



HP Pavilion 13 Laptop PC

Maintenance and Service Guide
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Product notice

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

Not all features are available in all editions of Windows. 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.

Software terms

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

For any further information or to request a full refund of the computer, please contact your local point of sale (the seller).

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP Pavilion 13 Laptop PC <i>* Model numbers: 13-an0xxx</i> <i>* CTO model number: 13t-an000</i>
Processors	8th generation Intel® Core™ processors: i7-8565U 1.80-GHz (SC turbo up to 4.60-GHz) quad-core processor (8.0-MB L3 cache, 2400-MHz FSB, 15 W) i5-8265U 1.60-GHz (SC turbo up to 3.90-GHz) quad-core processor (6.0-MB L3 cache, 2400-MHz FSB, 15 W) i3-8145U 2.10-GHz (SC turbo up to 3.90-GHz) quad-core processor (4.0-MB L3 cache, 2400-MHz FSB, 15 W)
Graphics	Intel UHD Graphics 620
Panel	13.3-in, white light-emitting (WLED), BrightView, eDP, 16:9 ultra wide aspect ratio: High-definition (HD) (1366×768), SVA, 45% CG, eDP, slim-flat (3.0 mm), 220 nits Full high-definition (FHD) (1920×1080), UWVA, 45% CG, eDP, slim-flat (3.0 mm), 220 nits Full high-definition (FHD) (1920×1080), UWVA, 72% CG, eDP 1.3+PSR, uslim-flat (2.0 mm), 300 nits
Memory	On-board system memory, non-customer-accessible/non-upgradable Supports up to 8-GB of system memory DDR4-2400 single channel support (available only for 8 GB) DDR4-2400 single channel support (DDR4-2666 bridged to DDR4-2400) (available only for 8 GB) DDR4-2400 single channel support (DDR4-2666 downgraded to DDR4-2400) (available only for 4 GB) Supports the following configurations: <ul style="list-style-type: none">• 8192 GB• 4096 GB
Storage	M.2, PCIe, NVMe, TLC, solid-state drive: 256-GB M.2, PCIe, NVMe, value, solid-state drive: 512-GB 256-GB M.2 SATA-3, solid-state drive, TLC: 256-GB 128-GB
Camera	HP Wide Vision HD camera with indicator light, USB 2.0, HD BSI sensor, f2.0, WDR, 88° wide field of vision 720p by 30 frames per second

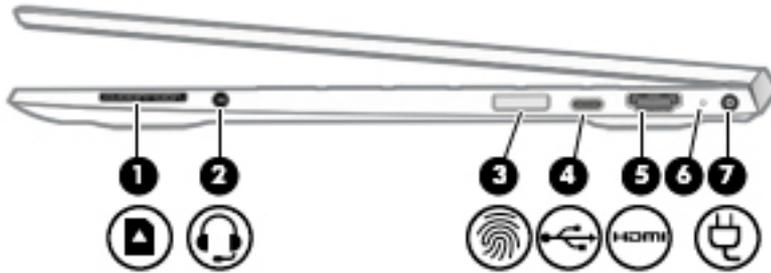
Category	Description
	Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression
Audio	B&O Play Audio
	Audio codec: ALC3258-CG
	Supports HP Audio Boost
	Dual speakers
Wireless	Turbo Lite WLAN SVTP
	Integrated wireless options with dual antennas:
	Realtek RTL8822BE 802.11 ac 2×2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)
	Intel Wireless-AC 9560 802.11ac 2×2 WiFi + Bluetooth5 (non-vPro) (MU-MIMO, Gigabit WiFi speeds supported)
	Integrated wireless options with single antenna:
	Intel Wireless-AC 9461 802.11ac 1×1 WiFi + Bluetooth5 (non-vPro) (MU-MIMO supported)
External media cards	HP Multi-Format Digital Media Card Reader
	Supports SD/SDHC/SDXC
	Push-push insertion/removal
	SIM slot (toolless, user accessible)
Internal card expansion	One M.2 slot for solid-state drive
	One M.2 slot for WLAN
Ports	Hot plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected)
	HDMI v1.4 supporting up to 1920×1080 @ 60Hz
	AC Smart Pin adapter plug
	Audio-out (headphone)/audio-in (microphone) combo jack
	USB 3.1 Gen 1 Type-A ports (2, left side)
	USB 3.1 Gen 1 Type-C port (right side)
Keyboard/TouchPad	Keyboard:
	Full-sized, 2-coat paint, island-style keyboard
	Full-sized, 3-coat paint, backlit, island-style keyboard
	Full-sized, 4-coat paint, backlit, island-style keyboard
	TouchPad requirements:
	Image sensor
	Multitouch gestures enabled
	Support for Modern TrackPad gestures
	Taps enabled as default
Power requirements	Battery:

Category	Description
	2-cell, 37.7-WHr, long-life battery
	Supports battery life enhancement
	AC adapter, barrel type, nPFC:
	65-W, EM
	45-W, right angle
	45-W, for use in Argentina
	Power cord:
	1.0 m conventional power cord with a C5 connector
	1.0 m conventional power cord with a C5 connector + Japan plug adapter
Security	Kensington Nano Security Slot
	Fingerprint reader (select models only)
Operating system	FreeDOS 2.0
	Windows 10 Home 64
	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 Single Language
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market PPP
	Windows 10 Home 64 Plus Single Language Indonesia Market PPP
	Windows 10 Home 64 Single Language
	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 Pro 64
	Windows 10 Pro 64 Chinese Market
	Windows 10 Pro S 64
Serviceability	End user replaceable parts:
	AC adapter

2 Getting to know your computer

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

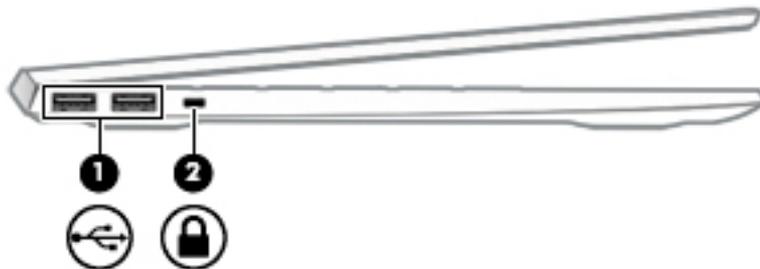
Right side



Component	Description
(1)  Memory card reader	<p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none">1. Hold the card label-side up, with connectors facing the computer.2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none">▲ Press in on the card, and then remove it from the memory card reader.
(2)  Audio-out (headphone)/Audio-in (microphone) combo jack	<p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none">▲ Select the Start button, select HP Help and Support, and then select HP Documentation. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>
(3)  Fingerprint reader (select products only)	<p>Allows a fingerprint logon to Windows, instead of a password logon.</p> <ul style="list-style-type: none">▲ To use the fingerprint reader, place your finger on the fingerprint reader for a few seconds until it reads your fingerprint.

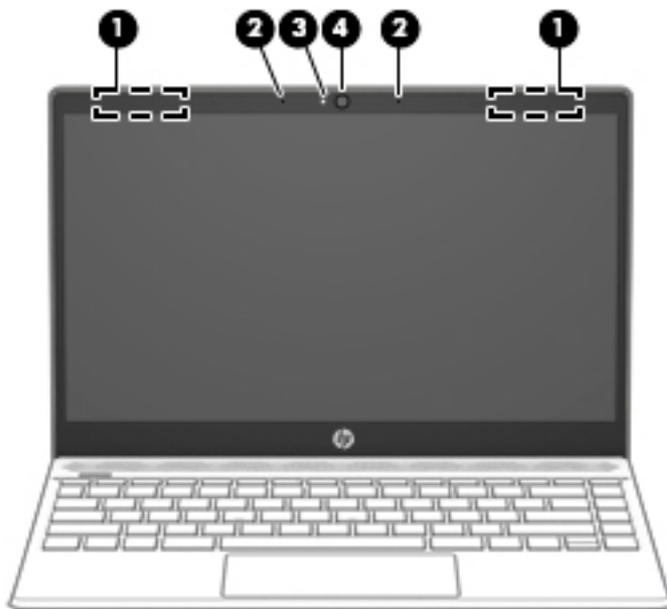
Component	Description
(4)  USB Type-C port	<p>Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.</p> <p>NOTE: Cables and/or adapters (purchased separately) may be required.</p>
(5)  HDMI port	<p>Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High-Definition Multimedia Interface (HDMI) device.</p>
(6) AC adapter and battery light	<ul style="list-style-type: none"> • White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.
(7)  Power connector	<p>Connects an AC adapter.</p>

Left side



Component	Description
(1)  USB ports (2)	<p>Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide data transfer.</p>
(2)  Kensington Nano Security slot	<p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p>

Display



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

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

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

To access this guide:

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

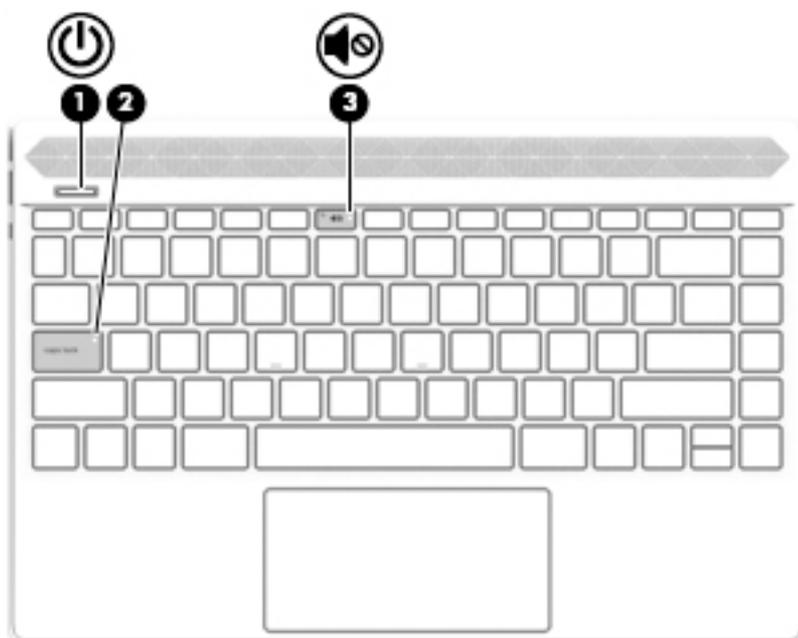
Keyboard area

TouchPad



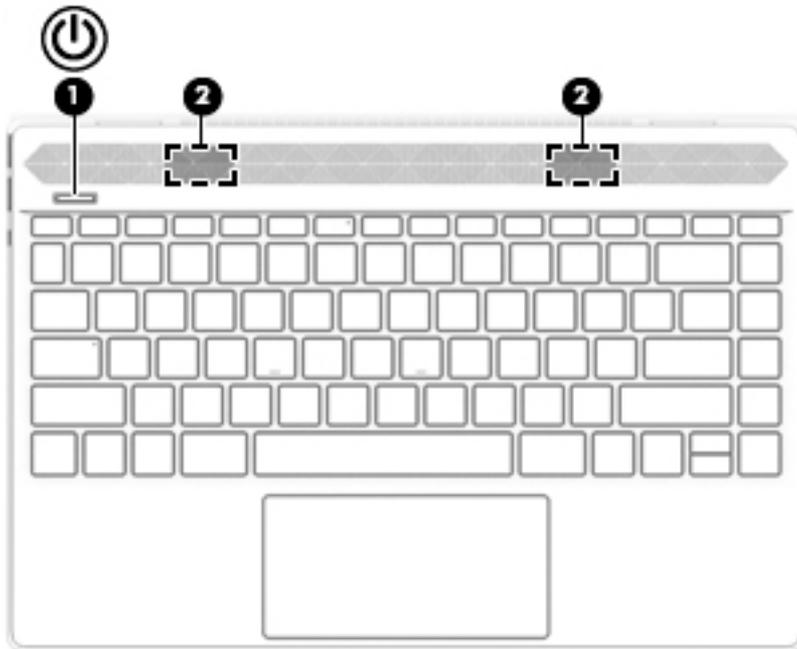
Component	Description
(1) TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2) Left control zone	Textured area that allows you to perform additional gestures.
(3) Right control zone	Textured area that allows you to perform additional gestures.

Lights



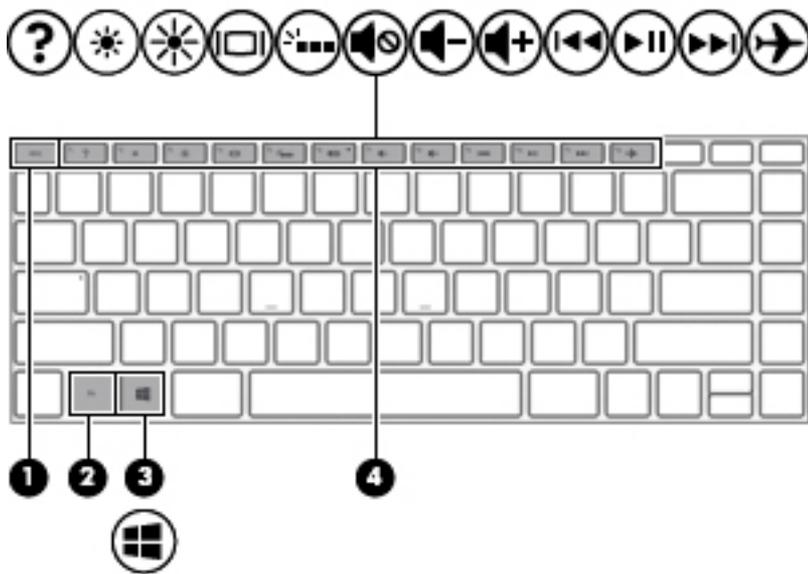
Component	Description
(1)  Power light	<ul style="list-style-type: none">• On: The computer is on.• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.• Off: The computer is off or in Hibernation. Hibernation is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

Button and speakers



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

Special keys



Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes specific functions when pressed in combination with another key.
(3)  Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4) Action keys	Execute frequently used system functions. NOTE: On select products, the <code>f5</code> action key turns the keyboard backlight feature off or on.

