



HP Spectre x360 Convertible PC

Model numbers: 13-w000 – 13-w099

Model numbers: 13-ac000 – 13-ac099

Maintenance and Service Guide

IMPORTANT! This document is intended for
HP authorized service providers only.

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Product notice

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

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

Your product does not support Windows 8 or Windows 7

In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on this product or provide any Windows 8 or Windows 7 drivers on <http://support.hp.com>.

Software terms

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

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

Important Notice about Customer Self-Repair Parts

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

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 the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

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1 Product description

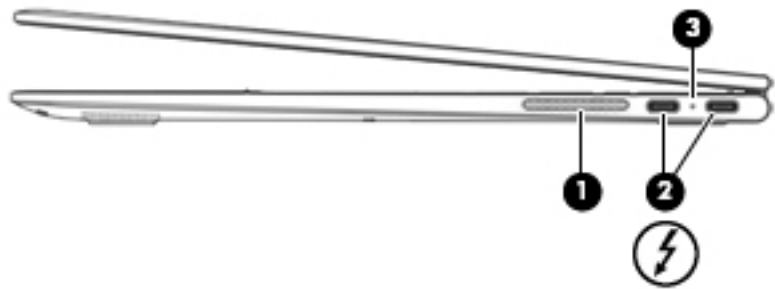
Category	Description	Models: 13-w000 – w099	Models: 13-ac000 – ac099
Product Name	HP Spectre x360 Convertible	√	
	Model numbers: 13-w000 – w099		
	HP Spectre x360 Convertible		√
	Model numbers: 13-ac000 – ac099		
Processor	7th generation Intel® Core™ i7 Processor	√	√
	Intel Core i7-7500U 2.70-GHz (SC turbo up to 3.50-GHz) processor (1866-MHz front side bus (FSB), 4-MB L3 cache, dual core, 15 W)		
	Intel Core i7-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (1866-MHz FSB, 3-MB L3 cache, dual core, 15 W)		
	Intel Core i7-7560U 2.40-GHz (SC turbo up to 3.80-GHz) processor (1866-MHz front side bus (FSB), 4-MB L3 cache, dual core, 15 W)		√
Graphics	Internal Graphics:	√	√
	Intel HD Graphics 620		
	Supports HD Decode, DX12, and DP1.2		
Panel	13.3-in, WLED, BrightView, UWVA, touch screen with flush glass design and multitouch enabled; eDP+PSR, 16:9 ultra-wide aspect ratio	√	√
	FHD (1920×1080), uslim-flat (2.2 mm panel), typical brightness: 300 nits		
	UHD (3840×1080), uslim-flat (2.0 mm panel), typical brightness: 340 nits		√
Memory	On-board system memory	√	√
	Support for LPDDR3-1866 dual channel		
	Support for up to 16384-MB system memory in the following configurations:		
	16384 MB 8192 MB 4096 MB		
Primary storage	Solid-state drive supporting PCIe/SATA-3, NVMe, and TLC, in the following configurations:	√	√
	1-TB, PCIe 512-GB, PCIe 256-GB, PCIe 128-GB, PCIe		
Audio and video	HP TrueVision FHD IR Camera	√	√
	1080p by 30 frames per second, supports Windows Help		
	Dual array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software		

Category	Description	Models: 13–w000 – w099	Models: 13–ac000 – ac099
	Support for voice recognition		
	Bang & Olufsen premium audio		
	Supports HP Audio Boost		
	Quad speakers		
	HP Wide Vision Full HD (FHD) Camera with activity light, USB 2.0, BSI sensor, f2.2	✓	
	HP IR Camera with two IR lights and IR sensor		
Internal card expansion	One M.2 slot for solid-state drive	✓	✓
	One M.2 slot for WLAN module		
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module	✓	✓
	Two built-in WLAN antennas (in display assembly)		
	Compatible with Miracast-certified devices (Windows 10 only)		
	WiFi SAR enabled in BIOS (Intel WLAN only)		
	Support for the following WLAN module:		
	Intel Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adaptor (non-vPro)		
Sensors	Accelerometer + Gyroscope + e-Compass	✓	✓
	Accelerator IC		
Ports	- USB Type-C ports (2) USB 3.1 Gen 2 with Thunderbolt™ Gen 3 technology All ports support data transfer, power delivery, and DisplayPort 1.2 out up to 3840 × 2160 at 60 Hz - USB Type-A ports - USB 3.1 Gen 1 - Supports HP Sleep & Charge - Combo audio-out (headphone)/audio-in (microphone) jack - Hot plug/unplug and auto detect for correct output to wide-aspect vs standard aspect video	✓	✓
	- USB Type-C port (2) USB 3.1 Gen 2 with Thunderbolt™ Gen 3 technology All ports support data transfer, power delivery, and HDMI 2.0 out up to 1920×1200 at 60 Hz	✓	
Keyboard/pointing devices	Keyboard Full-size, backlight, island-style keyboard Touchpad requirements TouchPad with imaging sensor Multi-touch gestures enabled	✓	✓

Category	Description	Models: 13-w000 – w099	Models: 13-ac000 – ac099
	Taps enabled as default		
	Support for Modern TrackPad Gestures		
Power requirements	AC adapter – USB Type-C 65-W Type-C with duckhead and/or duckhead power cords 45-W Type-C with duckhead and/or duckhead power cords Battery Support for a 3-cell, 57.8-WHr, 5.02-AHr, Li-ion battery Power cord Duck head (C5) 1 meter duckhead power cord with tag label (C5)	√	√
Security	Trusted Platform Module 2.0 (TPM)	√	√
Operating system	Preinstalled: Windows 10 Windows 10 Professional For Developed Market (ML): Windows 10 Home High End ML Windows 10 Home ML For Emerging Market (EM/SL): Windows 10 Home High End EM/SL Windows 10 Home EM/SL For China SL: CPPP Windows 10 Home China Language Edition CPPP Windows 10 Home High End China Language Edition For SEAP EM/SL: SEAP Windows 10 Home Single Language Edition SEAP Windows 10 Home High End	√	√
Serviceability	End user replaceable part: AC adapter	√	√

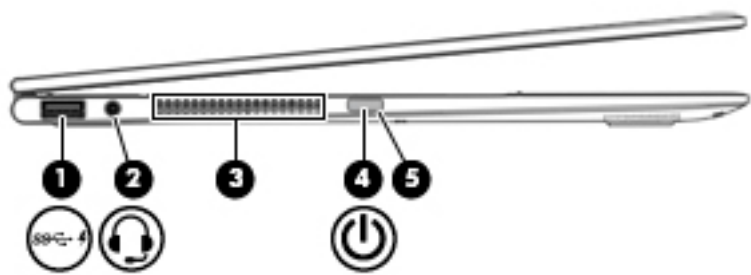
2 External component identification

Right side



Component		Description
(1)	Volume button	Controls speaker volume on the computer.
(2)	 USB Type-C power connector and Thunderbolt ports (2)	Connects an AC adapter that has a USB Type-C connector, supplying power to the computer, and if needed, charging the computer battery. – or – Connects and charges a USB device that has a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer. – or – Connects a display device that has a USB Type-C connector, providing display output. NOTE: Your computer may also support a Thunderbolt docking station.
(3)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.

Left side



Component		Description
(1)		USB 3.x port with HP Sleep and Charge Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges products such as a cell phone, camera, activity tracker, or smartwatch.
(2)		Audio-out (headphone)/Audio-in (microphone) combo jack 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. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i> . To access this guide: ▲ Select the Start button, select All apps (required on some products), select HP Help and Support, and then select HP Documentation. NOTE: When a device is connected to the jack, the computer speakers are disabled.
(3)		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.
(4)		Power button • 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. • When the computer is in Hibernation, press the button briefly to exit Hibernation. CAUTION: Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. To learn more about your power settings, see your power options.

Component	Description
	▲ Type <code>power</code> in the taskbar search box, and then select Power & sleep settings. – or – Right-click the Start button, and then select Power Options.
(5)  Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.

Display



Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Internal microphones (2)	Record sound.
(3)	Infrared camera lights (2)	On: The infrared camera is in use.
(4)	Camera light	On: The camera is in use.
(5)	Camera	Allows you to video chat, record video, and record still images. On select products, allows facial recognition logon to Windows, instead of a password logon.
(6)	Infrared camera (select products only)	Allows a facial recognition logon to Windows, instead of a password logon.

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

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

To access this guide:

- ▲ Select the **Start** button, select **All apps** (required on some products), select **HP Help and Support**, and then select **HP Documentation**.

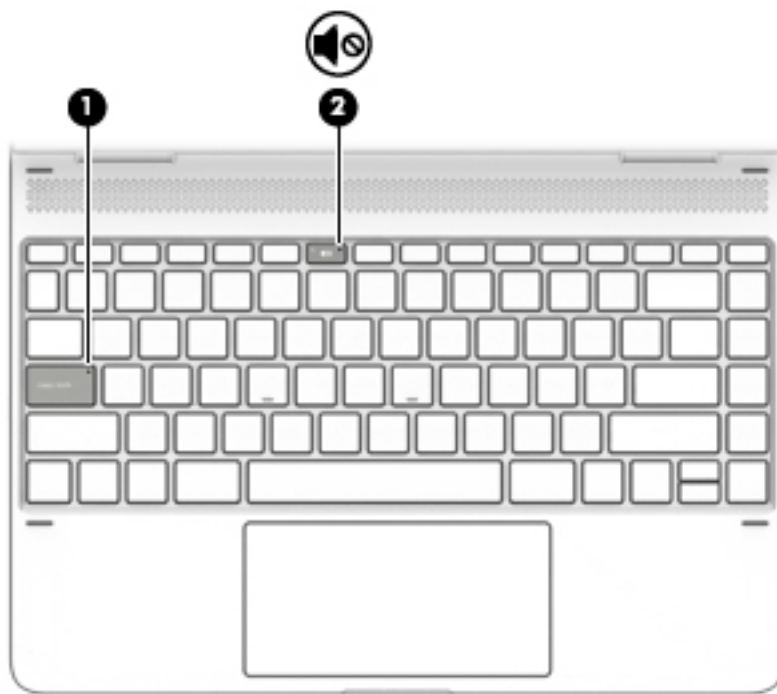
Top

TouchPad



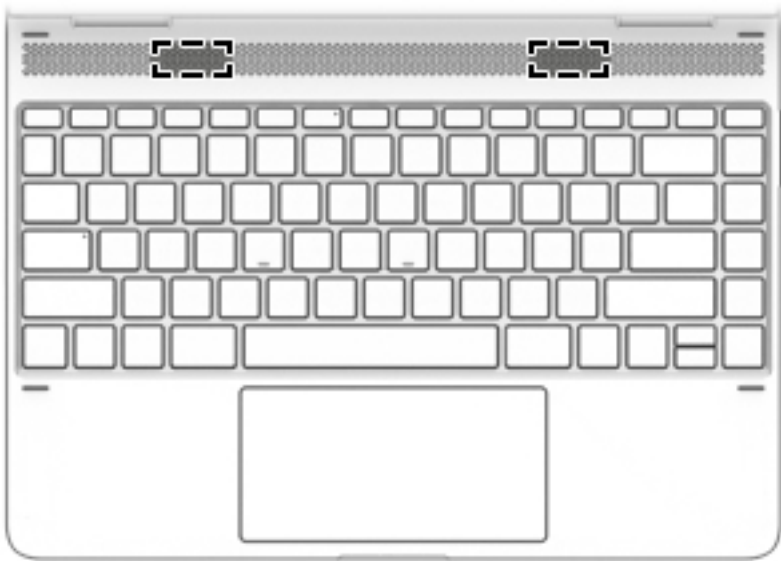
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



