Maintenance and Service Guide

SUMMARY

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

Legal information

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.

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1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	**HP Pro x360 435 13.3 inch G10 Notebook PC**
Processors	AMD Ryzen™ 7 PRO 7730U 2.0 GHz processor (8 cores, 16 MB L3 cache, 15 W)
	AMD Ryzen 5 PRO 7530U 2.00 GHz processor (6 cores, 16 MB L3 cache, 15 W)
	AMD Ryzen 7-7730U 2.0 GHz processor (8 cores, 16 MB L3 cache, 15 W)
	AMD Ryzen 5-7530U 2.0 GHz processor (6 cores, 16 MB L3 cache, 15 W)
	AMD Ryzen 3-7330U 2.3 GHz processor (4 cores, 8 MB L3 cache, 15 W)
Digital pen	HP slim rechargeable pen (select products only)
Display	**33.8 cm (13.3 in), liquid crystal display (LCD), full high-definition (FHD) (1920 × 1080), BrightView, white light emitting diode (WLED), ultra-wide viewing area (UWVA)**
	sRGB, 100% color gamut (CG), embedded DisplayPort™ (eDP) 1.3 + panel self-refresh (PSR), touch screen with ultraslim bezel, and G4 privacy filter; typical brightness: 1000 nits
	72% CG, eDP + PSR, low power (LP), touch screen, ultraslim; typical brightness: 400 nits
	45% CG, eDP without PSR, touch screen, slim; typical brightness: 250 nits
Media card reader	microSD® Media Reader Slot
Memory	Two memory module slots supporting up to 32 GB of RAM
	DDR4-3200, 1.2 V, SODIMM
	Supports the following configurations:
	● 32 GB (16 × 2)
	● 16 GB (16 × 1) or (8 × 2)
	● 8 GB (8 × 1) or (4 × 2)
	● 4 GB (4 × 1)
Primary storage	2 TB, M.2 2280, Peripheral Component Interconnect Express (PCIe)-4 × 4, Non-Volatile Memory Express (NVMe), solid-state drive with three-layer cell (TLC)
	1 TB, M.2 2280, PCIe-4 × 4, NVMe solid-state drive with TLC
	512 GB, M.2 2280, PCIe-4 × 4, NVMe solid-state drive with TLC
	256 GB, M.2 2280, PCIe, NVMe, solid-state drive
	128 GB, M.2 2230, PCIe, NVMe, solid-state drive

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

Category	Description
Audio and video	Camera, HD 720p
	Camera, HD 720p + IR
	Dual-array digital microphone
	Rear-facing camera, 5 MP (select products only)
	Stereo speakers
Wireless (select products only)	**Integrated wireless local area network (WLAN) options with dual antennas (M.2 2230 socket PCIe/USB)**
	MediaTek™ RZ616 Wi-Fi 6E Bluetooth® 5.3 AIM-T WLAN
	Realtek™ 8852CE Wi-Fi 6E + Bluetooth 5.3 WLAN
	WLAN antennas (2) (configured at top of panel)
	Miracast® support
Ports	HDMI 2.1
	Audio-out (headphone)/audio-in (microphone) combo jack
	(2) USB 3.1 Gen 2 Type A ports
	USB 3.2 Gen 2 Type-C® port
	microSD
Keyboard/pointing devices	**Keyboard with clickpad**
	Non-backlit, spill resistant
	Non-backlit, spill resistant, for second camera
	Backlit, spill resistant, premium
	Backlit, spill resistant, premium, for second camera
	Backlit, spill resistant, premium, privacy
	Backlit, spill resistant, premium, for second camera, privacy

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

Category	Description
Power requirements	**Battery**
	3 cell, 42 Whr, polymer
	Long life
	HP Fast Charge Technology
	Smart AC adapters
	65 W, right angle, 4.5 mm, 1.8 m (6.0 ft)
	65 W, right angle, 4.5 mm, LA MERCO
	65 W, right angle, 4.5 mm, EM
	65 W, straight, USB Type-C®, 1.8 m (6.0 ft)
	45 W, right angle, 4.5 mm, 1.8 m (6.0 ft)
	45 W, right angle, 4.5 mm, LA MERCO
	45 W, right angle, 4.5 mm, 2 prong, Japan
	45 W, straight, USB Type-C
	Power cord
	C7, 1 m (3.3 ft)
	C5, 1 m (3.3 ft), 2 prong
	C5 1 m (3.3 ft), sticker, conventional, straight, HF
Security	Fingerprint sensor (select products only)
	Combination nano cable lock
	Camera privacy cover
Sensors	**Sensors**
	Accelerometer + Gyroscope
	Hall effect sensor
	Magnetometer (E compass)

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

Category	Description
Operating system	Windows® 11 Enterprise 64
	Windows 11 Home 64
	Windows 11 Home 64 Advanced
	Windows 11 Home 64 Advanced Single Language
	Windows 11 Home 64 Chinese Market CPPP
	Windows 11 Home 64 High-end Chinese Market CPPP
	Windows 11 Home 64 Plus
	Windows 11 Home 64 Plus Single Language
	Windows 11 Home 64 Plus Single Language Africa Market PPP
	Windows 11 Home 64 Plus Single Language APAC EM PPP
	Windows 11 Home 64 Plus Single Language India Market PPP
	Windows 11 Home 64 Plus Single Language Indonesia Market PPP
	Windows 11 Home 64 Single Language
	Windows 11 Home 64 Single Language Africa Market PPP
	Windows 11 Home 64 Single Language APAC EM PPP
	Windows 11 Home 64 Single Language India Market PPP
	Windows 11 Home 64 Single Language Indonesia Market PPP
	Windows 11 Pro 64
	Windows 11 Pro 64 Chinese Market
	Windows 11 Pro 64 Downgrade Windows 10 Pro 64
	Windows 11 Pro 64 Downgrade Windows 10 Pro 64 Chinese Market
	Windows 11 Pro 64 Downgrade Windows 10 Pro 64 StF MSNA Standard
	Windows 11 Pro 64 StF MSNA Standard
	Windows 10 Enterprise 64
	Windows 10 Enterprise 64 LTSC 2109 (21H2)
	FreeDOS
Serviceability	**End user replaceable part:** AC adapter

2 Components

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

Right 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)	SD	microSD memory card reader	Reads optional memory cards that store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with the connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ■ Press in on the card, and then remove it from the memory card reader.
(2)	🎧	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: ■ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.

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

Component		Description
(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)	USB SuperSpeed port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. **NOTE:** Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
(5)	USB Type-C SuperSpeed port and DisplayPort™ connector	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. **NOTE:** Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device. – and – Connects a DisplayPort device that has a USB Type-C connector, providing display output.
(6)	Battery light	When AC power is connected: • White: The battery charge is greater than 90%. • Amber: The battery charge is from 0 to 90%. • Off: The battery is not charging. When AC power is disconnected (battery not charging): • Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly. • Off: The battery is not charging.
(7)	Power connector	Connects an AC adapter.

Left side

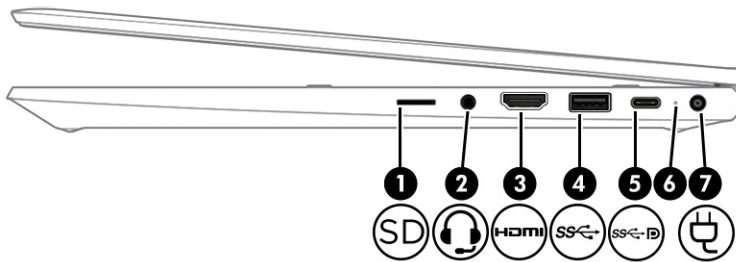Use the illustration and table to identify the components on the left side of the computer.
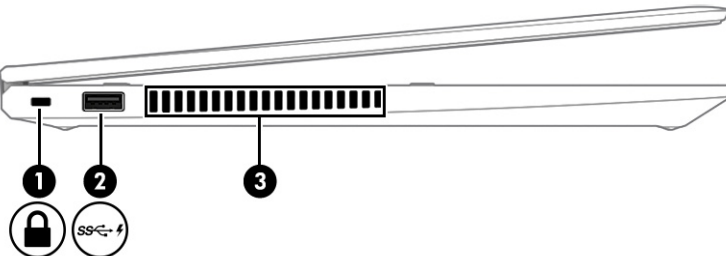
Table 2-2 Left-side components and their descriptions

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)	SS⟵⚡ USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off.
		NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
(3)	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.

Display

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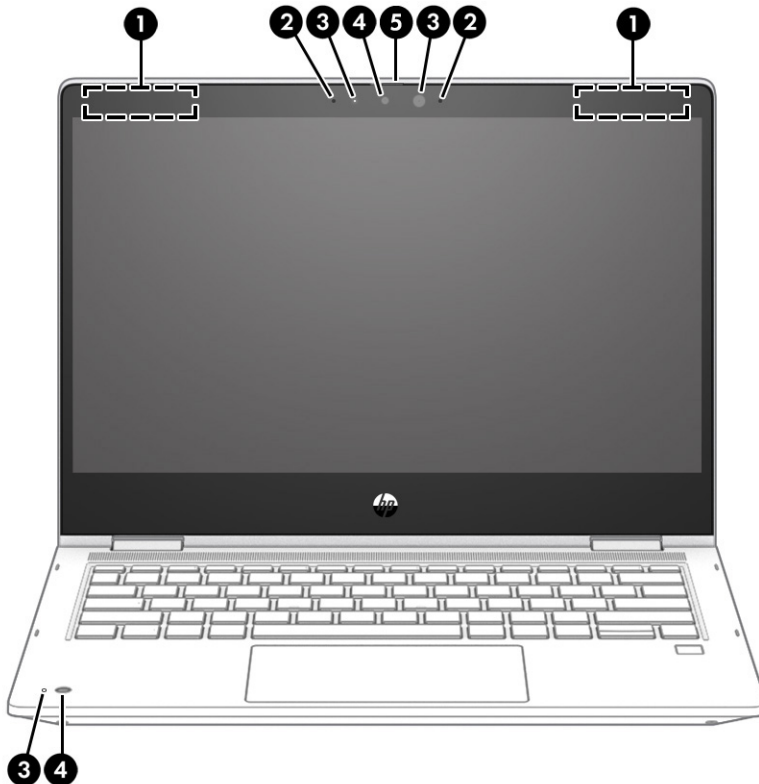
Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Internal microphones	Record sound.
(3)	Camera light(s)	On: One or more cameras are in use.
(4)	Camera(s)	Allow(s) you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. **NOTE:** Camera functions vary depending on the camera hardware and software installed on your product.
(5)	Camera privacy cover	By default, the camera lens is uncovered, but you can slide the camera privacy cover to block the camera's view. To use the camera, slide the camera privacy cover in the opposite direction to reveal the lens. **NOTE:** If you have both front-facing and rear-facing cameras, when one camera lens is revealed and ready to use, the other is concealed.

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

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

To access this guide:

▪ Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.

Keyboard area

Keyboards can vary by language.

Touchpad

The touchpad settings and components are described here.

Touchpad settings

You learn how to adjust the touchpad settings and components here.

Adjusting touchpad settings

Use these steps to adjust touchpad settings and gestures.

1. Type `touchpad settings` in the taskbar search box, and then press enter.

2. Choose a setting.

Turning on the touchpad

Follow these steps to turn on the touchpad.

1. Type `touchpad settings` in the taskbar search box, and then press enter.

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

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

Touchpad components

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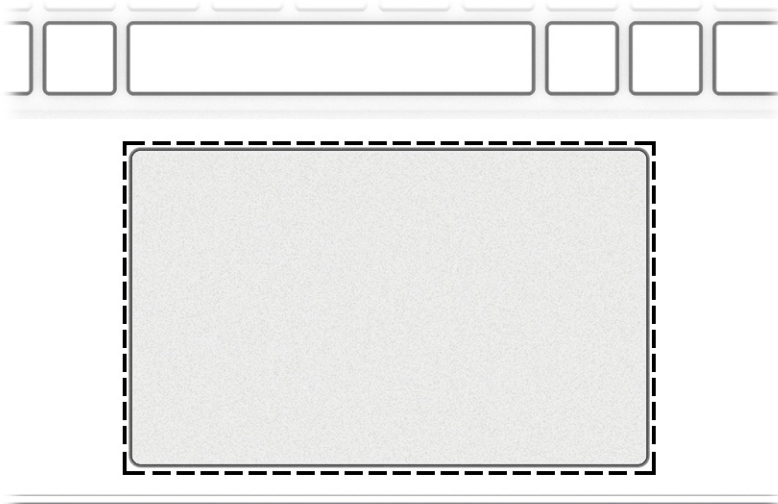
Table 2-4 Touchpad components and their descriptions

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

Lights

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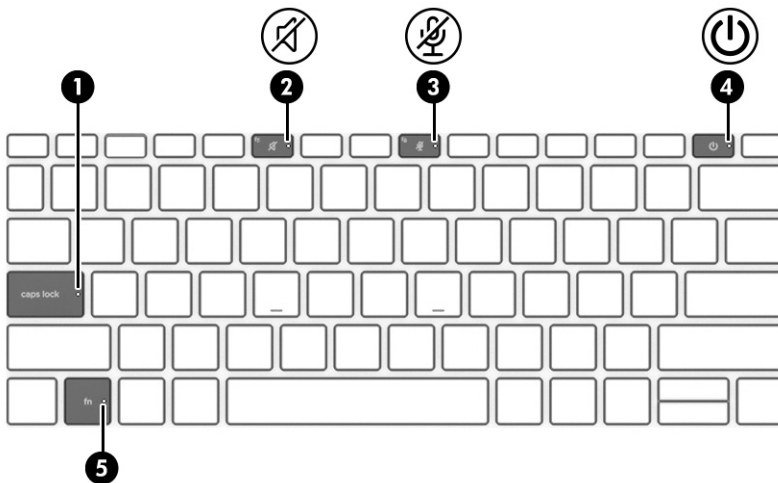
Table 2-5 Lights and their descriptions

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.
(3)	Microphone mute light	• On: Microphone is off. • Off: Microphone is on.
(4)	Power light	• On: The computer is on. • Blinking (select products only): The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unnecessary components. • Off: Depending on your computer model, the computer is off, in Hibernation, or in Sleep. Hibernation is the power-saving state that uses the least amount of power.
(5)	Fn lock light	On: The fn key is locked.

