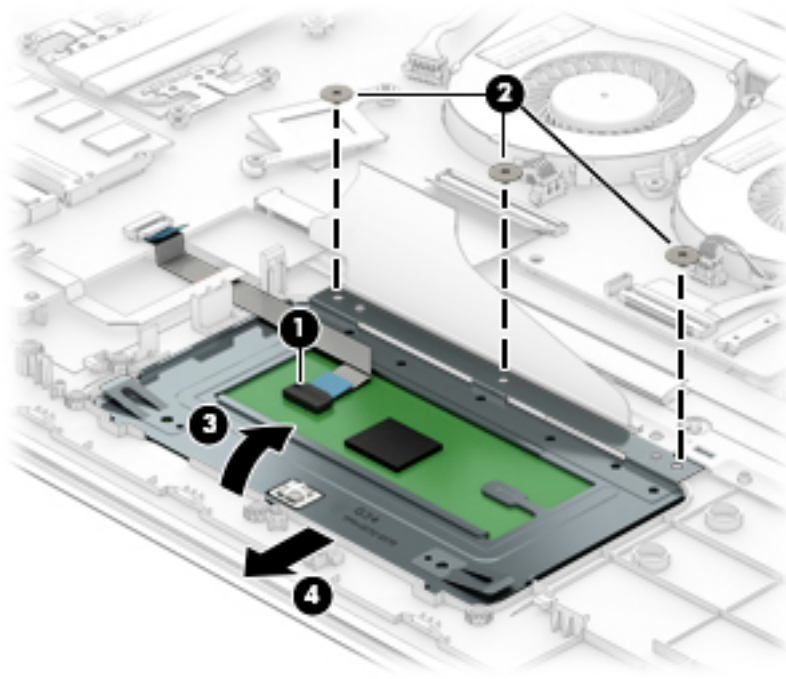
Remove the TouchPad:

1. Remove the three Phillips M2.0 × 2.0 screws that secure the TouchPad bracket **(1)**, and then remove the TouchPad bracket from the computer **(2)**.



2. Disconnect the TouchPad cable from the ZIF connector **(1)** on the TouchPad.
3. If tape secures the TouchPad to the computer, remove the.
4. Remove the three Phillips M2.0 × 2.5 screws **(2)** that secure the TouchPad to the computer.

5. Rotate the bottom of the TouchPad upward **(3)**, and then remove it from the computer **(4)**.



Reverse this procedure to install the TouchPad.

Fans


| Description | Spare part number |
|---|-------------------|
| Fan assembly for use in models 15-dp0000~0999 | L42999-001 |
| Fan assembly for use in models 15-bc300~bc399, 15-bc400~bc499 | L18458-001 |

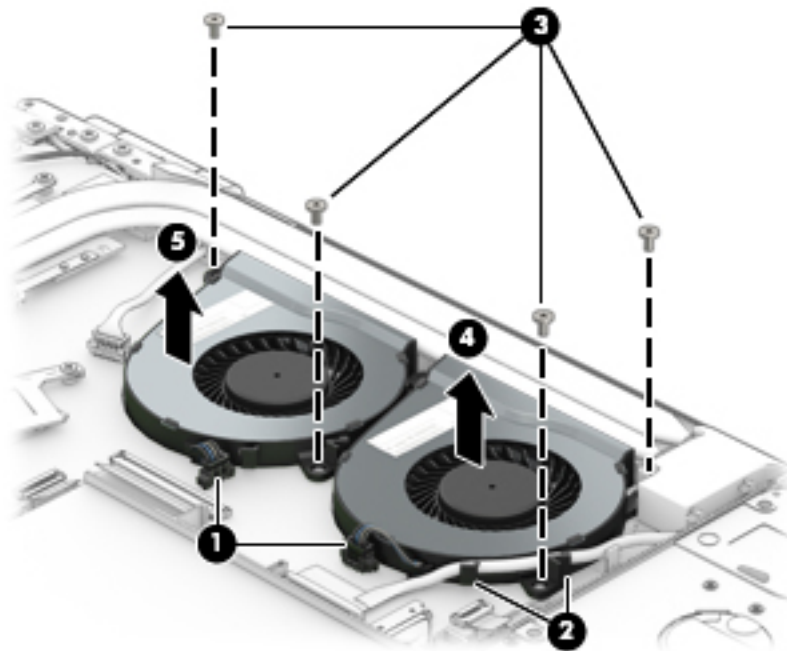
Before removing the fan, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).


Remove the fan assembly:

1. Disconnect the fan cables from the system board (1), and then release the display cable from the threading channel in the right fan (2).
2. Remove the four Phillips M2.0 × 4.0 screws from the fans (3), and then remove the right fan (4) and the left fan (5) from the computer.

 **TIP:** The right fan sits on top of the left fan on the shared post between the fans near the heat sink.



Reverse this procedure to install the fan assembly.

 **IMPORTANT:** When replacing the fans, you must install the left fan first.

System board

| Description | Spare part number |
|---|-------------------|
| System board (includes processor): | |
| All system boards use the following part numbers: | |
| xxxxxx-001: Non-Windows operating system | |
| xxxxxx-601: Windows 10 operating system | |
| Intel i7-7500U processor for use in models with 4 GB of GeForce GTX 950M discrete graphics memory | L03381-xxx |
| Intel i7-7200U processor for use in models with 4 GB of GeForce GTX 950M discrete graphics memory | L03382-xxx |
| Intel i7-7200U processor for use in models with 2 GB of GeForce GTX 950M discrete graphics memory | L03380-xxx |
| Intel i7-8550U processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory | L22035-xxx |
| Intel i7-8550U processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory | L22033-xxx |
| Intel i5-8250U processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory | L22036-xxx |
| Intel i5-8250U processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory | L22034-xxx |
| Intel i7-8750H processor for use in models with 4 GB of GeForce GTX 1050Ti discrete graphics memory | L30703-xxx |
| Intel i7-8750H processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory | L22039-xxx |
| Intel i7-8750H processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory | L22037-xxx |
| Intel i7-8750H processor for use in models with 6 GB of GeForce GTX 1060 discrete graphics memory | L42991-xxx |
| Intel i7-8750H processor for use in models with 3 GB of GeForce GTX 1060 discrete graphics memory | L42989-xxx |
| Intel i5-8300H processor for use in models with 4 GB of GeForce GTX 1050Ti discrete graphics memory | L30704-xxx |
| Intel i5-8300H processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory | L22040-xxx |
| Intel i5-8300H processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory | L22038-xxx |
| Intel i5-8300H processor for use in models with 6 GB of GeForce GTX 1060 discrete graphics memory | L42990-xxx |
| Intel i5-8300H processor for use in models with 3 GB of GeForce GTX 1060 discrete graphics memory | L42988-xxx |

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).
4. Remove the fans (see [Fans on page 52](#)).
5. Remove the solid-state drive (see [Solid-state drive \(M.2\) on page 41](#)).

