



Maintenance and Service Guide

HP OmniBook Ultra Flip 14 inch 2-in-1
Laptop Next Gen AI PC

Model numbers: 14-fh0xxx

SUMMARY

This guide provides maintenance information about such topics as spare parts, removal and replacement of parts, security, and backing up.

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Product notice

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

Not all features are available in all editions or versions of Windows. Systems might 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 might apply and additional requirements might 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 might not work (including some antivirus, PDF writers, driver utilities, and accessibility apps), and performance might 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.

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

Safety warning notice

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 provided by HP 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 OmniBook Ultra Flip 14 inch 2-in-1 Laptop Next Gen AI PC
	Model numbers: 14-fh0xxx
	CTO model number: 14t-fh000
Processors	Intel® Core™ Ultra9 288V
	Intel Core Ultra7 258V
	Intel Core Ultra7 256V
	Intel Core Ultra5 226V
Graphics	Internal graphics
	Intel Arc Integrated Graphics
Display	14.0 in (35.6 cm), 2.8K (2880 × 1800), OLED, bent, 100% sRGB, BrightView, narrow bezel, low blue light, ultrawide viewing angle (UWVA), DCI-P3, embedded DisplayPort™ (eDP) 1.4 + panel self-refresh (PSR), 400 nits, 120 Hz (VRR)
	16:10 Aspect Ratio
	Supports Intel OLED Power Saving Technology (OPST)
	Supports Edge Luminance Profile (ELP)
	Gorilla Glass 5
	Anti-Smudge
	Panel Certification, low blue light
	EyeSafe Label
	Flicker free
	Color Calibration with Delta E
	MSFT HDR Streaming Capable
	MSFT DRR (Dynamic Refresh Rate)
Memory	On-board system memory, not accessible or upgradeable
	Supports 32 GB or 16 GB of RAM
	LPDDR5x-8533
Primary storage	PCIe Gen4, Non-Volatile Memory express (NVMe), M.2 2280 solid-state drives
	2 TB, PCIe-4 × 4, triple layer cell (TLC)
	1 TB, PCIe-4 × 4, TLC
	1 TB

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

Category	Description
	512 GB, TLC
	512 GB
Audio and video	Quad speakers
	Supports speaker swap
	Poly Studio
	DTS:X Ultra
	HP Audio Boost 2.0
	XiaoWei
Video	HP Wide Vision 9 MP Camera: with shutter door, indicator LED, 1 × infrared (IR) LED, MIPI, f1.8, 9 MP BSI sensor, WDR/TNR/HDR, 88° wide field-of-view (WFOV)
	Camera enhancement
	Microsoft® Presence Sensing
	Gestures
	Posture detection
	Health features
	Smart Adapt (including theme detection)
	Dual-array digital microphone with appropriate software: beam forming, echo cancellation, noise suppression
Wireless	Integrated wireless module
	Intel Wi-Fi® 7 BE201 Bluetooth® 5.4
	Compatible with Miracast® devices
	Supports Modern Standby (Connected)
	Bluetooth Audio Offload
	Bluetooth LE Audio
	Wi-Fi BIOS SAR
	Dynamic antenna gain (Wi-Fi)
	Dynamic antenna gain (BT)
	UNII-4 5 GHz channel
	WLAN Time Average SAR (TAS)
Ports	Audio-out (headphone)/audio-in (microphone) combo jack

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

Category	Description
	USB 3.2 Gen 2 Type-C® (left side) <ul style="list-style-type: none"> • Data transfer • Power delivery • HP Sleep & Charge • DisplayPort 1.4a • HDMI 2.1 out up to 6K @ 60 Hz with HDCP 2.3 through adapter
	(2) USB 3.2 Type-C Thunderbolt™ 4 (right side): <ul style="list-style-type: none"> • 40 Gbps • Data transfer • Power delivery • HP Sleep & Charge • DisplayPort® 2.1 • HDMI 2.1 out up to 6K @ 60 Hz with HDCP 2.3 through adapter
Keyboard/pointing devices	Keyboard
	Backlit, island style
	Fingerprint reader located on power button
	Audio mute on/off key
	Mic mute on/off key
	HP Hubs Launcher key
	Haptics touchpad supporting gestures (brightness/volume)
	Multitouch gestures enabled
	Precision touchpad support
	Taps enabled as default
Power requirements	Battery (polymer, HP Long Life)
	6 cell, 64 Whr
	HP Fast Charge Technology
	Smart AC adapters (USB-C®, slim, straight)
	65 W
	Power cord
	C5, premium, 1 m (3.3 ft), sticker
Security	Supports Trusted Platform Module (TPM) 2.0, discrete
	Microphone mute
	Camera privacy cover

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

Category	Description
	Fingerprint reader
Sensors	Accelerometer
	Accelerometer + Gyroscope
	IR thermal sensor
	Magnetometer (E compass)
Operating system	Windows® 11 Pro
	Windows 11 Pro High End
	Windows 11 Pro High End China
	Windows 11 Pro China
	Windows 11 Pro Value
	Windows 11 Pro Value China
	Windows 11 Pro Entry
	Windows 11 Pro Entry China
	Windows 11 Home 64 Desktop AIO Chinese Market CPPP
	Windows 11 Home in S Mode for Developed Markets (ML)
	Windows 11 Home in S Mode for Emerging Markets (EM/SL)
	Windows 11 Home in S Mode for China Market
	Windows 11 Home in S Mode for APAC Markets
	Windows 11 Home in S Mode for Africa Markets
	Windows 11 Home in S Mode for Indonesia Market
	Windows 11 Home in S Mode for India Market
	Windows 11 Home for Developed Market (ML)
	Windows 11 Home for Developed Market (ML)
	Windows 11 Home for Emerging Market (EM/SL)
	Windows 11 Home for China Market
	Windows 11 Home for India Market
	Windows 11 Home for Indonesia Market
	Windows 11 Home for APAC Market
	Windows 11 Home for Africa PPP Market
Serviceability	End user replaceable parts
	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.

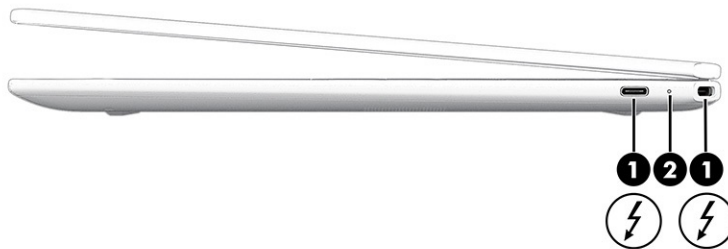



Table 2-1 Right-side components and their descriptions

	Component	Description
(1)	 USB Type-C® power connector and Thunderbolt™ ports with HP Sleep and Charge and DisplayPort™ output (2)	<p>Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.</p> <p>- and -</p> <p>Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off.</p> <p>NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.</p> <p>- and -</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort output.</p> <p>NOTE: Your computer might also support a Thunderbolt docking station.</p>
(2)	AC adapter and battery light	<ul style="list-style-type: none"> • 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.

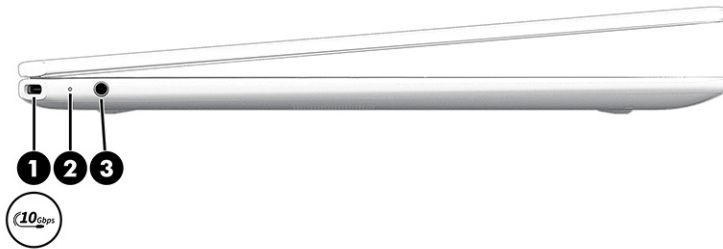




Table 2-2 Left-side components and their descriptions

	Component	Description
(1)	 USB Type-C port	Connects a USB Type-C cable to a peripheral device, such as a keyboard, mouse, or USB hard drive and charges up to 5 V/3 A.
(2)	AC adapter and battery light	<ul style="list-style-type: none">• 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.
(3)	 Audio-out (headphone)/ Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. WARNING! To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i> . To access this guide: <ul style="list-style-type: none">■ 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 a headphone jack, the computer speakers are disabled.

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>.

IMAX Enhanced Mode (select products only)

Select computer models are configured with IMAX® Enhanced Mode, a solution built into the hardware and software to enhance the IMAX audio and video experience.

To access the latest setup documentation, go to <http://www.hp.com/support>, type IMAX in the **Search our knowledge library** search box, and then select **HP Consumer Notebook PCs - Enabling the IMAX features**.

Wake-on-voice (select products only)

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

To access the wake-on-voice settings, follow these steps:

1. Select the **Search** icon in the taskbar, type *XiaoWei* in the search box, and then select **XiaoWei**.
2. When the tool opens, scan the QR code with your mobile device, which takes you to the settings page, where you can select your wake-on-voice features.
3. Follow the on-screen instructions.

📝 NOTE: Allow the XiaoWei app to continue running on the computer.

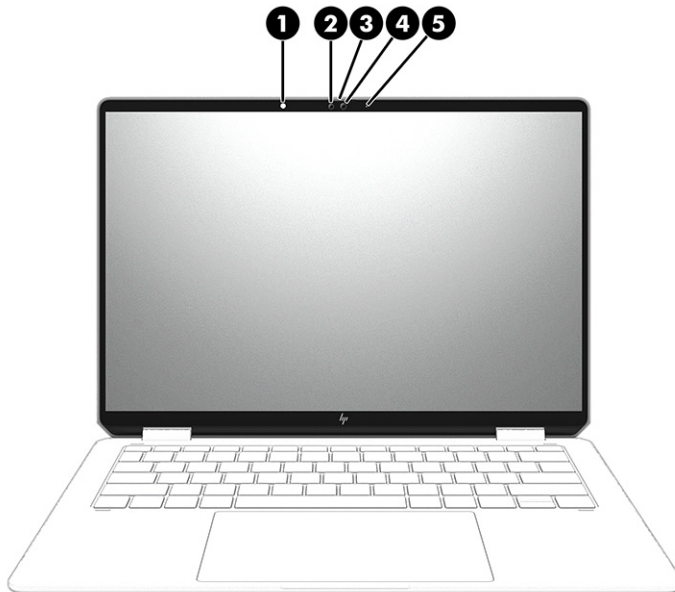


Table 2-3 Display components and their descriptions

Component	Description
(1) Infrared camera light	On: Infrared camera is in use.

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

	Component	Description
(2)	Infrared 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.
(3)	Manual camera shutter	Allows you to open or close the camera shutter by sliding the latch. <ul style="list-style-type: none">• Slide it to the left to close the shutter.• Slide it to the right to open the shutter.
(4)	Webcam	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)	Webcam light	On: Webcam is in use.

*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 key, is disabled in stand, tent, and tablet modes. To enable the keyboard, including the power key, 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.

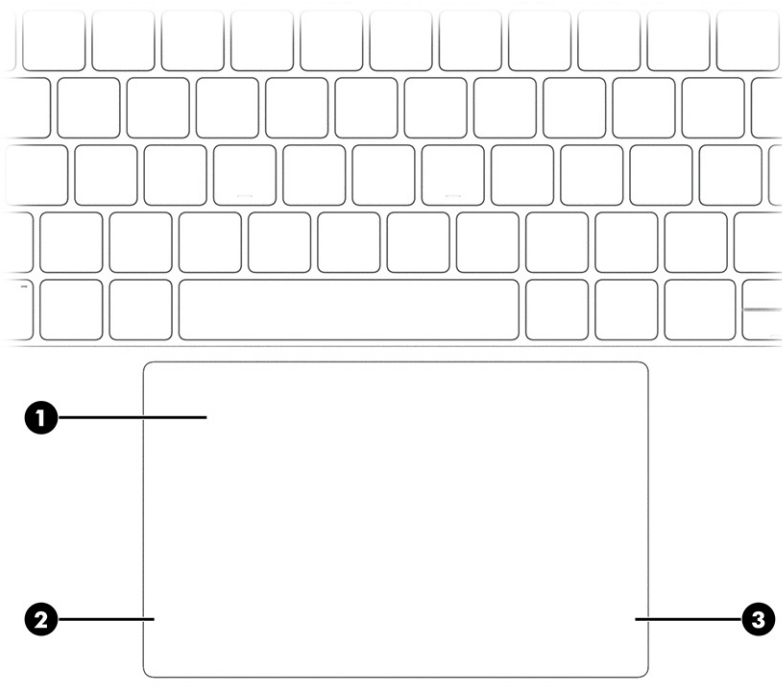


Table 2-4 Touchpad components and their descriptions

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

Lights

Identify the lights on the computer.

