



# Maintenance and Service Guide

## HP ENVY 17m Laptop PC

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### **Product notice**

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

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. Go to <http://www.microsoft.com> for details.

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## Safety warning notice

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 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

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# 1 Product description

**Table 1-1 Product components and their descriptions**

Category	Description
<b>Product Name</b>	<b>HP ENVY 17m Laptop PC</b> Model numbers: 17-ce0001 - 17-ce0999, 17t-ce000
<b>Processor</b>	Intel® Core™ i7-8565U (1.8 GHz, turbo up to 4.6 GHz, 2400 MHz FSB, 8 MB L3 cache, quad core, 15 W) Intel Core i5-8265U (1.6 GHz, turbo up to 3.9 GHz, 2400 MHz FSB, 6 MB L3 cache, quad core, 15 W)
<b>Graphics</b>	<b>Hybrid graphics</b> NVIDIA GeForce® MX250 with up to 4 GB of dedicated video memory (Core i7 processor) NVIDIA GeForce MX250 with up to 2 GB of dedicated video memory (Core i7/i5 processors) Supports HD decode, DX12, and HDMI Supports Optimus Supports FPS (GPU Performance Scaling)
<b>Display panel</b>	<b>43.9 cm (17.3 in) WLED, anti glare, slim-flat (3.5 mm), 16:9 ultra wide aspect ratio</b> Full high-definition (FHD) (1920 × 1080), UWVA, eDP, narrow bezel (DBCG); typical brightness: 300 nits, 72% color gamut (non-touch) Full high-definition (FHD) (1920 × 1080), UWVA, eDP, narrow bezel (DBTS); typical brightness: 300 nits, 72% color gamut (touch with flush glass, multitouch enabled) Microsoft HDR Streaming Capable
<b>Memory</b>	<b>Two SODIMM slots, non-accessible/non-upgradeable</b> DDR4-2400 dual channel support Supports up to 16 GB maximum system memory in the following configurations: <ul style="list-style-type: none"><li>• 16 GB (8 GB × 2)</li><li>• 12 GB (8 GB × 1 + 4 GB × 1)</li><li>• 8 GB (8 GB × 1 or 4 GB × 2)</li></ul>
<b>Storage</b>	<b>Supports 7.2 mm SATA hard drives</b> Support for solid-state drive + hard drive Support for M.2 solid-state drive Accelerometer/hard drive protection support <b>Single hard drive configurations</b> 1 TB, 7200 rpm, 7.2 mm <b>Dual storage configurations</b> 256 GB, PCIe, TLC, solid-state drive + 1 TB hard drive

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

Category	Description
	256 GB, PCIe, value, solid-state drive + 1 TB hard drive
	128 GB, SATA-3, TLC, solid-state drive + 1 TB hard drive
	<b>PCIe, NVMe, TLC, M.2 solid-state drive</b>
	512 GB
	<b>PCIe, NVMe, value, M.2 solid-state drive</b>
	512 GB
	<b>Intel Optane (3D Xpoint) Solution (PCIe)</b>
	16 GB (Optane) + 1 TB hard drive
<b>Optical drive</b>	9.0 mm tray load, SATA, fixed (not modular)
	DVD+/-RW Double-Layer Writer
	Supports Zero-Power optical drive
	Supports M-disc
<b>Audio</b>	<b>Audio brand:</b> BANG and OLUFSEN
	<b>Audio control panel:</b> BANG and OLUFSEN Audio Control
	Supports HP Audio Boost 2.0 (with discrete amplifier)
	Dual speakers
	Supports Far Field Cortana
<b>Video</b>	<b>HP Wide Vision HD Camera</b> - indicator LED, USB2.0, HD BSI sensor, f2.0, WDR, 88° WFOV
	720p by 30 frames per second
	Dual array digital microphone with appropriate software - beam forming, echo cancellation, noise suppression
<b>RJ-45 (network) jack</b>	Integrated 10/100/1000 NIC
<b>Sensors</b>	Accelerometer
<b>Wireless networking</b>	<b>Integrated wireless option with dual antennas (M.2/PCIe)</b>
	Intel Wireless-AC 9560 802.11ac 2 x 2 Wi-Fi + Bluetooth® 5 (non-vPro) (MU-MIMO, Gigabit Wi-Fi speeds supported)
	Support for Miracast-certified devices
<b>Ports</b>	HP Smart Plug AC adapter
	Headphone/microphone combo jack
	RJ-45 (network) jack
	High-definition multimedia interface (HDMI) v.2.0 + HDCP 2.2 supporting up to 4096 x 2160 at 60 Hz
	Hot plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected)
	USB 3.1 Gen 1 Type A ports (3); two on left side, one on right side; supports HP Sleep & Charge (right side)

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

<b>Category</b>	<b>Description</b>
	USB 3.1 Gen 1 Type-C port (supports data transfer, Power Delivery 3.0, Type-C adapter [65 W], DisplayPort 1.2 out up to 4096 × 2304 [60 Hz] and HDMI 1.4 out through adapter; HDMI 2.0 out up to 3840 × 2160 [60 Hz] with HDCP 2.2; HP Sleep & Charge)
<b>Media card reader</b>	Supports SD™/SDHC™/SDXC™ Push-push insertion/removal
<b>Internal card expansion</b>	One M.2 slot for WLAN One M.2 slot for solid-state drive
<b>Keyboard/pointing devices</b>	<p><b>Keyboard</b></p> <p>Backlit, full-sized, island-style, keyboard with numeric keypad</p> <p><b>TouchPad requirements</b></p> <p>ClickPad with image sensor</p> <p>Multitouch gestures enabled</p> <p>Support for Precision Touchpad</p> <p>Support for modern trackpad gestures</p> <p>Taps enabled as default</p>
<b>Power requirements</b>	<p><b>Battery</b></p> <p>Supports a 3-cell, 52 Whr, polymer/prismatic-mix battery</p> <p>Battery life enhancement</p> <p>Supports battery fast charge</p> <p><b>AC adapter</b></p> <p>65 W HP Smart AC adapter (non-PFC, standard barrel, 4.5 mm, straight)</p> <p>65 W HP Smart AC adapter, EM (non-PFC, standard barrel, 4.5 mm, straight)</p> <p><b>Power cord</b></p> <p>1 m, conventional power cord (C5)</p>
<b>Security</b>	<p>Trusted Platform Module (fTPM) 2.0, firmware based</p> <p>Fingerprint reader</p> <p>Privacy camera kill switch</p>
<b>Operating system</b>	<p><b>Preinstalled</b></p> <p>Windows® 10 Home 64</p> <p>Windows 10 Home 64 Advanced</p> <p>Windows 10 Home 64 Advanced Single Language</p> <p>Windows 10 Home 64 Advanced Web/Kiosk</p> <p>Windows 10 Home 64 Plus</p> <p>Windows 10 Home 64 Plus Single Language</p>

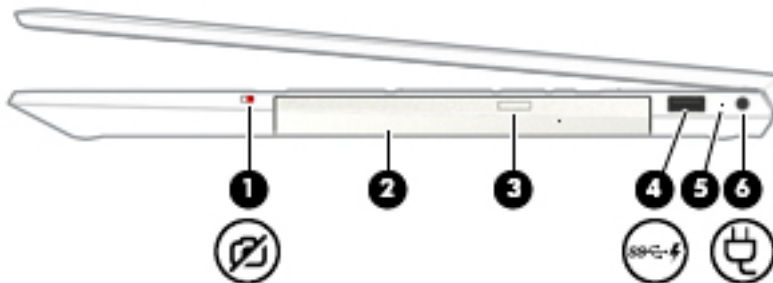
**Table 1-1 Product components and their descriptions (continued)**

<b>Category</b>	<b>Description</b>
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	Windows 10 Home 64 Plus Web/Kiosk
	Windows 10 Home 64 Single Language
<b>Serviceability</b>	<b>End-user replaceable part:</b>
	AC adapter




## 2 Getting to know your computer

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

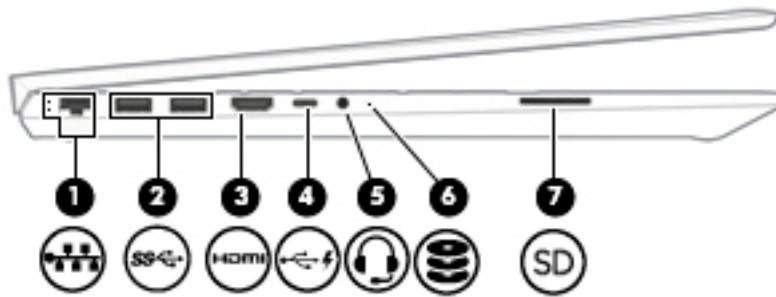
### Right side








**Table 2-1** Right-side components and their descriptions

Component	Description
(1)  Camera privacy switch	Turns the camera off and on.
(2) Optical drive	Depending on your computer model, reads an optical disc or reads and writes to an optical disc.
(3) Optical drive eject button	Releases the optical drive disc tray.
(4)  USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(5) AC adapter and battery light	<ul style="list-style-type: none"><li>• White: The AC adapter is connected and the battery is fully charged.</li><li>• Blinking white: The AC adapter is disconnected and the battery has reached a low battery level.</li><li>• Amber: The AC adapter is connected and the battery is charging.</li><li>• Off: The battery is not charging.</li></ul>
(6)  Power connector	Connects an AC adapter.



## Left side



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

Component	Description
<p>(1)  RJ-45 (network) jack/status lights</p>	<p>Connects a network cable.</p> <ul style="list-style-type: none"> <li>White: The network is connected.</li> <li>Amber: Activity is occurring on the network.</li> </ul>
<p>(2)  USB SuperSpeed ports (2)</p>	<p>Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.</p>
<p>(3)  HDMI port</p>	<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>
<p>(4)  USB Type-C port with HP Sleep and Charge</p>	<p>Connects a USB device that has a Type-C connector, provides data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.</p> <p>– and –</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort output.</p> <p><b>NOTE:</b> Cables and/or adapters (purchased separately) may be required.</p>
<p>(5)  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><b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> <li>▲ Select the <b>Start</b> button, select <b>HP Help and Support</b>, and then select <b>HP Documentation</b>.</li> </ul> <p><b>NOTE:</b> When a device is connected to the jack, the computer speakers are disabled.</p>

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

Component	Description
(6)  Drive light	<ul style="list-style-type: none"><li>• Blinking white: The hard drive is being accessed.</li></ul>
(7)  Memory card reader	<p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none"><li>1. Hold the card label-side up, with connectors facing the computer.</li><li>2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated.</li></ol> <p>To remove a card:</p> <ul style="list-style-type: none"><li>▲ Press in on the card, and then remove it from the memory card reader.</li></ul>

# Display



**Table 2-3** Display components and their descriptions

Component	Description
(1) Internal microphones	Record sound.
(2) 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. <b>NOTE:</b> Camera functions vary depending on the camera hardware and software installed on your product.
(3) Camera light	On: The camera is in use.
(4) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

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

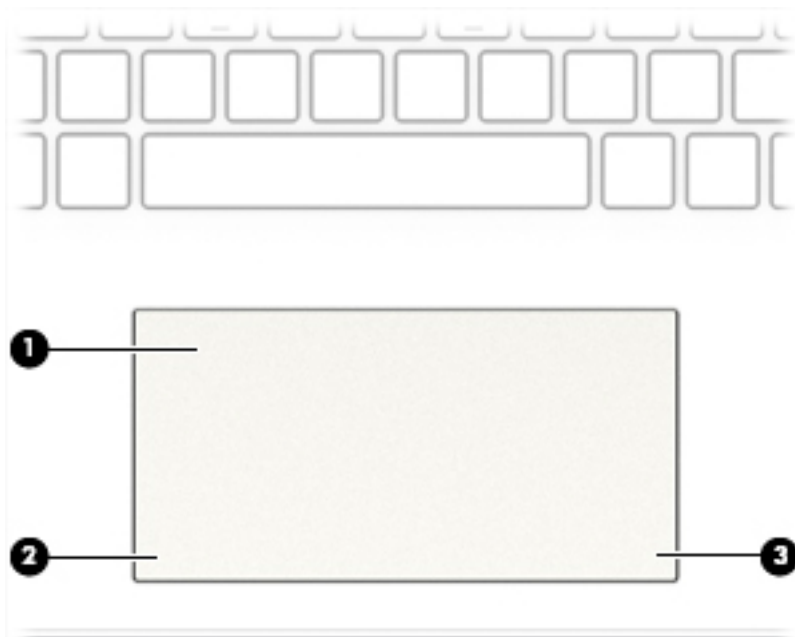
To access this guide:

