Maintenance and Service Guide

SUMMARY

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

Product notice

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

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. Go to http://www.microsoft.com for details.

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

Software terms

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

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	**HP 240 G8 Notebook PC**
Processor	Intel® Core® i7-1065G7 (1.3 GHz, 4 cores, 8 MB L3 cache, 12 W)
	Intel Core i5-1035G1 (1.0 GHz, 4 cores, 6 MB L3 cache, 12 W)
	Intel Core i3-1005G1 (1.2 GHz, 4 cores, 4 MB L3 cache, 13 W)
	Intel Pentium® 6805 (2.0 GHz, 2 cores, 4 MB L3 cache, 15 W)
	Intel Pentium Silver N5030 (1.1 GHz, 4 MB L2 cache, 4 cores, 6 W)
	Intel Celeron® N4020 (1.1 GHz, 4 MG L2 cache, 2 cores, 6 W)
Graphics	Supports HD decode, DX12, and HDMI
	Internal graphics
	Intel Iris® Plus Graphics (i7 processors)
	Intel UHD Graphics 620 (i5/i3 processors)
	Intel UHD Graphics 605 (Pentium processors)
	Intel UHD Graphics 600 (Celeron processors)
	Hybrid graphics
	AMD® Radeon™ 620 graphics
Panel	**35.6 cm (14.0 in), WLED, antiglare, eDP, slim-flat (3.0 mm), 16:9 ultrawide aspect ratio, narrow bezel**
	High definition (HD) (1366 × 768), SVA
	Full high-definition (FHD) (1920 × 1080), UWVA
Memory	**Two memory module slots** (Intel Core processors)
	Memory is not customer accessible/non-upgradeable
	DDR4-2666 dual-channel support
	Supports up to 16 GB of system RAM in the following configurations:
	● 16384 MB (8192 MB × 2)
	● 12288 MB (8192 MB × 1 + 4096 MB × 1)
	● 8192 MB (8192 MB × 1 or 4096 × 2)
	● 4096 MB (4096 MB × 1)
	One SODIMM slot (Intel Pentium and Celeron processors)
	Memory is not customer accessible/non-upgradeable

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

Category	Description
	DDR4-2400 dual-channel support (DDR4-3200 bridge to DDR4-2666, DDR4-2666 downgrade to DDR-2400)
	Supports up to 8 GB of system RAM in the following configurations:
	• 8192 MB (8192 MB × 1)
	• 4096 MB (4096 MB × 1)
Primary storage	**Single hard drive configurations, 6.35 cm (2.5 in), 7.0/7.2 mm, SATA hard drives**
	1 TB, 5400 rpm, 7.2 mm
	1 TB, 5400 rpm + 16 GB Optane™ memory
	500 GB, 7200 rpm, 7.0 mm
	500 GB, 5400 rpm, 7.0 mm
	M.2, SATA-3, TLC, solid-state drives
	256 GB
	128 GB
	PCIe, NVMe, M.2 solid-state drives
	1 TB
	512 GB
	512 GB + 32 GB Optane memory
	256 GB
	256 GB + 16 GB Optane memory
	Dual storage configurations
	256 GB, PCIe, solid-state drive + 1 TB, 5400 rpm hard drive
	128 GB, SATA-3, TLC, solid-state drive + 1 TB, 5400 rpm hard drive
	eMMC v5.0
	64 GB
Camera	**HP TrueVision HD Camera**: Indicator LED, USB2.0, HD BSI sensor, f2.0
	720p by 30 frames per second
	Single digital microphone
	HP Webcam: VGA camera, indicator LED, USB2.0, f2.4
	640 × 480 by 30 frames per second
	Single digital microphone
Audio	**Audio Application Name**: HP Audio Control
	Dual speakers
RJ-45 (network)	Realtek RTL8111HSH-CG
Wireless networking	Compatible with Miracast®-certified devices

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

Category	Description
	Integrated Wireless options with dual antennas
	Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth® 5 (MU-MIMO supported)
	Intel Wi-Fi 6 AX201 + Bluetooth 5 (non-vPro®) (802.11ax 2 × 2, MU-MIMO, supporting gigabit file transfer speeds)
	Integrated Wireless options with single antenna
	Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)
Media card reader	HP Multi-Format Digital Media Card Reader
	Supports SD™/SDHC™/SDXC™
	Push-pull insertion/removal
Internal card expansion	One M.2 slot for solid-state drive
	One M.2 slot for WLAN
Ports	Hot plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected)
	HDMI v1.4 supporting: up to 1920 × 1080 @ 60 Hz
	USB 3.2 Gen 1 Type-C
	(2) USB 3.2 Gen 1 Type-A
	RJ-45 (network) jack
	Audio-out (headphone)/audio-in (microphone) combo jack
	AC Smart Pin adapter plug
Keyboard/pointing devices	**Keyboard**
	Full-size, textured, island-style keyboard
	Touchpad with image sensor
	Multitouch gestures enabled
	Support Modern Trackpad Gestures
	Taps enabled by default
Power requirements	**Battery** (prismatic/polymer)
	4 cell, 46 Whr
	3 cell, 41 Whr
	Battery life enhancement
	Supports battery fast charge, 45 mins/50% charge
	AC adapter, standard barrel
	45 W Smart, nPFC, right angle, 4.5 mm
	45 W Smart, nPFC, 4.5 mm, EM
	65 W Smart, nPFC, 4.5 mm, standard barrel

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

Category	Description
	65 W Smart, nPFC, 4.5 mm, right angle
	65 W Smart, nPFC, 4.5 mm, EM
	Power cord (C5)
	1 m (3.3 ft), conventional
Security	Kensington Mini Security Slot
	Supports Trusted Platform Module (TPM) 2.0
Operating system	FreeDOS 3.0
	Windows® 10 Home 64
	Windows 10 Home 64 Chinese Market CPPP
	Windows 10 Home 64 High-end Chinese Market CPPP
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market PPP
	Windows 10 Home 64 Plus Single Language Indonesia Market PPP
	Windows 10 Home 64 Single Language
	Windows 10 Home 64 Single Language Africa Market PPP
	Windows 10 Home 64 Single Language APAC EM PPP
	Windows 10 Home 64 Single Language India Market PPP
	Windows 10 Home 64 Single Language Indonesia Market PPP
	Windows 10 Home 64 StF MSNA for Higher Education
	Windows 10 Home 64 Value Single Language
	Windows 10 Pro 64
	Windows 10 Pro 64 Chinese Market
	Windows 10 Pro 64 Entry
	Windows 10 Pro 64 StF MSNA
	Windows 10 Pro 64 StF MSNA Emerging Market
	Windows 10 Pro 64 StF MSNA Plus
	Windows 10 Pro 64 StF MSNA Standard
	Windows 10 Pro 64 StF MSNA Strategic
Serviceability	**End user replaceable parts**
	AC adapter

2   Getting to know your computer

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

Right side

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)	Audio-out (headphone)/ Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.
		WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.
		To access this guide:
		▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.
		NOTE: When a device is connected to the jack, the computer speakers are disabled.
(2)	USB SuperSpeed ports (2)	Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.
		NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
(3)	HDMI port	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.
(4)	RJ-45 (network) jack/ status lights	Connects a network cable.
		● White: The network is connected.
		● Amber: Activity is occurring on the network.
(5)	AC adapter and battery light	● White: The AC adapter is connected and the battery is fully charged.
		● Blinking white: The AC adapter is disconnected and the battery has reached a low battery level.
		● Amber: The AC adapter is connected and the battery is charging.

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

Component		Description
		● Off: The battery is not charging.
(6)	⏚	Power connector	Connects an AC adapter.

Left side

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

Table 2-2 Left-side components and their descriptions

Component		Description
(1)	🔒 Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen.
(2)	⟜ USB Type-C® port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. **NOTE:** Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.
(3)	SD Memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.
(4)	⛁ Drive light	Blinking white: The hard drive is being accessed.
(5)	⏻ Power light	● On: The computer is on. ● Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.

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

Component	Description
	● Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.

Display

Use the illustration and table to identify the display components.
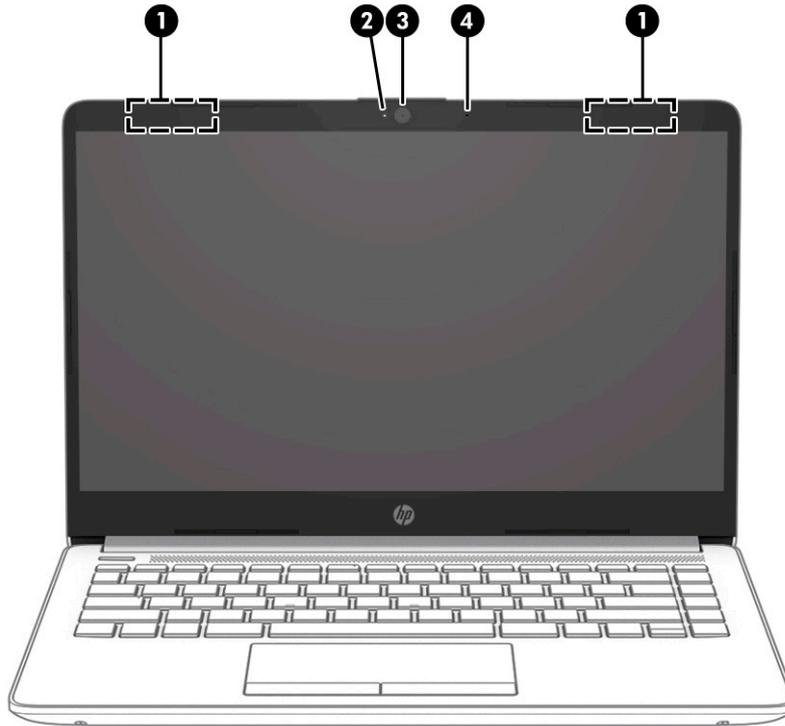
Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Camera light	On: The camera is in use.
(3)	Camera	Allows you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon.
		NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(4)	Internal microphone	Records sound.

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

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

To access this guide:

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

Component	Description
▲	Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.

Keyboard area

Keyboards can vary by language.

Touchpad

Use the illustration and table to identify the touchpad components.
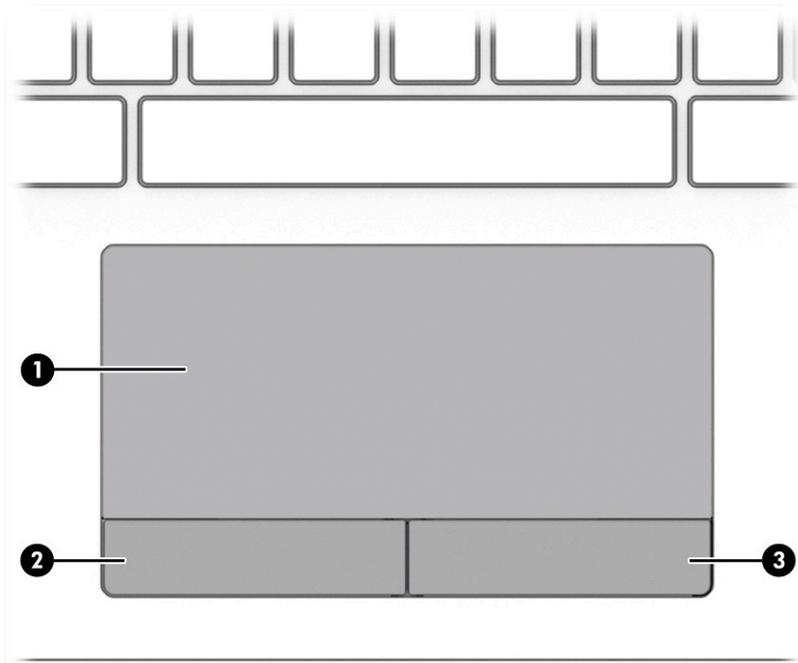
Table 2-4 TouchPad components and their descriptions

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

Lights

Use the illustration and table to identify the lights on the computer.
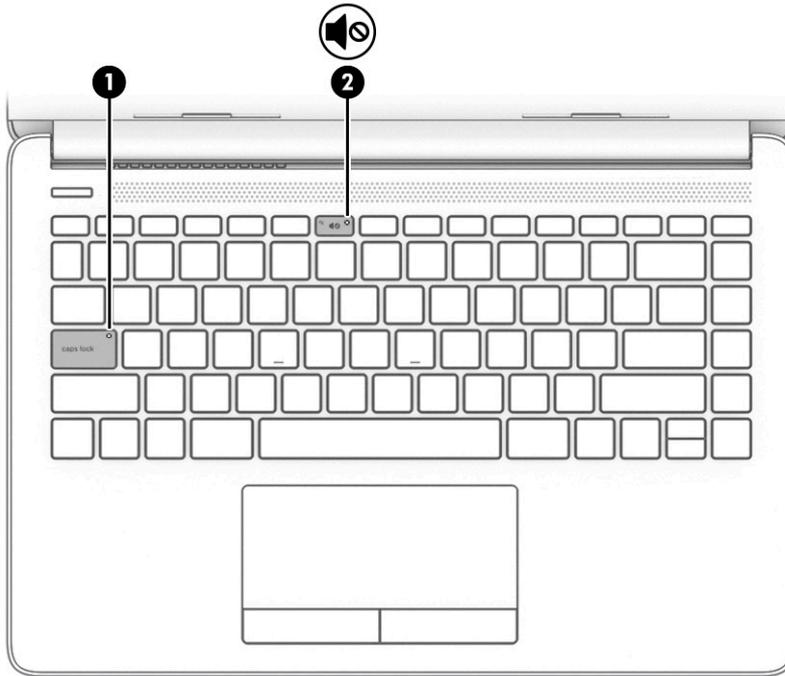
Table 2-5 Lights and their descriptions

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

Button, vent, and speakers

Use the illustration and table to identify the button, vent, and speakers on the computer.
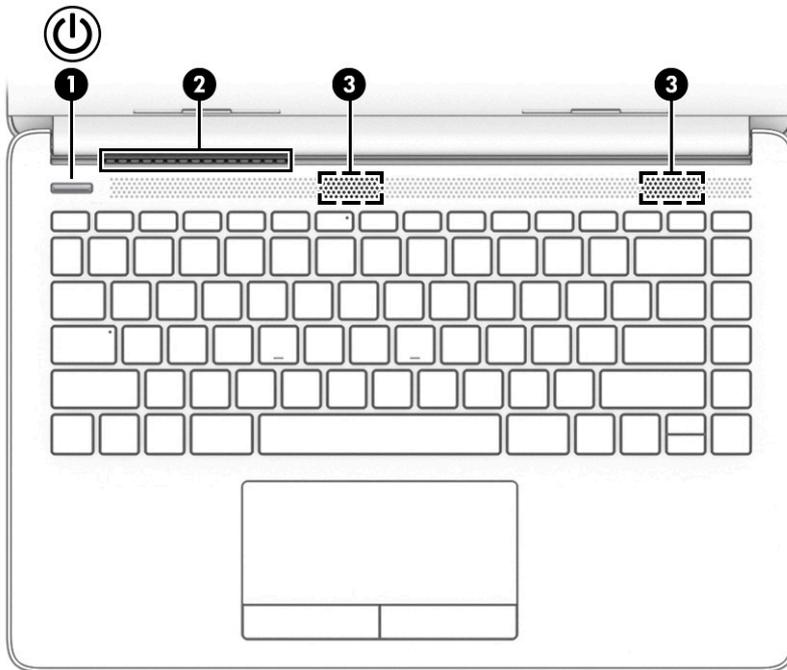
Table 2-6 Button, vent, and speakers and their descriptions

Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer.
		• When the computer is on, press the button briefly to initiate Sleep.
		• When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only).
		• When the computer is in Hibernation, press the button briefly to exit Hibernation.
		IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.
		If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 4 seconds to turn off the computer.
		To learn more about your power settings, see your power options:
		▲ Right-click the **Power** icon, and then select **Power Options**.
(2)	Vent	Enables airflow to cool internal components.
		NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	Speakers (2)	Produce sound.