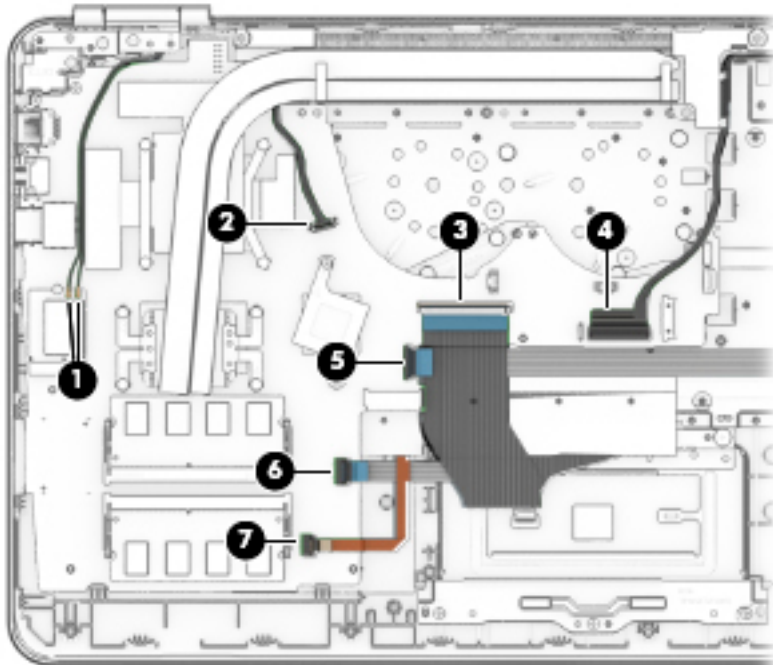
When replacing the system board, be sure to remove the following components (as applicable) from the defective system board and install on the replacement system board:

- Memory modules (see [Memory on page 42](#)).
- WLAN module (see [WLAN module on page 44](#)).

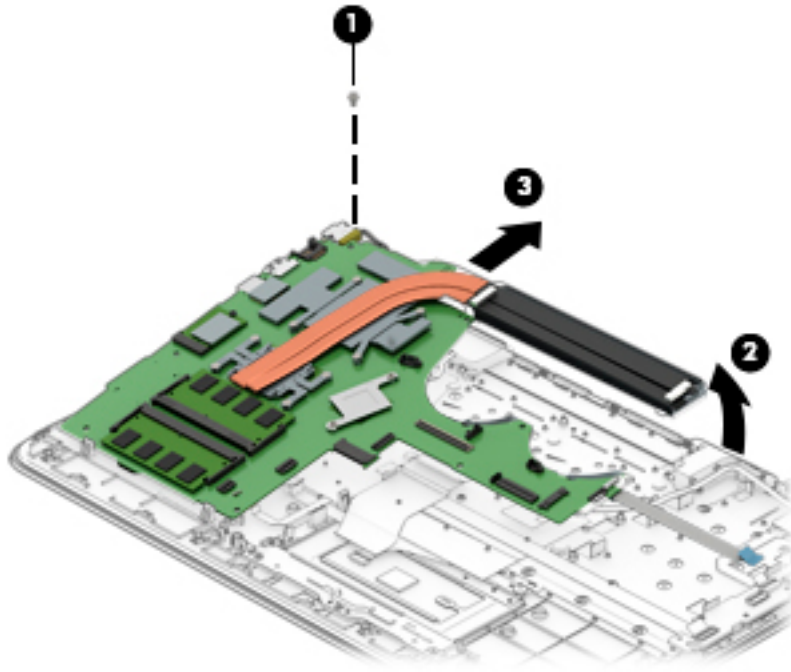
- Heat sink (see [Heat sink on page 45](#)).
- PCH heat sink (see [PCH heat sink on page 47](#)).

Remove the system board:

1. Disconnect the following cables:
 - Wireless antenna cable **(1)**
 - Speaker cable **(2)**
 - Keyboard cable (ZIF) **(3)**
 - Display cable (ZIF) **(4)**
 - USB board cable (ZIF) **(5)**
 - TouchPad cable (ZIF) **(6)**
 - Keyboard backlight cable (ZIF) **(7)**



2. Remove Phillips M2.0 × 4.0 screw (1), lift the top of system board (2), and then remove it from the computer (3).



Reverse this procedure to install the system board.

RTC battery

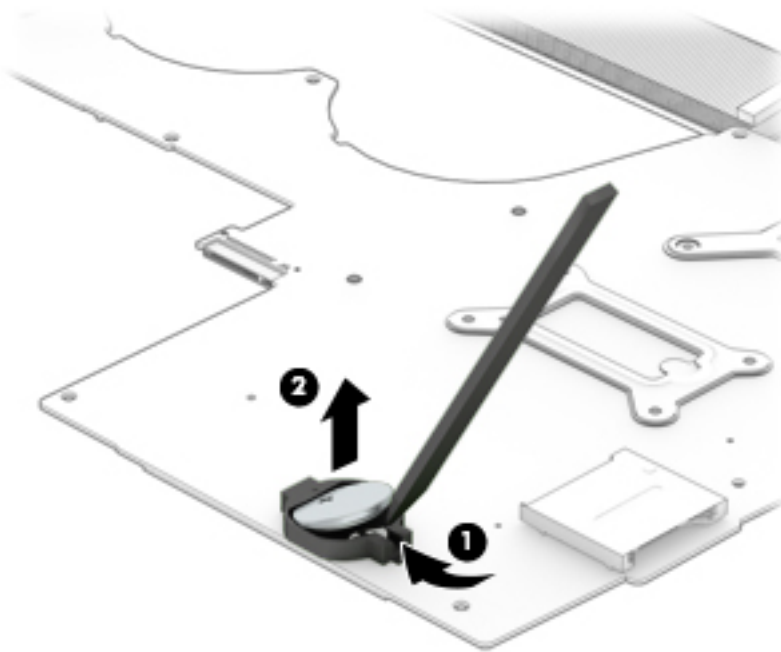
| Description | Spare part number |
|-------------|-------------------|
| RTC battery | 741976-001 |

Before removing the RTC battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)), and then remove the following components:
 - a. Solid-state drive (see [Solid-state drive \(M.2\) on page 41](#)).
 - b. Fans (see [Fans on page 52](#)).
 - c. System board (see [System board on page 53](#)).

Remove the RTC battery:

1. Position the removed system board upside down.
2. Use a non-conductive tool to pry the battery from the socket **(1)**, and then remove the battery from the system board socket **(2)**.



Reverse this procedure to install the RTC battery.