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



# Keyboard area

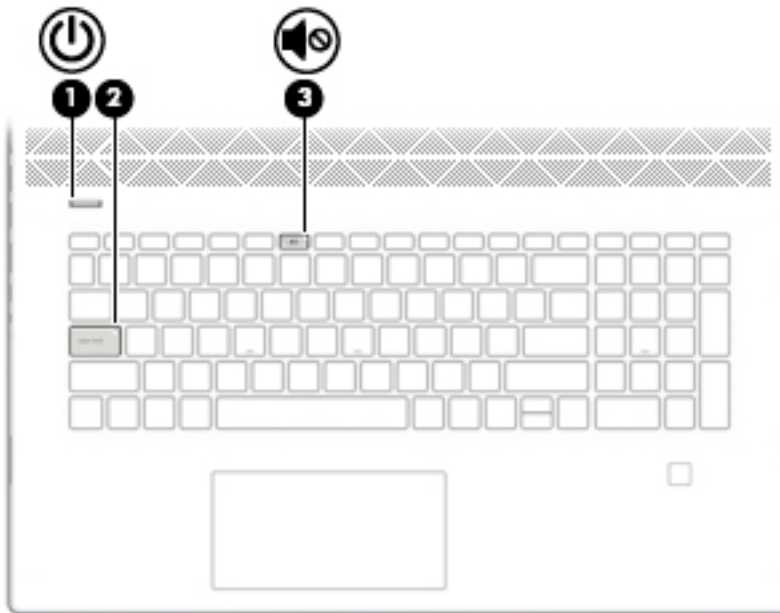
## TouchPad





**Table 2-4 TouchPad components and their descriptions**

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

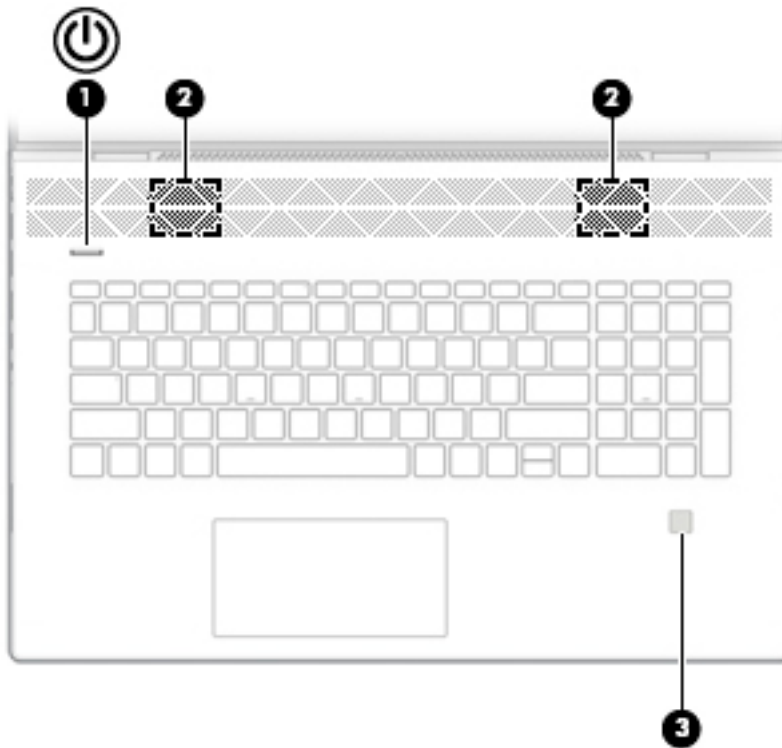
## Lights





**Table 2-5** Lights and their descriptions

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

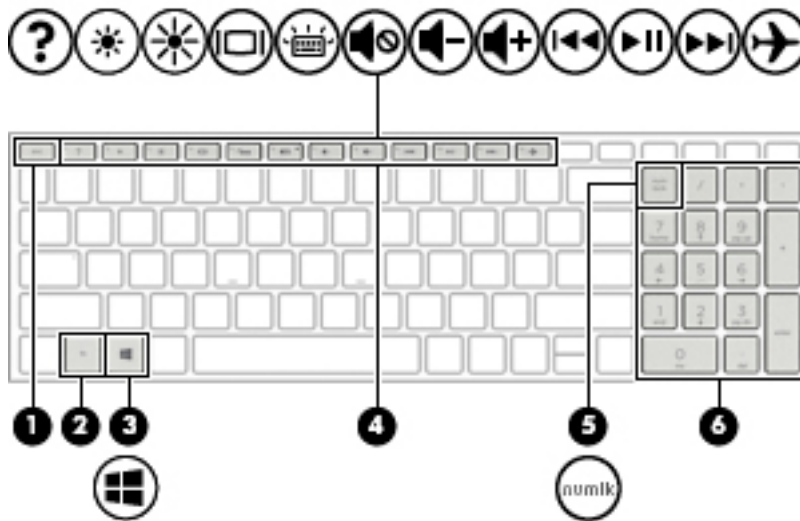
## Button, speakers, and fingerprint reader




**Table 2-6** Button, speakers, and fingerprint reader and their descriptions

Component	Description
(1)  Power button	<ul style="list-style-type: none"> <li>• When the computer is off, press the button to turn on the computer.</li> <li>• When the computer is on, press the button briefly to initiate Sleep.</li> <li>• When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).</li> <li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li> </ul> <p><b>CAUTION:</b> Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options:</p> <ul style="list-style-type: none"> <li>▲ Right-click the <b>Power</b> icon , and then select <b>Power Options</b>.</li> </ul>
(2) Speakers	Produce sound.
(3) Fingerprint reader	<p>Allows a fingerprint logon to Windows, instead of a password logon.</p> <ul style="list-style-type: none"> <li>▲ To use the fingerprint reader, place your finger on the fingerprint reader until it reads your fingerprint.</li> </ul> <p><b>IMPORTANT:</b> To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.</p>

## 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. <b>NOTE:</b> Pressing the Windows key again will close the Start menu.
(4) Action keys	Execute frequently used system functions. <b>NOTE:</b> On select products, the <code>f5</code> action key turns the keyboard backlight feature off or on.
(5) <code>num lock</code> key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6) Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When <code>num lock</code> is pressed, the keypad can be used like an external numeric keypad. <b>NOTE:</b> If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

## Bottom



**Table 2-8** Bottom components and their descriptions

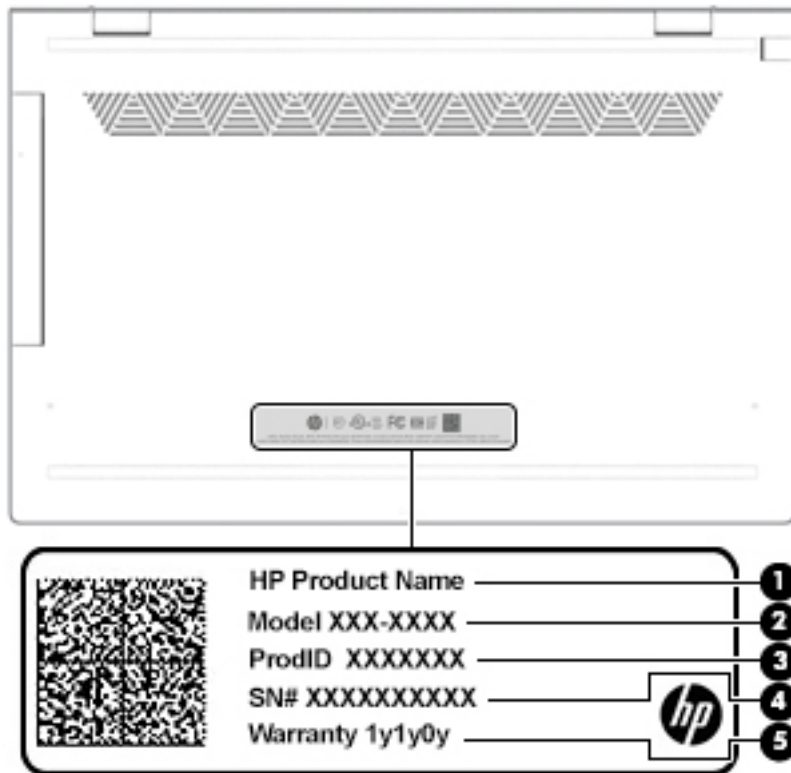
Component	Description
Vent	Enables airflow to cool internal components. <b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

# Labels

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

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

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



**Table 2-9** Service label components

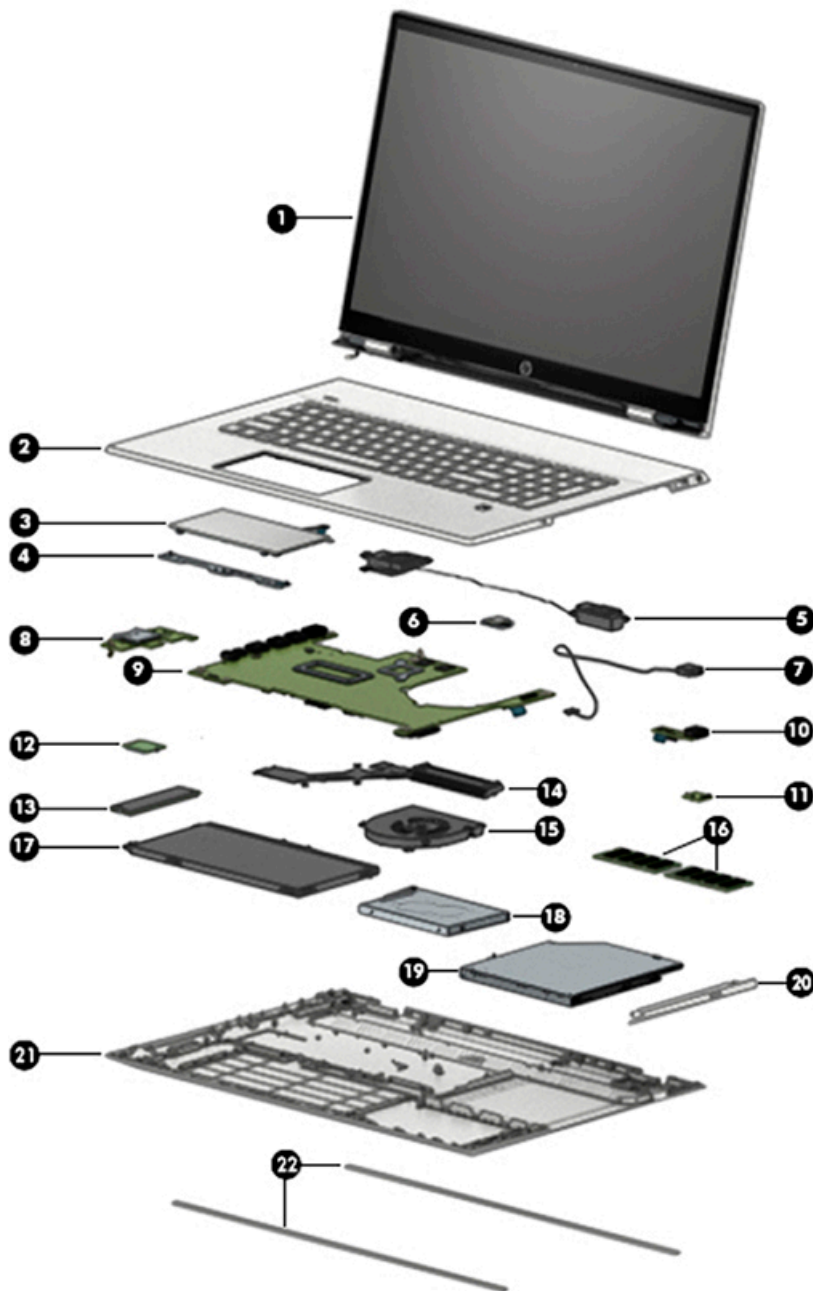
Component
(1) HP product name
(2) Model number
(3) Product ID
(4) Serial number
(5) Warranty period