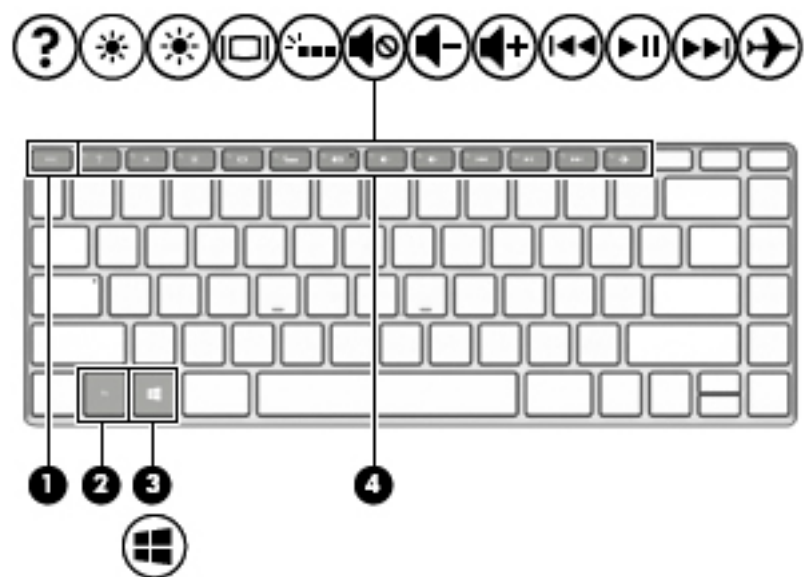
Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	 Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.

Speakers



Component	Description
Speakers (2)	Produce sound.

Keys



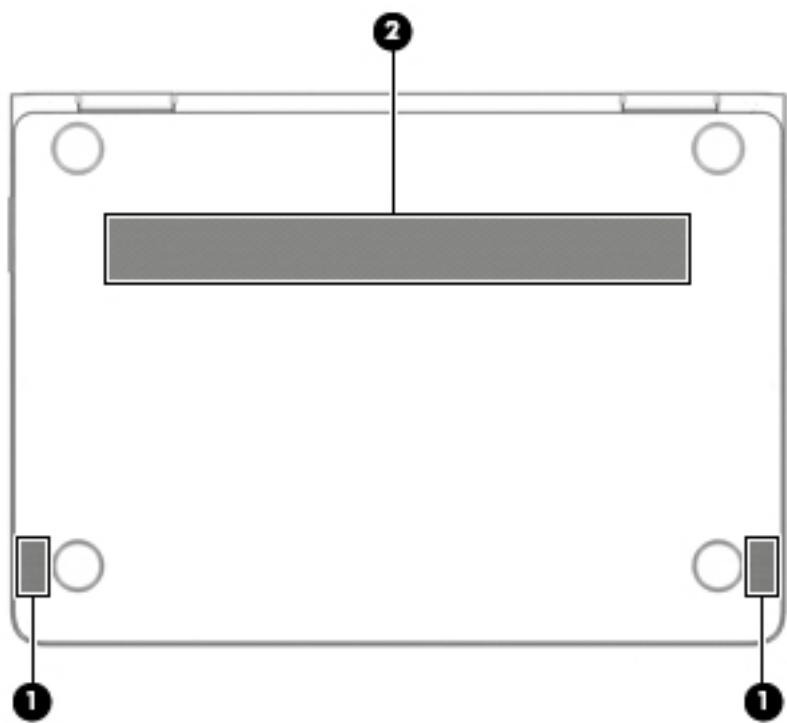
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with the esc key.
(3)	 Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4)	Action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

Using the action keys

- An action key performs an assigned function.
- The icon on each action key illustrates the function for that key.

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

Bottom



Component		Description
(1)	Speakers (2)	Produce computer sound.
(2)	Vent	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer.

 **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, or on the back of the display.

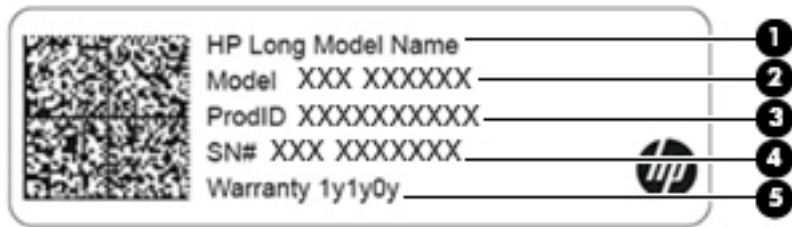
- **Service label**—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

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



Component

- | | |
|-----|-------------------------------------|
| (1) | Serial number |
| (2) | Product number |
| (3) | Warranty period |
| (4) | Model number (select products only) |



Component

- | | |
|-----|--|
| (1) | HP product name (select products only) |
| (2) | Model name (select products only) |
| (3) | Product number |
| (4) | Serial number |
| (5) | Warranty period |

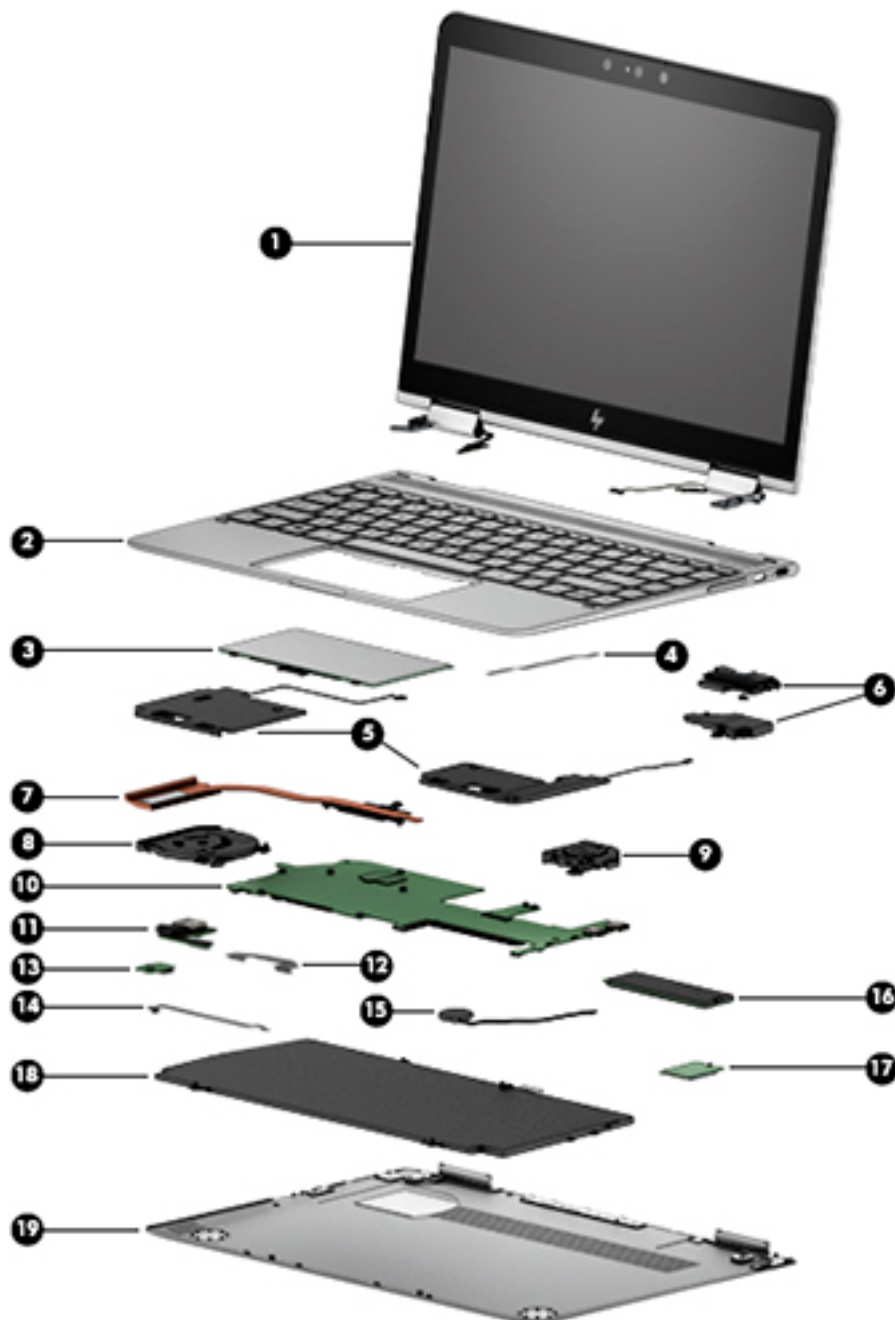
- **Regulatory label(s)**—Provide(s) regulatory information about the computer.
- **Wireless certification label(s)**—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3 Illustrated parts catalog



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

Computer major components



Item	Component	Spare part number
(1)	Display assembly (full hinge-up; includes display panel cable, microphones, hinges, webcam, and wireless antenna cables and transceivers)	
	Models: 13-w000 – 13-w099	907334-001
	Models: 13-ac000 – 13-ac099; display – FHD; computer color – natural silver	918030-001
	Models: 13-ac000 – 13-ac099; display – FHD; computer color – dark ash silver	918031-001
	Models: 13-ac000 – 13-ac099; display – UHD; computer color – natural silver	918032-001
	Models: 13-ac000 – 13-ac099; display – UHD; computer color – dark ash silver	918033-001
(2)	Top cover with keyboard (includes keyboard cable and keyboard backlight cable)	
	NOTE: For a detailed list of keyboard country codes, see Top cover and keyboard on page 50 .	
	Models: 13-w000 – 13-w099; computer color – natural silver	907335-xx1
	Models: 13-ac000 – 13-ac099; computer color – natural silver	918027-xx1
	Models: 13-ac000 – 13-ac099; computer color – dark ash silver	918028-xx1
(3)	TouchPad	
	Models: 13-w000 – 13-w099	907338-001
	Models: 13-ac000 – 13-ac099	918034-001
(4)	TouchPad cable	907332-001
(5)	Speakers, front (includes left and right speakers and cables)	907343-001
(6)	Speakers, rear (includes left and right speakers and cables)	907344-001
(7)	Heat sink (includes replacement thermal material)	907557-001
	Fan Kit , includes:	907333-001
(8)	Heat sink fan	
(9)	Rear fan	
(10)	System board (includes a graphics subsystem with UMA memory and replacement thermal material) equipped with: All system boards use the following part numbers: xxxxxx-001: Non-Windows operating systems xxxxxx-601: Windows 10 operating system	
	Models: 13-w000 – 13-w099	
	Intel Core i7-7500U processor, 16 GB of system memory	907558-xx1
	Intel Core i7-7500U processor, 8 GB of system memory	907559-xx1
	Intel Core i5-7200U processor, 8 GB of system memory	907560-xx1
	Intel Core i5-7200U processor, 4 GB of system memory	907561-xx1
	Models: 13-ac000 – 13-ac099	
	Intel Core i7-7560U processor, 16 GB of system memory	918040-xx1
	Intel Core i7-7500U processor, 16 GB of system memory	918042-xx1
	Intel Core i7-7500U processor, 8 GB of system memory	918041-xx1