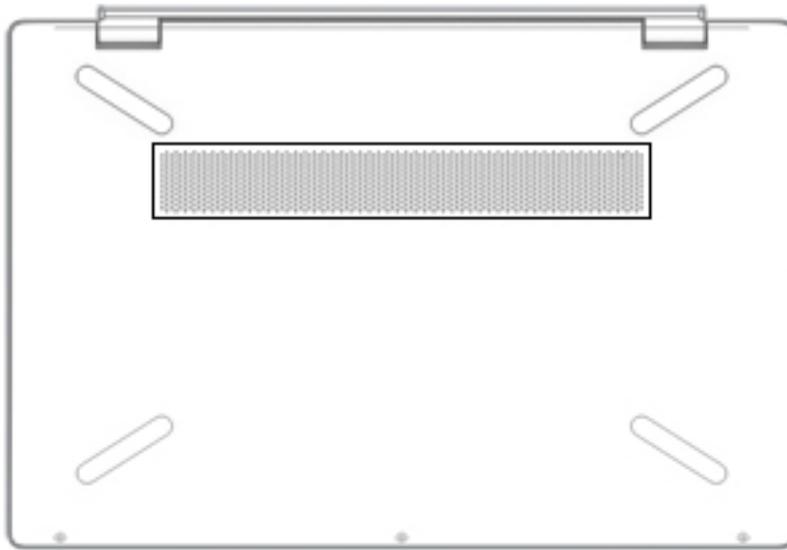
Action keys

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 11](#).

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

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. On select products, you can adjust the brightness of the keyboard backlight. Press the key repeatedly to adjust the brightness from high (when you first start up the computer), to low, to off. After you adjust the keyboard backlight setting, the backlight will revert to your previous setting each time you turn on the computer. The keyboard backlight will turn off after 30 seconds of inactivity. To turn the keyboard backlight back on, press any key or tap the TouchPad (select products only). To conserve battery power, turn off this feature.
	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. NOTE: The airplane mode key is also referred to as the wireless button. NOTE: A wireless network must be set up before a wireless connection is possible.

Bottom



Component	Description
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Vent

Enables airflow to cool internal components.

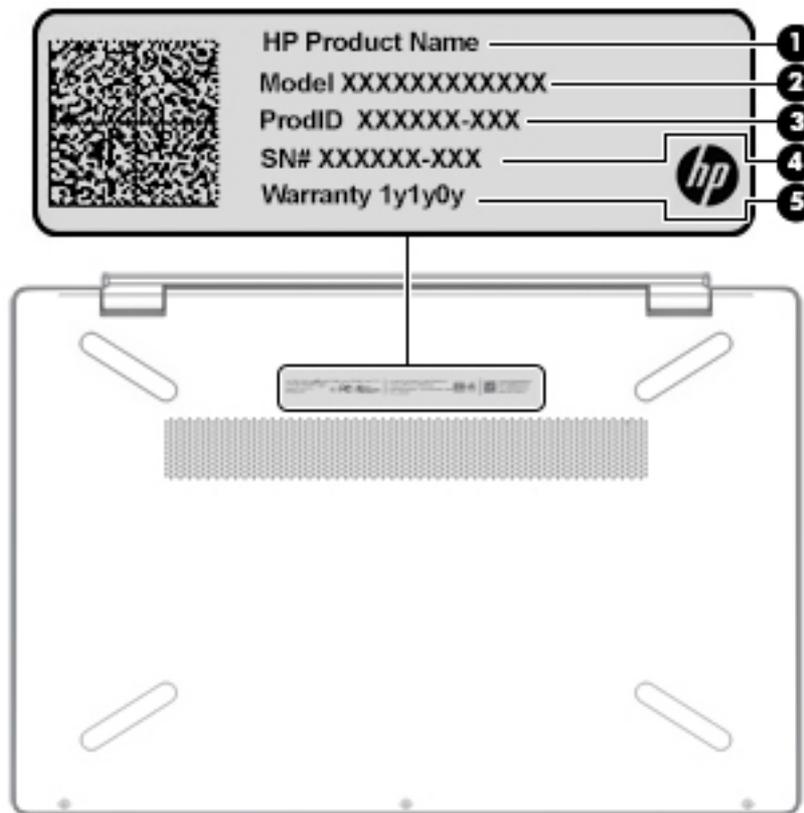
NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Labels

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

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

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



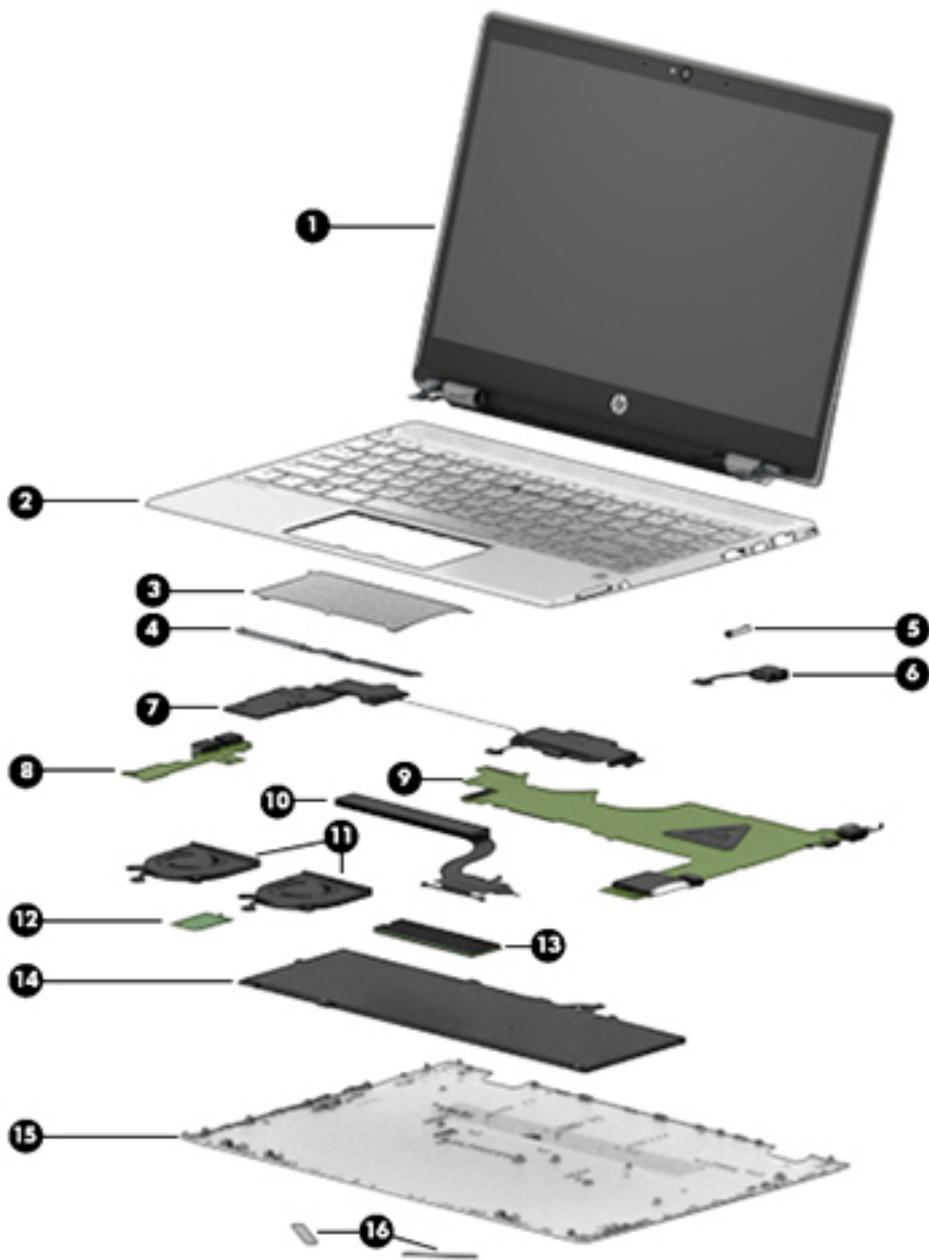
Component	
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period

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

3 Illustrated parts catalog

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

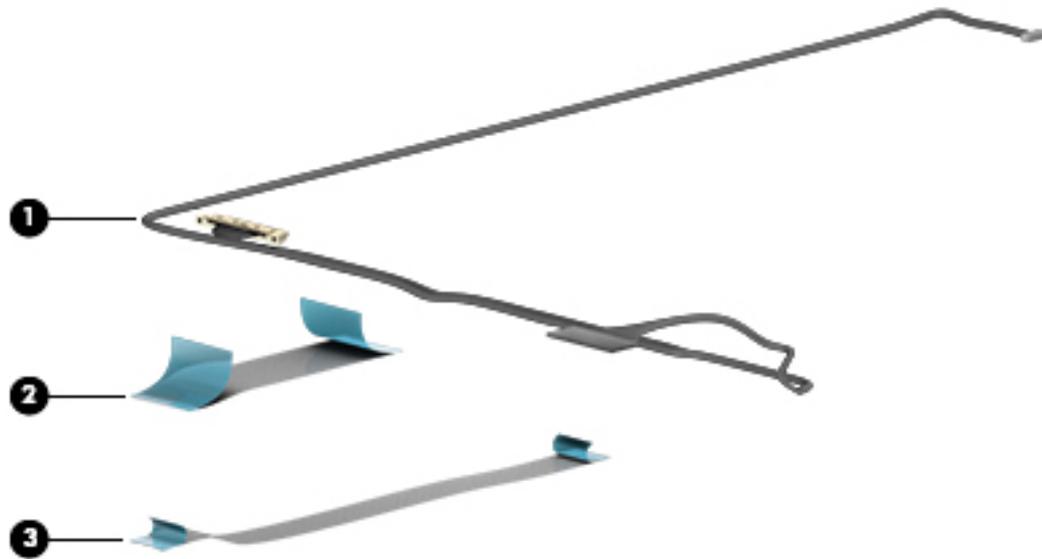
Computer components



Item	Component	Spare part number
(1)	Display assembly: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly components on page 18 .	
(2)	Top cover with keyboard	
	Non-backlit keyboard, includes fingerprint reader, pike silver	L37530-xx1
	Backlit keyboard, includes fingerprint reader, pike silver	L37531-xx1
	Non-backlit keyboard, no fingerprint reader, pike silver	L37533-xx1
	Backlit keyboard, no fingerprint reader, pike silver	L37534-xx1
	Backlit keyboard, includes fingerprint reader, mineral silver (-001 United States only)	L37532-xx1
(3)	TouchPad	
	NOTE: The TouchPad cable is available using spare part number L37375-001.	
	Pike silver	L38040-001
	Mineral silver	L38043-001
(4)	TouchPad bracket	included in TouchPad spare kit
(5)	Fingerprint reader (includes bracket)	
	Pike silver models	L37373-001
	Mineral silver models	L38041-001
(6)	Power connector cable	L37358-001
	NOTE: The power connector cable Mylar light cover is available using spare part number L45223-001.	
(7)	Speaker Kit (includes cable)	L37374-001
(8)	USB board	L37372-001
	NOTE: The USB board cable is available using spare part number L37371-001.	
(9)	System board (includes processor and replacement thermal material):	
	Intel Core i7-8565U processor, 8 GB of system memory, fingerprint reader	L37351-xx1
	Intel Core i5-8265U processor, 8 GB of system memory, fingerprint reader	L37350-xx1
	Intel Core i5-8265U processor, 8 GB of system memory, no fingerprint reader	L37349-xx1
	Intel Core i5-8265U processor, 4 GB of system memory, fingerprint reader	L37348-xx1
	Intel Core i3-8145U processor, 8 GB of system memory, fingerprint reader	L42277-xx1
	Intel Core i3-8145U processor, 4 GB of system memory, fingerprint reader	L37347-xx1
(10)	Heat sink (includes replacement thermal material):	L37377-001
(11)	Fan (includes cable)	L37376-001
(12)	WLAN module:	
	Realtek RTL8822BE 802.11ac 2×2 WiFi + Bluetooth 4.2 (MU-MIMO supported)	924813-855
	Intel Wireless-AC 9560 802.11ac 2×2 WiFi + Bluetooth5 (non-vPro) (MU-MIMO, Gigabit WiFi speeds supported)	L22634-005