Button, speakers, and fingerprint reader

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

IMPORTANT: To verify that your computer supports fingerprint reader sign-in, type `Sign-in options` in the taskbar search box and follow the on-screen instructions. If **Fingerprint reader** is not listed as an option, then your notebook does not include a fingerprint reader.
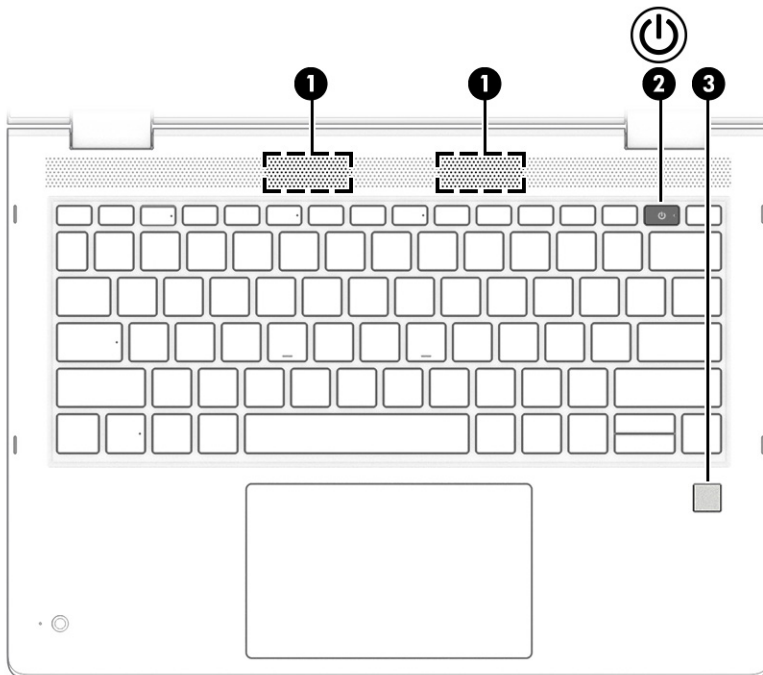
Table 2-6 Button, speakers, and fingerprint reader and their descriptions

Component		Description
(1)	Speakers	Produce sound.
(2)	Power button	- When the computer is off, press the button briefly to turn on the computer. - When the computer is on, press the button briefly to initiate Sleep. - When the computer is in the Sleep state, press the button briefly to exit Sleep (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 for at least 4 seconds to turn off the computer. To learn more about your power settings, use the Power icon. - Right-click the **Power** icon ▭, and then select **Power and sleep settings**.
(3)	Fingerprint reader (select products only)	Allows a fingerprint logon to Windows, instead of a password logon. Swipe the upper-left corner of the touchpad. IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.

Special keys

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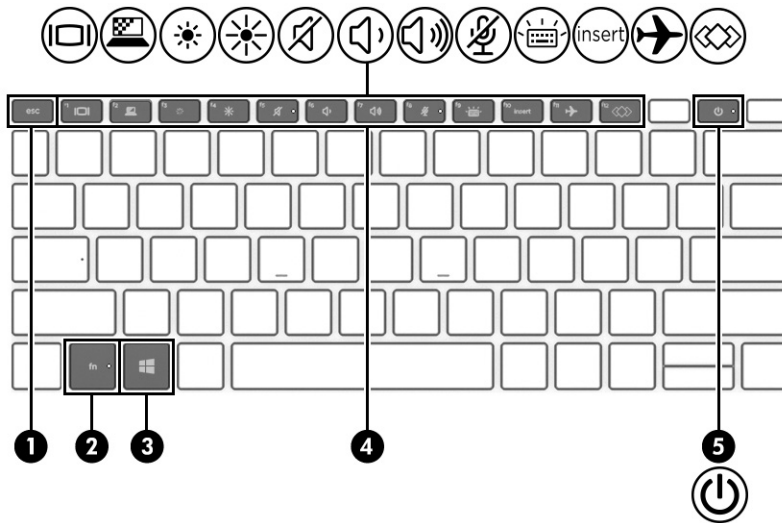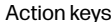
Table 2-7 Special keys and their descriptions

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with another key. Such key combinations are called *hot keys*.
(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.
(5)	Power button	• When the computer is off, press the button briefly to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep (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 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**.

Bottom

Use the illustration and table to identify the bottom component
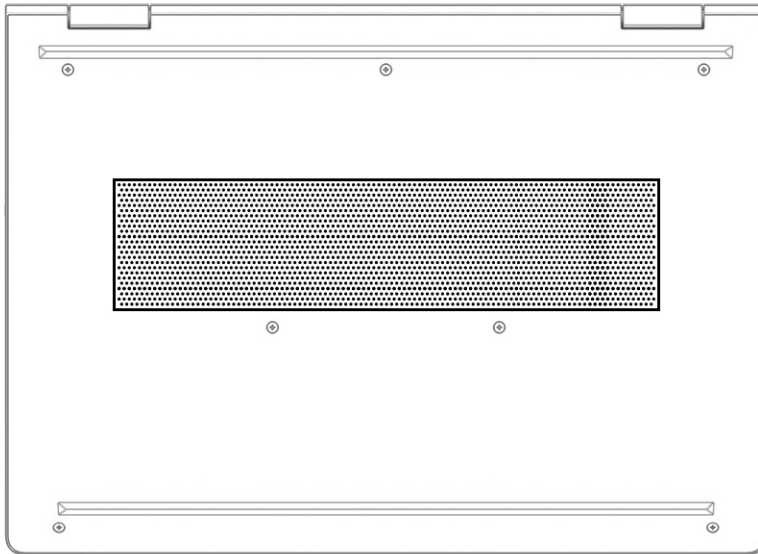
Table 2-8 Bottom component and its description

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 the examples shown below. Refer to the illustration that most closely matches the service label on your computer.
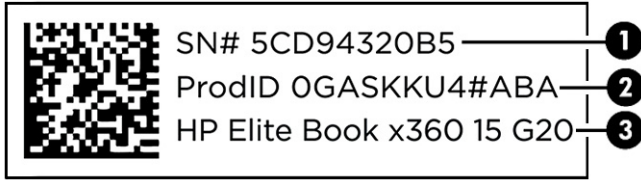
Table 2-9 Service label components

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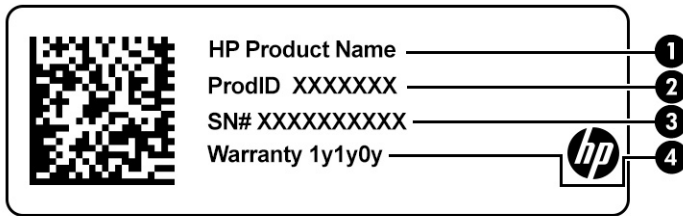
Table 2-10 Service label components

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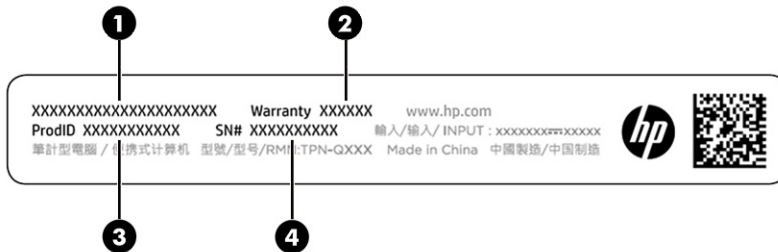
Table 2-11 Service label components

Component	
(1)	HP product name

Table 2-11 Service label components (continued)

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

- Regulatory labels—Provide regulatory information about the computer.

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

3   Illustrated parts catalog

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

Computer major components

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

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

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer.
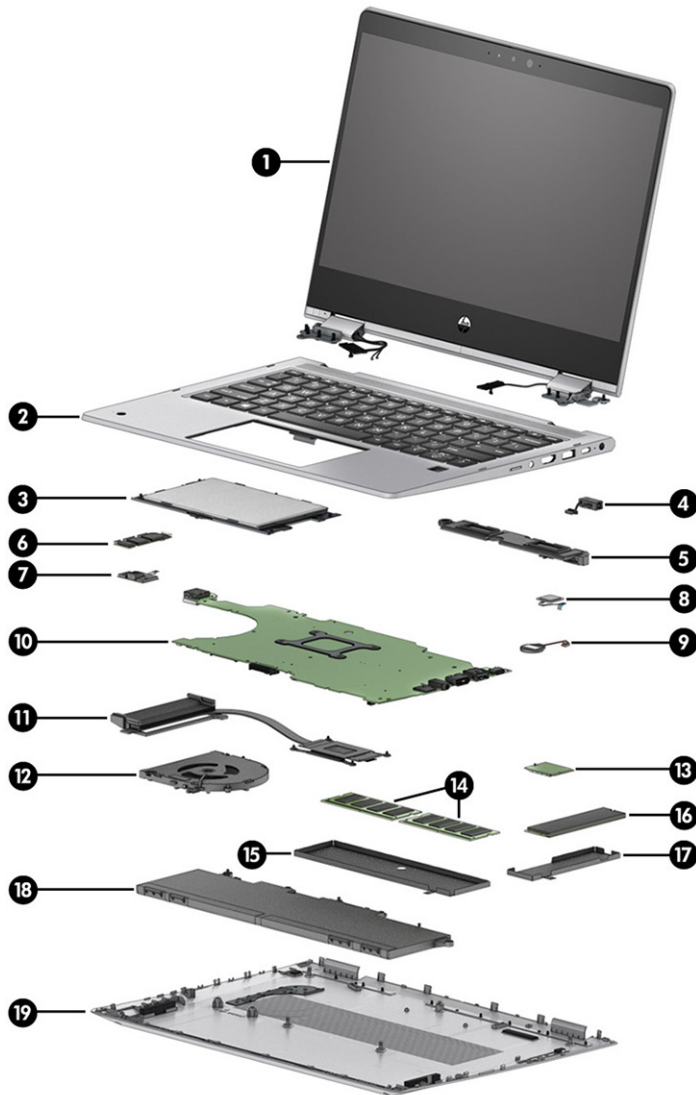
Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**33.78 cm [13.3 in], display assembly** (includes webcam, microphone, and wireless antennas):	
	250 nits, HD camera	N39190-001
	250 nits, HD + IR camera	N39191-001
	400 nits, HD camera	N39192-001
	400 nits, HD + IR camera	N39193-001
	1000 nits, privacy	N39194-001
(2)	**Keyboard/top cover**	
	Not backlit, HD camera	N39207-xxx
	Backlit, HD camera	N39208-xxx
	Not backlit, HD + IR camera (includes top cover camera)	N39209-xxx
	Backlit, HD + IR camera (includes top cover camera)	N39210-xxx
	Backlit, HD camera, privacy	N39211-xxx
	Backlit, HD + IR camera, privacy (includes top cover camera)	N39212-xxx
(3)	**Touchpad**	M46283-001
	NOTE: The touchpad cable is available in the Cable Kit, spare part number M03431-001.	
(4)	**Power connector cable**	M03424-001
(5)	**Speaker** (includes speaker, cable, and rubber isolator)	M03439-001
(6)	**Top-cover camera board** (included in Camera Module Kit)	N39206-001
	NOTE: The top-cover camera-board cable is available in the Cable Kit, spare part number M03431-001.	
(7)	**Top cover camera** (included in Camera Module Kit)	N39206-001
(8)	**Fingerprint reader** (includes gasket)	N10075-001
	NOTE: The fingerprint reader cable is available in the Cable Kit, spare part number M03431-001.	
(9)	**RTC battery** (includes cable)	L13694-001
(10)	**System board** (includes integrated processor and replacement thermal material)	
	All system boards use the following part numbers:	
	xxxxxx-001: Non-Windows operating system	
	xxxxxx-601: Windows operating system	
	AMD Ryzen 7 PRO 7730U processor, models with an HD camera	N39201-xxx
	AMD Ryzen 7 PRO 7730U processor, models with an HD + IR camera	N39205-xxx
	AMD Ryzen 5 PRO 7530U processor, models with an HD camera	N39199-xxx
	AMD Ryzen 5 PRO 7530U processor, models with an HD + IR camera	N39204-xxx
	AMD Ryzen 7 7730U processor, models with an HD camera	N39200-xxx
	AMD Ryzen 7 7730U processor, models with an HD + IR camera	N39203-xxx

