



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.

Software terms

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

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

Safety warning notice

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


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

Table of contents

1 Product description	1
2 Components	4
Right	4
Left	5
Display	6
Keyboard area	7
Touchpad	7
Speakers and fingerprint reader	8
Special keys	8
Bottom	9
Labels	10
3 Illustrated parts catalog	12
Computer major components	12
Display assembly subcomponents	14
Miscellaneous parts	16
4 Removal and replacement procedures preliminary requirements	18
Tools required	18
Service considerations	18
Plastic parts	18
Cables and connectors	18
Drive handling	18
Electrostatic discharge information	19
Generating static electricity	19
Preventing electrostatic damage to equipment	20
Personal grounding methods and equipment	20
Grounding the work area	21
Recommended materials and equipment	21
Cleaning your computer	22
Enabling HP Easy Clean (select products only)	22
Removing dirt and debris from your computer	22
Cleaning your computer with a disinfectant	23
Caring for wood veneer (select products only)	24
Packaging and transporting guidelines	24

Accessing support information	24
5 Removal and replacement procedures for authorized service provider parts	26
Component replacement procedures	26
Preparation for disassembly	26
Bottom cover	26
Battery	27
Solid-state drive	29
Speakers	29
Touchpad	30
Fingerprint sensor board	32
Fan	32
Heat sink	33
Lock bracket	35
USB board	36
USB door	37
System board	38
Display assembly	40
Keyboard with top cover	47
6 Backing up, resetting, and recovering	49
Backing up	49
Resetting	49
Recovering	49
Installing the Chromebook Recovery Utility	50
Creating recovery media	50
Recovering the Chrome operating system	50
Setting up your computer after a reset or recovery	51
Erasing and reformatting the recovery media	51
7 Specifications	52
Computer specifications	52
35.6 cm (14.0 in) display specifications	52
8 Statement of memory volatility	54
Current BIOS steps	54
Nonvolatile memory usage	56
Questions and answers	58
Using HP Sure Start (select products only)	59

9 Power cord set requirements	60
Requirements for all countries	60
Requirements for specific countries and regions	60
10 Recycling	62
Index	63

1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP Pro c640 G2 Chromebook™
Processors	Intel® processors Intel Core™ i7-1185G7 (3.00 GHz base frequency, up to 4.30 GHz with Intel Turbo Boost Technology, 12 MB cache, 4 cores) Intel Core i7-1165G7 (2.80 GHz base frequency, up to 4.70 GHz with Intel Turbo Boost Technology, 12 MB cache, 4 cores) Intel Core i5-1145G7 (2.60 GHz base frequency, up to 4.40 GHz with Intel Turbo Boost Technology, 8 MB cache, 4 cores) Intel Core i5-1135G7 (2.40 GHz base frequency, up to 4.20 GHz with Intel Turbo Boost Technology, 8 MB cache, 4 cores) Intel Core i3-1125G4 (2.00 GHz base frequency, up to 3.70 GHz with Intel Turbo Boost Technology, 8 MB cache, 4 cores) Intel Core i3-1115G4 (3.00 GHz base frequency, up to 4.10 GHz with Intel Turbo Boost Technology, 6 MB cache, 2 cores) Intel 7505 Pentium® Gold (2.00 GHz base frequency, up to 3.50 GHz with Intel Turbo Boost Technology, 4 MB cache, 2 cores) Intel Celeron® 6305 (1.80 GHz base frequency, 4 MB cache, 2 cores)
Graphics	Internal graphics Intel Iris® Xe Graphics (i7/i5 processors) Intel UHD Graphics (i3/Pentium/Celeron processors) Supports HD Decode, DX12, and HDMI
Display	35.6 cm (14.0 in), WLED, antiglare, eDP, narrow bezel, nontouch Full high definition (FHD) (1920 × 1080), UWVA 45, 250 nits High definition (HD) (1366 × 768), SVA 45, 250 nits 35.6 cm (14.0 in), antiglare, eDP, narrow bezel, Touch-on Panel (TOP) FHD, UWVA 45, 250 nits HD, SVA 45, 250 nits
Memory	Soldered on board, nonupgradeable DDR4-3200 dual-channel support Supports the following configurations: <ul style="list-style-type: none">• 16 GB

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

Category	Description
	<ul style="list-style-type: none"> 8 GB
Primary storage	On-board embedded MultiMedia Controller (eMMC v5.0) configuration
	64 GB
	32 GB
	Solid-state drive (2230, NVMe, PCIe)
	256 GB
	128 GB
Audio and video	HD audio
	B&O Play
	Dual stereo speakers
	HD Camera: HD WFOV + integrated dual microphone
	Dual microphone with appropriate software: beam forming, echo cancellation, noise suppression
	Supports Google Assistant™ virtual digital assistant
	1280 × 720 by 30 frames per second
	Camera privacy cover
Wireless	Integrated wireless options with dual antennas
	Intel® Wi-Fi 6 AX201 + Bluetooth® 5 (non-vPro®)
Media card reader	Supports microSD™, SDHC™, SDXC™ up to UHS-104
	Push-push insertion/removal
Ports	HDMI v2.0
	Audio-out (headphone)/audio-in (microphone) combo jack
	(2) USB 3.2 Gen2 Type C
	(2) USB 3.2 Gen2 Type-A
Keyboard/pointing devices	Keyboard
	Full size, island style, textured, not backlit, with or without fingerprint reader
	Full size, island style, 3-coat paint, backlit, with or without fingerprint reader
	Clickpad requirements
	Multitouch gestures enabled
	Taps enabled as default
Power requirements	Battery
	3 cell, 58 Whr, polymer, HP Long Life, fast charge
	AC adapter, USB Type-C
	65 W, nPFC, straight, 1.8 m (6 ft)

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

Category	Description
	45 W, nPFC, straight, 1.8 m (6 ft)
	Power cord
	C5, 1 m (3.3 ft)
Security	Fingerprint sensor (select products only)
	Camera privacy cover
	H1 Secure Microcontroller
Operating system	Google® Chrome™ 64
Serviceability	End user replaceable parts
	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.

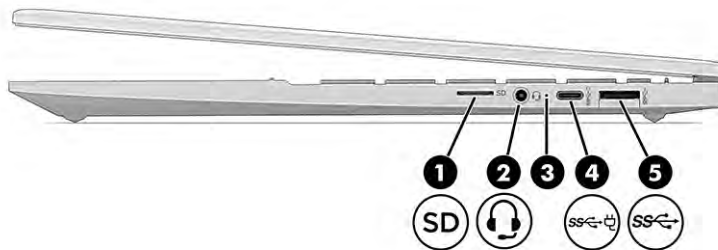


Table 2-1 Right-side components and their descriptions




Component	Description
(1) SD	<p>Memory card reader (select products only)</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">1. Hold the card label-side up, with the connectors facing the computer.2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none">▲ Press in on the card, and then remove it from the memory card reader.
(2) 	<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>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>
(3)	<p>AC adapter and battery light</p> <ul style="list-style-type: none">• White: The AC adapter is connected and the battery is fully charged.• Amber: The AC adapter is connected and the battery is charging.• Off: The battery is not charging.

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

Component	Description
<p>(4)</p>  <p>USB Type-C® power connector and SuperSpeed port</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>NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.</p> <p>– and –</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort™ output.</p>
<p>(5)</p>  <p>USB SuperSpeed port</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>NOTE: 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.

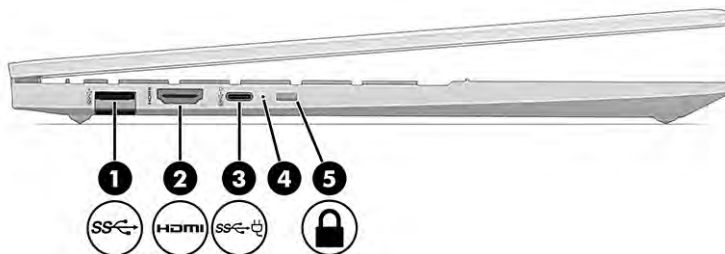


Table 2-2 Left-side components and their descriptions





Component	Description
<p>(1)</p>  <p>USB SuperSpeed port</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>NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.</p>
<p>(2)</p>  <p>HDMI port</p>	<p>Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High Definition Multimedia Interface (HDMI) device.</p>

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

Component	Description
<p>(3)</p>  <p>USB Type-C power connector and SuperSpeed port</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>NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.</p> <p>– and –</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort™ output.</p>
<p>(4)</p> <p>AC adapter and battery light</p>	<ul style="list-style-type: none"> • White: The AC adapter is connected and the battery is fully charged. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.
<p>(5)</p>  <p>Security cable slot</p>	<p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen.</p>

Display

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

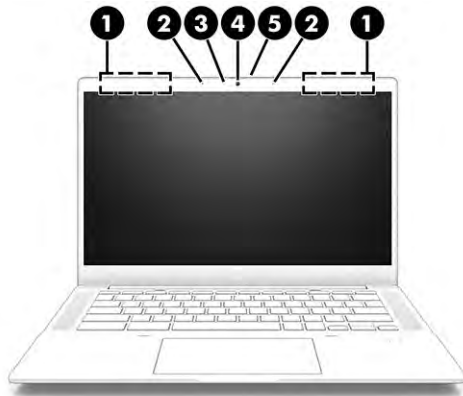


Table 2-3 Display components and their descriptions

Component	Description
<p>(1)</p> <p>WLAN antennas*</p>	<p>Send and receive wireless signals to communicate with wireless local area networks (WLANs).</p>
<p>(2)</p> <p>Internal microphones</p>	<p>Record sound.</p>

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

Component	Description
(3) Camera light	On (white): The camera is in use. On (amber): The camera is turned off by the switch. Off: The camera is turned off by the software.
(4) Camera	Allows you to video chat, record video, and record still images. NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(5) 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.

*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.

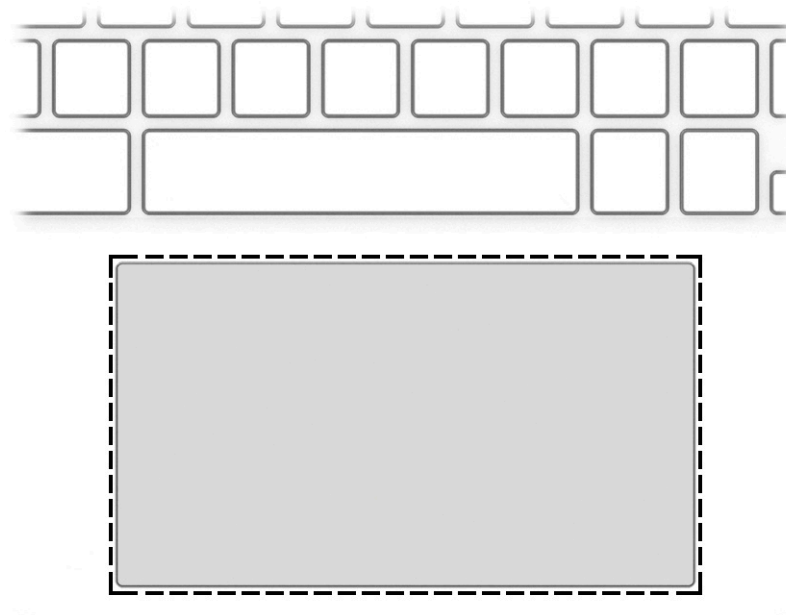


Table 2-4 Touchpad component and description

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

Speakers and fingerprint reader

Speakers are located on the right and left of the keyboard. Fingerprint readers can be located on the touchpad, on a side panel of the computer, or on the top cover below the keyboard.

