Maintenance and Service Guide

SUMMARY

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

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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 is automatically updated, which is always enabled. High-speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com. **If your product ships with Windows in S Mode:** Windows in S Mode works exclusively with apps from the Microsoft Store within Windows. Certain default settings, features, and apps cannot be changed. Some accessories and apps that are compatible with Windows may not work (including some antivirus, PDF writers, driver utilities, and accessibility apps), and performance may vary, even if you switch out of S Mode. If you switch to Windows, you cannot switch back to S Mode. Learn more at Windows.com/SmodeFAQ.

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.

Safety warning notice

Reduce the possibility of heat-related injuries or of overheating the computer by following the practices described.

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

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1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	**HP Spectre x360 13.5 inch 2-in-1 Laptop PC**
	Model number: 14-ef0*xxx*
	CTO model: 14t-ef000
Processor	Intel® Core™ i7-1255U 1.7 GHz (max turbo frequency 4.7 GHz) processor (10 cores, 12 MB Intel Smart Cache)
	Intel Core i5-1235U 1.3 GHz (max turbo frequency 4.4 GHz) processor (10 cores, 12 MB Intel Smart Cache)
Graphics controller	Intel Iris® Xe
Display	**34.3 cm (13.5 in), liquid crystal display (LCD), white light-emitting diode (WLED), ultrawide viewing angle (UWVA)**
	Wide ultra extended graphics array (WUXGA+) (1920 × 1280), BrightView, sRGB 100%, eDP 1.4 + panel self-refresh (PSR) 2, low power, 400 nits
	WUXGA+, 100% sRGB, eDP 1.3 + PSR, antiglare, 1000 nits, privacy screen
	3k2k (3000 × 2000), 100% DCI-P3, eDP 1.4 + PSR2, Active Matrix Organic Light Emitting Diodes (AMOLED), BrightView, low blue light, 400 nits, supports Intel OLED Power Saving Technology (OPST)
Memory	Onboard (not accessible) memory supporting up to 32 GB of RAM
	LDDR4X-4266
	Supports the following configurations:
	• 32 GB
	• 16 GB
	• 8 GB
Primary storage	**M.2 solid-state drive (PCIe-4 × 4, 2280, non-volatile memory express (NVMe), three-layer cell (TLC)**
	2 TB
	1 TB
	512 GB
Audio	Bang and Olufsen
	Quad speakers
	Supports Far Field Cortana
	Supports Alexa
	Supports speaker swap
	Supports HP Audio Boost 2.0
	Supports XiaoWei

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

Category	Description
Video	HP True Vision 5 MP camera with shutter door - indicator LED, 1x infrared (IR) LED, MIPI, 5 MP BSI sensor, f2.0
	Supports Windows Hello
	5 MP by 30 frames per second (fps)
	Dual-array, digital microphone with appropriate software - beam forming, echo cancellation, noise suppression
Wireless	**Wireless Local Area Network (WLAN)** (select products only)
	• Intel AX211 Wi-Fi® 6E Bluetooth® 5.2 WLAN
	• Intel AX411 Wi-Fi 6E Bluetooth 5.2 WLAN
	Support for Miracast®
	Supports BT Audio Offload
	WiFi SAR enabled in BIOS
	Connected Standby supports Modern Standby
Ports	Audio-out (headphone)/audio-in (microphone) combo jack
	USB 3.2 Gen 2 Type-A port; supports HP Sleep & Charge
	USB4 Type-C® Gen3 Thunderbolt 4 ×2 connector, supports: • Thunderbolt 4 • USB4, USB3.2 Gen2 • Display Port 1.4 – (2× 4K output [4096 × 2304 @ 60 Hz 36 bits per pixel (bpp)] via USB-C adapter) – (2× 5K output [5120 × 3200 @ 60 Hz 24 bpp] via USB-C adapter) • Power Delivery 3.0 • Data transfer • HDMI 2.0 output up to 3840 × 2160 @ 60 Hz with HDCP2.2 via adapter • HP Sleep & Charge
Media card reader	HP MultiFormat microSD MCR
	Supports MicroSD™/SDHC™/SDXC™
	Push-push insertion/removal
Sensors	Accelerometer + Gyroscope + eCompass
	Accelerometer ×2 (one for panel rotation, one for panel key detection)
	AI chip
	Ambient light sensor
	Color temperature sensor
	IR thermal sensor

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

Category	Description
Keyboard/pointing devices	**Keyboard**
	Island style, backlit keyboard with clickpad and image sensor
	Island style, backlit keyboard with clickpad and image sensor, privacy
	Clickpad with image sensor
	Microsoft® Precision Touchpad Default Gestures Support
	Firmware version default is Microsoft PTP requirement
	Multitouch gestures enabled
	Precision touchpad supported
	Taps enabled as default
Power requirements	**Battery**
	4 cell, 66 Whr
	Long life
	Fast charge
	HP Smart AC adapter (non-power correction factor [nPFC], straight, 1.8 m [6 ft] USB Type-C)
	65 W
	Power cord
	C5, right angle, 1.0 m (3.3 ft)
Security	Microphone mute
	Fingerprint reader (select products only)
	Camera privacy cover
	Privacy screen
	Trusted Platform Module (TPM) 2.0

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

Category	Description
Operating system	Windows® 11 Home 64
	Windows 11 Home 64 Advanced
	Windows 11 Home 64 Advanced Single Language
	Windows 11 Home 64 Chinese Market CPPP
	Windows 11 Home 64 High-End Chinese Market CPPP
	Windows 11 Home 64 Plus
	Windows 11 Home 64 Plus Single Language
	Windows 11 Home 64 Plus Single Language Africa Market PPP
	Windows 11 Home 64 Plus Single Language APAC EM PPP
	Windows 11 Home 64 Plus Single Language India Market PPP
	Windows 11 Home 64 Plus Single Language Indonesia Market PPP
	Windows 11 Home Single Language
	Windows 11 Home 64 Single Language Africa Market PPP
	Windows 11 Home 64 Single Language APAC EM PPP
	Windows 11 Home 64 Single Language India Market PPP
	Windows 11 Home 64 Single Language Indonesia Market PPP
	Windows 11 Pro 64
Serviceability	AC adapter

2 Getting to know your computer

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

Right side

Identify the components on the right side of the computer.

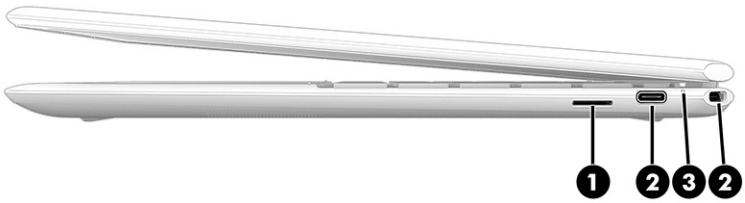


Table 2-1 Right-side components and their descriptions

Component		Description
(1)	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.

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

Component		Description
(2)	USB Type-C® power connector and Thunderbolt™ ports with HP Sleep and Charge and DisplayPort™ output (2)	Connect an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connect USB devices, provide high-speed data transfer, and charge small devices (such as a smartphone), even when the computer is off. **NOTE:** Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device. – and – Connect a display device that has a USB Type-C connector, providing DisplayPort output. **NOTE:** Your computer might also support a Thunderbolt docking station.
(3)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking amber: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.

Left side

Identify the components on the left side of the computer.

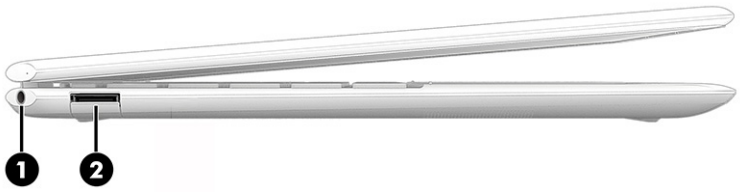


Table 2-2 **Left-side components and their descriptions**

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: ■ Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.
(2)	USB SuperSpeed 10 Gbps port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off. **NOTE:** Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.

Display

The computer display can include essential components such as speakers, antennas, cameras, and microphones.

Low blue light mode (select products only)

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

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

Wake-on-touch (select products only)

Use the wake-on-touch feature to bring the computer out of the Sleep state quickly.

To wake your computer, double-tap the touchscreen.

NOTE: This feature is available in stand, tent, and tablet modes, but not in clamshell mode.

NOTE: This feature is not available when the computer is in Hibernation.

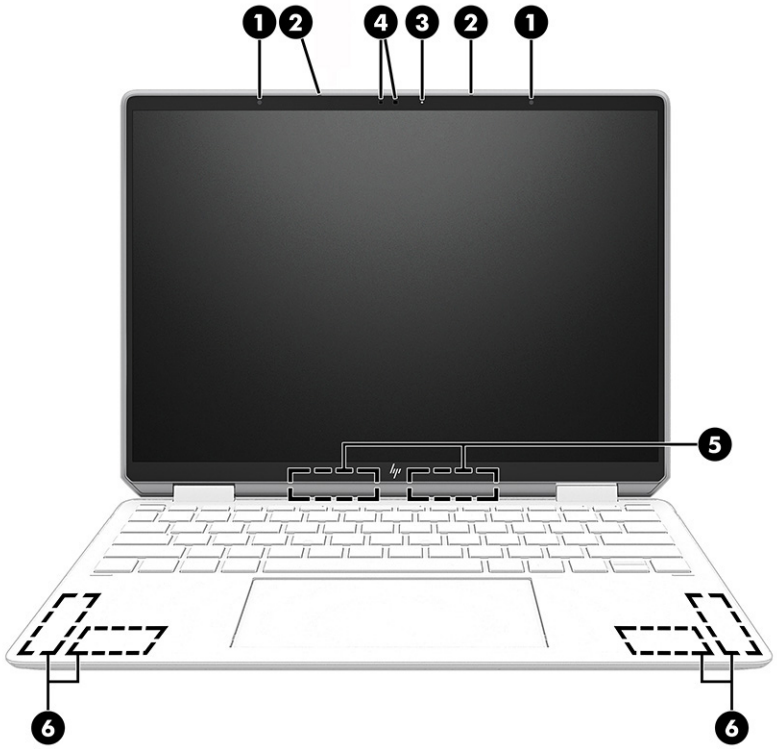


Table 2-3 Display components and their descriptions

Component		Description
(1)	Ambient light and color sensor (select products only)	Adjust the brightness of the display, depending on the ambient light, and manages and controls the color temperature. Color temperature enables you to measure and adjust the warmth or coolness of the light source. **NOTE:** Do not cover the sensor. The display brightness adjusts if the sensor notices light change.
(2)	Internal microphones (2)	Record sound.
(3)	Camera lights	On: One or more cameras are 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.
(5)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(6)	WWAN antennas* (select products only)	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).

Table 2-3 **Display components and their descriptions (continued)**

Component	Description
*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 **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.	

Keyboard area

Keyboards can vary by language.

NOTE: The keyboard area, including the function keys and (select products only) power button, is disabled in stand, tent, and tablet modes. To enable the keyboard, including the power button, change to the clamshell mode.

Touchpad settings and components

Learn the touchpad settings and components.

Touchpad settings

Learn how to adjust touchpad settings.

Adjusting touchpad settings

Use these steps to adjust touchpad settings and gestures.

1. Select the **Search** icon in the taskbar, type `touchpad settings` in the search box, and then press enter.
2. Choose a setting.

Turning on the touchpad

Follow these steps to turn on the touchpad.

1. Select the **Search** icon in the taskbar, type `touchpad settings` in the search box, and then press enter.
2. Using an external mouse, click the **touchpad** button.

   If you are not using an external mouse, press the Tab key repeatedly until the pointer rests on the **touchpad** button. Then press the spacebar to select the button.

Touchpad components

Identify the touchpad components.

