Maintenance and Service Guide

HP ENVY x360 13 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 **User Guides**.

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.

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP ENVY x360 13 Convertible PC (model number 13m-ar0xxx)
Processors	• AMD® Ryzen™7-3700U 2.3-GHz (turbo up to 4.0-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W) • AMD Ryzen5-3500U 2.1-GHz (turbo up to 3.7-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15) • AMD Ryzen3-3300U 2.1-GHz (turbo up to 3.5-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W)
Chipset	AMD integrated soldered-on-circuit (SoC)
Graphics	**Internal graphics:** • AMD Radeon RX Vega 10 Mobile Graphics • AMD Radeon Vega 8 Mobile Graphics • AMD Radeon Vega 6 Mobile Graphics
Panel	• 13.3-in., ultrahigh-definition (UHD), (3840×2160), BrightView, white light-emitting diode (WLED), UWVA, 72, 400 nits, eDP 1.4+PSR, ultraslim display assembly with narrow bezel • 13.3-in., full high-definition (FHD), (1920×1080), BrightView, WLED, UWVA, 72, 400 nits, eDP 1.4+PSR, ultraslim, low power display assembly with narrow bezel • 13.3-in., FHD, (1920×1080), AntiGlare, WLED, UWVA, 72, 700 nits, eDP 1.3+PSR, ultraslim display assembly with narrow bezel and privacy filter • 13.3-in., FHD, (1920×1080), BrightView, WLED, UWVA, 300 nits, eDP+PSR, ultraslim display assembly with narrow bezel
Memory	Support for DDR4-2400, 1.2V system memory Support for 16-GB or 8-GB of system memory in 16384-MB (512-MB×16×2) or 8192-MB (512-MB×16) configurations
Storage	**Support for the following solid-state drives:** • 1-TB, M.2 2280, Peripheral Component Interconnect Express (PCIe)-3×4, Non-Volatile Memory Express (NVMe), SuperSpeed (SS) solid-state drive with triple level cell (TLC) • 1-TB, M.2 2280, PCIe, NVMe, solid-state drive • 512-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC • 512-GB, M.2 2280, PCIe, NVMe, solid-state drive • 256-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC • 256-GB, PCIe, NVMe, solid-state drive • 128-GB, M.2, SATA-3 solid-state drive with TLC
Audio and video	**Audio:** Integrated quad Bang & Olufsen speakers Support for HP Audio Boost 2.0 **Camera:** Integrated HP HD 720p fixed infrared camera

Category	Description
Audio and video *(continued)*	**Microphones:** Dual-array microphone
External media card	HP MultiFormat digital media card reader
Internal card expansion	One M.2 slot for solid-state drive One M.2 slot for WLAN module
Keyboard/pointing device	Island-style, backlit keyboard with three-coat nightfall black paint Clickpad with Image Sensor
Optical drive	HP external DVD±RW DL SuperMulti Drive
Ports	• Audio-out (headphone)/audio-in (microphone) combo jack • USB 3.1 Type-A Gen. 1 port (2) • USB 3.1 Type-C Gen. 1 port
Power requirements	Support for a 4-cell, 53-Wh, 3.54-Ah, Li-Ion battery Support for the following AC adapters: • 65-W AC adapter (non-PFC, slim, black barrel, 4.5-mm, straight) • 65-W AC adapter (non-PFC, slim, black barrel, 4.5-mm, straight) LA MERCO • 65-W HP Smart AC adapter (non-PFC, EM, barrel, 4.5-mm, new EM) Support for a 1.00-m, Prime, Sticker power cord with a C5 connector in 15 countries and regions
Sensors	Accelerometer and Gyroscope/Accelerometer + Magnetometer
Security	• Camera privacy switch • Fingerprint reader (Secure Payment) • Trusted Platform Module (TPM) 2.0 - firmware
Wireless	**Wireless local area network (WLAN) options:** WLAN module integrated onto the system board Dual PCIe WLAN antennas built into display assembly Support for the RTL8822BE ac 2×2 MU-MIMO+Bluetooth® 4.2 M.2 PCIe WW with 2 antennas
Operating system	• Windows 10 Home 64-bit • Windows 10 Home 64-bit Advanced • Windows 10 Home 64-bit Advanced Single Language • Windows 10 Home 64-bit Chinese Market CPPP • Windows 10 Home 64-bit High-End Chinese Market CPPP • Windows 10 Home 64-bit Plus • Windows 10 Home 64-bit Plus Single Language • Windows 10 Home 64-bit Plus Single Language Africa Market PPP • Windows 10 Home 64-bit Plus Single Language APAC EM PPP • Windows 10 Home 64-bit Plus Single Language India Market PPP • Windows 10 Home 64-bit Plus Single Language Indonesia Market PPP

Category	Description
	• Windows 10 Home 64-bit Single Language • Windows 10 Home 64-bit Single Africa Market Language • Windows 10 Home 64-bit Single APAC EM Language • Windows 10 Home 64-bit Single India Market Language • Windows 10 Home 64-bit Single Indonesia Market Language • Windows 10 Professional 64-bit

2 External component identification

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

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.

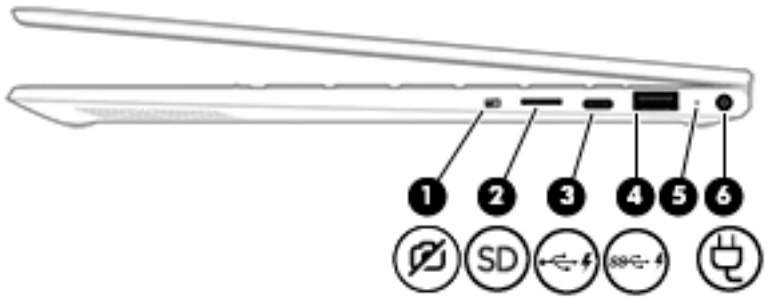
For information about system hardware components and the system BIOS version number, press fn+esc (select products only).

Locating software

To find out what software is installed on the computer:

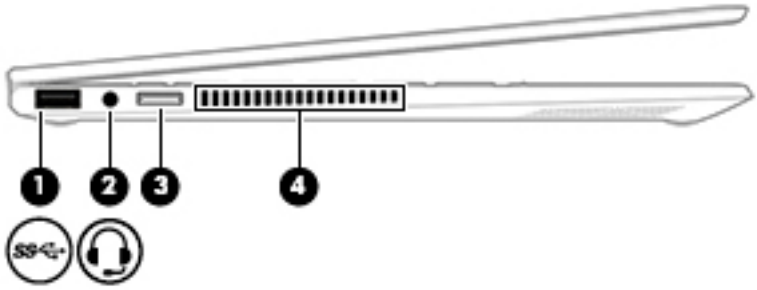
- Right-click the **Start** button, and then select **Apps and Features**.

Right side



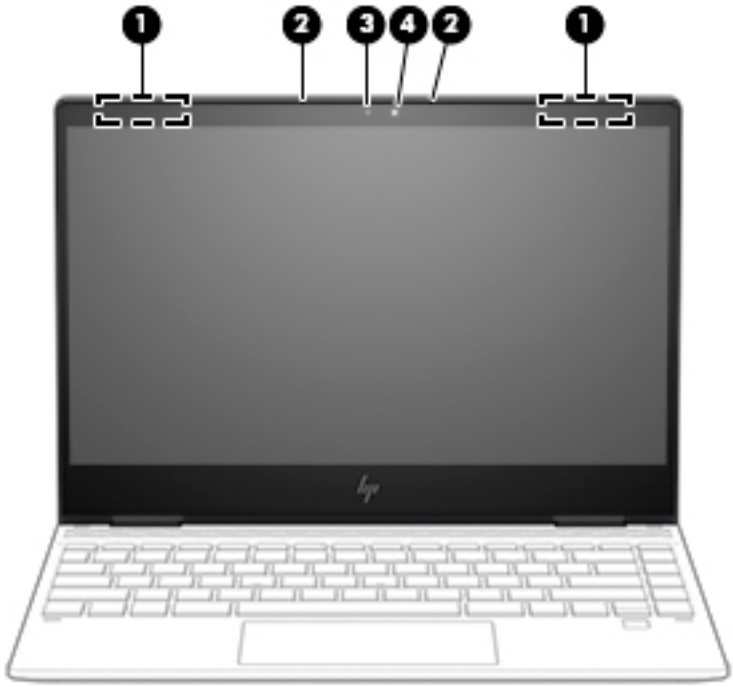
Component			Description
(1)		Camera privacy switch	Turns the camera off and on.
(2)	SD	Memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.
(3)		USB Type-C port with HP Sleep and Charge	Connects a USB device that has a Type-C connector, provides data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort output. NOTE: Cables and/or adapters (purchased separately) may be required.
(4)		USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(5)		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.
(6)		Power connector	Connects an AC adapter.

Left side



Component			Description
(1)	SS	USB SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(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, see the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Select the **Start** button, 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)		Power button and 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.
(4)		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.

Display



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

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

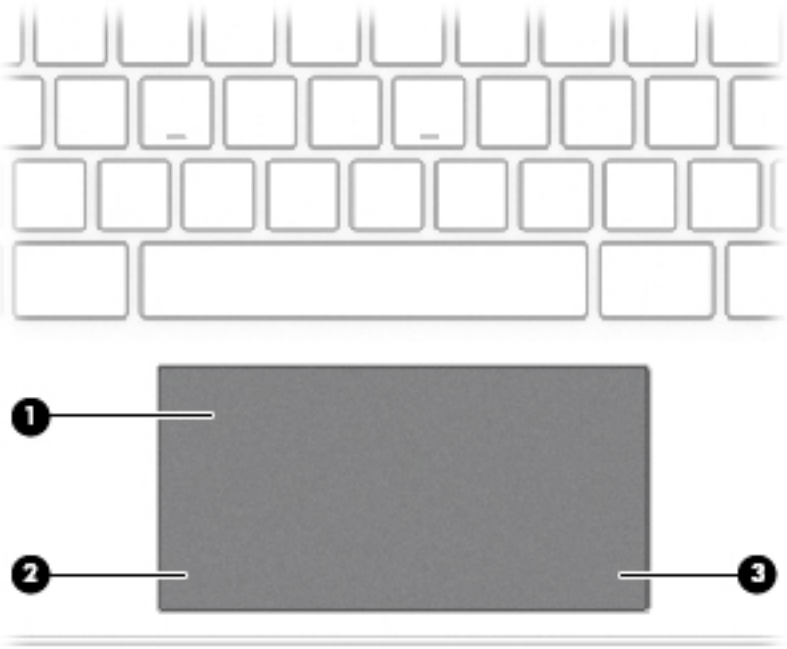
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

