



# Maintenance and Service Guide

HP 15 Laptop PC

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### **Product notice**

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

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


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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

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

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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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# Table of contents

<b>1 Product description .....</b>	<b>1</b>
<b>2 Getting to know your computer .....</b>	<b>6</b>
Right side .....	6
Left side .....	7
Display .....	8
Keyboard area .....	9
TouchPad .....	9
Lights .....	10
Button, speakers, and vent .....	11
Special keys .....	12
Action keys .....	13
Bottom .....	14
Labels .....	15
<b>3 Illustrated parts catalog .....</b>	<b>16</b>
Computer major components .....	16
Cables .....	21
Display assembly subcomponents .....	22
Miscellaneous parts .....	24
Mass storage devices .....	26
<b>4 Removal and replacement procedures preliminary requirements .....</b>	<b>28</b>
Tools required .....	28
Service considerations .....	28
Plastic parts .....	28
Cables and connectors .....	28
Drive handling .....	29
Workstation guidelines .....	29
Electrostatic discharge information .....	29
Generating static electricity .....	30
Preventing electrostatic damage to equipment .....	30
Personal grounding methods and equipment .....	31
Grounding the work area .....	31
Recommended materials and equipment .....	31
Packaging and transporting guidelines .....	32

<b>5 Removal and replacement procedures for Customer Self-Repair parts .....</b>	<b>33</b>
Component replacement procedures .....	33
Preparation for disassembly .....	33
Optical drive .....	34
<b>6 Removal and replacement procedures for authorized service provider parts .....</b>	<b>37</b>
Component replacement procedures .....	37
Bottom cover .....	38
Battery .....	41
Memory module .....	43
Hard drive .....	45
Solid-state drive .....	47
Solid-state drive bracket and connector board .....	48
WLAN module .....	50
Hard drive connector board .....	51
USB/card reader board .....	52
TouchPad button board .....	53
TouchPad module .....	54
Fan .....	56
Heat sink assembly .....	57
Display assembly .....	61
System board .....	71
Speakers .....	74
Power connector cable (DC-in) .....	75
Top cover with keyboard .....	76
<b>7 Using Setup Utility (BIOS) .....</b>	<b>77</b>
Starting Setup Utility (BIOS) .....	77
Updating Setup Utility (BIOS) .....	77
Determining the BIOS version .....	77
Downloading a BIOS update .....	78
<b>8 Using HP PC Hardware Diagnostics .....</b>	<b>79</b>
Using HP PC Hardware Diagnostics Windows (select products only) .....	79
Downloading HP PC Hardware Diagnostics Windows .....	79
Downloading the latest HP PC Hardware Diagnostics Windows version .....	80
Downloading HP Hardware Diagnostics Windows by product name or number (select products only) .....	80
Installing HP PC Hardware Diagnostics Windows .....	80
Using HP PC Hardware Diagnostics UEFI .....	80



Starting HP PC Hardware Diagnostics UEFI .....	81
Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive .....	81
Downloading the latest HP PC Hardware Diagnostics UEFI version .....	81
Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only) .....	81
Using Remote HP PC Hardware Diagnostics UEFI settings (select products only) .....	82
Downloading Remote HP PC Hardware Diagnostics UEFI .....	82
Downloading the latest Remote HP PC Hardware Diagnostics UEFI version .....	82
Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number .....	82
Customizing Remote HP PC Hardware Diagnostics UEFI settings .....	82
<b>9 Backing up, restoring, and recovering .....</b>	<b>84</b>
Backing up information and creating recovery media .....	84
Using Windows tools .....	84
Using the HP Cloud Recovery Download Tool to create recovery media (select products only) .....	84
Restoring and recovery .....	85
Restoring, resetting, and refreshing using Windows tools .....	85
Recovering using HP Recovery media .....	85
Changing the computer boot order .....	85
<b>10 Specifications .....</b>	<b>86</b>
Computer specifications .....	86
39.6-cm (15.6-in) display specifications .....	87
M.2 SATA solid-state drive specifications .....	87
M.2 PCIe solid-state drive specifications .....	88
Hard drive specifications .....	89
<b>11 Power cord set requirements .....</b>	<b>90</b>
Requirements for all countries .....	90
Requirements for specific countries and regions .....	90
<b>12 Recycling .....</b>	<b>92</b>
<b>Index .....</b>	<b>93</b>



# 1 Product description

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

Category	Description
<b>Product Name</b>	<b>HP 15 Laptop PC</b>
	Model numbers: 15-db0xxx, 15-db1xxx, 15g-db0xxx, 15g-db1xxx, 15q-dy0xxx, 15q-dy1xxx, 15z-db000, 15z-db100
<b>Processor</b>	<b>AMD processors:</b> A9-9425 (3.1 GHz, turbo up to 3.7 GHz), 2133 MHz/1 MB L2 cache, dual core, 15 W A6-9225 (2.6 GHz, turbo up to 3.0 GHz), 2133 MHz/1 MB L2 cache, dual core, 15 W A4-9125 (2.3 GHz, turbo up to 2.6 GHz), 2133 MHz/1 MB L2 cache, dual core, 15 W E2-9000e (1.5 GHz, turbo up to 2.0 GHz), 1866 MHz/1 MB L2 cache, dual core, 6 W Athlon® 300U (2.4 GHz, turbo up to 3.3 GHz), 2400 MHz/3 MB L3 cache, dual core Ryzen™ 7-3700U (2.3 GHz, turbo up to 4.0 GHz), 6 MB L2 + L3 cache, 2400 MHz, quad core, 15 W Ryzen 5-3500U (2.1 GHz, turbo up to 3.7 GHz), 6 MB L2 + L3 cache, 2400 MHz, quad core, 15 W Ryzen 3-3200U (2.6 GHz, turbo up to 3.5 GHz), 5 MB L2 + L3 cache, 2400 MHz, dual core, 15 W Ryzen 5-2500U (2.0 GHz, turbo up to 3.6 GHz), 6 MB L2 + L3 cache, 2400 MHz, quad core, 15 W Ryzen 3-2300U (2.0 GHz, turbo up to 3.4 GHz), 6 MB L2 + L3 cache, 2400 MHz, quad core, 15 W Ryzen 3-2200U (2.5 GHz, turbo up to 3.4 GHz), 1 MB L2 cache, 2400 MHz, dual core, 15 W
<b>Graphics</b>	Supports HD decode, DX12, HDMI <b>Internal graphics:</b> AMD Radeon™ RX Vega 10 Mobile Graphics (Ryzen 7 processor) AMD Radeon Vega 8 Mobile Graphics (Ryzen 5 processor) AMD Radeon Vega 6 Mobile Graphics (Ryzen 3-2300 processor) AMD Radeon Vega 3 Mobile Graphics (Ryzen 3-2200, Athlon 300U processor) AMD Radeon R5 Graphics (A9 processor) AMD Radeon R4 Graphics (A6 processor) AMD Radeon R3 Graphics (A4 processor) AMD Radeon R2 Graphics (E2 processor) <b>External graphics:</b> AMD Radeon 535 with up to 2 GB of dedicated video memory AMD Radeon 530 with up to 4 GB of dedicated video memory AMD Radeon 530 with up to 2 GB of dedicated video memory

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

Category	Description
	AMD Radeon 520 with up to 2 GB of dedicated video memory
<b>Panel</b>	<b>39.6 cm (15.6 in), WLED, eDP, slim-flat (3.2 mm), 16:10 ultra wide aspect ratio:</b>
	High definition (HD) (1366 × 768), BrightView, SVA, 220 nits
	HD (1366 × 768), anti glare, SVA, 220 nits
	HD (1366 × 768), BrightView, SVA, 200 nits, Touch on Panel (TOP)
	Full high-definition (FHD) (1920 × 1080), anti glare, SVA, 220 nits
	FHD (1920 × 1080), anti glare, UWVA, 220 nits, narrow bezel
	Touch solution with bezel, multi-touch enabled
<b>Memory</b>	<b>Two memory module slots</b> (Ryzen, A9 processors):
	Memory is non-customer accessible/non-upgradeable
	DDR4-2400 dual channel support (Ryzen, Athlon processors)
	DDR4-1866 dual channel support (A9 processors)
	Supports up to 16 GB of system RAM in the following configurations:
	<ul style="list-style-type: none"> <li>• 16384 MB (8192 MB × 2)</li> <li>• 12288 MB (8192 MB × 1 + 4096 MB × 1)</li> <li>• 8192 MB (8192 MB × 1 + 4096 × 2)</li> <li>• 4096 MB (4096 MB × 1)</li> </ul>
	<b>One memory module slot</b> (E2/A4/A6 processors):
	Memory is non-customer accessible/non-upgradeable
	DDR4-1866 single channel support
	Supports up to 8 GB of system RAM in the following configurations:
	<ul style="list-style-type: none"> <li>• 8192 MB (8192 MB × 1)</li> <li>• 4096 MB (4096 MB × 1)</li> </ul>
<b>Primary storage</b>	<b>Single hard drive configurations, 6.35 cm (2.5 in), 7.0 mm/7.2 mm/9.5 mm, SATA hard drives:</b>
	2 TB, 5400 rpm, 9.5 mm (7.2 mm bridge to 9.5 mm)
	1 TB, 5400 rpm, 9.5 mm (7.2 mm bridge to 9.5 mm)
	500 GB, 5400 rpm, 7.0 mm
	<b>M.2, SATA-3, solid-state drives:</b>
	256 GB, TLC
	128 GB, TLC
	<b>PCIe, NVMe, M.2 solid-state drives:</b>
	256 GB
	<b>Dual storage configurations</b> (Ryzen, Athlon, and A9 processors):

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

Category	Description
	256 GB, PCIe, solid-state drive + 1 TB, 5400 rpm hard drive
	256 GB, SATA-3, TLC, solid-state drive + 1 TB, 5400 rpm hard drive
	128 GB, SATA-3, TLC, solid-state drive + 1 TB, 5400 rpm hard drive
<b>Optical drive</b>	9.0 mm tray load
	DVD+/-RW Double-Layer Writer
<b>Camera</b>	<b>HP TrueVision HD Camera</b> - indicator LED, USB2.0, HD BSI sensor, f2.0
	720p by 30 frames per second
	Single digital microphone
	<b>HP Webcam</b> - VGA camera, indicator LED, USB 2.0, f2.4
	640 × 480 by 30 frames per second
	Single digital microphone
<b>Audio</b>	<b>Audio Application Name:</b> HP Audio Control
	Dual speakers
<b>Ethernet</b>	Ethernet Integrated 10/100/1000 NIC
<b>Wireless networking</b>	Compatible with Miracast-certified devices
	<b>Integrated Wireless options with dual antennas (M.2/PCIe):</b>
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth® 4.2 Combo Adapter (MU-MIMO supported)
	<b>Integrated Wireless options with single antenna (M.2/PCIe):</b>
	Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)
	Realtek RTL8723DE 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter
<b>External media cards</b>	<b>HP Multi-Format Digital Media Card Reader</b>
	Supports SD/SDHC/SDXC
	Push-pull insertion/removal
<b>Internal card expansion</b>	One M.2 slot for solid-state drive
	One M.2 slot for WLAN
<b>Ports</b>	Hot plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected)
	HDMI v1.4 supporting: up to 1920 × 1080 @ 60Hz
	USB 2.0 port (right side)
	(2) USB 3.1 Gen 1 ports (left side)
	RJ-45/Ethernet
	Audio-out (headphone)/audio-in (microphone) combo jack
	AC Smart Pin adapter plug

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

<b>Category</b>	<b>Description</b>
<b>Keyboard/pointing devices</b>	<b>Keyboard:</b>
	Full-size, textured, island-style keyboard with numeric keypad
	Full-size, two coat paint, backlit, island-style keyboard with numeric keypad
	Full-size, three coat paint, backlit, island-style keyboard with numeric keypad
	<b>TouchPad:</b>
	Multitouch gestures enabled
	Supports Modern Trackpad Gestures
	Taps enabled by default
<b>Power requirements</b>	<b>Battery:</b>
	3-cell Prismatic/Polymer battery, long life, 41 Whr
	Supports battery fast charge
	<b>AC adapter, barrel type:</b>
	65 W Smart, nPFC, right angle, 4.5 mm (models with discrete graphics)
	65 W Smart, nPFC, 4.5 mm, EM
	65 W Smart, nPFC, 4.5 mm, for use in Argentina (models with discrete graphics)
	45 W Smart, nPFC, right angle, 4.5 mm (models with UMA graphics)
	45 W Smart, nPFC, 4.5 mm, for use in Argentina (models with UMA graphics)
	<b>Power cord (CS):</b>
1 m, conventional	
<b>Security</b>	Kensington Mini Security Lock
	Supports firmware-based Trusted Platform Module (fTPM) 2.0
<b>Operating system</b>	FreeDOS 2.0
	Windows® 10 Home 64
	Windows 10 Home 64 Web/Kiosk
	Windows 10 Home 64 Chinese Market CPPP
	Windows 10 Home 64 High-End Chinese Market CPPP
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Web/Kiosk
	Windows 10 Home 64 Plus QVC
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market PPP

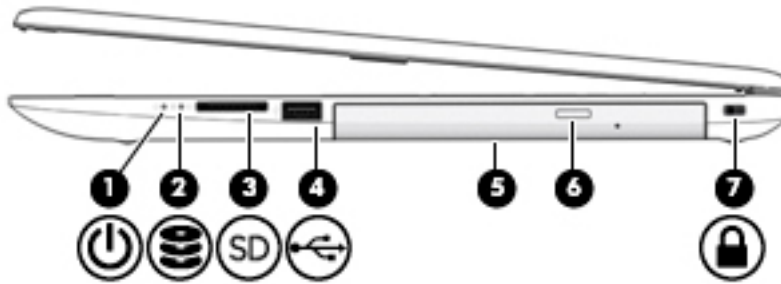
**Table 1-1 Product components and their descriptions (continued)**

<b>Category</b>	<b>Description</b>
	Windows 10 Home 64 Plus Single Language Indonesia Market PPP
	Windows 10 Home 64 Plus Web/Kiosk
	Windows 10 Home 64 QVC
	Windows 10 Home 64 Single Language
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	Windows 10 Home 64 Single Language APAC EM PPP
	Windows 10 Home 64 Single Language India Market PPP
	Windows 10 Home 64 Single Language Indonesia Market PPP
	Windows 10 Home 64 Single Language Value Africa Market PPP
	Windows 10 Home 64 Single Language Value APAC EM PPP
	Windows 10 Home 64 Single Language Value India Market PPP
	Windows 10 Home 64 Single Language Value Indonesia Market PPP
	Windows 10 Home 64 Value Notebook Single Language
	Windows 10 Home 64 Value Notebook Single Language SEAP
	Windows 10 Home 64 Value Notebook Single Language select GEO
	Windows 10 Home 64 Web/Kiosk
	Windows 10 Home S 64
	Windows 10 Home S 64 Web/Kiosk
	Windows 10 Home S 64 Plus
	Windows 10 Home S 64 Plus Web/Kiosk
	Windows 10 Home S 64 Plus QVC
	Windows 10 Home S 64 Plus Single Language
	Windows 10 Home S 64 QVC
	Windows 10 Home S 64 Single Language
	Windows 10 Pro 64
<b>Serviceability</b>	<b>End user replaceable parts:</b>
	AC adapter
	Optical drive








## 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

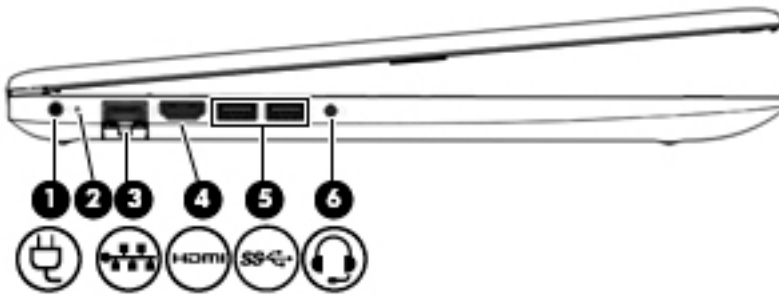


**Table 2-1** Right-side components and their descriptions







Component	Description
(1)  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)  Drive light	<ul style="list-style-type: none"><li>• Blinking white: The hard drive is being accessed.</li></ul>
(3)  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>▲ Pull to remove the card from the memory card reader.</li></ul>
(4)  USB port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.
(5)  Optical drive	Depending on your computer model, reads an optical disc or reads and writes to an optical disc.
(6)  Optical drive eject button	Releases the optical drive disc tray.
(7)  Security cable slot	Attaches an optional security cable to the computer. <b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.



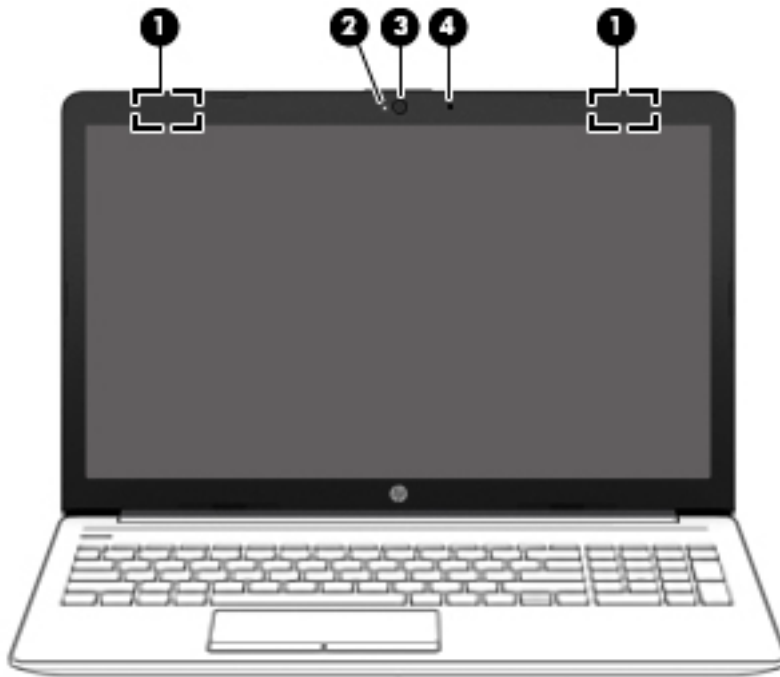
# Left side



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

Component	Description
(1) 	Connects an AC adapter.
(2) 	<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>
(3) 	Connects a network cable. <ul style="list-style-type: none"> <li>White: The network is connected.</li> <li>Amber: Activity is occurring on the network.</li> </ul>
(4) 	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High-Definition Multimedia Interface (HDMI) device.
(5) 	Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.
(6) 	<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>

# Display



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

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

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

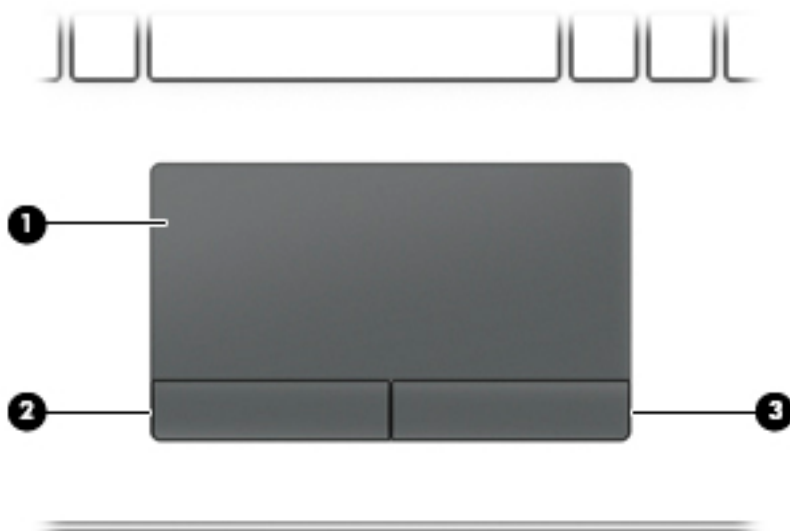
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

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

# Keyboard area

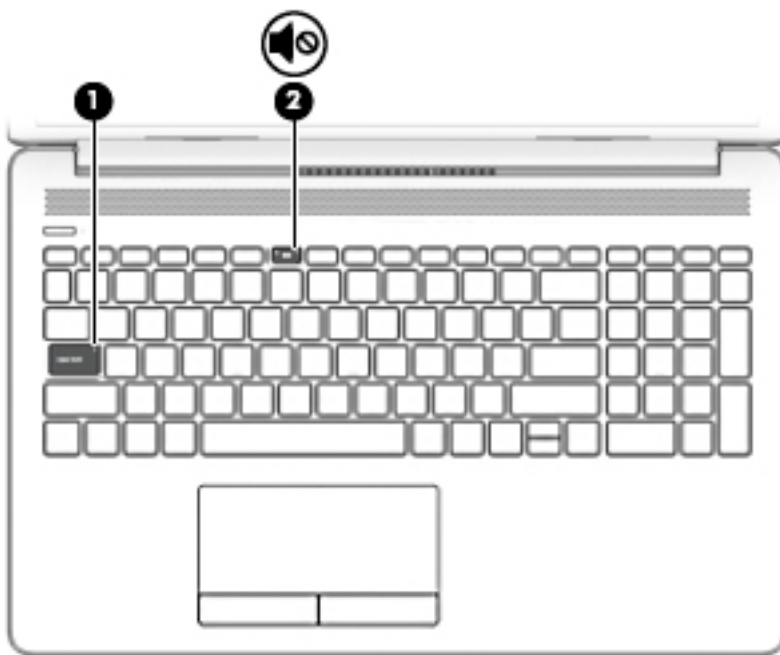
## TouchPad




**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 TouchPad button	Functions like the left button on an external mouse.
(3) Right TouchPad button	Functions like the right button on an external mouse.