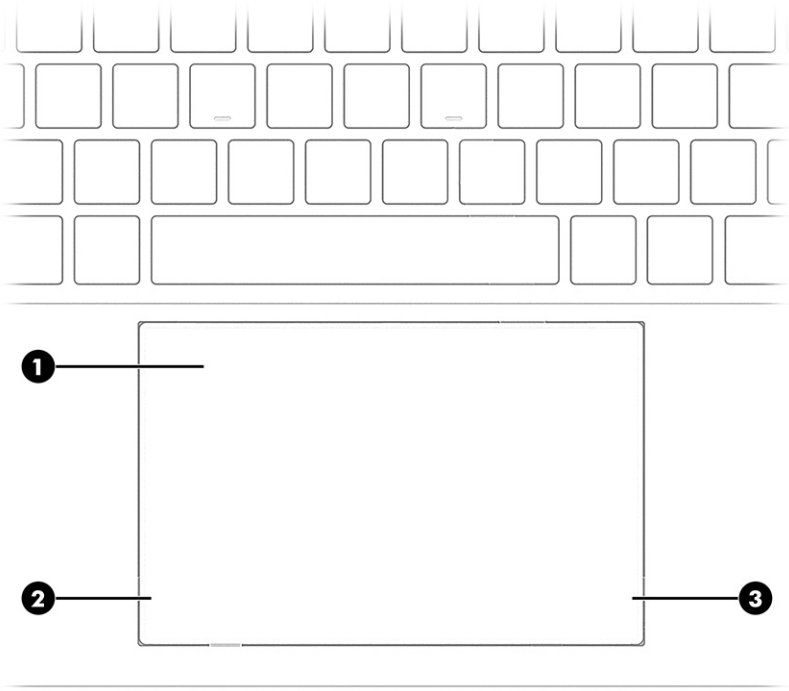


Table 2-4 Touchpad components and their descriptions

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

Lights

Identify the lights on the computer.

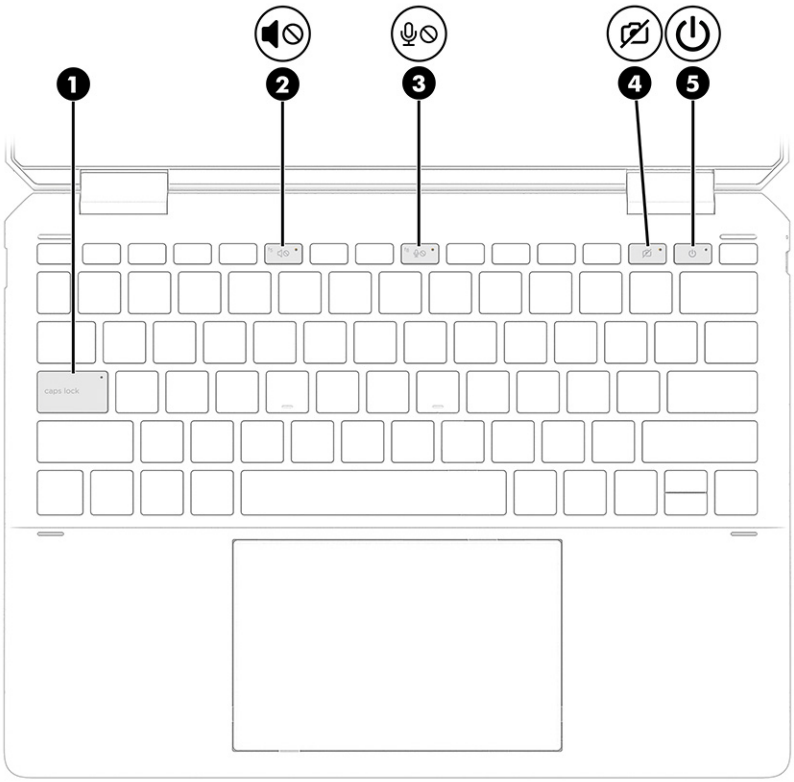


Table 2-5 **Lights and their descriptions**

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

Button and fingerprint reader

Identify the computer button and fingerprint reader.

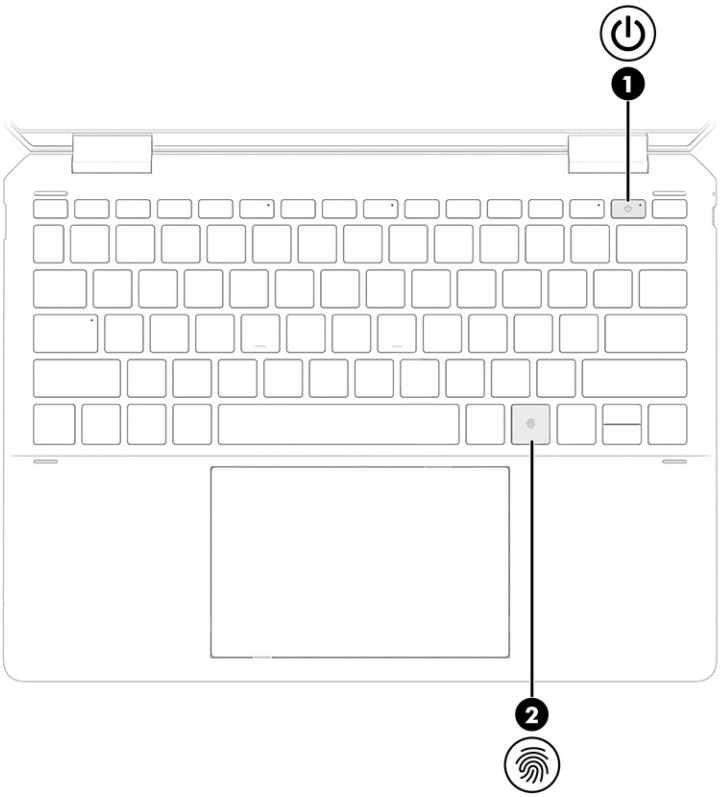


Table 2-6 Button and fingerprint reader and their descriptions

Component		Description
(1)	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 and sleep settings: ▪ Right-click the **Power** icon, and then select **Power and sleep settings**.

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

Component			Description
(2)		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.

Special keys

Identify the special keys.

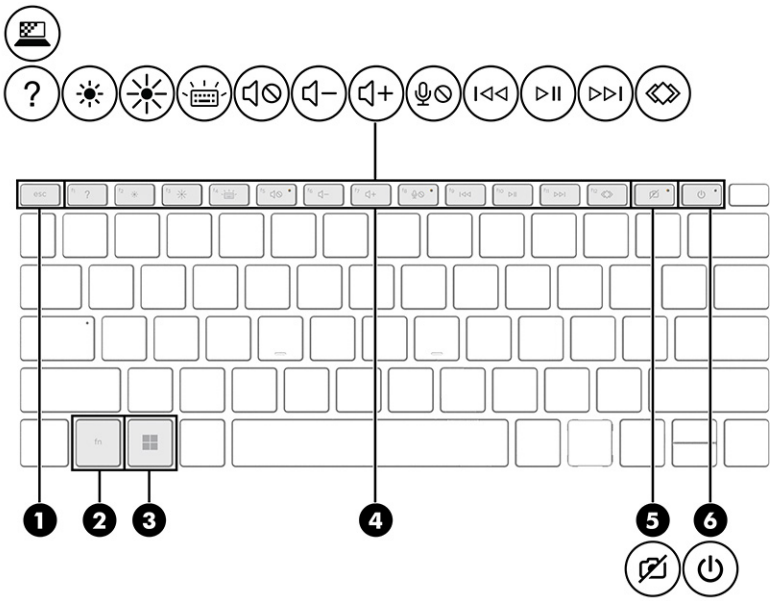


Table 2-7 Special keys and their descriptions

Component			Description
(1)		esc key	Displays system information when pressed in combination with the fn key.
(2)		fn key	Executes specific functions when pressed in combination with another key.
(3)		Windows key	Opens the Start menu. **NOTE:** Pressing the Windows key again will close the Start menu.
(4)		Action keys	Execute frequently used system functions as defined by the icon symbols on f1 through f12 function keys.
(5)		Camera privacy key	Turns the camera off and on.

Table 2-7 Special keys and their descriptions (continued)

Component		Description
(6)	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 and sleep settings: ▪ Right-click the **Power** icon, and then select **Power and sleep settings**.

Rear

Identify the rear component.

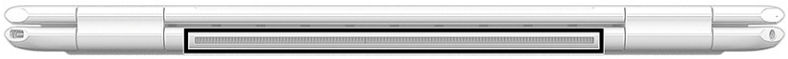


Table 2-8 Rear component and its description

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

Bottom

Identify the bottom components.

NOTE: Your computer might look slightly different from the following illustration.

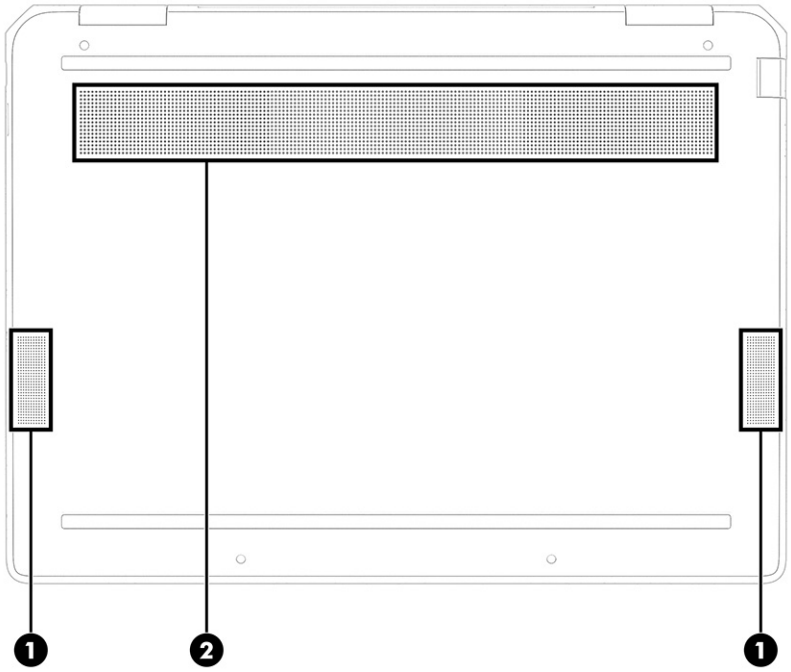


Table 2-9 Bottom components and their descriptions

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

Labels

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

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

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

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

Table 2-10 Service label components

Component	
(1)	Serial number
(2)	Product ID
(3)	HP product name and model number

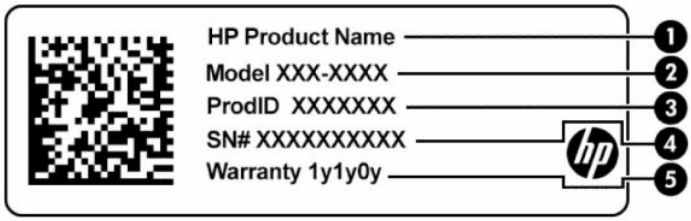


Table 2-11 Service label components

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

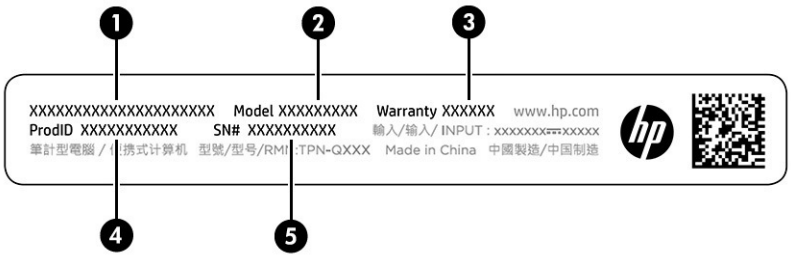


Table 2-12 Service label components

Component	
(1)	HP product name

Table 2-12 **Service label components (continued)**

Component	
(2)	Model number
(3)	Warranty period
(4)	Product ID
(5)	Serial number

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

3 Illustrated parts catalog

Use this chapter 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.