Item	Component	Spare part number
	Intel Core i5-7200U processor, 8 GB of system memory	918044-xx1
	Intel Core i5-7200U processor, 4 GB of system memory	918043-xx1
(11)	Audio/USB board	907336-001
(12)	Audio/USB board cable	
	Models: 13-w000 – 13-w099	907331-001
	Models: 13-ac000 – 13-ac099	920127-001
(13)	Power button board	907337-001
(14)	Power button board cable	907330-001
(15)	RTC battery	907341-001
(16)	Solid-state drive (PCIe-3x4, NVMe solid-state drive supporting TLC)	
	Models: 13-w000 – 13-w099	
	1-TB	865697-001
	512-GB	847110-009
	256-GB	847109-011
	128-GB	912322-002
	Models: 13-ac000 – 13-ac099	
	1-TB	865697-005
	512-GB	847110-014
	360-GB	917818-009
	256-GB	847109-016
	128-GB	912322-001
(17)	WLAN module	
	Intel Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adaptor (non-vPro)	910264-855
(18)	Battery, 3-cell, 58-WHr, 5.02-AHr, Li-ion (includes cable)	859356-855
(19)	Bottom cover	
	Models: 13-w000 – 13-w099	907329-001
	Models: 13-ac000 – 13-ac099; computer color – natural silver	918025-001
	Models: 13-ac000 – 13-ac099; computer color – dark ash silver	918026-001

Miscellaneous parts

Component	Spare part number
AC adapter	
65-W adapter, USB Type-C, nPFC, 3 pin	860209-850
45-W adapter, USB Type-C, nPFC, 3 pin	860210-850
HP 12-inch black notebook sleeve	913549-001
HP 12-inch black notebook sleeve with pen loop	921401-001
Stylus, MS Active Pen	
Models: 13-ac000 – 13-ac099; computer color – natural silver	910942-001
Models: 13-ac000 – 13-ac099; computer color – dark ash silver	920241-001
Adapters	
HP USB-to-Gigabit RJ-45 adapter	829941-001
USB Type-C to USB Type A dongle	833960-001
HP USB Type-C to VGA adapter	831751-001
HP USB Type-C to HDMI adapter	831752-001
HP USB Type-C to RJ-45 adapter	855560-001
Power cord (3-pin, C5, black, 1.00-m), for use in:	
Australia	213356-013
Denmark	213353-013
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway and Sweden)	213350-014
India	404827-008
Israel	398063-008
Japan	349756-006
North America	213349-015
People's Republic of China	286497-013
South Africa	361240-007
Switzerland	213354-013
Taiwan	393313-007
Thailand	285096-012
United Kingdom and Singapore	213351-013
Power cord (C5 duck head, 1.0-m [3.2-ft], 3-wire conductor)	
South Korea	854703-001
United States	854702-001
Rubber Kit (includes rubber feet)	
Models: 13-w000 – 13-w099 and 13-ac000 – 13-ac099; computer color – natural silver	912642-001

Component	Spare part number
Models: 13-ac000 – 13-ac099; computer color – dark ash silver	919438-001
Screw Kit	
Models: 13-w000 – 13-w099	907342-001
Models: 13-ac000 – 13-ac099	918035-001

4 Removal and replacement preliminary requirements

Tools required

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

- Flat-bladed screw driver
- Magnetic screw driver
- Phillips P0 screw driver

Service considerations

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



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

Plastic parts



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

Cables and connectors



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

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.

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or 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 Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures for Authorized Service Provider parts



NOTE: This chapter provides removal and replacement procedures for Authorized Service Provider only components. Components described in this chapter should only be accessed by an authorized service provider. Accessing these components can damage the computer or void the warranty.

There are as many as 44 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.



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

Bottom cover

Description	Spare part number
Bottom cover: Models: 13-w000 – 13-w099	907329-001
Bottom cover; models: 13-ac000 – 13-ac099; computer color – natural silver	918025-001
Bottom cover; models: 13-ac000 – 13-ac099; computer color – dark ash silver	918026-001

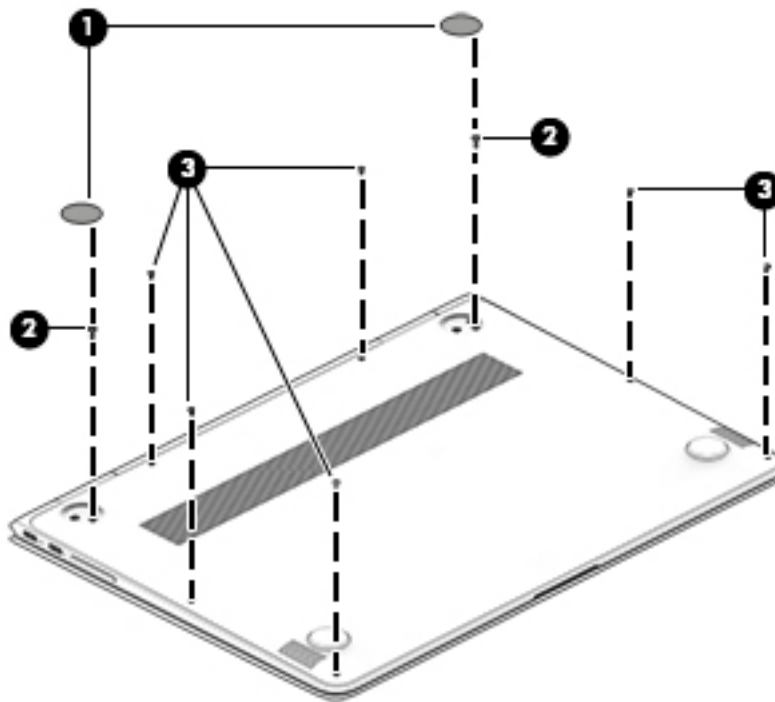
Before disassembling the computer, follow these steps:

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

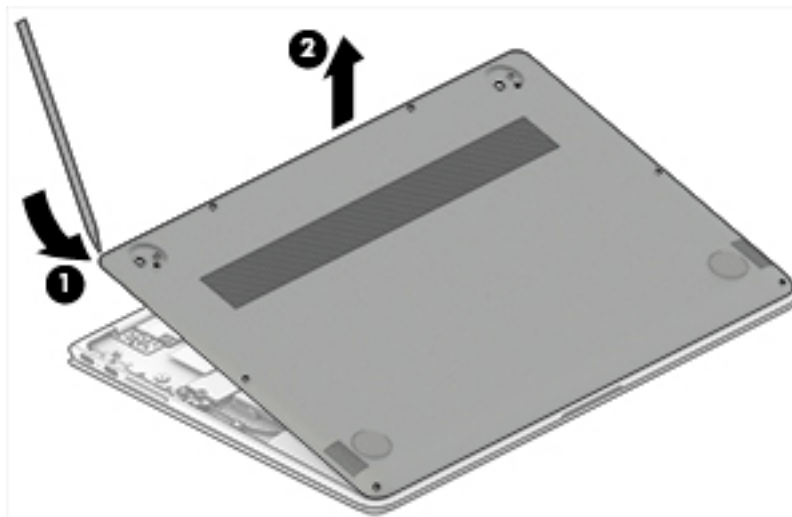
Remove the bottom cover:

1. Position the computer upside down with the front toward you.
2. Remove the two rubber feet from the top of the bottom cover **(1)**.

3. Remove the two Phillips PM2.0×5.0 screws **(2)** and the six Torx T8M2.0×3.0 screws **(3)** that secure the bottom cover to the computer.



4. Insert a tool into the bottom right corner and pry the cover loose **(1)**.
5. Remove the bottom cover **(2)**.



Reverse this procedure to install the bottom cover.

Battery

Description	Spare part number
Battery, 3-cell, 58-WHr, 5.02-AHr, Li-ion (includes cable)	859356-855

Before removing the battery, follow these steps:

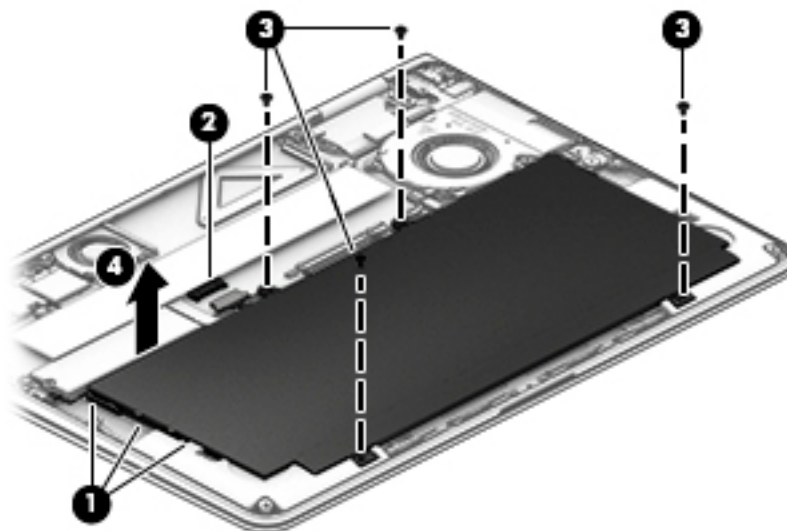
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)).

WARNING! To reduce potential safety issues, use only the battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

CAUTION: Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

Remove the battery:

1. Release the speaker cable from the routing channel built into the side of the battery **(1)**.
2. Disconnect the battery cable **(2)** from the system board.
3. Remove the four Phillips PM2.0×3.0 screws **(3)** that secure the battery to the computer.
4. Remove the battery **(4)**.



Reverse this procedure to install the battery.

WLAN module

Description	Spare part number
Intel Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adaptor (non-vPro)	910264-855

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

Before removing the WLAN module, follow these steps:

1. 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 24](#)).
5. Disconnect the battery cable from the system board (see [Battery on page 26](#)).