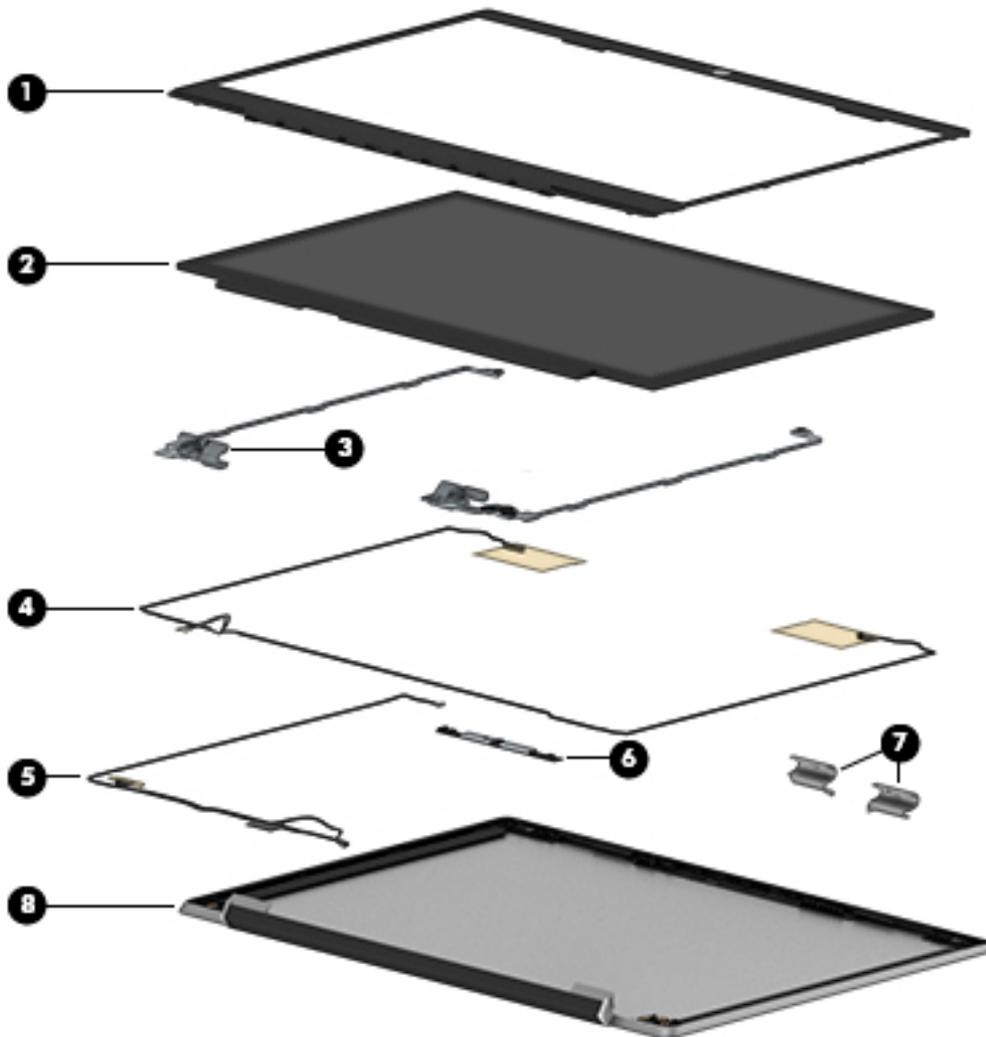
Item	Component	Spare part number
	Intel Wireless-AC 9461 802.11ac 1×1 WiFi + Bluetooth5 (non-vPro) (MU-MIMO supported)	L25889-005
(13)	Solid-state drive (2280 M.2):	
	512-GB, PCIe, NVMe	L37357-001
	256-GB, PCIe, NVMe, TLC	L38076-001
	256-GB, PCIe, NVMe	L37356-001
	256-GB, SATA-3, TLC	L38042-001
	128-GB, SATA-3, TLC	L37355-001
(14)	Battery (2-cell, 37-WHr, 4.96-AHr, Li-ion)	L28076-005
(15)	Bottom cover	
	Pike silver	L37379-001
	Mineral silver	L37378-001
(16)	Rubber Foot Kit	
	Pike silver	L37381-001
	Mineral silver	L37380-001

Cables



Item	Component	Spare part number
(1)	Display/camera cable	L37361-001
(2)	USB board cable	L37371-001
(3)	TouchPad cable	L37375-001

Display assembly components



Item	Component	Spare part number
(1)	Display bezel:	
	220n	L37359-001
	300n	L37360-001
(2)	Display panel (includes bezel adhesive and display panel adhesive)	
	FHD, UWVA, 220 nits, slim	L37352-001
	FHD, UWVA, 300 nits, uslim	L37353-001
	HD, SVA, 220 nits	L37354-001
(3)	Hinges (include left and right display hinges)	L37382-001
(4)	Wireless antennas (includes bezel adhesive and display panel adhesive)	L37539-001
(5)	Display panel cable (includes the camera/microphone module cable)	L37361-001
(6)	Camera/microphone module (includes bezel adhesive and display panel adhesive)	L37362-001

Item	Component	Spare part number
(7)	Hinge covers (includes bezel adhesive and display panel adhesive)	
	Mineral silver	L37383-001
	Pike silver	L37384-001
(8)	Display back cover (includes bezel adhesive):	
	Mineral silver, use with 220n bezel	L37363-001
	Pale gold + pike silver, use with 220n bezel	L37365-001
	Tranquil pink, use with 220n models	L37366-001
	Mineral silver, use with 300n bezel	L37367-001
	Pale gold + mineral silver, use with 220n bezel	L37368-001
	Pale gold + pike silver, use with 300n bezel	L37369-001
	Tranquil pink, use with 300n models	L37370-001
	Pale gold + mineral silver, use with 300n bezel	L40834-001
	Display enclosure adhesive (secures display panel to display enclosure; not illustrated)	L38078-001
	Display bezel adhesive (not illustrated)	L38077-001
	Display hinge gaskets (not illustrated)	L45222-001

Mass storage devices

Component	Spare part number
Solid-state drives (M.2)	
512-GB, PCIe, NVMe	L37357-001
256-GB, PCIe, NVMe, TLC	L38076-001
256-GB, PCIe, NVMe	L37356-001
256-GB, SATA-3, TLC	L38042-001
128-GB, SATA-3, TLC	L37355-001
External USB optical drive	747080-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
45-W AC adapter (non-PFC, 4.5-mm)	741727-001
45-W HP Smart AC adapter (non-PFC, 4.5-mm, for use in Argentina)	741553-852
65-W AC adapter (non-PFC, RC, EM, 4.5-mm)	913691-850
HP HDMI-to-VGA adapter	701943-001
USB-C to USB-A adapter	833960-001
HP USB to Gigabit RJ-45 Adapter	829941-001
HP USB-C to RJ-45 Adapter	855560-001
HP USB-C to USB-A Hub	916838-001
Power cord (C5 connector, 1.0 m):	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Brazil	L19359-001
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 Japan (duckhead)	L33157-001
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
External USB optical drive (not illustrated)	747080-001
Rubber Foot Kit, pike silver	L37381-001
Rubber Foot Kit, mineral silver	L37380-001
Screw Kit	L37385-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

 **CAUTION:** Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

Cables and connectors

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

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

Drive handling

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

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

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

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, 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."

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures for Authorized Service Provider parts

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

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

CAUTION: Only HP authorized service providers should perform the removal and replacement procedures described here. Accessing the internal part could damage the computer or void the warranty.

Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 14](#) 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 54 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

Description	Spare part number
Bottom cover	L37379-001

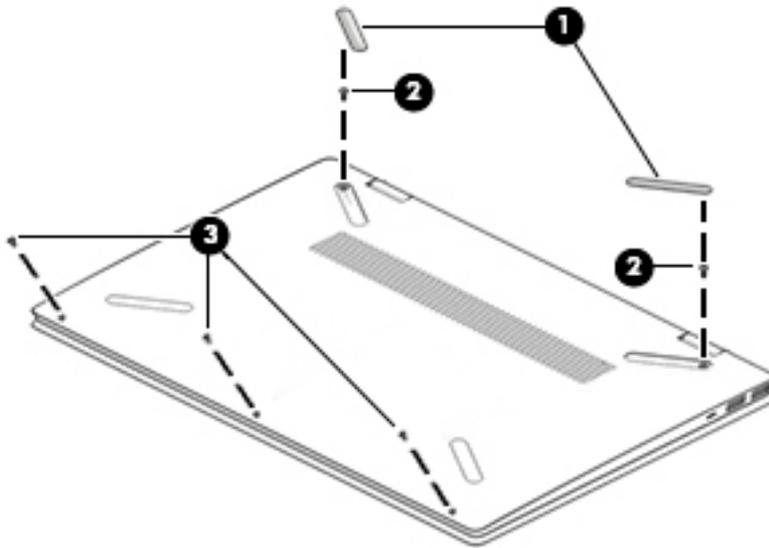
Before removing the bottom cover, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

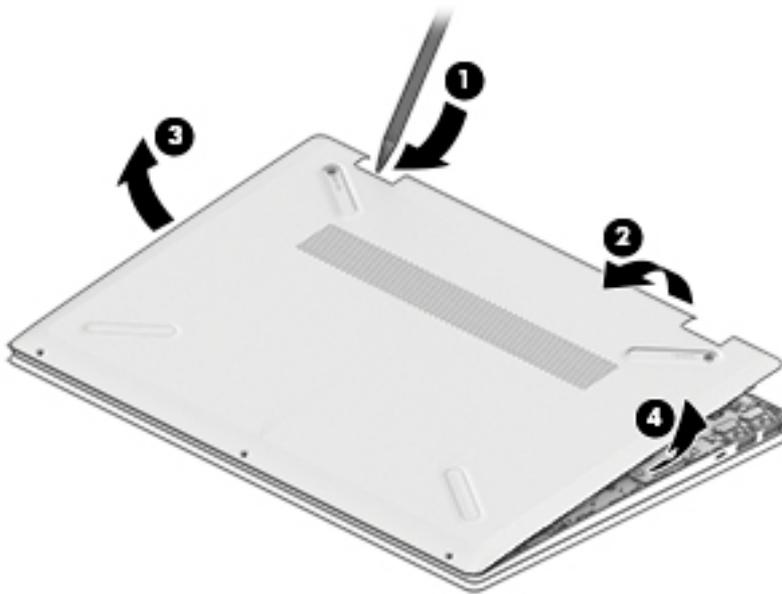
Remove the bottom cover:

1. Remove the two rubber feet **(1)** toward the top of the computer.
The rubber feet are available using spare part number L37381-001 for pike silver models and L37380-001 for mineral silver models.
2. Remove the two Phillips M2.5×5.0 screws **(2)** under the rubber feet.

3. Remove the three Phillips M2.0×2.5 screws (3) along the bottom edge on the bottom cover.



4. Starting under the hinges, use a thin, non-conductive tool to disengage the bottom cover from the computer (1).
5. Lift up along the top (2), and left (3) and right (4) sides to remove the bottom cover.



Reverse this procedure to install the bottom cover.

Battery

Description	Spare part number
2-cell, 37-WHr, 4.96-AHr, Li-ion battery	L28076-005

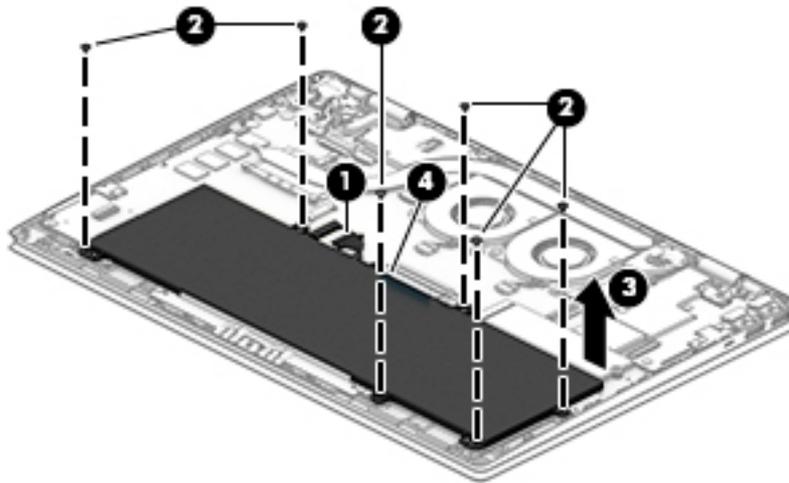
Before removing the battery, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).

Remove the battery:

1. Disconnect the battery cable from the system board **(1)**.
2. Remove the six Phillips M2.0×2.5 screws **(2)** that secure the battery to the computer.
3. Lift the inside of the battery, and then remove the battery from the computer **(3)**.

 **TIP:** When installing the battery, make sure to route the cable in the clips near the top of the battery **(4)**.



Reverse this procedure to install the battery.

WLAN module

Description	Spare part number
Realtek RTL8822BE 802.11ac 2×2 WiFi + Bluetooth 4.2	924813-855
Intel Wireless-AC 9560 802.11ac 2×2 WiFi + Bluetooth5 (non-vPro)	L22634-005
Intel Wireless-AC 9461 802.11ac 1×1 WiFi + Bluetooth5 (non-vPro)	L25889-005

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

Before removing the WLAN module, follow these steps:

1. 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 first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

Remove the WLAN module:

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



NOTE: Some models have only one antenna cable.