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

Item	Component	Spare part number
	AMD Ryzen 5 7530U processor, models with an HD camera	N39198-xxx
	AMD Ryzen 5 7530U processor, models with an HD + IR camera	N39202-xxx
	AMD Ryzen 3 7330U processor, models with an HD camera	N39197-xxx
(11)	**Heat sink** (includes captive screws and replacement thermal material)	M46284-001
(12)	**Fan**	M03432-001
(13)	**WLAN module**	
	Realtek 8852CE Wi-Fi 6E + Bluetooth 5.3 WLAN	N19618-007
	Mediatek RZ616 Wi-Fi 6E Bluetooth 5.3 AIM-T WLAN	N22541-006
(14)	**Memory modules** (DDR4-3200, 1.2V, SODIMM):	
	16 GB	L67710-001
	8 GB	L46598-001
	4 GB	L83673-001
(15)	**Memory module shield**: The memory module shield is included in Bracket Kit, spare part number M03436-001.	
(16)	**Solid-state drive** NOTE: The solid-state drive thermal pad is available as spare part number N39891-001.	
	2 TB, 2280, PCIe-4×4, ZTurbo, TLC	M52027-001
	1 TB, 2280, PCIe-4×4, TLC	M16560-001
	512 GB, 2280, PCIe-4×4, TLC	M17436-001
	256 GB, 2280, PCIe-4×4	N04489-001
	128 GB, 2230, PCIe	M11040-001
(17)	**Solid-state drive shield**: The solid-state drive shield is included in Bracket Kit, spare part number M03436-001.	
(18)	**Battery** (3 cell, 42 WHr)	M75597-006
(19)	**Bottom cover**	N39189-001

Cables

To identify the cables, use this illustration and table.
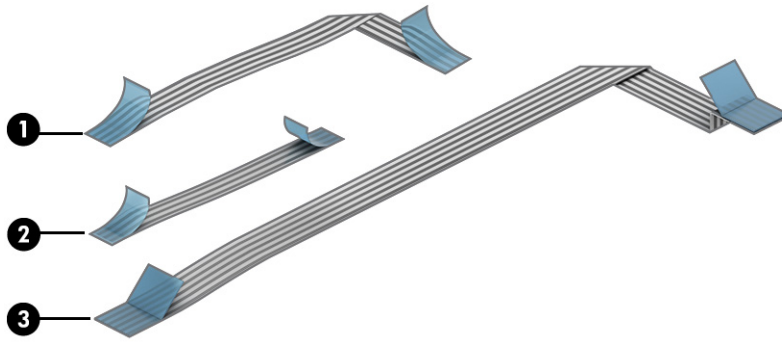
Table 3-2 Cable descriptions and part numbers

Item	Component	Spare part number
	Cable Kit includes:	M03431-001
(1)	Touchpad cable	
(2)	Fingerprint reader cable	
(3)	Top cover camera cable	

Brackets

To identify the brackets, use this illustration and table.
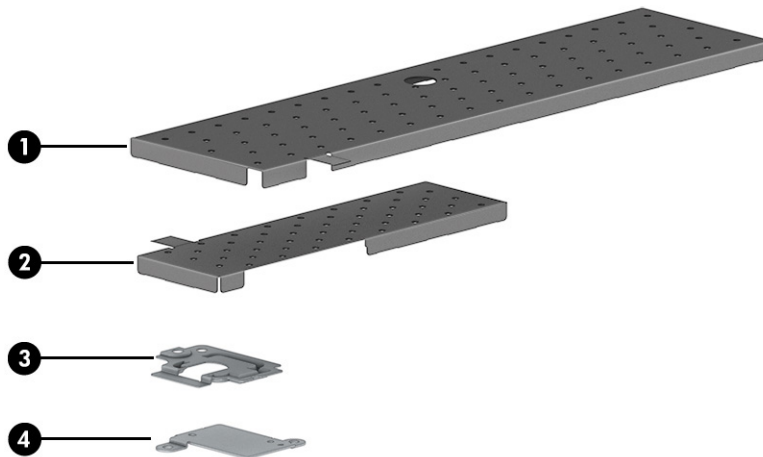
Table 3-3 Bracket descriptions and part numbers

Item	Component	Spare part number
	Bracket Kit includes:	M03436-001
(1)	Memory module shield	
(2)	Solid-state drive shield	
(3)	Fingerprint reader bracket	

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

Item	Component	Spare part number
(4)	Top cover camera bracket	

Plastics Kit

To identify the Plastics Kit, use this illustration and table.
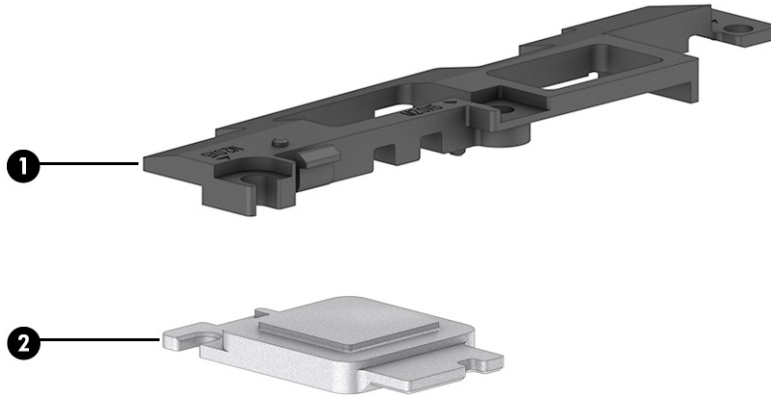
Table 3-4 Plastics Kit description and part number

Item	Component	Spare part number
	Plastics Kit includes:	N39195-001
(1)	I/O bracket	
(2)	Fingerprint reader insert (for models without a fingerprint sensor)	
	Top cover camera thermal shield (not illustrated)	
	Solid-state drive cap (not illustrated)	
	Solid-state drive WWAN spacer (not illustrated)	
	Gasket (not illustrated)	

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-5 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapters	
280 W, slim, PFC, 7.4 mm	M52952-001
120 W, Smart, PFC, 7.4 mm	L89695-001
120 W, Smart PFC, 4.5 mm	M95377-001

Table 3-5 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
65 W, Smart, nPFC, 4.5 mm	710412-001
65 W, USB Type-C, 1.8 m (6.0 ft)	L67440-001
65 W, USB Type-C	N05175-001
65 W, Smart, nPFC, 4.5 mm, EM	N31180-001
45 W, Smart, nPFC, 4.5 mm	741727-001
45 W, Smart, nPFC, 4.5 mm, 2 pin	742436-001
45 W, USB Type-C, 1.8 m (6.0 ft), 3 pin	L43407-001
Screw Kit	N39196-001
Screw Kit for docking station	L64089-001
Adapters	
USB 3.0-to-RJ-45	M95984-001
USB-C-to-RJ-45	M95985-001
HDMI-to-VGA	701943-001
USB-C-to-VGA	831751-001
USB-C-to-USB-A	916838-001
USB-C-to-HDMI 2.0	935325-001
USB-C-to-DisplayPort	831753-001
USB-C-to-USB-A connector	L65254-001
USB-C (male)-to-USB-C (male)	L65253-001
Smart AC adapter 7.4 mm	734734-001
Locks	
Nano combination cable lock	N10500-001
Essential nano combination cable lock	N10501-001
Nano lock	918431-001
HP Prelude Pro 15.6 Backpack	M03617-001
HP Prelude Pro 15.6 Top Load Case	M03618-001
Docking stations	
HP Thunderbolt Dock 120 W with cable	L15809-001
HP USB-C Dock with cable	L64086-001
HP USB-C/A Universal Dock with cable	L64087-001
HP Thunderbolt 120W G4 Dock with cable	M97105-001
HP Thunderbolt 280W G4 Dock with combo cable	M97106-001
HP USB-C G5 Essential Dock	N31329-001
Multiport USB-C universal hub	M96882-001

Table 3-5 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
HP USB-C Travel Hub	L72056-001
Cable for HP Thunderbolt 120W G4 Dock	M88058-001
Cable for HP Thunderbolt 280W G4 Dock	M88059-001
Bottom case for USB-C/A Universal Dock	L64088-001
Bottom case for HP USB-C Dock	L65256-001
Mouse	
HP Wireless Premium Mouse	923947-001
HP Bluetooth Travel Mouse	L62043-001
HP USB Mouse	L95713-001
HP 128 Laser Wired Mouse	M27885-001
HP 435 Wireless Mouse	M62277-001
HP USB Keyboard	L95712-001
External USB DVD-RW drive	747080-001
Power cords (C5, 1.0 m [3.3 ft])	
Argentina	L19357-001
Australia	L19358-001
Brazil	L19359-001
Denmark	L19360-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L19361-001
India	L19363-001
Israel	L19362-001
Italy	L19364-001
Japan	L19365-001
North America	L19367-001
People's Republic of China	L19368-001
South Africa	L19369-001
South Korea	L19366-001
Switzerland	L19370-001
Taiwan	L19372-001
Thailand	L19371-001
United Kingdom	L19373-001
Power cords (C5, 1.8 m [6.0 ft])	
Argentina	L19357-002
Australia	L19358-002

Table 3-5 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
Brazil	L19359-002
Denmark	L19360-002
Denmark, HF	M79264-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L19361-002
Europe, HF (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	M79266-001
Europe + ADP bundle	N16170-001
India	L19363-002
Israel	L19362-002
Italy	L19364-002
Japan	L19365-002
North America	L19367-002
People's Republic of China	L19368-002
South Africa	L19369-002
South Korea	L19366-002
Switzerland	L19370-002
Switzerland, HF	M79265-001
Taiwan	L19372-002
Thailand	L19371-002
Thailand + ADP bundle	M85418-001
United Kingdom	L19373-002
Power cords (C13, 1.8 m [6.0 ft])	
Argentina	L32029-001
Australia	N24670-001
Brazil	L32030-001
Denmark	N24672-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	N24669-001
India	N24679-001
Israel	N24678-001
Italy	L32031-001
Japan	N24680-001
North America	N24671-001
People's Republic of China	N24676-001
South Africa	N24674-001
South Korea	N24675-001

Table 3-5 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
Switzerland	N24673-001
Taiwan	N24677-001
United Kingdom	N24668-001
Power cord (C7, 1.0 m [3.3 ft]) for use in Japan	L19375-001
Duckhead power cord for use in Japan	L33157-001
Duckhead power cord for use in Brazil	L19341-002

4 Removal and replacement procedures preliminary requirements

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

Tools required

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

- Tweezers
- Nonconductive, nonmarking pry tool
- Magnetic Phillips P0 screwdriver (for one touchpad screw)
- Magnetic Phillips P1 screwdriver

Service considerations

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

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

Plastic parts

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

Cables and connectors

Handle cables with extreme care to avoid damage.

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

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

Drive handling

Note the following guidelines when handling drives.

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

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

- Before removing an optical drive, be sure that a disc is not in the drive, and be sure that the optical drive tray is closed.

- Handle drives on surfaces covered with at least 2.54 cm (1 inch) of shock-proof foam.

- Avoid dropping drives from any height onto any surface.

- After removing a hard drive or an optical drive, place it in a static-proof bag.

- Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.

- Avoid exposing a drive to temperature extremes or liquids.

- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging, and label the package "FRAGILE."

Electrostatic discharge information

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

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

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

- Keep components in their electrostatic-safe containers until you are ready to install them.

- Before touching an electronic component, discharge static electricity by using the guidelines described in Personal grounding methods and equipment on page 27.

- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.

- If you remove a component, place it in an electrostatic-safe container.

Generating static electricity

Follow these static electricity guidelines:

- Different activities generate different amounts of static electricity.

- Static electricity increases as humidity decreases.

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

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

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

NOTE: As little as 700 V of static electricity can degrade a product.

Preventing electrostatic damage to equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity.

The following packaging and grounding precautions are necessary to prevent static electricity damage to electronic components:

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.

- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.

- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.

- Place items on a grounded surface before removing them from their container.

- Always be properly grounded when touching a sensitive component or assembly.

- Avoid contact with pins, leads, or circuitry.

- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

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

- **Wrist straps** are flexible straps with a maximum of 1 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.

- You can use **heel straps, toe straps, and boot straps** at standing workstations. These straps are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of 1 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
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

Cleaning your computer

Cleaning your computer regularly removes dirt and debris so that your device continues to operate at its best. Use the following information to safely clean the external surfaces of your computer.

Enabling HP Easy Clean (select products only)

HP Easy Clean helps you to avoid accidental input while you clean the computer surfaces. This software disables devices such as the keyboard, touch screen, and touchpad for a preset amount of time so that you can clean all computer surfaces.

1. Start HP Easy Clean in one of the following ways:

    - Select the **Start** menu, and then select **HP Easy Clean**.

      – or –

    - Select the **HP Easy Clean** icon in the taskbar.

      – or –

    - Select **Start**, and then select the **HP Easy Clean** tile.

2. Now that your device is disabled for a short period, see Removing dirt and debris from your computer on page 29 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 30 for guidelines to help prevent the spread of harmful bacteria and viruses.

Removing dirt and debris from your computer

Here are the recommended steps to clean dirt and debris from your computer.

For computers with wood veneer, see Caring for wood veneer (select products only) on page 31.

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

    ⚠ CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with water. The cloth should be moist, but not dripping wet.

📝 **IMPORTANT:** To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

📝 **IMPORTANT:** Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

See <u>Cleaning your computer with a disinfectant on page 30</u> for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

The World Health Organization (WHO) recommends cleaning surfaces, followed by disinfection, as a best practice for preventing the spread of viral respiratory illnesses and harmful bacteria.

After cleaning the external surfaces of your computer using the steps in <u>Removing dirt and debris from your computer on page 29</u>, <u>Caring for wood veneer (select products only) on page 31</u>, or both, you might also choose to clean the surfaces with a disinfectant. A disinfectant that is within HP's cleaning guidelines is an alcohol solution consisting of 70% isopropyl alcohol and 30% water. This solution is also known as rubbing alcohol and is sold in most stores.

Follow these steps when disinfecting high-touch, external surfaces on your computer:

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

⚠ **CAUTION:** To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with a mixture of 70% isopropyl alcohol and 30% water. The cloth should be moist, but not dripping wet.