Special keys

Use the illustration and table to identify the special keys.
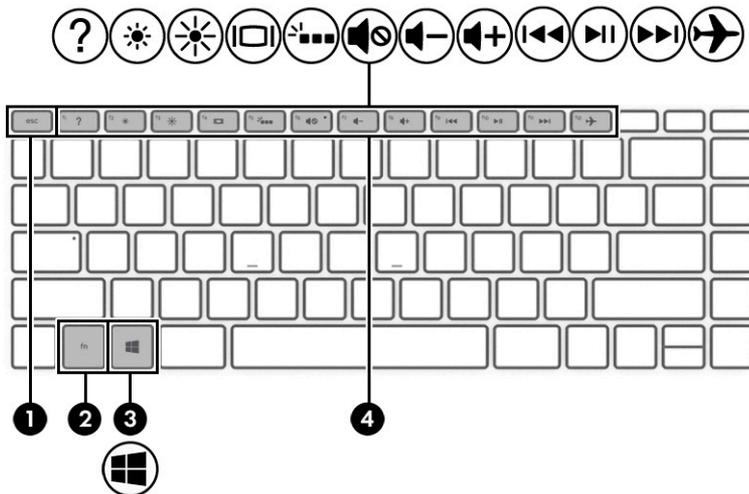
Table 2-7 Special keys and their descriptions

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows key	Opens the Start menu. **NOTE:** Pressing the Windows key again will close the Start menu.
(4)	Action keys	Execute frequently used system functions. **NOTE:** On select products, the f5 action key turns the keyboard backlight feature off or on.

Bottom

Use the illustration and table to identify the bottom component.
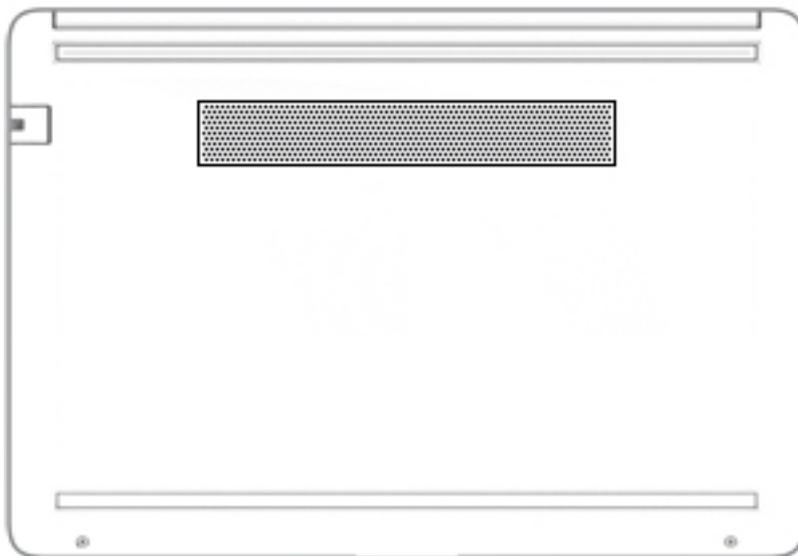
Table 2-8 Bottom components and their descriptions

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

Labels

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

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

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

  Your service label will resemble one of these examples. Refer to the illustration that most closely matches the service label on your computer.
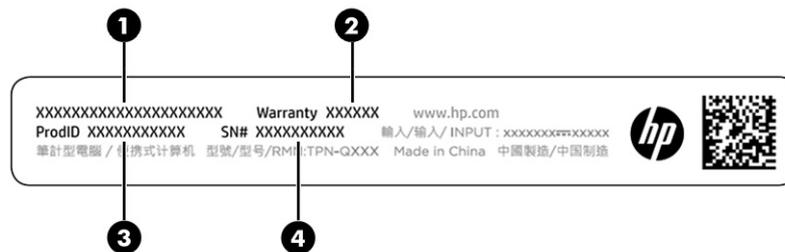
Table 2-9 Service label components

Component	
(1)	HP product name
(2)	Warranty period
(3)	Product ID
(4)	Serial number
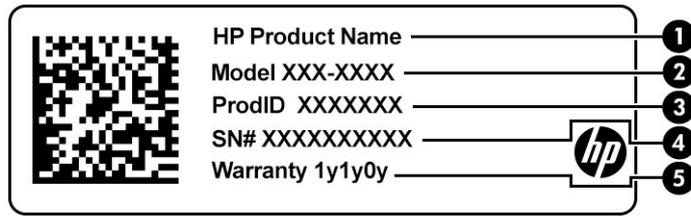
Table 2-10 Service label components

Component	
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period
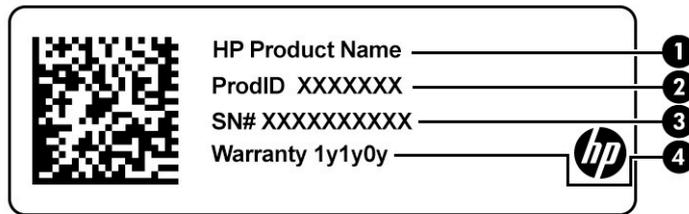
Table 2-11 Service label components

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

● 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.
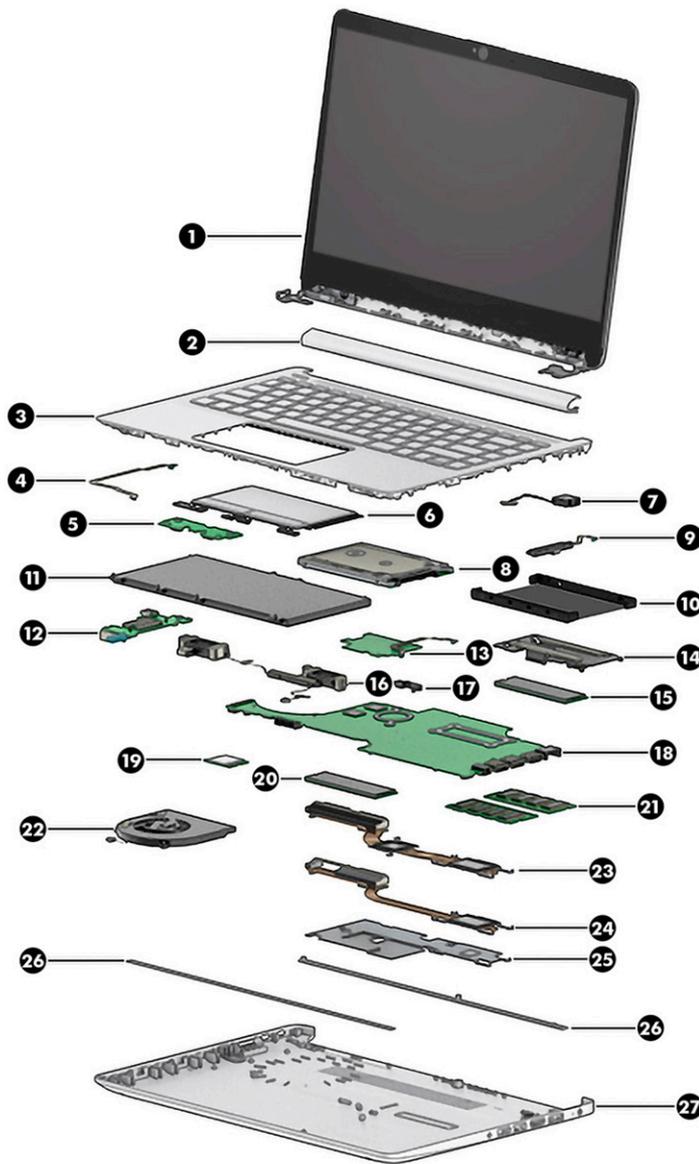
Table 3-1 Computer major components and their descriptions

Item	Component	Spare part number
(1)	**Display assembly**	
	NOTE: Displays are available as spare parts only at the subcomponent level. For display assembly spare part information, see Display assembly on page 48.	
(2)	**Hinge cover**	M23371-001
(3)	**Top cover with keyboard**	
	NOTE: For a detailed list of keyboard country codes, see Top cover with keyboard on page 55.	
	Black	M23367-xx1
	Silver	M42490-xx1
(4)	**Touchpad board cable**	L23184-001
(5)	**Touchpad click board**	L24486-001
	NOTE: The touchpad click board cable is available using spare part number L24485-001.	
(6)	**Touchpad board**	L24484-001
(7)	**Power connector**	L23188-001
(8)	**Hard drive** (does not include bracket)	
	1 TB, 5400 rpm, 7 mm	L30422-005
	500 GB, 7200 rpm, 7 mm	703267-005
	500 GB, 5400 rpm, 7 mm	778186-005
(9)	**Hard drive cable**	L23187-001
(10)	**Hard drive bracket**	L24490-001
(11)	**Battery**	
	3 cell, 41 Whr	L11119-855
	4 cell, 46 Whr	L71607-005
(12)	**USB board**	L24483-001
	NOTE: The USB board cable is available using spare part number L23186-001.	
(13)	**SSD board**	L24487-001
	NOTE: The SSD board cable is available using spare part number L23397-001.	
(14)	**SSD bracket**	L24488-001
	eMMC bracket (not illustrated)	L23387-001
(15)	**eMMC module, 64 GB** (not illustrated)	L83333-001
(16)	**Speakers**	L24489-001
(17)	**System board hook**	L88007-001
(18)	**System board** (includes replacement thermal materials)	
	All system boards use the following part numbers:	
	xxxxxx-001: non-Windows operating system	

Table 3-1 Computer major components and their descriptions (continued)

Item	Component	Spare part number
	xxxxxx-601: Windows operating system	
	For use in models with discrete graphics memory:	
	● Intel Core i7-1065G7 processor	M23363-xxx
	● Intel Core i5-1035G1 processor	L89468-xxx
	● Intel Core i3-1005G1 processor	M13938-xxx
	For use in models with UMA graphics memory:	
	● Intel Core i7-1065G7 processor	M23360-xxx
	● Intel Core i5-1035G1 processor	L89470-xxx
	● Intel Core i3-1005G1 processor	L89469-xxx
	● Intel Pentium Silver N5030 processor	L85889-xxx
	● Intel Pentium 6805U processor	M33066-xxx
	● Intel Celeron N4020 processor	L85887-xxx
	● Intel Celeron N4020 processor with 64 GB of eMMC memory	L85886-xxx
(19)	**WLAN module**	
	Dual antennas:	
	● Intel Wi-Fi 6 AX201 (NGW) 802.11ax 2 × 2 Wi-Fi + Bluetooth 5 (non-vPro)	L57250-005
	● Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + BT 5.0 Combo Adapter (MU-MIMO supported)	L44796-005
	Single antenna:	
	● Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + BT 4.2 Combo Adapter (MU-MIMO supported)	L17365-005
(20)	**Solid-state drive**	
	PCIe:	
	● 1 TB	L85370-005
	● 512 GB	L85364-005
	● 512 GB + 32 GB Optane memory	L85366-005
	● 256 GB	L85354-005
	● 256 GB + 16 GB Optane memory	L85356-005
	● 16 GB Optane memory module	L85372-005
	SATA-3, TLC:	
	● 256 GB	938184-855
	● 128 GB	L85346-005
(21)	**Memory module**	
	4 GB	L10598-855
	8 GB	937236-855

Table 3-1 Computer major components and their descriptions (continued)

Item	Component	Spare part number
(22)	**Fan**	L23189-001
	Heat sink assembly (includes replacement thermal materials)	
(23)	For use in models with discrete graphics memory	L96693-001
(24)	For use in models with UMA graphics memory with a system fan	L96692-001
(25)	For use in models with UMA graphics memory without a system fan	L23190-001
(26)	**Rubber Feet** (includes front and rear feet)	M23369-001
(27)	**Bottom cover**	
	Dark ash silver for use in models with a 3-cell battery	M23373-001
	Dark ash silver for use in models with a 4-cell battery	M23374-001
	Asteroid silver	M42492-001

Display assembly subcomponents

To identify the display assembly subcomponents, use this illustration and table.
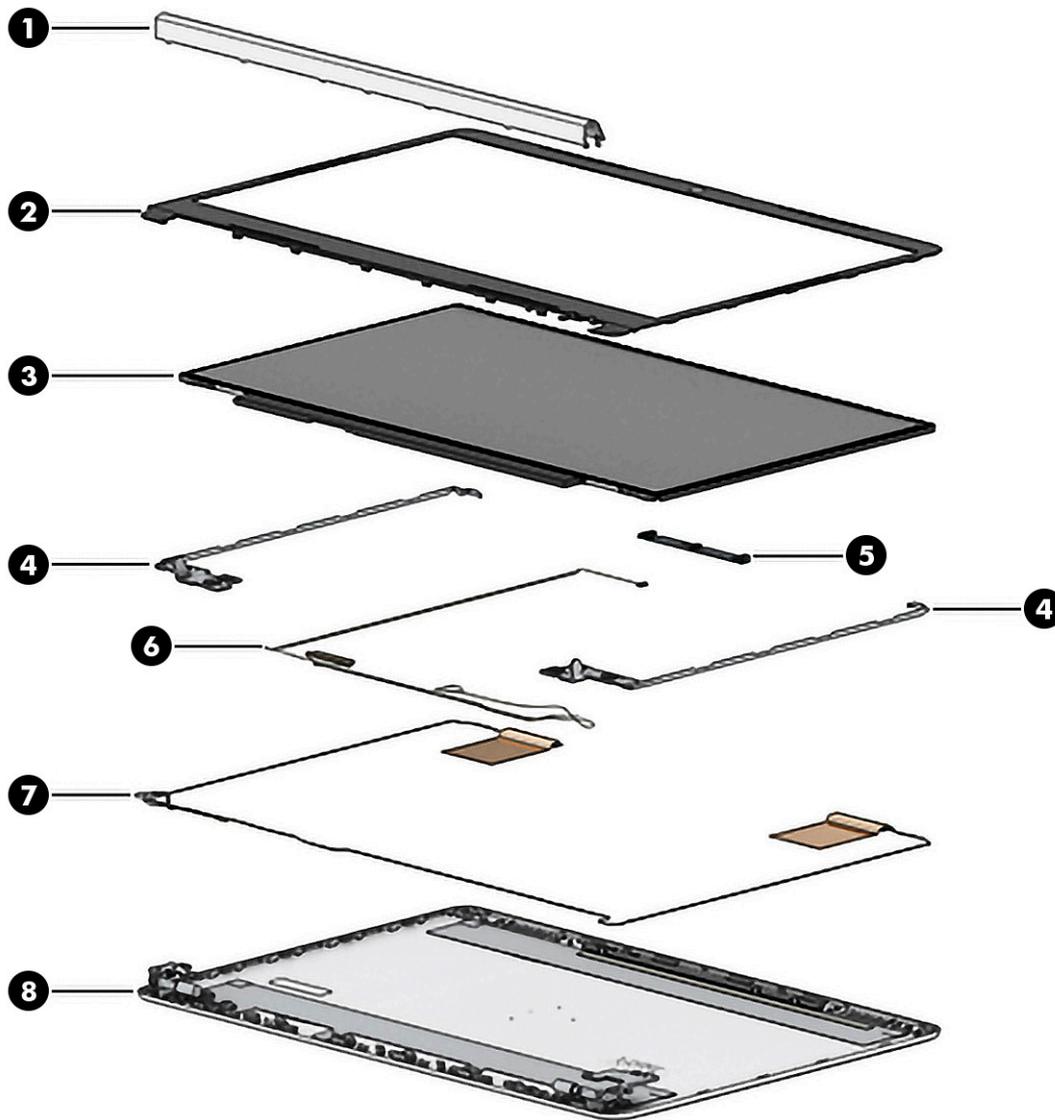
Table 3-2 Display major components and their descriptions