Power connector

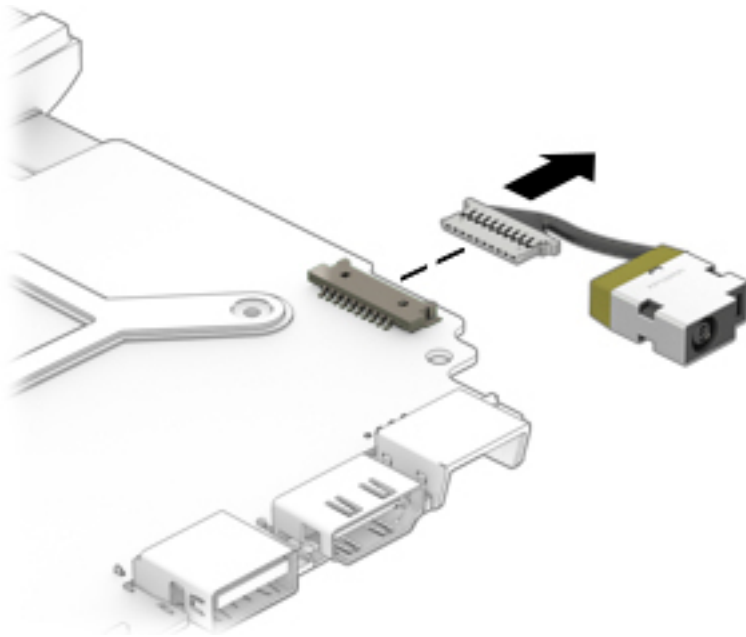
| Description | Spare part number |
|--|-------------------|
| Power connector cable for use in model numbers: 15-dp0000~0999 | L42996-001 |
| Power connector cable for use in model numbers: 15-bc300~399, 15-bc400~499 | 858021-001 |

Before removing the power connector, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)), and then remove the following components:
 - a. Solid-state drive (see [Solid-state drive \(M.2\) on page 41](#)).
 - b. Fans (see [Fans on page 52](#)).
 - c. System board (see [System board on page 53](#)).

Remove the power connector:

1. Position the removed system board upside down.
2. Disconnect the connector cable, and then remove the power connector.



Reverse this procedure to install the power connector.

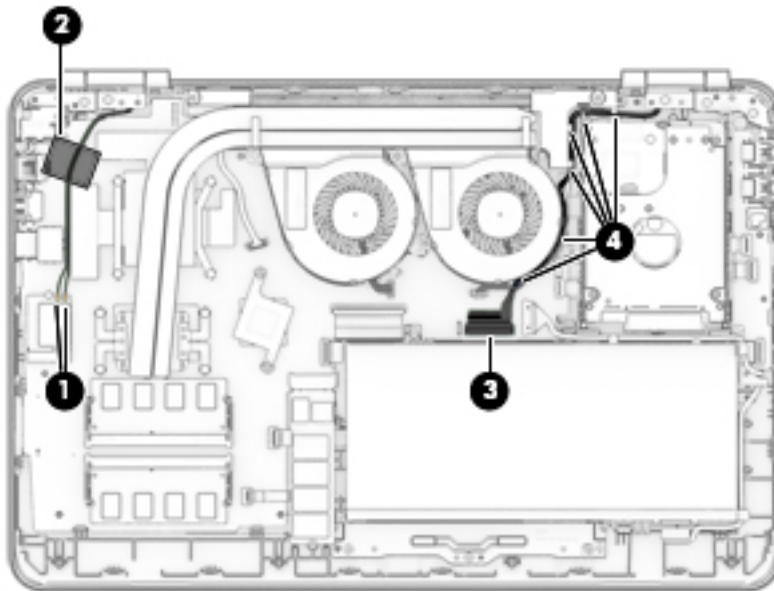
Display assembly

Before removing the display assembly, follow these steps:

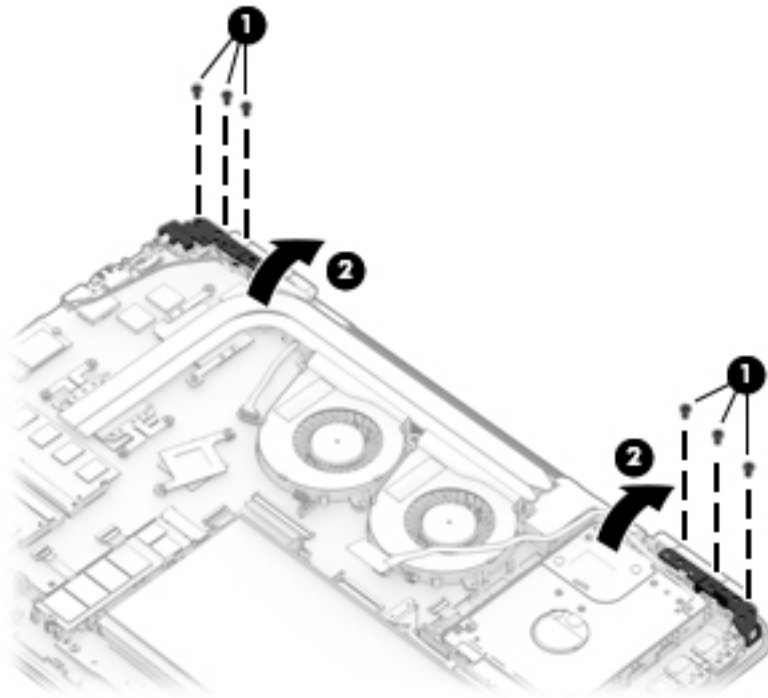
1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure.
3. Disconnect the cable from the battery (see [Battery on page 36](#)).

Remove and disassemble the display panel:

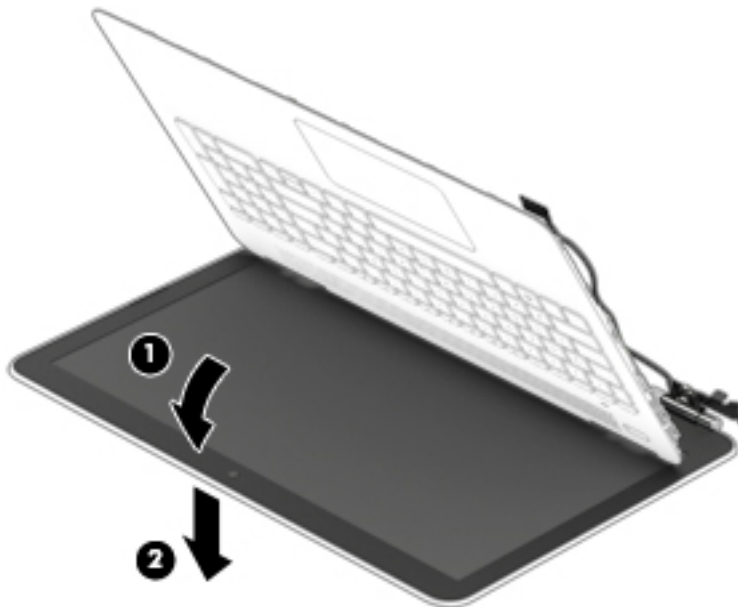
1. Disconnect the WLAN antenna cables from the WLAN module **(1)**, and then remove the tape the holding the antennas in place **(2)**.
2. Disconnect the display cable from the system board ZIF connector **(3)**, and then release the cable from the routing channels **(4)**.