⚠ **CAUTION:** Do not use any of the following chemicals or any solutions that contain them, including spray-based surface cleaners: bleach, peroxides (including hydrogen peroxide), acetone, ammonia, ethyl alcohol, methylene chloride, or any petroleum-based materials, such as gasoline, paint thinner, benzene, or toluene.

📝 **IMPORTANT:** To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

> **IMPORTANT:** Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

Caring for wood veneer (select products only)

Your product might feature high-quality wood veneer. As with all natural wood products, proper care is important for best results over the life of the product. Because of the nature of natural wood, you might see unique variations in the grain pattern or subtle variations in color, which are normal.

- Clean the wood with a dry, static-free microfiber cloth or chamois.

- Avoid cleaning products containing substances such as ammonia, methylene chloride, acetone, turpentine, or other petroleum-based solvents.

- Do not expose the wood to sun or moisture for long periods of time.

- If the wood becomes wet, dry it by dabbing with an absorbent, lint-free cloth.

- Avoid contact with any substance that might dye or discolor the wood.

- Avoid contact with sharp objects or rough surfaces that might scratch the wood.

See Removing dirt and debris from your computer on page 29 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 30 for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.

- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.

- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.

- Place items on a grounded surface before removing items from their containers.

- Always be properly grounded when touching a component or assembly.

- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.

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

Accessing support information

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

Table 4-3 Support information locations

Service consideration	Path to access information

Records of reported failure incidents stored on the computer	**Windows®:**
	
	Preoperating system failures are logged in the BIOS Event Log. To view the BIOS Event Log:
	
	1. Press the power button.
	
	2. Immediately and repeatedly press esc when the power button light turns white.
	
	   NOTE: If you do not press esc at the appropriate time, you must restart the computer and again repeatedly press esc when the power button light turns white to access the utility.
	
	3. Press f10 to enter the BIOS setup.
	
	4. (On commercial products) Under the **Main** tab, select **BIOS event log**, and then select **View BIOS Event Log**.
	
	   - or -
	
	   (On consumer products) Under the **Main** tab, select **System Log**.
	
	Post-operating system failures are logged in the Event Viewer.
	
	1. Turn on the computer and allow the operating system to open.
	
	2. Select the search icon in the taskbar.
	
	3. Type `Event Viewer`, and then press enter.
	
	4. Select the log from the left panel. Details display in the right panel.
	
	Chrome™:
	
	1. Go to support.google.com/chrome.
	
	2. Search `collect Chrome device logs`.

Technical bulletins	To locate technical bulletins: 1. Go to www.hp.com. 2. Place the cursor over **Problem solving** to display more options. 3. Select **Support & Troubleshooting**. 4. Type the serial number, product number, or product name to go to the product support page. 5. Select **Advisories** to view technical bulletins.

Table 4-3 Support information locations (continued)

Service consideration	Path to access information
Repair professionals	To locate repair professionals: 1. Go to www.hp.com. 2. Place the cursor over **Support resources** to display more options. 3. Select **Authorized service providers**.
Component and diagnosis information, failure detection, and required action	To locate diagnosis information and actions: 1. Go to http://www.hp.com/go/techcenter/pcdiags. 2. Select **Get Support**. 3. Near the bottom of the window, select **Notebook PCs**, and then select your location.

5 Removal and replacement procedures for authorized service provider parts

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

IMPORTANT: Only an authorized service provider should access the components described in this chapter. Accessing these parts can damage the computer or void the warranty.

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

Component replacement procedures

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

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

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

Preparation for disassembly

To remove and replace computer components, use these procedures:

For initial safety procedures, see Removal and replacement procedures preliminary requirements on page 25.

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

Bottom cover

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

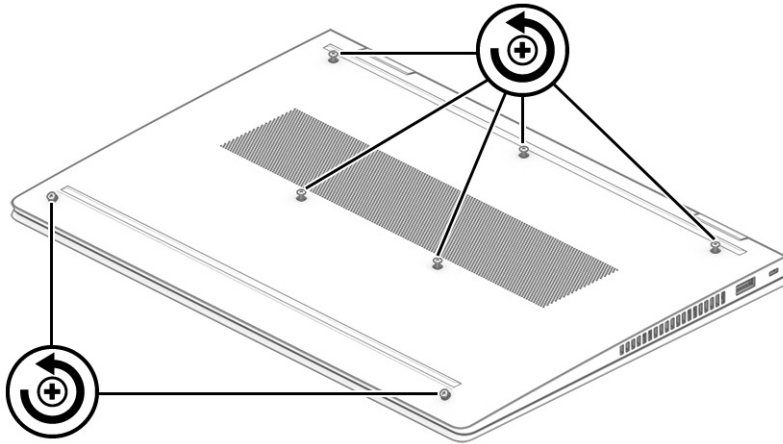Table 5-1 Bottom cover description and part number

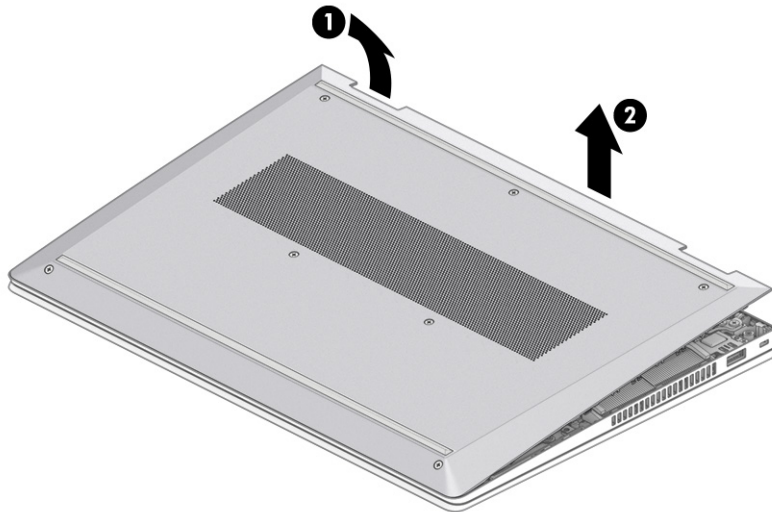| Description	Spare part number
Bottom cover	N39189-001

Before removing the bottom cover, prepare the computer for disassembly (see Preparation for disassembly on page 34).

Remove the bottom cover:

1. Loosen the seven captive Phillips screws that secure the bottom cover to the computer.

2. Starting near the display hinges, insert a tool to release the bottom cover from the computer **(1)**.

3. Remove the bottom cover **(2)** from the computer.

To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 Battery description and part number

Description	Spare part number
Battery (3 cell, 42 WHr; includes four captive screws)	M75597-006

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

- Do *not* puncture, twist, or crack the battery.

- Do *not* cause an external puncture or rupture to the battery. They can cause a short inside the battery, which can result in battery thermal runaway.

- Do *not* handle or touch the battery enclosure with sharp objects such as tweezers or pliers, which might puncture the battery.

- Do *not* compress or squeeze the battery case with tools or heavy objects stacked on top of the case. These actions can apply undue force on the battery.

- Do *not* touch the connectors with any metallic surface or object, such as metal tools, screws, or coins, which can cause shorting across the connectors.
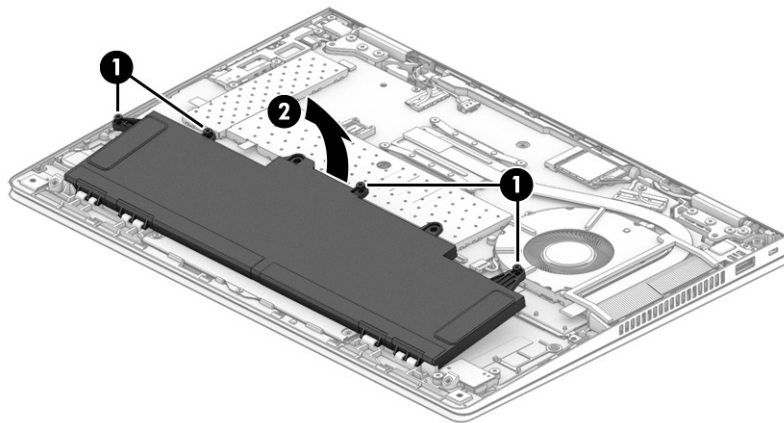
Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

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

📝 **IMPORTANT:** Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before you remove the battery.

Remove the battery:

1. Loosen the four captive Phillips screws **(1)** that secure the battery to the computer.

2. Lift the top of the battery **(2)** and swing it up and forward to remove it from the computer.

To insert the battery, reverse the removal procedures.

RTC battery

To remove the real-time clock (RTC) battery, use this procedure and illustration.

Table 5-3 RTC battery description and part number

Description	Spare part number
RTC battery (includes cable)	L13694-001

Before removing the RTC battery, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.

2. Release the RTC battery cable from the retention clip **(2)** that is built into the computer.

3. Remove the RTC battery **(3)** from the computer. The RTC battery is secured with double-sided adhesive.
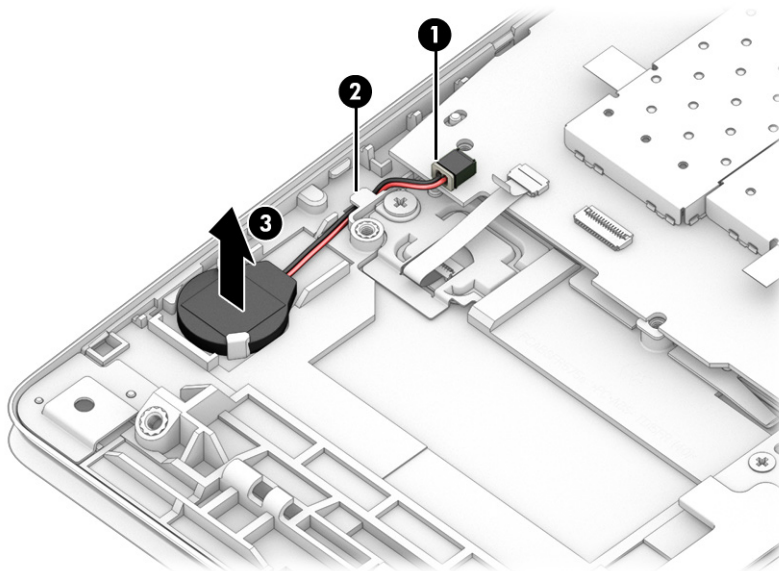
To install the RTC battery, reverse this procedure.

Touchpad cable

To remove the touchpad cable, use this procedure and illustration.

📝 NOTE: The touchpad cable is included in the Cable Kit, spare part number M03431-001.

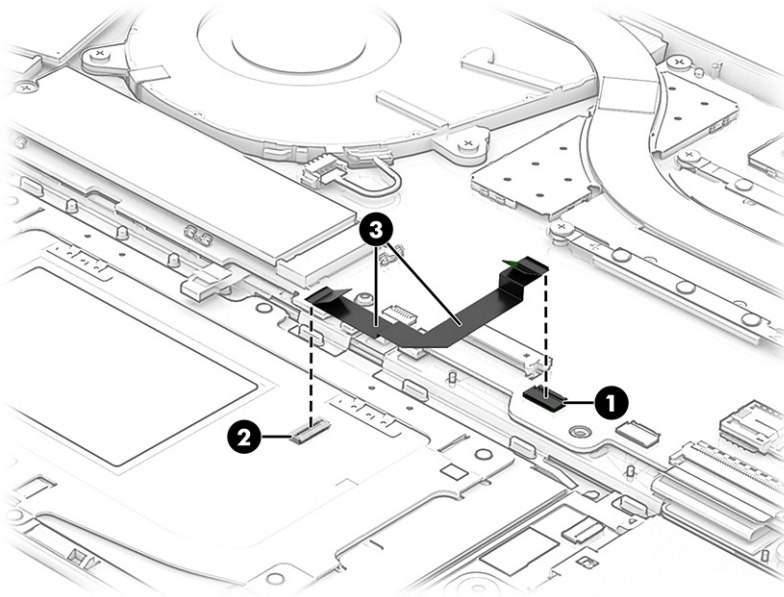Before removing the touchpad cable, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

Remove the touchpad cable:

1. Release the ZIF connector **(1)** the touchpad cable is connected to, and then disconnect the cable from the system board.

2. Release the ZIF connector **(2)** the touchpad cable is connected to, and then disconnect the cable from the touchpad.

3. Detach the touchpad cable **(3)** from the top cover with keyboard. (The touchpad cable is attached with double-sided adhesive.)

To install the touchpad cable, reverse this procedure.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-4 Touchpad description and part number

Description	Spare part number
Touchpad	M46283-001

NOTE: The touchpad cable is available in the Cable Kit, spare part number M03431-001.

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the touchpad:

1. Disconnect the cable from the ZIF connector on the touchpad **(1)**.

2. Lift the protective shielding from the top of the touchpad **(2)**.

3. Remove the five Phillips M2.0 × 2.3 screws **(3)** that secure the touchpad to the computer.

4. Remove the Phillips M1.6 × 2.0 screw **(4)** that secures the touchpad to the computer. Note that this screw requires a Phillips P0 screwdriver.