Item	Component	Spare part number
(1)	**Hinge cover**	M23371-001
(2)	**Display bezel**	L24465-001
(3)	**Raw display panel**	
	FHD, antiglare, UWVA	M28173-001
	HD, antiglare, WLED SVA	M28174-001
(4)	**Hinges** (left and right)	L24470-001
(5)	**Camera module**	
	HD	L23237-001
	VGA	L23238-001
(6)	**Display cable**	

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

Item	Component	Spare part number
	HD display	L24492-001
	FHD display	L24493-001
(7)	**Antennas**	
	Dual	L24640-001
	Single	L29012-001
(8)	**Display enclosure**	
	Dark ash silver	M23372-001
	Asteroid silver	M42491-001

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-3 Miscellaneous parts and their descriptions

Component	Spare part number
Adhesive tape kit	L24491-001
External DVD±RW drive	747080-001
Fan insert (for use in models without a system fan)	L31017-001
System board graphics pad (for use in models with discrete graphics memory)	M03294-001
HP Backpack	M03617-001
HP Smart AC adapter	
45 W, RC 4.5 mm, nPFC, nonslim	741727-001
65 W, nPFC, 3 pin, 4.5 mm	710412-001
65 W, nPFC, RC 4.5 mm, EM	913691-850
Power cord (3-pin, black, 1.0 m [3.3 ft]) for use in:	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Denmark	L19360-001
For use in Europe	L19361-001
For use in India	L19363-001
For use in Israel	L19362-001
For use in Italy	L19364-001
For use in North America	L19367-001
For use in the People's Republic of China	L19368-001
For use in South America	L19369-001

Table 3-3 Miscellaneous parts and their descriptions (continued)

Component	Spare part number
For use in South Korea	L19366-001
For use in Switzerland	L19370-001
For use in Thailand	L19371-001
For use in Taiwan	L19372-001
For use in the United Kingdom	L19373-001
Screw Kit	M23370-001

4 Removal and replacement procedures preliminary requirements

Use this information to properly prepare to disassemble and reassemble the computer.

Tools required

You will need the following tools to complete the removal and replacement procedures:

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Pick
- Tweezers

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 .

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

	Relative humidity		
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 MΩ ±10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.

- **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 MΩ ±10% resistance between the operator and ground.

Table 4-2 Static shielding protection levels

Static shielding protection levels	
Method	**Voltage**
Antistatic plastic	1,500

Table 4-2 Static shielding protection levels (continued)

Static shielding protection levels	
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the work area

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

- Cover the work surface with approved static-dissipative material.

- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

- Use static-dissipative mats, foot straps, or air ionizers to give added protection.

- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.

- Turn off power and input signals before inserting and removing connectors or test equipment.

- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.

- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.

- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.

- Avoid contact with pins, leads, or circuitry.

Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity.

- Antistatic tape

- Antistatic smocks, aprons, or sleeve protectors

- Conductive bins and other assembly or soldering aids

- Conductive foam

- Conductive tabletop workstations with ground cord of 1 MΩ ±10% resistance

- Static-dissipative table or floor mats with hard tie to ground

- Field service kits

- Static awareness labels

- Wrist straps and footwear straps providing 1 MΩ ±10% resistance

- Material handling packages

- Conductive plastic bags

- Conductive plastic tubes

- Conductive tote boxes

- Opaque shielding bags

- Transparent metallized shielding bags

- Transparent shielding tubes

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.

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: 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.

Component replacement procedures

To remove and replace computer components, use these procedures.

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.

This chapter provides removal and replacement procedures for Authorized Service Provider only parts.

You must remove, replace, or loosen as many as 58 screws when servicing Authorized Service Provider only parts. 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 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.

Computer feet

To remove the computer feet, use this procedure and illustration.

Table 5-1 Computer feet descriptions and part numbers

Description	Spare part number
Computer feet	M23369-001

Before removing the bottom cover, prepare the computer for disassembly ().

Remove the computer feet:

1. Close the computer and position it upside down, with the front toward you.

2. Insert a tool with no sharp edges between the base enclosure and one end of the rubber feet.

3. Peel the feet off the computer.
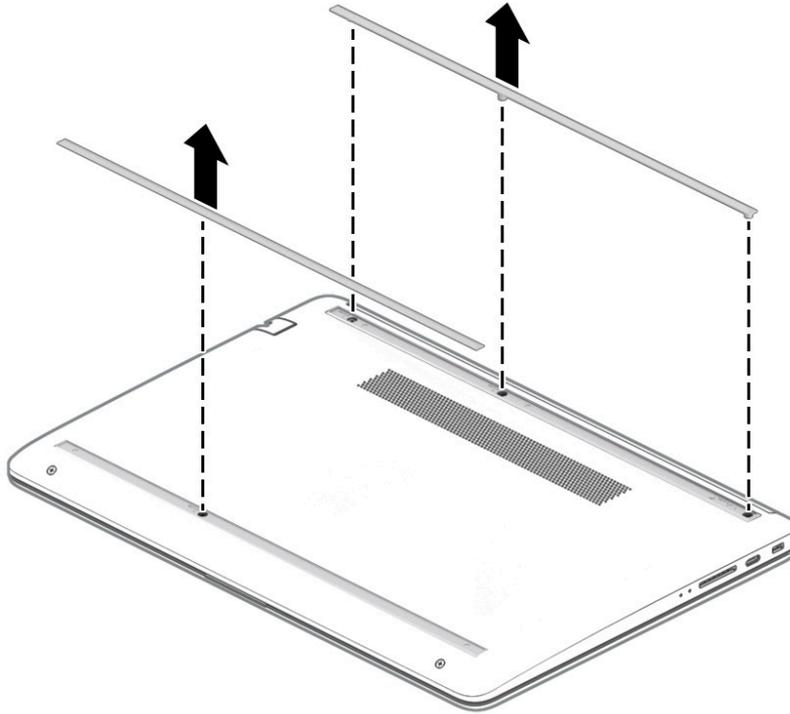
To install the rubber feet, refit them on the adhesive backing.

NOTE: The bottoms of the computer feet are ribbed. These ribs are designed to fit only one way in the grooves that are in the enclosure. Make sure the feet are positioned in those grooves when reinstalling the feet.

Bottom cover

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

Table 5-2 Bottom cover descriptions and part numbers

Description	Spare part number
Bottom cover, dark ash silver, for use in models with a 3-cell battery	M23373-001
Bottom cover, dark ash silver, for use in models with a 4-cell battery	M23374-001
Asteroid silver	M42492-001

Before removing the bottom cover, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

Remove the bottom cover:

1. Remove the four Phillips M2.5 × 6.0 screws **(1)** in the feet area, and the two Phillips M2.5 × 4.0 screws **(2)** in the front part of the bottom cover.
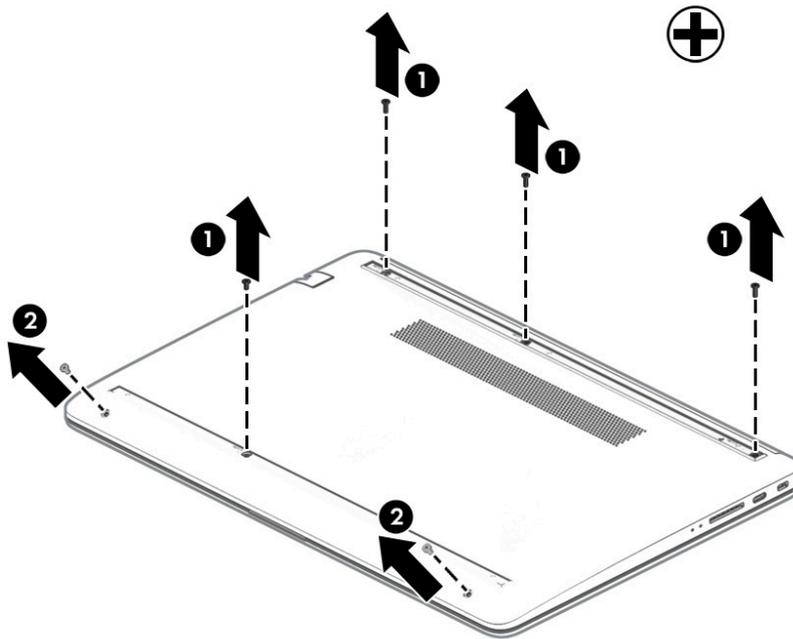
2. Use a thin plastic tool **(1)** to release the back cover. Work your way around prying to disengage the bottom cover from the computer, and then remove the cover **(2)**.
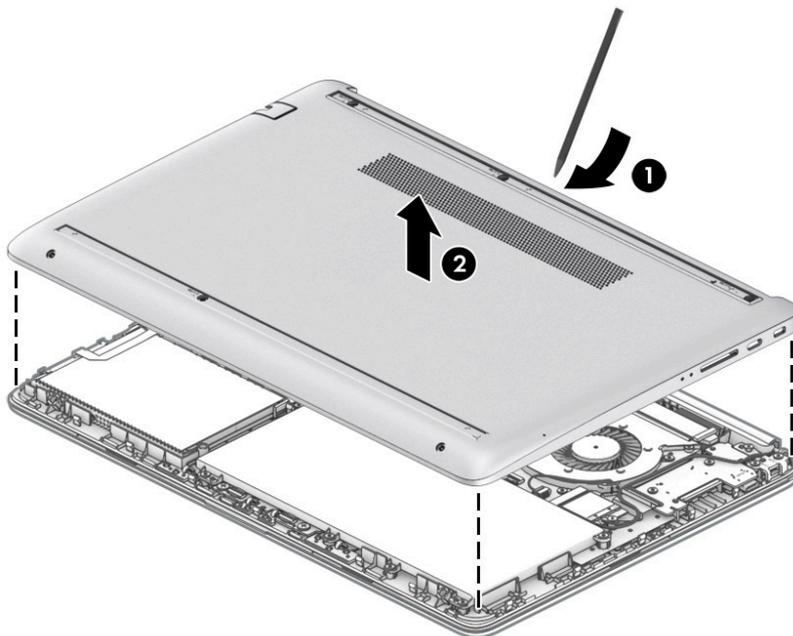
Reverse this procedure to install the bottom cover.

Battery

To remove the battery, use this procedure and illustration.

Table 5-3 Battery and system board hook descriptions and part numbers

Description	Spare part number
Battery, 3 cell, 41 Whr	L11119-855
Battery, 4 cell, 46 Whr	L71607-005
System board hook	L88007-001

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

Remove the battery:

1. Remove the five screws **(1)** securing the battery.

2. Lift the top of the battery **(2)**, and then remove the system board hook **(3)**.
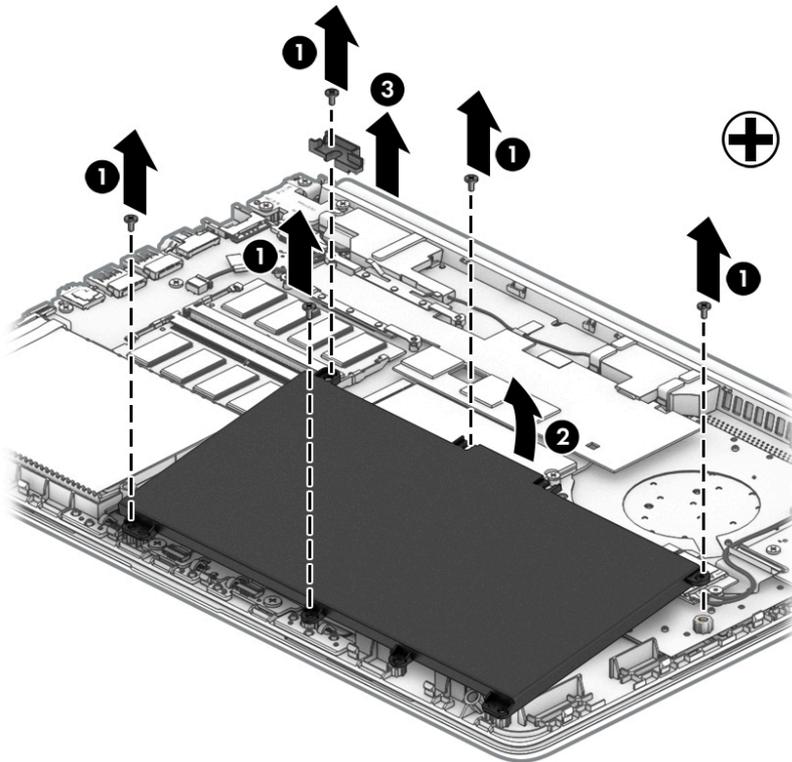
Reverse this procedure to install the battery.

Hard drive

To remove the hard drive, use this procedure and illustration.

NOTE: The hard drive spare part kit does not include the hard drive bracket.