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

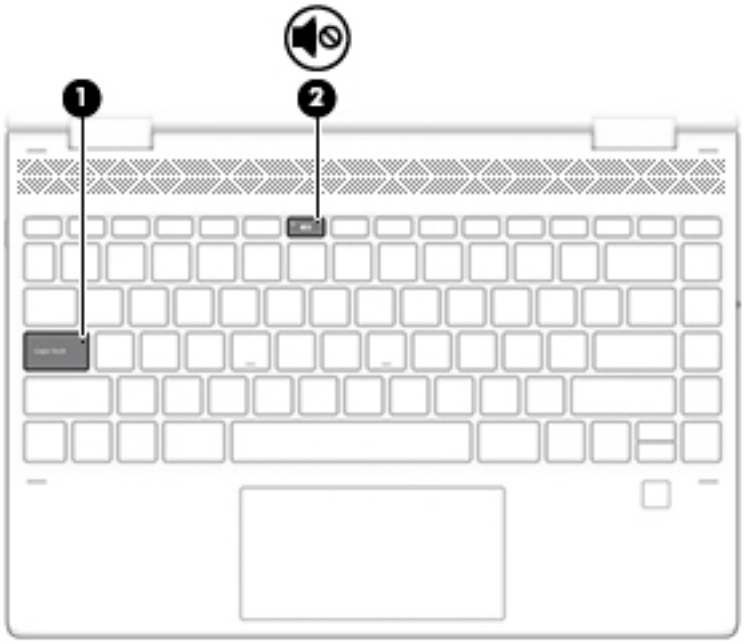
Keyboard area

TouchPad



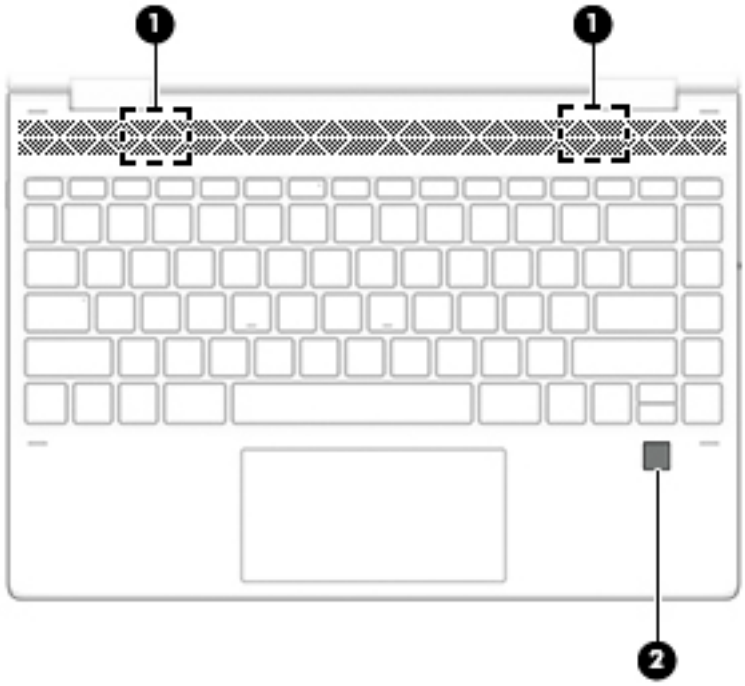
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



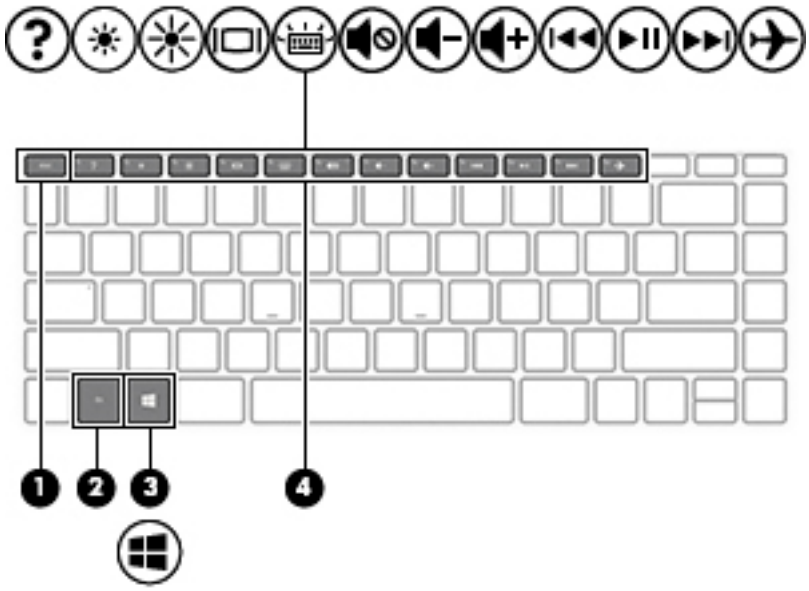
Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Mute light	On: Computer sound is off. Off: Computer sound is on.

Speakers and fingerprint reader



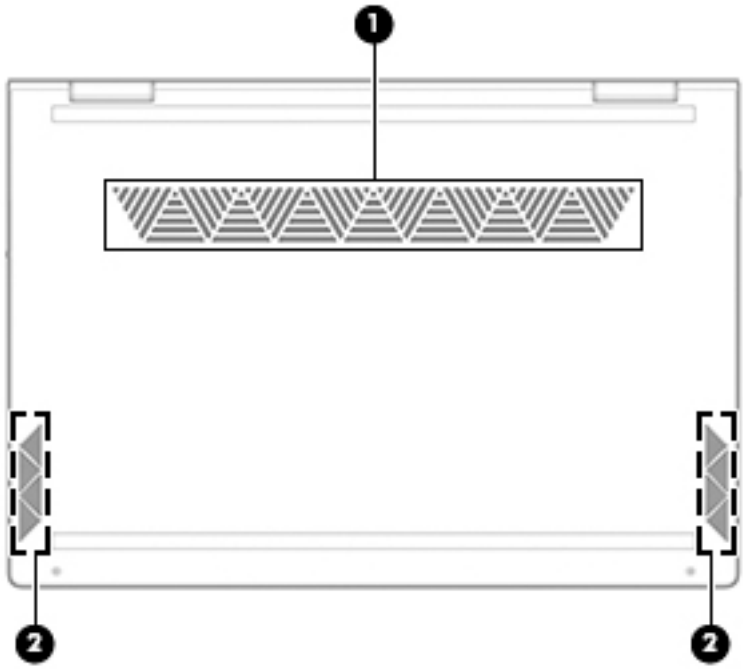
Component		Description
(1)	Speakers (2)	Produce sound.
(2)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon. ▲ To use the fingerprint reader, place your finger on the fingerprint reader until it reads your fingerprint.

Special keys



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with another key. Such key combinations are called *hot keys*.
(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.

Bottom



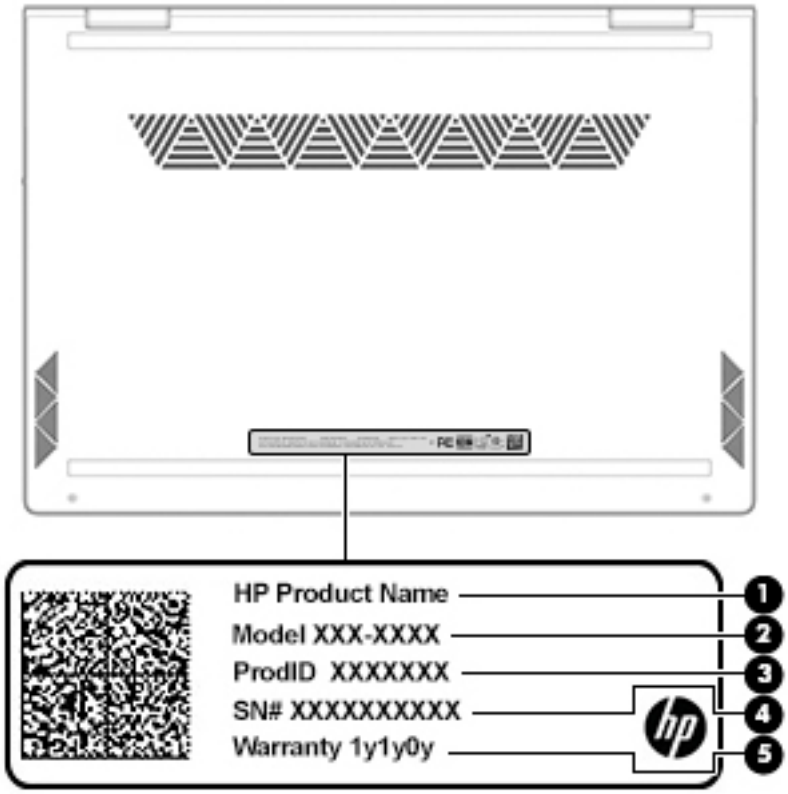
Component		Description
(1)	Vent	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	Speakers (2)	Produce sound.

Labels

The labels affixed to the computer provide information that may be needed when troubleshooting system problems or traveling internationally with the computer. Labels may be in paper form or imprinted on the product.

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

  The service label will resemble the example shown below:



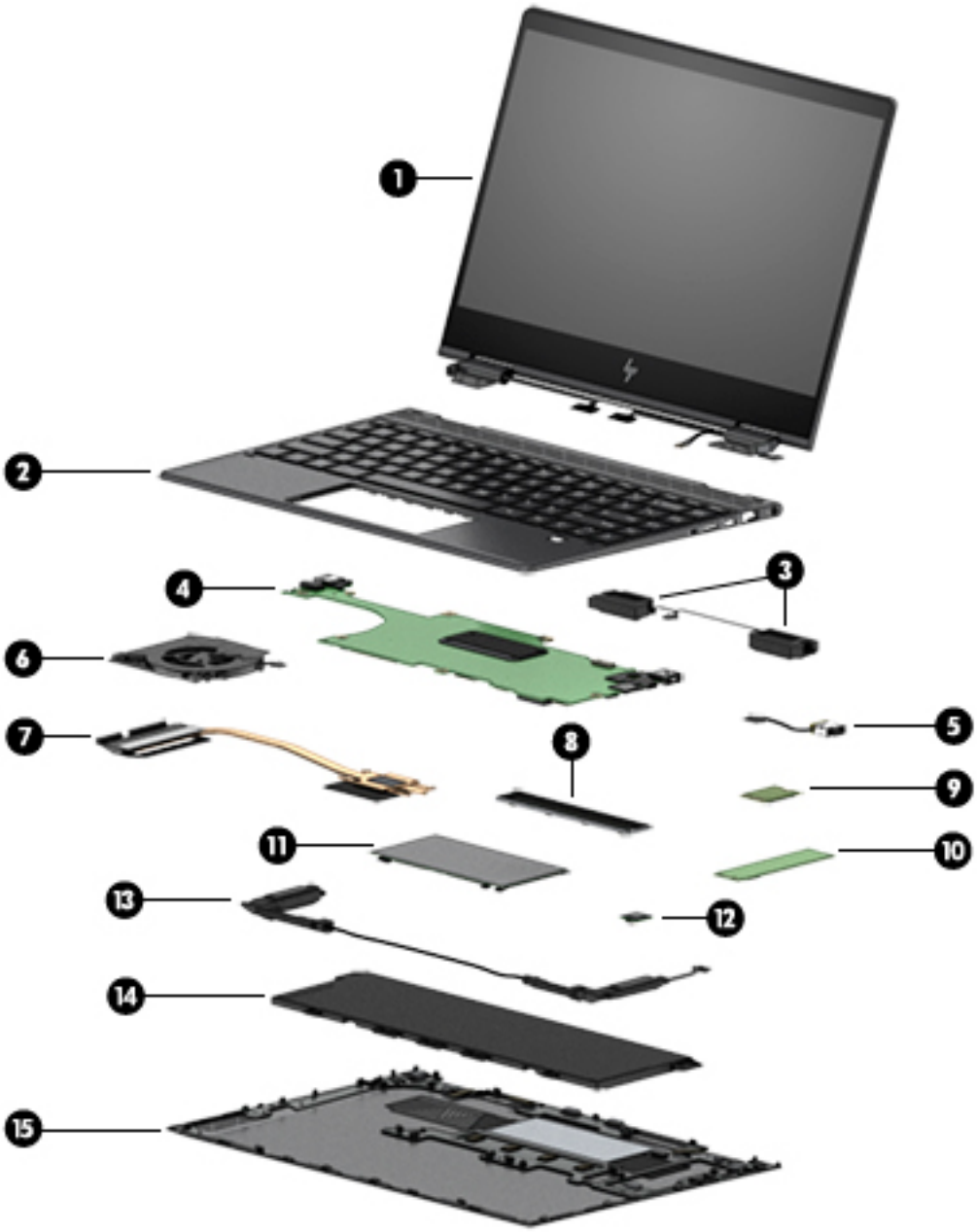
Item	Component
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period

