Maintenance and Service Guide

SUMMARY

This guide provides information about spare parts, removal and replacement of parts, security, backing up, and more.

Product notice

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

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

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

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.

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1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP ENVY x360 13 Convertible PC
	Model number: 13-bd0xxx
	CTO model number: 13T-bd000
Processors	● Intel™ Core® i7-1165G7 2.8 GHz (SC turbo up to 4.7 GHz) processor (3200 MHz front side bus (FSB), 8 cores, 12 MB L3 cache, 28 W)
	● Intel Core i5-1135G7 2.4 GHz (SC turbo up to 4.2 GHz) processor (3200 MHz front side bus (FSB), 4 cores, 8 MB L3 cache, 28 W)
	● Intel Core i3-1115G4 3.0 GHz (SC turbo up to 4.1 GHz) processor (3200 MHz front side bus (FSB), 2 cores, 8 MB L3 cache, 28 W)
Chipset	Intel integrated soldered-on-circuit (SoC)
Graphics controller	Intel Iris® Xe on computer models equipped with an Intel Core i7 or Intel Core i5 processor
	Intel UHD Integrated Graphics on computer models equipped with an Intel Core i3 processor
Display	● 33.8 cm (13.3 in), liquid crystal display (LCD), full high-definition (FHD) (1920×1080), BrightView, white light-emitting diode (WLED), UWVA, 72%, eDP 1.4+PSR2 bent, touchscreen display panel with privacy screen and narrow bezel; typical brightness: 1000 nits
	● 33.8 cm (13.3 in), LCD, FHD (1920×1080), BrightView, WLED, UWVA, sRGB 100%, eDP 1.4+PSR2 bent, touchscreen display panel with narrow bezel; typical brightness: 400 nits
	● 33.8 cm (13.3 in), LCD, FHD (1920×1080), BrightView, organic light-emitting diode (OLED), active-matrix organic light-emitting diode (AMOLED), UWVA, DCI-P3 100%, eDP 1.4+PSR bent, touchscreen display panel with narrow bezel; typical brightness: 400 nits
Memory	DDR4-3200 dual-channel support. No support for 32-bit operating system and Windows® 7 Home Basic.
	Supports 16 GB (3200 DDR4 1.2v IC, 16 GB × 16 × 8 pieces) and 8 GB (3200 DDR4 1.2v IC, 8 GB × 16 × 8 pieces) configurations

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

Category	Description
Primary storage	• 1 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC • 1 TB, M.2 2280, PCIe, NVMe, value solid-state drive • 512 GB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC • 512 GB, M.2 2280, PCIe, NVMe, value solid-state drive • 256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC • 256 GB, M.2 2280, PCIe, NVMe, value solid-state drive • 1 TB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive • 512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive
Connectors	• Audio-out (headphone)/Audio-in (microphone) combo jack • Next generation form factor (NGFF) connector for solid-state drive • Power connector • USB Type-A ports (2) • USB Type-C® Thunderbolt® port with HP Sleep and Charge
Audio and video	Integrated, one-piece, fixed, HD 720p camera with shutter • BANG and OLUFSEN • Dual speakers • Support for HP Audio Boost 2.0 • Support for Speaker Swap • Dual-array microphone • Support for Alexa • Support for Far Field Cortana • Support for XiaoWei
Wireless	Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth® 5.0 MU-MIMO M.2 1216 non-vPro® 160 MHz MIPI+BRI WW with two antennas
Keyboard/pointing devices	Standard notebook island-style backlit keyboard with clickpad with image sensor in pale gold finish
Power requirements	**Battery:** 3 cell, 51 WHr 65 W AC adapter (non-PFC, slim barrel, 4.5 mm, 1.8 m) 65 W HP Smart Adapter (non-PFC, RC, EM, 4.5 mm) C5 premium power cord, 1.0 m, with tag
Security	Integrated Secure Payment fingerprint reader Trusted Platform Module (TPM) 2.0 - Firmware

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

Category	Description
Sensors	● Accelerometer + Gyroscope + eCompass
	● Accelerometer × 2
	● Infrared thermal sensor
	● Sensor hub
Operating system	● Windows 10 Home 64
	● Windows 10 Home 64 High-End Chinese Market CPPP
	● Windows 10 Home 64 Plus
	● Windows 10 Home 64 Plus Single Language
	● Windows 10 Home 64 Plus Single Language APAC EM PPP
	● Windows 10 Home 64 Plus Single Language India Market PPP
	● Windows 10 Home 64 Plus Single Language Indonesia Market PPP
Serviceability	**End user replaceable part**: AC adapter

2 Components

Left side

Identify the components on the left side of the computer.

Table 2-1 Left-side components and their descriptions

Component		Description
(1)	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: ▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.

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

Component		Description
(2)	USB port	Connects a USB device, provides data transfer, and (for select products) charges small devices when the computer is on or in Sleep mode.
(3)	USB Type-C® Thunderbolt™ port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort™ output. NOTE: Your computer might also support a Thunderbolt docking station. NOTE: Cables, adapters, or both (purchased separately) might be required.

Rear

Identify the rear component.

Table 2-2 Rear component and its description

Component	Description
Vents	Enable 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.

Right side

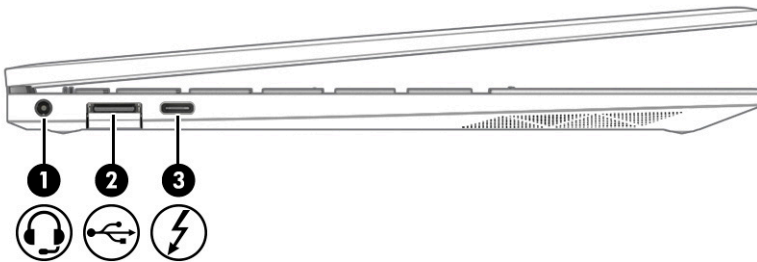Identify the components on the right side of the computer.
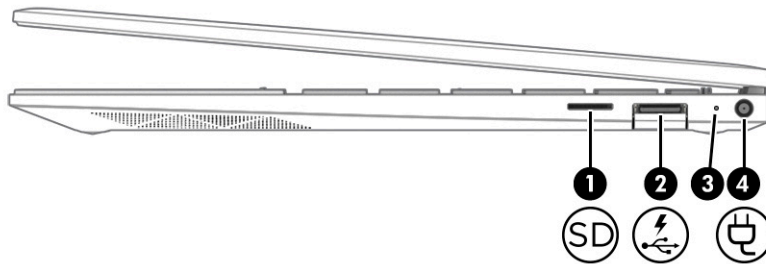
Table 2-3 Right-side components and their descriptions

Component		Description
(1)	SD microSD™ 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.
(2)	USB port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off.
(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.
(4)	Power connector	Connects an AC adapter.

Button and fingerprint reader

Identify the computer button and fingerprint reader.
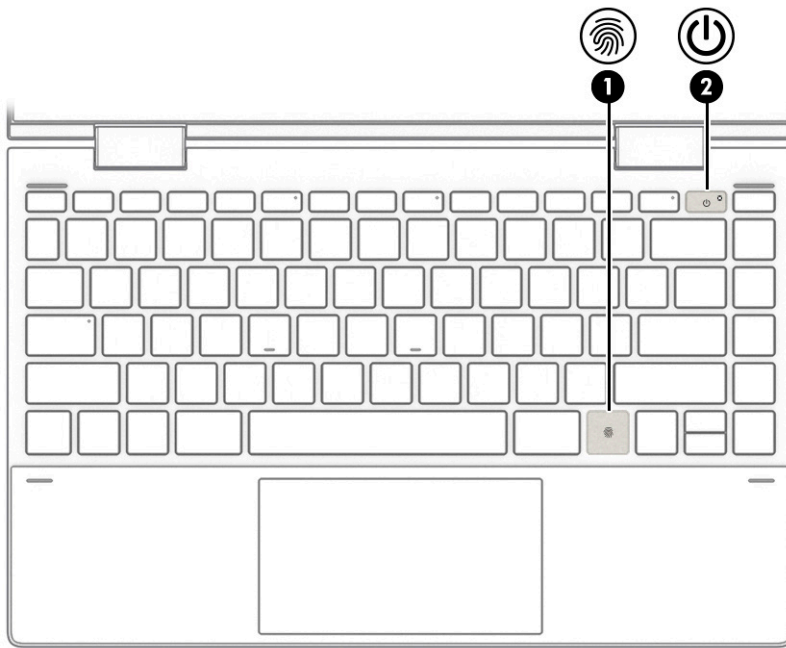
Table 2-4 Button and fingerprint reader and their descriptions

Component		Description
(1)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon.
		▲ Touch your finger to the fingerprint reader.
		IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.
(2)	Power button	● When the computer is off, press the button briefly to turn on the computer.
		● When the computer is on, press the button briefly to initiate Sleep.
		● When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).
		● When the computer is in Hibernation, press the button briefly to exit Hibernation.
		IMPORTANT: 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 10 seconds to turn off the computer.
		To learn more about your power settings, see your power options:
		▲ Right-click the **Power** icon ▬▬ , and then select **Power Options**.

Touchpad components

Identify the touchpad components.
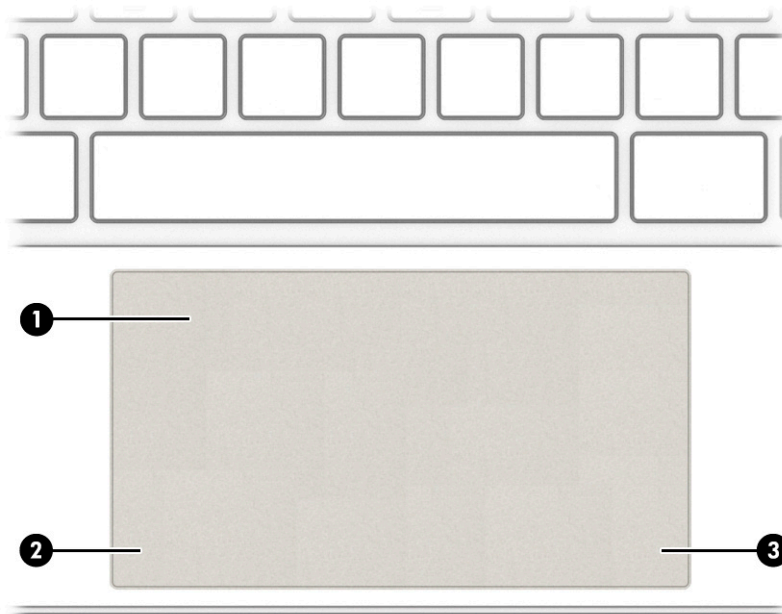
Table 2-5 Touchpad components and their descriptions

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

Special keys

Identify the special keys.

Table 2-6 Special keys and their descriptions

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4)	Action keys	Execute frequently used system functions as defined by the icon symbols on f1 through f12 function keys.
(5)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon. ▲ Touch your finger to the fingerprint reader. IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.

Table 2-6 Special keys and their descriptions (continued)

Component		Description
(6)	Camera privacy key	Turns the camera off and on.
(7)	Power button	• When the computer is off, press the button briefly to turn on the computer.
		• When the computer is on, press the button briefly to initiate Sleep.
		• When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).
		• When the computer is in Hibernation, press the button briefly to exit Hibernation.
		IMPORTANT: 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 10 seconds to turn off the computer.
		To learn more about your power settings, see your power options:
		▲ Right-click the **Power** icon , and then select **Power Options**.

Lights

Identify the lights on the computer.
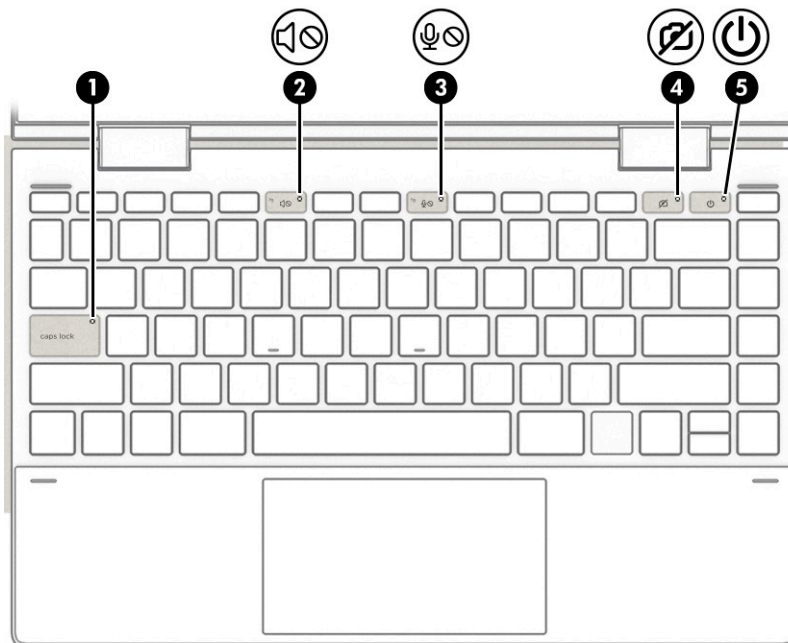
Table 2-7 Lights and their descriptions

Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Mute light	- On: Computer sound is off. - Off: Computer sound is on.
(3)	Microphone mute light	- On: Microphone is off. - Off: Microphone is on.
(4)	Camera privacy light	- On. The camera is off. - Off. The camera is on.
(5)	Power light	- On: The computer is on. - Blinking (select products only): The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unnecessary components. - Off: Depending on your computer model, the computer is off, in Hibernation, or in Sleep. Hibernation is the power-saving state that uses the least amount of power.

