Maintenance and Service Guide

SUMMARY

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

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 is automatically updated, which is always enabled. High-speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See http://www.microsoft.com. **If your product ships with Windows in S Mode:** Windows in S Mode works exclusively with apps from the Microsoft Store within Windows. Certain default settings, features, and apps cannot be changed. Some accessories and apps that are compatible with Windows may not work (including some antivirus, PDF writers, driver utilities, and accessibility apps), and performance may vary, even if you switch out of S Mode. If you switch to Windows, you cannot switch back to S Mode. Learn more at Windows.com/SmodeFAQ.

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.

Important notice about Customer Self-Repair parts

Your computer includes Customer Self-Repair parts and parts that should be accessed by only an authorized service provider.

IMPORTANT: See "Removal and replacement procedures for Customer Self-Repair parts" for details.

Accessing parts described in "Removal and replacement procedures for authorized service provider parts" can damage the computer or void your warranty.

Table of contents

1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP ENVY 17.3 inch Laptop PC
	Model number: 17-cr0xxx
	CTO model number: 17t-cr0xxx
Processors	**12th Generation Intel® Core™ processors**
	Intel® 1260P Core™ i7-(3.40 GHz base frequency, up to 4.70 GHz with Intel® Turbo Boost Technology, 18 MB Intel Smart cache, 12 cores, with unified memory architecture (UMA))
	Intel 1240P Core i5-(3.30 GHz base frequency, up to 4.40 GHz with Intel® Turbo Boost Technology, 12 MB cache, 12 cores, with unified memory graphics (UMA))
	Intel 1255U Core i7-(1.20 GHz base frequency, up to 4.70 GHz with Intel® Turbo Boost Technology, 12 MB cache, 10 cores, RTX 2050 with discrete graphics)
	Intel 1235U Core i5-(0.09 GHz base frequency, up to 4.40 GHz with Intel® Turbo Boost Technology, 12 MB cache, 10 cores, RTX 2050 with discrete graphics)
Graphics	**Internal graphics**
	unified memory architecture (UMA)
	discrete graphics
	External graphics
	NVIDIA® GeForce®
	Supports HDMI v2.1 + HDCP 2.3 supporting: up to 4K @ 60Hz
Display	**43.9 (17.3) ultrawide viewing angle (UWVA)**
	43.9 (17.3), Ultra high definition (UHD) (3840x2160), antiglare, low blue light, UWVA DCI-P3. 400 nits, Embedded DisplayPort (eDP) 1.4 + PSR2, 60Hz
	43.9 (17.3) Full high definition (FHD), (1920x1080), antiglare, UWVA, sRGB, 300 nits, eDP 1.2 without PSR, DBCG, narrow bezel, flat Panel
	43.9 (17.3), FHD (1920x1080), antiglare, UWVA, sRGB, 300 nits, eDP 1.2 without PSR, touch screen, flat panel, DBTS
Memory	Two customer-accessible memory module slots (small outline dual in-line memory modules (SODIMMs) supporting up to 32 GB of RAM
	DDR4-3200 dual-channel support
	Supports the following configurations:
	● 32 GB (16 × 2)
	● 16 GB (8 × 2)
	● 12 GB (8 + 4)
	● 8 GB (8 × 1 or 4 × 2)

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

Category	Description
Primary storage	**PCIe, (Non-Volatile Memory Express) NVMe, M.2 2280 solid-state drives**
	● 1 TB PCIe-4 × 4 NVMe Value
	● 512 GB PCIe-4 × 4 NVMe Value
Audio and video	**Audio brand:** Bang and Olufsen
	Dual speakers
	Far Field Cortana
	HP Audio Boost 2.0
	Supports Alexa
	HP Wide Vision HD Camera: indicator LED, USB 2.0, HD BSI sensor, f2.0, wide dynamic range (WDR), Temporal Noise Reduction (TNR), 76° normal field-of-view (NFOV)
	5 MP by 30 frames per second
	Dual-array digital microphone with appropriate software: beam forming, echo cancellation, noise suppression
Wireless	**Wireless Local Area Network (WLAN)**
	Intel Wi-Fi 6e AX211 + Bluetooth® 5.2 (non-vPro) (802.11ax, 160 MHz, multi-user, multiple input, multiple output (MU-MIMO), supporting gigabit file transfer speeds)
	Mediatek Tequila MT 7921 Wi-Fi 6 +Bluetooth 5.2 M.2 2230 (PCI-e + USB with WWAN and WLAN, MU-MIMO, supporting gigabit data speeds)
Media card reader	Supports microSD™, SDHC™, SDXC™
	Push-push insertion/removal
Ports	Hot plug/unplug and autodetect for correct output to wide-aspect vs. standard aspect video
	HDMI v2.1 supporting: up to 4096 × 2160 @ 60 Hz with HDCP 2.3
	Audio-out (headphone)/audio-in (microphone) combo jack
	USB 3.2 Gen 4 Type C with Thunderbolt™ Gen 3 technology (2) (right side)
	USB 3.1 Gen 2 Type A (3) (supports HP Sleep & Charge; 2 on left side, 1 on right side)
	AC Smart Pin adapter plug
Keyboard/pointing devices	**Keyboard**
	Full size, backlit, 3-coat paint, island style
	Touchpad
	Clickpad with image sensor
	Multitouch gestures enabled
	Precision touchpad support
	Support for Modern Trackpad Gestures
	Taps enabled as default

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

Category	Description
Power requirements	**Battery**
	4 cell, 55.0 Whr, polymer, HP Long Life
	HP Fast Charge Technology
	Smart AC adapters
	90 W, PFC, USB type C, Straight
	65 W, non-Power Factor Correction (nPFC), Slim USB type C Straight 1.8m
	Power cord
	C5, 1 m (3.3 ft)
Security	Supports Trusted Platform Module (TPM) 2.0, firmware based
Operating system	Windows® 11 Home 64
	Windows 11 Home 64 Advanced
	Windows 11 Home 64 Advanced Single Language
	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 Single Language
	WIndows 11 Pro 64
Serviceability	**End user replaceable parts**
	AC adapter
	Memory module
	Solid-state drive

2   Getting to know your computer

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

Locating hardware

To find out what hardware is installed on your computer, select the **Search** icon in the taskbar, type `device manager` in the search box, and then select the **Device Manager** app.

For information about system hardware components and the system BIOS version number, press fn+esc (select products only).

Locating software

To find out what software is installed on your computer, right-click the **Start** button, and then select **Apps and Features**.

Right side

Identify the components on the right side of the computer.

Table 2-1 Right-side components and their descriptions

Component		Description
(1)	SD Memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.
(2)	⚡ USB Type-C® power connector and Thunderbolt™ ports with HP Sleep and Charge and DisplayPort™ output (2)	Connect an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connect USB devices, provide high-speed data transfer, and charge small devices (such as a smartphone), even when the computer is off. **NOTE:** Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort output. **NOTE:** Your computer might also support a Thunderbolt docking station.
(3)	AC adapter and battery light	● White: The AC adapter is connected and the battery is fully charged. ● Blinking amber: The AC adapter is disconnected and the battery has reached a low battery level. ● Amber: The AC adapter is connected and the battery is charging. ● Off: The battery is not charging.
(4)	SS⟵⚡ USB SuperSpeed 10 Gbps port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off. **NOTE:** Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.