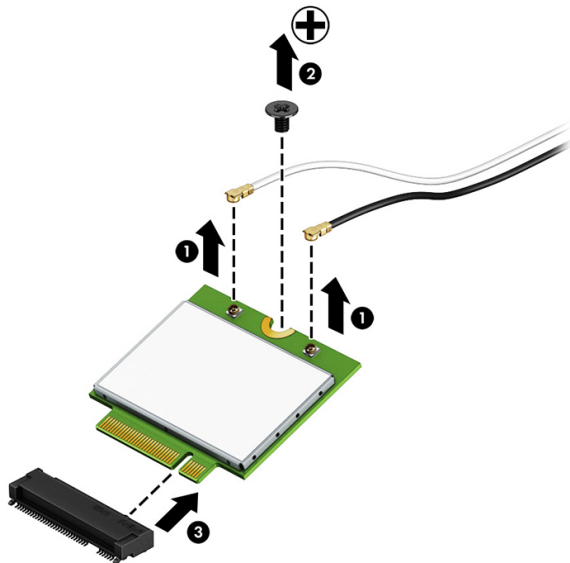
Remove the WLAN module:

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

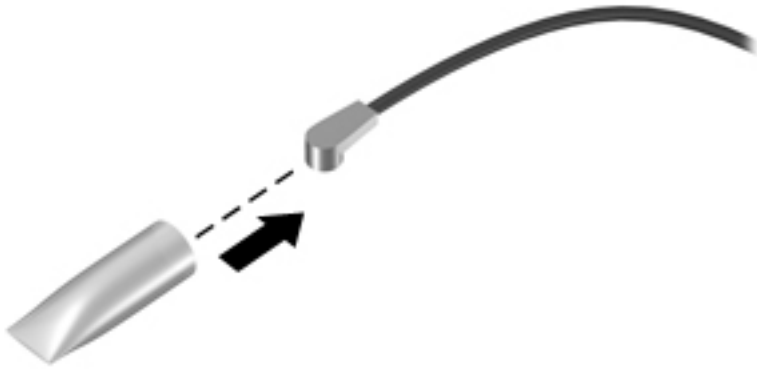


NOTE: The WLAN antenna cable labeled “1” connects to the WLAN module “Main” terminal labeled “1”. The WLAN antenna cable labeled “2” connects to the WLAN module “Aux” terminal labeled “2”.

2. Remove the Phillips PM2.0×2.7 screw **(2)** that secures the WLAN module to the computer. (The WLAN module tilts up.)
3. Remove the WLAN module **(3)** by pulling the module away from the slot at an angle.



 **NOTE:** If the WLAN antenna cables are not connected to the terminals on the WLAN module, protective sleeves should be installed on the antenna connectors, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

Solid-state drive

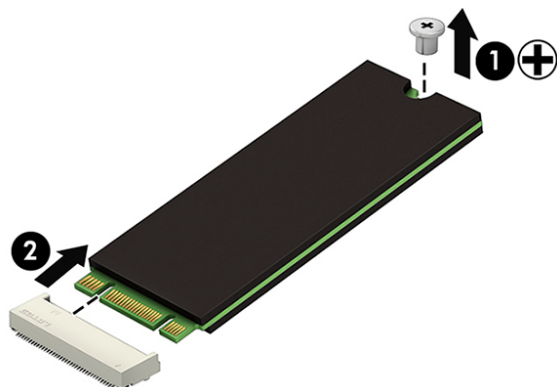
Description	Spare part number
Solid-state drive, PCI 3x4, NVMe, TLC for use in 13-w000 – 13-w099 models	
1-TB	865697-001
512-GB	847110-009
256-GB	847109-011
128-GB	912322-002
Solid-state drive, PCI 3x4, NVMe, TLC for use in 13-ac000 – 13-ac099 models	
1-TB	865697-005
512-GB	847110-014
360-GB	917818-009
256-GB	847109-016
128-GB	912322-001

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)).
5. Disconnect the battery cable from the system board (see [Battery on page 26](#)).

Remove the solid-state drive:

1. Remove the PM2.0×3.0 screw (1) that secures the solid-state drive to the computer. (The solid-state drive tilts up.)
2. Remove the solid-state drive (2) by pulling the drive away from the slot at an angle.



Reverse this procedure to install the solid-state drive.

Heat sink fan

Description	Spare part number
Heat sink fan (includes cable)	907333-001



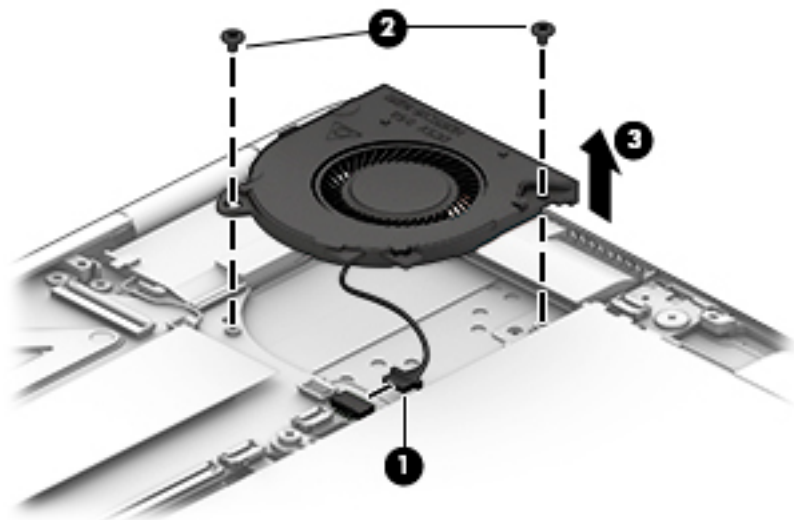
NOTE: To properly ventilate the computer, allow at least 7.6 cm (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

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 24](#)).
5. Disconnect the battery cable from the system board (see [Battery on page 26](#)).

Remove the heat sink fan:

1. Disconnect the fan cable (1) from the system board.
2. Remove the two Phillips PM2.0×3.0 screws (2) that secure the fan to the computer.
3. Remove the fan (3).



Reverse this procedure to install the heat sink fan.

Audio/USB board

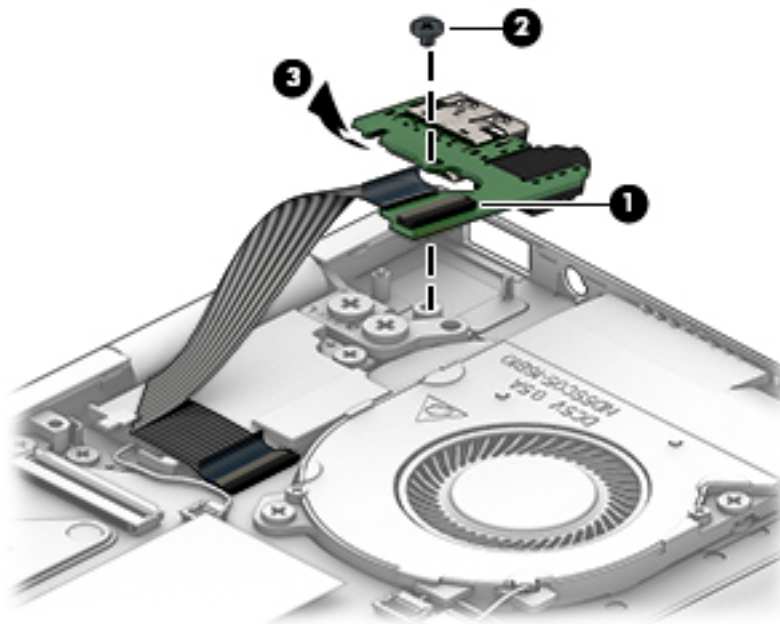
Description	Spare part number
Audio/USB board	907336-001
Audio/USB board cable for use in 13-w000 – 13-w099 models	907331-001
Audio/USB board cable for use in 13-ac000 – 13-ac099 models	920127-001

Before removing the audio/USB 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. Disconnect the battery cable from the system board (see [Battery on page 26](#)).

Remove the audio/USB board:

1. Release the zero insertion force (ZIF) connector **(1)** to which the cable is attached, and then disconnect the cable from the audio/USB board.
2. Remove the Phillips PM2.0×2.5 screw **(2)** that secures the audio/USB board to the computer.
3. Remove the audio/USB board from the computer **(3)**.



Reverse this procedure to install the audio/USB board.

Speaker, rear left

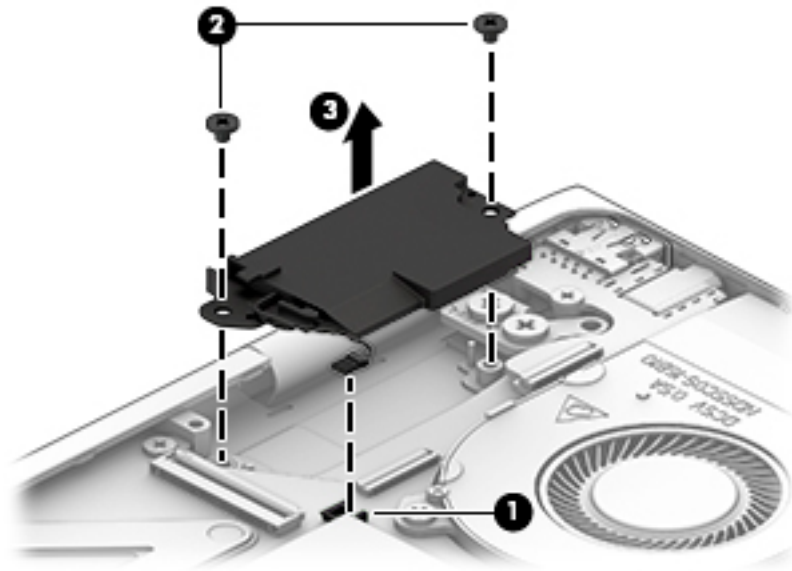
Description	Spare part number
Speaker, rear left (includes cable)	907344-001

Before removing the rear left speaker, 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 24](#)).
5. Disconnect the battery cable from the system board (see [Battery on page 26](#)).

Remove the rear left speaker:

1. Disconnect the speaker cable **(1)** from the system board.
2. Remove the two Phillips PM2.0×3.5 screws **(2)** that secure the speaker to the computer.
3. Remove the speaker **(3)**.



Reverse this procedure to install the rear left speaker.