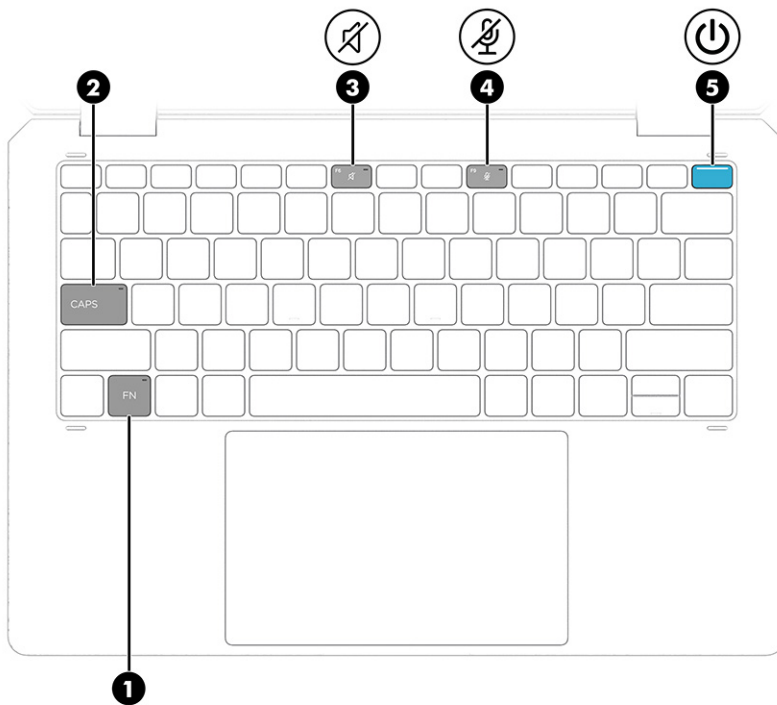
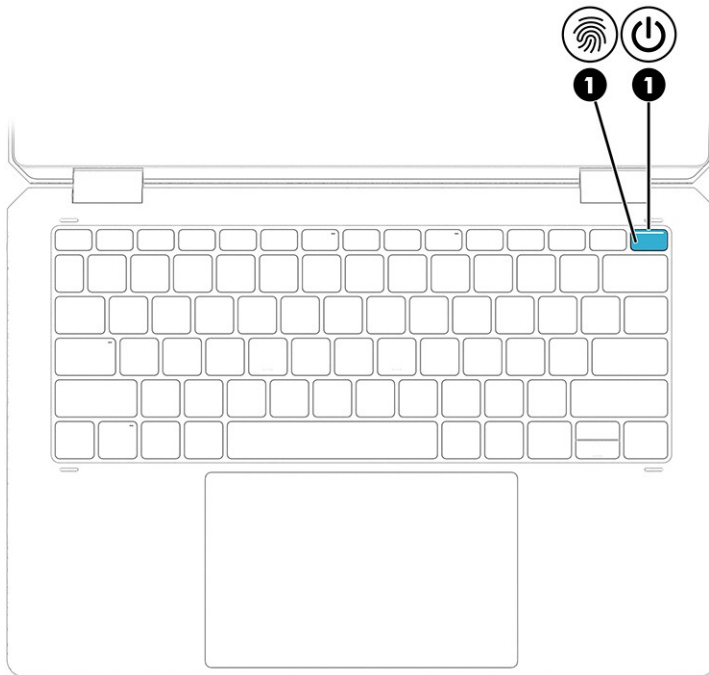


Table 2-5 Lights and their descriptions

	Component	Description
(1)	Fn lock light	<ul style="list-style-type: none"> On: The fn key is locked. Off: The fn key is unlocked.
(2)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(3)	Mute light	<ul style="list-style-type: none"> On: Computer sound is off. Off: Computer sound is on.
(4)	Microphone mute light	<ul style="list-style-type: none"> On: Microphone is off. Off: Microphone is on.
(5)	Power light	<ul style="list-style-type: none"> On: The computer is on. Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other 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 power button and fingerprint reader.



Fingerprint readers, which enable a fingerprint logon, can be located on the touchpad, the power button, a side panel of the computer, or the top cover below the keyboard.




 **IMPORTANT:** To verify that your computer supports fingerprint reader sign-in, select the **Search** icon in the taskbar, type `Sign-in options` in the search box and press `enter`. If **Fingerprint recognition** is not listed as an option, then your computer does not include a fingerprint reader.

Table 2-6 Button and fingerprint reader and their descriptions

	Component	Description
(1) 	Power button/fingerprint reader	<p>Power button</p> <ul style="list-style-type: none">• 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.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 10 seconds to turn off the computer.</p> <p>To learn more about your power and sleep settings:</p> <ul style="list-style-type: none">■ Right-click the Power icon , and then select Power and sleep settings. <p>Fingerprint reader</p> <p>Allows a fingerprint logon to Windows, instead of a password logon.</p> <ul style="list-style-type: none">■ Touch your finger to the fingerprint reader. <p>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.</p>

Special keys

Identify the special keys.

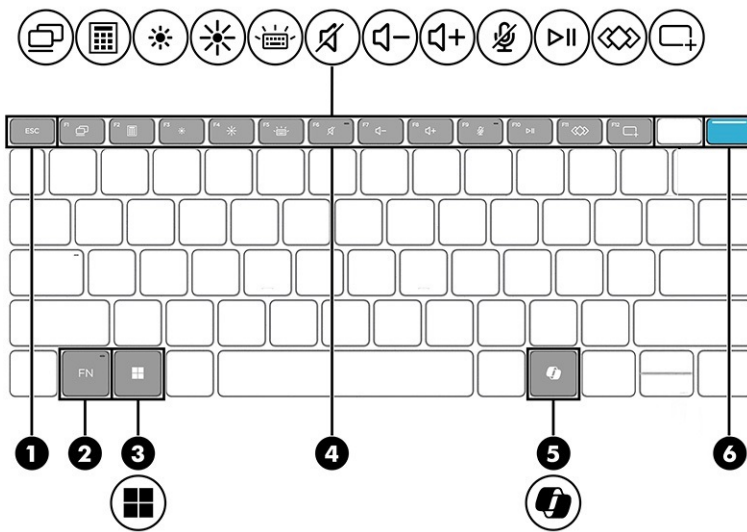




Table 2-7 Special keys and their descriptions

	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)	Windows Copilot key	Opens Windows Copilot (select products only). NOTE: Some features require a neural processing unit. The timing of feature delivery and availability varies by market and device. You must have a Microsoft account to use the Copilot feature. Where the Copilot feature is not available, pressing the Copilot key opens the Bing search engine. See http://aka.ms/WindowsAIFeatures .

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

	Component	Description
(6)	 Power button/Fingerprint reader	<p>Power button</p> <ul style="list-style-type: none">• 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.• When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 10 seconds to turn off the computer.</p> <p>To learn more about your power and sleep settings:</p> <ul style="list-style-type: none">■ Right-click the Power icon , and then select Power and sleep settings. <p>Fingerprint reader</p> <p>Allows a fingerprint logon to Windows, instead of a password logon.</p> <ul style="list-style-type: none">■ Swipe the upper-left corner of the touchpad. <p>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.</p>

Bottom

Identify the bottom components.

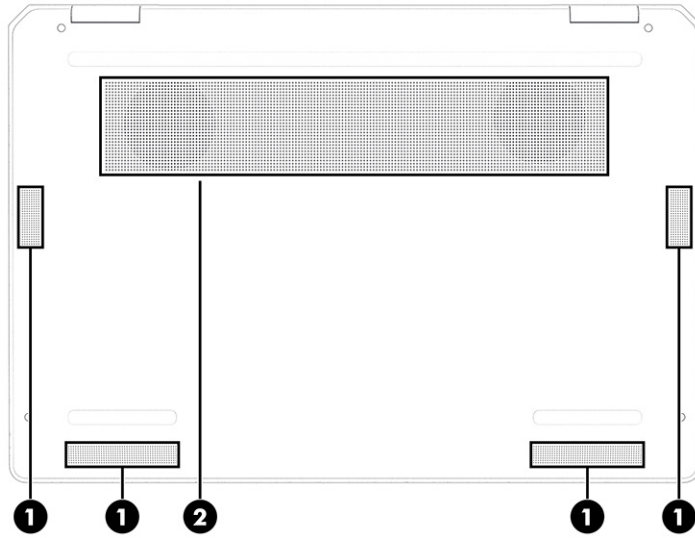


Table 2-8 Bottom components and their descriptions

	Component	Description
(1)	Speakers (4)	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 the following example.



Table 2-9 Service label components

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

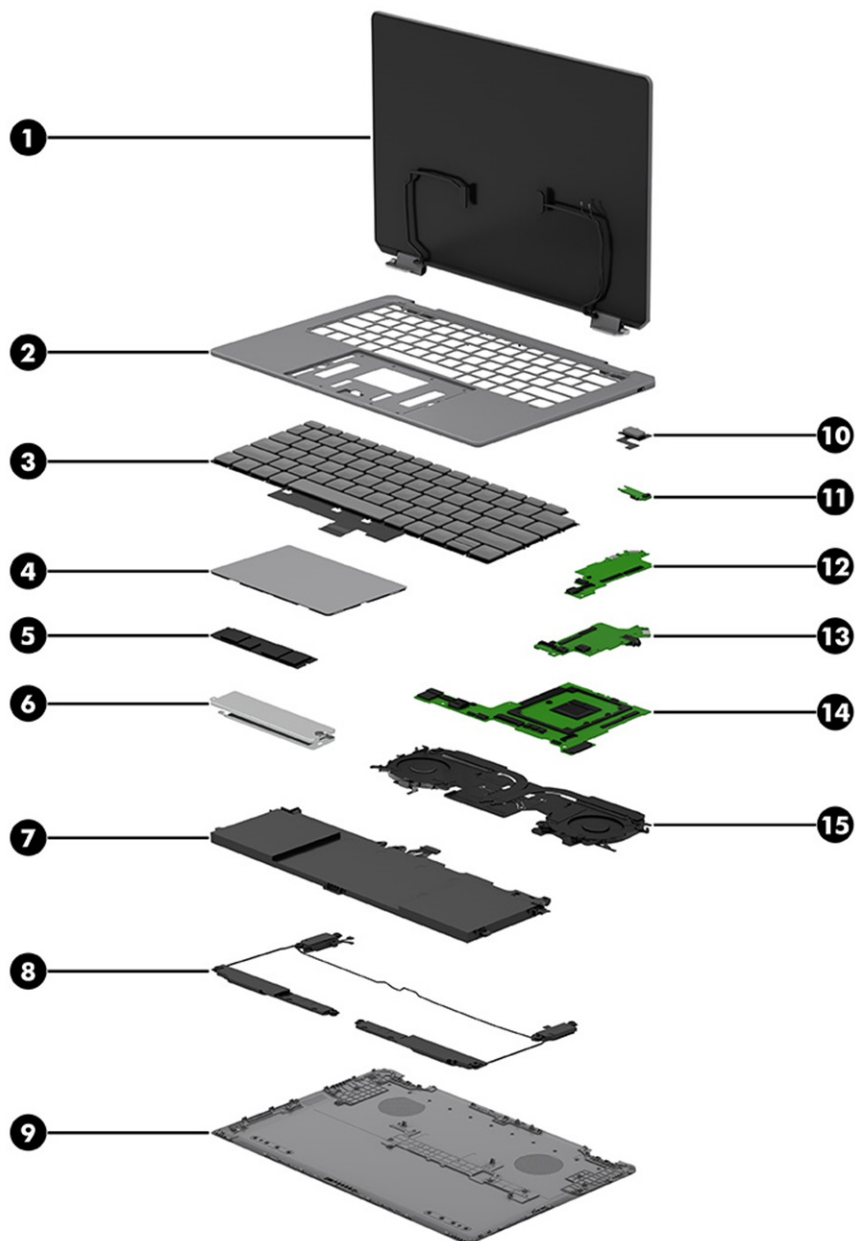


Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	Display assembly NOTE: Display assemblies are offered as spare parts only at a subcomponent level. For more information, see Display assembly subcomponents on page 19 .	not available as a spare part
(2)	Top cover	
	Atmospheric blue	P07122-001
	Eclipse gray	P07123-001
	Eclipse gray (for use in Japan)	P07124-001
(3)	Keyboard	
	Atmospheric blue	P07120-xx1
	Eclipse gray	P07121-xx1
(4)	Touchpad NOTE: The touchpad single cable is available using spare part number P07144-001. The touchpad power cable is available using spare part number P07143-001.	
	Atmospheric blue	P07125-001
	Eclipse gray	P07126-001
(5)	Solid-state drive (PCIe) NOTE: The solid state drive thermal pad is available as spare part number P07150-001.	
	2 TB, TLC	N77396-005
	1 TB, TLC	N77395-005
	1 TB	N77394-005
	512 GB	N77392-005
(6)	SSD bracket	not available as a spare part
(7)	Battery (6 cell, 64 Whr)	P07278-001
(8)	Speakers (left and right)	P07148-001
(9)	Bottom cover	
	Atmospheric blue	P07127-001
	Eclipse gray	P07128-001
(10)	Power button/fingerprint reader board The power button/fingerprint reader board cable is available using spare part number P07146-001.	
	Atmospheric blue	P07145-001
	Eclipse gray	P14067-001
(11)	IR sensor board The IR sensor board cable is available using spare part number P07132-001.	P07131-001

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

Item	Component	Spare part number
(12)	USB board The HS USB cable is available using spare part number P07134-001. The LS USB cable is available using spare part number P07135-001. The power USB cable is available using spare part number P07136-001.	P07133-001
(13)	Audio board The HS audio board cable is available using spare part number P07138-001. The LS audio board cable is available using spare part number P07139-001. The power audio board cable is available using spare part number P07140-001.	P07137-001
(14)	System board (includes processor; for use in models with the Windows operating system) NOTE: System board protective tape is available as spare part number P07142-001. Protective tape for system board connectors is available as spare part number P07141-001.	
	Intel Core Ultra9 288V processor	P16921-601
	Intel Core Ultra7 258V processor	P07116-601
	Intel Core Ultra7 256V processor	P07117-601
	Intel Core Ultra5 226V processor	P07118-601
(15)	Heat sink with fans	P07147-001