Table 5-4 Hard drive descriptions and part numbers

Description	Spare part number
1 TB, 5400 rpm, 7 mm	L30422-005
500 GB, 7200 rpm, 7 mm	703267-005
500 GB, 5400 rpm, 7 mm	778186-005
Hard drive cable	L23187-001
Hard drive bracket	L24490-001

Before removing the hard drive, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

Remove the hard drive:

1. Disconnect the cable **(1)** from the system board and remove the cable **(2)**.

2. Lift the hard drive **(3)**, and then remove it **(4)** from the computer.
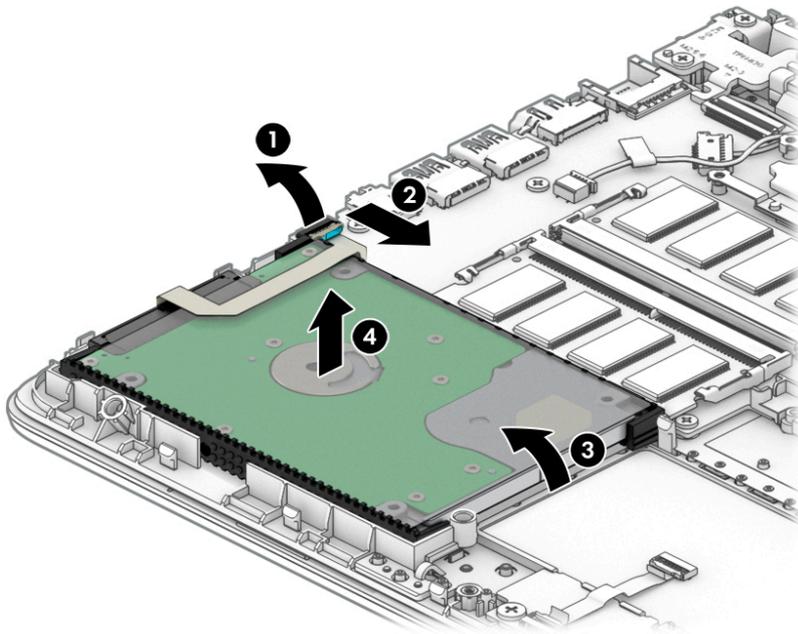
3. To remove the hard drive bracket, pull the holder sides **(1)** up and away from the hard drive, and then remove the bracket cover **(2)** from the hard drive.

4. To remove the hard drive connector, pull the connector **(3)** away from the hard drive.
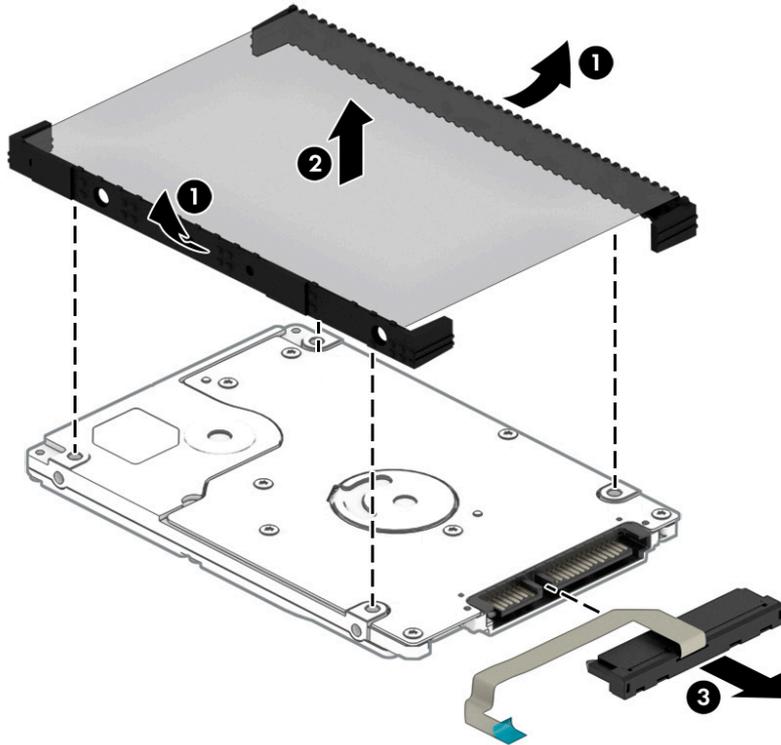
Reverse this procedure to reassemble and install the hard drive.

Solid-state drive (SSD) board

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

Table 5-5 SSD board descriptions and part numbers

Description	Spare part number
SSD board	L24487-001
SSD bracket	L24488-001
SSD cable	L23397-001

Before removing the SSD board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

To remove the SSD board:

1. Lift the ZIF connector **(1)**, and then disconnect the cable **(2)** from the SSD board.

2. Lift the assembly from the computer **(3)**.
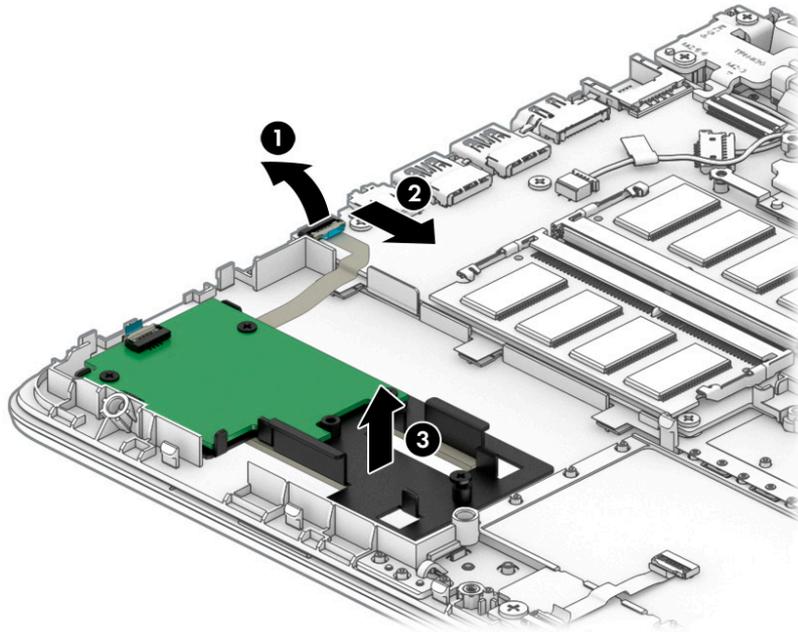
3. To remove the SSD board from the bracket, remove the three Phillips M2.0 × 3.0 screws **(1)** that secure the board to the bracket, and then remove the board from the bracket **(2)**.
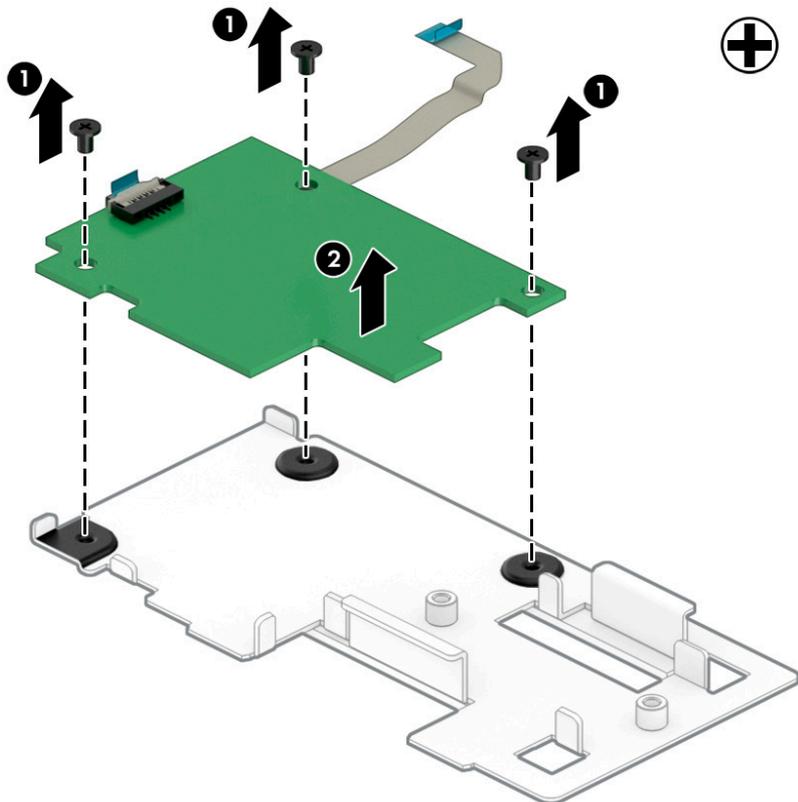
Reverse this procedure to reassemble and install the SSD board.

WLAN module

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

Table 5-6 WLAN module descriptions and part numbers

Description	Spare part number
Dual antenna	
Intel Wi-Fi 6 AX201 (NGW) 802.11ax 2 × 2 Wi-Fi + Bluetooth 5 (non-vPro)	L57250-005
Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + BT 5.0 Combo Adapter (MU-MIMO supported)	L44796-005
Single antenna	
Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + BT 4.2 Combo Adapter (MU-MIMO supported)	L17365-005

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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

Remove the WLAN module:

1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

   NOTE: The #1 WLAN antenna cable is connected to the WLAN module Main terminal. The #2 WLAN antenna cable is connected to the WLAN module Aux terminal.

2. Remove the Phillips M2.0 × 3.0 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

3. Remove the WLAN module by pulling the module away from the slot at an angle **(3)**.
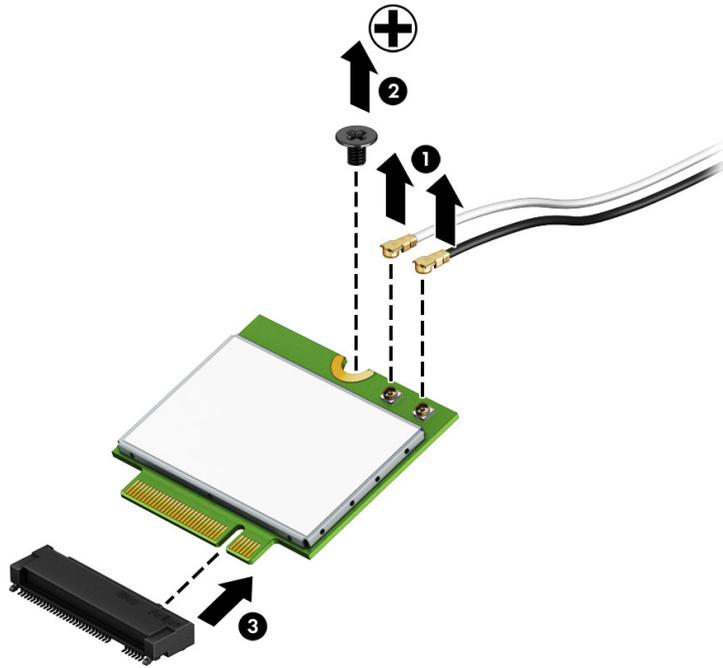
NOTE: If the WLAN antennas are not connected to the terminals on the WLAN module, the protective sleeves must be installed on the antenna connectors, as shown in the following illustration.
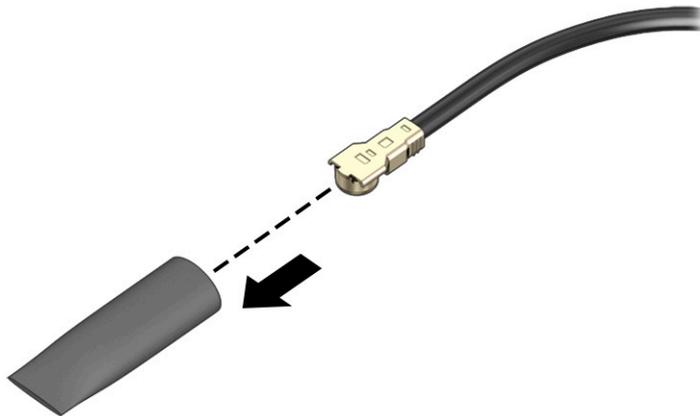
Reverse this procedure to install the WLAN module.

Memory module

To remove the memory modules, use this procedure and illustration.

Table 5-7 Memory module descriptions and part numbers

Description	Spare part number
4 GB	L10598-855
8 GB	937236-855

Before removing a memory module, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

To remove a memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

2. Remove the memory module **(2)** by pulling it away from the slot at an angle.
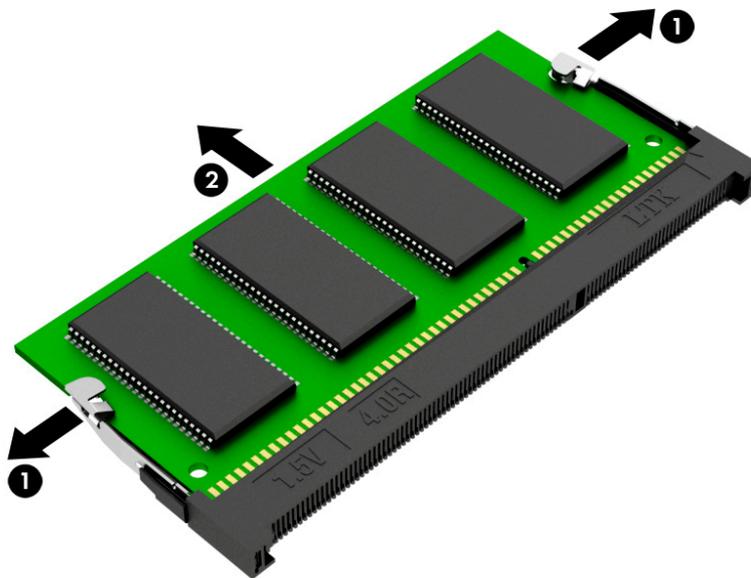
Reverse this procedure to install a memory module.

Solid-state drive

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

Table 5-8 Solid-state drive descriptions and part numbers

Description	Spare part number
Solid-state drive, PCIe:	
● 1 TB	L85370-005

Table 5-8 Solid-state drive descriptions and part numbers (continued)

Description	Spare part number
● 512 GB	L85364-005
● 512 GB + 32 GB Optane memory	L85366-005
● 256 GB	L85354-005
● 256 GB + 16 GB Optane memory	L85356-005
● 16 GB Optane memory module	L85372-005
Solid-state drive, SATA-3, TLC:	
● 256 GB	938184-855
● 128 GB	L85346-005

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

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

Remove the solid-state drive:

1. Remove the Phillips M2.0 × 2.0 screw **(1)** that secures the drive to the system board.

2. Remove the drive **(2)** by pulling it away from the connector.

> **NOTE:** Solid-state drives are designed with notches to prevent incorrect insertion.
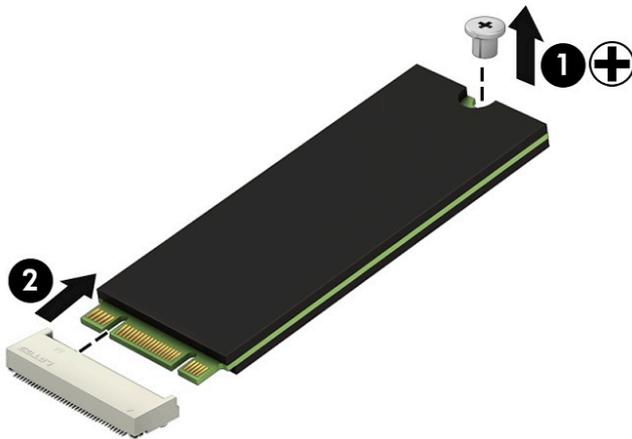
Reverse this procedure to install the solid-state drive.