3. Remove the three Phillips M2.5 × 5.0 screws from the left and right hinge brackets **(1)**, and then rotate the hinge brackets upward **(2)**.



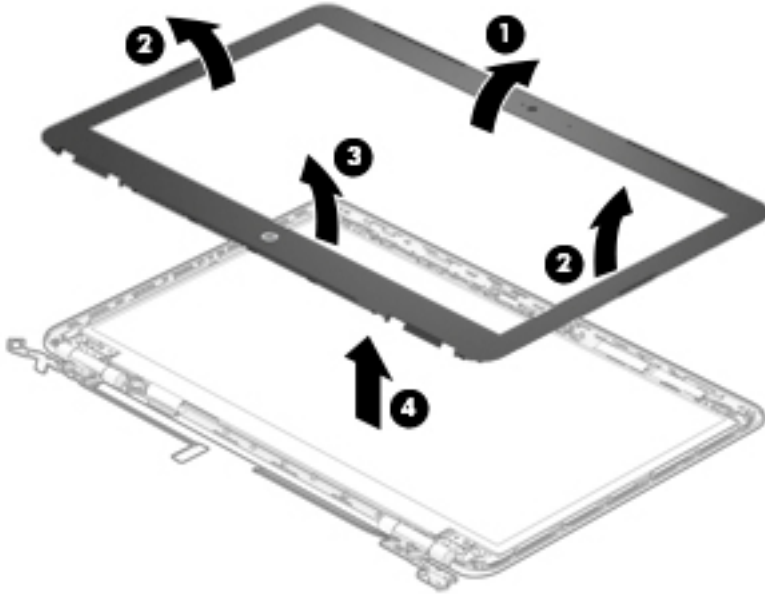
4. Position the computer upside-down on the display.
5. Rotate the display assembly **(1)**, and then separate the display assembly from the base enclosure **(2)**.



6. Position the display panel upright.

7. Using a non-marking, non-conductive pry tool, starting on the top edge **(1)**, loosen the display bezel, disconnecting the plastic clips to release the edge of the bezel. Continue on the left and right edges **(2)** and then bottom edge **(3)**, and then lift the display bezel **(4)** to remove it.

Display bezels are available using spare part number 856725-001 for non-touch panels and 856726-001 for touch panels.



8. If it is necessary to remove the camera, use a tool and lift the camera module to disengage the adhesive that secures it to the enclosure **(1)**, and then disconnect the cable **(2)** from the module.

 **IMPORTANT:** The camera module is fragile. Use care not to damage it during removal.

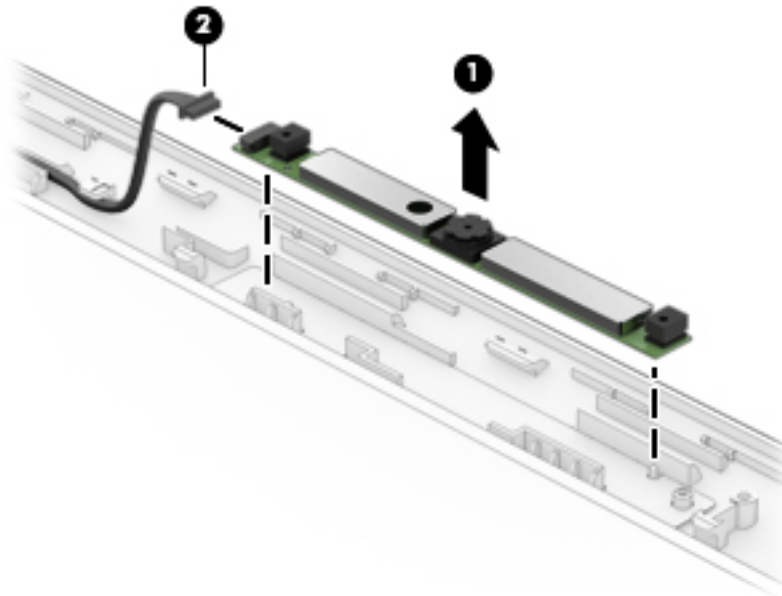
Camera are available using the following spare part numbers:

781624-005: NM USB 3.0 1080p Intel 3D (only for 15-bc300~399, 15-bc400~499 models)


833962-011: DM USB 2.0 Mjpeg 720p VDH2 PA (only for 15-bc300~399, 15-bc400~499 models)

846006-003: DM USB 2.0 Mjpeg 720p VDH SF (only for 15-bc300~399, 15-bc400~499 models)

L02666-001: DM USB 2.0, HD, Mjpeg, VDH, TL (used in all models)



9. If it is necessary to remove the display panel from the enclosure, remove the four Phillips M2.0 × 2.5 screws from the display panel **(1)**, and then lift the top of the panel **(2)** over and place it next to the enclosure.

 **IMPORTANT:** A cable connects to the bottom of the back of the display panel. When lifting the panel, be sure not to accidentally pull the cable from the connector.

Display panels are available using the following spare part numbers:

Non-touch for use in the following models: 15-bc300~399, 15-bc400~499

- 752920-012: FHD, UWVA
- 798933-015: FHD, SVA
- 842484-003: UHD

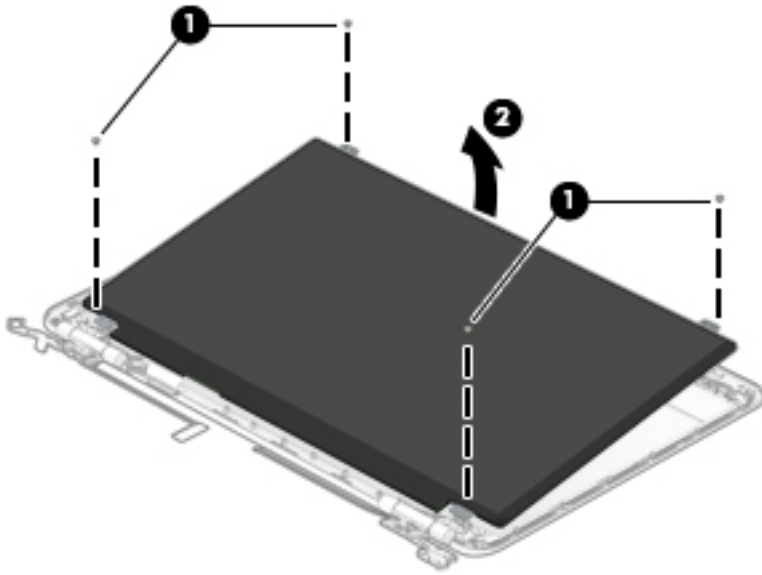
Non-touch for use in the following models: 15-dp000~0999