Display assembly subcomponents

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

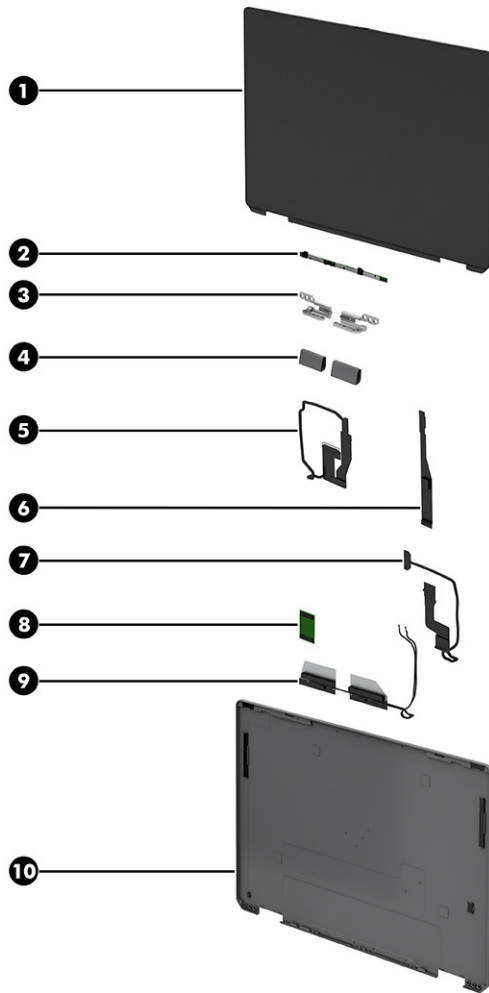


Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	Display panel (includes absorber and panel adhesive)	P07119-001
	NOTE: Panel adhesive is available as spare part number P07160-001.	
(2)	Camera module (includes rubber pieces and panel adhesive)	P07152-001
(3)	Hinges (left and right, includes panel adhesive)	P07157-001
(4)	Hinge covers (includes rubber cable guides and panel adhesive)	
	Atmospheric blue	P07158-001
	Eclipse gray	P15809-001
(5)	Display panel cable (includes absorber and panel adhesive)	P07156-001
(6)	Camera cable, FPC (connects to top of camera board; includes panel adhesive)	P07154-001
(7)	Camera cable (connects to bottom of camera board; includes panel adhesive)	P07153-001
(8)	Camera board	P07155-001

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

Item	Component	Spare part number
(9)	Wireless antenna kit (includes rubber and panel adhesive)	P07151-001
(10)	Display back cover (includes wireless antennas and panel adhesive)	
	Atmospheric blue	P07129-001
	Eclipse gray	P07130-001

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-3 Miscellaneous part descriptions and part numbers

Component	Spare part number
Slim AC adapter (65 W, nPFC, USB-C)	M54350-001
Screw Kit	P07159-001
Protective Tape Kit	P07142-001
Protect Tape Kit, Connectors	P07141-001
Display panel adhesive	P07160-001
HP USB-C-to-HDMI 2.0 adapter	935325-001
Pen, silver	N44378-001
Pen, black	N54711-001
Power cords (C5, premium, 1.0 m [3.3 ft])	
Australia	L22327-001
Denmark	L22322-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L22321-001
India	L22624-001
Israel	L22323-001
Italy	L30813-001
Japan	L22330-001
North America	L22319-001
People's Republic of China	L21930-001
South Africa	L22325-001
South Korea	L22328-001
Switzerland	L22324-001
Taiwan	L22328-001
Thailand	L22326-001
Thailand bundle	M85421-001

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

Component	Spare part number
United Kingdom	L22320-001

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
- Suction cups (to remove display panel)
- Heating device (to loosen display panel adhesive)
- Nonconductive, nonmarking pry tool
- Magnetic Phillips P1 screwdriver

Service considerations

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


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

Plastic parts

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 or Sleep mode, 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 25](#).
 - Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
 - If you remove a component, place it in an electrostatic-safe container.
-


Generating static electricity

Follow these static electricity guidelines:

- Different activities generate different amounts of static electricity.
- Static electricity increases as humidity decreases.

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

Event	55% relative humidity	40% relative humidity	10% relative humidity
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 dual in-line packages (DIPs) 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

 **NOTE:** Multiple electric components can be packaged together in plastic tubes, trays, or polystyrene foam.

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 M Ω \pm 10% resistance in the ground cords. To provide proper ground, wear a strap snug against bare skin. Verify that the ground cord is connected and fits 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 $1\text{ M}\Omega \pm 10\%$ resistance between the operator and ground.

Table 4-2 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 $1\text{ M}\Omega \pm 10\%$ resistance
- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing $1\text{ M}\Omega \pm 10\%$ 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**.
 - Select the **HP Easy Clean** icon in the taskbar.
 - 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 27](#) 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 28](#) 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 29](#).


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 28](#) 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 27](#), [Caring for wood veneer \(select products only\) on page 29](#), 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 27](#) 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 28](#) 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
<p>Records of reported failure incidents stored on the computer</p>	<p>Windows®:</p> <p>Preoperating system failures are logged in the BIOS Event Log. To view the BIOS Event Log:</p> <ol style="list-style-type: none"> 1. Press the power button. 2. Immediately and repeatedly press esc when the power button light turns white. <p>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.</p> <ol style="list-style-type: none"> 3. Press f10 to enter the BIOS setup. 4. Complete one of these tasks: <ul style="list-style-type: none"> • (On commercial products) Under the Main tab, select BIOS event log, and then select View BIOS Event Log. • (On consumer products) Under the Main tab, select System Log. <p>Post-operating system failures are logged in the Event Viewer.</p> <ol style="list-style-type: none"> 1. Turn on the computer and allow the operating system to open. 2. Select the search icon  in the taskbar. 3. Type <code>Event Viewer</code>, and then press enter. 4. Select the log from the left panel. Details display in the right panel. <p>Chrome™:</p> <ol style="list-style-type: none"> 1. Go to support.google.com/chrome. 2. Search <code>collect Chrome device logs</code>.
<p>Technical bulletins</p>	<p>To locate technical bulletins:</p> <ol style="list-style-type: none"> 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.
<p>Repair professionals</p>	<p>To locate repair professionals:</p> <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"><li data-bbox="703 310 1203 331">1. Go to http://www.hp.com/go/techcenter/pcdiags.<li data-bbox="703 359 938 380">2. Select Get Support.<li data-bbox="703 407 1445 457">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.

 **NOTE:** The [HP Support YouTube Channel](#) (in English) has videos that provide step-by-step removal and replacement instructions for many common parts and models.

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 <https://partsurfer.hp.com/partsurfer/>, 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 23](#).

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation or Sleep mode, 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.

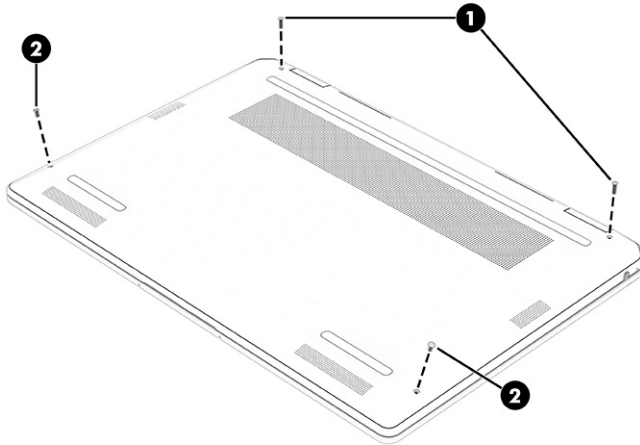
Table 5-1 Bottom cover descriptions and part numbers

Description	Spare part number
Atmospheric blue	P07127-001
Eclipse gray	P07128-001

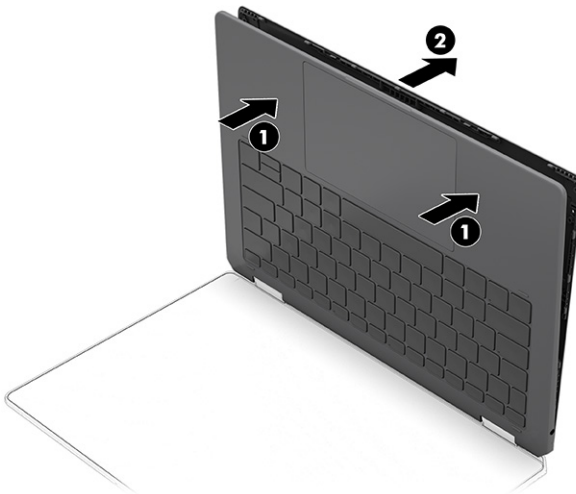
Before removing the bottom cover, prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).

Remove the bottom cover:

1. Remove the two Torx2 × 7.0 screws (1) from the bottom cover.
2. Remove the two Torx2 × 3.0 screws (2) from the bottom cover.

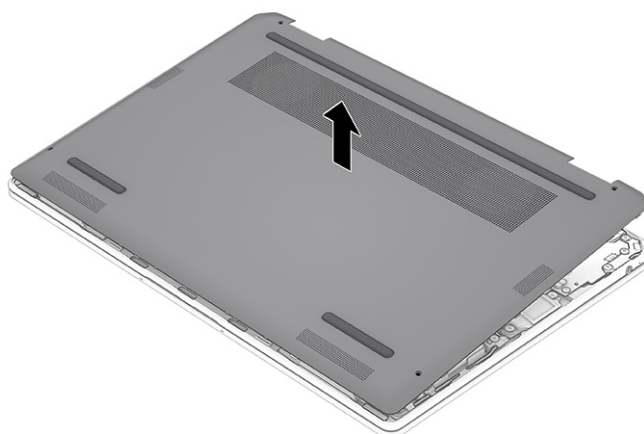


3. Press on the sides of the touchpad near the keyboard (1) as shown in the following illustration until the bottom cover releases from the computer (2). The cover remains on the computer.



4. Position the computer with the bottom cover facing upward.

5. Lift up on the back of the bottom cover to remove it from the computer.



To install 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
6 cell, 64 Whr	P07278-001


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

- Do *not* puncture, twist, or crack the battery.
- Do *not* cause an external puncture or rupture to the battery. They can cause a short inside the battery, which can result in battery thermal runaway.
- Do *not* handle or touch the battery enclosure with sharp objects such as tweezers or pliers, which might puncture the battery.
- Do *not* compress or squeeze the battery case with tools or heavy objects stacked on top of the case. These actions can apply undue force on the battery.
- Do *not* touch the connectors with any metallic surface or object, such as metal tools, screws, or coins, which can cause shorting across the connectors.

Before removing the battery, follow these steps:

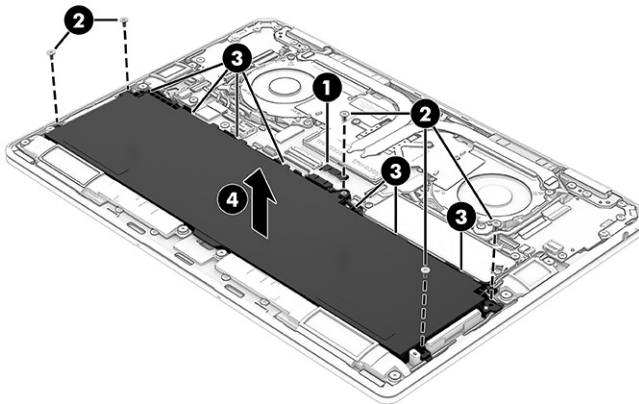
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).

⚠ 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 five Phillips M2.0 × 4.0 screws **(2)** that secure the battery to the computer.
3. Remove the speaker cables from the clips **(3)** along the top of the battery.
4. Remove the battery **(4)** from the computer.




To install the battery, reverse the removal procedures.

 **NOTE:** When replacing the battery, be sure to completely reassemble the computer and plug in the AC adapter before turning the computer on.

Display assembly

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

 **NOTE:** The display assembly is only available as spare parts at the subcomponent level. For display assembly spare part information, see the individual removal subsections.

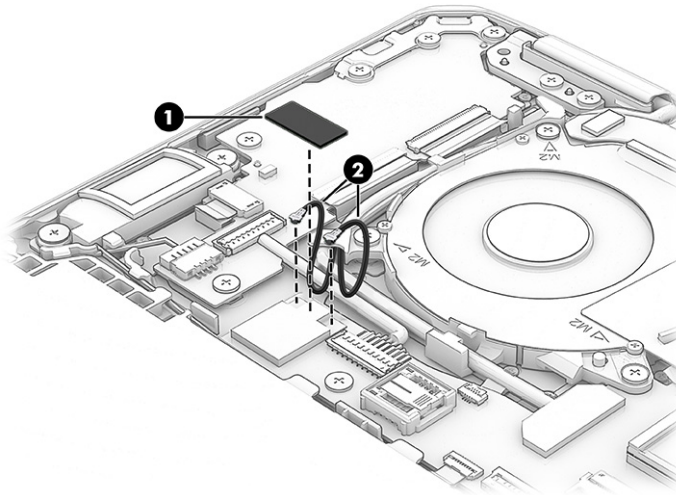
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 34](#)).