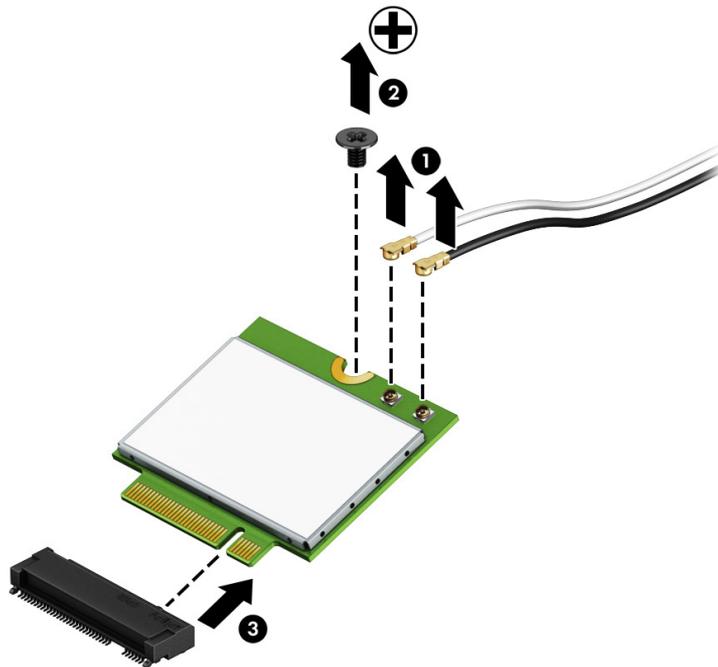
The WLAN antenna cable labeled "1/MAIN" connects to the WLAN module "Main" terminal. The WLAN antenna cable labeled "2/AUX" connects to the WLAN module "Aux" terminal.

2. Remove the Phillips M2.0×3.0 screw **(2)** that secures the WLAN module to the computer. (The WLAN module tilts up.)

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



NOTE: The WLAN module is designed with a notch to prevent incorrect insertion.



Reverse this procedure to install the WLAN module.

Solid-state drive

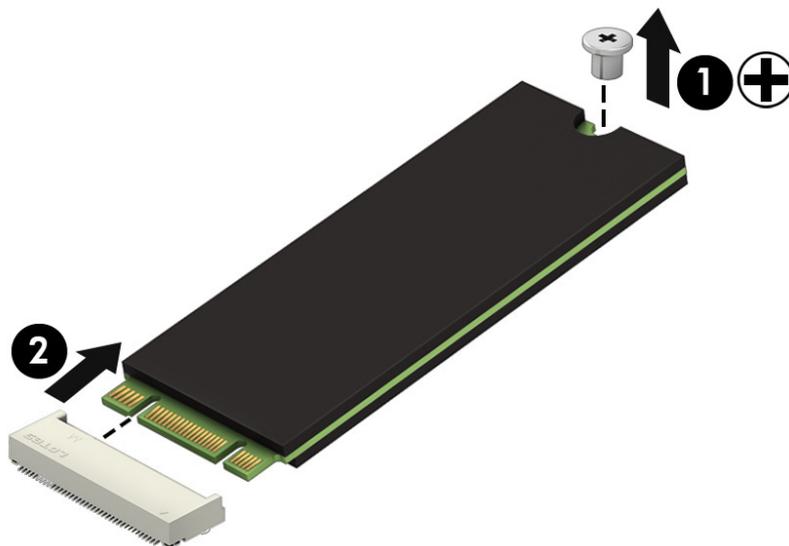
Description	Spare part number
512-GB, PCIe, NVMe	L37357-001
256-GB, PCIe, NVMe, TLC	L38076-001
256-GB, PCIe, NVMe	L37356-001
256-GB, SATA-3, TLC	L38042-001
128-GB, SATA-3, TLC	L37355-001

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

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

Remove the solid-state drive:

1. Remove the Phillips M2.0×3.0 screw **(1)** that secures the drive to the computer.
2. Remove the drive **(2)** by pulling it away from the connector.



Reverse this procedure to install the solid-state drive.

Fans

Description	Spare part number
Fan	L37376-001

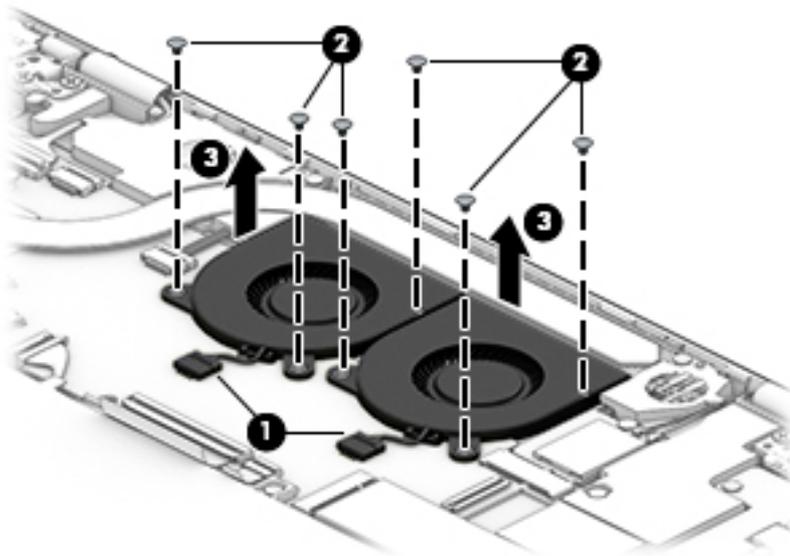
Before removing the fans, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

Remove the fans:

 **TIP:** The computer uses two fans, both of which are the same and can be removed individually.

1. Disconnect the fan cables **(1)** from the system board.
2. Remove the three Phillips M2.0×2.5 screws **(2)** that secure each fan to the computer.
3. Remove the fans from the computer **(3)**.



Reverse these procedures to install the fans.

Heat sink

 **NOTE:** The heat sink spare part kit includes replacement thermal material.

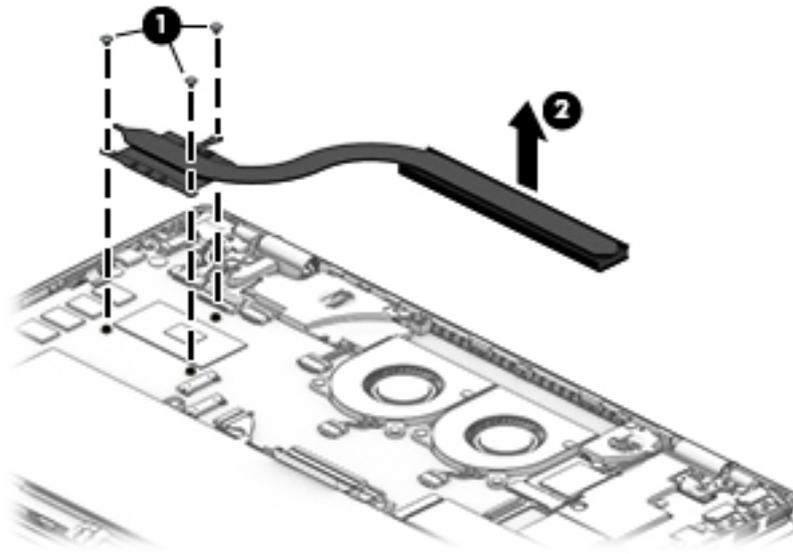
Description	Spare part number
Heat sink	L37377-001

Before removing the heat sink, follow these steps:

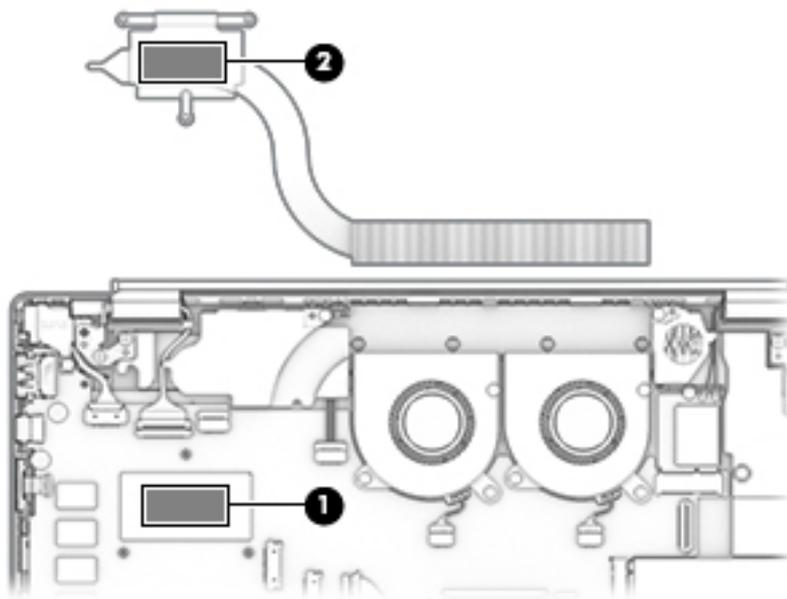
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

Remove the heat sink:

1. In the order indicated on the heat sink, remove the three Phillips M2.0×2.5 screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.



Each time the heat sink is removed, thoroughly clean the thermal material from the surface of the soldered processor on the system board **(1)** and the associated section of the heat sink **(2)**. Replacement thermal material is included with the heat sink and system board spare part kits.



Reverse this procedure to install the heat sink.

USB board

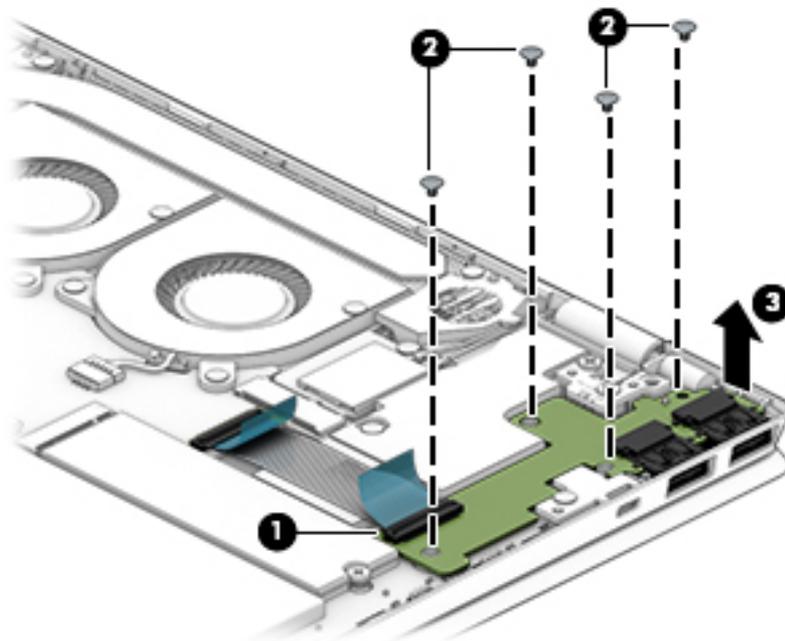
Description	Spare part number
USB board	L37372-001
USB board cable	L37371-001

Before removing the USB board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

Remove the USB board:

1. Disconnect the cable from the ZIF connector on the USB board **(1)**.
2. Remove the four Phillips M2.0×2.5 screws **(2)** that secure the board to the computer.
3. Remove the board from the computer **(3)**.



Reverse this procedure to install the USB board.

Fingerprint reader assembly

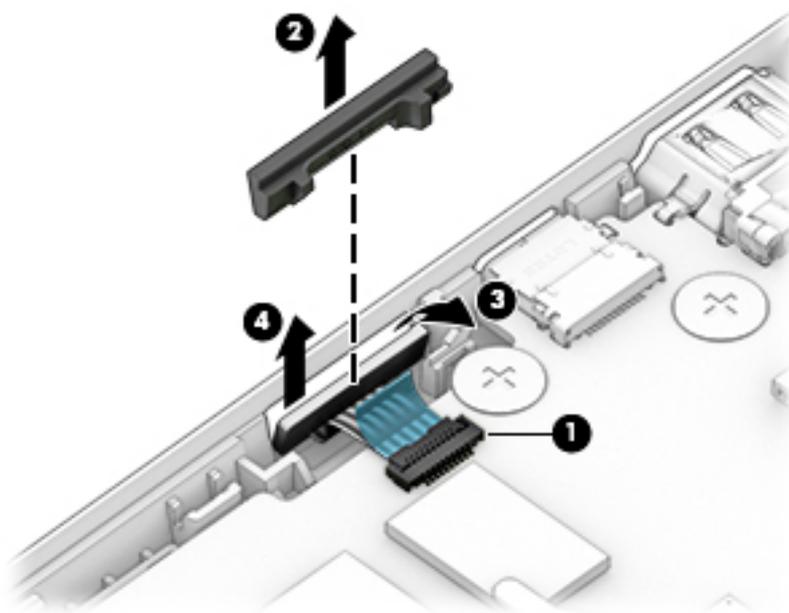
Description	Spare part number
Fingerprint reader assembly, pike silver (includes bracket)	L37373-001
Fingerprint reader assembly, mineral silver (includes bracket)	L38041-001

Before removing the fingerprint reader assembly, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

Remove the fingerprint reader assembly:

1. Disconnect the cable from the system board ZIF connector (1).
2. Lift to remove the bracket from the computer (2).
3. From the outside of the chassis, push the fingerprint reader module into the chassis (3), and then remove the module and cable from the computer (4).



Reverse this procedure to install the fingerprint reader assembly.