Speakers, front

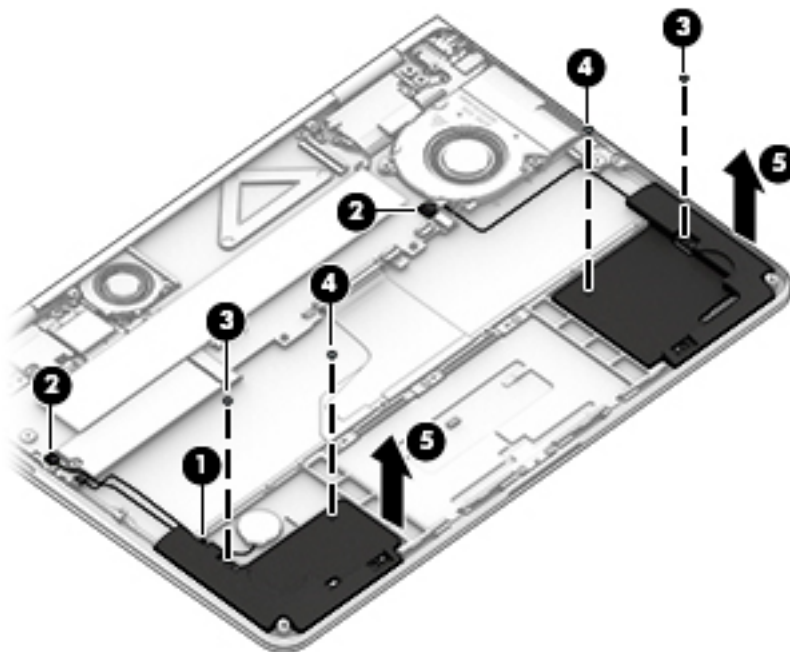
Description	Spare part number
Speakers, front (include left and right speakers and cables)	907343-001

Before removing the front speakers, follow these steps:

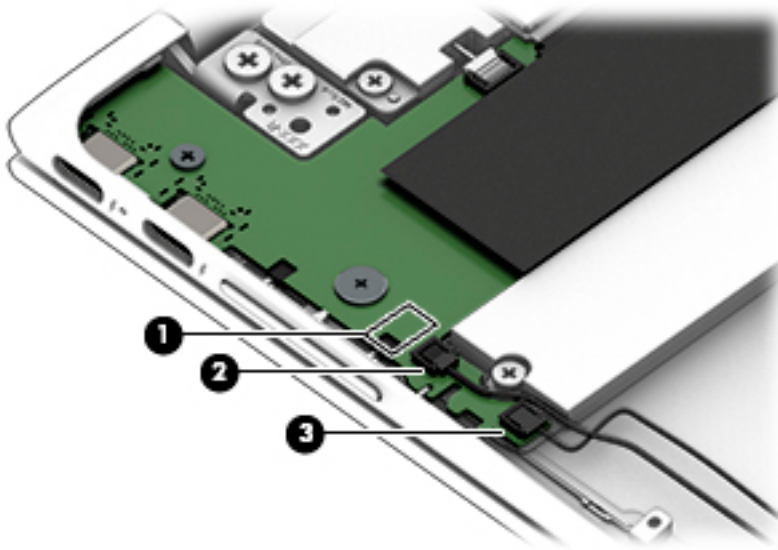
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)).
5. Remove the battery (see [Battery on page 26](#)).

Remove the front speakers:

1. Remove the RTC battery cable from clip in the right speaker **(1)**.
2. Disconnect both speaker cables **(2)** from the system board (to avoid system board damage, see step 5).
3. Remove the two Phillips PM2.0×3.5 screws **(3)** and the two Phillips PM1.6×2.0 screws **(4)** that secure the speakers to the computer.
4. Remove the speakers **(5)**.



5. To avoid damage to the system board, press down on the location as shown by callout **(1)** in the following image when disconnecting the right front speaker cable **(2)**.



Reverse this procedure to install the front speakers.

TouchPad

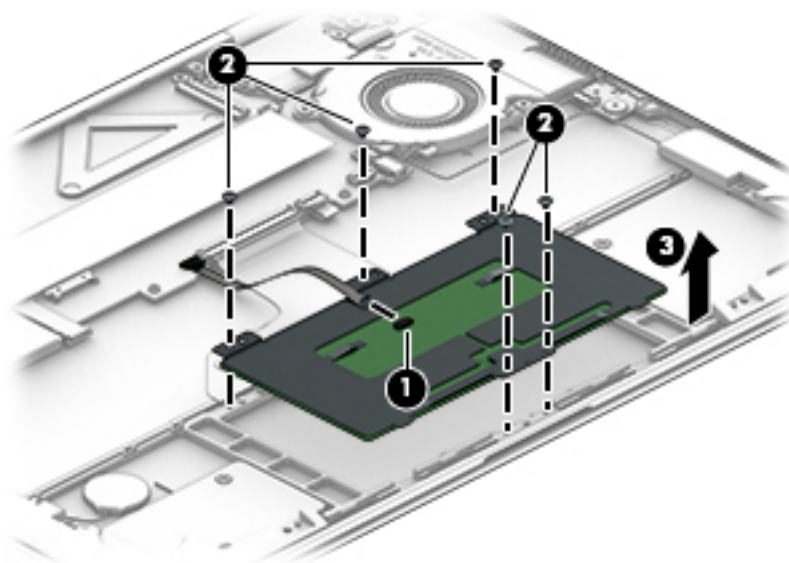
Description	Spare part number
TouchPad for use in models 13-w000 – 13-w099	907338-001
TouchPad for use in models 13-ac000 – 13-ac099	918034-001
TouchPad cable	907332-001

Before removing the TouchPad, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)).
5. Remove the battery (see [Battery on page 26](#)).

Remove the TouchPad:

1. Release the zero insertion force (ZIF) connector **(1)** to which the TouchPad cable is attached, and then disconnect the cable from the TouchPad.
2. Remove the five Phillips PM2.0×2.0 screws **(2)** that secure the TouchPad to the computer.
3. Remove the TouchPad and cable **(3)**.



Reverse this procedure to install the TouchPad.

Power button board

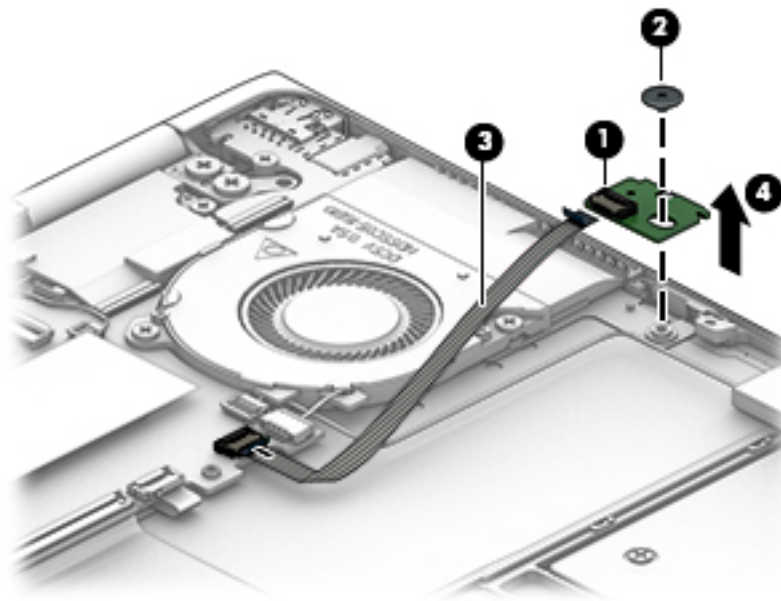
Description	Spare part number
Power button board	907337-001
Power button board cable	907330-001

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 24](#)).
5. Remove the battery (see [Battery on page 26](#)).

Remove the power button board:

1. Release the zero insertion force (ZIF) connector **(1)** to which the cable is attached, and then disconnect the cable from the power button board.
2. Remove the Phillips PM2.0×1.2 screw **(2)** that secures the board to the computer.
3. Lift the cable to disengage the adhesive that secures the cable to the computer **(3)**.
4. Remove the power button board from the computer **(4)**.



Reverse this procedure to install the power button board.

RTC battery

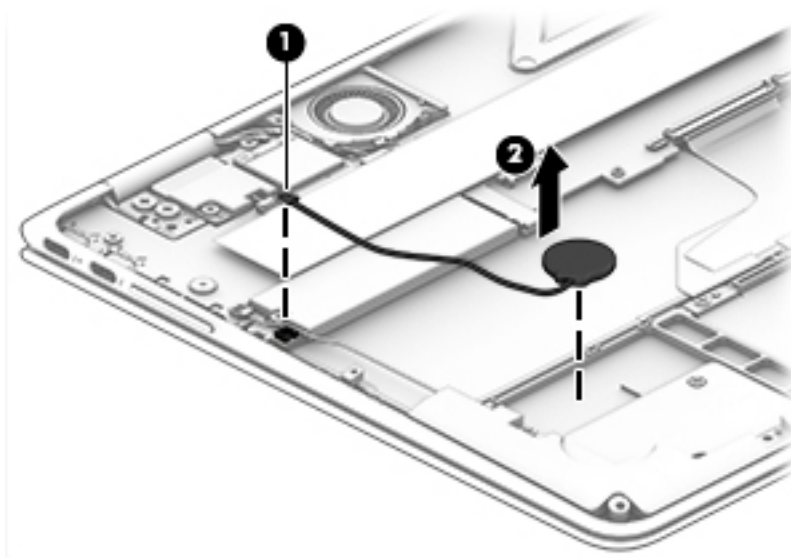
Description	Spare part number
RTC battery	907341-001

Before removing the RTC battery, follow these steps:

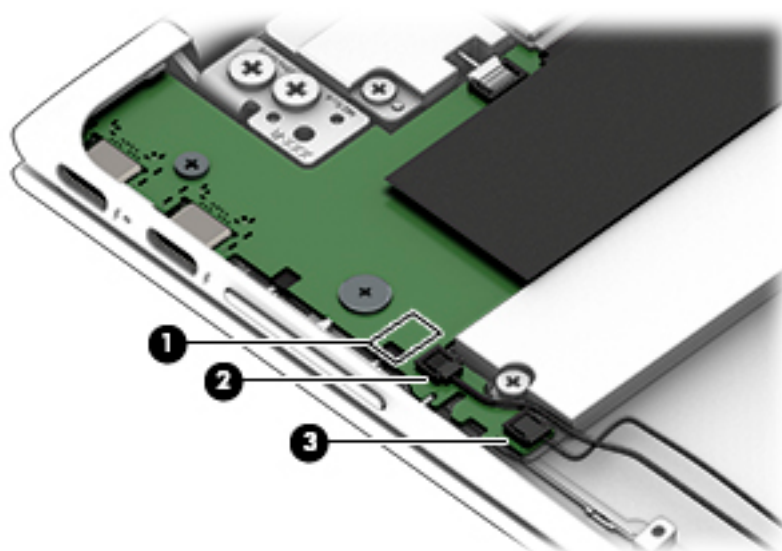
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)).
5. Remove the battery (see [Battery on page 26](#)).