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-9 Speakers description and part number

Description	Spare part number
Speakers (includes left and right speakers and cable)	926558-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

To remove the speakers:

1. Disconnect the speaker cable from the system board **(1)**.

2. Remove the tape **(2)** securing the cable.

3. Lift the speakers out of the computer **(3)**.
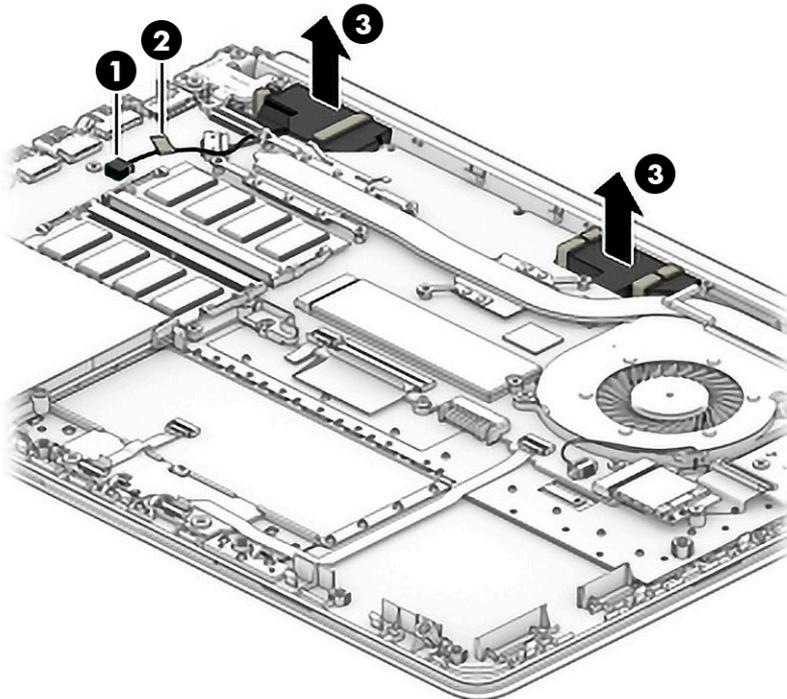
Reverse this procedure to install the speakers.

Power connector

To remove the power connector, use this procedure and illustration.

Table 5-10 Power connector description and part number

Description	Spare part number
Power connector	L23188-001

Before removing the power connector, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

5. Remove the right hinge screw and lift the right hinge (see Display assembly on page 48).

Remove the power connector:

1. Disconnect the power connector cable **(1)** from the system board.

2. Lift the power connector **(2)** to remove it.
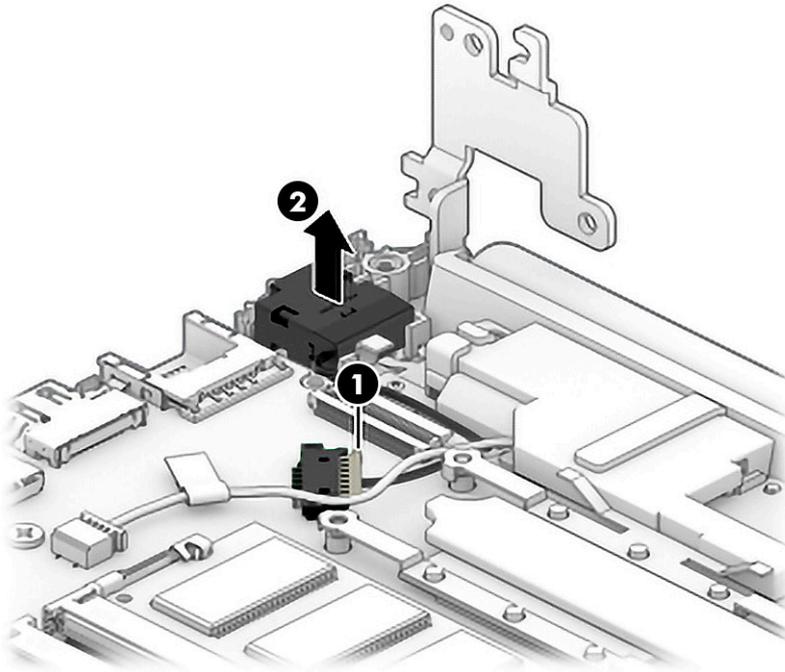
Reverse this procedure to install the power connector.

Touchpad click board

To remove the touchpad click board, use this procedure and illustration.

Table 5-11 Touchpad click board part descriptions and part numbers

Description	Spare part number
Touchpad click board	L24486-001
Touchpad board cable	L23184-001
Touchpad click board cable	L24485-001

Before removing the touchpad click board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

To remove the touchpad click board:

1. Disconnect the touchpad cable **(1)** from the system board, and then disconnect from the touchpad click board cable **(2)** touchpad.

2. Remove the two Phillips M2.0 × 2.0 screws **(3)** that secure the touchpad click board to the computer.

3. Lift the board, and then slide it outward from under the clips that hold it on place to remove it **(4)**.

☼ **TIP:** The edge of the board sits under clips. Be sure to slide the board out from under the clips to prevent damage to the board or clips.
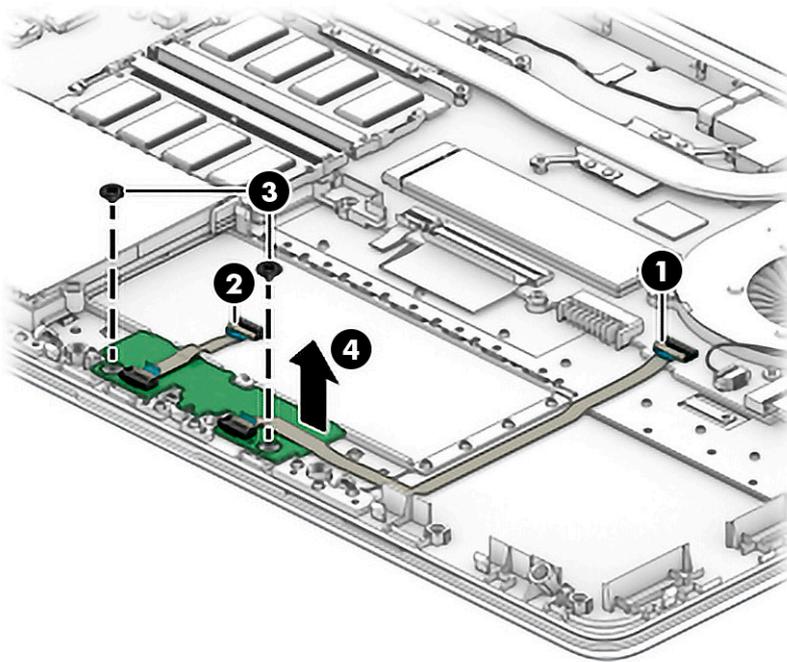
Reverse this procedure to install the touchpad click board.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-12 Touchpad description and part number

Description	Spare part number
Touchpad	L24484-001

Before removing the touchpad, follow these steps:

1.   Prepare the computer for disassembly (Preparation for disassembly on page 26).

2.   Remove the rubber feet (see Computer feet on page 26).

3.   Remove the bottom cover (see Bottom cover on page 27).

4.   Remove the battery (see Battery on page 28).

5.   Remove the touchpad click board (see Touchpad click board on page 38).

To remove the touchpad click board:

▲   Lift the touchpad to remove it from the computer.
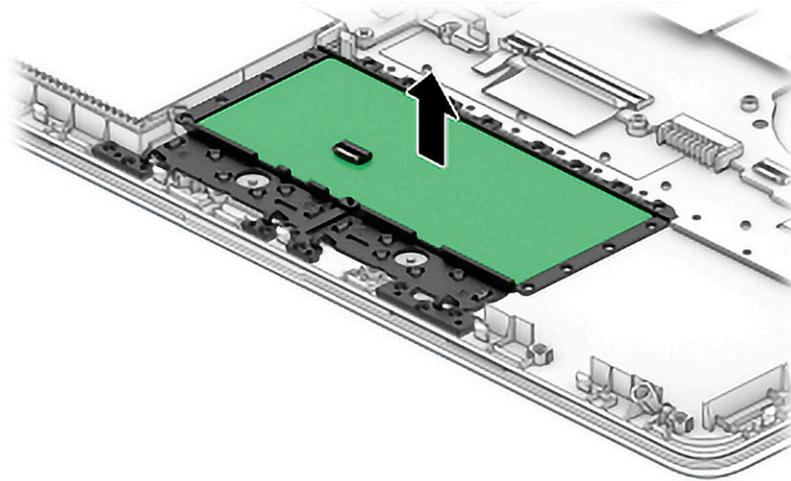
Reverse this procedure to install the touchpad.

USB board

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

Table 5-13 USB board and cable descriptions and part numbers

| Description	Spare part number
USB board	L24483-001
USB board cable	L23186-001

Before removing the USB board, follow these steps:

1.   Prepare the computer for disassembly (Preparation for disassembly on page 26).

2.   Remove the rubber feet (see Computer feet on page 26).

3.   Remove the bottom cover (see Bottom cover on page 27).

4.   Remove the battery (see Battery on page 28).

To remove the USB board:

1.   Disconnect the cable from the USB board **(1)**.

2.   Remove the two Phillips M2.0 × 3.0 screws **(2)** that secure the USB board to the computer.

3. Remove the USB board from the computer **(3)**.
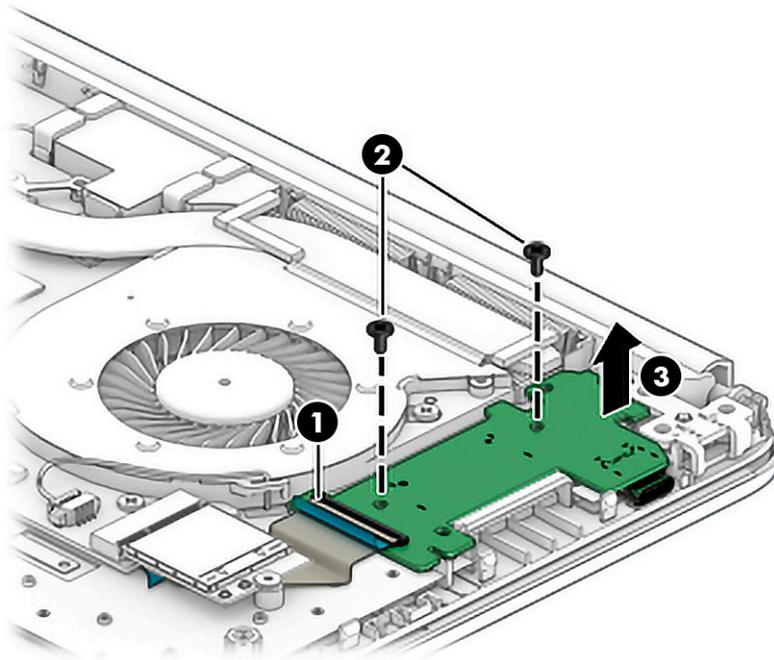
Reverse this procedure to install the USB board.

Fan

To remove the fan, use this procedure and illustration.

Table 5-14 Fan description and part number

Description	Spare part number
Fan	L23189-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly ().

2. Remove the rubber feet (see).

3. Remove the bottom cover (see).

4. Remove the battery (see).

Remove the fan:

1. Disconnect the fan cable from the system board **(1)**.

2. Remove the two Phillips M2.5 × 5.0 screws **(2)** that secure the fan to the computer.

3. Lift the fan out of the computer **(3)**.
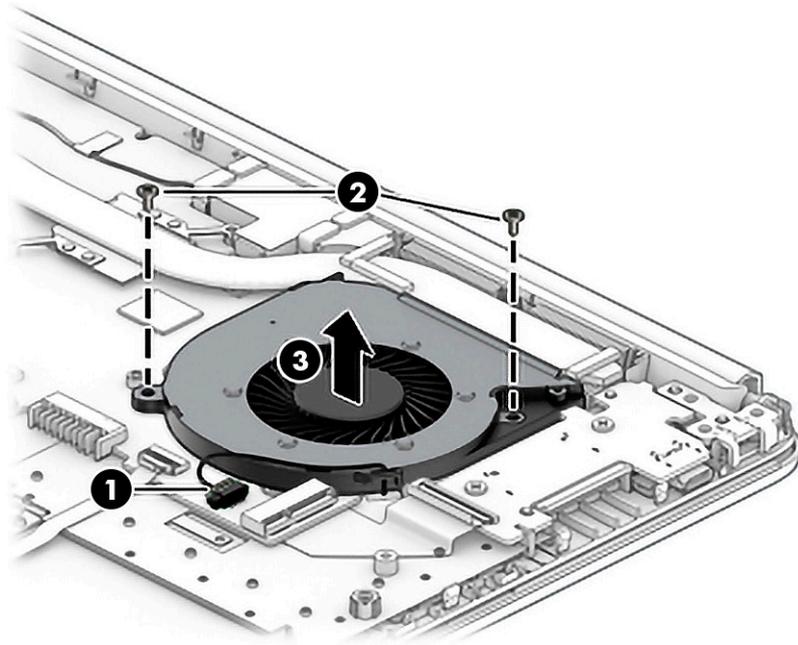
Reverse this procedure to install the fan.

System board

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

📝 **NOTE:** The system board spare part kit includes replacement thermal materials.

Table 5-15 System board descriptions and part numbers

Description	Spare part number
System board (includes replacement thermal materials):	
All system boards use the following part numbers:	
xxxxxx-001: Non-Windows operating system	
xxxxxx-601: Windows operating system	
For use in models with discrete graphics:	
● Intel Core i7-1065G7 processor	M23363-xxx
● Intel Core i5-1035G1 processor	L89468-xxx
● Intel Core i3-1005G1 processor	M13938-xxx
For use in models with UMA graphics:	
● Intel Core i7-1065G7 processor	M23360-xxx
● Intel Core i5-1035G1 processor	L89470-xxx
● Intel Core i3-1005G1 processor	L89469-xx1
● Intel Pentium Silver N5030 processor	L85889-xxx

Table 5-15 System board descriptions and part numbers (continued)

| Description	Spare part number
● Intel Pentium 6805U processor	M33066–xxx
● Intel Celeron N4020 processor	L85887–xxx
● Intel Celeron N4020 processor with 64 GB of eMMC memory	L85886–xxx
System board hook	L88007-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

5. Remove the fan (see Fan on page 41).

📝 **NOTE:**   When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

● WLAN module (see WLAN module on page 33)

● Memory modules (see Memory module on page 34)

● Solid-state drive (if installed) (see Solid-state drive on page 35)

● Heat sink assembly (see Heat sink assembly on page 44)

Remove the system board:

1. Position the computer upright, and then disconnect the following cables from the system board:

   (1) USB board cable

   (2) WLAN antenna cables

   (3) Touchpad button board cable

   (4) Keyboard cable

   (5) Backlight cable

   (6) Hard drive cable

   (7) Speaker cable

   (8) Power connector cable

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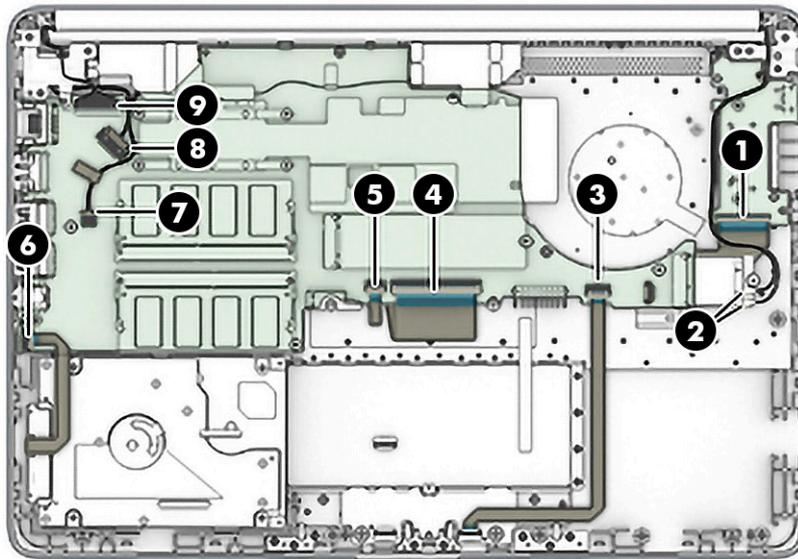
2. Remove the three Phillips M2.0 × 2.0 screws **(1)** that secure the system board to the computer.