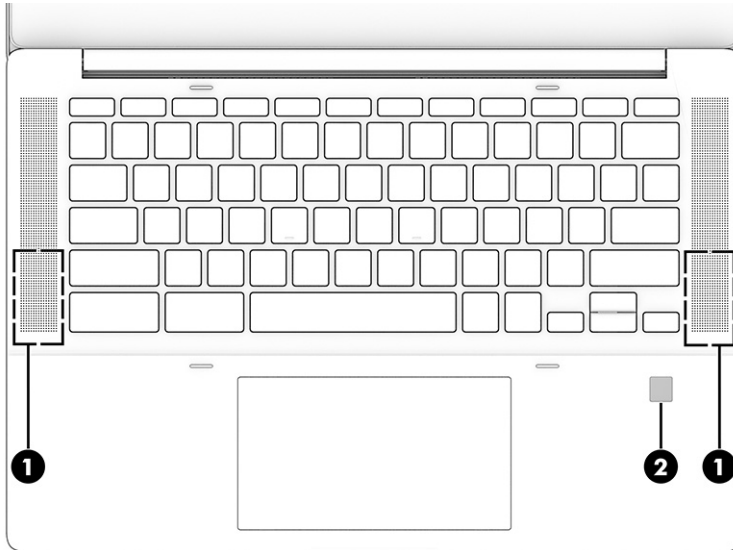


Table 2-5 Speakers and fingerprint reader and their descriptions

Component	Description
(1) Speakers (2)	Produce sound.
(2) Fingerprint reader (select products only)	The fingerprint reader allows you to unlock the computer screen or to resume computer operations. The reader does not function as a login device. ▲ Touch your finger to the fingerprint reader.

Special keys

Use the illustration and table to locate the special keys.

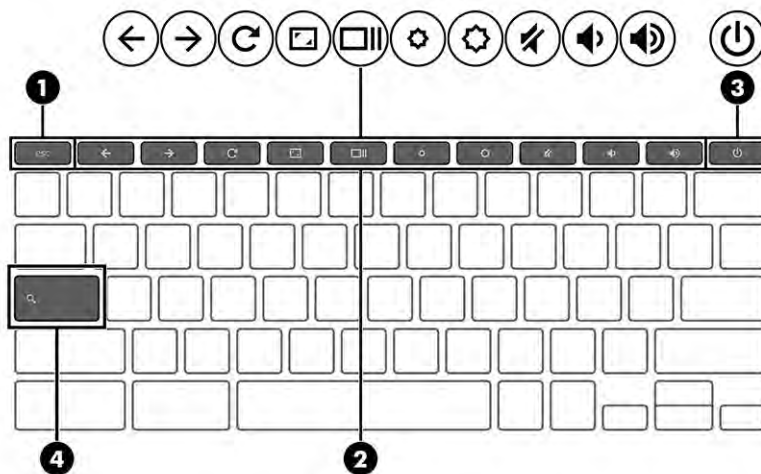



Table 2-6 Special keys and their descriptions

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) Action keys	Execute frequently used system functions.
(3)  Power key	<ul style="list-style-type: none">When the computer is off, press the button briefly to turn on the computer.When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button for at least 10 seconds to turn off the computer.</p>
(4) Search key	Opens a search box.

Bottom

Use the illustration and table to identify the bottom component.

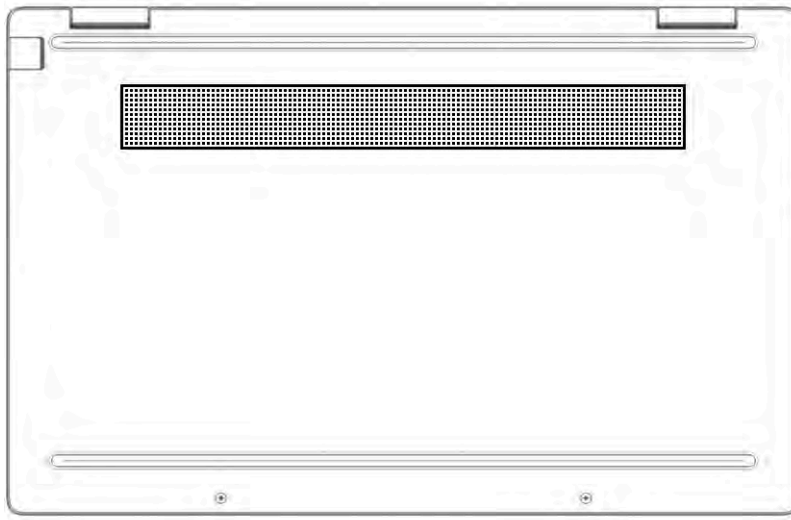



Table 2-7 Bottom component and its description

Component	Description
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 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 2-8 Service label components

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

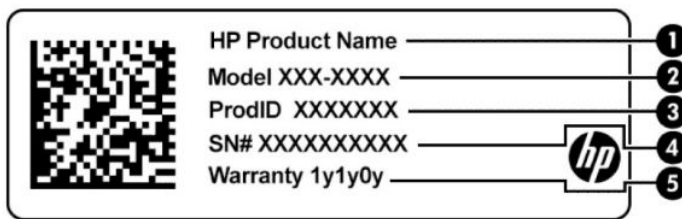


Table 2-9 Service label components

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

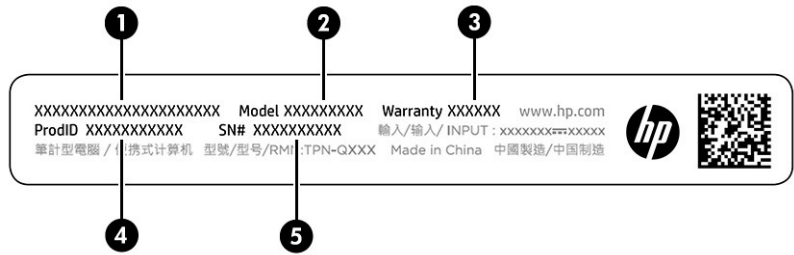


Table 2-10 Service label components

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.

3 Illustrated parts catalog

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

Computer major components

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

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

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

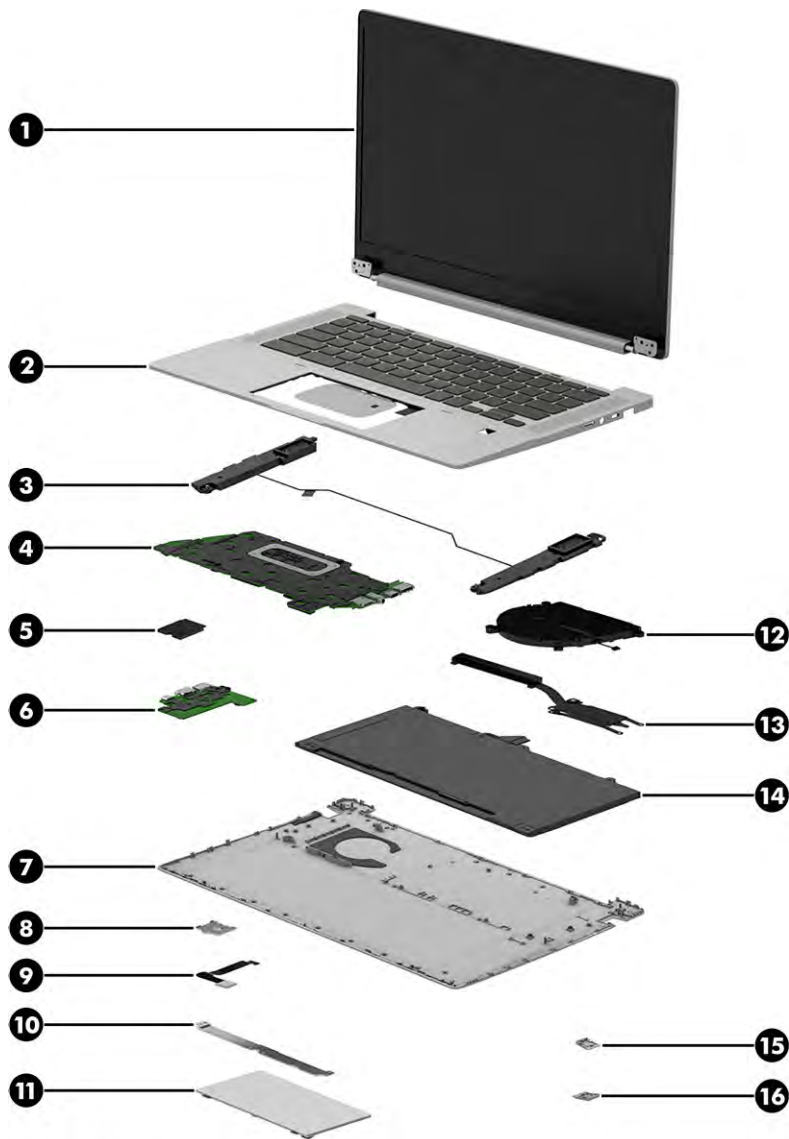


Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	Display assembly	
	NOTE: Display assemblies are available as spare parts only at the subcomponent level.	
(2)	Top cover with keyboard	
	Backlit	M57281-xx1
	Backlit, fingerprint sensor	M57282-xx1
	Not backlit	M57283-xx1
	Not backlit, fingerprint sensor	M57284-xx1
(3)	Speaker Kit	M00436-001
(4)	System board (includes integrated processor and system memory; some include eMMC memory; includes replacement thermal material)	
	Intel Core i7-1185G7 processor, 16 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57279-001
	Intel Core i7-1165G7 processor, 8 GB of system memory, and 64 GB of eMMC memory (models without a fingerprint sensor)	M57278-001
	Intel Core i5-1145G7 processor, 16 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57275-001
	Intel Core i5-1145G7 processor, 8 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57277-001
	Intel Core i5-1145G7 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57276-001
	Intel Core i5-1135G7 processor, 16 GB of system memory, 64 GB of eMMC memory (models without a fingerprint sensor)	M57272-001
	Intel Core i5-1135G7 processor, 8 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57274-001
	Intel Core i5-1135G7 processor, 8 GB of system memory, 64 GB of eMMC memory (models without a fingerprint sensor)	M57273-001
	Intel Core i3-1115G4 processor, 8 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57271-001
	Intel Core i3-1115G4 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57270-001
	Intel Pentium G7505 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57280-001
	Intel Celeron 6305 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57269-001
	Intel Celeron 6305 processor, 4 GB of system memory, 64 GB of eMMC memory (models without a fingerprint sensor)	M57268-001
(5)	Solid state drive (2230, PCIe, NVMe)	
	256 GB	M11042-002
	128 GB	M11040-002
(6)	USB board	M57287-001

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

Item	Component	Spare part number
	NOTE: USB board cables are available in as spare part number M57285-001 for HS and M57286-001 for LS.	
(7)	Bottom cover	M31754-001
(8)	Fingerprint reader bracket (available in the Bracket Kit)	M12524-001
(9)	Fingerprint sensor board (includes cable)	M31755-001
(10)	Touchpad bracket (available in the Bracket Kit)	M12524-001
(11)	Touchpad (includes rubber and protective tape)	M59382-001
	NOTE: The touchpad cable is available as spare part number M57289-001.	
(12)	Fan	M02014-001
(13)	Heat sink (includes replacement thermal material)	M31753-001
(14)	Battery (3 cell, 58 Whr)	M12585-005
	USB door	
(15)	Left door	M00444-001
(16)	Right door	M00445-001