- L43002-001: FHD, SVA
- L43003-001: FHD, UWVA

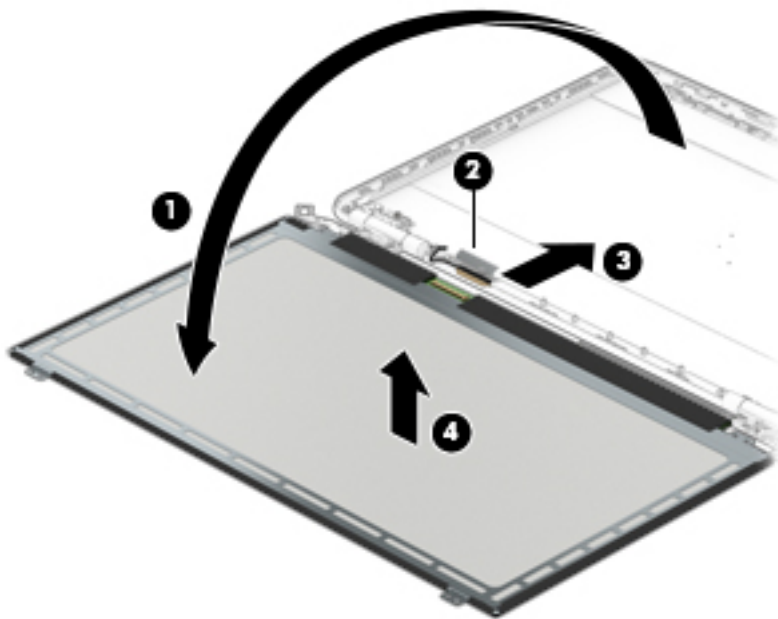
Touch models:

- 859098-001: FHD

- 859099-001: UHD

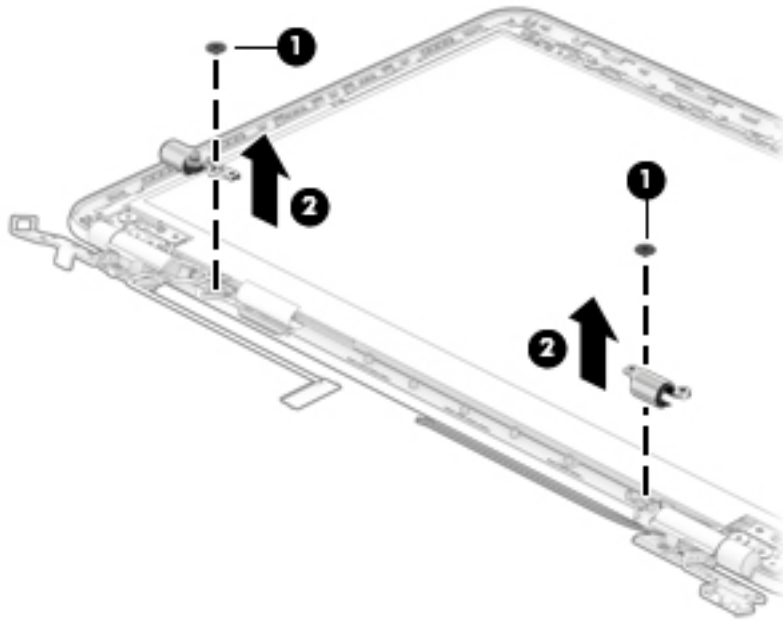


10. After rotating the display panel over next to the display enclosure **(1)**, lift the tape from the connector **(2)**, and then disconnect the display cable from the display panel **(3)**.
11. Remove the display panel from the enclosure **(4)**.



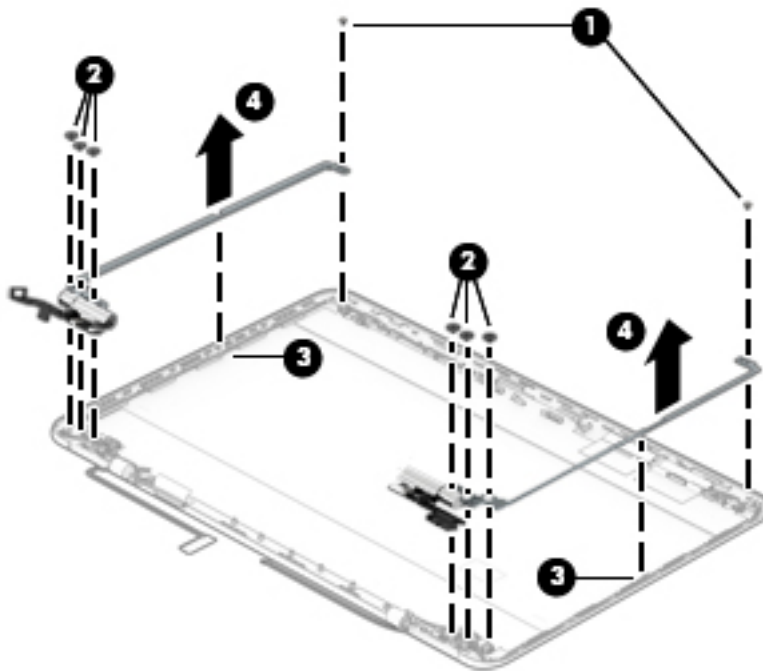
12. If it is necessary to remove the display hinges, remove the Phillips M2.0 × 2.0 screw from each hinge cover (1), and then remove the hinge covers from the enclosure (2).

All hinge covers and caps are available using spare part number 859737-001 for non-touch models and 856748-001 for touch models.



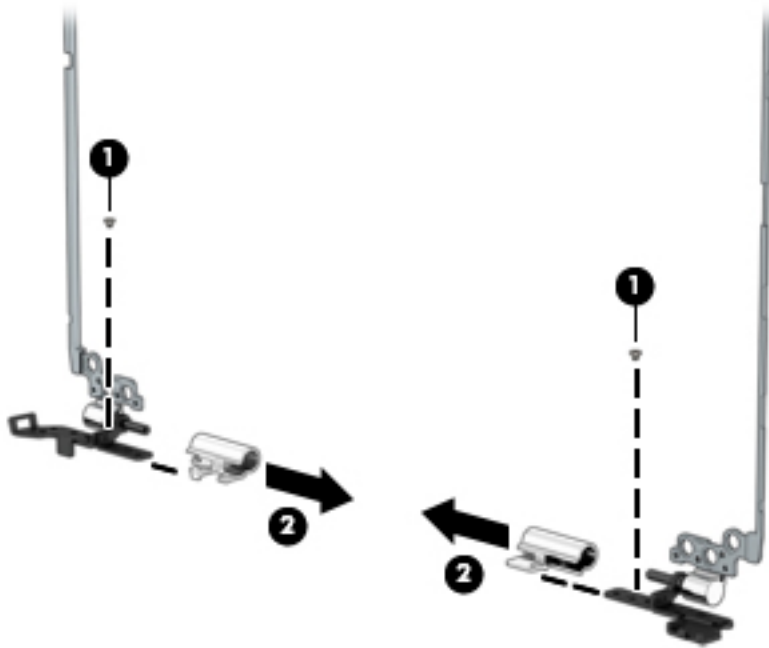
13. Remove Phillips M2.5 × 3.0 screw from the top of each hinge bracket (1) and three broad head Phillips M2.5 × 3.0 screws from each hinge (2). Remove the hinge brackets from the clips in the sides of the back cover (3), and then lift the hinge brackets (4) to remove them.

