



Maintenance and Service Guide

SUMMARY

This guide provides information about spare parts, removal and replacement of parts, security, backing up, and more.

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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.

To access the latest user guides, go to <http://www.hp.com/support>, and follow the instructions to find your product. Then select **User Guides**.

Software terms

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.

Important Notice about Customer Self-Repair Parts

Your computer includes Customer Self-Repair parts and parts that should be accessed by only an authorized service provider.



IMPORTANT: See "Removal and replacement procedures for Customer Self-Repair parts" for details.

Accessing parts described in "Removal and replacement procedures for authorized service provider parts" can damage the computer or void your warranty.

Safety warning notice

Reduce the possibility of heat-related injuries or of overheating the computer by following the practices described.


 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer 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 come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

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1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

| Category | Description |
|---------------------|---|
| Product Name | HP Pavilion Gaming 16 Laptop PC Model number: 16-a000 CTO model number: 16t-a000 |
| Processors | 10th Generation Intel® Core™ processors Intel Core i7-10750H (2.6 GHz [turbo up to 5.0 GHz], 6 cores, 12 MB Intel Smart Cache, 45 W) Intel Core i5-10300H (2.5 GHz [turbo up to 4.5 GHz], 4 cores, 8 MB Intel Smart Cache, 45 W) |
| Graphics | Internal graphics Intel UHD Graphics 630 External graphics NVIDIA® GeForce® RTX 2060 Max-Q with up to 6 GB of dedicated video memory NVIDIA GeForce GTX 1660Ti Max-Q with up to 6 GB of dedicated video memory NVIDIA GeForce GTX 1650Ti with up to 4 GB of dedicated video memory NVIDIA GeForce GTX 1650 with up to 4 GB of dedicated video memory NVIDIA GeForce GTX 1050 with up to 3 GB of dedicated video memory Supports Optimus™ Supports HD Decode, DX12, and HDMI Supports FPS (GPU Performance Scaling) Supports MR compatible (60 Hz frame rate) |
| Display | 40.9 cm (16.1 in), UWVA, full high definition (FHD) (1920 × 1080), antiglare, WLED, flat (3.2 mm), narrow bezel 45% NTSC, eDP 1.2, 250 nits 72% NTSC, eDP 1.2, 300 nits, 60 Hz 72% NTSC, eDP 1.3 + PSR, 300 nits, 144 Hz |
| Memory | Two customer-accessible memory module slots supporting up to 16 GB of RAM DDR4-2933 dual-channel support (DDR4-3200 downgrade to 2933) Supports the following configurations: <ul style="list-style-type: none">• 16 GB (8 × 2)• 12 GB (8 + 4)• 8 GB (4 × 2 or 8 × 1) |

Table 1-1 Product components and their descriptions (continued)

| Category | Description |
|-----------------------------|--|
| Primary storage | PCIe, NVMe, M.2 2280 solid-state drives |
| | <ul style="list-style-type: none"> 1 TB, PCIe, SS, TLC |
| | <ul style="list-style-type: none"> 512 GB, PCIe, TLC |
| | <ul style="list-style-type: none"> 512 GB, PCIe, value |
| | <ul style="list-style-type: none"> 512 GB, PCIe-3 × 2 × 2 + 32 GB 3D Xpoint Optane™ memory |
| | <ul style="list-style-type: none"> 256 GB, PCIe, TLC |
| | <ul style="list-style-type: none"> 256 GB, PCIe, value |
| | <ul style="list-style-type: none"> 256 GB, PCIe-3 × 2 × 2 + 16 GB 3D Xpoint Optane memory |
| | <ul style="list-style-type: none"> 128 GB, PCIe, TLC |
| | |
| | 256 GB, PCIe, TLC M.2 solid-state drive + 1 TB, 7200 rpm, 7.2 mm, 2.5 in, SATA, hard drive |
| | 128 GB, PCIe, TLC M.2 solid-state drive + 1 TB, 7200 rpm, 7.2 mm, 2.5 in, SATA, hard drive |
| | Hard drive, SATA, 6.35 cm (2.5 in.), 7.0 mm (0.28 in.) |
| | 1 TB, 7200 rpm |
| Audio and video | Audio brand: B & O |
| | Audio control panel: B & O Audio Control |
| | Support for HP Audio Boost |
| | Dual speakers |
| | HP TrueVision HD Camera: indicator LED, USB 2.0, HD sensor, f2.0 |
| | 720p by 30 frames per second |
| | Dual-array digital microphone with appropriate software: beam forming, echo cancellation, noise suppression |
| RJ-45 (network) jack | Integrated 10/100/1000 NIC |
| Wireless | Integrated wireless options with dual antennas (M.2/MIPI/BRI) |
| | Intel Wi-Fi 6 AX201 + Bluetooth® 5 (non-vPro) (802.11ax 2 × 2, MU-MIMO, supporting gigabit file transfer speeds) |
| | Integrated wireless options with dual antennas (M.2/PCIe) |
| | Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth 5 (MU-MIMO supported) |
| | Compatible with Miracast® devices |
| Media card reader | Supports microSD™, SDHC™, SDXC™ |
| | Push-push insertion/removal |
| Ports | Hot plug/unplug and autodetect for correct output to wide-aspect vs. standard aspect video |
| | HDMI v2.0a supporting: up to 4096 × 2160 @ 60 Hz with HDCP 2.2 |
| | Audio-out (headphone)/audio-in (microphone) combo jack |

Table 1-1 Product components and their descriptions (continued)

| Category | Description |
|----------------------------------|--|
| | USB 3.2 Gen 1 Type C (supports data transfer, DisplayPort 1.4 [4096 × 2160 @ 60 Hz] via USB Type-C® adapter; right side) |
| | (2) USB 3.2 Gen 1 Type A (right and left sides) |
| | RJ-45 (network) jack |
| | AC Smart Pin adapter plug |
| Keyboard/pointing devices | Keyboard |
| | Full size, 3-coat paint, island style, with image sensor and numeric keypad, backlit (acid green, ghost white, ultra violet) |
| | Full size, 3-coat paint, island style, with image sensor and numeric keypad, not backlit (ghost white) |
| | Touchpad |
| | Clickpad with image sensor |
| | Multitouch gestures enabled |
| | Precision touchpad support |
| | Support for Modern Trackpad Gestures |
| | Taps enabled as default |
| Power requirements | Battery |
| | 3 cell, 52.5 Whr, polymer polymer, HP Long Life |
| | HP Fast Charge Technology |
| | Smart AC adapters |
| | 200 W, slim barrel, PFC, 4.5 mm |
| | 150 W, slim barrel, PFC, 4.5 mm |
| | 135 W, slim barrel, PFC, 4.5 mm |
| | Power cord |
| | C5, 1 m |
| | C13, 1.0 m |
| Security | Supports Trusted Platform Module (TPM) 2.0, firmware based |
| Operating system | Windows® 10 Home 64 |
| | Windows 10 Home 64 Advanced |
| | Windows 10 Home 64 Advanced Single Language |
| | Windows 10 Home 64 High-End Chinese Market CPPP |
| | Windows 10 Home 64 Plus |
| | Windows 10 Home 64 Plus Single Language |
| | Windows 10 Home 64 Plus Single Language Africa Market |
| | Windows 10 Home 64 Plus Single Language APAC EM PPP |

Table 1-1 Product components and their descriptions (continued)

| Category | Description |
|-----------------------|--|
| | Windows 10 Home 64 Plus Single Language India Market PPP |
| | Windows 10 Home 64 Plus Single Language Indonesia Market PPP |
| | Windows 10 Pro 64 |
| | FreeDos 3.0 |
| Serviceability | End user replaceable parts |
| | AC adapter |
| | Memory module |
| | Solid-state drive |
| | Hard drive |

2 Components

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

Right side

Use the illustration and table to identify the components on the right side of the computer.

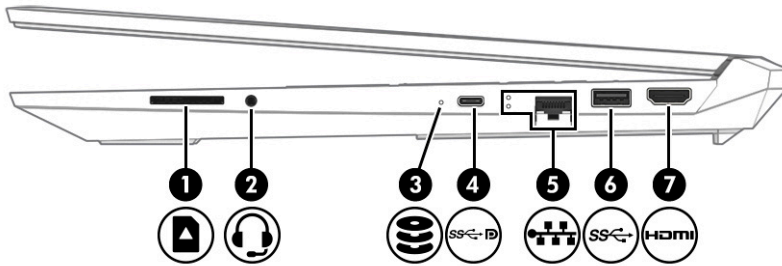


Table 2-1 Right-side components and their descriptions








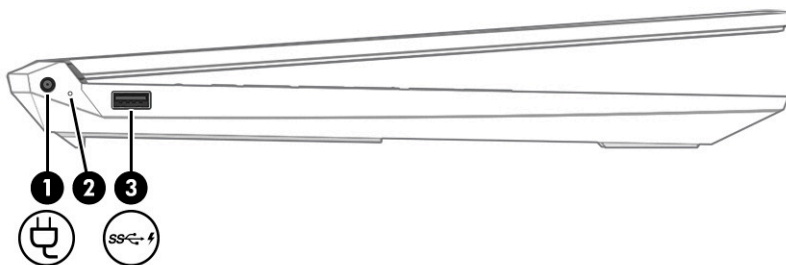
| Component | Description |
|---|--|
| <p>(1)  Memory card reader</p> | <p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none"> 1. Hold the card label-side up, with connectors facing the computer. 2. 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. |
| <p>(2)  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"> ▲ Type HP Documentation in the taskbar search box, and then select HP Documentation. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p> |

Table 2-1 Right-side components and their descriptions (continued)

| Component | Description |
|---|---|
| (3)  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. |
| (4)  USB Type-C SuperSpeed port and DisplayPort™ connector | <p>Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.</p> <p>NOTE: Cables, adapters, or both (purchased separately) might be required.</p> <p>- and -</p> <p>Connects a DisplayPort device that has a USB Type-C connector, providing display output.</p> |
| (5)  RJ-45 (network) jack/status lights | <p>Connects a network cable.</p> <ul style="list-style-type: none"> White: The network is connected. Amber: Activity is occurring on the network. |
| (6)  USB SuperSpeed port | <p>Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.</p> |
| (7)  HDMI port | <p>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.</p> |

Left side

Use the illustration and table to identify the components on the left side of the computer.

**Table 2-2 Left-side components and their descriptions**



| Component | Description |
|---|---|
| (1)  Power connector | Connects an AC adapter. |
| (2) AC adapter and battery light | <ul style="list-style-type: none"> White: The AC adapter is connected and the battery is fully charged. Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. |

Table 2-2 Left-side components and their descriptions (continued)

| Component | Description |
|---|---|
| (3)  | <ul style="list-style-type: none">Amber: The AC adapter is connected and the battery is charging.Off: The battery is not charging. |
| USB port with HP Sleep and Charge | Connects a USB device, provides data transfer, and charges small devices, even when the computer is off. |

Display

The computer display can include essential components such as speakers, antennas, cameras, and microphones.

Low blue light mode (select products only)

Your computer display is shipped from the factory in low blue light mode for improved eye comfort and safety. Also, blue light mode automatically adjusts blue light emissions when you are using the computer at night or for reading.

⚠ WARNING! To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup and proper posture, health, and work habits for computer users. The *Safety & Comfort Guide* also provides important electrical and mechanical safety information. The *Safety & Comfort Guide* is available on the web at <http://www.hp.com/ergo>.

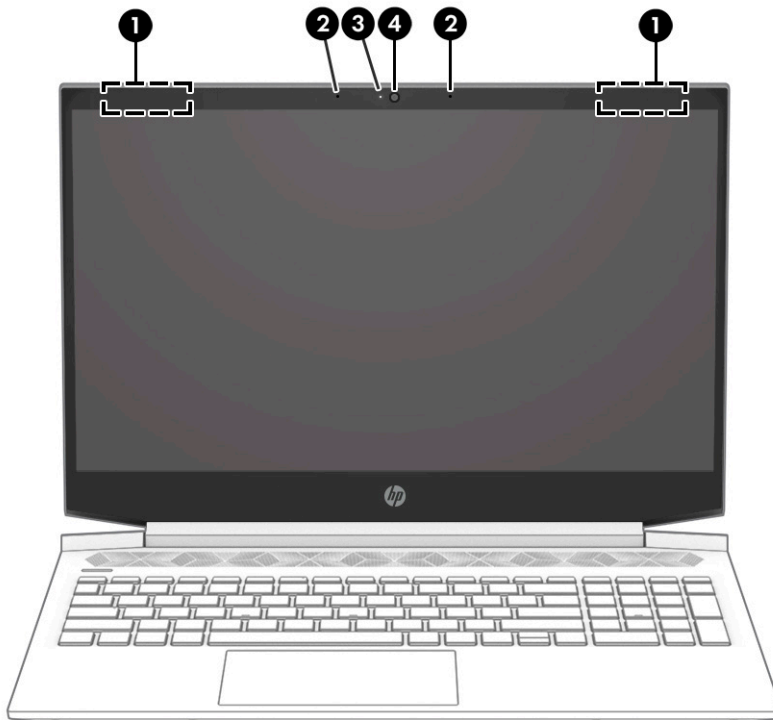


Table 2-3 Display components and their descriptions

| Component | Description |
|------------------------------|---|
| (1) WLAN antennas* | Send and receive wireless signals to communicate with wireless local area networks (WLANs). |
| (2) Internal microphones (2) | Record sound. |
| (3) Camera light | On: The camera is in use. |
| (4) 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. |

*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:

- ▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

Keyboard area

Keyboards can vary by language.

Touchpad settings

Use the illustration and table to identify the touchpad components.

To adjust touchpad settings and gestures, or to turn off the touchpad:

1. Type **touchpad settings** in the taskbar search box, and then press `enter`.
2. Choose a setting.

To turn on the touchpad:

1. Type **touchpad settings** in the taskbar search box, and then press `enter`.
2. Using an external mouse, click the **touchpad** button.

- or -

- ▲ Press the `Tab` key repeatedly until the pointer rests on the **touchpad** button. Then press the spacebar to select the button.

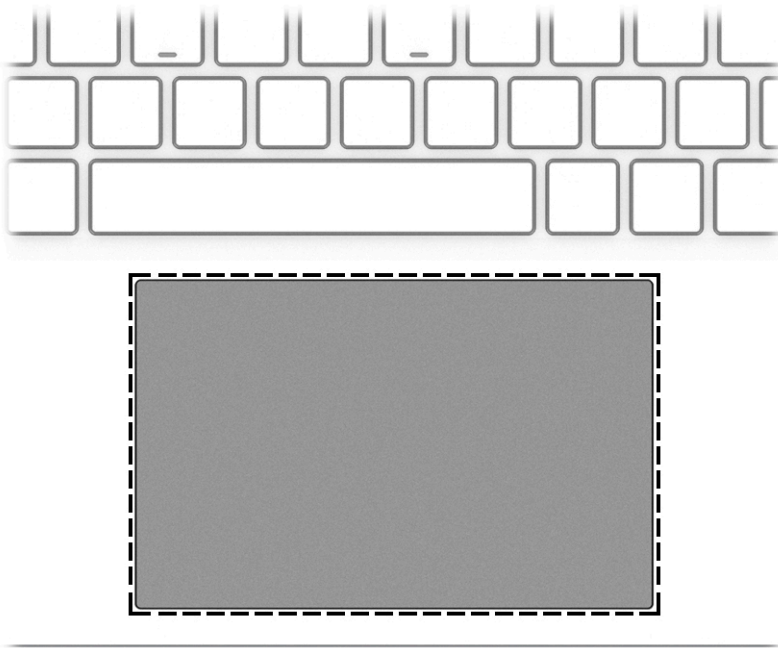


Table 2-4 Touchpad components and their descriptions

| Component | Description |
|---------------|---|
| Touchpad zone | Reads your finger gestures to move the pointer or activate items on the screen. |

Lights

Use the illustration and table to identify the lights on the computer.

