



Maintenance and Service Guide

HP Spectre x360 15 Convertible PC
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Product notice

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

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

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

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For any further information or to request a full refund of the price of the computer, please contact your seller.

Safety warning notice


 **WARNING!** To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

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1 Product description

Table 1-1 Product description

Category	Description
Product Name	HP Spectre x360 15 Convertible PC
Processor	Intel® Core™ i7-10750H 2.2-5.0 GHz (SC turbo up to 5.0 GHz) six core processor (12.0 MB L3 cache 2933 MHz FSB, 45 W) Intel Core i7-10510U 1.8 GHz (SC turbo up to 4.9 GHz) quad core processor (8.0 MB L3 cache 2666 MHz FSB, 15 W)
Chipset	Intel HM470 (on computer models equipped with an Intel Core i7-10750H processor) Intel integrated with soldered-on-circuit (SoC) processor (on computer models equipped with an Intel Core i7-10510U processor)
Graphics	NVIDIA GeForce GTX 1650Ti with 4 GB discrete memory (on computer models equipped with an Intel Core i7-10750H processor) NVIDIA GeForce MX330 with 2 GB discrete memory (on computer models equipped with an Intel Core i7-10750H processor) Intel UHD Graphics (on computer models equipped with an Intel Core i7-10750H processor) Intel UHD Graphics Integrated (on computer models equipped with an Intel Core i7-10510U processor)
Panel	<ul style="list-style-type: none">15.6 in, organic light-emitting diode (OLED), ultra high-definition (UHD) (3840×2160), brightview, active-matrix organic light-emitting diode (AMOLED), UWVA, eDP+PSR, 100% DCI-P3, AR, ultraslim, direct bonded touchscreen display panel with narrow bezel; typical brightness: 400 nits15.6 in, liquid crystal display (LCD), UHD (3840×2160), antiglare, white light-emitting diode (WLED), UWVA, eDP 1.4+PSR2, 100% sRGB, bent, low power, direct bonded touchscreen display panel with narrow bezel; typical brightness: 400 nits15.6 in, LCD, UHD (3840×2160), antiglare, WLED, UWVA, eDP 1.4+PSR2, 72%, eDP 1.3+PSR, ultraslim, direct bonded touchscreen display panel with narrow bezel; typical brightness: 340 nits
Memory	Support for DDR4-2933, 1.2 V, nonupgradeable, onboard system memory in 16 GB configuration (DDR4-3200 downgraded to DDR4-2933; only on computer models equipped with an Intel Core i7-10750H processor) Support for DDR4-2933, 1.2 V, nonupgradeable, onboard system memory in 8 GB configuration (DDR4-3200 downgraded to DDR4-2933; only on computer models equipped with an Intel Core i7-10750H processor and a non-OLED display assembly) Support for DDR4-2666, 1.2 V, nonupgradeable, onboard system memory in 16 GB configuration (DDR4-3200 bridge to DDR4-2666; only on computer models equipped with an Intel Core i7-10510U processor)
Storage	Support for the following solid-state drives: <ul style="list-style-type: none">2 TB, 2280, peripheral component interconnect express (PCIe)-3×4, non-volatile memory express (NVMe), SuperSpeed (SS) solid-state drive with three layer cell (TLC)1 TB, 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC512 GB, M.2 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC256 GB, M.2 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC

Table 1-1 Product description (continued)

Category	Description
Storage <i>(continued)</i>	<ul style="list-style-type: none"> 1 TB, 2280, PCIe-3×2×2, NVMe + 32 GB 3D Xpoint solid-state drive 512 GB, 2280, PCIe-3×2×2, NVMe + 32 GB 3D Xpoint solid-state drive
Audio and video	<p>Fixed (no tilt), one-piece, 720p HD HP True Vision camera integrated into display assembly</p> <p>Dual array microphones</p> <p>BANG and OLUFSEN</p> <p>Quad speakers</p> <p>Support for HP Audio Boost 2.0</p> <p>Support for Speaker Swap</p>
Wireless	<p>Integrated wireless local area network (WLAN) with two built-in antenna(s)</p> <p>Support for the Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth™ 5.0 MU-MIMO M.2 1216 non-vPro 160 MHz MIPI+BRI WW with 2 antenna(s)</p>
Ports	<ul style="list-style-type: none"> AC Smart Pin adapter plug High-definition multimedia interface (HDMI) v2.0 Headphone/microphone combo jack USB SuperSpeed port with HP Sleep and Charge USB Type-C port with HP Sleep and Charge USB Type-C Thunderbolt™ port with HP Sleep and Charge
Multimedia card	HP Multi-Format Digital Media Card Reader
Keyboard/pointing devices	Island-style standard notebook backlit keyboard with 3-coat paint in nightfall black and Poseidon blue finishes and clickpad with image sensor
Power requirements	<p>Support for a 6 cell, 72.9 WHr, Li-ion battery</p> <p>Support for 135 W HP Smart AC adapter (PFC, slim barrel, 4.5 mm) and 90 W HP Smart AC adapter (PFC, standard barrel, 4.5 mm, right angle, 1.8 m) AC adapters</p> <p>Support for a 1.0 m, C5 premium power cord with sticker and a 1.0 m, C5 premium power cord with sticker and plug adapter</p>
Fingerprint reader	Fingerprint reader (Secure Payment)
Security	<ul style="list-style-type: none"> Privacy camera kill switch Trusted Platform Module (TPM) 2.0 firmware Webcam kill switch
Sensors	<ul style="list-style-type: none"> Accelerometer Accelerometer + gyroscope + eCompass Infrared thermal sensor Sensor hub
Operating system	<p>Preinstalled:</p> <ul style="list-style-type: none"> Windows™ 10 Home 64 bit Advanced Windows 10 Home 64 bit Advanced Single Language Windows 10 Home 64 bit High-End Chinese Market CPPP

Table 1-1 Product description (continued)

Category	Description
Operating system <i>(continued)</i>	<ul style="list-style-type: none"> • Windows 10 Home 64 bit Plus Single Language Africa Market PPP • Windows 10 Home 64 bit Plus Single Language India Market PPP • Windows 10 Professional 64 bit
Serviceability	End user replaceable parts: AC adapter

2 Components

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



NOTE: Actual computer color, features, feature locations, icon labels, and accessories might vary from the images depicted.

Locating hardware

To find out what hardware is installed on the computer:

- ▲ Type `device manager` in the taskbar search box, and then select the **Device Manager** app.

A list displays all the devices installed on the computer.


For information about system hardware components and the system BIOS version number, press `fn+esc` (select products only).

Locating software

Software can vary by product. To find out what software is installed on the computer:

- ▲ Right-click the **Start** button, and then select **Apps and Features**.

Right side

 **NOTE:** Refer to the illustration that most closely matches the computer.

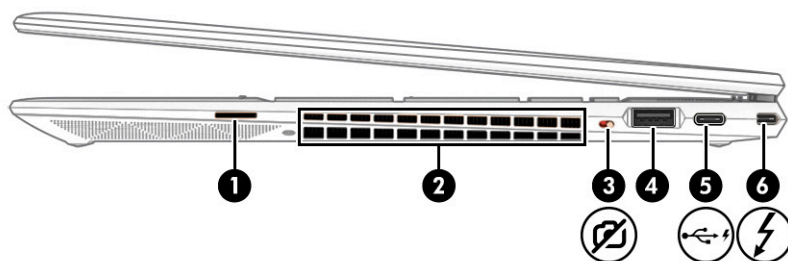


Table 2-1 Right-side components and their descriptions




Component	Description
(1) microSD™ memory card reader	<p>Reads optional memory cards that enable information to be stored, managed, shared, or accessed.</p> <p>To insert a card:</p> <ol style="list-style-type: none"> 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none"> ▲ Press in on the card, and then remove it from the memory card reader.
(2) Vent	<p>Enables airflow to cool internal components.</p> <p>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.</p>
(3)  Camera privacy switch	Turns the camera off and on.
(4) USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off.
(5)  USB Type-C port with HP Sleep and Charge	<p>Connects a USB device, provides data transfer, and charges small devices, even when the computer is off.</p> <p>– and –</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort™ output.</p> <p>NOTE: Cables, adapters, or both (purchased separately) might be required.</p>
(6)  USB Type-C Thunderbolt port with HP Sleep and Charge	<p>Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off.</p> <p>– and –</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort output.</p> <p>NOTE: The computer might also support a Thunderbolt docking station.</p>

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

Component	Description
NOTE: Cables, adapters, or both (purchased separately) might be required.	

Left side

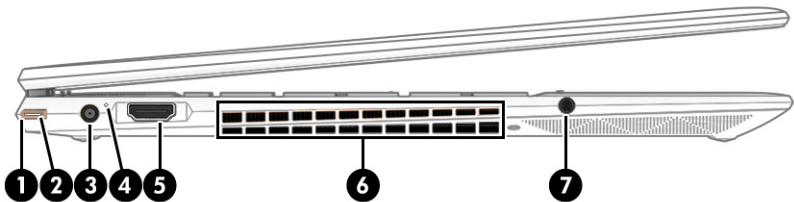


Table 2-2 Left-side components and their descriptions

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>IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 10 seconds to turn off the computer.</p> <p>To learn more about power settings, see power options.</p>
(2) Power light	<ul style="list-style-type: none">On: The computer is on.Blinking (select products only): The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unnecessary components.Off: Depending on the computer model, the computer is off, in Hibernation, or in Sleep. Hibernation is the power-saving state that uses the least amount of power.
(3) Power connector	Connects an AC adapter.
(4) 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 (select products only): 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.

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

Component		Description
		<ul style="list-style-type: none"> Off: The battery is not charging.
(5)	HDMI port	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.
(6)	Vent	<p>Enables airflow to cool internal components.</p> <p>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.</p>
(7)	Audio-out (headphone)/Audio-in (microphone) combo jack	<p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> ▲ Type HP Documentation in the taskbar search box, and then select HP Documentation. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>

Display

Low blue light mode (select products only)

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

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

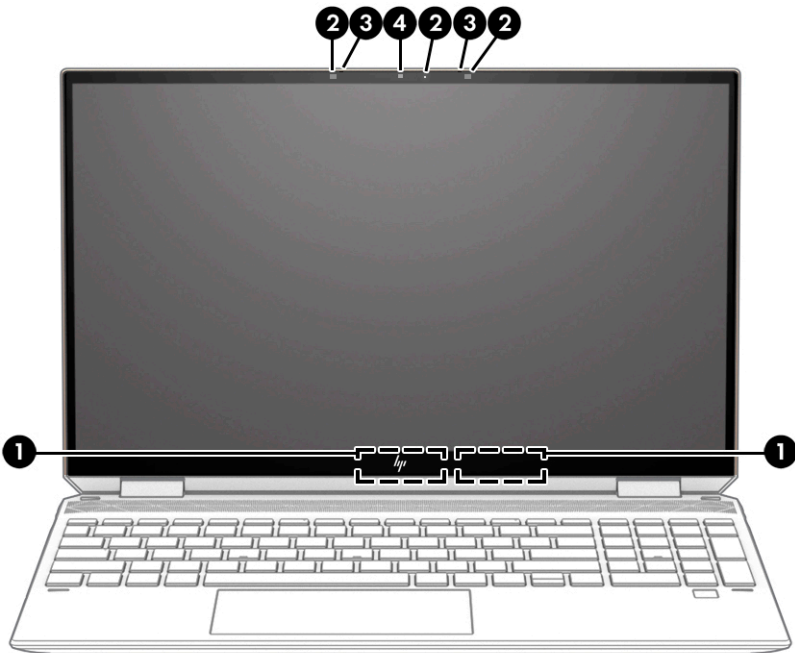


Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antenna(s)*	Send and receive wireless signals to communicate with WLANs.
(2)	Camera light(s)	On: One or more cameras are in use.
(3)	Internal microphones (2)	Record sound.
(4)	Camera(s)	Allow(s) 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 the product.


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

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

To access this guide:

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

Keyboard area

 **NOTE:** Keyboard components can vary by language.

Touchpad

Touchpad settings

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

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

To turn on the touchpad:

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

– or –

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

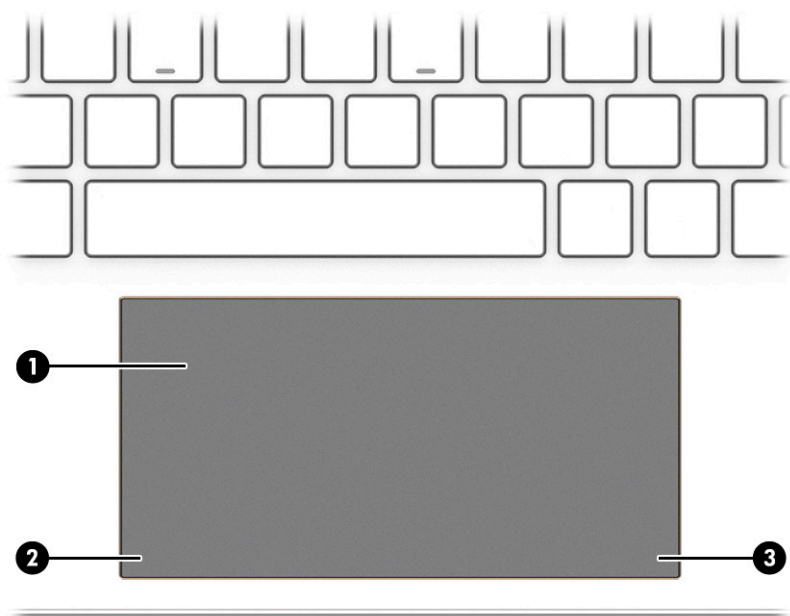


Table 2-4 Touchpad components and their descriptions

Component		Description
(1)	Touchpad zone	Reads 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

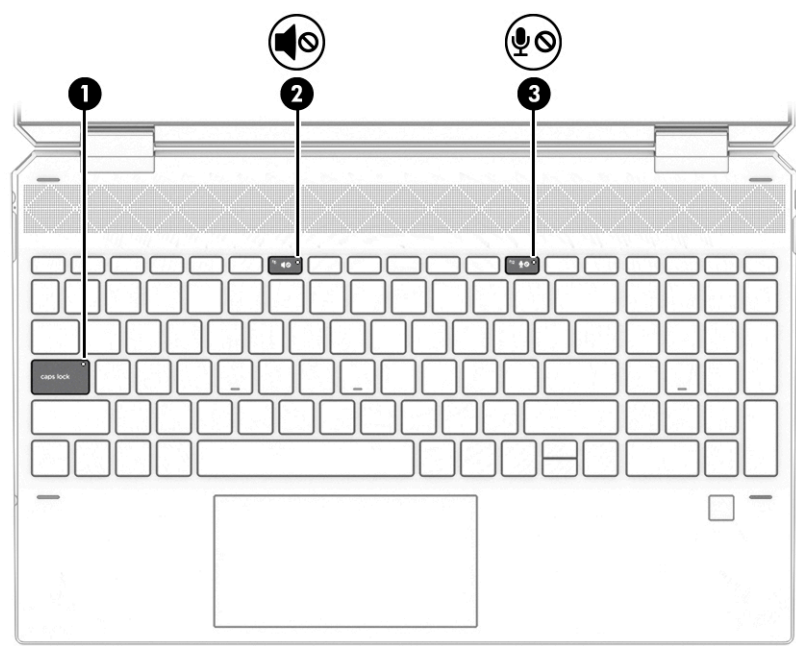




Table 2-5 Light components and their descriptions

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.
(3)	 Microphone mute light	<ul style="list-style-type: none">On: Microphone is off.Off: Microphone is on.

