



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

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1 Product description

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP 15 Laptop PC
	HP model number: 15-dw0xxx
	HP CTO model: 15t-dw000
	HP (APJ) model number: 15s-du0xxx
	HP (APJ IT Mall) model number: 15s-dr0xxx
	HP (APJ OLS) model number: 15s-dy0xxx
Processors	8th generation Intel® Core™ processors
	i7-8565U 1.8 GHz (SC turbo up to 4.60 GHz) quad core processor (8.0 MB L3 cache, 2400 MHz FSB, 15 W)
	i5-8265U 1.6 GHz (SC turbo up to 3.90 GHz) quad core processor (6.0 MB L3 cache, 2400 MHz FSB, 15 W)
	i3-8145U 2.1 GHz (SC turbo up to 3.90 GHz) dual core processor (4.0 MB L3 cache, 2400 MHz FSB, 15 W)
	7th generation Intel processors
	Core i3-7020U 2.3 GHz, dual core processor (3.0 MB L3 cache, 2133 MHz FSB, 15 W)
	Pentium® Silver N5000 1.1 GHz (turbo up to 2.7 GHz), dual core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W)
	Celeron® N4000 1.1 GHz (turbo up to 2.6 GHz), dual core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W)
Graphics	Support for HD decode, DX12, and high-definition multimedia interface (HDMI)
	Supports Optimus (GeForce MX250 only)
	Supports FPS (GPU Performance Scaling) (models with discrete graphics only)
	Internal graphics
	Intel UHD Graphics 620 (8th generation Intel Core processors)
	Intel HD Graphics 620 (7th generation Intel Core processors)
	Intel UHD Graphics 605 (Pentium processor)
	Intel UHD Graphics 600 (Celeron processor)
	Hybrid graphics
	NVIDIA GeForce® MX250 with 4 GB of discrete video memory
	NVIDIA GeForce MX130 with 2 GB of discrete video memory
	NVIDIA GeForce MX110 with 2 GB of discrete video memory
Panel	15.6-in, 16:9 ultra wide aspect ratio, white light-emitting (WLED), slim-flat (3.2 mm), eDP, narrow bezel, 220 nits
	HD (1366 × 768), BrightView, SVA
	HD (1366 × 768), BrightView, SVA, 220 nits, Touch-on Panel (TOP); multi touch enabled

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

Category	Description
	HD (1366 × 768), anti glare, SVA (select products only)
	Full high-definition (FHD) (1920 × 1080), anti glare, SVA
	Full high-definition (FHD) (1920 × 1080), anti glare, UWVA
Memory	Two SODIMM memory module slots, non-customer-accessible/non-upgradable (Core processors)
	Supports up to 16 GB of system memory
	DDR4-2400 dual channel support (8th generation Core processors)
	DDR4-2133 dual channel support (7th generation Core processors)
	Supports the following configurations:
	<ul style="list-style-type: none"> • 16 GB (8 GB × 2) • 12 GB (8 GB × 1 + 4 GB × 1) • 8 GB (8 GB × 1 or 4 GB × 2) • 4 GB (4 GB × 1)
	One SODIMM memory module slot, non-customer-accessible/non-upgradable (Pentium and Celeron processors)
	DDR4-2400 dual channel support
	Supports the following configurations:
	<ul style="list-style-type: none"> • 8 GB (8 GB × 1) • 4 GB (4 GB × 1)
Storage	Support for 7.0 mm/7.2 mm, SATA, 2.5-inch hard drive
	Support for solid-state drive + hard drive (select products only)
	Support for M.2 SATA/PCIe solid-state drive (select products only)
	Single hard drive configurations
	2 TB, 5400 rpm, 7.0 mm
	1 TB, 5400 rpm, 7.2 mm
	500 GB, 5400 rpm, 7.0 mm
	Dual storage configurations (select products only)
	256 GB, PCIe, value, solid-state drive + 1 TB, 5400 rpm, 7.2 mm hard drive
	256 GB, SATA, TLC, solid-state drive + 1 TB, 5400 rpm, 7.2 mm hard drive
	128 GB, SATA, TLC, solid-state drive + 2 TB, 5400 rpm, 7.2 mm hard drive
	M.2 SATA-3, TLC, solid-state drive (select products only)
	256 GB
	128 GB
	M.2, PCIe, NVMe, value, solid-state drive
	512 GB

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

Category	Description
	256 GB
	Intel Optane (3D Xpoint) Solution, PCIe, Gen3 × 2, M.2, solid-state drive (select products only)
	16 GB (Optane memory module) + 2 TB, 5400 rpm, 7.2 mm hard drive
	16 GB (Optane memory module) + 1 TB, 5400 rpm, 7.2 mm hard drive
Camera	HP TrueVision HD Camera with indicator light, USB 2.0, HD BSI sensor, f2.0
	720p by 30 frames per second
	Single digital microphone
Audio	Audio control panel: HP Audio Control
	Dual speakers
RJ-45 (network) jack	Integrated 10/100/1000 NIC
Wireless	Support for Miracast
	Turbo Lite WLAN SVTP
	Integrated wireless options with a single antenna (M.2/PCIe)
	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
	Integrated wireless options with dual antennas (M.2/PCIe)
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 (MU-MIMO supported)
Media card reader	Supports SD™/SDHC™/SDXC™
	Push-pull insertion/removal
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)
	AC Smart Pin adapter plug
	Audio-out (headphone)/audio-in (microphone) combo jack
	HDMI v1.4b supporting up to 1920 × 1080 @ 60 Hz
	RJ-45 (network) jack
	(2) USB 3.1 Gen 1 Type-A ports (right side)
	(1) USB 3.1 Gen 1 Type-C port (left side); supports data transfer
Keyboard/ TouchPad	Keyboard
	Full-sized, textured, island-style keyboard with numeric keypad
	Full-sized, 2-coat paint, backlit, island-style keyboard with numeric keypad
	Full-sized, 2-coat paint, no backlight, island-style keyboard with numeric keypad

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

Category	Description
	Full-sized, 3-coat paint, backlit, island-style keyboard with numeric keypad
	TouchPad requirements
	Image sensor
	MultiTouch gestures enabled
	Precision TouchPad support
	Support for Modern TrackPad gestures
	Taps enabled as default
Power requirements	Battery
	3-cell, 41 Whr, prismatic/polymer battery
	Battery life enhancement
	Supports battery fast charge
	AC adapter
	65 W HP Smart AC adapter (EM) with power cord
	65 W HP Smart AC adapter with power cord
	45 W HP Smart AC adapter with power cord
	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	Fingerprint reader
	Support for Trusted Platform Module (fTPM) 2.0 (firmware-based)
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 Africa Market PPP
	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 Africa Market PPP
	Windows 10 Home 64 Single Language APAC EM PPP

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

Category	Description
	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 Value Single Language
	Windows 10 Home S 64
	Windows 10 Home S 64 Plus
	Windows 10 Home S 64 Value
	Windows 10 Pro 64
Serviceability	End user replaceable part
	AC adapter

2 Getting to know your computer

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

Right side



Table 2-1 Right-side components and their descriptions

Component	Description
(1)  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">▲ Pull the card out of the memory card reader.
(2)  USB SuperSpeed ports (2)	<p>Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.</p>
(3) 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.
(4)  Power connector	<p>Connects an AC adapter.</p>

Left side

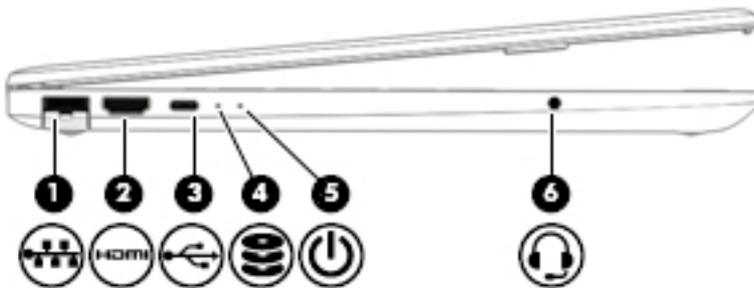


Table 2-2 Left-side components and their descriptions

Component	Description
(1) 	<p>RJ-45 (network) jack/status lights</p> <p>Connects a network cable.</p> <ul style="list-style-type: none"> White: The network is connected. Amber: Activity is occurring on the network.
(2) 	<p>HDMI port</p> <p>Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High-Definition Multimedia Interface (HDMI) device.</p>
(3) 	<p>USB Type-C port</p> <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>
(4) 	<p>Drive light</p> <ul style="list-style-type: none"> Blinking white: The hard drive is being accessed.
(5) 	<p>Power light</p> <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.
(6) 	<p>Audio-out (headphone)/Audio-in (microphone) combo jack</p> <p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> Select the Start button, select HP Help and Support, and then select HP Documentation. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>

Display

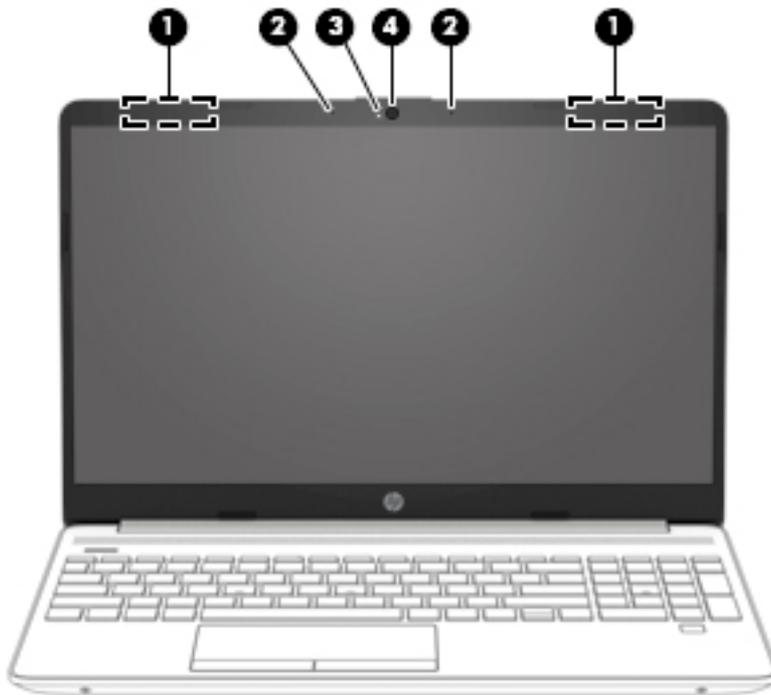


Table 2-3 Display components and their descriptions

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) 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

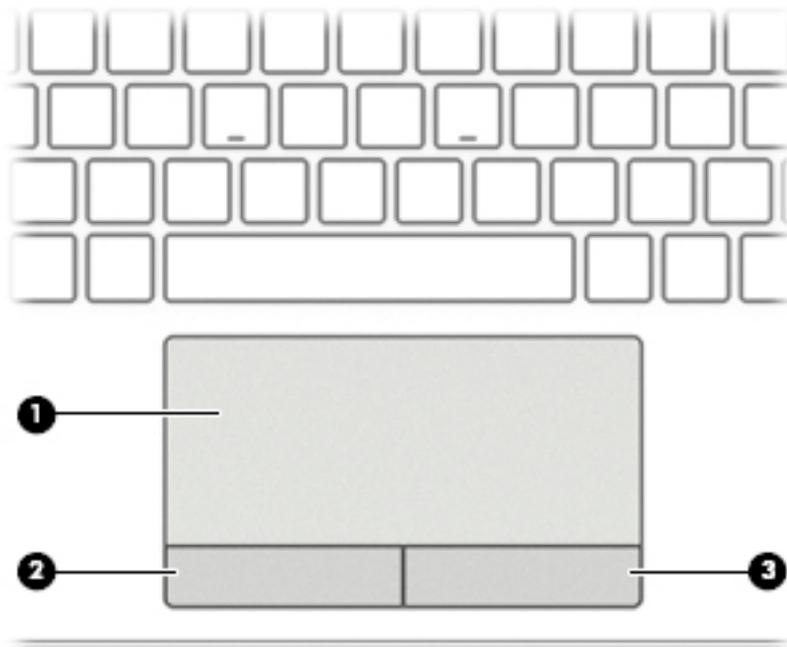


Table 2-4 TouchPad components and their descriptions

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

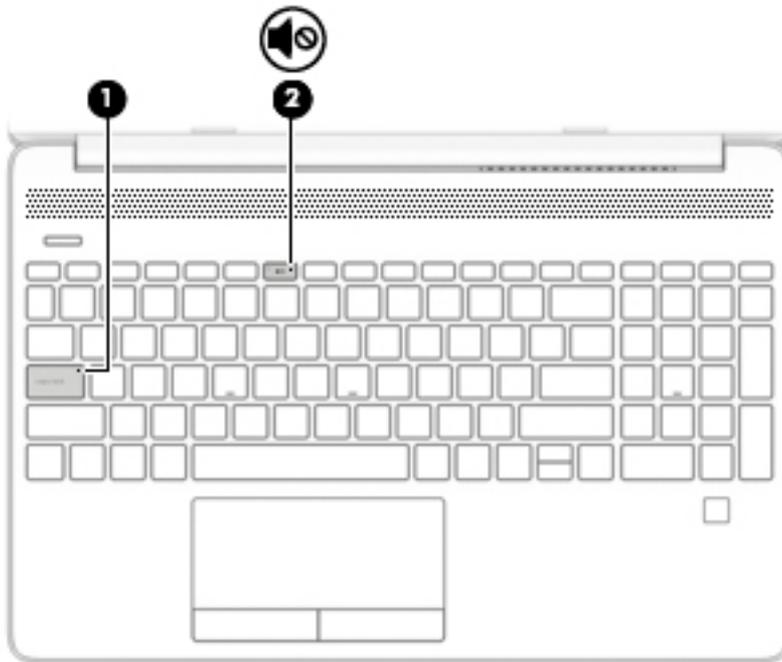


Table 2-5 Lights and their descriptions

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">• On: Computer sound is off.• Off: Computer sound is on.