5. Remove the touchpad from the computer **(5)**.
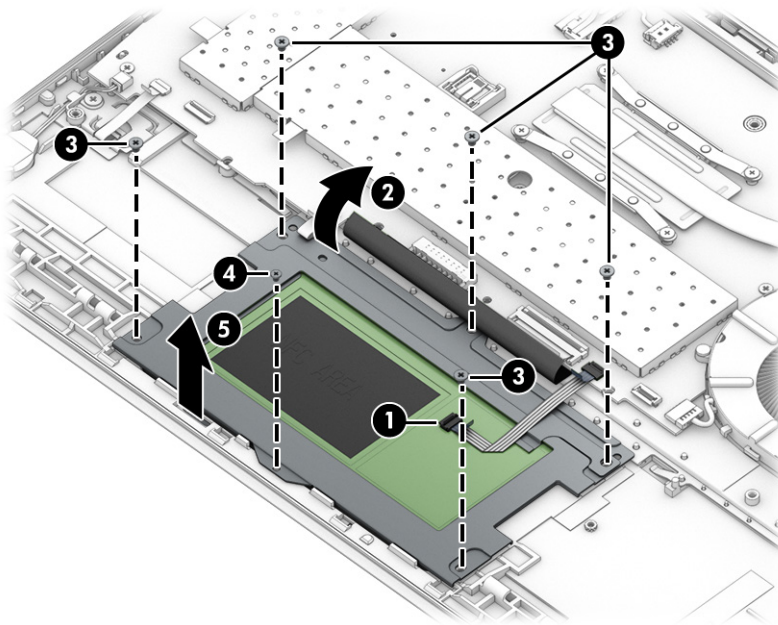
To install the touchpad, reverse this procedure.

Top-cover camera

To remove the top-cover camera, use this procedure and illustration.

Table 5-5 Top-cover camera description and part number

Description	Spare part number
Top-cover camera	N39206-001

NOTE: The top-cover camera cable is included in the Cable Kit, spare part number M03431-001. The top-cover camera bracket is included in the Bracket Kit, spare part number M03436-001. The top-cover camera thermal shield is included in the Plastics Kit, spare part number N39195-001.
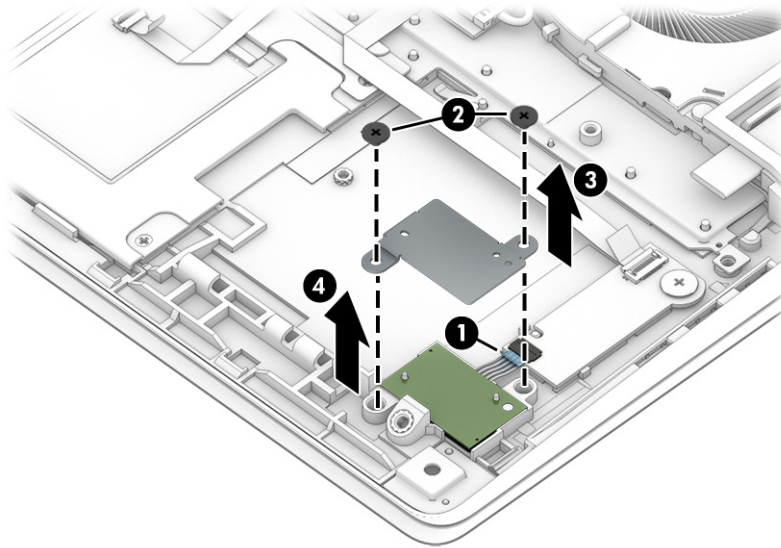
Before removing the top-cover camera, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the top-cover camera:

1. Remove the foil that covers the top-cover camera.

2. Release the ZIF connector **(1)** the top-cover camera cable is connected to, and then disconnect the cable from the top-cover camera board.

3. Remove the two M2.0 × 2.0 screws **(2)** that secure the top-cover camera and bracket to the computer.

4. Remove the top-cover camera bracket **(3)** from the computer.

5. Remove the top-cover camera **(4)** from the computer.

To install the top-cover camera, reverse this procedure.

Top-cover camera-board cable

To remove the top-cover camera-board cable, use this procedure and illustration.

📝 **NOTE:** The top-cover camera-board cable is included in the Cable Kit, spare part number M03431-001.

Before removing the top-cover camera-board cable, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the top-cover camera-board cable:

1. Release the ZIF connector **(1)** the top-cover camera-board cable is connected to, and then disconnect the cable from the system board.

2. Release the ZIF connector **(2)** the top-cover camera-board cable is connected to, and then disconnect the cable from the top cover camera board.

3. Detach the cable **(3)** from the top cover with keyboard. (The cable is attached with double-sided adhesive.)
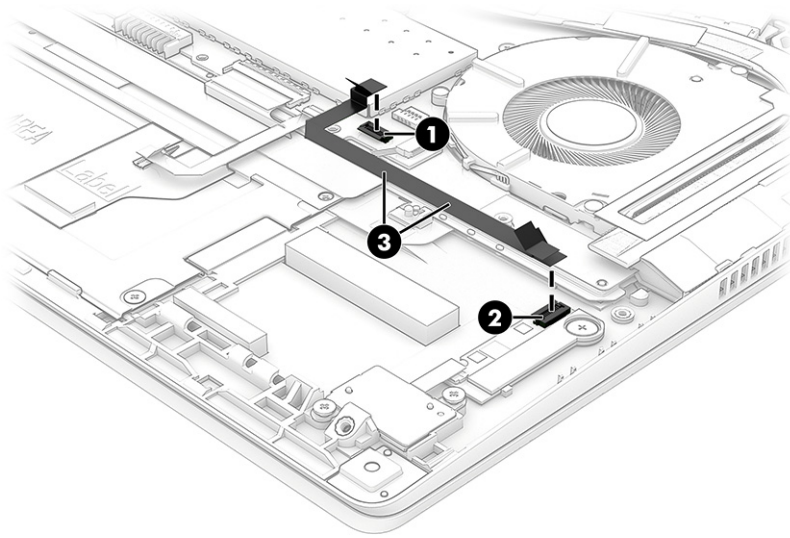
To install the top-cover camera-board cable, reverse this procedure.

Top-cover camera board

To remove the top-cover camera board, use this procedure and illustration.

Table 5-6 Top-cover camera board description and part number

Description	Spare part number
Top-cover camera board	N39206-001

NOTE: The top-cover camera-board cable is included in the Cable Kit, spare part number M03431-001. The top-cover camera board bracket is included in the Bracket Kit, spare part number M03436-001. The top-cover camera board thermal shield is included in the Plastics Kit, spare part number N39195-001.

Before removing the top-cover camera board, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the top-cover camera board:

1. Release the ZIF connector **(1)** the top-cover camera cable is connected to, and then disconnect the cable from the board.

2. Release the ZIF connector **(2)** the system board cable is connected to, and then disconnect the cable from the board.

3. Remove the M2.0 × 2.0 screw **(3)** that secures the board to the computer.

4. Remove the board **(4)** from the computer.
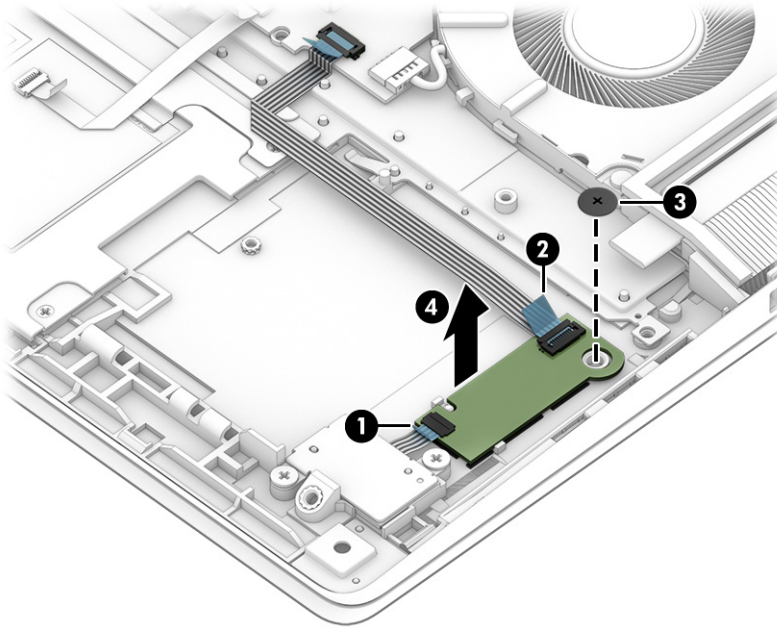
To install the top-cover camera board, reverse this procedure.

Solid-state drive

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

Table 5-7 Solid-state drive descriptions and part numbers

Description	Spare part number
2 TB, 2280, PCIe-4×4, ZTurbo, TLC	M52027-001
1 TB, 2280, PCIe-4×4, TLC	M16560-001
512 GB, 2280, PCIe-4×4, TLC	M17436-001
256 GB, 2280, PCIe-4×4	N04489-001
128 GB, 2230, PCIe	M11040-001
Solid-state drive thermal pad	N39891-001

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

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the solid-state drive:

1. Use the pull tab **(1)** to remove the solid-state drive shield **(2)**.

   The solid-state drive shield is included in the Bracket Kit, spare part number M03436-001.
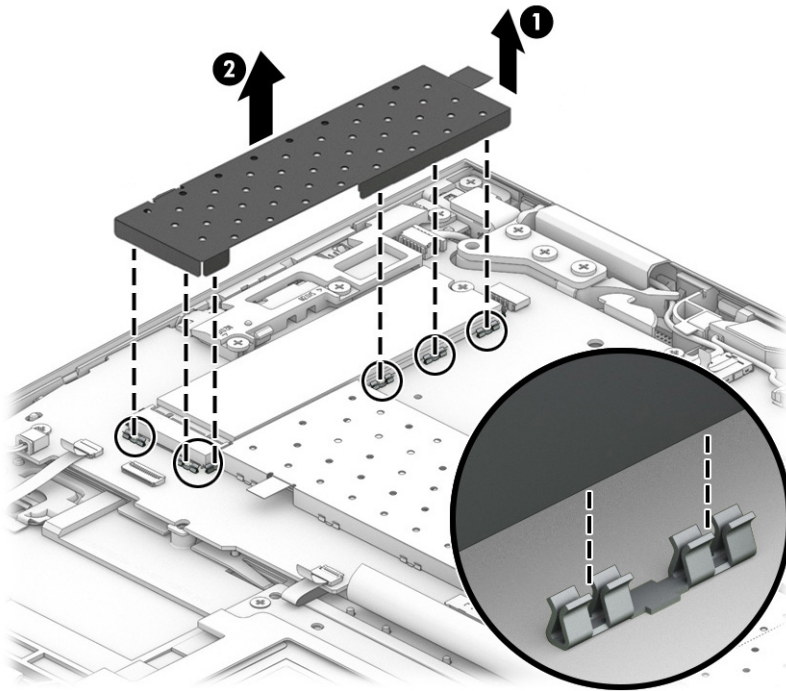
2. Remove the Phillips M2.0 × 3.0 screw **(1)** that secures the solid-state drive to the computer.

3. Pull the solid-state drive **(2)** away from the socket to remove it.
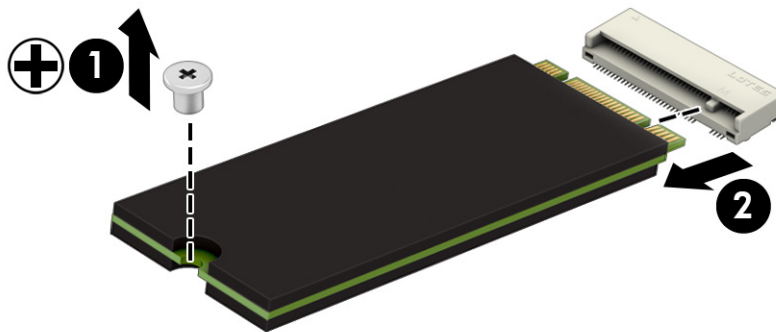
To install a solid-state drive, reverse the removal procedures.

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

Memory module

To remove a memory module, use this procedure and illustration.

Table 5-8 Memory module descriptions and part numbers

| Description	Spare part number
Memory module (DDR4-3200, 1.2V, SODIMM):	
16 GB	L67710-001
8 GB	L46598-001
4 GB	L83673-001

Before removing a memory module, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

If you are replacing a memory module, remove the existing memory module:

1. Use the pull tab **(1)** to remove the memory module shield **(2)**.

   The memory module shield is included in Bracket Kit, spare part number M03436-001.
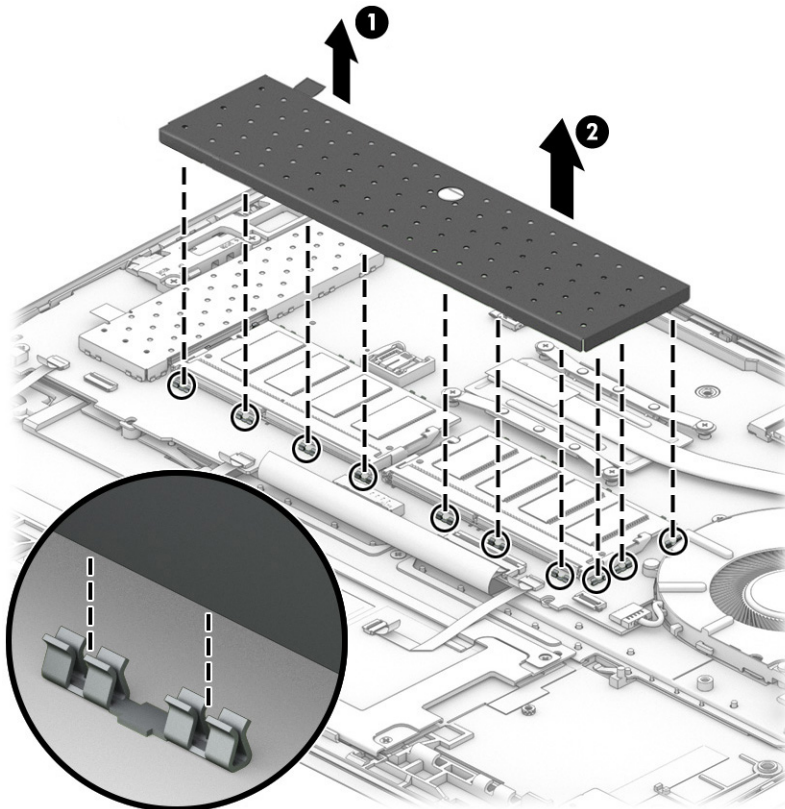
2. Spread the two retention clips **(1)** outward until the memory module tilts up at a 45° angle, and then remove the module **(2)**. Use the same procedure to remove all memory modules.

