



# Maintenance and Service Guide

## **SUMMARY**

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

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## Product notice

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

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows is automatically updated, which is always enabled. High-speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See <http://www.windows.com>.

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

## **Software terms**


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

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

## Safety warning notice

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

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

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# 1 Product description

This table provides detailed product information.

**Table 1-1 Product components and their descriptions**

Category	Description
Product Name	<b>HP ENVY x360 13.3 inch 2-in-1 Laptop PC</b>
	Model numbers: 13-bf0xxx
	CTO model: 13t-bf000
Processor	<b>Intel® Core™ processors</b>
	Intel Core i7-1250U (1.1 GHz [max turbo frequency 4.7 GHz], 10 cores, 10 MB cache)
	Intel Core i5-1230U (1.0 GHz [max turbo frequency 4.4 GHz], 10 cores, 10 MB cache)
Graphics controller	Intel Iris® Xe
	Supports HD decode, DX12, and HDMI
Display	<b>33.8 cm (13.3 in), ultrawide viewing angle (UWVA), touch screen</b>
	Wide ultra extended graphics array (WUXGA) (1920 × 1200), white light-emitting diode (WLED), antiglare, 100% sRGB, eDP 1.4 + panel self-refresh (PSR) 2, 400 nits
	Wide quad extended graphics array (WQXGA) (2560 × 1600), 100% sRGB, eDP 1.4 + PSR2, antiglare, 400 nits
	2.8k (2880 × 1800), 100% DCI-P3, eDP 1.4 + PSR, Organic Light Emitting Diode (OLED), low blue light, BrightView, 400 nits, EyeSafe label
Memory	Onboard (not upgradeable) memory supporting up to 16 GB of RAM
	LPDDR4X-4266
	Supports the following configurations:
	<ul style="list-style-type: none"><li>• 16 GB</li><li>• 8 GB</li></ul>
Primary storage	<b>M.2 solid-state drive (PCIe, 2280, non-volatile memory express (NVMe))</b>
	1 TB, PCIe-4 × 4, three-layer cell (TLC)
	1 TB, PCIe
	512 GB, PCIe-4 × 4, TLC
	512 GB, PCIe

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

Category	Description
Audio	Bang & Olufsen
	Dual speakers
	Supports Far Field Cortana
	Supports Alexa
	Supports speaker swap
	Supports HP Audio Boost 2.0
	Supports XiaoWei
Video	<b>HP True Vision 5 MP camera</b> (with shutter door, indicator LED, 1 × infrared (IR) LED, MIPI, 5 MP BSI sensor, f2.0)
	Supports Windows Hello
	5 MP by 30 frames per second (fps)
	Dual-array, digital microphone with appropriate software - beam forming, echo cancellation, noise suppression
	<b>Video call support</b>
	Appearance filter
	Auto frame
	Backlight adjustment
Wireless	<b>Wireless Local Area Network (WLAN)</b>
	<ul style="list-style-type: none"><li>Intel AX211 Wi-Fi® 6e Bluetooth® 5.2 WLAN</li></ul>
	Support for Miracast®
	Supports BT Audio Offload
	Dynamic antenna gain
	Connected Standby supports Modern Standby

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

Category	Description
Ports	Audio-out (headphone)/audio-in (microphone) combo jack
	(2) USB 3.2 Gen 2 Type-A port; only right side port supports HP Sleep & Charge
	(2) USB 4 Type-C Gen2 Thunderbolt™ 4 connector, supports:
	- Thunderbolt 4
	- USB4, USB3.2 Gen2
	- DisplayPort™ 1.4
	- Power Delivery 3.0
	- Data transfer
	- HDMI 2.0 output up to 4 K @ 60 Hz with HDCP2.2 via adapter
	- HP Sleep & Charge
Media card reader	HP MultiFormat microSD MCR
	Supports microSD™/SDHC™/SDXC™
Sensors	Accelerometer + Gyroscope + eCompass
	Accelerometer ×2 (one for panel rotation, one for system orientation)
	Ambient light sensor (ALS)
	IR thermal sensor
Keyboard/ pointing devices	<b>Keyboard</b>
	Island style, backlit keyboard with clickpad and image sensor, 2-coat paint, natural silver
	Island style, backlit keyboard with clickpad and image sensor, 3-coat paint, space blue
	<b>Clickpad with image sensor</b>
	Microsoft® Precision Touchpad Default Gestures Support
	Multitouch gestures enabled
	Precision touchpad supported
	Taps enabled as default

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

Category	Description
Power requirements	<b>Battery</b>
	4 cell, 66 Whr
	Long life
	Fast charge
	<b>HP Smart AC adapter</b> (slim, 1.8 m [6 ft] USB Type-C)
	65 W
	<b>Power cord</b>
	C5, premium, 1.0 m (3.3 ft)
Security	C5, premium, 1.0 m (3.3 ft) with plug adapter for use in Japan
	Microphone mute
	Camera privacy cover
	IR camera for Windows Hello
	Trusted Platform Module (TPM) 2.0
Operating system	Windows® 11 Home 64
	Windows 11 Home 64 Chinese Market CPPP
	Windows 11 Home 64 High-End Chinese Market CPPP
	Windows 11 Home 64 Plus
	Windows 11 Home 64 Plus Single Language
	Windows 11 Home 64 Plus Single Language Africa Market PPP
	Windows 11 Home 64 Plus Single Language APAC EM PPP
	Windows 11 Home 64 Plus Single Language India Market PPP
	Windows 11 Home 64 Plus Single Language Indonesia Market PPP
	Windows 11 Home 64 Single Language Africa Market PPP
	Windows 11 Home 64 Single Language APAC EM PPP
	Windows 11 Home 64 Single Language India Market PPP
	Windows 11 Home 64 Single Language Indonesia Market PPP
	Windows 11 Pro 64



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

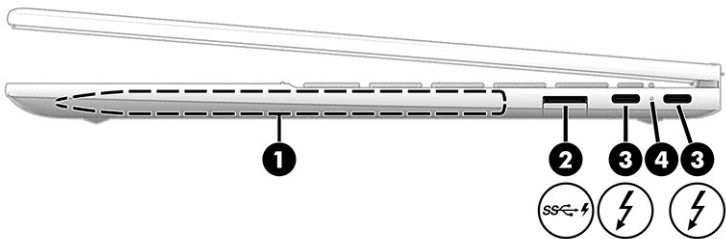
Category	Description
Serviceability	AC adapter

## 2 Getting to know your computer

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

### Right side


Identify the components on the right side of the computer.



**Table 2-1** Right-side components and their descriptions

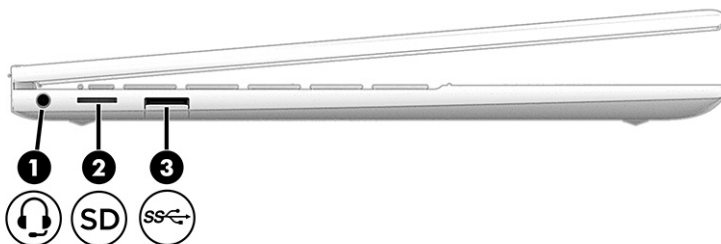
Component		Description
(1)	Magnetic pen attachment area	Holds an optional pen.  <b>NOTE:</b> For more information about the pen, see the documentation provided with the pen.
(2)	USB SuperSpeed 10 Gbps port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off.  <b>NOTE:</b> Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.

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

Component	Description
(3)  USB Type-C® power connector and Thunderbolt™ ports with HP Sleep and Charge and DisplayPort™ output (2)	<p>Connect 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>Connect a USB devices, provide high-speed data transfer, and charge small devices (such as a smartphone), even when the computer is off.</p> <p><b>NOTE:</b> Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.</p> <p>– and –</p> <p>Connect display devices that have a USB Type-C connector, providing DisplayPort output.</p> <p><b>NOTE:</b> Your computer might also support a Thunderbolt docking station.</p>
(4) AC adapter and battery light	<ul style="list-style-type: none"><li>• White: The AC adapter is connected and the battery is fully charged.</li><li>• Blinking amber: The AC adapter is disconnected and the battery has reached a low battery level.</li><li>• Amber: The AC adapter is connected and the battery is charging.</li><li>• Off: The battery is not charging.</li></ul>

## Left side


Identify the components on the left side of the computer.



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

Component	Description
<p>(1)  Audio-out (headphone)/Audio-in (microphone) combo jack</p>	<p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.</p> <p><b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> <li>■ Select the <b>Search</b> icon in the taskbar, type <b>HP Documentation</b> in the search box, and then select <b>HP Documentation</b>.</li> </ul> <p><b>NOTE:</b> When a device is connected to the jack, the computer speakers are disabled.</p>
<p>(2)  microSD™ memory card reader</p>	<p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none"> <li>1. Hold the card label-side up, with connectors facing the computer.</li> <li>2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated.</li> </ol> <p>To remove a card:</p> <ul style="list-style-type: none"> <li>■ Press in on the card, and then remove it from the memory card reader.</li> </ul>

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

Component	Description
(3)  USB SuperSpeed 10 Gbps port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.  <b>NOTE:</b> Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.

## Rear

Identify the rear component.



**Table 2-3** Rear component and its description


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

## Display

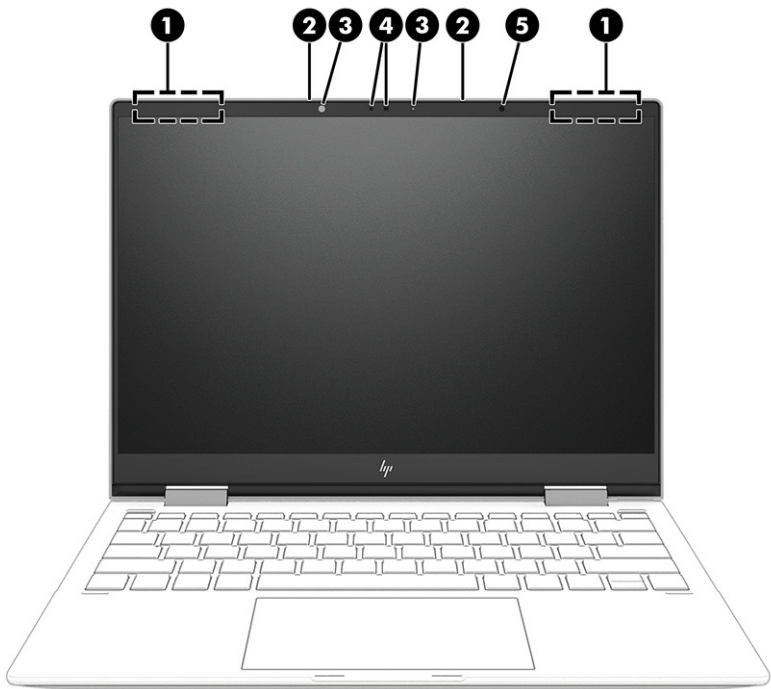
The computer display can include essential components such as speakers, antennas, cameras, and microphones.

### 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>.



**Table 2-4** Display components and their descriptions

Component	Description
(1) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2) Internal microphones	Record sound.
(3) Camera lights	On: One or more cameras are in use.
(4) Cameras	Allow 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.  <b>NOTE:</b> Camera functions vary depending on the camera hardware and software installed on your product.
(5) Ambient light sensor	Adjusts the brightness of the display, depending on the ambient light.

**Table 2-4 Display components and their descriptions (continued)**

Component	Description
<p>*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.</p> <p>For wireless regulatory notices, see the section of the <i>Regulatory, Safety, and Environmental Notices</i> that applies to your country or region.</p> <p>To access this guide:</p> <ul style="list-style-type: none"><li>■ Select the <b>Search</b> icon in the taskbar, type <b>HP Documentation</b> in the search box, and then select <b>HP Documentation</b>.</li></ul>	

# Keyboard area

Keyboards can vary by language.



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

# Touchpad settings and components

Learn the touchpad settings and components.

## Touchpad settings

Learn how to adjust touchpad settings.

## Adjusting touchpad settings

Use these steps to adjust touchpad settings and gestures.

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

## Turning on the touchpad

Follow these steps to turn on the touchpad.

1. Select the **Search** icon in the taskbar, type **touchpad settings** in the search box, and then press **enter**.

2. Using an external mouse, click the **touchpad** button.

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

Touchpad components

Identify the touchpad components.