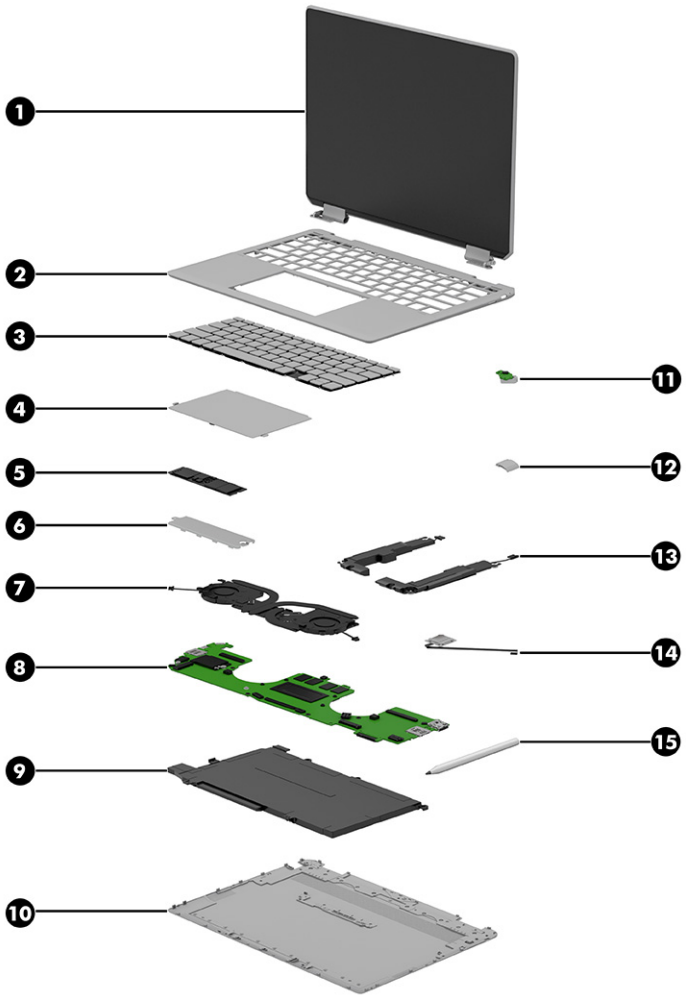


Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**Display assembly** **NOTE:** Display spare parts are available only as subcomponents. For spare part information, see Display assembly subcomponents on page 21.	
(2)	**Top cover** (does not include keyboard)	
	Natural silver, US	N12208-001
	Nightfall black, US	N12209-001
	Nocturne blue, US	N12210-001
	Natural silver, Japan	N12211-001
	Nightfall black, Japan	N12212-001
	Nocturne blue, Japan	N12213-001
(3)	**Keyboard** **NOTE:** For a detailed list of country codes, see Top cover on page 59.	
	Natural silver, backlit	N10735-*xx*1
	Nightfall black, backlit	N10736-*xx*1
	Nocturne blue, backlit	N10737-*xx*1
	Natural silver, backlit, privacy	N10738-*xx*1
	Nightfall black, backlit, privacy	N10739-*xx*1
	Nocturne blue, backlit, privacy	N10740-*xx*1
(4)	**Touchpad** **NOTE:** The touchpad cable is available as spare part number N12220-001.	
	Natural silver	N12217-001
	Nightfall black	N12218-001
	Nocturne blue	N12219-001
(5)	**Solid-state drive** **NOTE:** The solid-state drive thermal pad is available as spare part number N15331-001.	
	2 TB	M52027-005
	1 TB	M16560-005
	512 GB	M17436-005
(6)	**Solid-state drive cover**	not available as a spare part
(7)	**Fan and heat sink assembly** **NOTE:** Thermal material is available in the miscellaneous parts kit as spare part number N12197-001.	N12234-001
(8)	**System board** **NOTE:** The system board repair kit is available as spare part number M98015-888.	

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	Intel Core i7-1255U processor and 32 GB of system memory	N10723-601
	Intel Core i7-1255U processor and 16 GB of system memory	N10721-601
	Intel Core i7-1255U processor and 16 GB of system memory, OLED display	N10722-601
	Intel Core i5-1235U processor and 16 GB of system memory	N10718-601
	Intel Core i5-1235U processor and 8 GB of system memory	N10719-601
	Intel Core i5-1235U processor and 8 GB of system memory, OLED display	N10720-601
(9)	**Battery** (4 cell, 66 Whr)	L97357-005
(10)	**Bottom cover**	
	Natural silver	N12228-001
	Nightfall black	N12229-001
	Nocturne blue	N12230-001
(11)	**Headphone board**	N12221-001
	NOTE: The headphone board cable is available as spare part number N12227-001.	
(12)	**RJ-45 (network) jack door**	
	Natural silver	N12223-001
	Nightfall black	N12224-001
	Nocturne blue	N12225-001
(13)	**Speakers**	N12236-001
(14)	**Fingerprint reader module**	
	Natural silver	N12214-001
	Nightfall black	N12215-001
	Nocturne blue	N12216-001
(15)	**Pen** (includes cable)	
	Natural silver	L95614-001
	Nightfall black	L95615-001
*	**WLAN module**	
	Intel AX211 Wi-Fi 6E Bluetooth 5.2 WLAN	M53366-005
	Intel AX411 Wi-Fi 6E Bluetooth 5.2 WLAN	M53374-005
*	**IR sensor board**	N12222-001
	NOTE: The IR sensor board cable is available as spare part number N12226-001.	
*not illustrated		

Display assembly subcomponents

To identify the display assembly subcomponents, use this illustration and table.

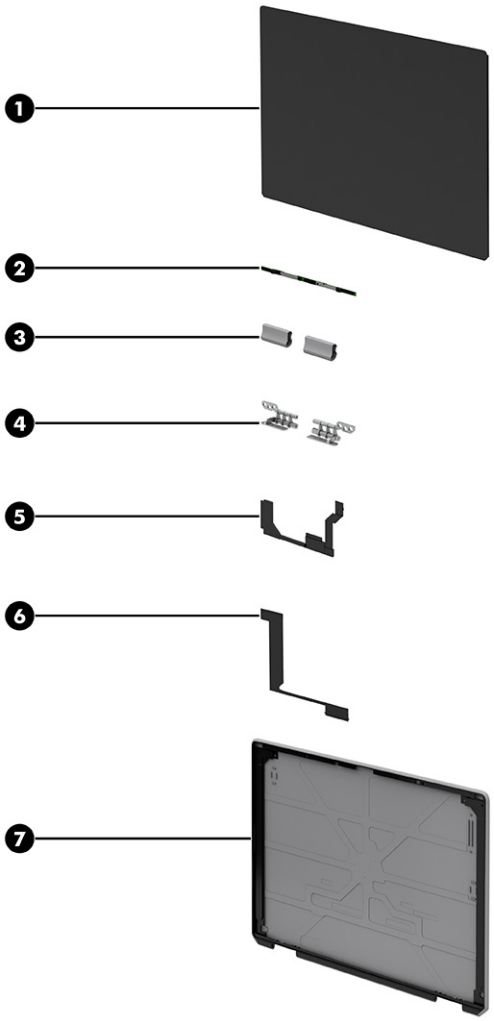


Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	**Display panel** (includes bezel)	
	FHD, privacy, natural silver	N10726-001
	OLED, natural silver	N10727-001
	400 nits, natural silver	N10728-001
	FHD, privacy, nightfall black	N10729-001
	OLED, nightfall black	N10730-001
	400 nits, nightfall black	N10731-001
	FHD, privacy, nocturne blue	N10732-001
	OLED, nocturne blue	N10733-001

Table 3-2 **Display component descriptions and part numbers (continued)**

Item	Component	Spare part number
	400 nits, nocturne blue	N10734-001
(2)	**Camera module**	N12241-001
	NOTE: Camera module rubber is available as spare part number N15360-001.	
(3)	**Display hinge covers** (left and right hinge covers)	N06911-001
	NOTE: Hinge cover rubber inserts are available as spare part number N12207-001.	
	Natural silver	N12205-001
	Nightfall black	N15357-001
	Nocturne blue	N15358-001
(4)	**Display hinges** (includes left and right hinges)	N12206-001
(5)	**Display cable** (includes display cables and adhesive for the bezel and display rear cover)	
	FHD	N12202-001
	Privacy	N12203-001
	OLED	N12204-001
(6)	**Camera cables**	
	Camera	N12200-001
	AI board	N12201-001
(7)	**Display back cover**	
	Natural silver	N12194-001
	Nightfall black	N12195-001
	Nocturne blue	N12196-001
*	**Camera board**	N15359-001
*	**WLAN antenna kit** (includes antenna cables and transceivers)	N12192-001
*	**Display panel adhesive**	N12238-001
*not illustrated		

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-3 **Miscellaneous part descriptions and part numbers**

Component	Spare part number
AC adapter (65 W, USB Type-C)	L43180-001
Zenvo Pen (natural silver with cable)	L95614-001
Zenvo Pen (nightfall black with cable)	L95615-001
USB External DVD±RW drive	747080-001

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

Component	Spare part number
USB-C-to-VGA adapter	831751-001
USB-C-to-USB-A adapter	833960-001
USB-C-to-RJ-45 (network) adapter	M95985-001
USB-C-to-HDMI 2.0 adapter	935325-001
USB-C-to-USB-A hub	916838-001
HP Elite USB-C Multi Port Hub	L39572-001
System board repair kit (includes CPU inner bracket, memory shielding, CPU absorber, USB protective tape, DC-in lens sponge, rubber, system board protective tape and absorbers)	M98015-888
Adhesive kit (includes display cover tape, top, left, top left, top right)	N12238-001
WLAN/WWAN protective tape	N12233-001
Miscellaneous parts kit (includes thermal pad, thermal putty, touch screen protective tape, antenna gasket, OLED cover thermal graphite, display cover sponge, OLED display cover sponge, mid cover sponges, display panel absorber, system board protective tape and absorber)	N12197-001
Screw Kit	N03741-001
Power cord (C5, 1.0 m (3.3 ft), premium, straight	L22319-001
Duck head adapter (for use in Japan)	L33157-001
Power cord (C5, 1.0 m [3.3 ft], premium with sticker)	
For use in Australia	L42486-001
For use in Denmark	L42487-001
For use in Europe	L42488-001
For use in Israel	L42489-001
For use in Japan	L42490-001
For use in North America	L42492-001
For use in South Africa and Argentina	L42493-001
For use in South Korea	L42491-001
For use in Switzerland	L42494-001
For use in Taiwan	L42496-001
For use in Thailand	L42495-001
For use in the United Kingdom	L42497-001

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
- Nonconductive, nonmarking pry tool
- Magnetic Phillips P1 screwdriver
- Suction cup (to disassemble the display)

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.”

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 in Personal grounding methods and equipment on page 26.
- 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**

	Relative humidity		
Event	**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 of static electricity 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.
- You can use **heel straps, toe straps, and boot straps** at standing workstations. These straps 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.
- Use a wrist strap connected to a properly grounded work surface and use 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 the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- Avoid contact with pins, leads, or circuitry.

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

Cleaning your computer

Cleaning your computer regularly removes dirt and debris so that your device continues to operate at its best. Use the following information to safely clean the external surfaces of your computer.

Enabling HP Easy Clean (select products only)

HP Easy Clean helps you to avoid accidental input while you clean the computer surfaces. This software disables devices such as the keyboard, touch screen, and touchpad for a preset amount of time so that you can clean all computer surfaces.

1. Start HP Easy Clean in one of the following ways:
   - Select the **Start** menu, and then select **HP Easy Clean**.

     – or –
   - Select the **HP Easy Clean** icon in the taskbar.

     – or –
   - Select **Start**, and then select the **HP Easy Clean** tile.
2. Now that your device is disabled for a short period, see Removing dirt and debris from your computer on page 28 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 29 for guidelines to help prevent the spread of harmful bacteria and viruses.

Removing dirt and debris from your computer

Here are the recommended steps to clean dirt and debris from your computer.

For computers with wood veneer, see Caring for wood veneer (select products only) on page 30.

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.
2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

⚠ **CAUTION:** To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with water. The cloth should be moist, but not dripping wet.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

See Cleaning your computer with a disinfectant on page 29 for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

The World Health Organization (WHO) recommends cleaning surfaces, followed by disinfection, as a best practice for preventing the spread of viral respiratory illnesses and harmful bacteria.

After cleaning the external surfaces of your computer using the steps in Removing dirt and debris from your computer on page 28, Caring for wood veneer (select products only) on page 30, or both, you might also choose to clean the surfaces with a disinfectant. A disinfectant that is within HP's cleaning guidelines is an alcohol solution consisting of 70% isopropyl alcohol and 30% water. This solution is also known as rubbing alcohol and is sold in most stores.

Follow these steps when disinfecting high-touch, external surfaces on your computer:

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with a mixture of 70% isopropyl alcohol and 30% water. The cloth should be moist, but not dripping wet.

CAUTION: Do not use any of the following chemicals or any solutions that contain them, including spray-based surface cleaners: bleach, peroxides (including hydrogen peroxide), acetone, ammonia, ethyl alcohol, methylene chloride, or any petroleum-based materials, such as gasoline, paint thinner, benzene, or toluene.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly

on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.
6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.
7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

Caring for wood veneer (select products only)

Your product might feature high-quality wood veneer. As with all natural wood products, proper care is important for best results over the life of the product. Because of the nature of natural wood, you might see unique variations in the grain pattern or subtle variations in color, which are normal.