Power connector cable

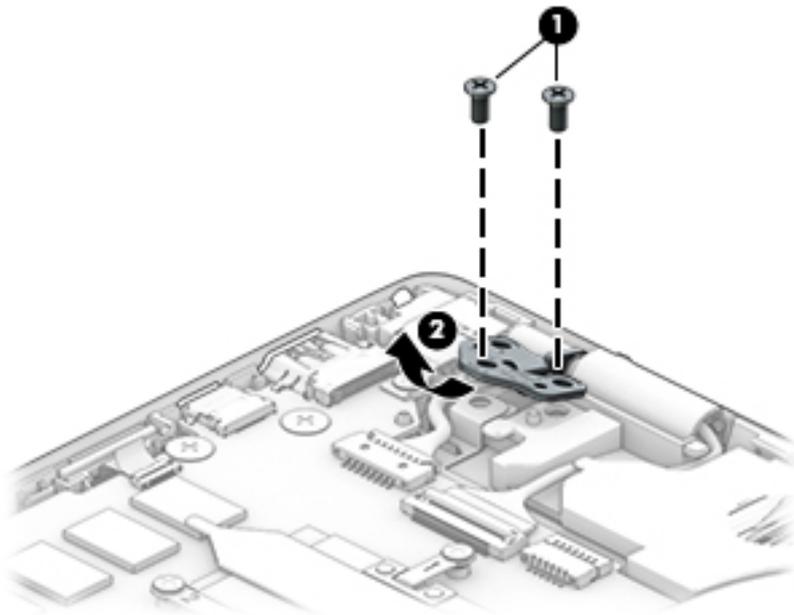
Description	Spare part number
Power connector cable	L37358-001
Power connector cable Mylar light cover	L45223-001

Before removing the power connector cable, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Disconnect the battery (see [Battery on page 27](#)).

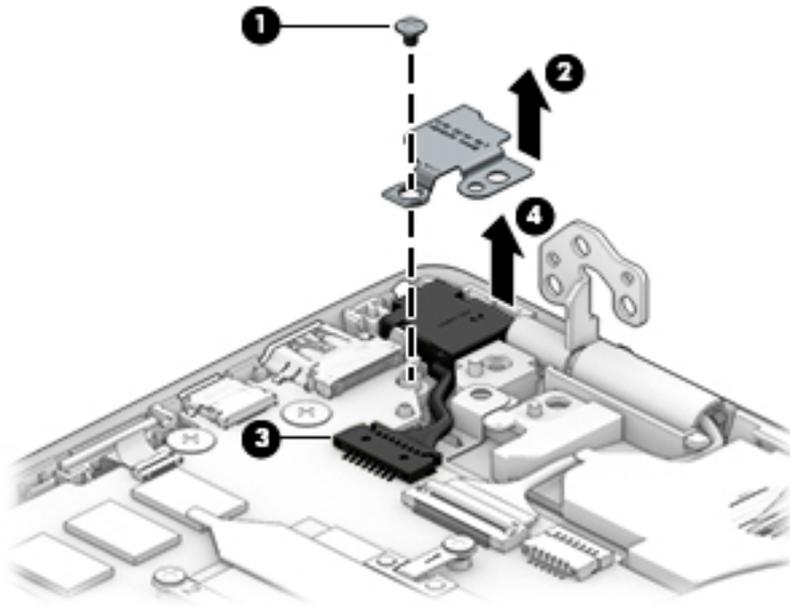
Remove the power connector cable:

1. Remove the two Phillips M2.5×6.0 screws (1) from the right display hinge, and then rotate the hinge open as far as possible (2).



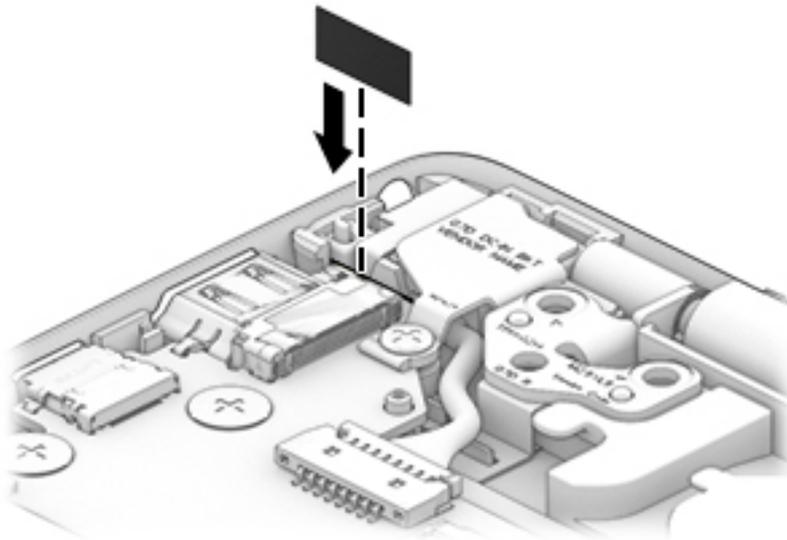
2. Remove the Phillips M2.0×2.5 screw (1) from the bracket, and then remove the bracket from on top of the connector (2).
3. Disconnect the power connector cable from the system board (3).

4. Remove the connector cable from the computer (4).



Reverse this procedure to install the power connector cable.

When installing the power connector cable, be sure to install the Mylar light cover as shown in the following illustration.



TouchPad

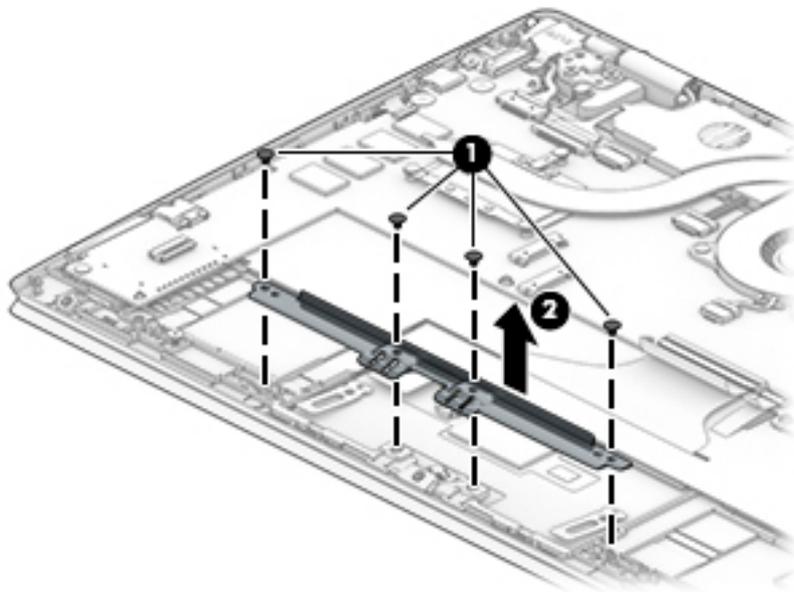
Description	Spare part number
TouchPad, pike silver	L38040-001
TouchPad, mineral silver	L38043-001
TouchPad cable	L37375-001

Before removing the TouchPad, follow these steps:

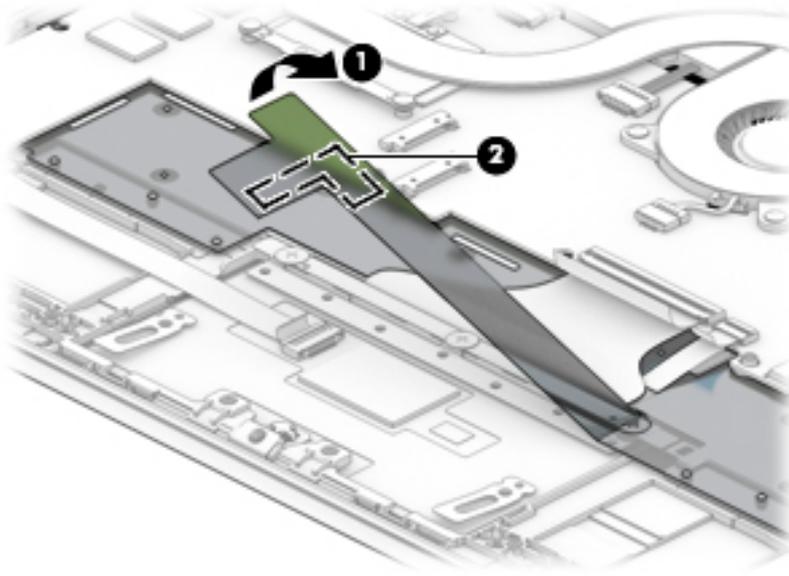
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Remove the battery (see [Battery on page 27](#)).

Remove the TouchPad:

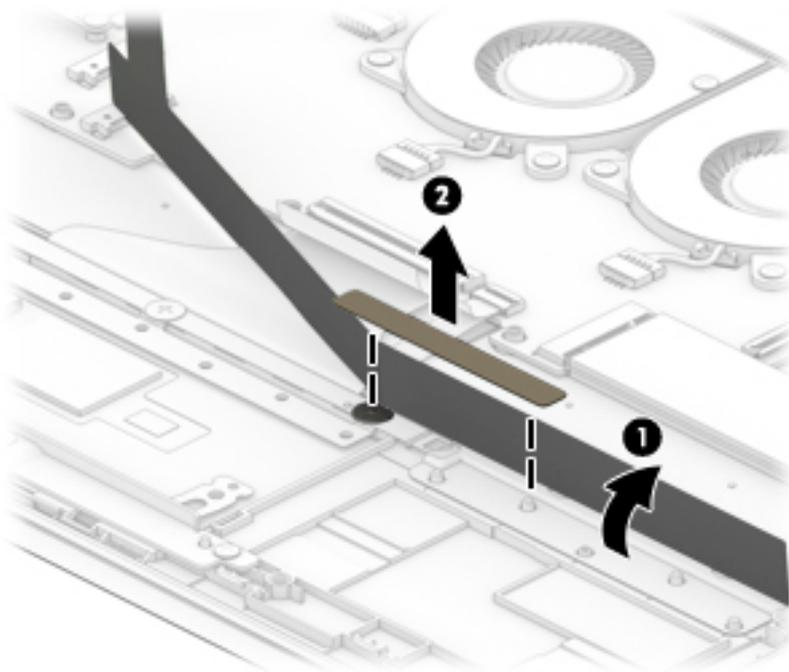
1. Remove the four Phillips M2.0×2.5 screws **(1)** that secure the TouchPad bracket to the computer.
2. Remove the bracket **(2)**.



3. Rotate the left side of the clear plastic cover from atop the screws **(1)** to disengage the adhesive **(2)** that secures it. Remove the plastic cover.

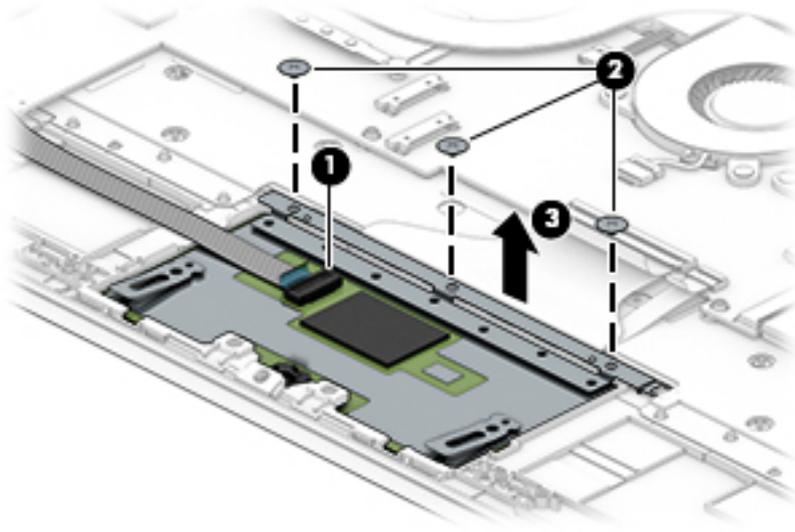


4. Lift the Mylar enough to access the conductive tape **(1)**, and then remove the tape from the right side of the TouchPad **(2)**.



5. Disconnect the cable from the ZIF connector on the TouchPad **(1)**.
6. Using a P0 driver, remove the three Phillips M2.0×2.0 broad head screws **(2)** that secure the TouchPad to the computer.

7. From underneath the upside-down computer, press near the top of the TouchPad and push it upward to remove it from the computer (3).



Reverse this procedure to install the TouchPad.