Hinges are available using spare part number 856741-001 for non-touch models and 856742-001 for touch models.



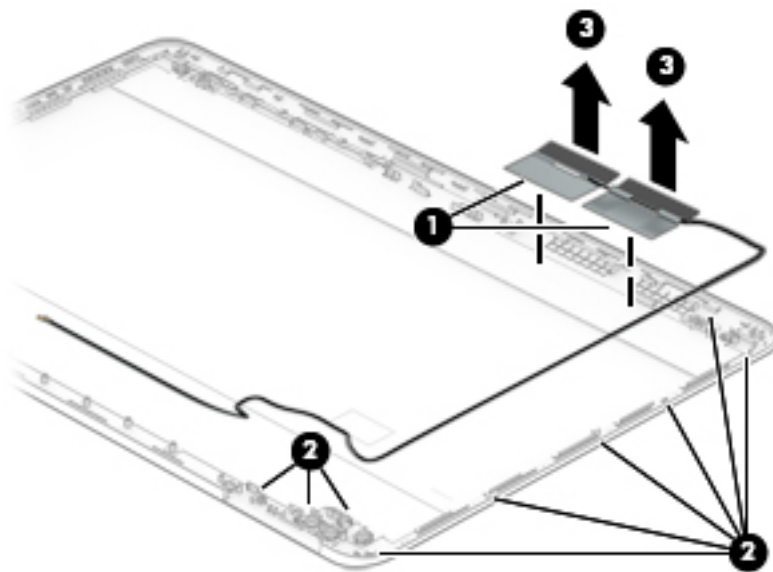
14. Remove the Phillips M2.0 × 2.0 screw from each hinge bracket (1), and then separate the hinge caps from the hinge brackets (2).

All hinge covers and caps are available using spare part number 859737-001 for non-touch models and 856748-001 for touch models.



15. If it is necessary to remove the WLAN antennas, peel the antennas from the top of the back cover (1), release the WLAN cable from the routing channels (2), and then remove the antennas and cables from the enclosure (3).

WLAN antennas and cables are available using spare part number 856923-001.



Display enclosures are available using the following spare part numbers:

856713-001: In natural silver finish for non-touch screen

856716-001: In natural silver finish for non-touch 3D screen

856719-001: In natural silver finish for touch screen


L03594-001: In shadow black finish for non-touch screen

L22939-001: In acid green finish for non-touch screen

Reverse this procedure to install the display assembly.

Power button board

| Description | Spare part number |
|--|-------------------|
| Power button board for use in model numbers 15-dp000~0999 | L42998-001 |
| Power button board for use in model numbers 15-bc300~399, 15-bc400~499 | 858974-001 |
| Power button board cable | 858966-001 |

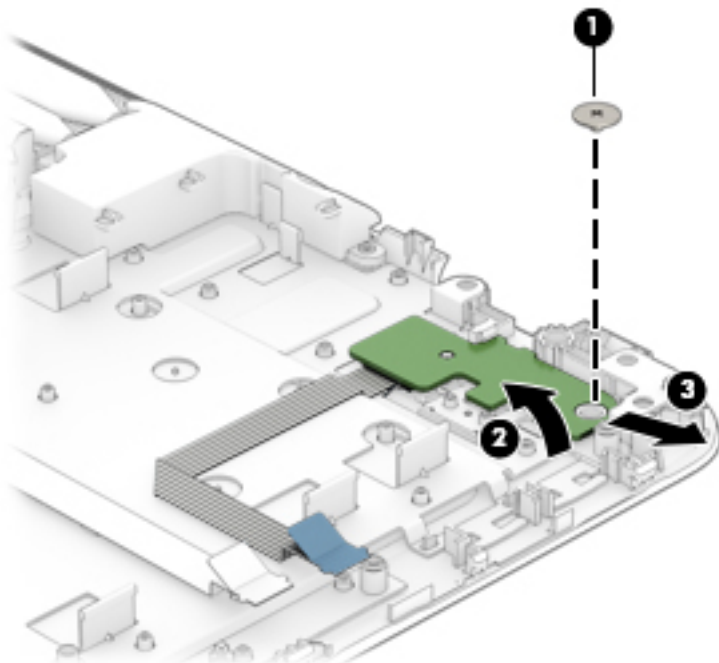
 **IMPORTANT:** Make special note of each screw and screw lock size and location during removal and replacement

Before removing the power button board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).
4. Remove the hard drive (see [Hard drive on page 39](#)).
5. Remove the USB board (see [USB board on page 49](#)).
6. Remove the display (see [Display assembly on page 58](#)).

Remove the power button board:

- ▲ Remove the broad head Phillips M2.0 × 2.0 screw **(1)**, lift the power button board at an angle **(2)**, and then remove it **(3)**.



Reverse this procedure to install the power button board.

Speakers

 **NOTE:** The speaker spare part kit includes the cable.

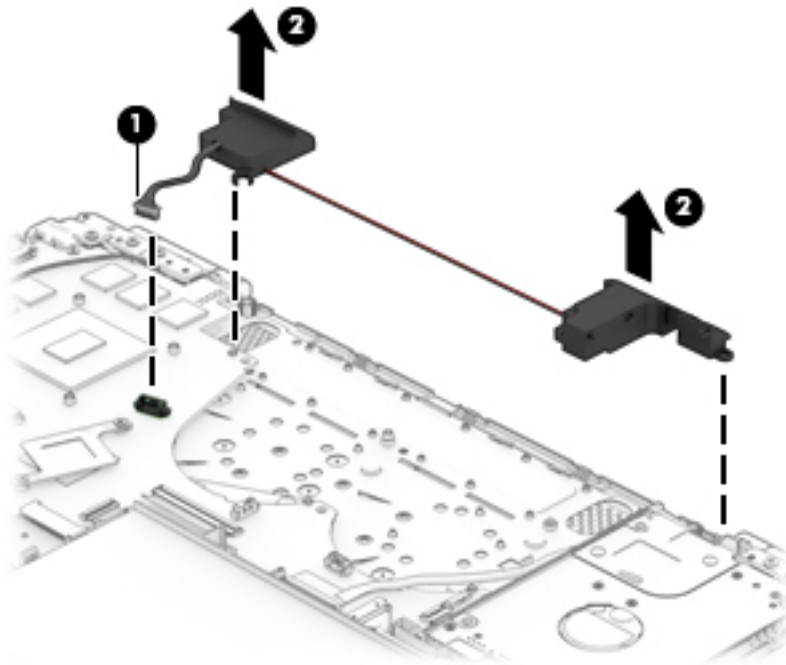
| Description | Spare part number |
|---|-------------------|
| Speaker Kit for use with the following models: 15-dp0000~0999 | L43001-001 |
| Speaker Kit for use with the following models: 15-bc300~399, 15-bc400~499 | 858976-001 |

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 34](#)).
2. Remove the base enclosure (see [Base enclosure on page 34](#)).
3. Disconnect the cable from the battery (see [Battery on page 36](#)).
4. Remove the fans (see [Fans on page 52](#)).
5. Remove the heat sink (see [Heat sink on page 45](#)).
6. Remove the display (see [Display assembly on page 58](#)).