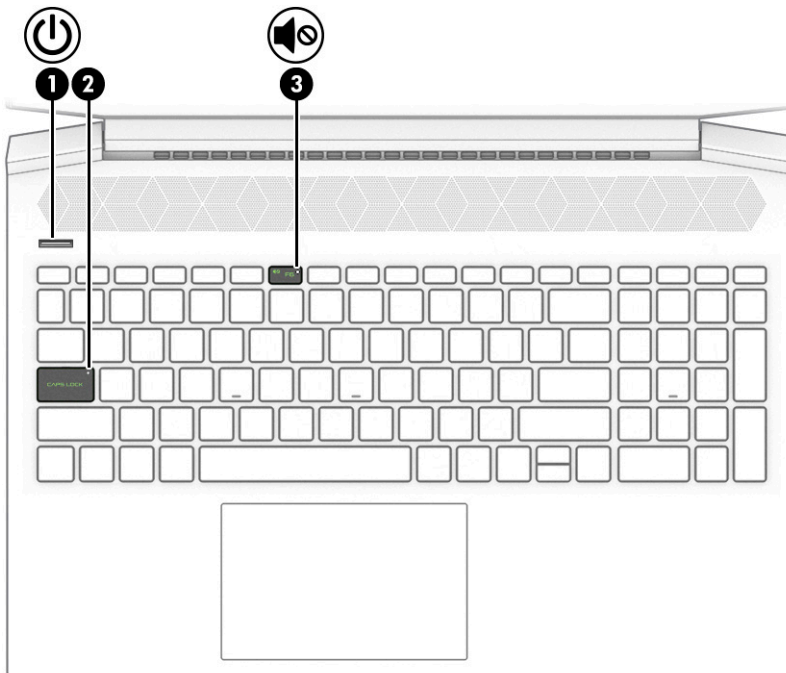




Table 2-5 Lights and their descriptions

| Component | Description |
|---|--|
| (1)  Power light | <ul style="list-style-type: none">• On: The computer is on.• Blinking (select products only): The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unnecessary components.• Off: Depending on your computer model, the computer is off, in Hibernation, or in Sleep. Hibernation is the 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. |
| (2)  Mute light | <ul style="list-style-type: none">• On: Computer sound is off.• Off: Computer sound is on. |

Button

Use the illustration and table to identify the computer button.

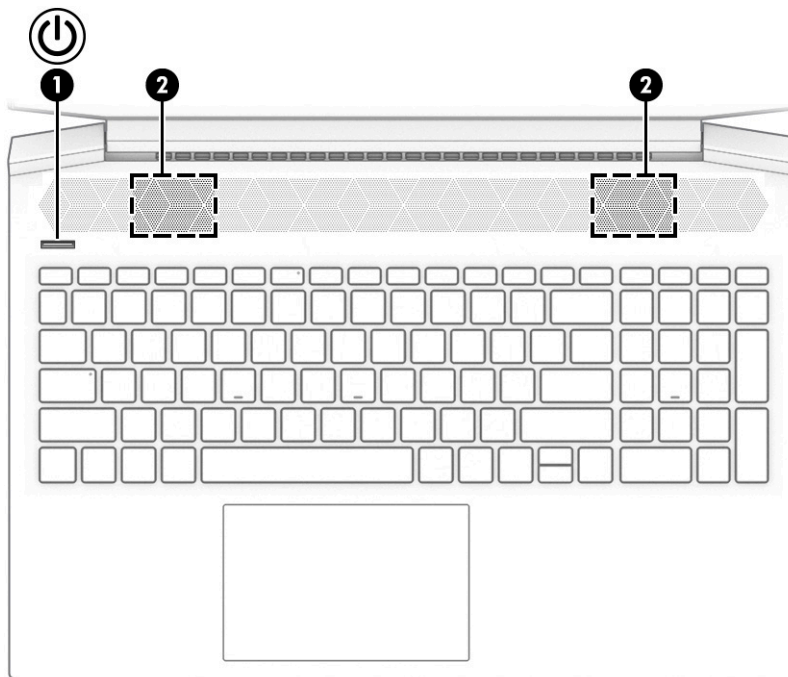


Table 2-6 Button and its description



| Component | Description |
|--|--|
| (1)  Power button | <ul style="list-style-type: none">• When the computer is off, press the button briefly 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). |

Table 2-6 Button and its description (continued)

| Component | Description |
|-----------|---|
| | <ul style="list-style-type: none"> When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>IMPORTANT: 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 10 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. |
| (2) | Speakers (2) Produce sound. |

Special keys

Use the illustration and table to identify the special keys.

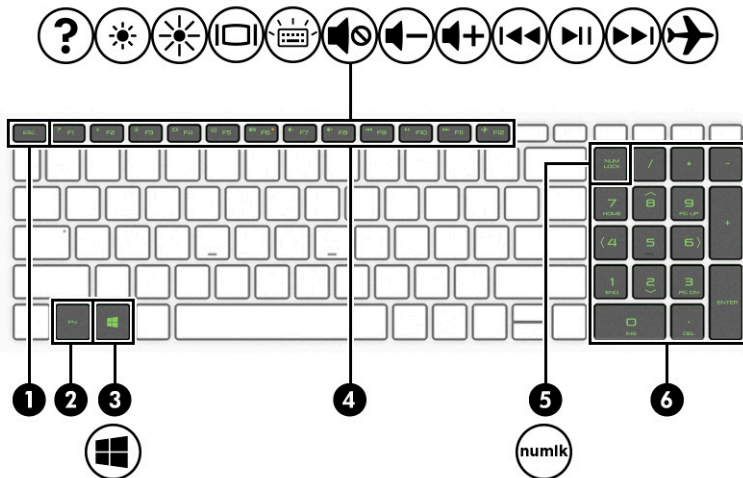


Table 2-7 Special keys and their descriptions


| 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 as defined by the icon symbols on <code>f1</code> through <code>f12</code> function keys. |

Table 2-7 Special keys and their descriptions (continued)

| Component | Description |
|-------------------------------|--|
| (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. |

Bottom

Use the illustration and table to identify the bottom component.

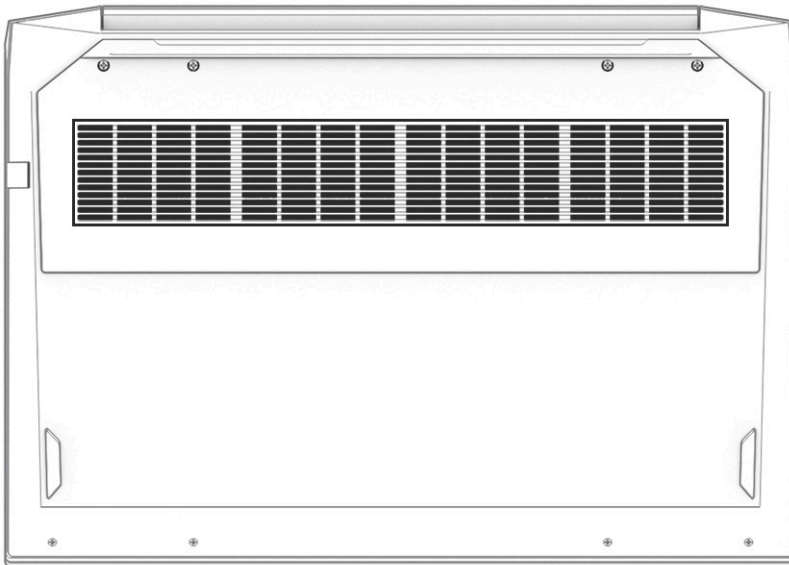


Table 2-8 Bottom component and its description

| 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. |

Rear

Use the illustration and table to identify the component on the rear of the computer.




Table 2-9 Rear component and its description

| 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 that you might need when you troubleshoot system problems or travel internationally with the computer. Labels can 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 might be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

Your service label information order may vary by country and might not include the wording "Model" due to the country regulation.

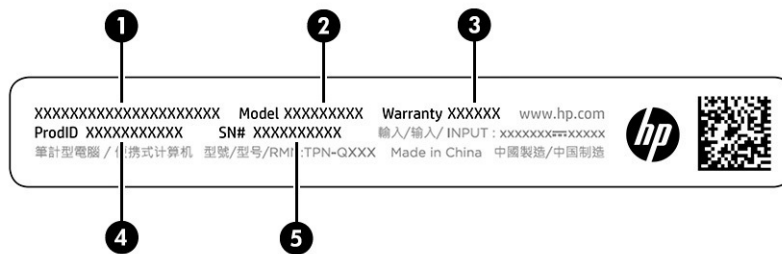


Table 2-10 Service label components

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

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


3 Illustrated parts catalog

Use this table to determine the spare parts that are available for the computer.

Computer major components

To identify the computer major components, use this illustration and table.

 **NOTE:** HP continually improves and changes product parts. For complete and current information about 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.

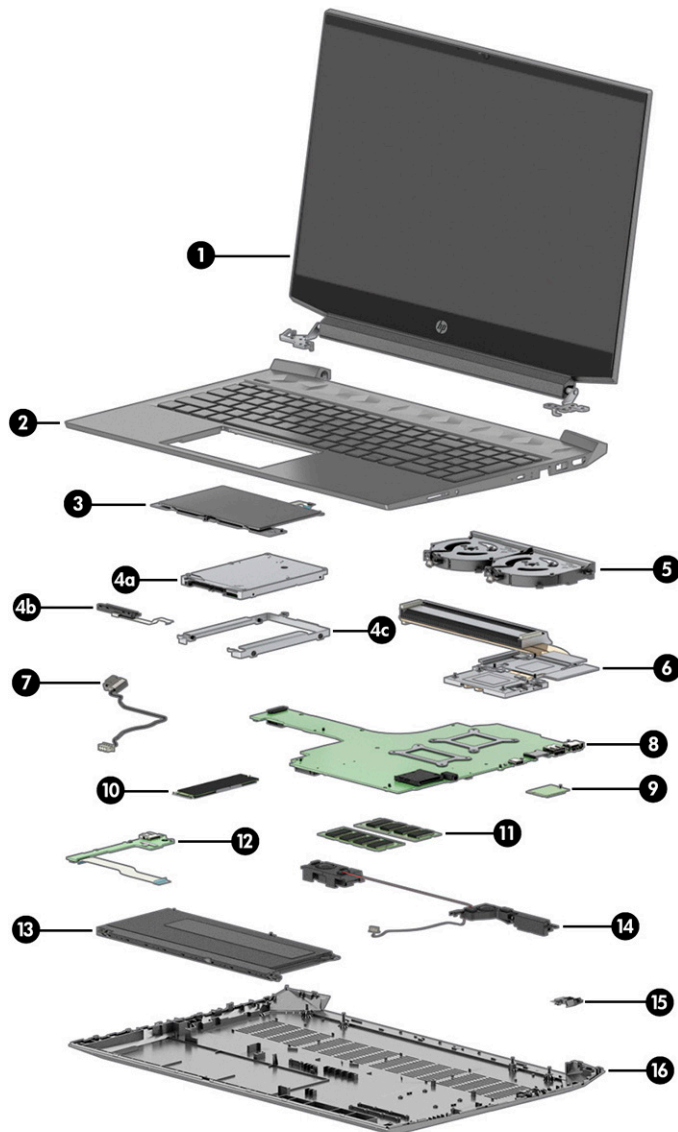


Table 3-1 Computer major component descriptions and part numbers

| Item | Component | Spare part number |
|-------------|--|-------------------------------|
| (1) | Display assembly NOTE: Spare parts are available for display assemblies only at the subcomponent level. | not available as a spare part |
| (2) | Top cover with keyboard NOTE: For a detailed list of keyboard country codes, see Keyboard with top cover on page 58 | |
| | Ghost white, not backlit | M02037-xx1 |
| | Ultra violet, backlit | M02038-xx1 |
| | Acid green, backlit | M02039-xx1 |
| | Ghost white, backlit | M02040-xx1 |
| (3) | Touchpad NOTE: The touchpad cable is available as spare part number M02049-001. | M02058-001 |
| (4a) | Hard drive (1 TB, 7200 rpm) | L06427-855 |
| (4b) | Hard drive cable | M02050-001 |
| (4c) | Hard drive bracket | not available as a spare part |
| (5) | Fans | L72702-001 |
| (6) | Heat sink NOTE: Heat sink thermal pads are available as spare part number M03600-001. | |
| | For use in models with RTX 2060 and GTX 1660Ti graphics | M02064-001 |
| | For use in models with GTX 1650Ti/1650 graphics | M02063-001 |
| | For use in models with GTX 1050 graphics | M02062-001 |
| (7) | Power connector cable | |
| | For use in 200 W models | L72704-001 |
| | For use in 150 W and 135 W models | L72703-001 |
| (8) | System board (includes integrated processor and replacement thermal material) All system boards use the following part numbers: xxxxxx-001: Non-Windows operating system xxxxxx-601: Windows 10 operating system | |
| | Intel Core i7-10750H processor with GeForce RTX 2060, 6 GB discrete graphics | M04833-xx1 |
| | Intel Core i7-10750H processor with GeForce GTX 1660Ti, 6 GB discrete graphics | M02036-xx1 |
| | Intel Core i7-10750H processor with GeForce GTX 1650Ti, 4 GB discrete graphics | M02035-xx1 |
| | Intel Core i5-10300H processor with GeForce RTX 2060 MQ, 6 GB discrete graphics | M09550-xx1 |
| | Intel Core i5-10300H processor with GeForce GTX 1660Ti, 6 GB discrete graphics | M04832-xx1 |
| | Intel Core i5-10300H processor with GeForce GTX 1650Ti, 4 GB discrete graphics | M02034-xx1 |
| | Intel Core i5-10300H processor with GeForce GTX 1650, 4 GB discrete graphics | M02033-xx1 |

Table 3-1 Computer major component descriptions and part numbers (continued)

| Item | Component | Spare part number |
|-------------|---|-------------------|
| | Intel Core i5-10300H processor with GeForce GTX 1050, 3 GB discrete graphics | M02032-xx1 |
| (9) | WLAN module | xxxxxx-001 |
| | Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth 5 | L44796-005 |
| | Intel Wi-Fi 6 AX201 + Bluetooth® 5 (non-vPro) (802.11ax 2 × 2) | L57250-005 |
| (10) | Solid-state drive | |
| | NOTE: Solid-state drive protective shielding is available as spare part number M13006-001. | |
| | 1 TB, PCIe, TLC | L85348-005 |
| | 512 GB, PCIe, TLC | L85360-005 |
| | 512 GB, PCIe, value | L85364-005 |
| | 512 GB, PCIe + 32 GB Optane memory | L85366-005 |
| | 256 GB, PCIe, TLC | L85350-005 |
| | 256 GB, PCIe, value | L85354-005 |
| | 256 GB, PCIe + 16 GB Optane memory | L85356-005 |
| | 128 GB, PCIe | M06792-005 |
| (11) | Memory module | |
| | 8 GB | L46598-005 |
| | 4 GB | L83673-005 |
| (12) | USB board | |
| | NOTE: The USB board cable is available as spare part number M02048-001. | |
| | Acid green | M02055-001 |
| | Ultra violet | M02056-001 |
| | Ghose white | M02057-001 |
| (13) | Battery (3 cell, 52 Whr) | L48495-005 |
| (14) | Speakers | M02060-001 |
| (15) | RJ-45 door | M03599-001 |
| (16) | Bottom cover | |
| | Ghost white | M02045-001 |
| | Acid green/ultra violet | M02046-001 |

Display assembly subcomponents

To identify the display assembly subcomponents, use this illustration and table.