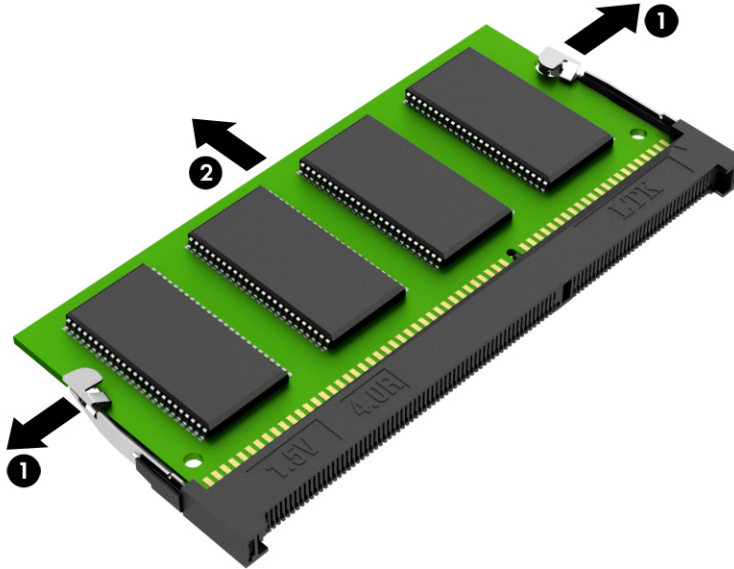📝 **IMPORTANT:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

To protect a memory module after removal, place it in an electrostatic-safe container.

To install a memory module:

1. Align the notched edge of the module with the tab in the slot **(1)**, and then press the module into the slot at an angle until it is seated **(2)**.

2. Press down on both sides of the module until the side retention clips snap into place **(3)**.

📝 **IMPORTANT:** Be sure to press down on both sides of the module using two fingers during installation. Failure to press on both sides might result in incorrect installation. Do not press down only in the middle of the module.
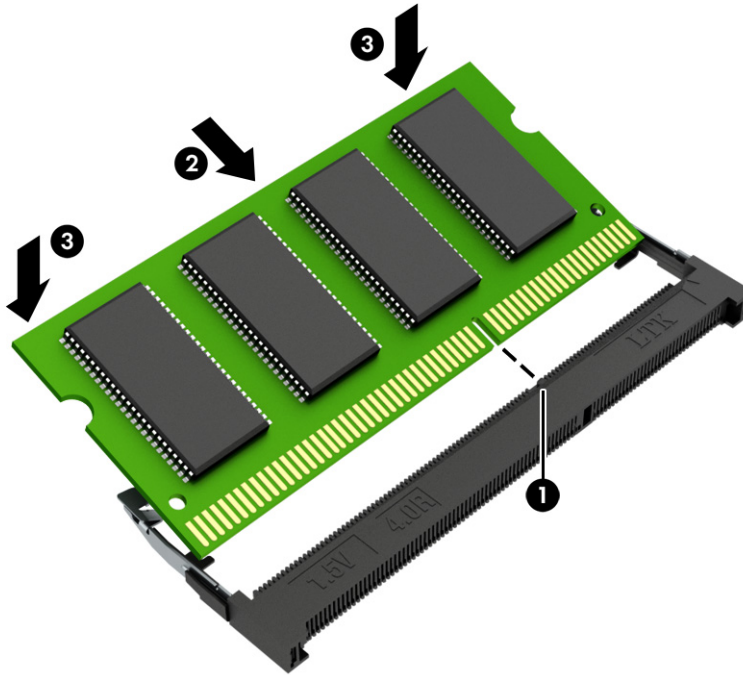
To install a memory module and shield, reverse the removal procedures.

NOTE: Memory modules are designed with a notch to prevent incorrect insertion.

WLAN module

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

Table 5-9 WLAN module descriptions and part numbers

Description	Spare part number
Realtek 8852CE Wi-Fi 6E + Bluetooth 5.3 WLAN	N19618-007
Mediatek RZ616 Wi-Fi 6E Bluetooth 5.3 AIM-T WLAN	N22541-006

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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

Remove the WLAN module:

1. Carefully disconnect the two WLAN module antenna cables **(1)** from the module.

📝 **NOTE:** Computer models have either one or two WLAN module antenna cables. On computer models with two antennas, the #1 white cable connects to the WLAN module #1 Main terminal. The #2 black WLAN module antenna cable connects to the WLAN module #1 Aux terminal.

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

3. Pull the WLAN module **(3)** away from the socket to remove it.

4. If the WLAN module antenna cable is not connected to the terminal on the WLAN module, you must install a protective sleeve on the antenna connector, as shown in the following illustration.
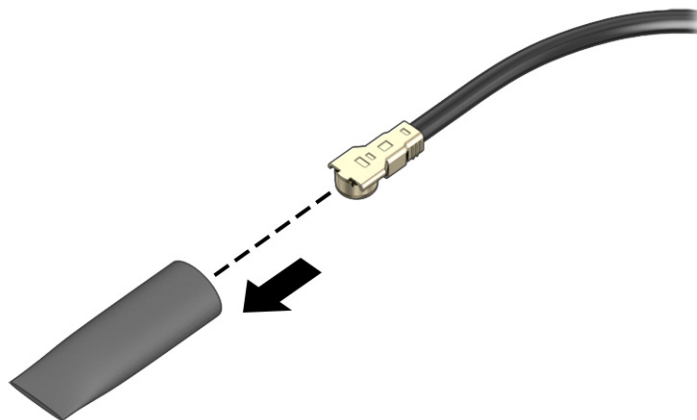
To install the WLAN module, reverse this procedure.

Fan

To remove the fan, use this procedure and illustration.

Table 5-10 Fan description and part number

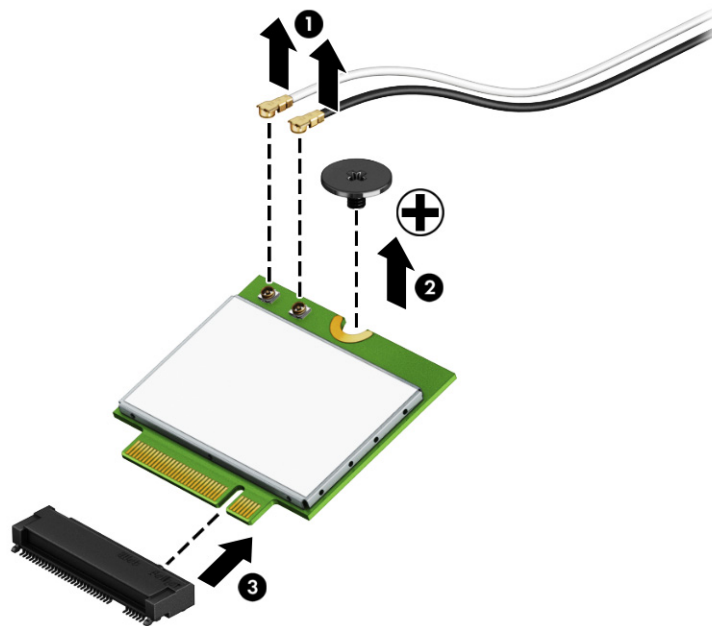| Description	Spare part number
Fan (includes cable and captive screws)	M03432-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

Remove the fan:

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

2. Loosen the three captive Phillips screws **(2)** that secure the fan to the computer.

3. Remove the fan **(3)** from the computer.
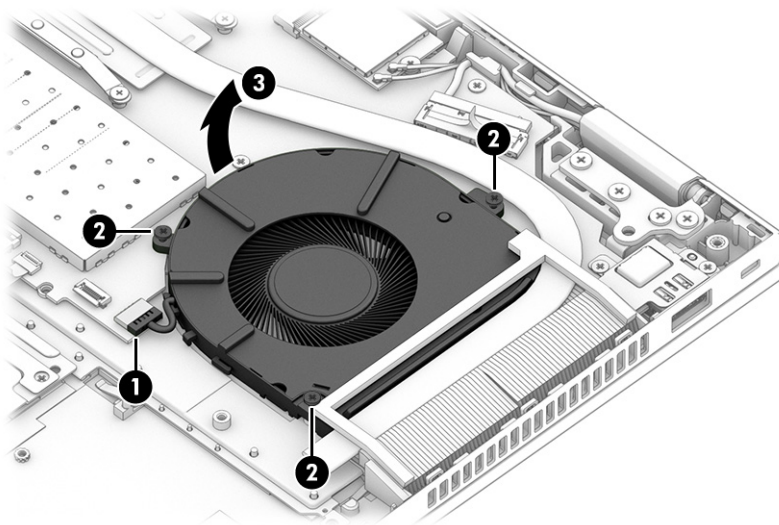
To install the fan, reverse this procedure.

Heat sink

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

Table 5-11 Heat sink descriptions and part number

Description	Spare part number
Heat sink (includes four captive screws and replacement thermal material)	M46284-001

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

4. Remove the fan (see Fan on page 48).

Remove the heat sink:

1. In the order indicated on the heat sink, loosen the four captive Phillips screws **(1)** that secure the heat sink to the system board.

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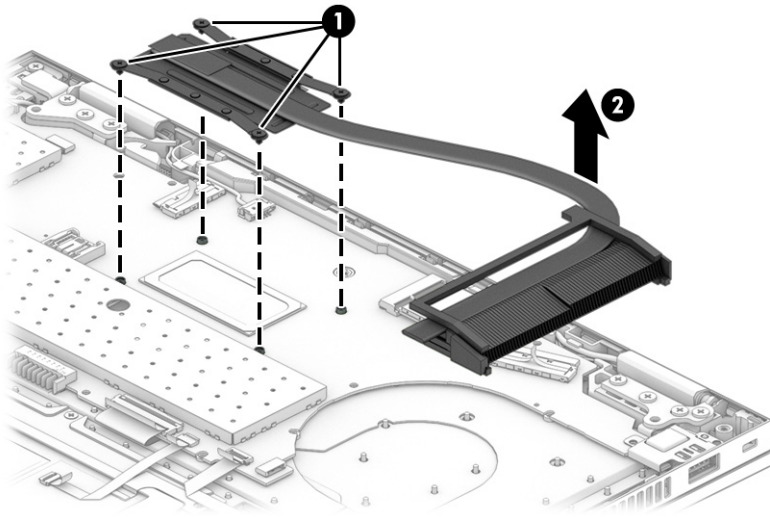
3. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. The following illustration shows the replacement thermal material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

   Thermal paste is used on the system board component **(1)** and on the associated heat sink component **(2)**.
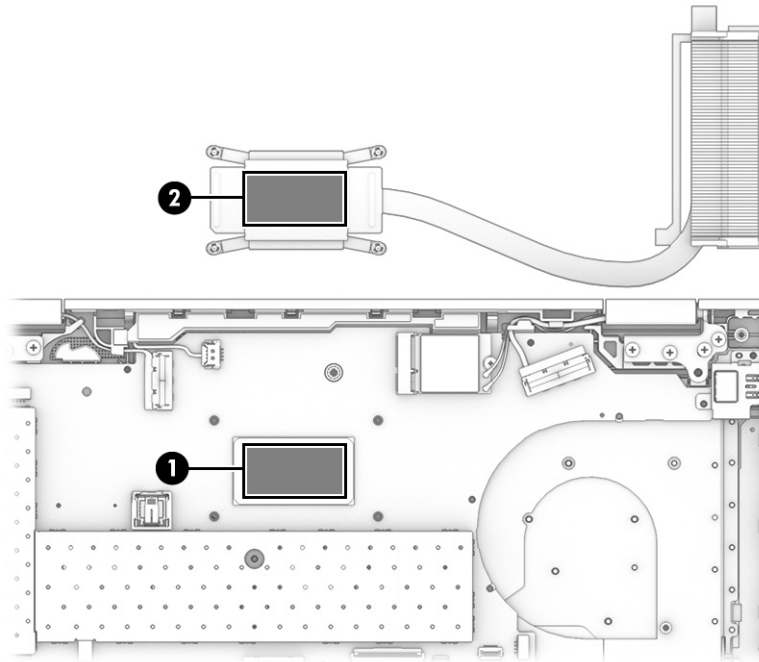
To install the heat sink, reverse this procedure.

Display assembly

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

📝 IMPORTANT: After replacing the display assembly, it is necessary to download and run the service tool to update the new ambient light sensor (ALS) data to the system BIOS. Please search for the related Service Advisory in WISE for details.

Table 5-12 Display assembly descriptions and part numbers

Description	Spare part number
Display assembly (includes webcam, microphone, and wireless antennas)	
250 nits, HD camera	N39190-001
250 nits, HD + IR camera	N39191-001
400 nits, HD camera	N39192-001
400 nits, HD + IR camera	N39193-001
1000 nits, privacy	N39194-001

Before removing the display assembly, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the display assembly:

1. Disconnect the webcam/microphone module cable **(1)** from the system board.

2. Release the webcam/microphone module cable from the retention clips **(2)** that are built into the computer.

3. Disconnect the WLAN module antenna cables **(3)** from the WLAN module.

📝 NOTE: Computer models have either one or two WLAN module antenna cables. On computer models with two antennas, the #1 white cable connects to the WLAN module #1 Main terminal. The #2 black WLAN module antenna cable connects to the WLAN module #1 Aux terminal.