3 Illustrated parts catalog

Computer major components

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.

NOTE: Details about the computer, including model number, serial number, product identification, and length of warranty, are on the service tag at the bottom of the computer. See Labels on page 13 for details.



Item	Component	Spare part number
(1)	**13.3-inch, UWVA, TouchScreen display assembly:**	
	FHD, AntiGlare, display assembly with privacy filter in ceramic white finish	L57886-001
	FHD, AntiGlare, display assembly with privacy filter in nightfall black finish	L53430-001
	UHD, BrightView, display assembly in ceramic white finish	L57889-001
	UHD, BrightView, display assembly in nightfall black finish	L53433-001
	FHD, BrightView, display assembly with LP in ceramic white finish	L57887-001
	FHD, BrightView, display assembly with LP in nightfall black finish	L53431-001

Item	Component	Spare part number
	FHD, BrightView, display assembly in ceramic white finish	L57888-001
	FHD, BrightView, display assembly in nightfall black finish	L53432-001
(2)	**Keyboard/top cover with backlight and TouchPad in ceramic white finish for use only on computer models equipped with a display assembly with a privacy filter** (includes backlight cable, keyboard cable, and TouchPad cable):	
	For use in Japan	L57948-291
	For use in South Korea	L57948-AD1
	For use in Taiwan	L57948-281
	For use in Thailand	L57948-AB1
	For use in the United States	L57948-001
	Keyboard/top cover with backlight and TouchPad in ceramic white finish (includes backlight cable, keyboard cable, and TouchPad cable):	
	For use in Japan	L57947-291
	For use in South Korea	L57947-AD1
	For use in Taiwan	L57947-281
	For use in Thailand	L57947-AB1
	For use in the United States	L57947-001
	Keyboard/top cover with backlight in nightfall black finish for use only on computer models equipped with a display assembly with a privacy filter (includes backlight cable and keyboard cable):	
	For use in Belgium	L53454-A41
	For use in Canada	L53454-DB1
	For use in the Czech Republic and Slovakia	L53454-FL1
	For use in Denmark, Finland, and Norway	L53454-DH1
	For use in France	L53454-051
	For use in Germany	L53454-041
	For use in Greece	L53454-151
	For use in Israel	L53454-BB1
	For use in Italy	L53454-061
	For use in Japan	L53454-291
	For use in the Netherlands	L53454-B31
	For use in Portugal	L53454-131
	For use in Russia	L53454-251
	For use in Saudi Arabia	L53454-171
	For use in South Korea	L53454-AD1
	For use in Spain	L53454-071
	For use in Switzerland	L53454-BG1

Item	Component	Spare part number
	For use in Taiwan	L53454-AB1
	For use in Thailand	L53454-281
	For use in Turkey	L53454-141
	For use in the United Kingdom	L53454-031
	For use in the United States	L53454-001
	Keyboard/top cover with backlight in nightfall black finish for use only on computer models NOT equipped with a display assembly with a privacy filter (includes backlight cable and keyboard cable):	
	For use in Belgium	L53453-A41
	For use in Canada	L53453-DB1
	For use in the Czech Republic and Slovakia	L53453-FL1
	For use in Denmark, Finland, and Norway	L53453-DH1
	For use in France	L53453-051
	For use in Germany	L53453-041
	For use in Greece	L53453-151
	For use in Israel	L53453-BB1
	For use in Italy	L53453-061
	For use in Japan	L53453-291
	For use in Latin America	L53453-161
	For use in the Netherlands	L53453-B31
	For use in Portugal	L53453-131
	For use in Russia	L53453-251
	For use in Saudi Arabia	L53453-171
	For use in South Korea	L53453-AD1
	For use in Spain	L53453-071
	For use in Switzerland	L53453-BG1
	For use in Taiwan	L53453-AB1
	For use in Thailand	L53453-281
	For use in Turkey	L53453-141
	For use in the United Kingdom	L53453-031
	For use in the United States	L53453-001
	Speakers (include cables and rubber isolators)	
(3)	Rear speakers	L19602-001
(13)	Front speakers	L53441-001
(4)	**System board** (includes processor and replacement thermal material):	

Item	Component	Spare part number
	Equipped with an AMD Ryzen7-3700U 2.3-GHz (turbo up to 4.0-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 16-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53452-601
	Equipped with an AMD Ryzen7-3700U 2.3-GHz (turbo up to 4.0-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 8-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53451-601
	Equipped with an AMD Ryzen5-3500U 2.1-GHz (turbo up to 3.7-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 8-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53450-601
	Equipped with an AMD Ryzen3-3300U 2.1-GHz (turbo up to 3.5-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 8-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53449-601
	Power button actuator (not illustrated)	
	In ceramic white finish	L57885-001
	In nightfall black finish	L53437-001
(5)	**Power connector cable**	L53429-001
(6)	**Fan** (includes cable)	L53434-001
(7)	**Heat sink** (includes replacement thermal material)	L53435-001
(8)	**Memory module shield**	L57890-001
(9)	**RTL8822BE ac 2×2 MU-MIMO+Bluetooth 4.2 M.2 PCIe WW with 2 antennas**	924813-855
(10)	**Solid-state drive:**	
	1-TB, PCIe, NVMe, solid-state drive with TLC	L53446-001
	1-TB, PCIe, NVMe, solid-state drive	L53442-001
	512-GB, PCIe, NVMe, solid-state drive with TLC	L53445-001
	512-GB, PCIe, NVMe, solid-state drive	L53448-001
	256-GB, PCIe, NVMe, solid-state drive with TLC	L53444-001
	256-GB, PCIe, NVMe, solid-state drive	L53447-001
	128-GB, M.2, SATA-3 solid-state drive with TLC	L53443-001
	Solid-state drive shield (not illustrated, available in the Miscellaneous Kit, spare part number L53436-001)	
(11)	**TouchPad** (in nightfall black finish, not for use with keyboard/top cover spare part kits in ceramic white finish; does not include cable)	L53438-001
	TouchPad cable (not illustrated)	L53427-001
(12)	**Fingerprint reader module** (includes bracket but does not include cable):	
	In ceramic white finish	L57884-001
	In nightfall black finish	L53481-001
	Fingerprint reader module cable (not illustrated)	L53428-001
(14)	**Battery** (4-cell, 53-Wh, 3.54-Ah, Li-Ion)	L08496-855
(15)	**Bottom cover** (includes shielding)	

Item	Component	Spare part number
	In ceramic white finish	L57882-001
	In nightfall black finish	L53425-001
	Rubber foot strips (2, not illustrated, included in the Rubber Foot Kits)	
	In ceramic white finish	L57883-001
	In nightfall black finish	L53439-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm)	913691-850
65-W slim AC adapter (non-PFC, 4.5-mm, 1.8-m)	L24008-001
65-W USB Type-C slim AC adapter (non-PFC, 4.5-mm)	L40713-001
Duck head adapter for use in Japan	L33157-001
Adapters:	
HP USB–to–Gigabit RJ45 adapter	829941-001
HP USB Type-C–to–HDMI 2.0 adapter	935325-001
HP USB Type-C-to-MultiPort hub	919666-001
HP USB Type-C–to–RJ45 adapter	855560-001
HP USB Type-C–to–USB-A dongle	833960-001
HP USB Type-C–to–USB-A hub	916838-001
HP USB Type-C–to–VGA adapter	831751-001
HP external DVD±RW DL SuperMulti Drive	747080-001
Impreza-C–to–A cable	L12232-001
Pen:	
Impreza	929863-001
Sunwoda	920241-001
Pen tip:	
Cadillac	L04536-001
Impreza	L04536-002
Power cord (C5 connector, 1.00-m, Prime, Sticker):	
For use in Argentina	L30811-001
For use in Australia	L22327-001
For use in Denmark	L22322-001
For use in Europe	L22321-001
For use in Italy	L30813-001
For use in India	L22624-001
For use in Israel	L22323-001
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

Component	Spare part number
For use in South Korea	L22328-001
For use in Switzerland	L22324-001
For use in Taiwan	L22329-001
For use in Thailand	L22326-001
For use in the United Kingdom	L22320-001
Screw Kit	L53440-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Torx T5 screwdriver

Service considerations

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

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

Plastic parts

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic

Cables and connectors

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

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

Drive handling

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

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

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

Before removing an optical drive, be sure that a disc is not in the drive and be sure that the optical drive tray is closed.

Handle drives on surfaces covered with at least one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

After removing a hard drive or an optical drive, place it in a static-proof bag.

Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.

Avoid exposing a drive to temperature extremes or liquids.

If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE.”

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			
	Relative humidity		
Event	**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 ±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

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

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

CAUTION: This computer does not have user-replaceable parts. Only HP authorized service providers should perform the removal and replacement procedures described here. Accessing the internal part could damage the computer or void the warranty.

Component replacement procedures

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Labels on page 13 for details.