Speakers and fingerprint reader

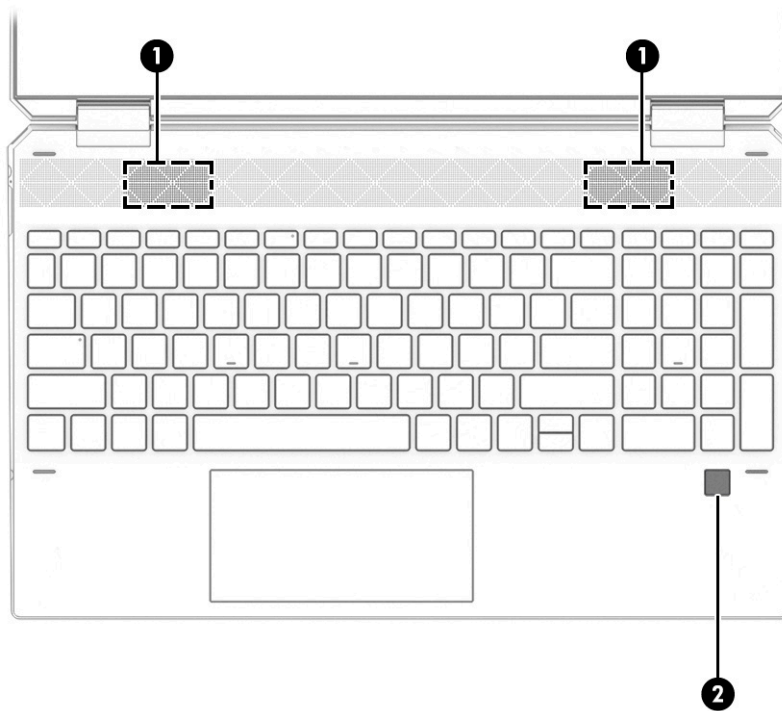


Table 2-6 Speaker and fingerprint reader components and their descriptions

Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon. IMPORTANT: To prevent fingerprint logon issues, be sure when registering a fingerprint that all sides of the finger are registered by the fingerprint reader.

Special keys

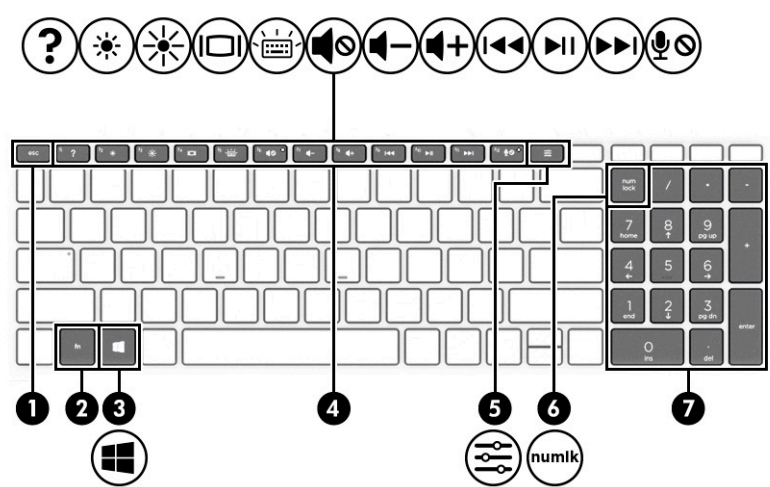





Table 2-7 Special keys components and their descriptions

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 as defined by the icon symbols on the f1 through f12 function keys. The action keys vary by computer.
(5)	 HP Command Center key	Opens the HP Command Center app. This app allows the temperature and cooling preferences on the computer to be adjusted.
(6)	 numlk num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(7)	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.

Bottom

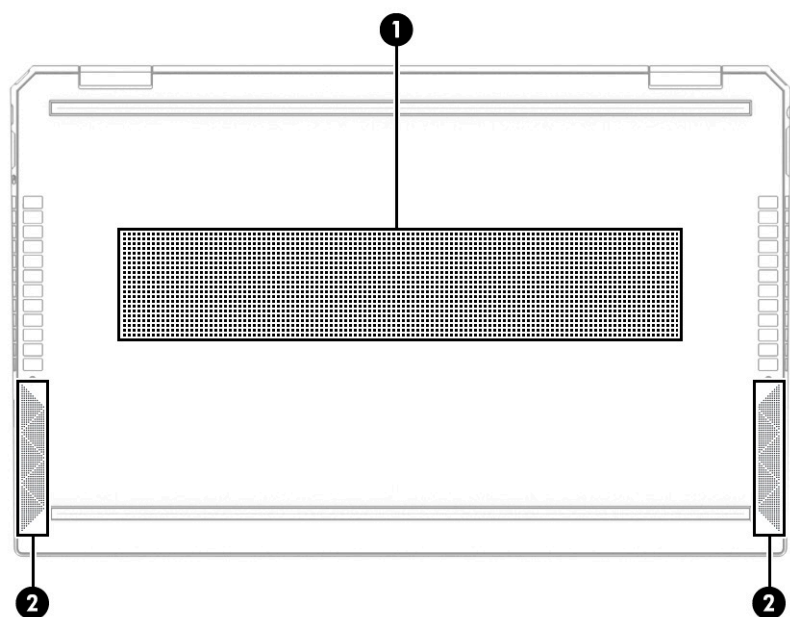


Table 2-8 Bottom components and their descriptions

Component		Description
(1)	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.
(2)	Speakers (2)	Produce sound.

Labels

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

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

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

Your service label will resemble one of the following examples. Refer to the illustration that most closely matches the service label on your computer.

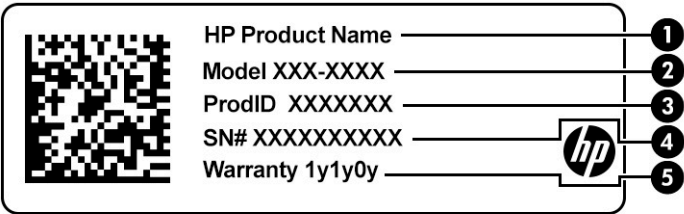


Table 2-9 Service label components

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

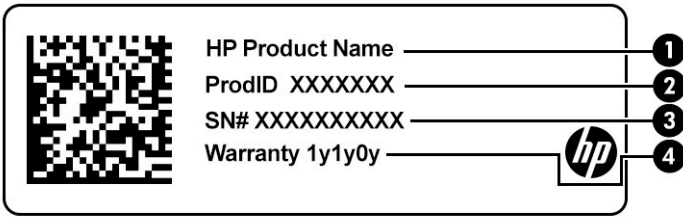


Table 2-10 Service label components


Component	
(1)	HP product name
(2)	Product ID

Table 2-10 Service label components (continued)

Component	
(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 about supported parts for the computer, go to <http://partsurfer.hp.com>, select the country or region, and then follow the on-screen instructions.

Computer major components

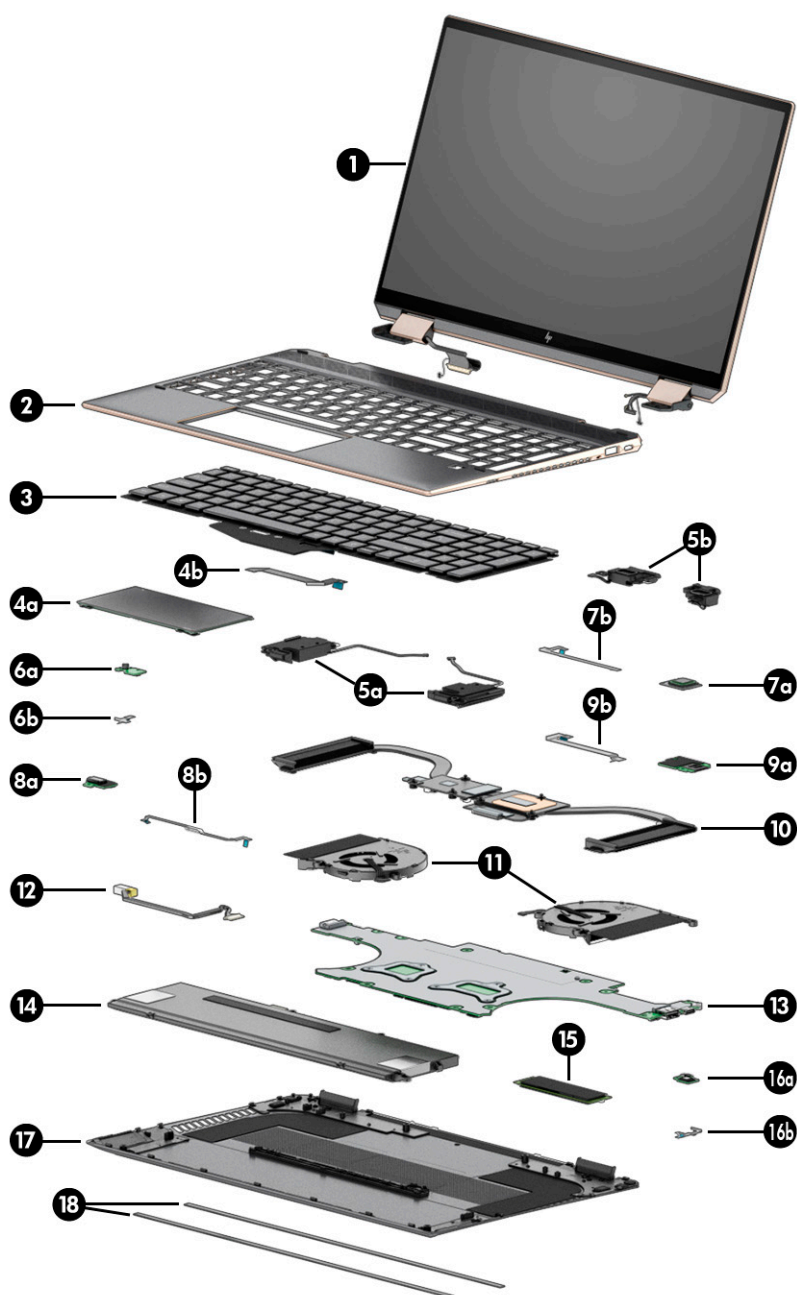


Table 3-1 Major component spare part information

Item	Component	Spare part number
(1)	Display assembly (includes webcam/microphone module wireless antenna(s):	
	In nightfall black finish:	
	15.6 in, OLED, UHD (3840×2160), brightview+AR	L99323-001
	15.6 in, UHD (3840×2160), antiglare	L97639-001
	15.6 in, UHD (3840×2160), AR, LP	L97635-001
	15.6 in, UHD (3840×2160), AR	L97633-001
	In Poseidon blue finish:	
	15.6 in, OLED, UHD (3840×2160), brightview+AR	L99324-001
	15.6 in, UHD (3840×2160), antiglare	L97640-001
	15.6 in, UHD (3840×2160), AR, LP	L97636-001
	15.6 in, UHD (3840×2160), AR	L97634-001
(2)	Top cover:	
	With TDB icon:	
	In nightfall black finish	L95653-001
	In Poseidon blue finish	L95654-001
	Without TDB icon:	
	In nightfall black finish	L95655-001
(3)	Keyboard with backlight in nightfall black finish (includes backlight cable and keyboard cable):	
	For use in Belgium	L95657-A41
	For use in Canada	L95657-DB1
	For use in the Czech Republic and Slovakia	L95657-FL1
	For use in Denmark, Finland, and Norway	L95657-DH1
	For use in France	L95657-051
	For use in Germany	L95657-041
	For use in Greece	L95657-151
	For use in Italy	L95657-061
	For use in Japan	L95657-291
	For use in Latin America	L95657-161
	For use in the Netherlands	L95657-B31
	For use in Russia	L95657-251
	For use in Saudi Arabia	L95657-171
	For use in South Korea	L95657-AD1

Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
	For use in Spain	L95657-071
	For use in Switzerland	L95657-BG1
	For use in the United Kingdom	L95657-031
	For use in United States	L95657-001
	Keyboard with backlight in Poseidon blue finish (includes backlight cable and keyboard cable):	
	For use in Belgium	L95658-A41
	For use in Canada	L95658-DB1
	For use in the Czech Republic and Slovakia	L95658-FL1
	For use in Denmark, Finland, and Norway	L95658-DH1
	For use in France	L95658-051
	For use in Germany	L95658-041
	For use in Greece	L95658-151
	For use in Italy	L95658-061
	For use in Japan	L95658-291
	For use in Latin America	L95658-161
	For use in the Netherlands	L95658-B31
	For use in Russia	L95658-251
	For use in Saudi Arabia	L95658-171
	For use in South Korea	L95658-AD1
	For use in Spain	L95658-071
	For use in Switzerland	L95658-BG1
	For use in the United Kingdom	L95658-031
	For use in the United States	L95658-001
(4a)	Touchpad:	
	In nightfall black finish	L95638-001
	In Poseidon blue finish	L95639-001
(4b)	Touchpad cable	L95625-001
	Speaker Kit (includes:)	L95647-001
(5a)	Left and right front speakers (includes cables and 4 rubber isolators)	
(5b)	Left and right rear speakers (includes cables)	
(6a)	Power button board	L95637-001
(6b)	Power button board cable	L95624-001
	Power button board actuator (not illustrated):	

Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
	In brass finish	L95641-001
	In copper finish	L95640-001
(7a)	Fingerprint reader:	
	In nightfall black finish	L71964-001
	In Poseidon blue finish	L71962-001
(7b)	Fingerprint reader cable	L95626-001
	Fingerprint reader bracket (not available as a spare part)	
(8a)	Audio jack board	L95635-001
(8b)	Audio jack board cable (includes double-sided adhesive)	L95621-001
(9a)	Card reader board	L95634-001
(9b)	Card reader board cable	L95620-001
(10)	Heat sink (includes replacement thermal material)	
	For use only on computer models equipped with an Intel Core i7-10750H processor	L95629-001
	For use only on computer models equipped with an Intel Core i7-10510U processor	L95628-001
(11)	Fans (2, include cables):	
	Serves the graphics subsystem	L95630-001
	Serves the processor	L95631-001
(12)	Power connector cable	L95627-001
	Camera privacy switch actuator:	
	In brass finish	L95643-001
	In copper finish	L95642-001
(13)	System board (includes the processor, a graphics subsystem with discrete memory, replacement thermal material, and the Windows 10 operating system):	
	For use only on computer models equipped with a display assembly with OLED:	
	Equipped with an Intel Core i7-10750H processor, an NVIDIA GeForce GTX 1650Ti graphics subsystem with 4 GB of discrete memory, and 16 GB of system memory	L95651-601
	Equipped with an Intel Core i7-10510U processor, an NVIDIA GeForce MX330 graphics subsystem with 2 GB of discrete memory, and 16 GB of system memory	L95652-601
	For use only on computer models not equipped with a display assembly with OLED:	
	Equipped with an Intel Core i7-10750H processor, an NVIDIA GeForce GTX 1650Ti graphics subsystem with 4 GB of discrete memory, and 16 GB of system memory	L95649-601
	Equipped with an Intel Core i7-10750H processor, an NVIDIA GeForce GTX 1650Ti graphics subsystem with 4 GB of discrete memory, and 8 GB of system memory	L95648-601
	Equipped with an Intel Core i7-10510U processor, an NVIDIA GeForce MX330 graphics subsystem with 2 GB of discrete memory, and 16 GB of system memory	L95650-601
(14)	Battery (6 cell, 72 WHr, 3.16 Ahr, Li-ion; includes cable)	L68299-005

Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
(15)	Solid-state drive:	
	2 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85358-005
	1 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85348-005
	512 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85360-005
	256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
	1 TB, M.2 2280, PCIe + 32 GB 3D Xpoint solid-state drive	L85374-005
	512 GB, M.2 2280, PCIe + 32 GB 3D Xpoint solid-state drive	L85366-005
(16a)	Infrared board	L95636-001
(16b)	Infrared board cable	L95622-001
(17)	Bottom cover:	
	In nightfall black finish:	
	For use only on computer models equipped with an Intel Core i7-10750H processor	L99527-001
	For use only on computer models equipped with an Intel Core i7-10510U processor	L95618-001
	In Poseidon blue finish:	
	For use only on computer models equipped with an Intel Core i7-10750H processor	L99528-001
	For use only on computer models equipped with an Intel Core i7-10510U processor	L95619-001
	Rubber feet:	
	In nightfall black finish:	L95644-001
	In Poseidon blue finish:	L95645-001

Miscellaneous parts

Table 3-2 Miscellaneous spare part information

Component	Spare part number
AC Adapter:	
135 W HP Smart AC adapter (PFC, RC, slim, 4.5 mm)	L15534-001
90 W HP Smart AC adapter (PFC, RA, 4.5 mm)	937532-850
Duck head adapter for use in Japan	L33157-001
HP 15.6 black sleeve	L96963-001
Adapter:	
HP Elite USB-C MultiPort hub	L39572-001
HP HDMI-to-VGA adapter	701943-001
HP USB-to-Gigabit RJ45 adapter	829941-001
HP USB-C-to-HDMI-2.0 adapter	935325-001

Table 3-2 Miscellaneous spare part information (continued)

Component	Spare part number
HP USB-C-to-MultiPort hub	919666-001
HP USB-C-to-RJ45 adapter	855560-001
HP USB-C-to-USB-A dongle	833960-001
HP USB-C-to-USB-A hub	916838-001
HP USB-C-to-VGA adapter	831751-001
HP USB external DVD-RW Drive	747080-001
Pen tip (Cadillac Sunwoda)	L04536-001
Pen:	
Zenvo pen in nightfall black finish with cable	L95615-001
Zenvo pen in nightfall black finish with cable (includes tips)	M09982-001
Power cord (C5, 1.0 m, premium with sticker):	
For use in Australia	L22327-001
For use in Denmark	L22322-001
For use in Europe	L22321-001
For use in India	L22624-001
For use in Japan	L22330-001
For use in North America	L22319-001
For use in the People's Republic of China	L21930-001
For use in South Africa	L22325-001
For use in South Korea	L22328-001
For use in Switzerland	L22324-001
For use in the United Kingdom	L22320-001
Screw Kit	L95646-001
Sunwoda stylus active pen in natural silver finish	910241-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screw driver
- Magnetic screw driver
- Phillips P0 and P1 screw drivers
- Case utility tool or similar thin plastic tool

Service considerations


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

 **NOTE:** As each subassembly is removed 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. Use care when handling the plastic.

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 2.54 cm (1.0 in.) 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."

Electrostatic discharge damage

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

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

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



IMPORTANT: To prevent damage to the computer when 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 a component is removed, place it in an electrostatic-safe container.

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



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

Table 4-1 Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or 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.

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of $1\text{ M}\Omega \pm 10\%$ resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of $1\text{ M}\Omega \pm 10\%$ resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

HP recommends the following grounding equipment to prevent electrostatic damage:


- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of $1\text{ M}\Omega \pm 10\%$ resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials


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

Table 4-2 Shielding protection provided by antistatic bags and floor mats

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

5 Removal and replacement procedures

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

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

Component replacement procedures

There are as many as 49 screws that must be removed, replaced, or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Bottom cover

Table 5-1 Bottom cover spare part information

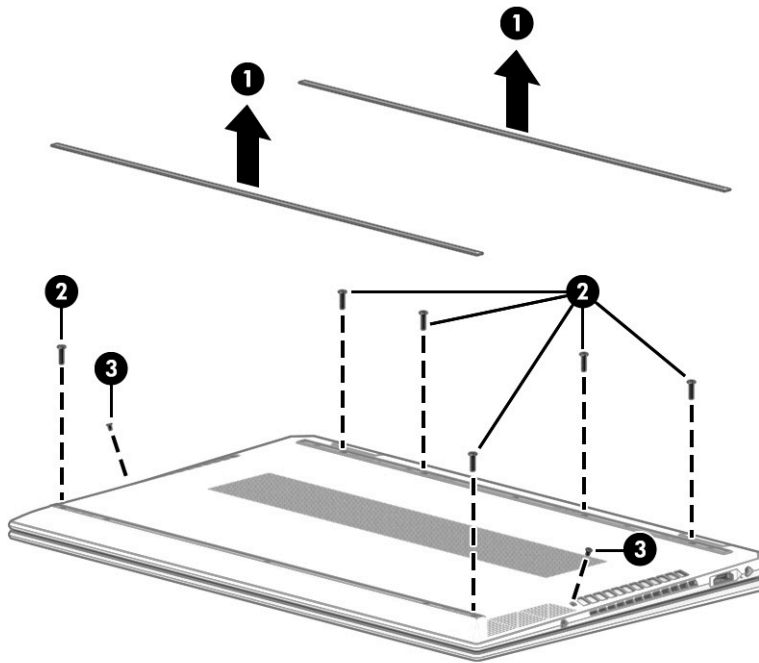
Description	Spare part number
In nightfall black finish:	
For use only on computer models equipped with an Intel Core i7-10750H processor	L99527-001
For use only on computer models equipped with an Intel Core i7-10510U processor	L95618-001
In Poseidon blue finish:	
For use only on computer models equipped with an Intel Core i7-10750H processor	L99528-001
For use only on computer models equipped with an Intel Core i7-10510U processor	L95619-001

Remove the bottom cover:

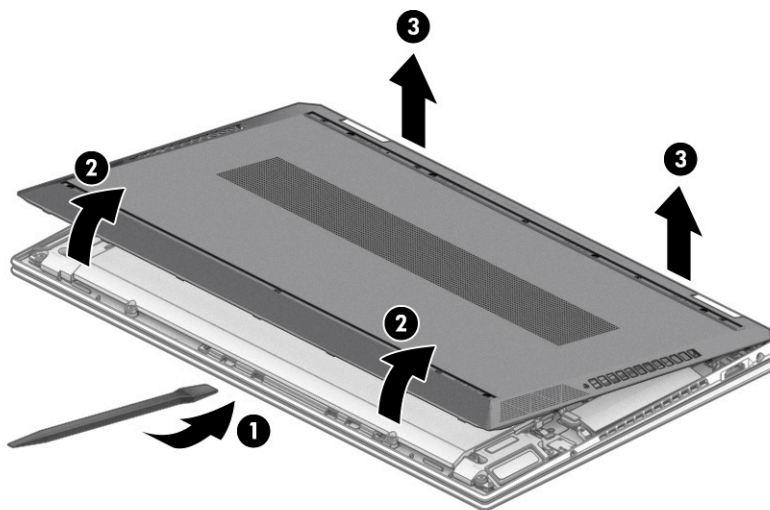
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Close the computer and position it upside down.
5. Remove the front **(1)** and rear rubber foot strips.

The rubber foot strips are available using spare part numbers L95644-001 (in nightfall black finish) and L95644-001 (in Poseidon blue finish).

6. Remove the six Phillips M2.5×7.2 screws (2) the two Torx5 M2.0×4.0 screws (3) that secure the bottom cover to the top cover.



7. Use a case utility tool (1) or similar thin plastic tool to separate the front edge (2) of the bottom cover from the top cover.
8. Remove the bottom cover (3).



Reverse this procedure to install the bottom cover.

Solid-state drive

Table 5-2 Solid-state drive spare part information

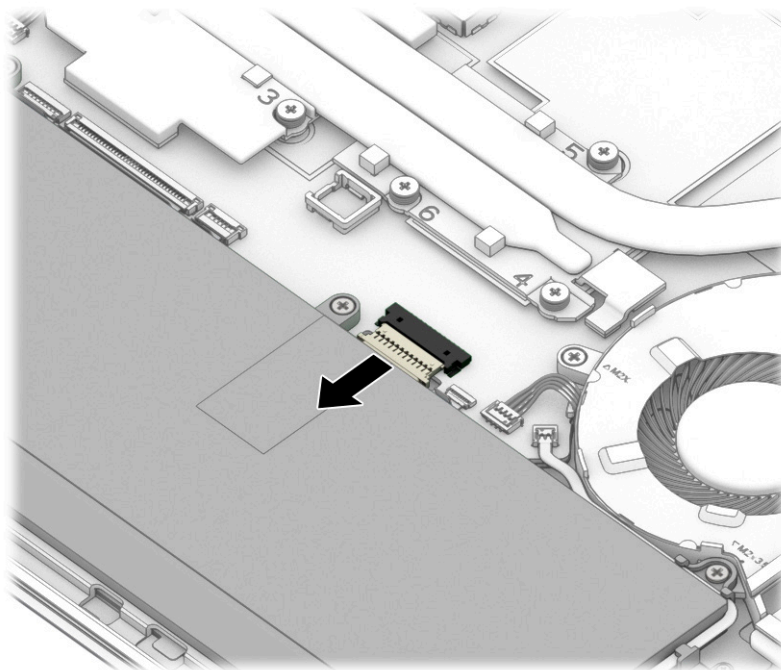
Description	Spare part number
2 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85358-005
1 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85348-005
512 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85360-005
256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
1 TB, M.2 2280, PCIe + 32 GB 3D Xpoint solid-state drive	L85374-005
512 GB, M.2 2280, PCIe + 32 GB 3D Xpoint solid-state drive	L85366-005

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

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

Remove the solid-state drive:

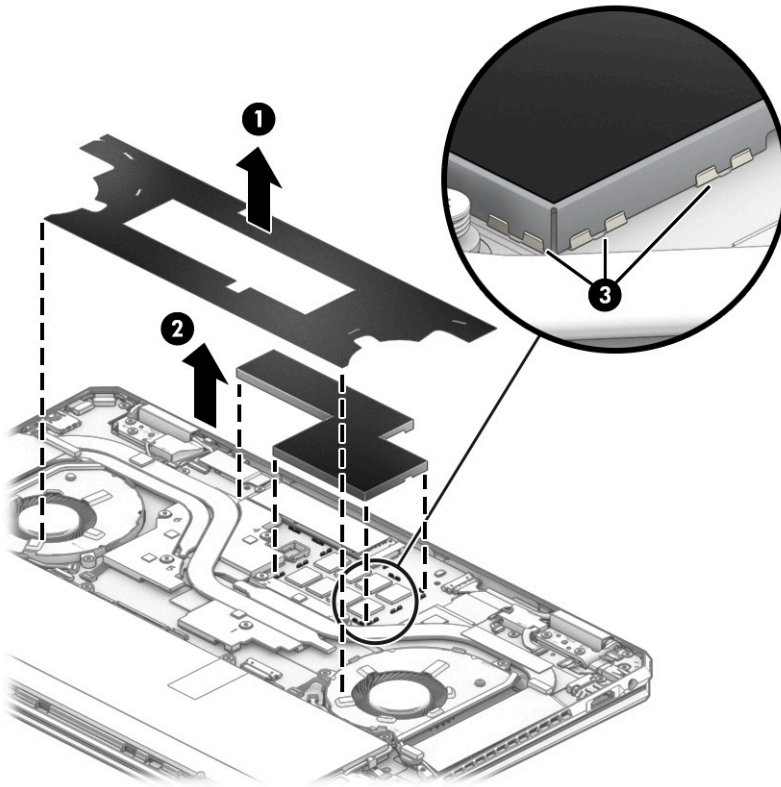
1. Disconnect the battery cable from the system board.