Remove the speakers:

1. Disconnect the speaker cable from the system board **(1)**.
2. Lift and remove the speakers **(2)**.



Reverse this procedure to install the speakers.

Top cover with keyboard

The top cover with keyboard remains after removing all other spared parts from the computer.


In this section, the first table provides the main spare part number for the keyboards. The second table provides the country codes.

| Description | Spare part number |
|---|-------------------|
| Top cover with backlit keyboard in natural silver finish for use in model numbers 15-bc300~15-bc399 and 15-bc400~15-bc499 | 858971-001 |
| Top cover with non-backlit keyboard in shadow black finish for use in model numbers 15-bc300~15-bc399 and 15-bc400~15-bc499 | L03595-001 |
| Top cover with non-backlit keyboard in acid green finish for use in model numbers 15-bc300~15-bc399 and 15-bc400~15-bc499 | L22937-xx1 |
| Top cover with backlit keyboard in acid green finish for use in model numbers 15-bc300~15-bc399 and 15-bc400~15-bc499 | L22938-xx1 |
| Top cover with non-backlit keyboard in shadow black finish for use in model numbers 15-dp0000~15-dp0999 | L43008-xx1 |
| Top cover with non-backlit keyboard in acid green finish for use in model numbers 15-dp0000~15-dp0999 | L43007-xx1 |
| Top cover with backlit keyboard in acid green finish for use in model numbers 15-dp0000~15-dp0999 | L43006-xx1 |

| For use in country or region | Spare part number | For use in country or region | Spare part number | For use in country or region | Spare part number |
|--------------------------------------|-------------------|------------------------------|-------------------|------------------------------|-------------------|
| Belgium | -A41 | India | -002 | South Korea | -AD1 |
| Bulgaria | -261 | Israel | -BB1 | Spain | -071 |
| Canada | -DB1 | Italy | -061 | Switzerland | -BG1 |
| Czech Republic and Slovakia | -FL1 | The Netherlands | -B31 | Taiwan | -AB1 |
| Denmark, Norway, Finland, and Sweden | -DH1 | Portugal | -131 | Thailand | -281 |
| France | -051 | Romania | -271 | Turkey | -141 |
| Germany | -041 | Russia | -251 | United Kingdom | -031 |
| Greece | -151 | Saudi Arabia | -171 | United States | -001 |
| Hungary | -211 | Slovenia | -BA1 | | |

6 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.

 **NOTE:** To start Setup Utility on convertible computers, your computer must be in notebook mode and you must use the keyboard attached to your notebook.

Starting Setup Utility (BIOS)

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

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

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (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 decide whether you need to update Setup Utility (BIOS), first determine the BIOS version on your computer.

To reveal the BIOS version information (also known as *ROM date* and *System BIOS*), use one of these options.


- HP Support Assistant
 1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
 2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
 1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 69](#)).
 2. Select **Main**, and then make note of the BIOS version.
 3. Select **Exit**, select one of the options, and then follow the on-screen instructions.

To check for later BIOS versions, see [Downloading a BIOS update on page 70](#).

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. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
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 version, make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the on-screen instructions to download your selection to the hard drive.
Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select 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 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.

7 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

HP PC Hardware Diagnostics Windows is a Windows-based utility that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs within the Windows operating system in order to diagnose hardware failures.

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 71](#).

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Help and Support or HP Support Assistant.

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:
 - a. Select the **Start** button, and then select **HP Help and Support**.
 - b. Right-click **HP PC Hardware Diagnostics Windows**, select **More**, and then select **Run as administrator**.

– or –

To access HP PC Hardware Diagnostics Windows from HP Support Assistant:

- a. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

– or –

Select the question mark icon in the taskbar.
 - b. Select **Troubleshooting and fixes**.
 - c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.
2. When the tool opens, 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 at any time, select **Cancel**.

3. When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, contact support, and then provide the Failure ID code.

Downloading HP PC Hardware Diagnostics Windows

- The HP PC Hardware Diagnostics Windows download instructions are provided in English only.
- You must use a Windows computer to download this tool because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics Windows version

To download HP PC Hardware Diagnostics Windows, follow these steps:

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics Windows**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

Downloading HP Hardware Diagnostics Windows by product name or number (select products only)

 **NOTE:** For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to <http://www.hp.com/support>.
2. Select **Get software and drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version for your computer or flash drive.


The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, follow these steps:

- ▲ Navigate to the folder on your computer or the USB flash drive where the .exe file was downloaded, double-click the .exe file, and then follow the on-screen instructions.


Using HP PC Hardware Diagnostics UEFI

 **NOTE:** For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see [Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 73](#).

HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface) 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.

If your PC will not boot into Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, contact support, and provide the Failure ID code.

 **NOTE:** To start diagnostics on a convertible computer, your computer must be in notebook mode, and you must use the attached keyboard.

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

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow these steps:

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

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

- a. Connected USB flash drive



NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see [Downloading the latest HP PC Hardware Diagnostics UEFI version on page 73](#).

- b. Hard drive

- c. BIOS

3. When the diagnostic tool opens, select a language, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in the following situations:

- HP PC Hardware Diagnostics UEFI is not included in the preinstall image.
- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.
- The hard drive is damaged.



NOTE: The HP PC Hardware Diagnostics UEFI download instructions are provided in English only, and you must use a Windows computer to download and create the HP UEFI support environment because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive:

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only)



NOTE: For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.


To download HP PC Hardware Diagnostics UEFI by product name or number (select products only) to a USB flash drive:

1. Go to <http://www.hp.com/support>.
2. Enter the product name or number, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

Using Remote HP PC Hardware Diagnostics UEFI settings (select products only)

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it may upload results to a preconfigured server. For more information on Remote HP PC Hardware Diagnostics UEFI, go to <http://www.hp.com/go/techcenter/pcdiags>, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI


 **NOTE:** HP Remote PC Hardware Diagnostics UEFI is also available as a Softpaq that can be downloaded to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download Remote Diagnostics**, and then select **Run**.

Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number

 **NOTE:** For some products, it may be necessary to download the software by using the product name or number.

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to <http://www.hp.com/support>.
2. Select **Get software and drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

Using the Remote HP PC Hardware Diagnostics setting in Computer Setup (BIOS), you can perform the following customizations:

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password settings used for uploads.
- Display status information about the diagnostics run previously.

To customize Remote HP PC Hardware Diagnostics UEFI settings, follow these steps:

1. Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.


3. Make your customization selections.
4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

8 Backing up, restoring, and recovering

This chapter provides information about the following processes, which are standard procedure for most products:


- **Backing up your personal information**—You can use Windows tools to back up your personal information (see [Using Windows tools on page 76](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 76](#)).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 76](#)).
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see [Using Windows tools on page 76](#)).