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

There are as many as 38 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Bottom cover

Description	Spare part number
In ceramic white finish	L57882-001
In nightfall black finish	L53425-001

Before disassembling the computer, follow these steps:

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

Remove the bottom cover:

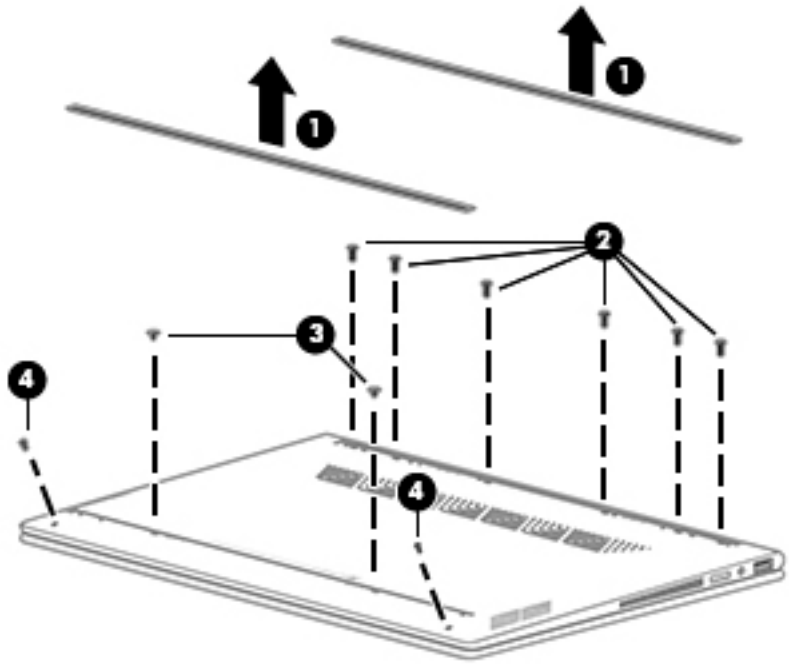
1. Turn the computer upside down with the front toward you.
2. Remove the two rubber foot strips **(1)**.

   The rubber foot strips are available in the Rubber Foot Kits, spare part numbers L57883-001 (in ceramic white finish) and L53439-001 (in nightfall black finish).
3. Remove the following screws that secure the bottom cover to the computer:

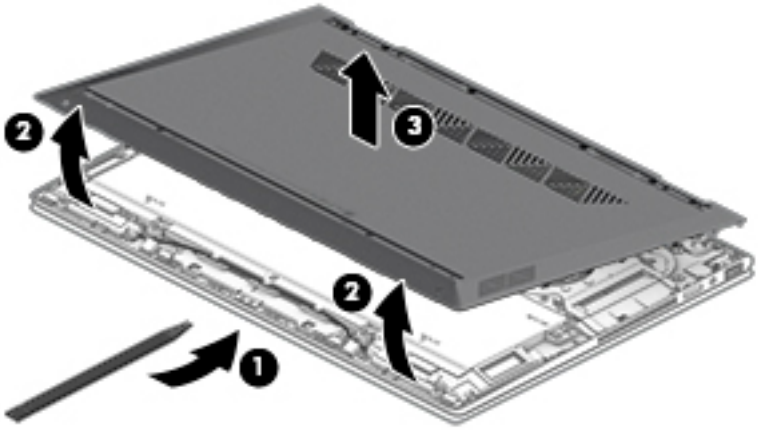
   (2) Six Phillips M2.5×6.6 screws under the rear rubber foot strip

   (3) Two Phillips M2.0×3.3 screws under the front rubber foot strip

   (4) Two Torx5 M2.0×4.3 screws on the front edge of the computer



4. Use a case utility tool **(1)** or similar thin plastic tool to separate the front edge **(2)** of the bottom cover from the keyboard/top cover.
5. Remove the bottom cover **(3)**.



Reverse this procedure to install the bottom cover.

Battery

Description	Spare part number
4-cell, 53-Wh, 3.54-Ah, Li-Ion battery	L08496-855

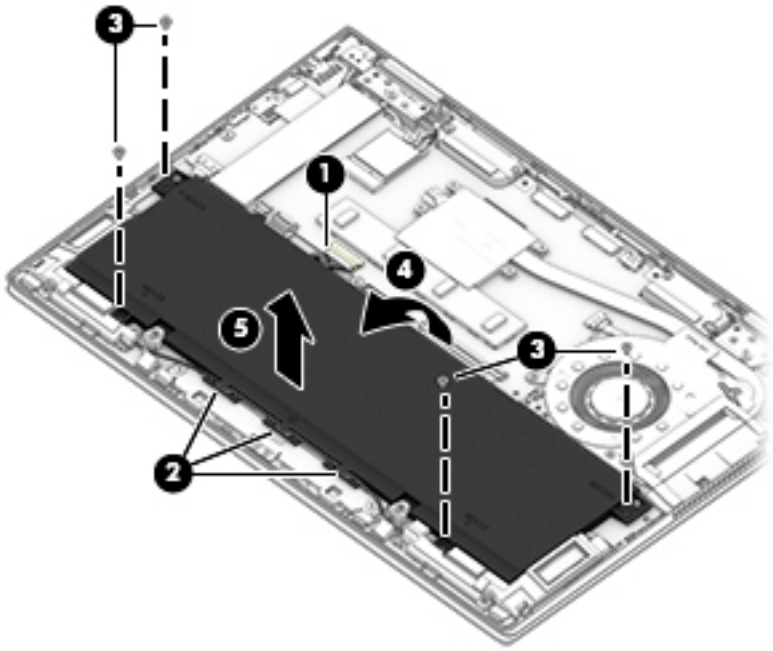
Before removing the battery, follow these steps:

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 28).

Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.
2. Release the front speaker cable from the retention clips **(2)** built into the front edge of the battery.
3. Remove the four Phillips M2.0×3.9 screws **(3)** that secure the bottom cover to the computer.
4. Lift the rear edge of the battery **(4)** until it rests at an angle.

5. Remove the battery **(5)**.



Reverse this procedure to install the battery.

Solid-state drive

Description	Spare part number
1-TB, PCIe, NVMe, solid-state drive with TLC	L53446-001
1-TB, PCIe, NVMe, solid-state drive	L53442-001
512-GB, PCIe, NVMe, solid-state drive with TLC	L53445-001
512-GB, PCIe, NVMe, solid-state drive	L53448-001
256-GB, PCIe, NVMe, solid-state drive with TLC	L53444-001
256-GB, PCIe, NVMe, solid-state drive	L53447-001
128-GB, M.2, SATA-3 solid-state drive with TLC	L53443-001
Solid-state drive shield	L53436-001

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 28).
5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the solid-state drive:

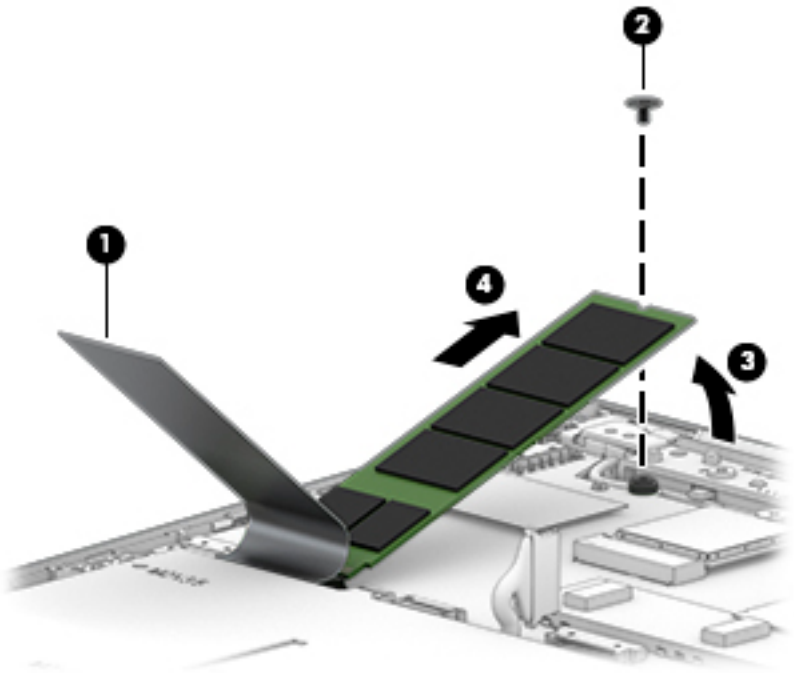
1. Fold back the solid-state shield **(1)** to access the solid-state drive retention screw.

   The solid-state drive shield is available using spare part number L53436-001.

2. Remove the Phillips M2.0×2.3 broad head screw **(2)** that secures the solid-state drive to the system board.

   The solid-state drive rises up **(3)**.

3. Remove the solid-state drive **(4)** by pulling it away from the connector.



Reverse this procedure to install the solid-state drive.

WLAN module

Description	Spare part number
RTL8822BE ac 2×2 MU-MIMO+Bluetooth 4.2 M.2 PCIe WW with 2 antenna	924813-855

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

4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the WLAN module:

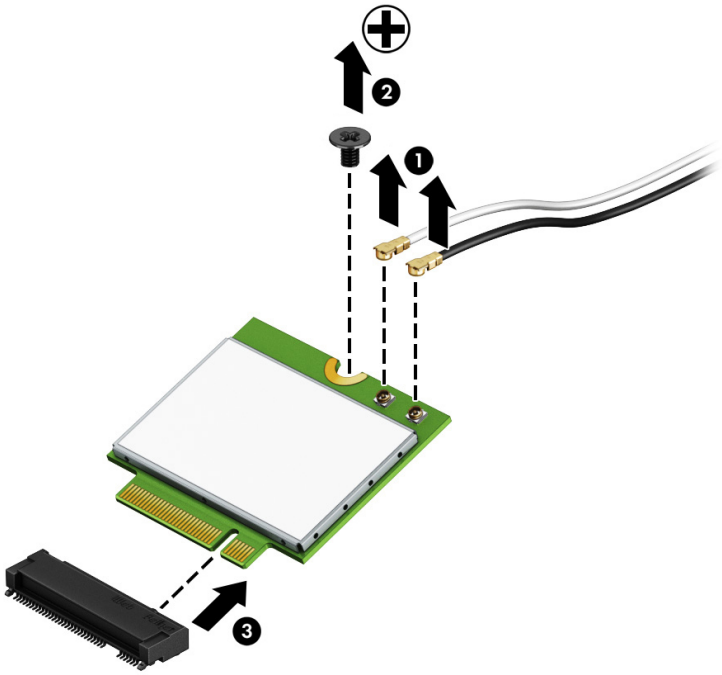
1. Disconnect the WLAN antenna cables **(1)** from the WLAN module.

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

2. Remove the Phillips M2.0×2.3 broad head screw **(2)** that secures the WLAN module to the system board.

   The WLAN module rises up.

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



Reverse this procedure to install the WLAN module.