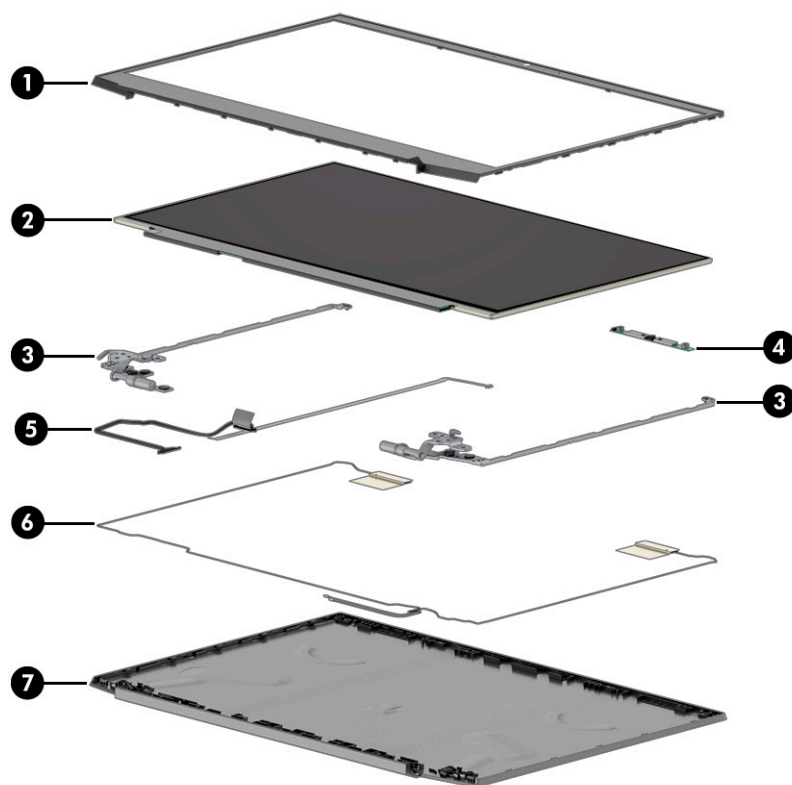


Table 3-2 Display component descriptions and part numbers

| Item | Component | Spare part number |
|------|---|-------------------|
| (1) | Display bezel | M02047-001 |
| (2) | Display panel | |
| | NOTE: Display panel adhesive is available as spare part number M03601-001. | |
| | 250 nits | M02080-001 |
| | 300 nits, 60 Hz | M02081-001 |
| | 300 nits, 144 Hz | M02082-001 |
| (3) | Hinges (left and right) | M02054-001 |
| (4) | Camera module | M02061-001 |
| (5) | Display/camera cable | |
| | For use with 60 Hz displays | M02051-001 |
| | For use with 144 Hz displays | M02052-001 |
| (6) | Wireless antennas (dual) | M02041-001 |
| (7) | Display back cover | |
| | Acid green | M02042-001 |
| | Ultra violet | M02043-001 |
| | Ghost white | M02044-001 |

Cables

To identify the cables, use this illustration and table.

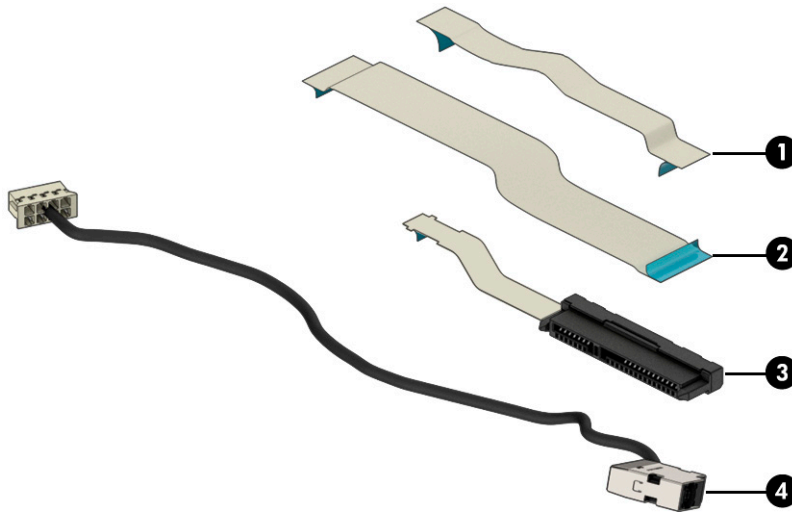


Table 3-3 Cable descriptions and part numbers

| Item | Component | Spare part number |
|------|-----------------------------------|-------------------|
| (1) | Touchpad cable | M02049-001 |
| (2) | USB board cable | M02048-001 |
| (3) | Hard drive connector cable | M02050-001 |
| (4) | Power connector cable | |
| | For use in 135 W and 150 W models | L72703-001 |
| | For use in 200 W models | L72704-001 |

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-4 Miscellaneous part descriptions and part numbers

| Component | Spare part number |
|--|-------------------|
| Smart AC adapters (PRF, slim, 4.5 mm) | |
| 200 W | L00818-850 |
| 150 W | L32661-001 |
| 135 W | L15534-001 |
| Screw Kit | M02059-001 |
| HP USB External DVD-RW Drive | 747080-001 |
| HDMI-to-VGA Adapter | 701943-001 |
| HP Pavilion 400 Gaming Headset | L29005-001 |

Table 3-4 Miscellaneous part descriptions and part numbers (continued)

| Component | Spare part number |
|--|--------------------------|
| HP Pavilion 400 Gaming GC Mouse 200 | L43619-001 |
| HP Pavilion 300 Mouse Pad | L33789-001 |
| Power cords (C5, 1.0 m) | |
| Argentina | L19357-001 |
| Australia | L19358-001 |
| Denmark | L19360-001 |
| Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden) | L19361-001 |
| India | L19363-001 |
| Israel | L19362-001 |
| Italy | L19364-001 |
| North America | L19367-001 |
| People's Republic of China | L19368-001 |
| South Africa | L19369-001 |
| South Korea | L19366-001 |
| Switzerland | L19370-001 |
| Taiwan | L19372-001 |
| Thailand | L19371-001 |
| The United Kingdom | L19373-001 |
| Power cords (C13, 1.0 m) | |
| Argentina | L22104-001 |
| Australia | L22339-001 |
| Denmark | L22334-001 |
| Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden) | L22333-001 |
| India | L22343-001 |
| Israel | L22335-001 |
| Italy/Chile | L22103-001 |
| North America | L22331-001 |
| People's Republic of China | L22341-001 |
| South Africa | L22337-001 |
| South Korea | L22340-001 |
| Switzerland | L22336-001 |
| Taiwan | L22342-001 |

Table 3-4 Miscellaneous part descriptions and part numbers (continued)

| Component | Spare part number |
|--------------------|--------------------------|
| Thailand | L22338-001 |
| The United Kingdom | L22332-001 |

4 Removal and replacement procedures preliminary requirements

Use this information to properly prepare to disassemble and reassemble the computer.


Tools required

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

- Tweezers
- Nonconductive, nonmarking 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

Using excessive force during disassembly and reassembly can damage plastic parts.

Cables and connectors

Handle cables with extreme care to avoid damage.

 **IMPORTANT:** 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.

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 so that they cannot be caught or snagged as you remove or replace parts. Handle flex cables with extreme care; these cables tear easily.

Drive handling

Note the following guidelines when handling drives.



IMPORTANT: Drives are fragile components. Handle them 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 2.54 cm (1 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 polystyrene foam.
- 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.

Electrostatic discharge information

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) might not appear to be affected at all and can work perfectly throughout a normal cycle. The device might function normally for a while, but it has been degraded in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.



IMPORTANT: To prevent damage to the device when you remove or install 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 [Personal grounding methods and equipment on page 26](#).

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.

Generating static electricity

Follow these static electricity guidelines.

- Different activities generate different amounts of static electricity.
- Static electricity increases as humidity decreases.

Table 4-1 Static electricity occurrence based on activity and humidity

| Event | Relative humidity | | |
|---|-------------------|----------|----------|
| | 55% | 40% | 10% |
| Walking across carpet | 7,500 V | 15,000 V | 35,000 V |
| Walking across vinyl floor | 3,000 V | 5,000 V | 12,000 V |
| Motions of bench worker | 400 V | 800 V | 6,000 V |
| Removing DIPs (dual in-line packages) from plastic tube | 400 V | 700 V | 2,000 V |
| Removing DIPs from vinyl tray | 2,000 V | 4,000 V | 11,500 V |
| Removing DIPs from polystyrene foam | 3,500 V | 5,000 V | 14,500 V |
| Removing bubble pack from PCB (printed circuit board) | 7,000 V | 20,000 V | 26,500 V |
| Packing PCBs in foam-lined box | 5,000 V | 11,000 V | 21,000 V |

Multiple electric components can be packaged together in plastic tubes, trays, or polystyrene foam.



NOTE: As little as 700 V can degrade a product.

Preventing electrostatic damage to equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following packaging and grounding precautions are necessary to prevent static electricity damage to electronic components.

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.

- Avoid contact with pins, leads, or circuitry.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

Using certain equipment can prevent static electricity damage to electronic components.

- **Wrist straps** are flexible straps with a maximum of $1\text{ M}\Omega \pm 10\%$ resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- **Heel straps/Toe straps/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 them on both feet with a maximum of $1\text{ M}\Omega \pm 10\%$ resistance between the operator and ground.

Table 4-2 Static shielding protection levels

| Static shielding protection levels | |
|------------------------------------|---------|
| Method | Voltage |
| Antistatic plastic | 1,500 |
| Carbon-loaded plastic | 7,500 |
| Metallized laminate | 15,000 |

Grounding the work area

To prevent static damage at the work area, follow these precautions.

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and polystyrene foam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity.

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of $1\text{ M}\Omega \pm 10\%$ resistance

- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing $1\text{ M}\Omega \pm 10\%$ resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes


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 Customer Self-Repair parts

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

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

Component replacement procedures

To remove and replace computer components, use these 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.

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

You must remove, replace, or loosen as many as 16 screws when you service Customer Self-Repair parts. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

To prepare to disassemble the computer, use these steps.

See [Removal and replacement procedures preliminary requirements on page 23](#) 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.

Bottom cover

To remove the bottom cover, use this procedure and illustration.

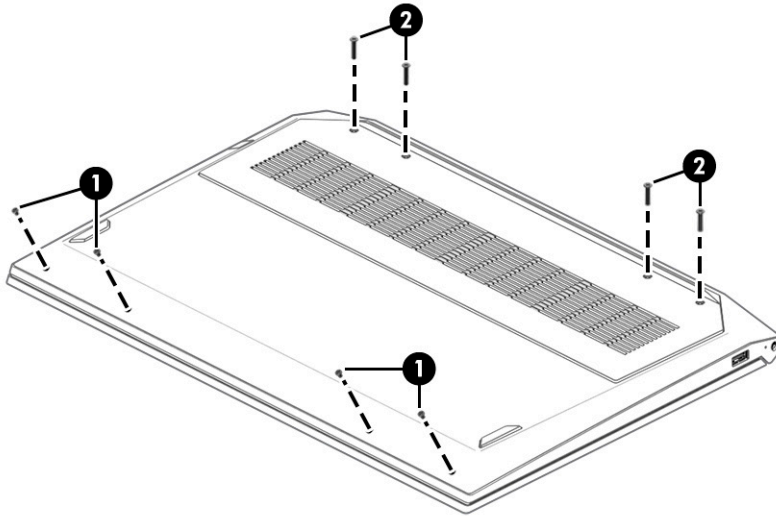
Table 5-1 Bottom cover description and part number

| Description | Spare part number |
|---------------------------------------|-------------------|
| Bottom cover, ghost white | M02045-001 |
| Bottom cover, acid green/ultra violet | M02046-001 |

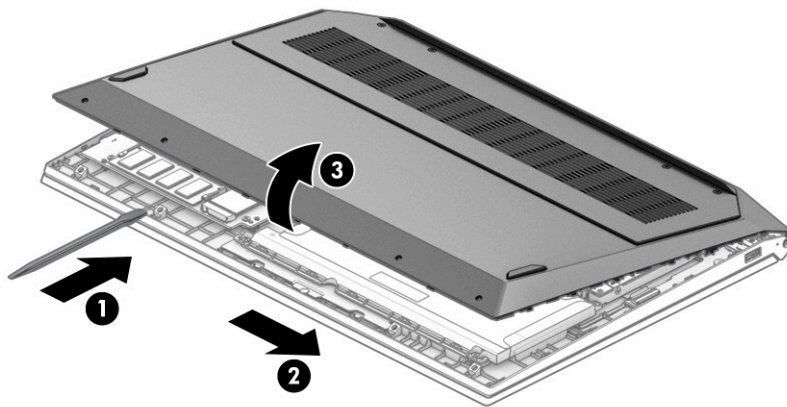
Before removing the bottom cover, prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).

Remove the bottom cover:

1. Remove the four Phillips M2.5 × 3.0 screws **(1)** and the four Phillips M2.5 × 12.0 screws **(2)** that secure the bottom cover to the computer.



2. Along the bottom edge of the computer, insert a nonmarking, nonconductive tool between the bottom cover and the computer **(1)**, and then pull the tool along the bottom to release the cover **(2)**.
3. Remove the bottom cover from the computer **(3)**.



To replace the bottom cover, reverse the removal procedures.

Memory modules

To remove the memory modules, use this procedure and illustration.

Table 5-2 Memory module descriptions and part numbers


| Description | Spare part number |
|-----------------|-------------------|
| 8 GB, DDR4-3200 | L46598-005 |
| 4 GB, DDR4-3200 | L83673-005 |

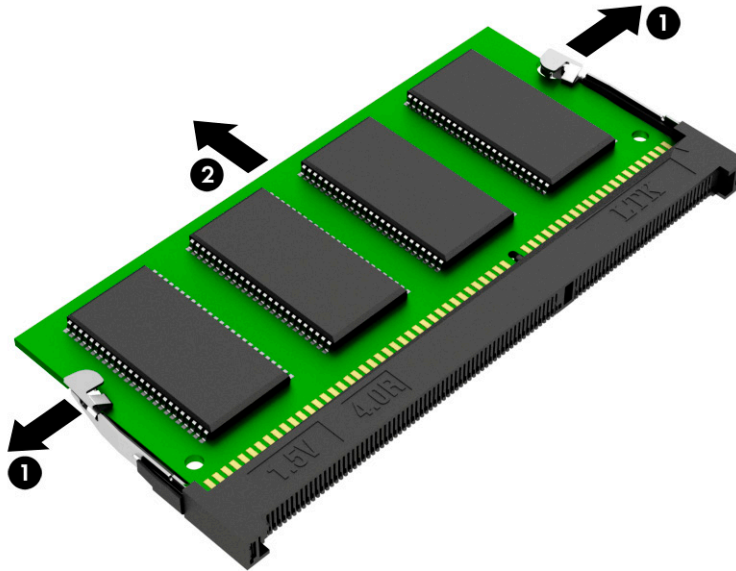
Before removing the memory, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

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

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

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

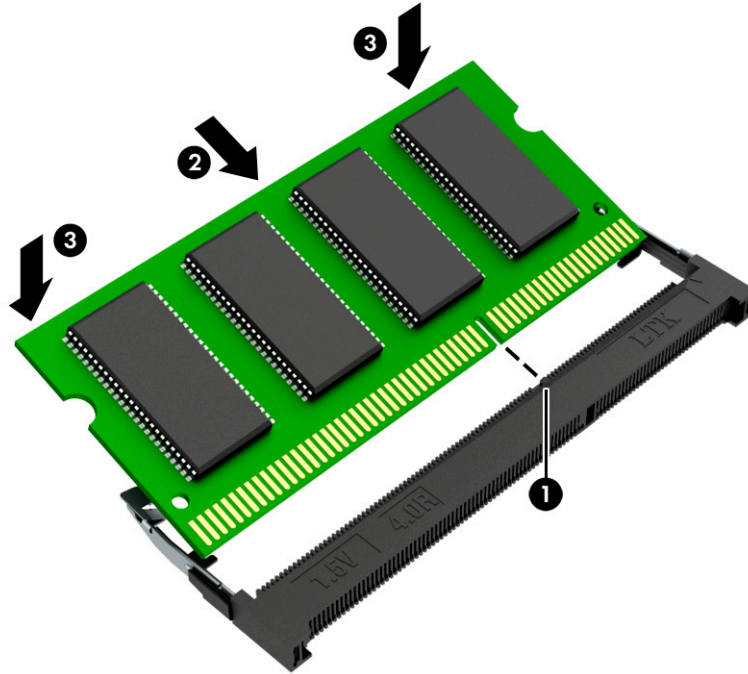


To protect a memory module after removal, place it in an electrostatic-safe container.