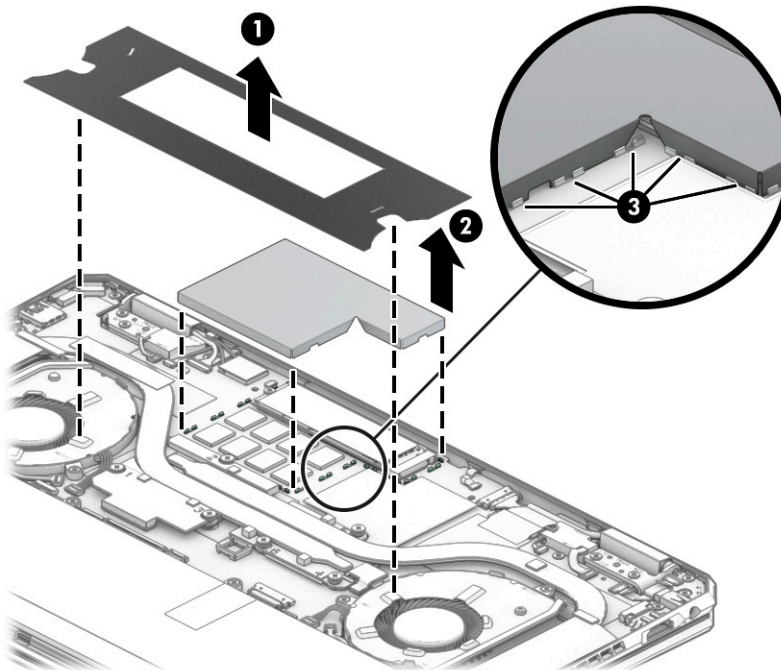
2. Remove the adhesive cover (1) that secures the solid-state drive shield to the system board.

3. Release the solid-state drive shield (2) from the retention clips (3) built onto the system board, and then remove the solid-state drive shield.

 **NOTE:** The following image shows the solid-state drive cover and shield being removed on a computer model equipped with an Intel Core i7-10750H processor.

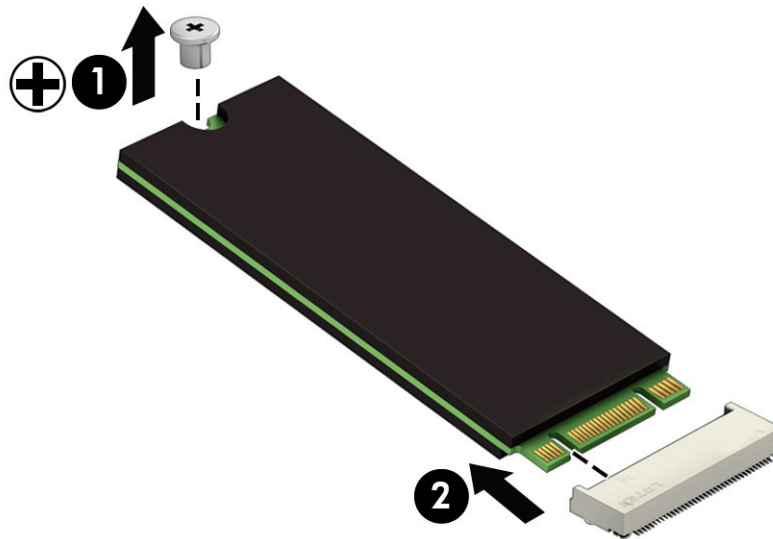


 **NOTE:** The following image shows the solid-state drive cover and shield being removed on a computer model equipped with an Intel Core i7-10510U processor.



4. Remove the Phillips M2.0×3.0 screw **(1)** that secures the solid-state drive to the system board.
5. Remove the solid-state drive **(2)** by sliding it away from the slot at an angle.

 **NOTE:** Solid-state drives are notched to prevent incorrect installation.



Reverse this procedure to install the solid-state drive.

Display assembly

Table 5-3 Display assembly spare part information

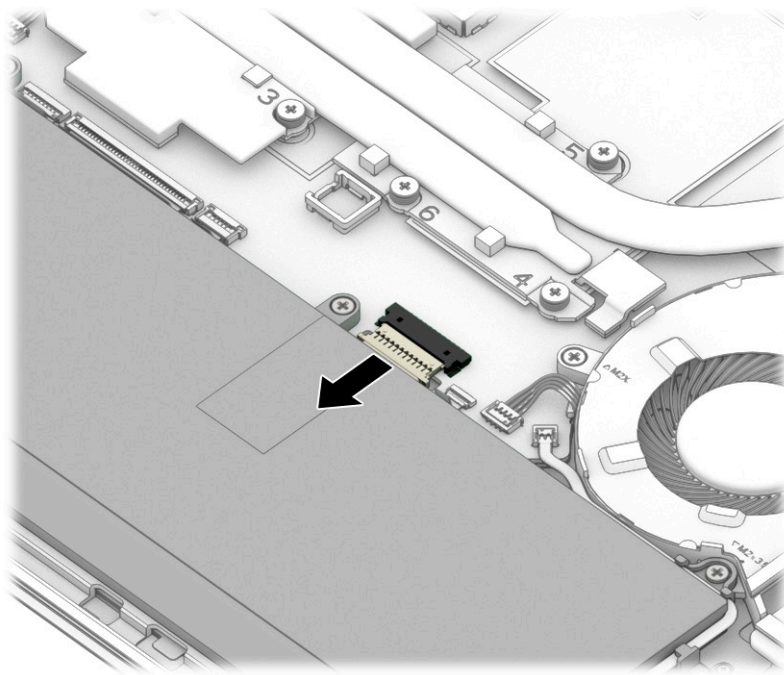
Description	Spare part number
In nightfall black finish:	
15.6 in, OLED, UHD (3840×2160), brightview+AR	L99323-001
15.6 in, UHD (3840×2160), antiglare	L97639-001
15.6 in, UHD (3840×2160), AR, LP	L97635-001
15.6 in, UHD (3840×2160), AR	L97633-001
In Poseidon blue finish:	
15.6 in, OLED, UHD (3840×2160), brightview+AR	L99324-001
15.6 in, UHD (3840×2160), antiglare	L97640-001
15.6 in, UHD (3840×2160), AR, LP	L97636-001
15.6 in, UHD (3840×2160), AR	L97634-001

Before removing the display assembly, follow these steps:

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

Remove the display assembly:

1. Disconnect the battery cable from the system board.



2. Remove the shield **(1)** that secures the wireless antenna cables to the WLAN module terminals.

3. Disconnect the wireless antenna cables **(2)** from the WLAN module terminals.



NOTE: The #1/white wireless antenna cable connects to the WLAN module **#1/Main** terminal. The #2/black wireless antenna cable connects to the WLAN module **#2/Aux** terminal.

4. Disconnect the webcam/microphone module cable **(3)** from the system board.

5. Disconnect the webcam shutter cable **(4)** from the system board.

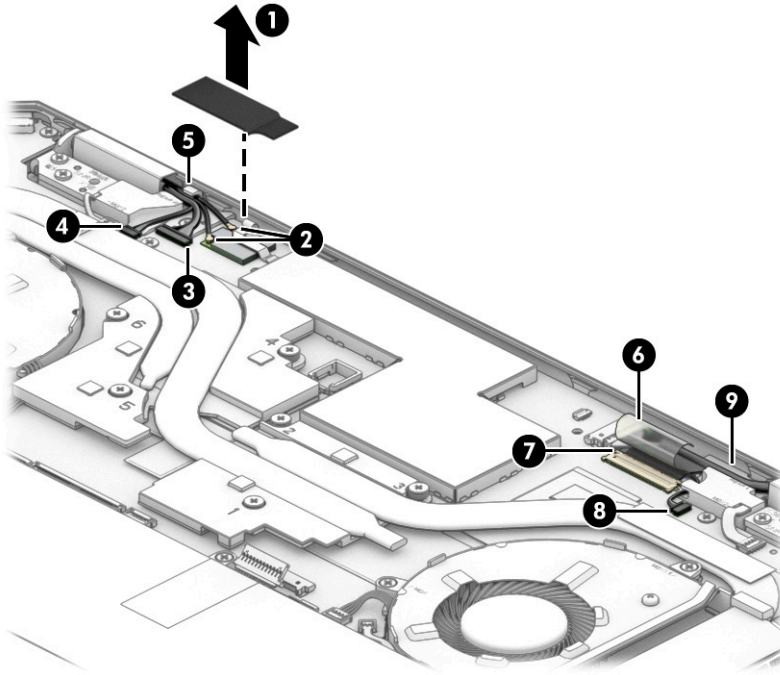
6. Release the wireless antenna cables and the webcam/microphone module cable from the retention clip **(5)** built into the speaker.

7. Release the adhesive support strip **(6)** that secures the display panel cable to the system board.

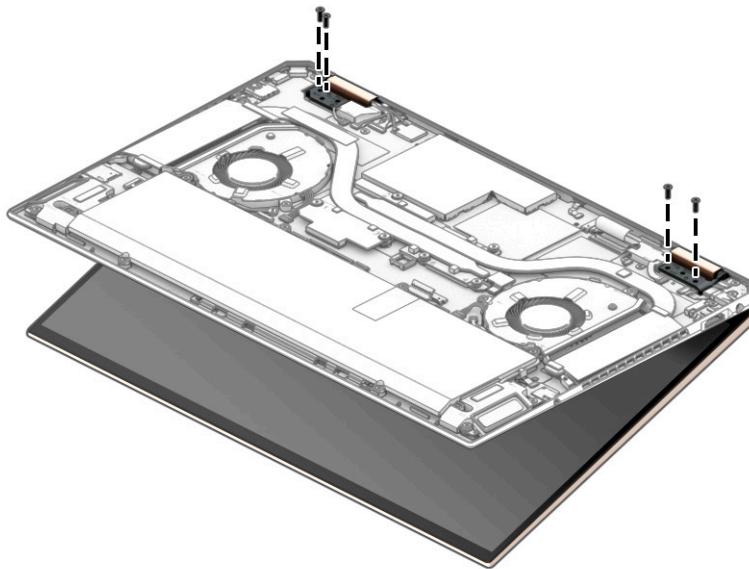
8. Disconnect the display panel cable **(7)** from the system board.

9. Disconnect the display OLED cable **(8)** from the system board.

10. Release the display panel cable from the routing channel (9) built into the top cover.

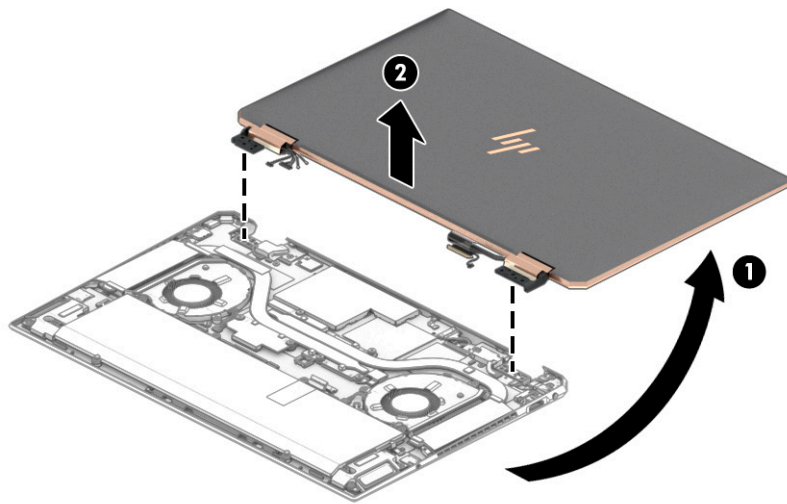


11. Remove the four Phillips M2.5×6.5 screws that secure the display assembly to the top cover.



12. Swing the top edge of the display assembly (1) away from the top cover. (The display assembly hinges disengage from the top cover.)

13. Separate the top cover (2) from the display assembly.



Reverse this procedure to install the display assembly.

Front speakers

Table 5-4 Front speakers spare part information

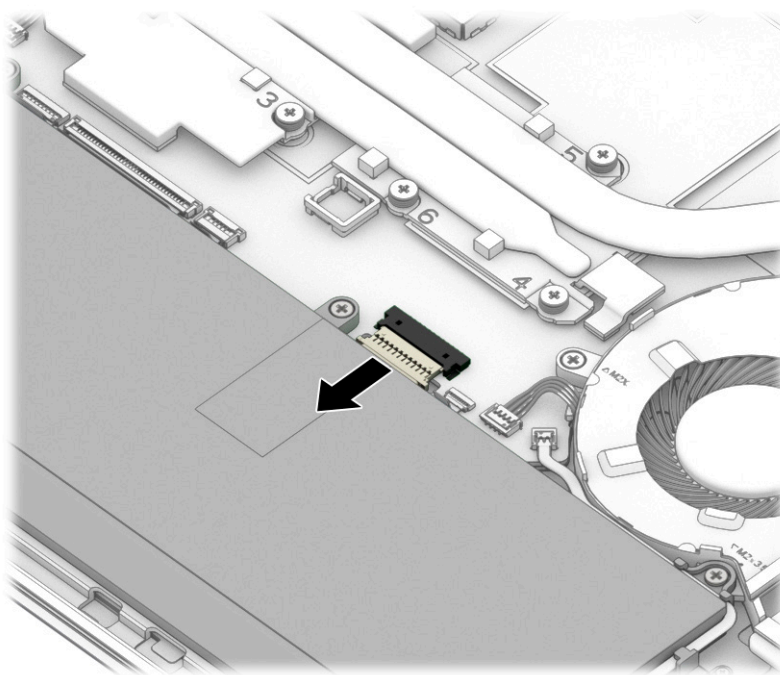
Description	Spare part number
Speaker Kit (includes left and right front speakers, cables, and 4 rubber isolators)	L95647-001

Before removing the front speakers, follow these steps:

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


Remove the front speakers:

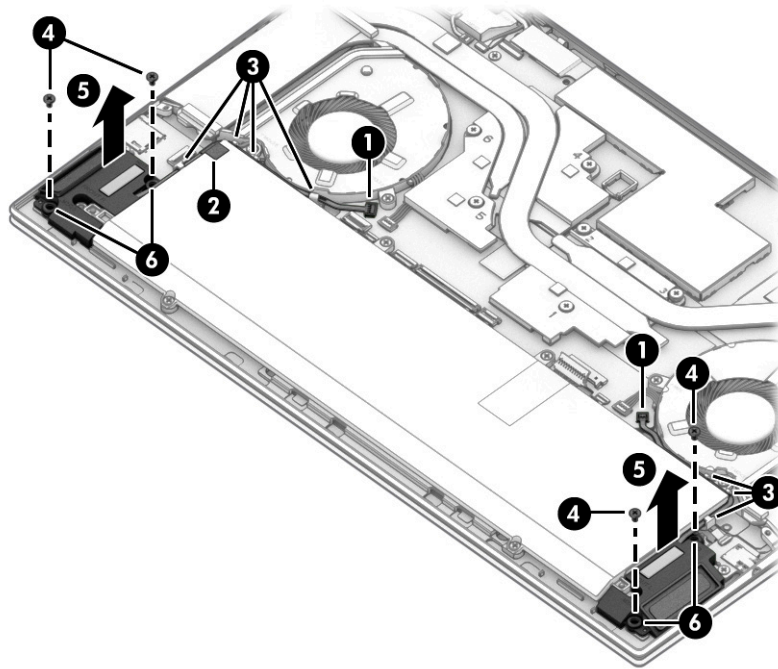
1. Disconnect the battery cable from the system board.