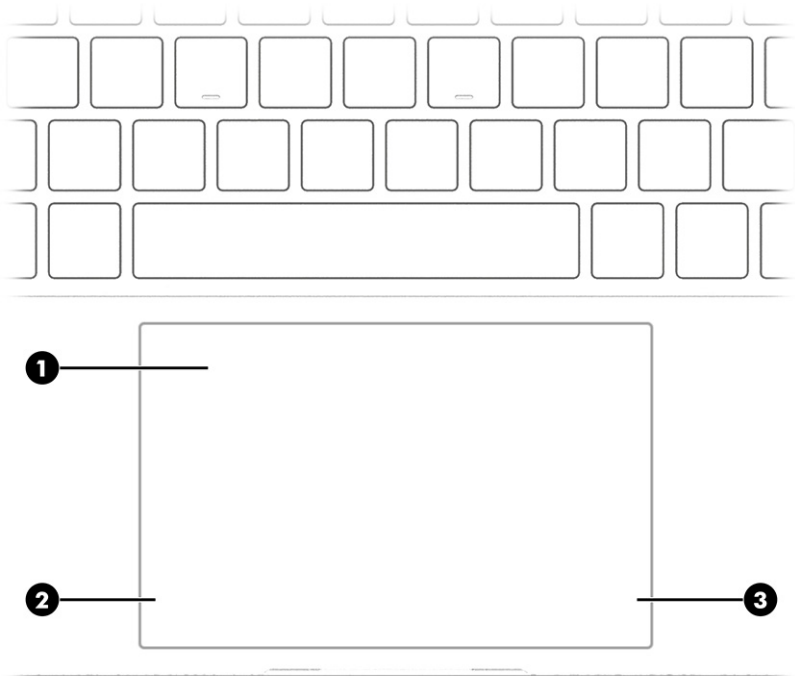


Table 2-5 Touchpad components and their descriptions

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



Lights

Identify the lights on the computer.

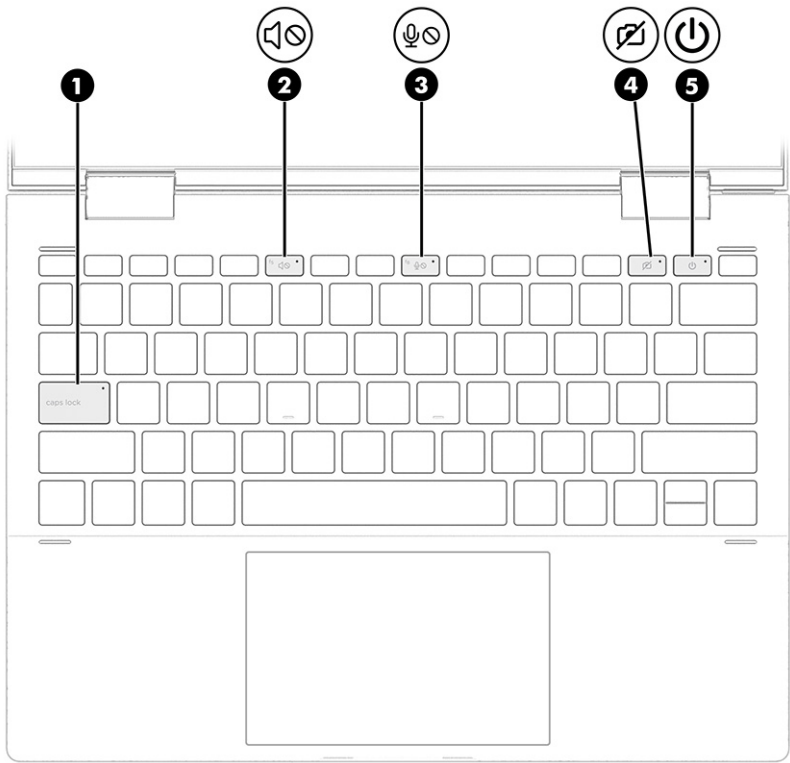




Table 2-6 Lights and their descriptions

Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Mute light	<ul style="list-style-type: none"><li>On: Computer sound is off.</li><li>Off: Computer sound is on.</li></ul>
(3)	Microphone mute light	<ul style="list-style-type: none"><li>On: Microphone is off.</li><li>Off: Microphone is on.</li></ul>

Table 2-6 Lights and their descriptions (continued)

Component	Description
(4)  Camera privacy light	<ul style="list-style-type: none"><li>• On. The camera is off.</li><li>• Off. The camera is on.</li></ul>
(5)  Power light	<ul style="list-style-type: none"><li>• On: The computer is on.</li><li>• Blinking (select products only): The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unnecessary components.</li><li>• 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.</li></ul>

Special keys

Identify the special keys.

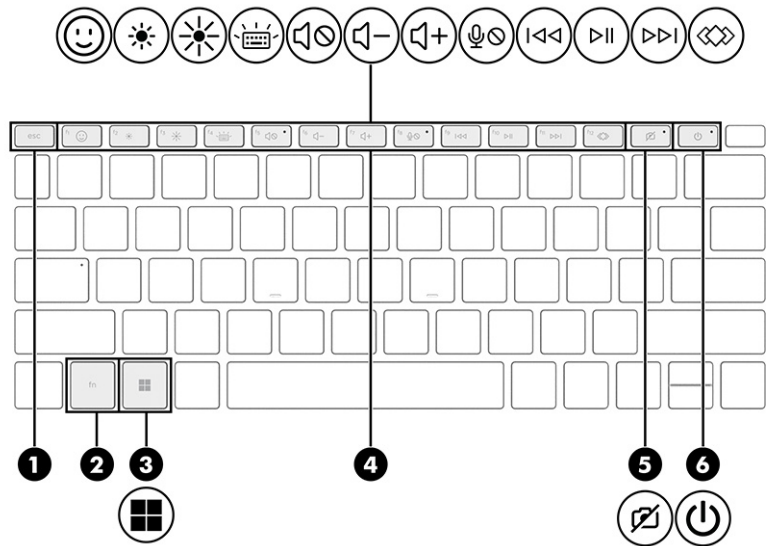





Table 2-7 Special keys and their descriptions

Component		Description
(1)	<a href="#">esc</a> key	Displays system information when pressed in combination with the <a href="#">fn</a> key.
(2)	<a href="#">fn</a> key	Executes specific functions when pressed in combination with another key.
(3)	Windows key	Opens the Start menu.  <b>NOTE:</b> 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 the <a href="#">f1</a> through <a href="#">f12</a> function keys.
(5)	 Camera privacy key	Turns the camera off and on.
(6)	 Power button	<ul style="list-style-type: none"><li>• When the computer is off, press the button briefly to turn on the computer.</li><li>• When the computer is on, press the button briefly to initiate Sleep.</li><li>• When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).</li><li>• When the computer is in Hibernation, press the button briefly to exit Hibernation.</li></ul> <p><b>IMPORTANT:</b> 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"><li>■ Right-click the <b>Power</b> icon  , and then select <b>Power and sleep settings</b>.</li></ul>

## HP Hubs Launcher (select products only)

Press or hold **f12** to open the HP Hubs Launcher. From the HP Hubs Launcher, you can open HP apps such as HP Command Center, OMEN Gaming Hub, myHP, and HP Palette.

- Press **f12** briefly to open the HP Hubs Launcher. Then use the mouse pointer to select an app to open.

-or-

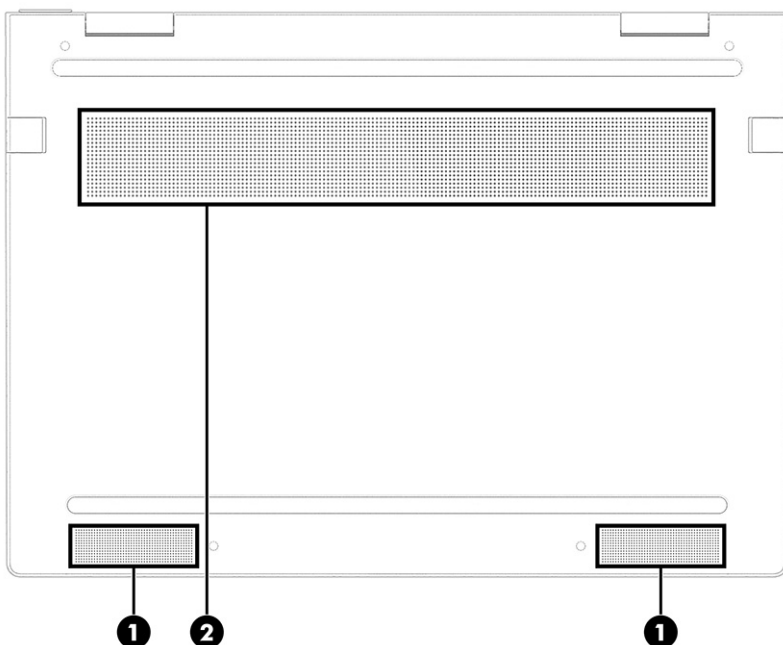
Hold **f12** to change the selected apps and then automatically open them.

Depending on your model, the following apps can be included in the HP Hubs Launcher:

- HP Command Center
  - Select **System Control** to adjust the temperature or cooling preference on your computer.
  - Select **GlamCam** to adjust camera-related settings for video calls.
- OMEN Gaming Hub, where you can customize your computer for your specific gaming needs.
- myHP, where you can learn more about your PC and the utilities that HP offers.
- HP Palette, where you can access creative tools in one place, simplifies the creative process, and helps find the right photos and assets in less time.

## Bottom

Identify the bottom components.



**Table 2-8** Bottom components and their descriptions

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

## Labels

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



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

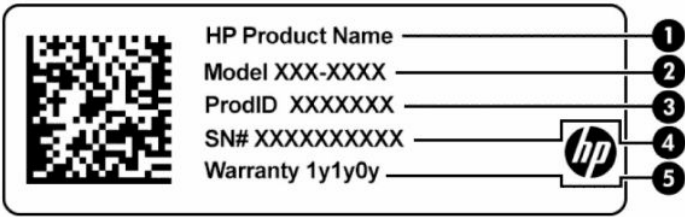
- Service label—Provides important information to identify your computer. When contacting support, you might be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

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



**Table 2-9** Service label components

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



**Table 2-10** Service label components

Component
(1) HP product name )
(2) Model number )

Table 2-10 Service label components (continued)

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

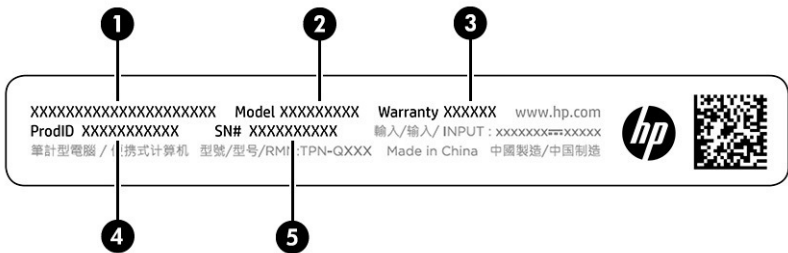


Table 2-11 Service label components

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

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

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## 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.



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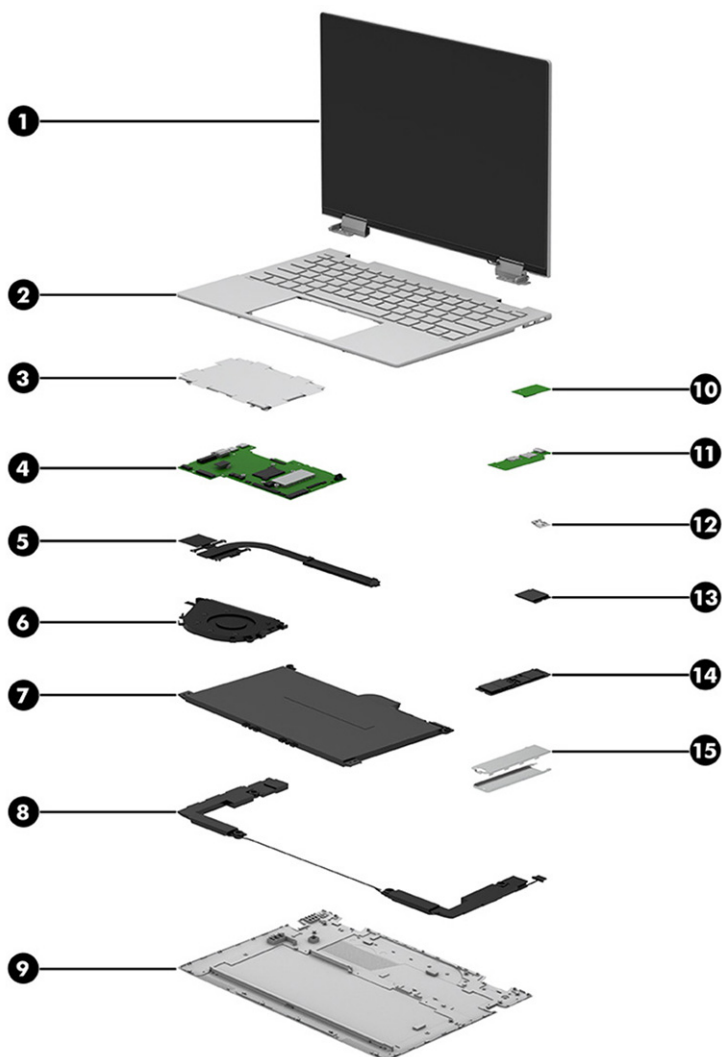
**NOTE:** HP continually improves and changes product parts. For complete and current information about supported parts for your computer, go to <http://partsurfer.hp.com>, select your country or region, and then follow the on-screen instructions.



**NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer.

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

Item	Component	Spare part number
(1)	Display assembly	
<p><b>NOTE:</b> Display spare parts are available only as subcomponents. For spare part information, see <a href="#">Display assembly subcomponents on page 23</a>.</p>		

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

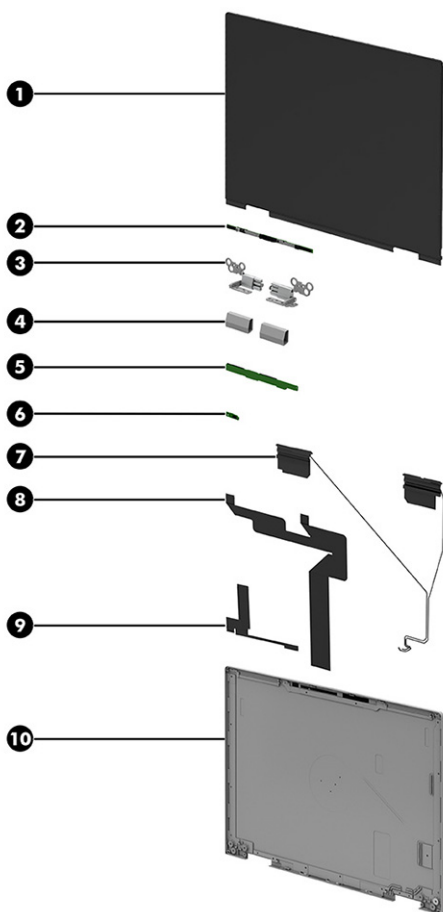
Item	Component	Spare part number
(2)	<b>Top cover</b> (does not include keyboard)	
	Natural silver	N15668-001
	Natural silver, Japan	N15669-001
	Space blue	N15670-001
	<b>Keyboard</b>	
	<b>NOTE:</b> For a detailed list of country codes, see <a href="#">Keyboard on page 60</a> .	
	Natural silver	N15666-xxx
	Space blue	N15667-xxx
(3)	<b>Touchpad</b>	
	<b>NOTE:</b> The touchpad cable is available as spare part number N15682-001.	
	Natural silver	N15683-001
	Space blue	N15684-001
(4)	<b>System board</b>	
	<b>NOTE:</b> The USB door is available as spare part number N15686-001.	
	Intel Core i7-1250U processor and 16 GB of system memory	N15662-601
	Intel Core i7-1250U processor and 8 GB of system memory	N15661-601
	Intel Core i5-1230U processor and 16 GB of system memory	N15660-601
	Intel Core i5-1230U processor and 8 GB of system memory	N15659-601
(5)	<b>Heat sink assembly</b>	N15687-001
	<b>NOTE:</b> Thermal material is available as spare part number N15688-001.	
(6)	<b>Fan</b>	N15692-001
(7)	<b>Battery</b> (4 cell, 66 Whr)	M90073-005
(8)	<b>Speakers</b> (includes cushion and sponge)	N15680-001
(9)	<b>Bottom cover</b> (includes rubber feet)	
	Natural silver	N15671-001
	Space blue	N15672-001

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

Item	Component	Spare part number
(10)	OLED board	N15696-001
(11)	I/O board (includes USB door)	N15685-001
	<b>NOTE:</b> The I/O board cable is available as spare part number N15700-001.	
(12)	USB door	N15686-001
(13)	WLAN module (Intel AX211 Wi-Fi 6e Bluetooth 5.2 WLAN)	M53366-005
	<b>NOTE:</b> Protective tape is available as spare part number N10779-001. WLAN plastic is available as spare part number N15679-001.	
(14)	Solid-state drive	
	<b>NOTE:</b> The solid-state drive thermal pad is available as spare part number N15681-001.	
	1 TB, TLC	M16560-005
	1 TB	L85370-005
	512 GB, TLC	M17436-005
	512 GB	N04490-005
(15)	Solid-state drive cover	not available as a spare part

## 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)	<b>Display panel</b> (touch screen)	
	2.8K, BrightView, OLED	N15663-001
	WQXGA, antiglare	N15664-001
	WUXGA, antiglare	N15665-001

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

Item	Component	Spare part number
(2)	<b>Camera module</b>  <b>NOTE:</b> The camera module thermal pad is available as spare part number N15691-001.	N15690-001
(3)	<b>Display hinges</b> (includes left and right hinges)	N15693-001
(4)	<b>Display hinge covers</b> (left and right hinge covers)	
	Natural silver	N15694-001
	Space blue	N15695-001
(5)	<b>Touch control board</b>  <b>NOTE:</b> The touch control board is included in the touch panel spare part kits.	not available as a spare part
(6)	<b>Ambient light sensor board</b>  <b>NOTE:</b> The ambient light sensor is included in the touch panel spare part kits.  The ambient light sensor cable is available as spare part number N15698-001.	not available as a spare part
(7)	<b>WLAN antenna kit</b> (includes antenna cables and transceivers)	
	OLED models	N15677-001
	LCD models	N17069-001
(8)	<b>Display cable</b>	
	QHD display	N22067-001
	FHD display	N22068-001
	OLED display	N15697-001
(9)	<b>Touch control board cable</b>	N15699-001
(10)	<b>Display back cover</b>	
	OLED, natural silver	N15673-001
	OLED, space blue	N15674-001
	LCD, natural silver	N15675-001
	LCD, space blue	N15676-001
*	<b>Display panel adhesive</b>	N15689-001

\*not illustrated

# Miscellaneous parts

To identify the miscellaneous parts, use this table.

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

Component	Spare part number
AC adapter (65 W, nPFC, 3 pin, USB Type-C)	M54350-001
Zenvo Pen (natural silver with cable)	L95614-001
Zenvo Pen (nightfall black with cable)	L95615-001
USB External DVD+RW drive	747080-001
USB-C-to-VGA adapter	831751-001
USB-C-to-USB-A adapter	833960-001
USB-C-to-RJ-45 (network) adapter	M95985-001
USB-C-to-HDMI 2.0 adapter	935325-001
USB-C-to-USB-A hub	916838-001
HP Elite USB-C Multi Port Hub	L39572-001
Display panel adhesive kit	N15689-001
WLAN protective tape	N10779-001
Screw Kit	N15678-001
Power cord (C5, 1.0 m (3.3 ft), premium, straight	L22319-001
Duck head adapter (for use in Japan)	L33157-001
Power cord (C5, 1.0 m [3.3 ft], premium)	
For use in Australia	L22327-001
For use in Denmark	L22322-001
For use in Europe	L22321-001
For use in India	L22624-001
For use in Israel	L22323-001
For use in Japan	L22330-001
For use in North America	L22319-001
For use in the People's Republic of China	L21930-001
For use in South Africa	L22325-001

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

Component	Spare part number
For use in South Korea	L22328-001
For use in Switzerland	L22324-001
For use in Taiwan	L22329-001
For use in Thailand	L22326-001
For use in Thailand (bundle)	M85421-001
For use in the 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
- Nonconductive, nonmarking pry tool
- Magnetic Phillips P1 screwdriver
- Suction cup (to disassemble the display)

### Service considerations

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



---

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

---

### Plastic parts

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

### Cables and connectors

Handle cables with extreme care to avoid damage.



---

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

---

Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed so that they cannot be caught or snagged as you remove or replace parts. Handle flex cables with extreme care; these cables tear easily.



## Drive handling

Note the following guidelines when handling drives.



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

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Before removing an optical drive, be sure that a disc is not in the drive, and be sure that the optical drive tray is closed.
- Handle drives on surfaces covered with at least 2.54 cm (1 inch) of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive or an optical drive, place it in a static-proof bag.
- Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging, and label the package "FRAGILE."

## Electrostatic discharge information

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

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



**IMPORTANT:** To prevent damage to the device when you remove or install internal components, observe these precautions:

- Keep components in their electrostatic-safe containers until you are ready to install them.
- Before touching an electronic component, discharge static electricity by using the guidelines described in [Personal grounding methods and equipment on page 31](#).
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- If you remove a component, place it in an electrostatic-safe container.

### Generating static electricity

Follow these static electricity guidelines:

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

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

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



**NOTE:** As little as 700 V 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  $1\text{ M}\Omega \pm 10\%$  resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- You can use **heel straps, toe straps, and boot straps** at standing workstations. These straps are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of  $1\text{ M}\Omega \pm 10\%$  resistance between the operator and ground.

**Table 4-2** Static shielding protection levels

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

## Grounding the work area

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

- Cover the work surface with approved static-dissipative material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- Avoid contact with pins, leads, or circuitry.

## Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of  $1\text{ M}\Omega \pm 10\%$  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**.  
– or –
  - Select the **HP Easy Clean** icon in the taskbar.  
– or –
  - Select **Start**, and then select the **HP Easy Clean** tile.
2. Now that your device is disabled for a short period, see [Removing dirt and debris from your computer on page 33](#) 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 34](#) 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 36](#).

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 34](#) 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 33](#), [Caring for wood veneer \(select products only\) on page 36](#), 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.


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 **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 33](#) 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 34](#) for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

## Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.




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

## Accessing support information

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

**Table 4-3** Support information locations

Service consideration	Path to access information
Records of reported failure incidents stored on the computer	<p><b>Windows:</b></p> <p>Pre-operating system failures are logged in the BIOS Event Log. To view the BIOS Event Log:</p> <ol style="list-style-type: none"><li>1. Press the power button.</li><li>2. Immediately and repeatedly press <b>esc</b> when the power button light turns white.</li></ol> <p><b>NOTE:</b> If you do not press <b>esc</b> at the appropriate time, you must restart the computer and again repeatedly press <b>esc</b> when the power button light turns white to access the utility.</p> <ol style="list-style-type: none"><li>3. Press <b>f10</b> to enter the BIOS setup.</li><li>4. (On commercial products) Under the <b>Main</b> tab, select <b>BIOS event log</b>, and then select <b>View BIOS Event Log</b>.</li></ol> <p>- or -</p> <p>(On consumer products) Under the <b>Main</b> tab, select <b>System Log</b>.</p> <p>Post-operating system failures are logged in the Event Viewer.</p> <ol style="list-style-type: none"><li>1. Turn on the computer and allow the operating system to open.</li><li>2. Select the search icon  in the taskbar.</li><li>3. Type <b>Event Viewer</b>, and then press <b>enter</b>.</li><li>4. Select the log from the left panel. Details display in the right panel.</li></ol> <p><b>Chrome:</b></p> <ol style="list-style-type: none"><li>1. Go to <a href="https://support.google.com/chrome">support.google.com/chrome</a>.</li><li>2. Search <b>collect Chrome device logs</b>.</li></ol>

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

Service consideration	Path to access information
Technical bulletins	<p>To locate technical bulletins:</p> <ol style="list-style-type: none"><li>1. Go to <a href="http://www.hp.com">www.hp.com</a>.</li><li>2. Place the cursor over <b>Problem solving</b> to display more options.</li><li>3. Select <b>Support &amp; Troubleshooting</b>.</li><li>4. Type the serial number, product number, or product name to go to the product support page.</li><li>5. Select <b>Advisories</b> to view technical bulletins.</li></ol>
Repair professionals	<p>To locate repair professionals:</p> <ol style="list-style-type: none"><li>1. Go to <a href="http://www.hp.com">www.hp.com</a>.</li><li>2. Place the cursor over <b>Support resources</b> to display more options.</li><li>3. Select <b>Authorized service providers</b>.</li></ol>
Component and diagnosis information, failure detection, and required action	<p>To locate diagnosis information and actions:</p> <ol style="list-style-type: none"><li>1. Go to <a href="http://www.hp.com/go/techcenter/pcdiags">http://www.hp.com/go/techcenter/pcdiags</a>.</li><li>2. Select <b>Get Support</b>.</li><li>3. Near the bottom of the window, select <b>Notebook PCs</b>, and then select your location.</li></ol>

---

## 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.

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### Component replacement procedures

To remove and replace computer components, use the procedures described in this section.



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

---

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

### Preparation for disassembly

To remove and replace computer components, use these procedures:

For initial safety procedures, see [Removal and replacement procedures preliminary requirements on page 28](#).