3. Remove the Phillips M2.0 × 3.5 screw **(2)** that secures the system board to the computer.

4. Lift the system board out of the computer **(3)**.
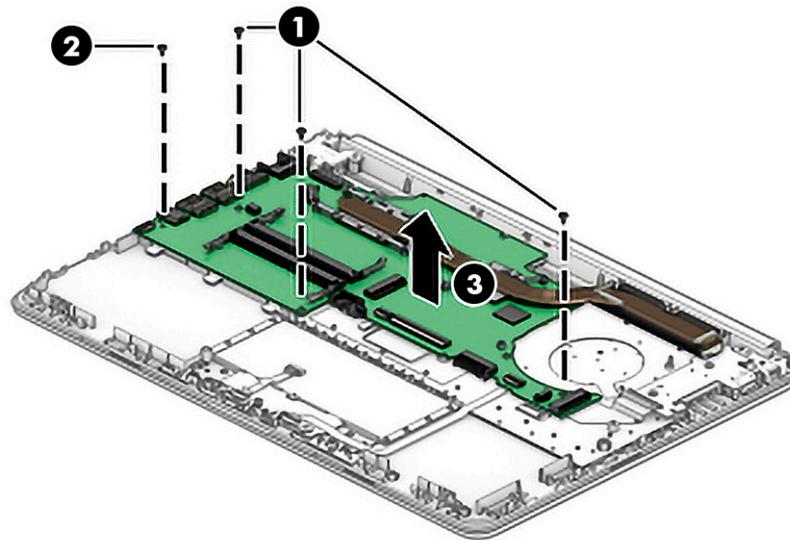
Reverse this procedure to install the system board.

Heat sink assembly

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

Table 5-16 Heat sink assembly description and part number

Description	Spare part number
Heat sink for use in models with UMA graphics memory without a system fan	L23190-001
Heat sink for use in models with UMA graphics memory with a system fan	L96692-001
Heat sink for use in models with discrete graphics memory	L96693-001

Before removing the heat sink assembly, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

Remove the heat sink assembly:

1. **Discrete graphics:** In the order indicated on the heat sink, remove the six Phillips M2.0 × 2.8 screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink **(2)**.
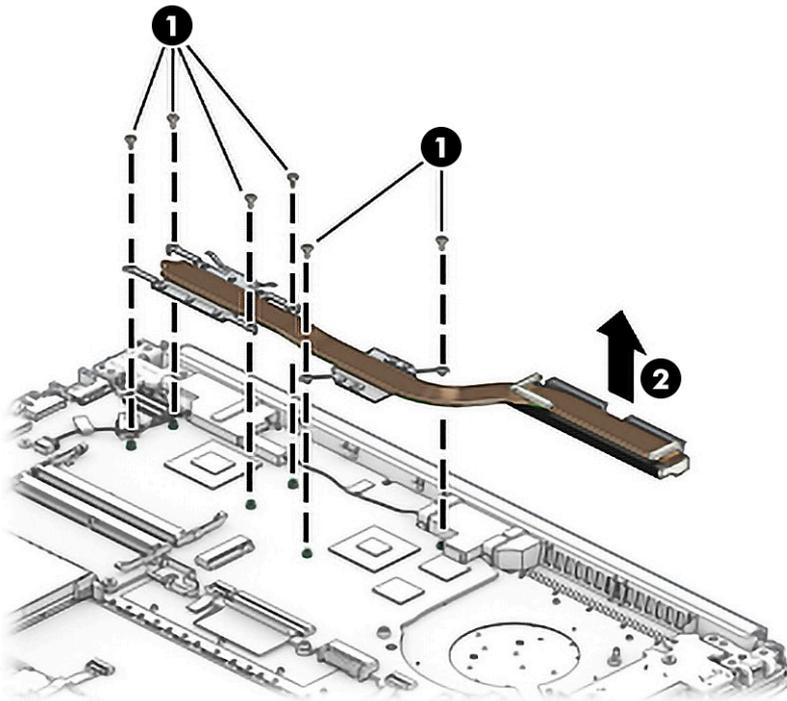
3. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

Thermal paste is used on the integrated system board processor **(1)** and associated location on the heat sink **(2)**. Thermal pads are used on specific system board components **(3)** and associated locations on the heat sink **(4)**.
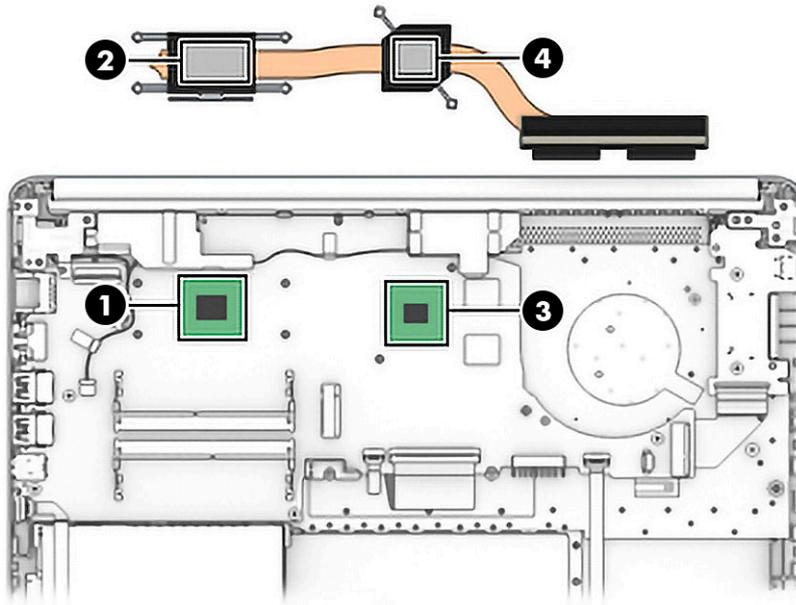
4. **UMA graphics with a fan:** In the order indicated on the heat sink, remove the four Phillips M2.0 × 2.8 screws **(1)** that secure the heat sink to the system board.

5. Remove the heat sink **(2)**.
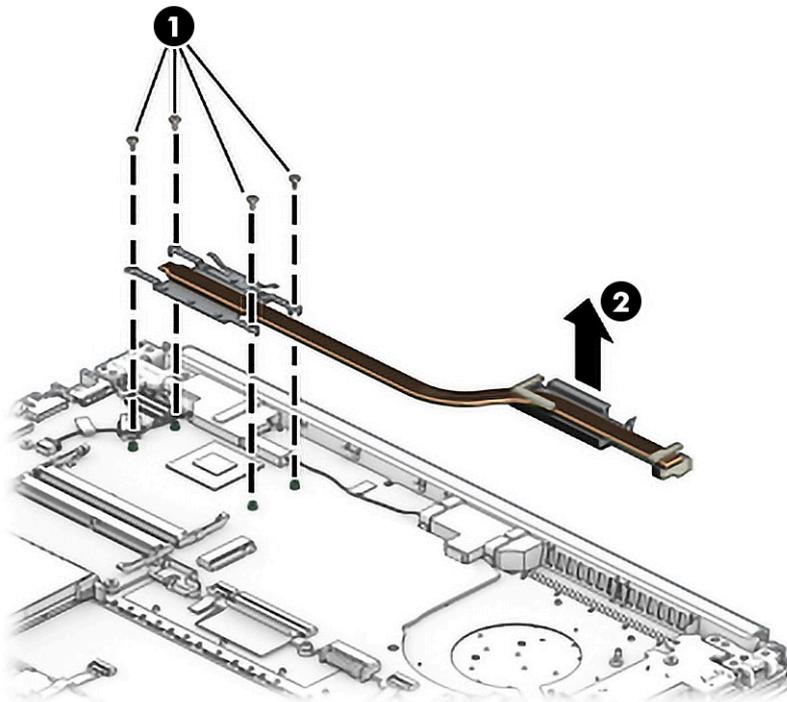
6. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

   Thermal paste is used on the integrated system board processor **(1)** and the heat sink **(2).**
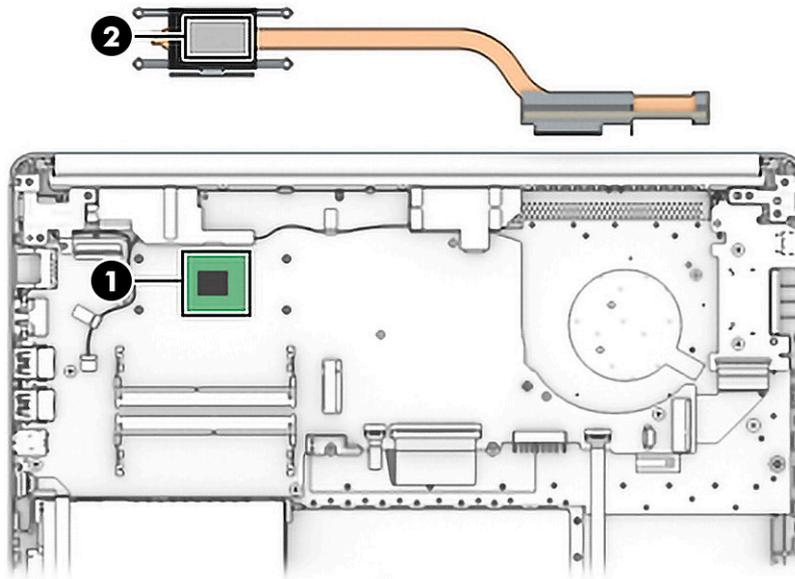
7. **UMA graphics without a fan:** In the order indicated on the heat sink, remove the four Phillips M2.0×4.0 screws **(1)** that secure the heat sink to the system board.

8. Remove the heat sink **(2)**.
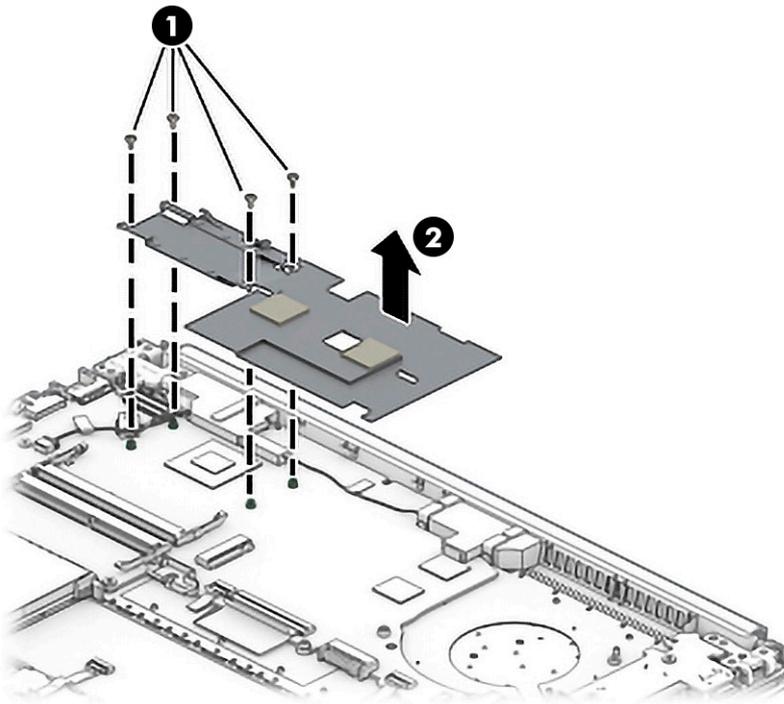
9. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

   Thermal paste is used on the integrated system board processor **(1)** and the heat sink **(2).**
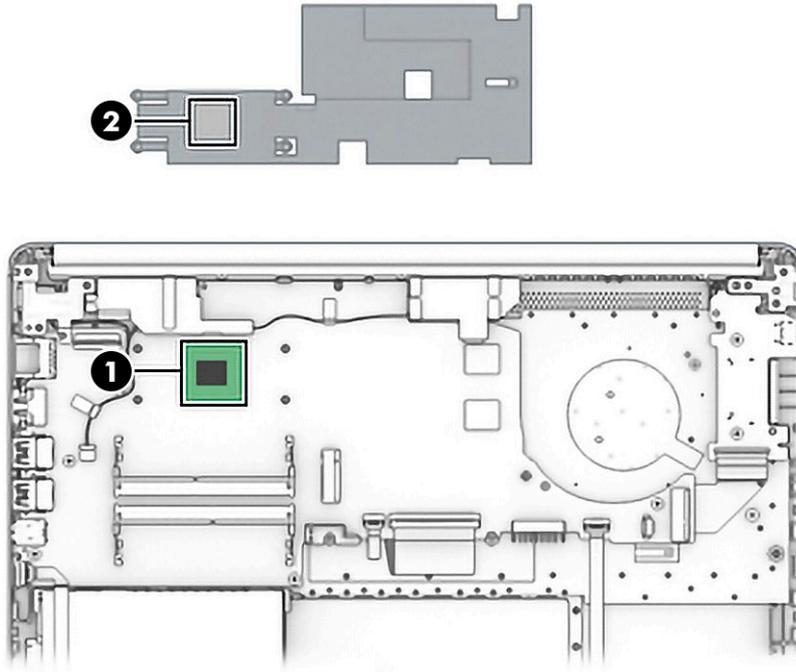
Reverse this procedure to reassemble and install the heat sink assembly.

Display assembly

To remove the display assembly, use this procedure and illustration.

Table 5-17 Display assembly part descriptions and part numbers

Description	Spare part number
Hinge cover	M23371-001
Display bezel	L24465-001
Webcam/microphone module	
HD	L23237-001
VGA	L23238-001
Raw display panel	
FHD, antiglare, UWVA	M28173-001
HD, antiglare, WLED SVA	M28174-001
Hinges (left and right)	L24470-001
Display cable	
HD display	L24492-001
FHD display	L24493-001

Table 5-17 Display assembly part descriptions and part numbers (continued)

Description	Spare part number
Antennas	
Dual	L24640-001
Single	L29012-001
Display enclosure	
Dark ash silver	M23372-001
Asteroid silver	M42491-001

Before removing the display assembly, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 26).