4. Disconnect the display panel cable **(4)** from the system board.

5. Release the display panel cable and the WLAN module antenna cables from the retention clips **(5)** that are built into the computer.
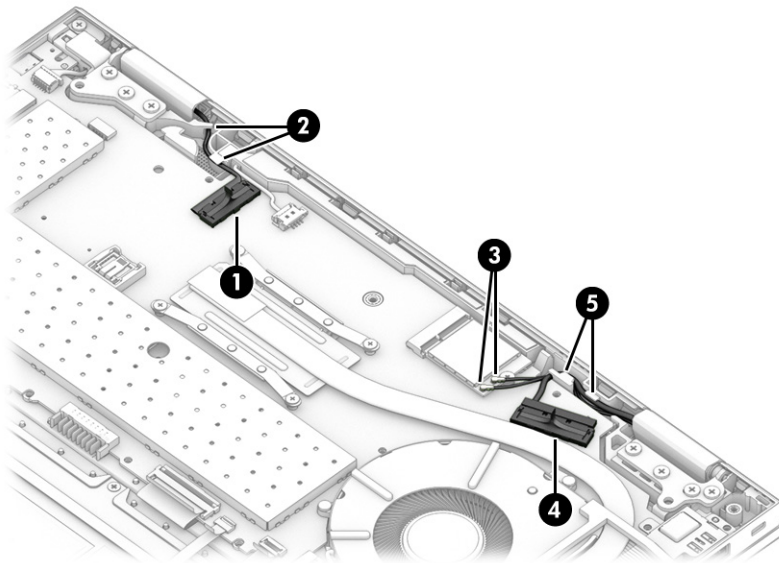
6. Rotate the computer to open the hinges **(1)**.

7. Remove the Phillips M2.0 × 5.0 screw **(2)** and seven Phillips M2.5 × 6.0 screws **(3)** that secure the display assembly to the computer.

8. Separate the computer from the display assembly **(4)**.
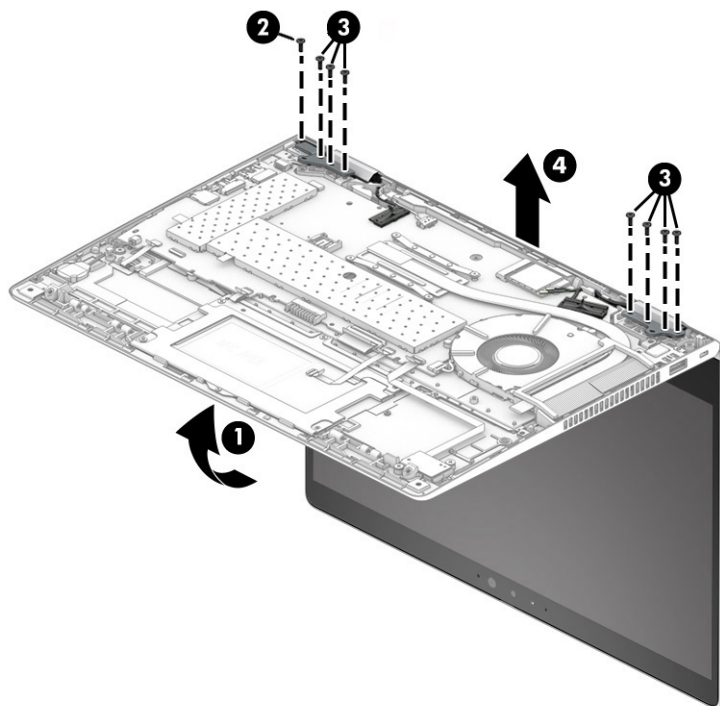
To replace the display assembly, reverse this procedure.

System board

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

IMPORTANT: After replacing the system board, it is necessary to download and run the service tool to update the new ambient light sensor (ALS) data to the system BIOS. Please search for the related Service Advisory in WISE for details.

Table 5-13 System board descriptions and part numbers

Description	Spare part number
System board (includes integrated processor and replacement thermal material)	
All system boards use the following part numbers:	
xxxxxx-001: Non-Windows operating system	
xxxxxx-601: Windows operating system	
AMD Ryzen 7 PRO 7730U processor, models with an HD camera	N39201-xxx
AMD Ryzen 7 PRO 7730U processor, models with an HD + IR camera	N39205-xxx
AMD Ryzen 5 PRO 7530U processor, models with an HD camera	N39199-xxx
AMD Ryzen 5 PRO 7530U processor, models with an HD + IR camera	N39204-xxx
AMD Ryzen 7 7730U processor, models with an HD camera	N39200-xxx
AMD Ryzen 7 7730U processor, models with an HD + IR camera	N39203-xxx
AMD Ryzen 5 7530U processor, models with an HD camera	N39198-xxx

Table 5-13 System board descriptions and part numbers (continued)

| Description	Spare part number
AMD Ryzen 5 7530U processor, models with an HD + IR camera	N39202-xxx
AMD Ryzen 3 7330U processor, models with an HD camera	N39197-xxx

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

4. Remove the fan (see Fan on page 48).

When you replace the system board, be sure to remove the following components (as applicable) from the defective system board and install them on the replacement system board:

- Memory modules (see Memory module on page 43).

- WLAN module (see WLAN module on page 46).

- Heat sink (see Heat sink on page 48).

Remove the system board:

1. Disconnect the following cables from the system board:

   - Power connector cable **(1)**

   - Webcam/microphone module cable**(2)**

   - Speaker cable **(3)**

   - WLAN module antenna cables **(4)**

   - Display panel cable **(5)**

   - Camera board cable (ZIF) **(6)**

   - Touchpad cable (ZIF) **(7)**

   - Keyboard cable (ZIF) **(8)**

   - Backlight cable (ZIF) **(9)**

   - Fingerprint reader cable (ZIF) **(10)** (select products only)

   - RTC battery cable **(11)**
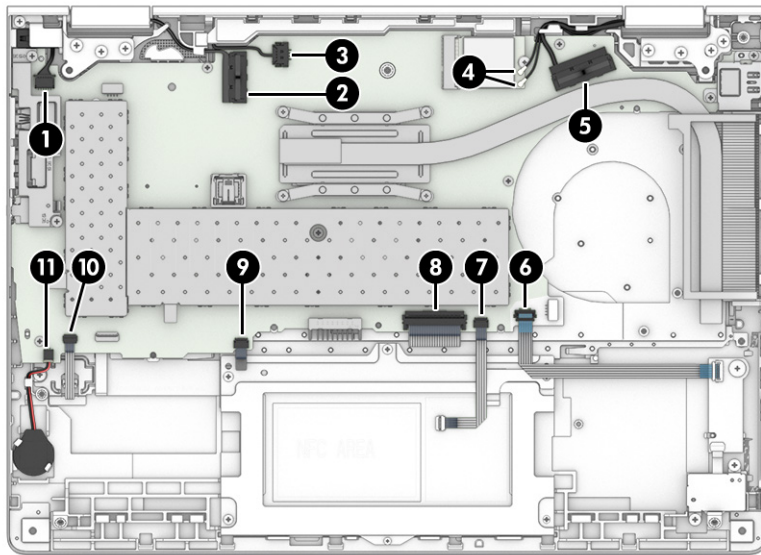
2. Remove the seven Phillips M2.0 × 2.3 screws **(1)** that secure the system board to the computer.

3. Remove the three Phillips M2.0 × 5.0 screws **(2)** that secure the system board and the I/O bracket to the computer.

4. Remove the I/O bracket **(3)**.

   The I/O bracket is included in the Plastics Kit, spare part number N39195-001.
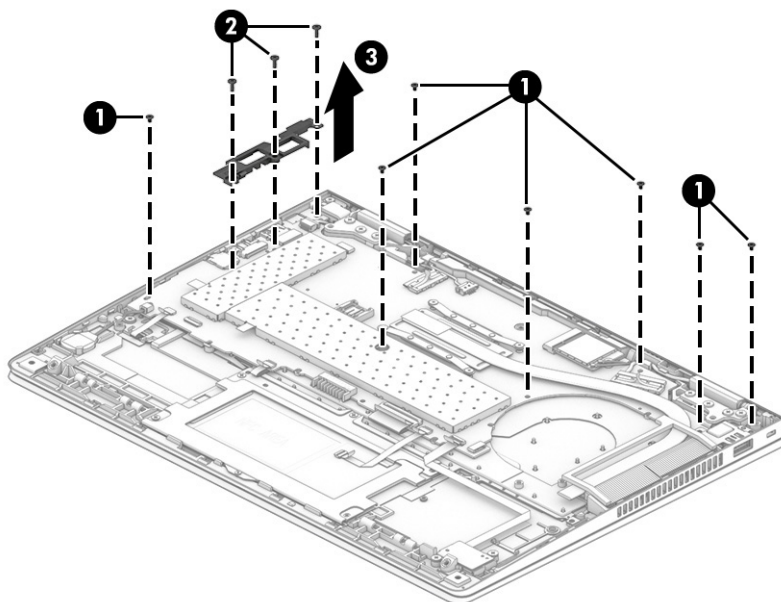
5. Lift the right side of the system board **(1)** until it rests at an angle.

6. Remove the system board **(2)** by sliding it up and to the right at an angle.

   When removing the system board, be sure to make note of the location of the USB port bracket **(3)**. This bracket may become dislodged when the system board is removed.

The USB port bracket is included in the Bracket Kit, spare part number M03436-001.

To install the system board, reverse this procedure.

Fingerprint reader (select products only)

To remove the fingerprint reader, use this procedure and illustration.

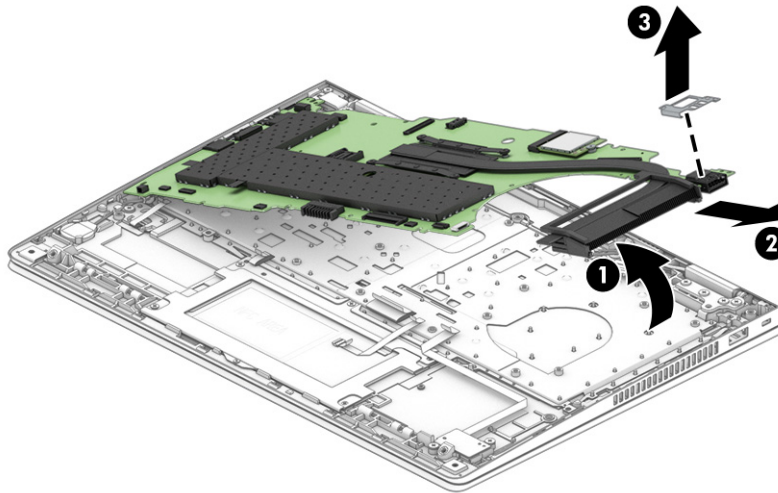| Description	Spare part number
Fingerprint reader	M46281-001

NOTE: The fingerprint reader cable is available in the Cable Kit, spare part number M03431-001. The fingerprint reader bracket is available in the Bracket Kit, spare part number M03436-001.

Before removing the fingerprint reader, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

4. Remove the fan (see Fan on page 48).

5. Remove the system board (see System board on page 52).

Remove the fingerprint reader:

1. Remove the Phillips M2.0 × 2.0 screw (1) that secures the fingerprint reader and bracket to the computer.

2. Remove the fingerprint reader bracket (2) from the computer.

3.	Remove the fingerprint reader **(3)** from the computer.

To install the fingerprint reader, reverse this procedure.

Fingerprint reader cable

To remove the fingerprint reader cable, use this procedure and illustration.

NOTE:	The fingerprint reader cable is included in the Cable Kit, spare part number M03431-001.

Before removing the fingerprint reader cable, follow these steps:

1.	Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2.	Remove the bottom cover (see Bottom cover on page 34).

3.	Remove the battery (see Battery on page 35).

4.	Remove the fan (see Fan on page 48).

5.	Remove the system board (see System board on page 52).

6.	Remove the fingerprint reader bracket (see Fingerprint reader (select products only) on page 55).

Remove the fingerprint reader cable:

- Release the ZIF connector **(1)** the fingerprint reader cable is connected to, and then disconnect the cable **(2)** from the fingerprint reader.
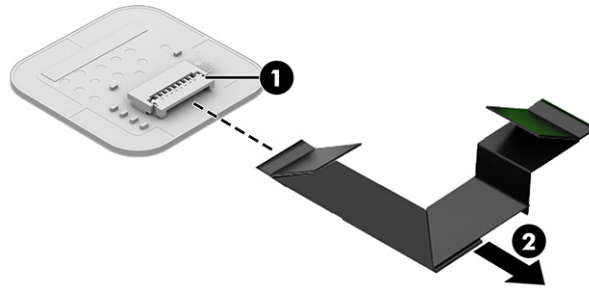
To install the fingerprint reader cable, reverse this procedure.