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

# 3 Illustrated parts catalog

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

## Computer major components



**Table 3-1 Computer major components and their descriptions**

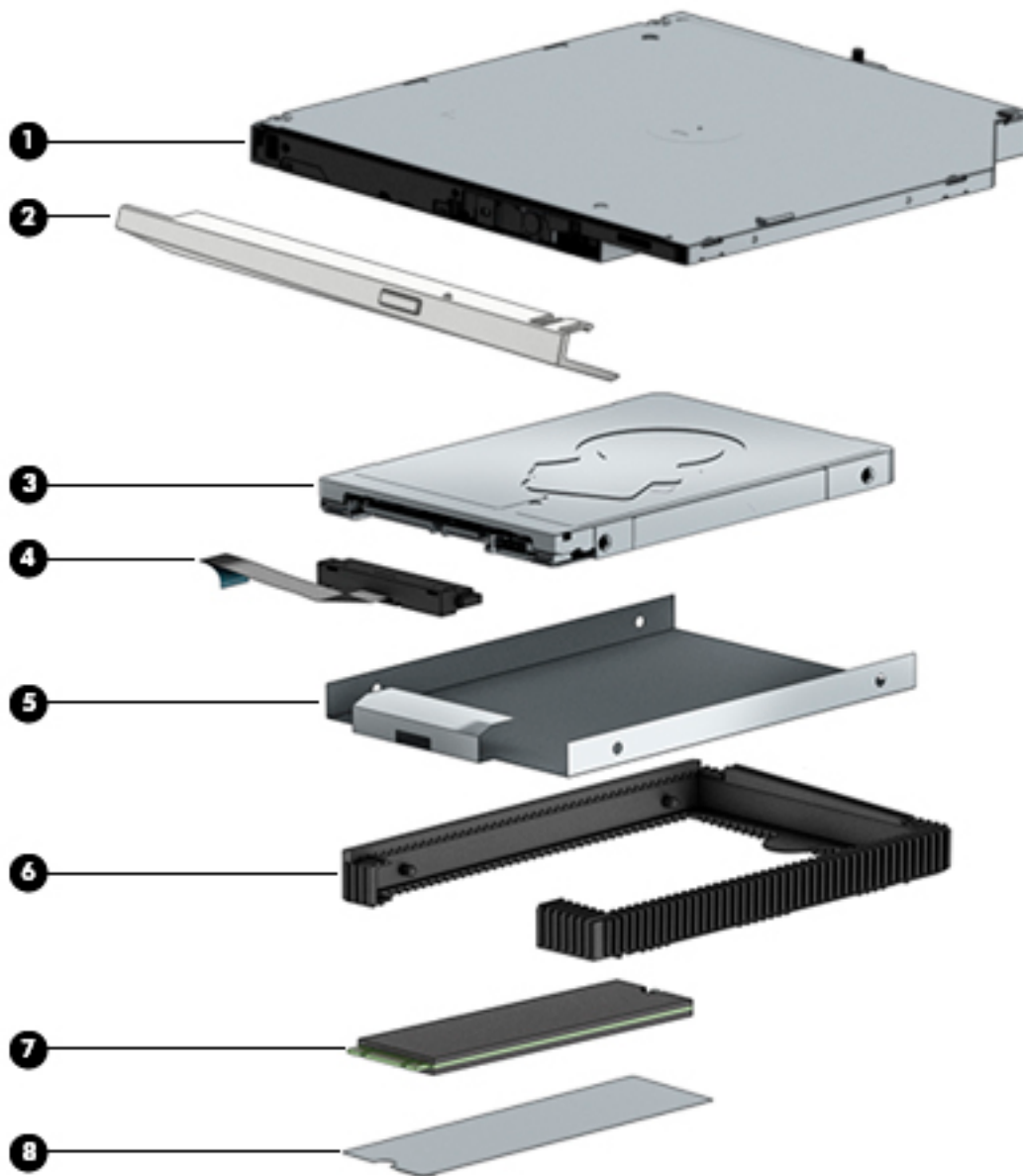
Item	Component	Spare part number
<b>(1)</b>	<b>Display assembly:</b>	
	Non-touch	L54269-001
	Touch screen	L52653-001
<b>(2)</b>	<b>Keyboard/top cover</b> (includes keyboard cable):	
	For a detailed list of country codes, see <a href="#">Keyboard/top cover on page 57</a> .	
	For use in models with stamped finish	L52452-xx1
<b>(3)</b>	<b>TouchPad</b>	L53699-001
	<b>NOTE:</b> The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is available using spare part number L52655-001.	
<b>(4)</b>	<b>TouchPad bracket</b>	
<b>(5)</b>	<b>Speakers</b> (include left and right speakers and cable)	L52667-001
<b>(6)</b>	<b>Fingerprint reader:</b>	
	<b>NOTE:</b> The fingerprint reader spare part kit does not include the cable. The cable is available using spare part number L52657-001.	
	For use in models with a stamped finish	L52651-001
<b>(7)</b>	<b>Power connector cable</b>	L52659-001
<b>(8)</b>	<b>Card reader board</b>	L52802-001
<b>(9)</b>	<b>System board</b> (includes processor):	
	<b>NOTE:</b> All system board spare part kits include replacement thermal material.	
	Intel Core i7-8565U processor and 4 GB of discrete graphics memory	L52451-601
	Intel Core i7-8565U processor and 2 GB of discrete graphics memory	L52450-601
	Intel Core i5-8265U processor and 2 GB of discrete graphics memory	L52449-601
	<b>Thermal pad</b> (not illustrated)	L54094-001
<b>(10)</b>	<b>USB board</b>	L52650-001
	<b>NOTE:</b> The USB board spare part kit does not include the cable. The cable is available using spare part number L52658-001.	
<b>(11)</b>	<b>Privacy board</b>	L52803-001
	<b>NOTE:</b> The privacy board spare part kit does not include the cable. The cable is available using spare part number L53278-001.	
<b>(12)</b>	<b>WLAN module</b> (Intel Wireless-AC 9560 802.11ac 2 × 2 Wi-Fi + Bluetooth 5)	L22634-005
<b>(13)</b>	<b>Solid-state drive (M.2):</b>	
	512 GB, PCIe, Gen 3 × 4	L52457-001
	512 GB, PCIe, value	L53277-001
	256 GB, PCIe, Gen 3 × 4	L52455-001
	256 GB, PCIe, Gen 3 × 2	L52456-001
	128 GB, SATA-3, TLC	L52454-001



**Table 3-1 Computer major components and their descriptions (continued)**

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	32 GB/512 GB, PCIe (Optane Memory Module/solid-state drive combination drive)	L57592-001
	16 GB, PCIe (Optane Memory Module)	L52458-001
<b>(14)</b>	<b>Heat sink</b> (includes replacement thermal material)	L52660-001
<b>(15)</b>	<b>Fan</b>	L52661-001
<b>(16)</b>	<b>Memory module (DDR4-2666):</b>	
	8 GB	937236-855
	4 GB	L10598-855
<b>(17)</b>	<b>Battery</b> (3-cell, 52 Whr)	L09281-855
<b>(18)</b>	<b>Hard drive</b> (1 TB, 7200 rpm; includes foil cover)	L23942-007
<b>(19)</b>	<b>Optical drive</b>	L55616-001
<b>(20)</b>	<b>Optical drive bezel</b>	L52801-001
<b>(21)</b>	<b>Bottom cover</b>	L52805-001
<b>(22)</b>	<b>Rubber Feet Kit</b>	L52666-001

## Mass storage devices



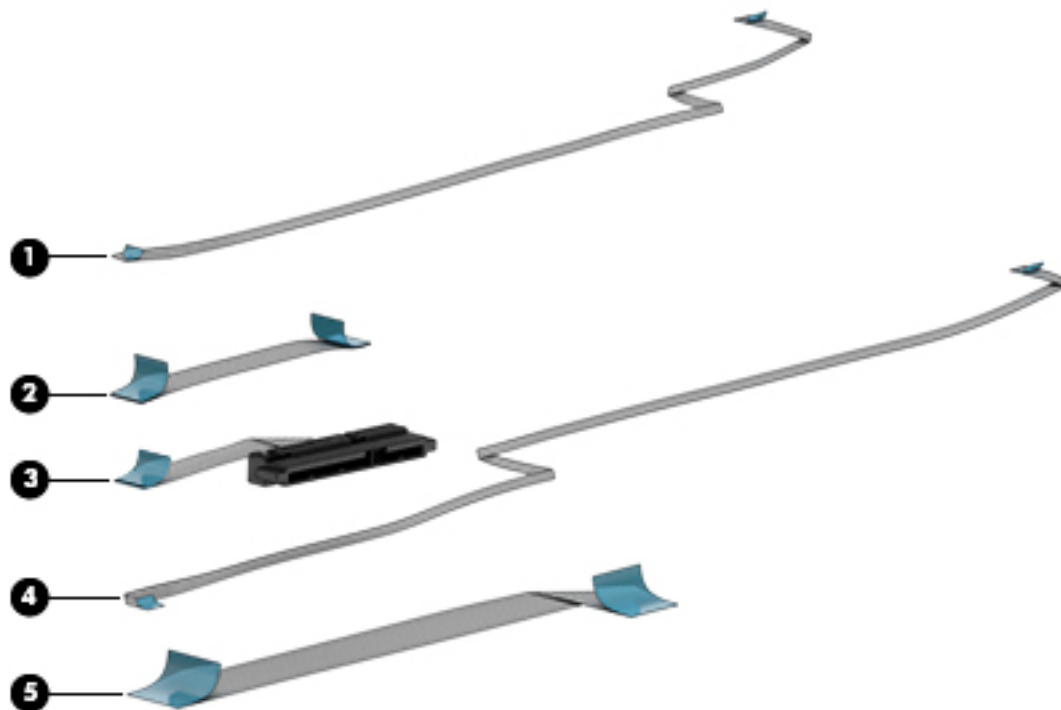
**Table 3-2** Mass storage devices and their descriptions

Item	Component	Spare part number
(1)	<b>Optical drive</b>	L55616-001
(2)	<b>Optical drive bezel</b>	L52801-001
(3)	<b>Hard drive</b> (1 TB, 7200 rpm; includes foil cover)	L23942-007
(4)	<b>Hard drive connector/cable</b>	L52656-001
(5)	<b>Hard drive foil cover</b>	included with hard drive
(6)	<b>Hard drive rubber holder</b>	L52662-001
(7)	<b>Solid-state drive</b> (M.2)	

**Table 3-2 Mass storage devices and their descriptions (continued)**

Item	Component	Spare part number
	512 GB, PCIe, Gen 3 × 4	L52457-001
	512 GB, PCIe, value	L53277-001
	256 GB, PCIe, Gen 3 × 4	L52455-001
	256 GB, PCIe, Gen 3 × 2	L52456-001
	128 GB, SATA-3, TLC	L52454-001
	32 GB/512 GB, PCIe (Optane Memory Module/solid-state drive combination drive)	L57592-001
	16 GB, PCIe (Optane Memory Module)	L52458-001
<b>(8)</b>	<b>Solid-state drive module foil cover</b>	L52664-001

## Cables

**Table 3-3 Cables and their descriptions**

Item	Component	Spare part number
<b>(1)</b>	<b>Privacy board cable</b>	L53278-001
<b>(2)</b>	<b>TouchPad cable</b>	L52655-001
<b>(3)</b>	<b>Hard drive connector/cable</b>	L52656-001
<b>(4)</b>	<b>Fingerprint reader cable</b>	L52657-001
<b>(5)</b>	<b>USB board cable</b>	L52658-001

## Miscellaneous parts

**Table 3-4 Miscellaneous parts and their descriptions**

<b>Component</b>	<b>Spare part number</b>
65 W Smart AC adapter (non-PFC, 4.5 mm)	913691-850
65 W AC adapter (slim, non-PFC, 4.5 mm, 1.8 m)	L24008-001
<b>Power cord, (straight, C5, 1.0 m)</b>	
For use in Denmark	L22322-001
For use in Europe	L22321-001
For use in Israel	L22323-001
For use in North America	L22319-001
For use in South Africa	L21929-810
For use in Switzerland	L22324-001
For use in the United Kingdom	L22320-001
<b>Miscellaneous kit (includes memory module absorber and heat sink conductive tape)</b>	L52665-001
<b>Hub, USB-C-to-Multiport</b>	919666-001
<b>Hub, USB-C-to-USB-A</b>	916838-001
<b>Adapter, USB-C-to-USB-A</b>	833960-001
<b>HP HDMI-to-VGA adapter</b>	701943-001
<b>Solid-state drive foil</b>	L52664-001
<b>Screw Kit</b>	L52668-001

---

# 4 Removal and replacement procedures preliminary requirements

## Tools required


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

- Non-marking, non-conductive pry tool
- Magnetic Phillips P1 screwdriver
- Suction cup
- Device to heat the display to loosen adhesive

## Service considerations

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

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

---

## Plastic parts


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

---

## Cables and connectors

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 **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.

---

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

## Drive handling



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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

## Workstation guidelines

Follow these grounding workstation guidelines:

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

## 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) may not appear to be affected at all and can work perfectly throughout a normal cycle. The device may 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 are removing or installing internal components, observe these precautions:

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

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

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

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

## Generating static electricity

Note the following:

- 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 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 Styrofoam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V

Electronic components are then multi-packaged inside plastic tubes, trays, or Styrofoam.



**NOTE:** As little as 700 volts 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

Use the following equipment to prevent static electricity damage to electronic components:

- **Wrist straps** are flexible straps with a maximum of one-megohm  $\pm$  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 one-megohm  $\pm$  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, use the following 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 Styrofoam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

## Recommended materials and equipment

Materials and equipment that are recommended for use in preventing static electricity include:

- 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 one-megohm  $\pm$  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 one-megohm +/- 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.

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# 5 Removal and replacement procedures for authorized service provider parts

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

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

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## Component replacement procedures

There are as many as 52 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

### Preparation for disassembly

See [Removal and replacement procedures preliminary requirements on page 21](#) 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 and rubber feet


**Table 5-1** Bottom cover and rubber feet descriptions and part numbers

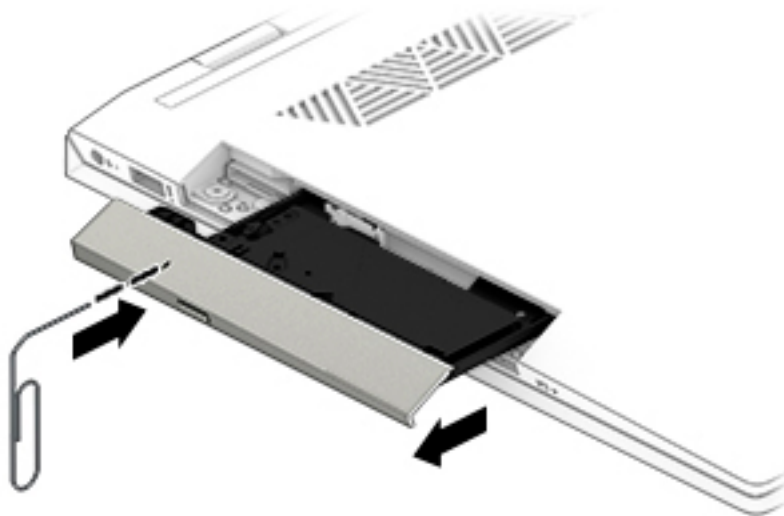
Description	Spare part number
Bottom cover	L52805-001
Rubber Foot Kit	L52666-001

- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).