2. Disconnect the front speaker cables (1) from the system board.
3. Release the tape (2) that secures the speaker cable to the battery.
4. Release the front speaker cables from the retention clips (3) built into the battery.
5. Remove the four Phillips M2.0×3.0 screws (4) that secure the front speakers to the top cover.

6. Remove the front speakers (5).

 **NOTE:** When removing the speakers, make note of the location of the four rubber isolators (6). The absence of or damage to these isolators can result in degraded speaker performance.



Reverse this procedure to install the front speakers.

Battery

Table 5-5 Battery spare part information

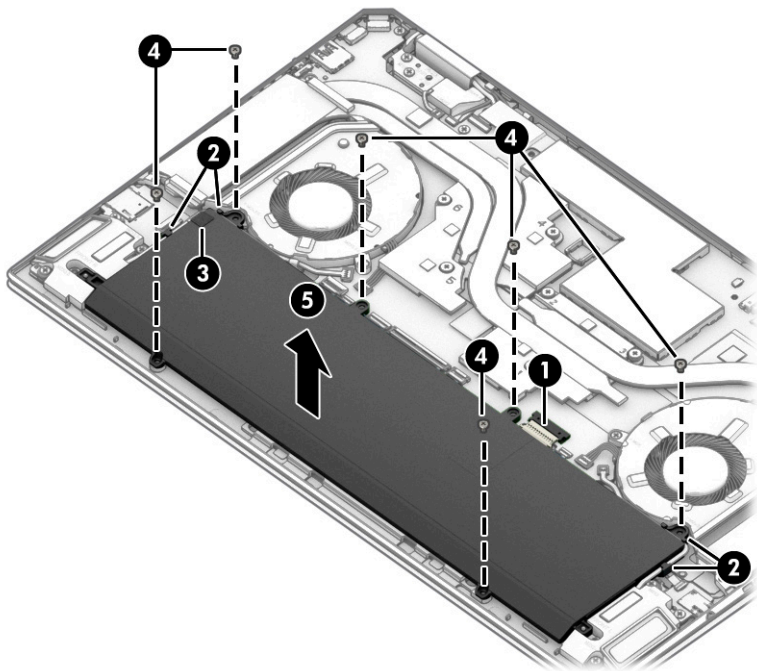
Description	Spare part number
Battery (6 cell, 72 WHr, 3.16 AHr, Li-ion; includes cable)	L68299-005

Before removing the battery, follow these steps:

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

Remove the battery:

1. Disconnect the battery cable (1) from the system board.
2. Release the front speaker cables from the retention clips (2) built into the battery.
3. Release the tape (3) that secures the speaker cable to the battery.
4. Remove the six Phillips M2.0×3.5 screws (4) that secure the battery to the top cover.
5. Remove the battery (5).



Reverse this procedure to install the battery.

Card reader board cable

Table 5-6 Card reader board cable spare part information

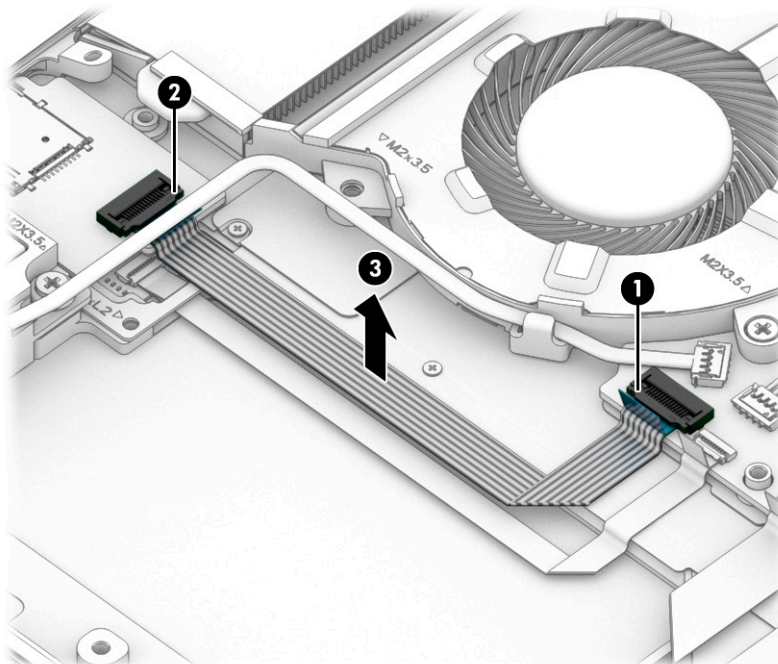
Description	Spare part number
Card reader board cable	L95620-001

Before removing the card reader board cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the card reader board cable:

1. Release the zero insertion force (ZIF) connector (1) to which the card reader board cable is connected, and then disconnect the card reader board cable from the system board.
2. Release the ZIF connector (2) to which the card reader board cable is connected, and then disconnect the card reader board cable from the card reader board.
3. Remove the card reader board cable (3).



Reverse this procedure to install the card reader board cable.

Card reader board

Table 5-7 Card reader board spare part information

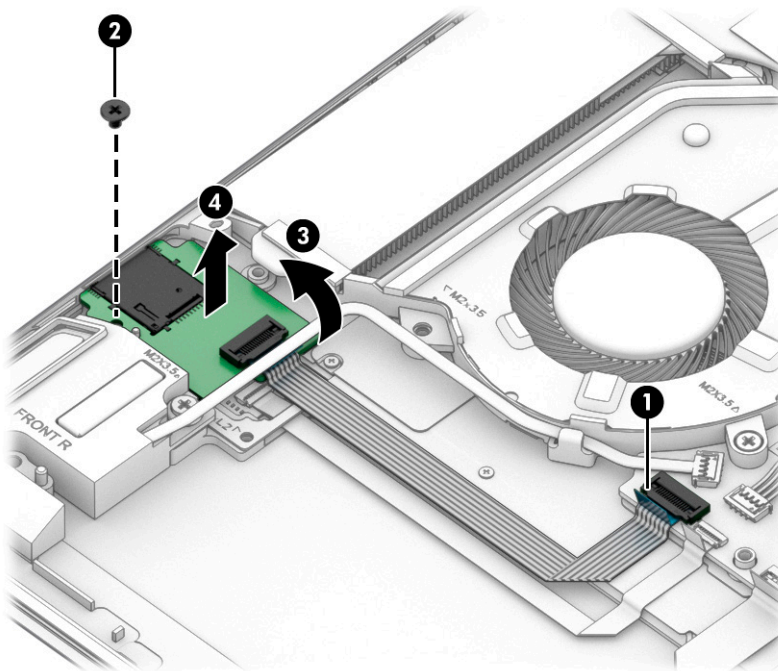
Description	Spare part number
Card reader board (does not include cable; the card reader board cable is available using spare part number L95620-001)	L95634-001

Before removing the card reader board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the card reader board:

1. Release the ZIF connector (1) to which the card reader board cable is connected, and then disconnect the card reader board cable from the system board.
2. Remove the Phillips M2.0×3.0 screw (2) that secures the card reader board to the top cover.
3. Lift the right side (3) of the card reader board to release it from the top cover.
4. Remove the card reader board (4) and cable.



Reverse this procedure to install the card reader board and cable.

Fingerprint reader cable

Table 5-8 Fingerprint reader cable spare part information

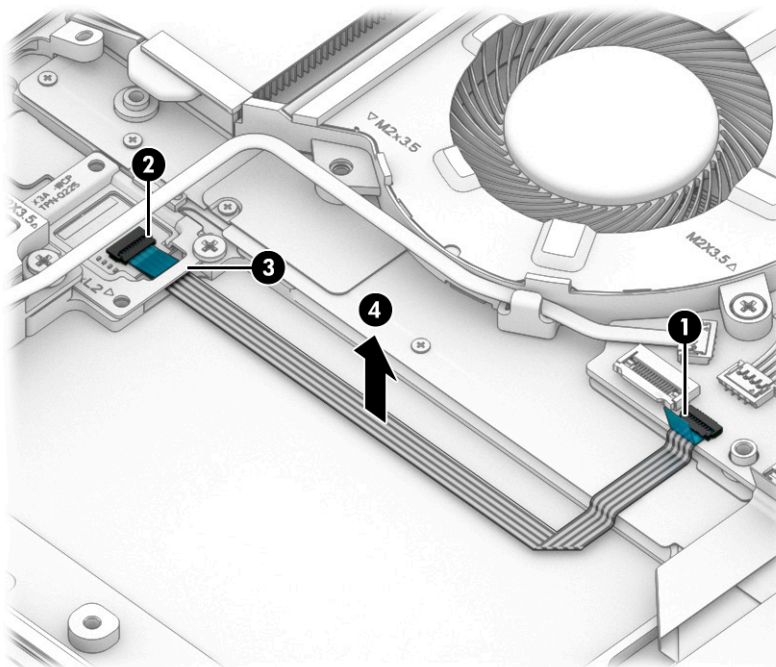
Description	Spare part number
Fingerprint reader cable	L95626-001

Before removing the fingerprint reader cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the fingerprint reader cable:

1. Release the ZIF connector (1) to which the fingerprint reader cable is connected, and then disconnect the fingerprint reader cable from the system board.
2. Release the ZIF connector (2) to which the fingerprint reader cable is connected, and then disconnect the fingerprint reader cable from the fingerprint reader.
3. Pass the fingerprint reader cable through the opening (3) between the top cover and the fingerprint reader bracket.
4. Remove the fingerprint reader cable (4).



Reverse this procedure to install the fingerprint reader cable.

Fingerprint reader


 **NOTE:** The fingerprint reader spare part kit does not include the fingerprint reader cable. The fingerprint reader cable is available using spare part number L95626-001.

Table 5-9 Fingerprint reader spare part information

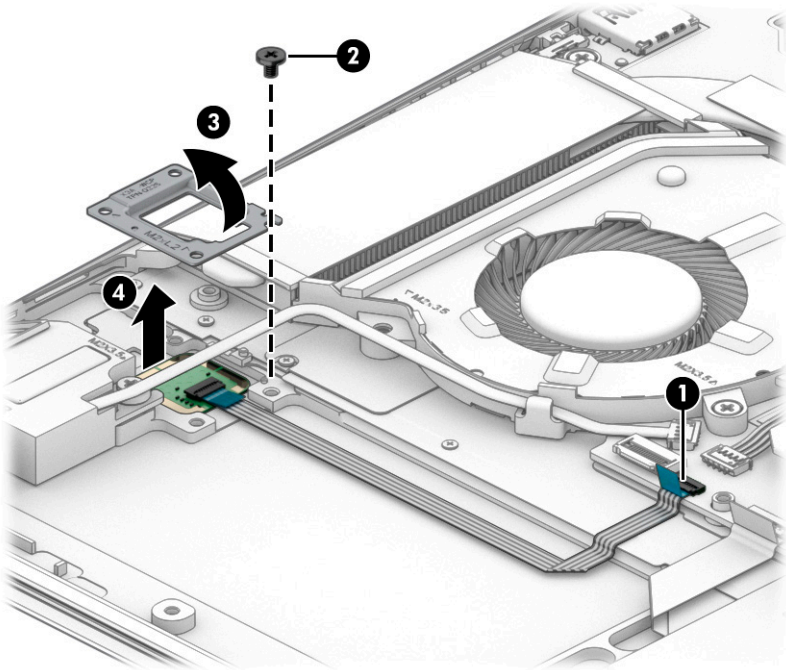
Description	Spare part number
In nightfall black finish	L71964-001
In Poseidon blue finish	L71962-001

Before removing the fingerprint reader, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the fingerprint reader:

1. Release the ZIF connector (1) to which the fingerprint reader cable is connected, and then disconnect the fingerprint reader cable from the system board.
2. Remove the Phillips M2.0×3.0 screw (2) that secures the fingerprint reader and bracket to the top cover.
3. Remove the fingerprint reader bracket (3).
4. Remove the fingerprint reader (4).



Reverse this procedure to install the fingerprint reader.

Touchpad cable

Table 5-10 Touchpad cable spare part information

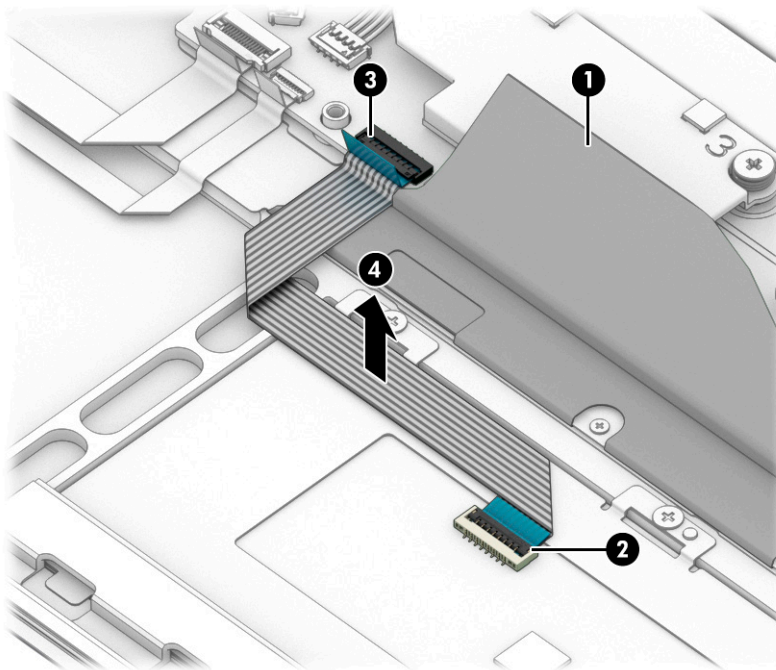
Description	Spare part number
Touchpad cable	L95625-001

Before removing the touchpad cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the touchpad cable:

1. Fold back the shielding material **(1)** that covers the touchpad cable.
2. Release the ZIF connector **(2)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the touchpad.
3. Release the ZIF connector **(3)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.
4. Remove the touchpad cable **(4)**.



Reverse this procedure to install the touchpad cable.

Touchpad



NOTE: The touchpad spare part kit does not include the touchpad cable. The touchpad cable is available using spare part number L95625-001.