To install a memory module:

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)**.



Solid-state drive

To remove the M.2 solid-state drive, use this procedure and illustration.

Table 5-3 Solid-state drive descriptions and part numbers

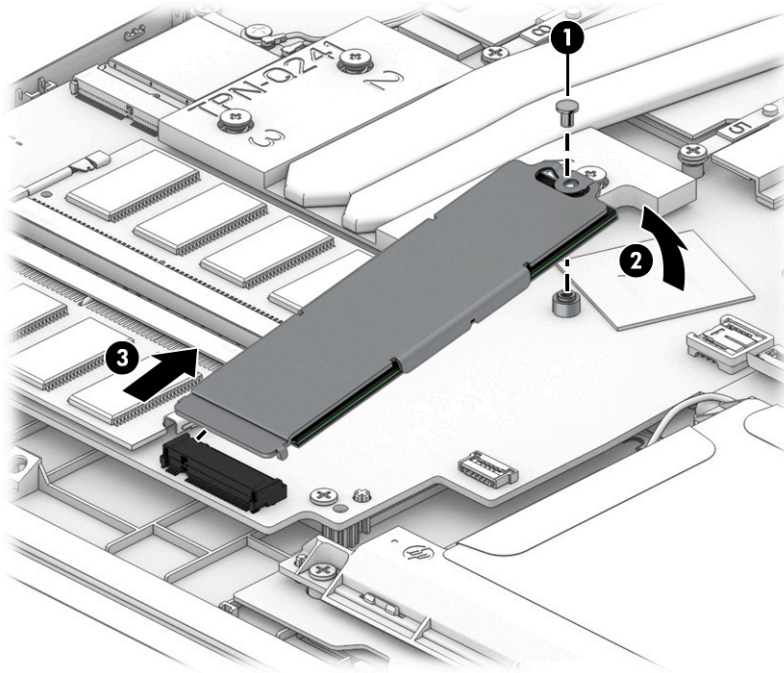
| Description | Spare part number |
|--|-------------------|
| 1 TB, PCIe, TLC | L85348-005 |
| 512 GB, PCIe, TLC | L85360-005 |
| 512 GB, PCIe, value | L85364-005 |
| 512 GB, PCIe + 32 GB Optane memory | L85366-005 |
| 256 GB, PCIe, TLC | L85350-005 |
| 256 GB, PCIe, value | L85354-005 |
| 256 GB, PCIe + 16 GB Optane memory | L85356-005 |
| 128 GB, PCIe | M06792-005 |
| Solid-state drive protective shielding | M13006-001 |

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

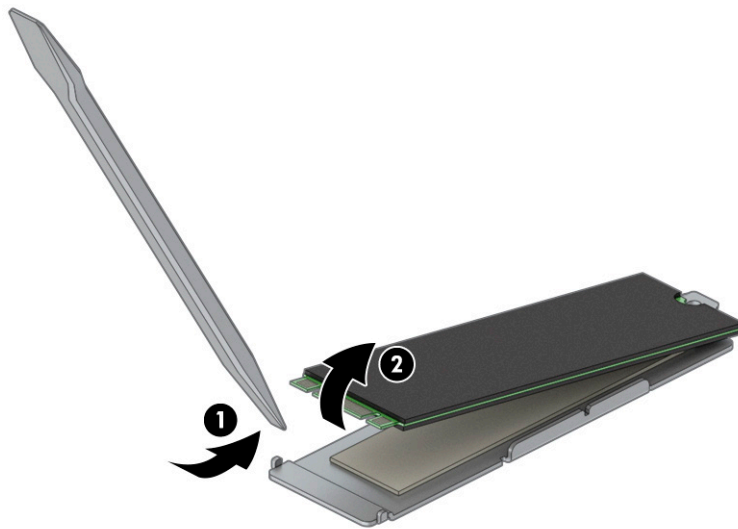
1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

Remove the solid-state drive:


1. Remove the Phillips M2.0 × 2.0 screw (1) that secures the drive assembly to the computer.
2. Lift the drive assembly up (2), and then pull it away from the socket to remove it (3).



3. A thermal pad installed on the drive secures the drive to the bracket. To separate the drive from the bracket, use a tool (1) to release the bottom of the drive from the bracket (2).



To install the solid-state drive, reverse the removal procedures.

 **NOTE:** Solid-state drives are designed with a notch to prevent incorrect insertion.

Hard drive

To remove the hard drive, use these procedures and illustrations.

Table 5-4 Hard drive, hard drive bracket and hard drive cable descriptions and part numbers

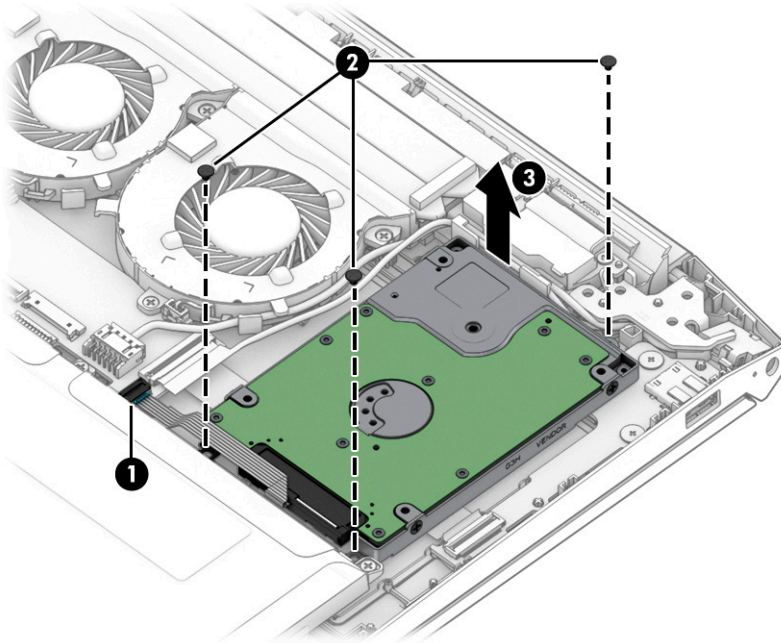
| Description | Spare part number |
|----------------------------|-------------------|
| Hard drive, 1 TB, 7200 rpm | L06427-855 |
| Hard drive cable | M02050-001 |

Before removing the hard drive, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

Remove the hard drive:

1. Disconnect the hard drive cable from the system board ZIF connector **(1)**.
2. Remove the three Phillips M2.0 × 2.5 screws **(2)** that secure the hard drive to the computer.
3. Remove the hard drive from the computer **(3)**.

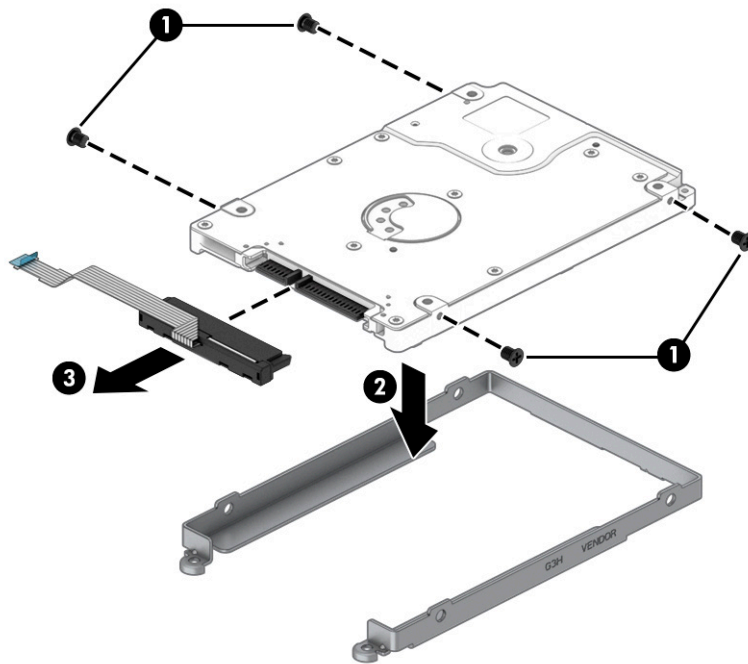


Reverse this procedure to install the hard drive.

If you need to disassemble the hard drive, follow these steps:

1. Remove the four Phillips M3.0 × 3.0 screws **(1)** that secure the bracket to the hard drive.
2. Remove the bracket from the hard drive **(2)**.


3. Disconnect the cable from the hard drive (3).




Reverse this procedure to reassemble and install the hard drive.

6 Removal and replacement procedures for authorized service provider parts

This chapter provides removal and replacement procedures for authorized service provider parts.

 **IMPORTANT:** 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.

 **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.

Component replacement procedures

To remove and replace computer components, use these procedures.

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

You must remove, replace, or loosen as many as 52 screws when you service the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Battery

To remove the battery, use this procedure and illustration.

Table 6-1 Battery description and part number

| Description | Spare part number |
|--------------------------|-------------------|
| Battery (3 cell, 52 Whr) | L48495-005 |

 **WARNING!** To avoid personal injury and damage to the product:

- Do *not* puncture, twist, or crack the battery.
- Do *not* cause an external puncture or rupture to the battery. They can cause a short inside the battery, which can result in battery thermal runaway.
- Do *not* handle or touch the battery enclosure with sharp objects such as tweezers or pliers, which might puncture the battery.
- Do *not* compress or squeeze the battery case with tools or heavy objects stacked on top of the case. These actions can apply undue force on the battery.
- Do *not* touch the connectors with any metallic surface or object, such as metal tools, screws, or coins, which can cause shorting across the connectors.

Before removing the battery, follow these steps:

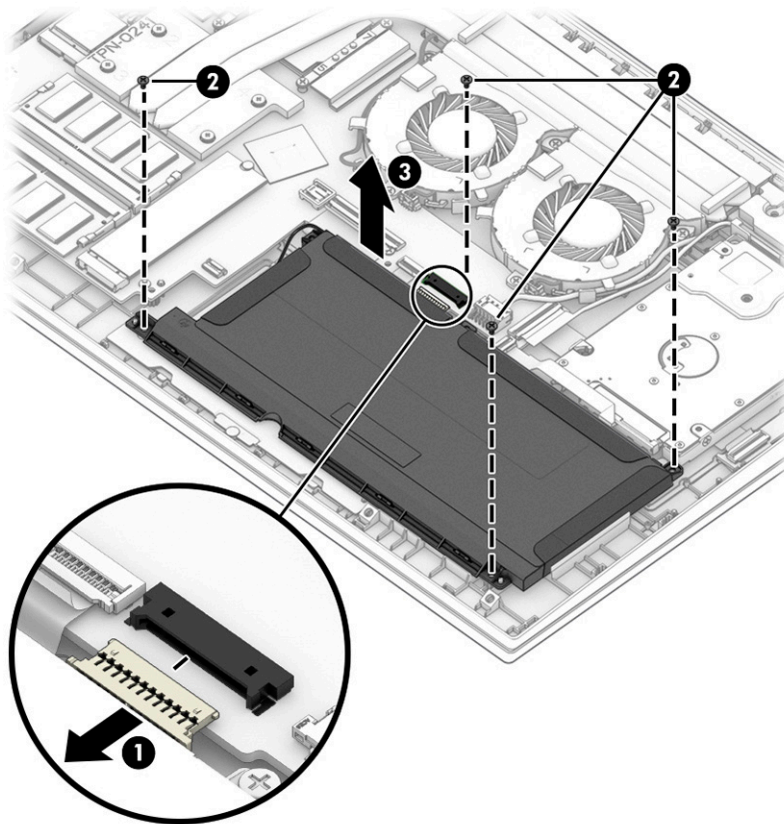
1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).

⚠ 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.

📄 IMPORTANT: Removing a 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 you remove the battery.

Remove the battery:

1. Disconnect the battery cable from the system board **(1)**.
2. Remove the four Phillips M2.0 × 4.0 screws **(2)** that secure the battery to the computer.
3. Remove the battery from the computer **(3)**.




To insert the battery, reverse the removal procedures.

WLAN module

To remove the WLAN module, use this procedure and illustration.

Table 6-2 WLAN module descriptions and part numbers

| Description | Spare part number |
|--|-------------------|
| Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth 5 | L44796-005 |
| Intel Wi-Fi 6 AX201 + Bluetooth® 5 (non-vPro) (802.11ax 2 × 2) | L57250-005 |


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

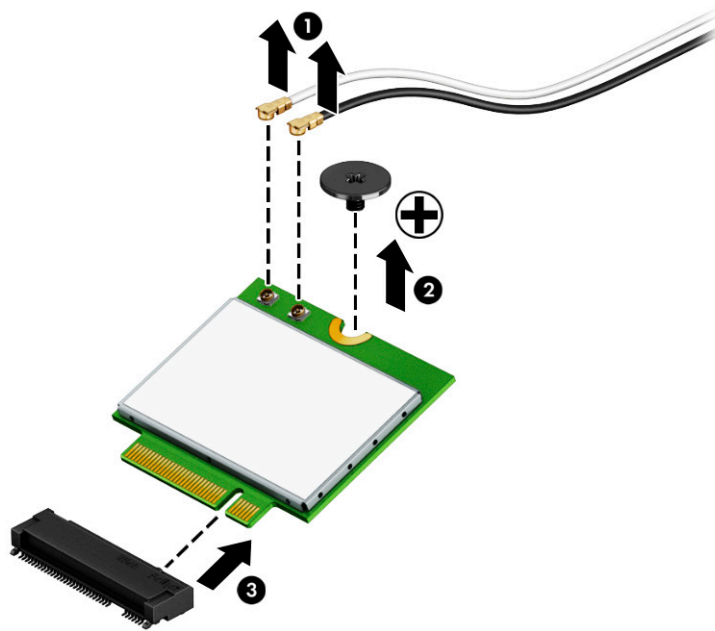
Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

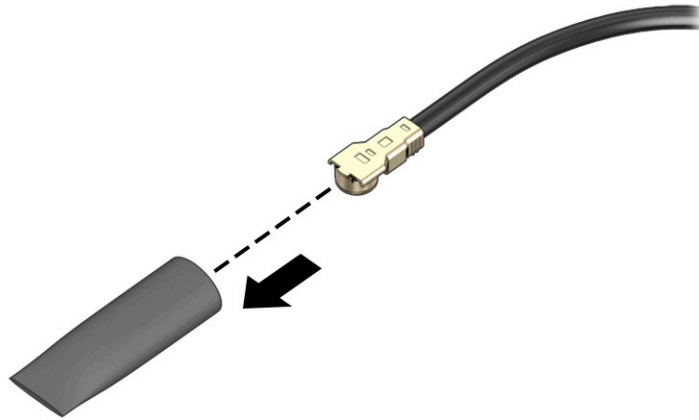
Remove the WLAN module:

1. Carefully disconnect the two antenna cables from the module **(1)**.
2. Remove the Phillips M2.0 × 2.5 screw **(2)**, and then remove the WLAN module **(3)**.