Remove the bottom cover and rubber feet:

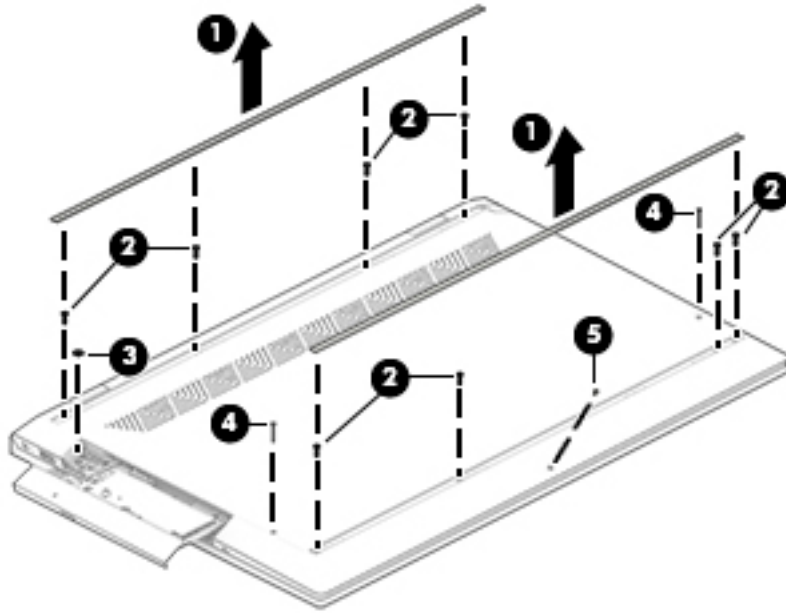
1. Insert a very thin paper clip or similar tool into the release hole in the optical drive bezel to release the drive tray.

 **IMPORTANT:** You must release the drive tray to gain access to the screw in the drive bay that secures the bottom cover. You cannot remove the optical drive in this step. You must remove the bottom cover before you can remove the optical drive from the computer.



2. Peel the two upper rubber feet off the bottom of the computer **(1)**.
3. Remove the four Phillips M2.5 × 4.0 screws from under each foot **(2)**.
4. Remove the Phillips broadhead M2.0 × 2.0 screw from the optical drive bay.
5. Remove the two Torx T8 2.5 × 14.0 screws from each side of the computer **(4)**.

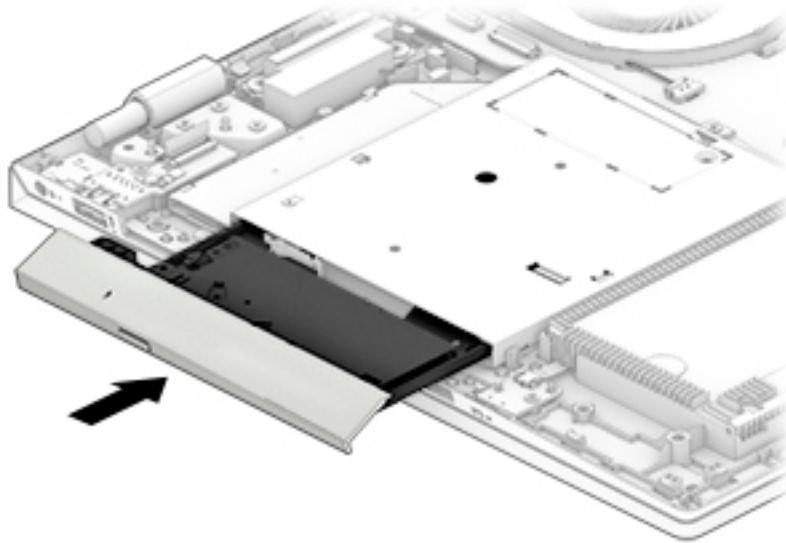
6. Remove the Torx T5 2.5 × 4.0 screw from the bottom edge of the computer (5).



7. Use a plastic tool (1) to separate the front of the bottom cover from the computer.
8. On the hinge side, lift up near both hinges to remove the bottom cover from the computer (2).



9. To avoid damaging the optical drive tray, push the tray back into the computer.



Reverse this procedure to install the bottom cover and rubber feet.

## Battery

**Table 5-2 Battery description and part number**

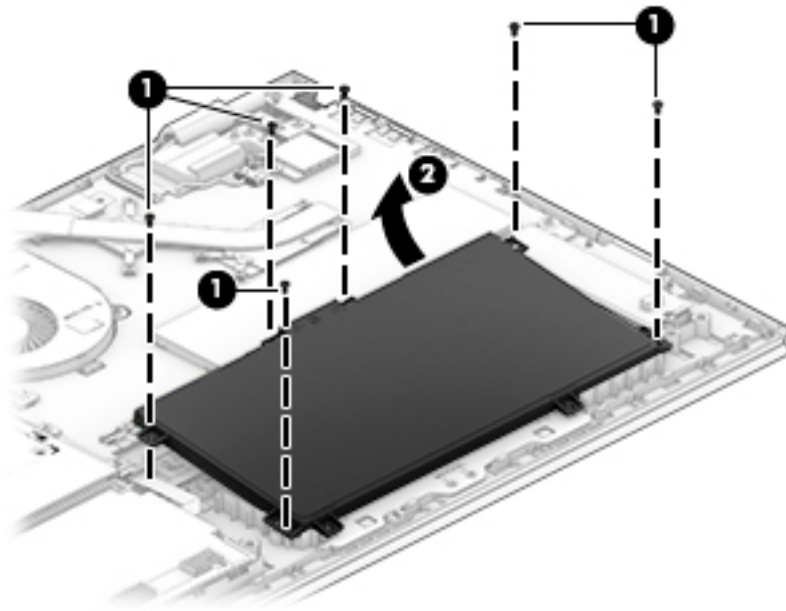
Description	Spare part number
Battery (3-cell, 52 Whr)	L09281-855

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).

Remove the battery:

1. Remove the six Phillips M2.0 × 4.0 screws (1) that secure the battery to the computer.
2. Remove the battery from the computer (2).



Reverse this procedure to install the battery.

## Optical drive and bezel

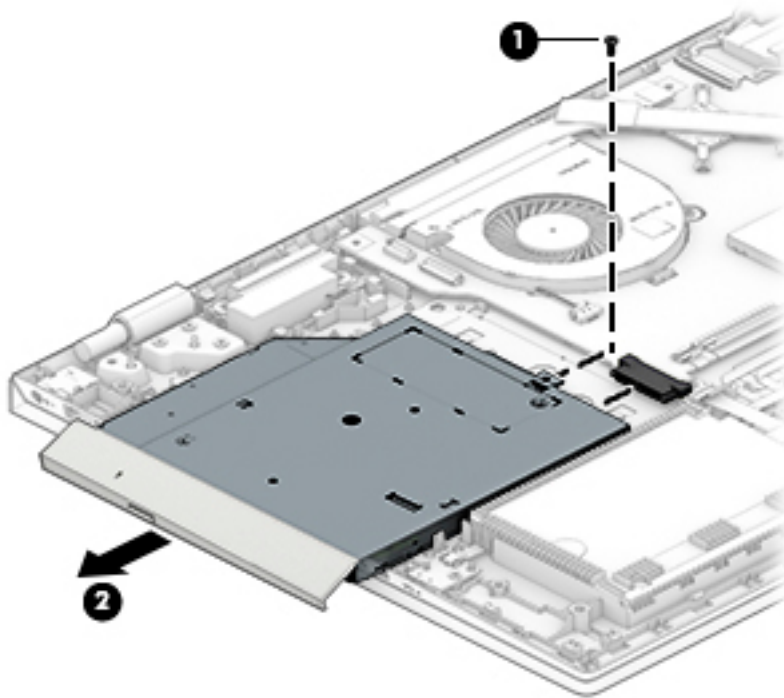
**Table 5-3** Optical drive and optical drive bezel descriptions and part numbers

Description	Spare part number
Optical drive	L55616-001
Optical drive bezel	L52801-001

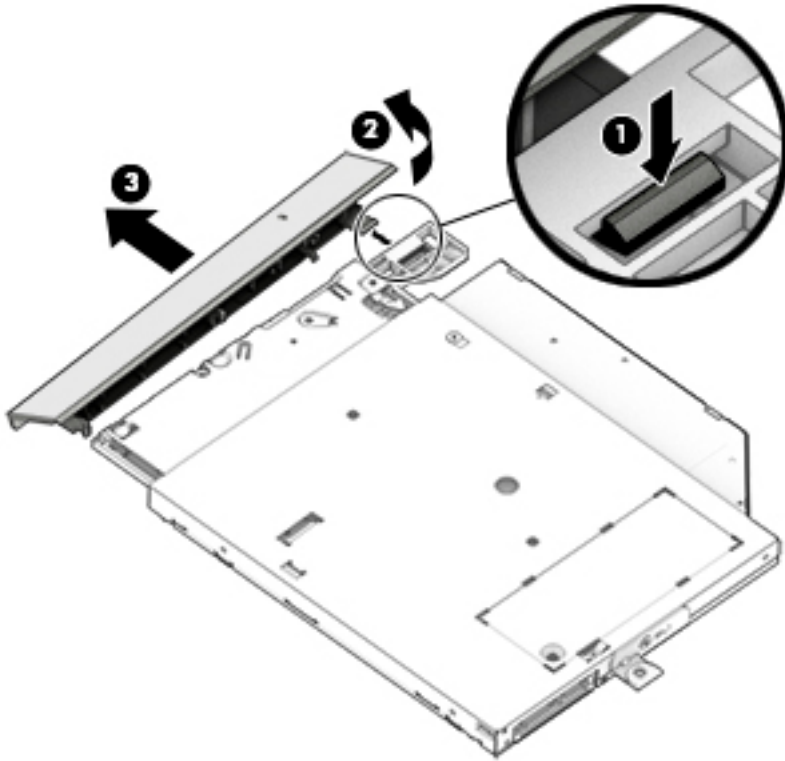
1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the optical drive:

1. Remove the Phillips M2.0 × 3.0 screw **(1)** that secures the optical drive to the computer.
2. Pull the optical drive away from the connector and remove it from the computer **(2)**.



3. If it is necessary to remove the bezel from the optical drive, press the release latch **(1)**, rotate the left side of the bezel outward **(2)**, and then remove the bezel from the drive **(3)**.




Reverse this procedure to install the optical drive and bezel.



## WLAN module

**Table 5-4 WLAN module description and part number**

Description	Spare part number
Intel Wireless-AC 9560 802.11ac 2 × 2 Wi-Fi + Bluetooth 5	L22634-005

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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the WLAN module:

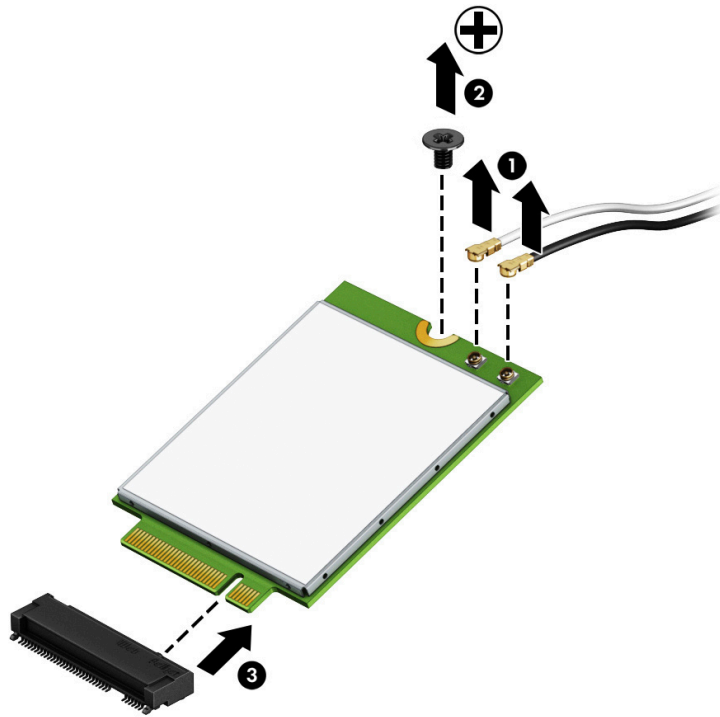
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.



**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.

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

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



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



Reverse this procedure to install the WLAN module.