Table 5-11 Touchpad spare part information

Description	Spare part number
In nightfall black finish	L95638-001
In Poseidon blue finish	L95639-001

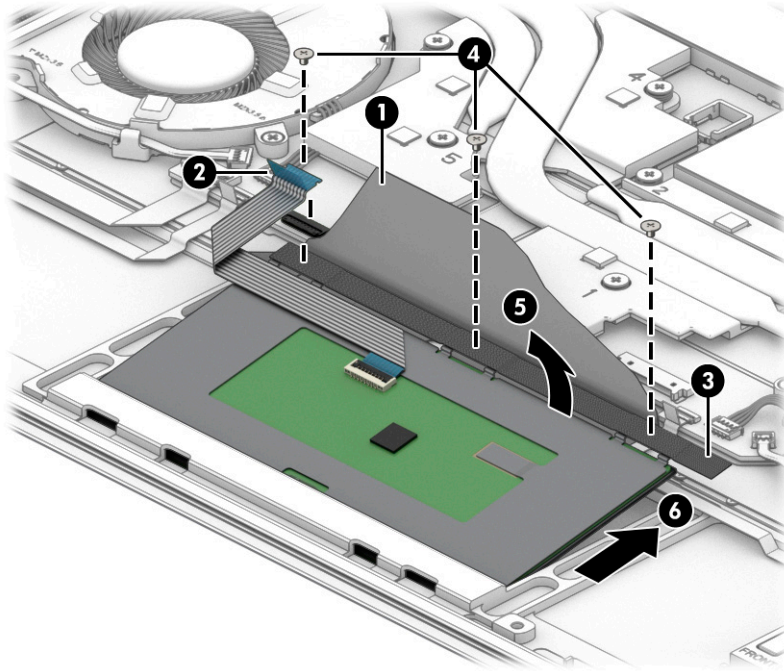
Before removing the touchpad, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the touchpad:

1. Fold back the shielding material **(1)** that covers the top edge of the touchpad.
2. Release the ZIF connector **(2)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.
3. Release the tape **(3)** that secures the touchpad to the top cover.
4. Remove the three Phillips M2.0×3.0 screws **(4)** that secure the touchpad to the top cover.
5. Lift the top edge of the touchpad **(5)** until it rests at an angle.

6. Remove the touchpad (6) by sliding it up and away at an angle.



Reverse this procedure to install the touchpad.

Audio jack board cable

Table 5-12 Audio jack board cable spare part information

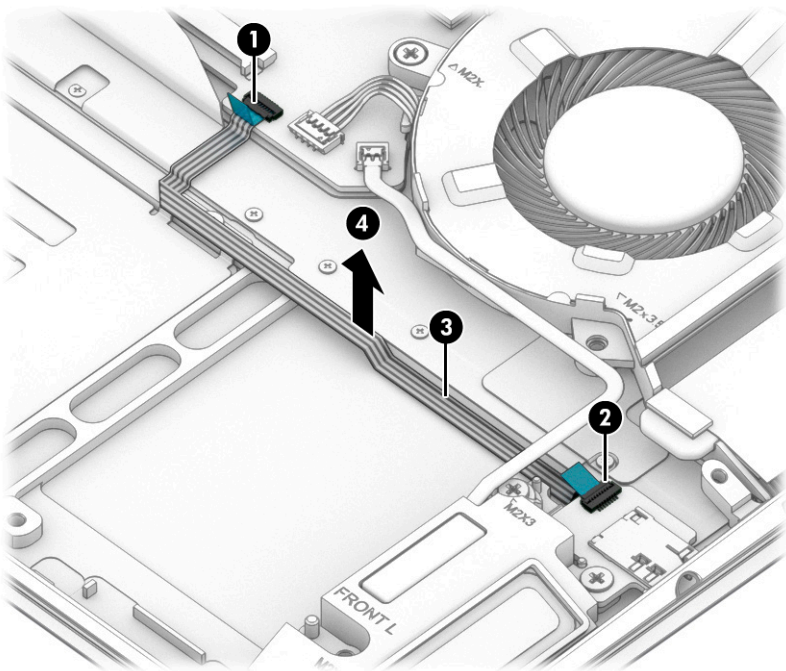
Description	Spare part number
Audio jack board cable (includes double-sided adhesive)	L95621-001

Before removing the audio jack board cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the audio jack board cable:

1. Release the ZIF connector (1) to which the audio jack board cable is connected, and then disconnect the audio jack board cable from the system board.
2. Release the ZIF connector (2) to which the audio jack board cable is connected, and then disconnect the audio jack board cable from the audio jack board.
3. Detach the audio jack board cable (3) from the top cover. (The audio jack board cable is attached to the top cover with double-sided adhesive.)
4. Remove the audio jack board cable (4).



Reverse this procedure to install the audio jack board cable.

Audio jack board

Table 5-13 Audio jack board spare part information

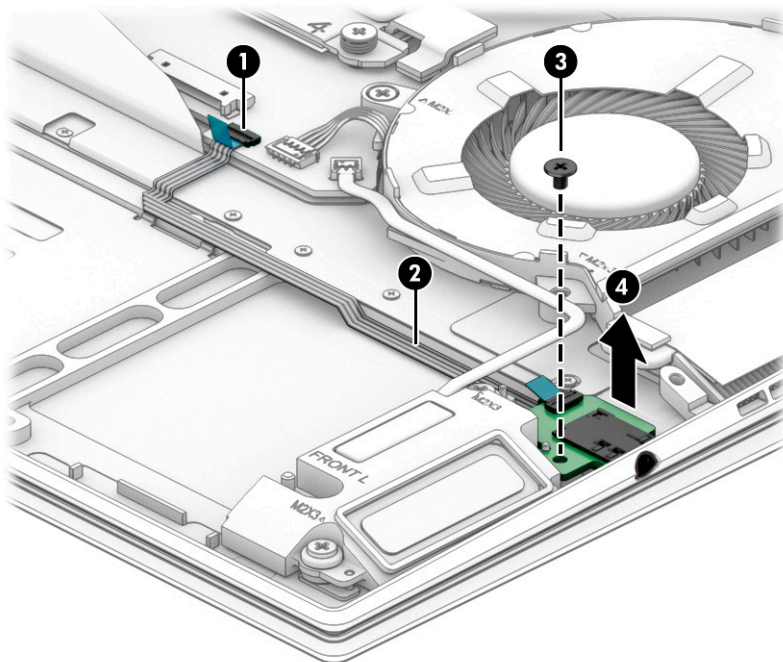
Description	Spare part number
Audio jack board (includes audio-out (headphone)/audio-in (microphone) combo jack; does not include cable; the audio jack board cable is available using spare part number L95621-001)	L95635-001

Before removing the audio jack board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the audio jack board:

1. Release the ZIF connector (1) to which the audio jack board cable is connected, and then disconnect the audio jack board cable from the system board.
2. Detach the audio jack board cable (2) from the top cover. (The audio jack board cable is attached to the top cover with double-sided adhesive.)
3. Remove the Phillips M2.0×3.0 screw (3) that secures the audio jack board to the top cover.
4. Remove the audio jack board (4) and cable.



Reverse this procedure to install the audio jack board and cable.

Power button board cable

Table 5-14 Power button board cable spare part information

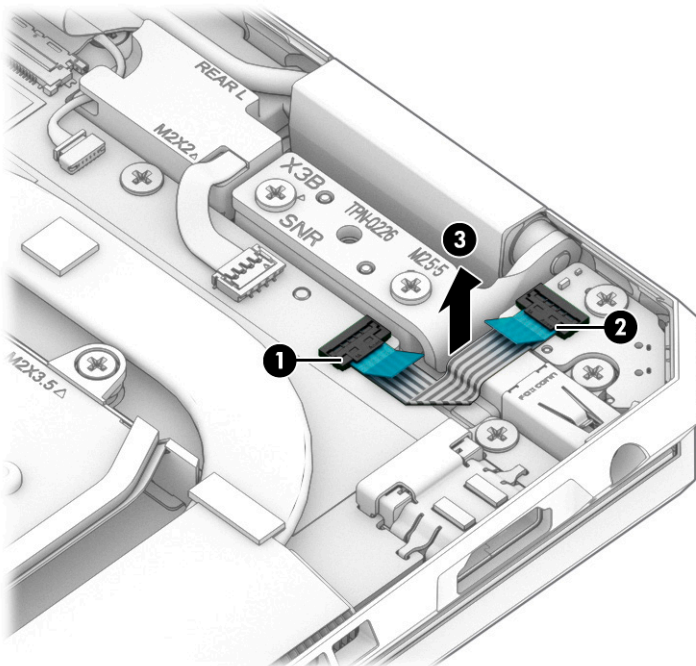
Description	Spare part number
Power button board cable	L95624-001

Before removing the power button board cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the power button board cable:

1. Release the ZIF connector (1) to which the power button board cable is connected, and then disconnect the power button board cable from the system board.
2. Release the ZIF connector (2) to which the power button board cable is connected, and then disconnect the power button board cable from the power button board.
3. Remove the power button board cable (3).



Reverse this procedure to install the power button board cable.

Power button board

Table 5-15 Power button board spare part information

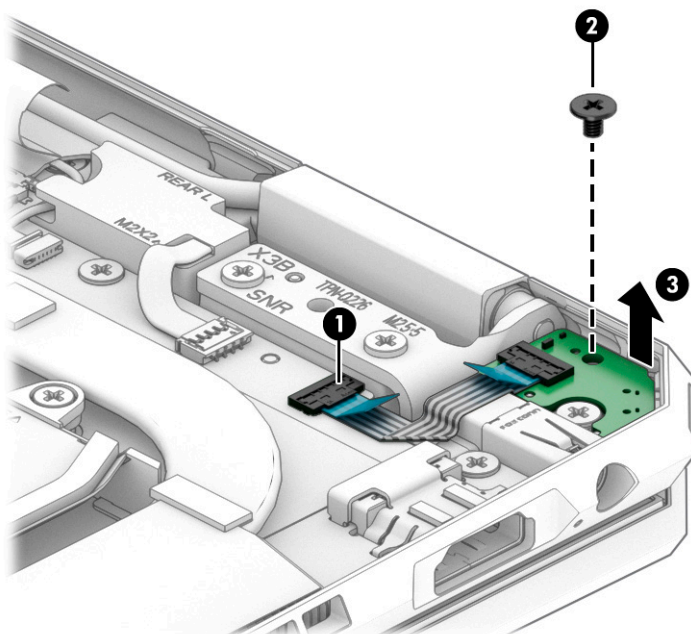
Description	Spare part number
Power button board (does not include cable; the power button board cable is available using spare part number L95624-001)	L95637-001

Before removing the power button board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

Remove the power button board:

1. Release the ZIF connector (1) to which the power button board cable is connected, and then disconnect the power button board cable from the system board.
2. Remove the Phillips M2.0×3.0 screw (2) that secures the power button board to the top cover.
3. Remove the power button board (3) and cable.



Reverse this procedure to install the power button board and cable.

Heat sink



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

Table 5-16 Heat sink spare part information

Description	Spare part number
For use only on computer models equipped with an Intel Core i7-10750H processor	L95629-001
For use only on computer models equipped with an Intel Core i7-10510U processor	L95628-001

Before removing the heat sink, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).

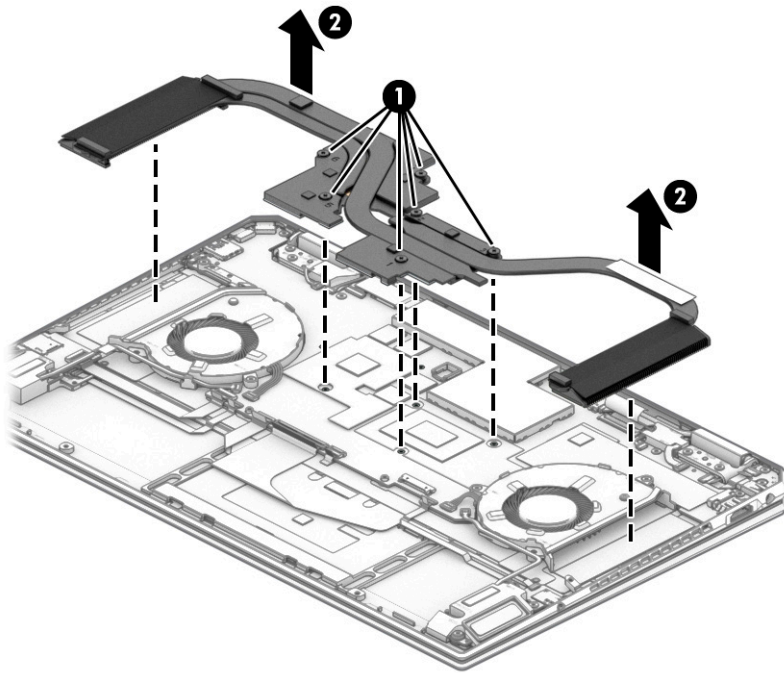
Remove the heat sink:

1. Turn the system board upside down with the front toward you.
2. In the **1, 2, 3, 4, 5, 6** sequence indicated on the heat sink, loosen the six Phillips M2.0×4.2 screws (**1**) that secure the heat sink to the system board.

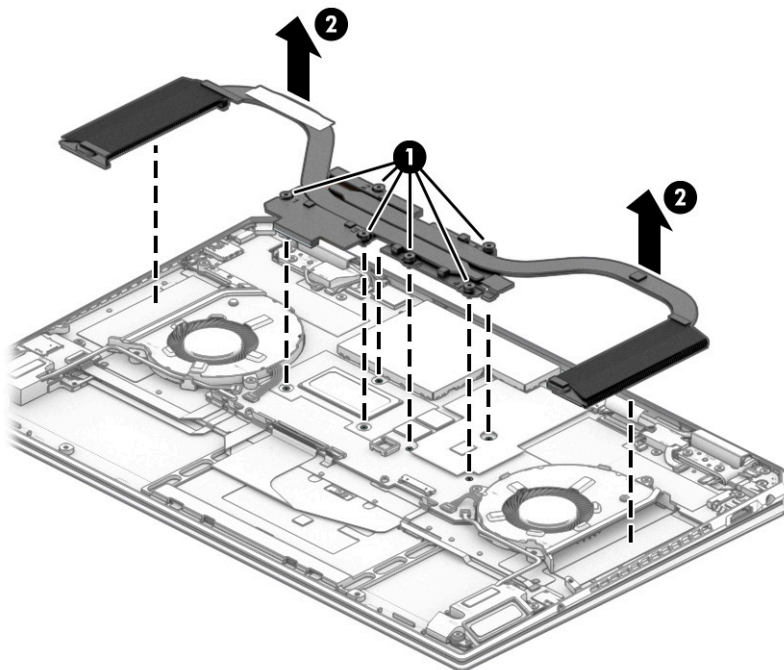
3. Remove the heat sink (2).