 **NOTE:** Models have either one or two WLAN antennas. On models with two antennas, the #1 white WLAN antenna cable connects to the WLAN module #1 Main terminal. The #2 black WLAN antenna cable connects to the WLAN module #1 Aux terminal.



3. If the WLAN antenna is not connected to the terminal on the WLAN module, a protective sleeve must be installed on the antenna connector, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

RJ-45 door

To remove the RJ-45 door, use this procedure and illustration.

Table 6-3 RJ-45 door description and part number

| Description | Spare part number |
|-------------|-------------------|
| RJ-45 door | M03599-001 |

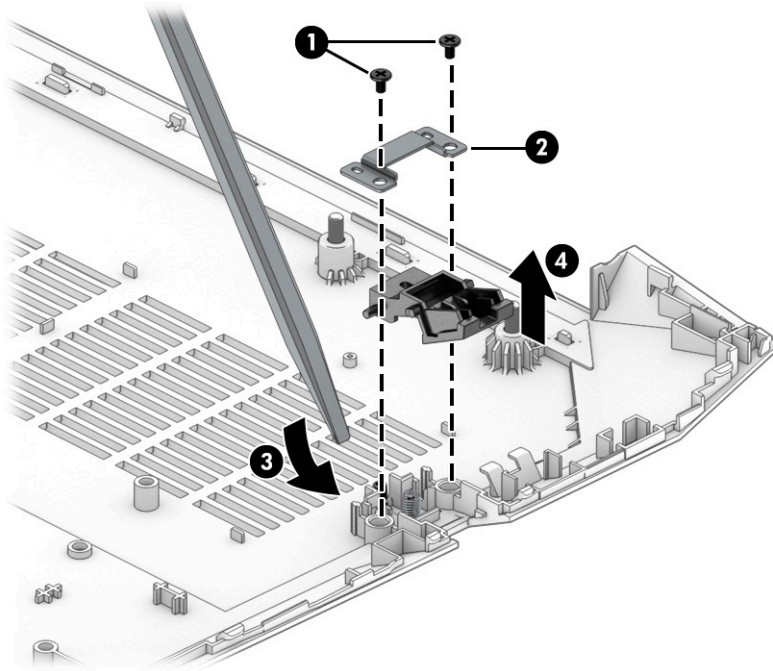
Before removing the RJ-45 door, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).

Remove the RJ-45 door:

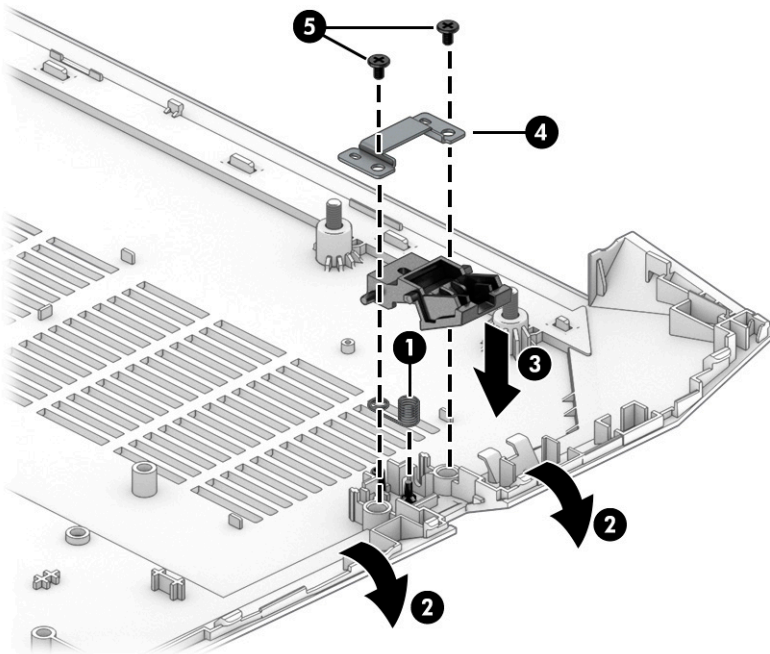
1. Remove the two Phillips M2.0 × 2.5 screws **(1)** that secure the bracket, and then remove the bracket from the top of the RJ-45 door **(2)**.

2. Use a tool **(3)** to release the door from the computer **(4)**.



To install the RJ-45 door:

1. Install the spring over the post **(1)**.
2. Flex the bottom cover on both sides of the RJ-45 door slot **(2)**, and then insert the door into the slot **(3)**.
3. Place the bracket on top of the door **(4)**, and then install the screws **(5)**.



USB board

To remove the USB board, use this procedure and illustration.

Table 6-4 USB board description and part number

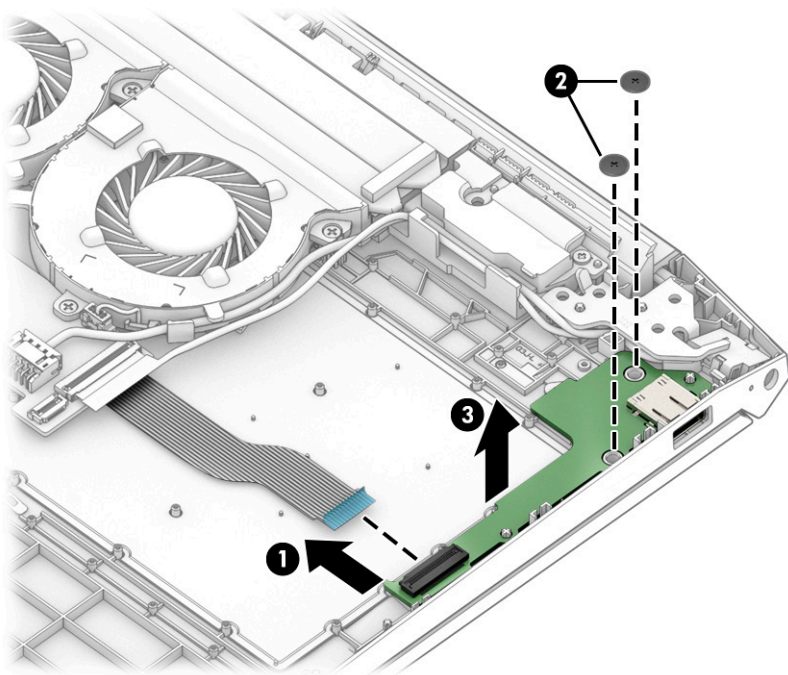
| Description | Spare part number |
|-------------------------|-------------------|
| USB board, acid green | M02055-001 |
| USB board, ultra violet | M02056-001 |
| USB board, ghost white | M02057-001 |
| USB board cable | M02048-001 |

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).
4. Remove the hard drive ([Hard drive on page 33](#)).

Remove the USB board:

1. Disconnect the cable from the ZIF connector on the USB board (**1**).
2. Remove the two Phillips M2.0 × 2.0 screws (**2**) that secure the board to the computer.
3. Remove the board from the computer (**3**).



Reverse this procedure to install the USB board.

Fans

To remove the fans, use this procedure and illustration.

Table 6-5 Fan descriptions and part numbers

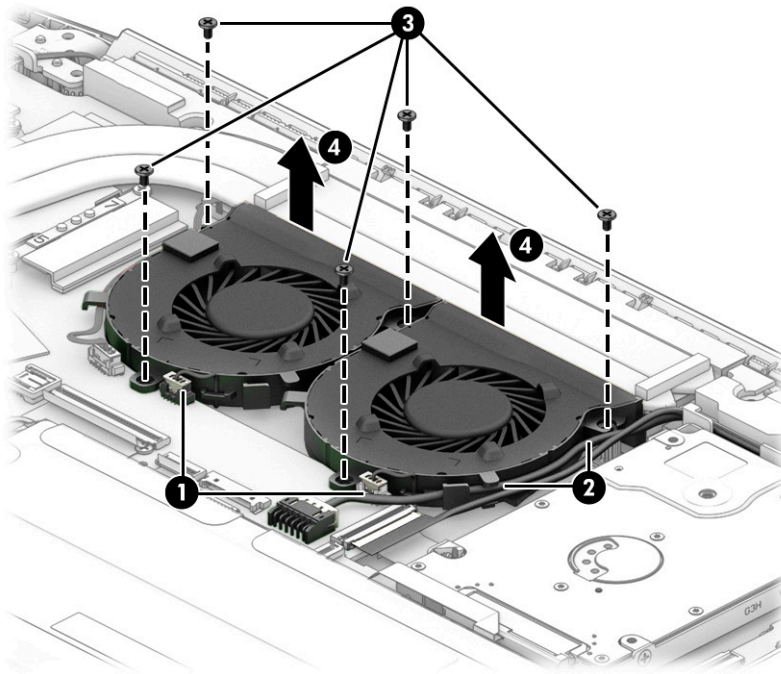
| Description | Spare part number |
|-------------|-------------------|
| Fans | L72702-001 |

Before removing the fans, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

Remove the fans:

1. Disconnect the fan cables from the system board **(1)**.
2. Remove the power connector cable from under the clip on the side of the fan near the hard drive **(2)**.
3. Remove the five Phillips M2.0 × 4.0 screws **(3)**, and then remove the fans from the computer **(4)**.



Reverse this procedure to install the fans.

Heat sink

To remove the heat sink, use these procedures and illustrations.

Table 6-6 Heat sink descriptions and part numbers

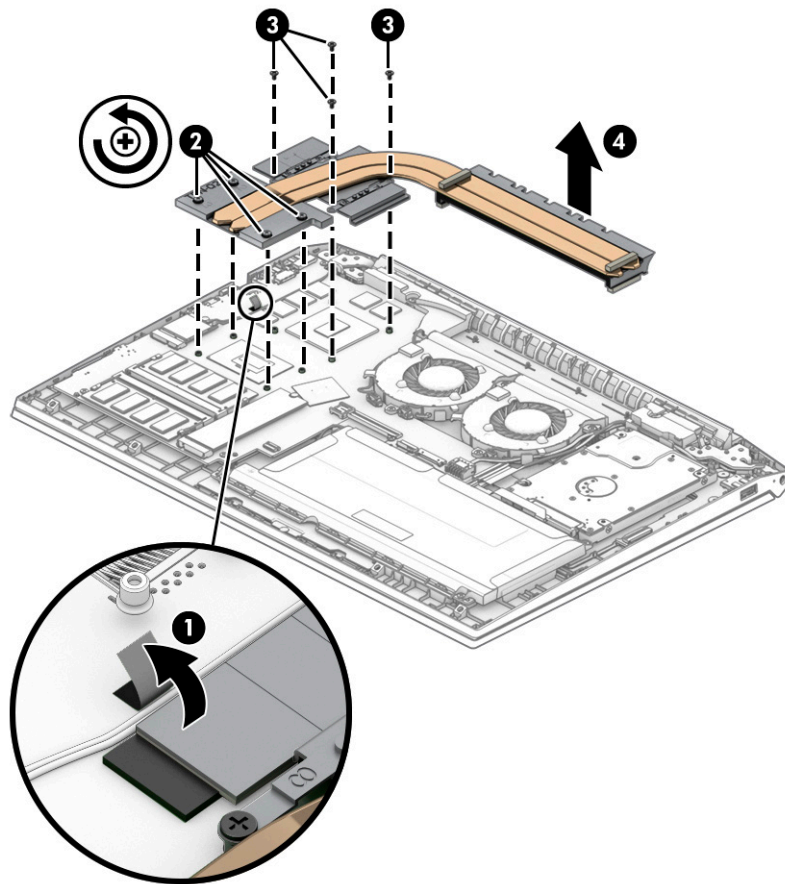
| Description | Spare part number |
|---|-------------------|
| Heat sink for use in models with RTX 2060 and GTX 1660Ti graphics | M02064-001 |
| Heat sink for use in models with GTX 1650Ti/1650 graphics | M02063-001 |
| Heat sink for use in GTX 1050 graphics | M02062-001 |
| Heat sink thermal pads | M03600-001 |

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).

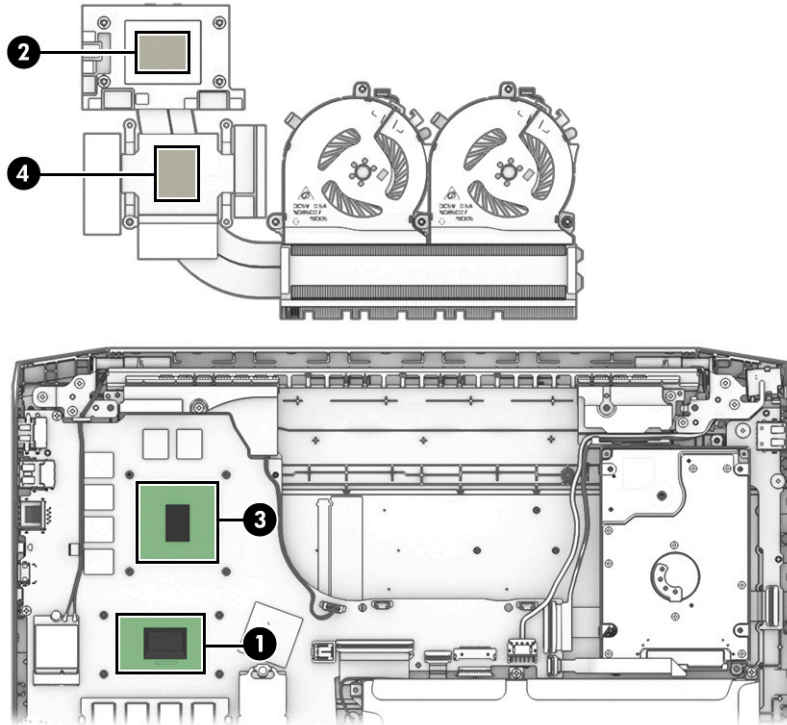
Remove the heat sink:

1. Remove the tape from the side of the heat sink **(1)**.
2. Loosen the four captive Phillips screws **(2)** and remove the four Phillips M2.0 × 4.0 screws **(3)** that secure the heat sink to the system board.
3. Remove the heat sink from the computer **(4)**.