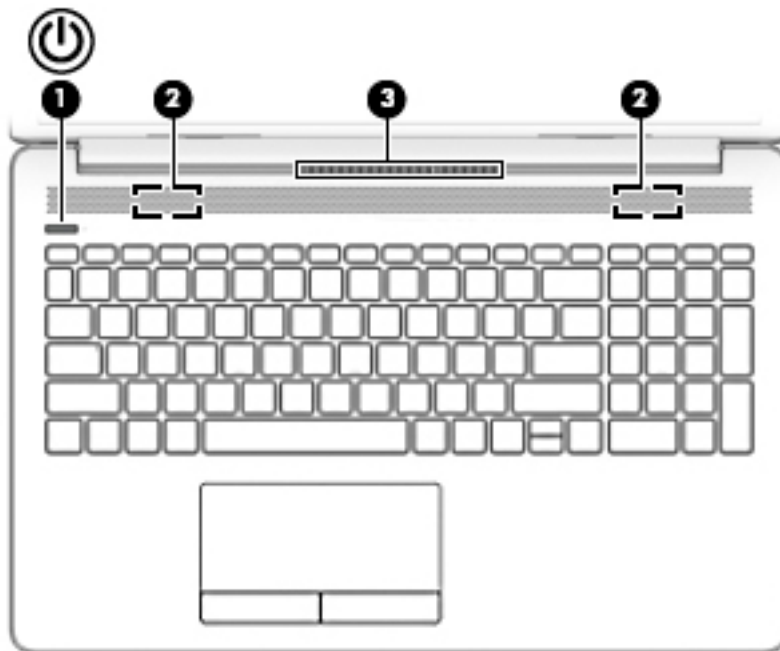
## Lights





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

Component	Description
(1) 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"><li>• Amber: Computer sound is off.</li><li>• Off: Computer sound is on.</li></ul>

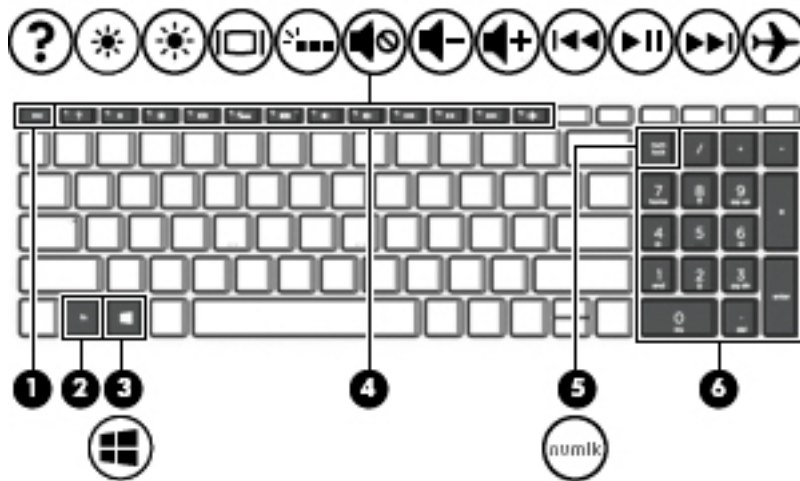
## Button, speakers, and vent




**Table 2-6** Button, speakers, and vent 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.</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 (2)	Produce sound.
(3) Vent	Enables airflow to cool internal components.
	<p><b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.</p>

## 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.

## Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see [Special keys on page 12](#).

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

**Table 2-8 Actions keys and their descriptions**

Icon	Description
	Opens the “How to get help in Windows 10” webpage.
	Decreases the screen brightness incrementally as long as you hold down the key.
	Increases the screen brightness incrementally as long as you hold down the key.
	Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor.
	Turns the keyboard backlight off or on. <b>NOTE:</b> To conserve battery power, turn off this feature.
	Mutes or restores speaker sound.
	Decreases speaker volume incrementally while you hold down the key.
	Increases speaker volume incrementally while you hold down the key.
	Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
	Plays the next track of an audio CD or the next section of a DVD or a BD.
	Turns the airplane mode and wireless feature on or off. <b>NOTE:</b> The airplane mode key is also referred to as the wireless button. <b>NOTE:</b> A wireless network must be set up before a wireless connection is possible.

## Bottom



**Table 2-9** Bottom component and its description

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.

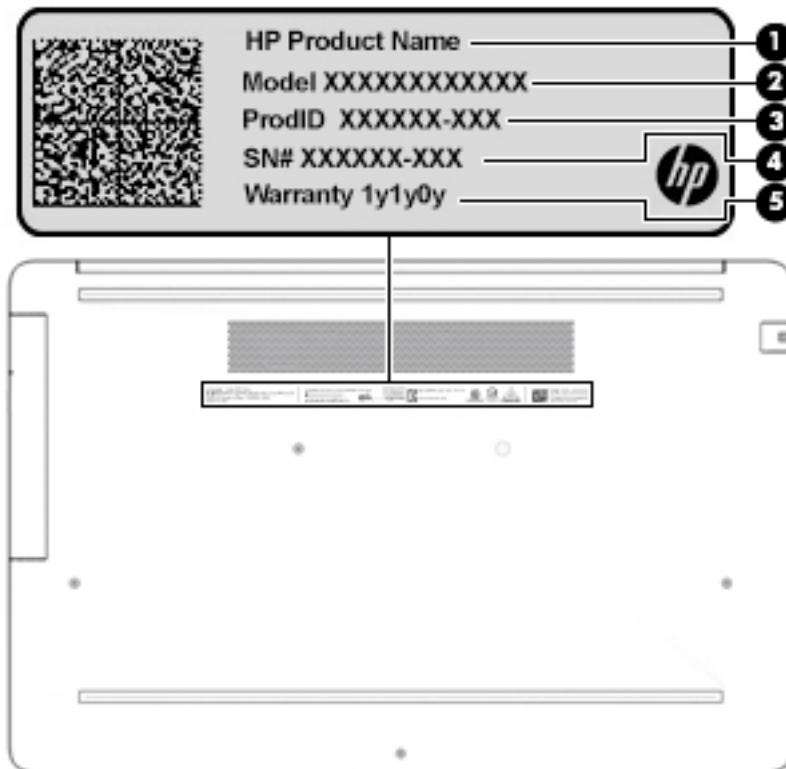


# Labels

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 2-10** Service label components


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

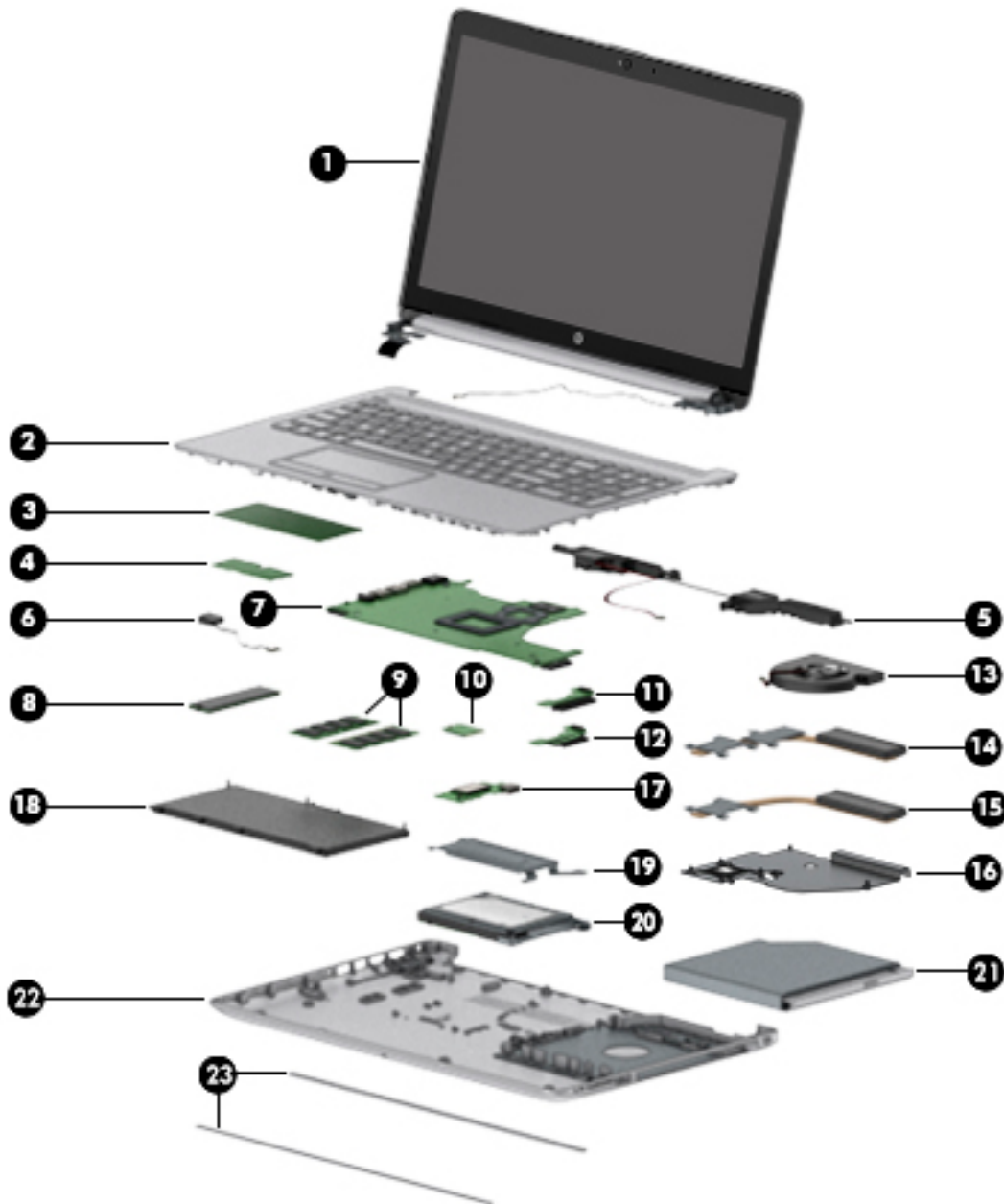
- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

# 3 Illustrated parts catalog

## Computer major components

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 15](#) for details.



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

Item	Component	Spare part number
(1)	<b>Display</b> <b>NOTE:</b> Displays are not spared as whole units. Display subcomponent spare parts are available. For spare part information, see <a href="#">Display assembly subcomponents on page 22</a> .	Not spared
(2)	<b>Top cover/keyboard</b> <b>NOTE:</b> For a detailed list of country codes, see <a href="#">Top cover with keyboard on page 76</a> .	
	Keyboard, no backlight, jet black	L20387-xx1
	Keyboard, no backlight, full-featured models, snow white	L20388-xx1
	Keyboard, no backlight, defeatured models, snow white	L23066-xx1
	Keyboard, no backlight, ash silver	L20386-xx1
	Keyboard, backlit, ash silver (available only with -001 United States, -002 India, and -DB1 Canadian French keyboards)	L23074-xx1
	Keyboard, no backlight, iridescent pale rose gold (available only with -001 United States keyboards)	L28504-001
	Keyboard, backlit, iridescent pale rose gold (available only with -001 United States keyboards)	L28505-001
	Keyboard, no backlight, iridescent ceramic white (available only with -001 United States keyboards)	L28506-001
	Keyboard, backlit, iridescent ceramic white (available only with -001 United States keyboards)	L28507-001
	Keyboard, no backlight, ocean teal (available only with -001 United States keyboards)	L31735-001
	Keyboard, no backlight, Real Tree (available only with -001 United States keyboards)	L31736-001
	Keyboard, no backlight, natural silver (available only with -002 India keyboards)	L32368-002
	Keyboard, backlit, ocean teal (available only with -001 United States keyboards)	L32863-001
	Keyboard, backlit, natural silver (available only with -002 India keyboards)	L32864-002
(3)	<b>TouchPad module</b>	L20449-001
(4)	<b>TouchPad button board</b>	not spared
(5)	<b>Speakers</b> (include cable)	L20453-001
(6)	<b>Power connector cable (DC-in)</b>	L20475-001
(7)	<b>System board</b> <b>NOTE:</b> All system board spare part kits include replacement thermal material. All system boards use the following part numbers: xxxxxx-001: Non-Windows operating systems xxxxxx-601: Windows operating system  For use in models with discrete graphics memory:	
	• AMD Athlon 300U processor and Radeon 530 graphics	L53469-xx1
	• AMD Ryzen 3-3200U processor and Radeon 530 graphics	L46517-xx1
	• AMD Ryzen 3-2200U processor and Radeon 530 graphics	L20668-xx1
	• AMD A9-9425 processor and Radeon 530 graphics	L46513-xx1

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

Item	Component	Spare part number
	• AMD A9-9425 processor and Radeon 520 graphics	L20480-xx1
	• AMD A6-9225 processor and Radeon 530 graphics	L46514-xx1
	• AMD A6-9225 processor and Radeon 520 graphics	L20481-xx1
	For use in models with UMA graphics memory:	
	• AMD Ryzen 7-3700U processor	L51325-xx1
	• AMD Ryzen 5-3500U processor	L46515-xx1
	• AMD Ryzen 3-3200U processor	L46516-xx1
	• AMD Ryzen 5-2500U processor	L20664-xx1
	• AMD Ryzen 3-2300U processor	L20665-xx1
	• AMD Ryzen 3-2200U processor	L20666-xx1
	• AMD A9-9425 processor	L20477-xx1
	• AMD A6-9225 processor	L20478-xx1
	• AMD A4-9125 processor	L31720-xx1
	• AMD E2-9000e processor	L20479-xx1
<b>(8)</b>	<b>Solid-state drive</b>	
	<b>NOTE:</b> For spare part information, see <a href="#">Mass storage devices on page 26</a> .	
<b>(9)</b>	<b>Memory modules (2400 MHz DDR4)</b>	
	8 GB	862398-855
	4 GB	862397-855
<b>(10)</b>	<b>WLAN module</b>	
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	924813-855
	Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	L17365-005
	Realtek RTL8723DE 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter	L21480-005
<b>(11)</b>	<b>Hard drive connector board</b>	L20454-001
<b>(12)</b>	<b>Solid-state drive connector board</b>	L20457-001
<b>(13)</b>	<b>Fan</b>	
	For use in models with discrete graphics	L20473-001
	For use in models with UMA graphics	L20474-001
<b>(14)</b>	<b>Heat sink for use in models with AMD Ryzen processors and discrete graphics</b>	L20482-001
	<b>Heat sink for use in models with AMD A6/A9 processors and discrete graphics</b>	L20484-001
<b>(15)</b>	<b>Heat sink for use in models with AMD Ryzen processors and integrated UMA graphics</b>	L20483-001
	<b>Heat sink for use in models with AMD A6/A9 processors and integrated UMA graphics</b>	L20491-001
<b>(16)</b>	<b>Heat sink for use in fanless models with AMD E2-9000e processors</b>	L20494-001

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

Item	Component	Spare part number
(17)	<b>USB/card reader board</b> The USB/card reader board cable is available using spare part number L20452-001.	L20448-001
(18)	<b>Battery</b> (3-cell, 41 Whr)	L11119-855
(19)	<b>Solid-state drive bracket</b>	L20458-001
(20)	<b>Hard drive</b> <b>NOTE:</b> For spare part information, see <a href="#">Mass storage devices on page 26</a> .	
(21)	<b>DVD+/-RW Double-Layer Writer</b>	L20485-001
(22)	<b>Bottom cover</b> For use in models with an optical drive	
	• Snow white	L20389-001
	• Jet black	L20390-001
	• Natural silver	L20391-001
	• Pale gold	L20392-001
	• Twilight blue	L20393-001
	• Scarlet red	L20397-001
	• Smoke gray	L20395-001
	• Maroon burgundy	L20398-001
	• Iridescent pale rose gold	L28510-001
	• Iridescent ceramic white	L28512-001
	• Ocean teal	L31725-001
	• Real Tree	L31726-001
	• Berry mauve; Pattern: mesh knit	L50283-001
	• Chalkboard gray; Pattern: mesh knit	L50284-001
	• Jet black; Pattern: mesh knit	L50285-001
	• Lumiere blue; Pattern: mesh knit	L50286-001
	• Snow white; Pattern: mesh knit	L50288-001
	For use in models without an optical drive	
	• Snow white	L20399-001
	• Jet black	L20400-001
	• Natural silver	L20401-001
	• Pale gold	L20402-001
	• Pale rose gold	L57161-001
	• Twilight blue	L20403-001