## Hard drive, drive rubber holder, and cable

**Table 5-5** Hard drive, drive rubber holder, and cable descriptions and part numbers

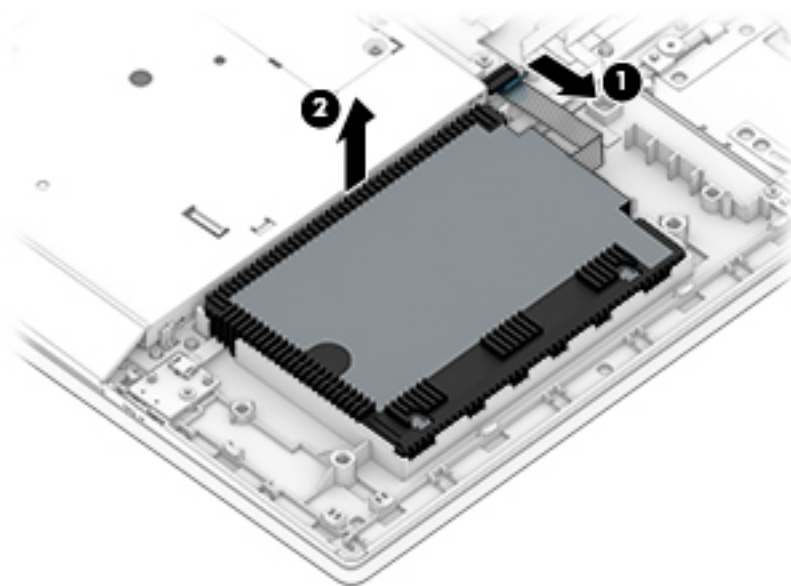
Description	Spare part number
Hard drive, 1 TB, 7200 rpm (includes foil cover)	L23942-007
Hard drive rubber holder	L52662-001
Hard drive connector/cable	L52656-001

Before removing the hard drive, follow these steps:

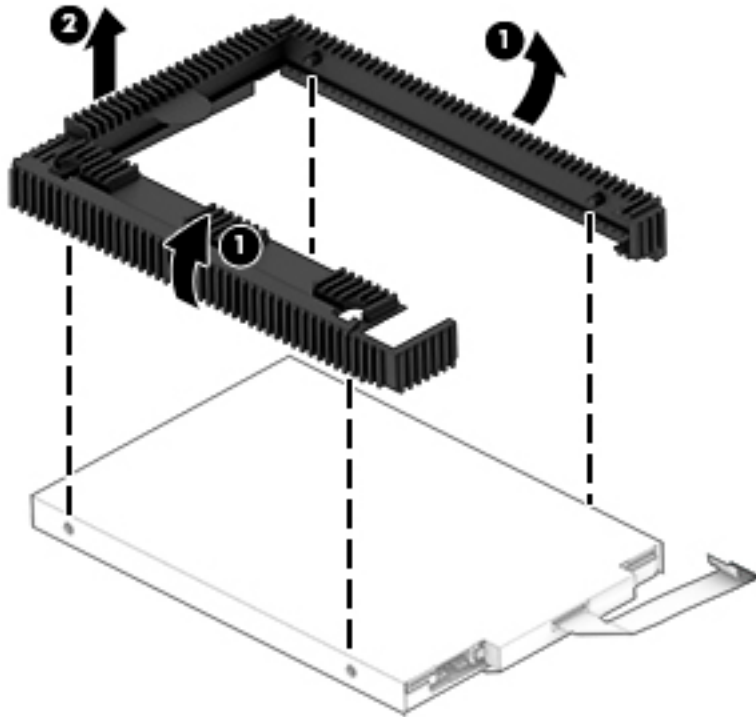
1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the hard drive:

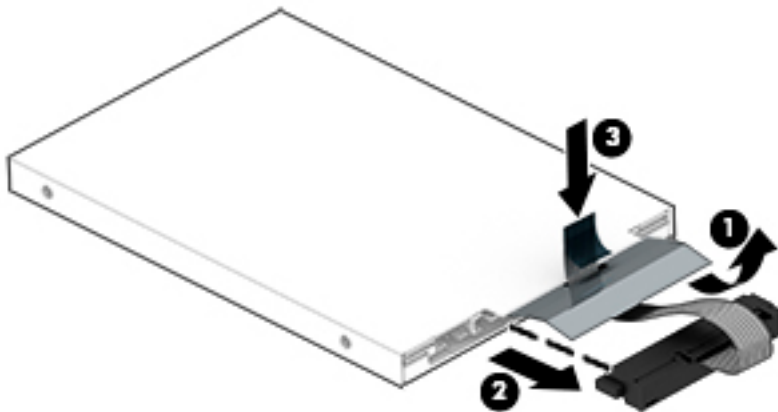
1. Disconnect the hard drive cable from the system board ZIF connector (**1**).
2. Lift the hard drive assembly out of the computer (**2**).



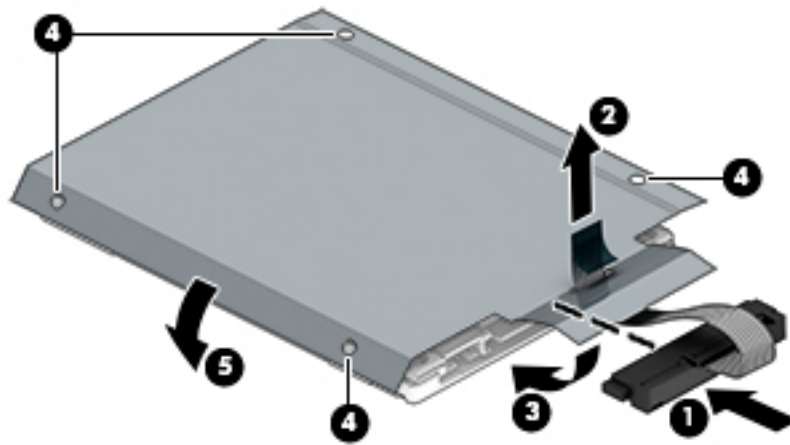
3. If it is necessary to remove the rubber hard drive cover, pull the sides of the cover outward **(1)**, and then remove the cover from the hard drive **(2)**.



4. If it is necessary to remove the connector from the hard drive, lift the tape from the connector **(1)**, disconnect the connector from the rear of the drive **(2)**, and then pull the cable through the hole in the foil **(3)**.



5. If it is necessary to install foil onto the hard drive:
- Insert the connector onto the rear of the drive **(1)**.
  - Insert the connector cable through the slot in the foil **(2)**.
  - Place the tape on top of the connector **(3)**.
  - Making sure the slots in the foil match up with screw holes in hard drive **(4)**, install the foil onto the hard drive **(5)**



Reverse this procedure to reassemble and install the hard drive.

## Solid-state drive and Optane Memory Module

**Table 5-6 Solid-state drive descriptions and part numbers**

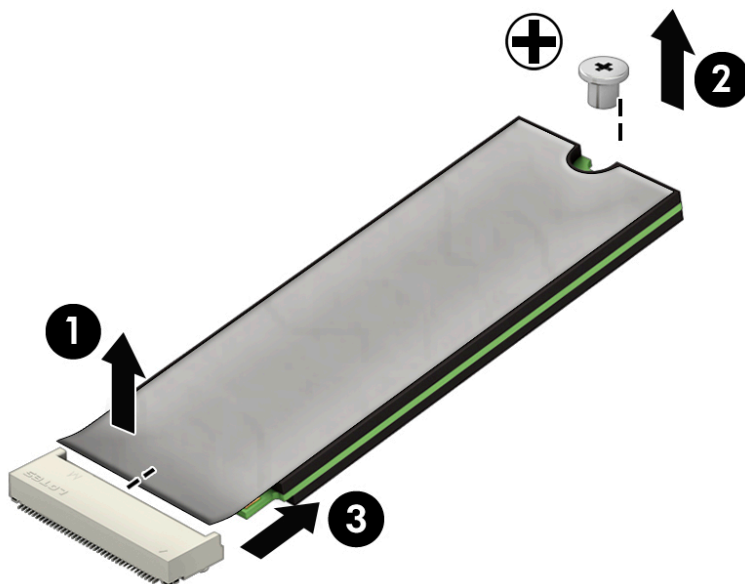
Description	Spare part number
512 GB, PCIe, Gen 3 × 4	L52457-001
512 GB, PCIe, value	L53277-001
256 GB, PCIe, Gen 3 × 4	L52455-001
256 GB, PCIe, Gen 3 × 2	L52456-001
128 GB, SATA-3, TLC	L52454-001
32 GB/512 GB, PCIe (Optane Memory Module/solid-state drive combination drive)	L57592-001
16 GB, PCIe (Optane Memory Module)	L52458-001
Solid-state drive module foil cover	L52664-001

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the solid-state drive:

1. Lift the foil up on the connector side of the drive **(1)**.
2. Remove the Phillips M2.0 × 2.5 screw **(2)**, and then pull the solid-state drive module from the socket **(3)**.



Reverse this procedure to install the solid-state drive.

## Memory module

**Table 5-7** Memory descriptions and part numbers

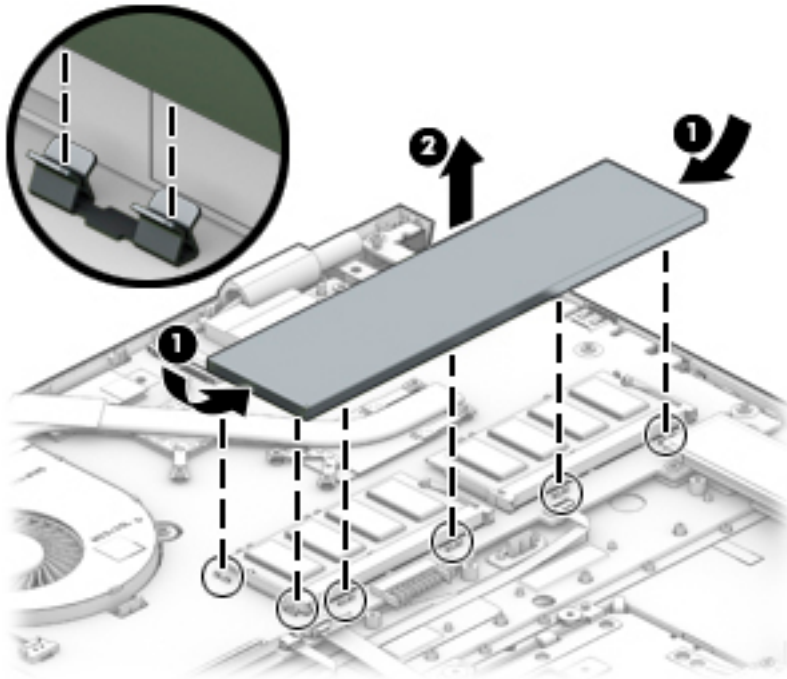
Description	Spare part number
Memory module, 8 GB	937236-855
Memory module, 4 GB	L10598-855

Before removing the memory modules, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the memory modules:

1. Squeeze the ends of the memory cover (1), and then lift the cover off the system board (2).

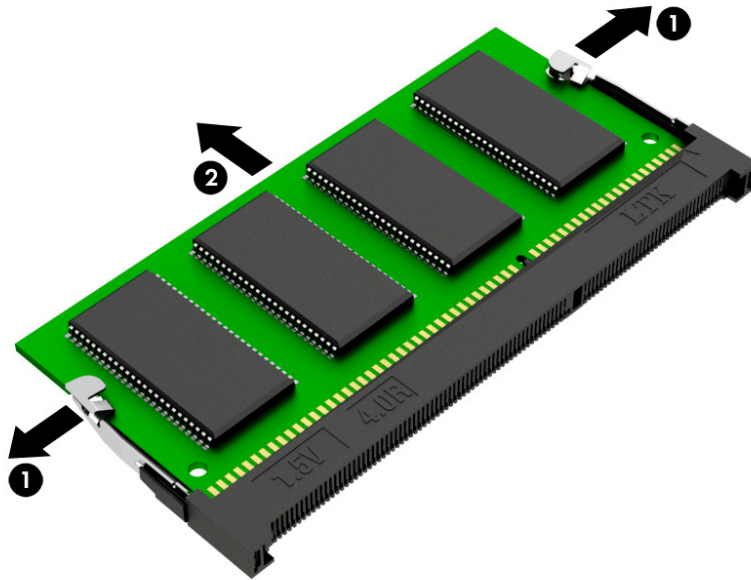


2. Spread the two retention clips outward (1) until the memory module tilts up at a 45-degree angle.

3. Grasp the edge of the memory module (2), and then gently pull the module out of the slot. Use the same procedure to remove both memory modules.

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

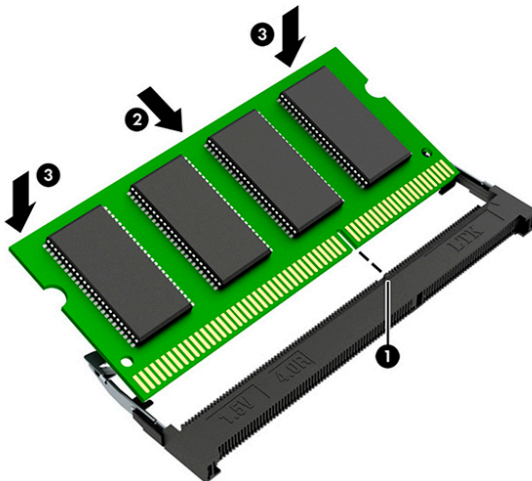
To protect a memory module after removal, place it in an electrostatic-safe container.