Display assembly subcomponents

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

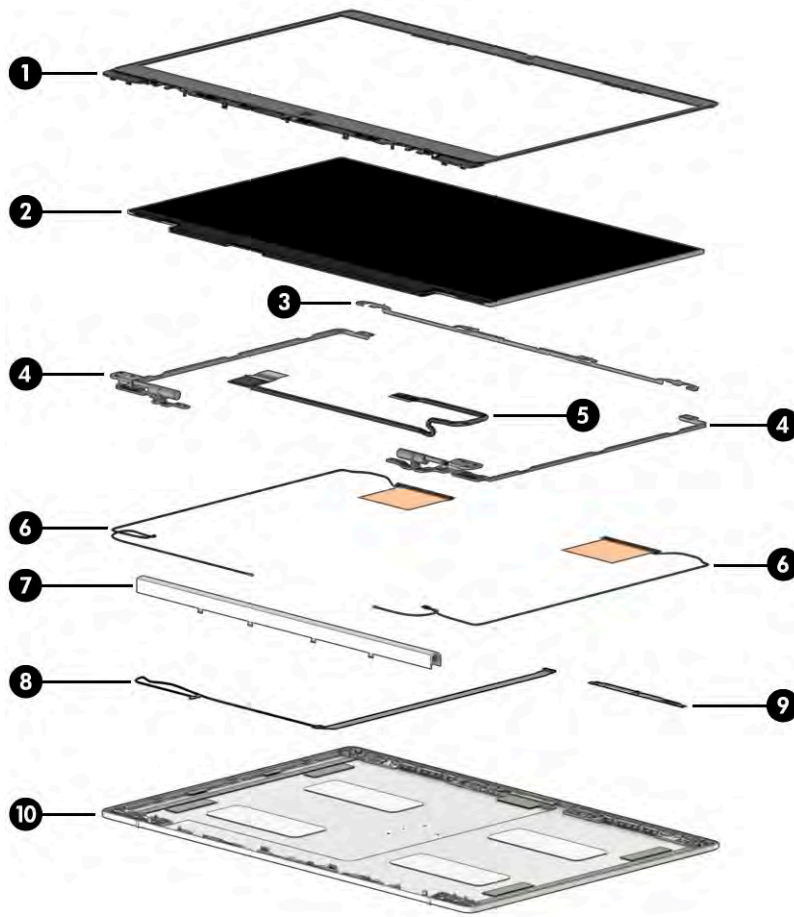


Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	Display bezel	M59381-001
(2)	Display panel	
	FHD, nontouch	M57293-001
	FHD, touch	M57294-001
	HD, nontouch	M57295-001
	HD, touch	M57296-001
(3)	Top bracket	M00700-001
(4)	Hinges (left and right)	M77032-001
(5)	Display cable	
	Nontouch	M57292-001
	Touch	M57291-001
(6)	Wireless antennas	M00435-001
(7)	Hinge cover	M00441-001
(8)	Camera cable	M12614-001

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

Item	Component	Spare part number
(9)	Camera module	M00442-001
(10)	Display back cover (includes dual antennas)	M00439-001
	Display Adhesive Tape Kit (includes cover tape and bezel tape, not illustrated)	M57290-001

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, USB Type-C (nPFC, 1.8 m [5.9 ft])	
65 W	L67440-001
45 W	L43407-001
Screw Kit	M59383-001
Display Adhesive Tape Kit (includes cover tape and bezel tape)	M57290-001
Bracket Kit (includes touchpad support bracket and fingerprint bracket)	M12524-001
Miscellaneous Hardware Kit (includes touchpad dome rubber cap with protective tape and touchpad protective tape)	M57288-001
Plastics Kit (includes WLAN protective tape and top rubber)	M31757-001
Power cord (C5, 1.0 m [3.3 ft])	
Argentina	L19357-001
Australia	L19358-001
Brazil	L19359-001
Denmark	L19360-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L19361-001
India	L19363-001
Israel	L19362-001
Italy	L19364-001
Japan	L19365-001
North America	L19367-001
South Africa	L19369-001
South Korea	L19366-001
Switzerland	L19370-001
Taiwan	L19372-001
Thailand	L19371-001

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

Component	Spare part number
The United Kingdom	L19373-001
Duckhead power cord	
Japan	L33157-001

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 [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

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

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

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

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

Preventing electrostatic damage to equipment

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

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.
- Avoid contact with pins, leads, or circuitry.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

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

- **Wrist straps** are flexible straps with a maximum of $1\text{ M}\Omega \pm 10\%$ 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.
- **Heel straps/Toe straps/Boot straps** can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of $1\text{ M}\Omega \pm 10\%$ 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 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.

 **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.

 **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

Use this information to find the HP support that you need.

Table 4-3 Support information locations


Service consideration	Path to access information
Records of reported failure incidents stored on the computer	Windows: Pre-operating system failures are logged in the BIOS Event Log. To view the BIOS Event Log: <ol style="list-style-type: none">1. Press the power button.2. Immediately and repeatedly press <code>esc</code> when the power button light turns white.


Table 4-3 Support information locations (continued)

Service consideration	Path to access information
	<p>NOTE: If you do not press <code>esc</code> at the appropriate time, you must restart the computer and again repeatedly press <code>esc</code> when the power button light turns white to access the utility.</p> <ol style="list-style-type: none">3. Press <code>f10</code> to enter the BIOS setup.4. (On commercial products) Under the Main tab, select BIOS event log, and then select View BIOS Event Log. <p>- or -</p> <p>(On consumer products) Under the Main tab, select System Log.</p> <p>Post operating system failures are logged in the Event Viewer.</p> <ol style="list-style-type: none">1. Turn on the computer and allow the operating system to open.2. Click the search icon  in the taskbar.3. Type <code>Event Viewer</code>, and then press <code>enter</code>.4. Select the log from the left panel. Details display in the right panel. <p>Chrome:</p> <ol style="list-style-type: none">1. Go to support.google.com/chrome.2. Search <code>collect Chrome device logs</code>.
Technical bulletins	<p>To locate technical bulletins:</p> <ol style="list-style-type: none">1. Go to www.hp.com.2. Place the cursor over Problem solving to display more options.3. Select Support & Troubleshooting.4. Type the serial number, product number, or product name to go to the product support page.5. Select Advisories to view technical bulletins.
Repair professionals	<p>To locate repair professionals:</p> <ol style="list-style-type: none">1. Go to www.hp.com.2. Place the cursor over Support resources to display more options.3. Select Authorized service providers.
Component and diagnosis information, failure detection, and required action	<p>To locate diagnosis information and actions:</p> <ol style="list-style-type: none">1. Go to http://www.hp.com/go/techcenter/pcdiags.2. Select Get Support.3. Near the bottom of the window, select Notebook PCs, and then select your location.

5 Removal and replacement procedures for authorized service provider parts


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

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

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

Component replacement procedures

To remove and replace computer components, use these procedures.

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

You must remove, replace, or loosen as many as 50 screws when you service the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

To remove and replace computer components, use these procedures.

See [Removal and replacement procedures preliminary requirements on page 18](#) for initial safety procedures.

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.

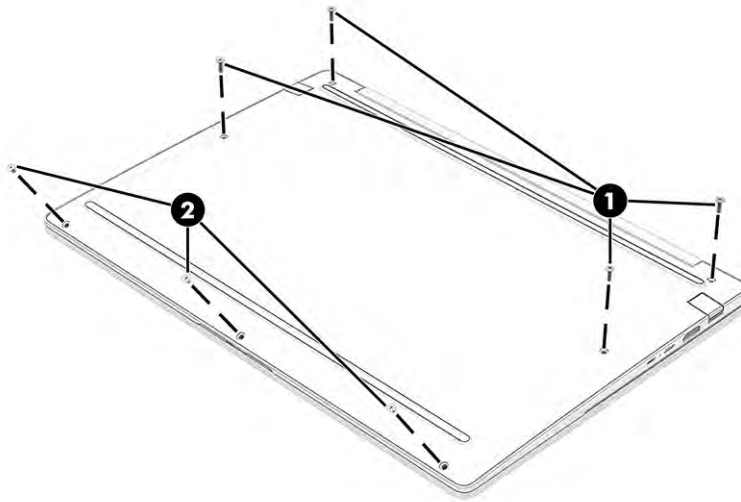
Table 5-1 Bottom cover description and part number

Description	Spare part number
Bottom cover	M31754-001

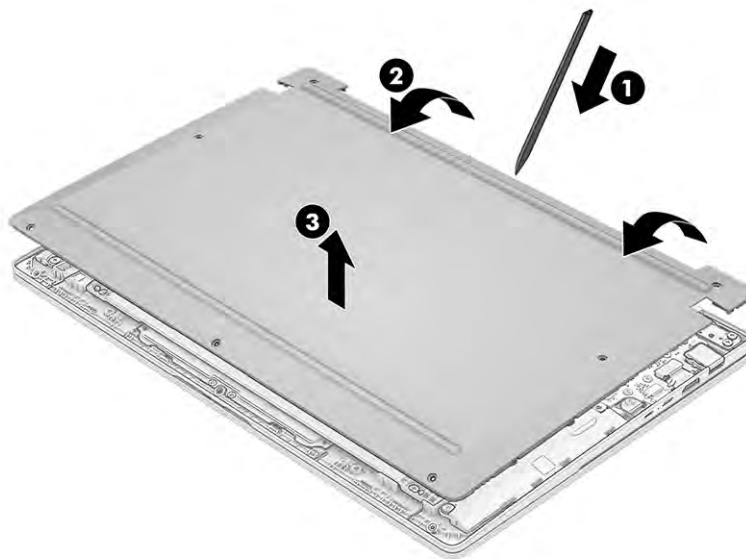
Before removing the bottom cover, prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).

Remove the bottom cover:

1. Remove the four Phillips M2.0 × 7.0 screws **(1)** from the sides and top and the three Phillips M2.0 × 4.0 screws **(2)** from the bottom that secure the bottom cover to the computer.



2. Use a nonmarking, nonconductive tool near the hinges (1) to release the bottom cover from the computer (2).
3. Remove the bottom cover from the computer (3).



To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 Battery description and part number

Description	Spare part number
Battery (3 cell, 58 Whr)	M12585-005

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

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

Before removing the battery, follow these steps:

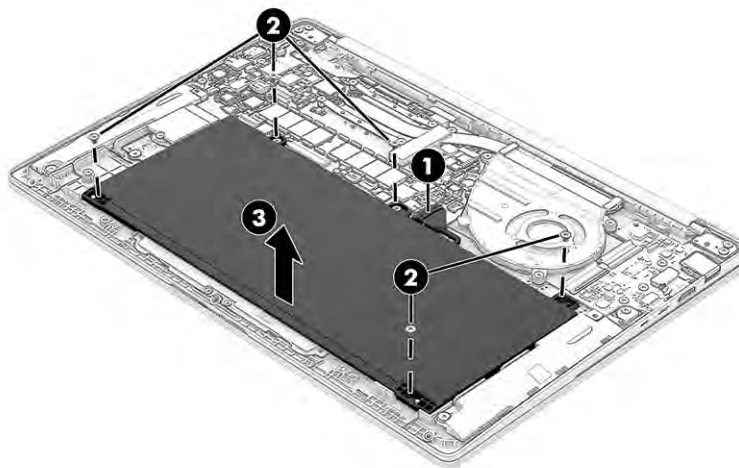
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
 2. Remove the bottom cover (see [Bottom cover on page 26](#)).
-

⚠ 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 the operating system before you remove the battery.

Remove the battery:

1. Disconnect the battery cable from the system board **(1)**.
2. Remove the five Phillips M2.0 × 3.0 screws **(2)** that secure the battery to the computer.
3. Remove the battery from the computer **(3)**.



To insert the battery, reverse the removal procedures.

Solid-state drive

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

Table 5-3 Solid-state drive description and part number

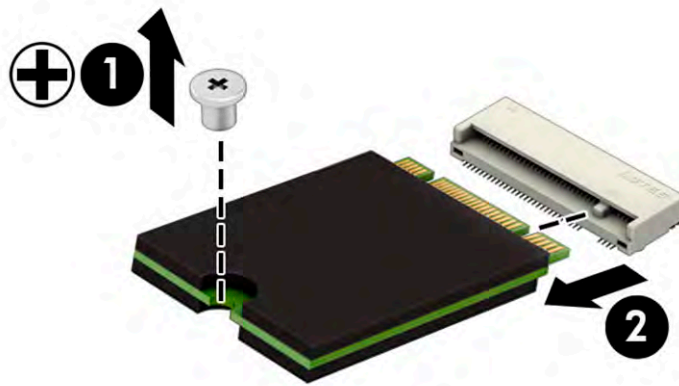
Description	Spare part number
Solid-state drive, 256 GB	M11042-002
Solid-state drive, 128 GB	M11040-002

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

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the solid-state drive:

1. Remove the Phillips M2.0 × 3.0 screw **(1)** that secures the drive to the computer.
2. Pull the drive away from the socket to remove it **(2)**.