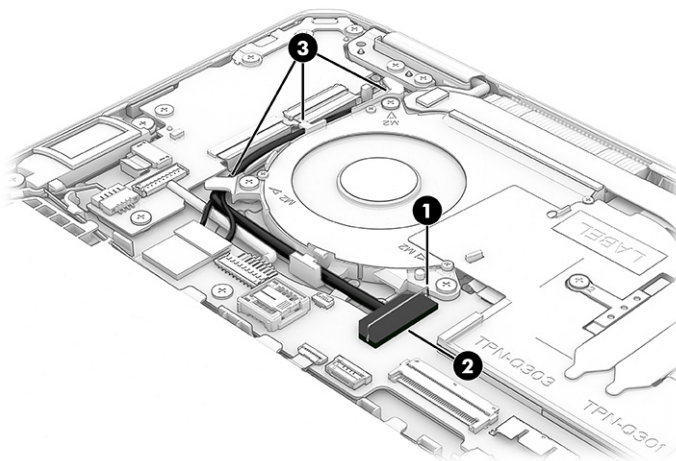
Remove the display assembly:

1. Remove the protective tape **(1)** that covers the WLAN antennas connected to the system board.

2. Disconnect the antenna cables (2) from the integrated WLAN module.

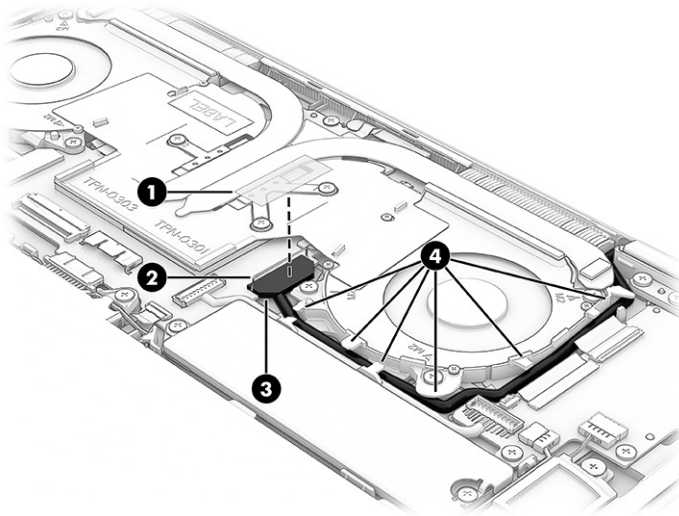


3. Lift the locking bar (1) from the camera cable connector on the system board, and then disconnect the camera cable (2).
4. Remove the camera cable and WLAN antennas from the clips (3) around the fan.

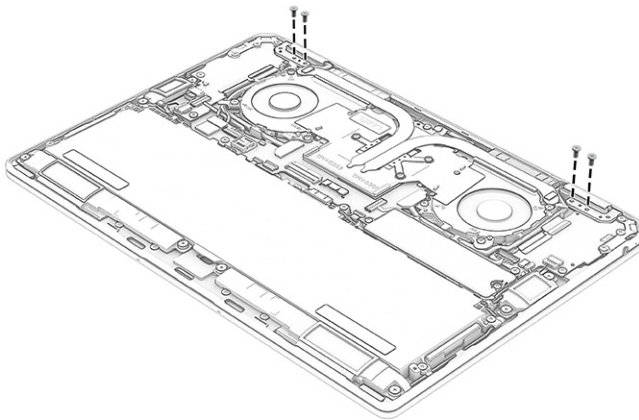


5. Lift the tape (1) off the display connector on the system board.
6. Lift the locking bar (2) from the display cable connector on the system board, and then disconnect the display cable (3).

7. Remove the display cable from the clips **(4)** around the fan.

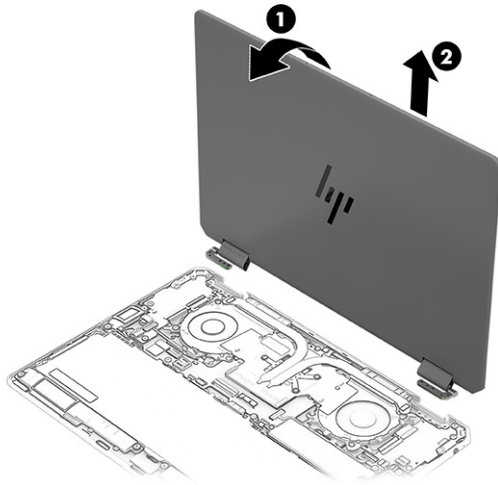


8. Remove the four Phillips M2.5 × 4.5 screws that secure the display assembly to the computer.




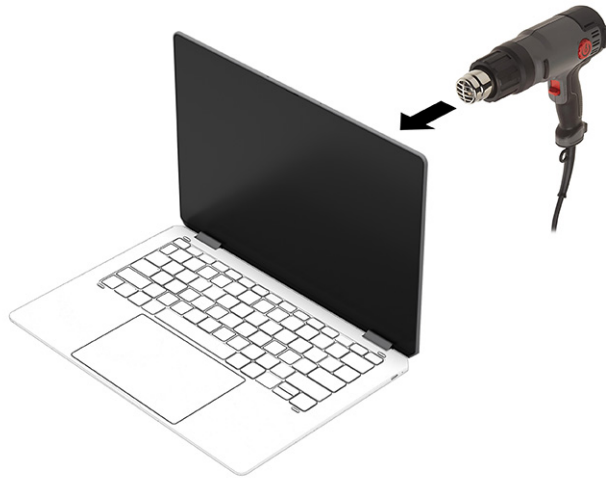
9. Open the display **(1)** to just past vertical.

10. Separate the display (2) from the computer.




11. To remove the display panel:
 - a. Use a heating device to heat the display rear cover to loosen the panel adhesive.

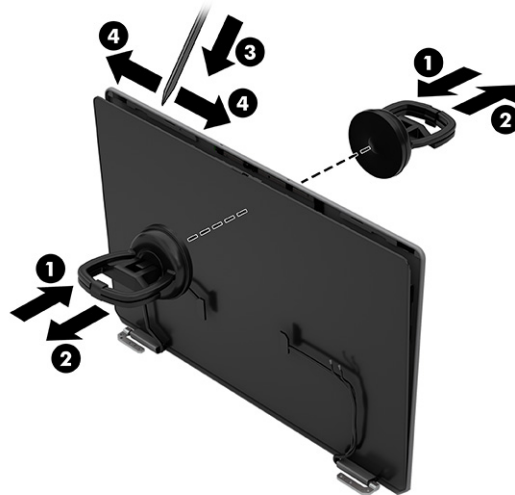
 **NOTE:** Heat the display to approximately 60°C.



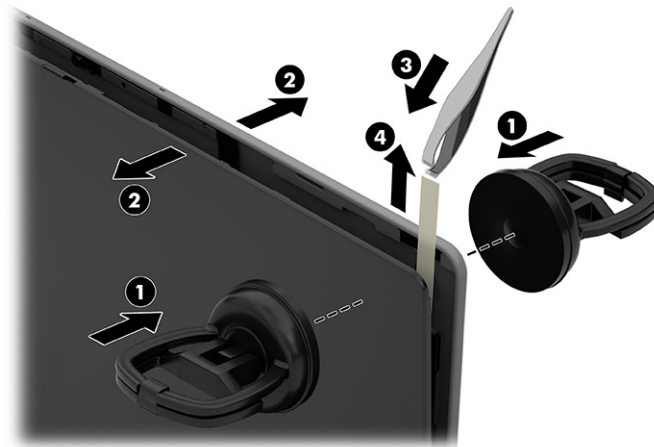
- b. Attach suction cups (1) to the top, middle of the display.

 **NOTE:** Be sure not to place the suction cup over the camera module.
 - c. Pull the suction cups apart (2) to create a gap between the panel and display rear cover.

- d. Insert a pry tool (3) into the gap, and then slide to tool back and forth (4) along the entire length of the top of the display to release the panel.

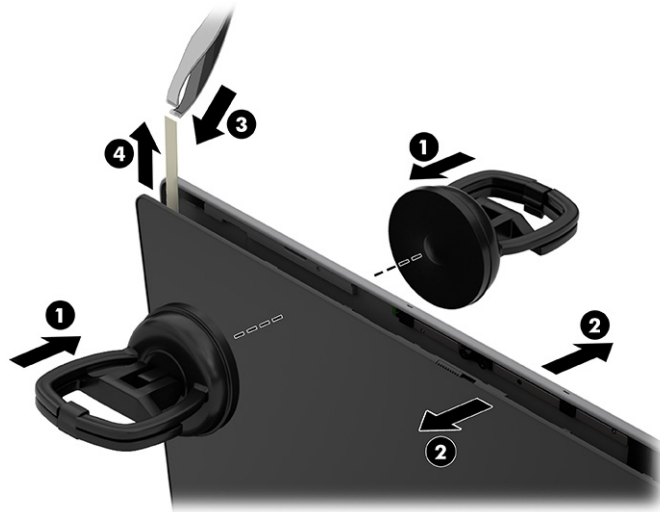


- e. Move the suction cups (1) to the top, right of the display.
f. Pull the suction cups apart to create a gap (2) between the panel and display rear cover.
g. Use tweezers (3) to pull the tape (4) out from behind the right side of the display panel.

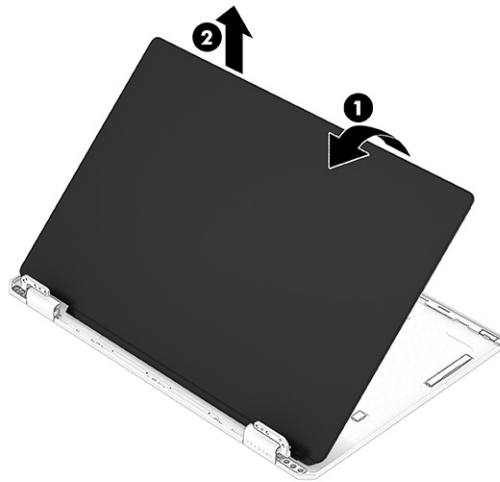


- h. Move the suction cups (1) to the top, left of the display.
i. Pull the suction cups apart to create a gap (2) between the panel and display rear cover.

- j. Use tweezers (3) to pull the tape (4) out from behind the left side of the display panel.

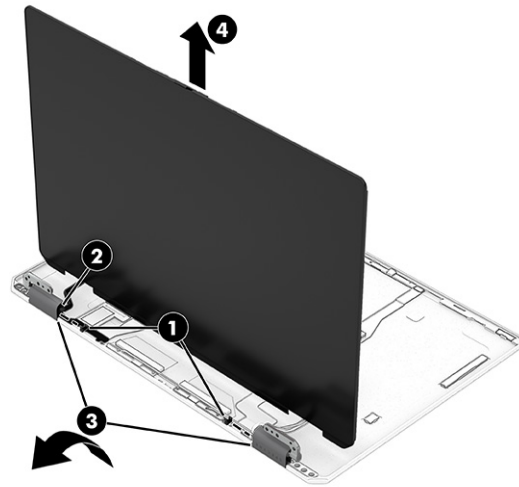


- k. Rotate the panel (1) up, and then pull the panel (2) up to separate it from the bottom of the display back cover.

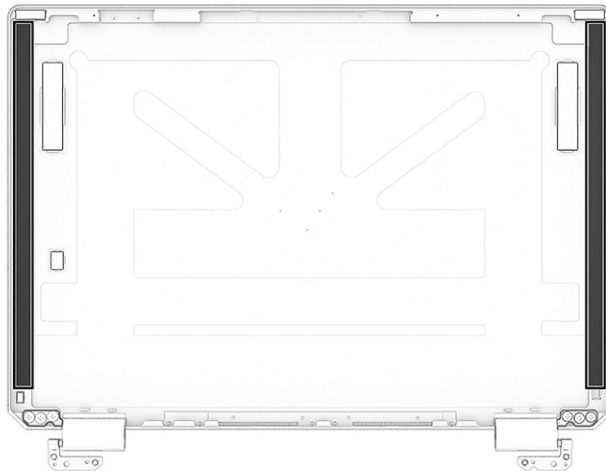


- l. Remove the two rubber pieces (1) from the hinge covers.
- m. Pull the cables (2) out of the left hinge cover.
- n. Open the hinges (3).

- o.** Remove the panel **(4)** from the display back cover.



- p.** When installing a display panel, use the following illustration to determine tape installation locations on the inside of the display rear cover.

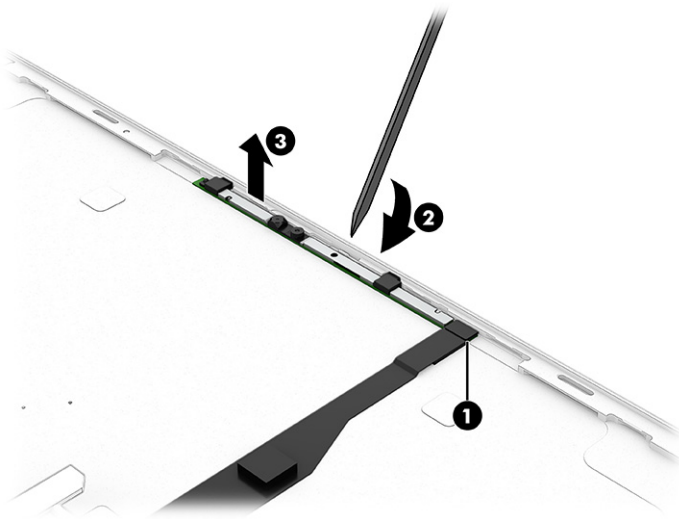


Display panels are available as spare part number P07119-001.

