



# Maintenance and Service Guide

## **SUMMARY**

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

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

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

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

## Safety warning notice

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

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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
<b>Product Name</b>	<b>HP Chromebook™ 15.6 inch</b> 15a-nb0xxx CTO number: 15at-nb000
<b>Processors</b>	Intel® Core® i3-N305 (up to 3.8 GHz, 6 MB cache, 8 cores, 15 W) Intel N200 (up to 3.7 GHz, 6 MB cache, 4 cores, 6 W) Intel N100 (up to 3.4 GHz, 6 MB cache, 4 cores, 6 W)
<b>Graphics</b>	<b>Internal graphics</b> Intel UHD Graphics
<b>Display</b>	<b>15.6 in (39.6 cm), white light-emitting diode (WLED), narrow bezel</b> Full high definition (FHD) (1920 × 1080), ultra wide viewing angle (UWVA), 45% NTSC, BrightView, 250 nits, touch-on panel (TOP) FHD, standard viewing angle, UWVA, 45% NTSC, embedded DisplayPort™ (eDP) 1.2 without panel self-refresh (PSR), antiglare, 250 nits FHD, standard viewing angle (SVA), 45% NTSC, eDP 1.2 without PSR, antiglare, 250 nits High definition (HD) (1366 × 768), SVA, 45% NTSC, eDP 1.2 without PSR, antiglare, 250 nits HD, SVA, 45% NTSC, eDP 1.2 without PSR, BrightView, 250 nits, touch-on panel (TOP)
<b>Memory</b>	Onboard, not customer accessible or upgradeable supporting up to 8 GB of RAM LPDDR5-4800 single-channel support Supports the following configurations: <ul style="list-style-type: none"><li>• 8 GB</li><li>• 4 GB</li></ul>
<b>Primary storage</b>	<b>Embedded MultiMedia Controller (eMMC) 5.0</b> 64 GB <b>Universal Flash (UFS v3.0)</b> 256 GB 128 GB

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

<b>Category</b>	<b>Description</b>
<b>Audio and video</b>	Dual speakers
	<b>HP True Vision FHD Camera with Indicator LED, USB2.0, HD BSI sensor, f2.0</b>
	1080p by 30 frames per second
	Dual-array digital microphone with appropriate software: beam forming, echo cancellation, noise suppression
	<b>HP True Vision HD Camera with Indicator LED, USB2.0, HD BSI sensor, f2.0</b>
	720p by 30 frames per second
<b>Wireless</b>	<b>Wireless Local Area Network (WLAN)</b> (with dual antennas)
	Intel AX211 Wi-Fi® 6E Bluetooth® 5.3 WLAN
	MediaTek™ MT7921 Wi-Fi 6 Bluetooth 5.3 WW WLAN
<b>Media card reader</b>	<b>HP MultiFormat microSD Memory Card Reader</b>
	Supports microSD™, SDHC™, SDXC™
	Push-push insertion and removal
<b>Ports</b>	USB 3.2 Gen 1 Type-C® (2), right and left side, supports:
	- power delivery
	- data transfer
	- DisplayPort™ 1.4, 4K output (4096 × 2160 @ 60 Hz) with USB-C® adapter
	USB 3.1 Gen 1 Type-A, right side, supports:
	- Supports HP Sleep & Charge
Audio-out (headphone)/audio-in (microphone) combo jack	
<b>Keyboard/pointing devices</b>	<b>Keyboard with numeric keypad</b>
	3-coat paint, backlit, natural silver or mineral silver
	2-coat paint, natural silver or mineral silver
	<b>Clickpad with image sensor</b>
<b>Power requirements</b>	<b>Battery</b> (li-ion polymer, long life)
	2 cell, 47 Whr (not available with i3 processor)
	3 cell, 58 Whr (for use with i3 processor)
	3 cell, 54 Whr (for use with i3 processor; not available with 144 Hz panel)
	Supports battery fast charge
	<b>Smart AC adapter</b> (USB Type-C, nonpower factor correction [nPFC], straight, 1.8 m [6 ft])
	45 W
	<b>Power cord</b>
C5, conventional, power cord with sticker label, 1 m (3.3 ft)	
<b>Security</b>	H1 Secure Microcontroller

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

<b>Category</b>	<b>Description</b>
	Microphone mute
	Camera privacy cover
<b>Operating system</b>	Google Chrome™ Premium (models with an i3 processor)
	Google Chrome Non-Premium (models with N200 or N100 processor)
<b>Serviceability</b>	<b>End user replaceable parts</b>
	AC adapter

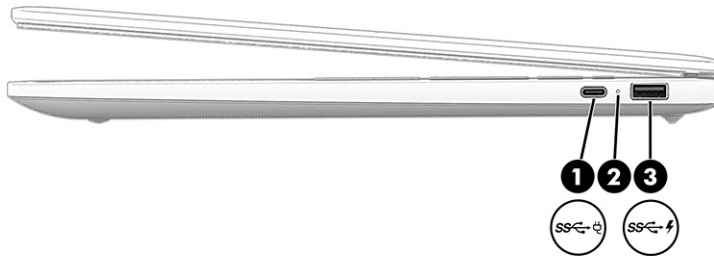


## 2 Components


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

### Right


Use the illustration and table to identify the components on the right side of the computer.



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

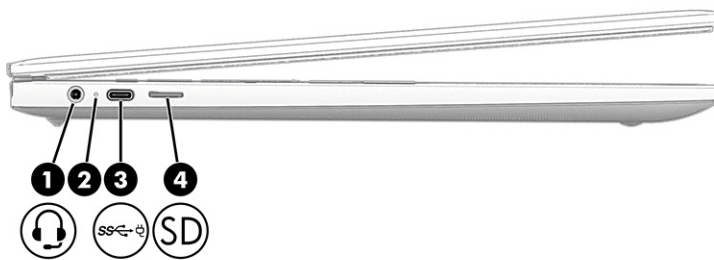
Component	Description
(1) 	<p>USB Type-C® power connector and 5 Gbps port with DisplayPort™ output</p> <p>Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.</p> <p>- and -</p> <p>Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.</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>Connects a display device that has a USB Type-C connector, providing DisplayPort output.</p>
(2)	<p>AC adapter and battery light</p> <ul style="list-style-type: none"> <li>• White: The AC adapter is connected and the battery is fully charged.</li> <li>• Amber: The AC adapter is connected and the battery is charging.</li> <li>• Blinking amber: The battery has an error.</li> <li>• Off: The battery is not charging.</li> </ul>

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


Component	Description
(3) 	<p>USB 5 Gbps port with HP Sleep and Charge</p> <p>Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off.</p> <p><b>NOTE:</b> Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.</p>

## Left



Use the illustration and table to identify the components on the left side of the computer.



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

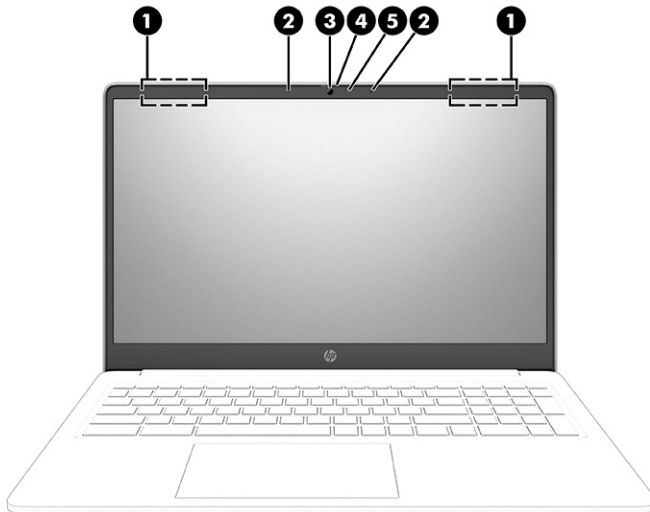
Component	Description
(1) 	<p>Audio-out (headphone)/Audio-in (microphone) combo jack</p> <p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.</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><b>NOTE:</b> When a device is connected to the jack, the computer speakers are disabled.</p>
(2)	<p>AC adapter and battery light</p> <ul style="list-style-type: none"> <li>• White: The AC adapter is connected and the battery is fully charged.</li> <li>• Amber: The AC adapter is connected and the battery is charging.</li> <li>• Blinking amber: The battery has an error.</li> <li>• Off: The battery is not charging.</li> </ul>

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

Component	Description
<p>(3)</p>  <p>USB Type-C power connector and 5 Gbps port with DisplayPort output</p>	<p>Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.</p> <p>- and -</p> <p>Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.</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>Connects a display device that has a USB Type-C connector, providing DisplayPort output.</p>
<p>(4)</p>  <p>microSD™ memory card reader</p>	<p>Reads optional memory cards that 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 the 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>

## Display

Use the illustration and table to identify the components on the display.



**Table 2-3 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 (2)	Record sound.
(3) Camera	Allows you to video chat, record video, and record still images.  <b>NOTE:</b> Camera functions vary depending on the camera hardware and software installed on your product.
(4) Camera privacy cover	By default, the camera lens is uncovered, but you can slide the camera privacy cover to block the camera's view. To use the camera, slide the camera privacy cover in the opposite direction to reveal the lens.
(5) Camera light	On: The camera is in use.  Off: The camera is off.

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

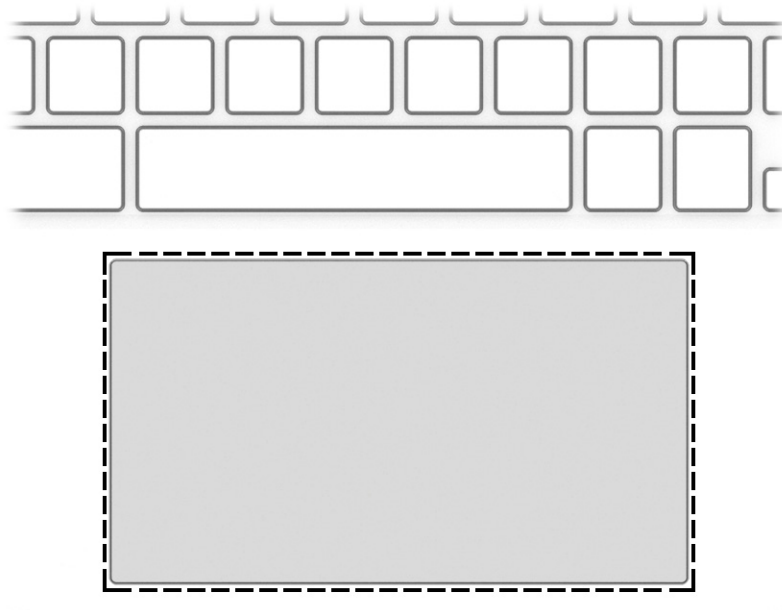
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

## Keyboard area

Keyboards can vary by language.

## Touchpad

The touchpad settings and components are described here.



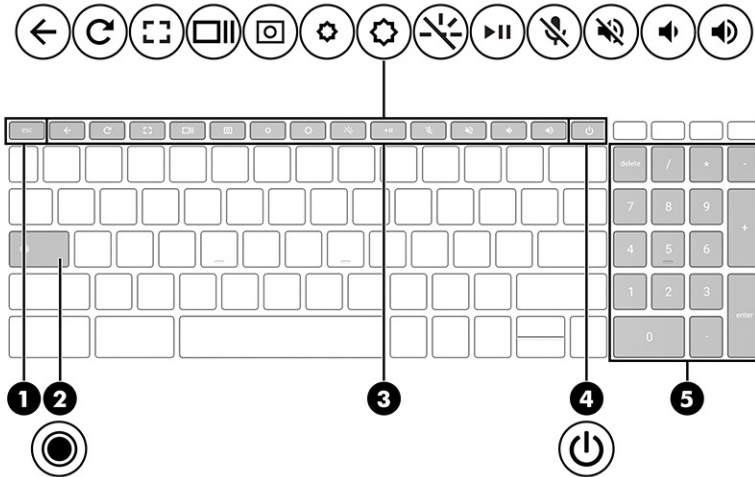
**Table 2-4 Touchpad component and description**

Component	Description
Touchpad zone	Reads your finger gestures to move the pointer or activate items on the screen.

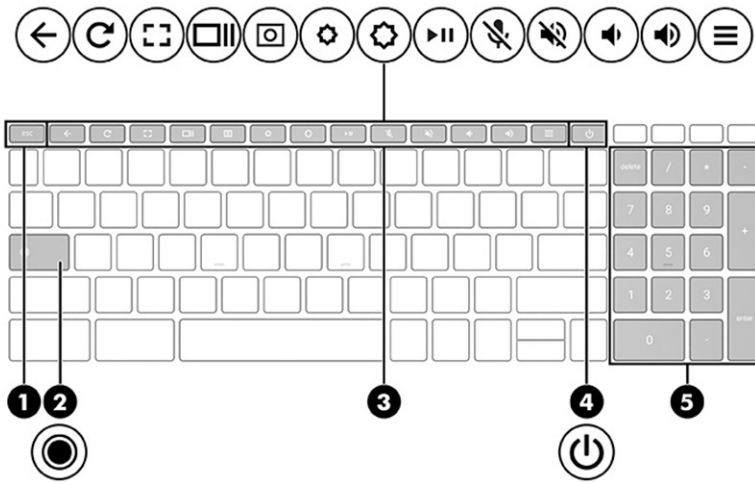
## Special keys

Use the illustration and table to locate the special keys.