- Clean the wood with a dry, static-free microfiber cloth or chamois.
- Avoid cleaning products containing substances such as ammonia, methylene chloride, acetone, turpentine, or other petroleum-based solvents.
- Do not expose the wood to sun or moisture for long periods of time.
- If the wood becomes wet, dry it by dabbing with an absorbent, lint-free cloth.
- Avoid contact with any substance that might dye or discolor the wood.
- Avoid contact with sharp objects or rough surfaces that might scratch the wood.

See Removing dirt and debris from your computer on page 28 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 29 for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

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.

Accessing support information

To find the HP support that you need, use this information.

Table 4-3 Support information locations

Service consideration	Path to access information
Records of reported failure incidents stored on the computer	**Windows:** Pre-operating system failures are logged in the BIOS Event Log. To view the BIOS Event Log: 1. Press the power button. 2. Immediately and repeatedly press esc when the power button light turns white. **NOTE:** If you do not press esc at the appropriate time, you must restart the computer and again repeatedly press esc when the power button light turns white to access the utility. 3. Press f10 to enter the BIOS setup. 4. (On commercial products) Under the **Main** tab, select **BIOS event log**, and then select **View BIOS Event Log**. - or - (On consumer products) Under the **Main** tab, select **System Log**. Post-operating system failures are logged in the Event Viewer. 1. Turn on the computer and allow the operating system to open. 2. Select the search icon in the taskbar. 3. Type `Event Viewer`, and then press enter. 4. Select the log from the left panel. Details display in the right panel. **Chrome:** 1. Go to support.google.com/chrome. 2. Search `collect Chrome device logs`.
Technical bulletins	To locate technical bulletins: 1. Go to www.hp.com. 2. Place the cursor over **Problem solving** to display more options. 3. Select **Support & Troubleshooting**. 4. Type the serial number, product number, or product name to go to the product support page. 5. Select **Advisories** to view technical bulletins.
Repair professionals	To locate repair professionals: 1. Go to www.hp.com. 2. Place the cursor over **Support resources** to display more options. 3. Select **Authorized service providers**.

Table 4-3 **Support information locations (continued)**

Service consideration	Path to access information
Component and diagnosis information, failure detection, and required action	To locate diagnosis information and actions: 1. Go to http://www.hp.com/go/techcenter/pcdiags. 2. Select **Get Support**. 3. Near the bottom of the window, select **Notebook PCs**, and then select your location.

5 Removal and replacement procedures for authorized service provider parts

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

IMPORTANT: Only an authorized service provider should access the components described in this chapter. 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 the procedures described in this section.

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.

Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

To remove and replace computer components, use these procedures:

For initial safety procedures, see Removal and replacement procedures preliminary requirements on page 24.

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

Bottom cover

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

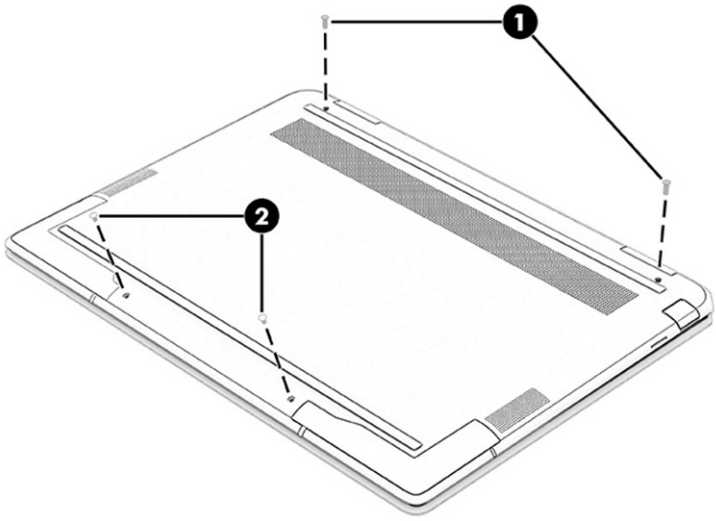
Table 5-1 Bottom cover description and part number

Description	Spare part number
Bottom cover for use in natural silver models	N12228-001
Bottom cover for use in nightfall black models	N12229-001
Bottom cover for use in nocturne blue models	N12230-001

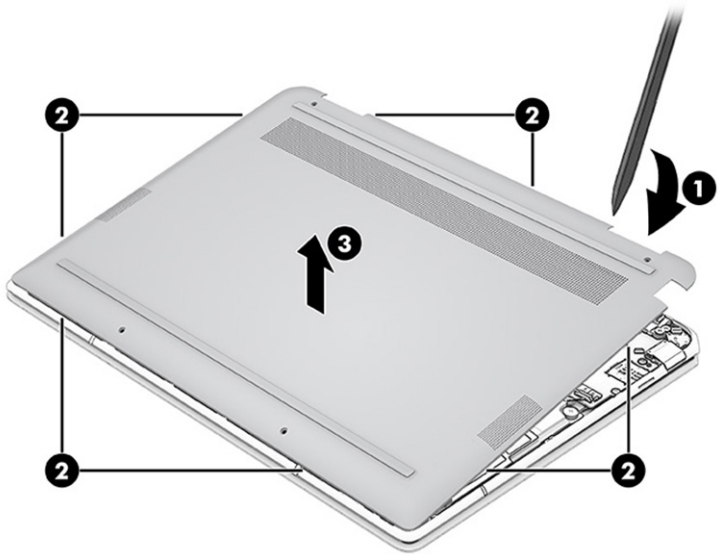
Before removing the bottom cover, prepare the computer for disassembly (see Preparation for disassembly on page 33).

Remove the bottom cover:

1. Close the computer and rest it upside down on a flat work surface with the front toward you.
2. Remove the top two Phillips M2.0 × 6.0 screws **(1)** that secure the bottom cover to the computer.
3. Remove the bottom two Phillips M2.0 × 3.0 screws **(2)** that secure the bottom cover to the computer.



4. Insert a thin, plastic tool in the seam between the bottom cover and computer **(1)**, and then pull the tool along the edges of the bottom cover to release it **(2)**.
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
Battery (4 cell, 66 Whr)	L97357-005

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, which 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 (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).

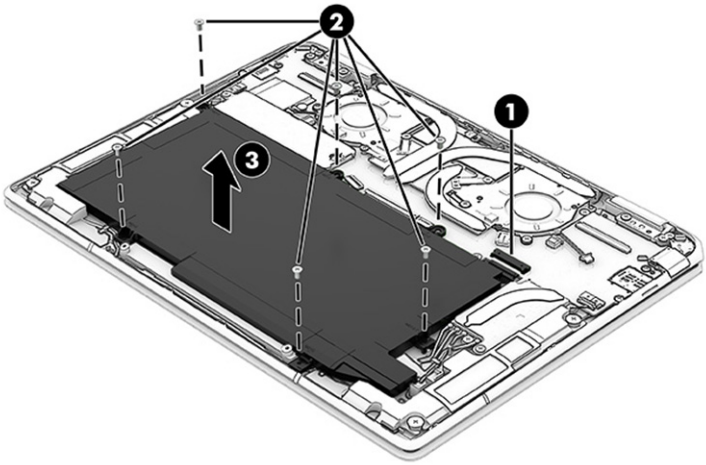
WARNING! To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

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 × 2.0 screws **(2)** that secure the battery to the computer.

3. Remove the battery **(3)**.



To install the battery, reverse the removal procedures.

Solid-state drive

To remove the M.2 solid-state drive, use this procedure and illustration.

Table 5-3 Solid-state drive descriptions and part numbers

Description	Spare part number
2 TB	M52027-005
1 TB	M16560-005
512 GB	M17436-005
Solid-state drive thermal pad	N15331-001

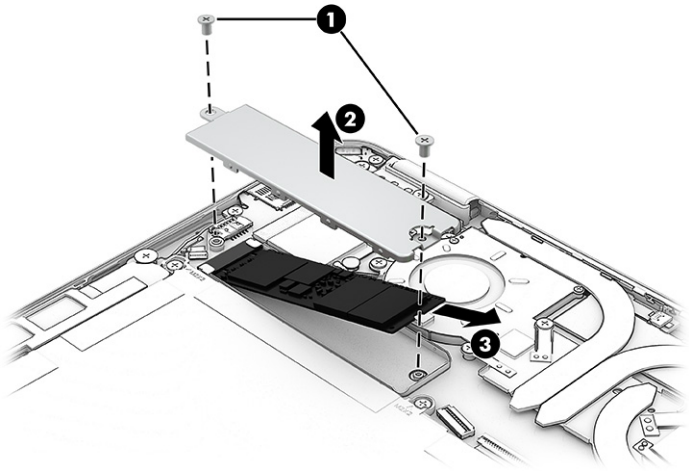
Before removing the solid-state drive, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Disconnect the battery cable from the system board (see Battery on page 34).

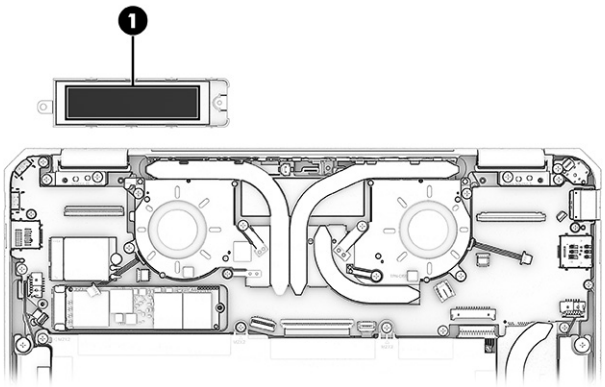
Remove the solid-state drive:

1. Remove the two Phillips M2.0 × 2.5 screws **(1)** that secure the drive cover, and then remove the cover **(2)**.

2. Pull the drive away from the socket to remove it **(3)**.



3. When installing a drive, be sure a thermal pad is installed on the bottom of the drive cover **(1)**.



To install the solid-state drive, reverse the removal procedures.

NOTE: Solid-state drives are designed with a notch to prevent incorrect insertion.

WLAN module

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

Table 5-4 WLAN module descriptions and part numbers

Description	Spare part number
Intel AX211 Wi-Fi 6E Bluetooth 5.2 WLAN	M53366-005
Intel AX411 Wi-Fi 6E Bluetooth 5.2 WLAN	M53374-005
Protective tape	N12233-001

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.

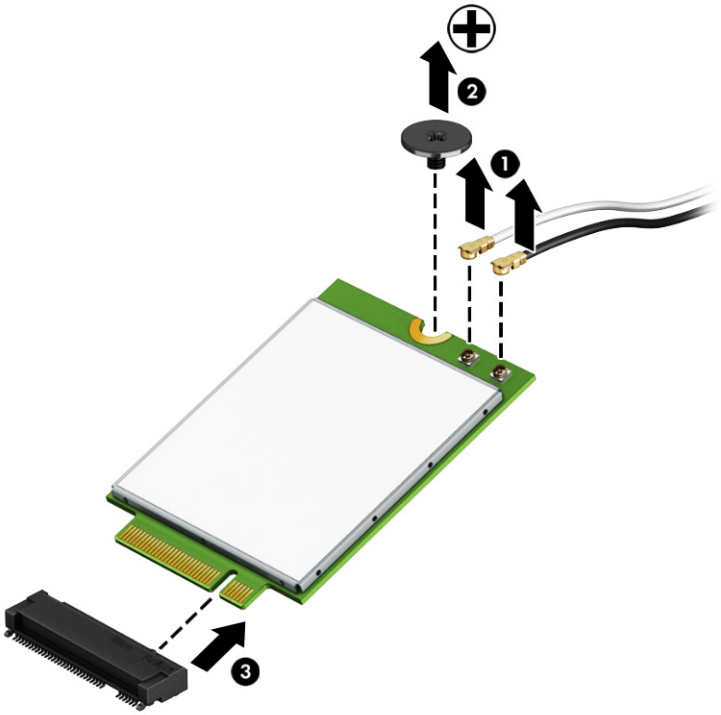
Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Disconnect the battery cable from the system board (see Battery on page 34).