Install the memory modules:

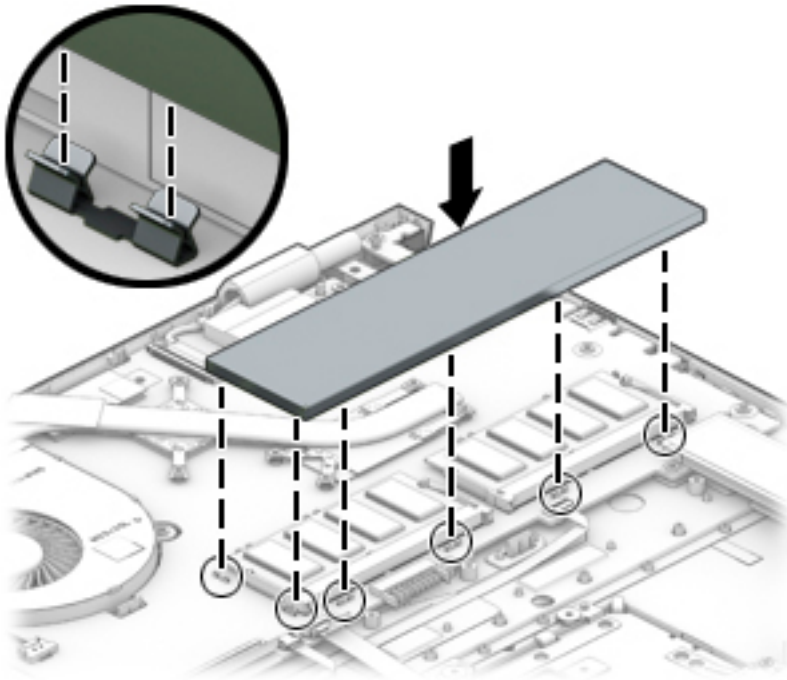
**IMPORTANT:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module. Do not bend the memory module.

1. Align the notched edge of the memory module with the tab in the memory module slot (1).
2. Press the module into the slot until seated (2).
3. Gently press down on the module edges until the side retention clips snap into place (3).



To replace the memory cover, insert the edges to the cover into the clips on the system board.





## USB board

 **NOTE:** The USB board spare part kit does not include the cable. The cable is available using spare part number L52658-001.

**Table 5-8 USB board description and part number**

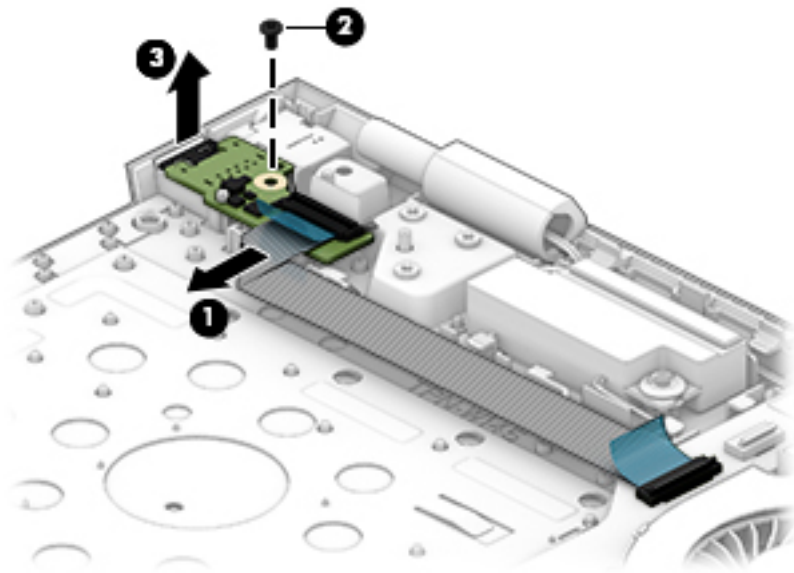
Description	Spare part number
USB board	L52650-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the USB board

1. Disconnect the cable from the ZIF connector on the board **(1)**.
2. Remove the Phillips M2.0 × 4.0 screw **(2)** that secures the board to the computer.
3. Remove the board from the computer **(3)**.



Reverse this procedure to install the USB board

## TouchPad



**NOTE:** The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is available using spare part number L52655-001.

**Table 5-9 TouchPad description and part number**

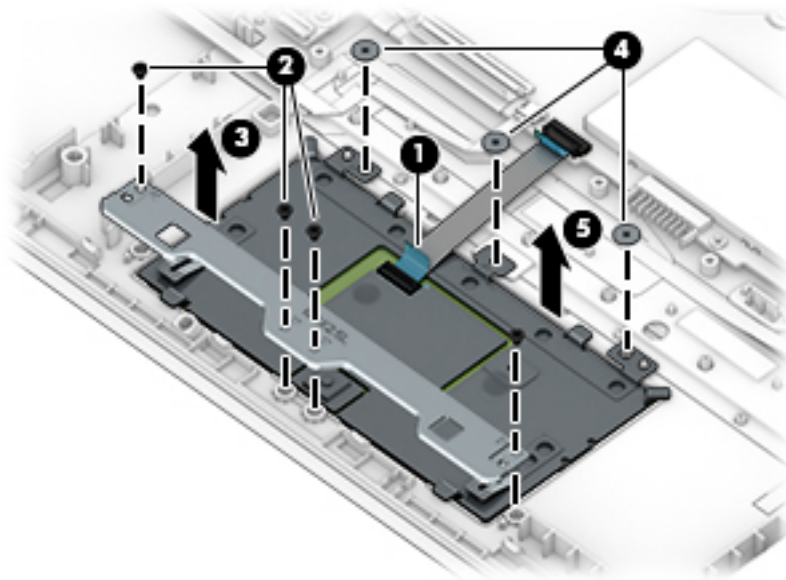
Description	Spare part number
TouchPad	L53699-001

Before removing the TouchPad , follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the TouchPad:

1. Disconnect the cable from the ZIF connector on the TouchPad **(1)**.
2. Remove the four Phillips M2.0 × 2.5 screws **(2)** that secure the TouchPad bracket to the computer.
3. Remove the TouchPad bracket from the computer **(3)**.
4. Remove the three broadhead Phillips M2.0 × 2.5 screws **(4)** that secure the TouchPad to the computer.
5. Remove the TouchPad from the computer **(5)**.



Reverse this procedure to install the TouchPad.

## Privacy board

 **NOTE:** The privacy board spare part kit does not include the cable. The privacy board cable is available using spare part number L53278-001.

**Table 5-10 Privacy board description and part number**

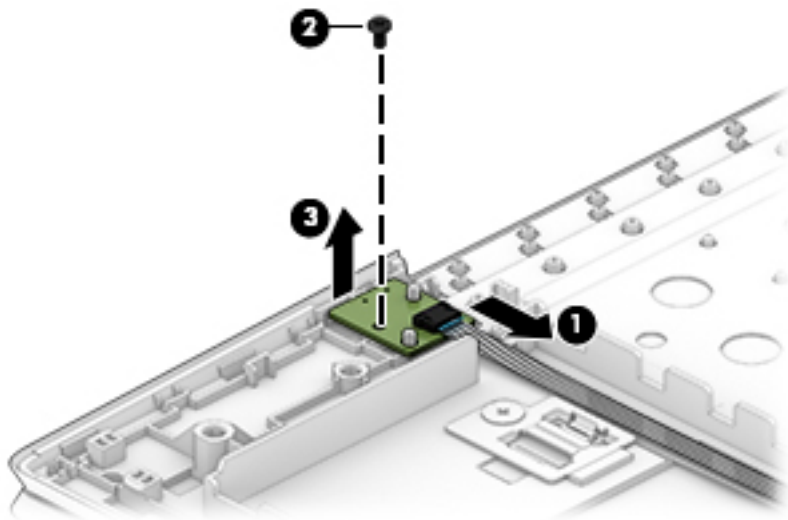
Description	Spare part number
Privacy board	L52803-001

Before removing the privacy board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).


Remove the privacy board:

1. Disconnect the cable from the ZIF connector on the board **(1)**.
2. Remove the Phillips M2.0 × 3.5 screw **(2)** that secures the board to the computer.
3. Lift the board out of the computer **(3)**.



Reverse this procedure to install the privacy board.

## Fingerprint reader board

 **NOTE:** The fingerprint reader board spare part kit does not include the cable. The board cable is available using spare part number L52657-001.

**Table 5-11 Fingerprint reader board descriptions and part numbers**

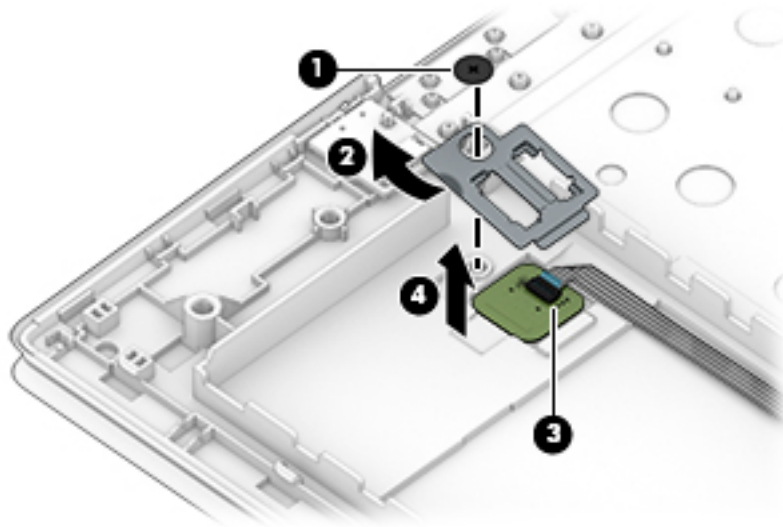
Description	Spare part number
Fingerprint reader board for use in models with a stamped finish	L52651-001

Before removing the fingerprint reader board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).
4. Remove the hard drive (see [Hard drive, drive rubber holder, and cable on page 35](#)).

Remove the fingerprint reader board:

1. Remove the Phillips M2.0 × 2.0 screw **(1)** that secures the fingerprint reader board bracket to the computer.
2. Slide the bracket toward the side of the computer, and then remove it **(2)**.
3. Disconnect the cable from the ZIF connector on the fingerprint reader board **(3)**.
4. Remove the fingerprint reader board from the computer **(4)**.



Reverse this procedure to install the fingerprint reader board.

## Fan

**Table 5-12 Fan description and part number**

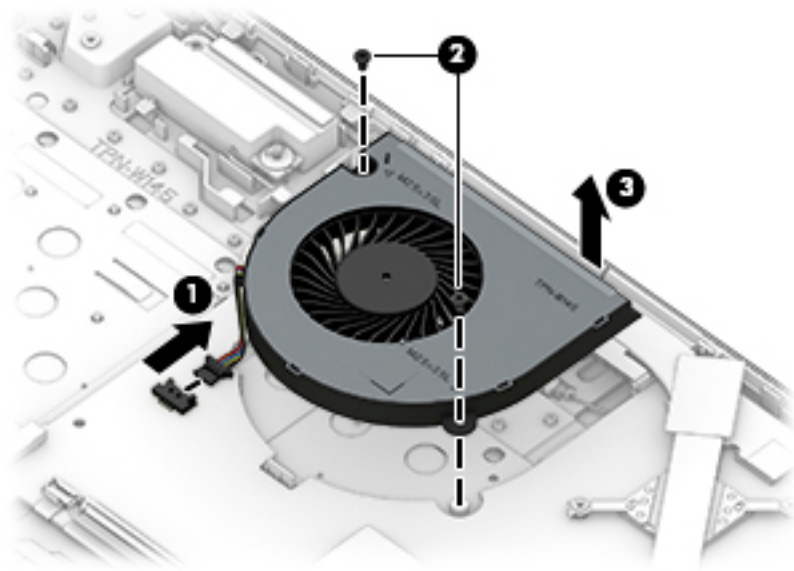
Description	Spare part number
Fan	L52661-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).
4. Remove the heat sink (see [Heat sink on page 47](#)).

Remove the fan:

1. Disconnect the fan cable from the system board (**1**).
2. Remove the two Phillips M2.5 × 3.5 screws (**2**) that secure the fan to the computer.
3. Remove the fan from the computer (**3**).



Reverse this procedure to install the fan.