### Backlit keyboard




### Non-backlit keyboard



**Table 2-5 Special keys and their descriptions**

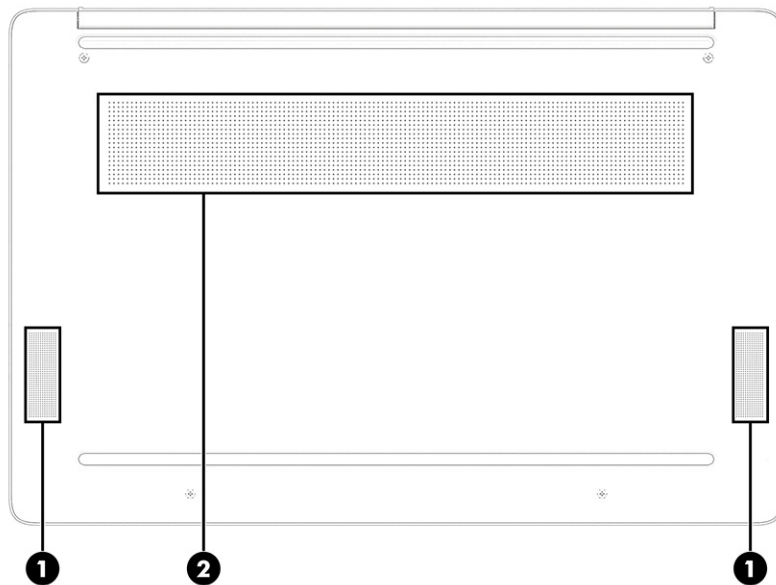
Component	Description
(1) <code>esc</code> key	Activates certain computer functions when pressed in combination with other keys, such as <code>tab</code> or <code>shift</code> .
(2) Search key	Opens a search box.
(3) Action keys	Execute frequently used system functions.

**Table 2-5** Special keys and their descriptions (continued)

Component	Description
(4)  Power key	<ul style="list-style-type: none"> <li>• When the computer is off, press the key briefly to turn on the computer.</li> <li>• When the computer is on, press the key briefly to initiate Sleep.</li> <li>• When the computer is in the Sleep state, press the key briefly to exit Sleep (select products only).</li> </ul> <p><b>IMPORTANT:</b> Pressing and holding down the power key 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 key for at least 10 seconds to turn off the computer.</p>
(5) Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard that can be used like an external numeric keypad.

## Bottom

Use the illustration and table to identify the bottom components.



**Table 2-6** Bottom component and description

Components	Description
(1) Speakers (2)	Produce sound.
(2) Vent	Enables airflow to cool internal components.

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

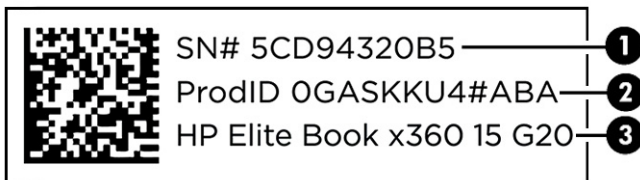
# Labels

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

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

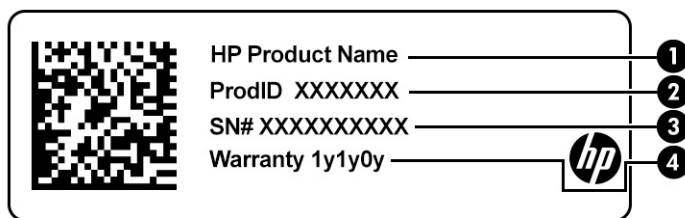
- Service label—Provides important information to identify your computer. When contacting support, you might be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

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



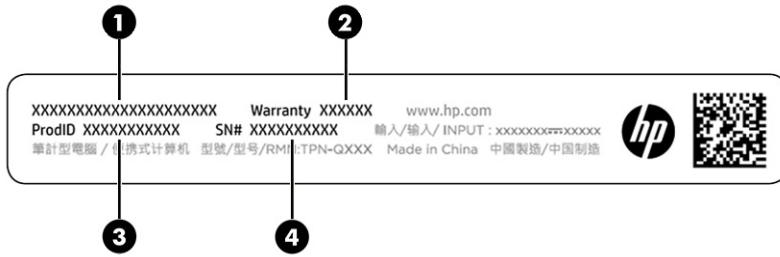
**Table 2-7** Service label components

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



**Table 2-8** Service label components

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



**Table 2-9 Service label components**

Component	
(1)	HP product name
(2)	Warranty period
(3)	Product ID
(4)	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 where the devices have been approved for use.




# 3 Illustrated parts catalog

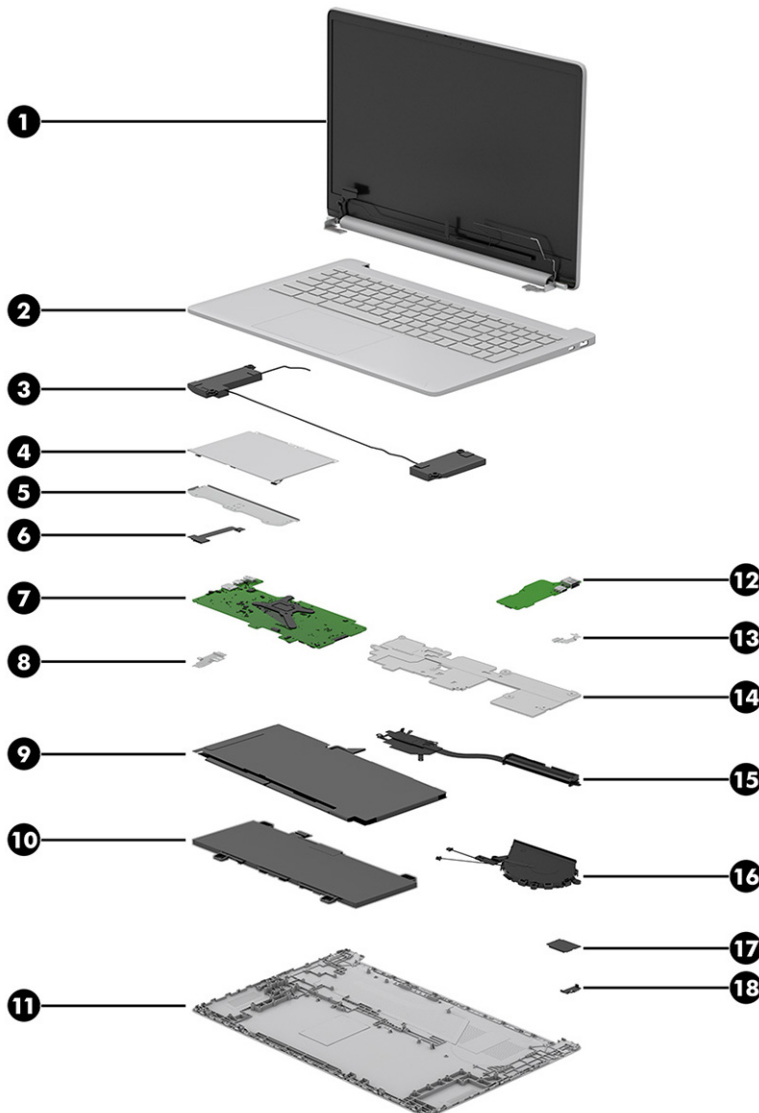
Use this chapter to determine the spare parts that are available for the computer.

## Computer major components

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

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

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



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

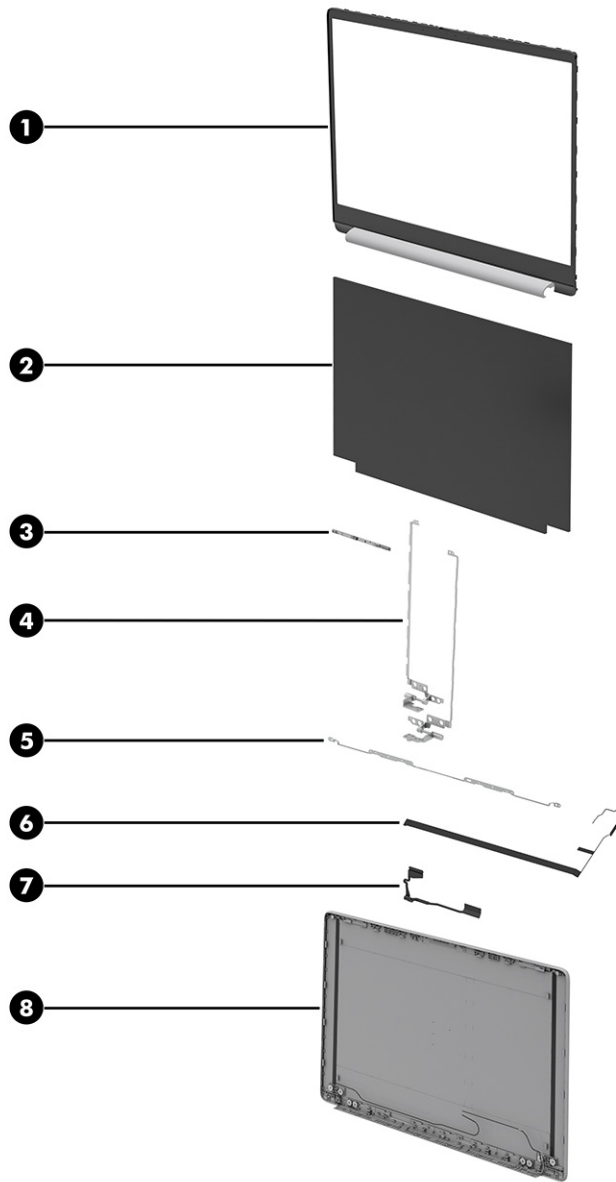
Item	Component	Spare part number
(1)	<b>Display assembly</b>  <b>NOTE:</b> Display assemblies are offered as spare parts only at a subcomponent level. For more information, see <a href="#">Display assembly subcomponents on page 14</a> .	not available as a spare part
(2)	<b>Top cover with keyboard</b>  For a detailed list of country codes, see <a href="#">Top cover with keyboard on page 53</a> .	
	Natural silver, not backlit, for use in 15 W models	N45574-xxx
	Natural silver, backlit, for use in 15 W models	N45575-xxx
	Natural silver, not backlit, for use in 6 W models	N45576-xxx
	Natural silver, backlit, for use in 6 W models	N45577-xxx
	Mineral silver, not backlit, for use in 15 W models	N45572-xxx
	Mineral silver, backlit, for use in 15 W models	N45573-xxx
(3)	<b>Speakers</b> (left and right)	N45605-001
(4)	<b>Touchpad</b>  <b>NOTE:</b> The touchpad misc parts kit is available as spare part number N45681-001. It includes top Mylar and rubber cable clip.	
	Natural silver, 6 W models	N45607-001
	Natural silver, 15 W models	N59798-001
	Mineral silver	N45608-001
(5)	<b>Touchpad bracket</b>	not available as a spare part
(6)	<b>Touchpad cable</b>	
	6 W models	N24964-001
	15 W models	N45606-001
(7)	<b>System board</b> (includes processor)	
	Intel Core i3-N305 processor, 8 GB of system memory, 256 GB UFS memory	N45586-001
	Intel Core i3-N305 processor, 8 GB of system memory, 128 GB UFS memory	N45583-001
	Intel Core i3-N305 processor, 4 GB of system memory, 64 GB UFS memory	N45582-001
	Intel N200 processor, 8 GB of system memory, 64 GB eMMC memory	N45584-001
	Intel N100 processor, 4 GB of system memory, 256 GB UFS memory	N45585-001
(8)	<b>USB bracket</b>	not available as a spare part
(9)	<b>Battery</b> (3 cell, 58 Whr)	M12585-005
(10)	<b>Battery</b> (3 cell, 54 Whr)	N32017-005
	<b>Battery</b> (2 cell, 47 Whr)	L75783-005
(11)	<b>Bottom cover</b> (includes rubber feet)	
	Natural silver, 6 W models	N45594-001