2. Remove the rubber feet (see Computer feet on page 26).

3. Remove the bottom cover (see Bottom cover on page 27).

4. Remove the battery (see Battery on page 28).

To remove the display assembly:

1. Disconnect the display cable from the system board **(1)**.

2. Disconnect the wireless antenna cables from the WLAN module **(2)**.
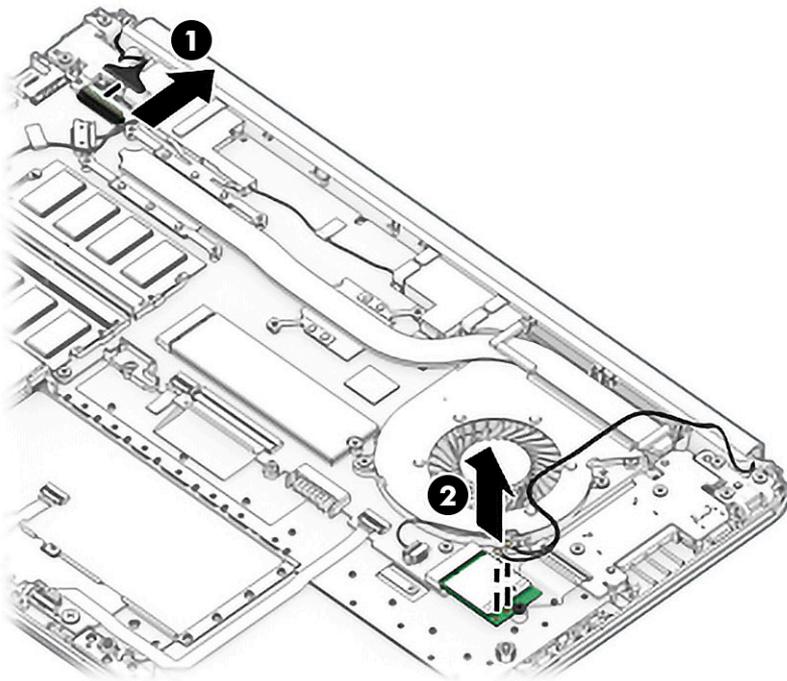
3. Position the computer so it is open with the display hanging off the table **(1)**.

4. Remove the six Phillips M2.5 × 6.0 screws **(2)** from the display hinges.

5. Rotate the hinges upward to an angle **(3)**, and then remove the display **(4)**.
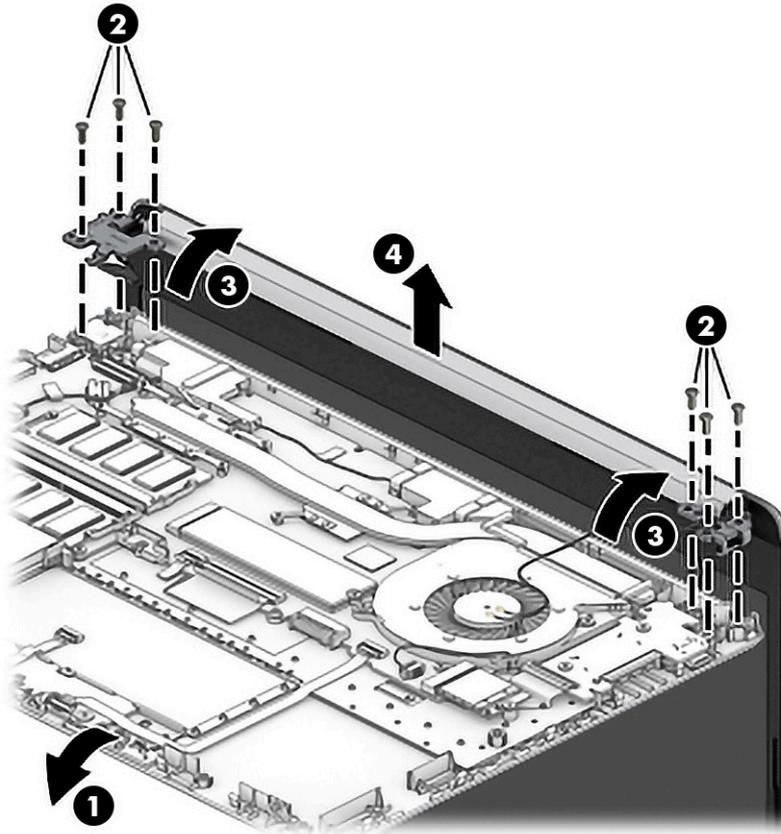
If it is necessary to replace any of the display assembly subcomponents:

6. Lift the hinge cap to remove it from display.
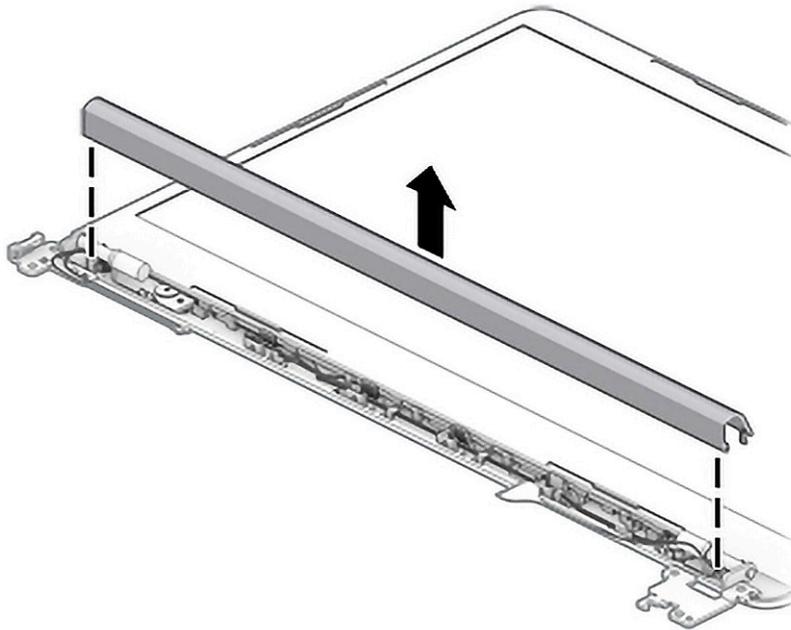
7. Flex the inside of the top edge **(1)**, left and right sides **(2)**, and the inside of the bottom edge **(3)** of the display bezel until the bezel disengages from the display enclosure.

8. Remove the display bezel **(4)**.
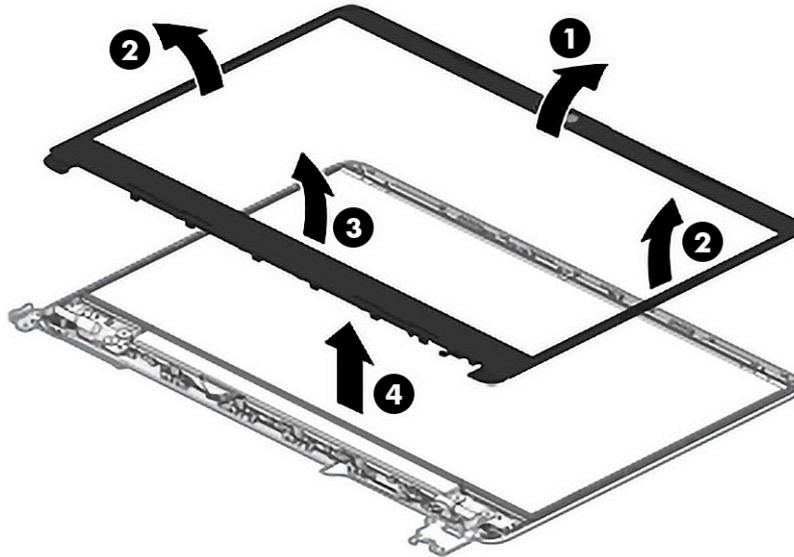
9. To remove the webcam/microphone module:

    a. Position the display assembly with the top edge toward you.

    b. Lift the webcam module to disengage the adhesive that secures the module to the display **(1)**.

    c. Lift the tape from the connector **(2)**, and then disconnect the cable **(3)** from the module.
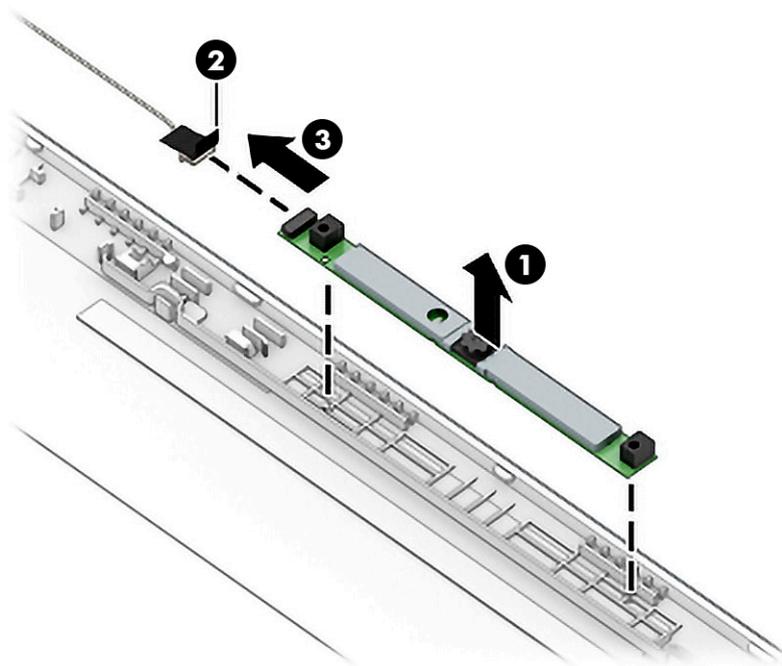
10. To remove the display panel:

a. 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 **(1)**. While turning the tweezers, wrap the tape around the tweezers **(2)** as you continue to pull the tape out from behind the display panel **(3)**. Rotate the display panel over and place it next to the display enclosure **(4)**.

☼ **TIP:** You must pull the tape several times to remove it.
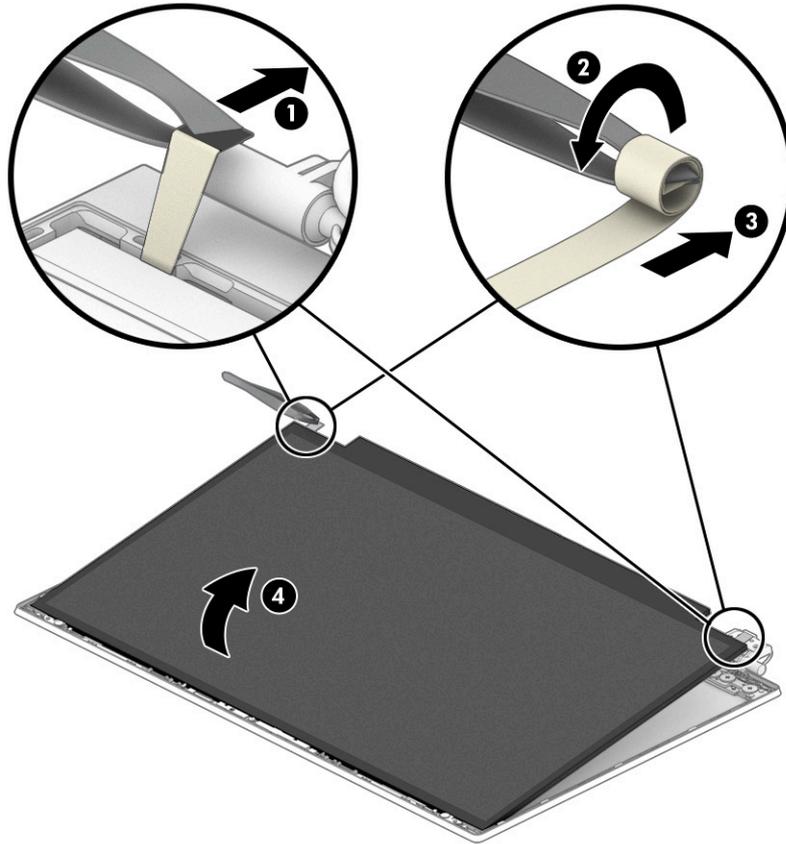
b. Rotate the display panel onto the keyboard **(1)** to gain access to the display cable connection on the back of the panel.

c. On the back of the display panel, release the adhesive strip that secures the display panel cable to the display panel, and then disconnect the cable **(2)**.

d. Lift the display panel **(3)** to remove it.
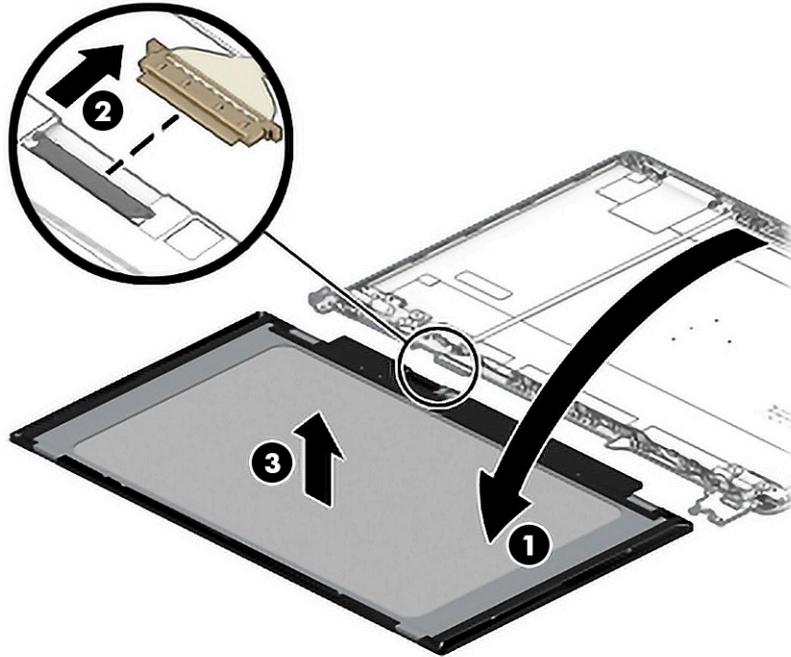
11. To remove the display hinges:

a. Remove the three Phillips M2.5 × 2.5 screw **(1)** from the bottom of each hinge.