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

### Bottom cover

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

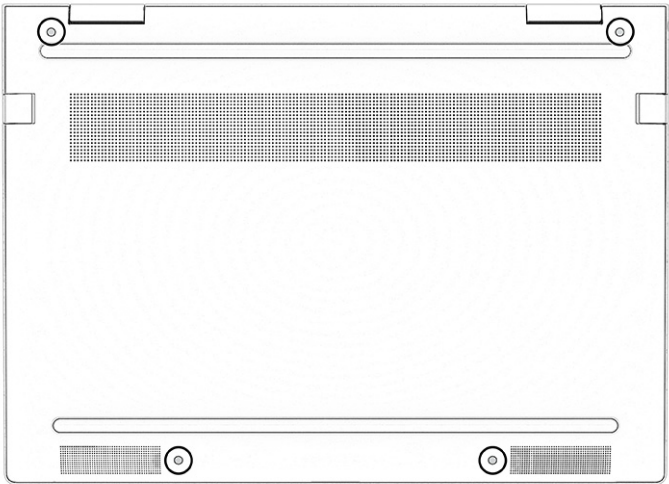
**Table 5-1 Bottom cover description and part number**

Description	Spare part number
Bottom cover for use in natural silver models	N15671-001
Bottom cover for use in space blue models	N15672-001

Before removing the bottom cover, prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).

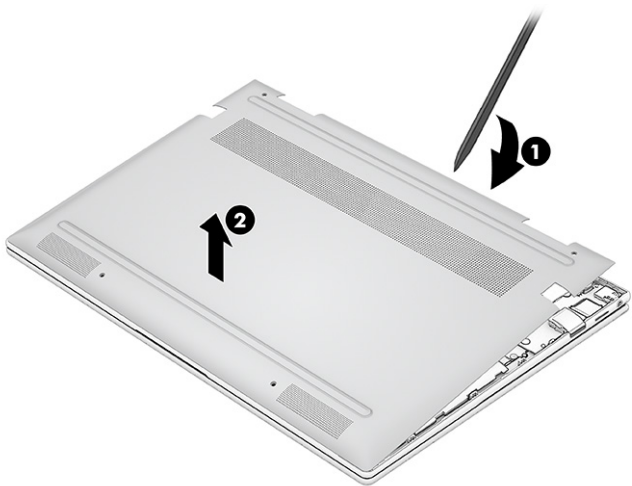
Remove the bottom cover:

1. Close the computer and rest it upside down on a flat work surface with the front toward you.
2. Remove the four Phillips M2.0 × 4.0 screws that secure the bottom cover to the computer.



3. Insert a thin, plastic tool in the seam between the bottom cover and computer to release the cover **(1)**.

4. Remove the bottom cover (2).



To replace the bottom cover, reverse the removal procedures.

## Battery

To remove the battery, use this procedure and illustration.

**Table 5-2** Battery description and part number

Description	Spare part number
Battery (4 cell, 66 Whr)	M90073-005



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

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

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

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
  2. Remove the bottom cover (see [Bottom cover on page 39](#)).
- 

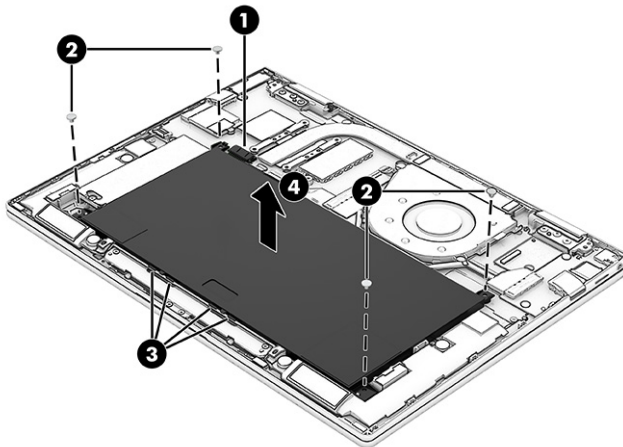
**⚠ WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

**📝 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 four Phillips M2.0 × 2.5 screws (2) that secure the battery to the computer.
3. Remove the speaker cable from the clips on the bottom of the battery (3).
4. Remove the battery (4).



To install the battery, reverse the removal procedures.

## Solid-state drive

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

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

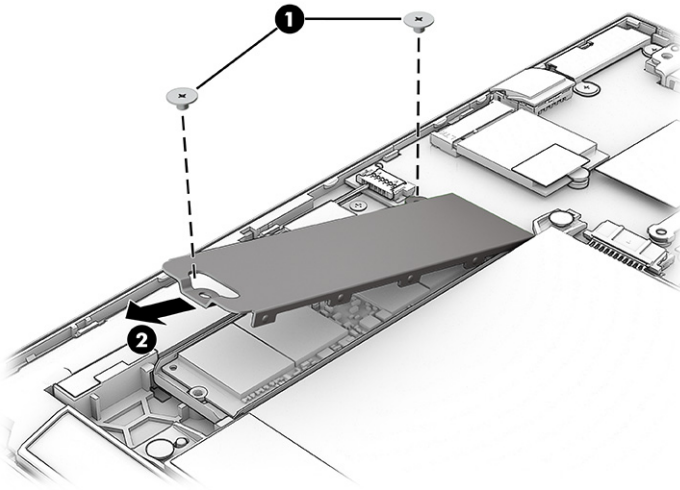
Description	Spare part number
1 TB, TLC	M16560-005
1 TB	L85370-005
512 GB, TLC	M17436-005
512 GB	N04490-005
Solid-state drive thermal pad	N15681-001

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

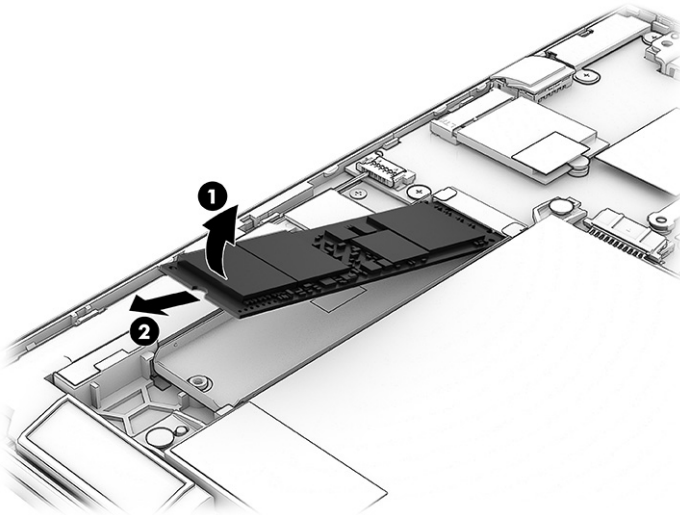
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

Remove the solid-state drive:

1. Remove the two Phillips M2.0 × 2.0 screws (1) that secure the drive cover, and then remove the cover (2).

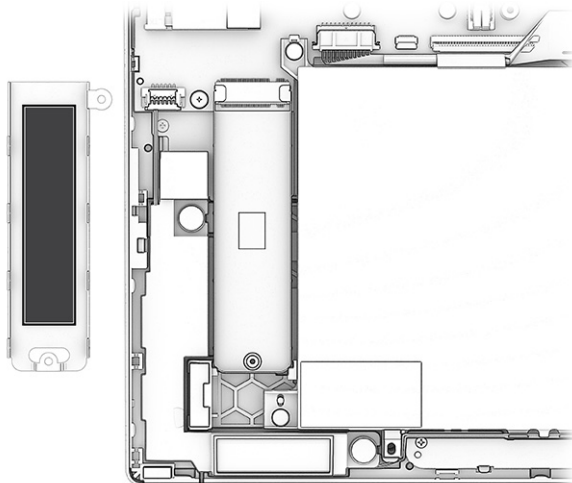


2. Lift the drive up (1), and then pull it away from the socket to remove it (2).

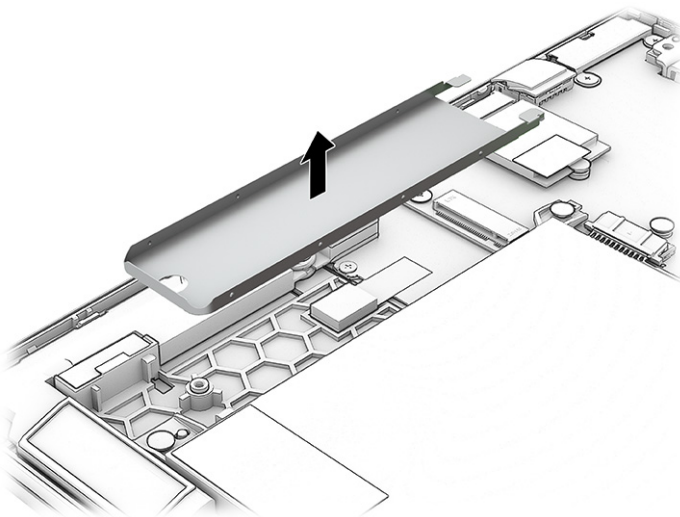




3. When installing a drive, be sure a thermal pad is installed on the bottom of the drive cover.



4. To remove the bottom metal cover, lift it straight up and out of the computer. The cover is secured with adhesive.



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



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

## Touchpad

To remove the touchpad, use this procedure and illustration.

**Table 5-4** Touchpad description and part number

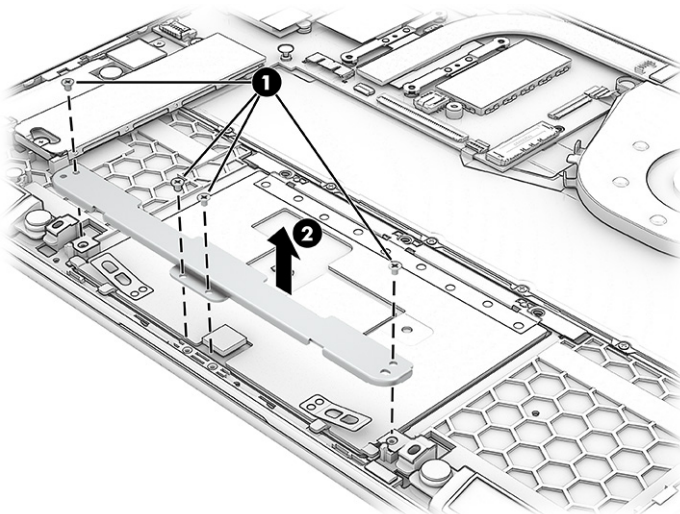
Description	Spare part number
Touchpad for use in natural silver models	N15683-001
Touchpad for use in space blue models	N15684-001
Touchpad cable	N15682-001

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Remove the battery (see [Battery on page 41](#)).

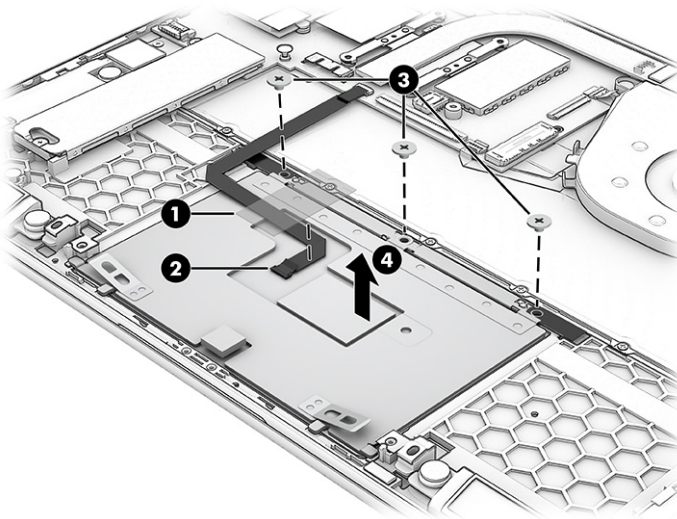
Remove the touchpad:

1. Remove the four Phillips M1.6 × 2.5 screws **(1)** that secure the touchpad bracket, and then remove the bracket **(2)**.



2. Remove the protective tape from the connector on the touchpad **(1)**. When installing a touchpad, you can reuse the tape or replace it with thin clear tape. Do not use thicker tape over this connector.
3. Disconnect the touchpad cable **(2)** from the touchpad ZIF connector.
4. Remove the three broadhead Phillips M2.0 × 2.0 screws **(3)** that secure the touchpad to the computer.

5. Remove the touchpad (4).



To install the touchpad, reverse this procedure.

## WLAN module

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

**Table 5-5** WLAN module descriptions and part numbers

Description	Spare part number
Intel AX211 Wi-Fi 6e Bluetooth 5.2 WLAN	M53366-005
WLAN Mylar (for use on antenna connectors)	N10779-001



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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).