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

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

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-4 Speaker description and part number

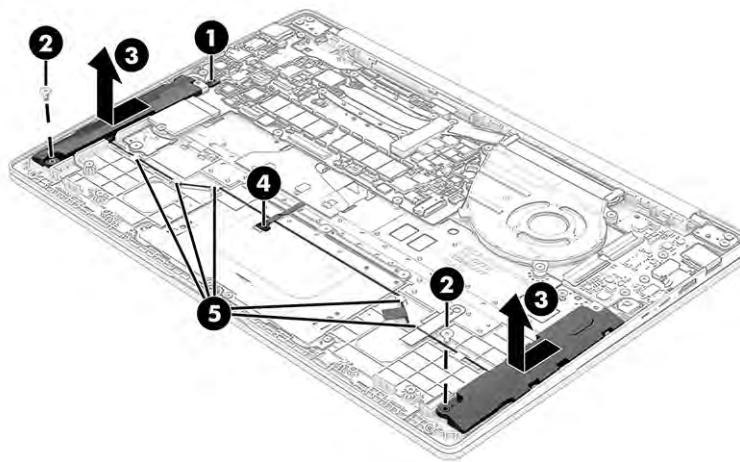
Description	Spare part number
Speaker Kit	M00436-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the speakers:

1. Disconnect the speaker cable from the system board **(1)**.
2. Remove the Phillips M2.0 × 5.0 screw **(2)** that secures each speaker to the computer.
3. Lift the bottom of the speakers up, and then pull the speaker toward the front to remove the tab on top of the speaker from the slot that holds it in place **(3)**.
4. Disconnect the cable from the ZIF connector on the touchpad **(4)**.
5. Remove the cable from the clips located between the speakers under the battery **(5)**.



Reverse this procedure to install the speakers.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-5 Touchpad description and part number

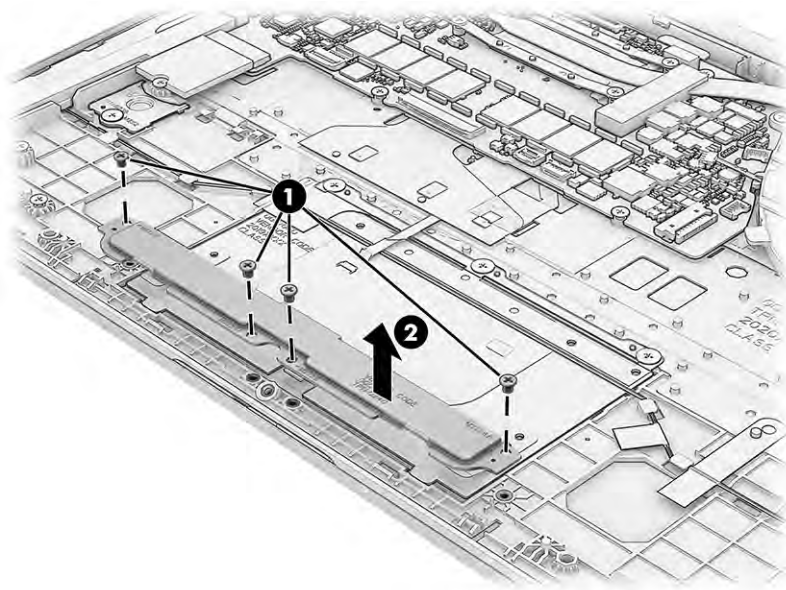
Description	Spare part number
Touchpad (includes rubber and protective tape)	M59382-001
Touchpad cable	M57289-001
Touchpad support bracket (included in Bracket Kit)	M12524-001

Before removing the touchpad, follow these steps:

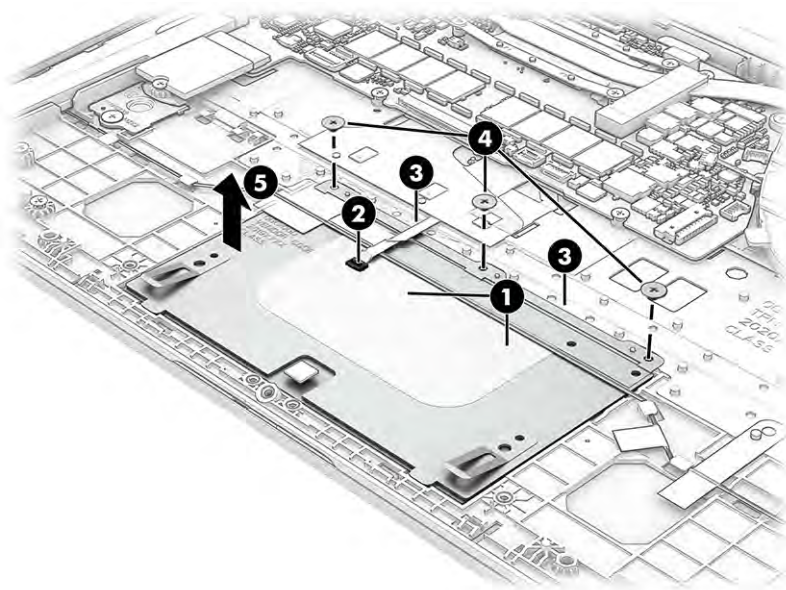
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the touchpad:

1. Remove the four Phillips M2.0 × 2.5 screws **(1)** that secure the touchpad bracket to the computer.
2. Remove the bracket from the computer **(2)**.



3. Lift the tape that covers the touchpad **(1)**.
4. Disconnect the cable from the ZIF connector on the touchpad **(2)**.
5. Remove the protective shielding from the top of the touchpad **(3)**.
6. Remove the three Phillips M2.0 × 2.0 screws **(4)** that secure the touchpad to the computer.
7. Remove the touchpad from the computer **(5)**.



Reverse this procedure to install the touchpad.

To be sure the cable is properly positioned when replacing the touchpad, first put the black protective tape back into place, reconnect the cable to the touchpad, and then replace the clear tape.

Fingerprint sensor board

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

Table 5-6 Fingerprint sensor board description and part number

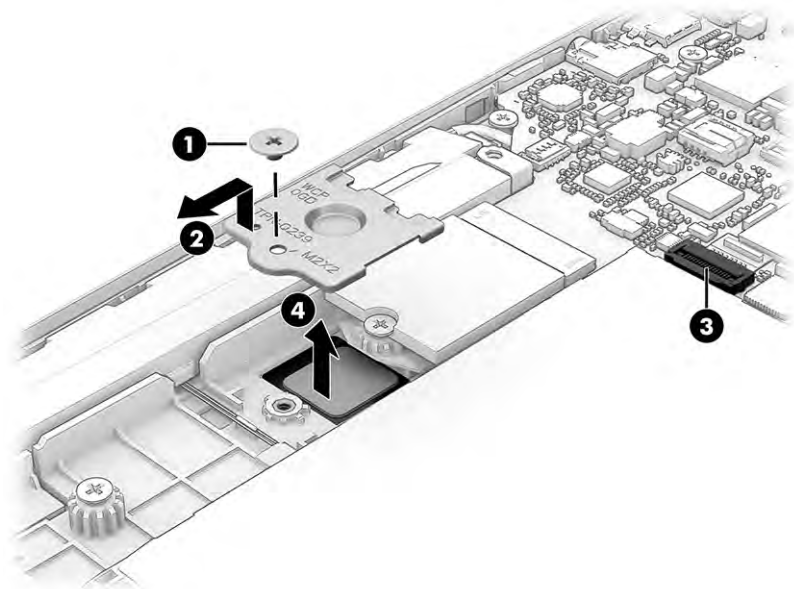
Description	Spare part number
Fingerprint sensor board (includes cable)	M31755-001
Fingerprint sensor bracket (available in the Bracket Kit)	M12524-001

Before removing the fingerprint sensor board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the fingerprint sensor board:

1. Remove the Phillips M2.0 × 2.0 screw **(1)** that secures the fingerprint sensor bracket.
2. Lift the bottom of the bracket up, and then pull bracket toward front and out from under lip at the top of the bracket **(2)**.
3. Disconnect the cable from the ZIF connector on the system board **(3)**, and then peel the cable off the computer.
4. Remove the fingerprint sensor board and cable from the computer **(4)**.



Reverse this procedure to install the fingerprint sensor board.

Fan

To remove the fan, use this procedure and illustration.

Table 5-7 Fan description and part number

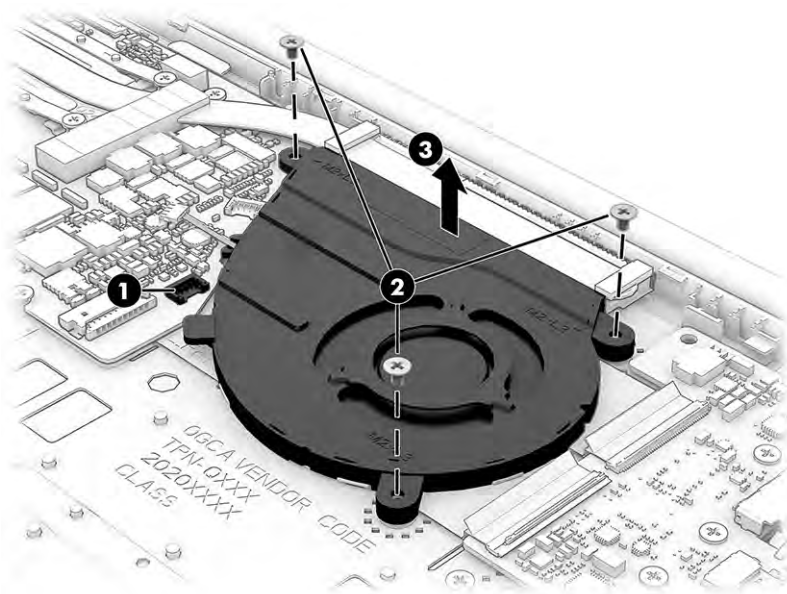
Description	Spare part number
Fan assembly	M02014-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the fan assembly:

1. Disconnect the fan cable from the system board **(1)**.
2. Remove the three Phillips M2.0 × 3.0 screws **(2)**, and then remove the fan **(3)**.



Reverse this procedure to install the fan assembly.