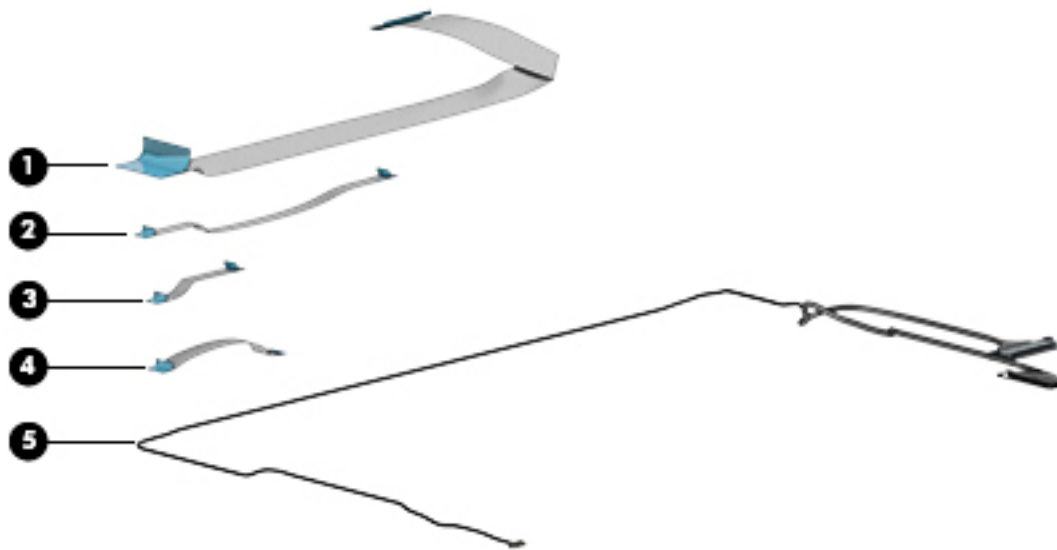
**Table 3-1 Computer major components and their descriptions (continued)**

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	• Scarlet red	L20405-001
	• Smoke gray	L20404-001
	• Iridescent pale rose gold	L28511-001
	• Iridescent ceramic white	L28513-001
	• Maroon burgundy	L31719-001
	• Berry mauve; Pattern: mesh knit	L50289-001
	• Chalkboard gray; Pattern: mesh knit	L50290-001
	• Jet black; Pattern: mesh knit	L50291-001
	• Lumiere blue; Pattern: mesh knit	L50292-001
	• Snow white; Pattern: mesh knit	L50293-001
<b>(23)</b>	<b>Front rubber feet</b>	
	Pale gold	L20408-001
	Pale rose gold	L57162-001
	Iridescent pale rose gold	L28518-001
	Scarlet red	L20411-001
	Twilight blue	L20409-001
	Maroon burgundy	L20412-001
	Dark ash silver	L20406-001
	Asteroid silver	L20407-001
	Ocean teal	L31731-001
	Real Tree	L31732-001
	Berry mauve; Pattern: mesh knit	L50314-001
	Lumiere blue; Pattern: mesh knit	L50317-001
<b>(23)</b>	<b>Rear rubber feet:</b>	
	Pale gold	L20415-001
	Pale rose gold	L57163-001
	Iridescent pale rose gold	L28519-001
	Scarlet red	L20418-001
	Twilight blue	L20416-001
	Maroon burgundy	L20419-001
	Dark ash silver	L20413-001
	Asteroid silver	L20414-001
	Ocean teal	L31733-001

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

Item	Component	Spare part number
	Real Tree	L31734-001
	Berry mauve; Pattern: mesh knit	L50320-001
	Lumiere blue; Pattern: mesh knit	L50323-001

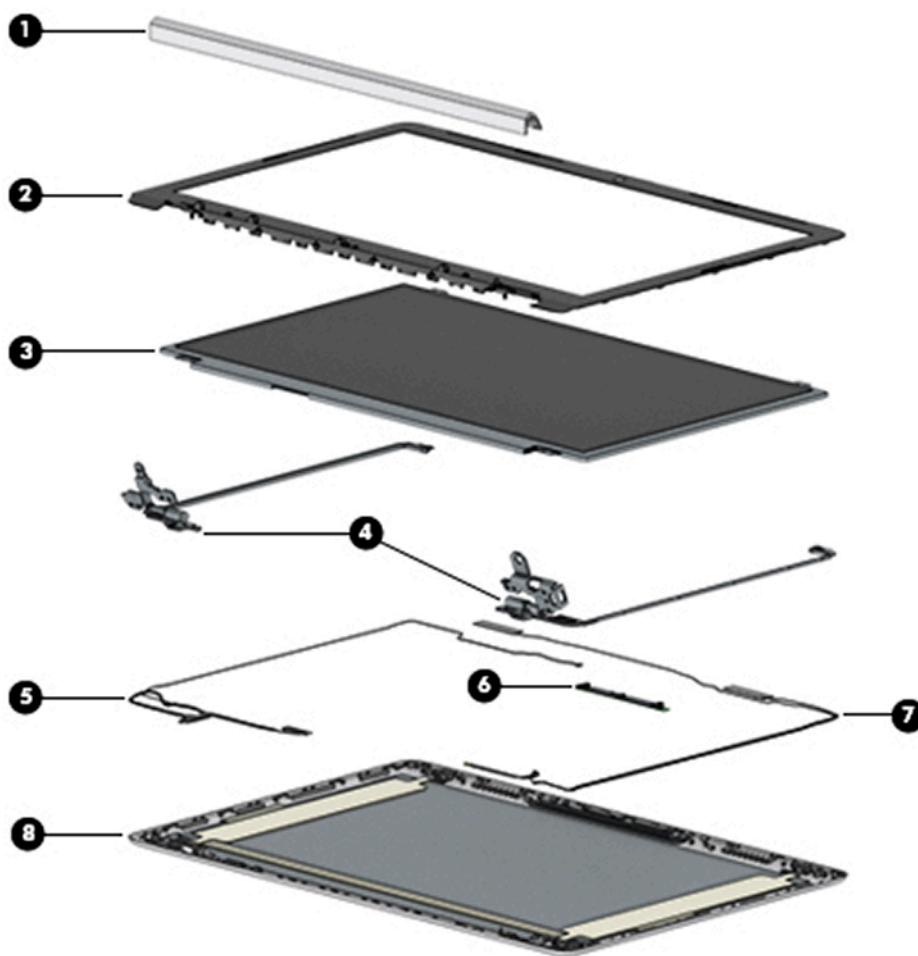
## Cables



**Table 3-2 Cables and their descriptions**

Item	Component	Spare part number
(1)	USB/card reader board cable	L20452-001
(2)	TouchPad button board cable	L20451-001
(3)	TouchPad cable	L20450-001
(4)	Hard drive/solid-state drive cable	L20456-001
(5)	Display cable	
	Display cable, non-touch, HD	L20443-001
	Display cable, non-touch, FHD	L23064-001
	Display cable, touch, HD	L20442-001

## Display assembly subcomponents



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

Item	Component	Spare part number
<b>(1)</b>	<b>Hinge cover</b>	
	Jet black	L20423-001
	Sparkling black	L20427-001
	Natural silver	L20424-001
	Pale gold	L20425-001
	Pale rose gold	L57159-001
	Iridescent pale rose gold	L28516-001
	Scarlet red	L20430-001
	Twilight blue	L20426-001
	Smoke gray	L20428-001
	Snow white (full-featured models)	L20422-001
	Snow white (defeatured) models	L21306-001



**Table 3-3 Display components and their descriptions (continued)**

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	Maroon burgundy	L20431-001
	Iridescent ceramic white	L28517-001
	Ocean teal	L31729-001
	Real Tree	L31730-001
	Berry mauve: Pattern: mesh knit	L50294-001
	Chalkboard gray: Pattern: mesh knit	L50295-001
	Lumiere blue; Pattern: mesh knit	L50297-001
<b>(2)</b>	<b>Display bezel</b>	
	Standard	L20421-001
	Real Tree	L32367-001
<b>(3)</b>	<b>Display panel</b>	
	HD, BrightView, non-touch	L20379-001
	HD, anti glare, non-touch	L20378-001
	HD, BrightView, touch-on panel (TOP)	L20380-001
	FHD, anti glare, non-touch	L20376-001
	FHD, anti glare, narrow bezel	L20377-001
	<b>Miscellaneous Display Kit</b> (includes gaskets [4] and rubber corner positioning tools [4]; not illustrated)	L23065-001
	<b>Display panel stretchable adhesive tape</b> (not illustrated)	L29080-001
<b>(4)</b>	<b>Hinge Kit</b> (includes left and right hinges)	L20420-001
<b>(5)</b>	<b>Display cable</b>	
	Non-touch, HD	L20443-001
	Non-touch, FHD	L23064-001
	Touch, HD	L20442-001
<b>(6)</b>	<b>Camera module</b>	
	HD camera	L20447-001
	VGA camera	L20446-001
<b>(7)</b>	<b>WLAN antenna cable</b>	
	Single antenna	L20445-001
	Single antenna, narrow bezel	L23060-001
	Dual antennas	L20444-001
	Dual antennas, narrow bezel	L23059-001
<b>(8)</b>	<b>Back cover</b>	
	Jet black	L20433-001

**Table 3-3 Display components and their descriptions (continued)**

Item	Component	Spare part number
	Jet black (narrow bezel models)	L23061-001
	Sparkling black	L20437-001
	Natural silver	L20434-001
	Natural silver (narrow bezel models)	L23062-001
	Pale gold	L20435-001
	Pale rose gold	L57158-001
	Scarlet red	L20440-001
	Twilight blue	L20436-001
	Smoke gray	L20438-001
	Smoke gray (narrow bezel models)	L23063-001
	Snow white (full-featured models)	L20432-001
	Snow white (defeatured models)	L21307-001
	Maroon burgundy	L20441-001
	Iridescent pale rose gold	L28508-001
	Iridescent ceramic white	L28509-001
	Ocean teal	L31723-001
	Real Tree	L31724-001
	Berry mauve; Pattern: mesh knit	L50301-001
	Chalkboard gray; Pattern: mesh knit	L50302-001
	Jet black; Pattern: mesh knit	L50303-001
	Lumiere blue; Pattern: mesh knit	L50304-001
	Snow white; Pattern: mesh knit; for use in defeatured models	L50306-001
	Snow white; Pattern: mesh knit; for use in full-featured models	L50307-001
	Chalkboard gray; Pattern: mesh knit	L54498-001
	Jet black; Pattern: mesh knit; for use on narrow bezel models	L54499-001

## Miscellaneous parts

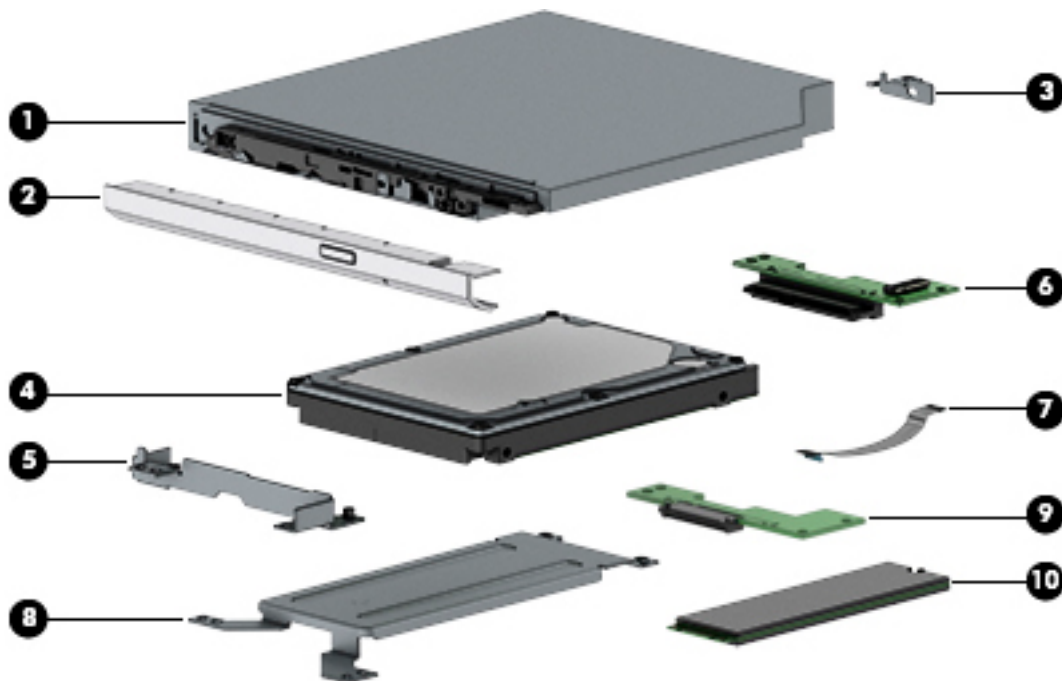
**Table 3-4 Miscellaneous parts and their descriptions**

Component	Spare part number
<b>AC adapter</b>	
65 W AC adapter, nPFC, 4.5 mm	710412-001
65 W AC adapter, nPFC, SMART, RC, 4.5 mm, EM	913691-850
65 W AC adapter, nPFC, 4.5 mm for use in Argentina	710340-850

**Table 3-4 Miscellaneous parts and their descriptions (continued)**

<b>Component</b>	<b>Spare part number</b>
45 W AC adapter, nPFC, SMART, RC, 4.5 mm, non-slim	741727-001
45 W AC adapter, nPFC, SMART, RC, 4.5 mm for use in Argentina	741553-852
<b>Power cord, C5, conventional, 1.0 m</b>	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Denmark	L19360-001
For use in Europe	L19361-001
For use in India	L19363-001
For use in Israel	L19362-001
For use in Italy	L19364-001
For use in Japan	L19365-001
For use in North America	L19367-001
For use in the People's Republic of China	L19368-001
For use in South Africa	L19369-001
For use in South Korea	L19366-001
For use in Switzerland	L19370-001
For use in Taiwan	L19372-001
For use in Thailand	L19371-001
For use in the United Kingdom	L19373-001
<b>Screw Kit</b>	L20476-001
<b>HP Rugged Bluetooth Speaker, black</b>	900777-001
<b>HP Sleeve, Chroma, Geo</b>	L07806-101
<b>HP Sleeve, neoprene, black</b>	L43042-001
<b>Mouse, X3000 wireless</b>	684978-001

## Mass storage devices



**Table 3-5** Mass storage devices and their descriptions

Item	Component	Spare part number
(1)	<b>DVD+/-RW Double-Layer Writer</b>	L20485-001
(2)	<b>Optical drive bezel</b>	
	Natural silver	L20462-001
	Pale gold	L20463-001
	Pale rose gold	L57160-001
	Iridescent pale rose gold	L28514-001
	Scarlet red	L20467-001
	Smoke gray	L20465-001
	Twilight blue	L20464-001
	Maroon burgundy	L20468-001
	Jet black	L20461-001
	Snow white	L20460-001
	Iridescent ceramic white	L28515-001
	Ocean teal	L31727-001
	Real Tree	L31728-001
	Berry mauve: Pattern: mesh knit	L50308-001
	Chalkboard gray: Pattern: mesh knit	L50309-001
	Jet black; Pattern: mesh knit	L50310-001

**Table 3-5 Mass storage devices and their descriptions (continued)**

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	Lumiere blue; Pattern: mesh knit	L50311-001
	Snow white; Pattern: mesh knit	L50313-001
<b>(3)</b>	<b>Optical drive bracket</b>	L20459-001
<b>(4)</b>	<b>Hard drive, 7 mm</b>	
	2 TB, 5400 rpm	912487-855
	1 TB, 5400 rpm	762990-005
	500 GB, 5400 rpm	778186-005
<b>(5)</b>	<b>Hard drive bracket</b>	L20455-001
<b>(6)</b>	<b>Hard drive connector board</b>	L20454-001
<b>(7)</b>	<b>Hard drive/solid-state drive cable</b>	L20456-001
<b>(8)</b>	<b>Solid-state drive bracket</b>	L20458-001
<b>(9)</b>	<b>Solid-state drive connector board</b>	L20457-001
<b>(10)</b>	<b>Solid-state drive (M.2)</b>	
	256 GB, PCIe, NVMe	L20384-001
	256 GB, SATA-3, TLC	L20382-001
	128 GB, SATA-3, TLC	L20381-001

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# 4 Removal and replacement procedures preliminary requirements

## Tools required

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

- Non-conductive, non-marking plastic 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.



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

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## Plastic parts



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

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## 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.

---


# 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 not supported by the Customer Self-Repair program may void your warranty. Check your warranty to determine if Customer Self-Repair is supported in your location.

---

## Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 15](#) for details.

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

---

## Preparation for disassembly

See [Removal and replacement procedures preliminary requirements on page 28](#) 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.

## Optical drive

**Table 5-1 Optical drive part descriptions and part numbers**

Description	Spare part number
<b>DVD+/-RW Double-Layer Writer</b>	L20485-001
<b>Optical drive bracket</b>	L20459-001
<b>Optical drive bezel</b>	
Natural silver	L20462-001
Pale gold	L20463-001
Pale rose gold	L57160-001
Iridescent pale rose gold	L28514-001
Scarlet red	L20467-001
Smoke gray	L20465-001
Twilight blue	L20464-001
Maroon burgundy	L20468-001
Jet black	L20461-001
Snow white	L20460-001
Iridescent ceramic white	L28515-001
Ocean teal	L31727-001
Real Tree	L31728-001
Berry mauve; Pattern: mesh knit	L50308-001
Chalkboard gray; Pattern: mesh knit	L50309-001
Jet black; Pattern: mesh knit	L50310-001
Lumiere blue; Pattern: mesh knit	L50311-001
Snow white; Pattern: mesh knit	L50313-001

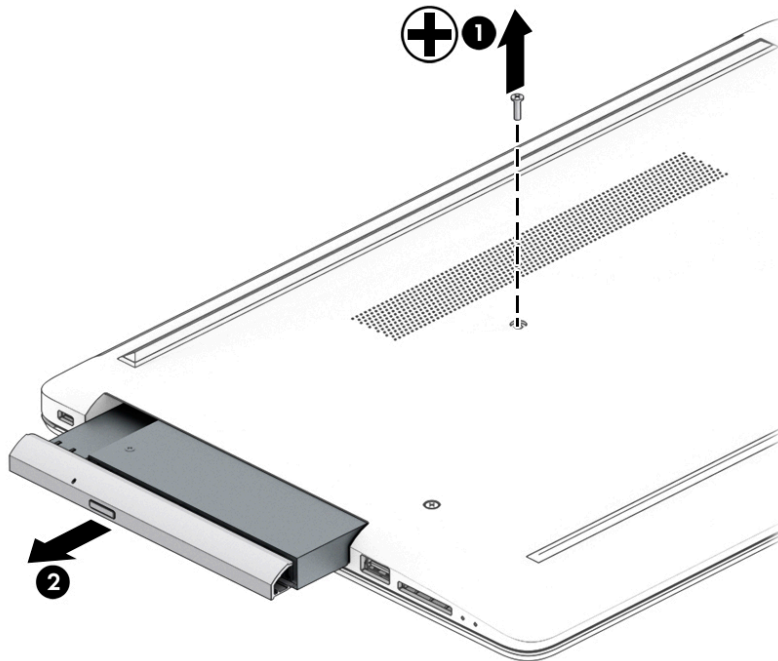
Before removing the optical drive, follow these steps:

- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).