NOTE: The following image shows the heat sink being removed on a computer model equipped with an Intel Core i7-10750H processor.



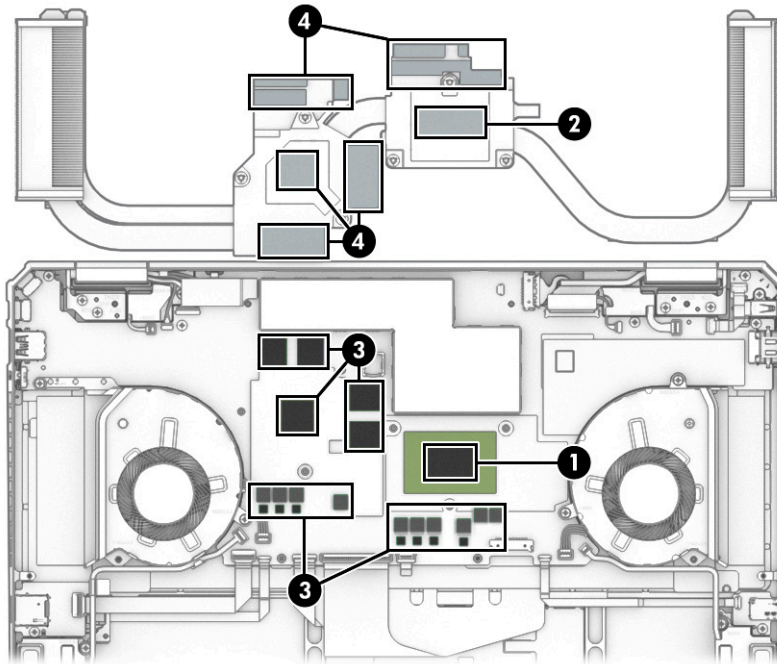
NOTE: The following image shows the heat sink being removed on a computer model equipped with an Intel Core i7-10510U processor.




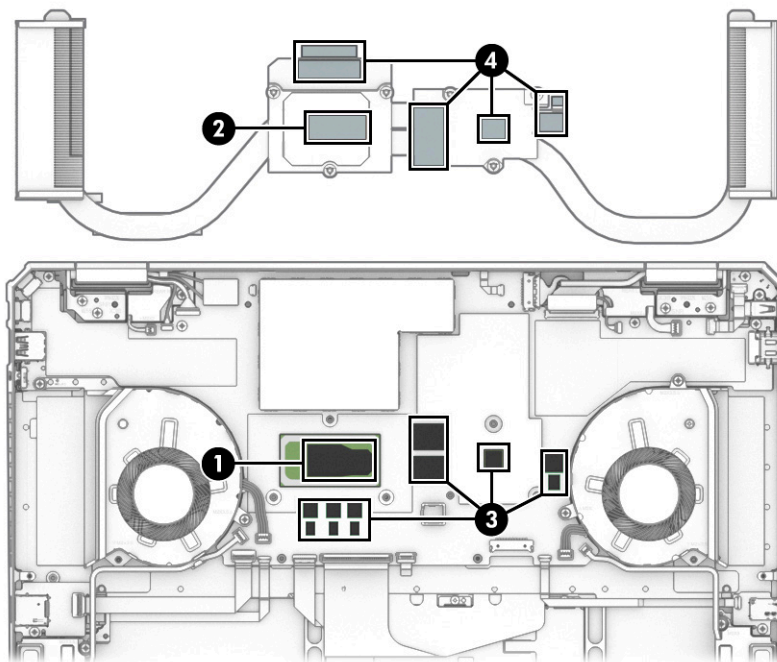
Each time the heat sink is removed, thoroughly clean all thermal material residue from the system board and heat sink surfaces.

A thermal pad is used on the processor (1). Residue from this pad may appear on the surface of the heat sink (2) that services it. A variety of thermal pads are also used on other system board components (3). Residue from these pads may appear on the surfaces of the heat sink (4) that service them. Replacement thermal material is included with the heat sink and system board spare part kits.

 **NOTE:** The following image shows the replacement thermal material locations on a computer model equipped with an Intel Core i7-10750H processor.



 **NOTE:** The following image shows the replacement thermal material locations on a computer model equipped with an Intel Core i7-10510U processor.



Reverse this procedure to install the heat sink.

Fans

Table 5-17 Fan spare part information

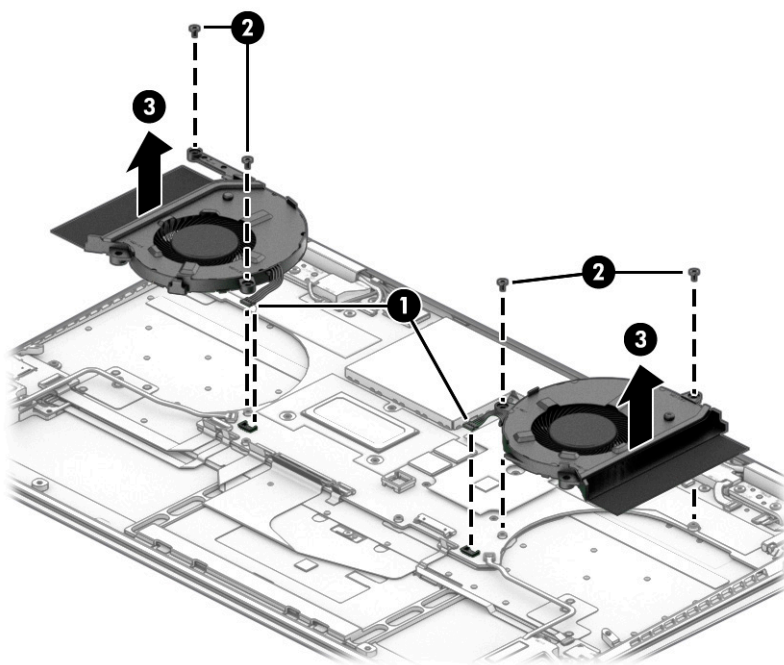
Description	Spare part number
Serves the graphics subsystem (includes cable)	L95630-001
Serves the processor (includes cable)	L95631-001

Before removing the fan, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)).
5. Remove the battery (see [Battery on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 50](#)).

Remove the fan:

1. Disconnect the fan cables (1) from the system board.
2. Remove the four Phillips M2.0×4.0 screws (2) that secure the fan to the system board.
3. Remove the fans (3).



Reverse this procedure to install the fan.

System board



NOTE: The system board spare part kit includes the processor, a graphics subsystem with discrete memory, replacement thermal material, and the Windows 10 operating system.

Table 5-18 System board spare part information

Description	Spare part number
For use only on computer models equipped with a display assembly with OLED:	
Equipped with an Intel Core i7-10750H processor, an NVIDIA GeForce GTX 1650Ti graphics subsystem with 4 GB of discrete memory, and 16 GB of system memory	L95651-601
Equipped with an Intel Core i7-10510U processor, an NVIDIA GeForce MX330 graphics subsystem with 2 GB of discrete memory, and 16 GB of system memory	L95652-601
For use only on computer models not equipped with a display assembly with OLED:	
Equipped with an Intel Core i7-10750H processor, an NVIDIA GeForce GTX 1650Ti graphics subsystem with 4 GB of discrete memory, and 16 GB of system memory	L95649-601
Equipped with an Intel Core i7-10750H processor, an NVIDIA GeForce GTX 1650Ti graphics subsystem with 4 GB of discrete memory, and 8 GB of system memory	L95648-601
Equipped with an Intel Core i7-10510U processor, an NVIDIA GeForce MX330 graphics subsystem with 2 GB of discrete memory, and 16 GB of system memory	L95650-601

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)), and then remove the following components:
 - a. Battery (see [Battery on page 38](#))
 - b. Heat sink (see [Heat sink on page 50](#))
 - c. Fan (see [Fans on page 53](#))



NOTE: When replacing the system board, make sure the following components are removed from the defective system board and installed on the replacement system board:

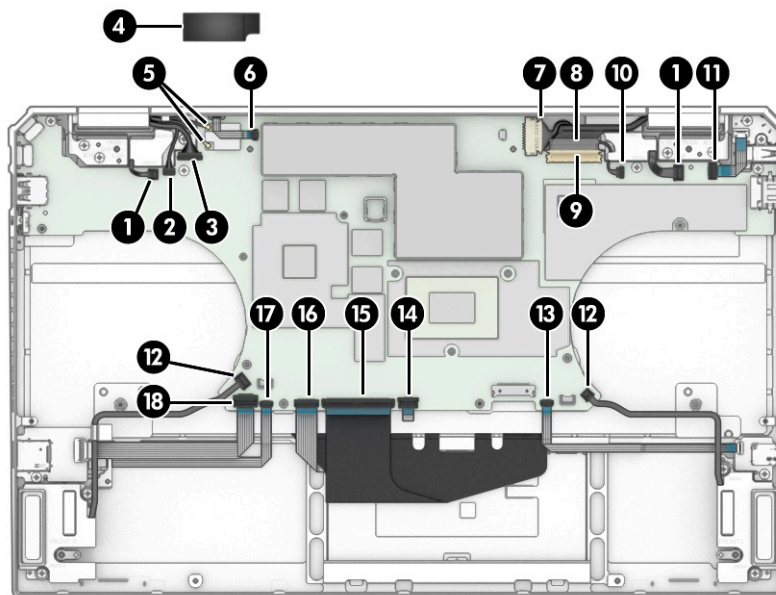
Remove the system board:

1. Disconnect the rear speaker cables **(1)** from the system board.
2. Disconnect the webcam shutter cable **(2)** from the system board.
3. Disconnect the webcam/microphone module cable **(3)** from the system board.
4. Remove the shield **(4)** that secures the wireless antenna cables to the WLAN module terminals.
5. Disconnect the wireless antenna cables **(5)** from the WLAN module terminals.

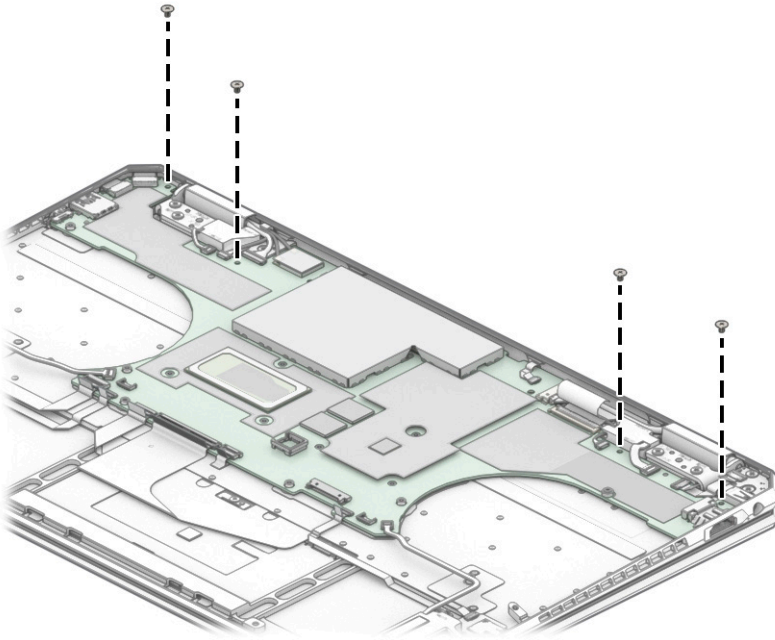


NOTE: The #1/white wireless antenna cable connects to the WLAN module **#1/Main** terminal. The #2/black wireless antenna cable connects to the WLAN module **#2/Aux** terminal.

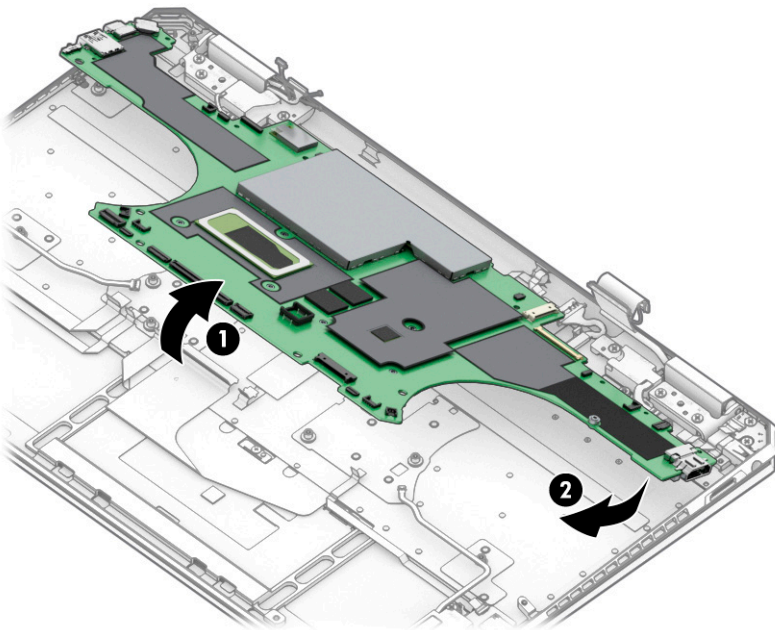
6. Disconnect the following cables from the system board:
- (6) Infrared board ZIF connector cable
 - (7) Power connector cable
 - (8) Release the adhesive support strip that secures the display panel cable to the system board
 - (9) Display panel cable
 - (10) Display OLED cable
 - (11) Power button board ZIF connector cable
 - (12) Front speakers cable
 - (13) Audio jack board ZIF connector cable
 - (14) Backlight ZIF connector cable
 - (15) Keyboard ZIF connector cable
 - (16) Touchpad ZIF connector cable
 - (17) Fingerprint reader ZIF connector cable
 - (18) Card reader board reader ZIF connector cable



7. Remove the four Phillips M2.0×3.0 screws that secure the system board to the top cover.



8. Lift the front edge of the system board (1) until it rests at an angle.
9. Remove the system board (2) by rotating the right side clockwise until it disengages from the top cover.



Reverse this procedure to install the system board.