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

<b>Item</b>	<b>Component</b>	<b>Spare part number</b>
	Natural silver, 15 W models	N59797-001
	Mineral silver	N45595-001
<b>(12)</b>	<b>USB board</b>	
	<b>NOTE:</b> On 6 W models, the USB board high-speed cable is available using spare part number N45601-001, and the USB board low-speed cable is available using spare part number N45602-001.	
	On 15 W models, the USB board high-speed cable is available using spare part number N45603-001, and the USB board low-speed cable is available using spare part number N45604-001.	
	6 W models	N45599-001
	15 W models	N45600-001
<b>(13)</b>	<b>USB board bracket</b>	not available as a spare part
<b>(14)</b>	<b>Heat sink (6 W models)</b>	N45596-001
<b>(15)</b>	<b>Heat sink (15 W models)</b>	N45597-001
<b>(16)</b>	<b>Fan (15 W models)</b>	N45598-001
<b>(17)</b>	<b>WLAN module</b>	
	MediaTek MT7921 Wi-Fi 6 Bluetooth 5.3 WW WLAN	N45619-001
	Intel AX211 Wi-Fi 6E Bluetooth 5.3 WLAN	N45620-001
<b>(18)</b>	<b>WLAN module bracket</b>	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 bezel</b> (includes hinge covers and camera privacy cover)	
	Natural silver	N45609-001
	Mineral silver	N45610-001
(2)	<b>Display panel</b>	
	<b>NOTE:</b> The display panel adhesive kit is available as spare part number N45611-001.	
	FHD, UWVA, nontouch	N45587-001
	FHD, SVA, nontouch	N45588-001
	FHD, UWVA, 144 Hz, nontouch	N45589-001

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

Item	Component	Spare part number
	FHD, UWVA, touch screen	N45590-001
	HD, nontouch	N45591-001
	HD, touch panel	N45592-001
<b>(3)</b>	<b>Camera module</b>	
	FHD	N45612-001
	HD	N45613-001
<b>(4)</b>	<b>Hinges</b> (includes left and right display hinges)	N45618-001
<b>(5)</b>	<b>Top bracket</b>	not available as a spare part
<b>(6)</b>	<b>Camera cable</b>	N45614-001
<b>(7)</b>	<b>Display panel cable</b>	
	Touch panel	N45617-001
	Nontouch, 144 Hz panel	N45616-001
	Nontouch panel	N45615-001
<b>(8)</b>	<b>Display back cover</b> (includes wireless antennas)	
	Natural silver, models with a MediaTek MT7921 Wi-Fi 6 WLAN module	N45578-001
	Natural silver, models with an Intel AX211 Wi-Fi 6E WLAN module	N45579-001
	Mineral silver, models with a MediaTek MT7921 Wi-Fi 6 WLAN module	N45580-001
	Mineral silver, models with an Intel AX211 Wi-Fi 6E WLAN module	N45581-001
	Mineral silver, models with a MediaTek MT7921 Wi-Fi 6 WLAN module (models with 8 GB of system memory and Universal Flash Storage [UFS])	N59795-001
	Mineral silver, models with an Intel AX211 Wi-Fi 6E WLAN module (models with 8 GB of system memory and Universal Flash Storage [UFS])	N59796-001

## Miscellaneous parts

To identify the miscellaneous parts, use this table.

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

Component	Spare part number
<b>45 W, USB Type-C AC adapter</b> (nPFC, 3 pin, 1.8 m [6 ft])	L43407-001
<b>Screw Kit</b>	N45593-001
<b>Display adhesive kit</b> (includes display bezel and rear cover tape)	N45611-001
<b>Power cords</b> (C5, conventional, 1.0 m [3.3 ft])	
Australia	L19358-001
Denmark	L19360-001

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

<b>Component</b>	<b>Spare part number</b>
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L19361-001
India	L19363-001
North America	L19367-001
South Africa	L19369-001
Switzerland	L19370-001
United Kingdom	L19373-001

---

# 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

## 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 20](#).
  - 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 dual in-line packages (DIPs) from plastic tube	400 V	700 V	2,000 V
Removing DIPs from vinyl tray	2,000 V	4,000 V	11,500 V
Removing DIPs from polystyrene foam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB (printed circuit board)	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V
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 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 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 22](#) 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 23](#) 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 24](#).

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.


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**⚠ 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 23](#) 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 22](#), [Caring for wood veneer \(select products only\) on page 24](#), 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 22](#) 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 23](#) 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>Preoperating 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 <code>Event Viewer</code>, 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 <code>collect Chrome device logs</code>.</li> </ol>
Technical bulletins	<p>To locate technical bulletins:</p> <ol style="list-style-type: none"> <li>1. Go to <a href="https://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>


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


Service consideration	Path to access information
Repair professionals	To locate repair professionals: <ol style="list-style-type: none"><li data-bbox="679 306 906 333">1. Go to <a href="http://www.hp.com">www.hp.com</a>.</li><li data-bbox="679 359 1337 386">2. Place the cursor over <b>Support resources</b> to display more options.</li><li data-bbox="679 411 1066 438">3. Select <b>Authorized service providers</b>.</li></ol>
Component and diagnosis information, failure detection, and required action	To locate diagnosis information and actions: <ol style="list-style-type: none"><li data-bbox="679 506 1177 533">1. Go to <a href="http://www.hp.com/go/techcenter/pcdiags">http://www.hp.com/go/techcenter/pcdiags</a>.</li><li data-bbox="679 558 911 585">2. Select <b>Get Support</b>.</li><li data-bbox="679 611 1422 653">3. Near the bottom of the window, select <b>Notebook PCs</b>, and then select your location.</li></ol>

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# 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 18](#).

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

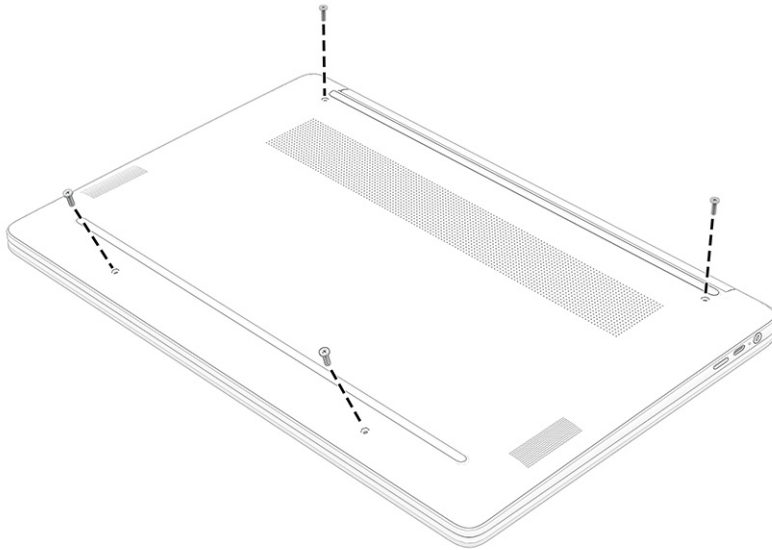
Description	Spare part number
Natural silver, 6 W models	N45594-001
Natural silver, 15 W models	N59797-001
Mineral silver	N45595-001

Before removing the bottom cover, prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).

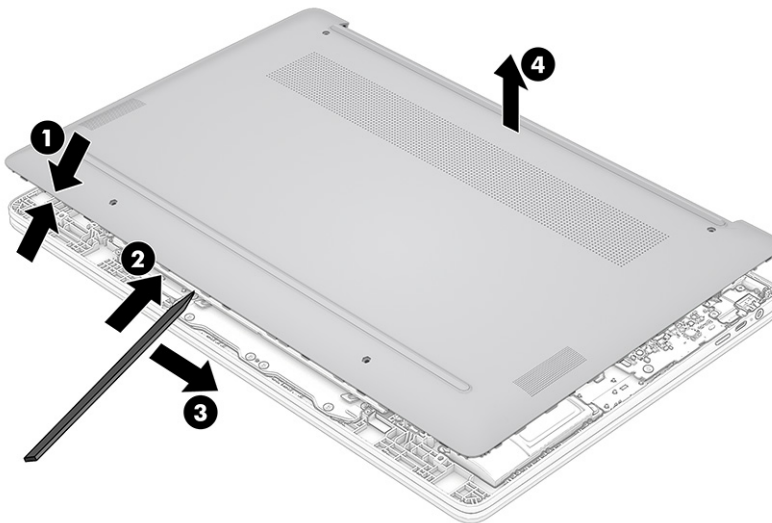


Remove the bottom cover:

1. Remove the four Phillips M2.0 × 6.0 screws from the bottom cover.



2. Use your hands to flex the bottom edge of the computer to slightly separate the bottom cover (1) from the computer.
3. Insert a tool (2) into the separation, and pull the tool across the bottom of the computer (3) to separate the cover from the computer.
4. Pull the bottom cover off the computer (4).




To replace the bottom cover, reverse the removal procedures.

## Battery

To remove the battery, use this procedure and illustration.

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


Description	Spare part number
3 cell, 58 Whr	M12585-005
3 cell, 54 Whr	N32017-005
2 cell, 47 Whr	L75783-005


 **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. Punctures 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 to 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:

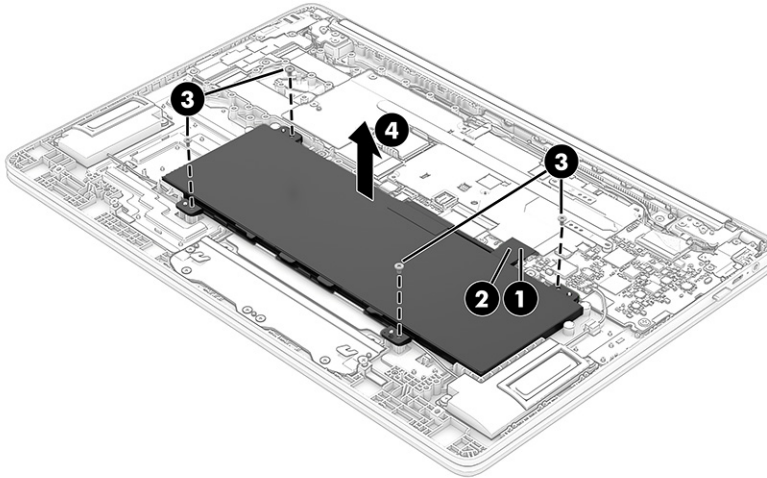
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).

 **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 before you remove the battery.

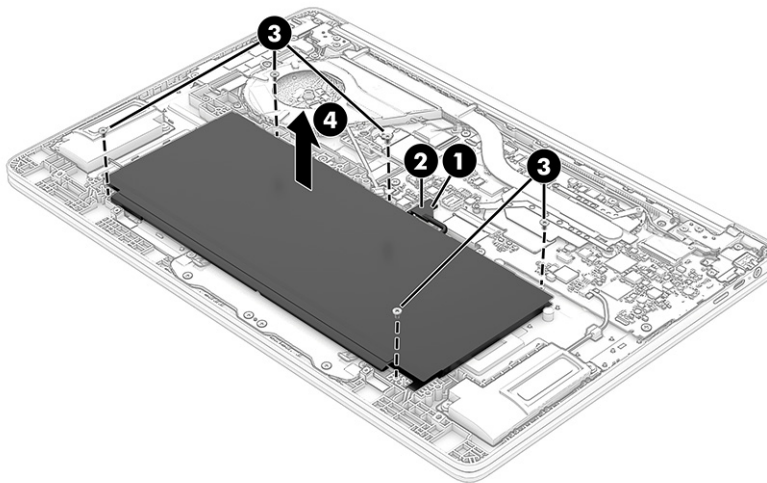
Remove the battery from **6 W models**:

1. Lift the tape **(1)** from the battery connector on the system board.
2. Disconnect the battery cable **(2)** from the system board.
3. Remove the four Phillips M2.0 × 3.5 screws **(3)** that secure the battery to the computer.
4. Remove the battery from the computer **(4)**.



Remove the battery from **15 W models**:

1. Lift the tape (1) from the battery connector on the system board.
2. Disconnect the battery cable (2) from the system board.
3. Remove the five Phillips M2.0 × 3.5 screws (3) that secure the battery to the computer.
4. Remove the battery from the computer (4).



To replace the battery, reverse the removal procedures.

## WLAN module


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

**Table 5-3** WLAN module descriptions and part numbers

Description	Spare part number
MediaTek MT7921 Wi-Fi 6 Bluetooth 5.3 WW WLAN	N45619-001

**Table 5-3 WLAN module descriptions and part numbers (continued)**

Description	Spare part number
Intel AX211 Wi-Fi 6E Bluetooth 5.3 WLAN	N45620-001


 **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.

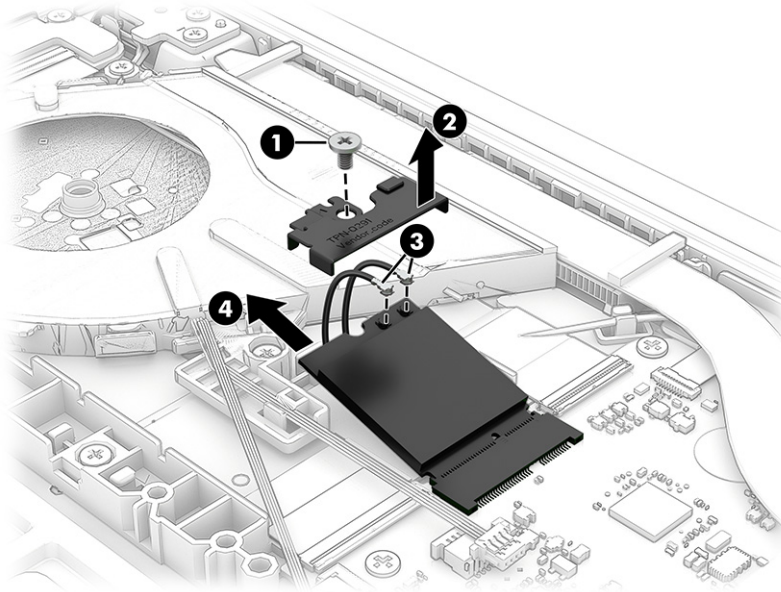
Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 28](#)).