Heat sink

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

Table 5-8 Heat sink descriptions and part numbers

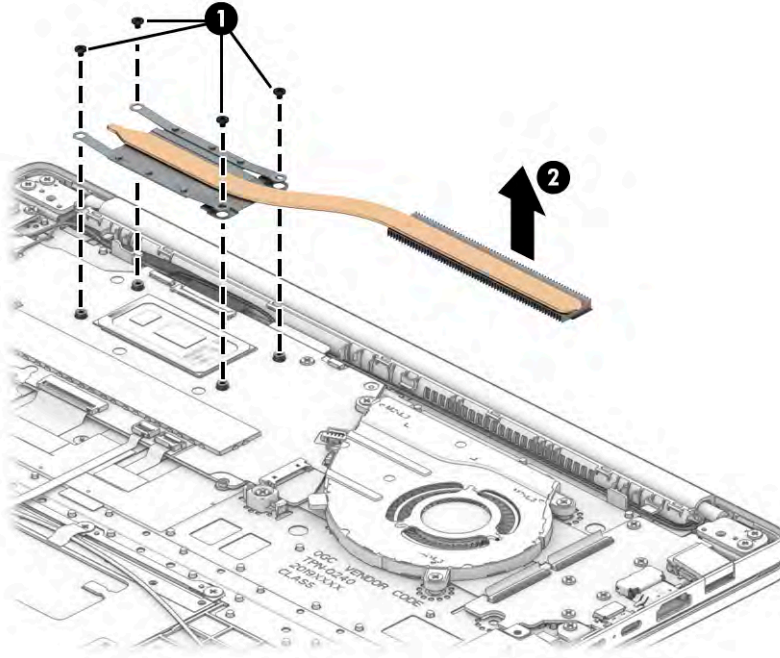
Description	Spare part number
Heat sink	M00434-001

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

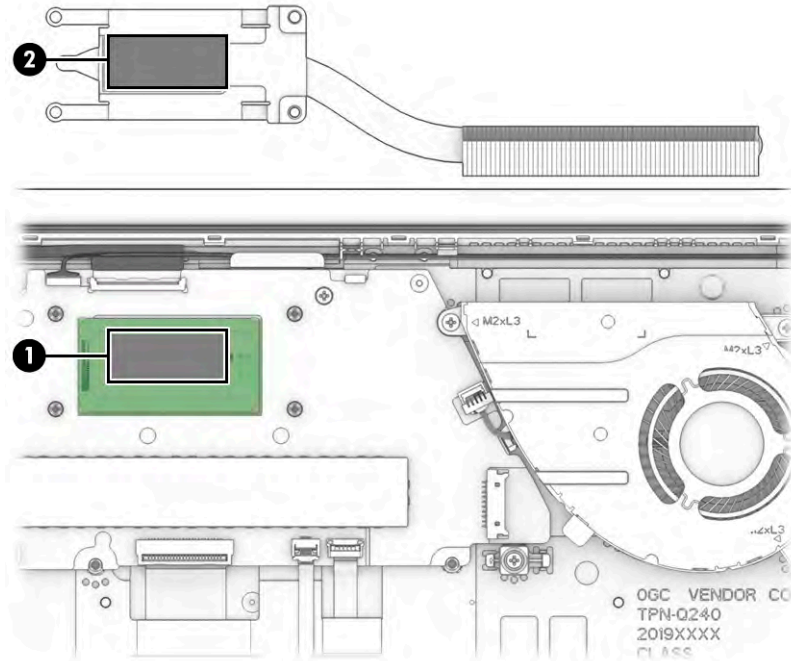
Remove the heat sink:

1. In the order indicated on the heat sink, remove the four Phillips M2.0 × 2.0 screws **(1)**, and then remove the heat sink from the computer **(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 paste is used on one system board component **(1)** and on the heat sink area **(2)** that services it.



Reverse this procedure to install the heat sink.

Lock bracket

To remove the lock bracket, use this procedure and illustration.

Table 5-9 Lock bracket description and part number

Description	Spare part number
Lock bracket	M00433-001

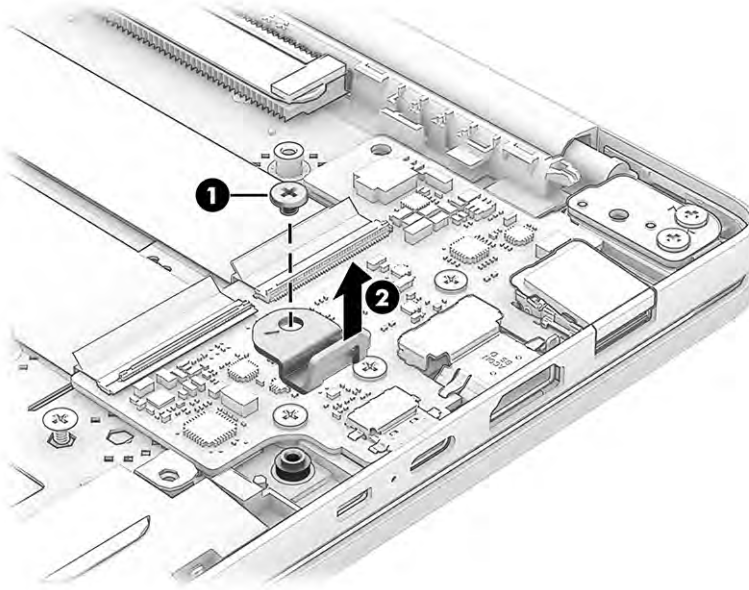
Before removing the lock bracket, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the lock bracket:

1. Remove the Phillips M2.0 × 3.0 screw **(1)** that secures the lock bracket to the computer.

2. Remove the bracket from the computer **(2)**.



Reverse this procedure to install the lock bracket.

USB board

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

Table 5-10 USB board description and part number

Description	Spare part number
USB board	M57287-001
USB board cable, HS	M57285-001
USB board cable, LS	M57286-001

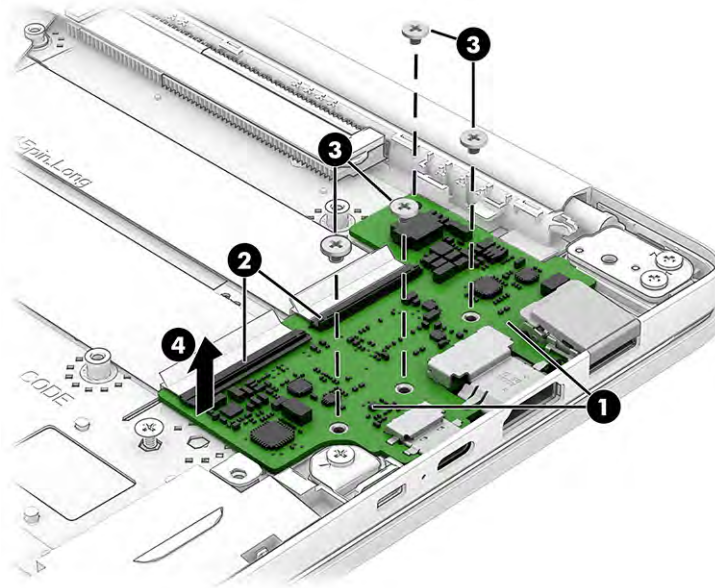
Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).
4. Remove the fan (see [Fan on page 32](#)).

Remove the USB board:

1. Remove the tape from the connectors on the USB board **(1)**.
2. Disconnect the two cables from the reverse ZIF connectors on the USB board **(2)**.
3. Remove the four Phillips M2.0 × 2.0 screws **(3)** that secure the board to the computer.

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



Reverse this procedure to install the USB board.

USB door

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

Table 5-11 USB door description and part number

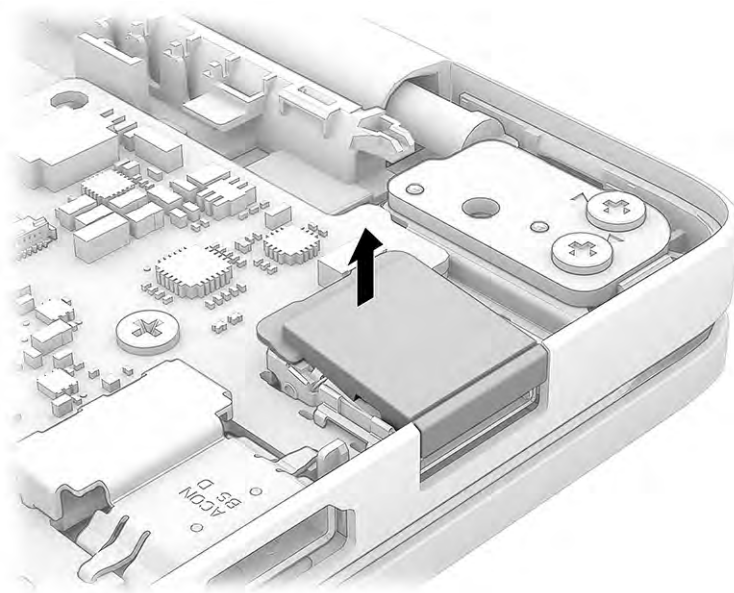
Description	Spare part number
USB door, left	M00444-001
USB door, right	M00445-001

Before removing the USB door, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).

Remove the USB door:

- ▲ Insert a removal tool under the back of the USB door, and then lift to remove the USB door from the computer.



USB doors are available for both sides of the computer. Use the same removal and replacement procedures for both doors.

Reverse this procedure to install the USB door.

System board

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

Table 5-12 System board descriptions and part numbers

Description	Spare part number
Intel Core i7-1185G7 processor, 16 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57279-001
Intel Core i7-1165G7 processor, 8 GB of system memory, and 64 GB of eMMC memory (models without a fingerprint sensor)	M57278-001
Intel Core i5-1145G7 processor, 16 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57275-001
Intel Core i5-1145G7 processor, 8 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57277-001
Intel Core i5-1145G7 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57276-001
Intel Core i5-1135G7 processor, 16 GB of system memory, 64 GB of eMMC memory (models without a fingerprint sensor)	M57272-001
Intel Core i5-1135G7 processor, 8 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57274-001
Intel Core i5-1135G7 processor, 8 GB of system memory, 64 GB of eMMC memory (models without a fingerprint sensor)	M57273-001
Intel Core i3-1115G4 processor, 8 GB of system memory; no eMMC memory (models with a fingerprint sensor)	M57271-001
Intel Core i3-1115G4 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57270-001

Table 5-12 System board descriptions and part numbers (continued)

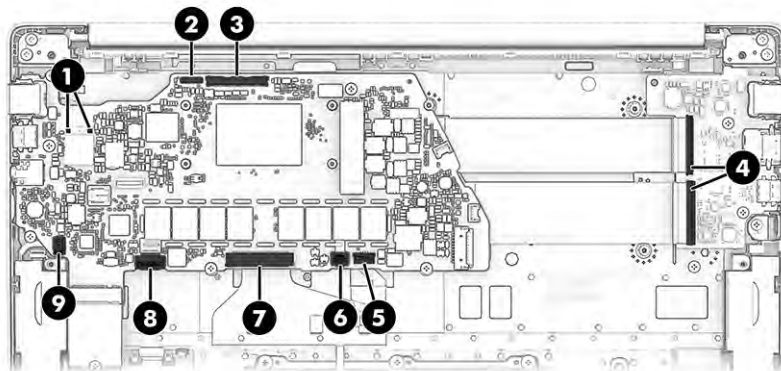
Description	Spare part number
Intel Pentium G7505 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57280-001
Intel Celeron 6305 processor, 8 GB of system memory, 64 GB of eMMC memory (models with a fingerprint sensor)	M57269-001
Intel Celeron 6305 processor, 4 GB of system memory, 64 GB of eMMC memory (models without a fingerprint sensor)	M57268-001

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).
4. Remove the fan (see [Fan on page 32](#)).
5. Remove the heat sink (see [Heat sink on page 33](#)).

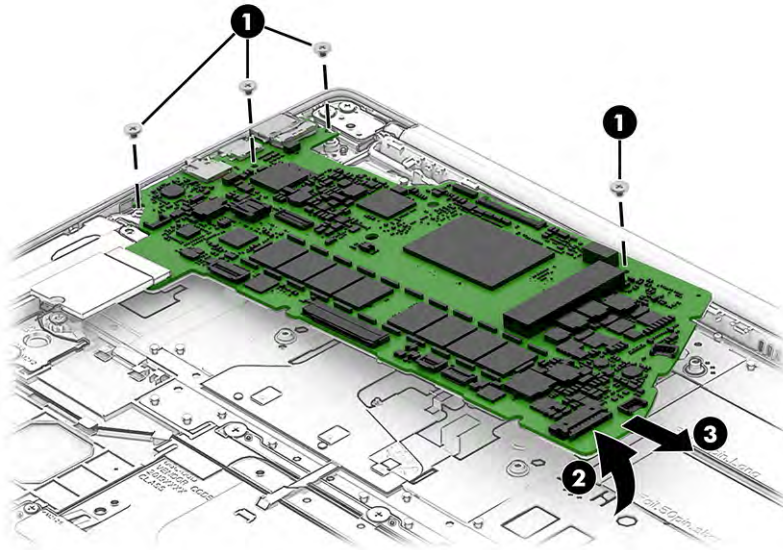
Remove the system board:

1. Disconnect the following cables from the system board:
 - Antenna cables from integrated WLAN module **(1)**
 - Camera cable **(2)**
 - Display cable **(3)**
 - USB board cables (ZIF) from USB board **(4)**
 - Keyboard backlight cable (ZIF) **(5)** (select products only)
 - Touchpad cable (ZIF) **(6)**
 - Keyboard cable (ZIF) **(7)**
 - Fingerprint reader cable (ZIF) **(8)**
 - Speaker cable **(9)**



2. Remove the four Phillips M2.0 × 2.0 screws **(1)** that secure the system board to the computer.

3. Lift the right side of the system board **(2)**, and then pull the board up and to the right to remove it **(3)**.



Reverse this procedure to install the system board.