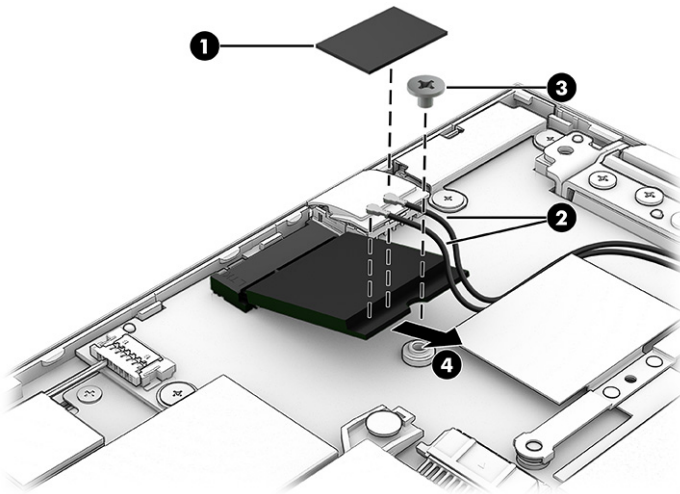
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

Remove the WLAN module:

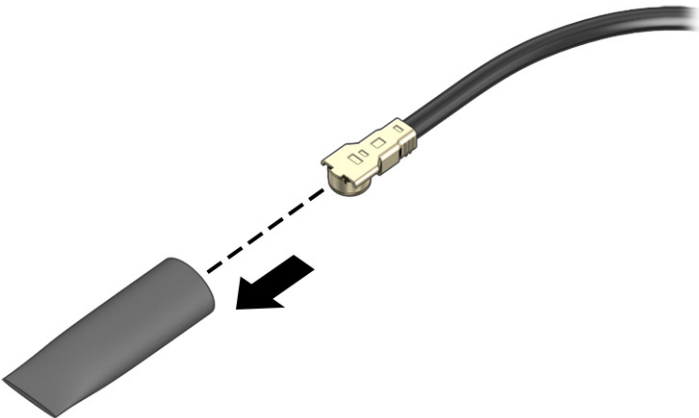
1. Remove the plastic that covers the antennas (1).
2. Carefully disconnect the two antenna cables from the module (2).
3. Remove the Phillips M2.0 × 2.5 screw (3), and then pull the WLAN module out of the socket (4).



**NOTE:** When installing a WLAN module, be sure to match the number on the antenna cable with the number next to the connector on the module.



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



To install the WLAN module, reverse this procedure.

## Speakers

To remove the speakers, use this procedure and illustration.

**Table 5-6 Speaker description and part number**

Description	Spare part number
Speakers (includes cushion and sponge)	N15680-001

Before removing the speakers, follow these steps:

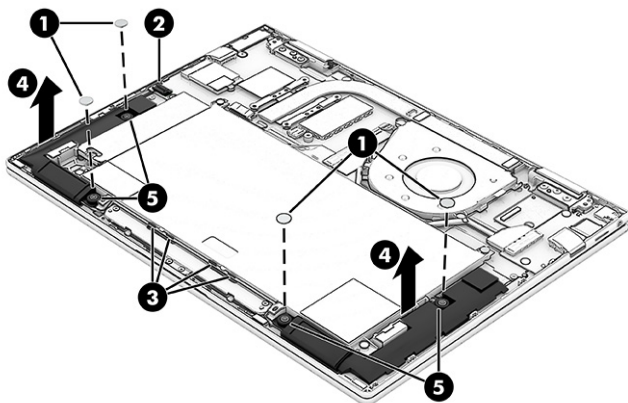
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

Remove the speakers:

1. Remove the two Phillips M2.0 × 2.0 broadhead screws (1) that secure each speaker to the computer.
2. Disconnect the drive cable from the system board (2).
3. Remove the speaker cable from the clips on the bottom of the battery (3).
4. Remove the speakers from the computer (4).



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



To install the speakers, reverse this procedure.

## I/O board

To remove the I/O board, use this procedure and illustration.

**Table 5-7** I/O board description and part number

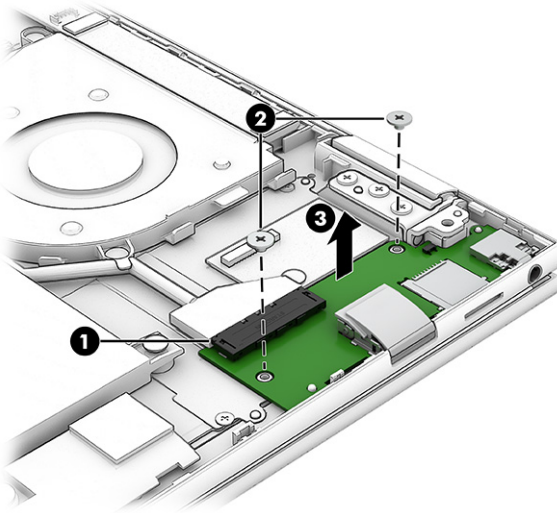
Description	Spare part number
I/O board	N15685-001
I/O board cable	N15700-001
USB door	N15686-001

Before removing the I/O board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

Remove the I/O board:

1. Disconnect the cable from the ZIF connector on the I/O board **(1)**.
2. Remove the two Phillips M2.0 × 2.0 screws **(2)** that secure the board to the computer.
3. Remove the I/O board from the computer **(3)**.

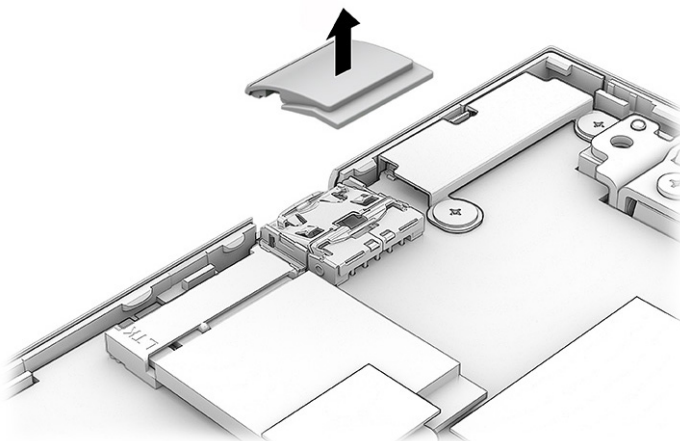


4. To remove the USB door, lift up on the inside of the door to remove it **(1)**.



**NOTE:** System board USB door shown. The removal procedure is the same for both USB doors.





To install the I/O board, reverse this procedure.

## OLED board

The OLED board is available on select products only. To remove the OLED board, use this procedure and illustration.

**Table 5-8 OLED board description and part number**

Description	Spare part number
OLED board	N15696-001

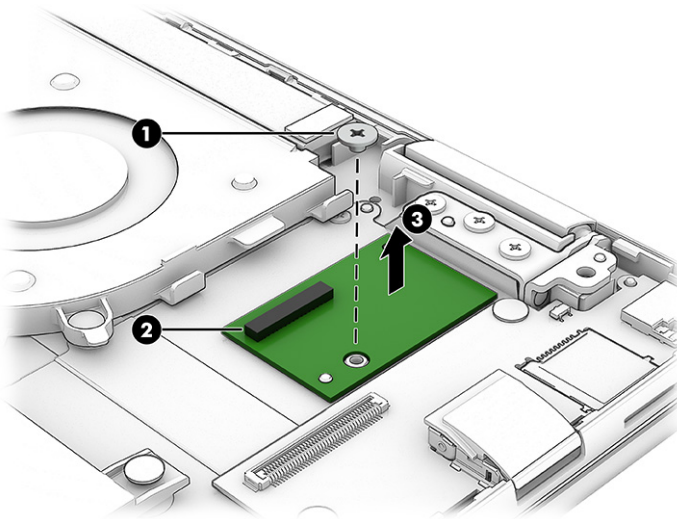
Before removing the OLED board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

Remove the OLED board:

1. Remove the Phillips M2.0 × 2.5 screw **(1)** that secures the board to the computer.
2. Disconnect the cable from the connector on the OLED board **(2)**.

3. Remove the OLED board (3).



To install the OLED board, reverse this procedure.

Fan

To remove the fan, use this procedure and illustration.

Table 5-9 Fan description and part number

Description	Spare part number
Fan	N15692-001

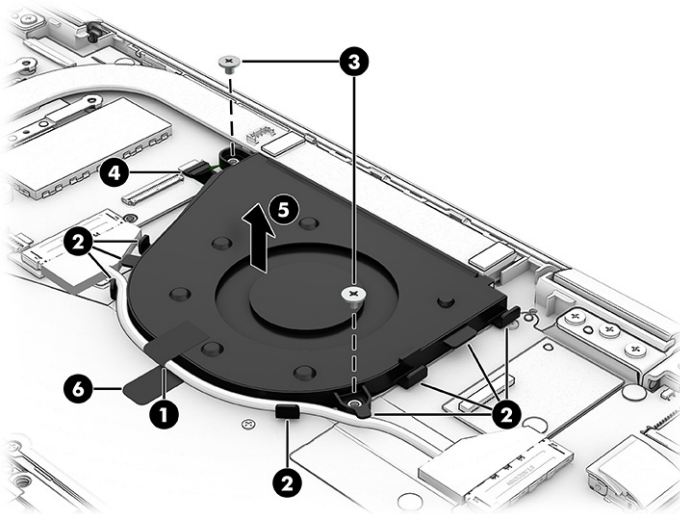
Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

Remove the fan:

1. Remove the tape that secures the cables to the fan (1).

2. Remove the display cable and I/O board cable from the clips on the sides of the fan (2).
3. Remove the two Phillips M2.0 × 2.5 screws (3) that secure the fan to the computer.
4. Disconnect the fan cable from the ZIF connector on the system board (4), and then remove the fan (5). Note the tape under the fan (6) that also helps secure the fan to the computer.



To install the fan, reverse this procedure.



**NOTE:** When replacing the tape (1) during fan installation, be sure the cables and tape are as flat as possible so they do not interfere with the bottom cover. Only place the tape on the flat fan surface.

## Heat sink assembly

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

**Table 5-10** Heat sink description and part number

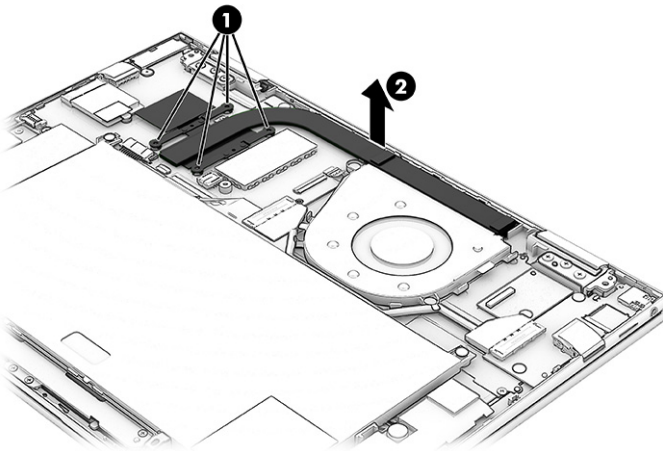
Description	Spare part number
Heat sink assembly	N15687-001
<b>NOTE:</b> Thermal material is available as spare part number N15688-001.	

Before removing the heat sink assembly, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

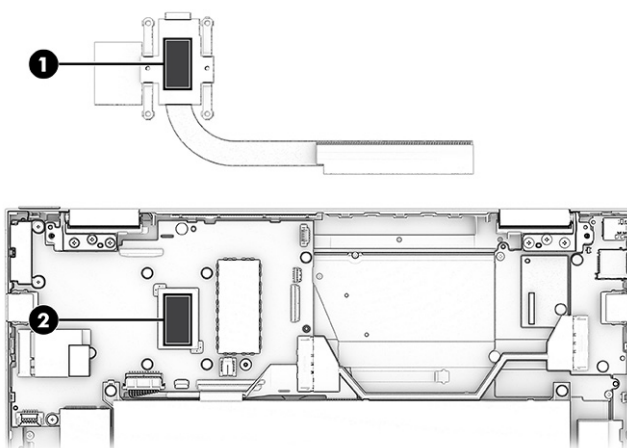
Remove the heat sink assembly:

1. Remove the four Phillips M2.0 × 2.5 screws **(1)** that secure the heat sink to the computer, and then remove the heat sink **(2)**.



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

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



To install the heat sink assembly, reverse this procedure.

## System board

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

**Table 5-11** System board and USB door descriptions and part numbers

Description	Spare part number
Intel Core i7-1250U processor and 16 GB of system memory	N15662-601
Intel Core i7-1250U processor and 8 GB of system memory	N15661-601
Intel Core i5-1230U processor and 16 GB of system memory	N15660-601
Intel Core i5-1230U processor and 8 GB of system memory	N15659-601
USB door	N15686-001

Before removing the system board, follow these steps:

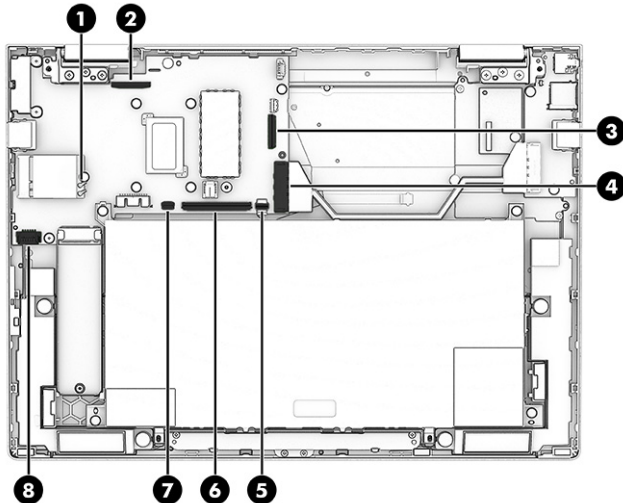
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

4. Remove the solid-state drive (see [Solid-state drive on page 43](#)).
5. Remove the WLAN module (see [WLAN module on page 48](#)).
6. Remove the fan assembly (see [Fan on page 54](#)).
7. Remove the heat sink assembly (see [Heat sink assembly on page 55](#)).