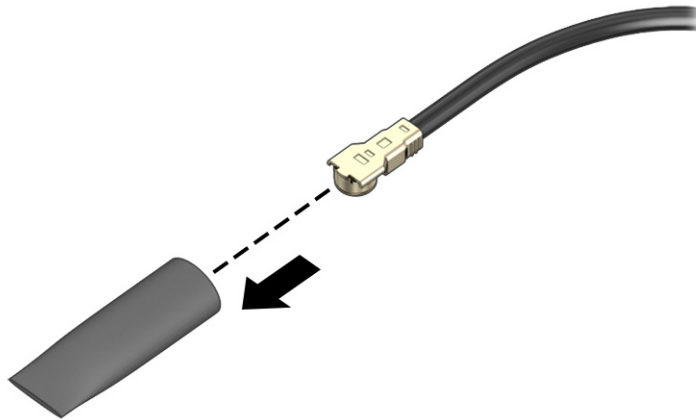
Remove the WLAN module:

1. Remove the Phillips M2.0 × 3.5 screw **(1)**, and then remove the bracket **(2)** from the module.
2. Carefully disconnect the antenna cables **(3)** from the module.
3. Pull the module out of the socket to remove it **(4)**.

 **NOTE:** When connecting the antenna cables, be sure to match the number or letter on the cable with the appropriate connector on the module.



4. If the WLAN antenna is not connected to the terminal on the WLAN module, you must 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 5-4** Speaker description and part number

Description	Spare part number
Speaker Kit	N45605-001

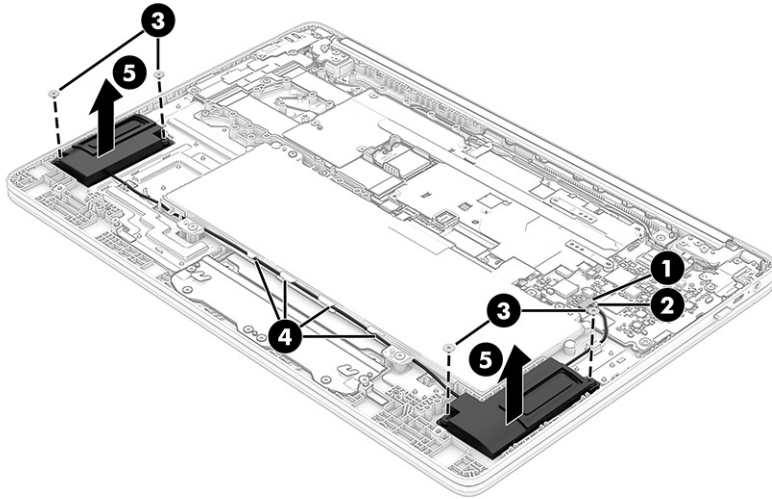
Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Disconnect the battery cable from the system board on 6 W models or remove the battery on 15 W models (see [Battery on page 28](#)).

 **NOTE:** On 6 W models, the speaker cable routes along clips on the bottom of the battery. On 15 W models, the speaker cable routes under the battery.

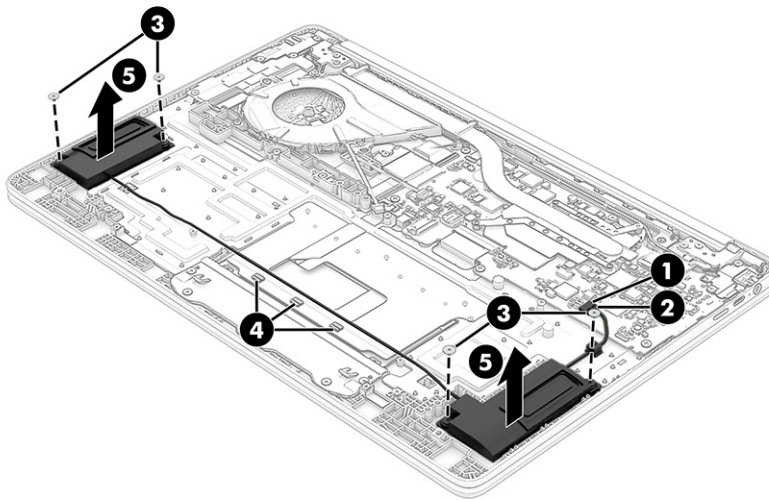
Remove the speakers from **6 W models**:

1. Lift the shielding **(1)** from the speaker connector on the system board.
2. Disconnect the speaker cable **(2)** from the system board.
3. Remove the two Phillips M1.6 × 2.5 screws **(3)** from each speaker.
4. Remove the speaker cable from the clips **(4)** along the bottom of the battery.
5. Remove the speakers from the computer **(5)**.



Remove the speakers from **15 W models**:

1. Lift the shielding **(1)** from the speaker connector on the system board.
2. Disconnect the speaker cable **(2)** from the system board.
3. Remove the two Phillips M1.6 × 2.5 screws **(3)** from each speaker.
4. Remove the speaker cable from the clips **(4)** under the battery.
5. Remove the speakers from the computer **(5)**.



To install the speakers, reverse this procedure.

## Heat sink

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

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

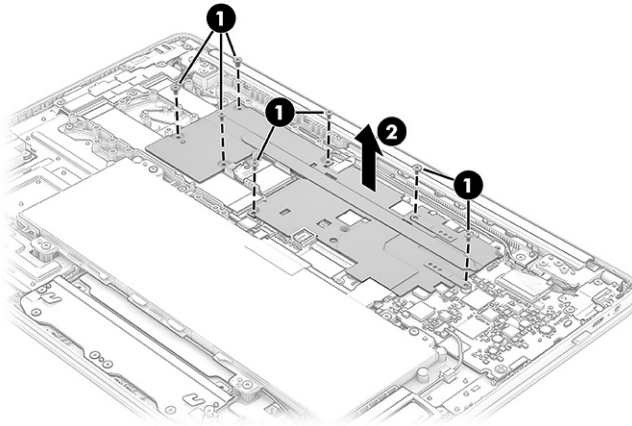
Description	Spare part number
6 W	N45596-001
15 W	N45597-001

Before removing the heat sink, follow these steps:

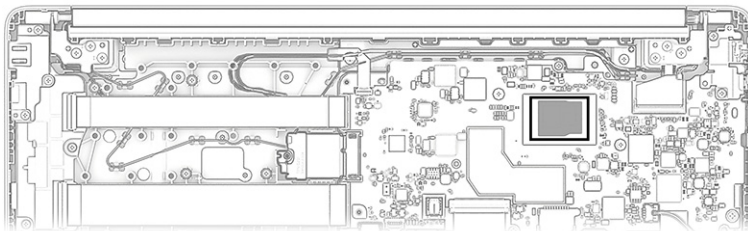
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 28](#)).

Remove the heat sink from **6 W models**:

1. Remove the seven Phillips M2.0 × 3.5 screws (1) from the heat sink.
2. Remove the heat sink from the computer (2).



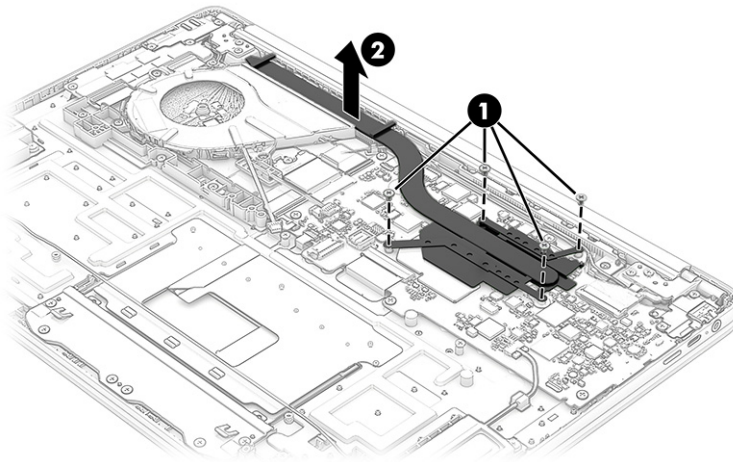
3. Thoroughly clean the thermal material from the surface on the system board each time the heat sink is removed. The following illustration shows the replacement thermal material location on the system board. Be sure to apply gray thermal grease to the CPU chip on the system board.



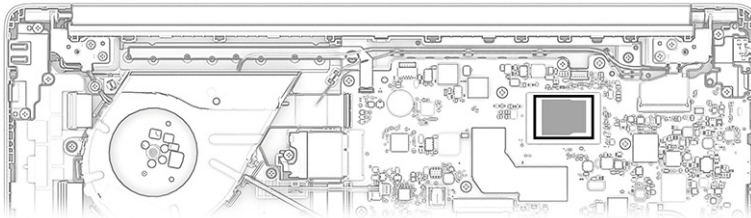
Remove the heat sink from **15 W models**:

1. Remove the four Phillips M2.0 × 3.0 screws (1) from the heat sink.

2. Remove the heat sink from the computer (2).



3. Thoroughly clean the thermal material from the surface on the system board each time the heat sink is removed. The following illustration shows the replacement thermal material location on the system board. Be sure to apply gray thermal grease to the CPU chip on the system board.



To install the heat sink, reverse this procedure.

## Fan, 15 W models only

To remove the fan, use this procedure and illustration.

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

Description	Spare part number
Fan, only for use in 15 W models	N45598-001

Before removing the fan, follow these steps:

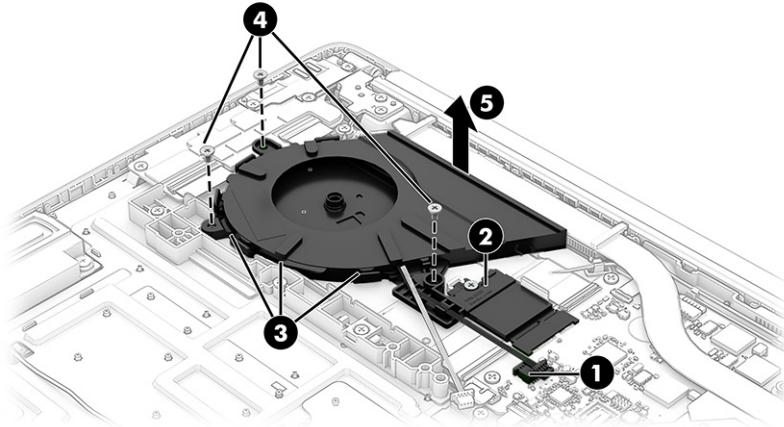
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 28](#)).

Remove the fan:

1. Disconnect the fan cable (1).
2. Disconnect the antenna cable (2) that routes around the fan from the WLAN module.



3. Remove the antenna cable from the clips (3) around the fan.
4. Remove the three Phillips M2.0 × 3.5 screws (4) from the fan.
5. Remove the fan from the computer (5).



To install the fan, reverse this procedure.

## USB board

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

**Table 5-7** USB board description and part number

Description	Spare part number
USB board, 6 W models	N45599-001
USB board, 15 W models	N45600-001
USB board cable, high speed, 6 W models	N45601-001
USB board cable, low speed, 6 W models	N45602-001
USB board cable, high speed, 15 W models	N45603-001
USB board cable, low speed, 15 W models	N45604-001

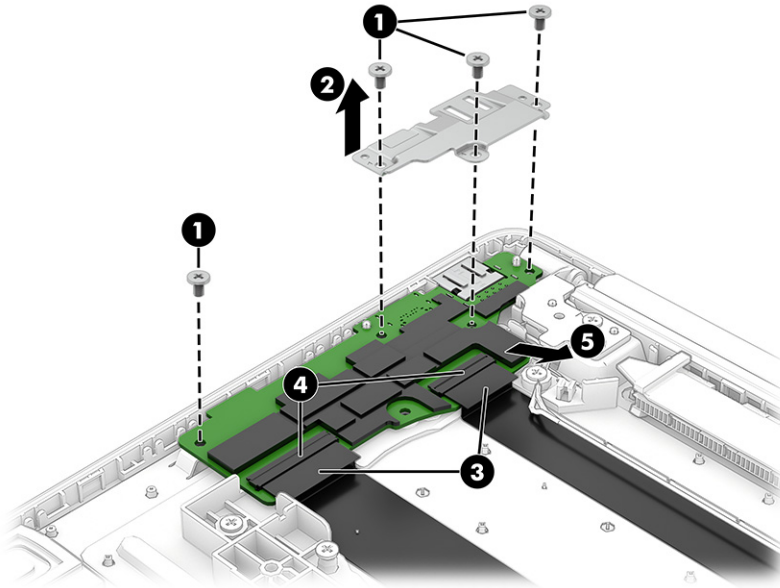
Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 28](#)).
4. (Select products only) Remove the fan (see [Fan, 15 W models only on page 35](#)).