Remove the RTC battery:

1. Disconnect the battery cable from the system board **(1)** (to avoid system board damage, see caution and associated image that follows step 2).
2. Remove the RTC battery from the computer **(2)**.



CAUTION: To avoid damage to the system board, press down on the location as shown by callout **(1)** in the following image when disconnecting the RTC battery cable **(3)**.



Reverse this procedure to install the RTC battery.

System board

All system boards use the following part numbers:

xxxxxx-001: Non-Windows operating systems

xxxxxx-601: Windows 10 operating system

Description	Spare part number
System board equipped with processor, a graphics subsystem with UMA memory and replacement thermal material for use in 13-w000 – 13-w099 models:	
Intel Core i7-7500U processor, 16 GB of system memory	907558-xx1
Intel Core i7-7500U processor, 8 GB of system memory	907559-xx1
Intel Core i5-7200U processor, 8 GB of system memory	907560-xx1
Intel Core i5-7200U processor, 4 GB of system memory	907561-xx1
System board equipped with processor, a graphics subsystem with UMA memory and replacement thermal material for use in 13-ac000 – 13-ac099 models:	
Intel Core i7-7560U processor, 16 GB of system memory	918040-xx1
Intel Core i7-7500U processor, 16 GB of system memory	918042-xx1
Intel Core i7-7500U processor, 8 GB of system memory	918041-xx1
Intel Core i5-7200U processor, 8 GB of system memory	918044-xx1
Intel Core i5-7200U processor, 4 GB of system memory	918043-xx1

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)).
5. Remove the battery (see [Battery on page 26](#)).
6. Remove the fan (see [Heat sink fan on page 30](#)).

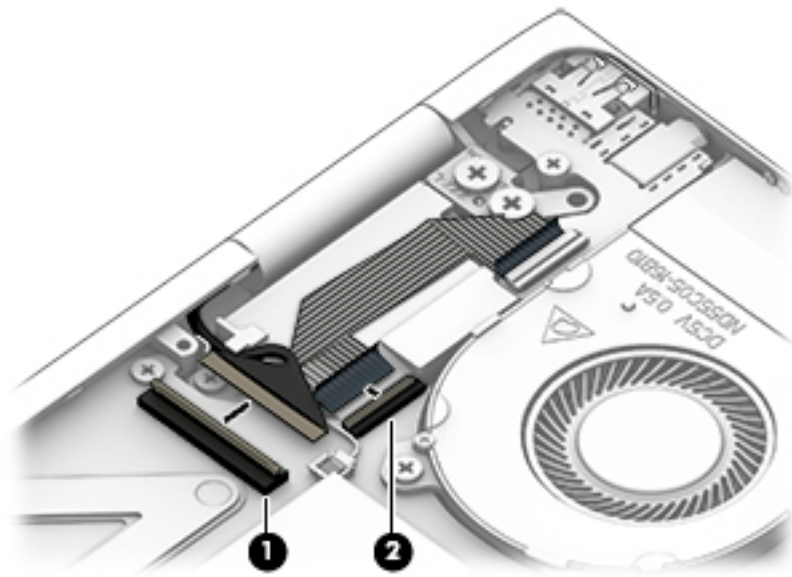
When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- WLAN module (see [WLAN module on page 27](#))
- Solid-state drive (see [Solid-state drive on page 29](#))
- Heat sink (see [Heat sink on page 44](#))

Remove the system board:

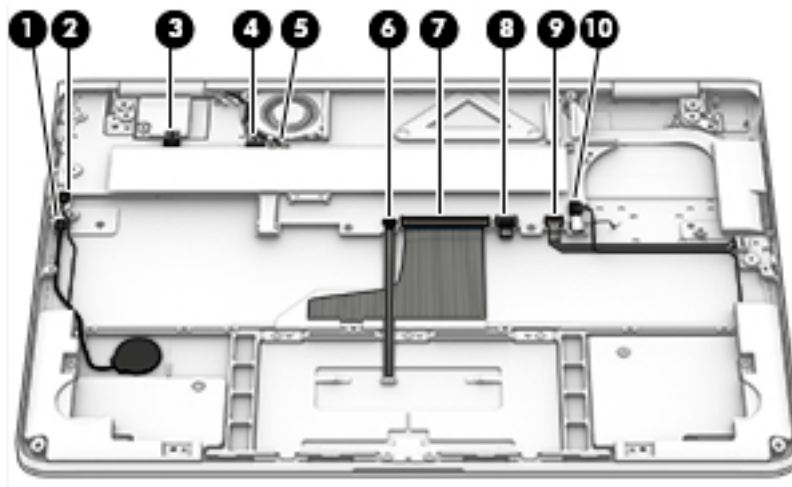
1. Disconnect the following cables from the system board:
 - (1) Display cable (ZIF connector)

(2) Audio cable (ZIF connector)

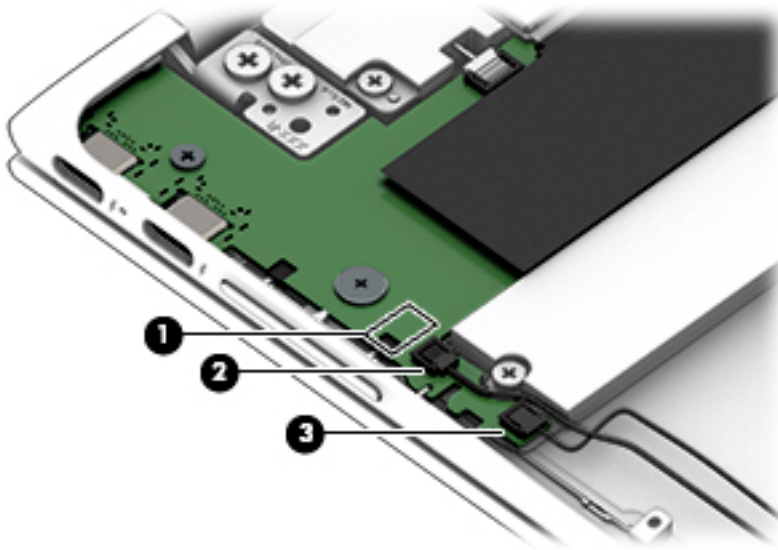


2. Disconnect the following cables from the system board:

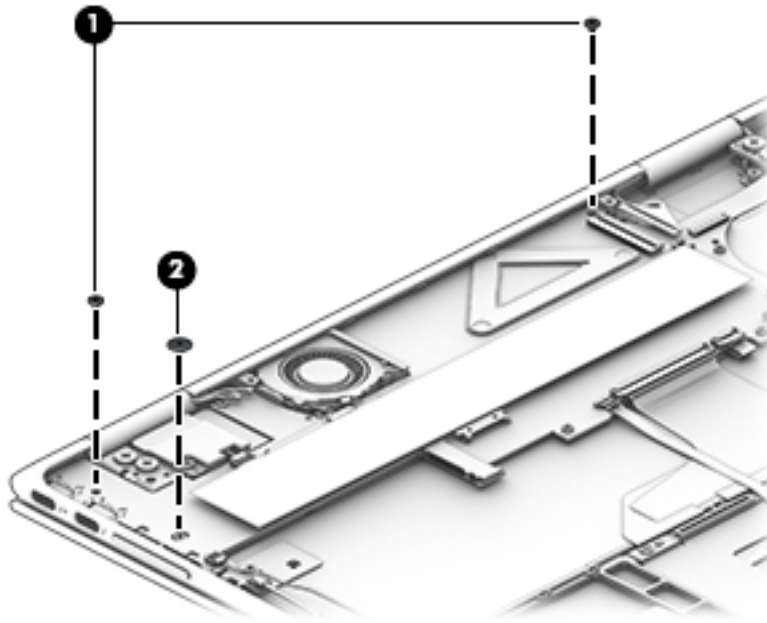
- (1)** RTC battery cable (to avoid system board damage, see caution and associated image that follows this step)
- (2)** Right front speaker cable (to avoid system board damage, see caution and associated image that follows this step)
- (3)** Right rear speaker cable
- (4)** Rear fan cable
- (5)** Webcam cable
- (6)** Touch pad cable (ZIF connector)
- (7)** Keyboard cable (ZIF connector)
- (8)** Backlight cable (ZIF connector)
- (9)** Power button board cable (ZIF connector)
- (10)** Left front speaker



3. To avoid damage to the system board, press down on the location as shown by callout **(1)** in the following image when disconnecting the right front speaker cable **(2)** and the RTC battery cable **(3)**.

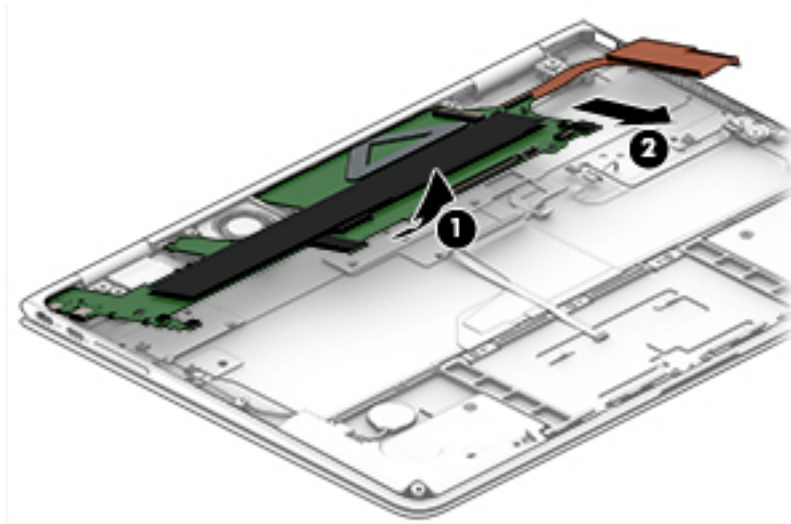


4. Remove the two Phillips PM2.0×2.5 screws **(1)** and the Phillips PM2.0×1.2 broad head screw **(2)** that secures the system board to the computer.



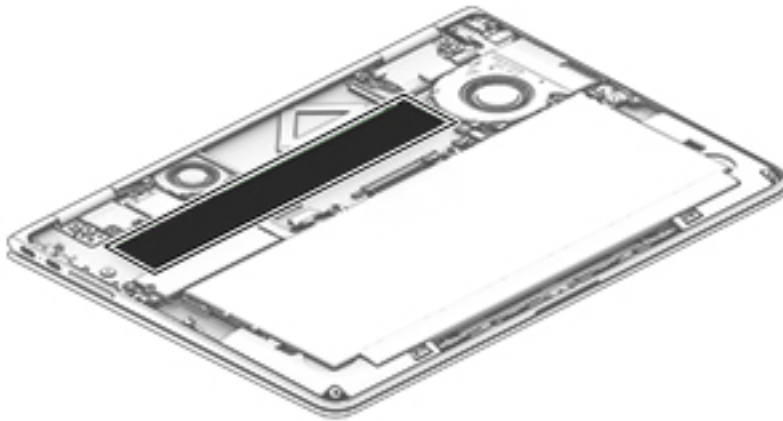
5. Lift the front edge system board **(1)** until it rests at an angle.