Button, speakers, vent, and fingerprint reader

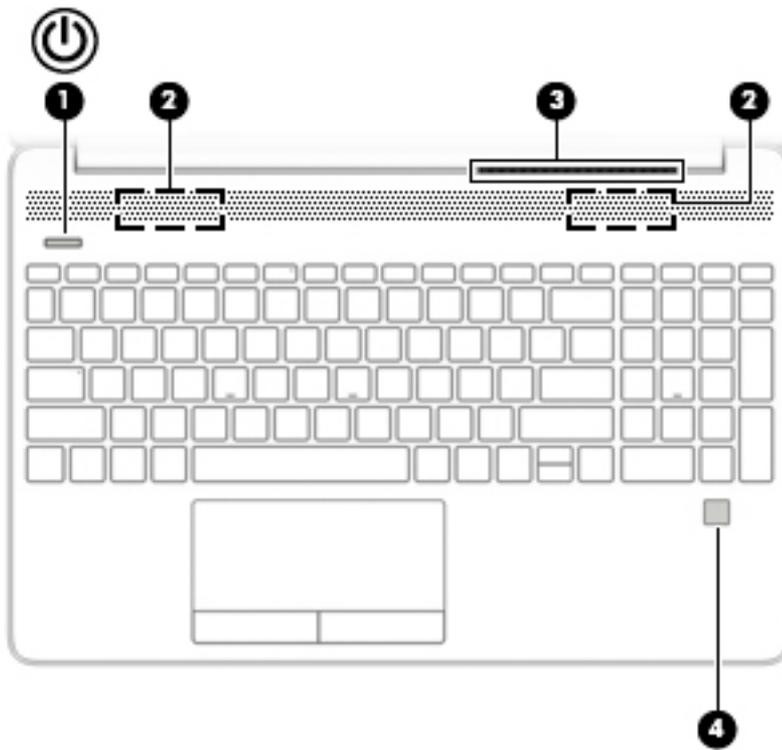


Table 2-6 Button, speakers, vent, and fingerprint reader and their descriptions

Component	Description
(1)  Power button	<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> <p>▲ Right-click the Power icon , and then select Power Options.</p>
(2) Speakers	Produce sound.
(3) Vent	Enables airflow to cool internal components.
(4) Fingerprint reader (select products only)	Allows a fingerprint logon to Windows, instead of a password logon.

Table 2-6 Button, speakers, vent, and fingerprint reader and their descriptions (continued)

Component	Description
	<p>▲ To use the fingerprint reader, place your finger on the fingerprint reader until it reads your fingerprint.</p> <p>IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.</p>

Special keys

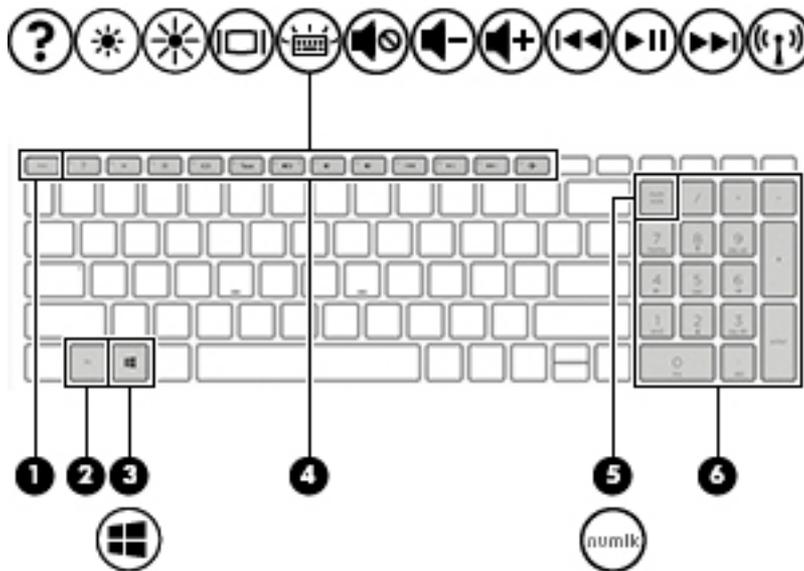


Table 2-7 Special keys and their descriptions

Component	Description
(1) esc key	Displays system information when pressed in combination with the fn key.
(2) fn 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 f5 action key turns the keyboard backlight feature off or on.
(5) num lock 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 num lock is pressed, the keypad can be used like an external numeric keypad. NOTE: If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

Action keys

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

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

Table 2-8 Action keys and their descriptions

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

Table 2-8 Action keys and their descriptions (continued)

Icon	Description
	Mutes or restores speaker sound.
	Turns the airplane mode and wireless feature on or off. NOTE: The airplane mode key is also referred to as the wireless button. NOTE: A wireless network must be set up before a wireless connection is possible.

Bottom

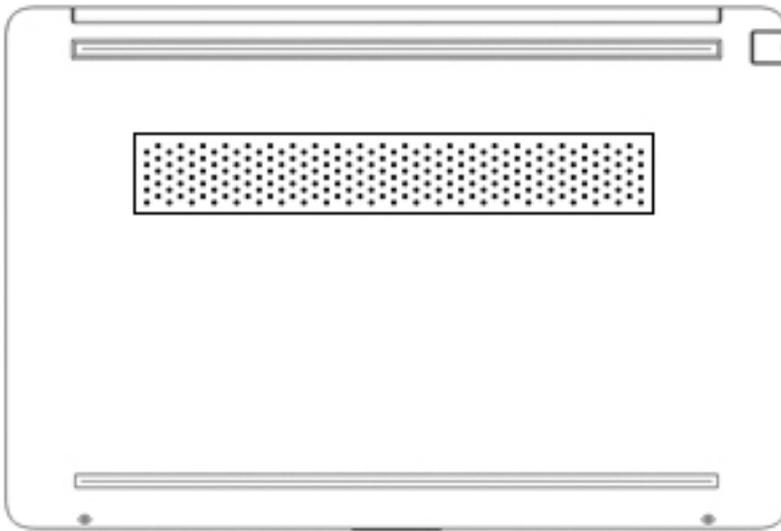


Table 2-9 Bottom components and their descriptions

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

Labels

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

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

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

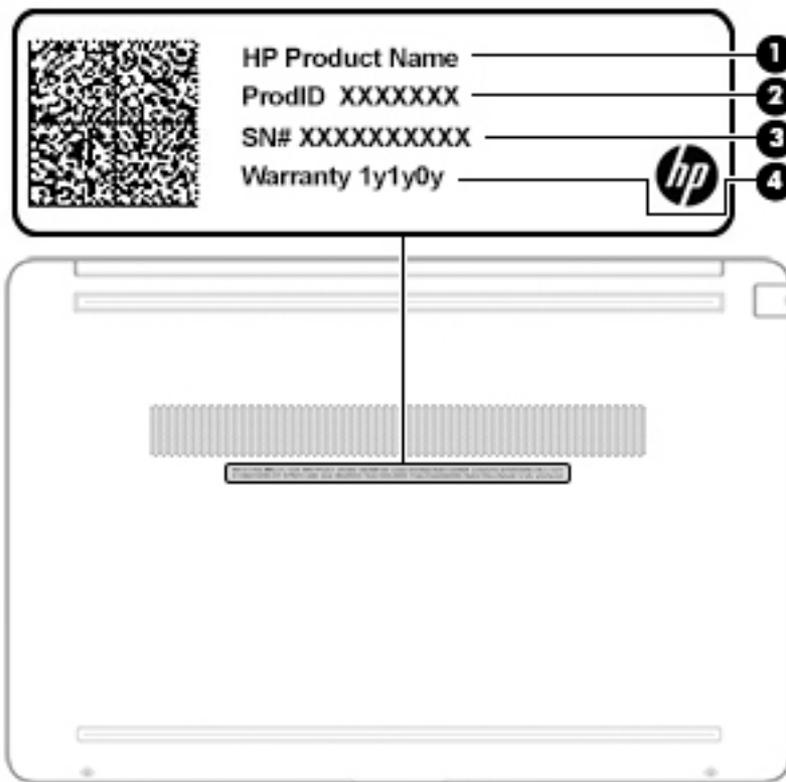


Table 2-10 Service label components

Component
(1) Product name
(2) Product ID
(3) Serial number
(4) Warranty period

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

3 Illustrated parts catalog

 **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

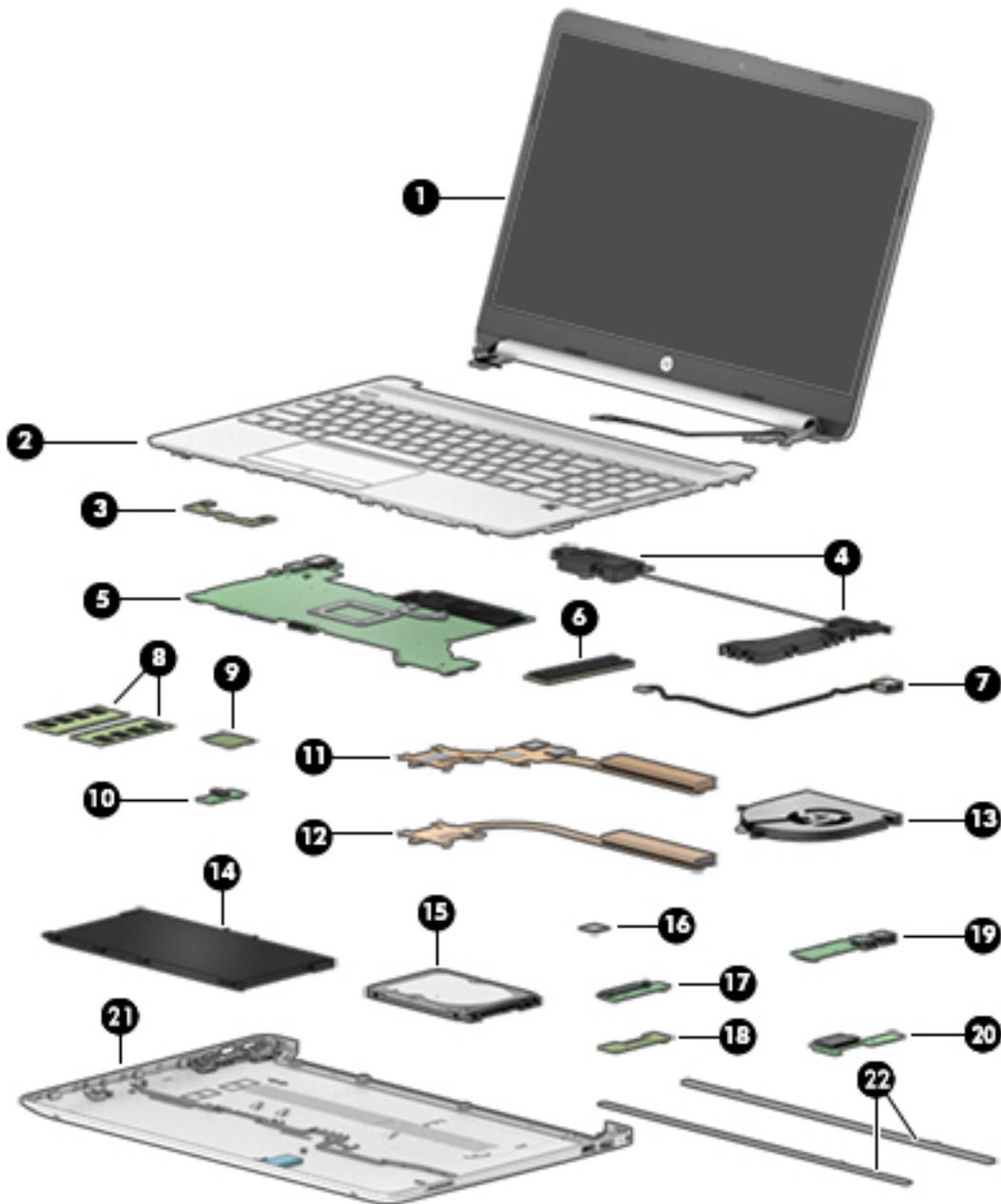


Table 3-1 Computer major components and their descriptions

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 19 .	
(2)	Top cover with keyboard	
	Ash silver, backlit	L52020-xx1
	Ash silver, no backlight	L52021-xx1
	Natural silver, backlit	L52022-xx1
	Natural silver, no backlight	L52023-xx1
	Ash silver, backlit, models with a fingerprint reader	L52152-xx1
	Ash silver, no backlight, models with a fingerprint reader	L52153-xx1
	Natural silver, backlit, models with a fingerprint reader	L52154-xx1
	Natural silver, no backlight, models with a fingerprint reader	L52155-xx1
(3)	TouchPad button board NOTE: The TouchPad button board cable is available using spare part number L52037-001. The TouchPad cable is available using spare part number L52038-001.	L52029-001
(4)	Speakers (left and right)	L52040-001
(5)	System board (includes processor and replacement thermal material) For use in models with discrete graphics equipped with the following processors:	
	Intel Core i7-8565U processor and 4 GB of GeForce MX250 discrete graphics memory	L51994-xx1
	Intel Core i7-8565U processor and 2 GB of GeForce MX130 discrete graphics memory	L51993-xx1
	Intel Core i5-8265U processor and 2 GB of GeForce MX130 discrete graphics memory	L51992-xx1
	Intel Core i5-8265U processor and 2 GB of GeForce GTX1050 discrete graphics memory	L51991-xx1
	Intel Core i3-7020U processor and 2 GB of GeForce MX110 discrete graphics memory	L51990-xx1
	For use in models with UMA graphics equipped with the following processors:	
	Intel Core i7-8565U processor	L51987-xx1
	Intel Core i5-8265U processor	L51986-xx1
	Intel Core i3-8145U processor	L51985-xx1
	Intel Core i3-7020U processor	L51984-xx1
	Intel Pentium N5000 processor	L51988-xx1
	Intel Celeron N4000 processor	L51989-xx1
(6)	Solid-state drive	
	512 GB, PCIe	L52006-001
	256 GB, PCIe	L52005-001
	256 GB, SATA-3, TLC	L52004-001

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

Item	Component	Spare part number
	128 GB, SATA-3, TLC	L52003-001
	Optane memory module , 16 GB, PCIe	L52002-001
(7)	Power connector (DC-in) cable	L51995-001
(8)	Memory modules (DDR4-2400)	
	8 GB	937236-855
	4 GB	L10598-855
(9)	WLAN module	
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + BT 4.2 (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-CG 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter	L21480-005
(10)	Audio board	L52028-001
	NOTE: The audio board cable is available using spare part number L52035-001.	
(11)	Heat sink, discrete graphics (includes replacement thermal material)	L52032-001
(12)	Heat sink, UMA graphics (includes replacement thermal material)	L52033-001
(13)	Fan	L52034-001
(14)	Battery (3-cell, 41 Whr)	L11119-855
(15)	Hard drive (does not include hard drive cable)	
	2 TB, 5400 rpm	912487-855
	1 TB, 5400 rpm	L30422-005
	500 GB, 5400 rpm	778186-005
(16)	Fingerprint reader	
	NOTE: The fingerprint reader cable is available using spare part number L52036-001.	
	Ash silver	L52044-001
	Natural silver	L56013-001
(17)	Hard drive board (does not include cable)	L52024-001
	NOTE: The hard drive board cable is available using spare part number L52025-001.	
(18)	Solid-state drive board (does not include cable)	L52026-001
	NOTE: The solid-state drive board cable is available using spare part number L52025-001.	
(19)	USB board (does not include cable)	L52031-001
	NOTE: The USB board cable is available using spare part number L52039-001.	
(20)	Card reader board	L52030-001
	NOTE: The card reader board cable is available using spare part number L52027-001.	
(21)	Bottom cover	
	Natural silver	L52007-001