Remove the USB board from **15 W models**:

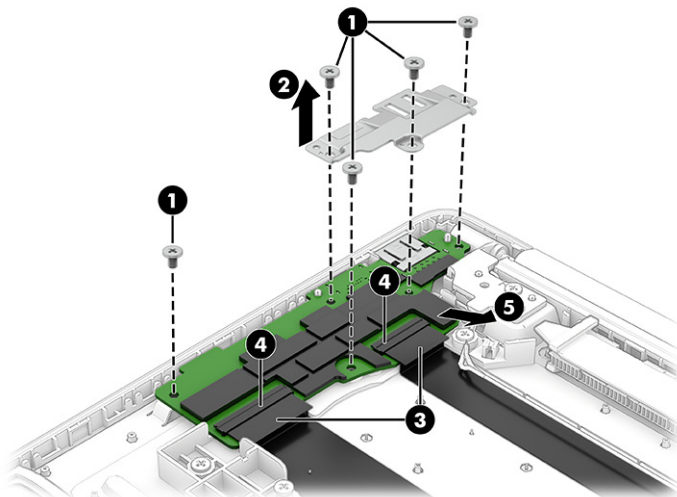
1. Remove the four Phillips M2.0 × 3.5 screws (1) that secure the USB bracket and board, and then remove the bracket (2).
2. Lift the Mylar (3) that covers each connector on the USB board.

3. Disconnect the two cables from the reverse ZIF connectors (4) on the USB board.
4. Lift the inside of the board up, and then pull it into the computer to remove it (5).



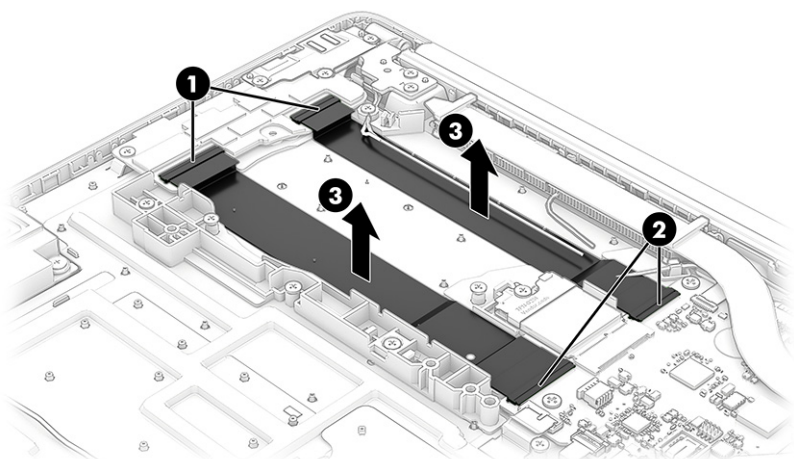
Remove the USB board from **6 W models**:

1. Remove the five Phillips M2.0 × 3.5 screws (1) that secure the USB bracket and board, and then remove the bracket (2).
2. Lift the Mylar (3) that covers each connector on the USB board.
3. Disconnect the two cables from the reverse ZIF connectors (4) on the USB board.
4. Lift the inside of the board up, and then pull it into the computer to remove it (5).



5. **15 W and 6 W models:** To remove the USB cables, disconnect the cables from the reverse ZIF connectors (1) on the USB board.
6. Disconnect the cables from the ZIF connectors (2) on the system board.

7. Remove the cables (3).



To install the USB board, reverse this procedure.

## Touchpad

To remove the touchpad, use this procedure and illustration.

**Table 5-8** Touchpad description and part number

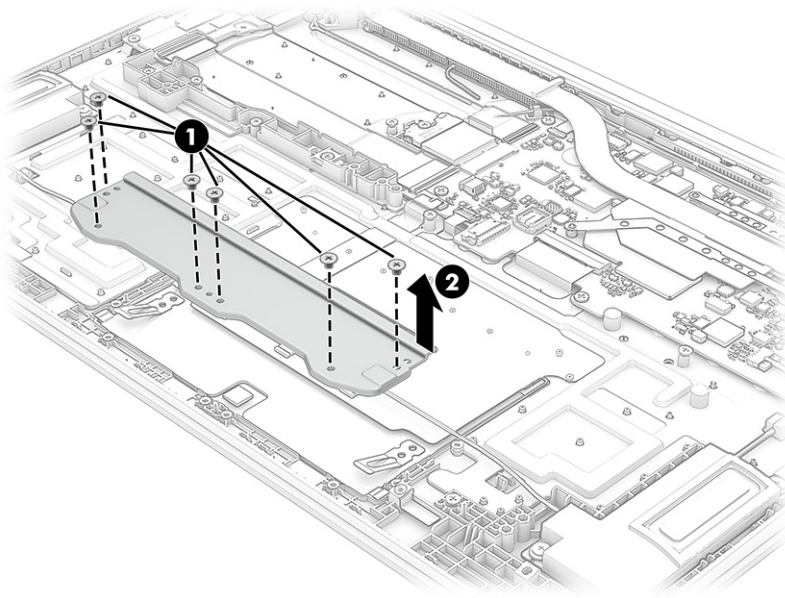
Description	Spare part number
Touchpad, natural silver, 6 W models	N45607-001
Touchpad, natural silver, 15 W models	N59798-001
Touchpad, mineral silver	N45608-001
Touchpad cable, 6 W models	N24964-001
Touchpad cable, 15 W models	N45606-001
Touchpad misc parts kit (includes top Mylar and rubber cable clip)	N45681-001

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Remove the battery (see [Battery on page 28](#)).

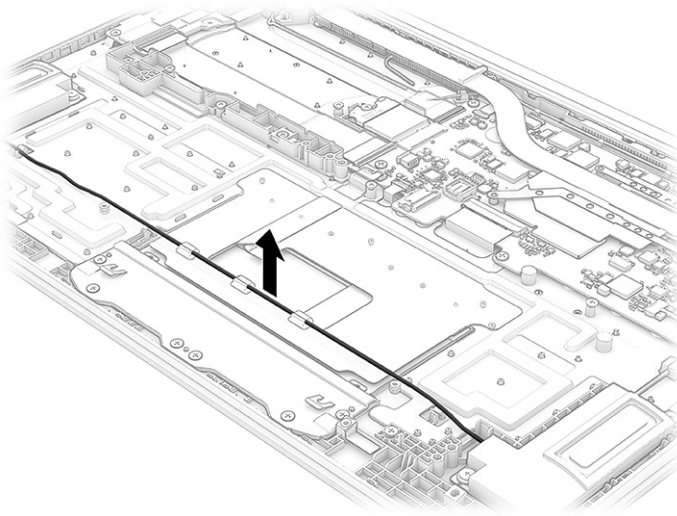
Remove the touchpad bracket:

- Remove the six Phillips M2.0 × 2.5 screws (1) from the touchpad bracket, and then remove the bracket from the computer (2).

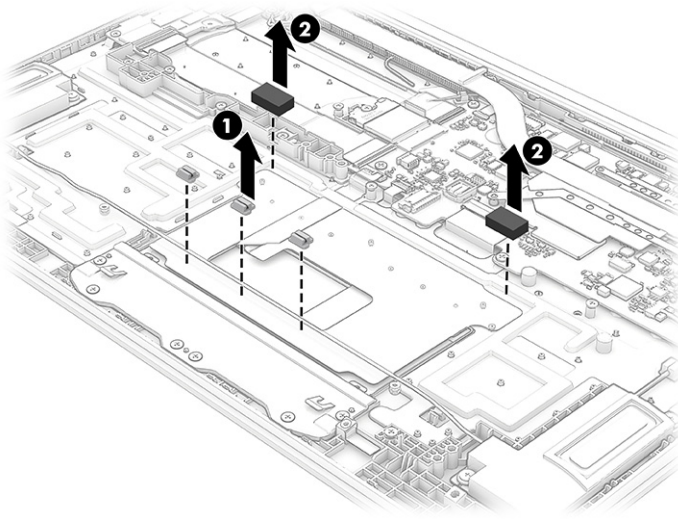


Remove the touchpad from **15 W models**:

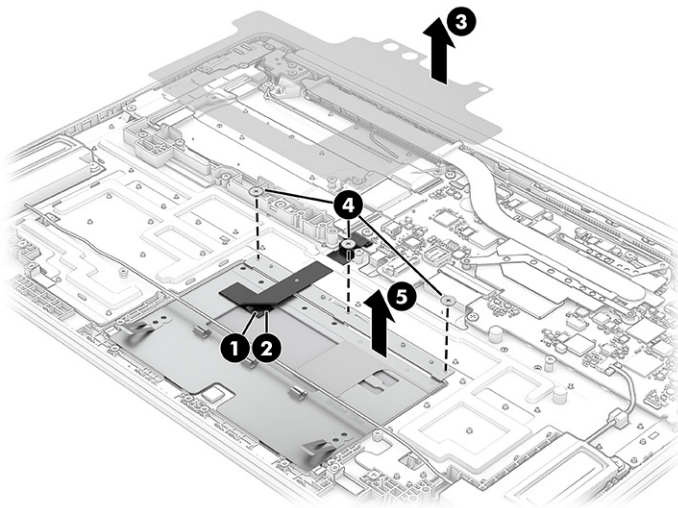
1. Remove the speaker cable from the three rubber cable clips on the touchpad.



2. Remove the three rubber cable clips **(1)** and two rubber bumpers **(2)** from the touchpad.

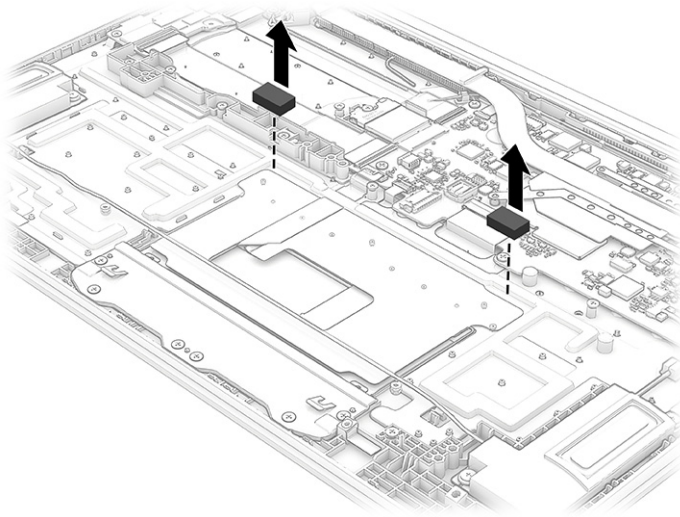


3. Lift the tape from the connector (1), and then disconnect the touchpad cable from the ZIF connector (2) on the touchpad.
4. Lift the Mylar (3) that covers the screws on the top of the touchpad.
5. Remove the three Phillips M2.0 × 2.0 screws (4) from the top of the touchpad.
6. Remove the touchpad from the computer (5).

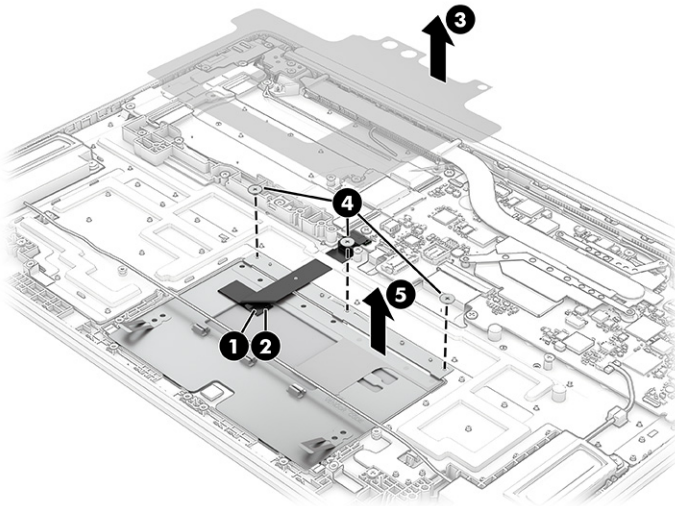


Remove the touchpad from **6 W models**:

- Remove the two rubber bumpers from the touchpad.