Bottom

Identify the bottom components.
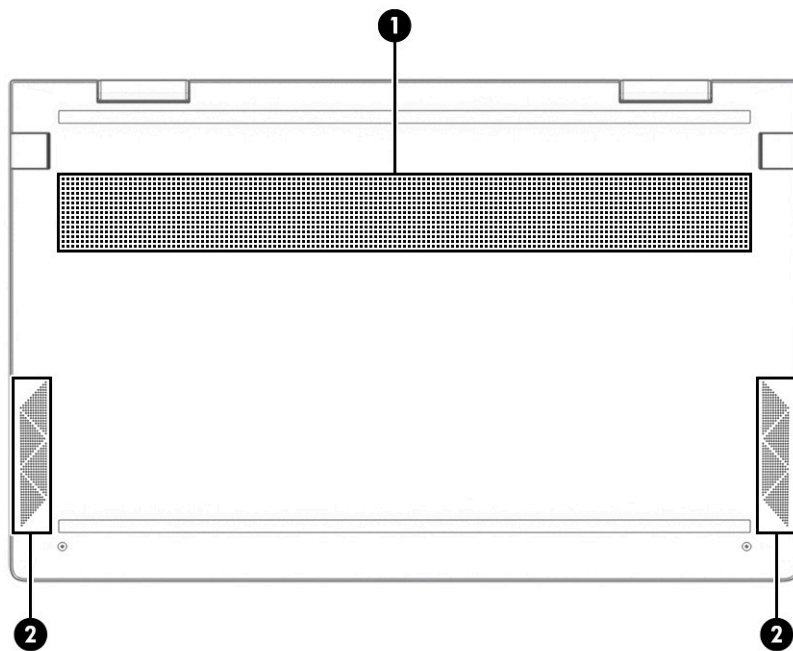
Table 2-8 Bottom components and their descriptions

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

Labels

Use the illustration and table to identify the label location and components.

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

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

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

Your service label will resemble one of the following examples. Refer to the illustration that most closely matches the service label on your computer.
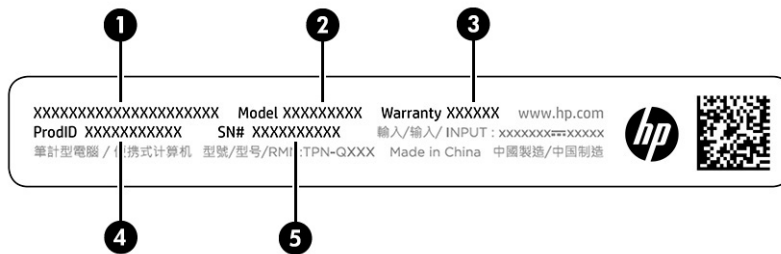
Table 2-9 Service label components and their descriptions

Component	
(1)	HP product name
(2)	Model name
(3)	Warranty period
(4)	Product ID
(5)	Serial number
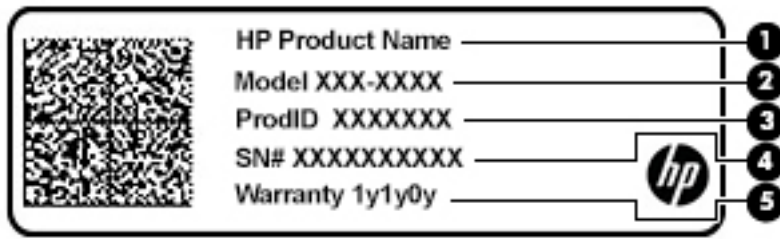
Table 2-10 Service label components and their descriptions

Component	
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period
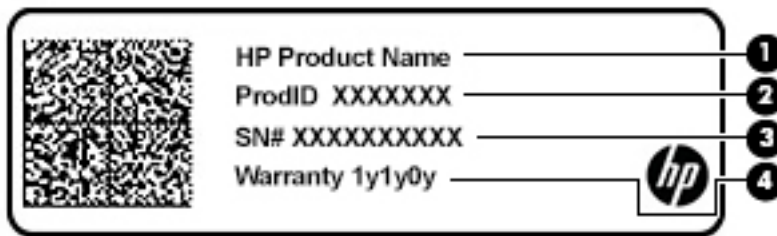
Table 2-11 Service label components and their descriptions

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

3   Illustrated parts catalog

Use this table to determine the spare parts that are available for the computer.

Computer major components

To identify the computer major components, use this illustration and table.

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

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.
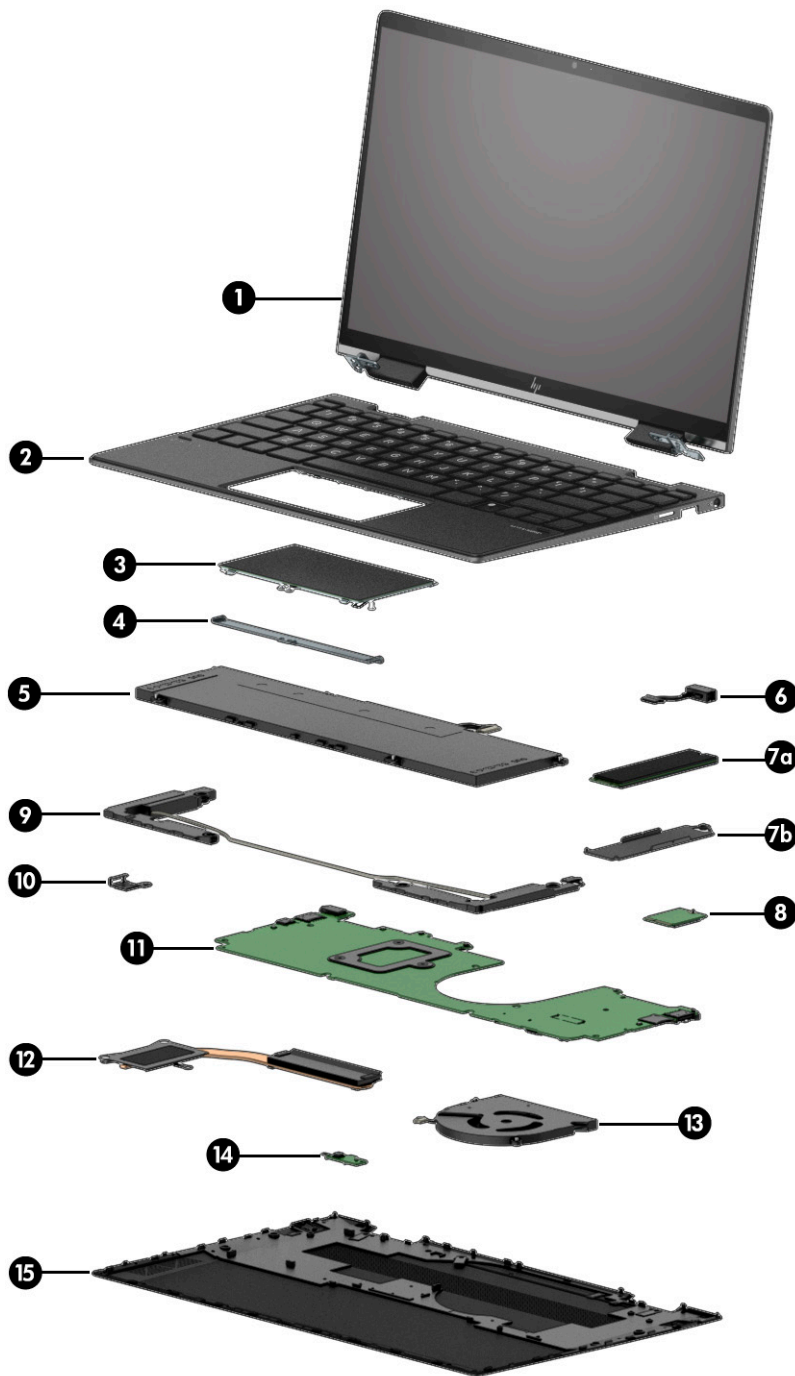
Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**33.8 cm (13.3 in) display assembly:** The display assembly is available as spare parts at the subcomponent level only. For more display assembly spare part information, see Display assembly subcomponents on page 18.	
(2)	**Keyboard with backlight and privacy shield** (includes backlight cable and keyboard cable):	
	For use in Japan	M15290-291
	For use in South Korea	M15290-AD1

Item	Component	Spare part number
	For use in Taiwan	M15290-AB1
	For use in Thailand	M15290-281
	For use in the United States	M15290-001
	Keyboard with backlight (includes backlight cable and keyboard cable):	
	For use in Japan	M15291-291
	For use in South Korea	M15291-AD1
	For use in Taiwan	M15291-AB1
	For use in Thailand	M15291-281
	For use in the United States	M15291-001
(3)	**Touchpad**	M15279-001
	NOTE: The touchpad spare part kit does not include the touchpad bracket or touchpad cable. The touchpad bracket is not available as a spare part. The touchpad cable is available using spare part number L94509-001.	
	Touchpad cable (not illustrated)	L94509-001
(4)	**Touchpad bracket** (not available as a spare part)	
(5)	**Battery** (3 cell, 51 Whr)	L77034-005
(6)	**Power connector cable**	L94512-001
(7a)	**Solid-state drive:**	
	1 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85348-005
	1 TB, M.2 2280, PCIe, NVMe, value solid-state drive	L85370-005
	512 GB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85360-005
	512 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85364-005
	256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
	256 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85354-005
	1 TB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85374-005
	512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85366-005
(7b)	**Solid-state drive shield** (not available as a spare part)	
(8)	**Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth 5.0 MU–MIMO M.2 1216 non–vPro 160 MHz MIPI+BRI WW with 2 antennas WLAN module**	TBD-001
	Shield Kit (not illustrated, includes WLAN module shield)	L98315-001
(9)	**Speakers** (includes left and right speakers, cables, and four rubber isolators)	L94513-001
(10)	**I/O bracket** (not available as a spare part)	
(11)	**System board** (includes the processor, a graphics subsystem with UMA memory, onboard system memory, and replacement thermal material):	
	Equipped with an Intel Core i7-1165G7 processor, 16 GB of system memory, and the Windows 10 operating system	M15288-601

Item	Component	Spare part number
	Equipped with an Intel Core i7-1165G7 processor, 16 GB of system memory, and a non-Windows operating system	M15288-001
	Equipped with an Intel Core i7-1165G7 processor, 8 GB of system memory, and the Windows 10 operating system	M15289-601
	Equipped with an Intel Core i7-1165G7 processor, 8 GB of system memory, and a non-Windows operating system	M15289-001
	Equipped with an Intel Core i5-1135G7 processor, 8 GB of system memory, and the Windows 10 operating system	M15287-601
	Equipped with an Intel Core i5-1135G7 processor, 8 GB of system memory, and a non-Windows operating system	M15287-001
	Equipped with an Intel Core i3-1115G4 processor, 8 GB of system memory, and the Windows 10 operating system	M15286-601
	Equipped with an Intel Core i3-1115G4 processor, 8 GB of system memory, and a non-Windows operating system	M15286-001
(12)	**Heat sink** (includes replacement thermal material)	M16591-001
(13)	**Fan** (includes cable)	L94511-001
(13)	**Infrared board** NOTE: The infrared board spare part kit does not include the infrared board cable. The I/O cable is available using spare part number L94507-001.	L94506-001
(14)	**Infrared board cable** (not illustrated)	L94507-001
(15)	**Bottom cover**	M15277-001
	Bottom Cover Adhesive Kit (not illustrated)	M11730-001
	Rubber Feet Kit (not illustrated)	M15284-001
	USB port cover (not illustrated)	M15280-001

Display assembly subcomponents

To identify the display assembly subcomponents, use this illustration and table.
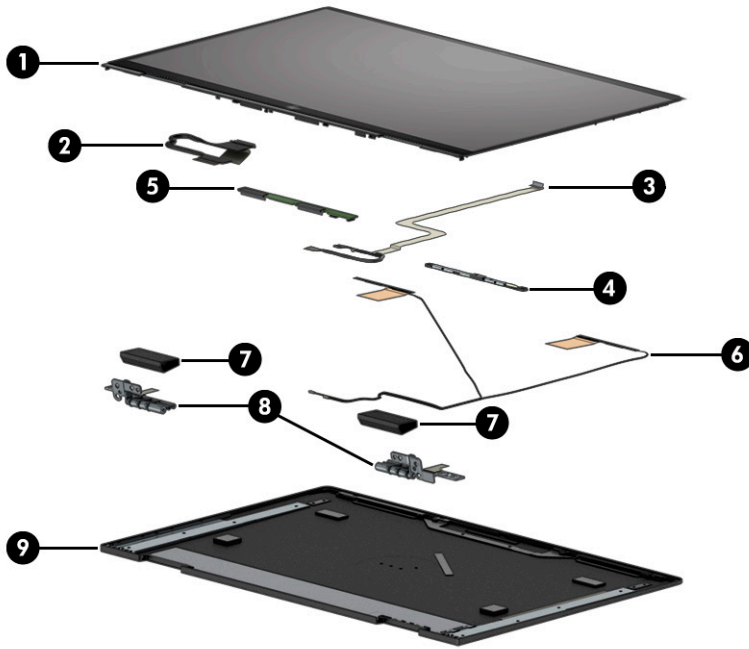
Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	**Display panel assembly** (includes display bezel and display panel):	
	13.3 in, FHD, 1000 nit touchscreen display panel assembly with a privacy filter	M15283-001
	13.3 in, FHD, 400 nit touchscreen display panel assembly	M15282-001
(2)	**Display panel cable:**	
	For use only on computer models equipped with display panel assembly with spare part number M15283-001	L94502-001
	For use only on computer models equipped with display panel assembly with spare part number M15282-001	L94501-001
(3)	**Touch control board cable** (includes webcam/microphone module cable and double-sided adhesive)	L94500-001
(4)	**Webcam/microphone module** (includes double-sided adhesive)	L94505-001
(5)	**Touch control board** (includes double-sided adhesive)	L94497-001
(6)	**Wireless Antenna Kit** (includes antenna cables and transceivers)	L94503-001
(7)	**Display hinge covers** (2, includes left and right hinge covers)	M15278-001
(8)	**Display hinges** (2, includes left and right hinges)	L94499-001
(9)	**Display back cover**	M15276-001

Mass storage devices

To identify the mass storage devices, use this illustration and table.