6. Remove the system board (2) by sliding it up and forward at an angle.



Reverse this procedure to install the system board.

Note that you can reuse the long strip of Mylar (193 mm × 35 mm × 0.1 mm) that adheres to the system board shown in the following image.



Heat sink



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

Description	Spare part number
Heat sink (includes replacement thermal material)	907557-001

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 24](#)), and then remove the following components:
 - a. Battery (see [Battery on page 26](#)).
 - b. Fan (see [Heat sink fan on page 30](#)).
 - c. System board (see [System board on page 39](#)).

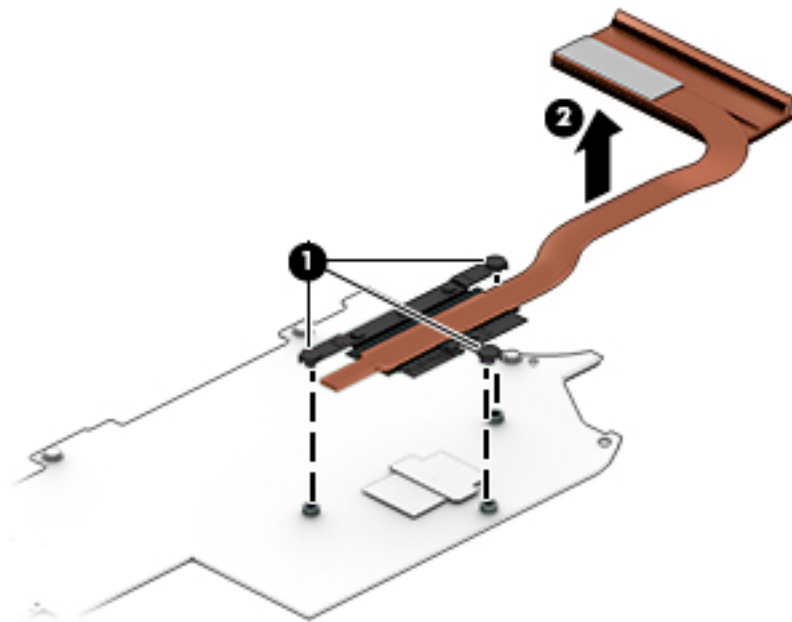
Remove the heat sink:

1. Position the system board upside down.
2. Loosen the three captive Phillips screws (1) that secure the heat sink to the system board.

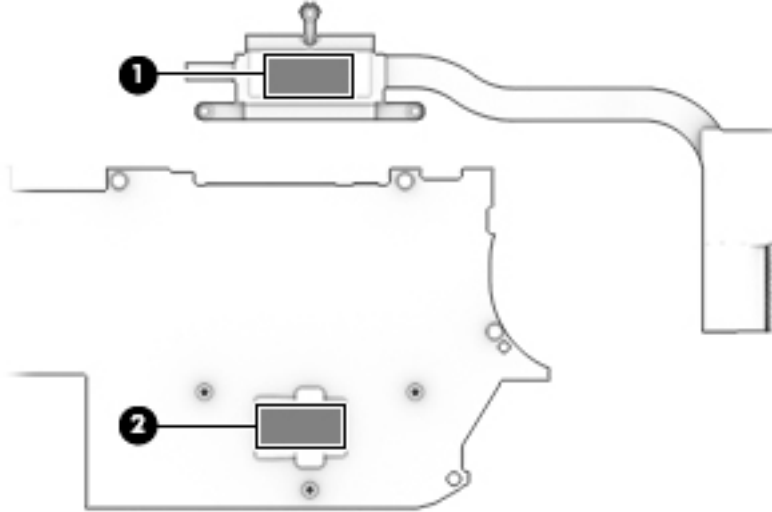


NOTE: Due to the adhesive quality of the thermal material located between the heat sink and system board components, it may be necessary to move the heat sink from side to side to detach it.

3. Remove the heat sink (2).



 **NOTE:** The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed. Thermal paste is used on the heat sink **(1)** and the processor **(2)**.



Reverse this procedure to install the heat sink.

Speaker, right rear

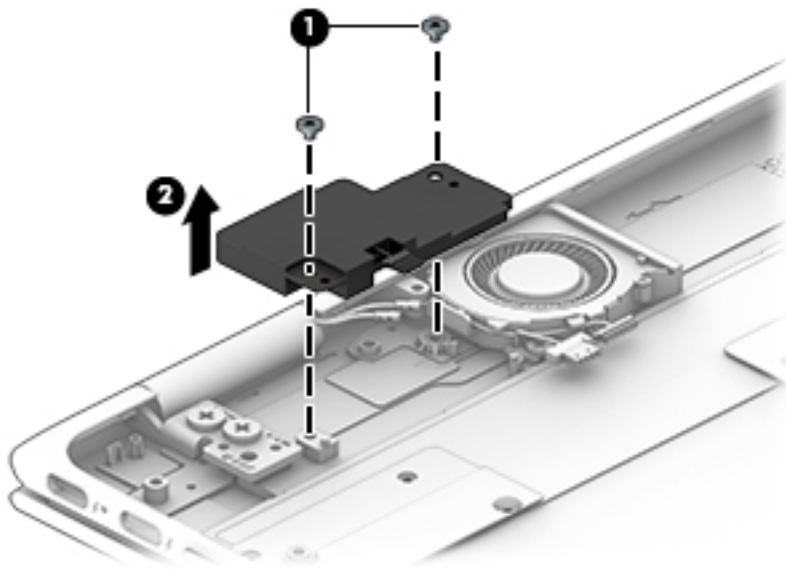
Description	Spare part number
Speaker, right rear (includes cable)	907344-001

Before removing the right rear speaker, 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 24](#)), and then remove the following components:
 - a. Battery (see [Battery on page 26](#)).
 - b. Fan (see [Heat sink fan on page 30](#)).
 - c. System board (see [System board on page 39](#)).

Remove the right rear speaker:

1. Remove the two Phillips PM2.0×3.5 screws **(1)** that secure the speaker to the computer.
2. Remove the speaker **(2)**.



Reverse this procedure to install the right rear speaker.

Rear fan

Description	Spare part number
Rear fan (includes cable)	907333-001

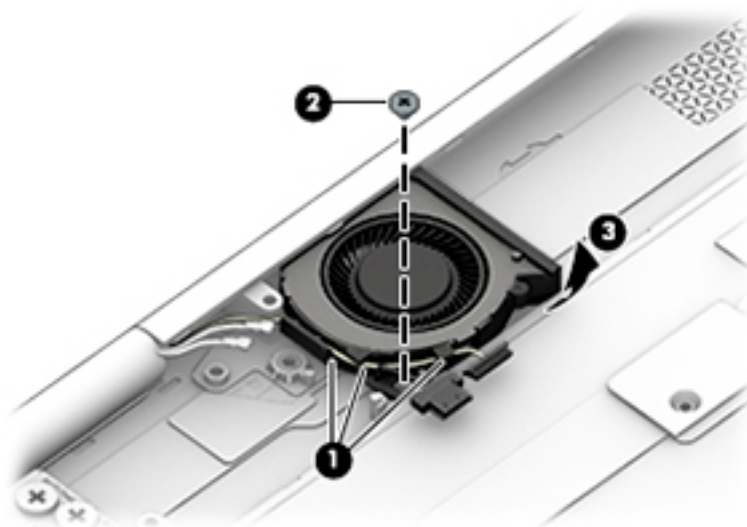
 **NOTE:** To properly ventilate the computer, allow at least 7.6 cm (3 in) of clearance on the left side of the computer. The computer uses an electric fan for ventilation. The fan is controlled by a temperature sensor and is designed to turn on automatically when high temperature conditions exist. These conditions are affected by high external temperatures, system power consumption, power management/battery conservation configurations, battery fast charging, and software requirements. Exhaust air is displaced through the ventilation grill located on the left side of the computer.

Before removing the rear 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 24](#)), and then remove the following components:
 - a. Battery (see [Battery on page 26](#)).
 - b. Fan (see [Heat sink fan on page 30](#)).
 - c. System board (see [System board on page 39](#)).

Remove the rear fan:

1. Remove the webcam cable from the channel on the side of the fan **(1)**.
2. Remove the Phillips PM2.0×3.0 screw **(2)** that secures the fan to the computer.
3. Rotate the side of the fan upward, and then remove the fan **(3)**.



Reverse this procedure to install the rear fan.

Display assembly

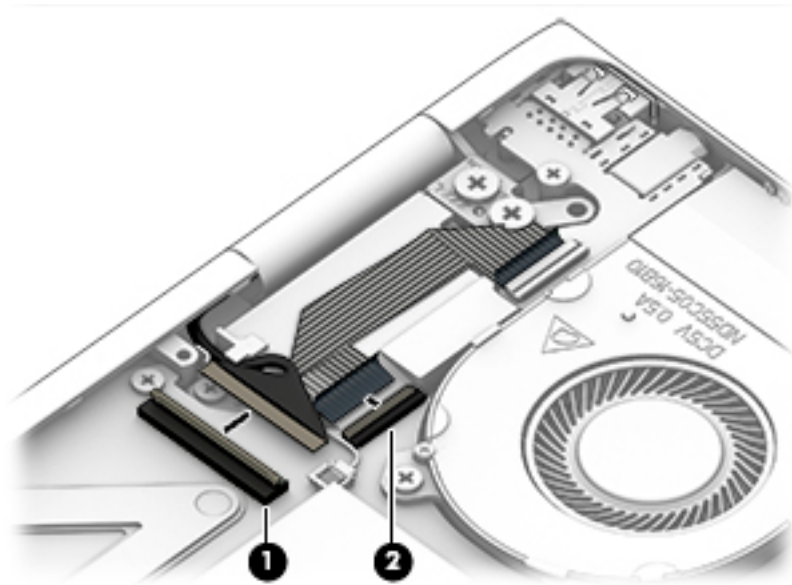
Description	Spare part number
Display assembly (full hinge-up; includes display panel cable, microphones, hinges, webcam, and wireless antenna cables and transceivers)	
Models: 13-w000 – 13-w099	907334-001
Models: 13-ac000 – 13-ac099; display – FHD; computer color – natural silver	918030-001
Models: 13-ac000 – 13-ac099; display – FHD; computer color – dark ash silver	918031-001
Models: 13-ac000 – 13-ac099; display – UHD; computer color – natural silver	918032-001
Models: 13-ac000 – 13-ac099; display – UHD; computer color – dark ash silver	918033-001

Before removing the display assembly, follow these steps:

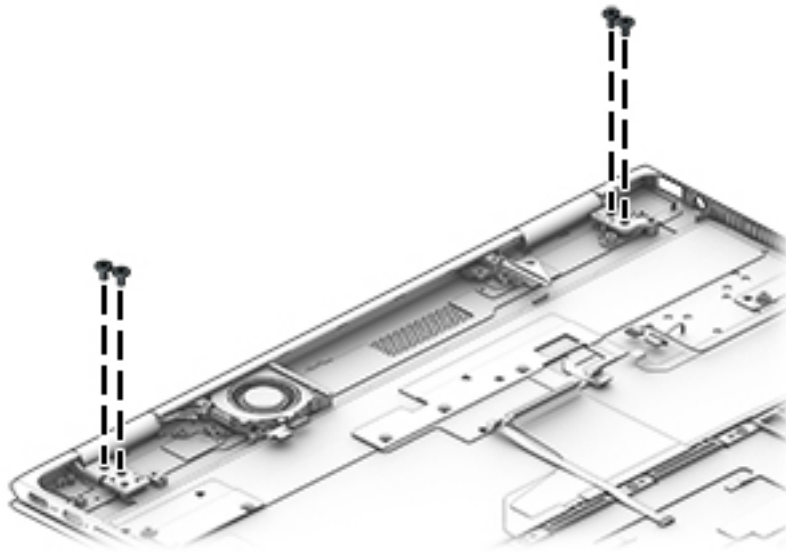
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see [Bottom cover on page 24](#)), and then remove the following components:
5. Disconnect the battery cable from the system board (see [Battery on page 26](#)).