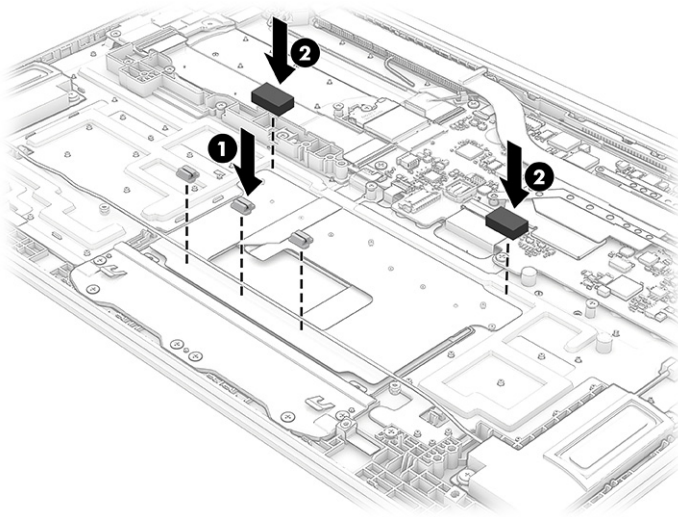


1. Lift the tape from the connector (1), and then disconnect the touchpad cable from the ZIF connector (2) on the touchpad.
2. Lift the Mylar (3) that covers the screws on the top of the touchpad.
3. Remove the three Phillips M2.0 × 2.0 screws (4) from the top of the touchpad.
4. Remove the touchpad from the computer (5).

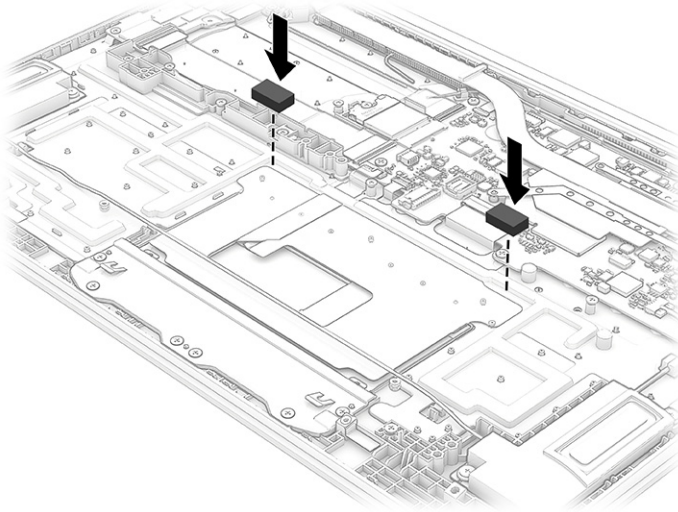


To install the touchpad, reverse this procedure.

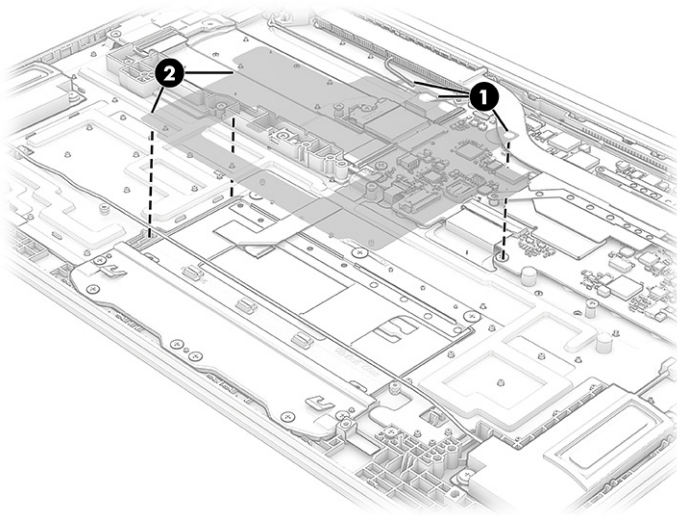
On **15 W models**, install the three rubber speaker cable clips (1) and two rubber bumpers (2) onto the installed touchpad. Then install the cable into the clips.



On **6 W models**, install the two rubber bumpers onto the installed touchpad.



When installing the touchpad, install the Mylar while aligning the holes at the top with the associated dimples **(1)**. Be sure to align the Mylar with the left edge of the touchpad **(2)**.



## System board

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

**Table 5-9 System board descriptions and part numbers**

Description	Spare part number
Intel Core i3-N305 processor, 8 GB of system memory, 256 GB UFS memory	N45586-001
Intel Core i3-N305 processor, 8 GB of system memory, 128 GB UFS memory	N45583-001
Intel Core i3-N305 processor, 4 GB of system memory, 64 GB UFS memory	N45582-001
Intel N200 processor, 8 GB of system memory, 64 GB eMMC memory	N45584-001
Intel N100 processor, 4 GB of system memory, 256 GB UFS memory	N45585-001

Before removing the system board, follow these steps:

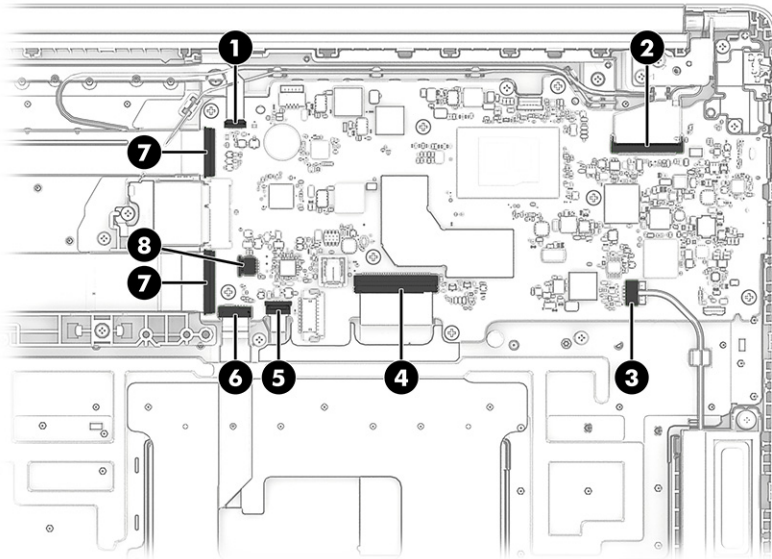
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Remove the battery (see [Battery on page 28](#)).
4. Remove the WLAN module (see [WLAN module on page 30](#)).
5. (15 W models only) Remove the heat sink (see [Heat sink on page 33](#)).

Remove the system board:

1. Mylar covers the entire system board. Lift the individual tabs in the Mylar to access each connector.
2. Disconnect the following cables from the system board:
  - Camera cable (ZIF) **(1)**
  - Display cable **(2)**
  - Speaker cable **(3)**

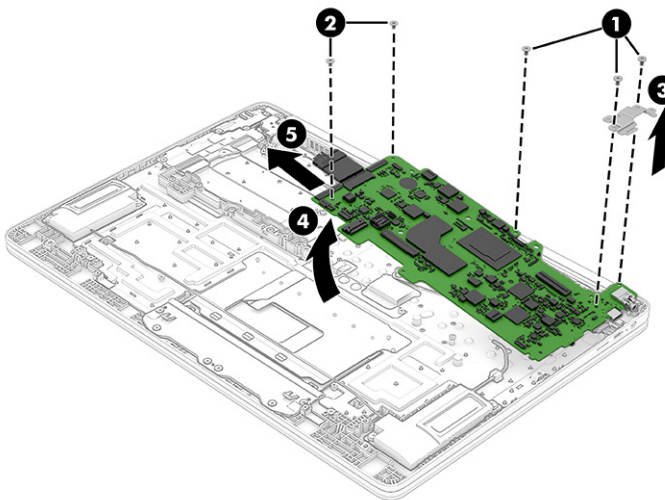


- Keyboard cable (ZIF) **(4)**
- Keyboard backlight cable (ZIF) **(5)** (select products only)
- Touchpad cable (ZIF) **(6)**
- USB cables (ZIF) **(7)**
- Fan cable **(8)** (select products only)



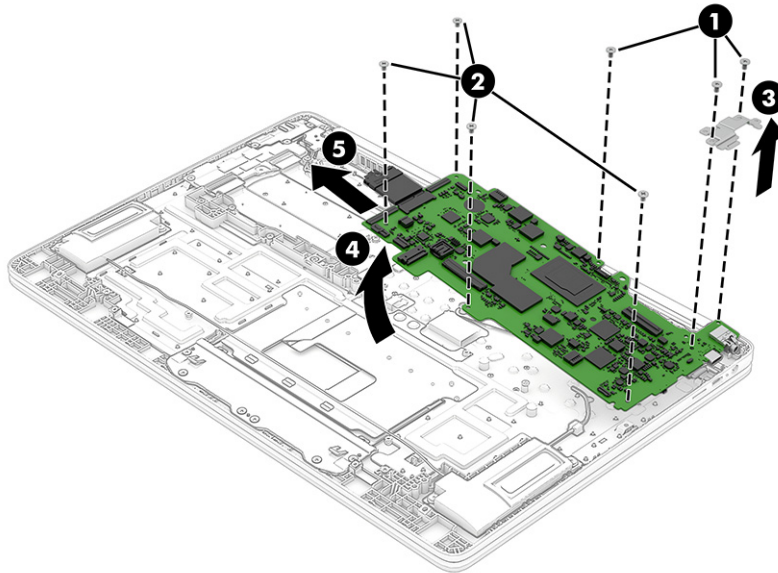
Remove the system board from **6 W models**:

1. Remove the three Phillips M2.0 × 3.5 screws **(1)** and the two Phillips M2.0 × 3.0 screws **(2)** that secure the system board to the computer.
2. Remove the bracket **(3)** from the system board.
3. Lift the inside of the system board **(4)** up to approximately 40°, and then pull the system board away from the connectors to remove it from the computer **(5)**.



Remove the system board from **15 W models**:


1. Remove the three Phillips M2.0 × 3.5 screws **(1)** and the four Phillips M2.0 × 3.0 screws **(2)** that secure the system board to the computer.
2. Remove the bracket **(3)** from the system board.
3. Lift the inside of the system board **(4)** up to approximately 40°, and then pull the system board away from the connectors to remove it from the computer **(5)**.



To install the system board, reverse this procedure.

## Display assembly

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

 **NOTE:** Spare parts for the display assembly are available at the subcomponent level.

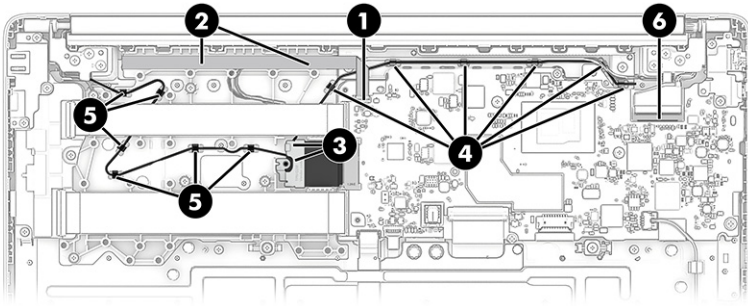
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 27](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 28](#)).

Remove the display assembly from **6 W models**:

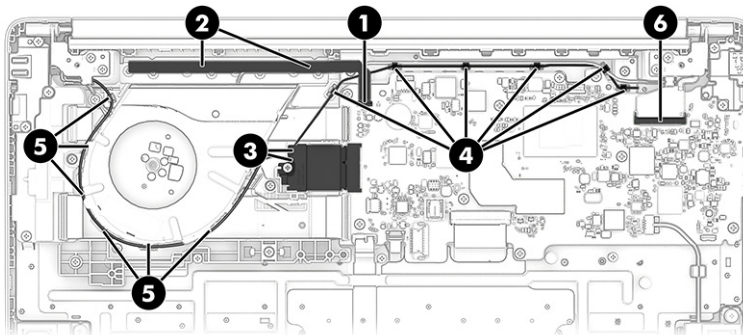
1. Disconnect the camera cable **(1)** from the system board ZIF connector.
2. Remove the camera cable **(2)** from the routing along the top of the computer. The cable is secured with adhesive.
3. Disconnect the WLAN antenna cables **(3)** from the terminals on the WLAN module.
4. Remove the WLAN antenna cables from the clips **(4)** along the top of the computer.
5. Remove antenna cable from the clips **(5)** that route it to the right hinge.