Power connector cable

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

Table 5-15 Power connector cable description and part number

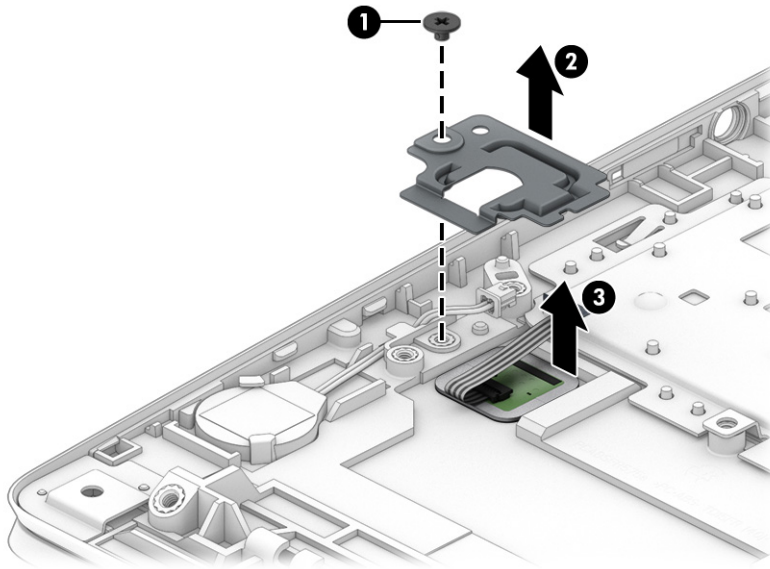| Description	Spare part number
Power connector cable	M03424-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

4. Remove the fan (see Fan on page 48).

5. Remove the system board (see System board on page 52).

Remove the power connector cable:

▪ Remove the power connector cable from the computer.
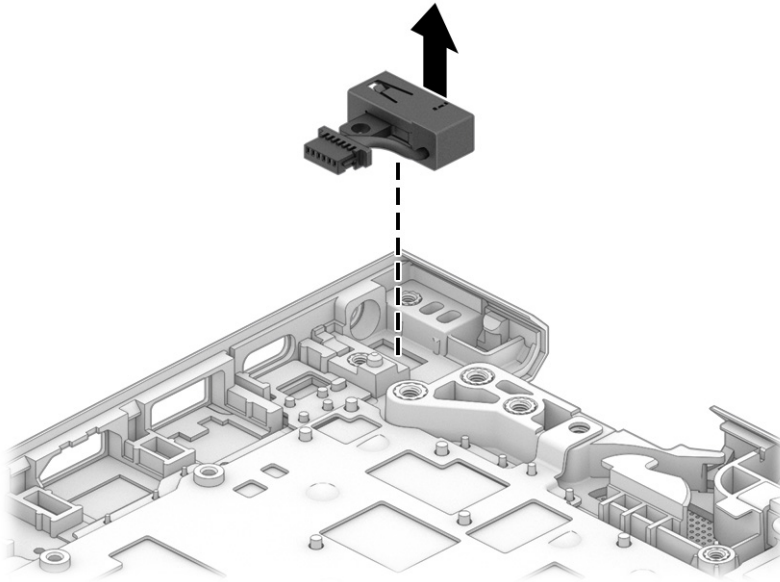
To install the power connector cable, reverse this procedure.

Speaker

To remove the speaker, use this procedure and illustration.

Description	Spare part number
Speaker (includes speaker, cable, and rubber isolator)	M03439-001

Before removing the speaker, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 34).

2. Remove the bottom cover (see Bottom cover on page 34).

3. Remove the battery (see Battery on page 35).

4. Remove the fan (see Fan on page 48).

5. Remove the system board (see System board on page 52).

Remove the speaker:

1. Remove the Phillips M2.0 × 2.0 screw **(1)** that secures the speaker to the computer.

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

   When removing the speaker, make note of the location of the rubber isolator location **(3)**. The absence of or damage to this isolator can result in degraded speaker performance.
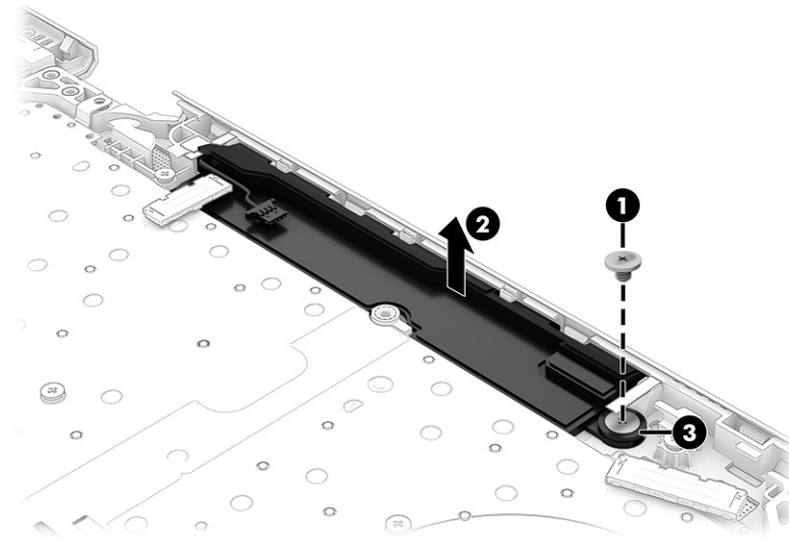
To install the speaker, reverse this procedure.

Top cover with keyboard

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

Table 5-17 Top cover with keyboard descriptions and part numbers

Description	Spare part number
Top cover with keyboard	
Not backlit, HD camera	N39207-xxx
Backlit, HD camera	N39208-xxx
Not backlit, HD + IR camera (includes top cover camera)	N39209-xxx
Backlit, HD + IR camera (includes top cover camera)	N39210-xxx
Backlit, HD camera, privacy	N39211-xxx
Backlit, HD + IR camera, privacy (includes top cover camera)	N39212-xxx

Table 5-18 Spare part country codes

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	India	-D61	Slovenia	-BA1
Brazil	-201	Israel	-BB1	South Korea	-AD1
Bulgaria	-261	Italy	-061	Spain	-071
The Czech Republic and Slovakia	-FL1	Japan	-291	Sweden and Finland	-B71

Table 5-18 Spare part country codes (continued)

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Denmark	-081	Kazakhstan	-DF1	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	Latin America	-161	Taiwan	-AB1
France	-051	The Netherlands	-B31	Thailand	-281
French Canada	-DB1	Northern Africa	-FP1	Turkey	-141
Germany	-041	Portugal	-131	Ukraine	-BD1
Greece	-151	Romania	-271	United Kingdom	-031
Hungary	-211	Russia	-251	United States	-001
Iceland	-DD1	Saudi Arabia	-171		

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 .

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.

If you are already in Windows, you can access BIOS version information (also known as *ROM date* and *System BIOS*) by pressing fn+esc (select products only). Or you can use Computer Setup.

1. Start Computer Setup. See .

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

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

    – or –

    Select the question mark icon (select products only) 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. Select the **Search** icon in the taskbar, type `file` in the search box, and then select **File Explorer**.

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

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

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

    The BIOS installation begins.

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

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

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 61.

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

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

Backing up information and creating recovery media

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

Using Windows tools for backing up

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

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

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

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

For details:

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

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

IMPORTANT: HP recommends that you follow the Restoring and recovery methods on page 66 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 <u>Restoring and recovery methods on page 66</u>.

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 <u>Recovering using HP Recovery media on page 66</u>.

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

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

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

Recovering using HP Recovery media

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

For details, see <u>Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 65</u>.

> **NOTE:**   If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to <u>http://www.hp.com/support</u>, 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 <u>Restoring and recovery methods on page 66</u> to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Changing the computer boot order

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

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

To change the boot order:

1. Insert the HP Recovery media.

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

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

    - For tablets without keyboards, turn on or restart the tablet, 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, you must download and install it. To download HP PC Hardware Diagnostics Windows, see .

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

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

- You have several options after you receive a failure ID:

  - Select **Next** to open the Event Automation Service (EAS) page, where you can log the case.

  - Scan the QR code with your mobile device, which takes you to the EAS page, where you can log the case.

  - Select the box next to the 24-digit failure ID to copy your failure code and send it to support.

Accessing HP PC Hardware Diagnostics Windows

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

Accessing HP PC Hardware Diagnostics Windows from HP Support Assistant

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

1. Complete one of the following tasks:

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

   - Select the question mark icon in the taskbar.

2. Select **Fixes & Diagnostics**.

3. Select **Run hardware diagnostics**, and then select **Launch**.

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

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

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

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

1. Select the **Start** button, and then select **All apps**.

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

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

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

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version from HP

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

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

2. Select **Download HP Diagnostics Windows**, and then select the specific Windows diagnostics version to download to your computer or a USB flash drive.

The tool downloads to the selected location.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

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

1. Select the Microsoft Store app on your desktop or select the **Search** icon in the taskbar, and then type `Microsoft Store` in the search box.

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

3. Follow the on-screen directions.

The tool downloads to the selected location.

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

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

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

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

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

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

The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

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

Using HP PC Hardware Diagnostics UEFI

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

📝 NOTE: For some products, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see .

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

Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

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

For assistance in solving the problem, complete one of these tasks:

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

*   Contact support, and provide the failure ID code.

Starting HP PC Hardware Diagnostics UEFI

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

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

2. Press f2.

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

a. Connected USB flash drive

> **NOTE:** To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see .

b. Hard drive

c. BIOS

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

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

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

1. From the **Start** menu, open the HP System Information Application or enter Fn+Esc.

2. In HP System Information screen, select **Run System Diagnostics**, select **Yes** to run the application, and then select **Restart**.

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

> **NOTE:** When the restart is complete, the computer will boot to HP PC Hardware Diagnostics UEFI Application. Proceed with the troubleshooting tests.

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

- HP PC Hardware Diagnostics UEFI is not included in the preinstallation image.

- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.

- The hard drive is damaged.

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

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

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

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

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

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

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

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

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

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

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

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

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

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

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

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

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

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

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

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

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

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

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

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

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

- Display status information about the diagnostics run previously.

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

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

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

3. Make your customization selections.

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

Your changes take effect when the computer restarts.

9 Specifications

This chapter provides specifications for your computer system.

Computer specifications

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

Table 9-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	**308.50 mm**	12.15 in
Depth	**222.95 mm**	8.78 in
Height (front to back)	**17.95 mm**	0.71 in
Weight	**1.45 kg**	3.19 lb
Input power		
Operating voltage and current	19.5 V DC @ 3.33 A – 65 W	
	19.5 V DC @ 2.31 A – 45 W	
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	–4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	–50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	–50 ft to 40,000 ft

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.

33.8 cm (13.3 in) display specifications

This section provides specifications for your display.

Table 9-2 Display specifications

	Metric	U.S.
Active diagonal size	**33.8 cm**	13.3 in
Resolution	1920 × 1080	
Surface treatment	BrightView	
Brightness	250 nits (45% CG panels)	
	400 nits (72% CG panels)	
	1000 nits (privacy panels)	
Viewing angle	UWVA	
Backlight	LED	
Display panel interface	eDP	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-3 Solid-state drive specifications

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

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications might 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, type 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, type 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 restarts.

   e. 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, type 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 restarts.

i.   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, type 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.   Restart 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:

📝 **NOTE:**   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 troubleshoot nonvolatile memory usage.

Table 10-1 Troubleshooting steps for nonvolatile memory usage

Description	Volatility description	Storage user data	How to erase
Primary storage device, holds the OS, applications, and application settings	Non-volatile, 8-256 GB of eMMC or NVMe SSD storage, removable	Yes[1]	Follow instructions below under "Erase the Primary Storage Device"
System memory (RAM), holds transient data during system operation	Volatile, SODIMM socket. Removable (4 GB/8 GB/16 GB)	Yes	Unplug unit from power
Permanent system BIOS settings*	Non-volatile; ?? KB; stored <<where>>,	No[2]	Follow instructions below under "Clearing BIOS Settings"
System boot ROM (BIOS)	Non-volatile memory, 128 Mbit (16 MB) socketed, removable	No	Download the latest BIOS for your model from the HP website and follow the instructions to flash the BIOS that are on the website
RTC (CMOS) RAM	Volatile memory, 256 bytes located in AMD embedded System on Chip (SoC)	No	Unplug unit from main power, remove top cover and press **Clear CMOS** button
Keyboard/mouse (ROM)	Non-volatile, 2 KB embedded in the super I/O controller (SIO2)	Yes	N/A
Keyboard/mouse (RAM)	Volatile, 256 bytes embedded in the super I/O controller (SIO2)	No	Unplug unit from main power
LOM EEPROM	Non-volatile, 2 MB embedded in LAN controller	No	N/A
Trusted Platform Module (TPM)	Non-volatile; 51 KB ROM for firmware and 38 KB system parametric data	No[3]	Follow instructions below under "Clearing TPM"

[1] Under typical operation, the only user data stored on the primary storage device are preferences for device configuration and settings for connections. However, the administrator can configure the system to allow users to store data locally.

[2] Only user data potentially stored in BIOS Settings are the ownership and asset tags, administrator password, and startup password.

[3] The Trusted Platform Module may contain encrypted passwords or certificates generated from user or administrator input.

Questions and answers

Use this section to answer your questions about nonvolatile memory.

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

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

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

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

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

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

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

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

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

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

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

3. **Where is the UEFI BIOS located?**

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

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

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

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

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

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

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

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

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

  b. Select **Main**, and then select **Reset Security to Factory Defaults**.

  c. Follow the on-screen instructions.

  d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

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

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

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

  b. Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.

  c. At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select products only)

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

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

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

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

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

Requirements for all countries

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

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).

- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.

- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 V AC or 250 V AC, as required by the power system of each country or region.

- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

Table 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

Table 11-1 Power cord requirements for specific countries and regions (continued)

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

1. The flexible cord must be Type HO5VV-F, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, three-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V AC) or NEMA 6-15P (15 A, 250 V AC) configuration. CSA or C-UL mark. UL file number must be on each element.

3. The appliance coupler, flexible cord, and wall plug must bear a T mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, three-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V AC) configuration.

4. The flexible cord must be Type RVV, three-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.

5. The flexible cord must be Type H05VV-F three-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Approval number and logo must be printed on a flag label.

6. The flexible cord must be Type HVCTF three-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.

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

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.

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