Left side

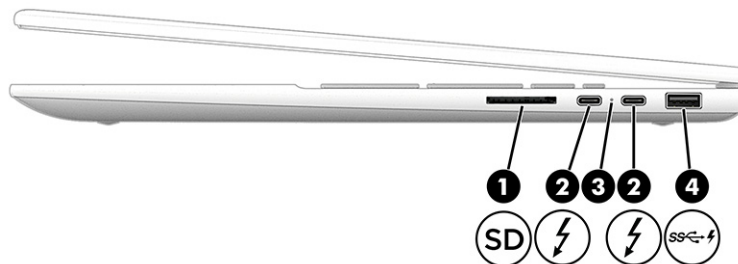Identify the components on the left side of the computer.
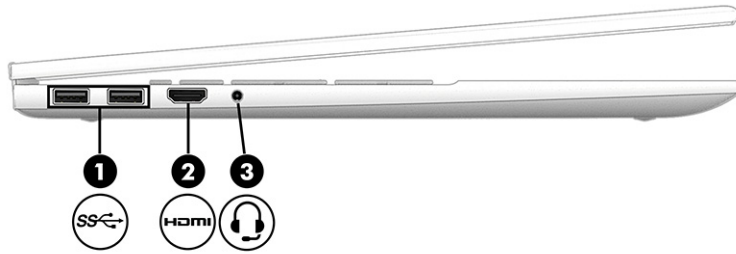
Table 2-2 Left-side components and their descriptions

| Component		Description
(1)	USB SuperSpeed 10 Gbps ports (2)	Connect USB devices, provide high-speed data transfer, and (for select products) charge 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.
(2)	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.
(3)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.
		WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.
		To access this guide:
		▲ Select the **Search** icon in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.
		NOTE: When a device is connected to the jack, the computer speakers are disabled.

Display

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

Low blue light mode (select products only)

Your computer display is shipped from the factory in low blue light mode for improved eye comfort and safety. Also, blue light mode automatically adjusts blue light emissions when you are using the computer at night or for reading.

⚠ **WARNING!** To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup and proper posture, health, and work habits for computer users. The *Safety & Comfort*

Guide also provides important electrical and mechanical safety information. The *Safety & Comfort Guide* is available on the web at http://www.hp.com/ergo.
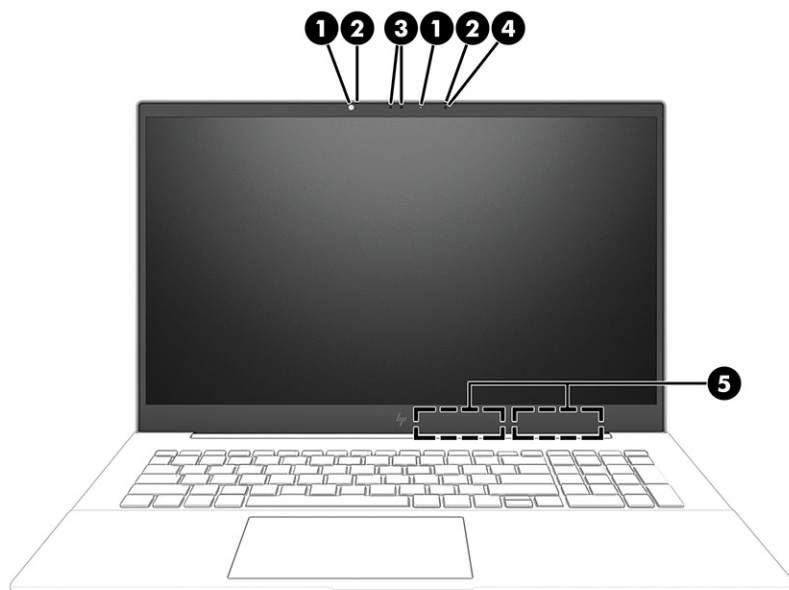
Table 2-3 Display components and their descriptions

Component		Description
(1)	Camera light(s)	On: One or more cameras are in use.
(2)	Internal microphones	Record sound.
(3)	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.
(4)	Ambient light sensor	Adjusts the brightness of the display, depending on the ambient light.
(5)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

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

To access this guide:

▲ 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.

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

Touchpad settings and components

Learn the touchpad settings and components.

Touchpad settings

Learn how to adjust touchpad settings.

Adjusting touchpad settings

Use these steps to adjust touchpad settings and gestures.

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

2. Choose a setting.

Turning on the touchpad

Follow these steps to turn on the touchpad.

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

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

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

Touchpad components

Identify the touchpad components.
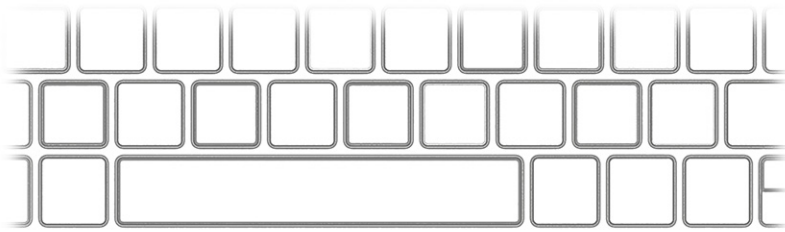
Table 2-4 Touchpad components and their descriptions

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

Lights

Identify the lights on the computer.
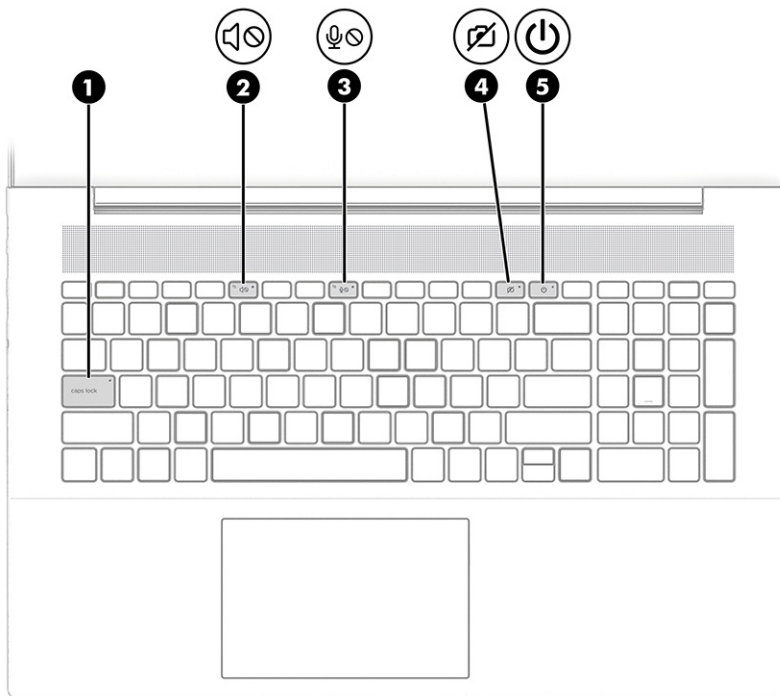
Table 2-5 Lights and their descriptions

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)	Camera privacy light	- On. The camera is off. - Off. The camera is on.
(5)	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.