Display assembly

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

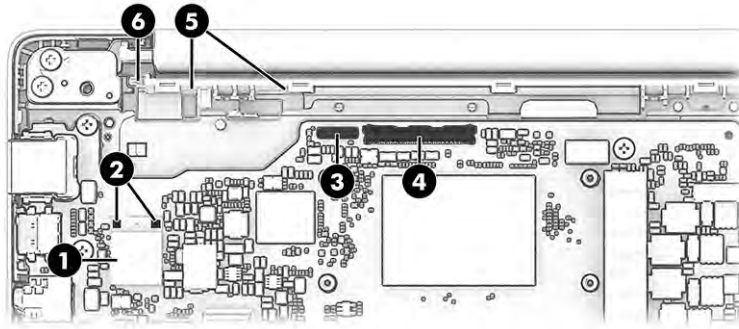
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 26](#)).
2. Remove the bottom cover (see [Bottom cover on page 26](#)).
3. Remove the battery (see [Battery on page 27](#)).
4. Remove the heat sink (see [Heat sink on page 33](#)).

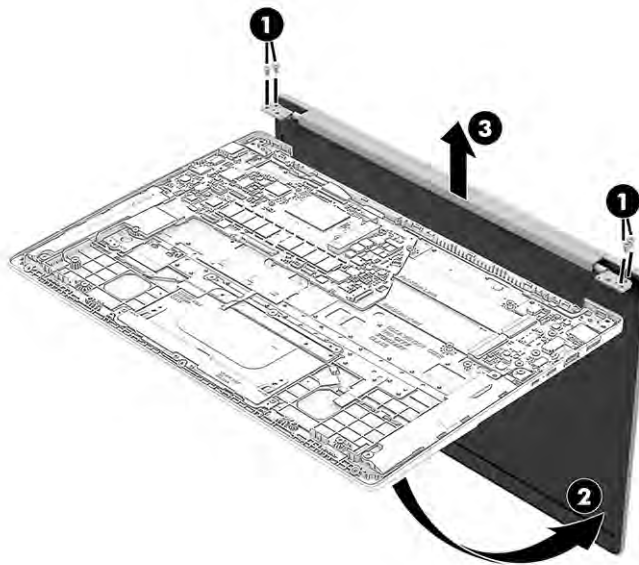
Remove the display assembly:

1. Remove the plastic that covers the integrated WLAN module **(1)**, and then disconnect the antennas from the module **(2)**.
2. Disconnect the camera cable **(3)**.
3. Disconnect the display cable **(4)**.
4. Remove the display cable from the clip at the top of the chassis **(5)**.

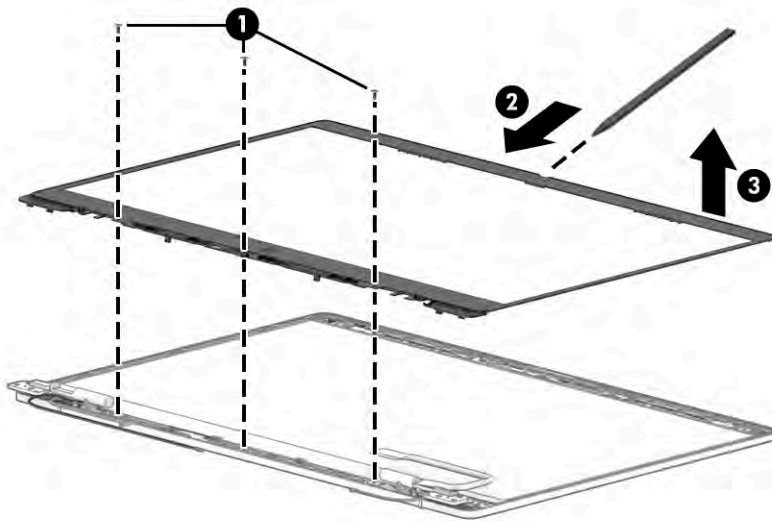
5. Remove the camera cable and one antenna cable from their routing at the top of the chassis **(6)**.



6. Remove the four Phillips M2.5 × 4.5 screws **(1)** that secure the display to the computer.
7. Open the computer to open the hinges **(2)**.
8. Separate the computer from the display **(3)**.

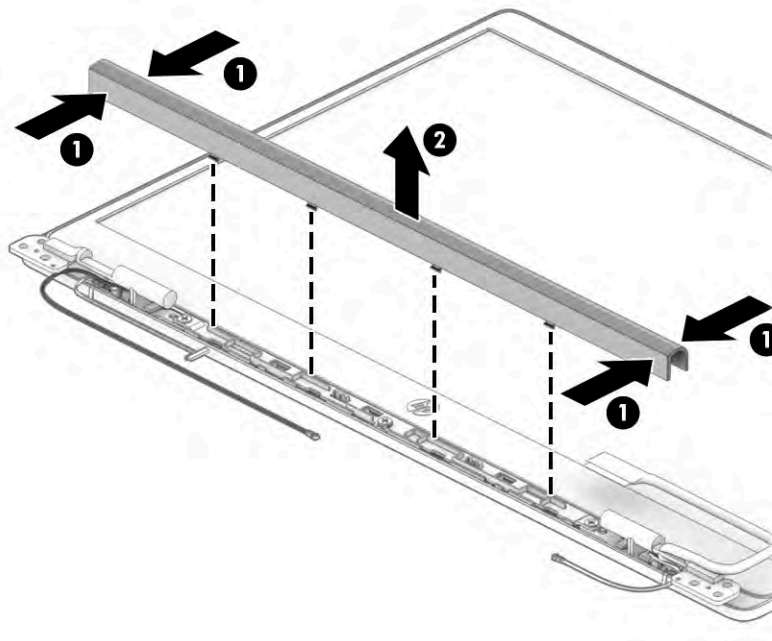


9. If you need to replace display assembly subcomponents:
 - a. Remove the three Phillips M2.0 × 3.0 screws **(1)** that secure the bezel to the display.
 - b. Slide a flat tool **(2)** under each side of the bezel to remove it **(3)**.The bezel is available as spare part number M59381-001.



- 10.** If you need to remove the hinge cover, squeeze near both ends of the cover **(1)**, and then pull the cover off the hinges **(2)**.

The hinge cover is available as spare part number M00441-001.



- 11.** If you need to remove the display panel:
- a.** Lift the bottom of the panel **(1)**.
 - b.** The display panel is secured to the display enclosure with tape that is installed under the left and right sides of the panel. To remove the panel, use tweezers to grasp the end of the tape **(2)**. While turning the tweezers, wrap the tape around the tweezers **(3)** as you continue to pull the tape out from behind the display panel **(4)**. You must pull the tape multiple times before it is completely removed.

- c. Rotate the display panel over and place it next to the display enclosure.

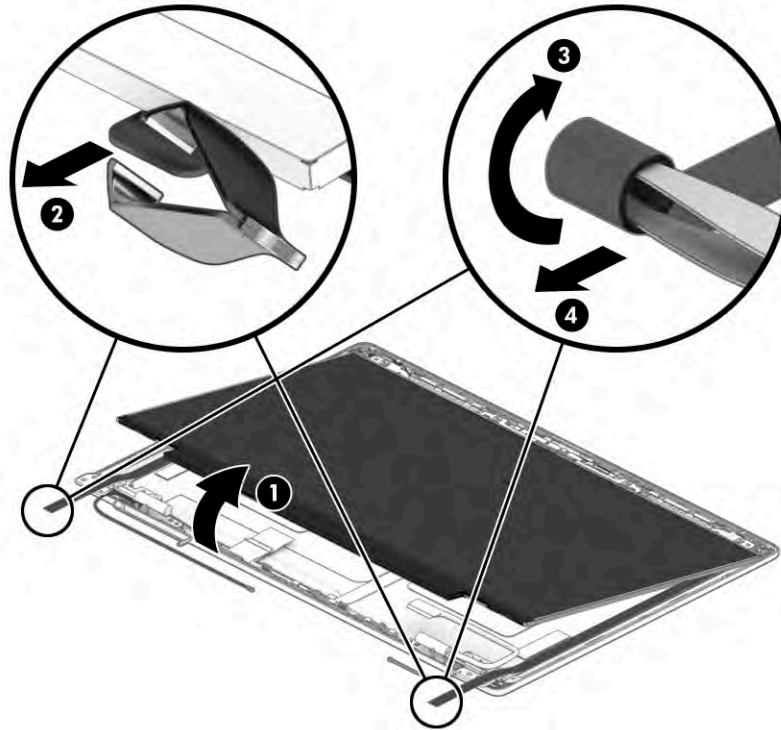
Display panels are available as the following spare part numbers:

M57293-001: FHD, nontouch

M57294-001: FHD, touch

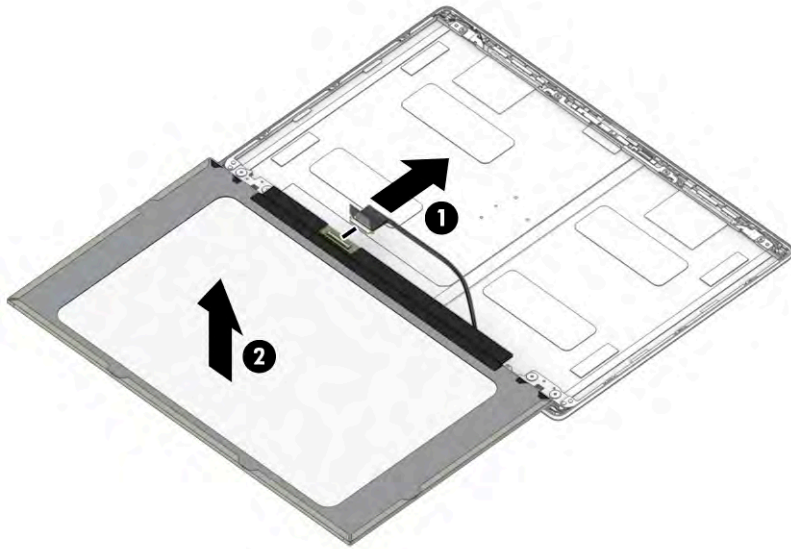
M57295-001: HD, nontouch

M57296-001: HD, touch



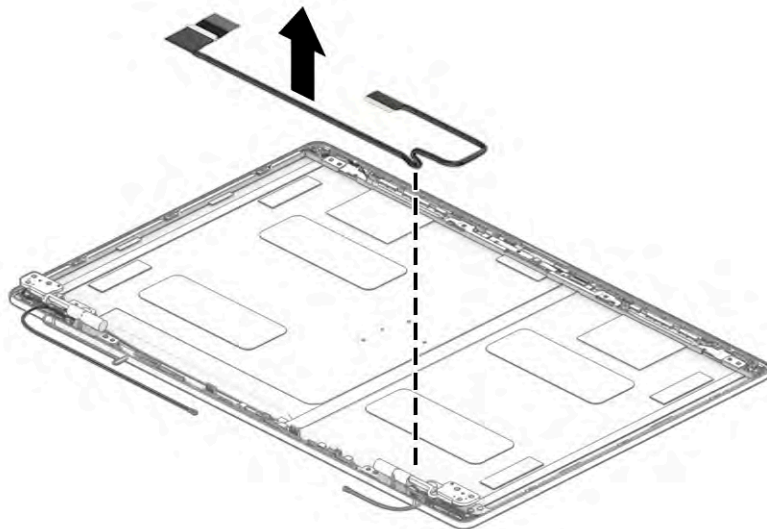
- d. Disconnect the cable from the panel (1).