Table 3-3 Mass storage device descriptions and part numbers

Item	Component	Spare part number
	Solid-state drive:	
	1 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85348-005
	1 TB, M.2 2280, PCIe, NVMe, value solid-state drive	L85370-005
	512 GB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85360-005
	512 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85364-005
	256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
	256 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85354-005
	1 TB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85374-005
	512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85366-005
	Solid-state drive shield (not available as a spare part)	

Cables

To identify the cables, use this illustration and table.

Table 3-4 Cable descriptions and part numbers

Item	Component	Spare part number
(1)	Touchpad cable	L94509-001
(2)	Power connector cable	L94512-001
(3)	Infrared board cable	

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-5 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapter:	
65 W HP Smart Adapter (non-PFC, RC, EM, 4.5 mm)	913691-850
65 W AC adapter (non-PFC, slim barrel, 4.5 mm, 1.8 m)	L24008-001
C5 duck head adapter for use only in Japan	226768-001
Adapter:	
HP USB–to–Gigabit RJ45 adapter	829941-001
	935325-001
	855560-001

Table 3-5 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
HP USB Type–C–to–VGA adapter	831751-001
HP USB External DVDRW Drive	747080-001
Hub:	
HP Elite USB-C MultiPort hub	L39572-001
HP USB Type–C–to–MultiPort hub	919666-001
HP USB Type–C–to–USB Type-A hub	916838-001
Pen:	
Sunwoda active pen stylus in natural silver finish	910942-001
Zenvo pen in natural silver finish (includes cable)	L95614-001
Power cord (C5, 1.0 m, premium with sticker):	
For use in Australia	L22327-001
For use in Europe	L22321-001
For use in India	L22624-001
For use in Japan	L22330-001
For use in North America	L22319-001
For use in the People's Republic of China	
For use in South Korea	L22328-001
For use in Taiwan	L22329-001
For use in Thailand	L22326-001
For use in the United Kingdom	L22320-001
Screw Kit	M15285-001
USB Type–C–to–USB Type-A dongleUSB Type–C–to–USB Type-A dongle	833960-001

4 Removal and replacement procedures preliminary requirements

Use this information to properly prepare to disassemble and reassemble the computer.

Tools required

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

- Tweezers
- Case utility tool or similar thin, non-marking, plastic tool
- Flat-bladed screwdriver
- Magnetic Phillips P0 and P1 screwdrivers
- Suction cups

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

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

Cables and connectors

Handle cables with extreme care to avoid damage.

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

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 so that they cannot be caught or snagged as you remove or replace parts. Handle flex cables with extreme care; these cables tear easily.

Drive handling

Note the following guidelines when handling drives.

📝 **IMPORTANT:** Drives are fragile components. Handle them with care. To prevent damage to the computer, damage to a drive, or loss of information, observe these precautions:

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

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

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

Handle drives on surfaces covered with at least 2.54 cm (1 inch) of shock-proof foam.

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.

- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

- Use conductive field service tools, such as cutters, screw drivers, and vacuums.

- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.

- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.

- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

- Avoid contact with pins, leads, or circuitry.

- Turn off power and input signals before inserting or removing connectors or test equipment.

Electrostatic discharge information

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) might not appear to be affected at all and can work perfectly throughout a normal cycle. The device might function normally for a while, but it has been degraded in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

IMPORTANT: To prevent damage to the device when you remove or install 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 Personal grounding methods and equipment on page 27.

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

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

Generating static electricity

Follow these static electricity guidelines.

- Different activities generate different amounts of static electricity.

- Static electricity increases as humidity decreases.

Table 4-1 Static electricity occurrence based on activity and humidity

Event	Relative humidity		
	55%	40%	10%
Walking across carpet	7,500 V	15,000 V	35,000 V
Walking across vinyl floor	3,000 V	5,000 V	12,000 V
Motions of bench worker	400 V	800 V	6,000 V
Removing DIPs (dual in-line packages) from plastic tube	400 V	700 V	2,000 V
Removing DIPs from vinyl tray	2,000 V	4,000 V	11,500 V
Removing DIPs from polystyrene foam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB (printed circuit board)	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V
Multiple electric components can be packaged together in plastic tubes, trays, or polystyrene foam.			

NOTE: As little as 700 V can degrade a product.

Preventing electrostatic damage to equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following packaging and grounding precautions are necessary to prevent static electricity damage to electronic components.

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.

- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.

- Place items on a grounded surface before removing them from their container.

- Always be properly grounded when touching a sensitive component or assembly.

- Avoid contact with pins, leads, or circuitry.

- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

Using certain equipment can prevent static electricity damage to electronic components.

- **Wrist straps** are flexible straps with a maximum of 1 MΩ ±10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.

- **Heel straps/Toe straps/Boot straps** can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of 1 MΩ ±10% resistance between the operator and ground.

Table 4-2 Static shielding protection levels

Static shielding protection levels	
Method	Voltage
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the work area

To prevent static damage at the work area, follow these precautions.

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.

- Use static-dissipative mats, foot straps, or air ionizers to give added protection.

- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.

- Turn off power and input signals before inserting and removing connectors or test equipment.

- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.

- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and polystyrene foam.

- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity.

- Antistatic tape

- Antistatic smocks, aprons, or sleeve protectors

- Conductive bins and other assembly or soldering aids

- Conductive foam

- Conductive tabletop workstations with ground cord of 1 MΩ ±10% resistance

- Static-dissipative table or floor mats with hard tie to ground

- Field service kits

- Static awareness labels

- Wrist straps and footwear straps providing 1 MΩ ±10% resistance

- Material handling packages

- Conductive plastic bags

- Conductive plastic tubes

- Conductive tote boxes

- Opaque shielding bags

- Transparent metallized shielding bags

- Transparent shielding tubes

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment.

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.

- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.

- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.

- Place items on a grounded surface before removing items from their containers.

- Always be properly grounded when touching a component or assembly.

- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.

- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

5 Removal and replacement procedures for authorized service provider parts

This chapter provides removal and replacement procedures for authorized service provider parts.

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

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.

Component replacement procedures

To remove and replace computer components, use these procedures.

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

You must remove, replace, or loosen as many as 45 screws when you service the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

Bottom cover

To remove the bottom cover, use this procedure and illustration.

Table 5-1 Bottom cover description and part number

Description	Spare part number
Bottom cover	M15277-001

Before removing the bottom cover, prepare the computer for disassembly (Preparation for disassembly on page 33).

Remove the bottom cover:

1. Close the computer and position it upside down with the front toward you.

2. Remove the rear rubber foot strip **(1)**.

   The rear rubber foot strip is available using spare part numbers M15284-001.

3. Remove the three Phillips M2.5×5.3 screws **(2)** and the two Torx5 M2.0×2.7 screws **(3)** that secure the bottom cover to the keyboard/top cover.
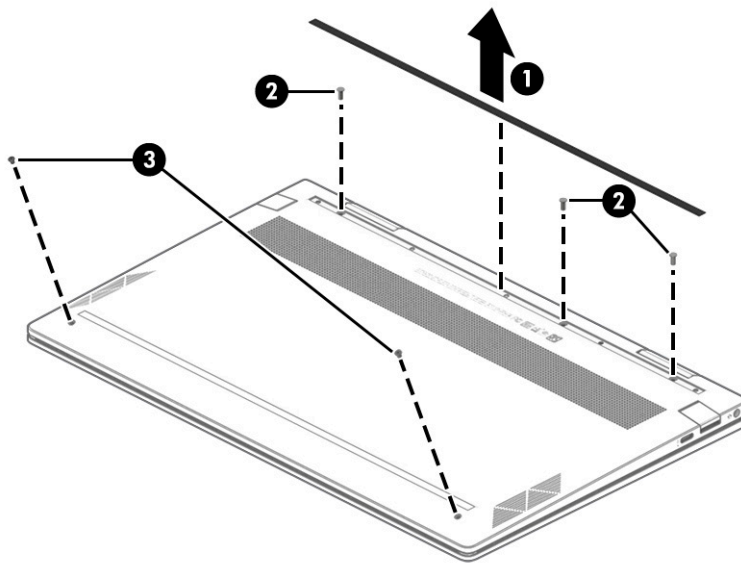
4. Use a case utility tool or similar thin plastic tool **(1)** to separate the front edge of the bottom cover **(2)** from the keyboard/top cover.

5. Remove the bottom cover **(3)**.

To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 Battery description and part number
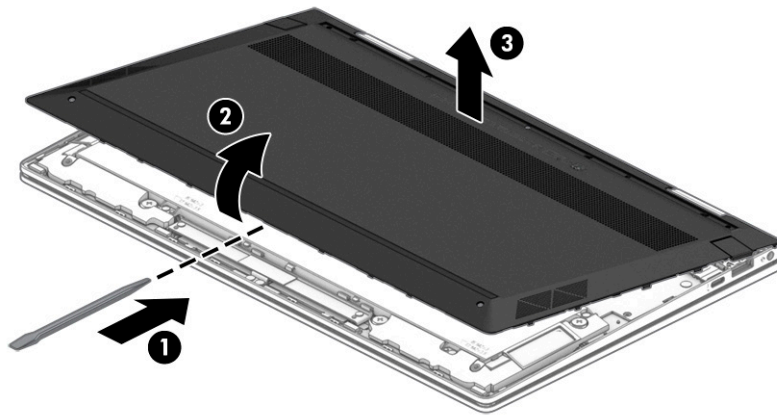
Description	Spare part number
3 cell, 51 Whr battery	L77034-005

⚠ **WARNING!**   To avoid personal injury and damage to the product:

●   Do *not* puncture, twist, or crack the battery.

●   Do *not* cause an external puncture or rupture to the battery. They can cause a short inside the battery, which can result in battery thermal runaway.

●   Do *not* handle or touch the battery enclosure with sharp objects such as tweezers or pliers, which might puncture the battery.

●   Do *not* compress or squeeze the battery case with tools or heavy objects stacked on top of the case. These actions can apply undue force on the battery.

●   Do *not* touch the connectors with any metallic surface or object, such as metal tools, screws, or coins, which can cause shorting across the connectors.

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ().

2. Remove the bottom cover ().

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

📝 **IMPORTANT:**   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 you remove the battery.

Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.

2. Remove the six Phillips M2.0×4.0 screws **(2)** that secure the battery to the keyboard/top cover.

3. Remove the battery **(3)**.
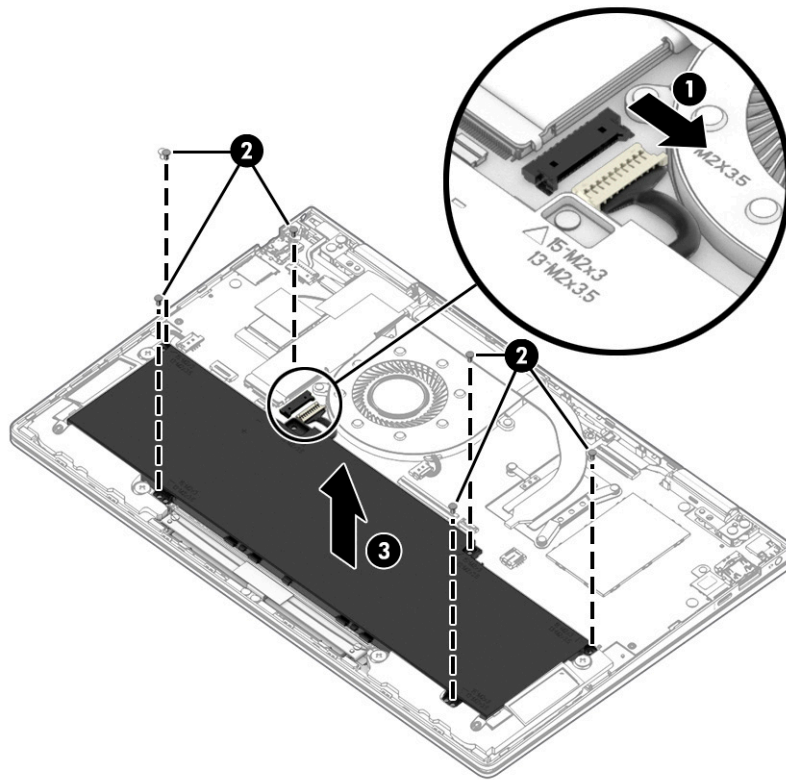
To insert the battery, reverse the removal procedures.

WLAN module

To remove the WLAN module, use this procedure and illustration.

Table 5-3 WLAN module description and part number

Description	Spare part number
Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth 5.0 MU-MIMO M.2 1216 non-vPro 160 MHz MIPI+BRI WW with 2 antennas WLAN module	TBD-001

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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

3. Disconnect the battery cable from the system board (see Battery on page 34).

Remove the WLAN module:

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

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

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

3. Remove the Phillips M2.0×3.0 screw **(3)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

4. Remove the WLAN module **(4)** by pulling the module away from the slot at an angle.

    📝 NOTE: WLAN modules are notched to prevent incorrect installation.