Button and speakers

Identify the computer button and speakers.
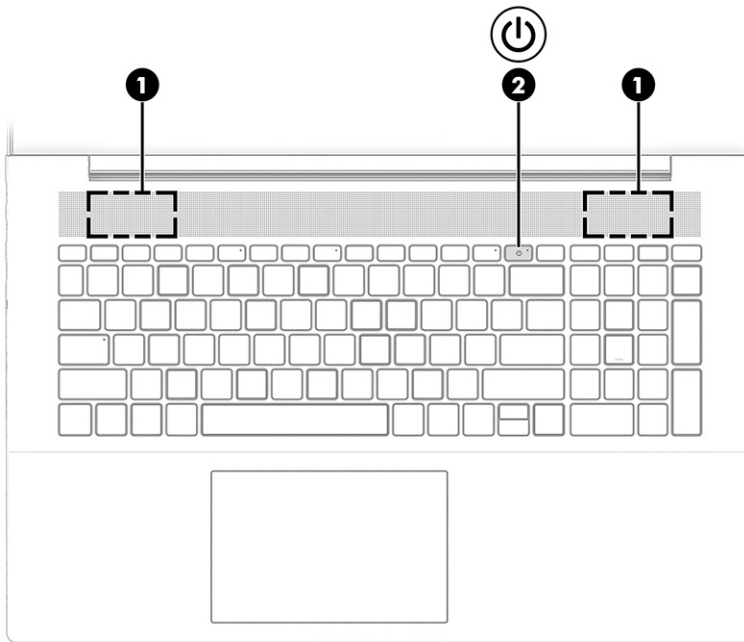
Table 2-6 Button and speakers and their descriptions

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 down for at least 10 seconds to turn off the computer.
		To learn more about your power and sleep settings:
		▲ Right-click the **Power** icon [icon], and then select **Power and sleep settings**.

Special keys

Identify the special keys.

Table 2-7 Special keys and their descriptions

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows key	Opens the Start menu. **NOTE:** Pressing the Windows key again will close the Start menu.
(4)	Action keys	Execute frequently used system functions as defined by the icon symbols on f1 through f12 function keys.
(5)	Camera privacy key	Turns the camera off and on.
(6)	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 down for at least 10 seconds to turn off the computer. To learn more about your power and sleep settings: ▲ Right-click the **Power** icon ▭ , and then select **Power and sleep settings**.

Table 2-7 Special keys and their descriptions (continued)

Component		Description
(7)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(8)	Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When num lock is pressed, the keypad can be used like an external numeric keypad.
		NOTE: If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

Action keys

Identify the action keys.

The action keys execute frequently used system functions as defined by the icon symbols on f1 through f12. The action keys vary by computer.

▲   To use an action key, press and hold the key.

NOTE: On some products, you must press the fn key in combination with the action key.

Table 2-8 Action keys and their descriptions

Icon	Description
☺	Launches the Windows emoji keyboard for select applications.
☀	Decreases the screen brightness incrementally as long as you hold down the key.
☀	Increases the screen brightness incrementally as long as you hold down the key.
⌨	Turns the keyboard backlight off or on. On select products, you can adjust the brightness of the keyboard backlight. Press the key repeatedly to adjust the brightness from high (when you first start up the computer), to low, to off. After you adjust the keyboard backlight setting, the backlight will revert to your previous setting each time you turn on the computer. The keyboard backlight will turn off after 30 seconds of inactivity. To turn the keyboard backlight back on, press any key or tap the touchpad (select products only). To conserve battery power, turn off this feature.
🔇	Mutes or restores speaker sound.
🔉	Decreases speaker volume incrementally while you hold down the key.
🔊	Increases speaker volume incrementally while you hold down the key.
🎤⊘	Mutes the microphone.

Table 2-8 Action keys and their descriptions (continued)

Icon	Description
◄◄	Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
▶❙❙	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
▶▶❙	Plays the next track of an audio CD or the next section of a DVD or a BD.
◇◇◇	Opens HP Hubs Launcher, where you can open HP apps such as HP Command Center, OMEN Gaming Hub, myHP, and HP Palette, depending on your computer model. For more information, see HP Hubs Launcher (select products only) on page 14.

HP Hubs Launcher (select products only)

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

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

  -or-

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

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

- HP Command Center

  – Select **System Control** to adjust the temperature or cooling preference on your computer.

  – Select **GlamCam** to adjust camera-related settings for video calls.

- OMEN Gaming Hub, where you can customize your computer for your specific gaming needs.

- myHP, where you can learn more about your PC and the utilities that HP offers.

- HP Palette, which gives you access to creative tools in one place, simplifies the creative process, and helps find the right photos and assets in less time.

Bottom

Identify the bottom components.
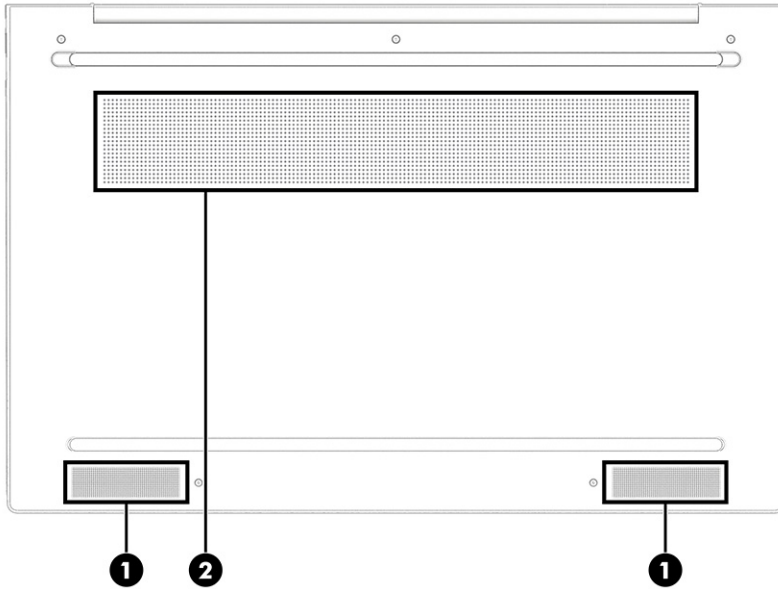
Table 2-9 Bottom components and their descriptions

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

Labels

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

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

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

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

Table 2-10 Service label components

	Component
(1)	Serial number
(2)	Product ID
(3)	HP product name and model number
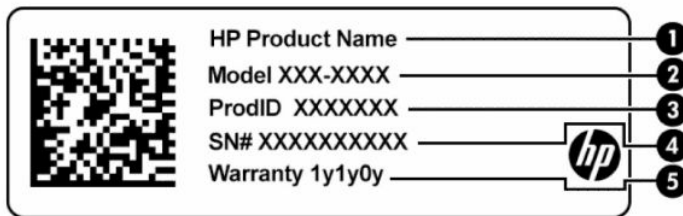
Table 2-11 Service label components

	Component
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period
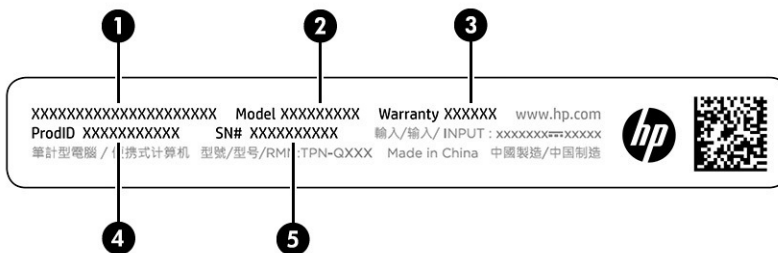
Table 2-12 Service label components

	Component
(1)	HP product name
(2)	Model number
(3)	Warranty period

Table 2-12 Service label components (continued)

Component	
(4)	Product ID
(5)	Serial number

- Regulatory labels—Provide regulatory information about the computer.