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

Item	Component	Spare part number
	Pale gold	L52008-001
(22)	Rubber Foot Kit (includes front and rear feet)	
	For use in natural silver models	L52041-001
	For use in pale gold models	L52042-001

Display assembly components

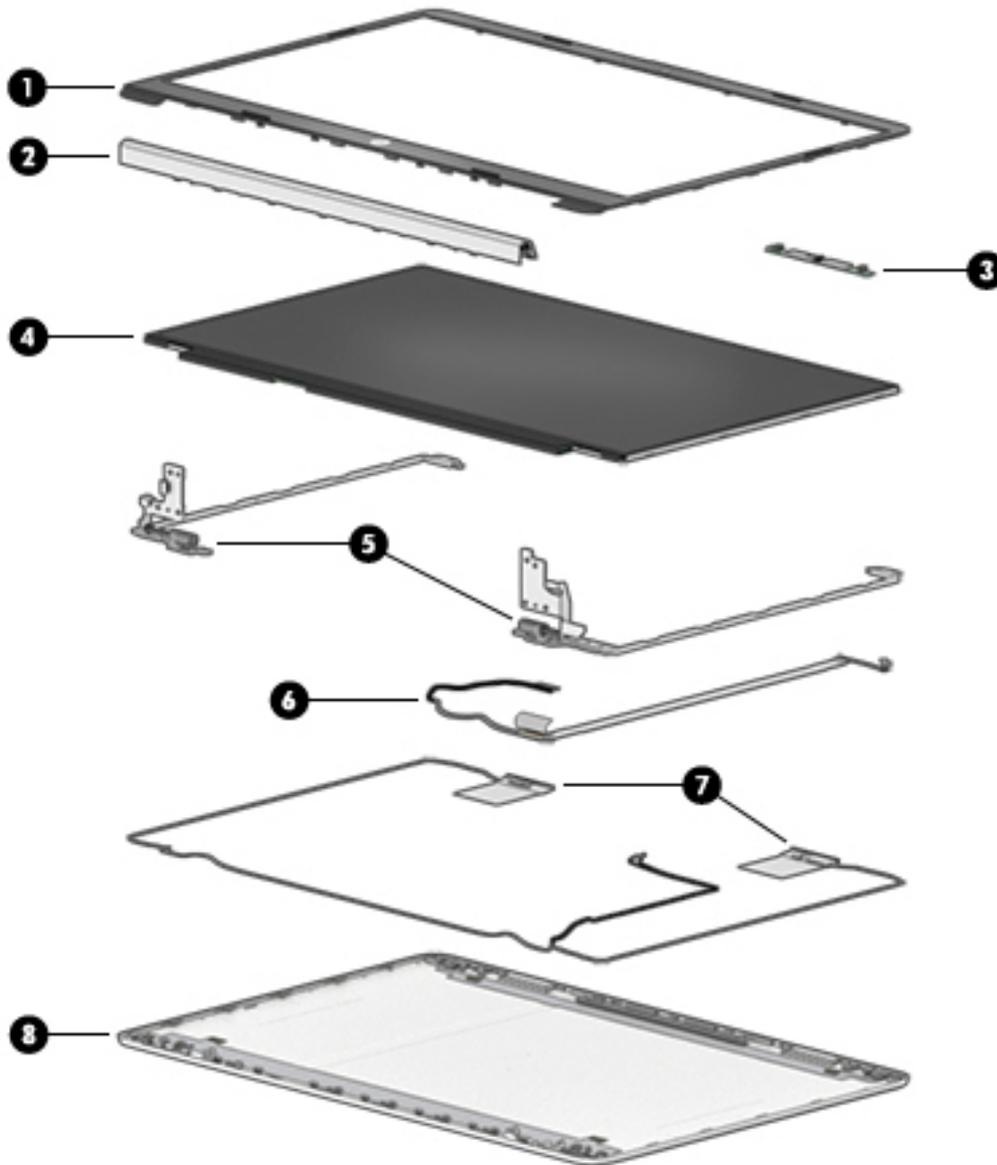


Table 3-2 Display components and their descriptions

Item	Component	Spare part number
(1)	Display bezel	L52014-001
(2)	Hinge cover (include display bezel adhesive and display rear cover adhesive)	
	Pale gold	L52011-001
	Natural silver	L52010-001
(3)	HD camera/microphone module (includes display panel adhesive kit)	L51996-001
(4)	Display panel (includes display panel adhesive kit)	
	FHD, anti glare, SVA, non-touch	L51997-001
	FHD, anti glare, UWVA, non-touch	L51998-001
	FHD, BrightView, UWVA, touch-on panel (TOP)	L52156-001
	HD, anti glare, non-touch	L51999-001
	HD, BrightView, non-touch	L52000-001
	HD, BrightView, touch-on panel (TOP)	L52001-001
(5)	Hinges (includes left and right display hinges; includes display panel adhesive and display bezel adhesive)	L52009-001
(6)	Display panel cable (includes display panel adhesive and display bezel adhesive)	
	Touch screen	L52016-001
	Non-touch screen	L52015-001
(7)	Wireless antenna kits (includes display panel adhesive kit)	
	Dual antenna kit	L52018-001
	Single antenna kit	L52017-001
(8)	Display back cover (includes antenna cables, display bezel adhesive and display panel adhesive tape kit):	
	Pale gold	L52013-001
	Natural silver	L52012-001
	Adhesive tape kit (includes display panel adhesive and display bezel adhesive; not illustrated)	L52528-001

Mass storage devices

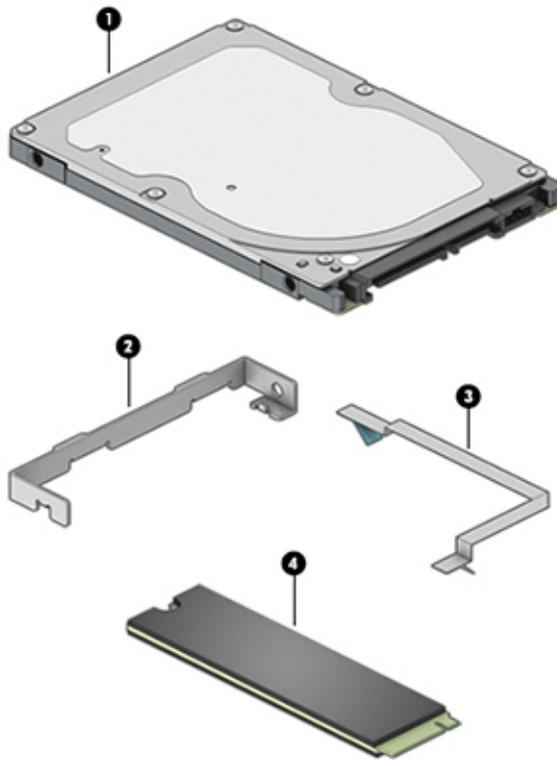


Table 3-3 Mass storage devices and their descriptions

Item	Component	Spare part number
(1)	Hard drives (does not include hard drive cable)	
	2 TB, 5400 rpm	912487-855
	1 TB, 5400 rpm	L30422-005
	500 GB, 5400 rpm	778186-005
(2)	Hard drive bracket	not spared
(3)	Hard drive cable	L52025-001
(4)	Solid-state drive (M.2)	
	512 GB, PCIe	L52006-001
	256 GB, SATA-3, TLC	L52004-001
	256 GB, PCIe	L52005-001
	128 GB, SATA-3, TLC	L52003-001
	Optane memory module , 16 GB, PCIe (not illustrated)	L52002-001

Cables

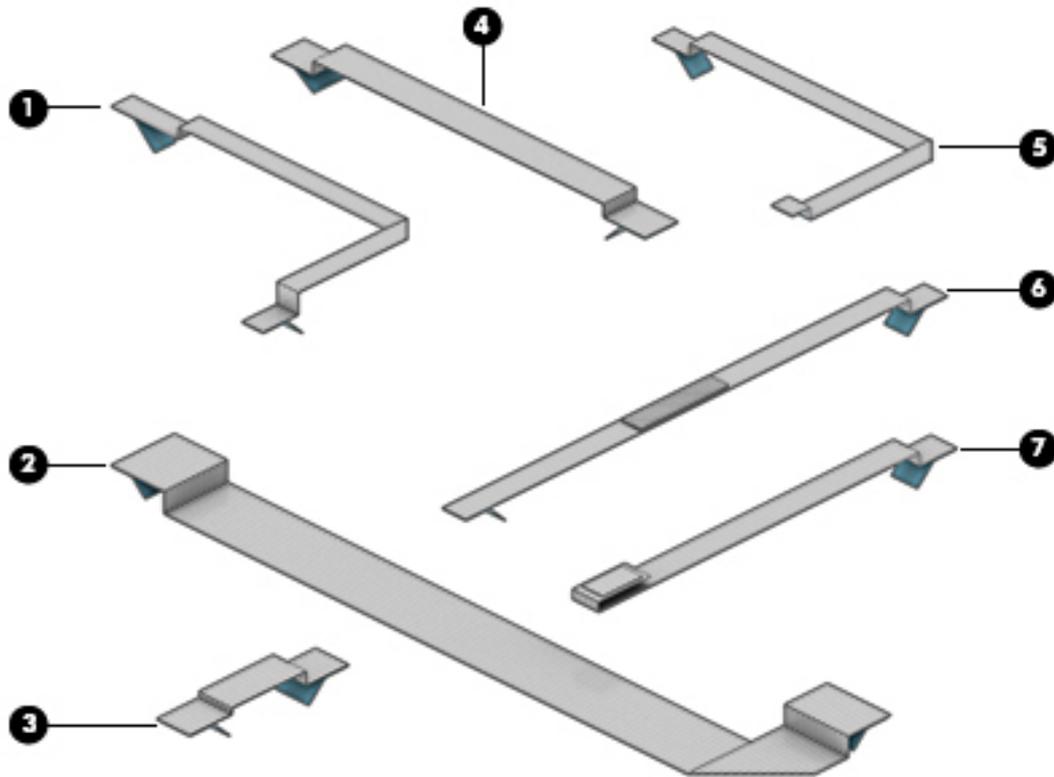


Table 3-4 Cables and their descriptions

Item	Component	Spare part number
(1)	Hard drive/solid-state drive cable	L52025-001
(2)	USB board cable	L52039-001
(3)	Audio board cable	L52035-001
(4)	Card reader board cable	L52027-001
(5)	Fingerprint reader board cable	L52036-001
(6)	TouchPad button board cable	L52037-001
(7)	TouchPad cable	L52038-001

Miscellaneous parts

Table 3-5 Miscellaneous parts and their descriptions

Component	Spare part number
AC adapter	
65 W HP Smart AC adapter (non-PFC, EM, RC, 4.5 mm)	913691-850
65 W AC adapter (non-PFC, S-3P, 4.5 mm)	710412-001
45 W HP Smart AC adapter (non-PFC, RC, 4.5 mm, non-slim)	741727-001
Power cord (C5 connector, 1.0 m)	
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 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
Screw Kit	L52043-001
External DVD±RW DL SuperMulti Drive	747080-001
HP HDMI-to-VGA adapter	701943-001
USB-C-to-USB-A adapter	833960-001
HP USB-C-to-USB-A hub	916838-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Plastic, nonmarking pry tool
- Phillips P1 magnetic screw driver
- Tweezer

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



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

Cables and connectors



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 authorized service provider 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.

IMPORTANT: 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 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 50 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.

Preparation for disassembly

See [Removal and replacement procedures preliminary requirements on page 24](#) for initial safety procedures.

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

Bottom cover

Table 5-1 Bottom cover descriptions and part numbers

Description	Spare part number
Bottom cover for use in natural silver models	L52007-001
Bottom cover for use in pale gold models	L52008-001

Before removing the bottom cover, follow these steps:

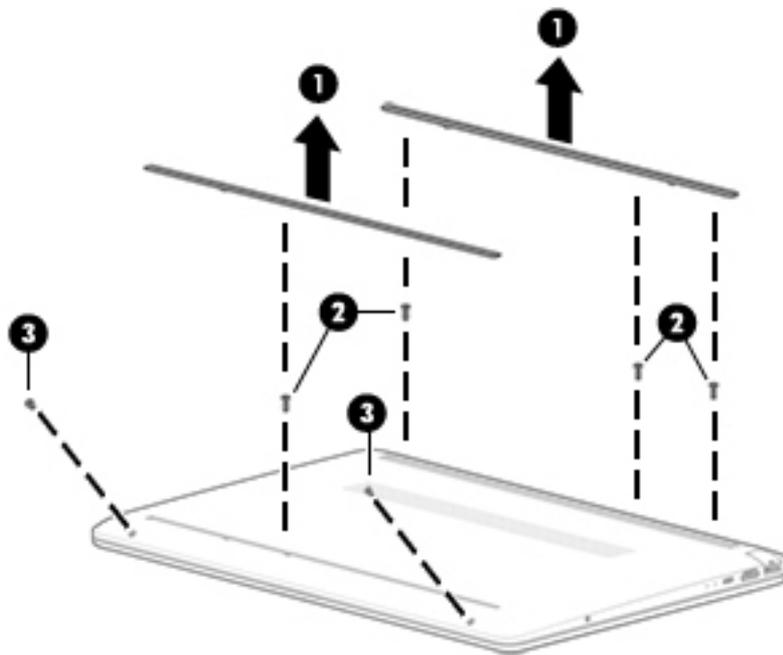
- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).

Remove the bottom cover:

1. Remove the two rubber feet **(1)**.

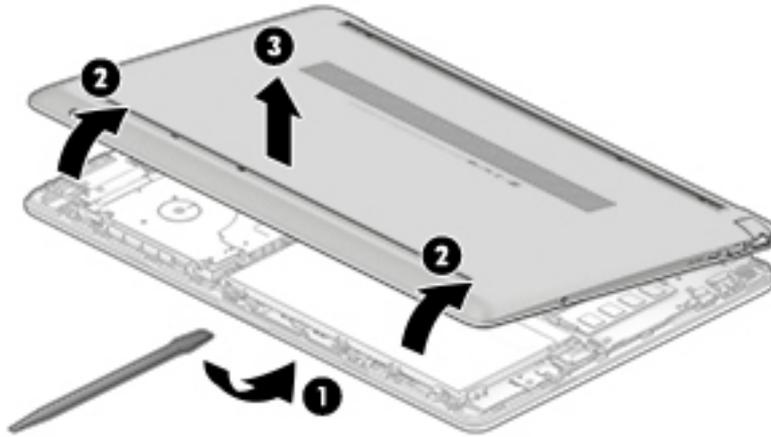
The rubber feet are available using spare part number L52041-001 for natural silver models and L52042-001 for pale gold models.