5. If the WLAN antenna is not connected to the terminal on the WLAN module, install a protective sleeve on the antenna connector, as shown in the following illustration.
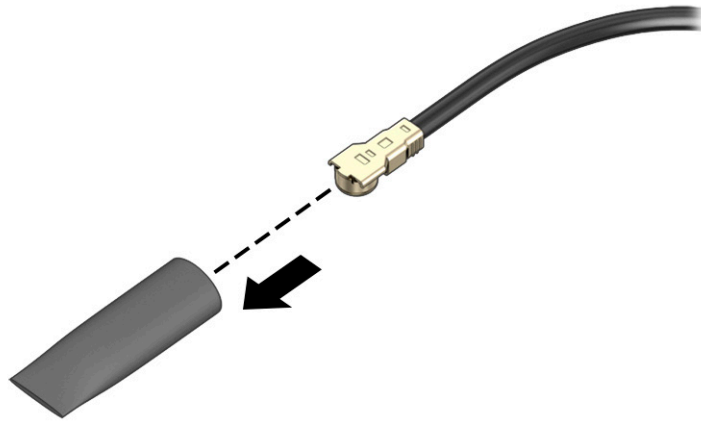
Reverse this procedure to install the WLAN module.

Solid-state drive

To remove the solid-state drive, use this procedure and illustration.

Table 5-4 Solid-state drive description and part numbers

Description	Spare part number
1 TB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85348-005
1 TB, M.2 2280, PCIe, NVMe, value solid-state drive	L85370-005
512 GB, M.2 2280, PCIe, NVMe-3×4, SS solid-state drive with TLC	L85360-005
512 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85364-005
256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
256 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85354-005
1 TB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85374-005
512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85366-005

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

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

3. Disconnect the battery cable from the system board (see Battery on page 34).

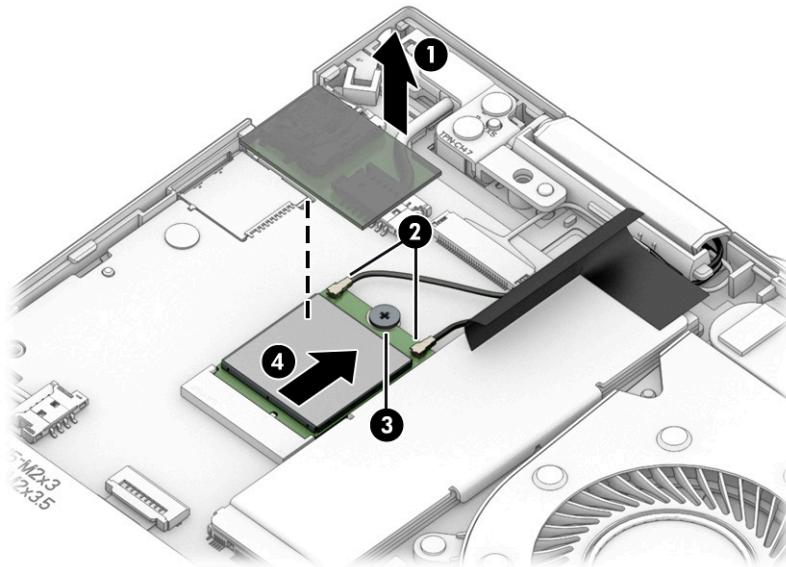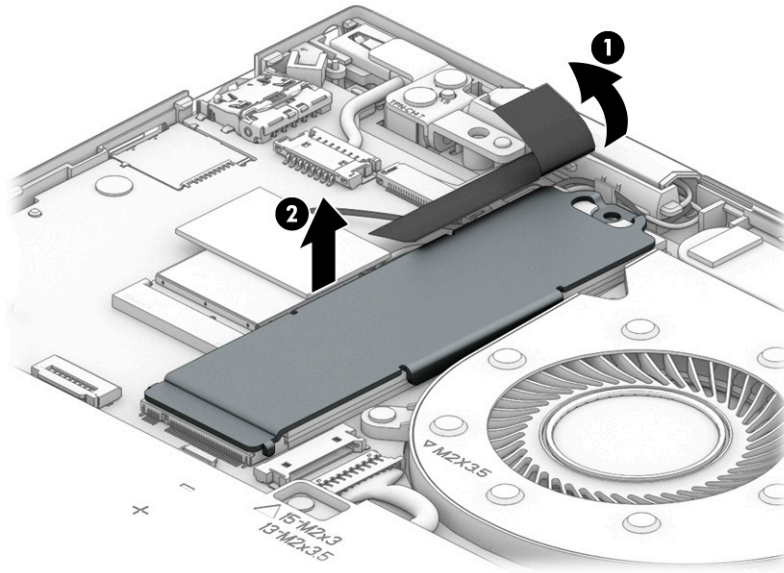Remove the solid-state drive:

1. Remove the tape **(1)** that secures the solid-state drive to the keyboard/top cover.

2. Remove the solid-state drive shield **(2)**.

3. Remove the solid-state drive by sliding it away from the slot at an angle.

Reverse this procedure to install the solid-state drive.

Fan

To remove the fan, use these procedures and illustrations.

Table 5-5 Fan description and part number

Description	Spare part number
Fan (includes cable)	L94511-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

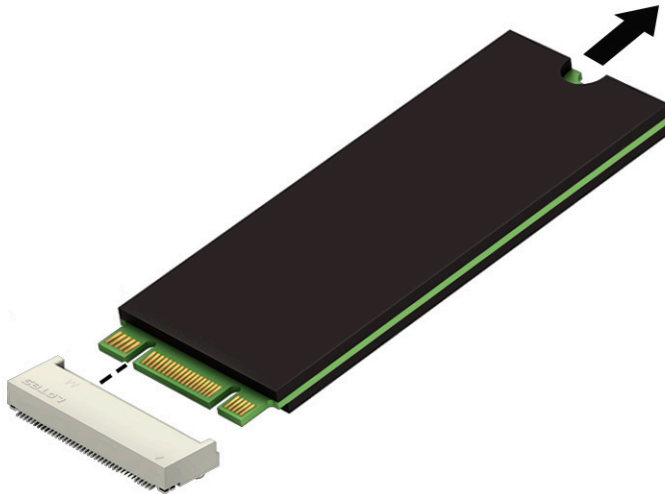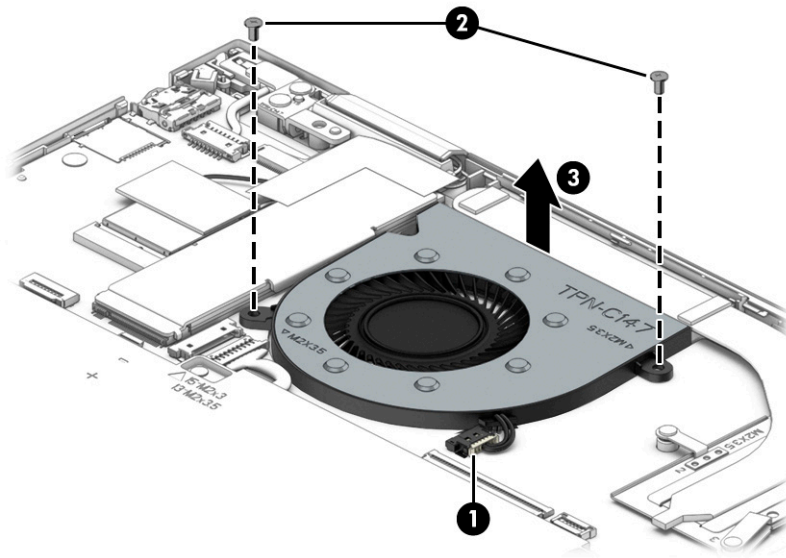3. Disconnect the battery cable from the system board (see Battery on page 34).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.

2. Remove the two Phillips M2.0×4.0 screws **(2)** that secure the fan to the system board.

3. Remove the fan **(3)**.

Reverse this procedure to install the fan.

39.6 cm (15.6 in) display assembly

To remove and disassemble the display assembly, use these procedures and illustrations.

The display assembly is available as spare parts at the subcomponent level only. See the removal section for each component for information.

Before removing the display assembly, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

3. Disconnect the battery cable from the system board (see Battery on page 34).

Remove the display assembly:

1. Release the tape **(1)** that covers the webcam/microphone module cable connector.

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

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

   The #1/Main WLAN antenna cable connects to the WLAN module **#1/Main** terminal. The #2/Aux WLAN antenna cable connects to the WLAN module **#2/Aux** terminal.

4. Release the zero insertion force (ZIF) connector **(4)** to which the webcam/microphone module cable is connected, and then disconnect the webcam/microphone module cable from the system board.

5. Release the webcam/microphone module cable and the WLAN antenna cables from the retention clip **(5)** built into the top cover.

6. Release the ZIF connector **(6)** to which the display panel cable is connected, and then disconnect the display panel cable from the system board.
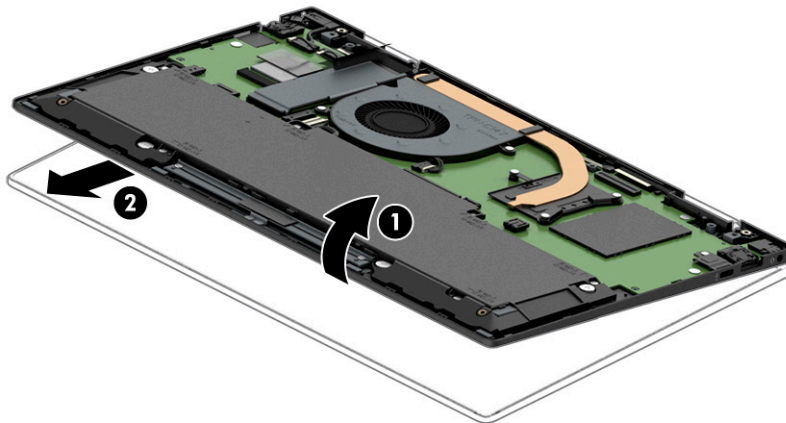
7. Release the display panel cable from the retention clip **(7)** built into the top cover.
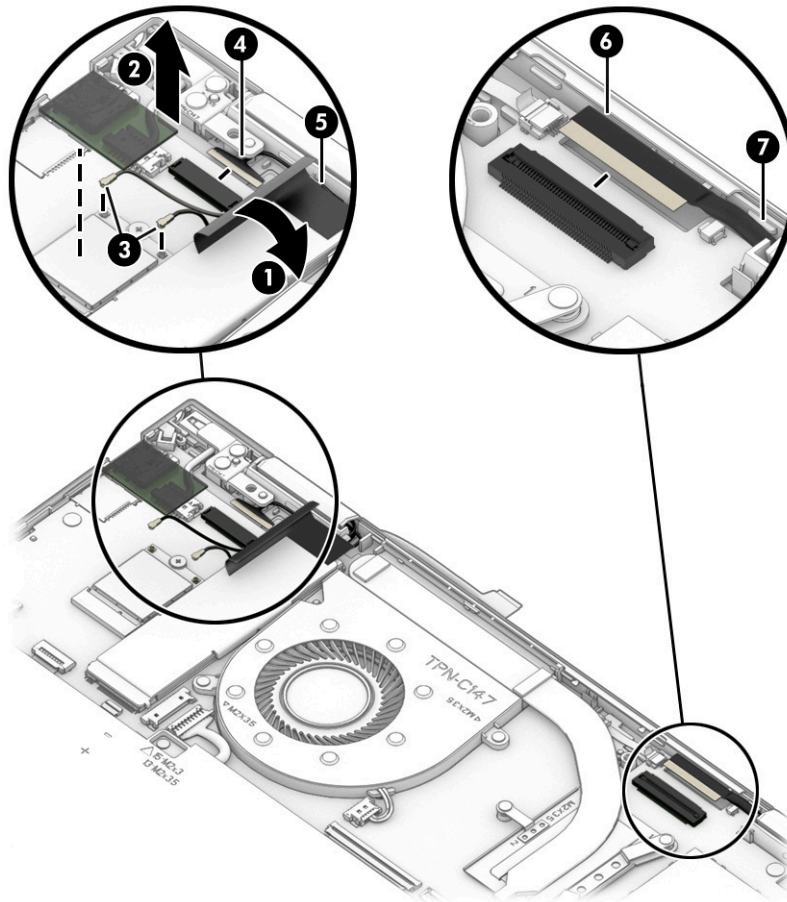
8. Remove the four Phillips M2.5 × 5.3 screws that secure the display assembly to the top cover.
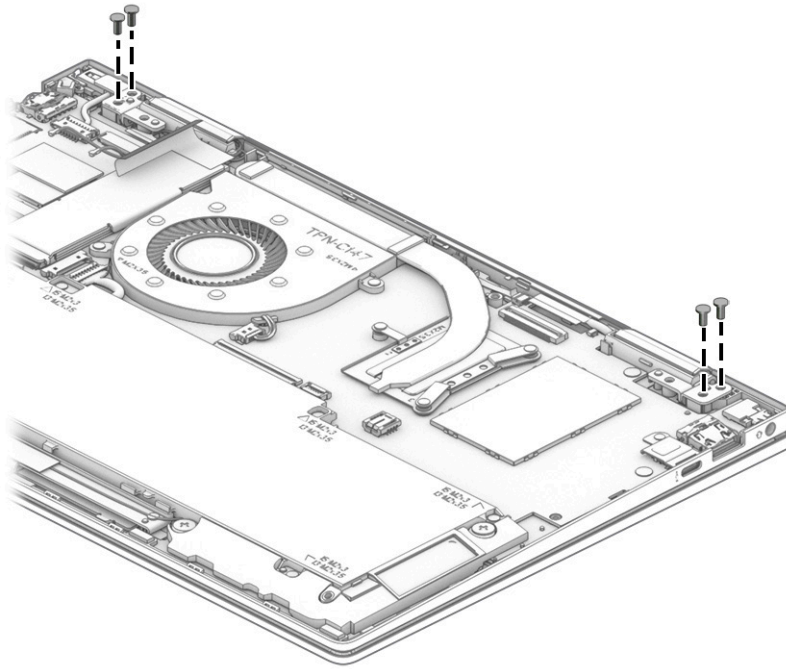
9. Swing the front edge of the top cover **(1)** up and away from the display assembly. (The top cover disengages from the display assembly hinges.)