Display tape is available in the Display Adhesive Kit as spare part number P07160-001.

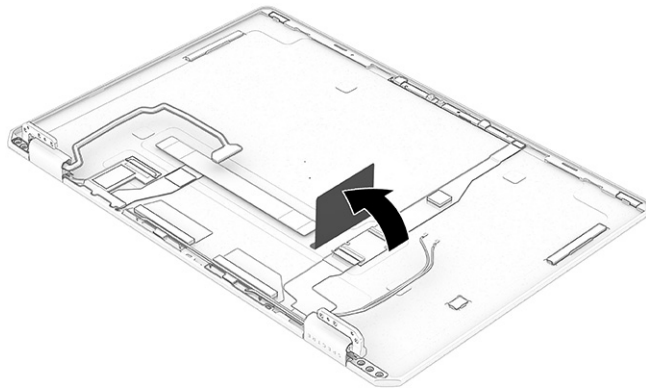
- 12.** To remove the camera module:
 - a.** Disconnect the cable **(1)** from the camera module.

- b. Insert a pry tool (2) into the gaps in the camera module, and use the tool to release the module (3).



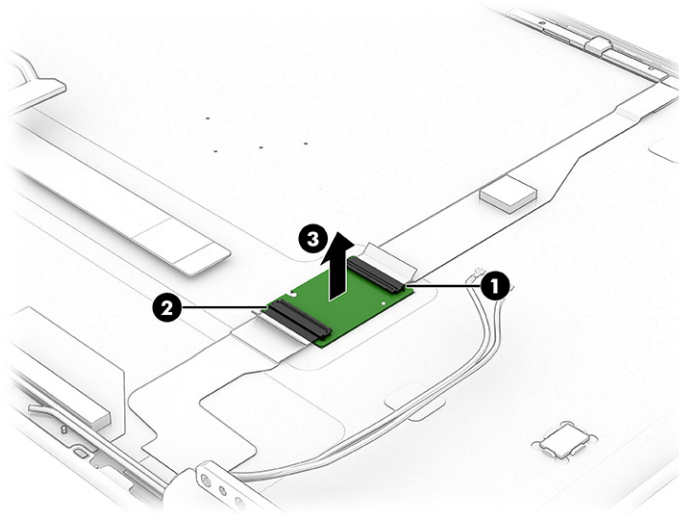
- 13. To remove the camera board:

- a. Peel the protective tape off the camera board.

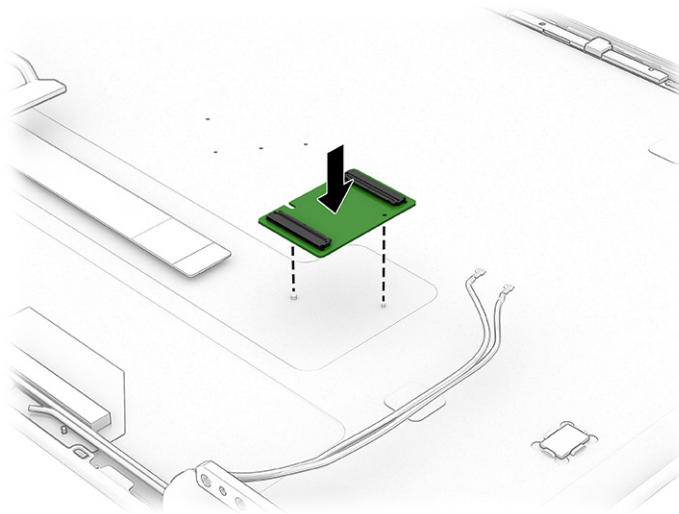


- b. Disconnect the top cable (1) and bottom cable (2) from the board.

- c. Release the board **(3)** from the inside of the display back cover.



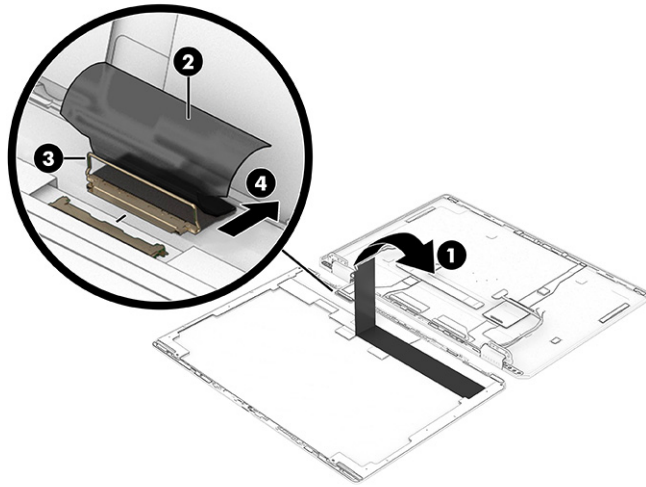
- d. To install a camera board, place board on the inside of the display back cover, making sure the holes in the board line up with the posts on the display.



The camera board is available as spare part number P07155-001.

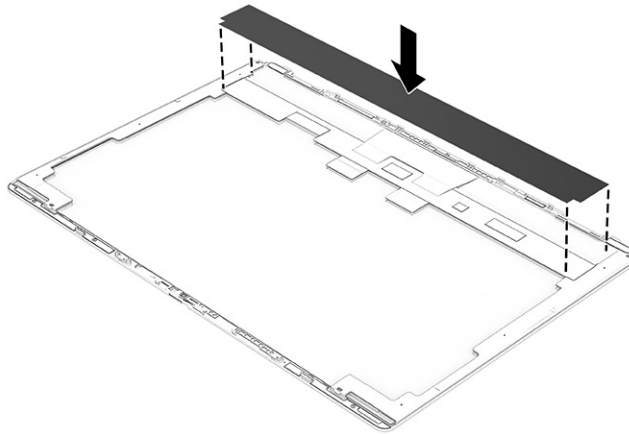
- 14. To remove the display cable:
 - a. Peel the tape **(1)** off the back of the panel.
 - b. Peel the conductive tape **(2)** off the connector on the bottom of the panel.

- c. Open the locking bar (3), and then disconnect the cable (4) from the panel.



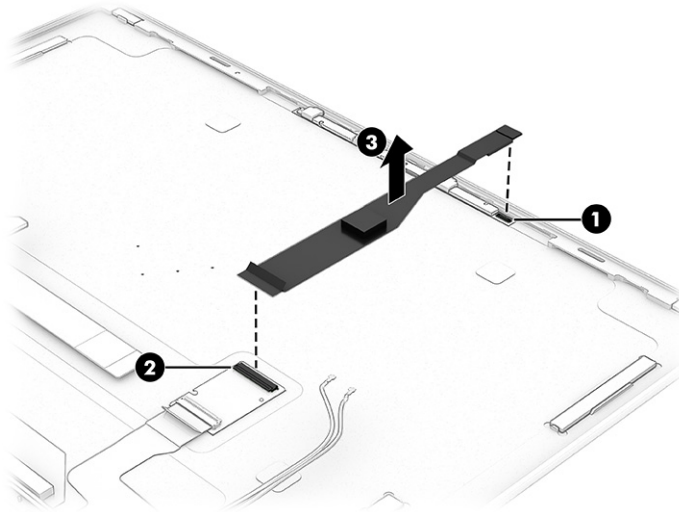
The display cable is available as spare part number P07156-001.

- d. When installing a display panel cable, install the long strip of black tape on the back of the panel as shown in the following illustration.

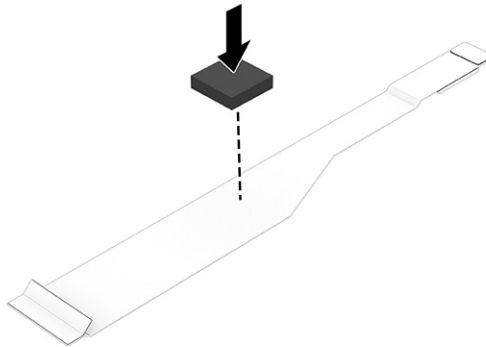


- 15. To remove the camera cable:
 - a. Disconnect the cable from the camera module (1).
 - b. Disconnect the cable from the camera board (2).

- c. Peel the cable **(3)** off the inside of the display back cover.



- d. Remove the gasket from the old camera cable and install it on the new cable.

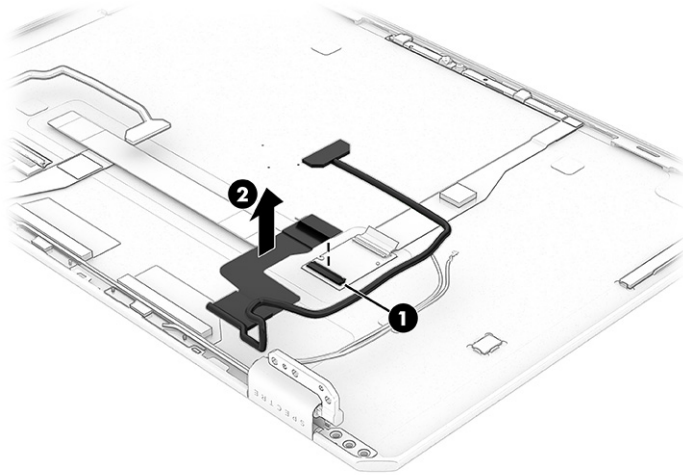


The FPC camera cable, which connects the camera module to the camera board, is available as spare part number P07154-001.

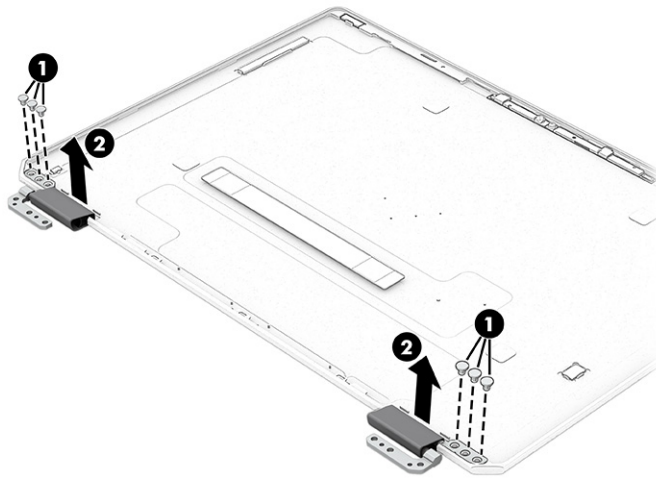
The camera cable, which connects to the bottom of the camera board, is available as spare part number P07153-001.

- 16. To remove the camera board cable:
 - a. Disconnect the cable from the camera board **(1)**.

- b. Peel the cable (2) off the inside of the display back cover.

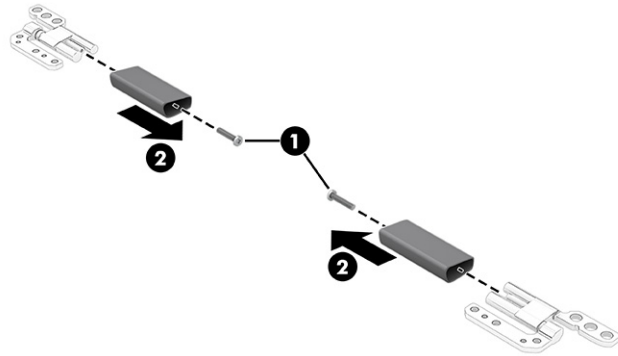


- 17. To remove the hinges and hinge covers from the display rear cover:
 - a. Remove the three Phillips M2.5 × 2.0 screws (1) from each hinge.
 - b. Remove the hinges (2) from the display back cover.



- c. Remove the Phillips M2.0 × 2.0 screw (1) from each hinge.

- d. Pull the covers (2) off the hinges.

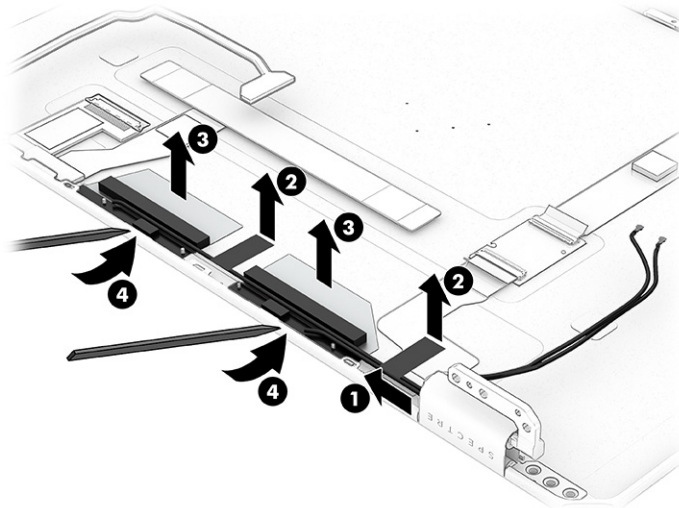


The display hinges are available as spare part number P07157-001.