4. 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.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 6-7 Touchpad description and part number

| Description | Spare part number |
|----------------|-------------------|
| Touchpad | M02058-001 |
| Touchpad cable | M02049-001 |

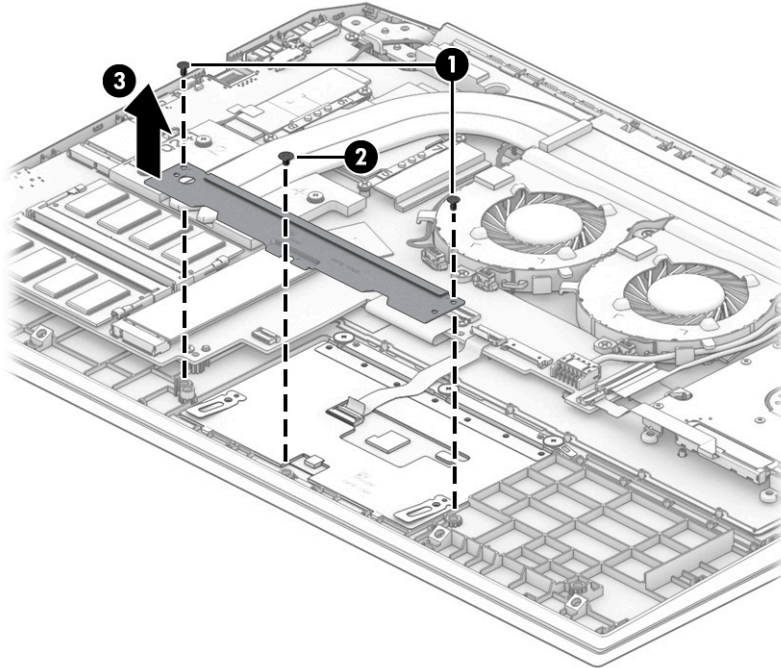
Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Remove the battery (see [Battery on page 37](#)).

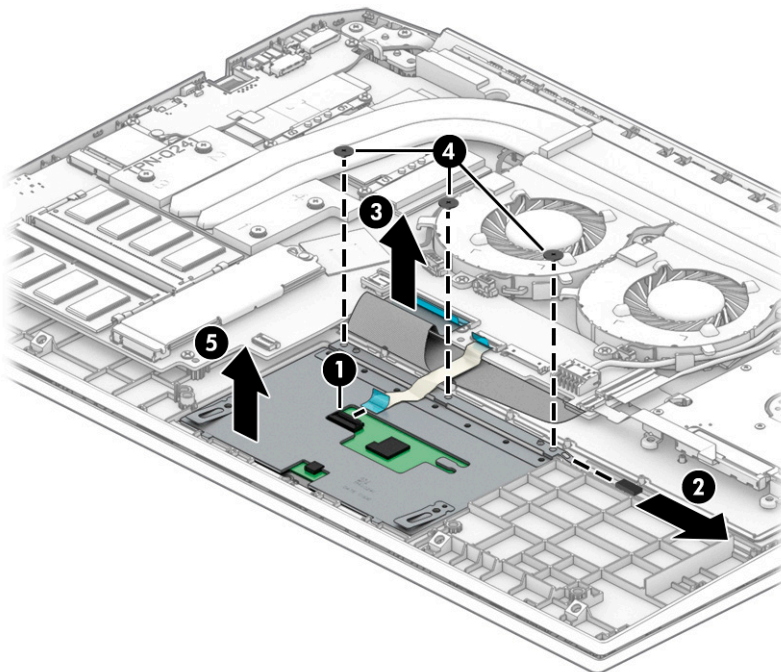
Remove the touchpad:

1. Remove the two Phillips M2.0 × 2.5 screws **(1)** and the Phillips M2.0 × 2.0 screw **(2)** that secures the touchpad bracket to the computer.

2. Remove the touchpad bracket from the computer (3).



3. Disconnect the cable from the ZIF connector on the touchpad (1).
4. Remove the rubber piece that sits over the screw on the right side of the touchpad (2).
5. Lift the flat keyboard cable and protective shielding from the top of the touchpad to access the screws underneath (3).
6. Remove the four Phillips M2.0 × 2.0 screws (4) that secure the touchpad to the computer.
7. Remove the touchpad from the computer (5).



Reverse this procedure to install the touchpad.

Power connector cable

To remove the power connector cable, use this procedure and illustration.

Table 6-8 Power connector cable description and part number

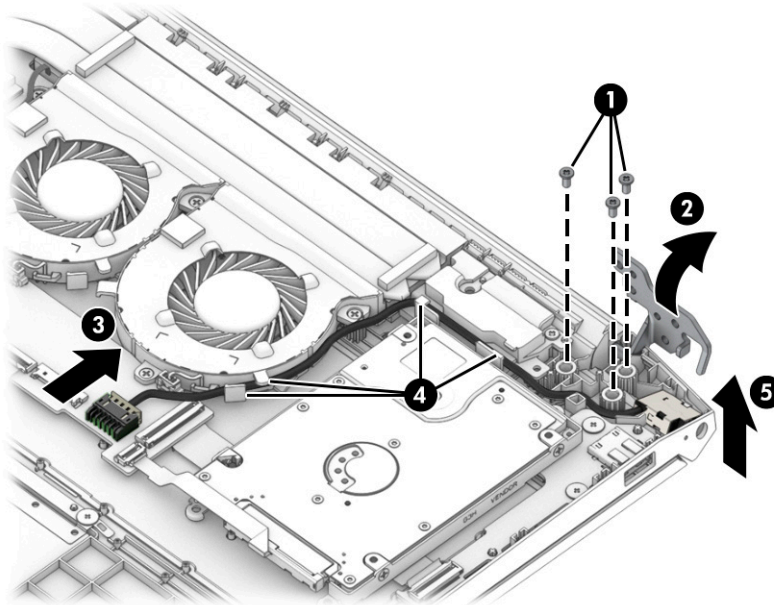
| Description | Spare part number |
|---|-------------------|
| Power connector for use in 200 W models | L72704-001 |
| Power connector for use in 150 W and 135 W models | L72703-001 |

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

Remove the power connector cable:

1. Remove the three Phillips M2.0 × 5.0 screws **(1)** that secure the left hinge, and then rotate the hinge upward **(2)**.
2. Disconnect the power connector cable from the system board **(3)**.
3. Remove the cable from its routing under the fan and left speaker **(4)**, and then remove the power connector cable from the computer **(5)**.



Reverse this procedure to install the power connector cable.

System board

To remove the system board, use these procedures and illustrations.

Table 6-9 System board descriptions and part numbers

| 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 Core i7-10750H processor with GeForce RTX 2060, 6 GB discrete graphics | M04833-xx1 |
| Intel Core i7-10750H processor with GeForce GTX 1660Ti, 6 GB discrete graphics | M02036-xx1 |
| Intel Core i7-10750H processor with GeForce GTX 1650Ti, 4 GB discrete graphics | M02035-xx1 |
| Intel Core i5-10300H processor with GeForce RTX 2060 MQ, 6 GB discrete graphics | M09550-xx1 |
| Intel Core i5-10300H processor with GeForce GTX 1660Ti, 6 GB discrete graphics | M04832-xx1 |
| Intel Core i5-10300H processor with GeForce GTX 1650Ti, 4 GB discrete graphics | M02034-xx1 |
| Intel Core i5-10300H processor with GeForce GTX 1650, 4 GB discrete graphics | M02033-xx1 |
| Intel Core i5-10300H processor with GeForce GTX 1050, 3 GB discrete graphics | M02032-xx1 |

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Remove the battery (see [Battery on page 37](#)).
4. Remove the fans (see [Fans on page 43](#)).
5. Remove the hard drive (see [Hard drive on page 33](#)).

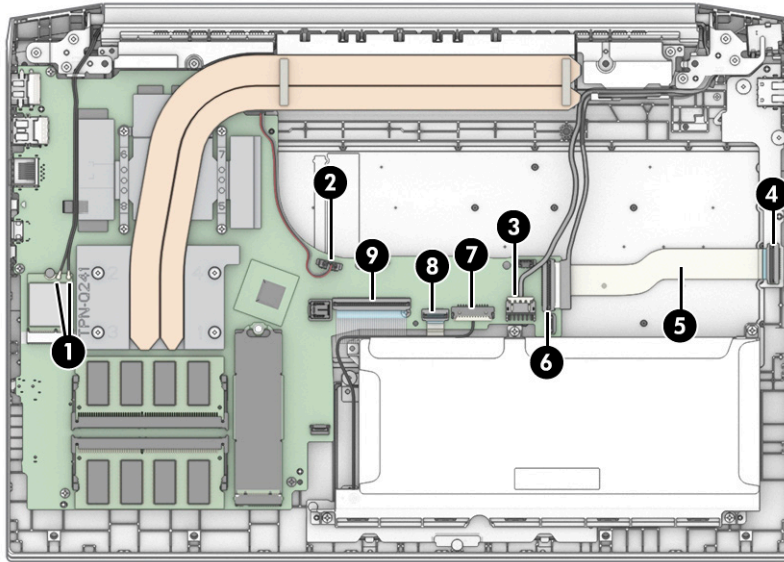
When you replace the system board, be sure to remove the following components (as applicable) from the defective system board and install them on the replacement system board:

- Memory modules (see [Memory modules on page 30](#)).
- Solid-state drive (see [Solid-state drive on page 32](#)).
- WLAN module (see [WLAN module on page 38](#)).
- Heat sink (see [Heat sink on page 43](#)).

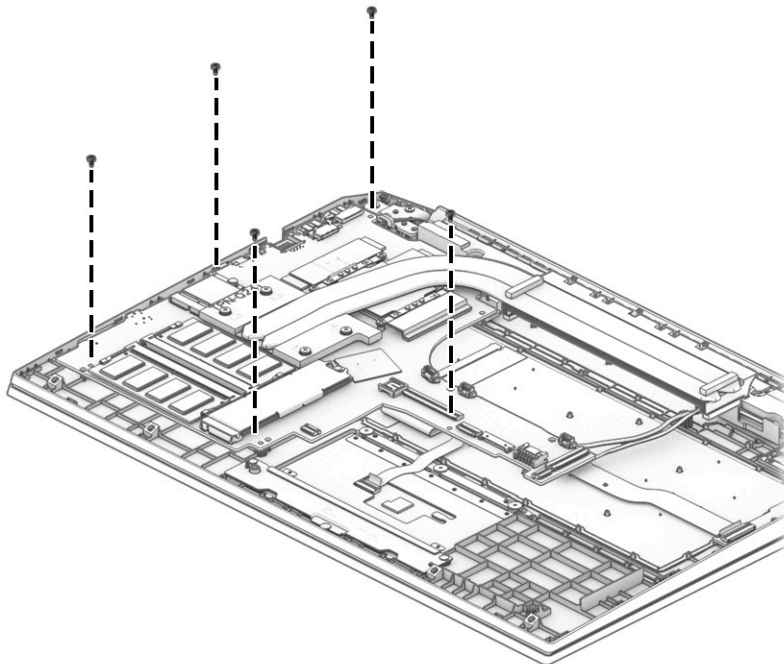
Remove the system board:

1. Disconnect the following cables from the system board:
 - Disconnect the antenna cables from the WLAN module **(1)**
 - Speaker cable **(2)**
 - Power connector cable **(3)**
 - USB board cable from USB board (ZIF) **(4)**
 - Release the USB board cable from the computer **(5)**
 - Hard drive cable **(6)**

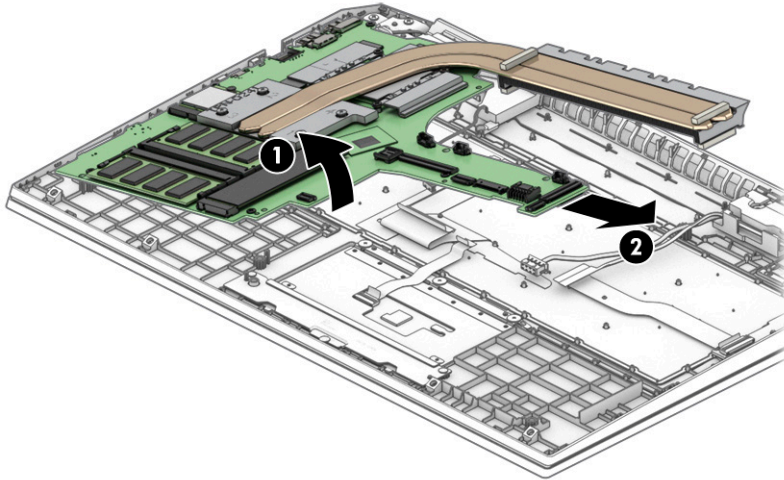
- Battery cable (ZIF) **(7)**
- Touchpad cable (ZIF) **(8)**
- Keyboard cable (ZIF) **(9)**



2. Remove the five Phillips M2.0 × 3.5 screws that secure the system board to the computer.



3. Lift the right side of the system board upward **(1)**, and then pull it up and to the right to remove it from the computer **(2)**.



Reverse this procedure to install the system board.

Speakers

To remove the speakers, use this procedure and illustration.

Table 6-10 Speaker description and part number

| Description | Spare part number |
|-------------|-------------------|
| Speaker Kit | M02060-001 |

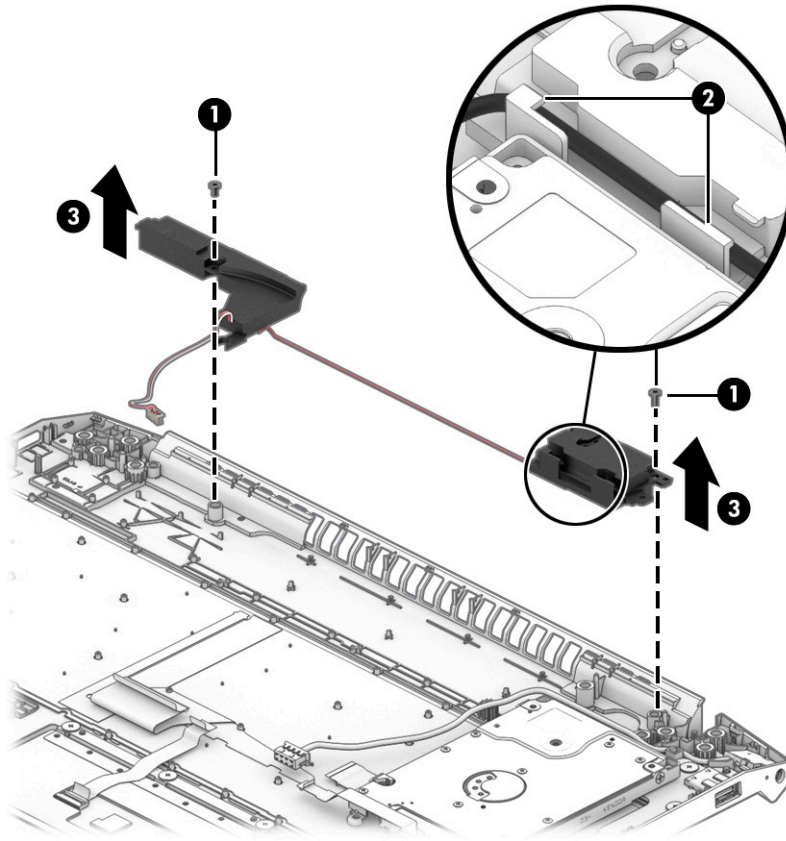
Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Remove the battery (see [Battery on page 37](#)).

Remove the speakers:

1. Remove the Phillips M2.0 × 4.0 screw **(1)** that secures each speaker to the computer.
2. Remove the cable from the clips in the speaker near the hard drive **(2)**.

3. Remove the speakers from the computer (3).



Reverse this procedure to install the speakers.

Display assembly

To remove and disassemble the display assembly, use these procedures and illustrations.