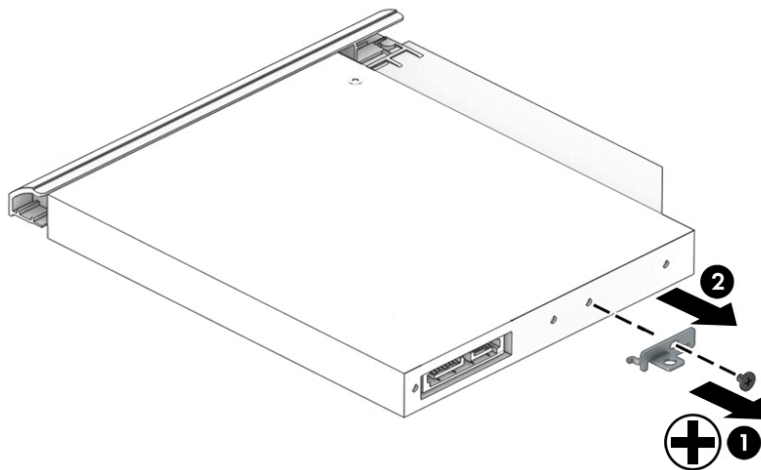
Remove the optical drive:

1. Remove the Phillips M2.5 × 9.0 screw **(1)** that secures the drive to the computer.

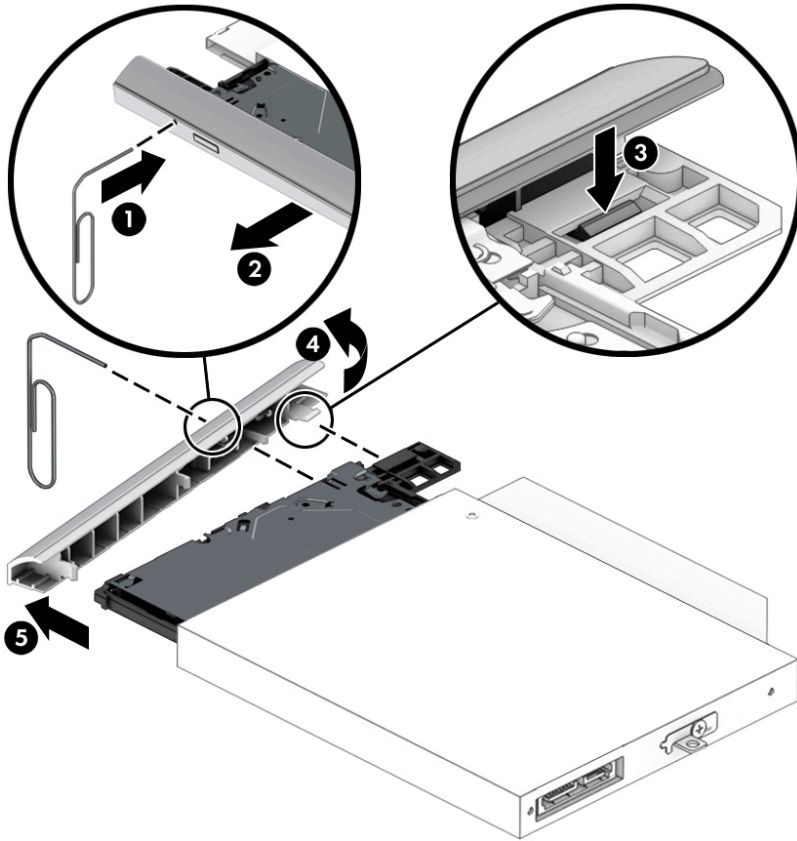
2. Slide the optical drive out of the computer (2).



3. If it is necessary to remove the bracket from the rear of the optical drive, remove the Phillips M2.0 × 3.0 screw (1), and then remove the bracket from the drive (2).



4. If it is necessary to remove the bezel from the front of the optical drive:
  - a. Insert a paper clip into the release hole on the front of the bezel (1). The left side of the bezel rotates outward (2).
  - b. Press the tab to release the bezel from the drive (3).
  - c. Rotate the side of the bezel (4), and then remove it (5).




Reverse this procedure to reassemble and install the optical drive.

---


## 6 Removal and replacement procedures for authorized service provider parts

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

 **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.

---

### Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 15](#) for details.

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

---

There are as many as 46 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

## Bottom cover

**Table 6-1 Bottom cover descriptions and part numbers**

Description	Spare part number
Bottom cover for use in models with an optical drive	
• Snow white	L20389-001
• Jet black	L20390-001
• Natural silver	L20391-001
• Pale gold	L20392-001
• Twilight blue	L20393-001
• Scarlet red	L20397-001
• Smoke gray	L20395-001
• Maroon burgundy	L20398-001
• Iridescent pale rose gold	L28510-001
• Iridescent ceramic white	L28512-001
• Ocean teal	L31725-001
• Real tree	L31726-001
• Berry mauve; Pattern: mesh knit	L50283-001
• Chalkboard gray; Pattern: mesh knit	L50284-001
• Jet black; Pattern: mesh knit	L50285-001
• Lumiere blue; Pattern: mesh knit	L50286-001
• Snow white; Pattern: mesh knit	L50288-001
Bottom cover for use in models without an optical drive	
• Snow white	L20399-001
• Jet black	L20400-001
• Natural silver	L20401-001
• Pale gold	L20402-001
• Pale rose gold	L57161-001
• Twilight blue	L20403-001
• Scarlet red	L20405-001
• Smoke gray	L20404-001
• Iridescent pale rose gold	L28511-001
• Iridescent ceramic white	L28513-001
• Maroon burgundy	L31719-001
• Berry mauve; Pattern: mesh knit	L50289-001
• Chalkboard gray; Pattern: mesh knit	L50290-001



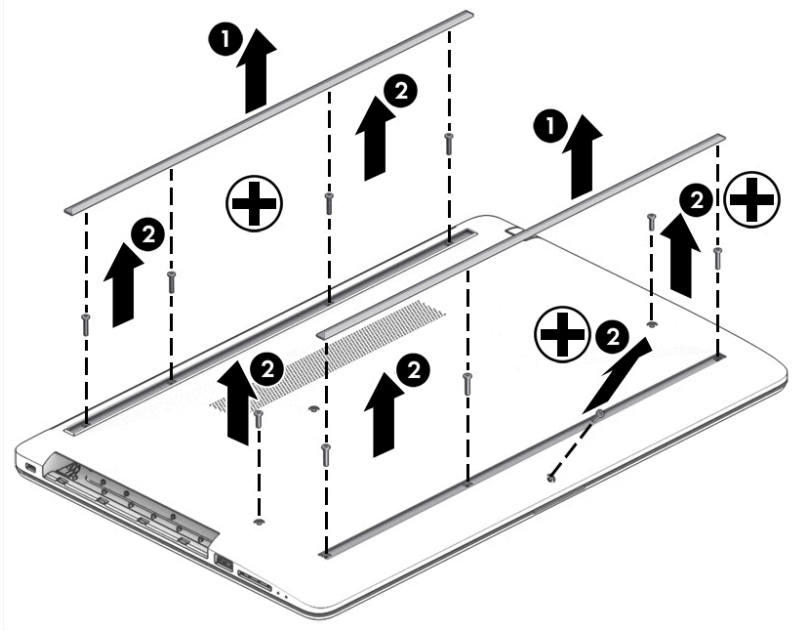
**Table 6-1 Bottom cover descriptions and part numbers (continued)**

Description	Spare part number
• Jet black; Pattern: mesh knit	L50291-001
• Lumiere blue; Pattern: mesh knit	L50292-001
• Snow white; Pattern: mesh knit	L50293-001
Front feet:	
• Pale gold	L20408-001
• Pale rose gold	L57162-001
• Iridescent pale rose gold	L28518-001
• Scarlet red	L20411-001
• Twilight blue	L20409-001
• Maroon burgundy	L20412-001
• Dark ash silver	L20406-001
• Asteroid silver	L20407-001
• Ocean teal	L31731-001
• Real Tree	L31732-001
• Berry mauve; Pattern: mesh knit	L50314-001
• Lumiere blue; Pattern: mesh knit	L50317-001
Rear feet:	
• Pale gold	L20415-001
• Pale rose gold	L57163-001
• Iridescent pale rose gold	L28519-001
• Scarlet red	L20418-001
• Twilight blue	L20416-001
• Maroon burgundy	L20419-001
• Dark ash silver	L20413-001
• Asteroid silver	L20414-001
• Ocean teal	L31733-001
• Real Tree	L31734-001
• Berry mauve; Pattern: mesh knit	L50320-001
• Lumiere blue; Pattern: mesh knit	L50323-001

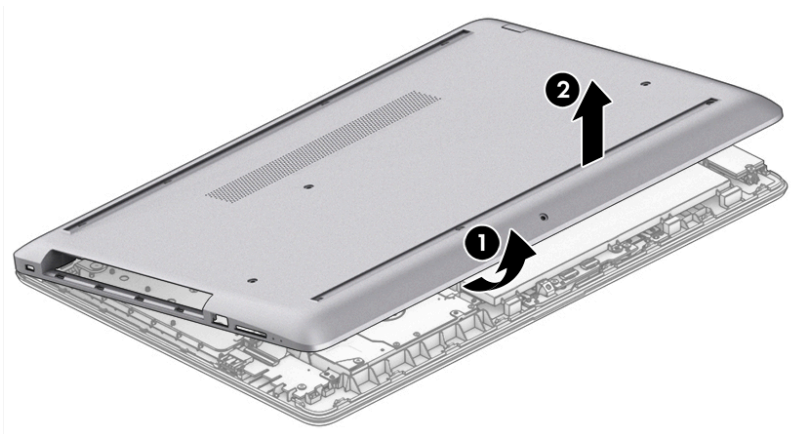
1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).

Remove the bottom cover:

1. Peel the rubber feet off the bottom of the computer (1).
2. Remove the 10 Phillips M2.5 × 9.0 screws that secure the bottom cover to the computer.



3. Starting near the middle, bottom of the bottom cover (1), pry the cover up to remove it (2).



Reverse this procedure to install the bottom cover.

## Battery

**Table 6-2 Battery description and part number**

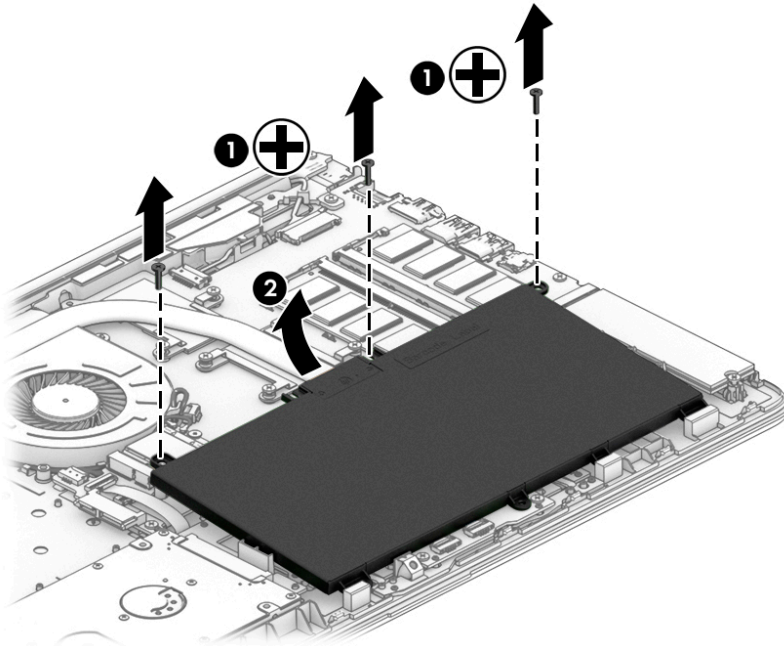
Description	Spare part number
Battery (3-cell, 48 Whr)	L11119-855

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).

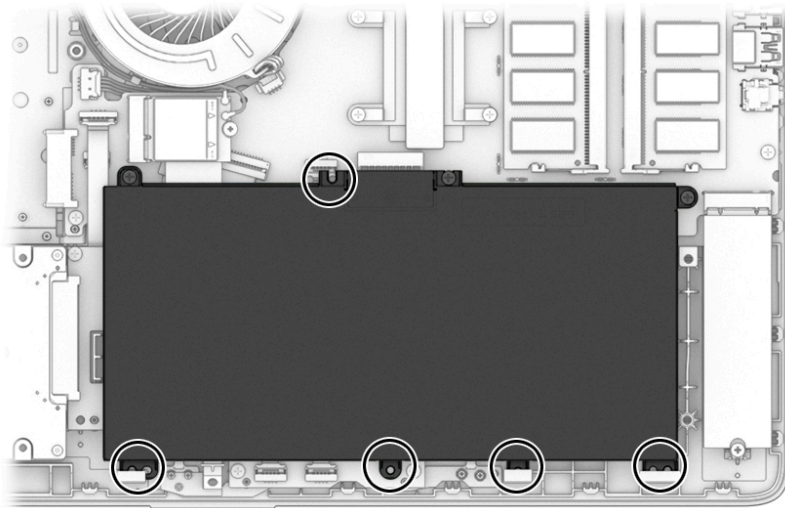
Remove the battery:

1. Remove the three Phillips M2.0 × 8.0 screws **(1)** that secure the battery to the computer.
2. Remove the battery from the computer **(2)**.



Reverse this procedure to install the battery.

When installing the battery, be sure to install screws in the proper locations. The following image shows the locations around the battery that have holes but do NOT require screws.



## Memory module

**Table 6-3** Memory module descriptions and part numbers

Description	Spare part number
Memory module, 8 GB	862398-855
Memory module, 4 GB	862397-855

Before removing the memory modules, follow these steps:

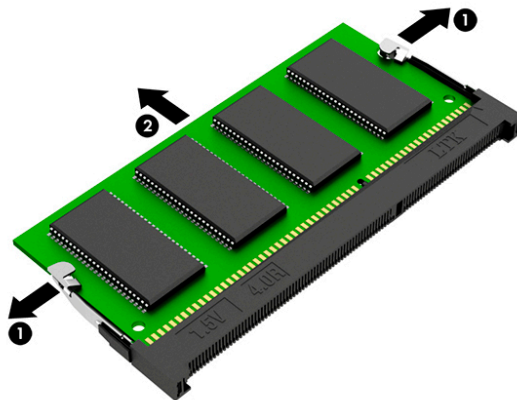
1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the memory modules:

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

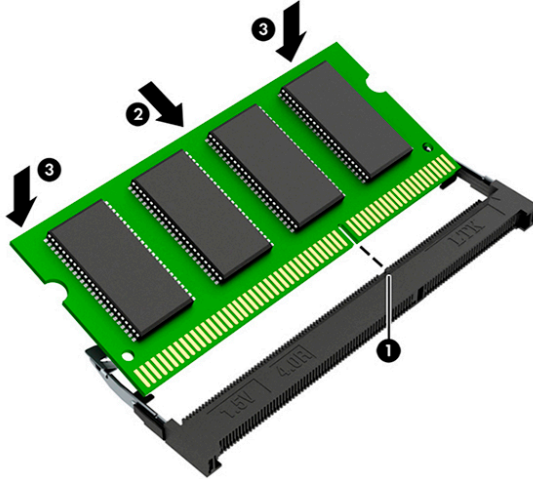


Install the memory modules:

**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)**.



# Hard drive

**Table 6-4** Hard drive descriptions and part numbers

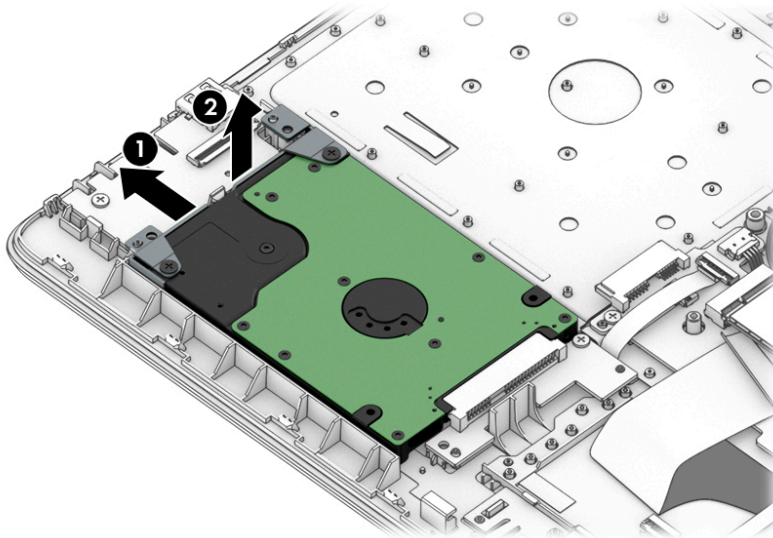
Description	Spare part number
Hard drive, 2 TB, 5400 rpm, 7 mm	912487-855
Hard drive, 1 TB, 5400 rpm, 7 mm	762990-005
Hard drive, 500 GB, 5400 rpm, 7 mm	778186-005
Hard drive bracket	L20455-001

Before removing the hard drive, follow these steps:

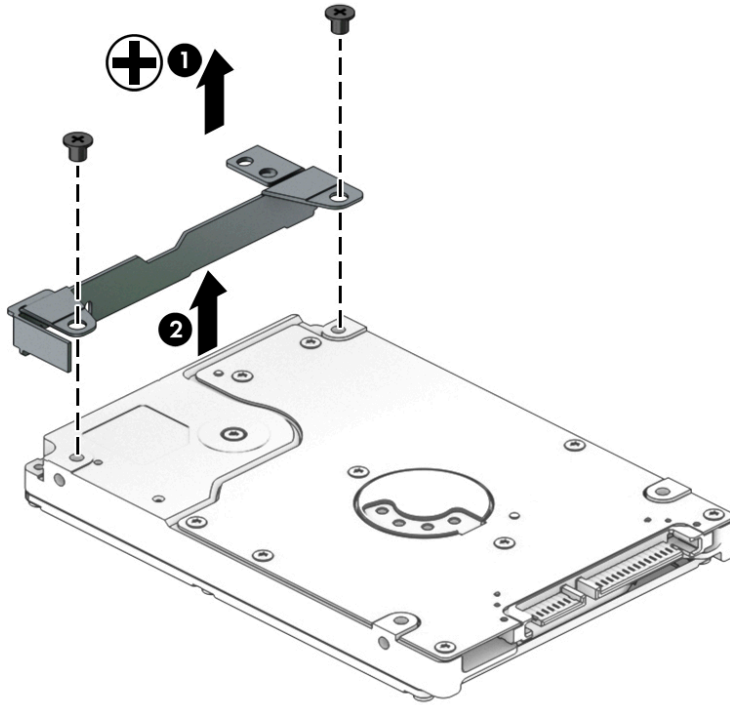
1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the hard drive:

1. Slide the hard drive away from the connector **(1)**, and then lift the hard drive out of the computer **(2)**.



2. If it is necessary to disassemble the hard drive, remove the two Phillips M3.0 × 3.0 screws **(1)**, and then lift the bracket off the drive **(2)**.



Reverse this procedure to reassemble and install the hard drive.



## Solid-state drive

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

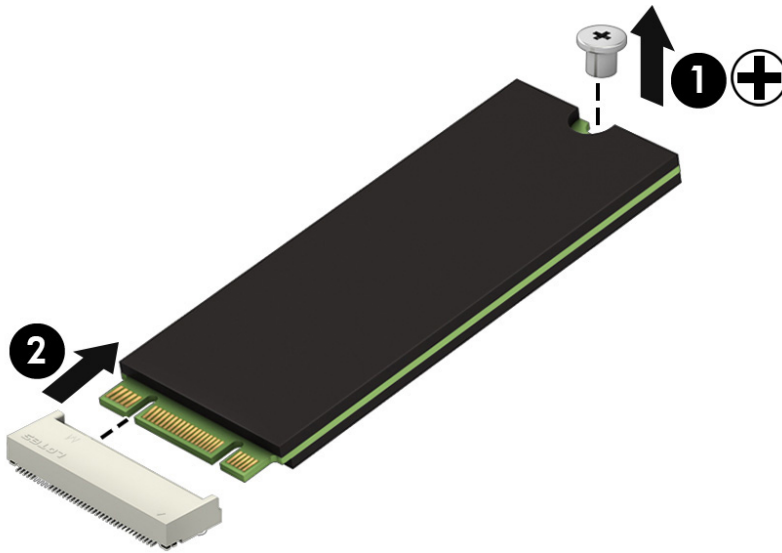
Description	Spare part number
256 GB, PCIe, NVMe	L20384-001
256 GB, SATA-3, TLC	L20382-001
128 GB, SATA-3, TLC	L20381-001

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the solid-state drive:

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



Reverse this procedure to install the solid-state drive.