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

3   Illustrated parts catalog

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

Computer major components

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

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

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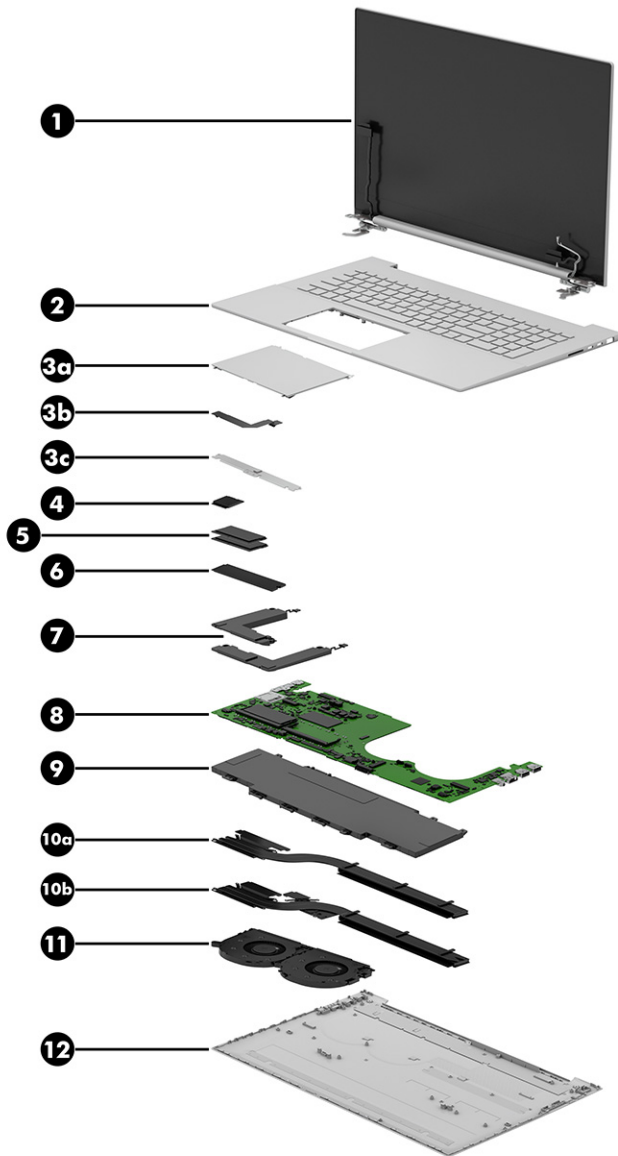
Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**Display assembly** **NOTE:** Display spare parts are available as subcomponents, not as whole units. Display subcomponent spare parts are available. For spare part information, see .Display assembly subcomponents on page 21.	not available as a spare part
(2)	**Top cover/keyboard** **NOTE:** For a detailed list of country codes, see Keyboard with top cover on page 58.	
	Keyboard with top cover in natural silver finish	N13556-001
(3a)	**Touchpad**	N13569-001
(3b)	Touchpad cable	N13570-001

Item	Component	Spare part number
(3c)	Touchpad bracket	Not available as a spare part
(4)	**WLAN module**	
	Intel Wireless Wi-Fi6e AX 211 Wi-Fi + Bluetooth® 5.2 (MU-MIMO)	M53366-005
	Intel Wireless Wi-Fi6 AX 211 2 × 2 Wi-Fi + Bluetooth® 5.2 (MU-MIMO)	M74879-005
(5)	**Memory modules**	
	16 GB, DDR4-3200	L67710-005
	8 GB, DDR4-3200	L46598-005
	4 GB, DDR4-3200	L83673-005
(6)	**Solid-state drive**	
	1 T, M2 2280, PCIe-4 × 4, NVMe value	N04491-001
	512 GB, M2 2280, PCIe-4 × 4, NVMe value	N04490-001
(7)	**Speaker**	N13560-001
(8)	**System board** (includes integrated processor)	
	NOTE: All system board spare part kits include replacement thermal material.	
	All system boards use the following part numbers:	
	xxxxxx-001: Non-Windows operating systems	
	xxxxxx-601: Windows operating system	
	Intel Core i5-1240P processor with 4 GB of unified memory architecture (UMA) graphics memory	N13551-601
	Intel Core i7-1260P processor with 4 GB of UMA graphics memory	N13552-601
	Intel Core i5-1235U processor and 4 GB of discrete graphics memory	N13549-601
	Intel Core i7-1255U processor and 4 GB of discrete graphics memory	N13550-601
(9)	**Battery** (4 cell, 55 Whr, 3.72Ah)	M24563-005
(10a)	**Heat sink** (for models with UMA graphics)	N13567-001
(10b)	**Heat sink** (for models with discrete graphics)	N13568-001
(11)	**Fan assembly**	
	Fan assembly (left) for use in models with discrete graphics	N18726-001
	Fan assembly (right) for use in models with discrete graphics	N18727-001
	Fan assembly (left) for use in models with UMA graphics	N13561-001
	Fan assembly (right) for use in models with UMA graphics	N13562-001
(12)	**Bottom cover** (for models with natural silver finish with rubber feet)	N13558-001

Display assembly subcomponents

To identify the display assembly subcomponents, use this illustration and table.
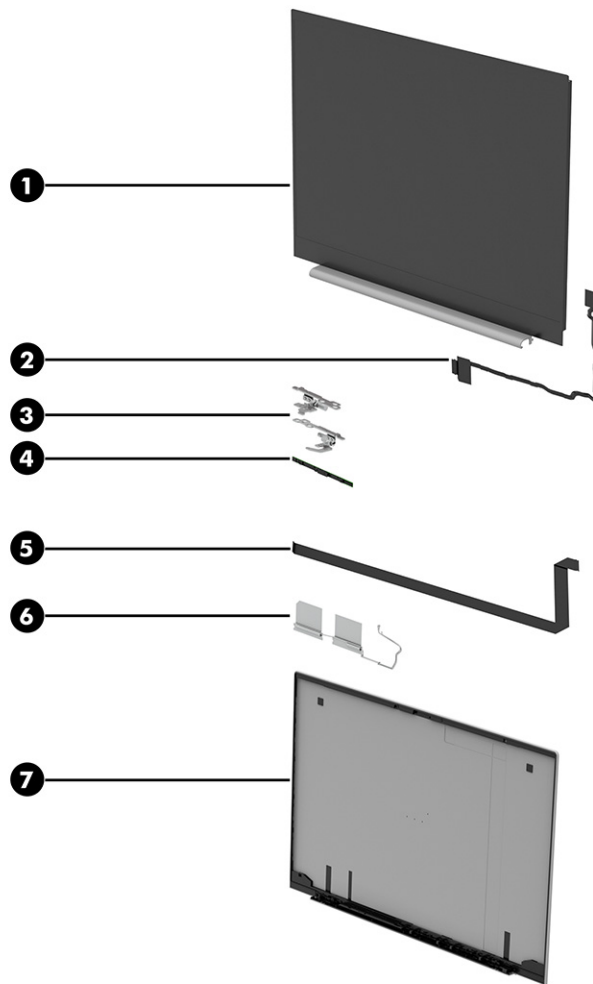
Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	**Display assembly panel**	
	43.9 (17.3), Ultra high definition (UHD) (3840 × 2160), antiglare, low blue light, UWVA DCI-P3. 400 nits, eDP 1.4 + PSR2, 60Hz	N13555-001
	43.9 (17.3) FHD (1920x1080), antiglare, UWVA, sRGB, 300 nits, eDP 1.2 without PSR, DBCG, flat Panel	N13554-001
	43.9 (17.3), Full high definition (FHD) (1920x1080), antiglare, UWVA, sRGB, 300 nits, eDP 1.2 without PSR, touch screen, flat panel, DBTS	N13553-001
(2)	**Display panel cable**	
	For ultra high definition (UHD) models	N13909-001
	For full high definition (FHD) models	N13920-001
(3)	**Display panel hinges**	N13563-001