## Heat sink

**Table 5-13** Heat sink and thermal pad descriptions and part numbers

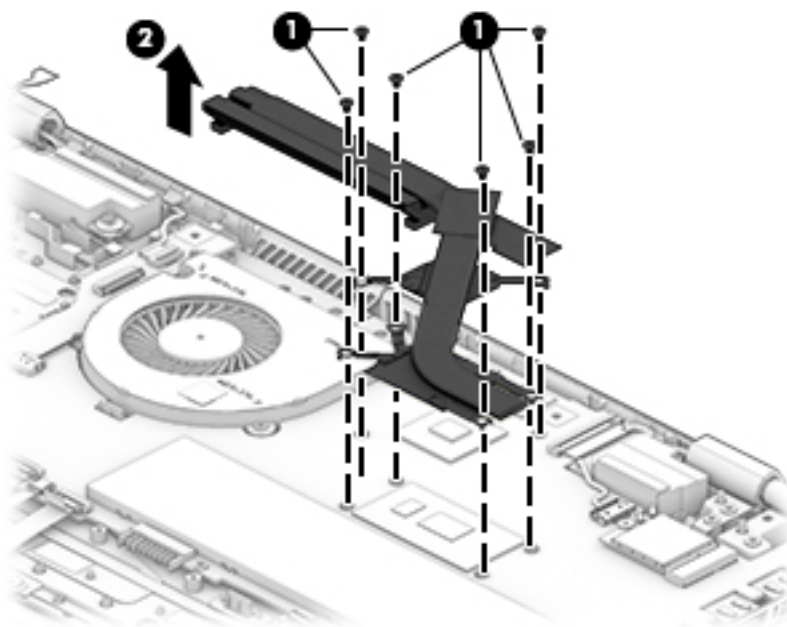
Description	Spare part number
Heat sink	L52660-001
Thermal pad	L54094-001

Before removing the heat sink, follow these steps:

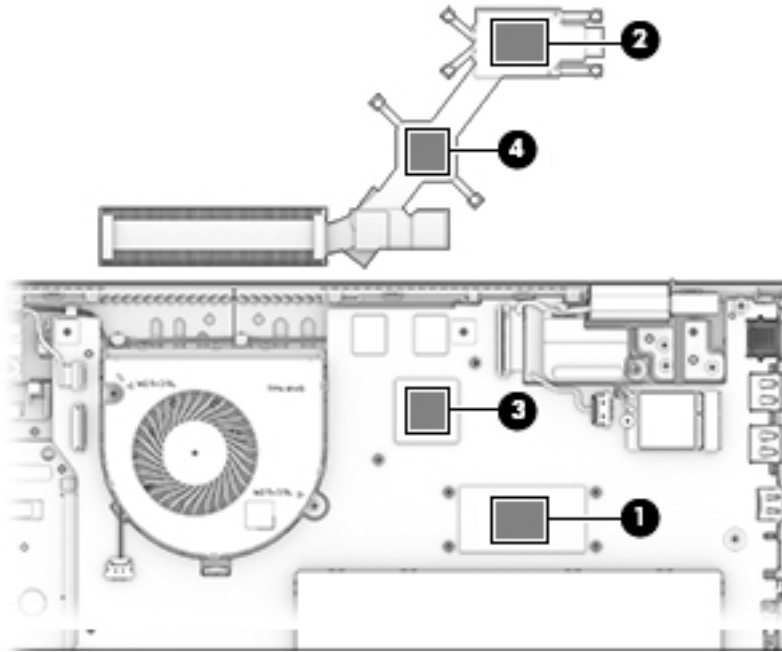
1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

Remove the heat sink:

1. Remove the six Phillips M2.0 × 4.0 screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.



3. Clean and reapply thermal material to the surfaces of the system board components **(1) (3)** and the heat sink **(2) (4)** each time the heat sink is removed.



Reverse this procedure to install the heat sink.



## System board

**Table 5-14 System board descriptions and part numbers**

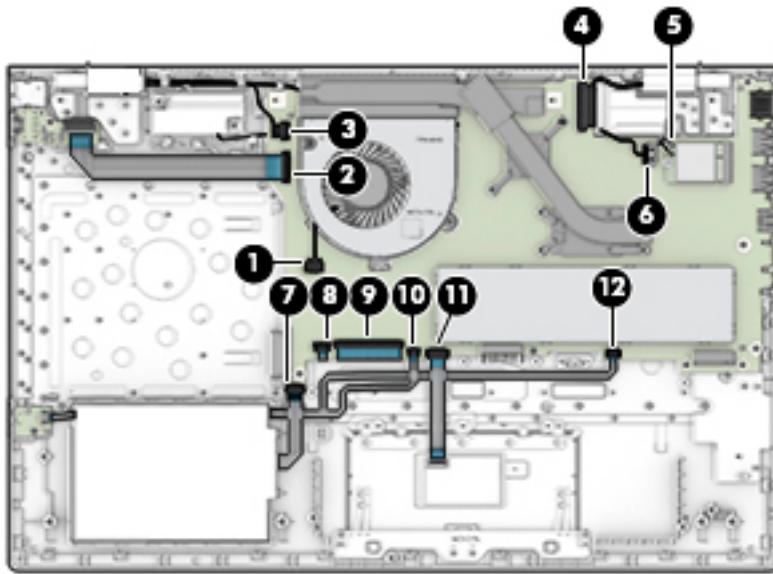
Description	Spare part number
System board including integrated Intel Core i7-8565U processor and 4 GB of discrete graphics memory	L52451-601
System board including integrated Intel Core i7-8565U processor and 2 GB of discrete graphics memory	L52450-601
System board including integrated Intel Core i5-8265U processor and 2 GB of discrete graphics memory	L52449-601

Before removing the system board, follow these steps:

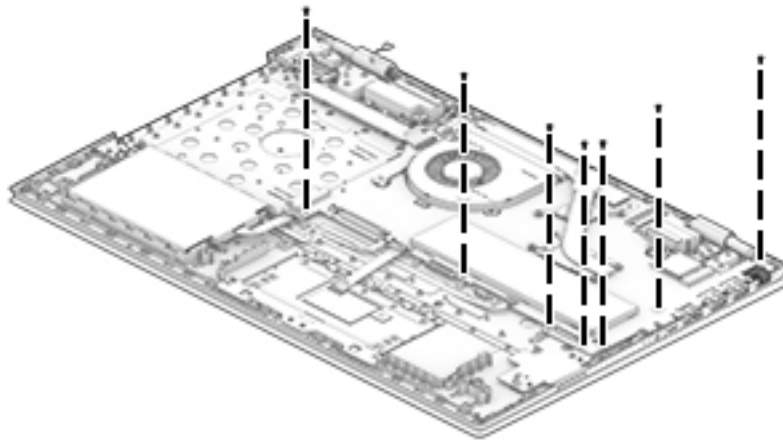
1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).
4. Remove the optical drive (see [Optical drive and bezel on page 31](#)).
5. Remove the solid-state drive (see [Solid-state drive and Optane Memory Module on page 38](#)).

Remove the system board:

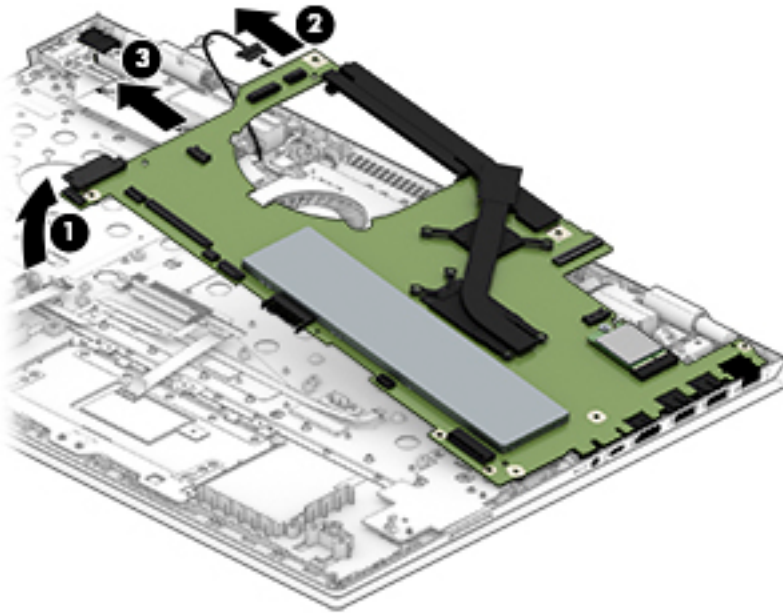
1. Disconnect the following cables from the system board:
  - (1) Fan cable
  - (2) USB board cable (ZIF)
  - (3) Speaker cable
  - (4) Display cable (ZIF)
  - (5) WLAN module antennas
  - (6) Webcam cable (ZIF)
  - (7) Hard drive cable (ZIF)
  - (8) Backlight cable (ZIF)
  - (9) Keyboard cable (ZIF)
  - (10) Privacy cable (ZIF)
  - (11) TouchPad cable (ZIF)
  - (12) Fingerprint board cable (ZIF)



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

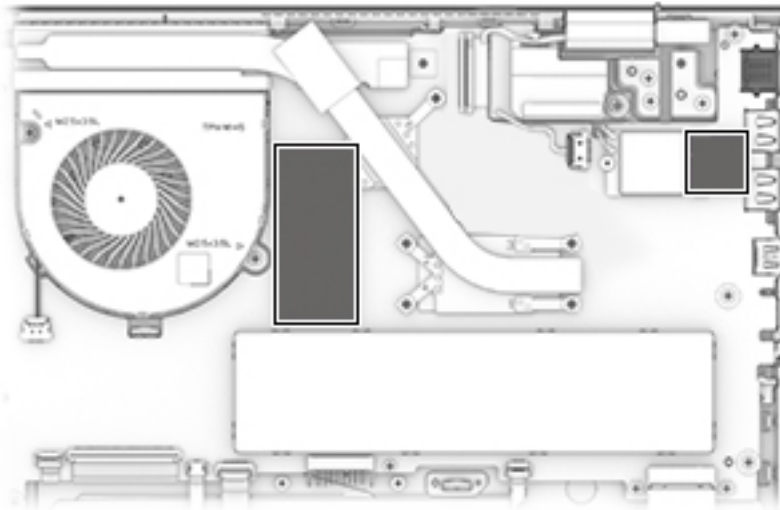


3. Lift the left side of the system board (1), disconnect the power connector cable from the bottom of the board (2), and then pull the system board to the left to remove it from the computer (3).



Reverse this procedure to install the system board.

Use the following illustration to determine the correct locations for the protective tape on the system board.



## Card reader board

**Table 5-15** Card reader board description and part number

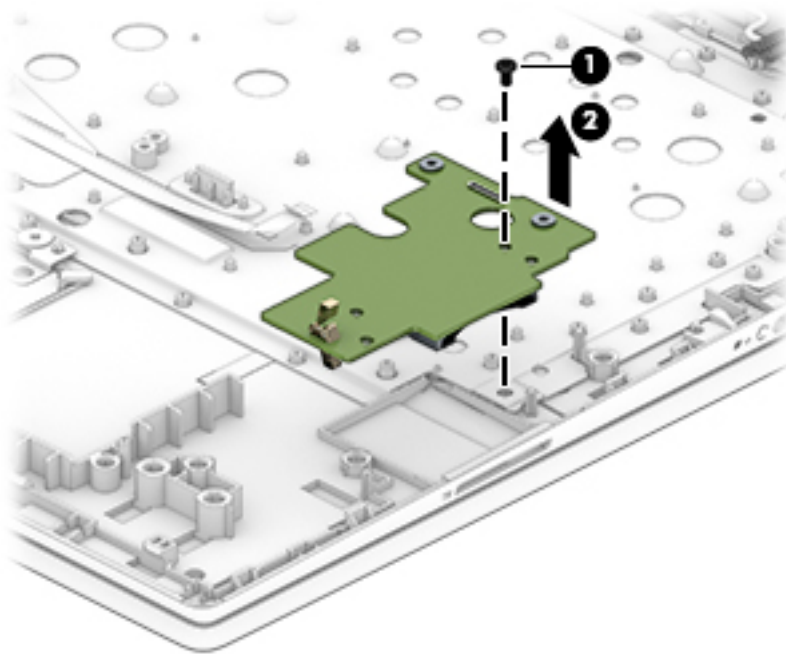
Description	Spare part number
Card reader board	L52802-001

Before removing the card reader board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).
4. Remove the optical drive (see [Optical drive and bezel on page 31](#)).
5. Remove the solid-state drive (see [Solid-state drive and Optane Memory Module on page 38](#)).
6. Remove the system board (see [Optical drive and bezel on page 31](#)).

Remove the card reader board:

1. Remove the Phillips M2.0 × 3.5 screw **(1)** that secures the board to the computer.
2. Remove the card reader board from the computer **(2)**.



Reverse this procedure to install the card reader board.