6. Disconnect the display cable from the ZIF connector **(6)** on the system board.



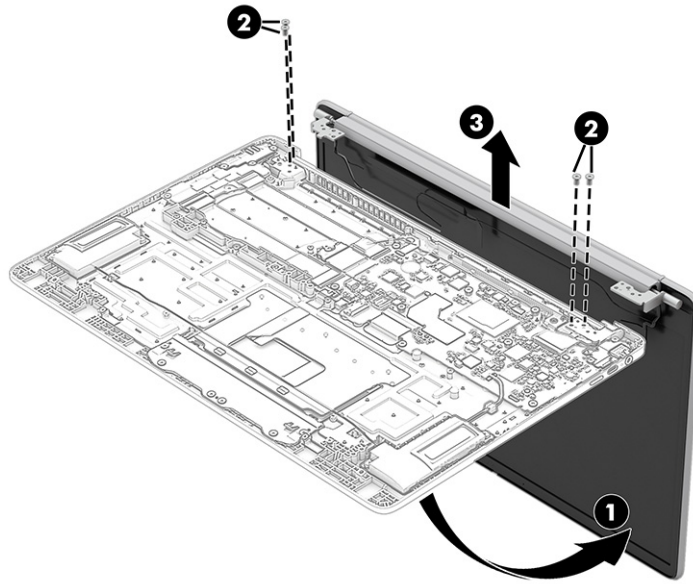
Remove the display assembly from **15 W models**:

1. Disconnect the camera cable **(1)** from the system board ZIF connector.
2. Remove the camera cable **(2)** from the routing along the top of the computer. The cable is secured with adhesive.
3. Disconnect the WLAN antenna cables **(3)** from the terminals on the WLAN module.
4. Remove the WLAN antenna cables from the clips **(4)** along the top of the computer.
5. Remove antenna cable from the clips **(5)** around the fan.
6. Disconnect the display cable from the ZIF connector **(6)** on the system board.



7. **For both 6W and 15W models:** Open the display to 90° to open the hinges **(1)**.
8. Remove the four Phillips M2.5 × 5.0 screws **(2)** that secure the display assembly to the computer.

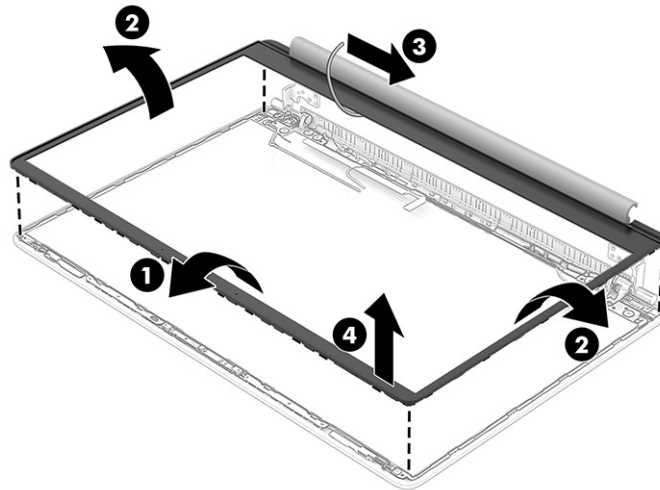
9. Separate the display from the computer (3).



10. To remove the display bezel:

- a. Release the top edge of the display bezel (1) from the display assembly.
- b. Release the left and right edges of the display bezel (2) from the display assembly.
- c. From either the left or right side, use tweezers or your fingers to pull the tape (3) out from behind the bottom of the bezel.
- d. Remove the display bezel (4) from the display assembly.

The bezel is available as spare part number N45609-001 for natural silver models and N45610-001 for mineral silver models.



11. To remove the display panel:

- a. The display panel is secured to the display enclosure with tape that is installed on top of the left and right sides of the panel. To remove the panel, use tweezers to grasp the end of the

tape. While turning the tweezers **(1)**, wrap the tape around the tweezers as you continue to pull the tape **(2)** out from behind the display panel. You must pull the tape multiple times before it is completely removed.

- b. Rotate the display panel over and place it next to the display enclosure **(3)**.



**NOTE:** Pull the tape out slowly and evenly to prevent it from breaking prematurely.

Display adhesive is available as spare part number N45611-001.

Display panels are available as the following spare part numbers:

N45587-001: FHD, UWVA, nontouch

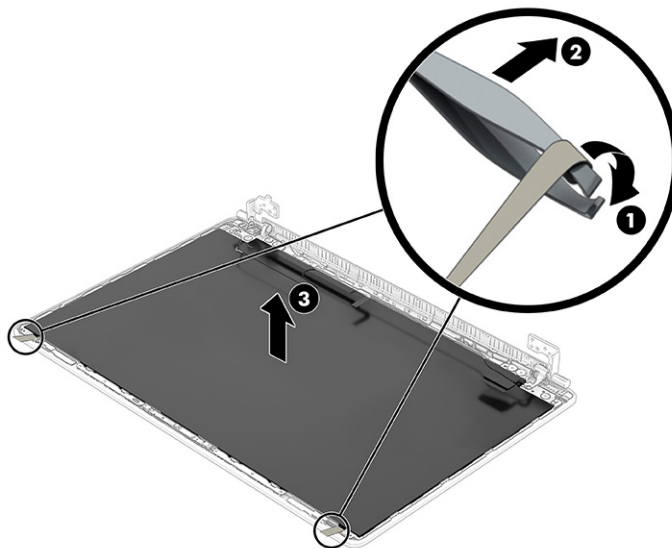
N45588-001: FHD, SVA, nontouch

N45589-001: FHD, UWVA, 144 Hz, nontouch

N45590-001: FHD, touch panel

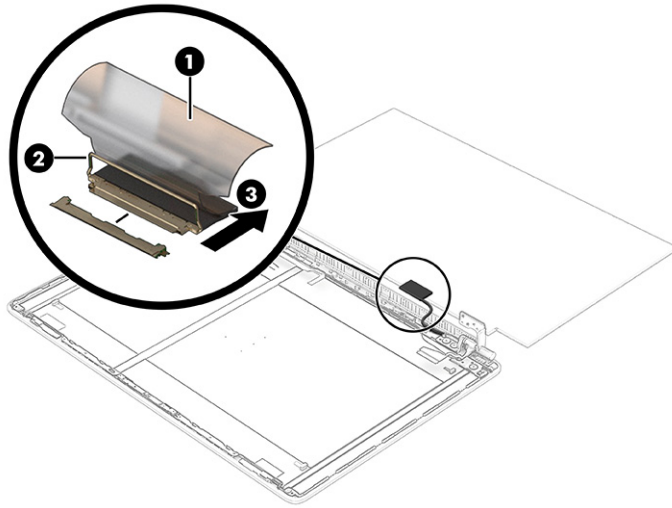
N45591-001: HD, nontouch

N45592-001: HD, touch panel

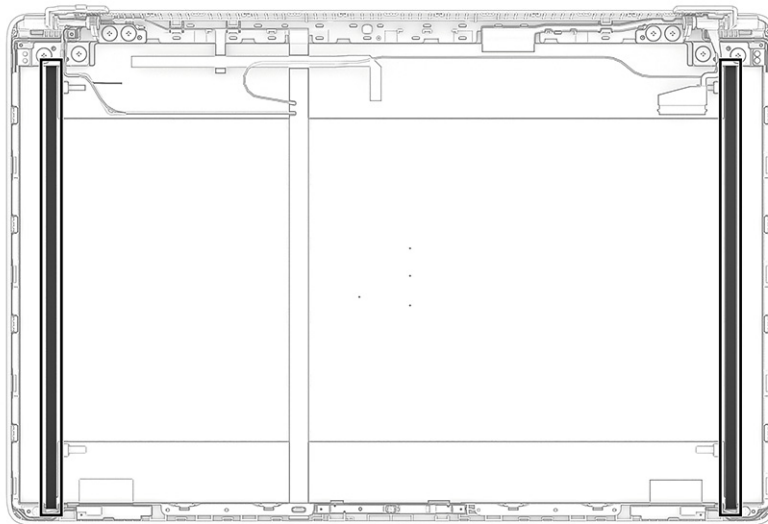


- c. Release the grounding tape **(1)** that secures the display panel cable connector to the display panel.
- d. Open the locking bar **(2)** that secures the cable to the connector.

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



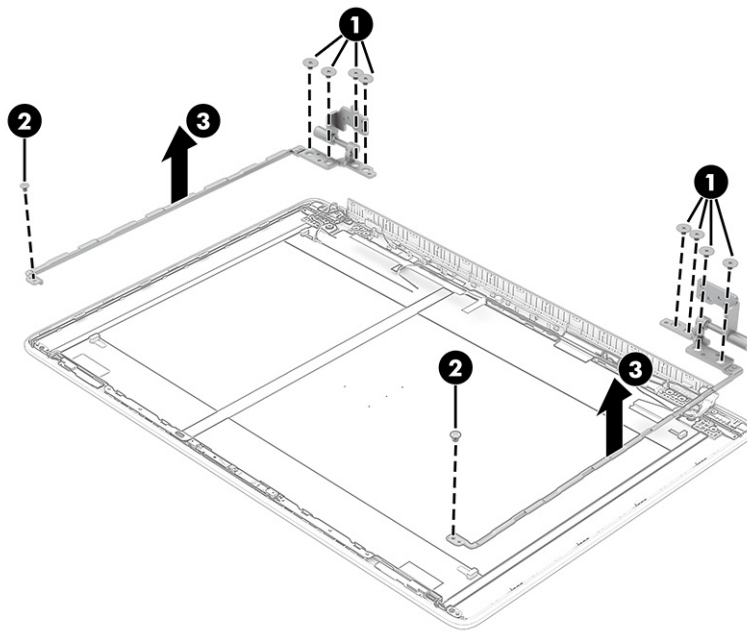
- f. When installing a display panel, be sure to install the adhesive strips along the right and left sides of the inside of the display back cover as shown in the following illustration.



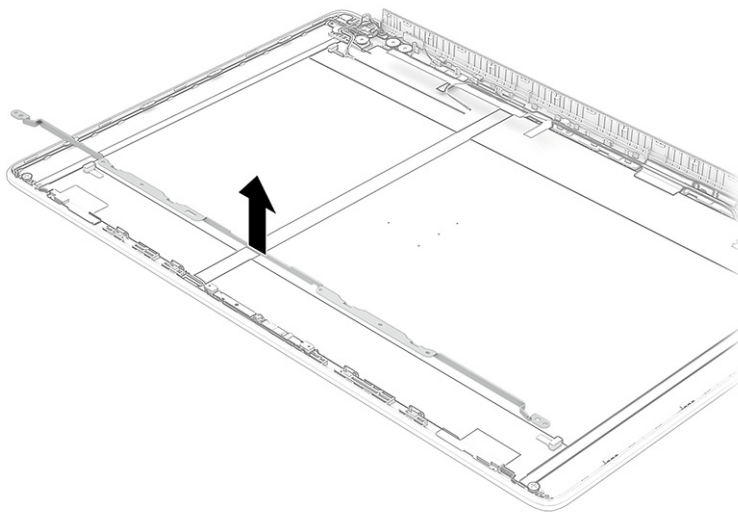
**12.** To remove the hinges from the display back cover:

- a. From each hinge, remove the four Phillips M2.5 × 3.0 broadhead screws **(1)** from the bottom and the Phillips 2.0 × 3.0 screw **(2)** from the top.
- b. Remove the hinges from the display back cover **(3)**.

The display hinges are available as spare part number N45618-001.

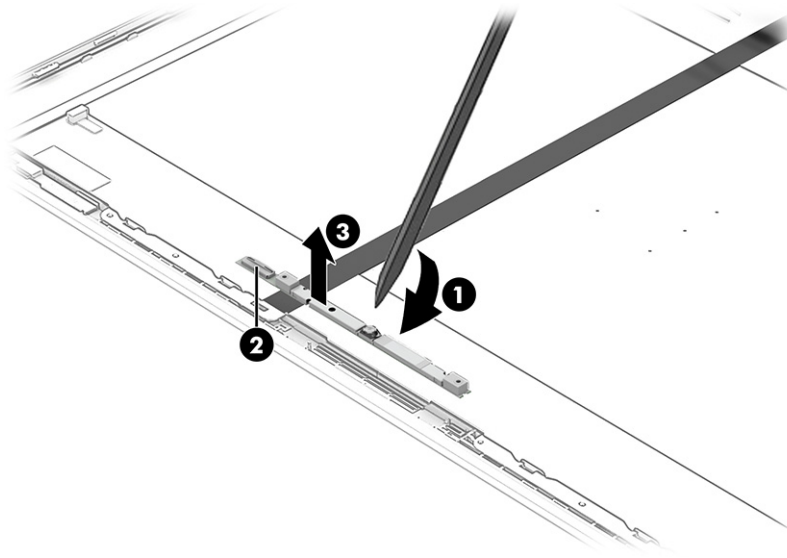


13. To remove the top bracket from the display rear cover, lift the bracket straight up and off the display back cover.



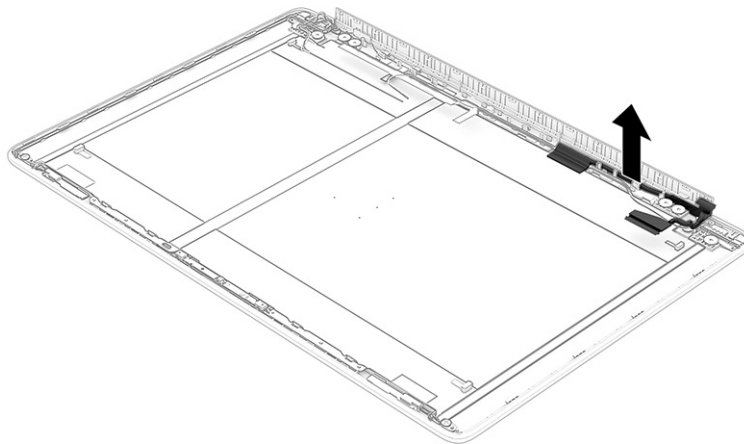
14. To remove the camera module:
- a. Insert a thin tool (1) under the module and pull the tool along the length of the module to release it from the display back cover. The module is attached with double-sided adhesive.
  - b. Disconnect the cable (2) from the module.
  - c. Remove the camera module (3).