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

Item	Component	Spare part number
(4)	**Camera module**	N13571-001
(5)	**Camera module cables**	
	For models with touch screens	N13574-001
	For models non touch screen models	N13911-001
(6)	**Antenna**	N13572-001
(7)	**Back cover** (in natural silver finish with antenna)	N13573-001

Cables

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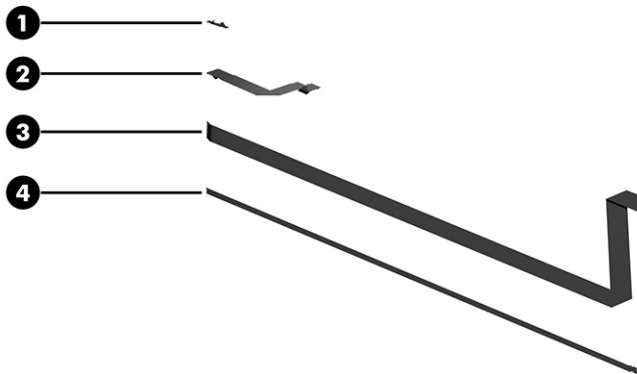
Table 3-3 Cable descriptions and part numbers

Item	Component	Spare part number
(1)	**IR sensor cable**	N13565-001
(2)	**Touchpad cable**	N13570-001
(3)	**Display panel cable**	
	For models with touch screens	N13574-001
	For models with non touch screens	N13911-001
(4)	**Camera module cable**	
	For ultra high definition (UHD) models	N13909-001
	For full high definition (FHD) models	N13910-001

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-4 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapters	
90 W, slim barrel, PFC, USB type C, Straight	L40893-001
65 W, non- Power Factor Correction (nPFC), Slim USB type C Straight 1.8m	M54350-001
Adapters/Hubs	
USB Type-C to VGA Adapter	831751-001
USB Type-C to USB Type-A Hub	916838-001
USB Type-C to RJ-45 adapter	M95985-001
Elite USB Type-C Multi Port Hub	L39572-001
Kits	
Display (UHD)	N13554-001
Display (FHD)	N13555-001
Display (FHD) (Touch screen)	N13553-001
Screw	N13557-001
Power cords (C5, 1.0 m [3.3 ft], STR, premium)	
Denmark	L22322-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L22321-001
Israel	L22323-001
Saudi Arabia	L22325-001
Switzerland	L22324-001
United Kingdom	L22320-001
United States	L22319-001
WLAN tape	L92736-001
Battery connector tape	N16242-001
USB Type-C bracket foil	N13566-001
Display gasket	N16241-001
Thermal pads	
Solid-state drive	N13559-001
Camera module	N14845-001
External optical drive	747080-001

4 Removal and replacement procedures preliminary requirements

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

Tools required

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

- Tweezers
- Nonconductive, nonmarking pry tool
- Magnetic Phillips P1 screwdriver

Service considerations

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

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

Plastic parts

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

Cables and connectors

Handle cables with extreme care to avoid damage.

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

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

Drive handling

Note the following guidelines when handling drives.

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Electrostatic discharge information

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

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

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

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

Before touching an electronic component, discharge static electricity by using the guidelines described .

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

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

Generating static electricity

Follow these static electricity guidelines.

● Different activities generate different amounts of static electricity.

● Static electricity increases as humidity decreases.

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

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

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

Preventing electrostatic damage to equipment

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

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

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

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

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

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

- Avoid contact with pins, leads, or circuitry.

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

Personal grounding methods and equipment

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

- **Wrist straps** are flexible straps with a maximum of 1 MΩ ±10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.

- **Heel straps/Toe straps/Boot straps** can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of 1 MΩ ±10% resistance between the operator and ground.

Table 4-2 Static shielding protection levels

Static shielding protection levels	
Method	Voltage
Antistatic plastic	1,500
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 28 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 29 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 30.

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

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

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

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

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

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

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

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

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

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

See Cleaning your computer with a disinfectant on page 29 for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

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

After cleaning the external surfaces of your computer using the steps in Removing dirt and debris from your computer on page 28, Caring for wood veneer (select products only) on page 30, 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 28 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 29 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:**
	
	Pre-operating 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.
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**.

Table 4-3 Support information locations (continued)

Service consideration	Path to access information
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: Components described in this chapter should be accessed only by an authorized service provider. Accessing these parts can damage the computer or void the warranty.

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

Component replacement procedures

To remove and replace computer components, use these procedures.

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

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

Preparation for disassembly

To prepare to disassemble the computer, use these steps.

See for initial safety procedures.

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

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

3. Disconnect all external devices from the computer.

Bottom cover

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

Table 5-1 Bottom cover description and part number

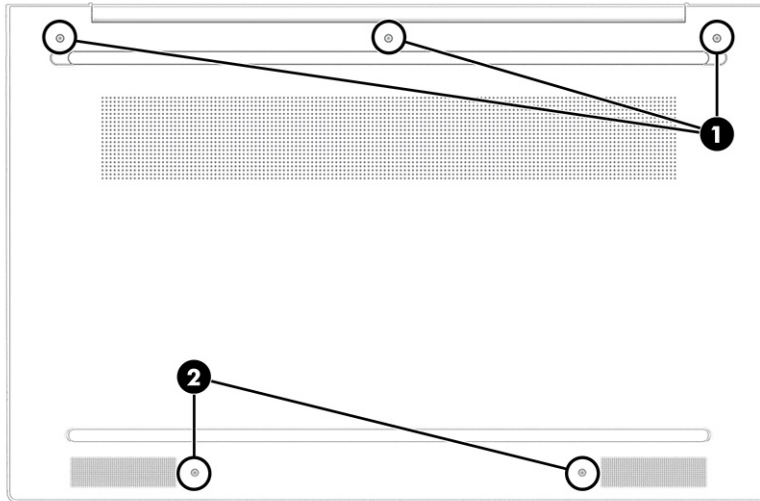| Description	Spare part number
Bottom cover	N13558-001

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

Remove the bottom cover:

1. Remove the 3 Phillips M2.0 × 8.0 screws that secure the bottom cover to the computer.

2. Remove the 2 Phillips M2.0 × 4.0 screws that secure the bottom cover to the computer.

3. Use a nonmarking, nonconductive tool to release the edges of the bottom cover from the computer **(1)**.

4. Rotate the bottom cover away from the computer **(2)**, and then remove the cover **(3)**.
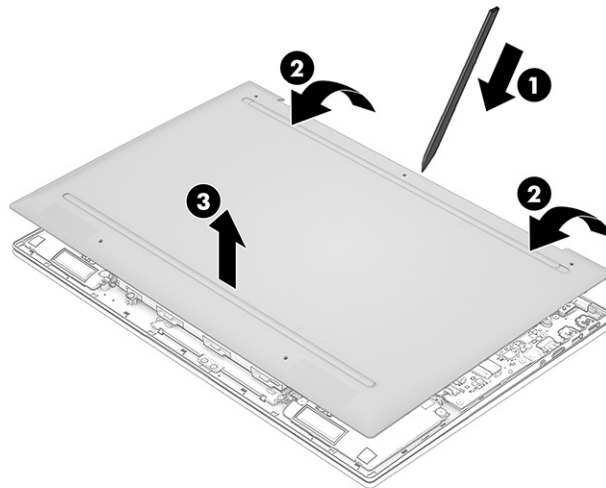
To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 Battery description and part number