- e. Remove the panel (2).



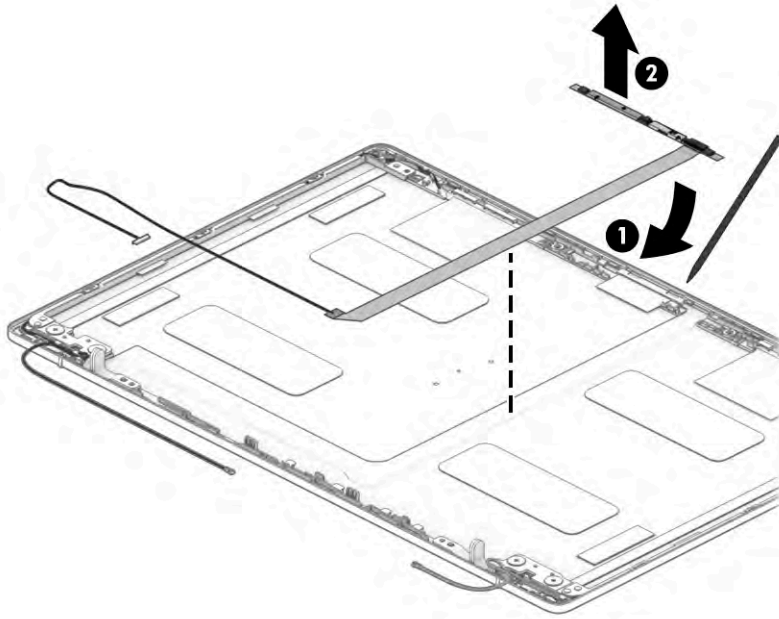
12. If you need to remove the display cable:

- ▲ Remove the cable from the right hinge and along the bottom of the display back cover. The display cable is available as spare part number M57292-001 for nontouch models and M57291-001 for touch models.

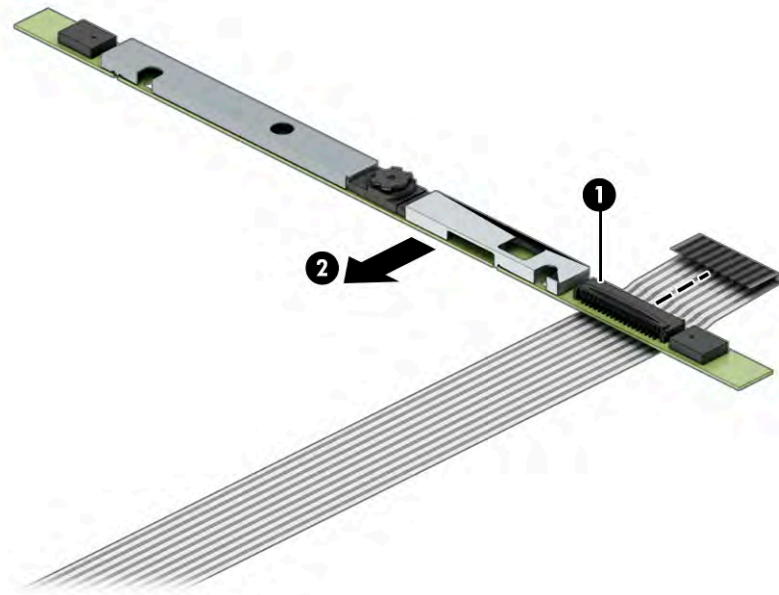


13. If you need to remove the camera module and cable:

- a. Use a flat tool to lift up evenly across the camera module to remove it from the display back cover **(1)**, and then remove the cable and module assembly **(2)**.

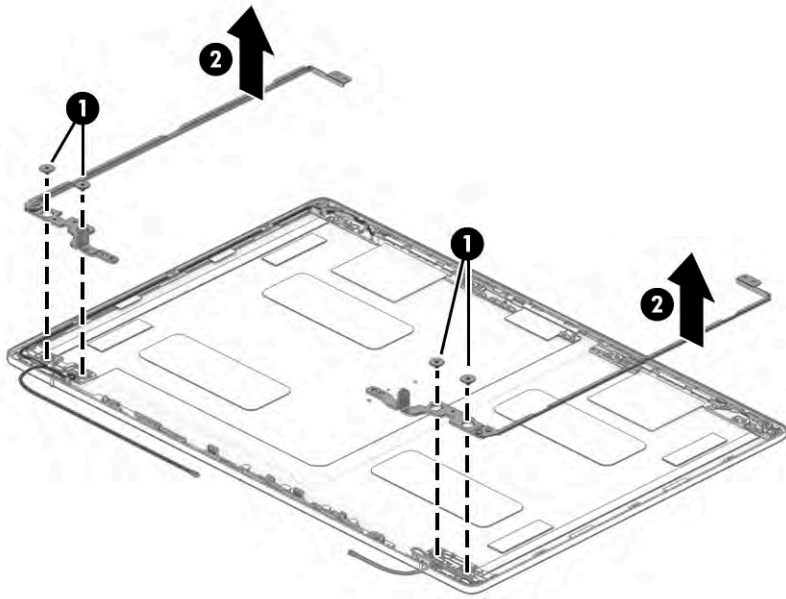


- b.** Lift the latch on the reverse ZIF connector on the camera module **(1)**, and then disconnect the cable **(2)**. The camera module is available as spare part number M00442-001. The camera cable is available as spare part number M12614-001.



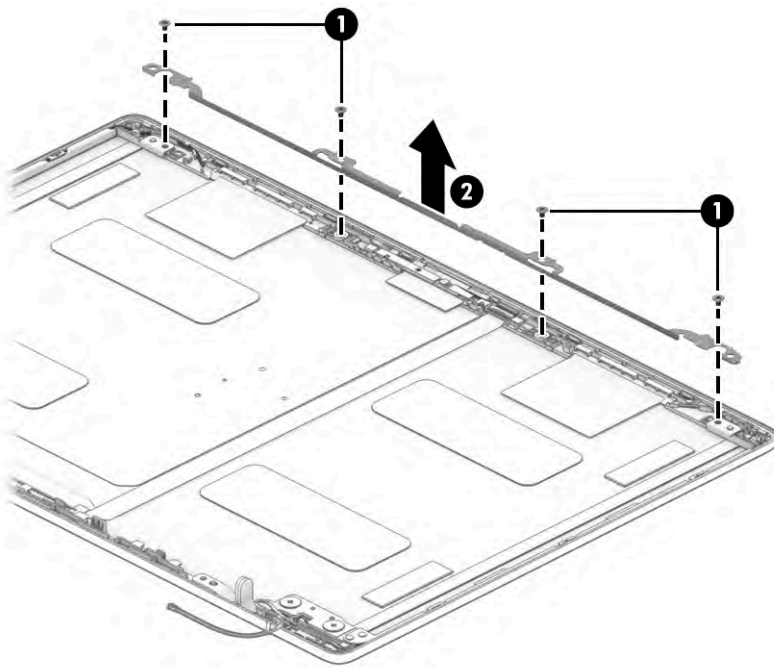
- 14.** If you need to remove the hinges from the display:
 - a.** Remove the two Phillips broad head M2.5 × 2.5 screws **(1)** from each hinge.
 - b.** Remove the hinges from the display **(2)**.

The display hinges are available as spare part number M77032-001.



- 15.** If you need to remove the top display bracket from the display:
- Remove the four Phillips broadhead M2.0 × 2.5 screws **(1)** from the bracket.
 - Remove the bracket from the display **(2)**.

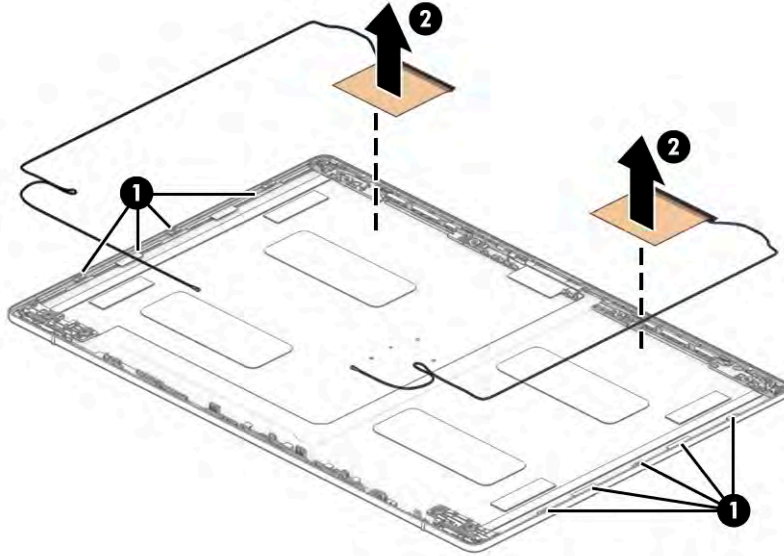
The bracket is available as spare part number M00700-001.



16. If you need to remove the antenna cables, remove the cables from the clips on the inside of the cover (1), and then peel the antennas off the cover to remove them (2).

Antenna cables are available as spare part number M00435-001.

The display back cover with dual antennas is available as spare part number M00439-001.



Reverse this procedure to reassemble and replace the display assembly.

Keyboard with top cover

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

Table 5-13 Keyboard with top cover descriptions and part numbers

Description	Spare part number
Keyboard with top cover, backlit, with fingerprint sensor	M57281-xx1
Keyboard with top cover, backlit, without fingerprint sensor	M57282-xx1
Keyboard with top cover, not backlit, without fingerprint sensor	M57283-xx1
Keyboard with top cover, not backlit, with fingerprint sensor	M57284-xx1

Table 5-14 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

Table 5-14 Spare part country codes (continued)

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
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

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 with the Chromebook Recovery Utility.

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. Under **Reset settings**, in the **Powerwash** section, select **Reset**.
3. In the window that appears, select **Powerwash**, and then select **Continue**.
4. 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.

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

Recovering

When your Chrome OS™ 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>.

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.
- Computer AC adapter. The computer must be plugged into AC power during recovery.
- The “Chrome OS 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 “Chrome OS is missing or damaged” screen.

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.

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.
-
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.

Recovering the Chrome operating system

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 “Chrome OS 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.

 **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 Chrome OS 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.

Computer specifications

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

Table 7-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	323.6 mm	12.8 in
Depth	221 mm	8.07 in
Height	16.5 mm	0.65 in
Weight		
	1.54 kg	3.4 lb
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 2.31 A – 45 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

35.6 cm (14.0 in) display specifications

This section provides specifications for your display.

Table 7-2 Display specifications

	Metric	U.S.
Active diagonal size	35.6 cm	14.0 in
Resolution	1920 × 1080 (FHD) 1368 × 766 (HD)	
Surface treatment	Antiglare	
Brightness	250 nits	
Viewing angle	UWVA (FHD panels) SVA (HD panels)	
Backlight	WLED	
Display panel interface	eDP	

8 Statement of memory volatility

For general information regarding nonvolatile memory in HP business computers, and to restore nonvolatile memory that can contain personal data after the system has been turned off and the hard drive has been removed, use these instructions.

HP business computer products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP, with the following assumptions:

- No subsequent modifications were made to the system.
- No applications, features, or functionality were added to or installed on the system.

Following system shutdown and removal of all power sources from an HP business computer system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and also remains in nonvolatile memory. Use the following steps to remove personal data from the computer, including the nonvolatile memory found in Intel-based and AMD-based system boards.



NOTE: If your tablet has a keyboard base, connect to the keyboard base before beginning steps in this chapter.

Current BIOS steps

Use these instructions to restore nonvolatile memory.

1. Follow these steps to restore the nonvolatile memory that can contain personal data. Restoring or reprogramming nonvolatile memory that does not store personal data is neither necessary nor recommended.