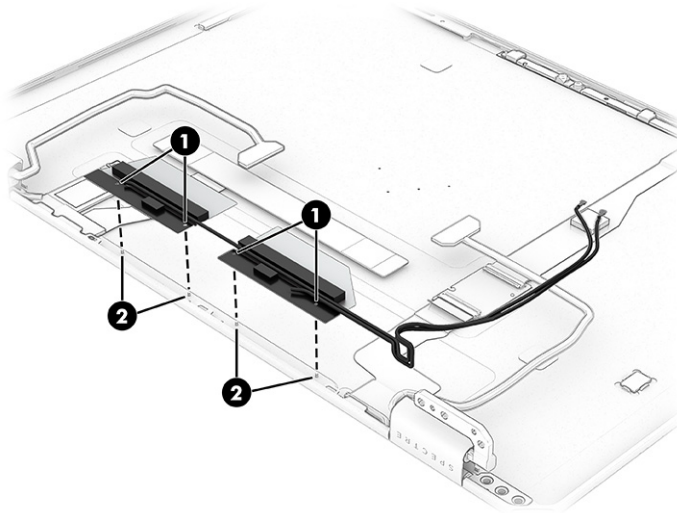
The display hinge covers are available as spare part number P07158-001 for atmospheric blue models and P15809-001 for eclipse gray models

- 18. To remove the wireless antennas:

- a. Remove the antenna cables (1) from the hinge cover.
- b. Peel up the two pieces of black tape (2).
- c. Peel the bottom part of the antennas (3) off the display rear cover.
- d. Insert and slide a tool (4) to release the top of the antenna from the display back cover.



- e. When installing the wireless antennas, place the holes **(1)** in the antennas onto the pins **(2)** on the inside of the display back cover.



The wireless cables and antennas are available as spare part number P07151-001. The wireless cables and antennas are also included in the display rear cover spare part kit.

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

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-3 Speaker description and part number

Description	Spare part number
Speakers (left and right)	P07148-001

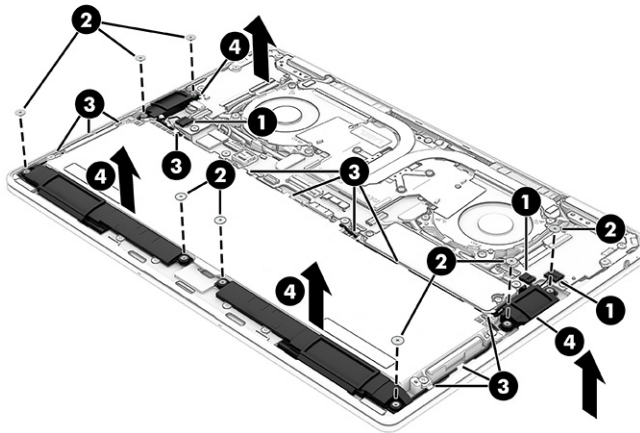
Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 34](#)).

Remove the speakers:

1. Disconnect the speaker cables **(1)** from the system board.
2. Remove the eight Phillips M1.6 × 2.0 screws **(2)** that secure the speakers.
3. Remove speaker cable from clips **(3)** along the top and sides of the battery.

4. Remove the speakers (4) from the computer.



To install the speakers, reverse this procedure.

Solid-state drive

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

Table 5-4 SSD descriptions and part numbers

Description	Spare part number
2 TB, TLC	N77396-005
1 TB, TLC	N77395-005
1 TB	N77394-005
512 GB	N77392-005
SSD thermal pad	P07150-001

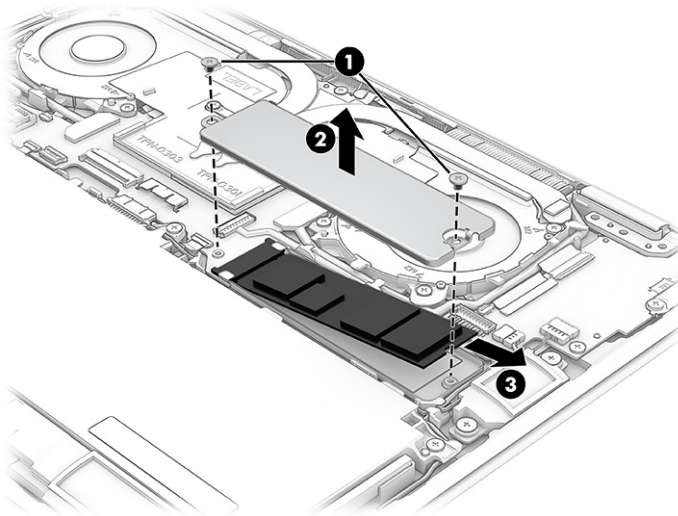
Before removing the SSD, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 34](#)).

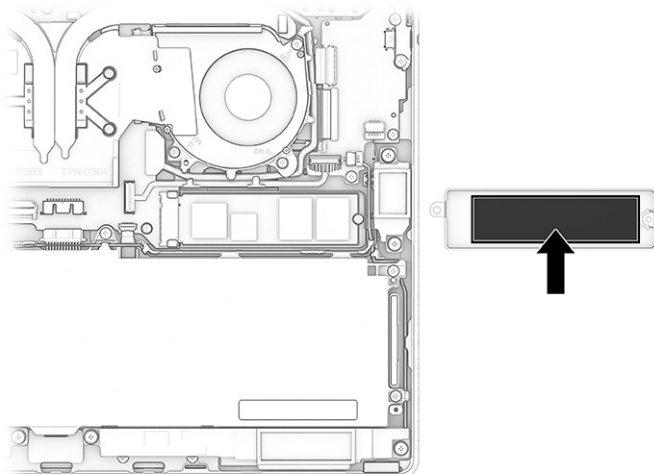
Remove the SSD:

1. Remove two Phillips M2.0 × 2.5 screws (1) that secure the SSD cover.
2. Lift the cover (2) off the drive.


3. Pull the drive (3) out of the socket.



4. When installing an SSD, be sure a thermal pad is installed on the bottom of the SSD cover.



To install an SSD, reverse the removal procedures.

 **NOTE:** SSDs are designed with a notch to prevent incorrect insertion.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-5 Touchpad descriptions and part numbers

Description	Spare part number
Touchpad, atmospheric blue	P07125-001
Touchpad, eclipse gray	P07126-001
Touchpad cable, single	P07143-001

Table 5-5 Touchpad descriptions and part numbers (continued)

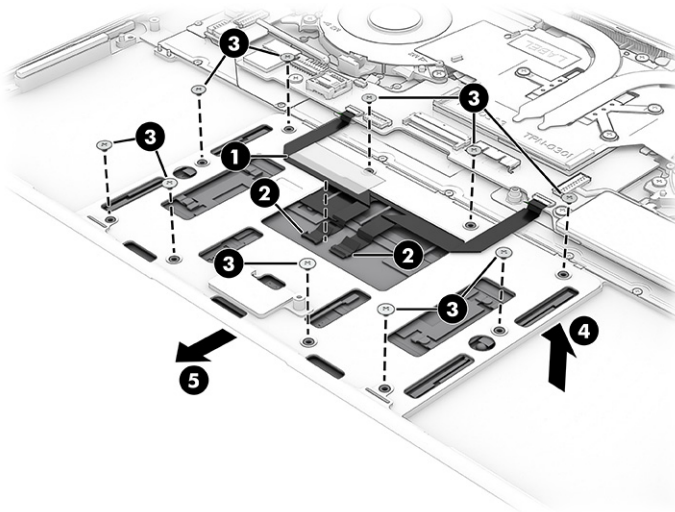
Description	Spare part number
Touchpad cable, power	P07144-001

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Remove the battery (see [Battery on page 34](#)).

Remove the touchpad:

1. Remove the clear plastic covers (1) from the system board touchpad cable connectors.
2. Disconnect both cables from the ZIF connectors (2) on the touchpad.
3. Remove the 10 Phillips M1.6 × 2.0 screws (3) from the touchpad.
4. Lift the computer (4) up and off the touchpad, and then remove the touchpad (5).



To install the touchpad, reverse the removal procedures.

Daughter board power cables

To remove the daughter board (audio board and USB board) power cables, use this procedure and illustration.

Table 5-6 Daughter board power cables descriptions and part numbers

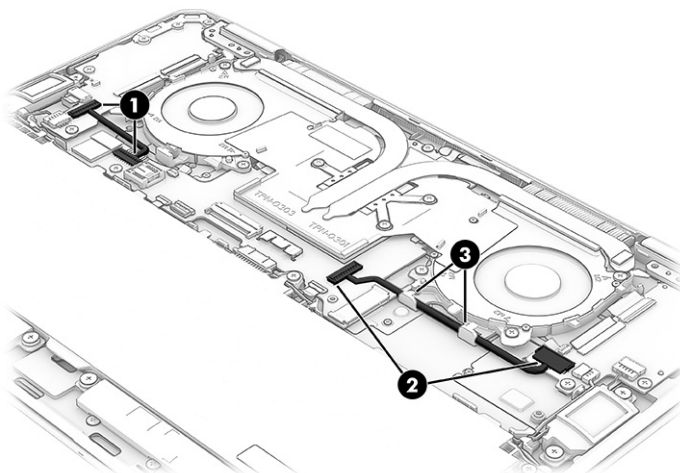
Description	Spare part number
Audio board power cable	P07140-001
USB board power cable	P07136-001

Before removing the daughter board power cables, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).

Remove the daughter board power cables:

1. USB board: Disconnect the power cable (1) from the system board and USB board.
2. Audio board: Disconnect the power cable (2) from the system board and audio board, and then remove the cable from the clips (3) above the fan.



To install daughter board power cables, reverse this procedure.

Heat sink and fan assembly

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

Table 5-7 Heat sink and fan assembly description and part number

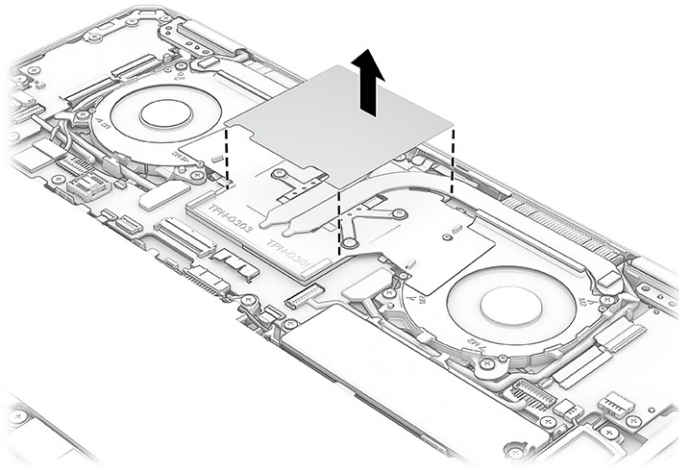
Description	Spare part number
Heat sink and fan assembly	P07147-001

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

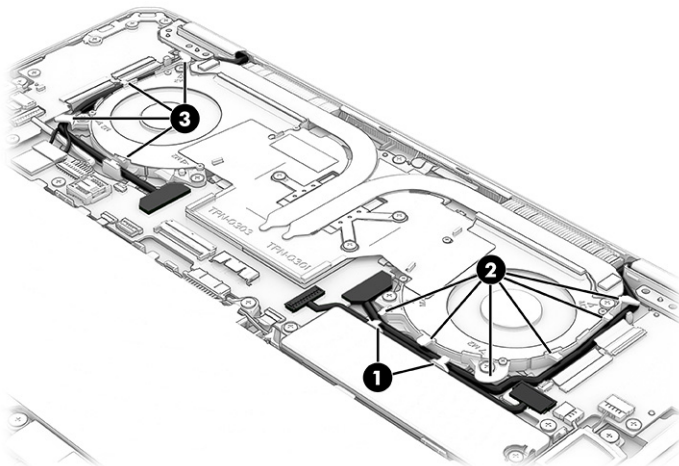
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 34](#)).

Remove the heat sink and fan assembly:


1. Remove the foil from the heat sink..



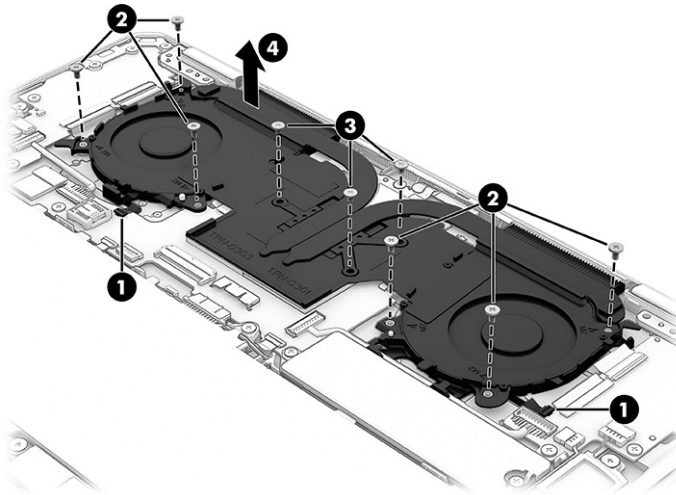
2. Remove the power cable from the clips **(1)** on the bottom of the right fan.
3. Remove the display cable from the clips **(2)** on the bottom and side of the right fan.
4. Remove the camera and WLAN cables from the clips **(3)** along the bottom and left sides of the left fan.



5. Disconnect two fan cables from ZIF connectors **(1)** on system board
6. Remove six Phillips 2.0 × 4.0 screws **(2)** from the fans.
7. Remove three Phillips 2.0 × 2.0 screws **(3)** from the heat sink.