Description	Spare part number
Battery (4 cell, 55 Whr, 3.72 Ah)	M24563-005

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

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

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

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

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

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

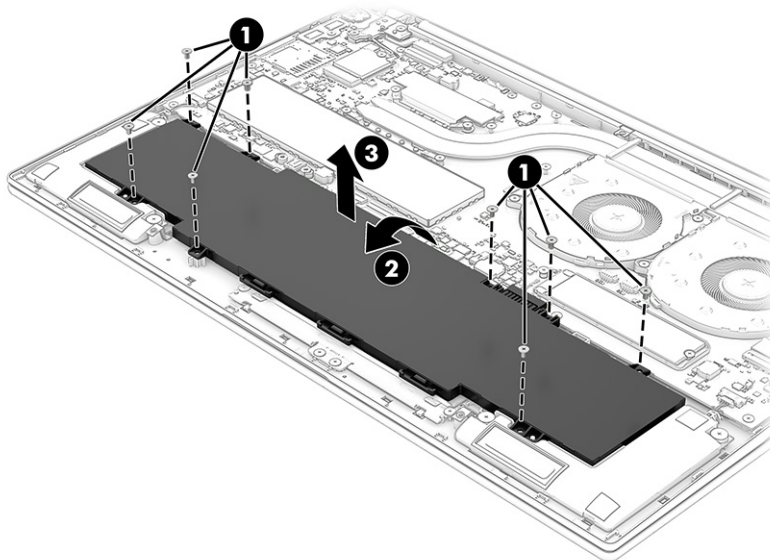Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (see <u>Preparation for disassembly on page 33</u>).

2. Remove the bottom cover (see <u>Bottom cover on page 33</u>).

⚠ **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. Remove the 8 Phillips M2.0 × 3.5 screws **(1)** that secure the battery to the computer.

2. Rotate the battery out from the computer **(2)**, and then remove the battery from the computer **(3)**.

To insert the battery, reverse the removal procedures.

Memory modules

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

Table 5-3 Memory module descriptions and part numbers

Description	Spare part number
16 GB, DDR4-3200	L67710-005
8 GB, DDR4-3200	L46598-005
4 GB, DDR4-3200	L83673-005

Before removing the memory, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

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

1. Using a tool, lift the corner of the memory module cover **(1)**, and then remove the memory module cover **(2)**.
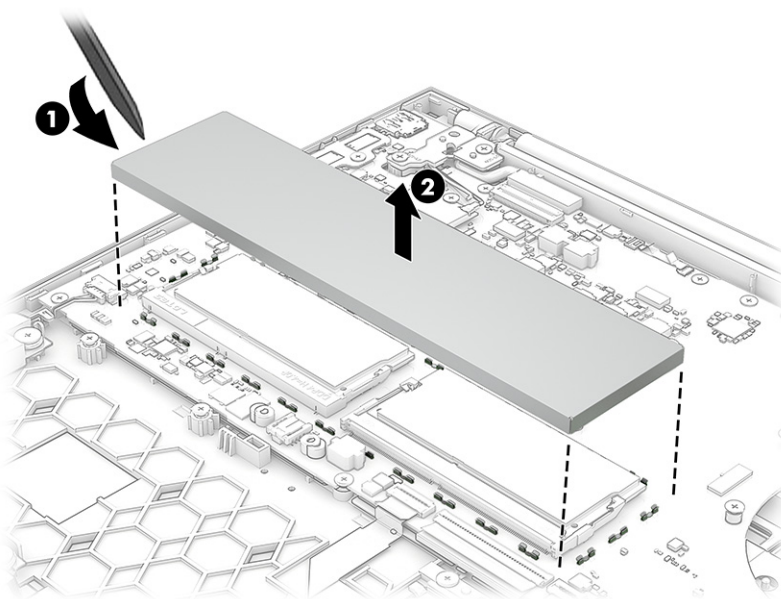
2. Spread the two retention clips outward **(1)** until the memory module tilts up at a 45° angle, and then remove the module **(2)**. Use the same procedure to remove all memory modules.

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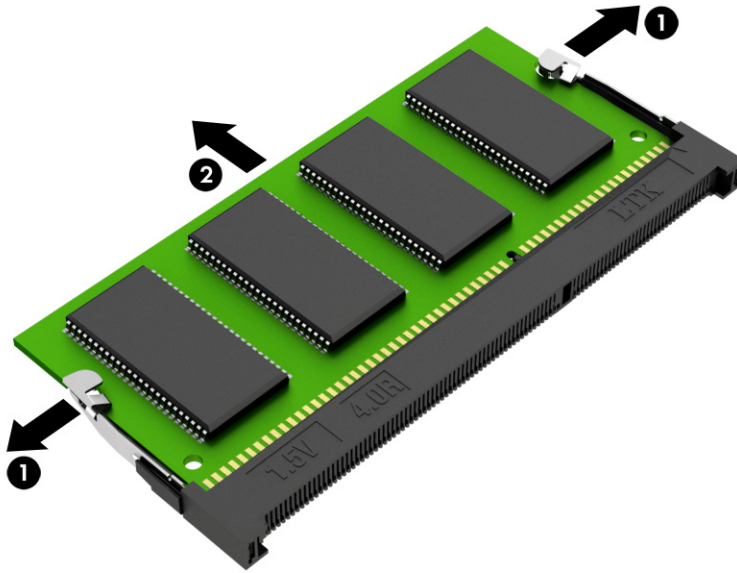
To protect a memory module after removal, place it in an electrostatic-safe container.

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 the module until the side retention clips snap into place **(3)**.
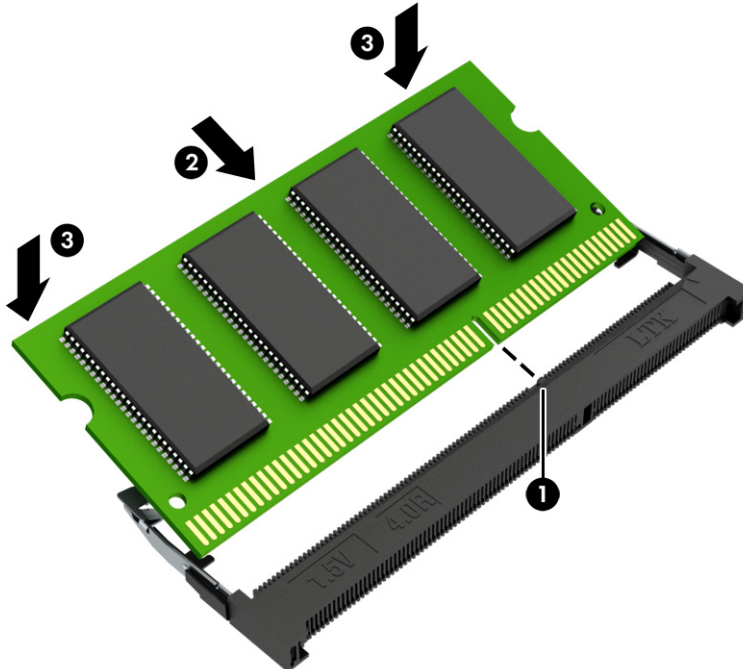
WLAN module

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

Table 5-4 WLAN module descriptions and part numbers

Description	Spare part number
Intel Wireless Wi-Fi 6e AX 211 Wi-Fi + Bluetooth® 5.2 (MU-MIMO)	M53366-005
Intel Wireless Wi-Fi 6 AX 211 2 × 2 Wi-Fi + Bluetooth® 5.2 (MU-MIMO)	M74879-005
WLAN transparent cover	L92736-001

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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the WLAN module:

The WLAN module shield is available using spare part number

1. Remove the WLAN module shield **(1)**.

2. Carefully disconnect the two antenna cables from the module **(2)**.

3. Remove the Phillips M2.0 × 2.5 screw **(3)**, and then remove the WLAN module **(4)**.

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

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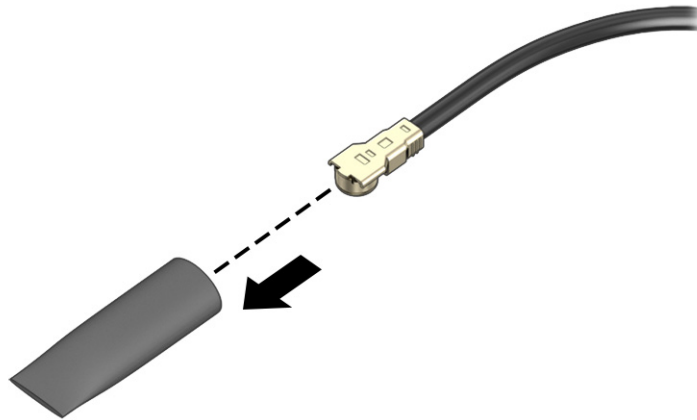
Reverse this procedure to install the WLAN module.