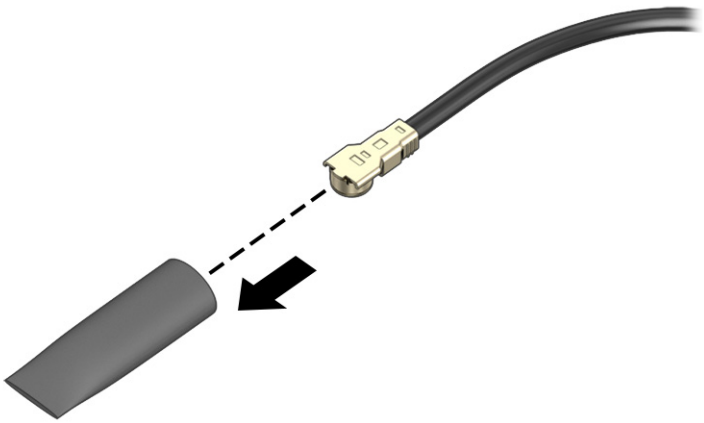
Remove the WLAN module:

1. Remove the Mylar that covers the WLAN module.
2. Remove the plastic that covers the antennas.
3. Carefully disconnect the two antenna cables from the module **(1)**.
4. Remove the Phillips M2.0 × 2.5 screw **(2)**, and then remove the WLAN module **(3)**.

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 #1 Aux terminal.



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.



To install the WLAN module, reverse this procedure.

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-5 Speaker description and part number

Description	Spare part number
Speaker Kit	N12236-001

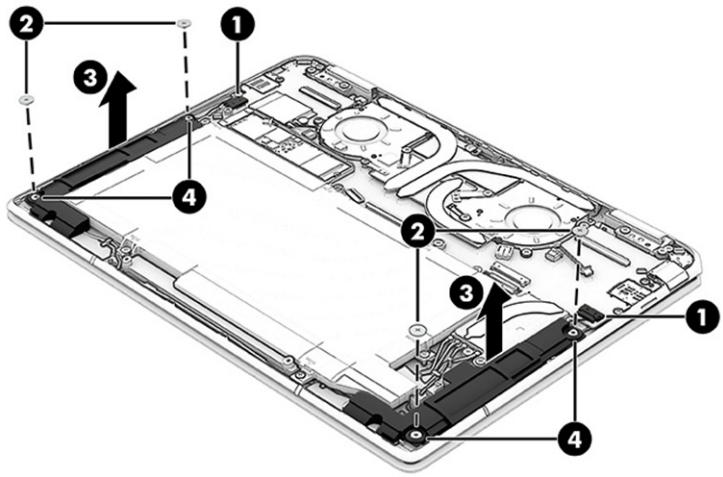
Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Disconnect the battery cable from the system board (see Battery on page 34).

Remove the speakers:

1. Disconnect the drive cable from the system board **(1)**.
2. Remove the two broadhead Phillips M2.0 × 2.0 screws **(2)** that secure each speaker to the computer.
3. Remove the speakers from the computer **(3)** .

NOTE: When removing the speakers, make note of the location of the rubber isolator locations **(4)**. The absence of or damage to these isolators can result in degraded speaker performance.



To install the speakers, reverse this procedure.

Headphone board

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

Table 5-6 headphone board description and part number

Description	Spare part number
Headphone board	N12221-001
Headphone board cable	N12227-001

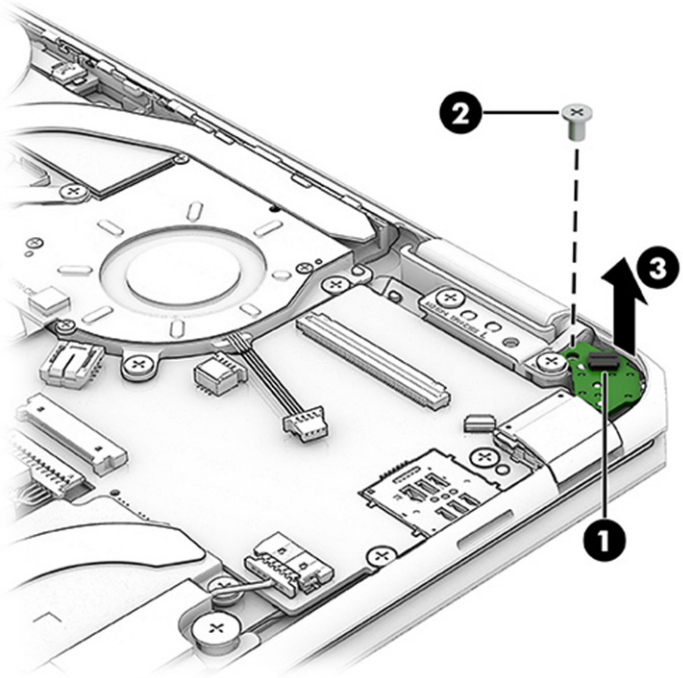
Before removing the headphone board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Disconnect the battery cable from the system board (see Battery on page 34).

Remove the headphone board:

1. Disconnect the cable from the ZIF connector on the headphone board **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)** that secures the board to the computer.

3. Remove the headphone board from the computer **(3)**.



To install the headphone board, reverse this procedure.

Fan and heat sink assembly

To remove the fan and heat sink assembly, use this procedure and illustration.

Table 5-7 Fan and heat sink description and part number

Description	Spare part number
Fan and heat sink assembly	N12234-001
NOTE: Thermal material is available in the miscellaneous parts kit as spare part number N12197-001.	

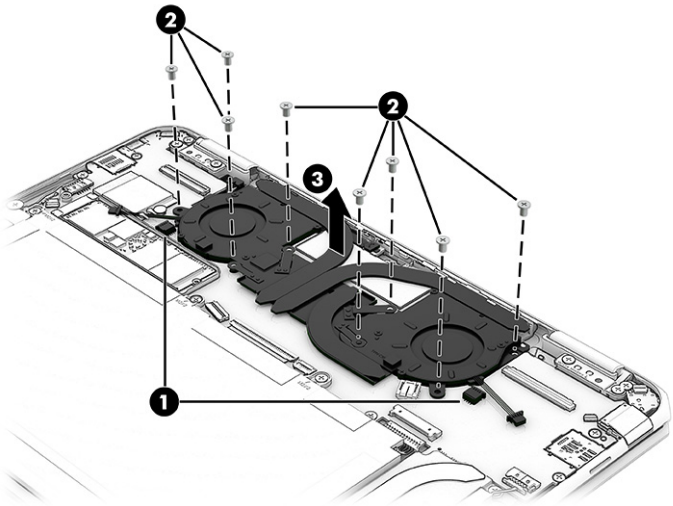
Before removing the fan and heat sink assembly, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Disconnect the battery cable from the system board (see Battery on page 34).

Remove the fan and heat sink assembly:

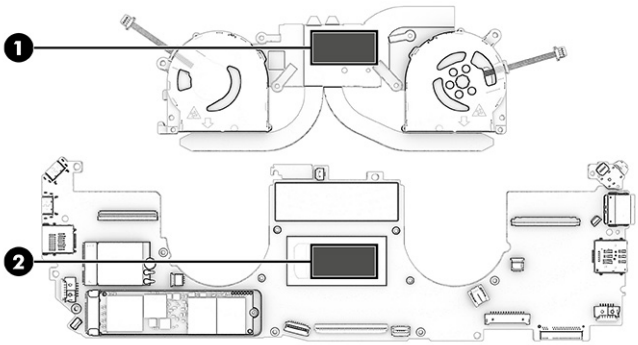
1. Lift the protective tape from the sides of the fans.
2. Disconnect the fan cables from the system board **(1)**.

3. Remove the eight Phillips M2.0 × 2.5 screws **(2)** that secure the assembly to the computer, and then remove the assembly **(3)**.



4. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. The following illustration shows the replacement thermal material locations.

   Thermal material is used on the heat sink **(1)** and associated system board component **(2)**.



To install the fan and heat sink assembly, reverse this procedure.

System board

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

Table 5-8 System board and USB door descriptions and part numbers

Description	Spare part number
Intel Core i7-1255U processor and 32 GB of system memory	N10723-601

Table 5-8 System board and USB door descriptions and part numbers (continued)

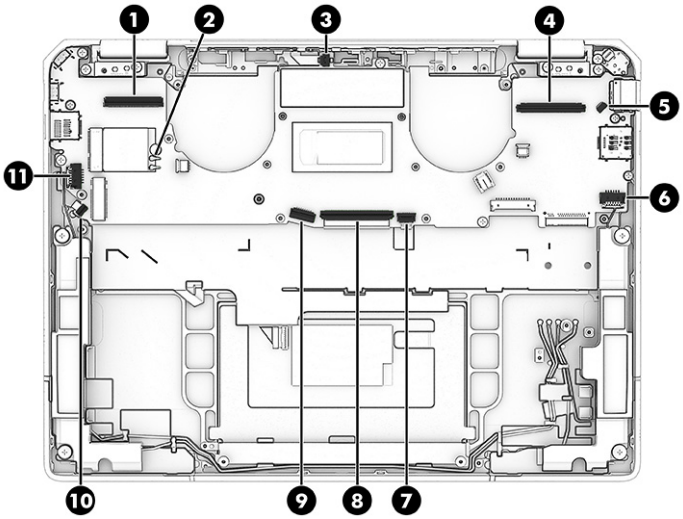
Description	Spare part number
Intel Core i7-1255U processor and 16 GB of system memory	N10721-601
Intel Core i7-1255U processor and 16 GB of system memory, OLED display	N10722-601
Intel Core i5-1235U processor and 16 GB of system memory	N10718-601
Intel Core i5-1235U processor and 8 GB of system memory	N10719-601
Intel Core i5-1235U processor and 8 GB of system memory, OLED display	N10720-601
RJ-45 (network) jack door, natural silver	N12223-001
RJ-45 (network) jack door, nightfall black	N12224-001
RJ-45 (network) jack door, nocturne blue	N12225-001

Before removing the system board, follow these steps:

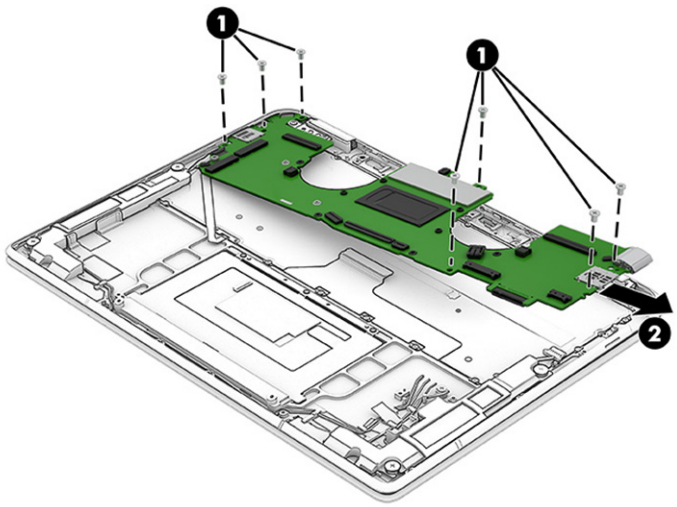
1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Remove the battery (see Battery on page 34).
4. Remove the solid-state drive (see Solid-state drive on page 36).
5. Remove the WLAN module (see WLAN module on page 37).
6. Remove the fan/heat sink assembly (see Fan and heat sink assembly on page 41).

Remove the system board:

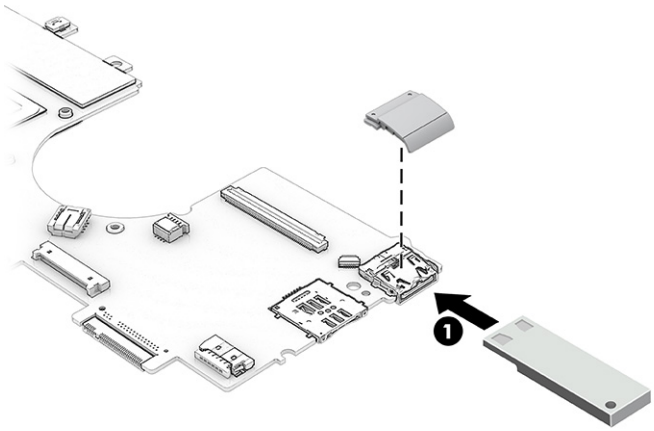
1. Disconnect the following cables from the system board:
   - Camera cable and touch connector **(1)** (ZIF)
   - Wireless antenna cables **(2)** from the WLAN module
   - Sensor board cable (ZIF) **(3)**
   - Display cable **(4)**
   - Headphone jack cable (ZIF) **(5)**
   - Speaker cable **(6)**
   - Backlight cable (ZIF) **(7)**
   - Keyboard cable (ZIF) **(8)**
   - Touchpad cable (ZIF) **(9)**
   - Fingerprint reader cable (ZIF) **(10)**
   - Speaker cable **(11)**



2. Remove the seven Phillips M2.0 × 2.5 screws **(1)** that secure the system board to the computer.
3. Lift the right edge of the system board, and then pull the board up and to the right to remove it from the computer **(2)**.