Speakers

Description	Spare part number
Speakers (includes cable)	L37374-001

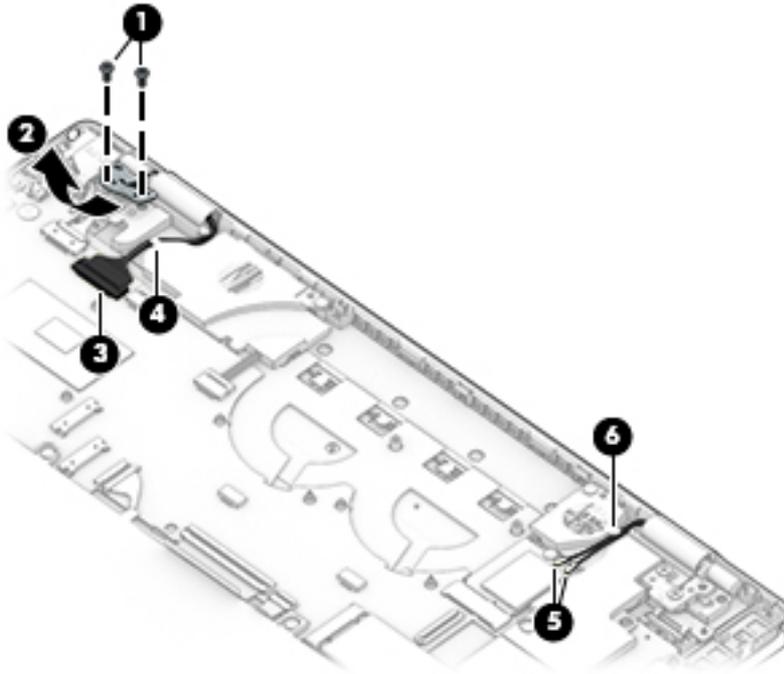
Before removing the speakers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Bottom cover (see [Bottom cover on page 25](#))
 - b. Battery (see [Battery on page 27](#))
 - c. Heat sink (see [Heat sink on page 32](#))
 - d. USB board (see [USB board on page 34](#))
 - e. Fans (see [Fans on page 31](#))

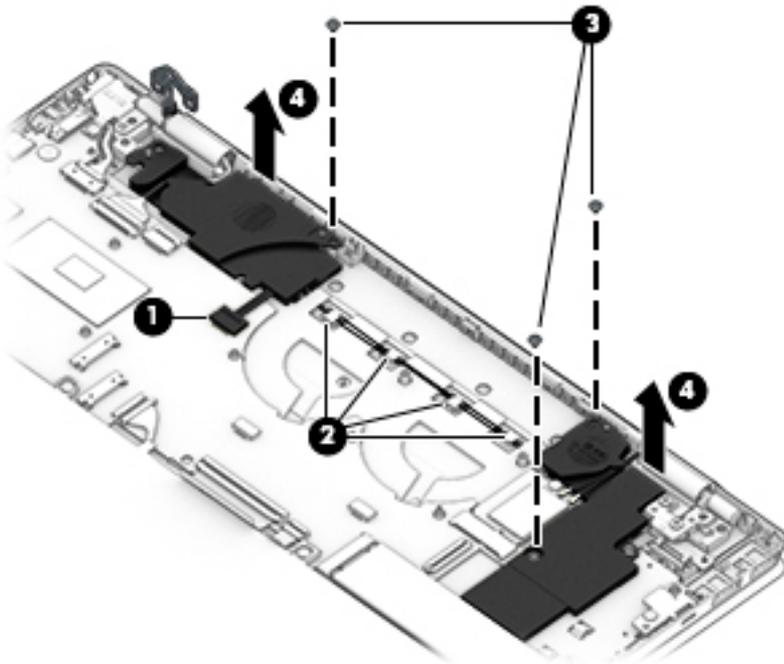
Remove the speakers:

1. Remove the two Phillips M2.5×6.0 screws **(1)** from the right display hinge, and then rotate the hinge open as far as possible **(2)**.
2. Disconnect the display cable from the system board **(3)**, and then remove the cable from the retention clips and routing channel built into the right speaker **(4)**.

3. Disconnect the antennas from the WLAN module (5), and then remove the antenna cables from the retention clips and routing channel built into the left speaker (6).



4. Disconnect the speaker cable from the system board (1).
5. Remove the cable between the speakers from the clips under the removed fans (2).
6. Remove the three Phillips M2.0×2.5 screws (3) from the speakers.
7. Remove the speakers from the computer (4).



Reverse this procedure to install the speakers.

System board



NOTE: All system board spare part kits include a processor and replacement thermal material.

Description	Spare part number
Intel Core i7-8565U processor, 8 GB of system memory, fingerprint reader	L37351-xx1
Intel Core i5-8265U processor, 8 GB of system memory, fingerprint reader	L37350-xx1
Intel Core i5-8265U processor, 8 GB of system memory, no fingerprint reader	L37349-xx1
Intel Core i5-8265U processor, 4 GB of system memory, fingerprint reader	L37348-xx1
Intel Core i3-8145U processor, 8 GB of system memory, fingerprint reader	L42277-xx1
Intel Core i3-8145U processor, 4 GB of system memory, fingerprint reader	L37347-xx1

Before removing the system board, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the following components:
 - a. Bottom cover (see [Bottom cover on page 25](#))
 - b. Battery (see [Battery on page 27](#))
 - c. Power connector cable bracket (see [Power connector cable on page 36](#))

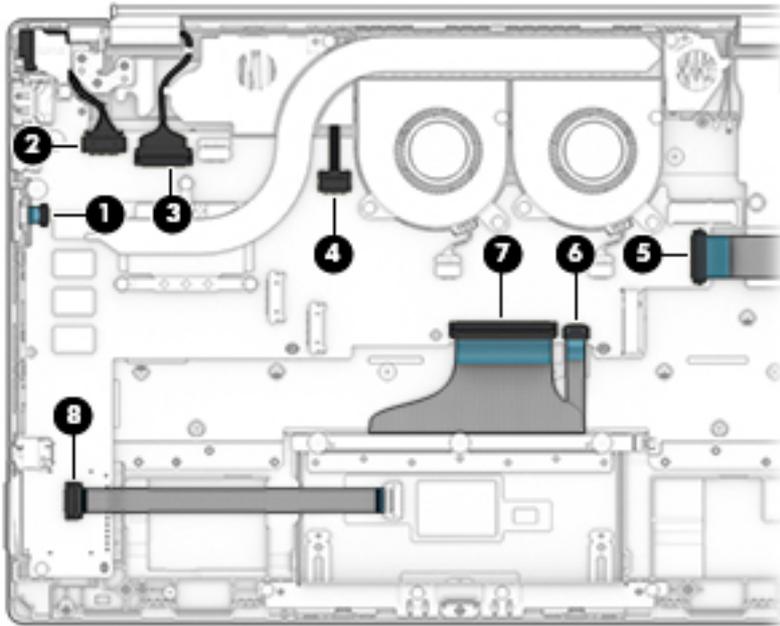
When replacing the system board, be sure to remove the following components from the defective system board and install them on the replacement system board:

- WLAN module (see [WLAN module on page 28](#))
- Solid-state drive (see [Solid-state drive on page 30](#))
- Fans (see [Fans on page 31](#))
- Heat sink (see [Heat sink on page 32](#))

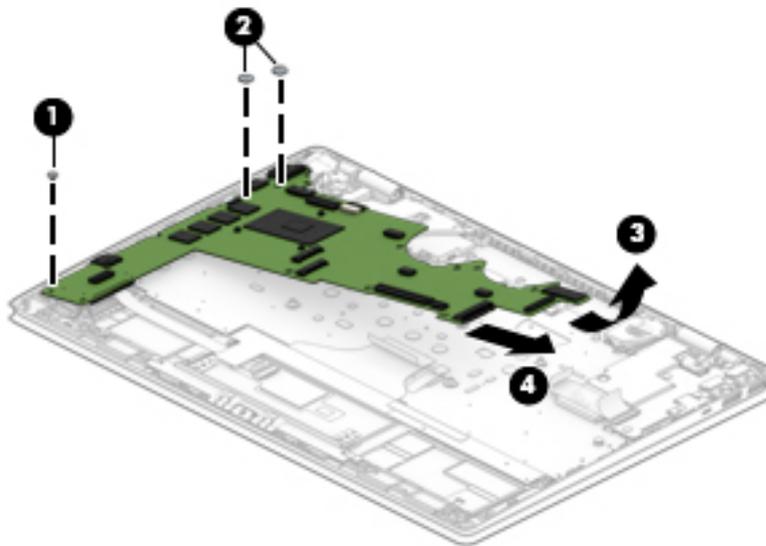
Remove the system board:

1. Disconnect the following cables:
 - (1) Fingerprint reader cable
 - (2) Power connector cable
 - (3) Display cable
 - (4) Speaker cable
 - (5) USB board cable
 - (6) Backlight cable
 - (7) Keyboard cable

(8) TouchPad cable



2. Remove the Phillips M2.0×2.5 screw **(1)** that secures the system board to the computer.
3. Remove the two broad head Phillips M2.0×2.0 screws **(2)** that secure the system board to the computer.
4. Lift the right side of the system board **(3)**, and then pull the system board to the right and out of the computer **(4)**.



Reverse this procedure to install the system board.

Display assembly

 **NOTE:** The display assembly is spared at the subcomponent level. For display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 25](#)).
5. Remove the battery (see [Battery on page 27](#)).

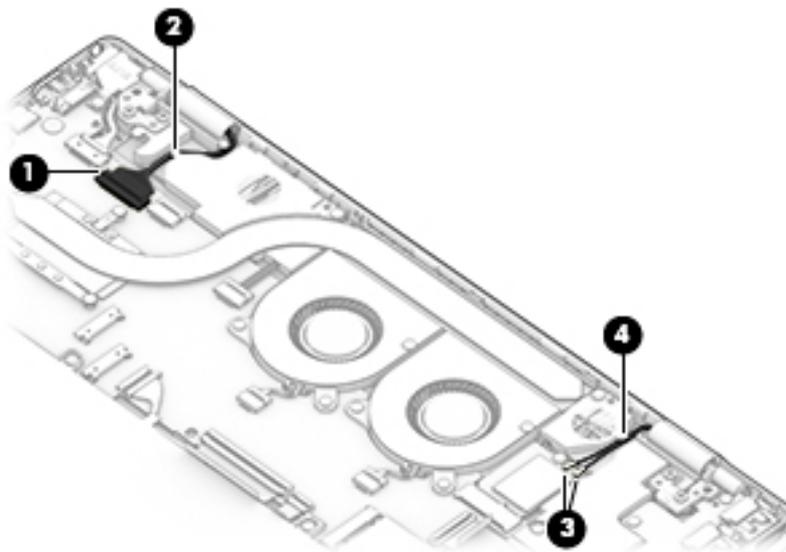
Remove the display assembly:

1. Disconnect the display cable from the system board ZIF connector **(1)**.
2. Release the display panel from the retention clip **(2)** and routing channel built into the right speaker.
3. Disconnect the WLAN antenna cables **(3)** from the terminals on the WLAN module.

 **NOTE:** Some models have only one antenna cable.

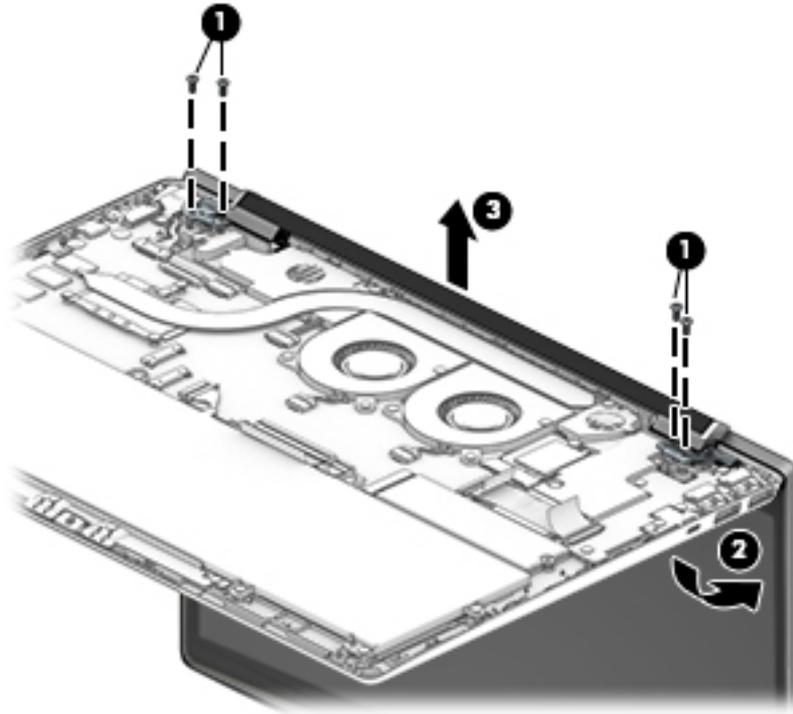
The WLAN antenna cable labeled "1/MAIN" connects to the WLAN module "Main" terminal. The WLAN antenna cable labeled "2/AUX" connects to the WLAN module "Aux" terminal.

4. Release the WLAN antenna cables from the retention clips **(4)** and routing channel built into the computer and the left speaker.



5. Remove the four Phillips M2.5×5.0 screws **(1)** that secure the display assembly to the computer.
6. Rotate the display downward to separate it from the hinges **(2)**.

7. Separate the display from the computer (3).

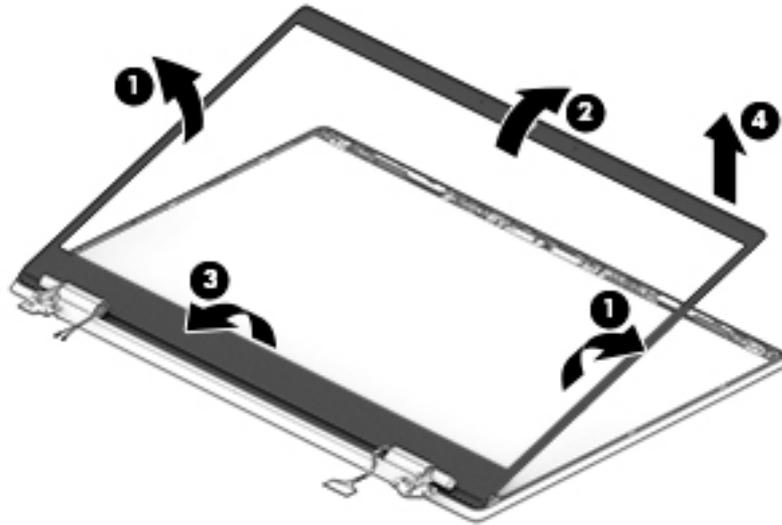


8. If it is necessary to remove or replace the display bezel or any of the display assembly subcomponents:
- Release the left and right edges of the display bezel (1) from the display assembly.
 - Release the top edge of the display bezel (2) from the display assembly.
 - Release the bottom edge of the display bezel (3) from the display assembly.
 - Remove the display bezel from the display assembly (4).