- a. Turn on or restart the computer, and then quickly press `esc`.



NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

- b. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes** to load defaults. The computer restarts.
- c. During the restart, press `esc` while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.



NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

- d. Select the **Security** menu, select **Restore Security Settings to Factory Defaults**, and then select **Yes** to restore security level defaults. The computer reboots.
- e. During the reboot, press `esc` while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.



NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

- f. If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select **Asset Tracking Number**. Clear the tag, and then make the selection to return to the prior menu.

- g. If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Utilities** under the **Utilities** menu. Select **Hard Drive Utilities**, select **DriveLock**, and then clear the check box for **DriveLock password on restart**. Select **OK** to proceed.
- h. Select the **Main** menu, and then select **Reset BIOS Security to factory default**. Select **Yes** at the warning message. The computer reboots.
- i. During the reboot, press **esc** while the "Press the ESC key for Startup Menu" message is displayed at the bottom of the screen.



NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

- j. Select the **Main** menu, select **Apply Factory Defaults and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.
 - k. Reboot the system. If the system has a Trusted Platform Module (TPM), fingerprint reader, or both, one or two prompts will appear—one to clear the TPM and the other to Reset Fingerprint Sensor. Press or tap **f1** to accept or **f2** to reject.
 - l. Remove all power and system batteries for at least 24 hours.
2. Complete one of the following:
- Remove and retain the storage drive.
– or –
 - Clear the drive contents by using a third-party utility designed to erase data from an SSD.
– or –
 - Clear the contents of the drive by using the following BIOS Setup Secure Erase command option steps:

If you clear data using Secure Erase, you cannot recover it.

- a. Turn on or restart the computer, and then quickly press **esc**.
- b. Select the **Security** menu and scroll down to the **esc** menu.
- c. Select **Hard Drive Utilities**.
- d. Under **Utilities**, select **Secure Erase**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

– or –

Clear the contents of the drive using the following Disk Sanitizer commands steps:

- i. Turn on or restart the computer, and then quickly press **esc**.
- ii. Select the **Security** menu and scroll down to the **Utilities** menu.
- iii. Select **Hard Drive Utilities**.
- iv. Under **Utilities**, select **Disk Sanitizer**, select the hard drive with the data that you want to clear, and then follow the on-screen instructions to continue.



NOTE: The amount of time it takes for Disk Sanitizer to run can take several hours. Plug the computer into an AC outlet before starting.

Nonvolatile memory usage

Use this table to troubleshooting nonvolatile memory usage.

Table 8-1 Troubleshooting steps for nonvolatile memory usage

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data entered into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	8 MB	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical computer configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select products only) on page 59 .	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using Computer Setup (BIOS), or by changing the Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KB (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility must be used to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC nonfunctional.
DIMM Serial Presence Detect (SPD) configuration data	256 bytes per memory module, 128 bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a computer. The specific write-protection method varies by memory vendor.
System BIOS	9 MB	Yes	Yes	Stores system BIOS code and computer configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are entered using the Computer Setup (BIOS) or a custom utility.	NOTE: Writing data to this ROM in an inappropriate manner can render the computer nonfunctional. A utility must be used for writing data to this memory and is available


Table 8-1 Troubleshooting steps for nonvolatile memory usage (continued)

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data entered into this memory?	How is this memory write-protected?
Intel Management Engine Firmware (present only in select Elite or Z models. For more information, go to http://www.hp.com/support . Select Identify your product for manuals and specific product information , and then follow the on-screen instructions.)	1.5 MB or 7 MB	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third-party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	on the HP website; go to http://www.hp.com/support . Select Find your product , and then follow the on-screen instructions.
Bluetooth flash (select products only)	2 megabits	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility must be used for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 kilobits to 8 kilobits	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility must be used for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Camera (select products only)	64 kilobits	No	Yes	Stores camera configuration and firmware.	Camera memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility must be used for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader (select products only)	512 KB flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

Use this section to answer your questions about nonvolatile memory.

1. How can the BIOS settings be restored (returned to factory settings)?

 **IMPORTANT:** The restore defaults feature does not securely erase any information on your hard drive. See question and answer 6 for steps to securely erase information.

The restore defaults feature does not reset the Custom Secure Boot keys. See question and answer 7 for information about resetting the keys.

- a. Turn on or restart the computer, and then quickly press `esc`.
- b. Select **Main**, and then select **Apply Factory Defaults and Exit**.
- c. Follow the on-screen instructions.
- d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

2. What is a UEFI BIOS, and how is it different from a legacy BIOS?

The Unified Extensible Firmware Interface (UEFI) BIOS is an industry-standard software interface between the platform firmware and an operating system (OS). It replaces the older BIOS architecture but supports much of the legacy BIOS functionality.

Like the legacy BIOS, the UEFI BIOS provides an interface to display the system information and configuration settings and to change the configuration of your computer before an OS is loaded. BIOS provides a secure runtime environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (touch screen, touchpad, pointing stick, or USB mouse) or the keyboard to navigate and make menu and configuration selections. The UEFI BIOS also contains basic system diagnostics.

The UEFI BIOS provides functionality beyond that of the legacy BIOS. In addition, the UEFI BIOS works to initialize the computer's hardware before loading and executing the OS; the runtime environment allows the loading and execution of software programs from storage devices to provide more functionality, such as advanced hardware diagnostics (with the ability to display more detailed system information) and advanced firmware management and recovery software.

HP has provided options in Computer Setup (BIOS) to allow you to run in legacy BIOS, if required by the operating system. Examples of this requirement would be if you upgrade or downgrade the OS.

3. Where is the UEFI BIOS located?

The UEFI BIOS is located on a flash memory chip. You must use a utility to write to the chip.


4. What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory module? How would this data be written?

The DIMM SPD memory contains information about the memory module, such as size, serial number, data width, speed and timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. You cannot write to this EEPROM when the memory module is installed in a computer. Third-party tools do exist that can write to the EEPROM when the memory module is not installed in a computer. Various third-party tools are available to read SPD memory.

5. What is meant by “Restore the nonvolatile memory found in Intel-based system boards”?

This message relates to clearing the Real Time Clock (RTC) CMOS memory that contains computer configuration data.

6. How can the BIOS security be reset to factory defaults and erase the data?

 **IMPORTANT:** Resetting results in the loss of information.

These steps do not reset Custom Secure Boot Keys. See question and answer 7 for information about resetting the keys.

- a. Turn on or restart the computer, and then quickly press **esc**.
- b. Select **Main**, and then select **Reset Security to Factory Defaults**.
- c. Follow the on-screen instructions.
- d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

7. How can the Custom Secure Boot Keys be reset?

Secure Boot is a feature to ensure that only authenticated code can start on a platform. If you enabled Secure Boot and created Custom Secure Boot Keys, disabling Secure Boot does not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure that you used to create the Custom Secure Boot Keys, but select to clear or delete all Secure Boot Keys.

- a. Turn on or restart the computer, and then quickly press **esc**.
- b. Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.
- c. At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors your computer's BIOS for attacks or corruption.

If the BIOS becomes corrupted or is attacked, HP Sure Start restores the BIOS to its previously safe state, without user intervention. Those select computer models ship with HP Sure Start configured and enabled. HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. Advanced users can customize the default configuration.

To access the latest documentation on HP Sure Start, go to <http://www.hp.com/support>.

9 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 9-1 Power cord requirements for specific countries and regions

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

Table 9-1 Power cord requirements for specific countries and regions (continued)

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

1. The flexible cord must be Type H05VV-F, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, three-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.
3. The appliance coupler, flexible cord, and wall plug must bear a T mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, three-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) configuration.
4. The flexible cord must be Type RVV, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
5. The flexible cord must be Type H05VV-F three-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF three-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F three-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.

10 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>.

Index

A

- AC adapter light 4, 6
- action keys
 - identifying 8
- audio-in (microphone) jack,
 - identifying 4
- audio-out (headphone) jack,
 - identifying 4

B

- backing up 49
- battery
 - light 4, 6
- Bluetooth label 10
- bottom cover
 - removal 26
 - spare part number 26
- buttons
 - power 9

C

- camera 7
 - identifying 7
- camera light, identifying 7
- camera privacy cover, identifying 7
- caring for your computer 22
- cautions
 - electrostatic discharge 18, 19
- Chromebook Recovery Utility,
 - installing 50
- cleaning your computer 22
 - caring for wood veneer 24
 - disinfecting 23
 - HP Easy Clean 22
 - removing dirt and debris 22
- components
 - bottom 9
 - display 6
 - keyboard area 7
 - left side 5
 - right side 4
- computer major components 12
- computer specifications 52

D

- display
 - specifications 52
- display assembly
 - subcomponents 14

E

- electrostatic discharge (ESD) 18, 19
 - preventing damage 18, 19, 20
- esc key, identifying 8

F

- fan
 - removal 32
 - spare part number 32
- fingerprint reader, identifying 8
- fingerprint sensor board
 - removal 32
 - spare part numbers 32

G

- grounding methods 18, 19, 20
- guidelines
 - packaging 18, 24
 - transporting 18, 24
 - workstation 18

H

- hard drive
 - specifications 52
- HDMI port, identifying 5
- headphone (audio-out) jack 4
- heat sink
 - removal 33
 - spare part numbers 33
- HP Sure Start 54, 59

I

- illustrated parts catalog 12
- internal microphones, identifying 6

J

- jacks
 - audio-in (microphone) 4
 - audio-out (headphone) 4

K

- keyboard
 - product description 2
- keyboard with top cover
 - spare part numbers 47
- keys
 - esc 8
 - search 9

L

- labels
 - Bluetooth 10
 - regulatory 10
 - serial number 10
 - service 10
 - wireless certification 10
 - WLAN 10
- lights
 - AC adapter and battery 4, 6
 - camera 7
- lock bracket
 - removal 35
 - spare part number 35

M

- memory
 - nonvolatile 54
 - volatile 54
- memory card reader, identifying 4
- microphone (audio-in) jack,
 - identifying 4
- miscellaneous parts, spare part number 16

N

- nonvolatile memory 54

P

- packaging guidelines 18, 24
- pointing device, product description 2
- ports
 - HDMI 5
 - product description 2

- USB SuperSpeed 5
- USB Type-C power connector and SuperSpeed port 5, 6
- power button, identifying 9
- power cord
 - requirements for all countries 60
 - requirements for specific countries and regions 60
 - set requirements 60
- product description
 - keyboard 2
 - pointing device 2
 - ports 2
- product name and number, computer 10

R

- recovery media
 - creating 50
 - erase 51
- recovery, performing 49
- regulatory information
 - regulatory label 10
 - wireless certification labels 10
- removal and replacement
 - procedures 26
 - solid-state drive 29
- removing personal data from volatile system memory 54
- resetting 49

S

- search key, identifying 9
- security cable slot, identifying 6
- serial number, computer 10
- service labels, locating 10
- solid-state drive
 - removal and replacement 29
- spare part country codes 47
- speaker
 - removal 29
 - spare part numbers 29
- speakers, identifying 8
- specifications
 - computer 52
 - display 52
 - hard drive 52
- static electricity 18, 19
- support information 24

- system board
 - removal 38
 - spare part numbers 38
- system memory, removing personal data from volatile 54
- system recovery
 - Chrome operating system 50
 - Chromebook Recovery Utility 50
 - recovery media 50

T

- touchpad
 - removal 30
 - spare part numbers 30
- touchpad zone, identifying 7
- transporting guidelines 18, 24
- traveling with the computer 10

U

- USB board
 - illustrated 13
 - removal 36
 - spare part number 13
 - spare part numbers 36
- USB door
 - removal 37
 - spare part numbers 37
- USB SuperSpeed port, identifying 5
- USB Type-C power connector and SuperSpeed port, identifying 5, 6

V

- vent, identifying 9

W

- wireless certification label 10
- WLAN antennas, identifying 6
- WLAN device 10
- WLAN label 10
- workstation guidelines 18