## Solid-state drive bracket and connector board

**Table 6-6 Solid-state drive bracket and connector board descriptions and part numbers**

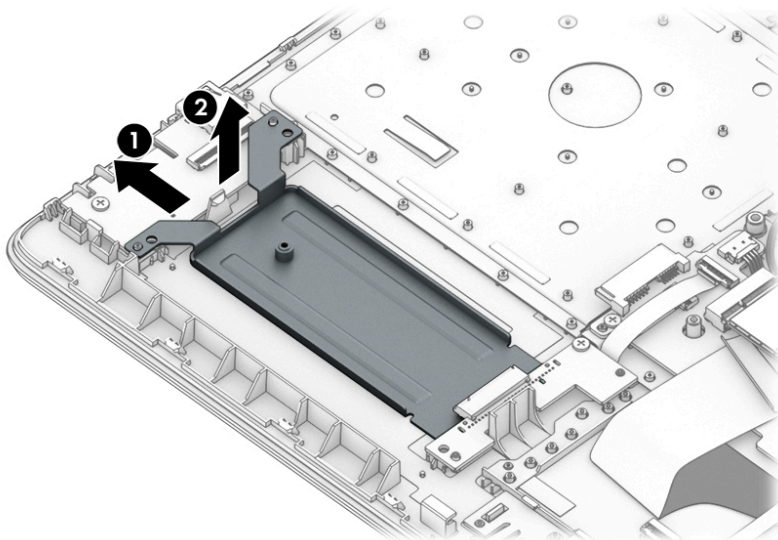
Description	Spare part number
Solid-state drive bracket	L20458-001
Solid-state drive connector board	L22542-001
Solid-state drive cable	L20456-001

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the solid-state drive (see [Solid-state drive on page 47](#)).

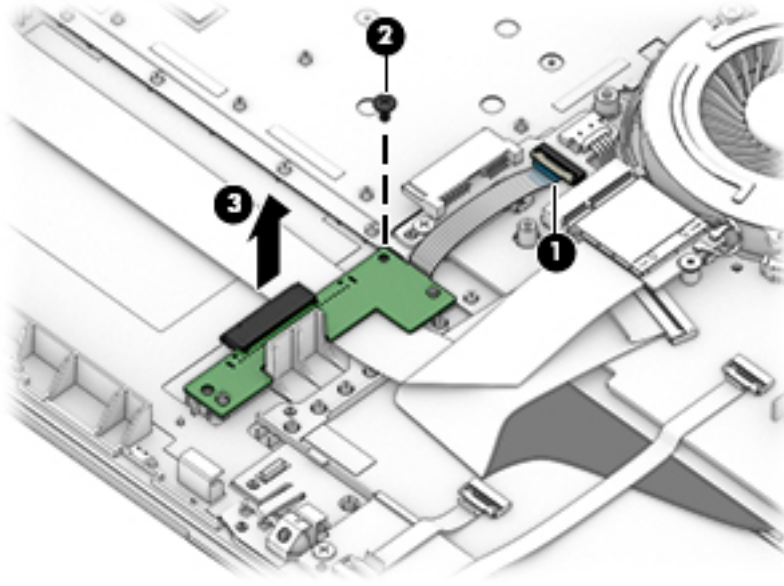
Remove the solid-state drive bracket and connector board:

1. Slide the bracket toward the side of the computer **(1)**, and then lift the bracket out of the computer **(2)**.



2. Disconnect the solid-state connector board cable from the system board ZIF connector **(1)**.
3. Remove the Phillips M2.0 x 3.0 screw **(2)** that secures the board to the computer.

4. Remove the connector board from the computer (3).



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

## WLAN module

**Table 6-7 WLAN module descriptions and part numbers**

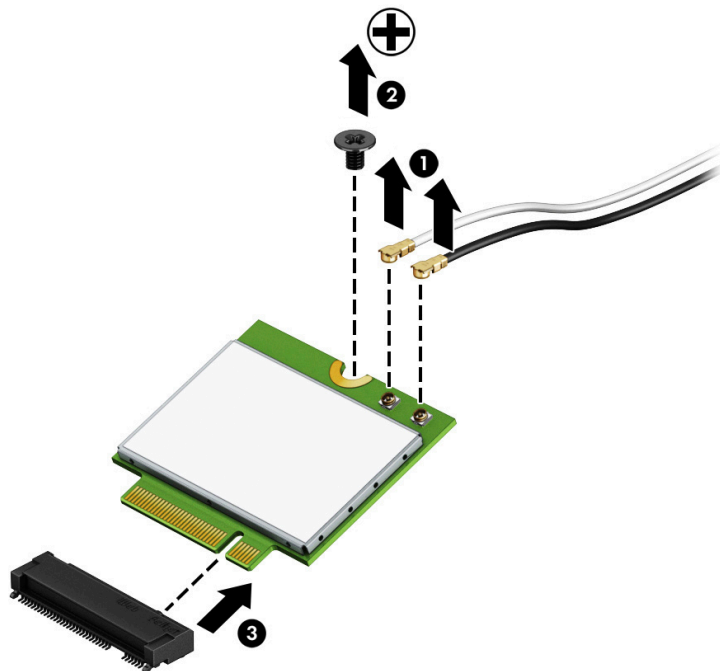
Description	Spare part number
Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	924813-855
Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	L17365-005
Realtek RTL8723DE 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter	L21480-005

Before removing the WLAN, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the WLAN module:

1. Disconnect the two antenna cables from the module **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)**, and then pull the module out of the socket **(3)**.



Reverse this procedure to install the WLAN module.

## Hard drive connector board

**Table 6-8** Hard drive connector board description and part number

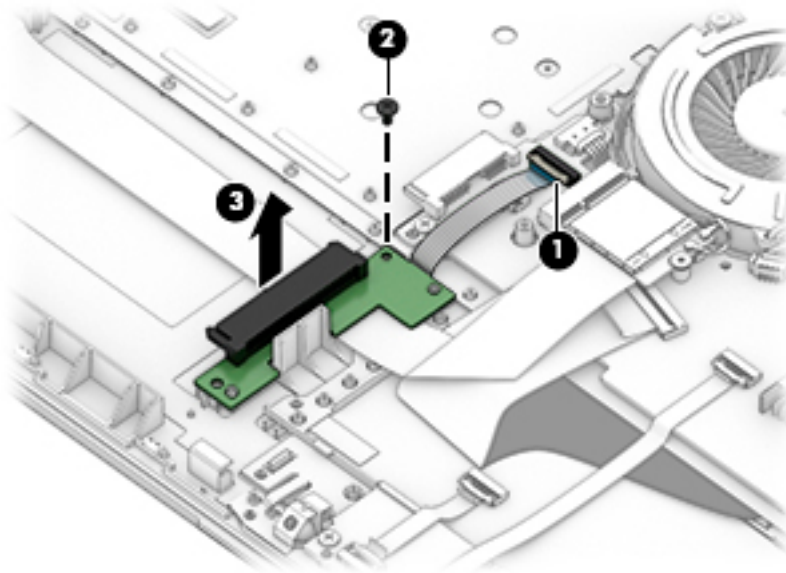
Description	Spare part number
Hard drive connector board	L20454-001

Before removing the hard drive connector board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the hard drive (see [Hard drive on page 45](#)).

Remove the hard drive connector:

1. Disconnect the cable from the system board ZIF connector **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)** that secures the board to the computer.
3. Remove the board from the computer **(3)**.



Reverse this procedure to install the hard drive connector board.

## USB/card reader board

**Table 6-9 USB/card reader board part descriptions and part numbers**

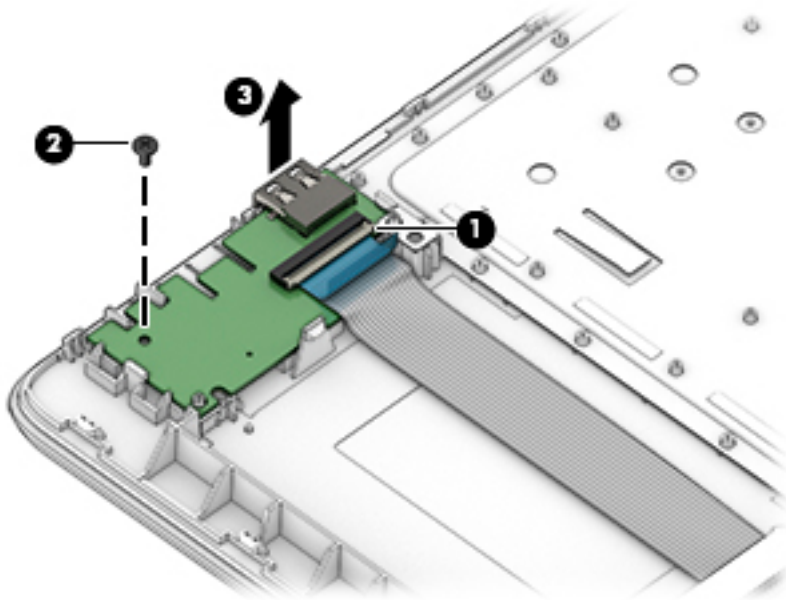
Description	Spare part number
USB/card reader board	L20448-001
USB/card reader board cable	L20452-001

Before removing the USB/card reader board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the USB/card reader board:

1. Disconnect the cable from the ZIF connector on the USB board **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)**, and then remove the board from the computer **(3)**.



Reverse this procedure to replace the USB/card reader board.

## TouchPad button board

**Table 6-10** TouchPad button board part descriptions and part numbers

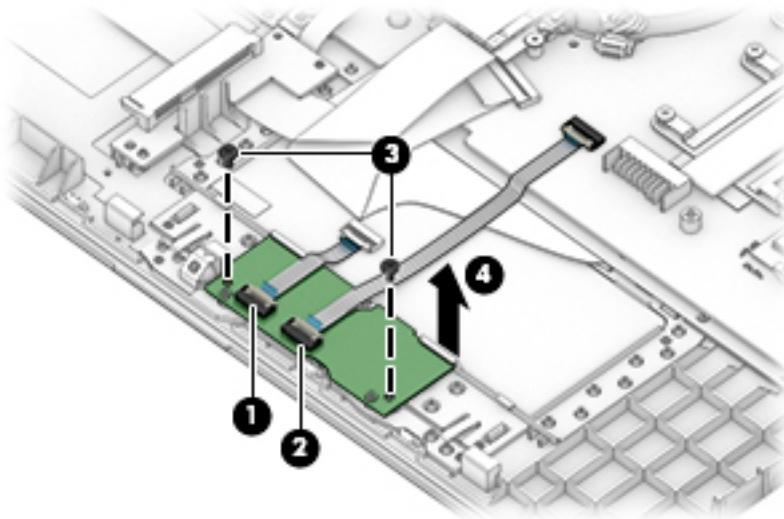
Description	Spare part number
TouchPad button board	not spared

Before removing the TouchPad button board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the TouchPad button board:

1. Disconnect the system board cable from the ZIF connector on the TouchPad button board **(1)**.
2. Disconnect the TouchPad cable from the ZIF connector on the TouchPad button board **(2)**.
3. Remove the two Phillips M2.0 × 3.0 screws **(3)** that secure the board to the computer.
4. Remove the TouchPad button board from the computer **(4)**.



Reverse this procedure to install the TouchPad button board.

## TouchPad module

**Table 6-11 TouchPad module part descriptions and part numbers**

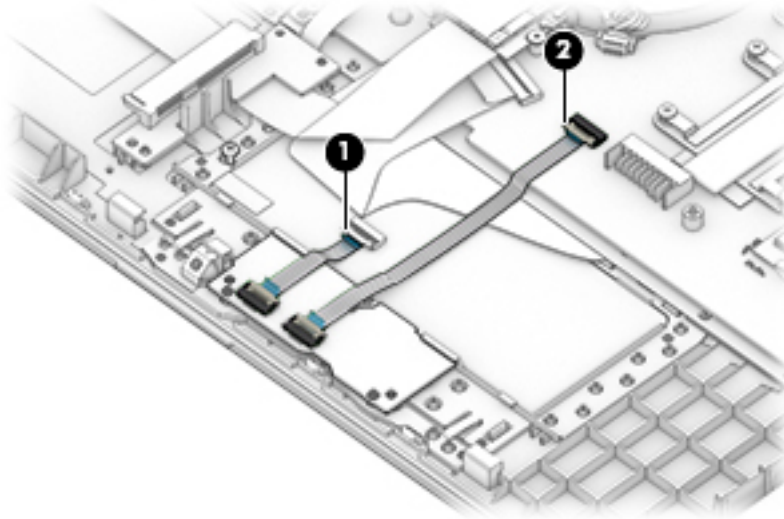
Description	Spare part number
TouchPad module	L20449-001
TouchPad module cable	L20450-001
TouchPad button board cable	L20451-001

Before removing the TouchPad module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

To remove the TouchPad module:

1. Disconnect the TouchPad cable from the ZIF connector on the TouchPad **(1)** and the TouchPad button board cable from the ZIF connector on the system board **(2)**.

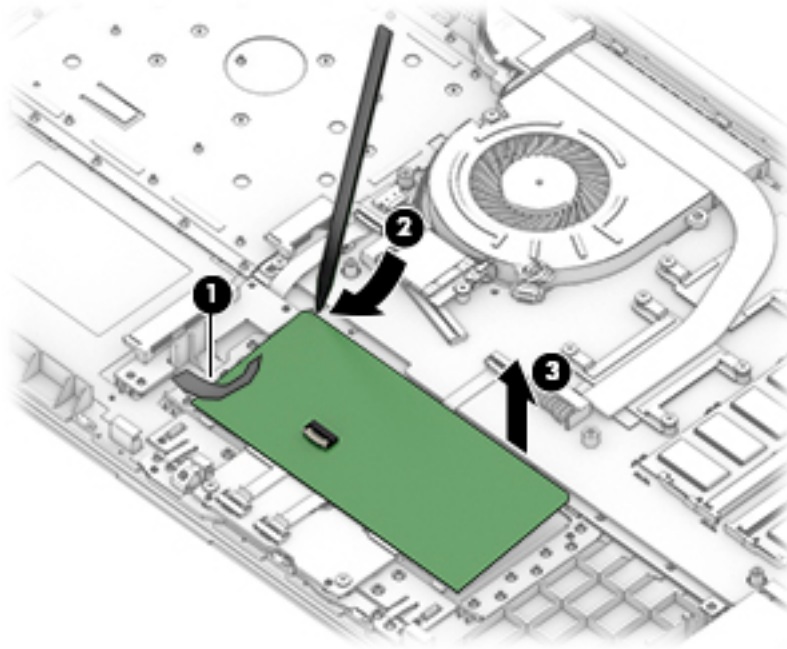


2. Peel the tape off the TouchPad **(1)**.
3. Starting in the corner, use a plastic, non-marking tool to pry up the TouchPad module to disengage the adhesive that secures it to the top cover **(2)**.



4. Working around each edge, pry the TouchPad module loose, and then remove it from the computer **(3)**.

 **NOTE:** The TouchPad module may be very tight and difficult to remove.



Reverse this procedure to install the TouchPad module.

## Fan

**Table 6-12 Fan descriptions and part numbers**

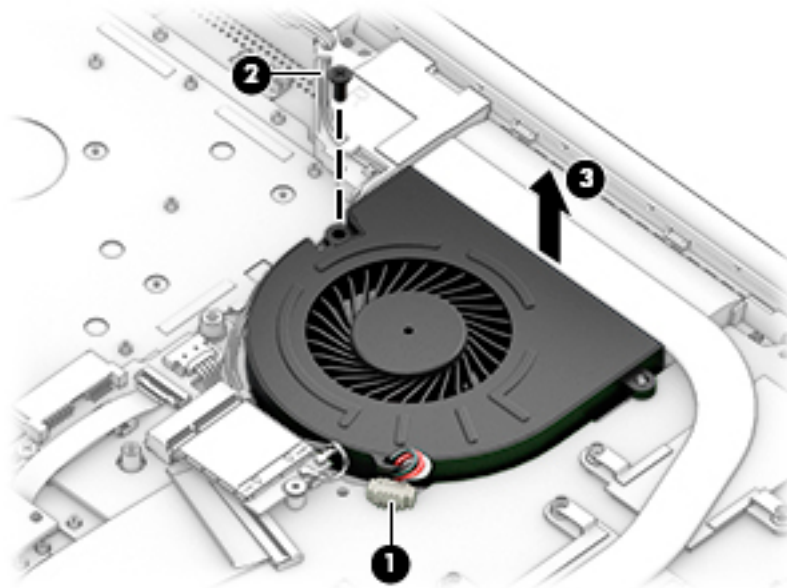
Description	Spare part number
Fan for use in models with discrete graphics	L20473-001
Fan for use in models with UMA graphics	L20474-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

Remove the fan:

1. Disconnect the fan cable from the system board **(1)**.
2. Remove the Phillips M2.5 × 6.0 screw **(2)** that secures the fan to the computer.
3. Lift the fan from the computer **(3)**.



Reverse this procedure to install the fan.