b. Remove the display hinges from the enclosure **(2)**.
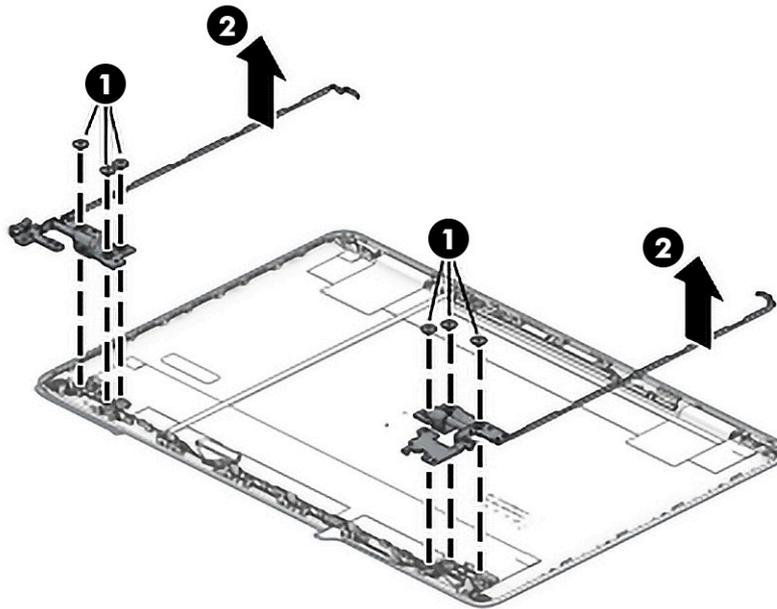
12. To remove the display/webcam cable, lift the tape from the connector on the webcam module **(1)**, and then disconnect the cable from the webcam module **(2)**. Lift the cable from the display enclosure to disengage the adhesive that secures it **(3)**.
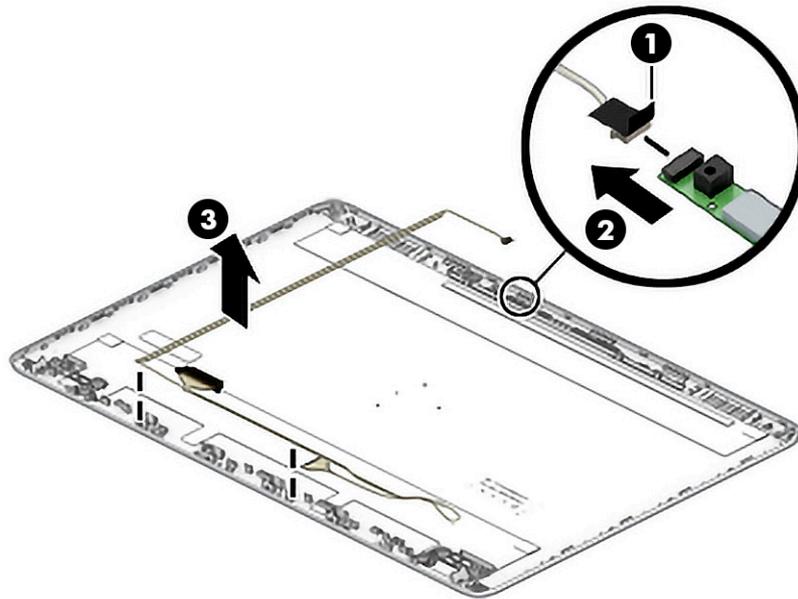
13. To remove the wireless antennas and cables, release the wireless antenna cables from the clips **(1)** built into the side of the display enclosure, and then peel the antennas of the display enclosure **(2)** to remove the antennas and cables.

> **NOTE:** Number of antennas and transceivers can vary.
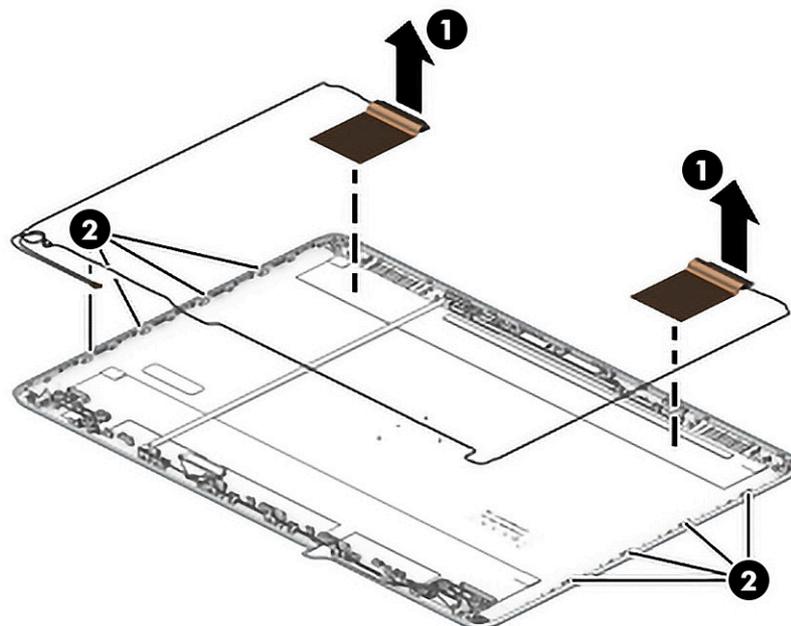
14. If replacing the display enclosure, be sure that the subcomponents (including the webcam/microphone module, the antenna receivers, and all associated cables and hardware) are transferred to the new enclosure.

Reverse this procedure to reassemble and install the display assembly.

Top cover with keyboard

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

Table 5-18 Top cover with keyboard descriptions and part numbers

Description	Spare part number
Top cover with keyboard, black	M23367-xx1
Top cover with keyboard, silver	M42490-xx1

Table 5-19 Keyboard country codes

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

The top cover with keyboard spare part kit includes the keyboard, keyboard cable, and the keyboard backlight cable.

The top cover with keyboard spare part remains after all other spare parts have been removed.

6 Computer Setup (BIOS), TPM, and HP Sure Start

HP provides several tools to help set up and protect your computer.

Using Computer Setup

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

NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

To start Computer Setup, turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

Navigating and selecting in Computer Setup

You can navigate and select in Computer Setup using one or more methods.

- To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to select the item.

- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.

- To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

To exit Computer Setup, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

  NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

- To save your changes and exit Computer Setup menus, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

  NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

To return all settings in Computer Setup to the values that were set at the factory, follow these steps.

NOTE: Restoring defaults will not change the hard drive mode.

1. Start Computer Setup. See Using Computer Setup on page 56.

2. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes**.

> 📝 **NOTE:** If you are using arrow keys to highlight your choice, you must then press enter.

> 📝 **NOTE:** On select products, the selections might display **Restore Defaults** instead of **Apply Factory Defaults and Exit**.

Your changes go into effect when the computer restarts.

> 📝 **NOTE:** Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

Updated versions of the BIOS might be available on the HP website. Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

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

You can access BIOS version information (also known as *ROM date* and *System BIOS*) by pressing fn+esc (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup. See Using Computer Setup on page 56.

2. Select **Main**, and then select **System Information**.

3. To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

> 📝 **NOTE:** If you are using arrow keys to highlight your choice, you must then press enter.

To check for later BIOS versions, see Preparing for a BIOS update on page 57.

Preparing for a BIOS update

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

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

Do not disconnect power on the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep.

Do not insert, remove, connect, or disconnect any device, cable, or cord.

Downloading a BIOS update

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

1. Type `support` in the taskbar search box, and then select the HP Support Assistant app.

    – or –

    Select the question mark icon in the taskbar.

2. Select **Updates**, and then select **Check for updates and messages**.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

    a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You might need this information to locate the update later, after it has been downloaded to your hard drive.

    b. Follow the on-screen instructions to download your selection to the hard drive.

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

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

Installing a BIOS update

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.

2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder that contains the update.

4. Double-click the file that has an .exe extension (for example, *filename*.exe).

    The BIOS installation begins.

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

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

Changing the boot order using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps.

1. Access the Boot Device Options menu:

    ●   Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.

2. Select a boot device, press enter, and then follow the on-screen instructions.

TPM BIOS settings (select products only)

TPM provides additional security for your computer. You can modify the TPM settings in Computer Setup (BIOS).

IMPORTANT: Before enabling Trusted Platform Module (TPM) functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation or usage of TPM that violates the previously mentioned requirement, you shall bear all the liabilities wholly and solely. HP will not be responsible for any related liabilities.

NOTE: If you change the TPM setting to Hidden, TPM is not visible in the operating system.

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Using Computer Setup on page 56.

2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that monitors the computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start automatically restores the BIOS to its previously safe state, without user intervention.

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. Select **Find your product**, and then follow the on-screen instructions.

7   Backing up, restoring, and recovering

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

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

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

Backing up information and creating recovery media

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

Using Windows tools for backing up

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

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

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

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

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

For details:

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

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

IMPORTANT: HP recommends that you follow the to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Restoring and recovering your system

You have several tools available to recover your system both within and outside of Windows if the desktop cannot load.

HP recommends that you attempt to restore your system using the .

Creating a system restore

System Restore is available in Windows. The System Restore software can automatically or manually create restore points, or snapshots, of the system files and settings on the computer at a particular point.

When you use System Restore, it returns your computer to its state at the time you made the restore point. Your personal files and documents should not be affected.

Restoring and recovery methods

After you run the first method, test to see whether the issue still exists before you proceed to the next method, which might now be unnecessary.

1. Run a Microsoft System Restore.

2. Run Reset this PC.

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

3. Recover using HP Recovery media. For more information, see Recovering using HP Recovery media on page 61.

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

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

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

Recovering using HP Recovery media

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

For details, see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 60.

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

To recover your system:

▲ Insert the HP Recovery media, and then restart the computer.

NOTE: HP recommends that you follow the Restoring and recovery methods on page 61 to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Changing the computer boot order

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

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

To change the boot order:

1. Insert the HP Recovery media.

2. Access the system **Startup** menu.

   - For computers or tablets with keyboards attached, turn on or restart the computer or tablet, quickly press esc, and then press f9 for boot options.

   - For tablets without keyboards, turn on or restart the tablet, quickly press and hold the volume up button, and then select **f9**.

     – or –

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

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

Using HP Sure Recover (select products only)

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

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

- Latest version of the operating system

- Platform-specific device drivers

- Software applications, in the case of a custom image

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

8 Using HP PC Hardware Diagnostics

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

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 64.

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

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

▲ Depending on the instructions on the screen, choose one of these options:

- If failure ID link is displayed, select the link and follow the on-screen instructions.

- If instructions for calling support are displayed. Follow those instructions.

Accessing HP PC Hardware Diagnostics Windows

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

Accessing HP PC Hardware Diagnostics Windows from HP Help and Support (select products only)

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

1. Select the **Start** button, and then select **HP Help and Support**.

2. Select **HP PC Hardware Diagnostics Windows**.

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

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

Accessing HP PC Hardware Diagnostics Windows from Support Assistant

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

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

    – or –

    Select the question mark icon in the taskbar.

2. Select **Troubleshooting and fixes**.

3. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.

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

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

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version from HP

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

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics Windows**, and then select a location on your computer or a USB flash drive.

    The tool downloads to the selected location.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

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

1. Select the Microsoft Store app on your desktop or enter `Microsoft Store` in the taskbar search box.

2. Enter `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.

3. Follow the on-screen directions.

    The tool downloads to the selected location.

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

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

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

1. Go to http://www.hp.com/support.

2. Select **Software and Drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.

3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version to be downloaded to your computer or USB flash drive.

    The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

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

Using HP PC Hardware Diagnostics UEFI

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

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 66.

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

Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

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

For assistance in solving the problem:

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

– or –

Contact support, and provide the Failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

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

1. Turn on or restart the computer, and quickly press esc.

2. Press f2.

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

    a. Connected USB flash drive

b. Hard drive

c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

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

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

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

1. Go to http://www.hp.com/support.

2. Enter the product name or number, select your computer, and then select your operating system.

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

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

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

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

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

1.   Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2.   Select **Download Remote Diagnostics**, and then select **Run**.

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

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

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

1.   Go to http://www.hp.com/support.

2.   Select **Software and Drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.

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

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

●   Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.

●   Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a hard drive or USB flash drive) to run remote diagnostics.

●   Set a location for storing the test results. You can also set the user name and password that you use for uploads.

●   Display status information about the diagnostics run previously.

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

1.   Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

2.   Select **Advanced**, and then select **Settings**.

3.   Make your customization selections.

4.   Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

9 Specifications

This chapter provides specifications for your computer.

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 9-1 Computer specifications

	Metric	U.S.
Dimensions		
Depth	**324 mm**	12.76 in
Width	**226 mm**	8.9 in
Height (rear)	**19.9 mm**	0.78 in
Weight		
SSD/eMMC	**1474 g**	3.33 lb
Hard drive	**1511 g**	3.35 lb
SSD+HDD	**1519 g**	5.67 lb
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 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 9-2 Display specifications

	Metric	U.S.
Active diagonal size	35.6 cm	14.0 in
Thickness	3.0 mm	0.118 in
Resolution	1920 × 1080 FHD	
	1366 × 768 HD	
Surface treatment	Antiglare	
Brightness	250 nits	
Viewing angle	SVA (HD)	
	UWVA (FHD)	
Backlight	WLED	
Graphics adapter	eDP	

Hard drive specifications

This section provides specifications for your hard drive.

Table 9-3 Hard drive specifications

	1 TB*	500 GB*
Dimensions		
Height	7.2 mm or 9.5 mm	7.2 mm
Length	100.4 mm	100.6 mm
Width	69.9 mm	70.1 mm
Weight	115.0 g	92.0 g
Interface type	SATA	SATA
Transfer rate		
Synchronous (maximum)	300 MB/s	300 MB/s
Security	ATA security	ATA security
Seek times (typical read, including setting)		
Single track	1.4 ms	3 ms
Average (read/write)	10 ms	13 ms
Maximum	12 ms	24 ms
Logical blocks	1,938,921,461	1,048,576,000
Disk rotational speed	5400 rpm	5400 rpm
Operating temperature	**0℃** to **60℃** (32°F to 140°F)	

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.

NOTE: Certain restrictions and exclusions apply. Contact technical support for details.

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-4 Solid-state drive specifications

	256 GB*	512 GB*	1 TB*
Dimensions			
Height	1.0 mm	1.0 mm	1.0 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	PCIe	PCIe	PCIe
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms	1.0 ms
Access times, logical	0.1 ms	0.1 ms	0.1 ms
Transfer rate			
Sequential read	up to 2150 MB/s	up to 2150 MB/s	up to 2150 MB/s
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MB/s	up to 1550 MB/s	up to 1550 MB/s
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs	Up to 100,000 IOPs
Total logical sectors	468,883,296	1,000,215,216	1,500,336,388
Operating temperature	**0°C to 70°C** (32°F to 158°F)		

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications can differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact support for details.

10   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 10-1 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 76.	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 non-functional.
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 non-functional. A utility must be used for writing data to this memory and is available

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?
						on the HP website; go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.
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.	The Intel chipset is configured to enforce hardware protection to block all direct read-write access to this area. An Intel utility must be used for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
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 data on your hard drive. See question and answer 6 for steps to securely erase data.
   >
   > 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.

11 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 3-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 11-1 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 11-1 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 HO5VV-F, 3-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, 3-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, 3-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, 3-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 3-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 3-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 3-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.

12 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