10. Separate the top cover **(2)** from the display assembly.

11. If it is necessary to replace the display panel assembly or any of the internal display components, follow these steps:

    The display panel assembly is extremely fragile. Using excessive force can damage the panel. Use caution when removing the display panel assembly. Before positioning the display panel assembly face down, make sure the work surface is free of all foreign objects, screws, and tools. Failure to follow this caution can result in damage to the display panel surface.

    a. Position the display assembly with the panel facing down and the bottom edge of the assembly toward you.

    b. Attach two suction cups **(1)** to the display assembly as shown in the following illustration.

c. Secure the suction cups to the display assembly by swinging the handles **(2)** into position.
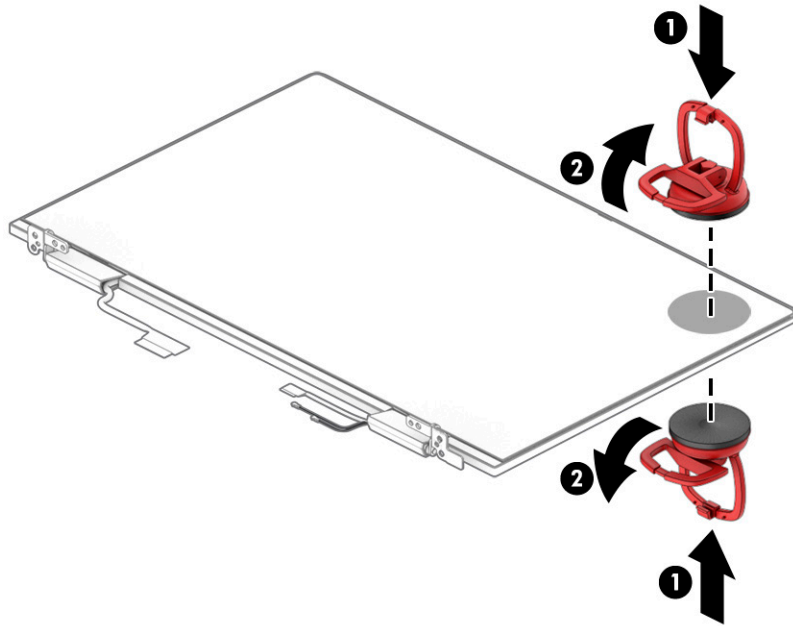
d. Position the display assembly with the panel facing up and the bottom edge of the assembly toward you.

e. Use the suction cup **(1)** to separate the top edge of the display panel assembly from the display back cover.

> **NOTE:** Slow, steady pressure is required when working with the pull-to-release tabs in substep f. Pulling too fast can result in the tabs breaking and the release action being incomplete.

f. Grasp the pull-to-release tabs **(2)** located in the top corners of the display panel assembly and pull them **(3)** as far as they will release.

g. Separate the top edge **(4)** of the display panel assembly from the display back cover.
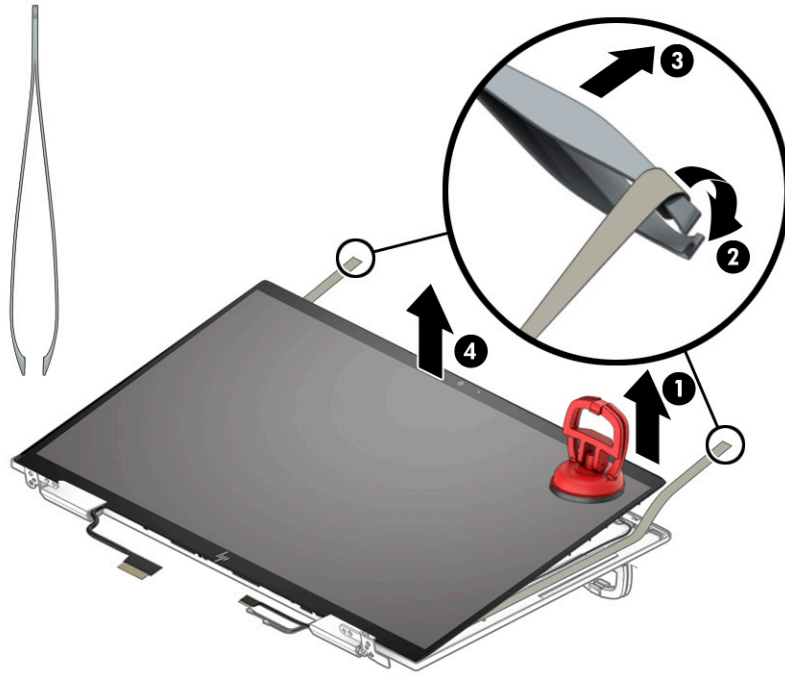
h. Release the display panel cable from the display left hinge **(1)**.

i. Release the webcam/microphone module cable and the WLAN antenna cables from the display right hinge **(2)**.

j. Remove the display panel assembly **(3)**.
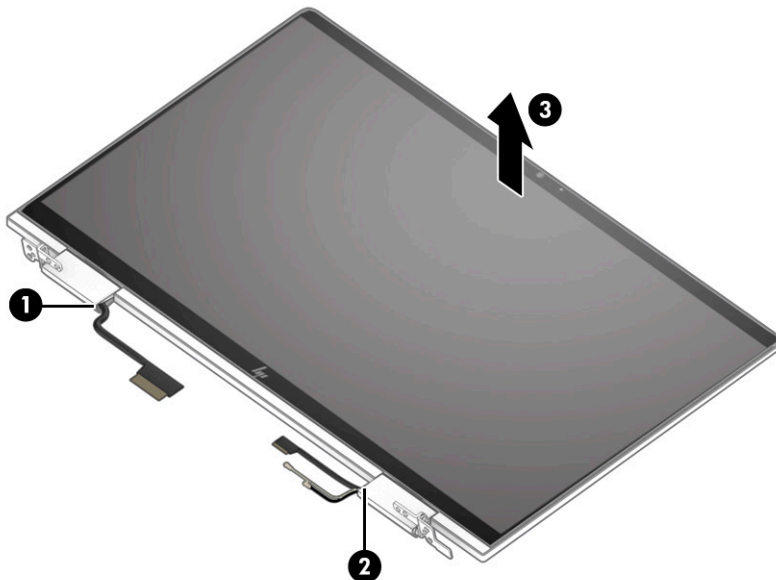
12. If it is necessary to replace the webcam/microphone module or touch control board cable, follow these steps:

a. Remove the display panel assembly.

b. Disconnect the touch control board cables from the touch control board (two locations) **(1)**.

c. Detach the touch control board cable **(2)** from the display back cover. (The touch control board cable is attached to the display back cover with double-sided adhesive.)

d. Detach the webcam/microphone module **(3)** from the display back cover. (The webcam/microphone module is attached to the display back cover with double-sided adhesive.)
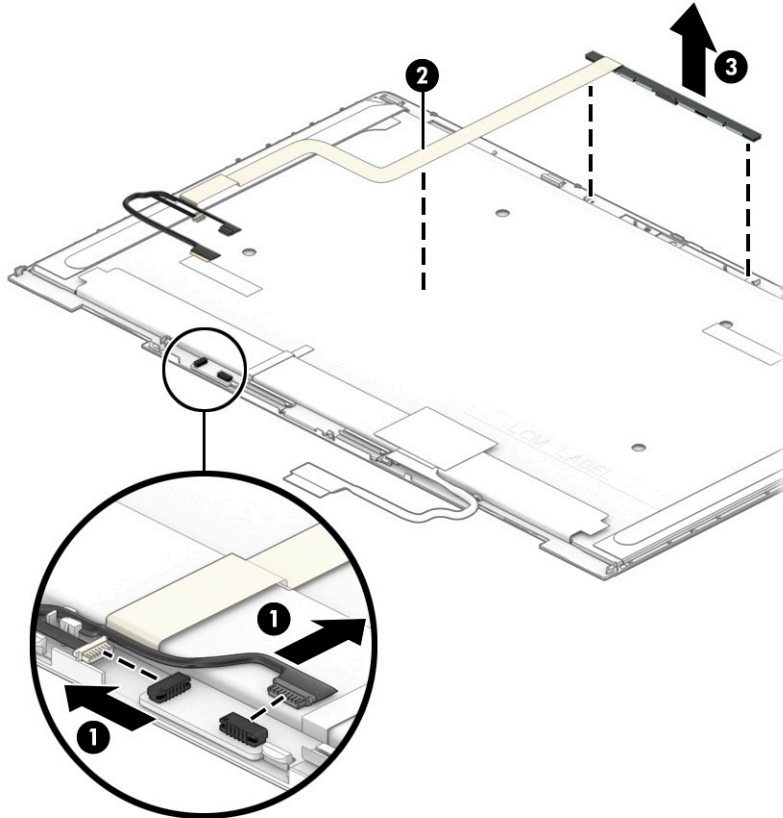
e. Remove the webcam/microphone module and touch control board cable.

f. Position the webcam/microphone module and touch control board cable with the webcam lens facing up.

g. Release the ZIF connector **(1)** to which the touch control board cable cable is connected, and then disconnect the touch control board cable **(2)** from the webcam/microphone module.

The webcam/microphone module is available using spare part number L94505-001.

The touch control board cable is available using spare part number L94500-001.
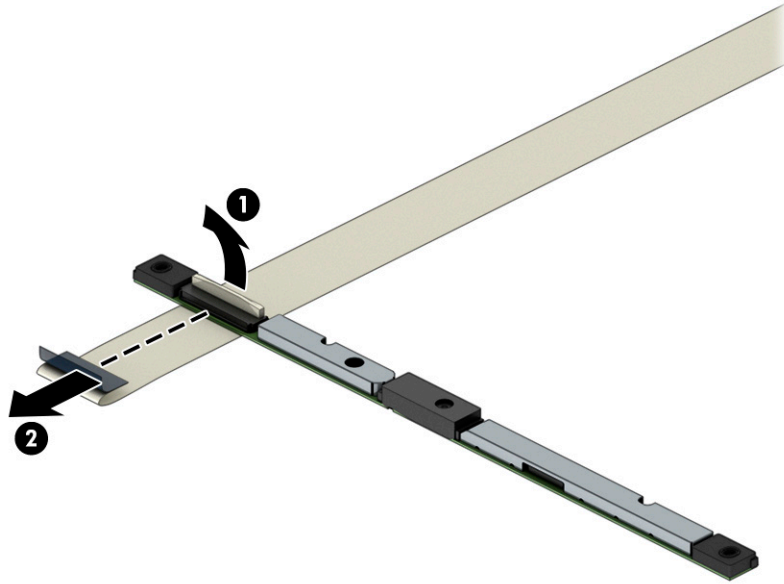
13. If it is necessary to replace the touch control board, follow these steps:

   a. Remove the display panel assembly.

   b. Disconnect the webcam/microphone module cables **(1)** and **(2)** from the touch control board.

   c. Release the ZIF connectors **(3)** to which the touch control board cables are connected, and then disconnect the touch control board cables from the touch control board.

d. Detach the touch control board **(4)** from the display panel. (The touch control board is attached to the display panel with double-sided tape.)
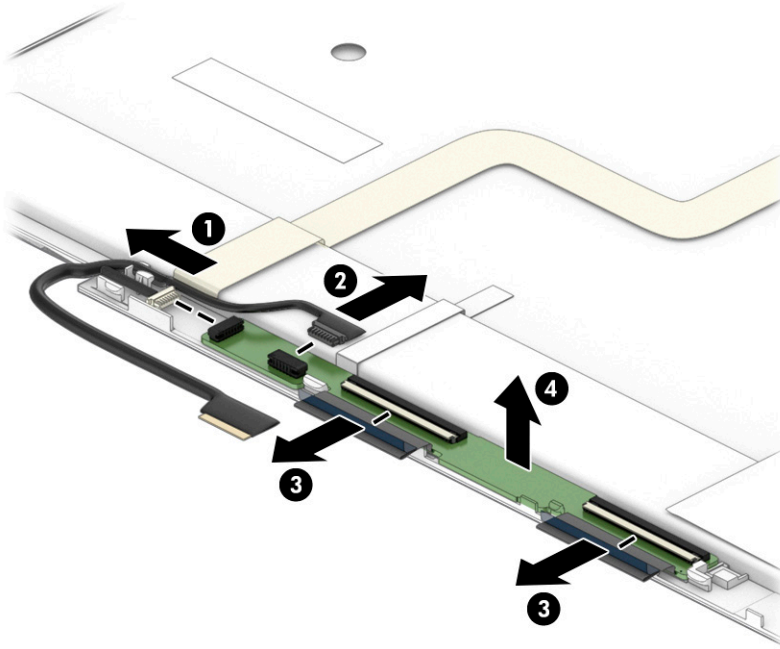
e. Remove the touch control board.

The touch control board is available using spare part number L94497-001.

14. If it is necessary to replace the display panel cable, follow these steps:

a. Remove the display panel assembly.

b. Release the grounding strip **(1)** that secures the display panel cable to the display panel.

c. Release the adhesive support strip **(2)** that secures the display panel cable to the display panel.

d. Disconnect the display panel cable **(3)** from the display panel.
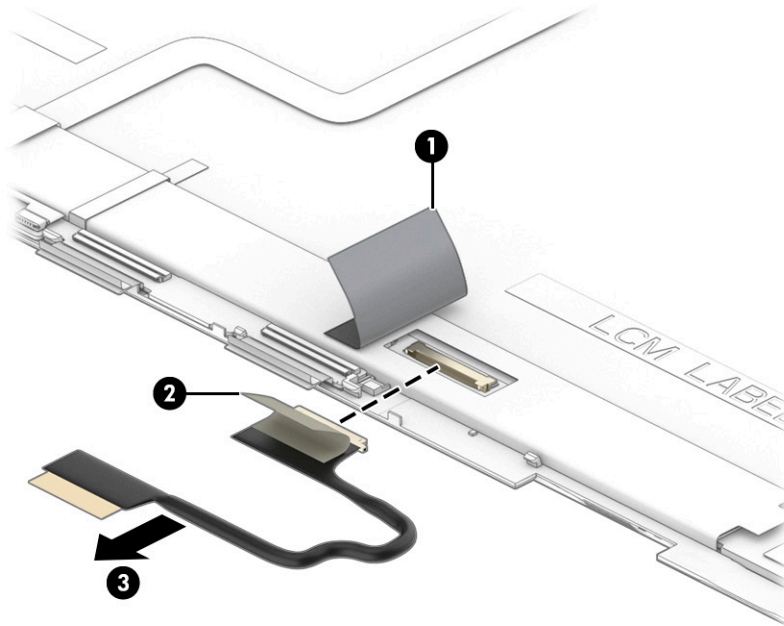
e. Remove the display panel cable.