4. If you need to remove the USB door, insert the removal tool into the outside of the USB port and push the door upward to release it **(1)**.



To install the system board and USB door, reverse this procedure.

NOTE: After replacing a display panel or system board, be sure to run the service tool to write new ALS data to the system BIOS. For more information, see the related service advisory in WISE.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-9 Touchpad description and part number

Description	Spare part number
Touchpad for use in natural silver	N12217-001
Touchpad for use in nightfall black models	N12218-001
Touchpad for use in nocturne blue models	N12219-001
Touchpad cable (available in the Cable Kit)	N12220-001

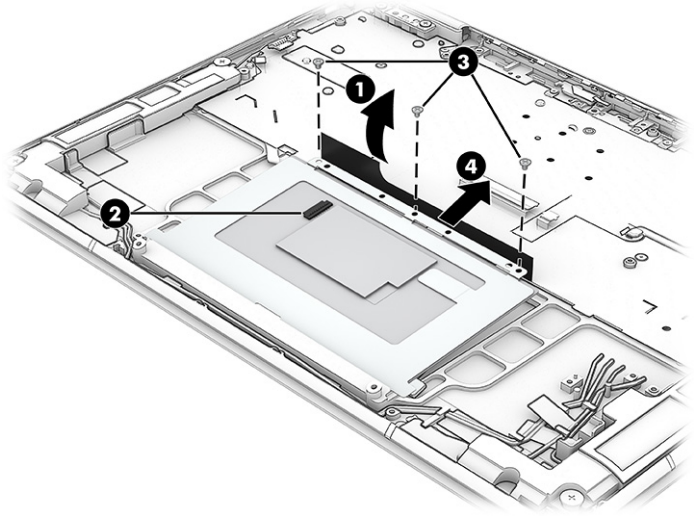
Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Remove the battery (see Battery on page 34).
4. Remove the fan/heat sink assembly (see Fan and heat sink assembly on page 41).
5. Remove the system board (see System board on page 42).

Remove the touchpad:

1. Remove the protective tape from the top of the touchpad **(1)**.
2. Disconnect the touchpad cable **(2)** from the touchpad ZIF connector.

3. Remove the three broadhead Phillips M2.0 × 2.0 screws **(3)** that secure the touchpad to the computer.
4. Lift the top of the touchpad up to a 30° angle, and then pull it out from under the bracket to remove it **(4)**.



To install the touchpad, reverse this procedure.

IR sensor board

To remove the IR sensor board, use this procedure and illustration.

Table 5-10 IR sensor board description and part number

Description	Spare part number
IR sensor board	N12222-001
IR sensor board cable	N12226-001

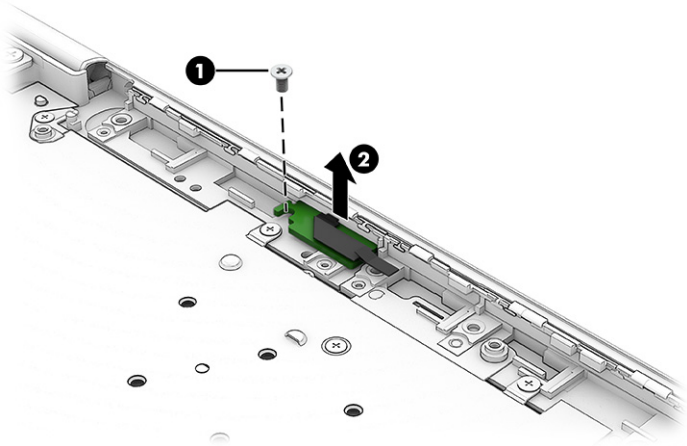
Before removing the IR sensor board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Remove the battery (see Battery on page 34).
4. Remove the fan/heat sink assembly (see Fan and heat sink assembly on page 41).
5. Remove the system board (see System board on page 42).

Remove the IR sensor board:

1. Remove the Phillips M2.0 × 2.5 screw **(1)** that secures the board to the top of the computer.

2. Remove the IR sensor board **(2)**.



To install the IR sensor board, reverse this procedure.

Keyboard

To remove the keyboard, use this procedure and illustration.

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

Table 5-11 Keyboard description and part number

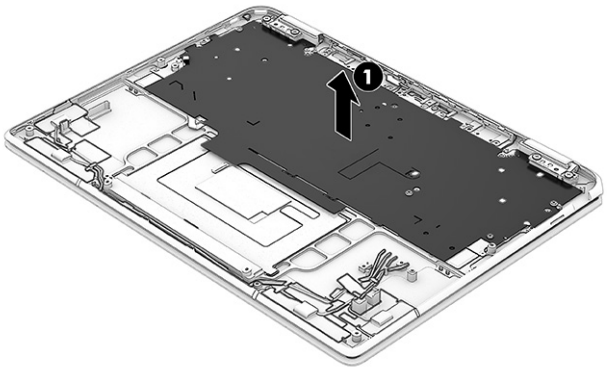
Description	Spare part number
Keyboard (backlit, includes protective Mylar):	
• Natural silver	N10735-*xx*1
• Nightfall black	N10736-*xx*1
• Nocturne blue	N10737-*xx*1
• Natural silver, privacy	N10738-*xx*1
• Nightfall black, privacy	N10739-*xx*1
• Nocturne blue, privacy	N10740-*xx*1

Before removing the keyboard, follow these steps:

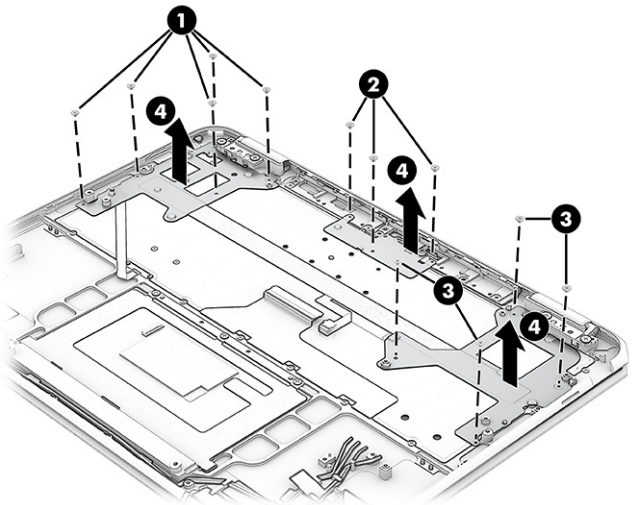
1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Remove the battery (see Battery on page 34).
4. Remove the fan/heat sink assembly (see Fan and heat sink assembly on page 41).
5. Remove the system board (see System board on page 42).

Remove the keyboard:

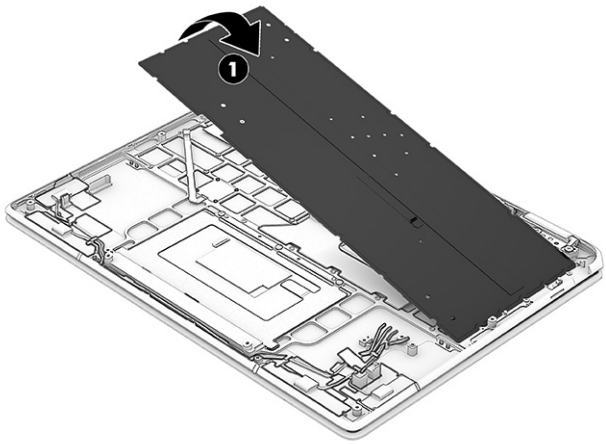
1. Peel off the protective keyboard cover **(1)**.



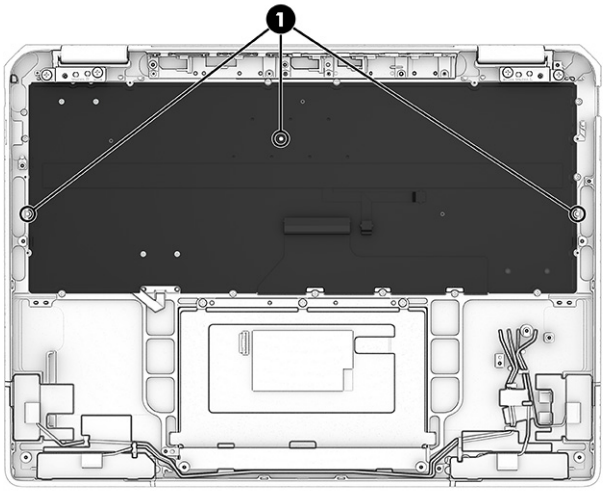
2. Remove the five Phillips M2.0 × 2.0 screws **(1)** from the right bracket.
3. Remove the three Phillips M2.0 × 2.0 screws **(2)** from the middle bracket.
4. Remove the four Phillips M2.0 × 2.0 screws **(3)** from the left bracket.
5. Remove the brackets **(4)**.



6. Peel up the keyboard cover **(1)**.

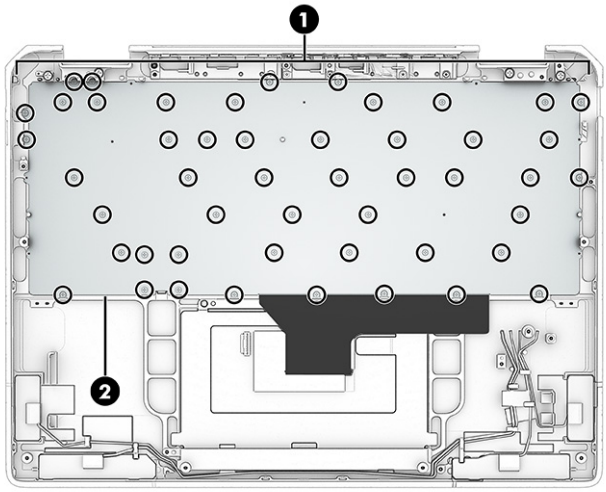


NOTE: When replacing the keyboard, use the alignment holes **(1)** to be sure the cover is correctly positioned.



7. Remove the 49 screws that secure the keyboard **(1)**.

8. Remove the keyboard **(2)**.



To install the keyboard, reverse this procedure.

Table 5-12 Keyboard country codes

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	Israel	-BB1	Slovenia	-BA1
Bulgaria	-261	Italy	-061	South Korea	-AD1
Canada	-DB1	Japan	-291	Spain	-071
Czech Republic and Slovakia	-FL1	Latin America	-161	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	Taiwan	-AB1
France	-051	Portugal	-131	Thailand	-281
Germany	-041	Romania	-271	Turkey	-141
Greece	-151	Russia	-251	United Kingdom	-031
Hungary	-211	Saudi Arabia	-171	United States	-001
India	-002				

Fingerprint reader

To remove the fingerprint reader, use this procedure and illustration.

Table 5-13 Fingerprint reader description and part number

Description	Spare part number
Fingerprint reader for use in natural silver models	N12214-001
Fingerprint reader for use in nightfall black models	N12215-001

Table 5-13 **Fingerprint reader description and part number (continued)**

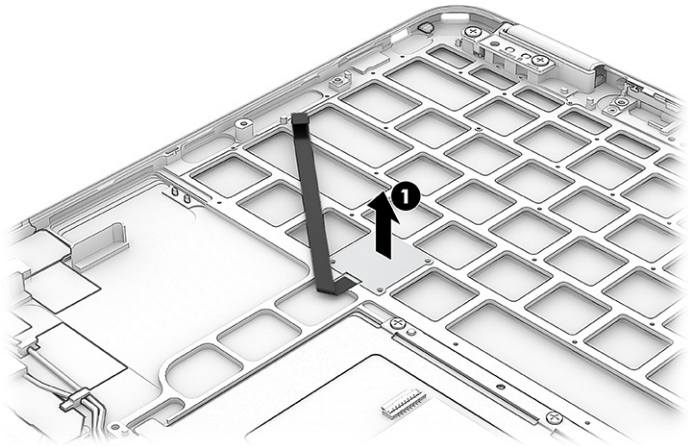
Description	Spare part number
Fingerprint reader for use in nocturne blue models	N12216-001

Before removing the fingerprint reader board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Remove the battery (see Battery on page 34).
4. Remove the fan/heat sink assembly (see Fan and heat sink assembly on page 41).
5. Remove the system board (see System board on page 42).
6. Remove the keyboard (see Keyboard on page 47).