## Speakers

**Table 5-16 Speaker description and part number**

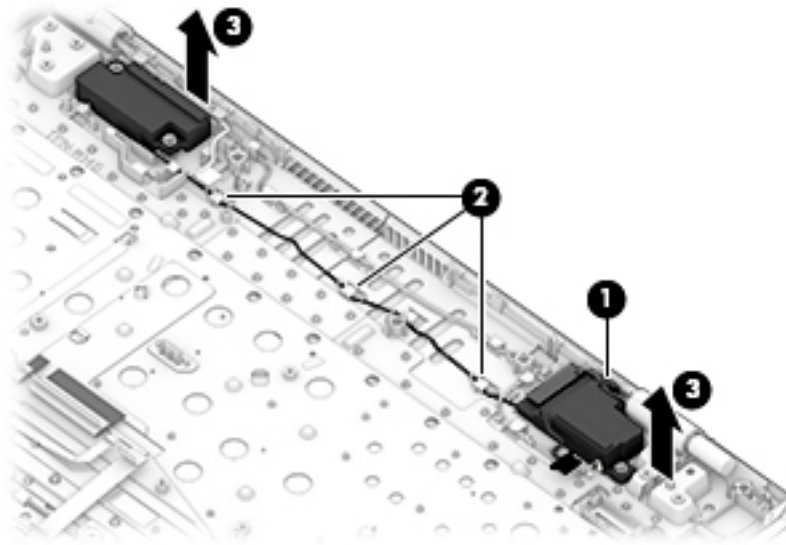
Description	Spare part number
Speakers (includes left and right speakers and cables)	L52667-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).
4. Remove the optical drive (see [Optical drive and bezel on page 31](#)).
5. Remove the solid-state drive (see [Solid-state drive and Optane Memory Module on page 38](#)).
6. Remove the fan (see [Fan on page 46](#)).
7. Remove the system board (see [Optical drive and bezel on page 31](#)).

Remove the speakers:

1. Remove the display cable from the clips in the left speaker **(1)**.
2. Remove the cable between the speakers from the clips in the computer **(2)**.
3. Remove the speakers from the computer **(3)**.



Reverse this procedure to install the speakers.

## Display assembly

**Table 5-17 Display assembly descriptions and part numbers**

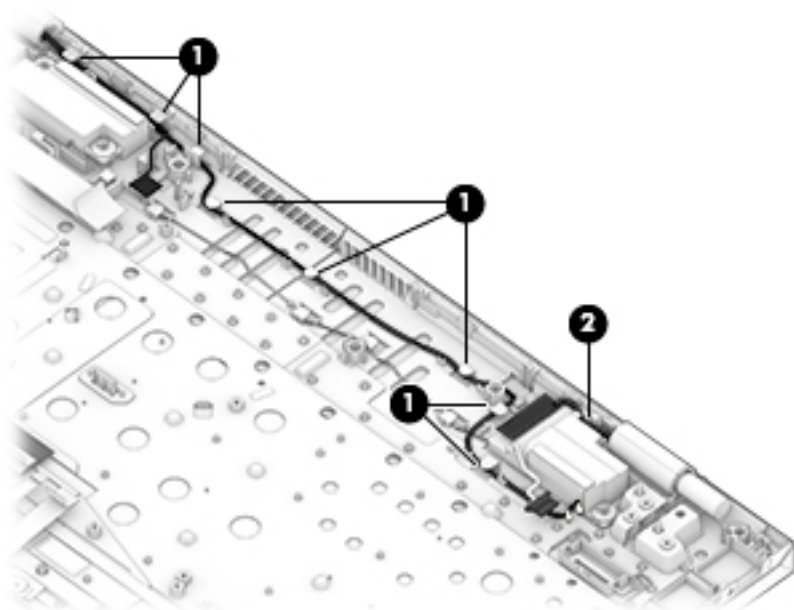
Description	Spare part number
Display assembly, non-touch	L54269-001
Display assembly, touch screen	L52653-001

Before removing the display assembly, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).

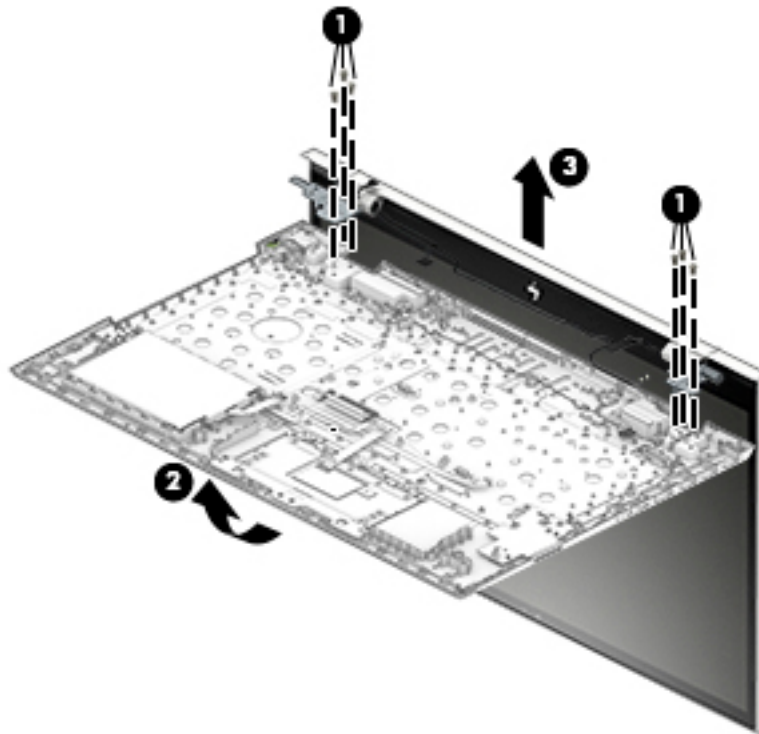
Remove the display assembly:

1. Remove the WLAN antennas and webcam cable from the clips and channel in the right speaker and computer **(1)**.
2. Remove the display cable from the routing channel in the left speaker **(2)**.



3. Remove the three Phillips M2.5 × 6.0 screws **(1)** from each hinge.
4. Open the display to open the hinges **(2)**.

5. Separate the display from the computer by pulling the display up and away from the chassis **(3)**.



Reverse this procedure to install the display assembly.

## Power connector

**Table 5-18 Power connector description and part number**

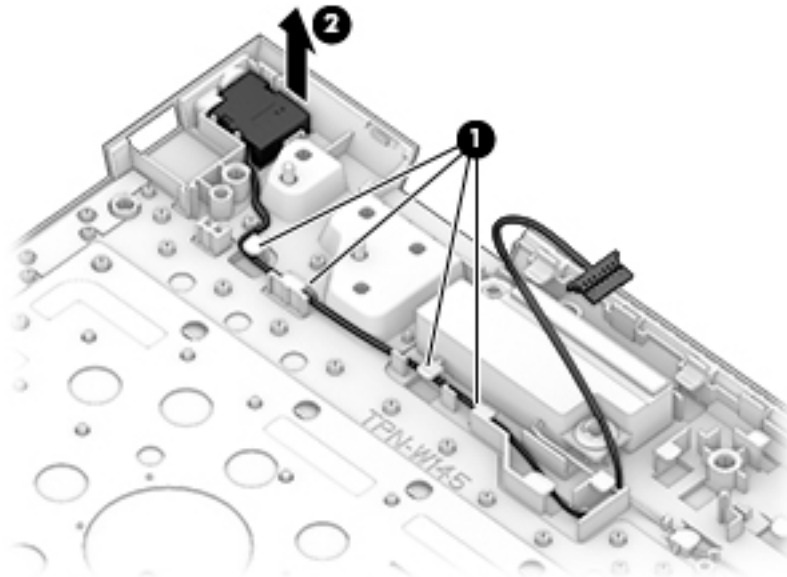
Description	Spare part number
Power connector	L52659-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover and rubber feet on page 27](#)).
3. Remove the battery (see [Battery on page 30](#)).
4. Remove the USB board (see [USB board on page 42](#)).
5. Remove the display (see [Display assembly on page 54](#)).

Remove the power connector cable:

1. Remove the cable from the clips in the computer **(1)**.
2. Remove the power connector and cable from the computer **(2)**.



Reverse this procedure to install the power connector cable.



## Keyboard/top cover

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

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

**Table 5-19 Keyboard/top cover description and part number**

Description	Spare part number
Keyboard/top cover with stamped finish	L52452-xx1

**Table 5-20 Keyboard 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	Israel	-BB1	Slovenia	-BA1
Czech Republic and Slovakia	-FL1	Italy	-061	Spain	-071
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	Switzerland	-BG1
France	-051	Portugal	-131	Turkey	-141
French Canada	-DB1	Romania	-271	Ukraine	-BD1
Germany	-041	Russia	-251	United Kingdom	-031
Greece	-151	Saudi Arabia	-171	United States	-001
Hungary	-211				

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## 6 Using Setup Utility (BIOS)

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

---

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

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### Starting Setup Utility (BIOS)

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

---

▲ Turn on or restart the computer 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) may be available on the HP website.

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

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

### Determining the BIOS version

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


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

- HP Support Assistant
  1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.  
– or –  
Select the question mark icon in the taskbar.
  2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
  1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 58](#)).
  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 [Downloading a BIOS update on page 59](#).

## Downloading a BIOS update

---

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

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

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


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

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an `.exe` extension (for example, `filename.exe`).  
  
The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

---

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

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# 7 Using HP PC Hardware Diagnostics

## Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 60](#).

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

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

– or –

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

- a. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
    - or –
    - Select the question mark icon in the taskbar.
  - b. Select **Troubleshooting and fixes**.
  - c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.
2. When the tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.



**NOTE:** If you need to stop a diagnostic test at any time, select **Cancel**.

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. The screen displays one of the following options:

- A Failure ID link is displayed. Select the link and follow the on-screen instructions.
- A Quick Response (QR) code is displayed. With a mobile device, scan the code and then follow the on-screen instructions.
- Instructions for calling support are displayed. Follow those instructions.

## Downloading HP PC Hardware Diagnostics Windows

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

## Downloading the latest HP PC Hardware Diagnostics Windows version


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

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

The tool is downloaded to the selected location.

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

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

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

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

The tool is downloaded to the selected location.


## Installing HP PC Hardware Diagnostics Windows

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

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

## Using HP PC Hardware Diagnostics UEFI

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 **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 62](#).

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

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


When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in solving the problem:

- ▲ Select **Get Support**, and then use a mobile device to scan the QR code that displays on the next screen. The HP Customer Support - Service Center page displays, 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`.

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## Starting HP PC Hardware Diagnostics UEFI

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

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

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

- a. Connected USB flash drive

 **NOTE:** To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see [Downloading the latest HP PC Hardware Diagnostics UEFI version on page 62](#).

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- b. Hard drive


- c. BIOS

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

## Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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

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


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## Downloading the latest HP PC Hardware Diagnostics UEFI version

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

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

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

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

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

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

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

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it may upload results to a preconfigured server. For more information 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



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

### Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

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

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



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

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

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

## Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.

- Set a location for storing the test results. You can also set the user name and password settings used for uploads.
- Display status information about the diagnostics run previously.

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

1. Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.
3. Make your customization selections.
4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.




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# 8 Backing up, restoring, and recovering

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

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see [Using Windows tools on page 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](#)).

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 **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.

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## Backing up information and creating recovery media


### Using Windows tools

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

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


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

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

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

---

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

---

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

You can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive.

To download the tool:

- ▲ Go to the Microsoft Store and search for HP Cloud Recovery.

For details, go to <http://www.hp.com/support>, search for HP Cloud Recovery, and then select "HP PCs – Using the Cloud Recovery Tool (Windows 10, 7)."



---

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

---

## Restoring and recovery

### Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see [Using Windows tools on page 65](#).

### Recovering using HP Recovery media

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

# 9 Specifications

**Table 9-1 Computer specifications**

	<b>Metric</b>	<b>U.S.</b>
<b>Computer dimensions</b>		
Width	<b>405.0 mm</b>	15.9 in
Depth	<b>266.0 mm</b>	10.5 in
Height	<b>22.5 mm</b>	0.9 in
Weight, solid-state drive + optical drive	<b>2830.0 g</b>	6.2 lbs
Weight, hard drive + optical drive	<b>2920.0 g</b>	6.4 lbs
<b>Input power</b>		
<b>Rating</b>		
Operating voltage and current	19.5 V dc @ 2.31 A – 45 W	
	19.5 V dc @ 3.33 A – 65 W	
<b>Temperature</b>		
Operating	<b>5°C to 35°C</b>	41°F to 95°F
Nonoperating	<b>-20°C to 60°C</b>	-4°F to 140°F
<b>Relative humidity</b> (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		
Operating	<b>-15 m to 3,048 m</b>	-50 ft to 10,000 ft
Nonoperating	<b>-15 m to 12,192 m</b>	-50 ft to 40,000 ft

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

---

# 10 Power cord set requirements

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

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

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

## Requirements for all countries

The following requirements are applicable to all countries and regions:

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

## Requirements for specific countries and regions

**Table 10-1 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
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 mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

**Table 10-1 Power cord requirements for specific countries and regions (continued)**

Country/region	Accredited agency	Applicable note number
		<b>2.</b> 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.
		<b>3.</b> 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 mm <sup>2</sup> or 1.25 mm <sup>2</sup> conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.
		<b>4.</b> The flexible cord must be Type RVV, 3-conductor, 0.75 mm <sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
		<b>5.</b> The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm <sup>2</sup> conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
		<b>6.</b> The flexible cord must be Type HVCTF 3-conductor, 1.25 mm <sup>2</sup> conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
		<b>7.</b> 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 mm <sup>2</sup> or 1.00 mm <sup>2</sup> conductor size, with plug BS 1363/A with BSI or ASTA marks.

---

# 11 Recycling

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

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

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