Memory module shield

Description	Spare part number
Memory module shield	L57890-001

Before removing the memory module shield, follow these steps:

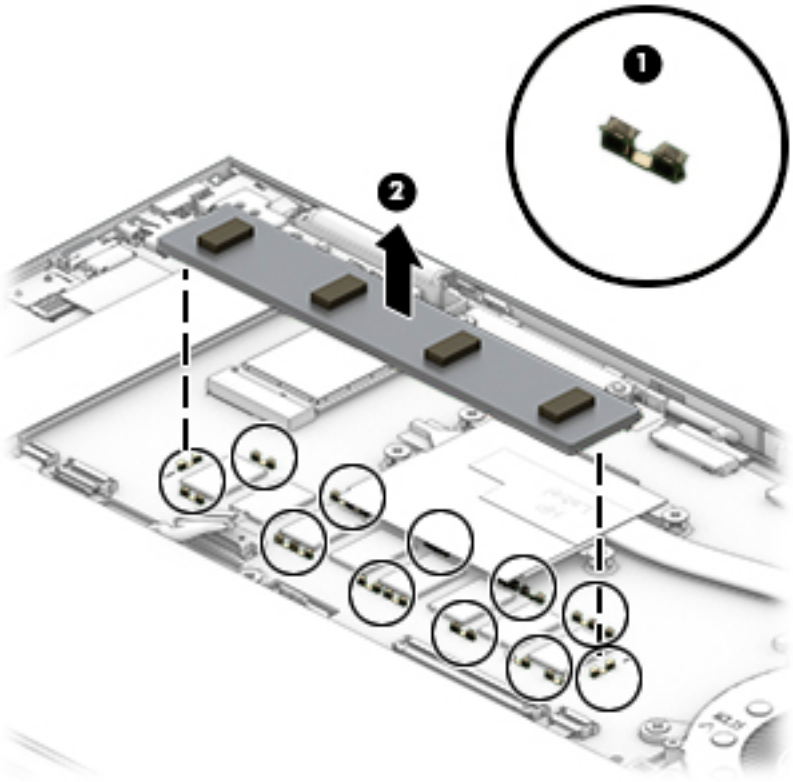
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the memory shield:

▲ Detach the edges of the memory shield from the retention clips **(1)** built into the system board, and then remove the memory shield **(2)**.

The memory shield is available using spare part number xxx-001.

⚠ WARNING! The memory shield is constructed of metal and has sharp edges. Exercise care when handling the memory shield to prevent injuries.



Reverse this procedure to install the memory shield.

Fan

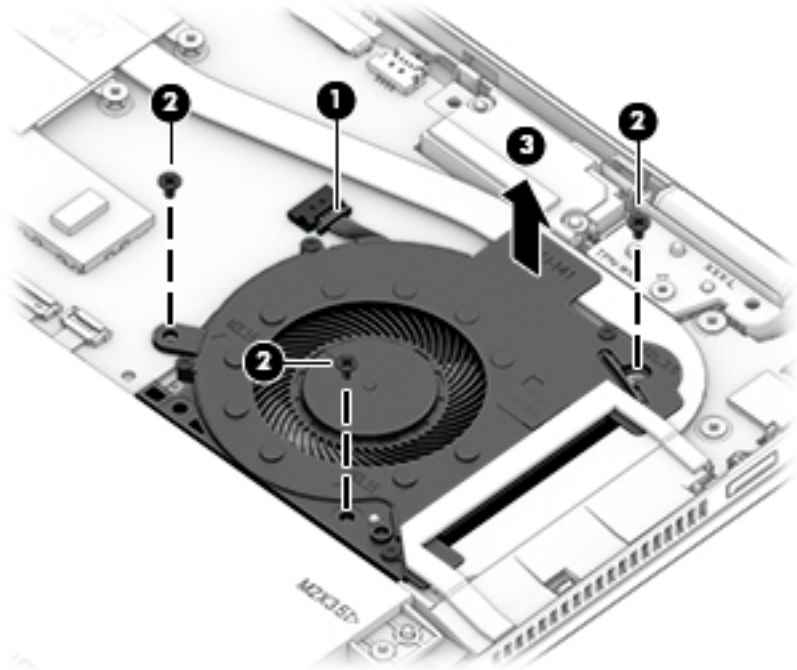
Description	Spare part number
Fan (includes cable)	L53434-001

Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the three Phillips M2.0×3.9 screws **(2)** that secure the fan to the system board.
3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

Front speakers

Description	Spare part number
Front speakers (includes left and right speakers, cables, and rubber isolators)	L53441-001

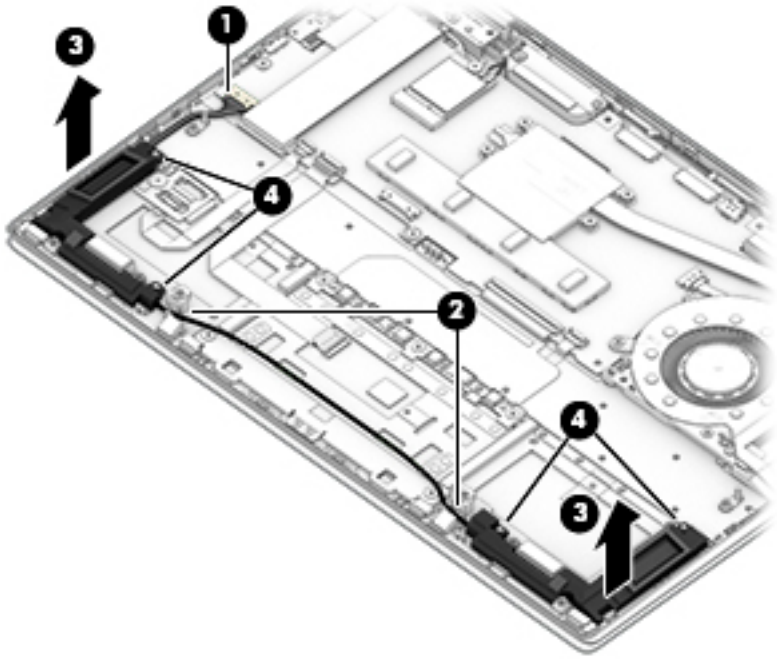
Before removing the front speakers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 29).

Remove the front speakers:

1. Disconnect the front speaker cable **(1)** from the system board.
2. Release the front speaker cable from the retention clips **(2)** built into the keyboard/top cover.
3. Remove the front speakers **(3)**.

NOTE: When removing the front speakers, make note of the location and condition of the four rubber isolators **(4)**. These isolators are critical to the performance of the front speakers. The absence of these isolators or damage to them can degrade the front speaker performance.



Reverse this procedure to install the front speakers.

TouchPad cable

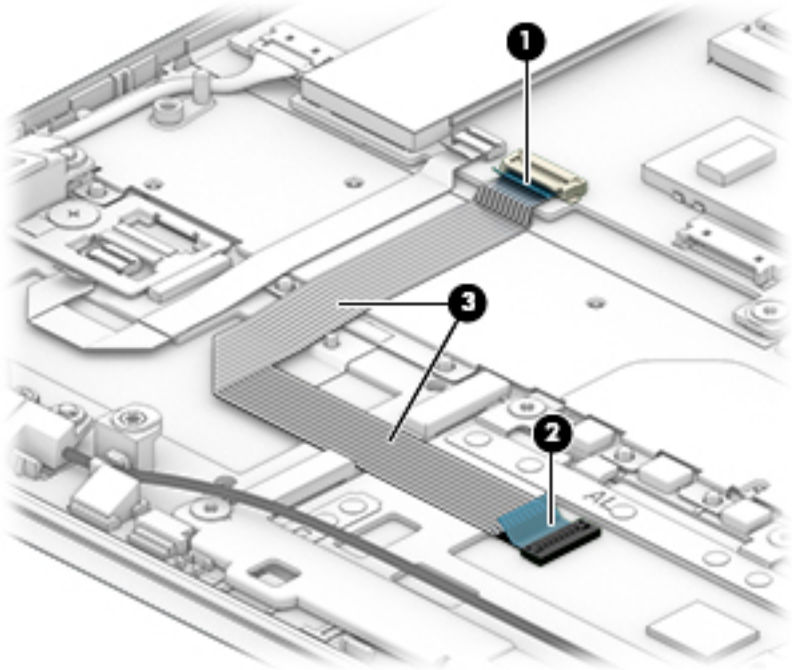
NOTE: The TouchPad cable is available using spare part number L53427-001.

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 28).
5. Remove the battery (see Battery on page 29).

Remove the TouchPad cable:

1. Release the ZIF connector **(1)** to which TouchPad cable is connected, and then disconnect the TouchPad cable from the system board.
2. Release the ZIF connector **(2)** to which TouchPad cable is connected, and then disconnect the TouchPad cable from the TouchPad.
3. Detach the TouchPad cable **(3)** from the keyboard/top cover. (The TouchPad cable is attached to the keyboard/top cover with tape.)



4. Remove the TouchPad cable.

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 L53427-001.

Description	Spare part number
TouchPad (includes TouchPad bracket)	L53438-001

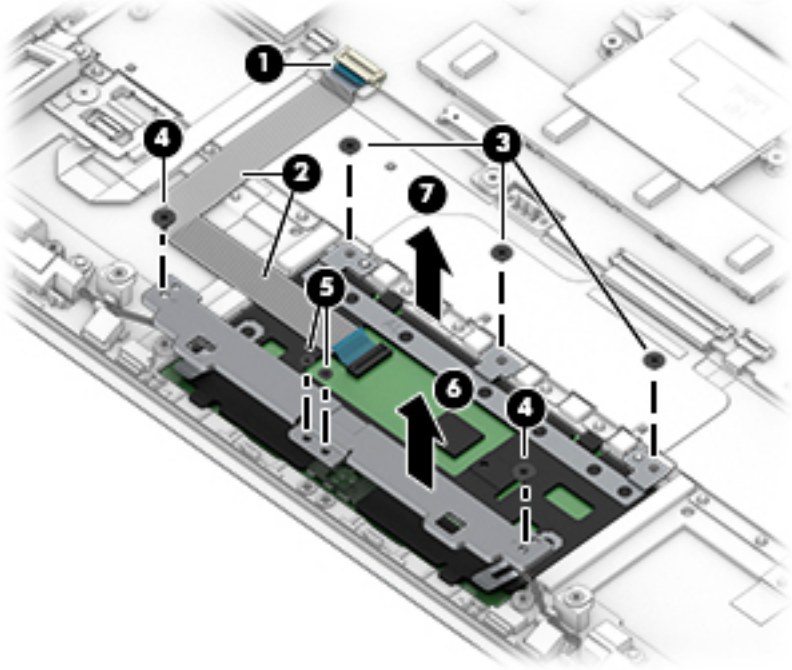
Before removing the TouchPad, follow these steps:

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 28).
5. Remove the battery (see Battery on page 29).