## Heat sink assembly

**Table 6-13 Heat sink assembly descriptions and part numbers**

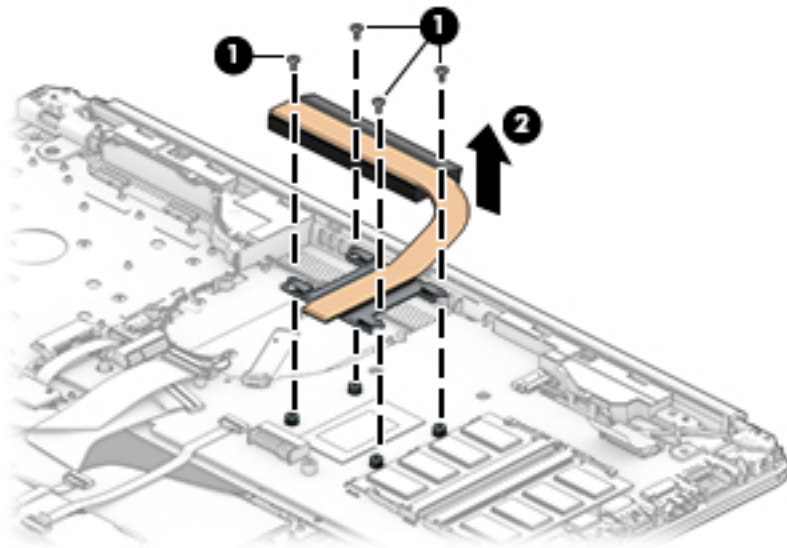
Description	Spare part number
Heat sink for use in models with AMD Ryzen processors and discrete graphics	L20482-001
Heat sink for use in models with AMD A6/A9 processors and discrete graphics	L20484-001
Heat sink for use in models with AMD Ryzen processors and integrated UMA graphics	L20483-001
Heat sink for use in models with AMD A6/A9 processors and integrated UMA graphics	L20491-001
Heat plate for use in fanless models with AMD E2-9000e processors	L20494-001

Before removing the heat sink, follow these steps:

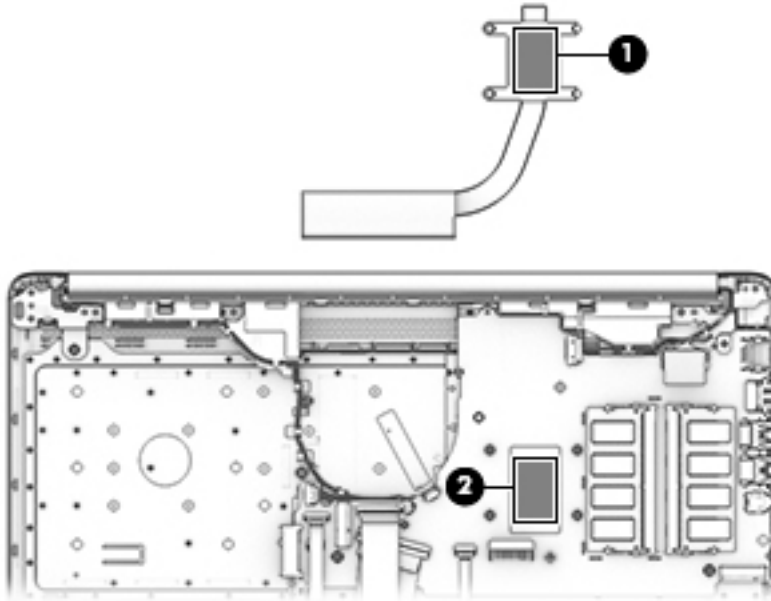
1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

To remove the heat sink assembly from products with integrated UMA graphics:

1. In the order indicated on the heat sink assembly, remove the four Phillips M2.0 × 3.0 screws **(1)** that secure the heat sink to the computer.
2. Lift the heat sink assembly from the computer **(2)**.

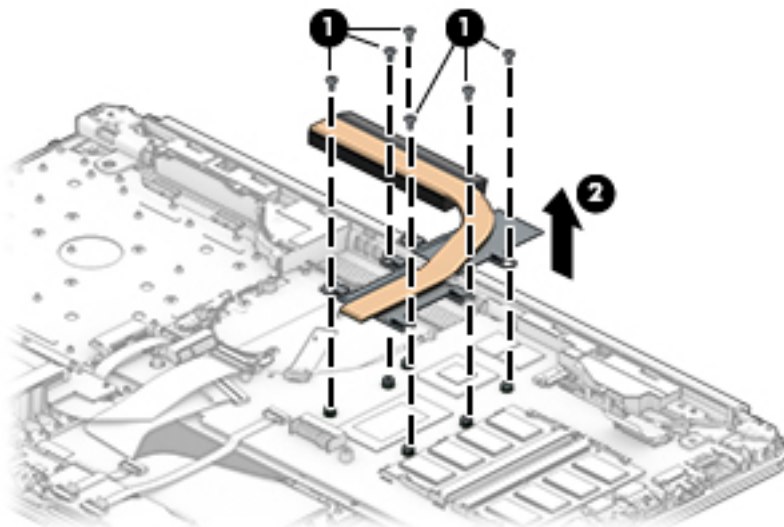


3. Thoroughly clean the thermal material from the surface of the heat sink **(1)** and its associated system board component **(2)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

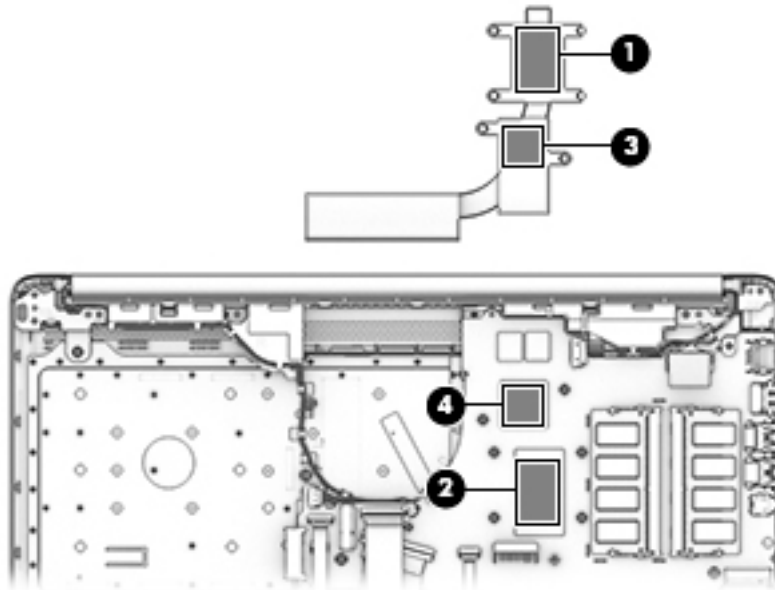


To remove the heat sink assembly from products with discrete graphics:

1. In the order indicated on the heat sink assembly, remove the six Phillips M2.0 × 3.0 screws **(1)** that secure the heat sink to the computer.
2. Lift the heat sink assembly from the computer **(2)**.

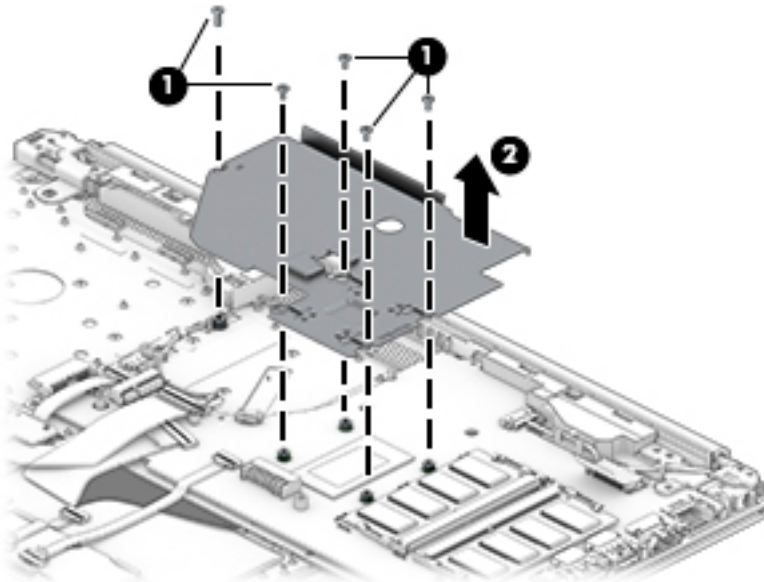


3. Thoroughly clean the thermal material from the surfaces of the heat sink **(1)** **(3)** and associated system board components **(2)** **(4)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

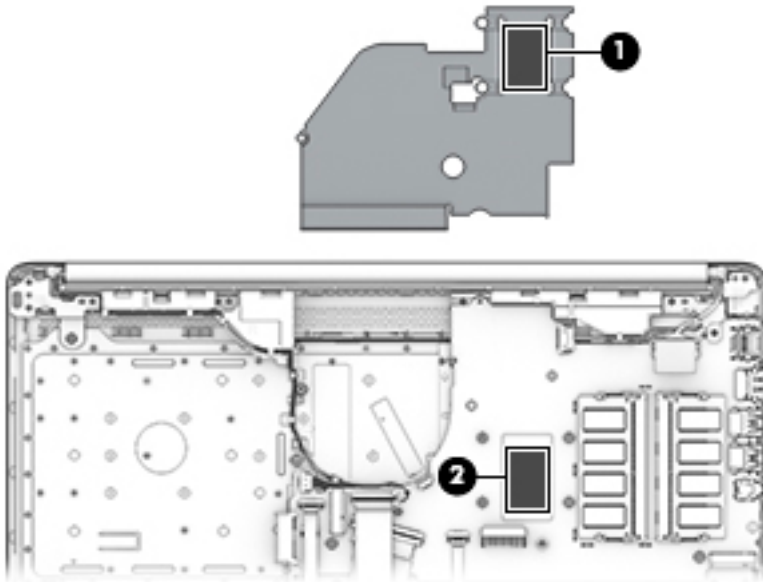


To remove the heat plate from fanless models:

1. In the order indicated on the heat plate, remove the five Phillips M2.0 × 3.0 screws **(1)** that secure the heat plate to the computer.
2. Lift the heat plate from the computer **(2)**.



3. Thoroughly clean the thermal material from the surface of the heat plate **(1)** and associated system board component **(2)** each time the heat plate is removed. Replacement thermal material is included with the heat plate and system board spare part kits.



Reverse this procedure to install the heat plate or heat sink assembly.

## Display assembly

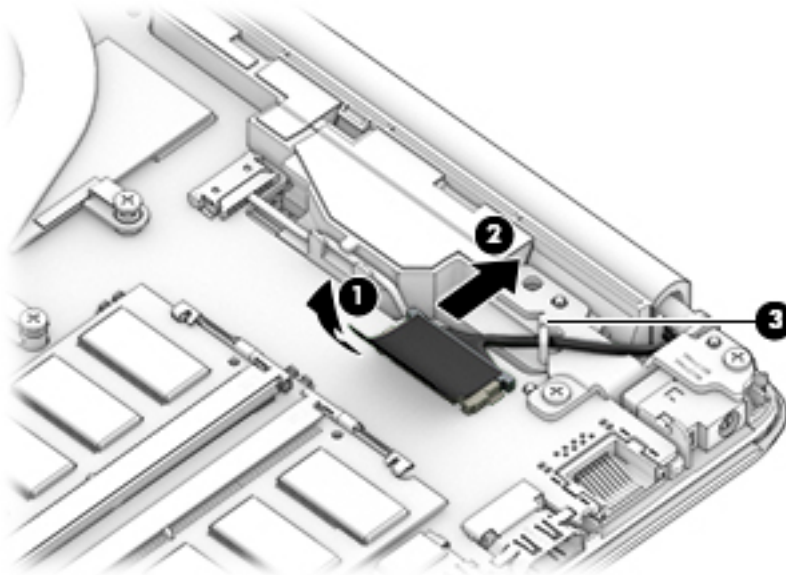
Full hinge-up displays are not spared. Displays are spared only at the subcomponent level.

Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).

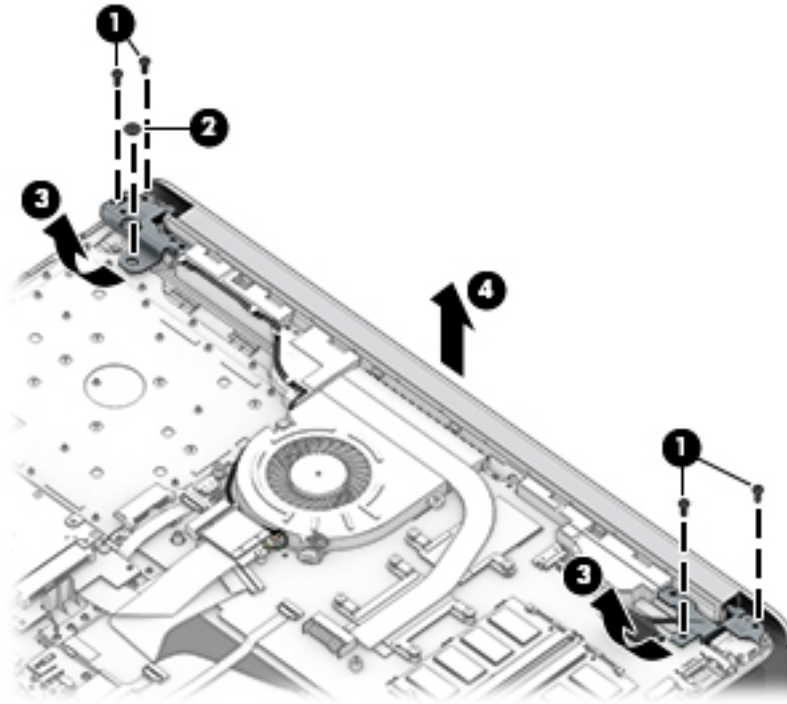
Remove the display assembly:

1. Lift the tape from the display connector on the system board **(1)**.
2. Disconnect the cable from the connector **(2)**.
3. Remove the cable from the clip **(3)**.



4. Remove the four Phillips M2.5 × 6.0 screws **(1)** from the display hinges.
5. Remove the Phillips broad head M2.0 × 2.0 screw **(2)** from the right display hinge.
6. Rotate the hinges upward **(3)**.

7. Separate the display from the computer (4).



Remove the display assembly subcomponents:

1. To remove the hinge cover, pull upward near the hinge to disengage it from the display enclosure (1), and then remove the hinge cover from the display enclosure (2).

Hinge covers are available using the following spare part numbers:

L20423-001: Jet black

L20427-001: Sparkling black

L20424-001: Natural silver

L20425-001: Pale gold

L57159-001: Pale rose gold

L28516-001: Iridescent pale rose gold

L20430-001: Scarlet red

L20426-001: Twilight blue

L20428-001: Smoke gray

L20422-001: Snow white (full-featured models)

L21306-001: Snow white (defeatured models)

L20431-001: Maroon burgundy

L28517-001: Iridescent ceramic white

L31729-001: Ocean teal

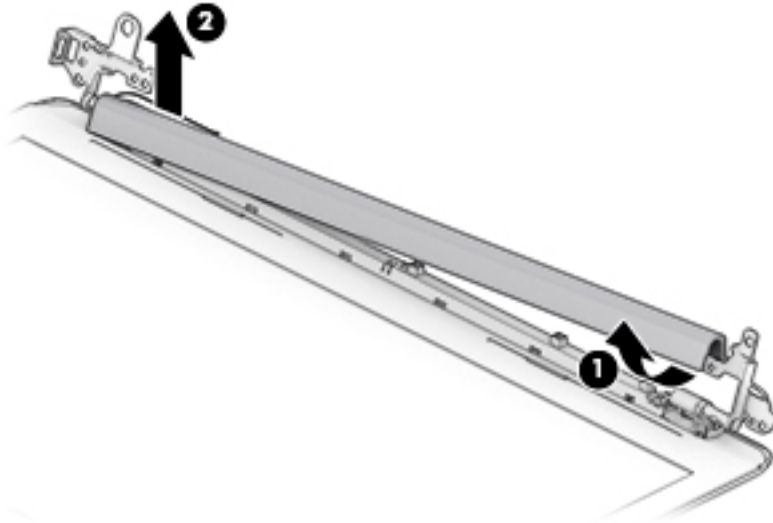
L31730-001: Real Tree



L50294-001: Berry mauve; Pattern: mesh knit

L50295-001: Chalkboard gray; Pattern: mesh knit

L50297-001: Lumiere blue; Pattern: mesh knit

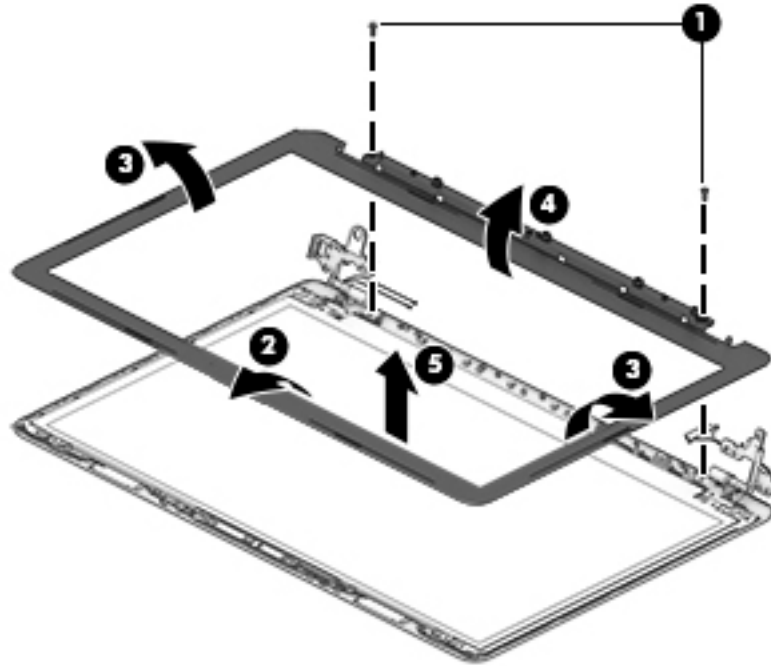


When replacing the hinge cover, make sure the hinges rotate downward as far as they can go. Align the cover, and then start from above and rotate the cover downward onto the hinges. Make sure the clips snap into place along the bottom of the display cover.

2. If it is necessary to replace the display bezel:
  - a. Remove the two Phillips M2.0 × 3.0 screws **(1)**, flex the top **(2)** of the bezel, the inside edges of the left and right sides **(3)**, and then the bottom **(4)** of the bezel until it disengages from the display enclosure.

**b. Remove the bezel (5).**

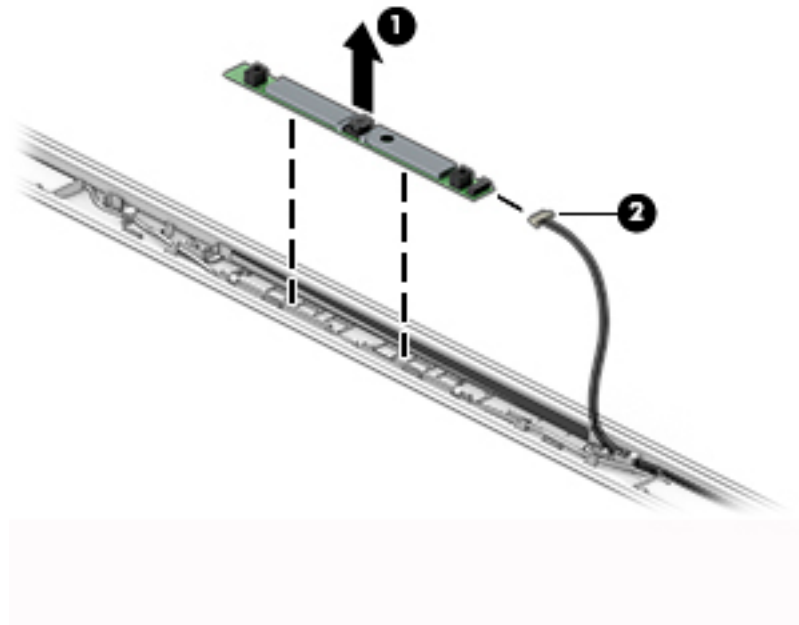
The display bezel is available using spare part number L20421-001 for standard bezels and L32367-001 for Real Tree bezels.




**3. If it is necessary to replace the camera/microphone module:**

- a.** Detach the module (1) from the display back cover. (The module is attached with double-sided adhesive.)
- b.** Disconnect the cable (2) from the camera/microphone module.

The HD camera module is available using spare part number L20447-001. The VGA camera module is available using spare part number L20446-001.