Remove the display assembly:

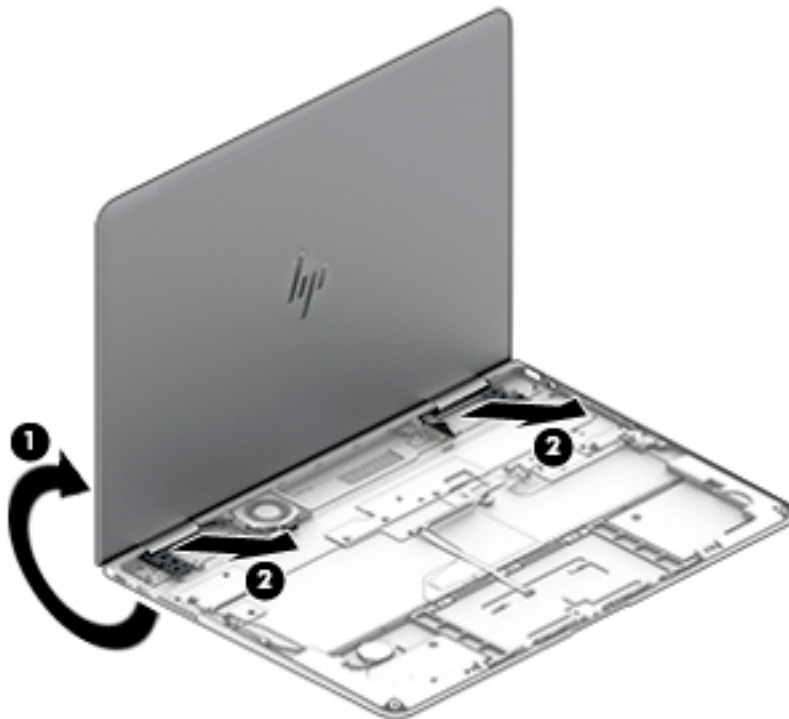
1. Open the computer to the interactive position, as shown in the following illustrations.
2. Release the ZIF connector and then disconnect the display cable from the system board (1).
3. Release the ZIF connector and then disconnect the audio cable from the system board (1).



4. Remove the four Phillips PM2.5×4.0 screws that secure the display assembly to the computer.



5. Rotate the display 270 degrees until it is upright as shown in the following image **(1)**.
6. Slide the display assembly forward until the display hinges **(2)** clear the computer.



Reverse this procedure to install the display assembly.

Top cover and keyboard

The top cover and keyboard remain after disassembling the computer. The first table provides the main spare part number for the keyboards. The second table provides the country codes.



NOTE: The top cover/keyboard spare part kit includes the keyboard cable and the keyboard backlight cable.

Description	Spare part number
Keyboard in natural silver for use in models: 13-w000 – 13-w099	907335-xx1
Keyboard in natural silver for use in models: 13-ac000 – 13-ac099	918027-xx1
Keyboard in dark ash silver for use in models: 13-ac000 – 13-ac099	918028-xx1

For use in country or region	Spare part number	For use in country or region	Spare part number
For use in Belgium	-A41	For use in Portugal	-131
For use in Bulgaria	-261	For use in Romania	-271
For use in Canada	-DB1	For use in Russia	-251
For use in the Czech Republic and Slovakia	-FL1	For use in Saudi Arabia	-171
For use in Denmark, Finland, and Norway	-DH1	For use in Slovenia	-BA1
For use in France	-051	For use in South Korea	-AD1
For use in Germany	-041	For use in Spain	-071
For use in Greece	-151	For use in Switzerland	-BG1
For use in Israel	-BB1	For use in Taiwan	-AB1
For use in Italy	-061	For use in Thailand	-281
For use in Japan	-291	For use in Turkey	-141
For use in Latin America	-161	For use in the United Kingdom and Singapore	-031
For use in the Netherlands	-B31	For use in the United States	-001

6 Using Setup Utility (BIOS)

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



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

Starting Setup Utility (BIOS)



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

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

Updating Setup Utility (BIOS)

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

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

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

Determining the BIOS version

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

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

- HP Support Assistant
 1. Type **support** in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Click the question mark icon in the taskbar.
 2. Select **My PC**, and then select **Specifications**.
- Setup Utility (BIOS)
 1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 51](#)).
 2. Select **Main**, select **System Information**, and then make note of the BIOS version.
 3. Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see [Downloading a BIOS update on page 52](#).

Downloading a BIOS update

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

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

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

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

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

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

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

7 Using HP PC Hardware Diagnostics (UEFI)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that 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.

When HP PC Hardware Diagnostics (UEFI) detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. This ID code can then be provided to support to help determine how to correct the problem.



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

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 drive



NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see [Downloading HP PC Hardware Diagnostics \(UEFI\) to a USB device on page 53](#).

- b. Hard drive
 - c. BIOS
3. When the diagnostic tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.



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

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device



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

There are two options to download HP PC Hardware Diagnostics to a USB device.

Download the latest UEFI version

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

Download any version of UEFI for a specific product

1. Go to <http://www.hp.com/support>.
2. Select **Get software and drivers**.

3. Enter the product name or number.

– or –

Select **Identify now** to let HP automatically detect your product.

4. Select your computer, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

8 Specifications

	Metric	U.S.
Dimensions		
Width	305.66 mm	12.03 in
Depth	217.96 mm	8.58 in
Height	13.79 mm	0.54 in
Weight (equipped with solid-state drive)	1440 g	3.17 lbs
Input power		
Operating voltage and current	19.5 V dc @ 2.31 A – 45 W	
	19.5 V dc @ 3.33 A – 65 W	
NOTE: This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms.		
NOTE: The computer operating voltage and current can be found on the system regulatory label.		
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 Backing up, restoring, and recovering

This chapter provides information about the following processes. The information in the chapter is standard procedure for most products.

- Creating recovery media and backups
- Restoring and recovering your system

For additional information, refer to the HP support assistant app.

▲ Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

– or –

Click the question mark icon in the taskbar.



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 keyboard to the keyboard dock before beginning any recovery process.

Creating recovery media and backups

The following methods of creating recovery media and backups are available on select products only. Choose the available method according to your computer model.

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see [Creating HP Recovery media \(select products only\) on page 56](#). For information on the recovery options that are available using the recovery media, see [Using Windows tools on page 57](#).
- Use Windows tools to create system restore points and create backups of personal information.

For more information, see [Recovering using HP Recovery Manager on page 58](#).



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

Creating HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. From the **Start** menu, select **File Explorer**, and then select **This PC**.

- If your computer does not list the Windows partition and the Recovery partition, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information on the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.

You can use Windows tools to create system restore points and create backups of personal information, see [Using Windows tools on page 57](#).

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.
 - Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
 - HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
 - To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
 - If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information on the HP website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.
 - Be sure that the computer is connected to AC power before you begin creating the recovery media.
 - The creation process can take an hour or more. Do not interrupt the creation process.
 - If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media:



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

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see [Recovering using HP Recovery Manager on page 58](#).

Using Windows tools

You can create recovery media, system restore points, and backups of personal information using Windows tools.



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

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

- ▲ Select the **Start** button, and then select the **Get started** app.

Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:



IMPORTANT: Not all methods are available on all products.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see the Get started app.
 - ▲ Select the **Start** button, and then select the **Get started** app.
- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option (select products only) of HP Recovery Manager to reinstall the individual application or driver.
 - ▲ Type `recovery` in the taskbar search box, select **HP Recovery Manager**, select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.
- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 58](#). If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 56](#).
- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see [Recovering using HP Recovery Manager on page 58](#).
- On select products, if you want to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see [Removing the HP Recovery partition \(select products only\) on page 61](#).

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 56](#).

What you need to know before you get started

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.



IMPORTANT: Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 56](#).
- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 56](#).
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP

website. Go to <http://www.hp.com/support>, select your country or region, and follow the on-screen instructions.



IMPORTANT: HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you want to retain.

Using HP Recovery media, you can choose from one of the following recovery options:



NOTE: Only the options available for your computer display when you start the recovery process.

- **System Recovery**—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- **Factory Reset**—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select products only) allows System Recovery only.

Using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without the need for recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

To start HP Recovery Manager from the HP Recovery partition:



IMPORTANT: For a tablet with a detachable keyboard, connect the keyboard to the keyboard dock before beginning these steps (select products only).

1. Type **recovery** in the taskbar search box, select **Recovery Manager**, and then select **HP Recovery Environment**.

- or -

For computers or tablets with keyboards attached, press **f11** while the computer boots, or press and hold **f11** as you press the power button.

For tablets without keyboards:

Turn on or restart the tablet, and then quickly hold down the volume up button; then select **f11**.

- or -

Turn on or restart the tablet, and then quickly hold down the volume down button; then select **f11**.

- or -

Turn on or restart the tablet, and then quickly hold down the Windows button; then select **f11**.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

1. If possible, back up all personal files.
2. Insert the HP Recovery media, and then restart the computer.



NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See [Changing the computer boot order on page 60](#).

3. Follow the on-screen instructions.

Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order, which 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.

To change the boot order:



IMPORTANT: For a tablet with a detachable keyboard, connect the keyboard to the keyboard dock 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, and then quickly hold down the volume up button; then select **f9**.

- or -

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

- or -

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

3. Select the optical drive or USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.



IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see [Creating HP Recovery media \(select products only\) on page 56](#).



NOTE: The Remove Recovery Partition option is only available on products that support this function.

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

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

11 Recycling

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

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

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