Remove the system board:

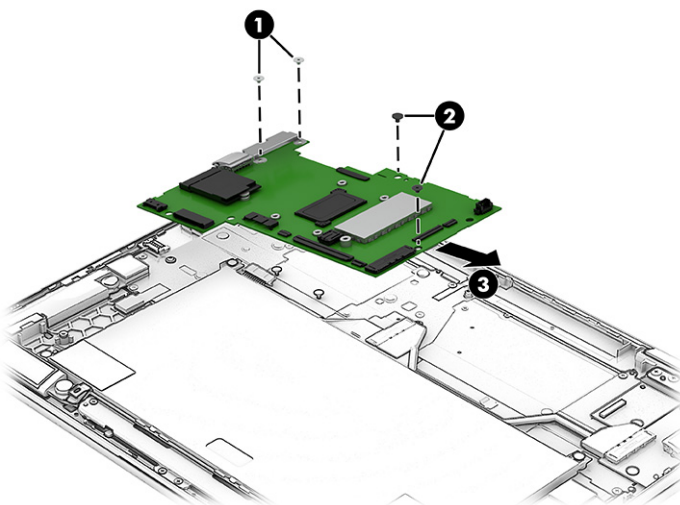
1. Disconnect the following cables from the system board:

- Wireless antenna cables **(1)** from the WLAN module
- Camera cable (ZIF) **(2)**
- Display cable **(3)**
- I/O board cable **(4)**
- Backlight cable (ZIF) **(5)**
- Keyboard cable (ZIF) **(6)**
- Touchpad cable (ZIF) **(7)**
- Speaker cable **(8)**

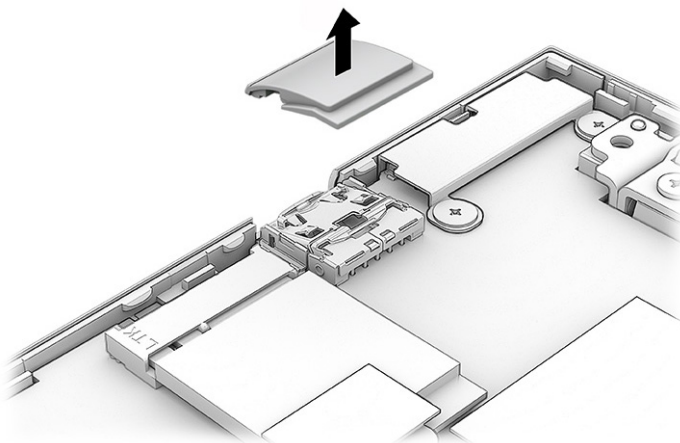


2. Remove the two Phillips M2.0 × 2.5 screws **(1)** from the USB bracket.

3. Remove the two Phillips M2.0 × 2.0 screws (2) from the system board.
4. Lift the right edge of the system board, and then pull the board up and to the right to remove it from the computer (3).



5. To remove the USB door, lift up on the inside of the door to remove it.



To install the system board, reverse this procedure.



**NOTE:** After replacing the display panel assembly or the system board, it is necessary to run the service tool to have the new ambient light sensor (ALS) data written to the system BIOS. Search for the related advisory for more information.

## Keyboard

To remove the keyboard, use this procedure and illustration. The first table provides the main spare part number for the keyboard. The second table provides the country codes.

**Table 5-12 Keyboard description and part number**

Description	Spare part number
Keyboard, natural silver	N15666-xxx
Keyboard, space blue	N15667-xxx

**Table 5-13 Spare part country codes**

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	Hungary	-211	Saudi Arabia	-171
Brazil	-201	Iceland	-DD1	Slovenia	-BA1
Bulgaria	-261	India	-D61	South Korea	-AD1
Chile	-161	Israel	-BB1	Spain	-071
Czech Republic/ Slovakia	-FL1	Italy	-061	Switzerland	-BG1
Denmark	-081	Japan	-291	Taiwan	-AB1
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	Thailand	-281
French Canada	-DB1	Northern Africa	-FP1	Turkey	-141
Finland/Sweden	-B71	Norway	-091	Turkey-F	-541
France	-051	Portugal	-131	Ukraine	-BD1
Germany	-041	Romania	-271	United Kingdom	-031
Greece	-151	Russia	-251	United States	-001



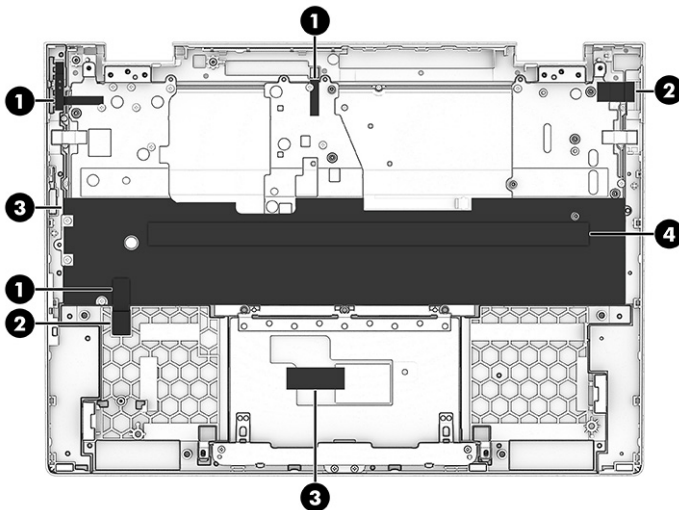
Before removing the keyboard, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Remove the battery (see [Battery on page 41](#)).
4. Remove the fan (see [Fan on page 54](#)).
5. Remove the heat sink (see [Heat sink assembly on page 55](#)).
6. Remove the system board (see [System board on page 57](#)).

Remove the keyboard:

1. Remove the following components from the keyboard:

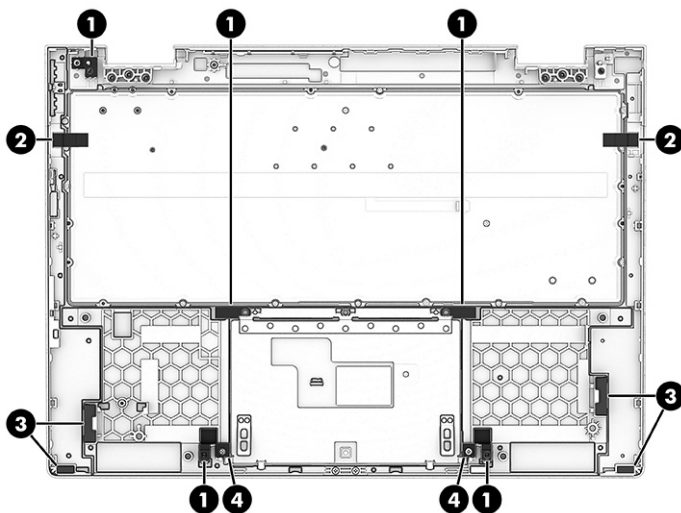
- (1) Conductive tape
- (2) Gaskets
- (3) Mylar
- (4) Sponge



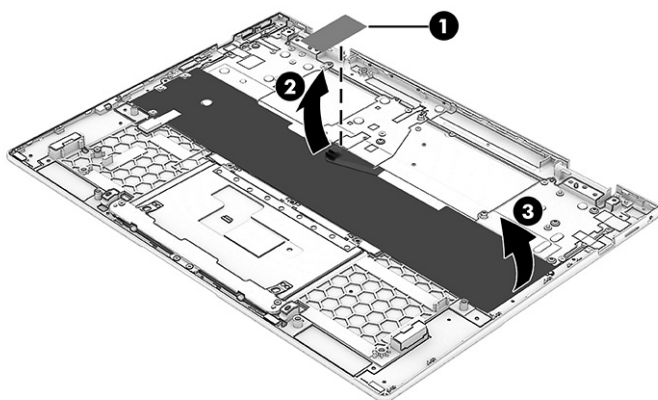
2. Remove the following components from the keyboard:

- (1) Conductive tape

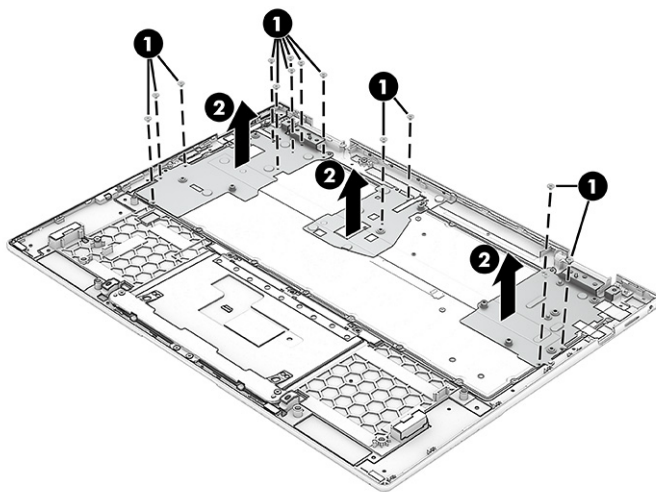
- (2) Gaskets
- (3) Magnets
- (4) Rubber pieces



3. Remove the tape (1) from the large Mylar piece, release the backlight cable (2), and then peel the large Mylar piece from the computer (3).

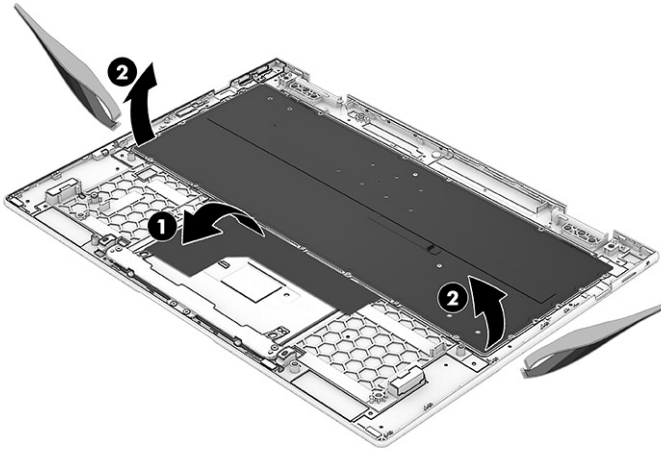


4. Remove the 13 Phillips M2.0 × 3.0 screws (1) from the three brackets that secure the keyboard.
5. Remove the three brackets (2).

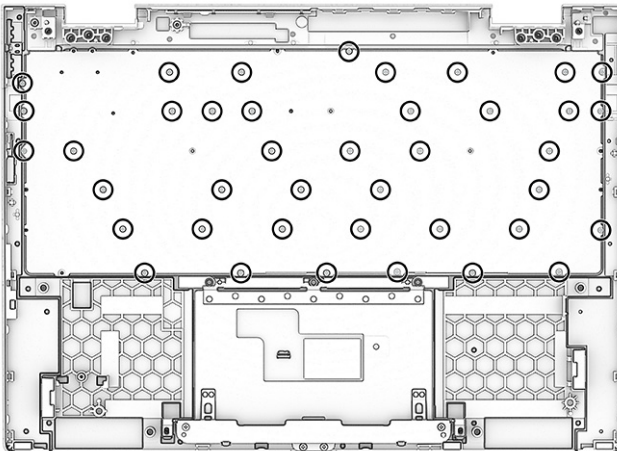


6. Peel the keyboard cable off the keyboard and rotate it down away from the keyboard (1).

7. Use tweezers to release the bottom corners of the Mylar, and then pull the Mylar off the keyboard (2).



8. Remove the 40 screws that secure the keyboard.



9. Remove the keyboard.

To install the keyboard, reverse this procedure.

## Display assembly

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

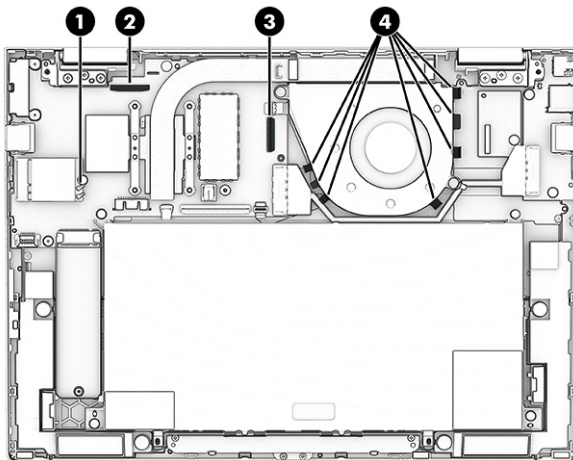
Full hinge-up displays are not available as spare parts. Spare parts for displays are available only at the subcomponent level.

Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 39](#)).
2. Remove the bottom cover (see [Bottom cover on page 39](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 41](#)).

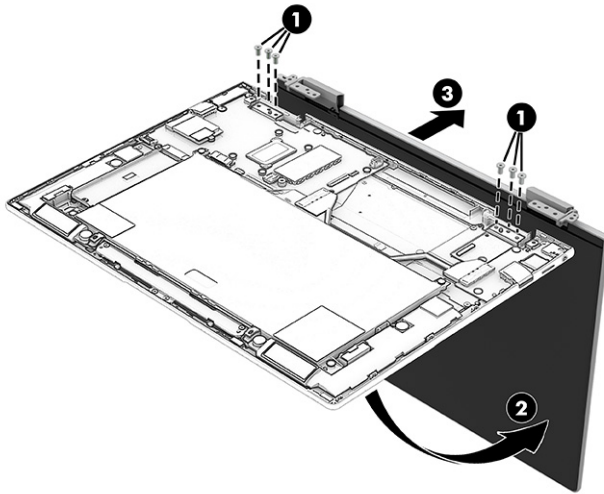
Remove the display assembly:

1. Remove the plastic protector and then disconnect the wireless antenna cables **(1)** from the WLAN module.
2. Disconnect the camera cable **(2)** from the ZIF connector on the system board.
3. Remove the Mylar and then disconnect the display cable **(3)** from the ZIF connector on the system board.
4. Remove the display cable from the clips along the sides of the fan **(4)**.



5. Remove the six Phillips M2.5 × 5.0 screws **(1)** that secure the display assembly to the computer.

6. Open the display to open the hinges (2).
7. Separate the display from the computer (3).



8. If you need to remove the display panel:



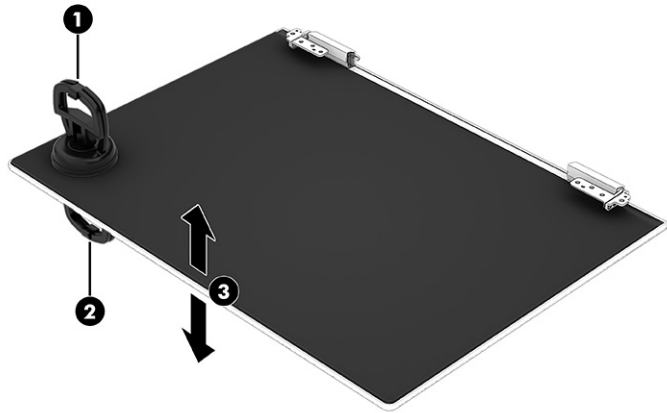
**NOTE:** After replacing the display panel assembly or the system board, it is necessary to run the service tool to have the new ambient light sensor (ALS) data written to the system BIOS. Search for the related advisory for more information.



**IMPORTANT:** After replacing the display panel assembly, it is necessary to reload the calibration data. Refer to Service Advisory C06640672 for details about reloading the HP Display Control Panel Color Calibration Data Reload Process.

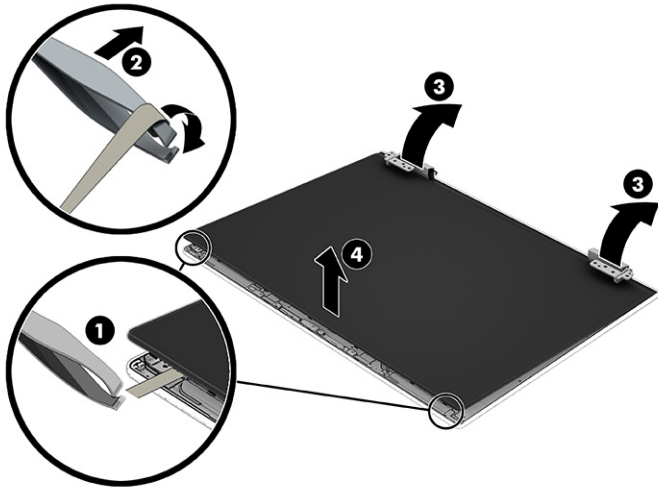
- a. Place suction cups on the top corner of the panel (1) and display back cover (2).

- b. Pull the suction cups to release the panel from the cover only enough to access the tape on the inside **(3)**.



- c. Tape is installed under the left and right sides of the display panel. Use tweezers to grasp the end of the tape **(1)**.
- d. While turning the tweezers **(2)**, wrap the tape around the tweezers as you continue to pull the tape out from behind the display panel.

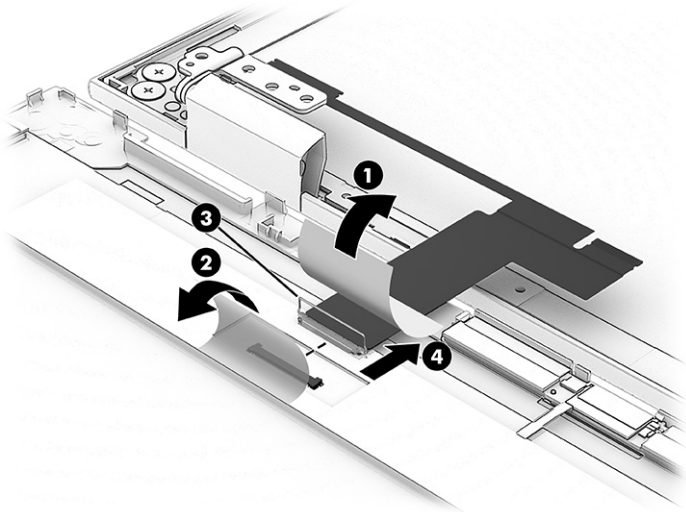
- e. Rotate the hinges 90° (3), and then lift the panel up and place it next to the display back cover (4).



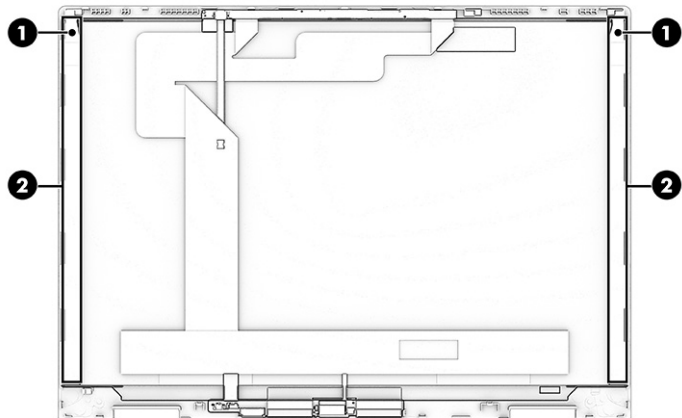
- f. Peel the silver tape off the connector on the bottom of the display panel (1).
- g. Peel the clear tape off the connector on the bottom of the display panel (2).



- h. Rotate the retainer latch off the connector (3), and then disconnect the cable from the panel (4).



- i. When installing a display panel, use the alignment holes (1) and install the tape along the left and right sides of the panel (2).



Display panels are available as the following spare part numbers:

N15663-001—2.8K, BrightView, OLED, privacy, natural silver

N15664-001—WQXGA, antiglare

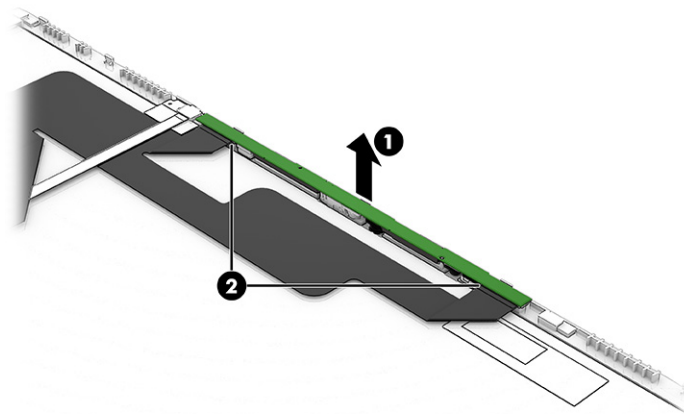
N15665-001—WUXGA, antiglare

Display panel adhesive is available as spare part number N15689-001.

9. If you need to remove the camera module:

- a. Carefully lift the module to release it from the display back cover **(1)**. (The module is attached to the display back cover with double-sided adhesive.)
- b. Disconnect the both cables from the ZIF connectors on the module **(2)**.

The camera module is available as spare part number N15690-001. The camera module thermal pad is available as spare part number N15691-002.

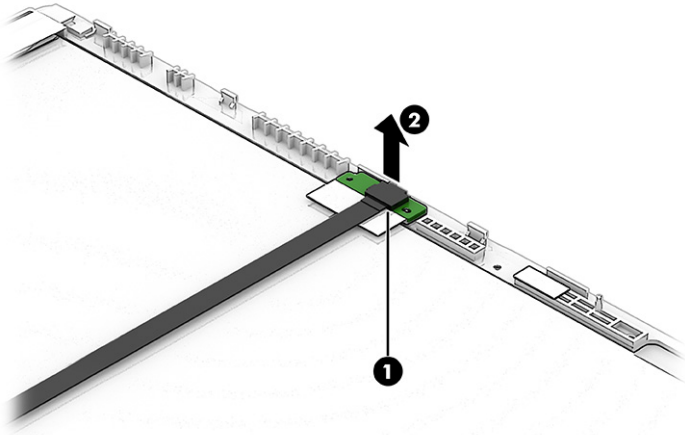


10. If you need to remove the ambient light sensor (ALS) board, disconnect the cable from the board **(1)**, and then carefully lift the board to release it from the display back cover **(2)**. (The board is attached to the display back cover with double-sided adhesive.)



**NOTE:** The ALS is included in the touch panel spare part kits.

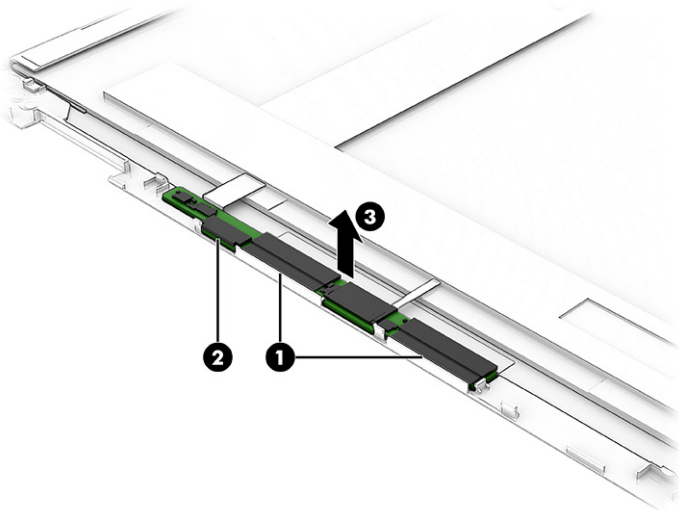
The ALS board cable is available as spare part number N15698-001.



11. To remove the touch control board:

- a. Disconnect the larger two cables (1) and smaller cable (2) from the touch control board.
- b. Peel the board off the bottom of the display back cover (3).

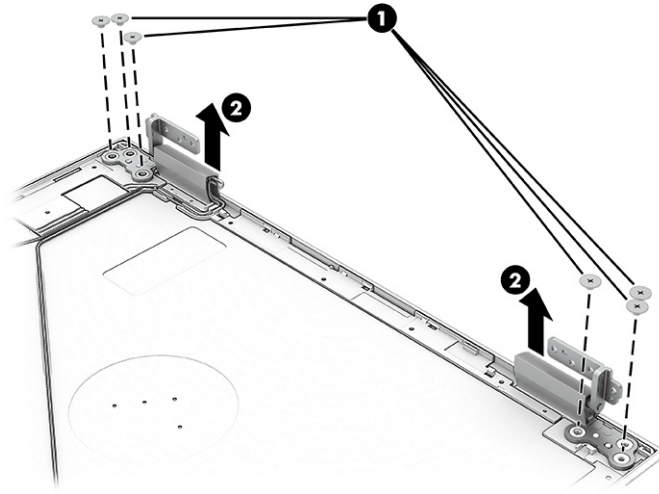
The touch control board is included in the touch panel spare part kits.



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

- a. Remove the three Phillips M2.0 × 2.5 broadhead screws **(1)** that secure each hinge to the display back cover.
- b. Remove the display hinges **(2)**.

The display hinges are available using spare part number N15693-001.