The display panel cable is available using spare part numbers L94502-001 (for use only on computer models equipped with display panel assembly with spare part number M15283-001) and L94501-001 (for use only on computer models equipped with display panel assembly with spare part number M15282-001).

15. If it is necessary to replace the display hinges, follow these steps:

a. Remove the display panel assembly.

b. Remove the four Phillips M2.5×3.5 screws **(1)** that secure the display hinges to the display back cover.

c. Release the grouding tape **(2)** that secures the display hinges to the display back cover.

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

The display hinges are available using spare part number L94499-001.
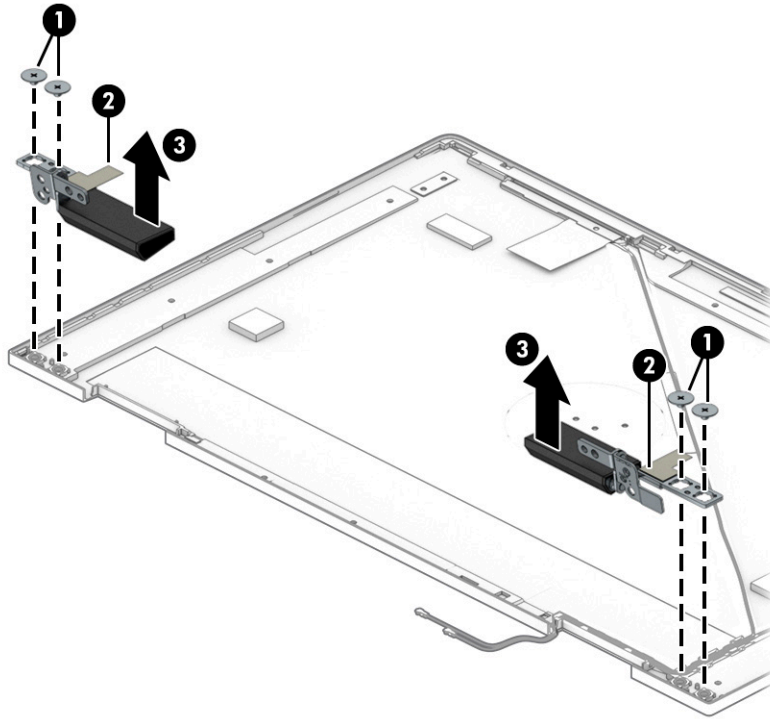
16. If it is necessary to replace the display hinge covers, follow these steps:

   a. Remove the display panel assembly.

   b. Remove the display hinges.

   c. Remove the two Phillips M2.0×4.1 screws **(1)** that secure the display hinge covers to the display hinges.

   d. Remove the display hinge covers **(2)**.

   The display hinge covers are available using spare part number M15278-001.

17. If it is necessary to replace the WLAN antenna, follow these steps:

a. Remove the display panel assembly.
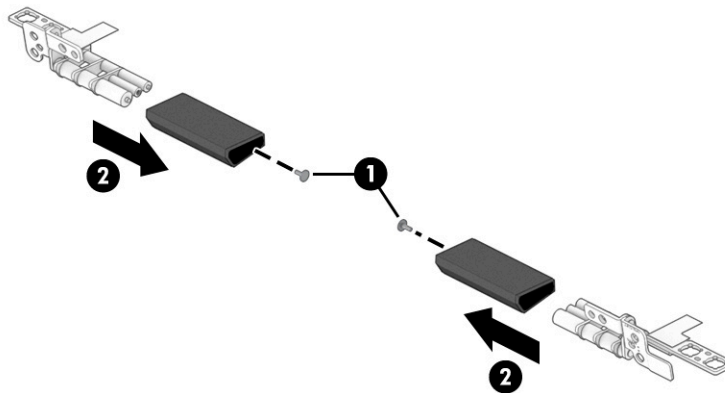
b. Remove the display right hinge.

c. Detach the WLAN antenna transceivers **(1)** from the display back cover. (The WLAN antenna transceivers are attached to the display back cover with double-sided adhesive.)

d. Release the antenna cables from the routing channels **(2)** built into the display back cover.

e. Remove the WLAN antenna cables and transceivers **(3)**.

   The WLAN antenna are available using spare part number L94503-001.
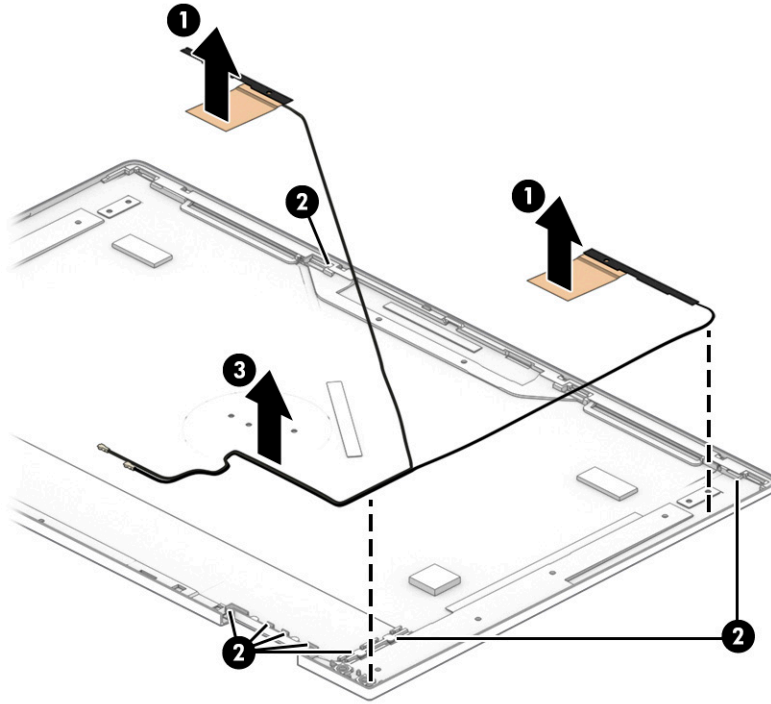
Reverse this procedure to reassemble and replace the display assembly.

Power connector cable

To remove the power connector cable, use these procedures and illustrations.

Table 5-6 Power connector cable description and part number

Description	Spare part number
Power connector cable	L94512-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

3. Disconnect the battery cable from the system board (see Battery on page 34).

4. Remove the display assembly (see 39.6 cm (15.6 in) display assembly on page 39).
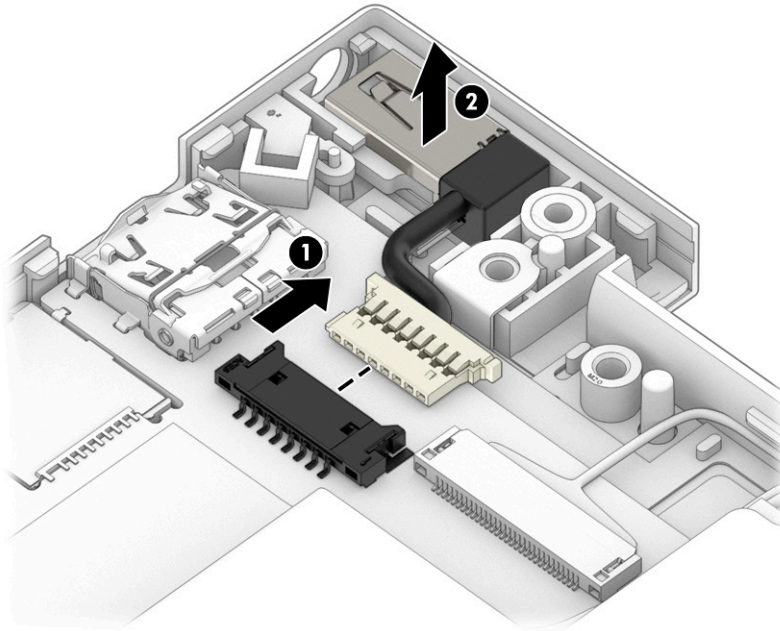
Remove the power connector cable:

1. Disconnect the power connector cable **(1)** from the system board.

2. Remove the power connector cable **(2)**.

Reverse this procedure to install the power connector cable.

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-7 Speaker description and part number

Description	Spare part number
Speakers (includes left and right speakers, cables, and four rubber isolators)	L94513-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

3. Remove the battery (see Battery on page 34).

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the system board.

2. Release the tape tabs **(2)** that secure the speaker cables to the keyboard/top cover.

3. Remove the four Phillips M2.0×2.3 broad head screws **(3)** that secure the speakers to the keyboard/top cover.

4. Remove the speakers **(4)**.

   When removing the speakers, make note of the location of the four rubber isolator locations **(5)**. The absence of or damage to these isolators can result in degraded speaker performance.

Reverse this procedure to install the speakers.

Touchpad cable

To remove the touchpad cable, use this procedure and illustration.

The touchpad cable is available using spare part number L94509-001.

Before removing the touchpad cable, follow these steps:

1. Prepare the computer for disassembly ().

2. Remove the bottom cover ().

3. Remove the battery (see).

Remove the touchpad cable:

1. Detach the touchpad cable **(1)** from the top cover. (The touchpad cable is attached to the top cover with double-sided adhesive.)

2. Release the ZIF connector **(2)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.

3. Release the ZIF connector **(3)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the touchpad.

4. Remove the touchpad cable **(4)**.

Reverse this procedure to install the touchpad cable.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-8 Touchpad description and part number

Description	Spare part number
Touchpad	M15279-001

NOTE: The touchpad spare part kit does not include the touchpad bracket or touchpad cable. The touchpad bracket is not available as a spare part. The touchpad cable is available in the Cable Kit, spare part number L94509-001.
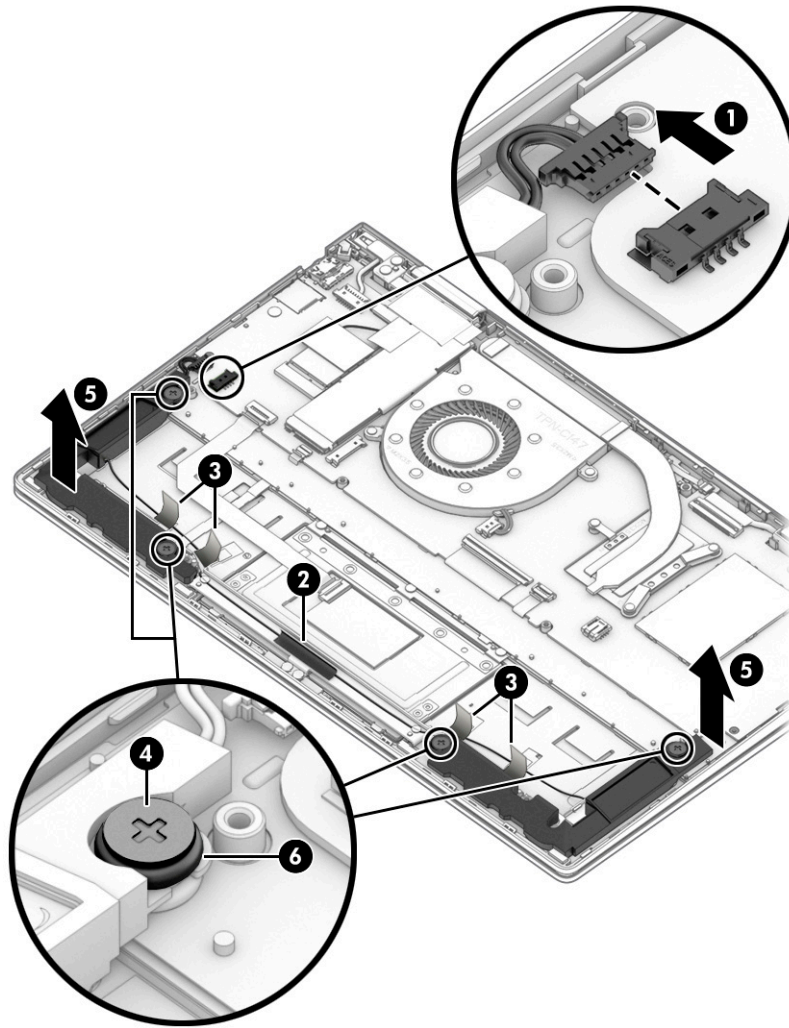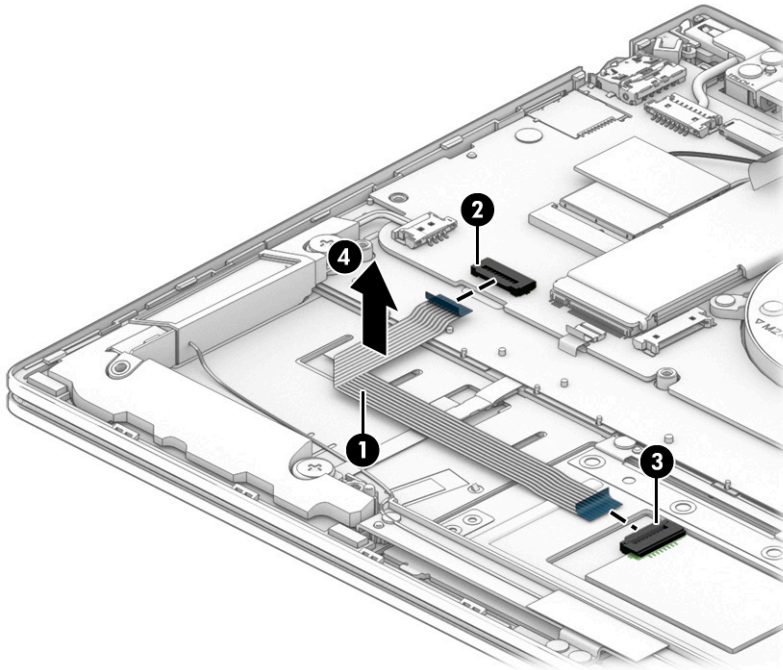
Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33).