 **IMPORTANT:** If you will be performing recovery procedures on a tablet, the tablet battery must be at least 70% charged before you start the recovery process.

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning any recovery process.

Backing up information and creating recovery media

Using Windows tools


 **IMPORTANT:** Windows is the only option that allows you to back up your personal information. Schedule regular backups to avoid information loss.

You can use Windows tools to back up personal information and create system restore points and recovery media.

 **NOTE:** If computer storage is 32 GB or less, Microsoft System Restore is disabled by default.

For more information and steps, see the Get Help app.

1. Select the **Start** button, and then select the **Get Help** app.
2. Enter the task you want to perform.

 **NOTE:** You must be connected to the Internet to access the Get Help app.

Using the HP Cloud Recovery Download Tool to create recovery media (select products only)

You can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive, as follows:

1. Go to <http://www.hp.com/support>.
2. Select **Software and Drivers**, and then follow the on-screen instructions.



NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to <http://www.hp.com/support>, select your country or region, and then follow the on-screen instructions.

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see [Using Windows tools on page 76](#).

Recovering using HP Recovery media

HP Recovery media is used to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 76](#).



NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to <http://www.hp.com/support>, select your country or region, and then follow the on-screen instructions.

To recover your system:

- ▲ Insert the HP Recovery media, and then restart the computer.

Changing the computer boot order

If your computer does not restart using the HP Recovery media, you can change the computer boot order. This is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection to an optical drive or a USB flash drive, depending on the location of your HP Recovery media.

To change the boot order:



IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.

For computers or tablets with keyboards attached:

- ▲ Turn on or restart the computer or tablet, quickly press **esc**, and then press **f9** for boot options.

For tablets without keyboards:

- ▲ Turn on or restart the tablet, quickly hold down the volume up button, and then select **f9**.

– or –

Turn on or restart the tablet, quickly hold down the volume down button, and then select **f9**.

3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

9 Specifications

Computer specifications

| | Metric | U.S. |
|---|---------------------------|---------------------|
| Dimensions | | |
| Width | 382.4 mm | 15.06 in |
| Depth | 252.5 mm | 9.94 in |
| Height | 24.5 mm | 0.96 in |
| Weight | | |
| 15-dp0000~0999 | 2.23 kg | 4.92 lb |
| 15-bc300~399, bc400~499 | 2.20 kg | 4.85 lb |
| Input power | | |
| Operating voltage and current | 19.5 V dc @ 2.31 A – 45 W | |
| | 19.5 V dc @ 3.33 A – 65 W | |
| Temperature | | |
| Operating | 5°C to 35°C | 41°F to 95°F |
| Nonoperating | -20°C to 60°C | -4°F to 140°F |
| Relative humidity (noncondensing) | | |
| Operating | 10% to 90% | |
| Nonoperating | 5% to 95% | |
| Maximum altitude (unpressurized) | | |
| Operating | -15 m to 3,048 m | -50 ft to 10,000 ft |
| Nonoperating | -15 m to 12,192 m | -50 ft to 40,000 ft |
| NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures. | | |

39.62 cm (15.6 in) display specifications

| | Metric | U.S. |
|--------------------------------|--|-----------|
| Dimensions | | |
| Height | 20.77 cm | 8.175 in |
| Width | 37.78 cm | 14.875 in |
| Diagonal | 39.62 cm | 15.6 in |
| Number of colors | Up to 16.8 million | |
| Contrast ratio | 500:1 (typical) | |
| Brightness | 220, 250, or 300 nits | |
| Pixel resolution | | |
| Pitch | 0.252mm × 0.252mm | |
| Format | 1920 × 1080 or 3840 × 2160 | |
| Backlight | LED | |
| Total power consumption | 2.0 W | |
| Viewing angle | ±65° horizontal, ±50° vertical (typical) | |

Hard drive specifications

| | 1 TB* | 2 TB* |
|---|----------------------------|----------------------------|
| Dimensions | | |
| Height | 9.5 mm | 9.5 mm |
| Width | 69.85 mm | 69.85 mm |
| Weight | 102 g max | 130 g max |
| Interface type | SATA 3.0 | SATA 3.0 |
| Transfer rate | 600 MB/sec | 600 MB/sec |
| Security | ATA-8 security | ATA-8 security |
| Seek times (typical read, including setting) | | |
| Single track | 2 ms | 2 ms |
| Average | 13.0 ms | 12.0 ms |
| Maximum | 15.0 ms | 22.0 ms |
| Logical blocks | 1,953,525,168 | 3,907,029,168 |
| Disk rotational speed | 5400 rpm | 5400 rpm |
| Operating temperature | 0°C to 60°C (0°F to 140°F) | 0°C to 60°C (0°F to 140°F) |
| *Size refers to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly. | | |

M.2 PCIe solid-state drive specifications

| | 256 GB* | 512 GB* |
|--|-------------------------------|-------------------------------|
| Dimensions | | |
| Height | 1 mm | 1 mm |
| Length | 50.8 mm | 50.8 mm |
| Width | 28.9 mm | 28.9 mm |
| Weight | < 10 g | < 10 g |
| Interface type | | |
| | ATA-7 | ATA-7 |
| Transfer rate | | |
| Sequential Read | Up to 2150 MB/s | Up to 2150 MB/s |
| Random Read | Up to 300,000 IOPs | Up to 300,000 IOPs |
| Sequential Write | Up to 1260 MB/s | Up to 1550 MB/s |
| Random Write | Up to 100,000 IOPs | Up to 100,000 IOPs |
| Ready time, Maximum (to not busy) | | |
| | 1.0 s | 1.0 s |
| Access times | | |
| Logical | 0.1 | 0.1 |
| Total logical sectors | | |
| | 500,118,192 | 1,000,215,216 |
| Operating temperature | | |
| Operating | 0° to 70°C (32°F to 158°F) | 0° to 70°C (32°F to 158°F) |
| Non-operating | -40° to 80°C (-40°F to 176°F) | -40° to 85°C (-40°F to 185°F) |
| *1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. | | |
| NOTE: Certain restrictions and exclusions apply. Contact technical support for details. | | |

M.2 SATA solid-state drive specifications

| | 128 GB* | 256 GB* |
|-----------------------------------|-----------------------------|------------------|
| Height | 1.35 mm | 1.35 mm |
| Weight | < 10 g | < 10 g |
| Form factor | M.2 2280-D2-B-M | M.2 2280-D2-B-M |
| Transfer rate | up to 540 MB/sec | up to 540 MB/sec |
| Interface type | SATA-3 | SATA-3 |
| Ready time, maximum (to not busy) | 1.0 ms | < 1.0 ms |
| Access times, logical | 0.1 ms | 0.1 ms |
| Total logical sectors | 234,441,648 | 468,883,296 |
| Operating temperature | 0°C to 70°C (32°F to 158°F) | |

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact technical support for details.

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

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

11 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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