Remove the fingerprint reader:

- Lift the fingerprint reader off the keyboard membrane **(1)**.



To install the fingerprint reader, reverse this procedure.

Display assembly

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

Full hinge-up displays are not available as spare parts. Spare parts for displays are available only at the subcomponent level.

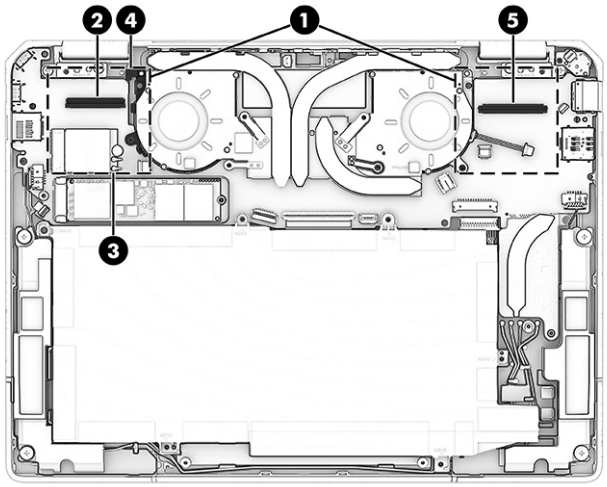
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).
2. Remove the bottom cover (see Bottom cover on page 33).
3. Disconnect the battery cable from the system board (see Battery on page 34).

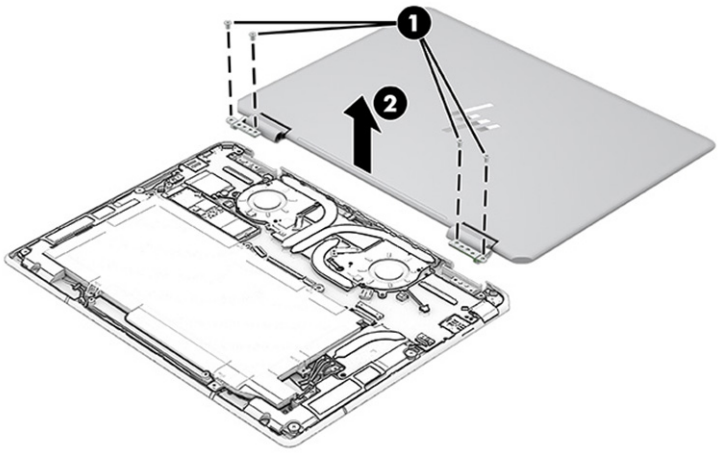
Remove the display assembly:

1. Remove the protective tape from the sides of the fans **(1)**.
2. Disconnect the camera cable/touch connector **(2)** from the ZIF connector on the system board.
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 camera cable/touch connector and wireless antenna cables from the clip on the left side of the fan **(4)**.
5. Disconnect the display panel cable **(5)** from the ZIF connector on the system board.



6. Open and rotate the display 180° so it is positioned next to the computer.
7. Remove the four Phillips M2.5 × 4.0 screws **(1)** that secure the display assembly to the computer.
8. Separate the display from the computer **(2)**.

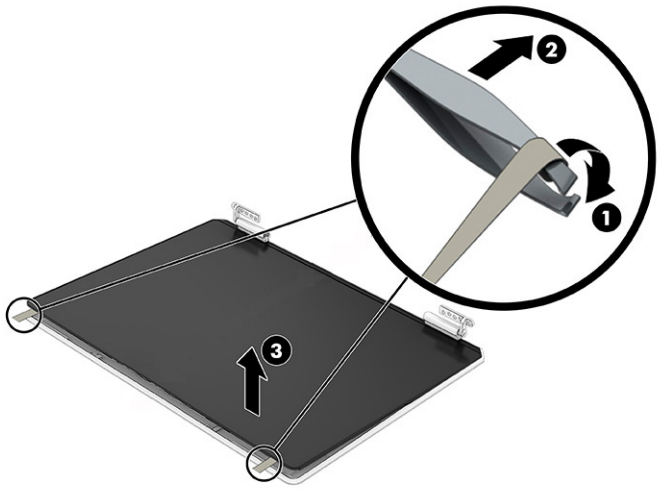


9. If you need to remove the display panel:

a. On the top-left side of the display panel, use a suction cup tool to separate the panel slightly from the rear cover. Only separate the panel enough to gain access to the panel tape.

b. Use tweezers to grasp the end of the retention tape **(1)** that is installed under the panel.

c. While turning the tweezers **(2)**, wrap the tape around the tweezers as you continue to pull the tape **(3)** out from behind the display panel.

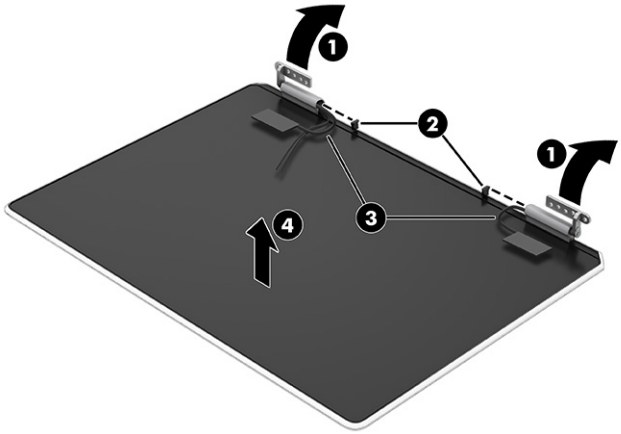


d. Rotate the hinges all the way up **(1)**.

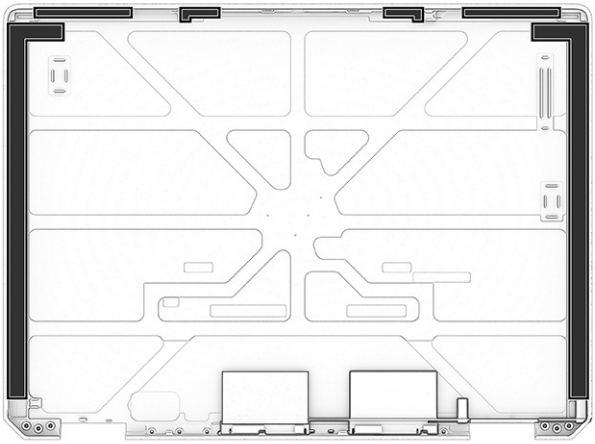
e. Remove the rubber piece from each hinge cover **(2)**.

f. Pull the cables free from both hinges covers **(3)**.

g. Separate the panel from the rear cover **(4)**.



h. When replacing the display panel, use the following illustration to determine the proper installation locations of the panel tape on the display back cover.



Display panels are available as the following spare part numbers:

N10726-001—FHD, privacy, natural silver

N10727-001—OLED, natural silver

N10728-001—400 nits, natural silver

N10729-001—FHD, privacy, nightfall black

N10730-001—OLED, nightfall black

N10731-001—400 nits, nightfall black

N10732-001—FHD, privacy, nocturne blue

N10733-001—OLED, nocturne blue

N10734-001—400 nits, nocturne blue

Display panel adhesive is available as spare part number N12238-001.

NOTE: After replacing a display panel or system board, be sure to run the service tool to write new ALS data to the system BIOS. For more information, see the related service advisory in WISE.

NOTE: Be sure to reload the calibration data after replacing the display panel assembly. For information about reloading the HP Display Control Panel Color Calibration Data, see the related Service Advisory.

NOTE: Touch panel firmware is available under **Software and Drivers** at support.hp.com.

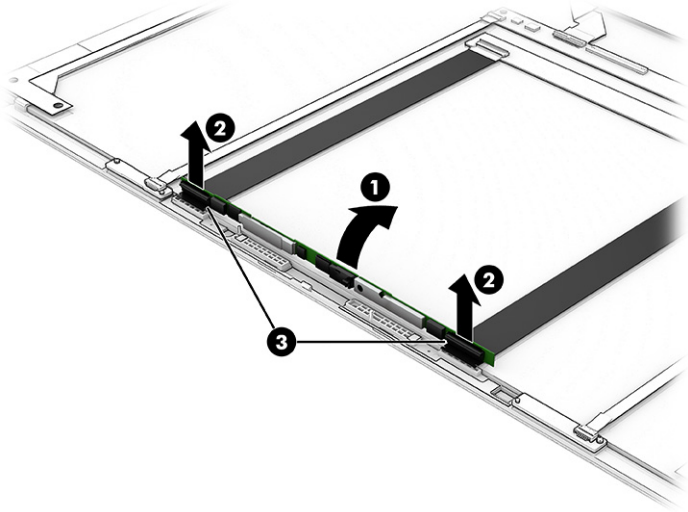
10. If you need to remove the camera/microphone module:

a. Carefully lift the module to release it from the display back cover **(1)**. (The module is attached to the display back cover with double-sided adhesive.)

b. Pull both cables up enough to access the connectors on the module **(2)**.

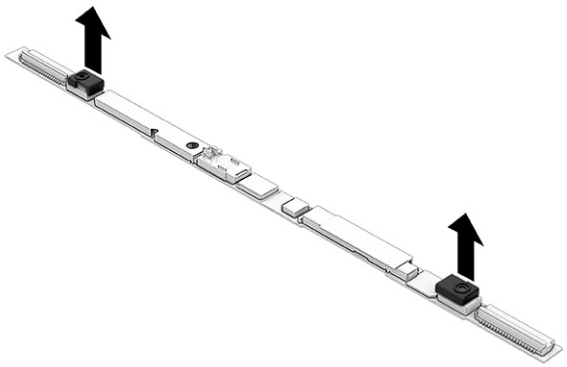
c. Disconnect the both cables from the ZIF connectors on the module **(3)**.

Camera/microphone modules are available as spare part number N12241-001.

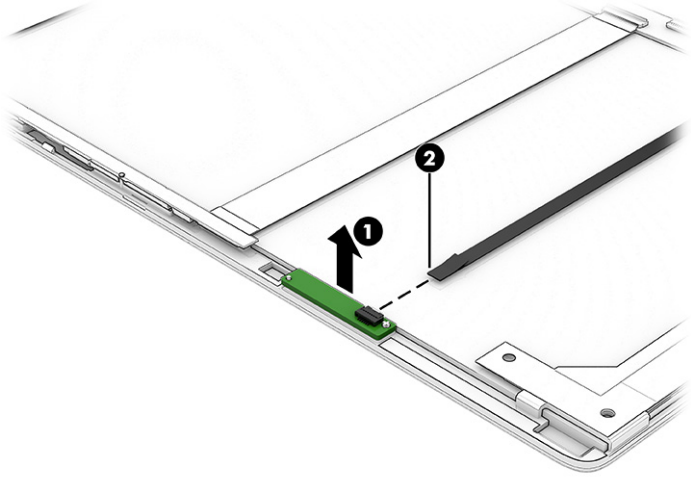


d. If you need to remove the microphone rubber pieces from the camera/microphone module, pull the rubber pieces off the module.

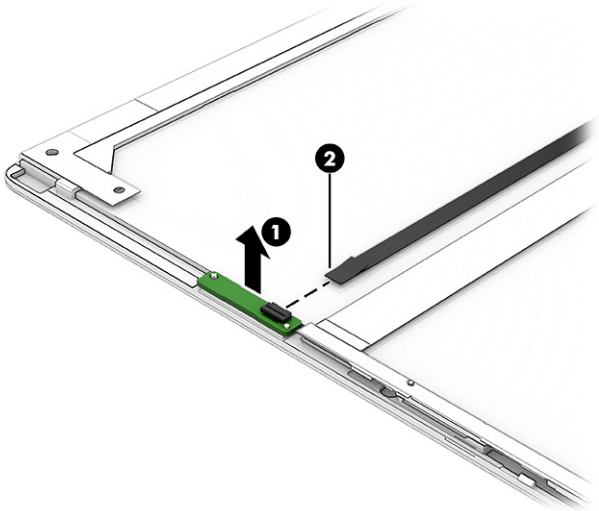
   Camera/microphone module rubber pieces are available as spare part number N15360-001.