 **NOTE:** Spare parts are available for display assemblies only at the subcomponent level.

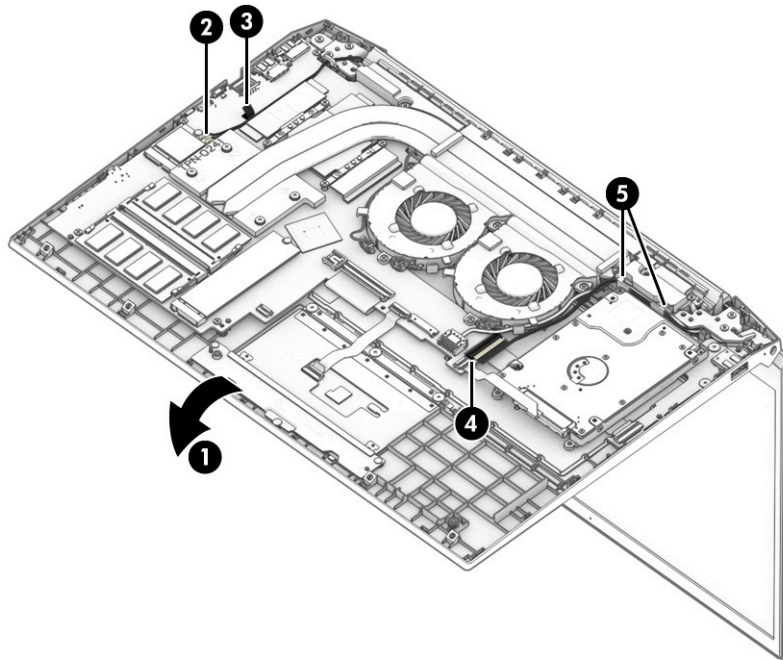
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover ([Bottom cover on page 29](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 37](#)).

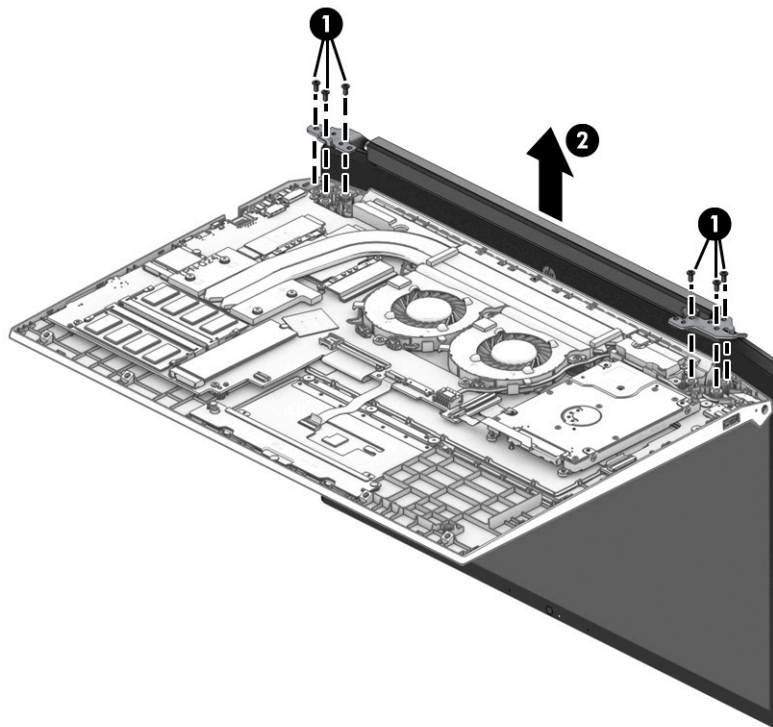
Remove the display assembly:

1. Open the computer to open the hinges (1).
2. Disconnect the antenna cables from the WLAN module (2) and remove the cables from the routing path in the computer (3).

3. Disconnect the display cable from the ZIF connector on the system board (4) and remove the cable from the routing path along the fan and speaker (5).



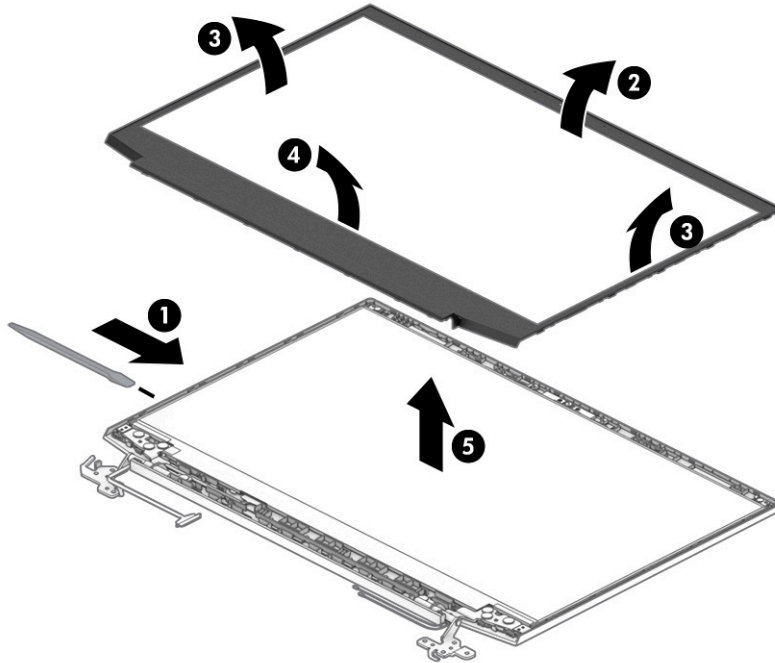
4. Remove the six Phillips M2.5 × 5.0 screws (1) that secure the display to the computer.
5. Separate the display from the computer (2).



6. If you need to replace display assembly subcomponents:

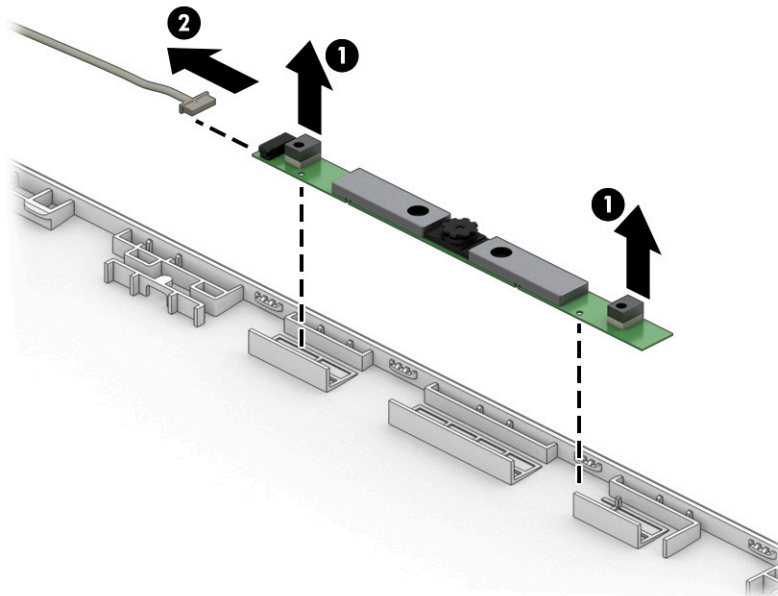
- a. Insert a flat tool between the bezel and the display to release the bezel **(1)**.
- b. Flex the top **(2)**, left and right sides **(3)**, and bottom of the bezel **(4)** to release it.
- c. Remove the bezel from the display **(5)**.

The bezel is available as spare part number M02047-001.



7. If you need to remove the camera module:

- ▲ Lift up evenly across the module and peel the module up from the display back cover **(1)**, and then disconnect the cable from the module **(2)**. The camera module is available as spare part number M02061-001.



8. If you need to remove the display panel:

a. The display panel is secured to the display enclosure with tape that is installed under the left and right sides of the panel. To remove the panel, use tweezers to grasp the end of the tape. While turning the tweezers, wrap the tape around the tweezers **(1)** as you continue to pull the tape out from behind the display panel **(2)**. You must pull the tape multiple times before it is completely removed.

b. Turn the display panel over and place it next to the display enclosure **(3)**.

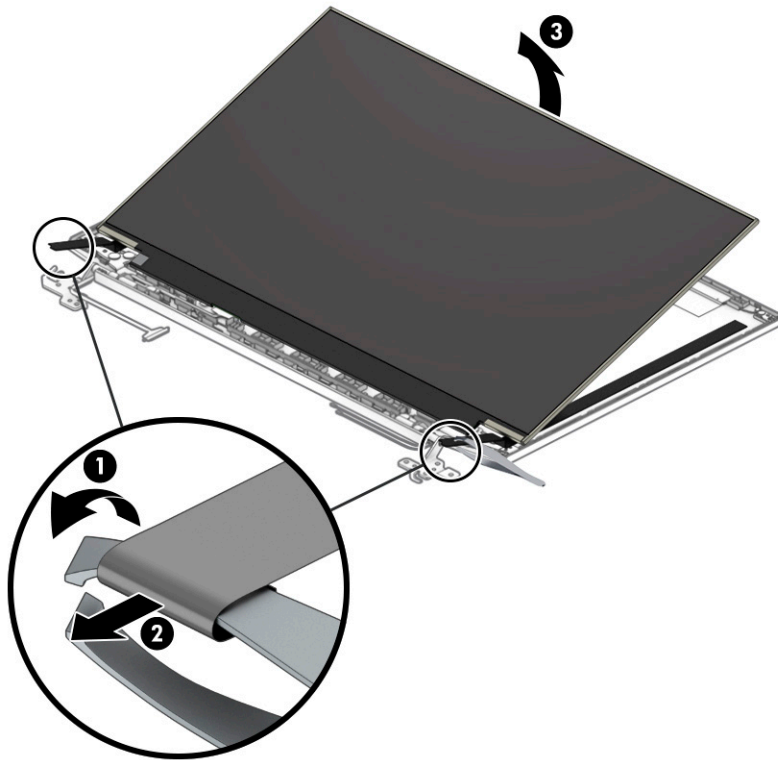
Display panels are available as the following spare part numbers:

M02080-001: 250 nits

M02081-001: 300 nits, 60 Hz

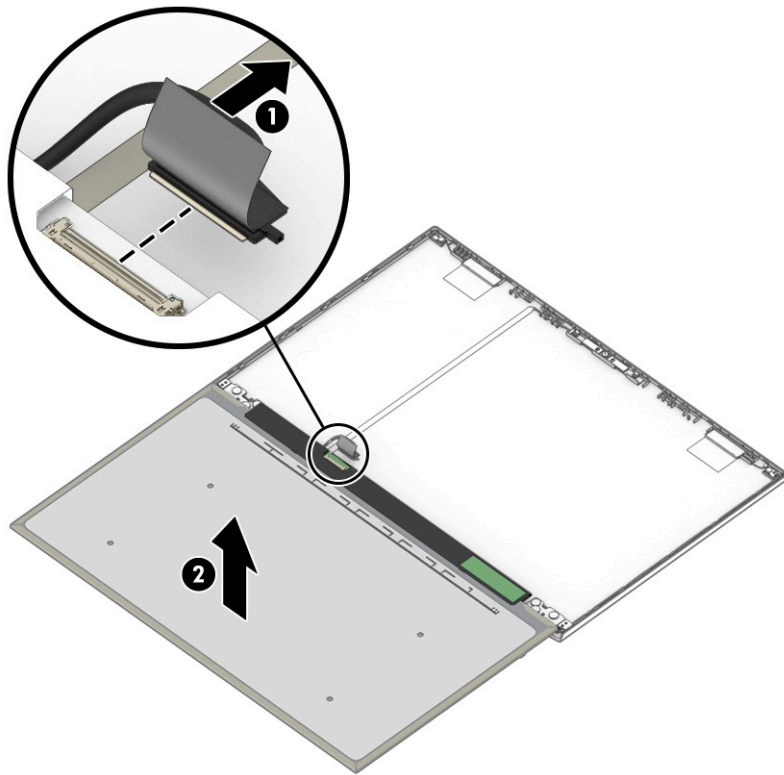
M02082-001: 300 nits, 144 Hz

Display panel adhesive is available as spare part number M03601-001.



c. Disconnect the cable from the panel **(1)**.

d. Remove the panel **(2)**.

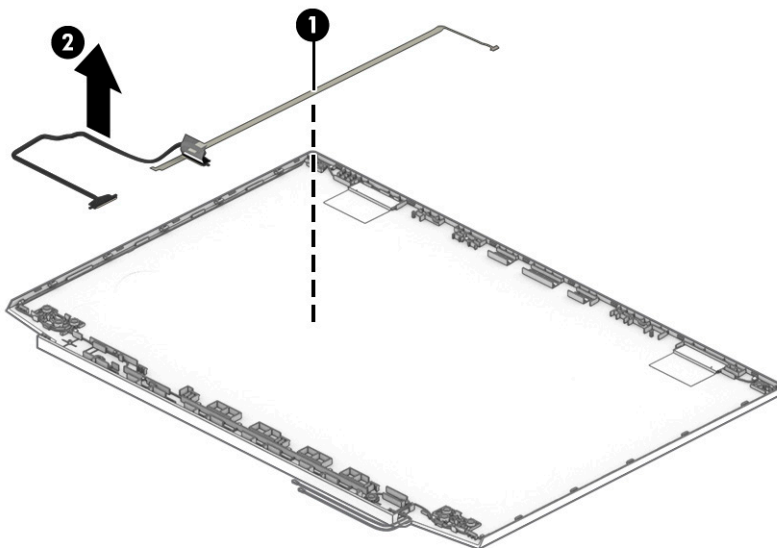


9. If you need to remove the display/camera cable, peel the cable off the inside of the display back cover **(1)**, and then remove the cable **(2)**.

Display panel cables are available as the following spare part numbers:

M02051-001: 60 Hz display panels

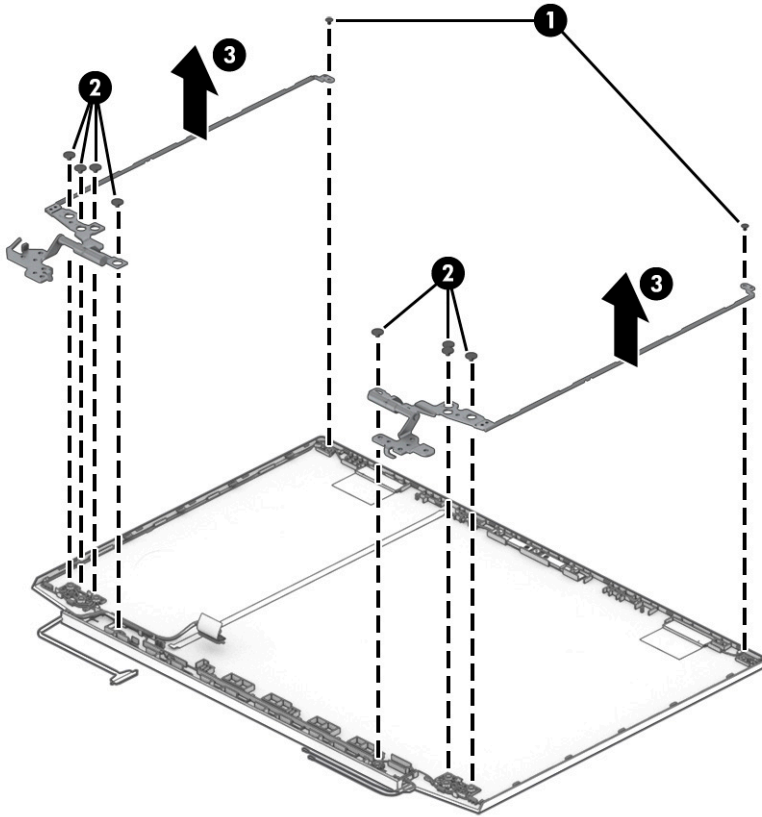
M02052-001: 144 Hz display panels



10. If you need to remove the hinges:

- a. Remove the Phillips M2.0 × 2.5 screw **(1)** from the top of each hinge and the four Phillips broadhead M2.0 × 2.5 screws **(2)** from the bottom of each hinge.
- b. Remove the hinges from the display back cover **(3)**.