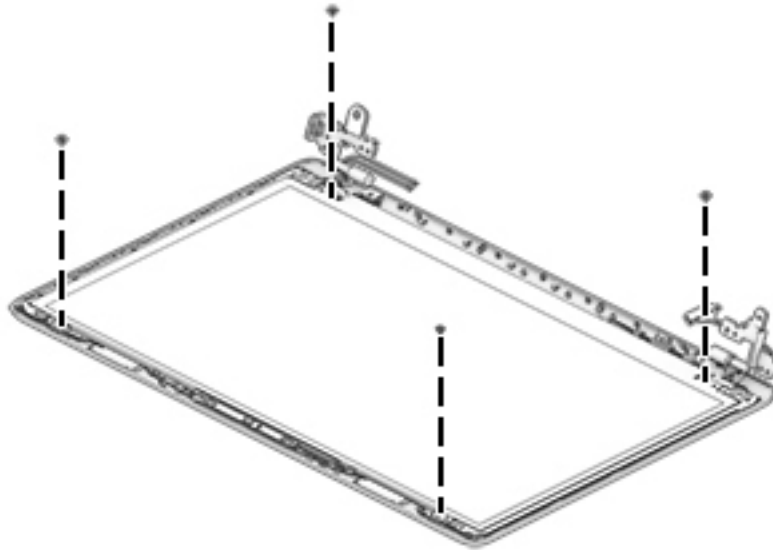


4. If it is necessary to replace the display panel:

 **IMPORTANT:** HD panels are secured to the display enclosure with screws. FHD panels are secured with tape.

**a. HD panels:**

Remove the four Phillips M2.0 × 3.0 screws that secure the panel to the display enclosure.

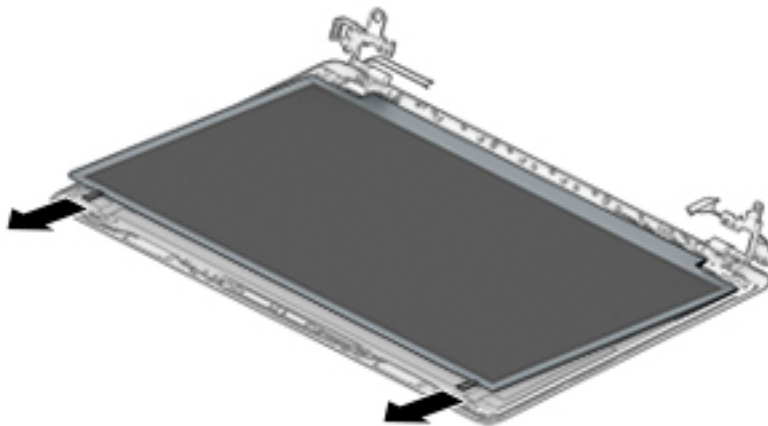


**FHD panels:**

**b.** Pull the tape out from behind the left and right sides of the panel.

 **NOTE:** You have to pull on the tape multiple times before it is completely removed.

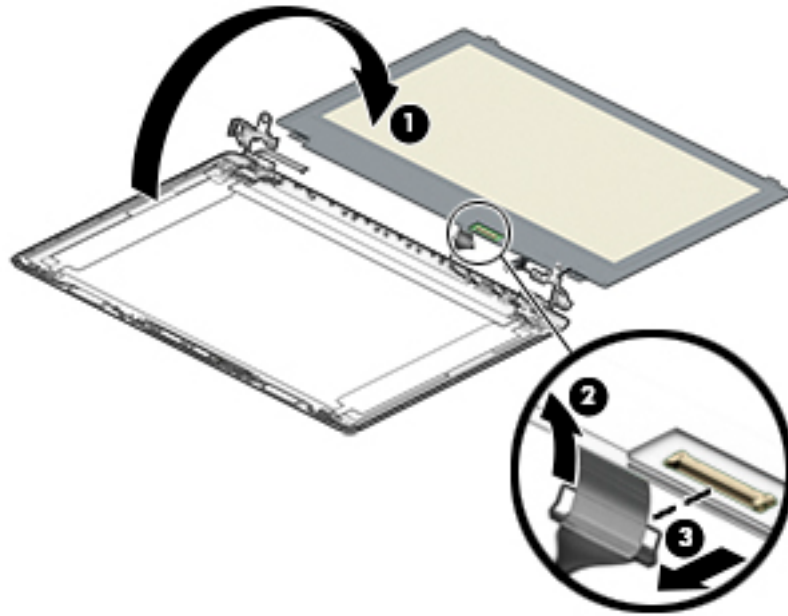
Display panel stretchable adhesive tape is available using spare part number L29080-001.



**c. HD and FHD panels:**

Swing the top edge of the display panel forward and position it upside down next to the display enclosure **(1)**.

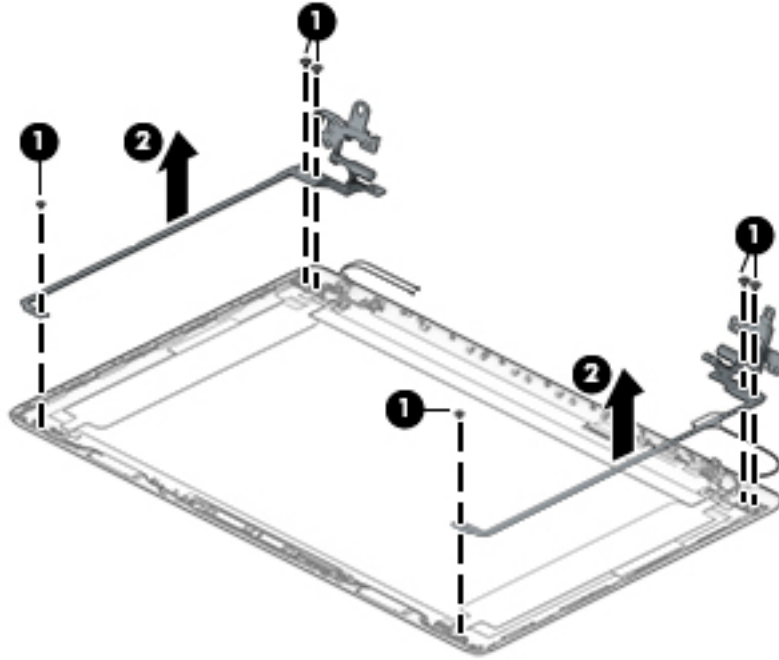
- d. Release the adhesive support strip **(2)** that secures the display panel cable connector to the display panel.
- e. Disconnect the display panel cable **(3)** from the display panel.



- f. Remove the display panel.  
Raw display panels are available using the following spare part numbers:  
L23208-001: FHD, anti glare  
L23209-001: FHD, BrightView  
L23210-001: HD, anti glare  
L23211-001: HD, BrightView
5. If it is necessary to replace the display hinges:
- a. Remove the three Phillips M2.5 × 2.5 screws **(1)** from each hinge.

- b.** Remove the display hinges (2).

The display hinges are available using spare part number L20420-001.



- 6.** If it is necessary to replace the display panel cable:

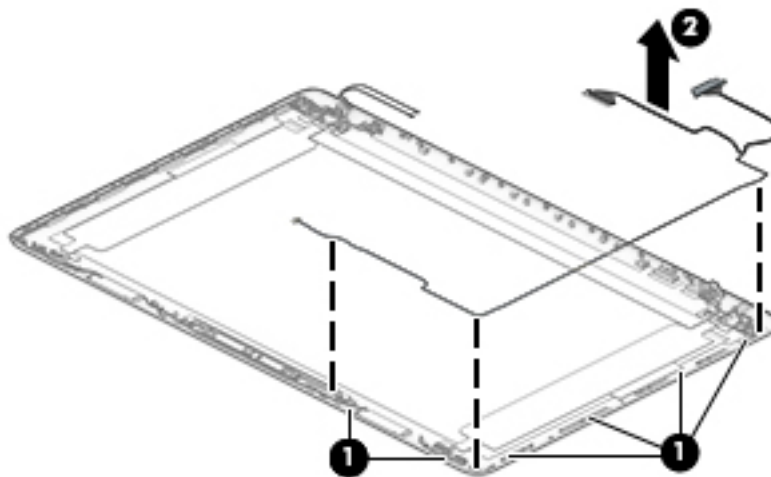
- a.** Release the cable from the retention clips and routing channel built into the bottom edge and side of the display enclosure (1).
- b.** Remove the display panel cable (2).

The display panel cable is available using the following spare part numbers:

L20443-001: HD, non-touch display

L23064-001: FHD, non-touch display

L20442-001: HD, touch display



- 7.** If it is necessary to replace the wireless antenna cables and transceivers:

- a. Remove the antennas from the top of the display enclosure **(1)**.
- b. Release the wireless antenna cables from the retention clips and routing channel built into the sides of the display enclosure **(2)**.

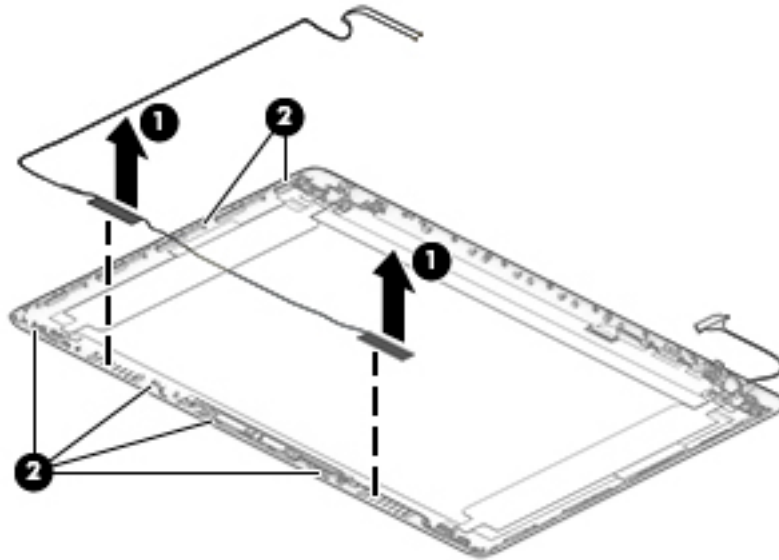
Antennas are available using the following spare part numbers:

L20445-001: Single antenna models

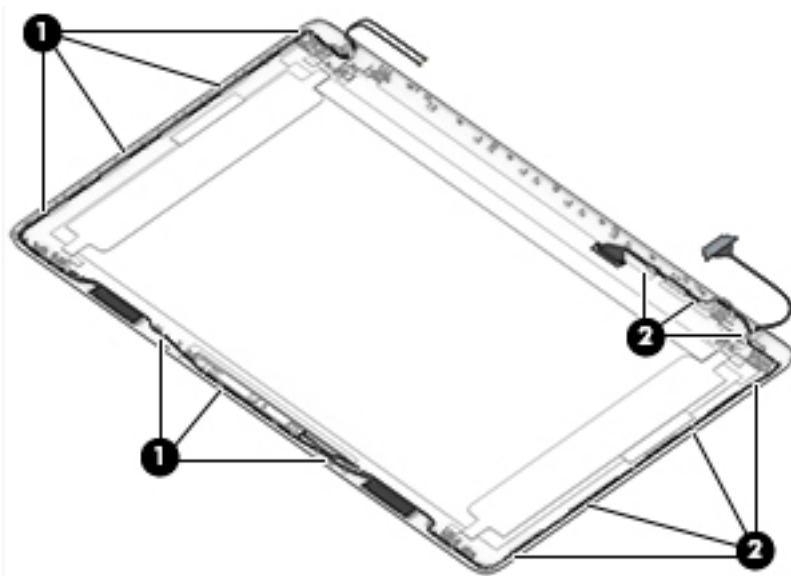
L23060-001: Single antenna, narrow bezel models

L20444-001: Dual antenna models

L23059-001: Dual antenna, narrow bezel models



Use the following image to determine proper cable routing in the display of the antenna cable **(1)** and display cable **(2)**.



The display rear cover is available using the following spare part numbers:

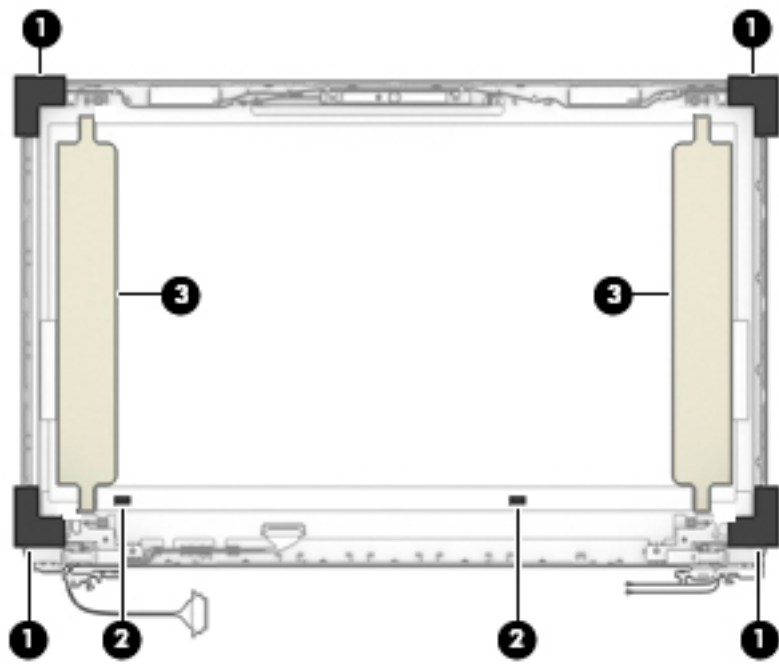
L20433-001: Jet black

L23061-001: Jet black (narrow bezel models)  
L20437-001: Sparkling black  
L20434-001: Natural silver  
L23062-001: Natural silver (narrow bezel models)  
L20435-001: Pale gold  
L57158-001: Pale rose gold  
L20440-001: Scarlet red  
L20436-001: Twilight blue  
L20438-001: Smoke gray  
L23063-001: Smoke gray (narrow bezel models)  
L20432-001: Snow white (full-featured models)  
L21307-001: Snow white (defeatured models)  
L20441-001: Maroon burgundy  
L28509-001: Iridescent ceramic white  
L28508-001: Iridescent pale rose gold  
L31723-001: Ocean teal  
L31724-001: Real Tree  
L50301-001: Berry mauve; Pattern: mesh knit  
L50302-001: Chalkboard gray; Pattern: mesh knit  
L50303-001: Jet black; Pattern: mesh knit  
L50304-001: Lumiere blue; Pattern: mesh knit  
L50306-001: Snow white; Pattern: mesh knit; for use in defeatured models  
L50307-001: Snow white; Pattern: mesh knit; for use in full-featured models  
L54498-001: Chalkboard gray pattern; mesh knit  
L54499-001: Jet black; Pattern: mesh knit; for use on narrow bezel models

Reverse these procedures to reassemble and install the display assembly components.

When reassembling an FHD display assembly, be sure to install the following parts into the display enclosure from the Display Miscellaneous Kit, spare part number L23065-001 and display panel stretchable adhesive tape, spare part number L29080-001.

- (1)** Four positioning corner pieces
- (2)** Two gaskets
- (3)** Display panel stretchable adhesive tape





## System board



**NOTE:** All system board spare part kits include replacement thermal material.

All system boards use the following part numbers:

xxxxxx-001: Non-Windows operating systems

xxxxxx-601: Windows operating system

**Table 6-14 System board descriptions and part numbers**

Description	Spare part number
System board for use in models with discrete graphics memory:	
• AMD Athlon 300U processor and Radeon 530 graphics	L53469-xx1
• AMD Ryzen 3-3200U processor and Radeon 530 graphics	L46517-xx1
• AMD Ryzen 3-2200U processor and Radeon 530 graphics	L20668-xx1
• AMD A9-9425 processor and Radeon 530 graphics	L46513-xx1
• AMD A9-9425 processor and Radeon 520 graphics	L20480-xx1
• AMD A6-9225 processor and Radeon 530 graphics	L46514-xx1
• AMD A6-9225 processor and Radeon 520 graphics	L20481-xx1
System board for use in models with UMA graphics memory:	
• AMD Ryzen 7-3700U processor	L51325-xx1
• AMD Ryzen 5-3500U processor	L46515-xx1
• AMD Ryzen 3-3200U processor	L46516-xx1
• AMD Ryzen 5-2500U processor	L20664-xx1
• AMD Ryzen 3-2300U processor	L20665-xx1
• AMD Ryzen 3-2200U processor	L20666-xx1
• AMD A9-9425 processor	L20477-xx1
• AMD A6-9225 processor	L20478-xx1
• AMD A4-9125 processor	L31720-xx1
• AMD E2-9000e processor	L20479-xx1

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the following components:
  - a. Optical drive (see [Optical drive on page 34](#))
  - b. Bottom cover (see [Bottom cover on page 38](#))
  - c. Battery (see [Battery on page 41](#))
  - d. Display (see [Display assembly on page 61](#))

When replacing 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:

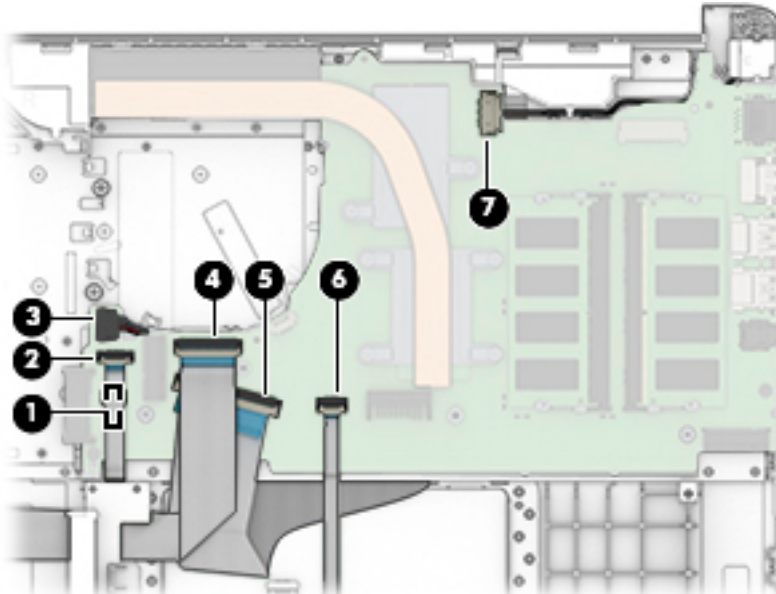
- WLAN module (see [WLAN module on page 50](#))
- Memory modules (see [Memory module on page 43](#))
- Heat sink (see [Heat sink assembly on page 57](#))

Remove the system board:

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

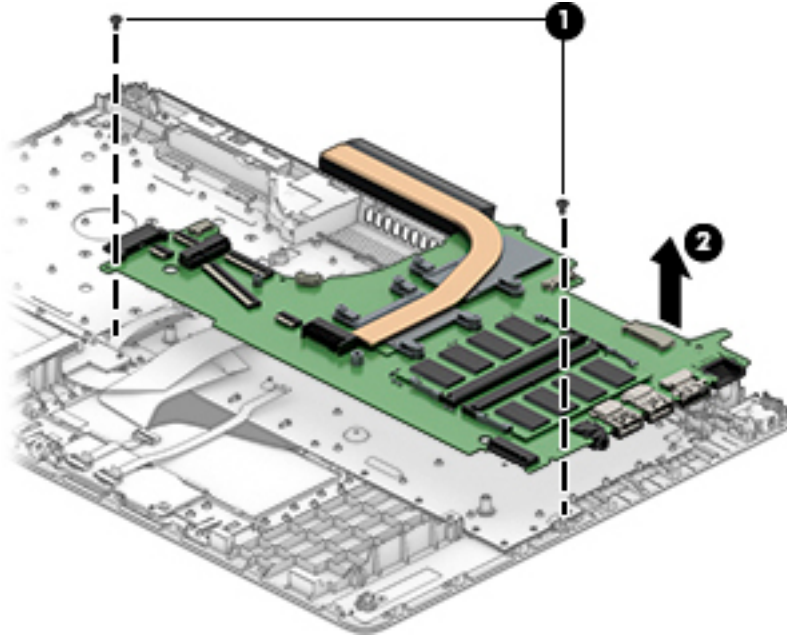
1. Disconnect the following cables from the system board:

- (1) Keyboard backlight cable
- (2) Hard drive connector cable
- (3) Speaker cable
- (4) USB/card reader board cable
- (5) Keyboard cable
- (6) TouchPad button board cable
- (7) Power connector cable



2. Remove the two Phillips M2.0 × 3.0 screws that secure the system board to the computer (1).

3. Lift the left side of the system board, and then remove the system board from the computer (2).



Reverse this procedure to install the system board.