The display bezel is available using the following spare part numbers:

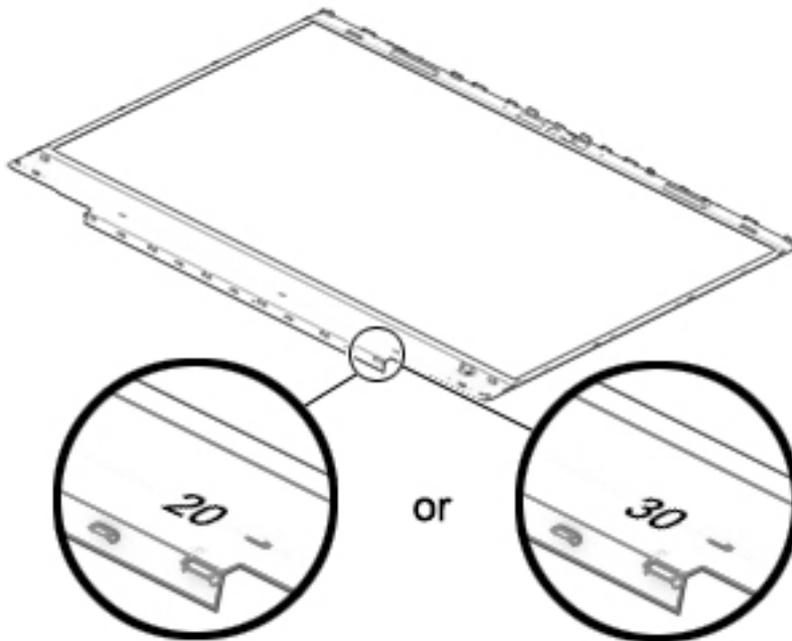
- L37359-001 - 220n bezel
- L37360-001 - 300n bezel

Display bezel adhesive is available using spare part number L38077-001.



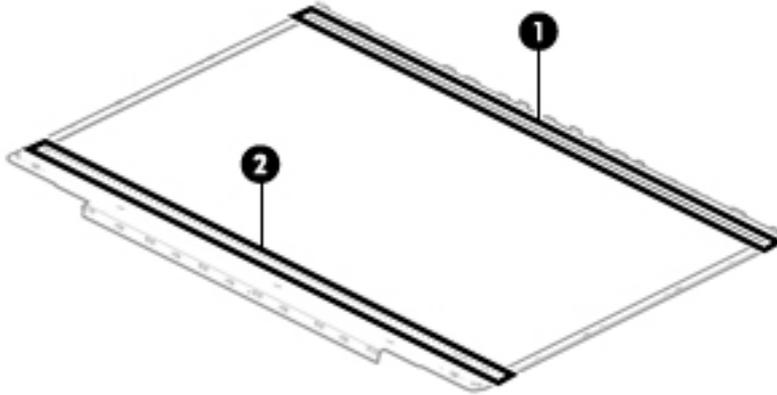
TIP: If replacing the bezel, make sure to use the correct size. The size is stamped on the inside of the bezel, as shown in the following illustration.

- '20' indicates the bezel is used with a 2 mm thickness display panel
- '30' indicates the bezel is used with a 3 mm thickness display panel



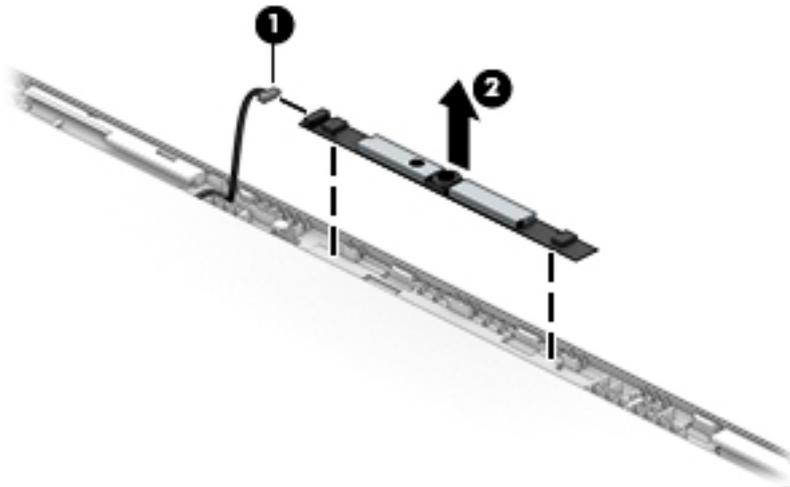
IMPORTANT: When replacing the bezel, use the following guidelines:

- On 3 mm thickness display panels, install 2.5 mm width adhesive on the top **(1)** and 5 mm adhesive on the bottom **(2)** of the bezel.
- On 2 mm thickness display panels, install 2.5 mm width adhesive on the top **(1)** and bottom **(2)** of the bezel.



9. If it is necessary to replace the camera/microphone module:
 - a. Disconnect the cable **(1)** from the camera/microphone module.
 - b. Detach the camera/microphone module **(2)** from the display enclosure. (The module is attached with double-sided adhesive.)

The camera/microphone module is available using spare part number L37362-001.

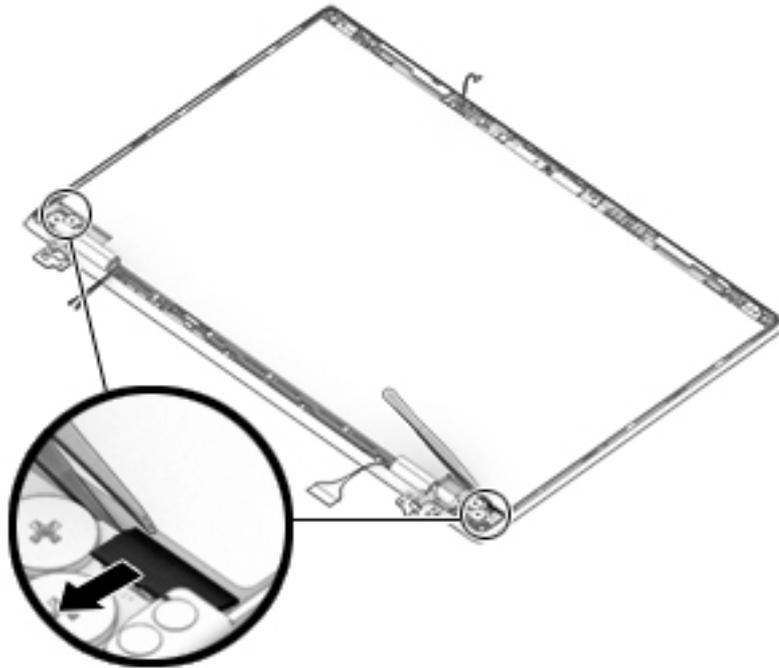


10. If it is necessary to replace the display panel:
 - a. The panel is secured to the display enclosure with long strips of adhesive tape located on each side of the panel. Use a tweezer to grasp the tape just above each hinge, and then steadily pull the tape out from behind the panel.

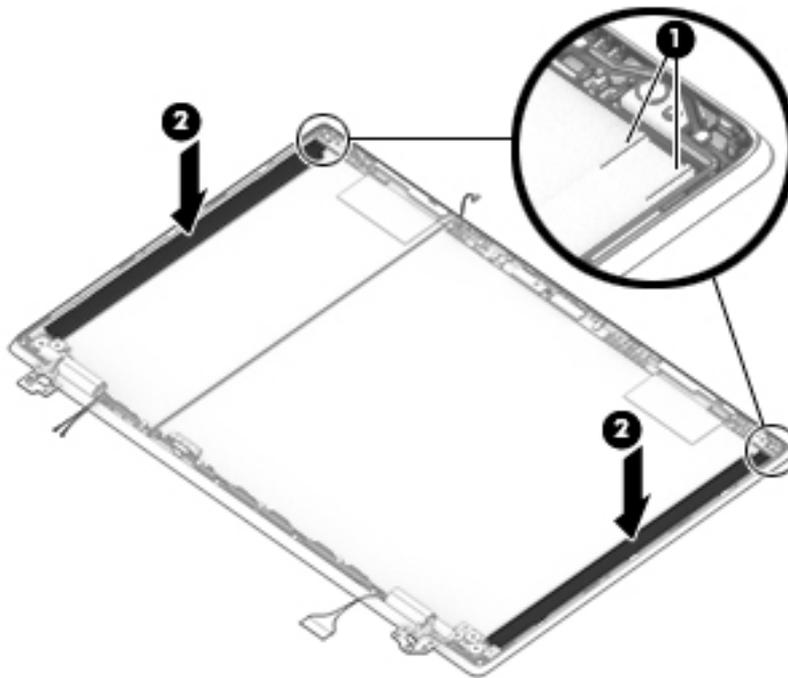


NOTE: You have to pull on the tape multiple times before it is completely removed.

Display adhesive tape is available using spare part number L38078-001.

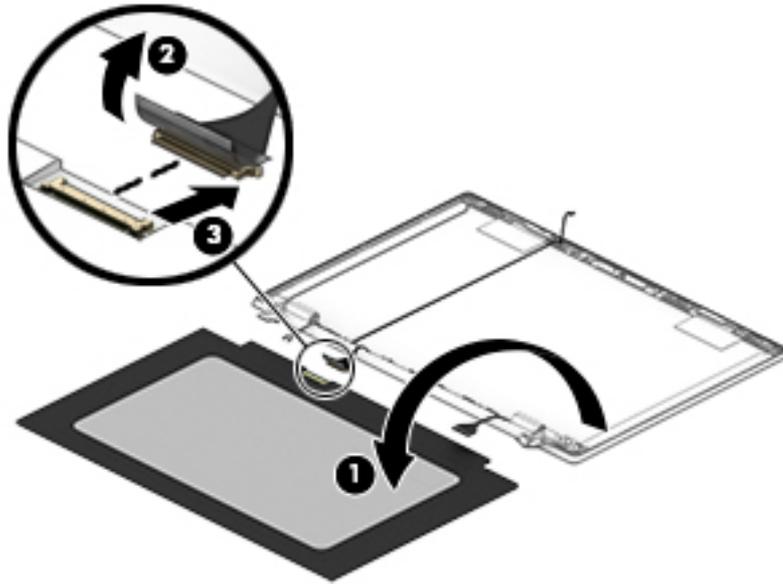


TIP: When installing a panel into the display, use the alignment marks **(1)**, and then press the adhesive tape onto each side of the display enclosure **(2)**.



- b.** Swing the top edge of the display panel **(1)** forward until the panel rests upside down next to the display.
- c.** Release the adhesive support strip **(2)** that secures the display panel cable connector to the display panel.

- d. Disconnect the display panel cable (3) from the display panel.



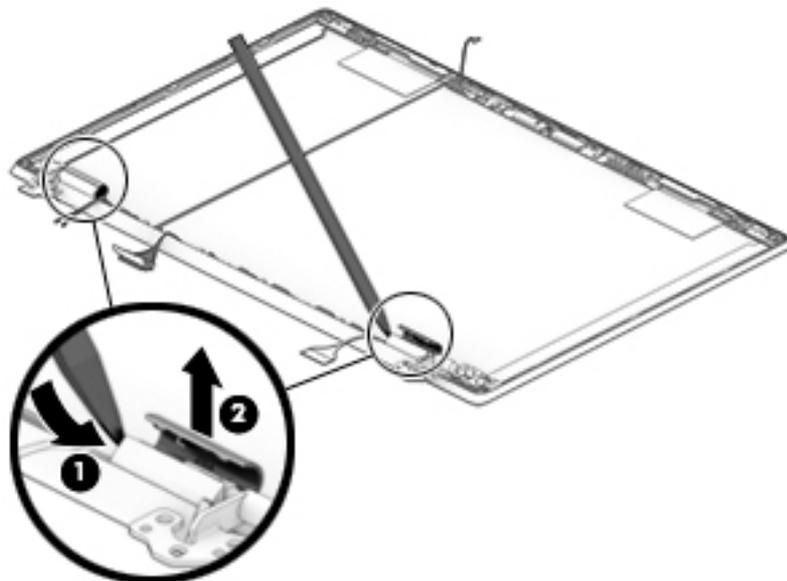
- e. Remove the display panel.

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

- L37352-001 – FHD, UWVA, slim, 220 nits
- L37353-001 – FHD, UWVA, uslim, 300 nits
- L37354-001 – HD, SVA, 220 nits

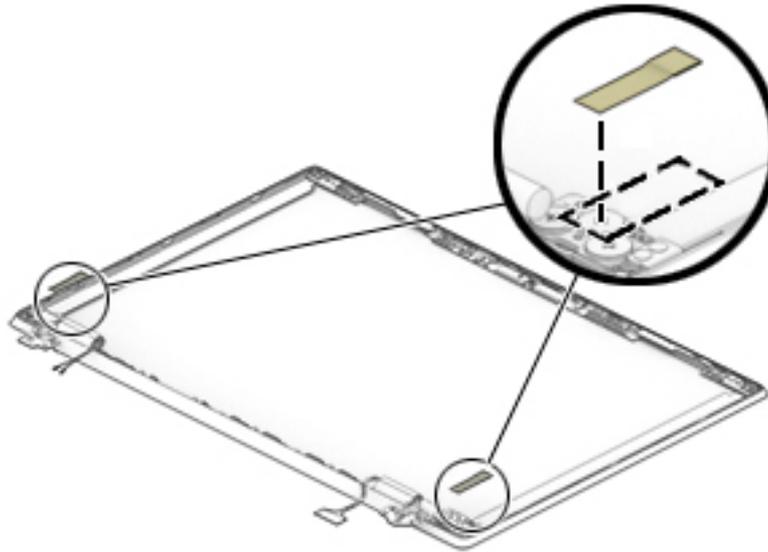
11. If it is necessary to replace the hinge covers, use a tool (1) to lift up the side of the hinge cover to remove it (2).