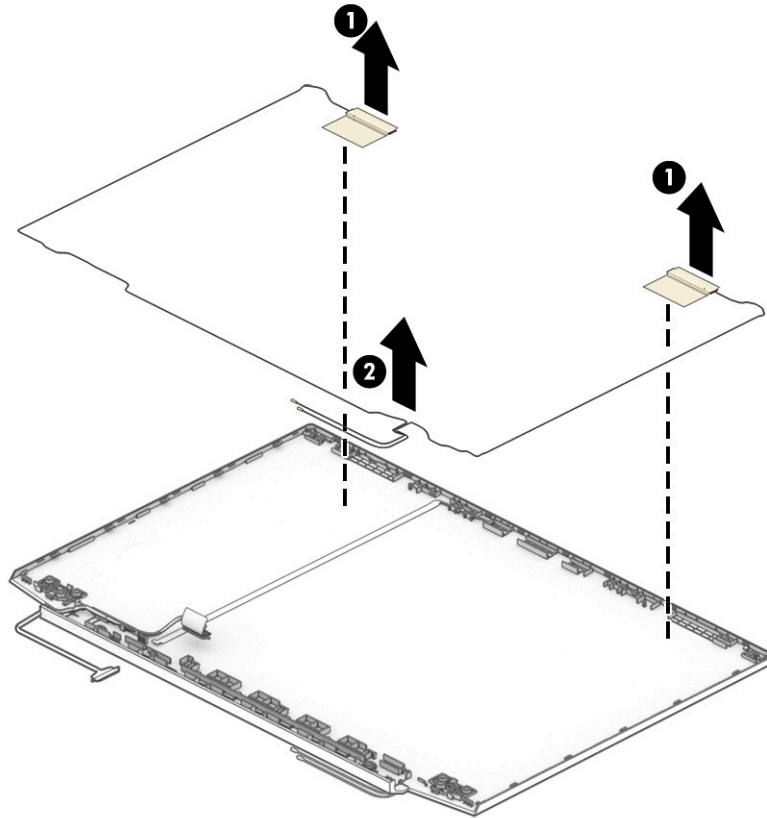
The display hinges are available as spare part number M02054-001.



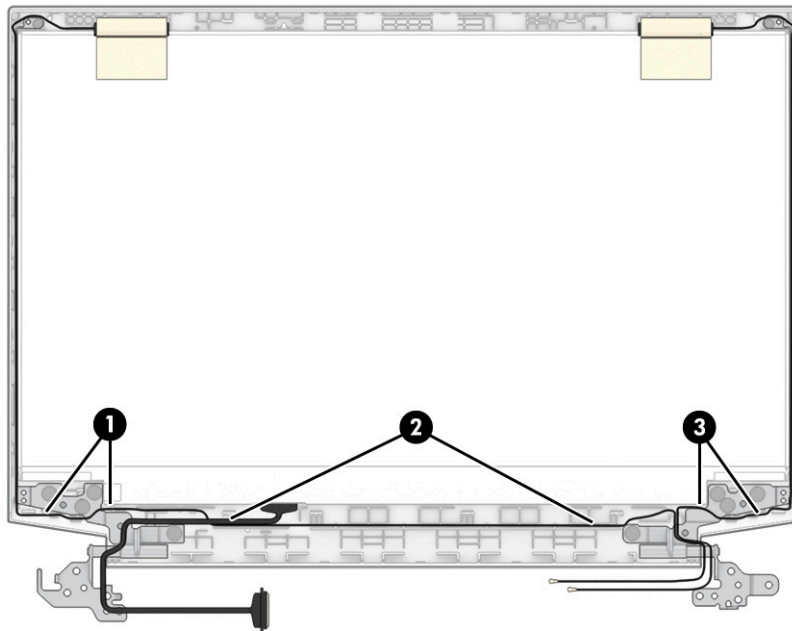
11. If you need to remove the antenna cables, peel the antennas off the inside of the display back cover **(1)**, and then remove the antennas and cables **(2)**.

Antenna cables are available as spare part number M02041-001.

Display back covers are available as spare part number M02042-001 for acid green models, M02043-001 for ultra violet models, and M02044-001 for ghost white models.



- When installing the display and antenna cables, be sure to route the antenna cables along the bottom of the left **(1)** and right **(3)** hinges and along the bottom of the display **(2)**. Route the display cable around the left hinge.



Reverse this procedure to reassemble and replace the display assembly.

Keyboard with top cover

The top cover with keyboard remains after removing all other spare parts from the computer. In this section, the first table provides the main spare part number for the top cover/keyboards. The second table provides the country codes.

Table 6-11 Keyboard with top cover descriptions and part numbers

| Description | Spare part number |
|---|-------------------|
| Keyboard with top cover, ghost white, not backlit | M02037-xx1 |
| Keyboard with top cover, ultra violet, backlit | M02038-xx1 |
| Keyboard with top cover, acid green, backlit | M02039-xx1 |
| Keyboard with top cover, ghost white, backlit | M02040-xx1 |

Table 6-12 Spare part country codes


| 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 | Iceland | -DD1 | Slovenia | -BA1 |
| Brazil | -201 | India | -D61 | South Korea | -AD1 |
| Bulgaria | -261 | Israel | -BB1 | Spain | -071 |
| Chile | -161 | Italy | -061 | Switzerland | -BG1 |

Table 6-12 Spare part country codes (continued)

| 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 |
|-------------------------------------|--------------------------|-------------------------------------|--------------------------|-------------------------------------|--------------------------|
| Czech Republic/Slovakia | -FL1 | Japan | -291 | Taiwan | -AB1 |
| Denmark, Finland, and Norway | -DH1 | The Netherlands | -B31 | Thailand | -281 |
| French Canada | -DB1 | Northern Africa | -FP1 | Turkey | -141 |
| France | -051 | Portugal | -131 | Ukraine | -BD1 |
| Germany | -041 | Romania | -271 | United Kingdom | -031 |
| Greece | -151 | Russia | -251 | United States | -001 |
| Hungary | -211 | Saudi Arabia | -171 | | |


7 Using Setup Utility (BIOS)

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

 **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)

You have several ways to access the Setup Utility (BIOS).

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

▲ Turn on or restart the computer and quickly press **f10**.

– or –

Turn on or restart the computer, quickly press **esc**, and then press **f10** when the Start menu is displayed.

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (BIOS) might 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 61](#)).
 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.
- In Windows, press `ctrl+alt+s`.


To check for later BIOS versions, see [Preparing for a BIOS update on page 62](#).

Preparing for a BIOS update

Be sure to follow all prerequisites before downloading and installing a BIOS update.

 **IMPORTANT:** 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.

Downloading a BIOS update

After you review the prerequisites, you can check for and download 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 might 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.

Installing a BIOS 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.

8 Backing up, restoring, and recovering

This chapter provides information about processes that 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 65](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 65](#)).
- **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 65](#)).
- **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 65](#)).

 **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

These methods of creating recovery media and backups are available on select products only. Choose the appropriate method for your computer model.


Using Windows tools

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

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

 **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.

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

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

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.

For details:

- ▲ Go to <http://www.hp.com/support>, search for HP Cloud Recovery, and then select the result that matches the type of computer that you have.



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

You have several options for recovering your system. Choose the method that best matches your situation and level of expertise.



NOTE: Not all methods are available on all products.

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 65](#).

Recovering using HP Recovery media

You can use HP Recovery media 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 65](#).



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.

Using HP Sure Recover (select products only)

Select computer models are configured with HP Sure Recover, a PC OS recovery solution built into the hardware and firmware. HP Sure Recover can fully restore the HP OS image without installed recovery software.

Using HP Sure Recover, an administrator or user can restore the system and install:

- Latest version of the operating system
- Platform-specific device drivers
- Software applications, in the case of a custom image

To access the latest documentation for HP Sure Recover, go to <http://www.hp.com/support>. Select **Find your product**, and then follow the on-screen instructions.

9 Using HP PC Hardware Diagnostics

The HP PC Hardware Diagnostics utility allows you to run diagnostics tests to determine whether your computer hardware is running properly. The three versions are HP PC Hardware Diagnostics Windows, HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface), and (for select products only) a firmware feature called Remote HP PC Hardware Diagnostics UEFI.

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 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 70](#).

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated.

- ▲ Depending on the instructions on the screen, choose one of these options:
 - If failure ID link is displayed, select the link and follow the on-screen instructions.
 - If instructions for calling support are displayed. Follow those instructions.

Accessing HP PC Hardware Diagnostics Windows

After HP PC Hardware Diagnostics Windows is installed, you can access it from HP Help and Support or HP Support Assistant.

Accessing HP PC Hardware Diagnostics Windows from HP Help and Support

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

To access HP PC Hardware Diagnostics Windows from HP Help and Support:

1. Select the **Start** button, and then select **HP Help and Support**.
2. Select **HP PC Hardware Diagnostics Windows**.
3. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.



NOTE: To stop a diagnostic test, select **Cancel**.

Accessing HP PC Hardware Diagnostics Windows from Support Assistant

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

To access HP PC Hardware Diagnostics Windows from 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 **Troubleshooting and fixes**.
3. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.
4. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.



NOTE: To stop a diagnostic test, select **Cancel**.

Downloading HP PC Hardware Diagnostics Windows

The HP PC Hardware Diagnostics Windows downloading 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 from HP

To download HP PC Hardware Diagnostics Windows from HP, 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 downloads to the selected location.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

You can download the HP PC Hardware Diagnostics Windows from the Microsoft Store.

1. Select the Microsoft app on your desktop or enter `Microsoft Store` in the taskbar search box.
2. Enter `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.
3. Follow the on-screen directions.

The tool downloads to the selected location.

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

You can download HP PC Hardware Diagnostics Windows by product name or number.



NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

1. Go to <http://www.hp.com/support>.
2. Select **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 to be downloaded to your computer or USB flash drive.

The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, navigate to the folder on your computer or the USB flash drive where the .exe file downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

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.



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 72](#).

If your PC does not start in Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated.

For assistance in solving the problem:

- ▲ Select **Contact HP**, accept the HP privacy disclaimer, and then use a mobile device to scan the Failure ID code that appears on the next screen. The HP Customer Support - Service Center page appears with your Failure ID and product number automatically filled in. Follow the on-screen instructions.

– or –

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 this procedure.

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 72](#).


- 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 some situations.

- HP PC Hardware Diagnostics UEFI is not included in the preinstallation 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 downloading 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, follow this procedure.

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)

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

 **NOTE:** For some products, you might have to download the software to a USB flash drive by using the product name or number.

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 might upload results to a preconfigured server.

For more information about 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

HP Remote PC Hardware Diagnostics UEFI is also available as a SoftPaq that you can download to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

You can 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 Remote Diagnostics**, and then select **Run**.

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

You can download HP Remote PC Hardware Diagnostics UEFI by product name or number.



NOTE: For some products, you might have to download the software by using the product name or number.

1. Go to <http://www.hp.com/support>.
2. Select **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 hard 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 that you use 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.

10 Specifications

This chapter provides specifications for your computer.

Computer specifications

This section provides specifications for your computer. When traveling with your computer, the computer dimensions and weights, as well as input power ratings and operating specifications, provide helpful information.

Table 10-1 Computer specifications

| | Metric | U.S. |
|--|----------------------------|---------------------|
| Dimensions | | |
| Width | 370.0 mm | 14.57 in |
| Depth | 262.5 mm | 10.34 in |
| Height | 23.5 mm | 0.93 in |
| Weight | | |
| Solid-state drive configuration | 2350.8 g | 5.18 lb |
| Hard drive configuration | 2440 g | 5.36 lb |
| Input power | | |
| Operating voltage and current | 19.5 V dc @ 6.9 A – 135 W | |
| | 19.5 V dc @ 7.70 A – 150 W | |
| | 19.5 V dc @ 10.3 A – 200 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.

40.9 cm (16.1 in) display specifications

This section provides specifications for your display.

Table 10-2 Display specifications

| | Metric | U.S. |
|-------------------------|--|-------------|
| Active diagonal size | 40.9 cm | 16.1 in |
| Resolution | 1920 × 1080 (FHD) | |
| Surface treatment | Antiglare | |
| Brightness | 250 nits (45% NTSC) 300 nits (72% NTSC) | |
| Viewing angle | UWVA | |
| Backlight | WLED | |
| Display panel interface | eDP | |

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 10-3 Solid-state drive specifications

| | 256 GB* | 512 GB* | 1 TB* |
|-----------------------------------|------------------------------------|--------------------|--------------------|
| Dimensions | | | |
| Height | 1.0 mm | 1.0 mm | 1.0 mm |
| Length | 50.8 mm | 50.8 mm | 50.8 mm |
| Width | 28.9 mm | 28.9 mm | 28.9 mm |
| Weight | < 10 g | < 10 g | < 10 g |
| Interface type | | | |
| Ready time, maximum (to not busy) | 1.0 ms | < 1.0 ms | 1.0 ms |
| Access times, logical | 0.1 ms | 0.1 ms | 0.1 ms |
| Transfer rate | | | |
| Sequential read | up to 2150 MB/s | up to 2150 MB/s | up to 2150 MB/s |
| Random read | Up to 300,000 IOPs | Up to 300,000 IOPs | Up to 300,000 IOPs |
| Sequential write | up to 1550 MB/s | up to 1550 MB/s | up to 1550 MB/s |
| Random write | Up to 100,000 IOPs | Up to 100,000 IOPs | Up to 100,000 IOPs |
| Total logical sectors | 468,883,296 | 1,000,215,216 | 1,500,336,388 |
| Operating temperature | 0°C to 70°C (32°F to 158°F) | | |

Table 10-3 Solid-state drive specifications (continued)

| | 256 GB* | 512 GB* | 1 TB* |
|--|---------|---------|-------|
| <p>*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.</p> | | | |
| <p>NOTE: Certain restrictions and exclusions apply. Contact support for details.</p> | | | |

11 Power cord set requirements

This chapter provides power cord requirements for countries and regions.

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

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

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

Requirements for all countries

These power cord requirements are applicable to all countries and regions.

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 V ac 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

To determine power cord requirements for specific countries and regions, use this table.

Table 11-1 Power cord requirements for specific countries and regions

| Country/region | Accredited agency | Applicable note number |
|----------------|-------------------|------------------------|
| Argentina | IRAM | 1 |
| Australia | SAA | 1 |
| Austria | OVE | 1 |
| Belgium | CEBEC | 1 |
| Brazil | ABNT | 1 |
| Canada | CSA | 2 |
| Chile | IMQ | 1 |
| Denmark | DEMKO | 1 |
| Finland | FIMKO | 1 |
| France | UTE | 1 |
| Germany | VDE | 1 |

Table 11-1 Power cord requirements for specific countries and regions (continued)

| Country/region | Accredited agency | Applicable note number |
|--------------------------------|-------------------|------------------------|
| India | BIS | 1 |
| Israel | SII | 1 |
| Italy | IMQ | 1 |
| Japan | JIS | 3 |
| The Netherlands | KEMA | 1 |
| New Zealand | SANZ | 1 |
| Norway | NEMKO | 1 |
| The People's Republic of China | CCC | 4 |
| Saudi Arabia | SASO | 7 |
| Singapore | PSB | 1 |
| South Africa | SABS | 1 |
| South Korea | KTL | 5 |
| Sweden | SEMKO | 1 |
| Switzerland | SEV | 1 |
| Taiwan | BSMI | 6 |
| Thailand | TISI | 1 |
| The United Kingdom | ASTA | 1 |
| The United States | UL | 2 |

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

12 Recycling

When a nonrechargeable 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 website at <http://www.hp.com/recycle>.

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