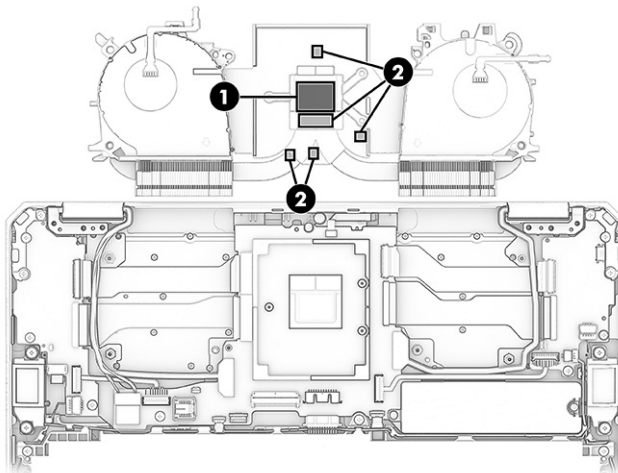
 **NOTE:** The heat sink has numbers next to the screws that indicate installation order. When removing the heat sink, remove the screws in reverse order from what is shown on the heat sink. When installing a heat sink, install the screws in the order shown on the heat sink.

- Remove the heat and fan assembly (4).



- Thoroughly clean the thermal paste 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.

Gray thermal grease (1) and thermal pads (2) are used on the heat sink.



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

USB board

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

Table 5-8 USB board descriptions and part numbers

Description	Spare part number
USB board	P07133-001
HS USB cable	P07134-001

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

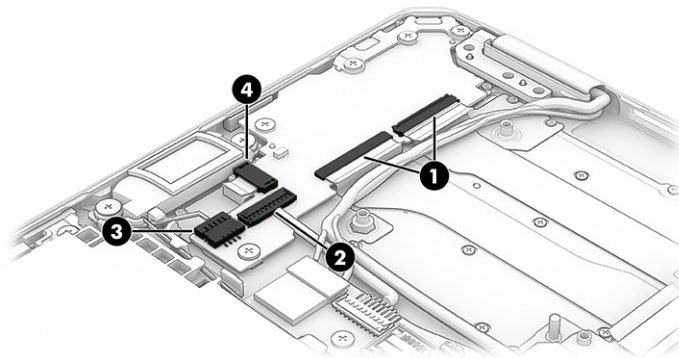
Description	Spare part number
LS USB cable	P07135-001
Power USB cable	P07136-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 34](#)).
4. Remove the heat sink and fan assembly (see [Heat sink and fan assembly on page 52](#)).

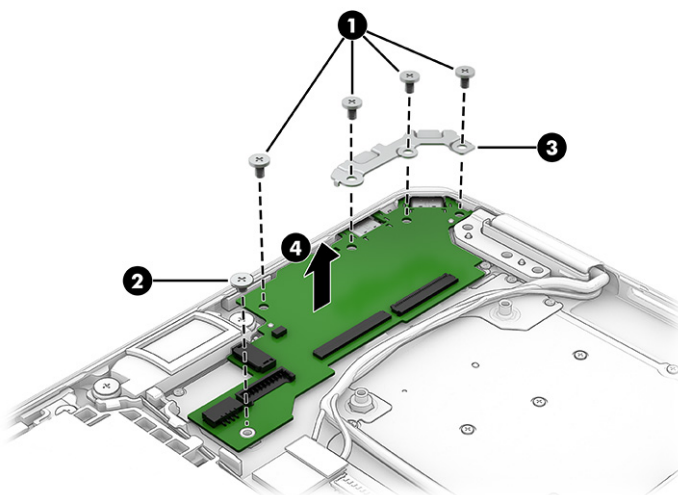
Remove the USB board:

1. Disconnect the two wide system board cables from reverse ZIF connectors **(1)** on the USB board.
2. Disconnect the power cable **(2)** from the USB board.
3. Disconnect the speaker cable **(3)** from the USB board.
4. Disconnect the narrow fingerprint reader cable from ZIF connector **(4)** on the USB board.



5. Remove the four Phillips M2.0 × 4.0 screws **(1)** and the Phillips M2.0 × 2.5 screws **(2)** from the USB board.
6. Remove the bracket **(3)**.

- Lift the USB board **(4)** out of the computer.



To install the USB board, reverse this procedure.

Audio board

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

Table 5-9 Audio board descriptions and part numbers

Description	Spare part number
Audio board	P07137-001
HS audio cable	P07138-001
LS audio cable	P07139-001
Power audio cable	P07140-001

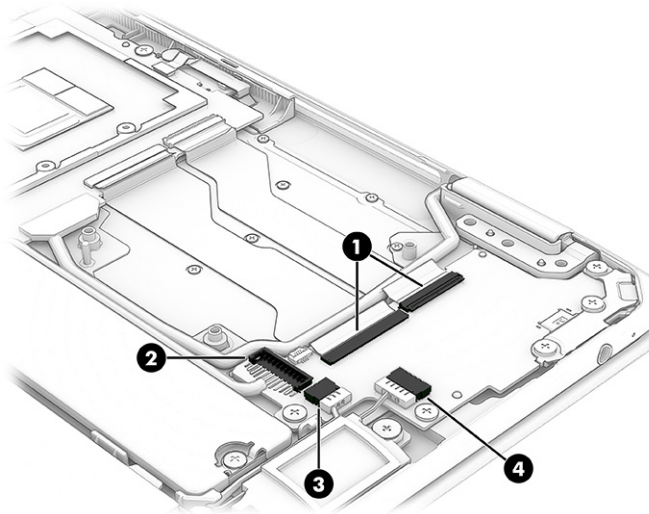
Before removing the audio board, follow these steps:

- Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
- Remove the bottom cover (see [Bottom cover on page 32](#)).
- Disconnect the battery cable from the system board (see [Battery on page 34](#)).
- Remove the heat sink and fan assembly (see [Heat sink and fan assembly on page 52](#)).

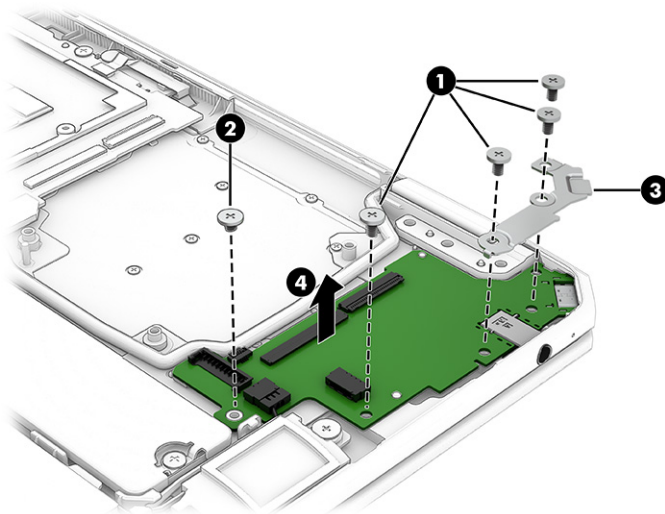
Remove the audio board:

- Disconnect the two wide system board cables from reverse ZIF connectors **(1)** on the audio board.
- Disconnect the power cable **(2)** from the audio board.
- Disconnect the upper speaker cable **(3)** from the audio board.

4. Disconnect the lower speaker cable (4) from the audio board.



5. Remove the four Phillips M2.0 × 4.0 screws (1) and the Phillips M2.0 × 2.5 screw (2) from the USB board.
6. Remove the bracket (3).
7. Lift the audio board (4) out of the computer.



To install the audio board, reverse this procedure.

Infrared (IR) sensor board

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

Table 5-10 IR sensor board descriptions and part numbers

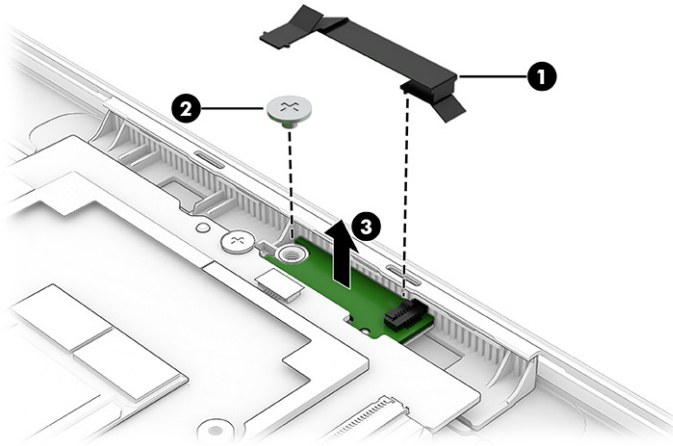
Description	Spare part number
IR sensor board	P07131-001
IR sensor cable	P07132-001

Before removing the IR sensor board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 34](#)).
4. Remove the heat sink and fan assembly (see [Heat sink and fan assembly on page 52](#)).

Remove the IR sensor board:

1. Disconnect the cable (1) from the ZIF connector on the IR sensor board.
2. Remove the Phillips M2.0 × 2.0 screw (2) from the board.
3. Remove the board (3).



To install the IR sensor board, reverse this procedure.

System board

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

Table 5-11 System board descriptions and part numbers

Description	Spare part number
System board (includes processor and integrated system memory; for use in models with the Windows operating system)	
Intel Core Ultra9 288V processor	P16921-601
Intel Core Ultra7 258V processor	P07116-601
Intel Core Ultra7 256V processor	P07117-601
Intel Core Ultra5 226V processor	P07118-601
System board protective tape	P07142-001
Protective tape for system board connectors	P07141-001

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Remove the battery (see [Battery on page 34](#)).
4. Remove the heat sink and fan assembly (see [Heat sink and fan assembly on page 52](#)).
5. Remove the solid-state drive (see [Solid-state drive on page 49](#)).

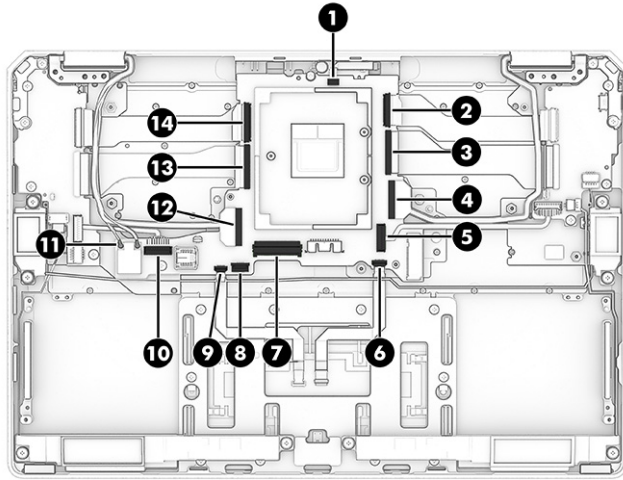
Remove the system board:

1. Disconnect the following cables from the system board:

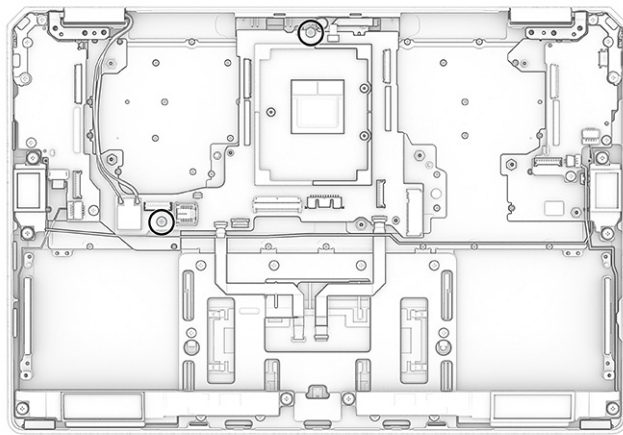


NOTE: Some connectors are covered by transparent tape.