3. Remove the battery (see Battery on page 34).

Remove the touchpad:

1. Detach the touchpad cable **(1)** from the top cover. (The touchpad cable is attached to the top cover with double-sided adhesive.)

2. Release the ZIF connector **(2)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.

3. Remove the three Phillips M1.5×2.0 screws **(3)** that secure the touchpad to the top cover.

4. Remove the four Phillips M1.5×2.8 screws **(4)** that secure the touchpad and touchpad bracket to the top cover.

5. Remove the touchpad bracket **(5)**.

6. Remove the touchpad **(6)** and cable.
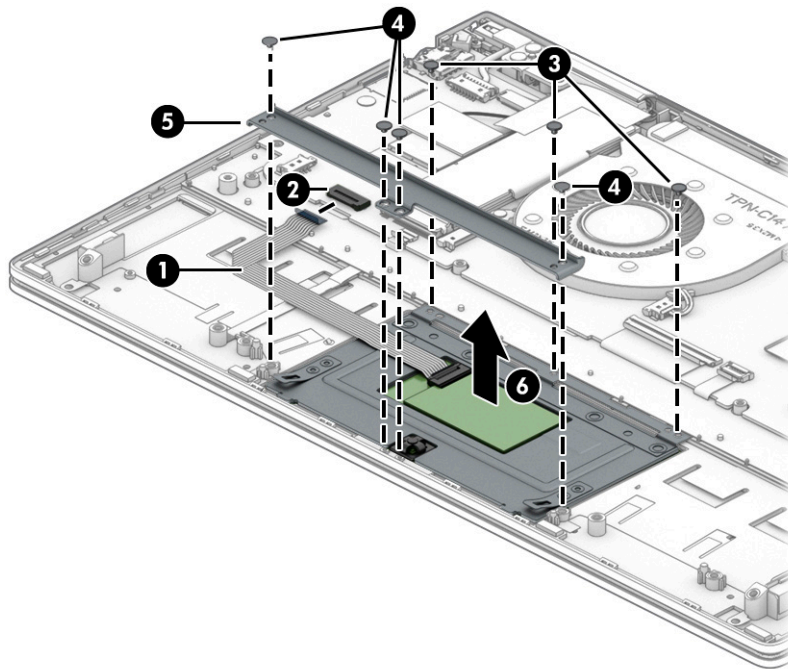
Reverse this procedure to install the touchpad.

System board

To remove the system board, use these procedures and illustrations.

Table 5-9 System board descriptions and part numbers

Description	Spare part number
The system board spare part kit includes the processor, a graphics subsystem with UMA memory, onboard system memory, and replacement thermal material.	
Equipped with an Intel Core i7-1165G7 processor, 16 GB of system memory, and the Windows 10 operating system	M15288-601
Equipped with an Intel Core i7-1165G7 processor, 16 GB of system memory, and a non-Windows operating system	M15288-001
Equipped with an Intel Core i7-1165G7 processor, 8 GB of system memory, and the Windows 10 operating system	M15289-601

Table 5-9 System board descriptions and part numbers (continued)

Description	Spare part number
Equipped with an Intel Core i7-1165G7 processor, 8 GB of system memory, and a non-Windows operating system	M15289-001
Equipped with an Intel Core i5-1135G7 processor, 8 GB of system memory, and the Windows 10 operating system	M15287-601
Equipped with an Intel Core i5-1135G7 processor, 8 GB of system memory, and a non-Windows operating system	M15287-001
Equipped with an Intel Core i3-1115G4 processor, 8 GB of system memory, and the Windows 10 operating system	M15286-601
Equipped with an Intel Core i3-1115G4 processor, 8 GB of system memory, and a non-Windows operating system	M15286-001

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33), and then remove the following components:

   1. Battery (see Battery on page 34)

   2. Solid-state drive (see Solid-state drive on page 37)

   3. Fan (see Fan on page 38)

When you replace the system board, be sure to remove the WLAN module (see WLAN module on page 35) and heat sink (see Heat sink on page 56) from the defective system board and install them on the replacement system board.

Remove the system board:

1. Remove the cover **(1)** that secures the WLAN antenna cables to the WLAN module.

2. Disconnect the following cables from the system board:

   ● Power connector cable **(2)**

   ● Webcam/microphone module ZIF connector cable **(3)**

   ● WLAN antenna cables **(4)**

   ● Infrared board ZIF connector cable **(5)**

   ● Display panel ZIF connector cable **(6)**

   ● Backlight ZIF connector cable **(7)**

   ● Keyboard ZIF connector cable **(8)**

   ● Fingerprint reader ZIF connector cable **(9)**

   ● Touchpad ZIF connector cable **(10)**

   ● Speaker cable **(11)**
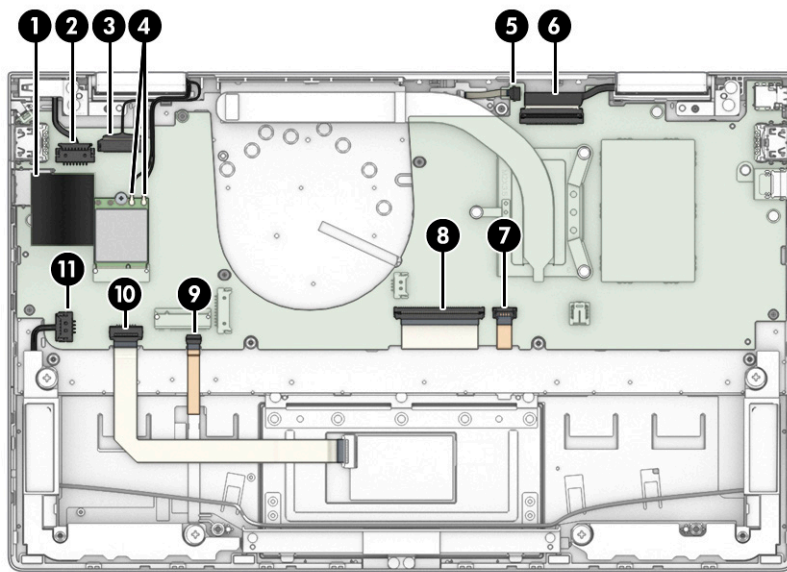
3. Remove the three Phillips M2.0×2.3 broad head screws **(1)** that secure the system board to the keyboard/top cover.
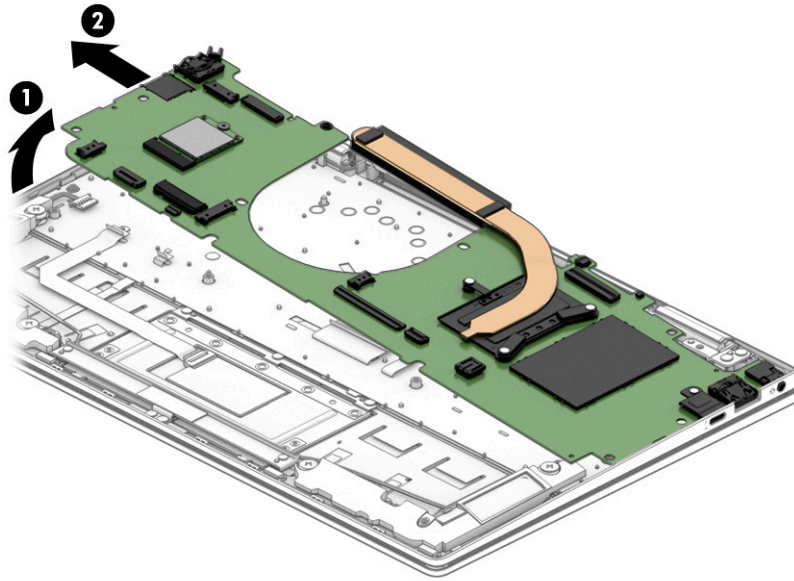
4. Remove the Phillips M2.0×3.0 screw **(2)** that secures the system board and the I/O bracket **(3)** to the keyboard/top cover.
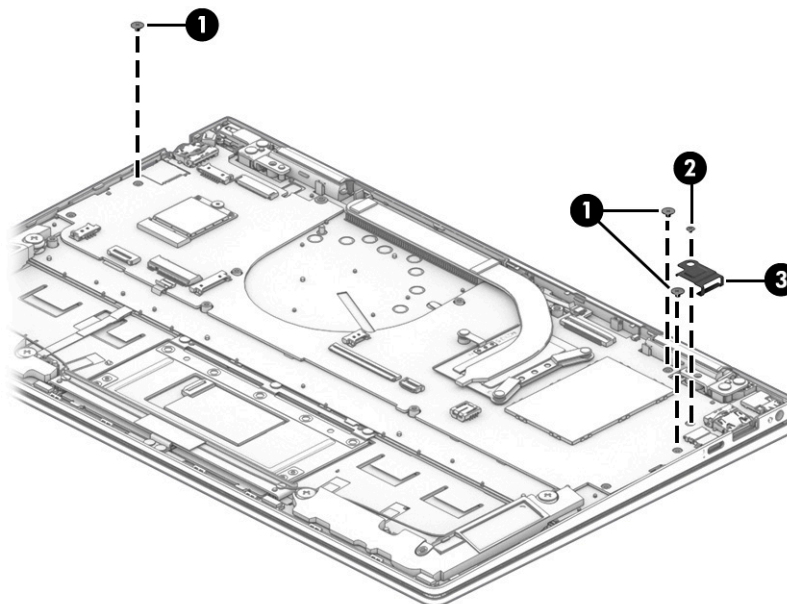
5. Lift the left side the system board **(1)** until it rests at an angle.

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

Reverse this procedure to install the system board.

Heat sink

To remove the heat sink, use these procedures and illustrations.

Table 5-10 Heat sink description and part number

Description	Spare part number
Heat sink (includes replacement thermal material)	M16591-001

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly (<u>Preparation for disassembly on page 33</u>).

2. Remove the bottom cover (<u>Bottom cover on page 33</u>), and then remove the following components:

   1. Battery (see <u>Battery on page 34</u>)

   2. Solid-state drive (see <u>Solid-state drive on page 37</u>)

   3. Fan (see <u>Fan on page 38</u>)

   4. System board (see <u>System board on page 53</u>)

Remove the heat sink:

1. Remove the three Phillips M2.0×4.0 screws **(1)** that secure the heat sink to the system board.

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

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

Reverse this procedure to install the heat sink.

Infrared board cable

To remove the infrared board cable, use this procedure and illustration.

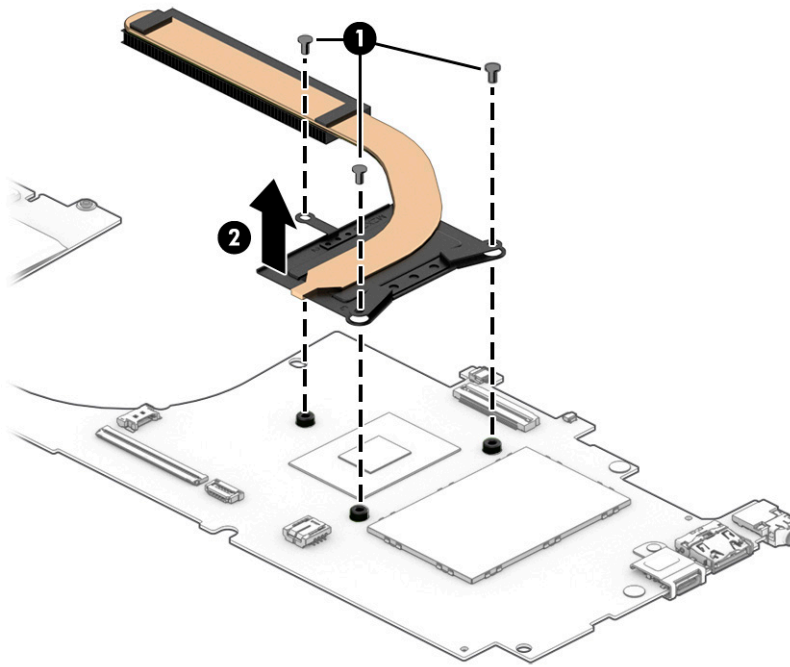The infrared board cable is available in the Cable Kit, spare part number L94507-001.