Remove the TouchPad:

1. Release the ZIF connector **(1)** to which the TouchPad cable is connected, and then disconnect the TouchPad cable from the system board.
2. Detach the TouchPad cable **(2)** from the keyboard/top cover. (The TouchPad cable is attached to the keyboard/top cover with tape.)
3. Remove the three Phillips M2.0×2.3 broad head screws **(3)** that secure the TouchPad to the keyboard/top cover.
4. Remove the two Phillips M2.0×3.3 screws **(4)** and the two Phillips M1.5×2.0 screws **(5)** that secure the TouchPad and bracket to the keyboard/top cover.
5. Remove the TouchPad bracket **(6)**.

6. Remove the TouchPad **(7)**.



Reverse this procedure to install the TouchPad and cable.

Fingerprint reader module

NOTE: The fingerprint reader module spare part kit includes the bracket but does not include the fingerprint reader module cable. The fingerprint reader module cable is available using spare part number L53428-001.

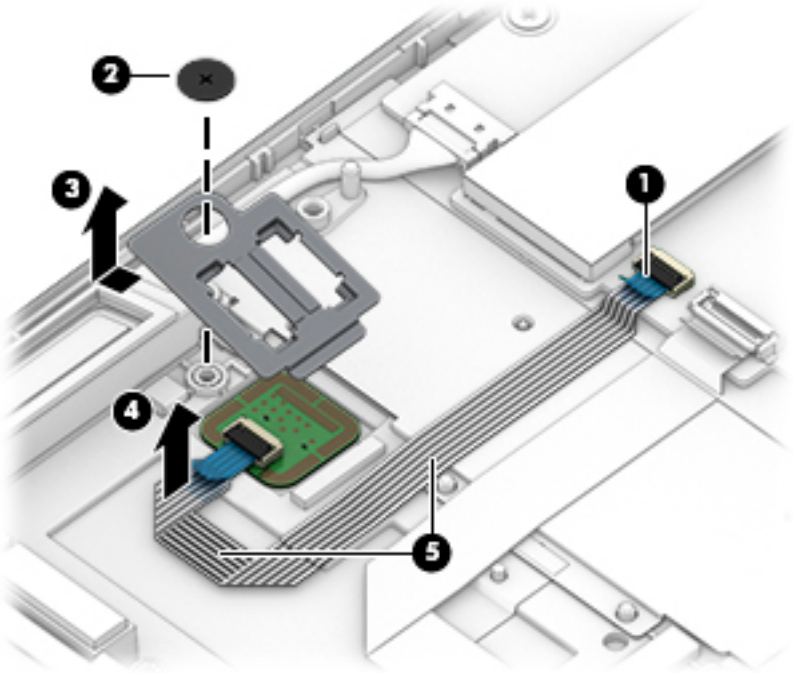
Description	Spare part number
In ceramic white finish	L57884-001
In nightfall black finish	L53481-001

Before removing the fingerprint reader 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 28).
5. Remove the battery (see Battery on page 29).

Remove the fingerprint reader module:

1. Release the ZIF connector **(1)** to which the fingerprint reader module cable is connected, and then disconnect the fingerprint reader module cable from the system board.
2. Remove the Phillips M2.0×2.3 broad head screw **(2)** that secures the fingerprint reader module and bracket to the keyboard/top cover.
3. Remove the fingerprint reader module bracket **(3)**.
4. Remove the fingerprint reader module **(4)** and cable.



Reverse this procedure to install the fingerprint reader module.

Fingerprint reader module cable

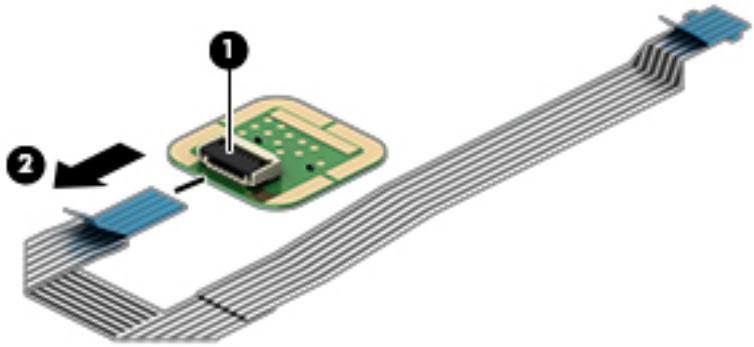
NOTE: The fingerprint reader module cable is available using spare part number L53428-001.

Before removing the fingerprint reader module 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 28).
5. Remove the battery (see Battery on page 29).
6. Remove the fingerprint reader module (see Fingerprint reader module on page 38).

Remove the fingerprint reader module cable:

1. Release the zero insertion force connector **(1)** to which fingerprint reader module cable is connected, and then disconnect the fingerprint reader module cable from the fingerprint reader module.
2. Remove the fingerprint reader module cable **(2)**.



Reverse this procedure to install the fingerprint reader module cable.

Rear speakers

Description	Spare part number
Rear speakers (includes left and right speakers, cables, and rubber isolators)	L19602-001

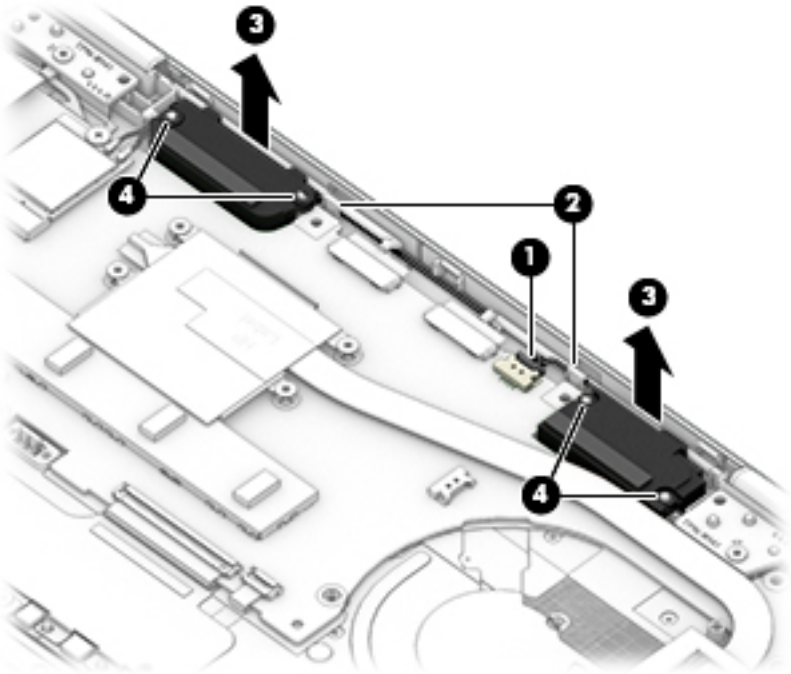
Before removing the rear speakers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28).
5. Remove the battery (see Battery on page 29).

Remove the rear speakers:

1. Disconnect the rear speaker cable **(1)** from the system board.
2. Release the rear speaker cable from the retention clips **(2)** built into the keyboard/top cover.
3. Remove the rear speakers **(3)**.

NOTE: When removing the rear speakers, make note of the location and condition of the four rubber isolators **(4)**. These isolators are critical to the performance of the rear speakers. The absence of these isolators or damage to them can degrade the rear speaker performance.



Reverse this procedure to install the rear speakers.

System board

NOTE: The system board spare part kit includes a processor and replacement thermal material.

Description	Spare part number
Equipped with an AMD Ryzen7-3700U 2.3-GHz (turbo up to 4.0-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 16-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53452-601
Equipped with an AMD Ryzen7-3700U 2.3-GHz (turbo up to 4.0-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 8-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53451-601
Equipped with an AMD Ryzen5-3500U 2.1-GHz (turbo up to 3.7-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 8-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53450-601
Equipped with an AMD Ryzen3-3300U 2.1-GHz (turbo up to 3.5-GHz) processor (2400-MHz FSB, 6-MB L2/L3 cache, quad core, 15 W), 8-GB of system memory, a graphics subsystem with UMA memory, and the Windows 10 operating system	L53449-601

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 28), and then remove the following components:
   a. Battery (see Battery on page 29)
   b. Solid-state drive (see Solid-state drive on page 30)
   c. Fans (see Fan on page 34)

When replacing the system board, be sure to remove the WLAN module (see WLAN module on page 31) and memory module shield (see Memory module shield on page 33) from the defective system board and install them on the replacement system board.

Remove the system board:

1. Disconnect the following cables from the system board:

   (1) WLAN antenna cables

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

   (2) Webcam/microphone module ZIF connector cable

   (3) Display panel ZIF connector cable

   (4) Rear speaker cable

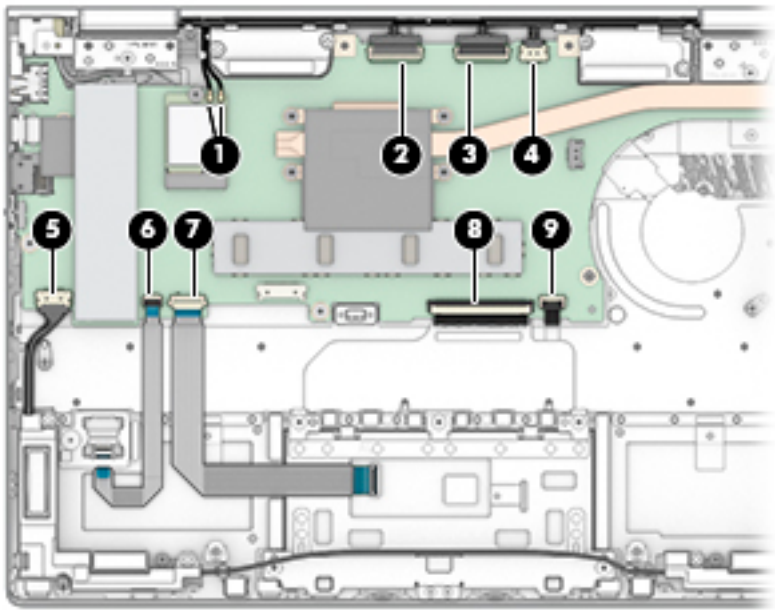
   (5) Front speaker cable

   (6) Fingerprint reader module ZIF connector cable

(7) TouchPad ZIF connector cable

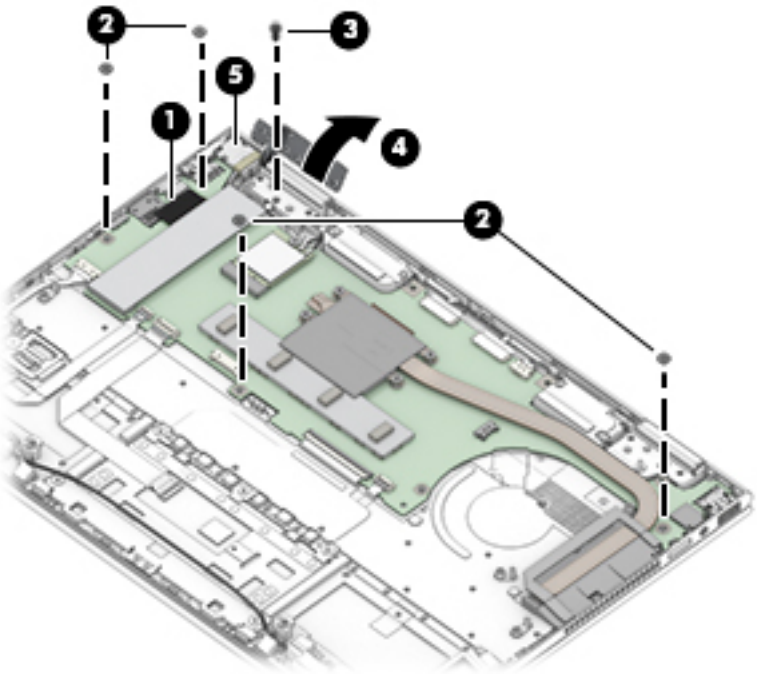
(8) Keyboard ZIF connector cable

(9) Keyboard backlight ZIF connector cable

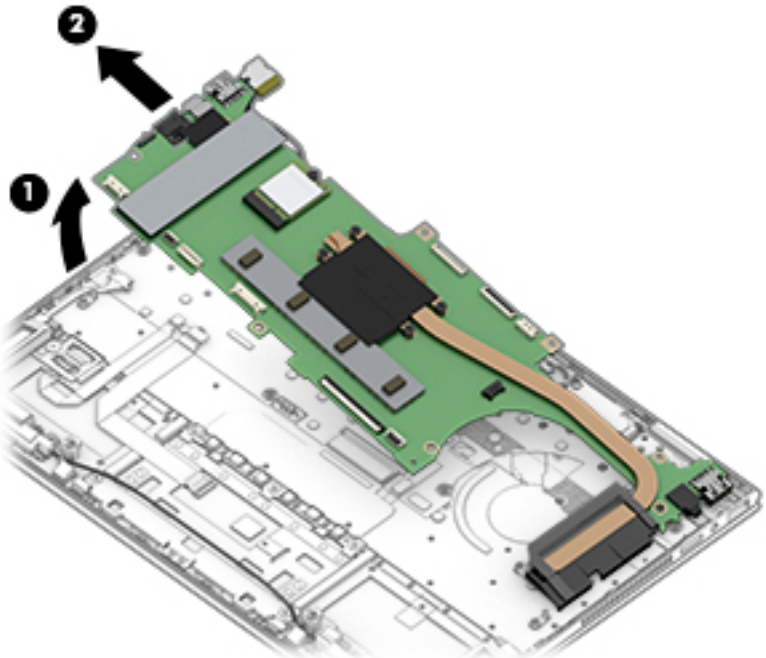


2. Fold back the shielding material (1) to access the system board screws.
3. Remove the four Phillips M2.0×3.0 broad head screws (2) that secure the system board to the keyboard/top cover.
4. Remove the Phillips M2.5×6.6 screw (3) that secures the display right hinge to the keyboard/top cover.
5. Lift the display right hinge (4) and swing it back as far as it will travel.

6. Release the power connector **(5)** from the fitting in the keyboard/top cover.



7. Lift the left side **(1)** of the system board until it rests at an angle, and then remove the system board **(2)** by sliding it up and to the left at an angle.



8. Remove the system board.

Reverse this procedure to install the system board.

Heat sink

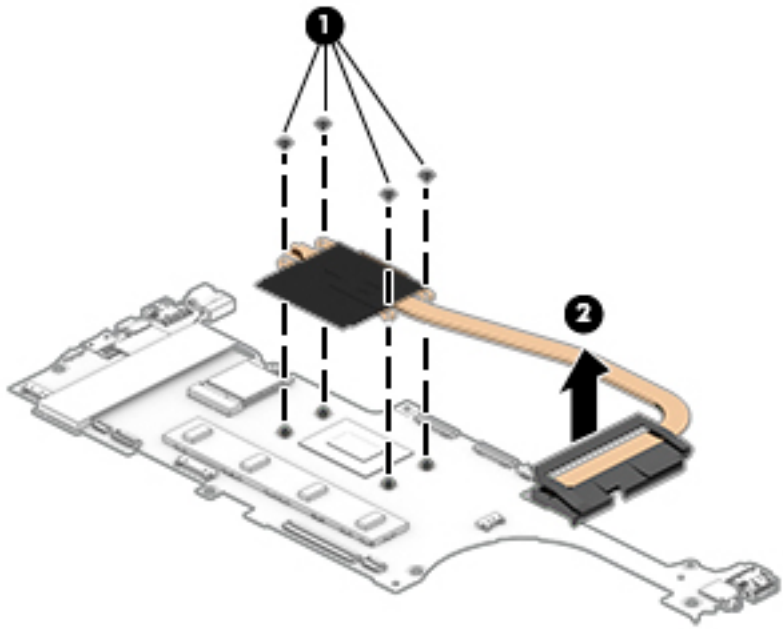
Description	Spare part number
Heat sink (includes replacement thermal material)	L53435-001

Before removing the heat sink, follow these steps:

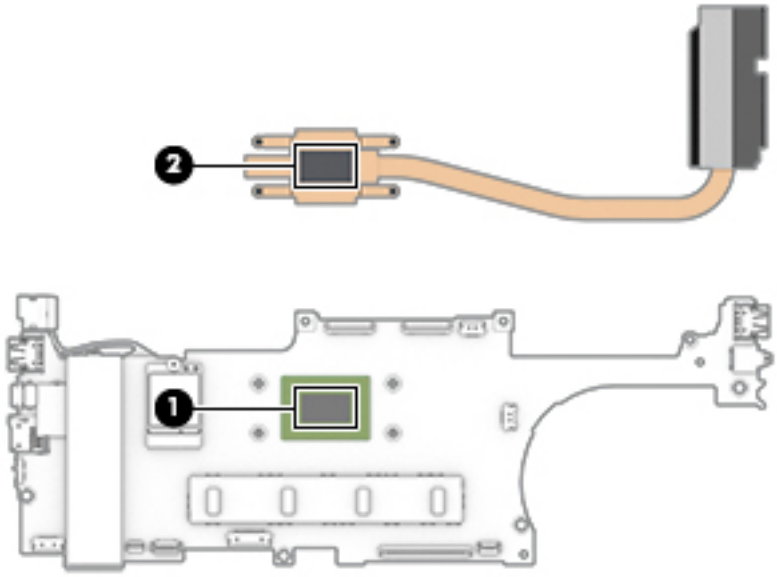
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 28), and then remove the following components:
   a. Battery (see Battery on page 29)
   b. Solid-state drive (see Solid-state drive on page 30)
   c. Fans (see Fan on page 34)
   d. System board (see System board on page 42)

Remove the heat sink:

1. Remove the four Phillips M2.0×3.0 screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



Reverse this procedure to install the heat sink.

Power connector cable

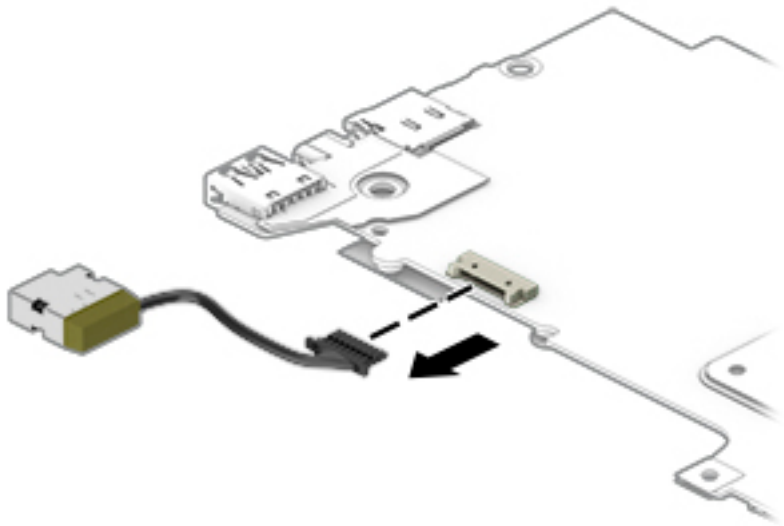
Description	Spare part number
Power connector cable	L53429-001

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 28), and then remove the following components:
   a. Battery (see Battery on page 29)
   b. Solid-state drive (see Solid-state drive on page 30)
   c. Fans (see Fan on page 34)
   d. System board (see System board on page 42)

Remove the power connector cable:

1. Turn the system board upside down with the rear edge toward you.
2. Disconnect the power connector cable from the system board.



Reverse this procedure to install the power connector cable.

Power button actuator

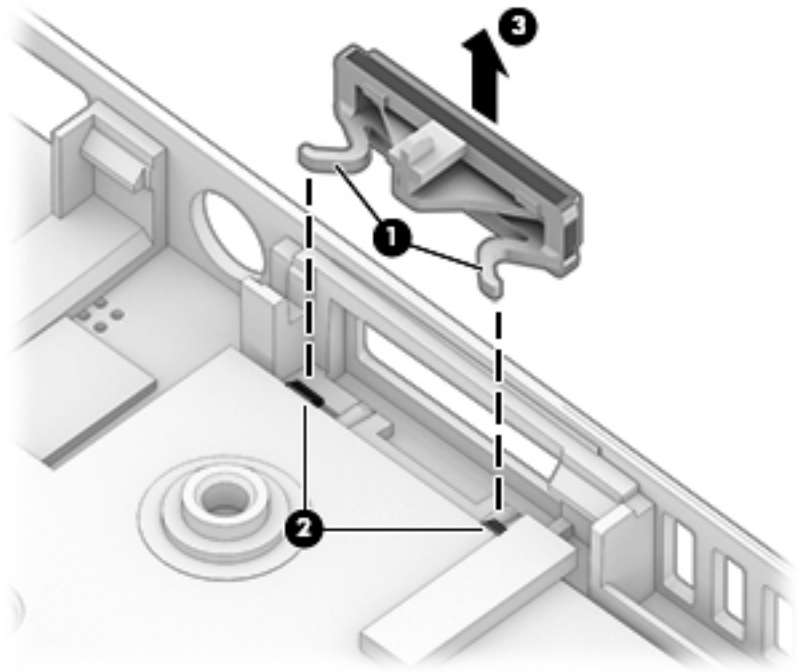
Description	Spare part number
In ceramic white finish	L57885-001
In nightfall black finish	L53437-001

Before removing the power button actuator, 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 28), and then remove the following components:
   a. Battery (see Battery on page 29)
   b. Solid-state drive (see Battery on page 29)
   c. System board (see System board on page 42)

Remove the power button actuator:

1. Release the power button actuator spring arms **(1)** from the retention tabs **(2)** built into the keyboard/top cover.
2. Remove the power button actuator **(3)**.



3. Remove the power button actuator.

Reverse this procedure to install the power button actuator.