Hinge covers are available using spare part number L37383-001 for mineral silver models and L37384-001 for pike silver models.



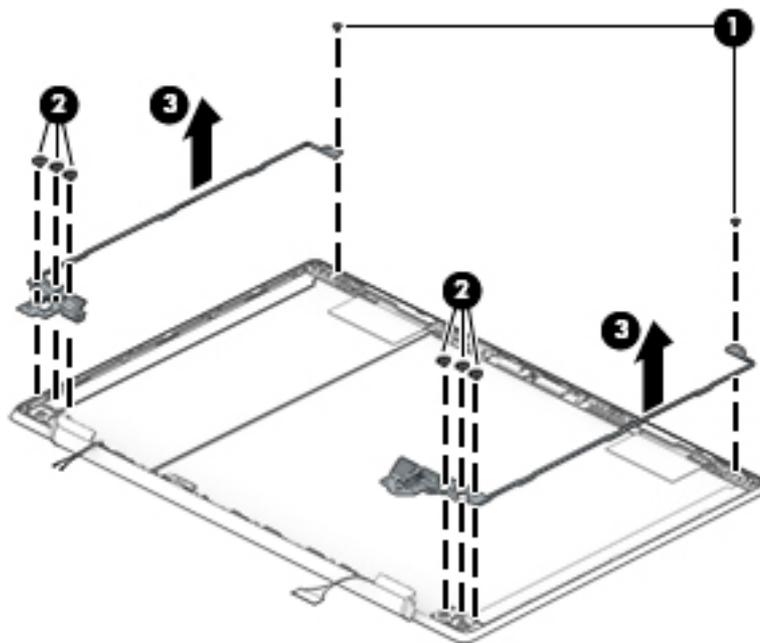
12. If it is necessary to replace the display hinges:

- a.** Remove the two Phillips M2.0×2.5 screws **(1)** from the top of the hinges.
- b.** Remove the six Phillips M2.0×2.5 broad head screws **(2)** from the bottom of the hinges.
- c.** Remove the two gaskets from the bottom of the display hinges as shown in the following illustration. The gaskets are available using spare part number L45222-001.



- d.** Remove the display hinges **(3)**.

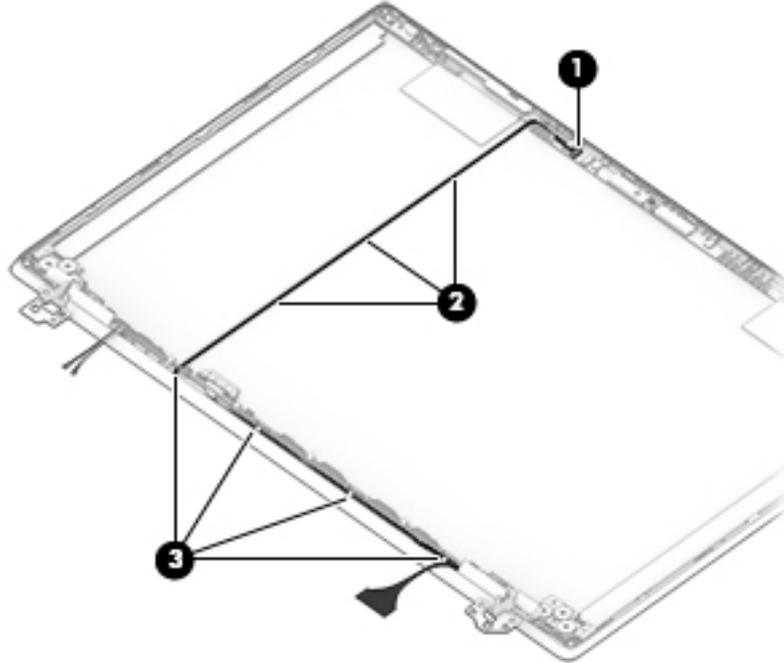
The display hinges are available using spare part number L37382-001.



13. If it is necessary to replace the display panel cable:

- a. Disconnect the cable from the camera module **(1)**.
- b. Lift to disengage the cable from the adhesive that secures it to the display enclosure **(2)**.
- c. Release the cable from the retention clips and routing channel **(3)** built into the bottom edge of the display enclosure.

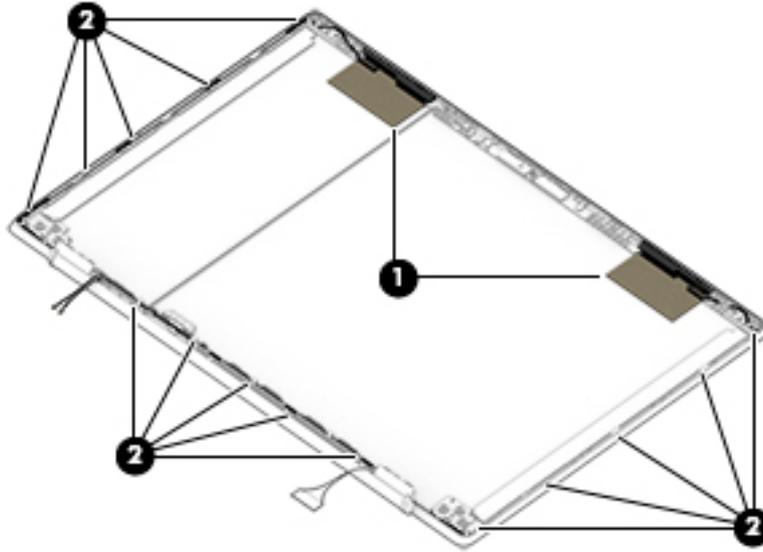
The display panel cable is available using spare part number L37361-001.



14. If it is necessary to replace the wireless antenna cables and transceivers:
 - a. Detach the wireless antenna transceivers **(1)** from the display enclosure. (The wireless antenna transceivers are attached to the enclosure with double-sided adhesive.)

- b.** Release the wireless antenna cables from the retention clips and routing channels built into the sides and bottom of the display enclosure **(2)**.

The wireless antenna cables and transceivers are available using spare part number L37539-001.



Reverse this procedure to reassemble and install the display assembly.

Top cover with keyboard

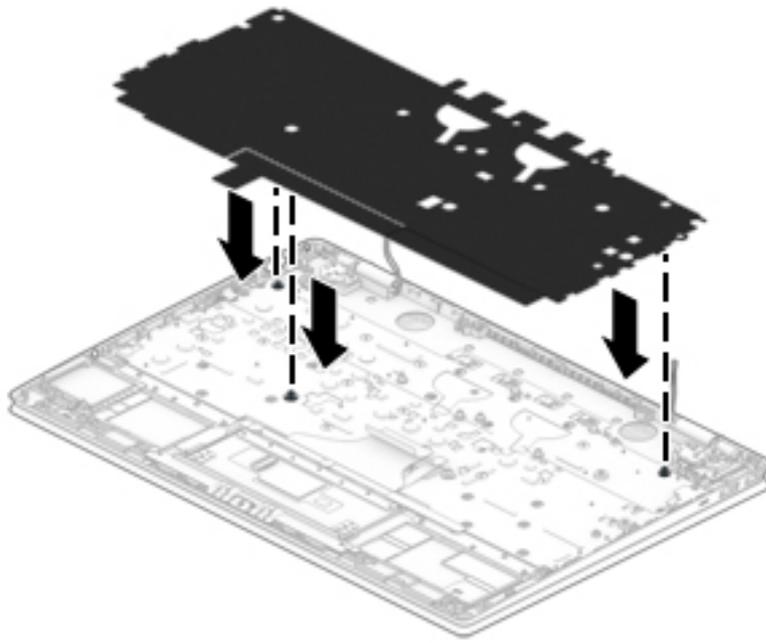
The top cover with keyboard remains after removing all other spared parts from the computer.

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

Description	Spare part number
Top cover with non-backlit keyboard, includes fingerprint reader, pike silver	L37530-xx1
Top cover with backlit keyboard, includes fingerprint reader, pike silver	L37531-xx1
Top cover with non-backlit keyboard, no fingerprint reader, pike silver	L37533-xx1
Top cover with backlit keyboard, no fingerprint reader, pike silver	L37534-xx1
Top cover with backlit keyboard, includes fingerprint reader, mineral silver (-001 United States only)	L37532-xx1

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	Italy	-061	South Korea	-AD1
Bulgaria	-261	Latin America	-161	Spain	-071
Czech Republic and Slovakia	-FL1	The Netherlands	-B31	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	Portugal	-131	Taiwan	-AB1
France	-051	Romania	-271	Thailand	-281
Germany	-041	Russia	-251	Turkey	-141
Greece	-151	Saudi Arabia	-171	United Kingdom	-031
Hungary	-211	Slovenia	-BA1	United States	-001
Israel	-BB1				

When replacing the top cover, be sure to install the Mylar shielding onto the top cover, noting the three positioning screw holes in the Mylar.



6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

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

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (BIOS) may be available on the HP website.

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

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

Determining the BIOS version

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

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

- HP Support Assistant
 1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
 2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
 1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 57](#)).
 2. Select **Main**, and then make note of the BIOS version.
 3. Select **Exit**, select one of the options, and then follow the on-screen instructions.

To check for later BIOS versions, see [Downloading a BIOS update on page 58](#).

Downloading a BIOS update

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

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

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

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

Make a note of the path to the location on your hard drive where the BIOS update is downloaded. You will need to access this path when you are ready to install the update.

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

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

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

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

7 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 59](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 59](#)).
- **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 59](#)).
- **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 59](#)).

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

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

Backing up information and creating recovery media

Using Windows tools

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

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

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

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

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

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

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

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

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



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

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see [Using Windows tools on page 59](#).

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 59](#).



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

To recover your system:

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

Changing the computer boot order

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

To change the boot order:



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

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

For computers or tablets with keyboards attached:

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

For tablets without keyboards:

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

– or –

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

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

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 61](#).

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



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

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

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version

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

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

The tool is downloaded to the selected location.

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

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

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

1. Go to <http://www.hp.com/support>.
2. Select **Get software and drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select a location on your computer or a 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

 **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 63](#).

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

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

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

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

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

Starting HP PC Hardware Diagnostics UEFI

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

1. Turn on or restart the computer, and quickly press [esc](#).
2. Press [f2](#).

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

- a. Connected USB flash drive



NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see [Downloading the latest HP PC Hardware Diagnostics UEFI version on page 63](#).

- 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. In the **HP PC Hardware Diagnostics UEFI** section, select **Download UEFI Diagnostics**, and then select **Run**.

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



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

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

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

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

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

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics UEFI** section, 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 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Depth	211 mm	8.31 in
Width	311 mm	12.24 in
Height	15.4 mm	0.61 in
Weight	1308 g	2.88 lb
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W 19.5 V dc @ 2.31 A – 45 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

33.8-cm (13.3-in) display specifications

	Metric	U.S.
Active diagonal size	33.8-cm	13.3-in
Resolution	1366×768 (HD) 1920×1080 (FHD)	
Surface treatment	BrightView	
Brightness	220 nits 300 nits	
Backlight	WLED	
Graphics adapter	eDP	
Thickness	3.0 mm 2.0 mm	

M.2 solid-state drive specifications

	128-GB*	256-GB*	512-GB*
Dimensions			
Height	1 mm	1 mm	1 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	SATA-3 (6 Gbps)	SATA-3 (6 Gbps)	SATA-3 (6 Gbps)
Transfer rate			
Sequential Read	Up to 520 MB/s	Up to 540 MB/s	Up to 530 MB/s
Random Read	Up to 60K IOPs	Up to 85K IOPs	Up to 97K IOPs
Sequential Write	Up to 160 MB/s	Up to 280 MB/s	Up to 515 MB/s
Random Write	Up to 34K IOPs	Up to 67K IOPs	Up to 88K IOPs
Ready time, Maximum (to not busy)	1.0 s	1.0 s	1.0 s
Access times			
Logical	0.1 ms	0.1	0.1
Total logical sectors	250,069,680	500,118,192	1,000,215,216
Operating temperature			
Operating	0° to 70°C (32°F to 158°F)	0° to 70°C (32°F to 158°F)	0° to 70°C (32°F to 158°F)
Non-operating	-40° to 95°C (-40°F to 203°F)	-55° to 90°C (-67°F to 194°F)	-40° to 85°C (-40°F to 185°F)
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.			

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.5 m** (5.0 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 or 250 V ac, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.

Country/region	Accredited agency	Applicable note number
		3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75mm ² or 1.25mm ² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.
		4. The flexible cord must be Type RVV, 3-conductor, 0.75mm ² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
		5. The flexible cord must be Type H05VV-F 3X0.75mm ² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
		6. The flexible cord must be Type HVCTF 3X1.25mm ² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
		7. For 127 V ac, the flexible cord must be Type SVT or SJT 3 x 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3X0.75/1.00mm ² conductor size, with plug BS 1363/A with BSI or ASTA marks.

11 Recycling

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

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

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