2. Remove the four Phillips M2.5 × 8.0 screws **(2)** from under the feet and the two Phillips M2.0 × 4.0 screws **(3)** along the bottom edge of the bottom cover.



3. Use a plastic tool **(1)** to disengage the bottom cover from the computer **(2)**.

4. Remove the bottom cover (3).



Reverse this procedure to install the bottom cover.

Battery

Table 5-2 Battery description and part number

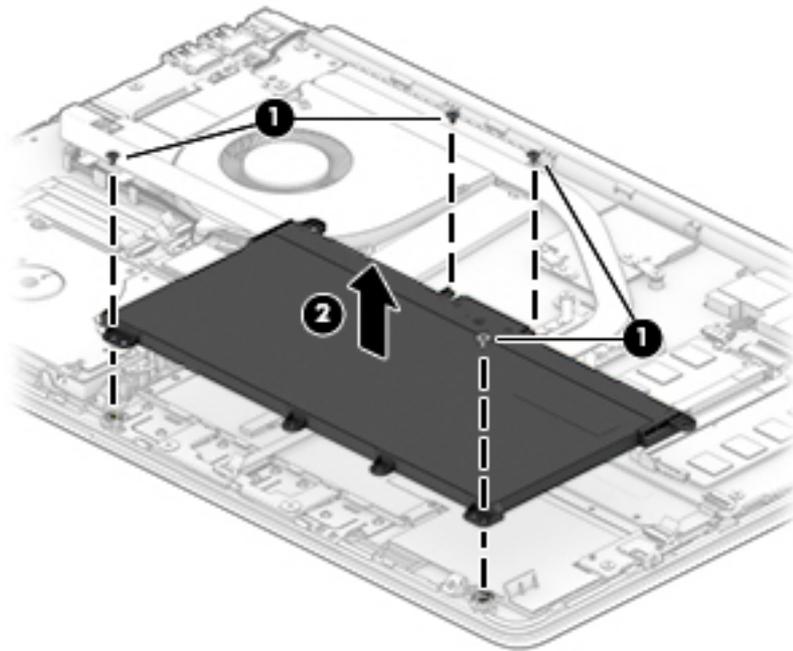
Description	Spare part number
3-cell, 41 Whr, Li-ion battery	L11119-855

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).

Remove the battery:

1. Remove the four Phillips M2.0 × 2.8 screws **(1)** that secure the battery to the computer.
2. Remove the battery from the computer **(2)**.



Reverse this procedure to install the battery.

Hard drive



NOTE: The hard drive spare part kit does not include the hard drive cable. The hard drive cable is available using spare part number L52025-001

Table 5-3 Hard drives, hard drive board, and hard drive cable descriptions and part numbers

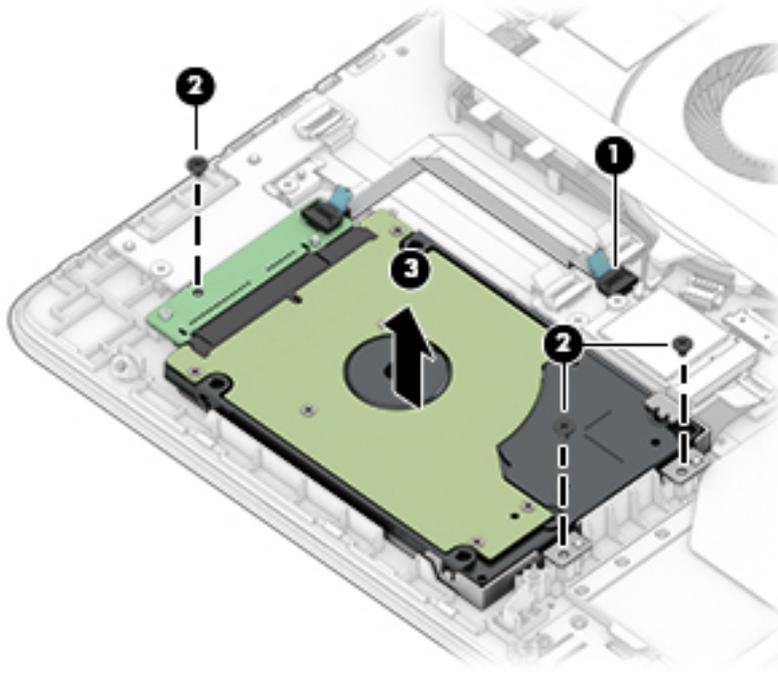
Description	Spare part number
2 TB, 5400 rpm	912487-855
1 TB, 5400 rpm	L30422-005
500 GB, 5400 rpm	778186-005
Hard drive board	L52024-001
Hard drive cable	L52025-001

Before removing the hard drive, follow these steps:

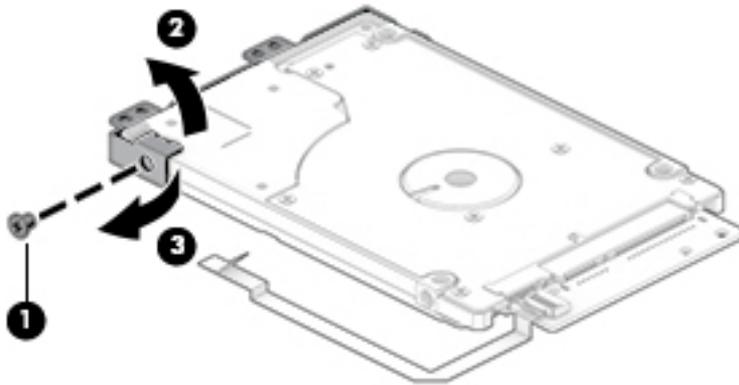
1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the hard drive:

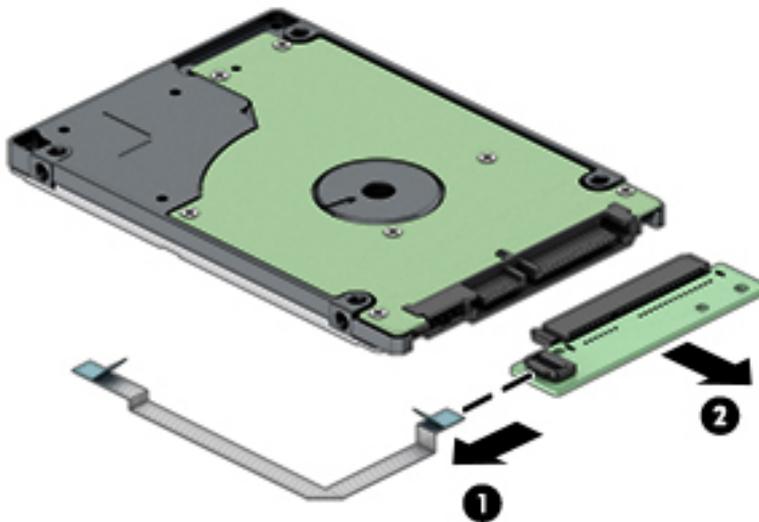
1. Disconnect the hard drive cable from the ZIF connector on the system board **(1)**.
2. Remove the three Phillips M2.0 × 2.8 screws **(2)** that secure the hard drive and hard drive board to the computer.
3. Remove the hard drive assembly from the computer **(3)**.



4. If it is necessary to remove the bracket from the hard drive, remove the Phillips M3.0 × 3.0 screw **(1)** that secures the bracket to the drive, rotate the bracket away from the drive **(2)**, and then pull the bracket off the drive **(3)**.



5. If it is necessary to remove the board from the hard drive, disconnect the hard drive cable from the ZIF connector on the hard drive board **(1)**, and then pull the board off the drive **(2)**.



Reverse this procedure to reassemble and install the hard drive.

WLAN module

Table 5-4 WLAN module descriptions and part numbers

Description	Spare part number
Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 (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-CG 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter	L21480-005

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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the WLAN module:

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

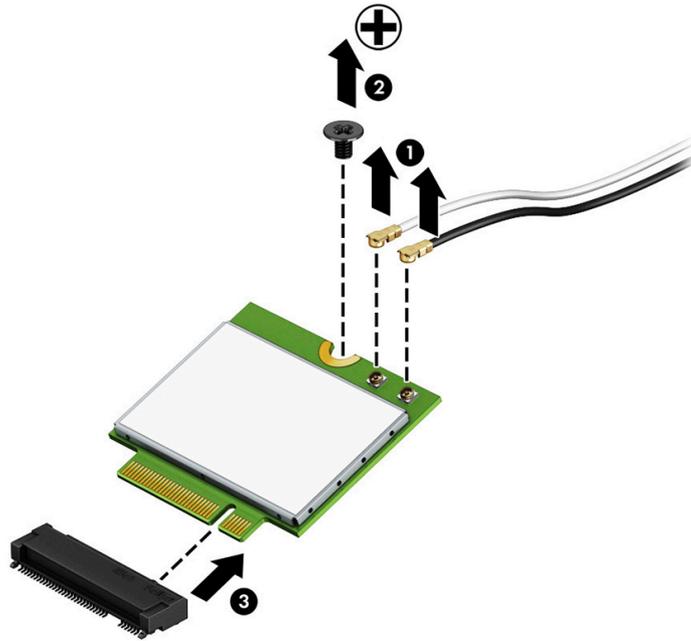


NOTE: The WLAN antenna cable labeled "1/MAIN" connects to the WLAN module "Main" terminal. The WLAN antenna cable labeled "2/AUX" connects to the WLAN module "Aux" terminal.

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

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

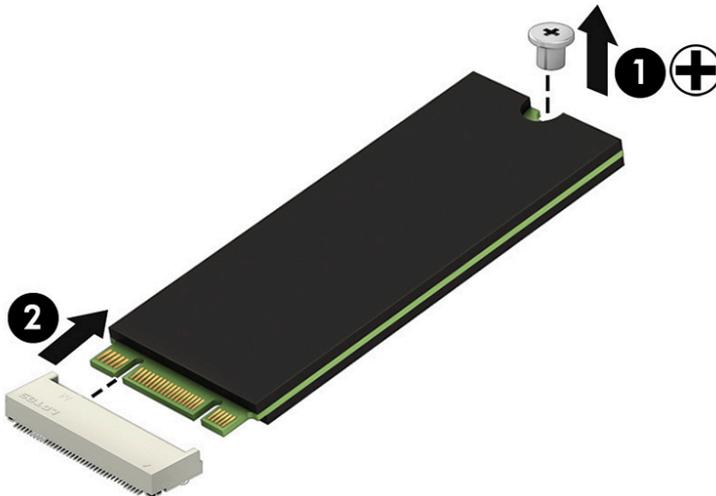
Description	Spare part number
512 GB, PCIe	L52006-001
512 GB, PCIe, TLC	L56705-001
256 GB, SATA-3, TLC	L52004-001
256 GB, PCIe	L52005-001
128 GB, SATA-3, TLC	L52003-001

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the solid-state drive module:

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 socket.



Reverse this procedure to reassemble and install the solid-state drive.

Optane memory module

 **IMPORTANT:** The M.2 connector that supports the Optane memory module can also support a solid-state drive. You cannot simultaneously install both an Optane memory module and a solid-state drive in the computer.

Table 5-6 Optane memory module description and part number

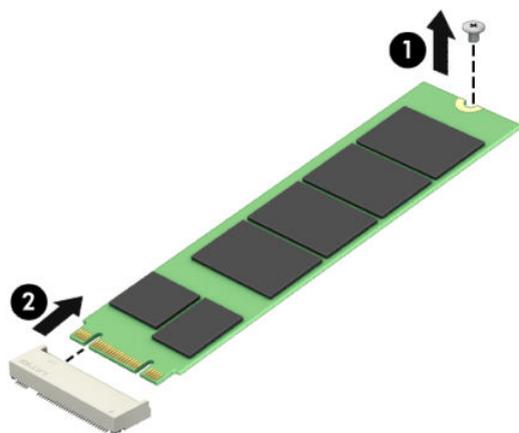
Description	Spare part number
Optane memory module, 16 GB	L52002-001

Before removing the Optane memory module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the Optane memory module:

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



Reverse this procedure to install the Optane memory module.

Memory module

 **NOTE:** Primary and expansion memory is installed in a side-by-side configuration in the bottom of the computer. If only one memory module is installed, it must be installed in the socket labeled '1'.

Table 5-7 Memory module description and part number

Description	Spare part number
8 GB, DDR4-2400	937236-855
4 GB, DDR4-2400	L10598-855

Before removing the memory module, follow these steps:

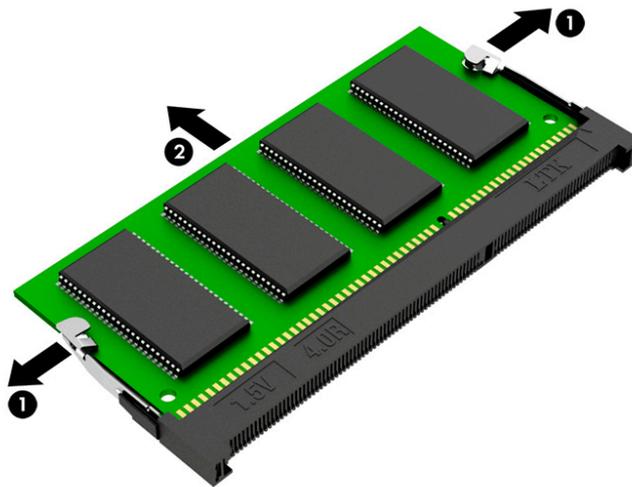
1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

 **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.

 **NOTE:** Memory modules are designed with a notch to prevent incorrect insertion.



To protect a memory module after removal, place it in an electrostatic-safe container.
Reverse this procedure to install a memory module.