Solid-state drive

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

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

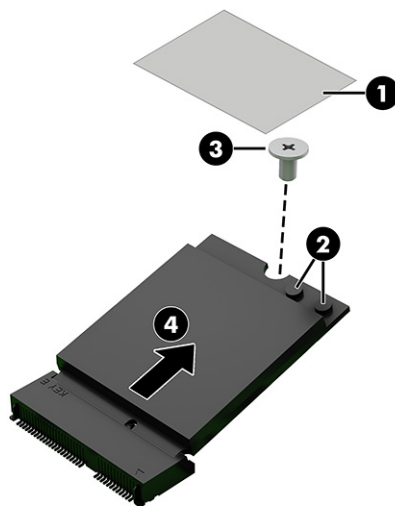| Description	Spare part number
1 T, M2 2280, PCIe-4 × 4, NVMe value	N04491-001
512 GB, M2 2280, PCIe-4 × 4, NVMe value	N04490-001
Thermal pad	N13559-001

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

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).

2. Remove the bottom cover (see Bottom cover on page 33).

3. Remove the battery (see Battery on page 34).

Remove the solid-state drive cover and solid-state drive:
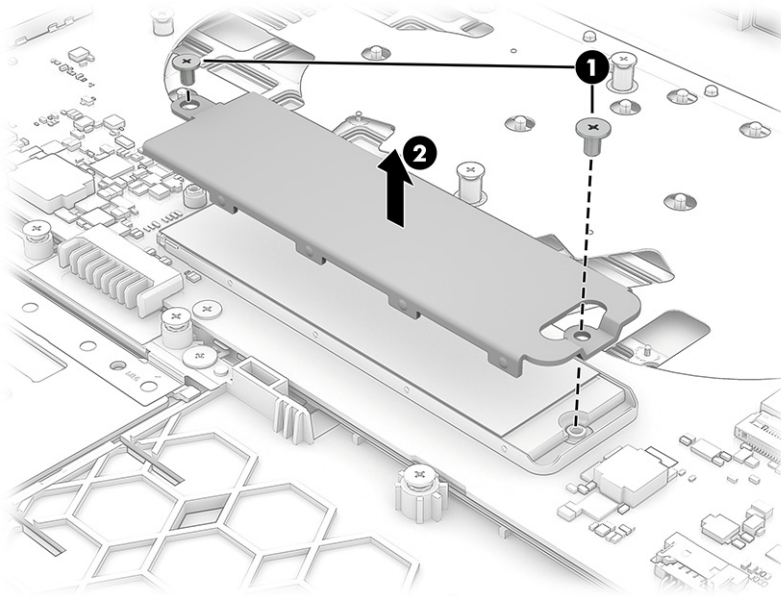
1. Remove the two Phillips M2.0 × 3.5 screws **(1)** that secure the solid-state drive cover to the computer.

2. Remove the solid-state drive cover **(2)**.

3. Lift the front edge of the solid-state drive until it rests at an angle. **(1)**, and then pull the solid-state drive away from the socket to remove it **(2)**.
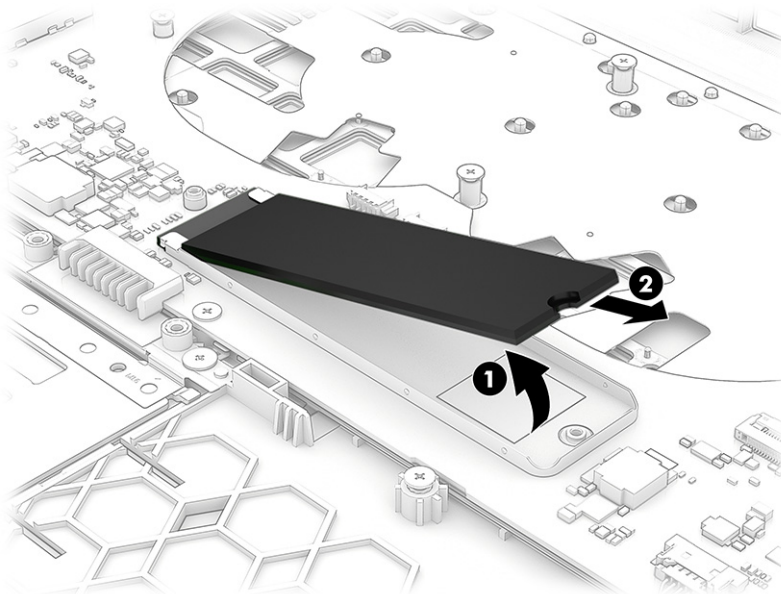
4. Thoroughly clean the thermal material from the surfaces of the solid-state drive and the solid-state drive top shield each time the solid-state drive top shield is removed. The solid-state drive thermal pad is available in the Solid-State Drive Thermal Pad Kit, spare part number N13559-001. Note that this thermal pad is already attached to the solid-state drive cover, which is not available as a spare part. The following illustration shows the replacement thermal material locations.

   A thermal pad is used on the solid-state drive shield **(1)** and on the solid-state drive **(2)**.
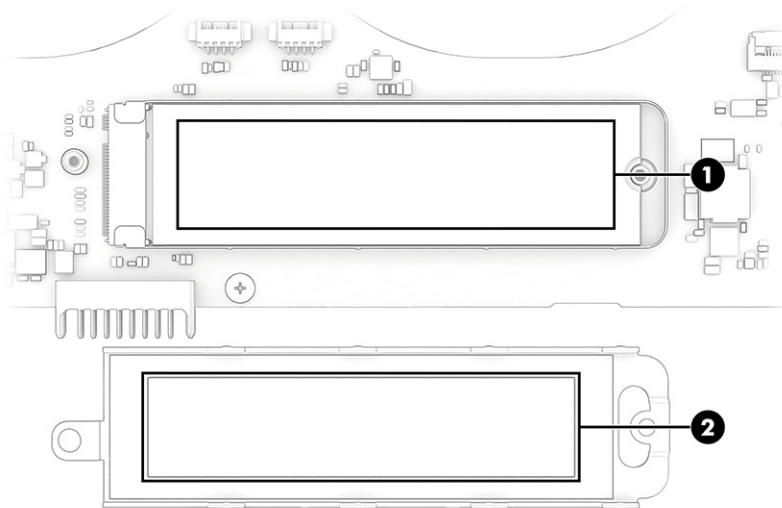
To install the solid-state drive, reverse the removal procedures.

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

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-6 Speaker description and part number

Description	Spare part number
Speaker Kit	N13560-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).