The FHD camera module is available as spare part number N45612-001. The HD camera module is available as spare part number N45613-001.



15. To remove the display cable:

- Remove the cable from the clips at the bottom of the cover.




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

- N45617-001: Touch panel
- N45616-001: Nontouch, 144 Hz panel
- N45615-001: Nontouch panel

16. To remove the camera cable:

The camera cable is available as spare part number N45614-001.

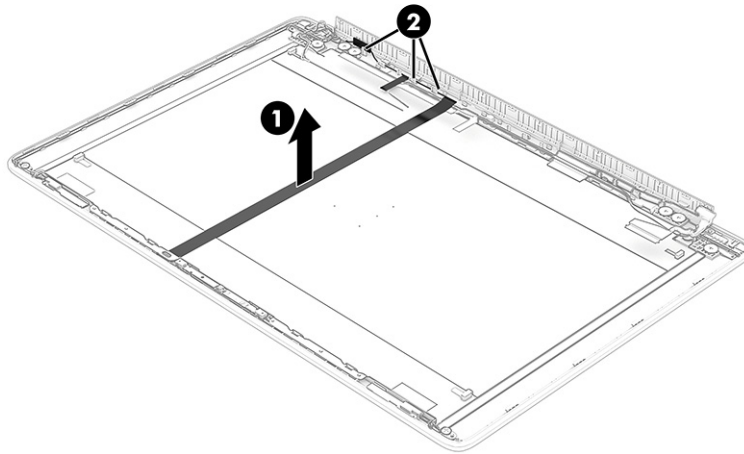
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 **NOTE:** Be sure to remove the camera cable after removing the hinges.

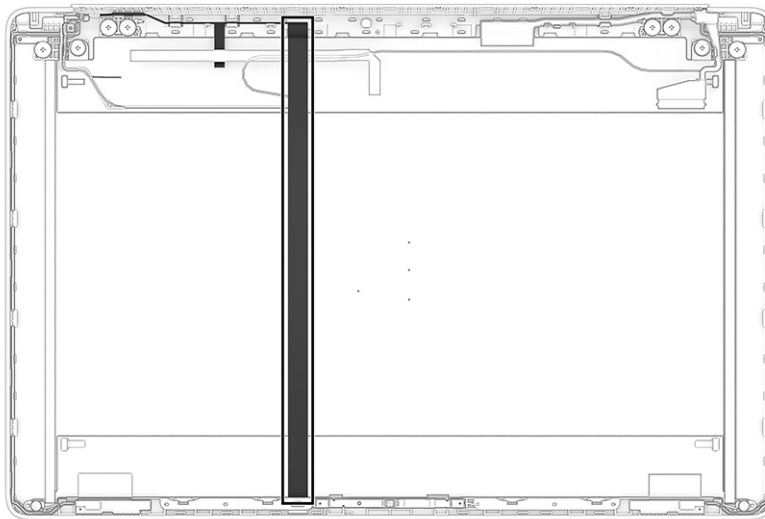
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- a. Peel the camera cable **(1)** off the inside of the display back cover, and then remove the cable from the clips **(2)** at the bottom of the cover.



- b. When installing a camera cable, note the proper installation location on the inside of the display back cover as shown in the following illustration.



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

- N45578-001: Natural silver, models with a MediaTek MT7921 Wi-Fi 6 WLAN module
- N45579-001: Natural silver, models an Intel AX211 Wi-Fi 6E WLAN module
- N45580-001: Mineral silver, models with a MediaTek MT7921 Wi-Fi 6 WLAN module
- N45581-001: Mineral silver, models an Intel AX211 Wi-Fi 6E WLAN module
- N59795-001: Mineral silver, models with a MediaTek MT7921 Wi-Fi 6 WLAN module (models with 8 GB of system memory and Universal Flash Storage [UFS])

- N59796-001: Mineral silver, models an Intel AX211 Wi-Fi 6E WLAN module (models with 8 GB of system memory and Universal Flash Storage [UFS])

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

## Top cover with keyboard

The top cover with keyboard remains after removing all other spare parts from the computer. The first table provides the main spare part number for the top covers with keyboards. The second table provides the keyboard country codes.

**Table 5-10 Top cover with keyboard descriptions and part numbers**

Description	Spare part number
Natural silver, not backlit, for use in 15 W models	N45574-xxx
Natural silver, backlit, for use in 15 W models	N45575-xxx
Natural silver, not backlit, for use in 6 W models	N45576-xxx
Natural silver, backlit, for use in 6 W models	N45577-xxx
Mineral silver, not backlit, for use in 15 W models	N45572-xx1
Mineral silver, backlit, for use in 15 W models	N45573-xx1

**Table 5-11 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	Germany	-041	Spain	-071
Denmark, Finland, and Norway	-DH1	Greece	-151	Switzerland	-BG1
French Canada	-DB1	Italy	-061	United Kingdom	-031
France	-051	The Netherlands	-B31	United States	-001

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## 6 Backing up, resetting, and recovering

This chapter provides information about the standard procedures of backing up your personal data, resetting your computer to original factory conditions, and recovering your operating system.

### Backing up

You can back up your data to an optional USB flash drive or SD memory card or through Google Drive™.

For detailed information about creating a backup, go to <http://www.support.google.com>.

### Resetting

A factory reset erases the information on your computer hard drive, including files in the Downloads folder. Before you reset, back up your files to an optional USB flash drive, to an SD memory card, or through Google Drive. The factory reset will not delete your files at these locations.

You might want to reset your computer in the following circumstances:

- You see the message "Reset this Chrome device."
- You are having problems with your user profile or settings.
- You restarted your computer, and it still doesn't work properly.
- You want to change the owner of your computer.

To reset your computer:

1. Under the **Settings** menu, select **Advanced**.
2. In the **Powerwash** section, select **Powerwash**.
3. Select **Restart**.
4. In the window that appears, select **Powerwash**, and then select **Continue**.
5. Follow the on-screen instructions to reset your computer, and sign in with your Google Account.



**NOTE:** The account you sign in with after you reset your computer is recognized as the owner account.


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6. After you complete the reset, you can set up your computer and check to see whether the problem is fixed.

### Recovering

When your ChromeOS™ doesn't work properly, you can perform a recovery. A recovery reinstalls the operating system, software programs, and original factory settings. It deletes locally saved files and saved networks for all accounts. A system recovery does not affect Google Accounts and data synced to Google Drive.

---

 **IMPORTANT:** Recovery permanently erases everything on your computer hard drive, including your downloaded files. If possible, back up your files before you recover your computer.

 **NOTE:** For more information about performing a system recovery on your computer, go to <http://www.support.google.com>.

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Before you begin the recovery process, you need the following prerequisites:


- A USB flash drive or SD memory card with a capacity of 4 GB or greater. All data is erased from this storage device when the recovery media is created, so back up all files from the device before you begin.
- A computer with internet access. You must also have administrative rights to the computer.
- A computer AC adapter. The computer must be plugged into AC power during recovery.
- The “ChromeOS is missing or damaged” screen displaying on your computer. If this message is not already displayed:
  - Turn on the computer, press and hold the **esc+f3** keys, and then press the power button. The computer restarts, and the screen shows the “ChromeOS is missing or damaged” screen.

## Option 1: Recovering using an internet connection

Use these instructions to recover the Chrome operating system on your computer without recovery media:

1. Disconnect any external devices connected to your computer, plug in the power cord, and then turn on the computer.
2. To enter recovery mode, press and hold the **esc+f3** keys, and then press the power button. When the “ChromeOS is missing or damaged” screen appears, select **Recover using internet connection** and follow the on-screen instructions.

---

 **NOTE:** The computer must have internet access.

---


3. When the “System Recovery is complete” message appears, reboot your computer.

The computer restarts with ChromeOS reinstalled.

## Option 2: Installing the Chromebook Recovery Utility

The Chromebook™ Recovery Utility recovers the original operating system and software programs that were installed at the factory. You can install this utility from the Chrome Web Store on any computer.

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 **NOTE:** Use this option if you do not have Internet access on your computer.

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To install the Chromebook Recovery Utility:

- Open the Chrome Web Store, search for `chrome recovery`, select **Chromebook Recovery Utility** from the Apps list, and follow the on-screen instructions.


## Creating recovery media

You can use recovery media to recover the original operating system and software programs that were installed at the factory.

To create recovery media:

1. Turn on a computer that has internet access.


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 **NOTE:** You must have administrative rights to the computer.

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2. Select the **Launcher** icon, and then select **All Apps**.
3. In the Apps window, select **Recovery**, and then select **Get started**.
4. Follow the on-screen instructions to create the recovery media.

---

 **NOTE:** All data and partitions on your recovery media will be deleted. Do not remove the USB flash drive or SD memory card until the process is complete.


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## Recovering the Chrome operating system with recovery media

Use these instructions to recover the Chrome operating system on your computer using the recovery media that you created.

1. Disconnect any external devices connected to your computer, plug in the power cord, and then turn on the computer.
2. To enter recovery mode, press and hold **esc+f3**, and then press the power button. When the “ChromeOS is missing or damaged” screen appears, insert the recovery media into your computer. The recovery process begins immediately.
3. Wait while Chrome verifies the integrity of the recovery media.

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 **NOTE:** If you need to cancel the recovery during the verification process, press and hold the power button until the computer turns off. Do not disrupt the system recovery process after the verification step is complete.

 **NOTE:** If an error message is displayed, you might need to run the Chrome Recovery Utility again or use a different USB flash drive or SD memory card.

---

4. When the “System Recovery is complete” message appears, remove the recovery media.  
The computer restarts with ChromeOS reinstalled.

## Setting up your computer after a reset or recovery

After a reset or recovery is complete, perform the initial setup process.

For details about setting up the computer, go to <http://www.support.google.com>.

## Erasing and reformatting the recovery media

When you create recovery media, the USB flash drive or SD memory card is formatted as a recovery tool. After recovery, you must erase the recovery media to reuse your storage device. Follow these steps to use the Chromebook Recovery Utility to erase the recovery media.

1. Select the **Launcher** icon, and then select **All Apps**.
2. In the apps window, select **Recovery**.
3. Select the **Settings** icon, and then select **Erase recovery media**.

4. Select the USB flash drive or SD memory card that you inserted, select **Continue**, and then select **Erase now**.
5. After the recovery media is erased, select **Done** to close the Chromebook Recovery Utility, and then remove the USB flash drive or SD memory card.

The media is ready to be formatted using a formatting tool provided by your operating system.

# 7 Specifications

This chapter provides specifications for your computer system.

## Computer specifications

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

**Table 7-1 Computer specifications**

	Metric	U.S.
<b>Dimensions</b>		
Width	362.6 mm	14.3 in
Depth	241.5 mm	9.5 in
Height	19.9 mm	0.8 in
<b>Weight</b>		
	1730.0 g	3.8 lb
<b>Input power</b>		
Operating voltage and current	19.5 V DC @ 2.31 A - 45 W	
<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)		
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 7-2 Display specifications**

	Metric	U.S.
Active diagonal size	<b>39.6 cm</b>	15.6 in

**Table 7-2 Display specifications (continued)**

	<b>Metric</b>	<b>U.S.</b>
Resolution	1920 × 1080 (FHD) 1366 × 768 (HD)	
Surface treatment	Antiglare BrightView	
Brightness	250 nits	
Viewing angle	UWVA SVA	
Backlight	WLED	
Display panel interface	eDP	



## 8 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 8-1** Power cord requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1

**Table 8-1 Power cord requirements for specific countries and regions (continued)**

Country/region	Accredited agency	Applicable note number
Germany	VDE	1
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
United Kingdom	ASTA	1
United States	UL	2

1. The flexible cord must be Type 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.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, three-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V AC) or NEMA 6-15P (15 A, 250 V AC) configuration. CSA or C-UL mark. UL file number must be on each element.
3. The appliance coupler, flexible cord, and wall plug must bear a T mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, three-conductor, 0.75 mm<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.
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.
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.
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.
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.

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## 9 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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