Solid-state drive board

Table 5-8 Solid-state drive board and cable descriptions and part numbers

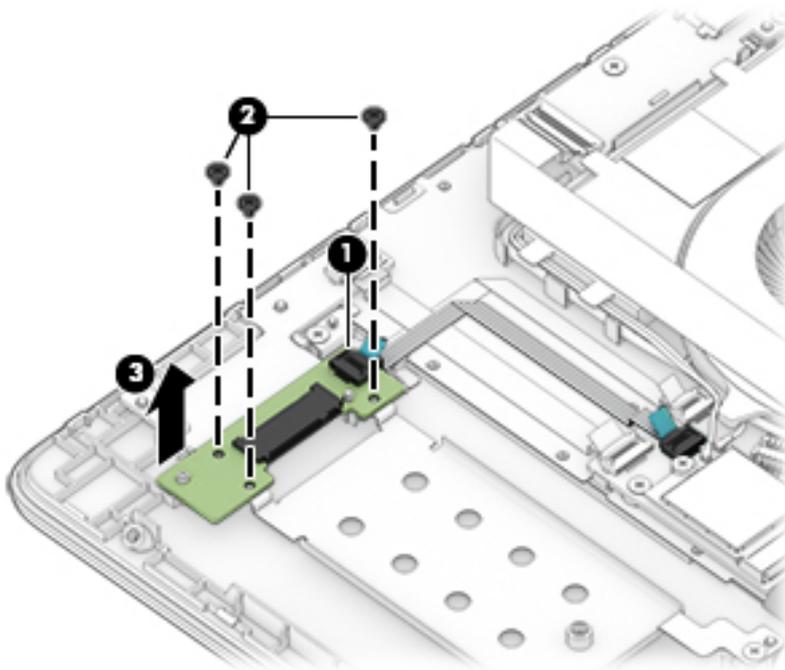
Description	Spare part number
Solid-state drive board	L52026-001
Solid-state drive cable	L52025-001

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drive (see [Solid-state drive on page 37](#)).

Remove the solid-state drive board:

1. Disconnect the cable from the ZIF connector on the solid-state drive board **(1)**.
2. Remove the three Phillips M2.0 × 2.8 screws **(2)** that secure the board to the computer.
3. Remove the solid-state drive board from the computer **(3)**.



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

Card reader board

Table 5-9 Card reader board and cable descriptions and part numbers

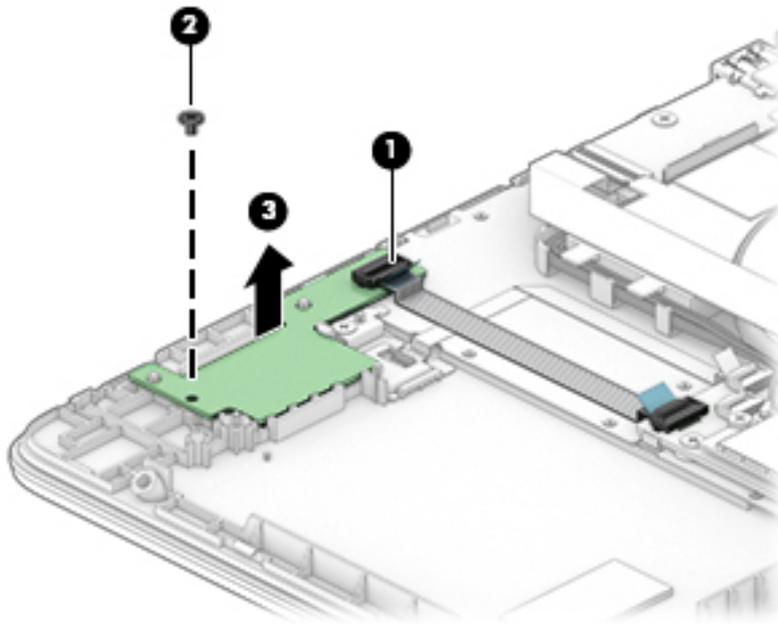
Description	Spare part number
Card reader board	L52030-001
Card reader board cable	L52027-001

Before removing the card reader board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the card reader board:

1. Disconnect the cable from the ZIF connector on the card reader board **(1)**.
2. Remove the Phillips M2.0 × 2.8 screw **(2)** that secures the board to the computer.
3. Remove the board from the computer **(3)**.



Reverse this procedure to install the card reader board.

USB board

Table 5-10 USB board and cable descriptions and part numbers

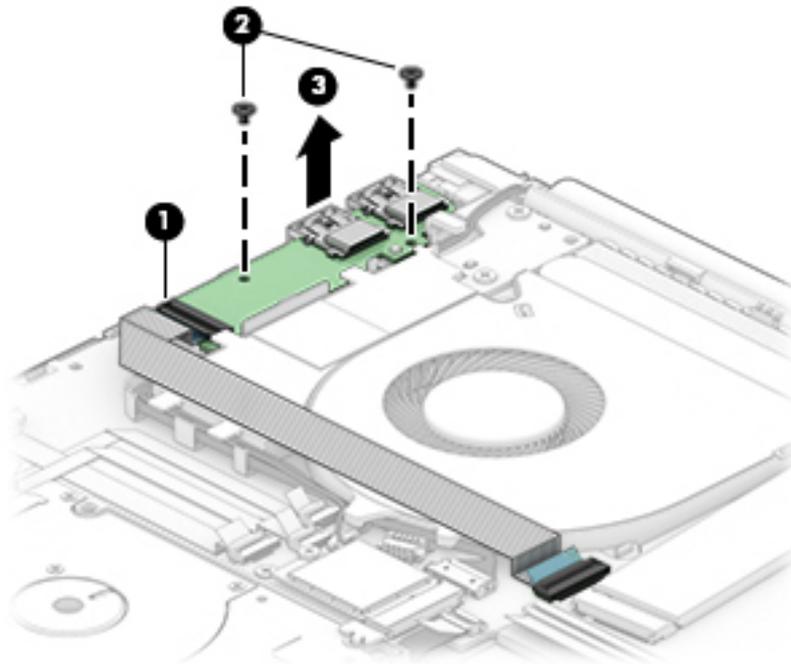
Description	Spare part number
USB board	L52031-001
USB board cable	L52039-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the USB board:

1. Disconnect the cable from the ZIF connector on the USB board **(1)**.
2. Remove the two Phillips M2.0 × 2.8 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.

Audio board

Table 5-11 Audio board and cable descriptions and part numbers

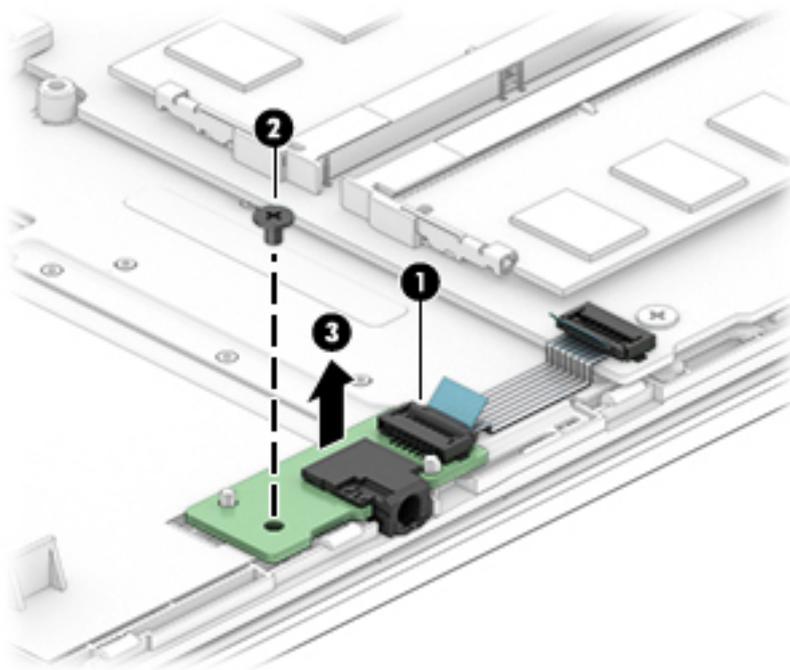
Description	Spare part number
Audio board	L52028-001
Audio board cable	L52035-001

Before removing the audio board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the audio board:

1. Disconnect the cable from the ZIF connector on the audio board **(1)**.
2. Remove the Phillips M2.0 × 2.8 screw **(2)** that secures the board to the computer.
3. Remove the board from the computer **(3)**.



Reverse this procedure to install the audio board.

TouchPad button board

Table 5-12 TouchPad button board and cable descriptions and part numbers

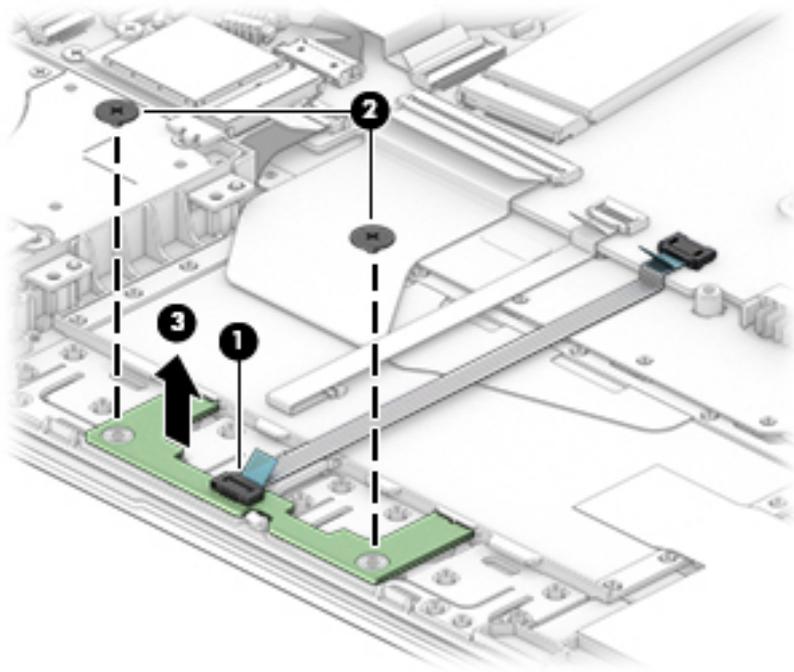
Description	Spare part number
TouchPad button board	L52029-001
TouchPad button board cable	L52037-001
TouchPad cable	L52038-001

Before removing the TouchPad button board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the TouchPad button board:

1. Disconnect the cable from the ZIF connector on the TouchPad button board **(1)**.
2. Remove the two Phillips M2.0 × 2.8 screws **(2)** that secure the board to the computer.
3. Remove the TouchPad button board from the computer **(3)**.



Reverse this procedure to install the TouchPad button board.

Fingerprint reader

Table 5-13 Fingerprint reader board and cable descriptions and part numbers

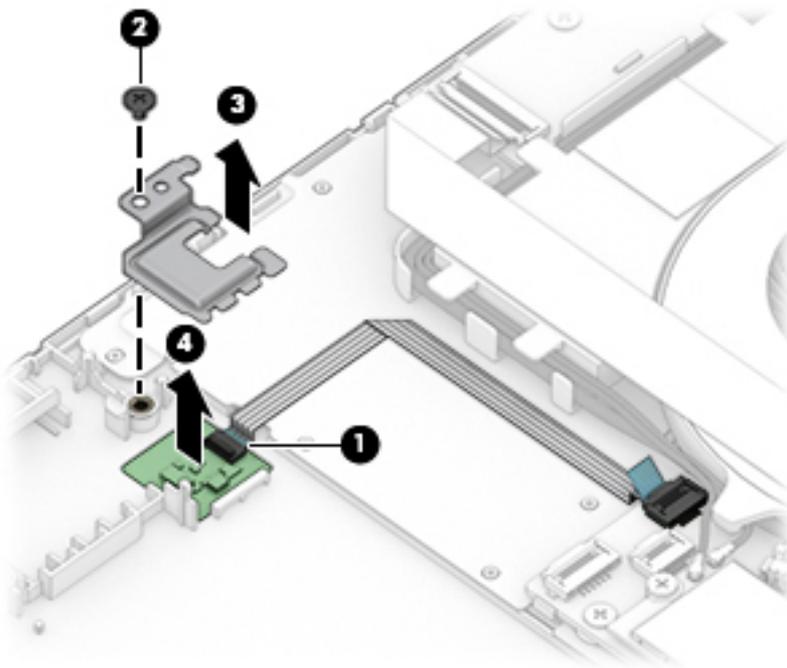
Description	Spare part number
Fingerprint reader, ash silver	L52044-001
Fingerprint reader, natural silver	L56013-001
Fingerprint reader cable	L52036-001

Before removing the fingerprint reader, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the fingerprint reader:

1. Disconnect the cable from the fingerprint reader board (1).
2. Remove the Phillips M2.0 × 2.8 screw (2) that secures the fingerprint reader bracket to the computer.
3. Remove the bracket from on top of the fingerprint reader (3).
4. Remove the fingerprint reader from the computer (4).



Reverse this procedure to install the fingerprint reader.

Fan

Table 5-14 Fan description and part number

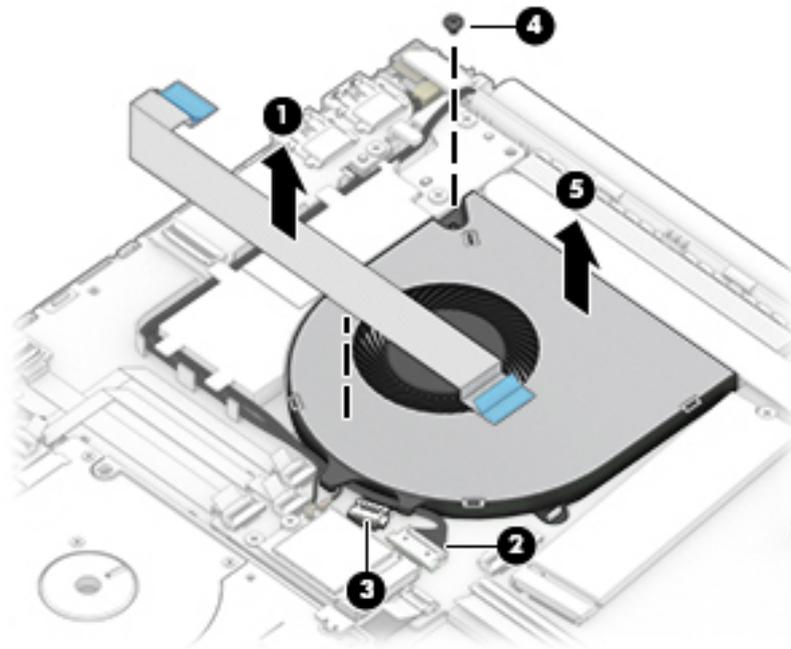
Description	Spare part number
Fan	L52034-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the fan:

1. Remove the USB board cable from the top of the fan **(1)**.
2. Disconnect the power connector (DC-in) cable from the system board and remove the cable from the clips in the fan **(2)**.
3. Disconnect the fan cable **(3)** from the system board.
4. Remove the Phillips M2.0 × 4.0 screw **(4)** that secures the fan to the computer.
5. Remove the fan from the computer **(5)**.