Display assembly

Description	Spare part number
In ceramic white finish:	
13.3-inch, FHD, AntiGlare, UWVA, TouchScreen display assembly with privacy filter	L57886-001
13.3-inch, UHD, BrightView, UWVA, TouchScreen display assembly	L57889-001
13.3-inch, FHD, BrightView, UWVA, TouchScreen display assembly with LP	L57887-001
13.3-inch, FHD, BrightView, UWVA, TouchScreen display assembly	L57888-001
In nightfall black finish:	
13.3-inch, FHD, AntiGlare, UWVA, TouchScreen display assembly with privacy filter	L53430-001
13.3-inch, UHD, BrightView, UWVA, TouchScreen display assembly	L53433-001
13.3-inch, FHD, BrightView, UWVA, TouchScreen display assembly with LP	L53431-001
13.3-inch, FHD, BrightView, UWVA, TouchScreen display assembly	L53432-001

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 28).
5. Remove the battery (see Battery on page 29).

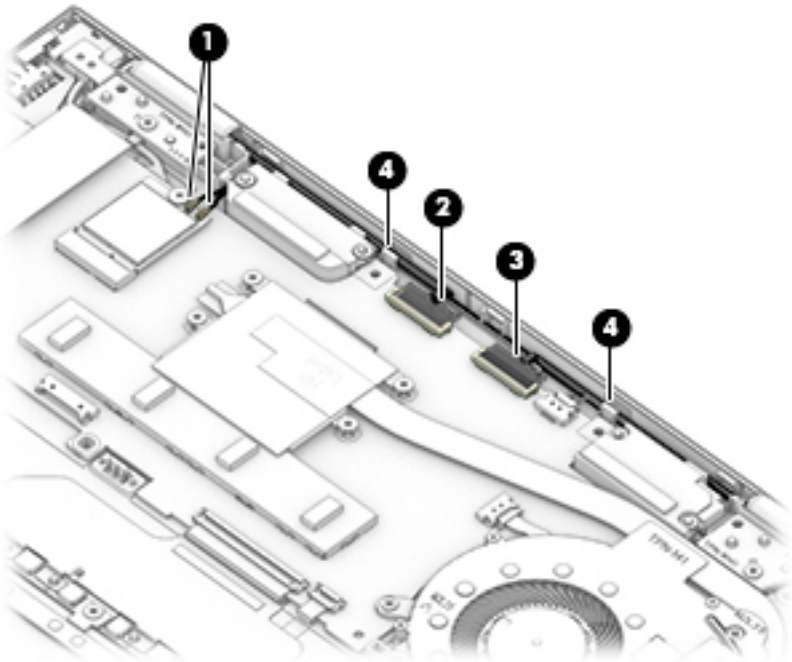
Remove the display assembly:

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

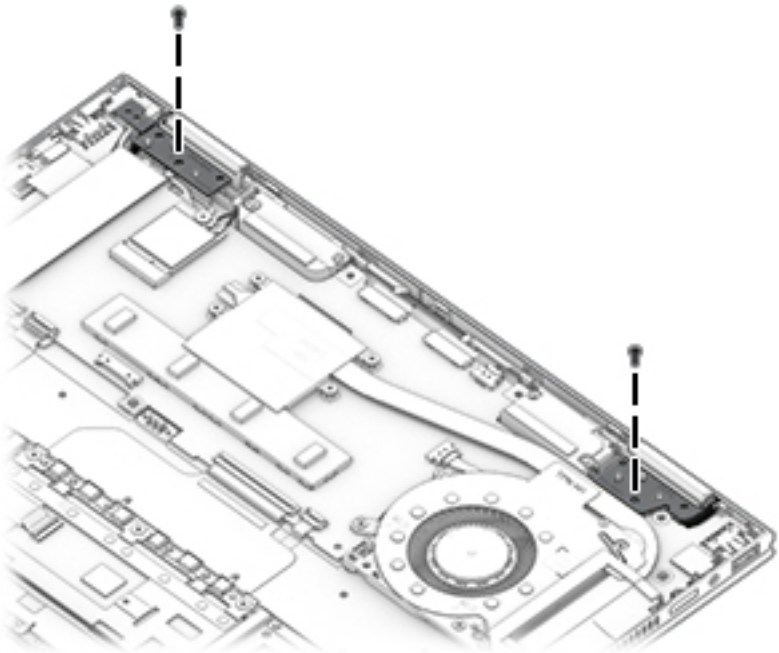
NOTE: The #1/white WLAN antenna cable connects to the WLAN module "#1/Main" terminal. The #2/black WLAN antenna cable connects to the WLAN module "#2/Aux" terminal.

2. Release the ZIF connector **(2)** to which the webcam/microphone module cable is connected, and then disconnect the webcam/microphone module cable from the system board.
3. Release the ZIF connector **(3)** to which the display panel cable is connected, and then disconnect the display panel cable from the system board.

4. Release the webcam/microphone module cable and display panel cable from the retention clips **(4)** and routing channel built into the keyboard/top cover.

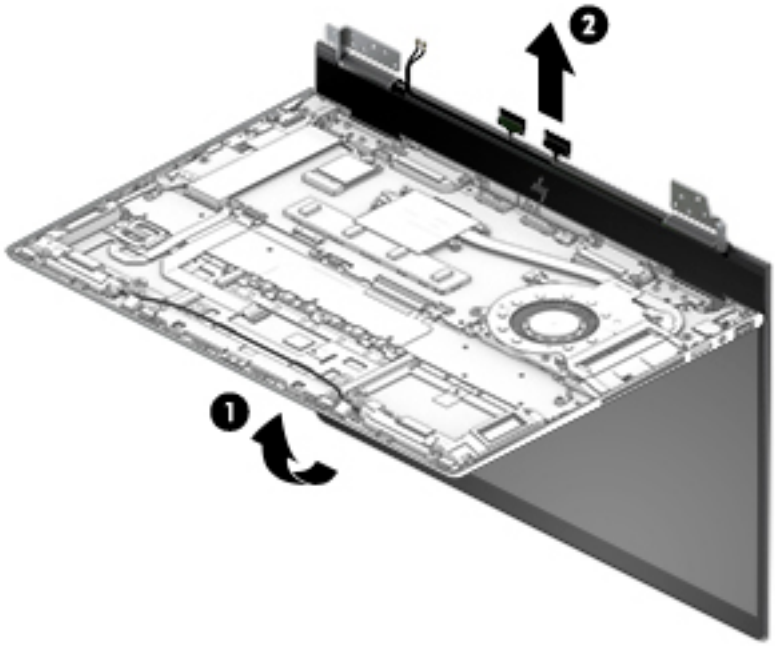


5. Remove the two Phillips M2.5×6.6 screws that secure the display assembly to the keyboard/top cover.



6. Swing the keyboard/top cover **(1)** up and away from the display assembly.

7. Lift the display assembly (2) up and away from the keyboard/top cover and remove the display assembly.



Reverse this procedure to install the display assembly.

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

- Turn on or restart the computer and quickly press f10.

  – or –

  Turn on or restart the computer, quickly press esc, and then press f10 when the Start menu is displayed.

Updating Setup Utility (BIOS)

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

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

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

Determining the BIOS version

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

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

- HP Support Assistant

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

   – or –

   Select the question mark icon in the taskbar.
2. Select **My notebook**, and then select **Specifications**.

- Setup Utility (BIOS)

1. Start Setup Utility (BIOS).
2. Select **Main**, and then make note of the BIOS version.
3. Select **Exit**, select one of the options, and then follow the on-screen instructions.

- In Windows, press CTRL+Alt+S.

To check for later BIOS versions, see Downloading a BIOS update on page 53.

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 the computer is connected to a network, consult the network administrator before installing any software updates, especially system BIOS updates.

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

   – or –

   Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:

   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on the computer. If the update is more recent than the BIOS version, make a note of the date, name, or other identifier. This information may be needed to locate the update later, after it has been downloaded to the computer.

   b. Follow the on-screen instructions to download the BIOS selection. Make a note of the path to the computer location where the BIOS update is downloaded. This path will need to be accessed when installing the update.

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select the storage designation. The storage designation is typically Local Disk (C:).
3. Using the storage path 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, the downloaded BIOS file can be deleted from the computer.

7 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first first first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 55.

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Help and Support or HP Support Assistant.

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:
   a. Select the **Start** button, and then select **HP Help and Support**:
   b. Right-click **HP PC Hardware Diagnostics Windows**, select **More**, and then select **Run as administrator**.

   – or –

   To access HP PC Hardware Diagnostics Windows from HP Support Assistant:
   a. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

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

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

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. The screen displays one of the following options:

- A Failure ID link is displayed. Select the link and follow the on-screen instructions.
- A Quick Response (QR) code is displayed. With a mobile device, scan the code and then follow the on-screen instructions.
- Instructions for calling support are displayed. Follow those instructions.

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags.

   The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics Windows**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

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

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

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

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

The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

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

▲ Navigate to the folder on your computer or the USB flash drive where the .exe file was downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 57.

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

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

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

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

  – or –

  Contact support, and provide the Failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

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

1. Turn on or restart the computer, and quickly press esc.
2. Press f2.

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

   a. Connected USB flash drive

      NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 57.

   b. Hard drive

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags.

   The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

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

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

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

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

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

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

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags.

   The HP PC Diagnostics home page is displayed.

2. Select **Download Remote Diagnostics**, and then select **Run**.

Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number

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

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

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

Using the Remote HP PC Hardware Diagnostics setting in Computer Setup (BIOS), you can perform the following customizations:

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password settings used for uploads.
- Display status information about the diagnostics run previously.

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

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

Your changes take effect when the computer restarts.

8 Backing up, restoring, and recovering

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

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see Using Windows tools on page 60).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 60).
- **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 60).
- **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 60).

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

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

Backing up information and creating recovery media

Using Windows tools

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

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

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

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

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

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

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

You can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive.

To download the tool:

▲ Go to the Microsoft Store and search for HP Cloud Recovery.

For details, go to http://www.hp.com/ support, search for HP Cloud Recovery, and then select “HP PCs -- Using the Cloud Recovery Tool (Windows 10,7).”

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

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see Using Windows tools on page 60.

Recovering using HP Recovery media

HP Recovery media is used to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 60.

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

To recover your system:

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

Changing the computer boot order

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

To change the boot order:

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

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

   For computers or tablets with keyboards attached:

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

   For tablets without keyboards:

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

     – or –

     Turn on or restart the tablet, quickly hold down the volume down button, and then select f9.
3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

9 Specifications

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 100–240 V, 50–60 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.

	Metric	U.S.
Dimensions		
Width	30.6 cm	12.1 in
Depth	21.2 cm	8.4 in
Height	1.5 cm	0.6 in
Weight	1.3 kg	2.9 lbs
Input power		
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 @ 3A / 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	

	Metric	U.S.
	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	
	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.		

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

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.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.

Country/region	Accredited agency	Applicable note number

3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm² or 1.25 mm² 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 mm² 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 mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm² 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 mm² or 1.00 mm2 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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