11. If you need to remove the ambient light sensor (ALS) board, carefully lift the board to release it from the display back cover **(1)**, and then disconnect the cable from the board **(2)**. The CLS board is available using spare part number N15359-001.



12. If you need to remove the color calibration (CLS) board, carefully lift the board to release it from the display back cover **(1)**, and then disconnect the cable from the board **(2)**. Note that the cable is secured with double-sided tape.

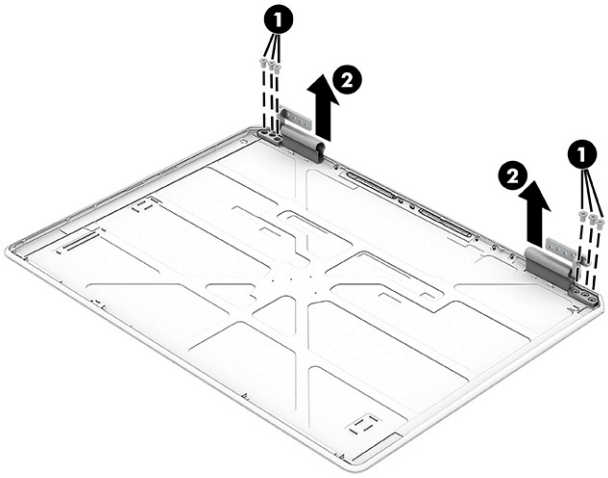


13. If you need to remove the hinges from the display enclosure:

    a. Remove the three Phillips M2.0 × 3.0 screws **(1)** that secure each hinge to the display back cover.

    b. Remove the display hinges **(2)**.

       The display hinges are available using spare part number N12206-001.



14. If you need to remove the hinge covers from the hinges:
    a. Remove the Phillips M2.0 × 8.0 screw **(1)** from each hinge cover.
    b. Pull the covers off the hinges **(2)**.

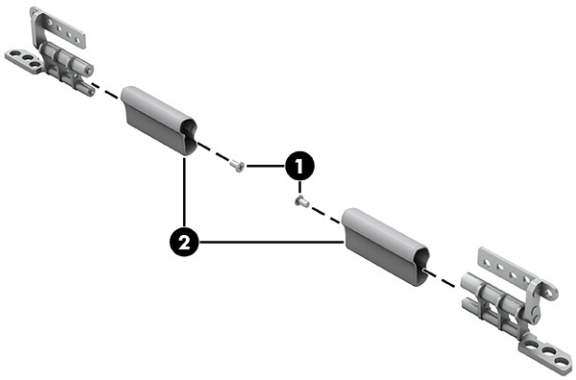
    The display hinge covers are available as the following spare part numbers:

    N12205-001: Natural silver

    N15357-001: Nightfall black

    N15358-001: Nocturne blue

    Hinge cover rubber inserts are available as spare part number N12207-001.



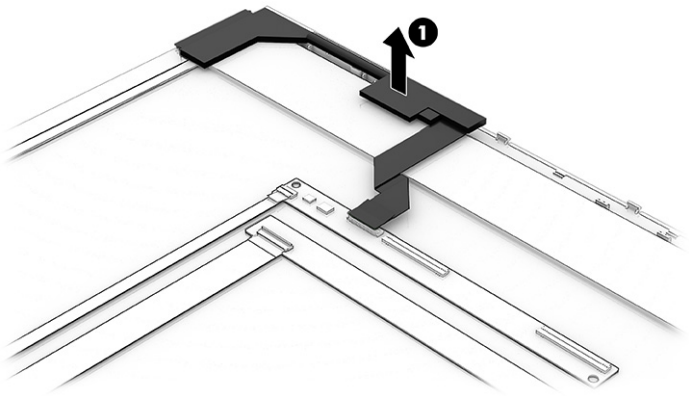
15. If you need to remove the display panel cable:
    - Peel the cable off the inside of the display rear cover **(1)**.

      The display cable is available as the following spare part numbers:

      N12202-001: FHD

N12203-001: Privacy

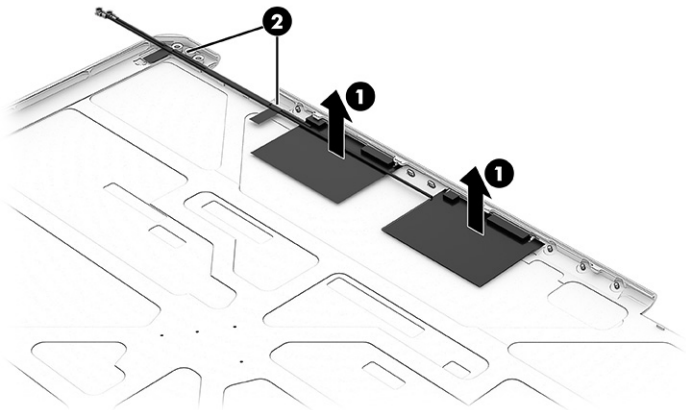
N12204-001: OLED



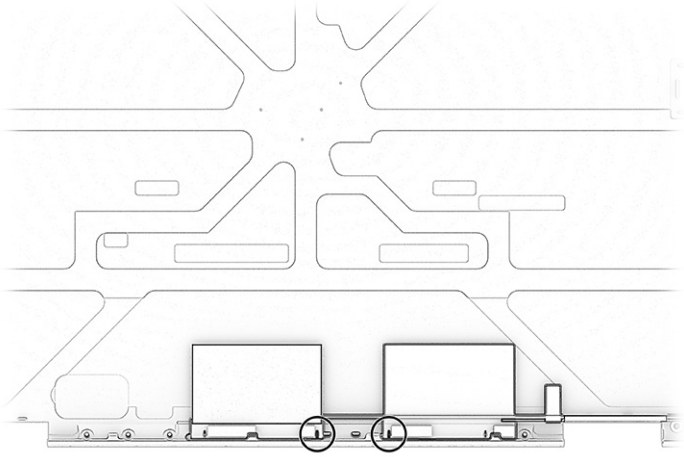
16. If you need to remove the WLAN antennas:

    a. Peel the wireless antennas off the display rear cover **(1)**. (The antennas are attached with double-sided adhesive.)

    b. Release the wireless antenna cables from the retention clips **(2)** on the display back cover. The wireless antennas are available using spare part number N12192-001.



c. When installing wireless antennas, be sure to properly place the alignment holes in the antennas at the inside-bottom of the display back cover.



Display rear covers are available as the following spare part numbers:

N12194-001: Natural silver

N12195-001: Nightfall black

N12196-001: Nocturne blue

To reassemble and replace the display assembly, reverse these procedures.

Top cover

The top cover remains after removing all other spare parts from the computer.

Table 5-14 Top cover descriptions and part numbers

Description	Spare part number
Top cover, natural silver, US	N12208-001
Top cover, nightfall black, US	N12209-001
Top cover, nocturne blue, US	N12210-001
Top cover, natural silver, Japan	N12211-001
Top cover, nightfall black, Japan	N12212-001
Top cover, nocturne blue, Japan	N12213-001

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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. Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.

     – or –

     Select the question mark icon in the taskbar.

  2. Under **My notebook**, select **Specifications**.

- Setup Utility (BIOS)

  1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 60).

  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 on page 61.

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. Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.

   – or –

   Select the question mark icon in the taskbar.

2. Select **Updates**. The **Checking for Updates** window opens, and Windows checks for updates.
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. Select the **Search** icon in the taskbar, type `file` in the 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 flash 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, 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 64 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 Restoring and recovery methods on page 64.

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.

   NOTE: The options **Remove everything** and then **Fully clean the drive** can take several hours to complete and leave no information on your computer. It is the safest way to reset your computer before you recycle it.

3. Recover using HP Recovery media. For more information, see Recovering using HP Recovery media on page 64.

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

- Select the **Start** button, select **All apps**, 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 operating system and drivers 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 63.

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 Restoring and recovery methods on page 64 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 operating system (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.

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 67.

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit failure ID code is generated for select component tests. For interactive tests, such as keyboard, mouse, or audio and video palette, you must perform troubleshooting steps before you can receive a failure ID.

- You have several options after you receive a failure ID:
  - Select **Next** to open the Event Automation Service (EAS) page, where you can log the case.

    – or –

  - Scan the QR code with your mobile device, which takes you to the EAS page, where you can log the case.

    – or –

  - Select the box next to the 24-digit failure ID to copy your failure code and send it to support.

Accessing HP PC Hardware Diagnostics Windows

After HP PC Hardware Diagnostics Windows is installed, you can access it from HP Support Assistant or the Start menu.

Accessing HP PC Hardware Diagnostics Windows from HP Support Assistant

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

1. Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.

   – or –

   Select the question mark icon in the taskbar.

2. Select **Fixes & Diagnostics**.
3. Select **Run hardware diagnostics**, and then select **Launch**.
4. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.

NOTE: To stop a diagnostic test, select **Cancel**.

Accessing HP PC Hardware Diagnostics Windows from the Start menu (select products only)

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from the Start menu.

1. Select the **Start** button, and then select **All apps**.
2. Select **HP PC Hardware Diagnostics Windows**.
3. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.

NOTE: To stop a diagnostic test, select **Cancel**.

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version from HP

To download HP PC Hardware Diagnostics Windows from HP, 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 the specific Windows diagnostics version to download to your computer or a USB flash drive.

The tool downloads to the selected location.

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 select the **Search** icon in the taskbar, and then type `Microsoft Store` in the search box.
2. Type `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.
3. Follow the on-screen directions.

The tool downloads to the selected location.

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

You can download HP PC Hardware Diagnostics Windows by product name or number.

NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

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

The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, navigate to the folder on your computer or the USB flash drive where the .exe file downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

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.

NOTE: For some products, 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 69.

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

Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit failure ID code is generated.

For assistance in solving the problem:

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

  – or –

  Contact support, and provide the failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow this procedure.

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 69.

   b. Hard drive

   c. BIOS

3. When the diagnostic tool opens, select the type of diagnostic test that 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 some situations.

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

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive, follow this procedure.

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)

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

NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

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

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

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

For more information about Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

You can 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 Remote Diagnostics**, and then select **Run**.

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

You can download HP Remote PC Hardware Diagnostics UEFI by product name or number.

NOTE: For some products, you might have to download the software by using the product name or number.

1. Go to http://www.hp.com/support.
2. Select **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 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 **Exit**, then select **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 system.

Computer specifications

This section provides specifications for your computer. When you travel 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	**298 mm**	11.7 in
Depth	**221 mm**	8.7 in
Height	**17 mm**	0.67 in
Weight	**1366.7 g**	3.01 lb
Input power		
Operating voltage and current	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	
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.

Display specifications

This section provides specifications for your display.

Table 9-2 Display specifications

	Metric	U.S.
Active diagonal size	**34.3 cm**	13.5 in

Table 9-2 **Display specifications (continued)**

	Metric	U.S.
Resolution	1920 × 1280 (WUXGA+) 3000 × 2000 (3k2k)	
Surface treatment	BrightView Antiglare (privacy)	
Brightness	1000 nits (privacy) 400 nits	
Viewing angle	UWVA	
Backlight	WLED	
Display panel interface	eDP	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-3 **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
Transfer rate			
Sequential read	up to 2150 MBps	up to 2150 MBps	up to 2150 MBps
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MBps	up to 1550 MBps	up to 1550 MBps
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 three-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
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1

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

Country/region	Accredited agency	Applicable note number
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
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
United Kingdom	ASTA	1
United States	UL	2

1. The flexible cord must be Type H05VV-F, three-conductor, 0.75 mm^2 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, three-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, three-conductor, 0.75 mm^2 or 1.25 mm^2 conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.
4. The flexible cord must be Type RVV, three-conductor, 0.75 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
5. The flexible cord must be Type H05VV-F three-conductor, 0.75 mm^2 conductor size. KTL logo and individual approval number must be on each element. Approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF three-conductor, 1.25 mm^2 conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F three-conductor, 0.75 mm^2 or 1.00 mm^2 conductor size, with plug BS 1363/A with BSI or ASTA marks.

11 Recycling

When a 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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