Reverse this procedure to install the fan.

Heat sink



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

Table 5-15 Heat sink descriptions and part numbers

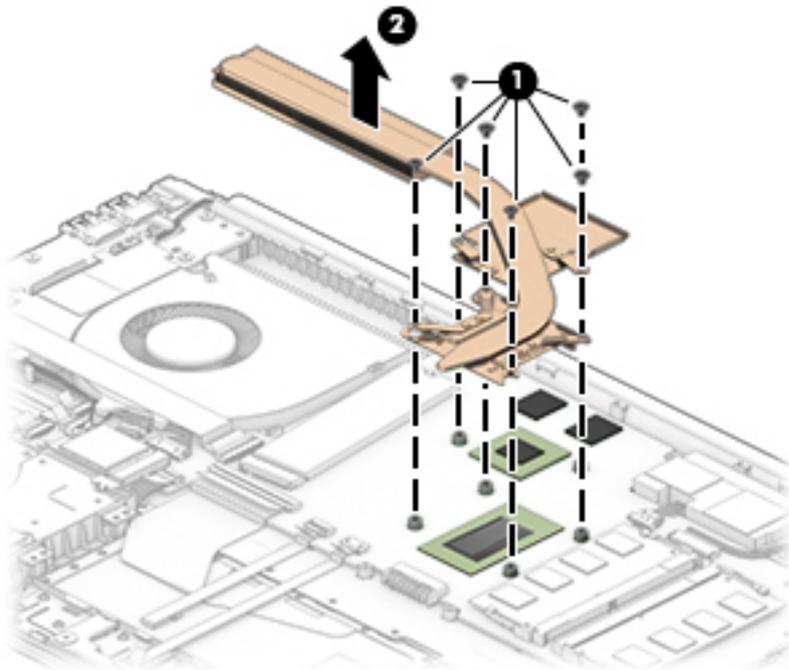
Description	Spare part number
Heat sink for use in models with UMA graphics memory	L52033-001
Heat sink for use in models with discrete graphics memory	L52032-001
Heat sink for use in fanless computer models	tbd

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the fan (see [Fan on page 46](#)).

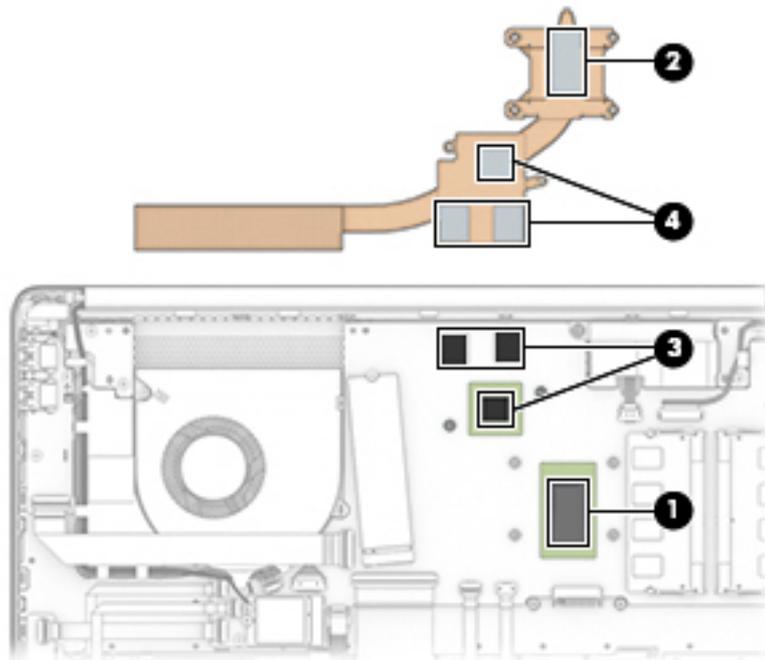
Remove the heat sink:

1. **Discrete graphics:** In the order indicated on the heat sink, remove the six Phillips M2.0 × 2.8 screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.



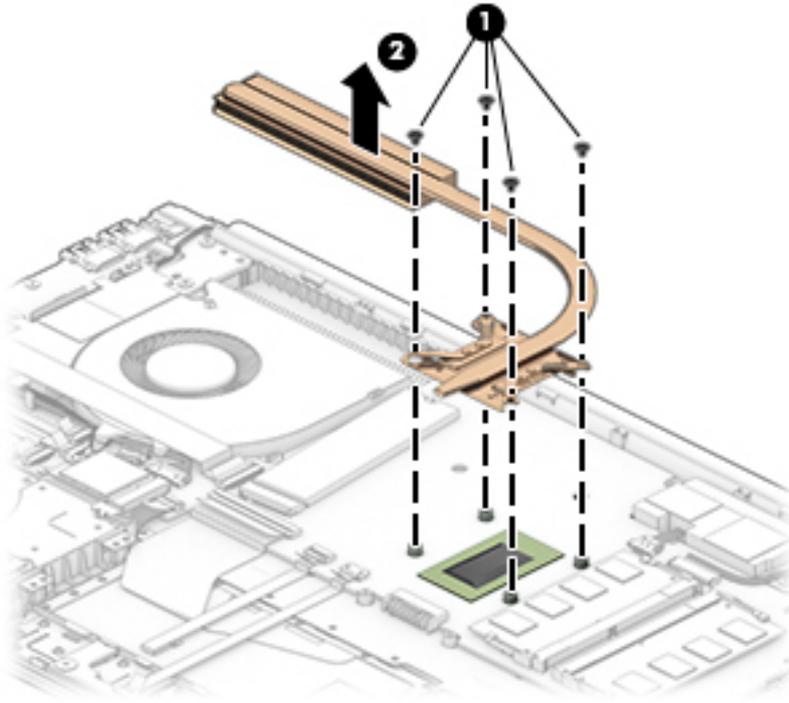
3. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

Thermal paste is used on the integrated system board processor **(1)** and associated location on the heat sink **(2)**. Thermal pads are used on specific system board components **(3)** and associated locations on the heat sink **(4)**.



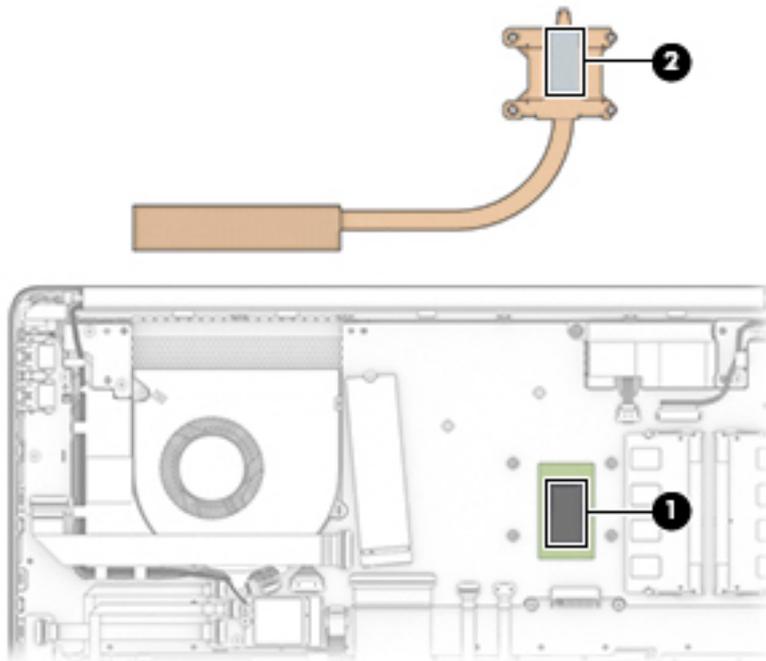
4. **UMA graphics:** In the order indicated on the heat sink, remove the four Phillips M2.0 × 2.8 screws **(1)** that secure the heat sink to the system board.

5. Remove the heat sink (2).



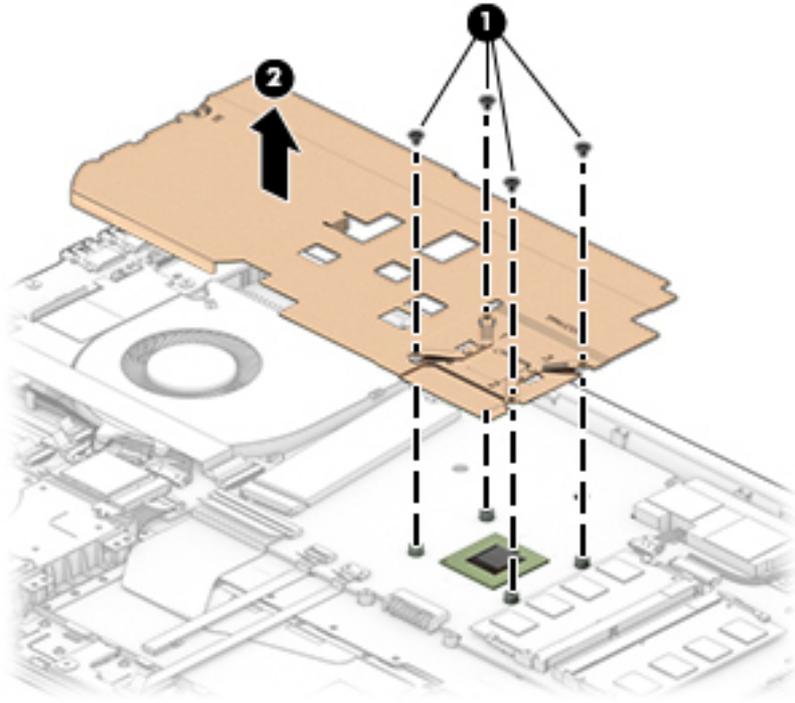
6. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

Thermal paste is used on the integrated system board processor (1) and the heat sink (2).



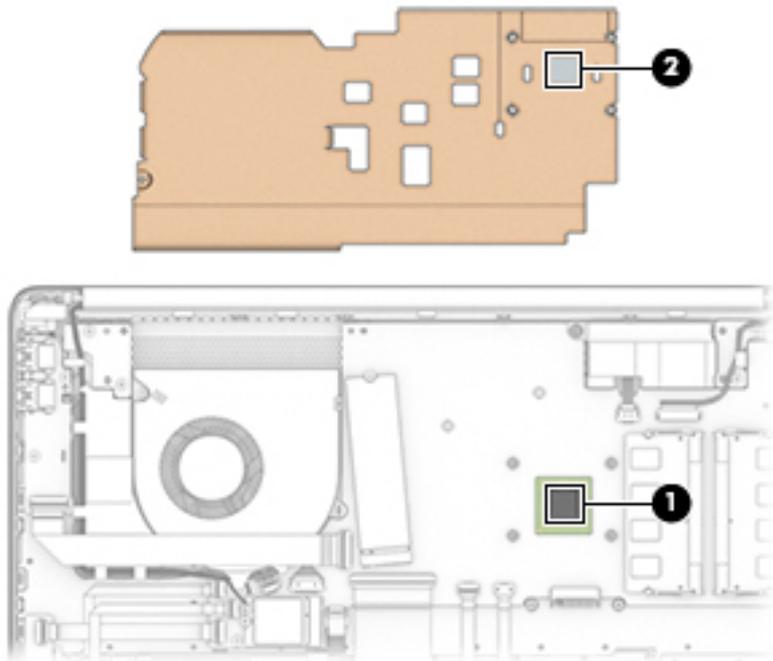
7. **Fanless models:** In the order indicated on the heat sink, remove the four Phillips M2.0 × 2.8 screws (1) that secure the heat sink to the system board.

8. Remove the heat sink **(2)**.



9. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

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



Reverse this procedure to install the heat sink.

System board



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

Table 5-16 System board descriptions and part numbers

Description	Spare part number
System board for use in models with discrete graphics equipped with the following processors:	
Intel Core i7-8565U processor and 4 GB of GeForce MX250 discrete graphics memory	L51994-xx1
Intel Core i7-8565U processor and 2 GB of GeForce MX130 discrete graphics memory	L51993-xx1
Intel Core i5-8265U processor and 2 GB of GeForce MX130 discrete graphics memory	L51992-xx1
Intel Core i5-8265U processor and 2 GB of GeForce GTX1050 discrete graphics memory	L51991-xx1
Intel Core i3-7020U processor and 2 GB of GeForce MX110 discrete graphics memory	L51990-xx1
System board for use in models with UMA graphics equipped with the following processors:	
Intel Core i7-8565U processor	L51987-xx1
Intel Core i5-8265U processor	L51986-xx1
Intel Core i3-8145U processor	L51985-xx1
Intel Core i3-7020U processor	L51984-xx1
Intel Pentium N5000 processor	L51988-xx1
Intel Celeron N4000 processor	L51989-xx1

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)), and then remove the following components:
 - a. Battery (see [Battery on page 32](#))
 - b. Fan (see [Fan on page 46](#))

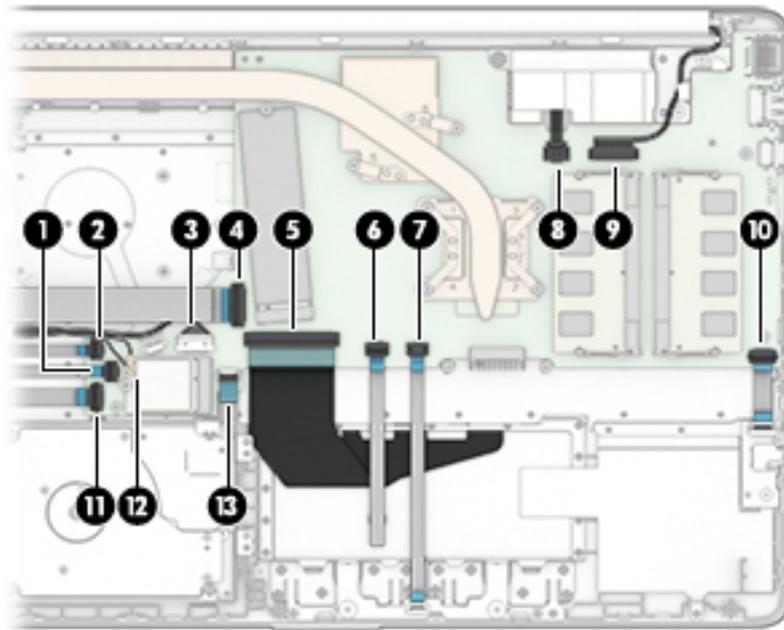
When replacing the system board, be sure to remove the following components (as applicable) from the defective system board and install them on the replacement system board:

- WLAN module (see [WLAN module on page 35](#))
- Memory modules (see [Memory module on page 39](#))
- Solid-state drive (see [Solid-state drive on page 37](#)) or Optane memory module ([Optane memory module on page 38](#))
- Optane memory module (see [Optane memory module on page 38](#))

Remove the system board:

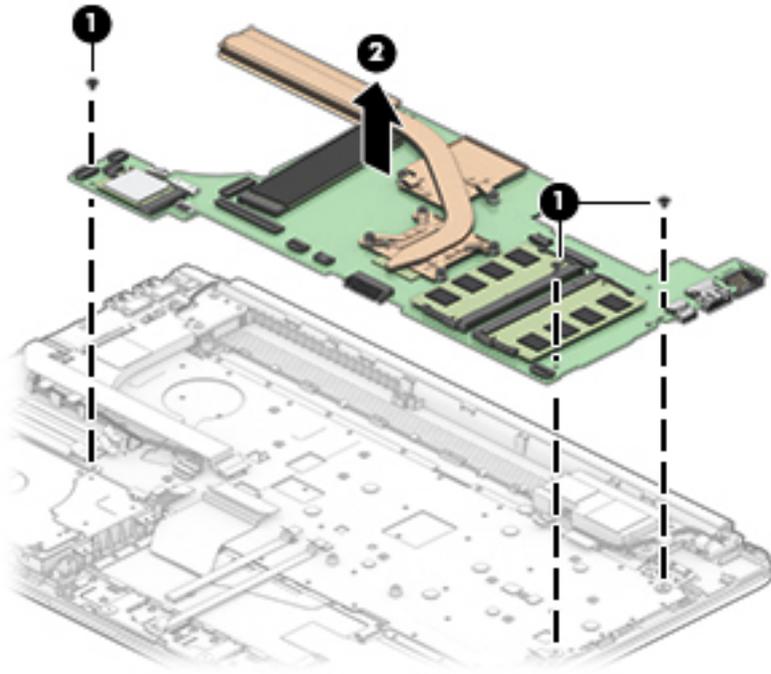
1. Disconnect the following cables:
 - (1) Hard drive board cable
 - (2) Fingerprint reader cable
 - (3) Power connector (DC-in) board cable

- (4) USB board cable
- (5) Keyboard cable
- (6) TouchPad cable
- (7) TouchPad button board cable
- (8) Speaker cable
- (9) Display cable
- (10) Audio board cable
- (11) Card reader board cable
- (12) WLAN antennas from the WLAN module
- (13) Keyboard backlight cable (select models only)



2. Remove the three Phillips M2.0 × 2.8 screws (1) that secure the system board to the computer.

3. Lift the system board out of the computer (2).



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:

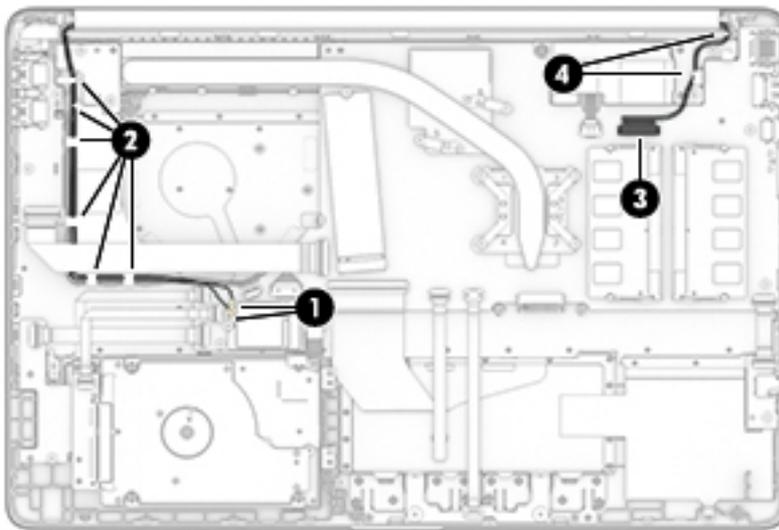
1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the display assembly:

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

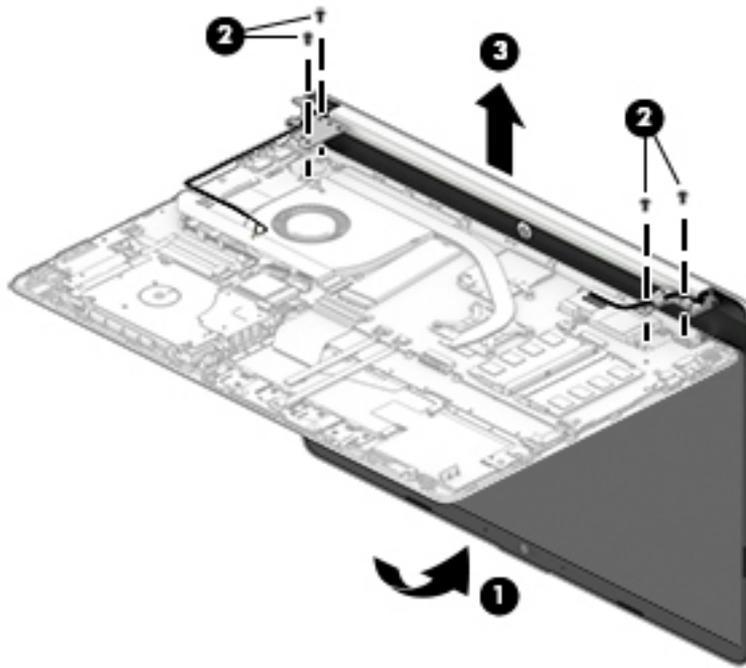
 **NOTE:** The WLAN antenna cable labeled "1/MAIN" connects to the WLAN module "Main" terminal. The WLAN antenna cable labeled "2/AUX" connects to the WLAN module "Aux" terminal.

2. Release the WLAN antenna cables from the retention clips and routing channel built into the right speaker **(2)**.
3. Disconnect the display cable from the system board ZIF connector **(3)**.
4. Release the display panel from the retention clips and routing channel built into the left display hinge **(4)**.

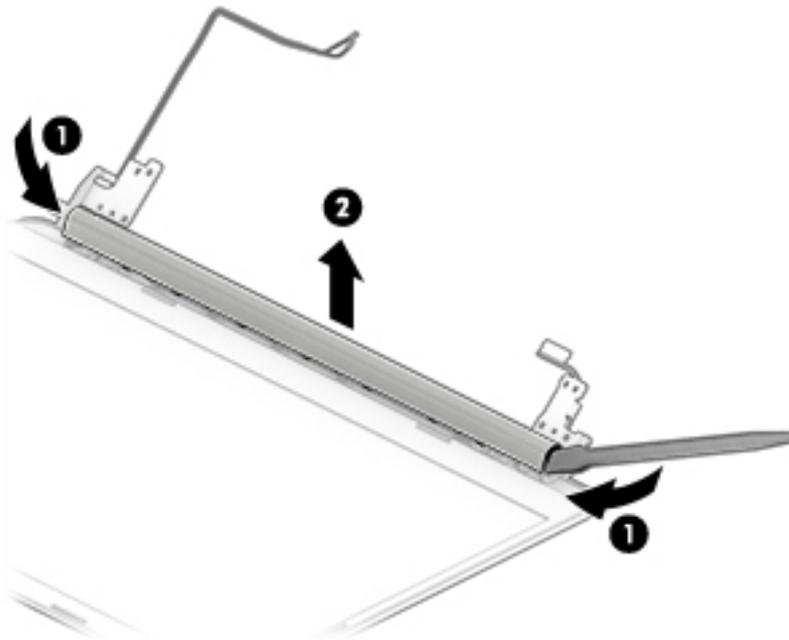


5. Remove the four Phillips M2.5 × 6.0 screws **(1)** that secure the display assembly to the computer.
6. Open the display to open the hinges **(2)**.

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



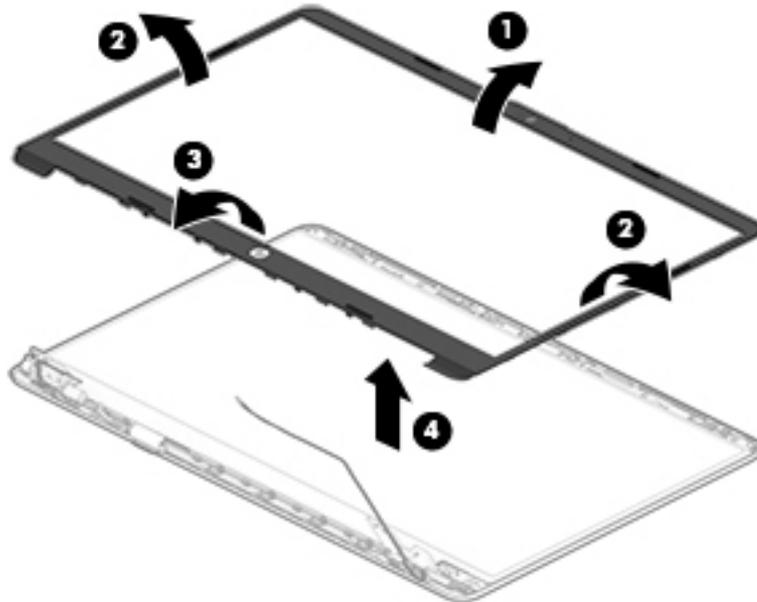
8. If it is necessary to remove the hinge cover, use a plastic tool to lift and disengage the inside of both sides of the cover (1), and then remove the cover from the display (2).



Hinge covers are available using spare part number L52011-001 for pale gold models and L52010-001 for natural silver models.

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

- c. Release the bottom edge of the display bezel **(3)** from the display assembly.
- d. Remove the display bezel **(4)** from the display assembly.

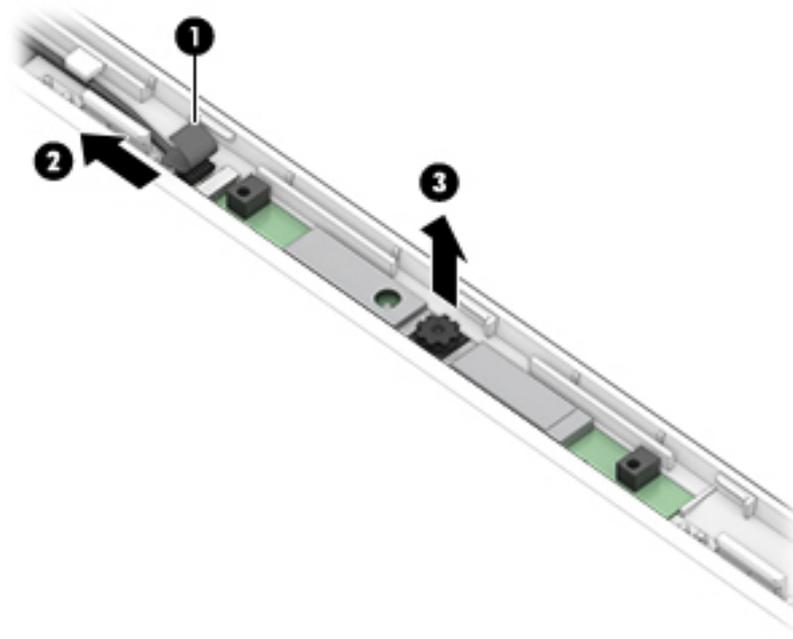


The display bezel is available using spare part number L52014-001.

- 10. If it is necessary to replace the camera/microphone module:
 - a. Lift the tape from on top of the connector on the webcam module **(1)**, and then disconnect the cable **(2)** from the module.

- b.** Use a tool to detach the camera/microphone module **(3)** from the display back cover. (The module is attached with double-sided adhesive.)

The camera/microphone module is available using spare part number L51996-001.



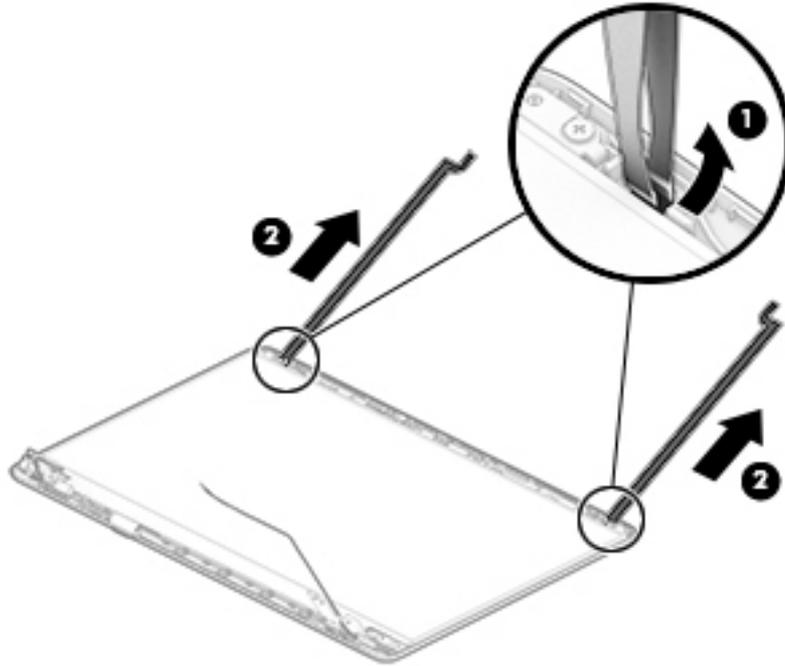
- 11.** If it is necessary to replace the display panel:

- a.** Use tweezers to grasp the ends of the tape that secures the display panel to the display rear cover **(1)**.

- b. Pull the tape out from behind the left and right sides of the panel **(2)**.

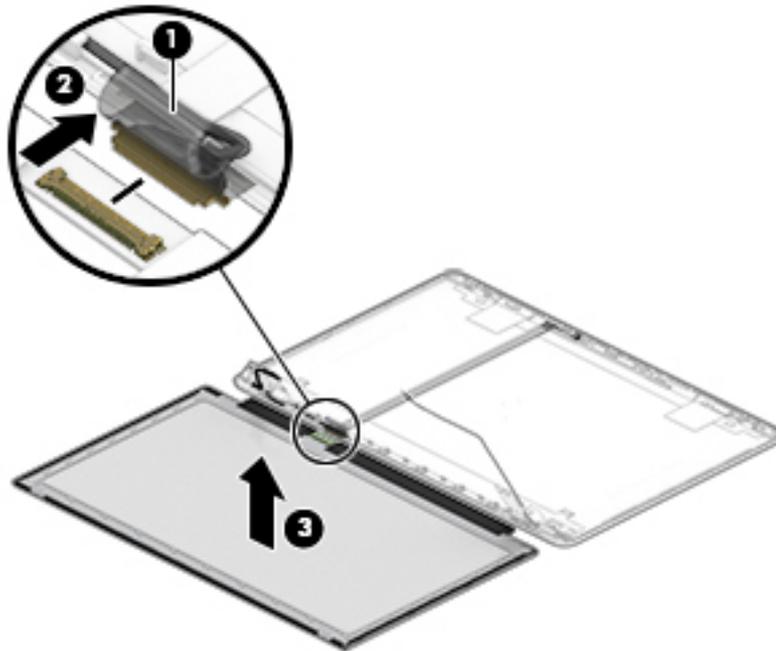
 **NOTE:** You have to pull on the tape multiple times before it is completely removed.