## Speakers

**Table 6-15 Speaker Kit description and part number**

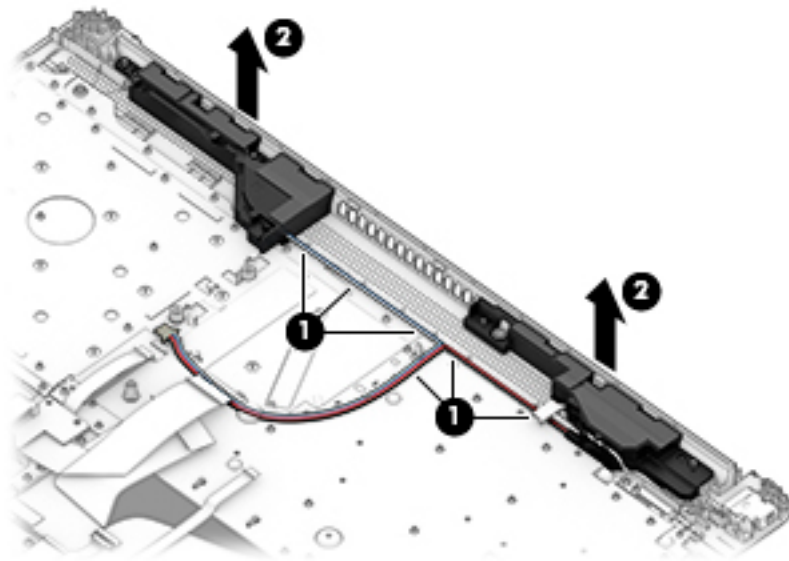
Description	Spare part number
Speaker Kit	L20453-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the display (see [Display assembly on page 61](#)).

Remove the speakers:

1. Remove the speaker cable from the clips built into the computer **(1)**.
2. Remove the speakers from the computer **(2)**.



Reverse this procedure to install the speakers.

## Power connector cable (DC-in)

**Table 6-16** Power connector cable description and part number

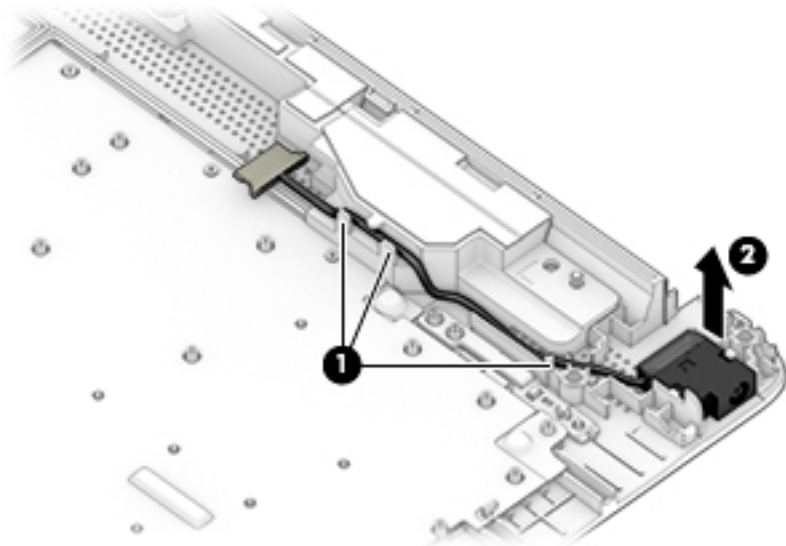
Description	Spare part number
Power connector cable	L20475-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 33](#)).
2. Remove the optical drive (see [Optical drive on page 34](#)).
3. Remove the bottom cover (see [Bottom cover on page 38](#)).
4. Remove the battery (see [Battery on page 41](#)).
5. Remove the system board (see [System board on page 71](#)).
6. Remove the display (see [Display assembly on page 61](#)).

Remove the power connector cable:

1. Remove the cable from the clips built into the computer (**1**).
2. Remove the power connector cable from the computer (**2**).



Reverse this procedure to install the power connector cable.

## Top cover with keyboard

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

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

**Table 6-17 Top cover with keyboard descriptions and part numbers**


Description	Spare part number
Keyboard, no backlight, jet black	L20387-xx1
Keyboard, no backlight, full-featured models, snow white	L20388-xx1
Keyboard, no backlight, defeatured models, snow white	L23066-xx1
Keyboard, no backlight, ash silver	L20386-xx1
Keyboard, backlit, ash silver (available only with -001 United States, -002 India, and -DB1 Canadian French keyboards)	L23074-xx1
Keyboard, no backlight, iridescent pale rose gold (available only with -001 United States keyboards)	L28504-001
Keyboard, backlit, iridescent pale rose gold (available only with -001 United States keyboards)	L28505-001
Keyboard, no backlight, iridescent ceramic white (available only with -001 United States keyboards)	L28506-001
Keyboard, backlit, iridescent ceramic white (available only with -001 United States keyboards)	L28507-001
Keyboard, no backlight, ocean teal (available only with -001 United States keyboards)	L31735-001
Keyboard, no backlight, Real Tree (available only with -001 United States keyboards)	L31736-001
Keyboard, no backlight, natural silver (available only with -002 India keyboards)	L32368-002
Keyboard, backlit, ocean teal (available only with -001 United States keyboards)	L32863-001
Keyboard, backlit, natural silver (available only with -002 India keyboards)	L32864-002

**Table 6-18 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
Bulgaria	-261	Italy	-061	South Korea	-AD1
Canada	-DB1	Japan	-291	Spain	-071
Czech Republic and Slovakia	-FL1	Latin America	-161	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	Taiwan	-AB1
France	-051	Portugal	-131	Thailand	-281
Germany	-041	Romania	-271	Turkey	-141
Greece	-151	Russia	-251	United Kingdom	-031
Hungary	-211	Saudi Arabia	-171	United States	-001
India	-002				

# 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)

 **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 77](#)).
  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 78](#).

## Downloading a BIOS update

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


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

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

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

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

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

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



# 8 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 79](#).

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 81](#).

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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 81](#).

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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.


---

## 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.


---

# 9 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 84](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 84](#)).
- **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 84](#)).
- **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 84](#)).

---

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


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

---

## Backing up information and creating recovery media


### Using Windows tools

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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 84](#).

### 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 84](#).



---

**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:



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**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.

# 10 Specifications

## Computer specifications

**Table 10-1 Computer specifications**

	Metric	U.S.
<b>Dimensions</b>		
Length	246.0 mm	10.72 in
Width	376.0 mm	16.33 in
Height	22.5 mm	0.97 in
<b>Weight</b> (lowest configuration)		
SSD, Ryzen processors, UMA graphics	1829.5 g	4.03 lbs
SSD, A9/A6/A4 processors, UMA graphics	1771.5 g	3.91 lbs
SSD, Ryzen/A9/A6/A4 processors, discrete graphics	1855.5 g	4.09 lbs
HDD and ODD, Ryzen processors, UMA graphics	2062.7 g	4.55 lbs
HDD and ODD, A9/A6/A4 processors, UMA graphics	2004.7 g	4.42 lbs
HDD and ODD, Ryzen/A9/A6/A4 processors, discrete graphics	2088.7 g	4.60 lbs
<b>Input power</b>		
Operating voltage	19.0 V dc @ 4.74 A – 90 W or 18.5 V dc @ 3.5 A - 65 W or 45 W	
Operating current	4.74 A or 3.5 A	
<b>Temperature</b>		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
<b>Relative humidity</b>		
Operating	10% to 90%	
Nonoperating	5% to 95%	

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



## 39.6-cm (15.6-in) display specifications

**Table 10-2 Display specifications**

	<b>Metric</b>	<b>U.S.</b>
Active diagonal size	39.6-cm	15.6-in
Resolution	FHD: 1920 × 1080 HD: 1366 × 768	
Surface treatment	Anti-glare BrightView	
Brightness	220 nits 200 nits (BrightView, HD, Touch-on Panel)	
Viewing angle	SVA UWVA (FHD, anti glare panel)	
Backlight	WLED	
Aspect ratio	16:10 ultra wide	
Display panel interface	eDP	
Width	Slim-flat, 3.2 mm	

## M.2 SATA solid-state drive specifications

**Table 10-3 Solid-state drive specifications**

	<b>128-GB*</b>	<b>256-GB*</b>
<b>Height</b>	1.35 mm	1.35 mm
<b>Weight</b>	< 10 g	< 10 g
<b>Form factor</b>	M.2 2280-D2-B-M	M.2 2280-D2-B-M
<b>Transfer rate</b>	up to 540 MB/sec	up to 540 MB/sec
<b>Interface type</b>	SATA-3	SATA-3
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms
Access times, logical	0.1 ms	0.1 ms
<b>Total logical sectors</b>	234,441,648	468,883,296
<b>Operating temperature</b>	0°C to 70°C (32°F to 158°F)	
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.		
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.		

## M.2 PCIe solid-state drive specifications

**Table 10-4 Solid-state drive specifications**

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

# Hard drive specifications

**Table 10-5 Hard drive specifications**

	2-TB*	1-TB*	500-GB*
<b>Dimensions</b>			
Height	7.2 mm or 9.5 mm	7.2 mm or 9.5 mm	7.0 mm
Length	100.4 mm	100.4 mm	100.6 mm
Width	69.9 mm	69.9 mm	70.1 mm
Weight	130.0 g	107.0 g	92.0 g
<b>Interface type</b>	SATA	SATA	SATA
<b>Transfer rate</b>			
Synchronous (maximum)	300 MB/sec	300 MB/sec	300 MB/sec
Security	ATA security	ATA security	ATA security
<b>Seek times</b> (typical read, including setting)			
Single track	2.0 ms	2.0 ms	3 ms
Average (read/write)	12 ms	12 ms	13 ms
Maximum	22 ms	22 ms	24 ms
<b>Logical blocks</b>	3,907,029,168	1,953,525,168	1,048,576,000
<b>Disk rotational speed</b>	5400 rpm	5400 rpm	5400 rpm
<b>Operating temperature</b>	0°C to 60°C (32°F to 140°F)		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
<b>NOTE:</b> Certain restrictions and exclusions apply. Contact technical support for details.			

# 11 Power cord set requirements

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

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

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

## Requirements for all countries

The following requirements are applicable to all countries and regions:

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

## Requirements for specific countries and regions

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

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

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

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

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

---

## 12 Recycling

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

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

# Index

## A

- AC adapter and battery light, identifying 7
- AC adapter, spare part numbers 24
- action keys
  - airplane mode 13
  - help 13
  - identifying 12, 13
  - keyboard backlight 13
  - mute 13
  - next track 13
  - pause 13
  - play 13
  - screen brightness 13
  - speaker volume 13
  - switch screen image 13
  - using 13
- airplane mode key 13
- antenna
  - removal 67
- audio
  - adjusting volume 13
  - audio, product description 3
  - audio-out (headphone)/audio-in (microphone) combo jack, identifying 7

## B

- back cover
  - spare part number 23
- backup, creating 84
- backups 84
- battery
  - removal 41
  - spare part number 19, 41
- BIOS
  - determining version 77
  - downloading an update 78
  - starting the Setup Utility 77
  - updating 77
- Bluetooth label 15
- boot order, changing 85
- bottom components 14

- bottom cover
  - removal 38
  - spare part number 19, 38
- buttons
  - left TouchPad 9
  - optical drive eject 6
  - power 11
  - right TouchPad 9

## C

- camera
  - identifying 8
  - product description 3
- camera light, identifying 8
- camera module
  - spare part number 23
- camera/microphone module
  - spare part numbers 64
- caps lock light, identifying 10
- cautions
  - electrostatic discharge 29
- chipset, product description 1
- components
  - bottom 14
  - display 8
  - keyboard area 9
  - left side 7
  - right side 6
- computer major components 16
- computer specifications 86
- connector, power 7

## D

- Display assembly
  - spare part numbers 17
- display assembly
  - removal 61
  - subcomponents 22
- display assembly components
  - removal 61
  - spare part numbers 61
- display bezel
  - removal 63
  - spare part numbers 23, 64
- display cable, spare part number 23

- display components 8
- display panel
  - product description 2
  - removal 65
- display panel cable
  - removal 67
  - spare part numbers 67
- display specifications 87
- drive light, identifying 6
- DVD+/-RW Double-Layer Writer
  - spare part number 19, 26, 34

## E

- electrostatic discharge (ESD) 29
  - preventing damage 30
- esc key, identifying 12
- ethernet
  - product description 3

## F

- fan
  - removal 56
  - spare part number 18, 56
- fn key, identifying 12

## G

- Get Help in Windows 10 action key 13
- grounding methods 31
- guidelines
  - packaging 32
  - transporting 32
  - workstation 29

## H

- hard drive
  - product description 2
  - removal 45
  - spare part number 19, 27
  - spare part numbers 45
  - specifications 89
- hard drive bracket
  - spare part number 27

- hard drive connector board
    - removal 51
    - spare part number 18, 27, 51
  - hard drive/solid-state drive cable
    - spare part number 27
  - HDMI port
    - identifying 7
  - heat sink
    - spare part numbers 18
  - heat sink assembly
    - removal 57
    - spare part numbers 57
  - hinge
    - removal 66
    - spare part number 67
  - hinge cover
    - spare part number 22
  - Hinge Kit
    - spare part number 23
  - HP PC Hardware Diagnostics UEFI
    - downloading 81
    - starting 81
    - using 80
  - HP PC Hardware Diagnostics Windows
    - downloading 79
    - installing 80
    - using 79
  - HP Recovery Manager
    - correcting boot problems 85
  - HP Recovery media
    - recovery 85
- I**
- integrated numeric keypad,
    - identifying 12
  - internal microphones, identifying 8
- J**
- jacks
    - audio-out (headphone)/audio-in (microphone) 7
    - network 7
    - RJ-45 (network) 7
- K**
- keyboard
    - product description 4
    - removal 76
    - spare part number 76
    - spare part numbers 17
  - keyboard backlight action key 13
- L**
- keypad, integrated numeric 12
  - keys
    - action 12
    - airplane mode 13
    - esc 12
    - fn 12
    - num lock 12
    - Windows 12
  - labels
    - Bluetooth 15
    - regulatory 15
    - serial number 15
    - service 15
    - wireless certification 15
    - WLAN 15
  - left side components 7
  - lights
    - AC adapter and battery 7
    - camera 8
    - caps lock 10
    - drive 6
    - mute 10
    - power 6
    - RJ-45 (network) status 7
- M**
- M.2 solid-state drive
    - specifications 88
  - memory
    - product description 2
    - removal 43
    - spare part number 18
    - spare part numbers 43
  - MicroSD memory card reader,
    - identifying 6
  - model name 1
  - mute light, identifying 10
  - mute volume action key 13
- N**
- network jack, identifying 7
  - next track action key 13
- O**
- operating system, product
    - description 4
  - optical drive
    - product description 3
    - removal 34
    - spare part numbers 34
  - optical drive eject button,
    - identifying 6
  - optical drive, identifying 6
- P**
- packaging guidelines 32
  - panel
    - spare part numbers 23
  - pause action key 13
  - play action key 13
  - pointing device, product
    - description 4
  - ports
    - HDMI 7
    - product description 3
    - USB 6
    - USB SuperSpeed 7
  - power button, identifying 11
  - power connector
    - identifying 7
  - power connector cable
    - removal 75
    - spare part numbers 75
  - power cord
    - set requirements 90
  - power lights, identifying 6
  - power requirements, product
    - description 4
  - processor 1
  - product description
    - audio 3
    - camera 3
    - chipset 1
    - display panel 2
    - ethernet 3
    - external media cards 3
    - hard drive 2
    - keyboard 4
    - memory 2
    - operating system 4
    - optical drive 3
    - pointing device 4
    - ports 3
    - power requirements 4
    - processor 1
    - product name 1
    - security 4



- serviceability 5
  - wireless networking 3
- product name 1
- product name and number, computer 15
- R**
- recovery 84
  - discs 85
  - HP Recovery partition 85
  - media 85
  - USB flash drive 85
- recovery media
  - creating using HP Cloud Recovery Download Tool 84
  - creating using Windows tools 84
- regulatory information
  - regulatory label 15
  - wireless certification labels 15
- Remote HP PC Hardware Diagnostics UEFI settings
  - customizing 82
  - using 82
- removal/replacement
  - procedures 33, 37
- restoring 84
- right side components 6
- RJ-45 (network) jack, identifying 7
- RJ-45 (network) status lights, identifying 7
- S**
- screen brightness action keys 13
- Screw Kit, spare part numbers 25
- security cable slot, identifying 6
- security, product description 4
- serial number, computer 15
- service labels, locating 15
- serviceability, product description 5
- slots
  - memory card reader 6
  - security cable 6
- solid-state drive
  - removal 47
  - spare part number 18, 27
  - spare part numbers 47
  - specifications 87
- solid-state drive bracket and connector board
  - removal 48
  - spare part numbers 48
- solid-state drive cable
  - spare part number 27
- solid-state drive connector board
  - spare part number 18
- speaker volume action keys 13
- speakers
  - identifying 11
  - removal 74
  - spare part number 17
  - spare part numbers 74
- special keys, using 12
- specifications
  - computer 86
  - display 87
  - hard drive 89
  - M.2 solid-state drive 88
  - solid-state drive 87
- static electricity 30
- switch screen image action key 13
- system board
  - removal 71
  - spare part number 17
  - spare part numbers 71
- system restore point, creating 84
- T**
- top cover
  - removal 76
  - spare part number 76
- top cover/keyboard
  - spare part numbers 17
- TouchPad button board
  - removal 53
  - spare part number 17
  - spare part numbers 53
- TouchPad buttons
  - identifying 9
- TouchPad module
  - removal 54
  - spare part number 17, 54
- TouchPad zone, identifying 9
- transporting guidelines 32
- traveling with the computer 15
- U**
- USB port, identifying 6
- USB SuperSpeed port, identifying 7
- USB/card reader board
  - removal 52
  - spare part number 19, 52
- V**
- vents, identifying 11, 14
- volume
  - adjusting 13
  - mute 13
- W**
- webcam/microphone module
  - removal 64
- Windows
  - backup 84
  - recovery media 84
  - system restore point 84
- Windows key, identifying 12
- Windows tools, using 84
- wireless antenna
  - removal 67
- wireless certification label 15
- wireless networking
  - product description 3
- WLAN
  - removal 50
  - spare part numbers 50
- WLAN antenna
  - removal 67
- WLAN antennas, identifying 8
- WLAN cable
  - spare part number 23
- WLAN device 15
- WLAN label 15
- WLAN module
  - spare part number 18
- workstation guidelines 29