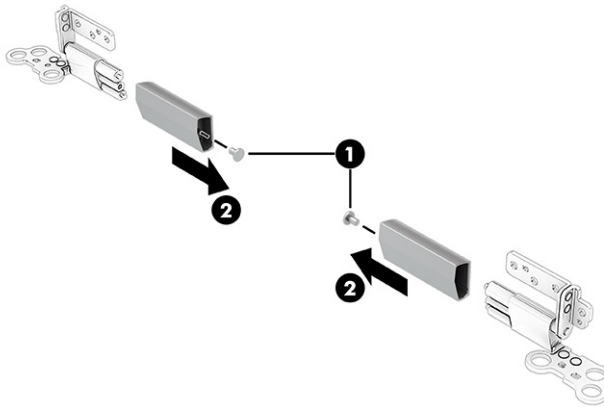
13. If you need to remove the hinge covers from the hinges:

- a. Remove the Phillips M2.0 × 3.0 screw **(1)** from the inside of each hinge cover.
- b. Pull the covers off the hinges **(2)**.

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

N15694-001: Natural silver

N15695-001: Space blue



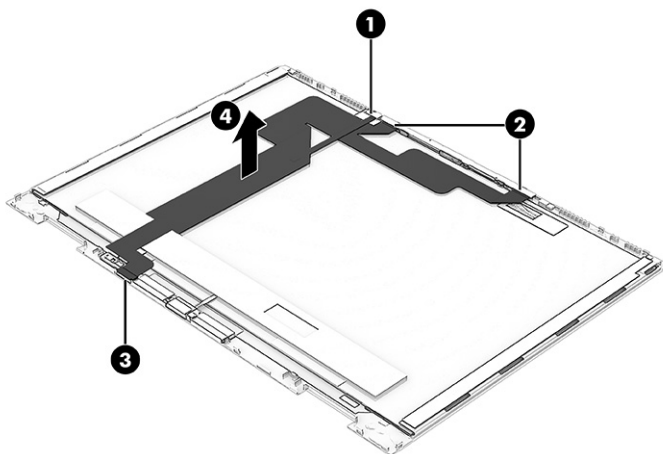
14. If you need to remove the display panel cable:
- a. Disconnect the cable from the ALS board at the top of the display back cover **(1)**.
  - b. Disconnect the cable from the two connectors on the camera module **(2)**.
  - c. Disconnect the cable from the touch board at the bottom of the display back cover **(3)**.
  - d. Peel the cable off the inside of the display rear cover **(4)**.

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

N22067-001: QHD

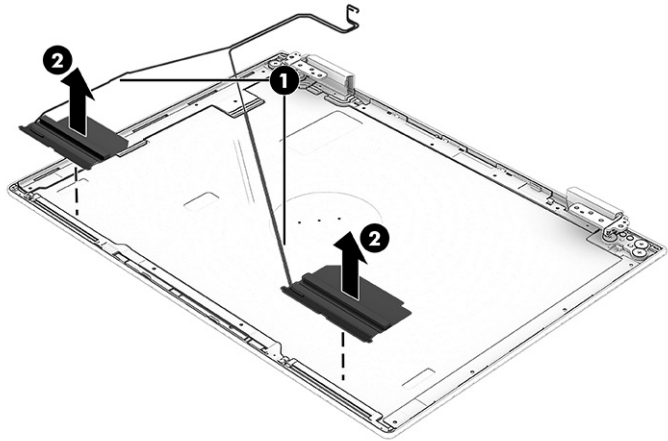
N22068-001: FHD

N15697-001: OLED



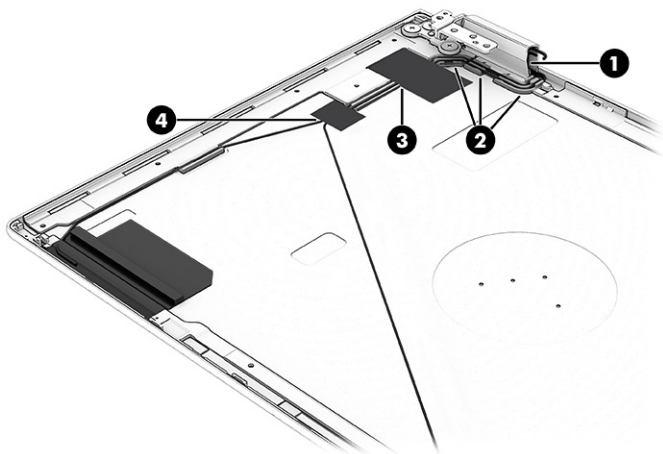
15. If you need to remove the WLAN antennas:
  - a. Release the wireless antenna cables from the tape (1) on the inside of the display back cover.

- b. Peel the wireless antennas off the display rear cover **(2)**. The wireless antennas are available using spare part number N15677-001 for OLED models and N17069-001 for LCD models.



- c. When installing a display, insert the antenna cables into the right hinge **(1)**, route the cables through the clips in the display back cover **(2)**, route the cables under the Mylar above the hinge **(3)**, route the cables together until the

reach the next Mylar piece (4), and then split the antenna cables into different directions to route to the antennas.



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

N15673-001: OLED, natural silver

N15674-001: OLED, space blue

N15675-001: LCD, natural silver

N15676-001: LCD, space blue

To reassemble and replace the display assembly, reverse this procedure.

## Top cover

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

**Table 5-14** Top cover descriptions and part numbers

Description	Spare part number
Top cover, natural silver	N15668-001
Top cover, natural silver, Japan	N15669-001
Top cover, space blue	N15670-001



## 6 Using Setup Utility (BIOS)

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



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

### Starting Setup Utility (BIOS)

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



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

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

— or —

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

### Updating Setup Utility (BIOS)

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

### Determining the BIOS version

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

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

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

– or –

Select the question mark icon in the taskbar.

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

- Setup Utility (BIOS)

1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 77](#)).

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 78](#).

## Preparing for a BIOS update

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



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

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



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

## Downloading a BIOS update

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

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

– or –

Select the question mark icon in the taskbar.

2. Select **Updates**. The **Checking for Updates** window opens, and Windows checks for updates.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
  - a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You might need this information to locate the update later, after it has been downloaded to your hard drive.
  - b. Follow the on-screen instructions to download your selection to the hard drive.

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

## Installing a BIOS update

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

1. Select the **Search** icon in the taskbar, type `file` in the search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename.exe*).

The BIOS installation begins.

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



---

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

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## 7 Backing up, restoring, and recovering

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



---

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



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

---

### Backing up information and creating recovery media

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

#### Using Windows tools for backing up

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



---

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



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

---

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

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

For details:

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



---

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



**IMPORTANT:** HP recommends that you follow the [Restoring and recovery methods on page 81](#) 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 81](#).

### 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 82](#).

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

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



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

---

## Recovering using HP Recovery media

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

For details, see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 80](#).



**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 81](#) to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

## Changing the computer boot order

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



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

To change the boot order:

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.
  - For computers or tablets with keyboards attached, turn on or restart the computer or tablet, quickly press **esc**, and then press **f9** for boot options.
  - For tablets without keyboards, turn on or restart the tablet, quickly press and hold the volume up button, and then select **f9**.

— or —

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

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

## Using HP Sure Recover (select products only)

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

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

- Latest version of the operating system
- Platform-specific device drivers
- Software applications, in the case of a custom image

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

---

## 8 Using HP PC Hardware Diagnostics

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

### Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 85](#).

### Using an HP PC Hardware Diagnostics Windows hardware failure ID code

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

- You have several options after you receive a failure ID:
  - Select **Next** to open the Event Automation Service (EAS) page, where you can log the case.  
– or –
  - Scan the QR code with your mobile device, which takes you to the EAS page, where you can log the case.  
– or –
  - Select the box next to the 24-digit failure ID to copy your failure code and send it to support.

### Accessing HP PC Hardware Diagnostics Windows

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



## Accessing HP PC Hardware Diagnostics Windows from HP Support Assistant

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

1. Select the **Search** icon in the taskbar, type **support** in the search box, and then select the **HP Support Assistant** app.  
  
– or –  
Select the question mark icon in the taskbar.
2. Select **Fixes & Diagnostics**.
3. Select **Run hardware diagnostics**, and then select **Launch**.
4. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.



---

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

---

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

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

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



---

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

---

## Downloading HP PC Hardware Diagnostics Windows

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

## Downloading the latest HP PC Hardware Diagnostics Windows version from HP

To download HP PC Hardware Diagnostics Windows from HP, follow these steps.

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics Windows**, and then select the specific Windows diagnostics version to download to your computer or a USB flash drive.

The tool downloads to the selected location.

## Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

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

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

The tool downloads to the selected location.

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

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



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

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

The tool downloads to the selected location.

## Installing HP PC Hardware Diagnostics Windows

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

## Using HP PC Hardware Diagnostics UEFI

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



**NOTE:** For some products, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see [Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 88](#).

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

## Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

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

For assistance in solving the problem:

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

– or –

Contact support, and provide the failure ID code.



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



**NOTE:** If you need to stop a diagnostic test, press [esc](#).

## Starting HP PC Hardware Diagnostics UEFI

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

1. Turn on or restart the computer, and quickly press [esc](#).
2. Press [f2](#).

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

- a. Connected USB flash drive



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**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 88](#).

---

- b. Hard drive
- c. BIOS

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

## Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in some situations.

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



---

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

---

## Downloading the latest HP PC Hardware Diagnostics UEFI version

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

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

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

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



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

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

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

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

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

## Downloading Remote HP PC Hardware Diagnostics UEFI

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

## Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

You can download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive.

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

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

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



---

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

---

1. Go to <http://www.hp.com/support>.
2. Select **Software and Drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.

3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

## Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

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

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

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

Your changes take effect when the computer restarts.

# 9 Specifications

This chapter provides specifications for your computer system.

## Computer specifications

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

Table 9-1 Computer specifications

	Metric	U.S.
<b>Dimensions</b>		
Width	298.4 mm	11.8 in
Depth	214.9 mm	8.5 in
Height	16.1 mm	0.63 in
<b>Weight</b>		
	1317 g (OLED)	2.91 lb
	1383 g (WLED)	3.06 lb
<b>Input power</b>		
Operating voltage and current	65 W USB-C	
	5 V dc @ 3 A	
	9 V dc @ 3 A	
	12 V dc @ 5 A	
	15 V dc @ 4.33 A	
	20 V dc @ 3.25 A	
<b>Temperature</b>		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	–20°C to 60°C	–4°F to 140°F
<b>Relative humidity</b> (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
<b>Maximum altitude</b> (unpressurized)		

Table 9-1 Computer specifications (continued)

	Metric	U.S.
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
<b>NOTE:</b> 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	33.8 cm	13.3 in
Resolution	1920 × 1200 (WUXGA)	
	2560 × 1600 (WQXGA)	
	2880 × 1800 (2.8K)	
Surface treatment	BrightView (2.8K)	
	Antiglare	
Brightness	400 nits	
Viewing angle	UWVA	
Backlight	WLED	
	OLED (2.8K)	
Display panel interface	eDP	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-3 Solid-state drive specifications

	256 GB*	512 GB*	1 TB*
Dimensions			



**Table 9-3 Solid-state drive specifications (continued)**

	256 GB*	512 GB*	1 TB*
Height	1.0 mm	1.0 mm	1.0 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	PCIe	PCIe	PCIe
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms	1.0 ms
Access times, logical	0.1 ms	0.1 ms	0.1 ms
Transfer rate			
Sequential read	up to 2150 MBps	up to 2150 MBps	up to 2150 MBps
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MBps	up to 1550 MBps	up to 1550 MBps
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs	Up to 100,000 IOPs
Total logical sectors	468,883,296	1,000,215,216	1,500,336,388
Operating temperature	0°C to 70°C (32°F to 158°F)		
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.			
NOTE: Certain restrictions and exclusions apply. Contact support for details.			

# 10 Power cord set requirements

This chapter provides power cord requirements for countries and regions.

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

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

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

## Requirements for all countries

These power cord requirements are applicable to all countries and regions.

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

## Requirements for specific countries and regions

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

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

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1

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

Country/region	Accredited agency	Applicable note number
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
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

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

Country/region	Accredited agency	Applicable note number
		<ol style="list-style-type: none"><li>1. The flexible cord must be Type H05VV-F, three-conductor, 0.75 mm<sup>2</sup> 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.</li><li>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.</li><li>3. The appliance coupler, flexible cord, and wall plug must bear a T mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, three-conductor, 0.75 mm<sup>2</sup> or 1.25 mm<sup>2</sup> conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.</li><li>4. The flexible cord must be Type RVV, three-conductor, 0.75 mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.</li><li>5. The flexible cord must be Type H05VV-F three-conductor, 0.75 mm<sup>2</sup> conductor size. KTL logo and individual approval number must be on each element. Approval number and logo must be printed on a flag label.</li><li>6. The flexible cord must be Type HVCTF three-conductor, 1.25 mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.</li><li>7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F three-conductor, 0.75 mm<sup>2</sup> or 1.00 mm<sup>2</sup> conductor size, with plug BS 1363/A with BSI or ASTA marks.</li></ol>

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## 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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