Display panel adhesive tape is available using spare part number L52528-001.



- c. Rotate the display panel upside down next to the display back cover.
- d. Release the adhesive support strip **(1)** that secures the display panel cable connector to the display panel.

- e. Disconnect the display panel cable **(2)** from the display panel, and then remove the display panel **(3)**.



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

L51997-001 – FHD, anti glare, SVA, non-touch

L51998-001 – FHD, anti glare, UWVA, non-touch

L52156-001 – FHD, BrightView, UWVA, touch-on panel (TOP)

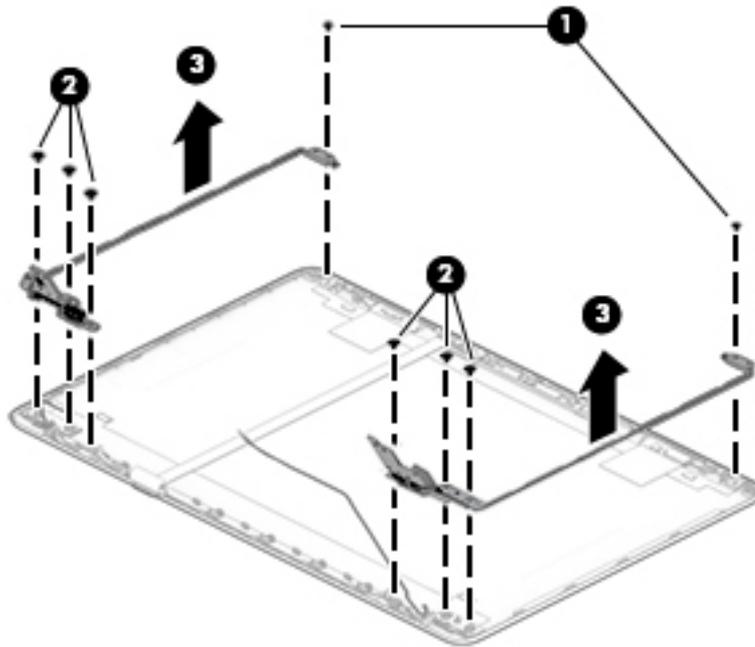
L51999-001 – HD, anti glare, SVA, non-touch

L52000-001 – HD, BrightView, SVA, non-touch

L52001-001 – HD, BrightView, SVA, touch-on panel (TOP)

12. If it is necessary to remove the display hinges:
 - a. Remove the Phillips M2.0 × 2.8 screw **(1)** from the top of each hinge.
 - b. Remove the three Phillips M2.5 × 3.5 screws **(2)** from the bottom of each hinge.

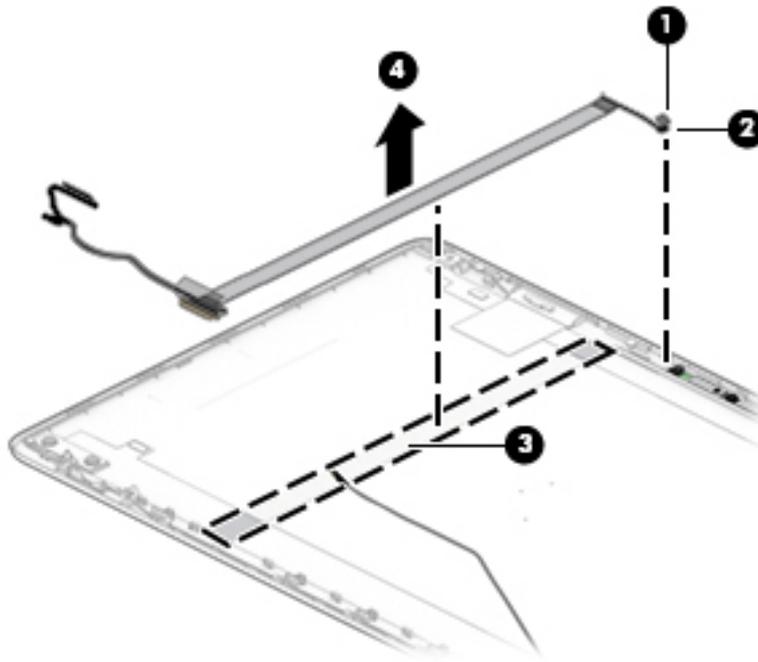
- c. Remove the display hinges from the display back cover (3).



The display hinges are available using spare part number L52009-001.

13. If it is necessary to remove the display panel cable:
- Lift the tape from atop the connector on the webcam module (1), and then disconnect the cable from the module (2).
 - Peel the cable off the inside of the display back cover (3). The cable is secured with adhesive.

- c. Remove the display panel cable **(4)**.



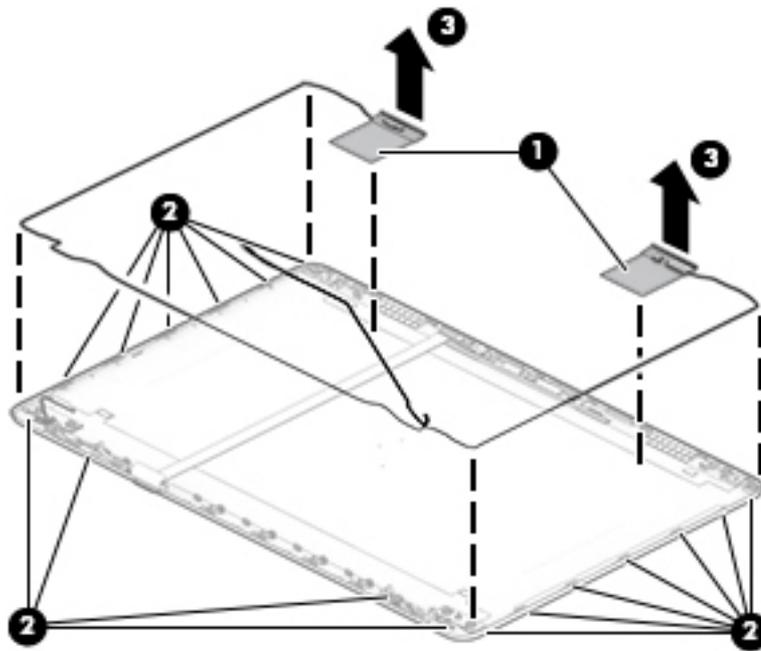
The display panel cable is available using the following spare part numbers:

L52015-001 – non-touch display assembly

L52016-001 – touch display assembly

- 14.** If it is necessary to remove the wireless cables and antennas:
- Detach the wireless antennas **(1)** from the display back cover. The antennas are secured with adhesive.
 - Release the wireless antenna cables from the retention clips **(2)** and routing channels built into the sides of the display back cover.

- c. Remove the antennas from the display back cover (3).



The wireless cables and antennas are available using spare part number L52018-001 for dual antennas or L52017-001 for single antennas..



NOTE: If it is necessary to replace the display bezel or any of the display assembly subcomponents, please see the instructions above.

Reverse this procedure to reassemble and install the display assembly.

Power connector (DC-in) cable

Table 5-17 Power connector cable description and part number

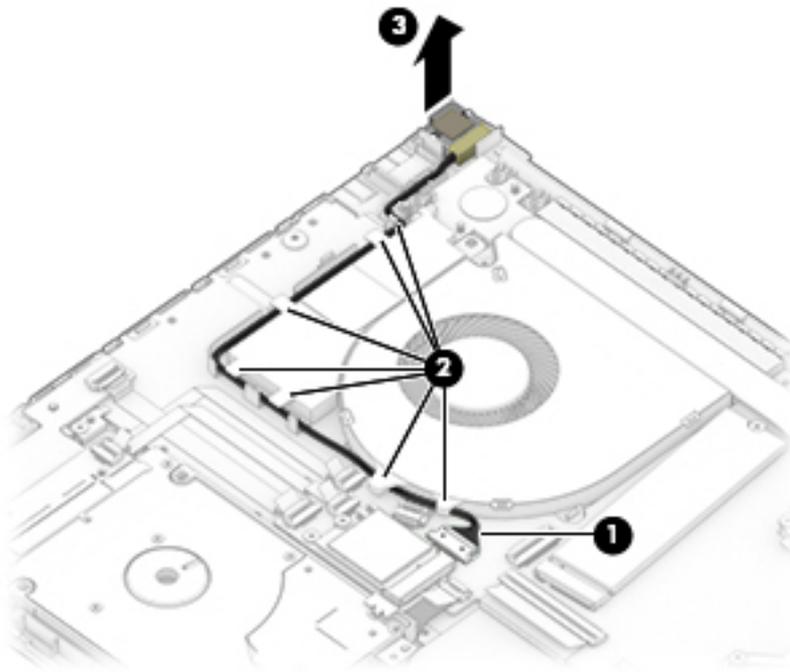
Description	Spare part number
Power connector (DC-in) cable	L51995-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)), and then remove the following components:
 - a. Battery (see [Battery on page 32](#))
 - b. USB board (see [USB board on page 42](#))
 - c. Display assembly (see [Display assembly on page 54](#))

Remove the power connector cable:

1. Disconnect the power connector cable from the system board **(1)**.
2. Release the cable from the retention clips and routing channel built into the fan and speaker **(2)**.
3. Remove the power connector cable from the computer **(3)**.



Reverse this procedure to install the power connector cable.

Speakers

Table 5-18 Speaker description and part number

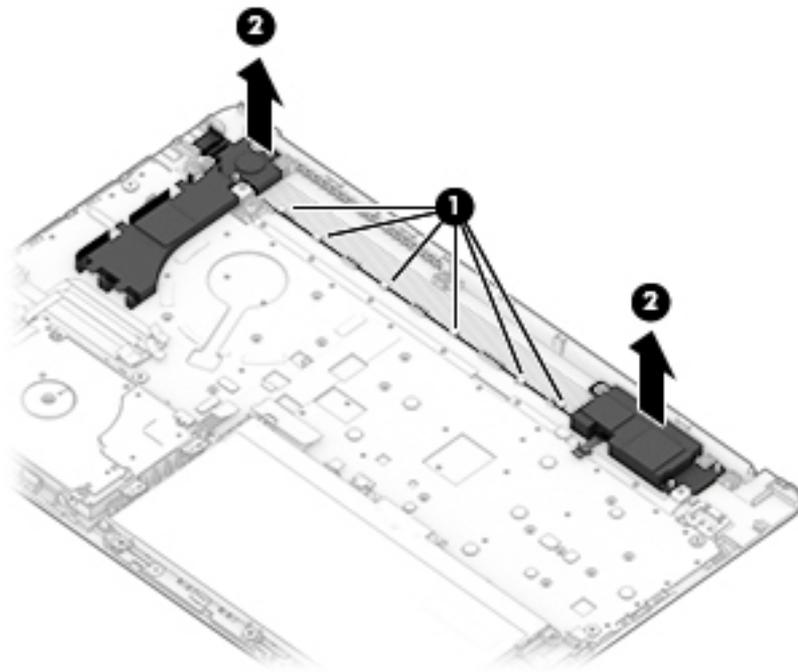
Description	Spare part number
Speakers	L52040-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 29](#)).
2. Remove the bottom cover (see [Bottom cover on page 30](#)), and then remove the following components:
 - a. Battery (see [Battery on page 32](#))
 - b. System board (see [System board on page 51](#))
 - c. Display (see [Display assembly on page 54](#))
 - d. Power connector cable (see [Power connector \(DC-in\) cable on page 63](#))

Remove the speakers:

1. Release the cable from the retention clips and routing channel built into the computer **(1)**.
2. Remove the speakers from the computer **(2)**.



Reverse this procedure to install the speakers.

Top cover with keyboard

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

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

Table 5-19 Top cover with keyboard descriptions and part numbers

Description	Spare part number
Top cover with keyboard, ash silver, backlit	L52020-xx1
Top cover with keyboard, ash silver, no backlight	L52021-xx1
Top cover with keyboard, natural silver, backlit	L52022-xx1
Top cover with keyboard, natural silver, no backlight	L52023-xx1
Top cover with keyboard, ash silver, backlit, models with a fingerprint reader	L52152-xx1
Top cover with keyboard, ash silver, no backlight, models with a fingerprint reader	L52153-xx1
Top cover with keyboard, natural silver, backlit, models with a fingerprint reader	L52154-xx1
Top cover with keyboard, natural silver, no backlight, models with a fingerprint reader	L52155-xx1

Table 5-20 Keyboard country codes

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Bulgaria	-261	Italy	-061	South Korea	-AD1
Canada (French)	-DB1	Latin America	-161	Spain	-071
France	-051	The Netherlands	-B31	Taiwan	-AB1
Germany	-041	Portugal	-131	Thailand	-281
Greece	-151	Romania	-271	Ukraine	-BD1
India	-002	Russia	-251	United Kingdom	-031
Israel	-BB1	Slovenia	-BA1	United States	-001

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 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 66](#)).
 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 67](#).

Downloading a BIOS update

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

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

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

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

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

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

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

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

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

7 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 68](#).

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)

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

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

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

 **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 70](#).

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`.

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 70](#).

- b. Hard drive

- c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

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

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

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

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

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

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

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

8 Backing up, restoring, and recovering

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

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see [Using Windows tools on page 73](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 73](#)).
- **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 73](#)).
- **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 73](#)).

 **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.

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 73](#).

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 73](#).



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

To recover your system:

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

Changing the computer boot order

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

To change the boot order:



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

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

For computers or tablets with keyboards attached:

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

For tablets without keyboards:

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

– or –

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

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

9 Specifications

Table 9-1 Computer specifications

	Metric	U.S.
Computer dimensions		
Width	358.5 mm	14.10 in
Depth	242.0 mm	9.50 in
Height	19.9 mm	0.78 in
Weight (lowest weight configuration)*	1740 g	3.84 lbs
*Fan adds 40 g (0.09 lbs), SSD adds 25 g (0.06 lbs), HDD+SSD adds 83 g (0.18 lbs)		
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.

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer. Requirements for all countries 113

Requirements for specific countries and regions

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

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

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

11 Recycling

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

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

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