Rear speakers

Table 5-19 Rear speakers spare part information

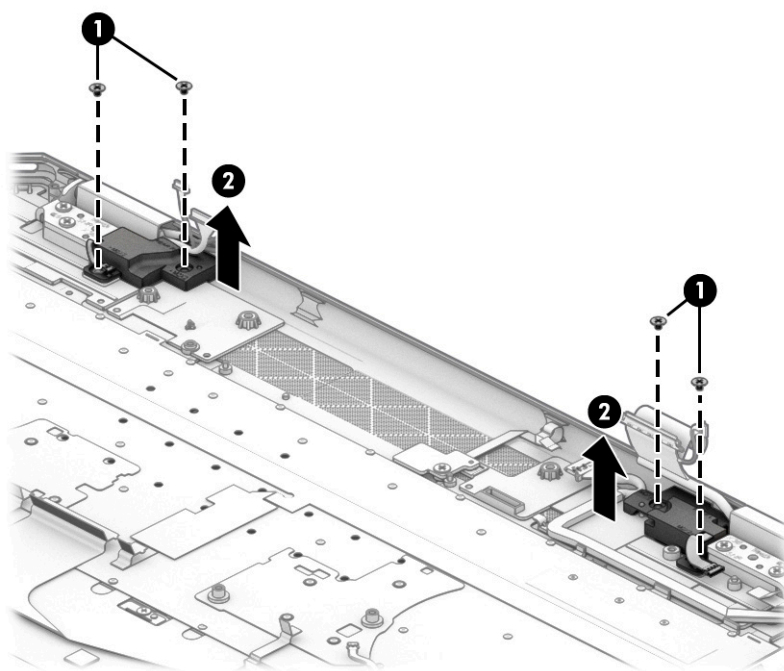
Description	Spare part number
Speaker Kit (includes left and right rear speakers and cables)	L95647-001

Before removing the rear speakers, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)), and then remove the following components:
 - a. Battery (see [Battery on page 38](#))
 - b. Heat sink (see [Heat sink on page 50](#))
 - c. Fan (see [Fans on page 53](#))
 - d. System board (see [System board on page 54](#))

Remove the rear speakers:

1. Remove the four Phillips M2.0×3.0 screws (1) that secure the rear speakers to the top cover.
2. Remove the rear speakers (2).



Reverse this procedure to install the rear speakers.

Infrared board

Table 5-20 Infrared board spare part information

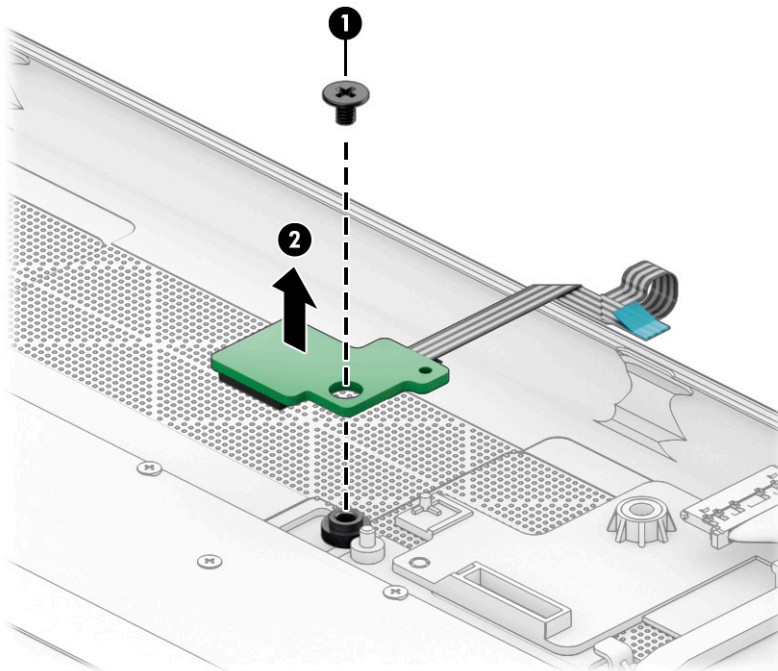
Description	Spare part number
Infrared board (does not include cable; the infrared board cable is available using spare part number L95622-001)	L95636-001

Before removing the infrared board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)), and then remove the following components:
 - a. Battery (see [Battery on page 38](#))
 - b. Heat sink (see [Heat sink on page 50](#))
 - c. Fan (see [Fans on page 53](#))
 - d. System board (see [System board on page 54](#))

Remove the infrared board:

1. Remove the Phillips M2.0×3.0 screw (1) that secures the infrared board to the top cover.
2. Remove the infrared board (2) and cable.



Reverse this procedure to install the infrared board and cable.

Infrared board cable

Table 5-21 Infrared board cable spare part information

Description	Spare part number
Infrared board cable	L95622-001

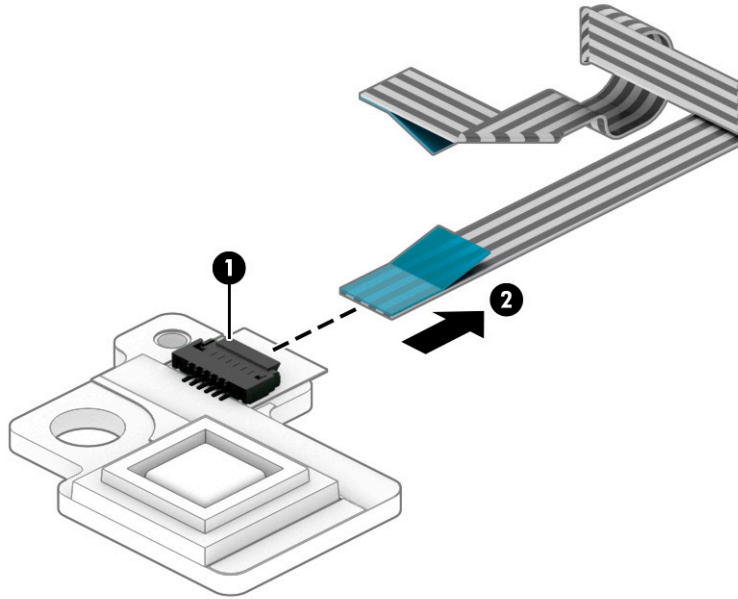
Before removing the infrared board cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)), and then remove the following components:
 - a. Battery (see [Battery on page 38](#))
 - b. Heat sink (see [Heat sink on page 50](#))
 - c. Fan (see [Fans on page 53](#))
 - d. System board (see [System board on page 54](#))
 - e. Infrared board (see [Infrared board on page 58](#))

Remove the infrared board cable:

1. Turn the infrared board upside down with the top edge toward you.

2. Release the ZIF connector (1) to which the infrared board cable is connected, and then disconnect the infrared board cable (2) from the infrared board.



3. Remove the infrared board cable.
Reverse this procedure to install the infrared board cable.

Power connector cable

Table 5-22 Power connector cable spare part information

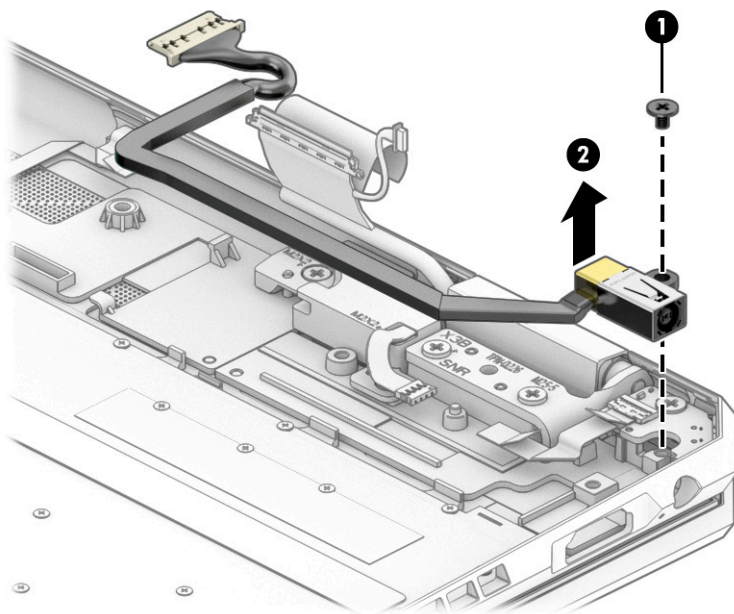
Description	Spare part number
Power connector cable	L95627-001

Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 27](#)), and then remove the following components:
 - a. Battery (see [Battery on page 38](#))
 - b. Heat sink (see [Heat sink on page 50](#))
 - c. Fan (see [Fans on page 53](#))
 - d. System board (see [System board on page 54](#))

Remove the power connector cable:

1. Remove the Phillips M2.0×3.0 screw (1) that secures the power connector cable to the top cover.
2. Remove the power connector cable (2).



Reverse this procedure to install the power connector cable.

6 Computer Setup (BIOS), TPM, and HP Sure Start

Using Computer Setup

Computer Setup, 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). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

 **NOTE:** Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

- ▲ Turn on or restart the computer, and when the HP logo appears, press **F10** to enter Computer Setup.

Navigating and selecting in Computer Setup

- To select a menu or a menu item, use the **Tab** key and the keyboard arrow keys and then press **Enter**, or use a pointing device to select the item.
- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
- To close open dialog boxes and return to the main Computer Setup screen, press **Esc**, and then follow the on-screen instructions.

To exit Computer Setup, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

 **NOTE:** If you are using arrow keys to highlight your choice, you must then press **Enter**.

- To save your changes and exit Computer Setup menus, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

 **NOTE:** If you are using arrow keys to highlight your choice, you must then press **Enter**.

Your changes go into effect when the computer restarts.


Restoring factory settings in Computer Setup

 **NOTE:** Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Start Computer Setup. See [Starting Computer Setup on page 62](#).
2. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes**.

 **NOTE:** If you are using arrow keys to highlight your choice, you must then press **Enter**.

 **NOTE:** On select products, the selections might display **Restore Defaults** instead of **Apply Factory Defaults and Exit**.

Your changes go into effect when the computer restarts.

 **NOTE:** Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

Updated versions of the BIOS might be available on the HP website.

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

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

Determining the BIOS version

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


You can access BIOS version information (also known as *ROM date* and *System BIOS*) by pressing **fn+esc** (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup. See [Starting Computer Setup on page 62](#).
2. Select **Main**, and then select **System Information**.
3. To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

 **NOTE:** If you are using arrow keys to highlight your choice, you must then press **enter**.

To check for later BIOS versions, see [Downloading a BIOS update on page 63](#).

Downloading a BIOS update

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

Do not disconnect power on 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.

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. Make a note of the date, name, or other identifier. You might need this information to locate the update later, after it has been downloaded to your hard drive.
- b. Follow the on-screen instructions to download your selection to the hard drive.

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



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

BIOS installation procedures vary. Follow any instructions that are displayed on the screen after the download is complete. If no instructions are displayed, 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.

Changing the boot order using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Access the Boot Device Options menu:
 - Turn on or restart the computer, and when the HP logo appears, press **f9** to enter the Boot Device Options menu.
2. Select a boot device, press **enter**, and then follow the on-screen instructions.

TPM BIOS settings (select products only)



IMPORTANT: Before enabling Trusted Platform Module (TPM) functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation or usage of TPM that violates the previously mentioned requirement, you shall bear all the liabilities wholly and solely. HP will not be responsible for any related liabilities.

TPM provides additional security for your computer. You can modify the TPM settings in Computer Setup (BIOS).



NOTE: If you change the TPM setting to Hidden, TPM is not visible in the operating system.

To access TPM settings in Computer Setup:

1. Start Computer Setup. See [Starting Computer Setup on page 62](#).
2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that monitors the computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start automatically restores the BIOS to its previously safe state, without user intervention.


HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. Advanced users can customize the default configuration.

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

7 Backing up, restoring, and recovering

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


- **Backing up your personal information**—You can use Windows tools to back up your personal information (see [Using Windows tools on page 66](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 66](#)).
- **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 66](#)).
- **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 66](#)).

 **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.

For details:

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



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

Restoring and recovery

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 66](#).

Recovering using HP Recovery media

You can use HP Recovery media to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 66](#).



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

To recover your system:

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

Changing the computer boot order

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

To change the boot order:



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

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

For computers or tablets with keyboards attached:

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

For tablets without keyboards:

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

– or –

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

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

Using HP Sure Recover (select products only)

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

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

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

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

8 Specifications

Computer specifications

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100 V–240 V, 50 Hz–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source that is supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. Operating voltage and current varies by platform. The voltage and current for your computer is located on the regulatory label.

Table 8-1 Computer specifications

	Metric	U.S.
Dimensions:		
Width	35.9 cm	14.2 in
Depth	22.6 cm	8.9 in
Height	1.9 cm	0.8 in
Weight		
Equipped with an OLED display assembly	1.9 kg	4.2 lbs
Equipped with an non-OLED display assembly	2.0 kg	4.5 lbs
Input power	Rating	
Operating voltage and current	5 V dc @ 2 A / 12 V dc @ 3 A / 15 V dc @ 3 A – 45 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A – 45 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 3.75 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A / 20 V dc @ 2.25 A – 45 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 5 A / 20 V dc @ 4.5 A – 90 W USB-C	
	19.5 V dc @ 2.31 A – 45 W	
	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 4.62 A – 90 W	
	19.5 V dc @ 6.15 A – 120 W	
	19.5 V dc @ 6.9 A – 135 W	
	19.5 V dc @ 7.70 A – 150 W	
	19.5 V dc @ 10.3 A – 200 W	

Table 8-1 Computer specifications (continued)

	Metric	U.S.
	19.5 V dc @ 11.8 A – 230 W	
	19.5 V dc @ 16.92 A – 330 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	–20°C to 60°C	–4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	–15 m to 3,048 m	–50 ft to 10,000 ft
Nonoperating	–15 m to 12,192 m	–50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

9 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 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 71](#).

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. Select **HP PC Hardware Diagnostics Windows**.

– 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 that you want to run, and then follow the on-screen instructions.



NOTE: To stop a diagnostic test, 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.
- Instructions for calling support are displayed. Follow those instructions.

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version

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 downloads to the selected location.

– or –

You can use the following steps to download the HP PC Hardware Diagnostics Windows from the Microsoft Store:

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

The tool downloads to the selected location.

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



NOTE: For some products, you might have 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 downloads 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 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 73](#).

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

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

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

– or –

Contact support, and provide the Failure ID code.

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

 **NOTE:** If you need to stop a diagnostic test, press [esc](#).

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow 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 73](#).


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

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

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, you might have 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 might upload results to a preconfigured server. For more information about Remote HP PC Hardware Diagnostics UEFI, go to <http://www.hp.com/go/techcenter/pcdiags>, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI



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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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, you might have 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 hard drive or USB flash drive) to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password that you use for uploads.
- Display status information about the diagnostics run previously.

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

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

Your changes take effect when the computer restarts.

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75 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.

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

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

11 Recycling

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

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

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