Before removing the infrared board cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33), and then remove the following components:

   1. Battery (see Battery on page 34)

   2. Solid-state drive (see Solid-state drive on page 37)

   3. Fan (see Fan on page 38)

   4. System board (see System board on page 53)

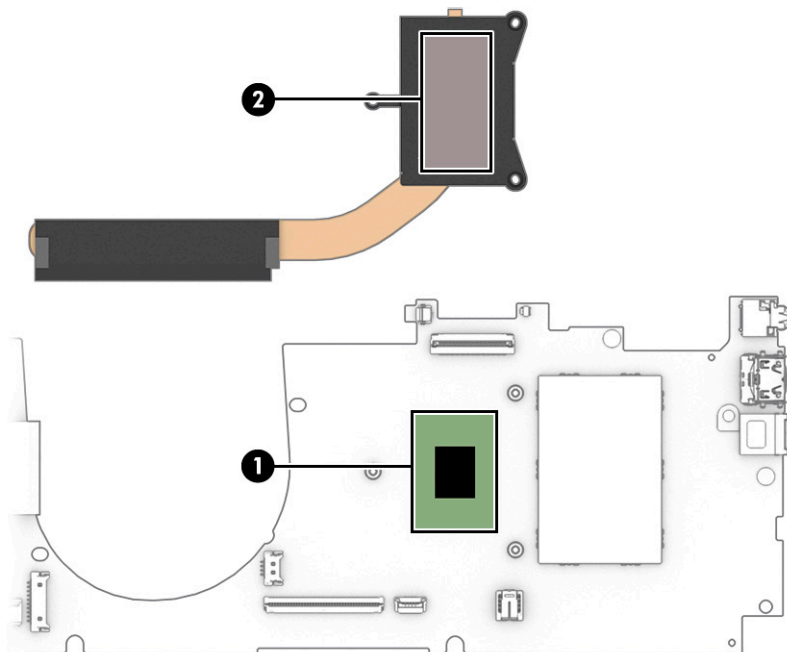Remove the infrared board cable:

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

2. Remove the infrared board cable **(2)**.

Reverse this procedure to install the infrared board cable.

Infrared board

To remove the infrared board, use this procedure and illustration.

Table 5-11 Infrared board description and part number

Description	Spare part number
Infrared board	L94506-001

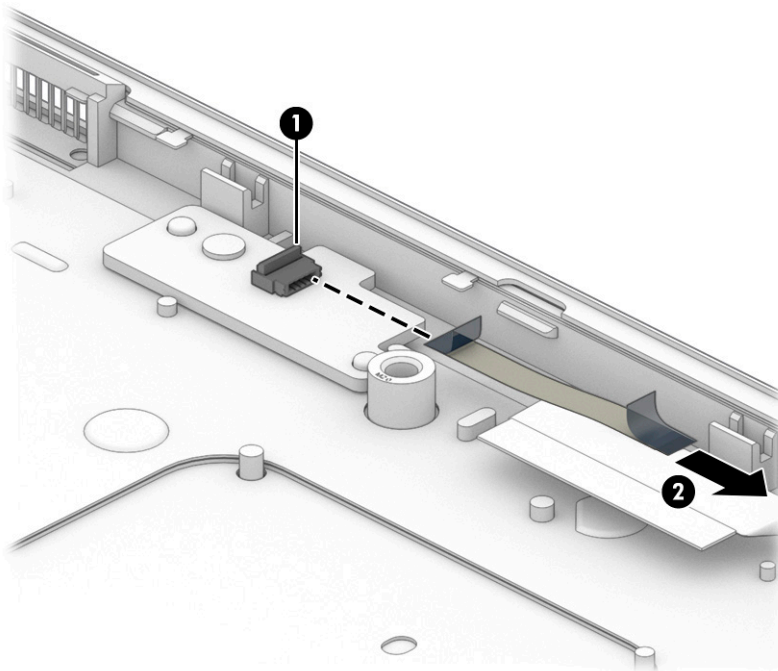NOTE: The fingerprint fingerprint infrared board spare part kit does not include the fingerprint fingerprint infrared board cable. The fingerprint fingerprint infrared board cable is available in the Cable Kit, spare part number L94507-001.

Before removing the infrared board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 33).

2. Remove the bottom cover (Bottom cover on page 33), and then remove the following components:

   1. Battery (see Battery on page 34)

   2. Solid-state drive (see Solid-state drive on page 37)

   3. Fan (see Fan on page 38)

   4. System board (see System board on page 53)

Remove the infrared board:

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

2. Remove the infrared board **(2)**.
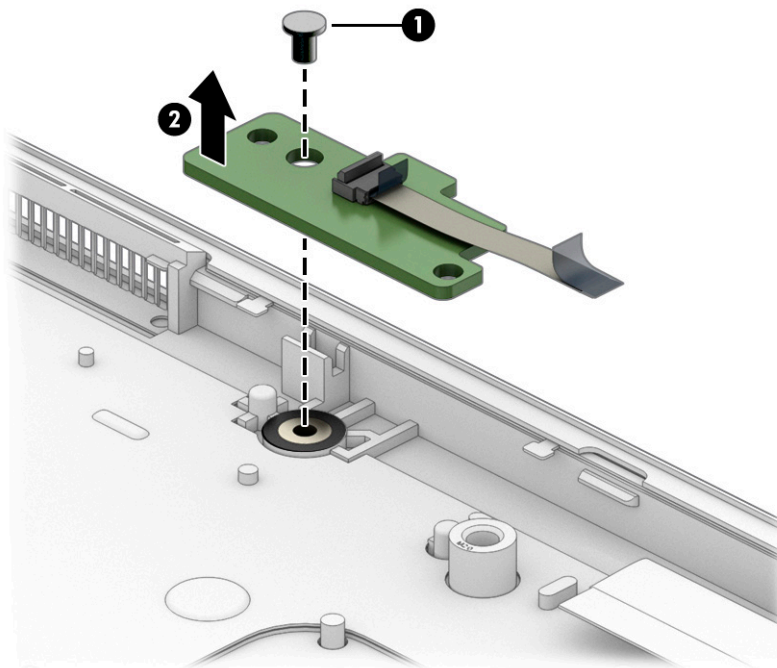
Reverse this procedure to install the infrared board.

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)

You have several ways to access the Setup Utility (BIOS).

IMPORTANT: 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) might be available on the HP website. Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*. Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

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

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

- HP Support Assistant

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

        – or –

        Select the question mark icon in the taskbar.

    2. Select **My notebook**, and then select **Specifications**.

- Setup Utility (BIOS)

    1. Start Setup Utility (BIOS) (see).

    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 .

Preparing for a BIOS update

Be sure to follow all prerequisites before downloading and installing a BIOS update.

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

- Do not disconnect power 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.

Downloading a BIOS update

After you review the prerequisites, you can check for and download BIOS updates.

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

   – or –

   Select the question mark icon in the taskbar.

2. Select **Updates**, and then select **Check for updates and messages**.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You might need this information to locate the update later, after it has been downloaded to your hard drive.

   b. Follow the on-screen instructions to download your selection to the hard drive.

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

Installing a BIOS update

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.

2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder that contains the update.

4. Double-click the file that has an .exe extension (for example, *filename*.exe).

    The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.

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

7 Backing up, restoring, and recovering

You can use Windows tools or HP software to back up your information, create a restore point, reset your computer, create recovery media, or restore your computer to its factory state. Performing these standard procedures can return your computer to a working state faster.

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

These methods of creating recovery media and backups are available on select products only.

Using Windows tools for backing up

HP recommends that you back up your information immediately after initial setup. You can do this task either using Windows Backup locally with an external USB drive or using online tools.

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

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

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

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

For details:

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

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

IMPORTANT: HP recommends that you follow the Restoring and recovery methods on page 67 to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Restoring and recovering your system

You have several tools available to recover your system both within and outside of Windows if the desktop cannot load.

HP recommends that you attempt to restore your system using the .

Creating a system restore

System Restore is available in Windows. The System Restore software can automatically or manually create restore points, or snapshots, of the system files and settings on the computer at a particular point.

When you use System Restore, it returns your computer to its state at the time you made the restore point. Your personal files and documents should not be affected.

Restoring and recovery methods

After you run the first method, test to see whether the issue still exists before you proceed to the next method, which might now be unnecessary.

1. Run a Microsoft System Restore.

2. Run Reset this PC.

3. Recover using HP Recovery media. For more information, see .

For more information about the first two methods, see the Get Help app:

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

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

Recovering using HP Recovery media

You can use HP Recovery media to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool.

For details, see .

📝 **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.

📝 **NOTE:** HP recommends that you follow the to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Changing the computer boot order

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

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

To change the boot order:

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 press and hold the volume up button, and then select **f9**.

        – or –

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

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

Using HP Sure Recover (select products only)

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

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

● Latest version of the operating system

● Platform-specific device drivers

● Software applications, in the case of a custom image

To access the latest documentation for HP Sure Recover, go to http://www.hp.com/support. Follow the on-screen instructions to find your product and locate your documentation.

8 Using HP PC Hardware Diagnostics

You can use the HP PC Hardware Diagnostics utility to determine whether your computer hardware is running properly. The three versions are HP PC Hardware Diagnostics Windows, HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface), and (for select products only) Remote HP PC Hardware Diagnostics UEFI, a firmware feature.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

You can download the HP PC Hardware Diagnostics Windows from the Microsoft Store.

1. Select the Microsoft Store app on your desktop or enter `Microsoft Store` in the taskbar search box.

2. Enter `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.

3. Follow the on-screen directions.

The tool downloads to the selected location.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.

- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a hard drive or USB flash drive) to run remote diagnostics.

- Set a location for storing the test results. You can also set the user name and password that you use for uploads.

- Display status information about the diagnostics run previously.

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

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

2. Select **Advanced**, and then select **Settings**.

3. Make your customization selections.

4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

9 Specifications

This chapter provides specifications for your computer.

Computer specifications

This section provides specifications for your computer. When traveling with your computer, the computer dimensions and weights, as well as input power ratings and operating specifications, provide helpful information.

Table 9-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	**30.7 cm**	12.1 in
Depth	**19.5 cm**	7.7 in
Height (front to back)	**1.6 cm**	0.6 in
Weight (varies by computer configuration and components)	**1.3 kg**	2.7 lb
Input power		

Table 9-1 Computer specifications (continued)

	Metric	U.S.
Operating voltage and current	5 V dc @ 2 A / 12 V dc @ 3 A /15 V dc @ 3 A – 45 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 3.75 A /15 V dc @ 3 A – 45 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 3.75 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A / 20 V dc @ 2.25 A – 45 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C	
	5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 5 A / 20 V dc @ 4.5 A – 90 W USB-C	
	19.5 V dc @ 2.31 A – 45 W	
	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 4.62 A – 90 W	
	19.5 V dc @ 6.15 A – 120 W	
	19.5 V dc @ 6.9 A – 135 W	
	19.5 V dc @ 7.70 A – 150 W	
	19.5 V dc @ 10.3 A – 200 W	
	19.5 V dc @ 11.8 A – 230 W	
	19.5 V dc @ 16.92 A – 330 W	
	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 4.62 A – 90 W	
	19.5 V dc @ 7.70 A – 150 W	
	19.5 V dc @ 10.3 A – 200 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.

39.6 cm (15.6 in) display specifications

This section provides specifications for your display.

Table 9-2 Display specifications

	Metric	U.S.
Active diagonal size	**39.6 cm**	15.6 in
Resolution	1920 × 1080 (FHD)	
	3840 × 2160 (UHD)	
Surface treatment	Antiglare (FHD, UHD panels)	
	Brightview (UHD panel)	
Brightness	300 nits (FHD, sRGB panels)	
	550 nits (UHD panel)	
Viewing angle	UWVA	
Backlight	WLED	
Display panel interface	eDP	

Hard drive specifications

This section provides specifications for your hard drives.

Table 9-3 Hard drive specifications

	2 TB	1 TB	500 GB
Dimensions			
Height	7.0 mm	7.0 mm	7.0 mm
Width	70 mm	70 mm	70 mm
Weight	107 g max	107 g max	107 g max
Interface type	SATA	SATA	SATA
Transfer rate	300 MB/s	300 MB/s	300 MB/s
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	1.5 ms	1.1 ms	1.1 ms
Average	12.0 ms	12.0 ms	12.0 ms
Maximum	22.0 ms	21.0 ms	21.0 ms
Logical blocks	[TBD]	[TBD]	976,752,240
Disk rotational speed	5400 rpm	7200 rpm	7200 rpm
Operating temperature	**0°C to 60°C** (0°F to 140°F)	**0°C to 60°C** (0°F to 140°F)	**0°C to 60°C** (0°F to 140°F)

	2 TB	1 TB	500 GB

*Size refers to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications can differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact support for details.

Solid-state drive specifications (SATA-3)

This section provides specifications for your solid-state drive.

Table 9-4 Solid-state drive specifications

	256 GB*
Dimensions	
Height	1.35 mm
Weight	< 10 g
Interface type	SATA-3
Ready time, maximum (to not busy)	1.0 ms
Access times, logical	0.1 ms
Transfer rate	up to 540 MB/s
Total logical sectors	234,441,648
Operating temperature	**0°C to 70°C** (32°F to 158°F)

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact support for details.

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-5 Solid-state drive specifications

	256 GB*	512 GB*	1 TB*
Dimensions			
Height	1.0 mm	1.0 mm	1.0 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	PCIe	PCIe	PCIe
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms	1.0 ms
Access times, logical	0.1 ms	0.1 ms	0.1 ms

Table 9-5 Solid-state drive specifications (continued)

	256 GB*	512 GB*	1 TB*
Transfer rate			
Sequential read	up to 2150 MB/s	up to 2150 MB/s	up to 2150 MB/s
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MB/s	up to 1550 MB/s	up to 1550 MB/s
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs	Up to 100,000 IOPs
Total logical sectors	468,883,296	1,000,215,216	1,500,336,388
Operating temperature	**0°C to 70°C** (32°F to 158°F)		

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.
Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact support for details.

10 Power cord set requirements

This chapter provides power cord requirements for countries and regions.

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

These power cord 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 V ac 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

To determine power cord requirements for specific countries and regions, use this table.

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

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2

Country/region	Accredited agency	Applicable note number
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

Country/region	Accredited agency	Applicable note number
The United States	UL	2

1. The flexible cord must be Type HO5VV-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.

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. 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 nonrechargeable 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 website at http://www.hp.com/recycle.

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