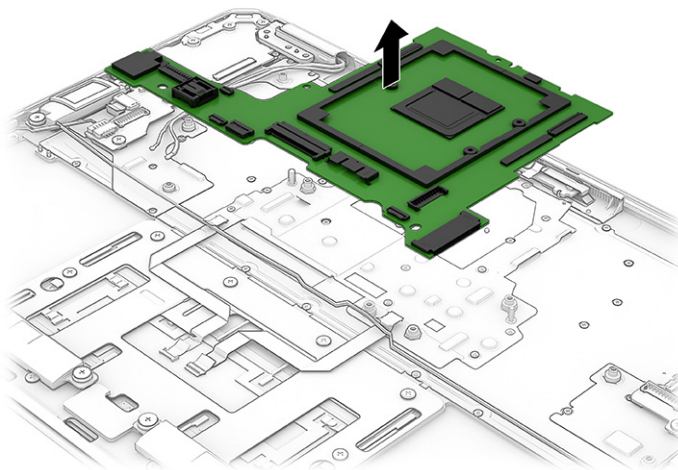
- IR board cable (ZIF) **(1)**
- Audio board cable (ZIF) **(2)**
- Audio board cable (ZIF) **(3)**
- Display cable **(4)**
- Power cable from the audio board **(5)**
- Touchpad cable (ZIF) **(6)**
- Keyboard cable (ZIF) **(7)**
- Keyboard backlight cable (ZIF) **(8)**
- Touchpad cable (ZIF) **(9)**
- Power cable to the USB board **(10)**
- Antennas from the integrated WLAN module **(11)**
- Camera cable **(12)**
- USB board cable (ZIF) **(13)**
- USB board cable (ZIF) **(14)**



2. Remove the two Phillips M2.0 × 2.5 screws from the system board.

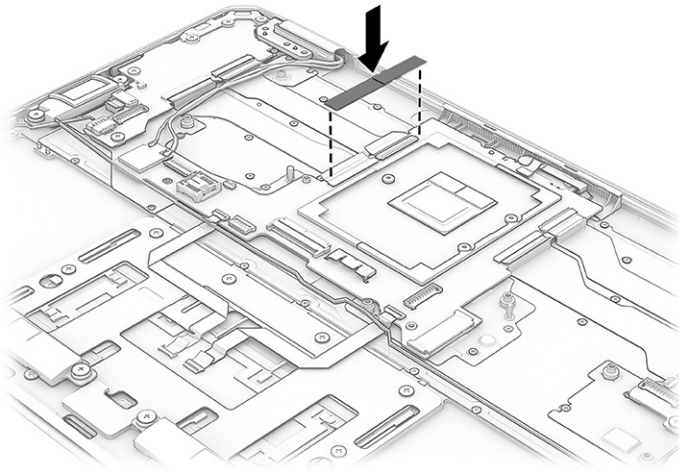


3. Remove the system board from the computer.

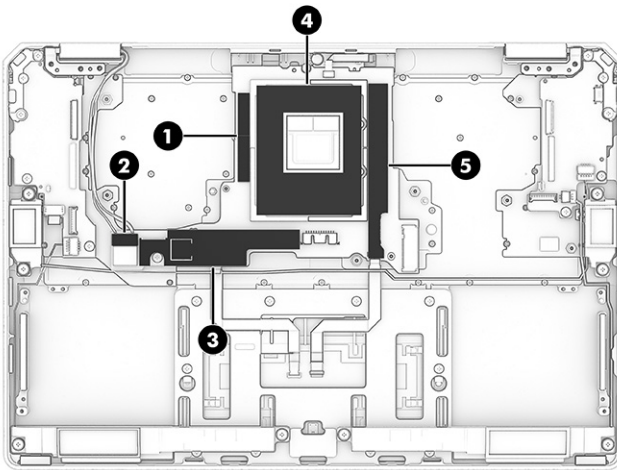


To install a system board, reverse this procedure.

When installing a system board, after connecting the USB cables to the system board, place the tape over the two connectors with the conductive tape covering the bottom connector.



When installing a new system board, install five pieces of protective tape onto the system board as shown in the following illustration.



Power button/fingerprint reader board

To remove the power button/fingerprint reader board, use this procedure and illustration.

Table 5-12 Power button/fingerprint reader board descriptions and part numbers

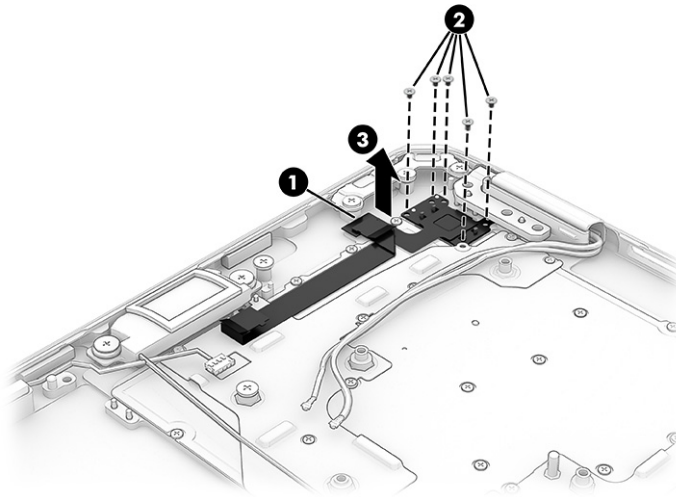
Description	Spare part number
Power button/fingerprint reader board, atmospheric blue	P07145-001
Power button/fingerprint reader board, eclipse gray	P14067-001
Power button/fingerprint reader board cable	P07146-001

Before removing the power button/fingerprint reader board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).
3. Remove the battery (see [Battery on page 34](#)).
4. Remove the heat sink and fan assembly (see [Heat sink and fan assembly on page 52](#)).
5. Remove the system board (see [System board on page 58](#)).

Remove the power button/fingerprint reader board:

1. Disconnect the cable (1) from the ZIF connector on the board.
2. Remove the five Phillips M1.0 × 1.4 screws (2) from the board.
3. Peel the board (3) up to release it.



To install the power button/fingerprint reader board, reverse this procedure.

Keyboard

To remove the keyboard, use these procedures and illustrations. The table at the end provides the keyboard country codes.

Table 5-13 Keyboard descriptions and part numbers

Description	Spare part number
Atmospheric blue	P07120-xx1
Eclipse gray	P07121-xx1

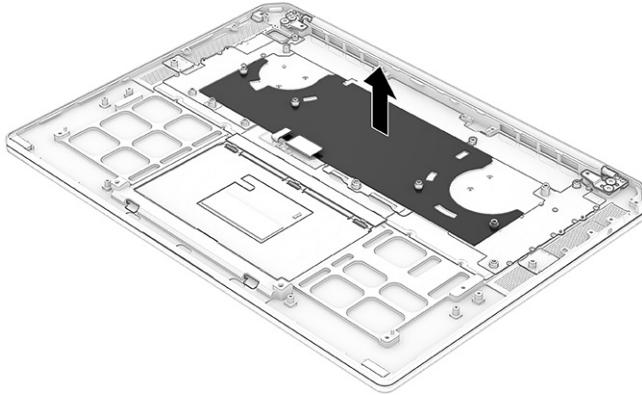
Before removing the keyboard from the top cover, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 32](#)).
2. Remove the bottom cover (see [Bottom cover on page 32](#)).

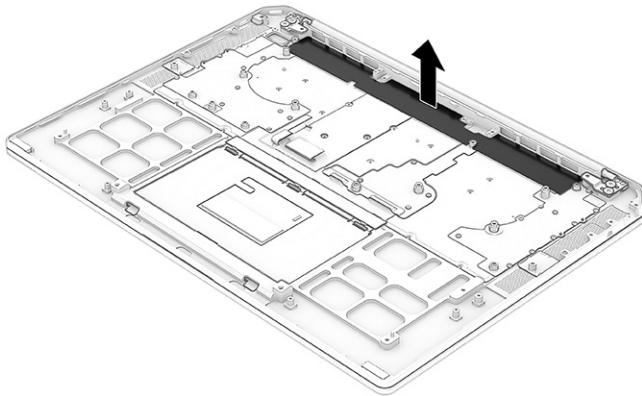
3. Remove the battery (see [Battery on page 34](#)).
4. Remove the heat sink and fan assembly (see [Heat sink and fan assembly on page 52](#)).
5. Remove the system board (see [System board on page 58](#)).

Remove the keyboard from the top cover:

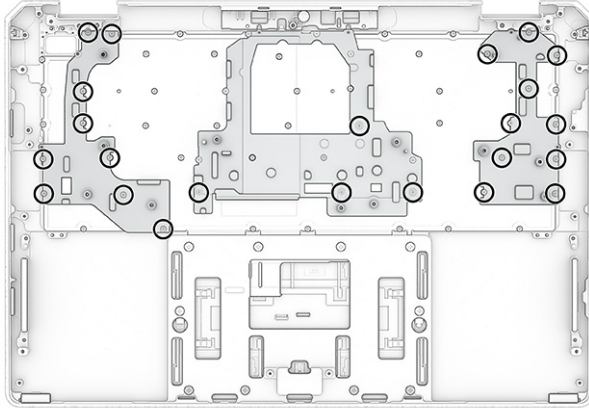
1. Peel the protective thermal shielding off the keyboard.



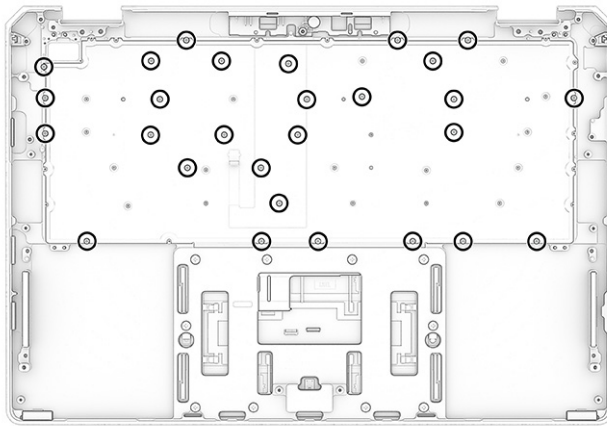
2. Peel the long graphite sheet off the keyboard.



- Remove 23 Phillips M1.0 × 1.2 screws from three keyboard brackets, and then remove the brackets.



- Remove 28 Phillips M1.0 × 1.0 screws from the keyboard, and then remove the keyboard.



The top cover spare part remains after removing the keyboard.

To install a keyboard, reverse this procedure.

Table 5-14 Spare part country codes

For use in country or region	Spare part number
Belgium	-A41
Brazil	-201
Bulgaria	-261
Chile	-161
Czech Republic/Slovakia	-FL1
Denmark	-081
Denmark, Finland, and Norway	-DH1

Table 5-14 Spare part country codes (continued)

For use in country or region	Spare part number
French Canada	-DB1
Finland/Sweden	-B71
France	-051
Germany	-041
Greece	-151
Hungary	-211
Iceland	-DD1
India	-D61
Israel	-BB1
Italy	-061
Japan	-291
The Netherlands	-B31
Northern Africa	-FP1
Norway	-091
Portugal	-131
Romania	-271
Russia	-251
Saudi Arabia	-171
Slovenia	-BA1
South Korea	-AD1
Spain	-071
Switzerland	-BG1
Taiwan	-AB1
Thailand	-281
Turkey	-141
Turkey-F	-541
Ukraine	-BD1
United Kingdom	-031
United States	-001

Top cover


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

Table 5-15 Top cover descriptions and part numbers

Description	Spare part number
Atmospheric blue	P07122-001
Eclipse gray	P07123-001
Eclipse gray (for use in Japan)	P07124-001


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.

Use one of these options:

- Turn on or restart the computer and quickly press **f10**.
- 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. Perform one of these tasks:
 - Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.
 - 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 67](#)).
 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 68](#).

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 HP AC adapter provided with the computer (select products only), a replacement AC adapter provided by HP, or an AC adapter with the power rating specified on the product label. 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. Perform one of these tasks:
 - Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.
 - 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 are 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.


 **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 71](#) 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 71](#).

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 71](#).

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, you can create recovery media 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 70](#).

 **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 71](#) 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, which is 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, and then quickly press and hold one of the following buttons:
 - Volume up
 - Volume down

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, you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 74](#).

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.
- Scan the QR code with your mobile device, which takes you to the EAS page, where you can log the case.
- 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. Complete one of the following tasks:
 - Select the **Search** icon in the taskbar, type `support` in the search box, and then select the **HP Support Assistant** app.
 - 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 Unified Extensible Firmware Interface (UEFI) 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 76](#).

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, complete one of these tasks:

- 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.
- Contact support, and provide the failure ID code.

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 77](#).

- 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.

Starting HP PC Hardware Diagnostics UEFI through HP Hotkey Support software (select products only)

This section describes how to start HP PC Hardware Diagnostics UEFI through HP Hotkey Support software.



NOTE: You must disable fast boot to access HP PC Hardware Diagnostics UEFI from the HP System Information application.

To disable fast boot:

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 **Boot Options**.
3. Clear **Fast Boot**.
4. Select **Save Changes and Exit**, and then select **Yes**.

To start HP PC Hardware Diagnostics UEFI through HP Hotkey Support software, follow this procedure:

1. From the **Start** menu, open the HP System Information Application or press **fn+esc**.
2. In HP System Information screen, select **Run System Diagnostics**, select **Yes** to run the application, and then select **Restart**.



IMPORTANT: To prevent loss of data, save your work in all open apps before restarting your computer.



NOTE: When the restart is complete, the computer opens the HP PC Hardware Diagnostics UEFI Application. Proceed with the troubleshooting tests.

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 run 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

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



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

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 UEFI**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage, such as a hard drive or USB flash drive, to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password that you use for uploads.
- Display status information about the diagnostics run previously.

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

1. Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.
3. Make your customization selections.
4. Select **Main**, 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	313.7 mm	12.4 in
Depth	216.25 mm	8.5 in
Height	14.9 mm	0.59 in
Weight		
	1349 g	2.97 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	
	5 V DC @ 3 A / 9 V DC @ 3 A / 10 V DC @ 5 A / 12 V DC @ 5 A / 15 V DC @ 4.33 A / 20 V DC @ 3.25 A - 65 W USB-C	
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	35.6 cm	14.0 in
Resolution	2880 × 1800 (2.8K)	
Surface treatment	BrightView	
Brightness	400 nits	
Viewing angle	UWVA	
Backlight	OLED	
Display panel interface	eDP	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-3 Solid-state drive specifications

	512 GB*	1 TB*	2 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			
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 300,000 IOPs	Up to 300,000 IOPs
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 2500 MBps
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs	Up to 125,000 IOPs
Total logical sectors	1,000,215,216	1,500,336,388	2,985,523,121
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 might 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

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

Country/region	Accredited agency	Applicable note number
Germany	VDE	1
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 HO5VV-F, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 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 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V AC) configuration.
4. The flexible cord must be Type RVV, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
5. The flexible cord must be Type HO5VV-F three-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF three-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.

7. For 127 V AC, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V AC), with UL and CSA or C-UL marks. For 240 V AC, the flexible cord must be Type H05VV-F three-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.

11 Recycling

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

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

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