2. Remove the bottom cover (see Bottom cover on page 33).

3. Remove the battery (see Battery on page 34).

Remove the speakers:

1. Disconnect the speaker cables on each side of the computer **(1)**.

2. Remove the 2 Phillips M2.0 × 2.0 screw **(2)** that secures the speakers to the computer.
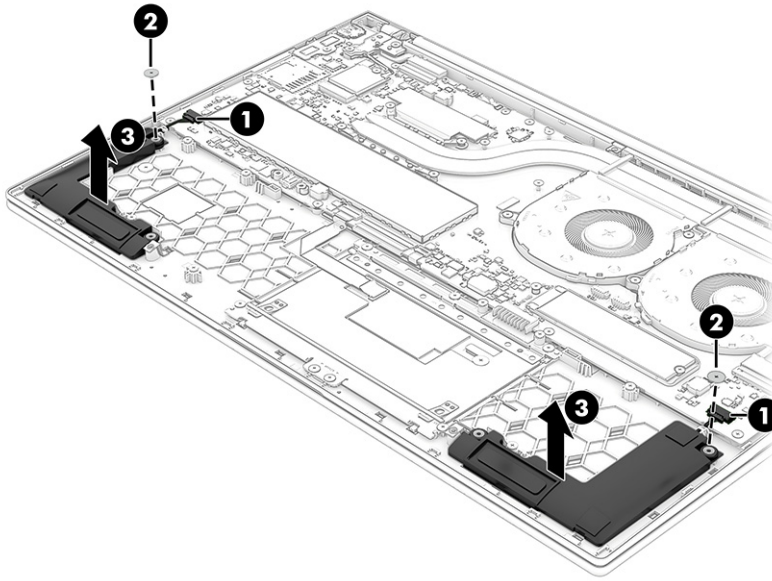
3. Remove the speakers from the computer **(3)** .

Reverse this procedure to install the speakers.

Fan

To remove the fan, use this procedure and illustration.

Table 5-7 Fan description and part number

Description	Spare part number
Fan assembly (left) for use in models with discrete graphics	N18726-001
Fan assembly (right) for use in models with discrete graphics	N18727-001
Fan assembly (left) for use in models with UMA graphics	N13561-001
Fan assembly (right) for use in models with UMA graphics	N13562-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the fan assembly:

1. Disconnect the fan cables from the system board **(1)**, and then disconnect the display panel cable **(2)** from the system board.

2. Release the display panel cable from the fan's retention clips **(3)**.

3. Remove the four Phillips M2.0 × 3.5 screws **(4)** that secure the fans to the computer, and then remove the fans from the computer **(5)**.
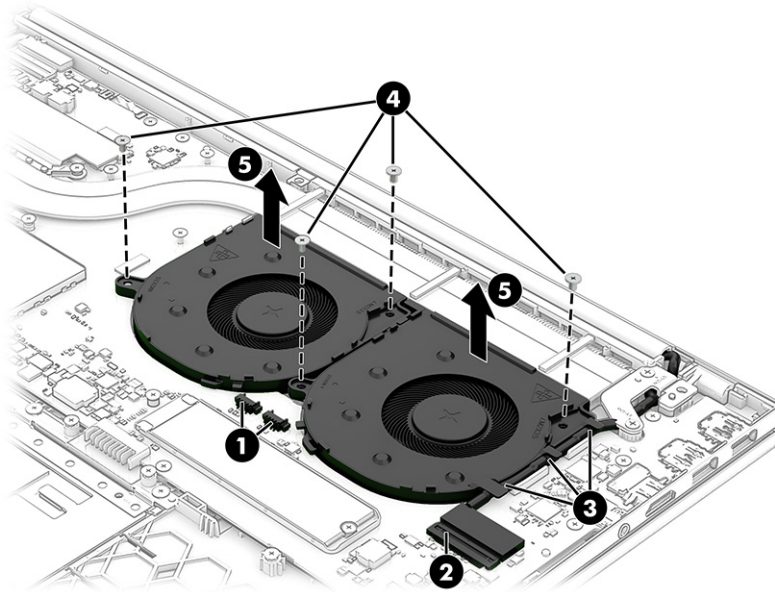
Reverse this procedure to install the fan assembly.

Heat sink

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

Table 5-8 Heat sink descriptions and part numbers

Description	Spare part number
Heat sink for use in models with discrete graphics	N13567-001
Heat sink for use in models with UMA graphics	N13568-001

📝 **NOTE:** The heat sink can also be removed with the system board.

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the heat sink:

📝 **NOTE:** The thermal pad should be changed every time the heat sink is replaced.

1. In the order indicated on the heat sink, remove the four screws on models with discrete graphics or seven Phillips M2.0 × 4.0 screws for models with UMA graphics **(1)** that secure the heat sink to the computer.

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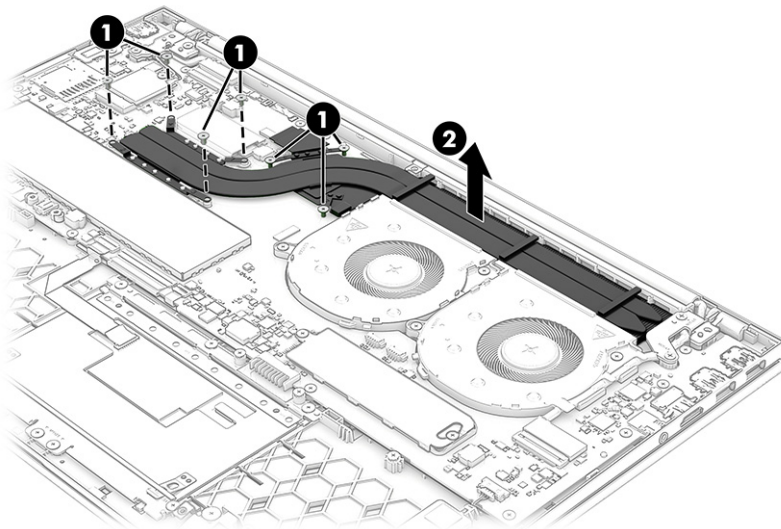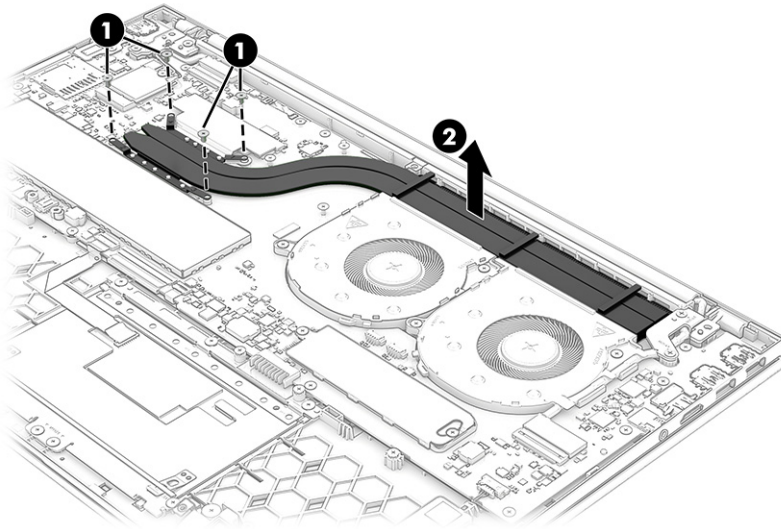
3. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. The following illustration shows the replacement thermal material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

   Thermal paste is used on the system board components **(1)** and on the heat sink areas **(2)** that service them.
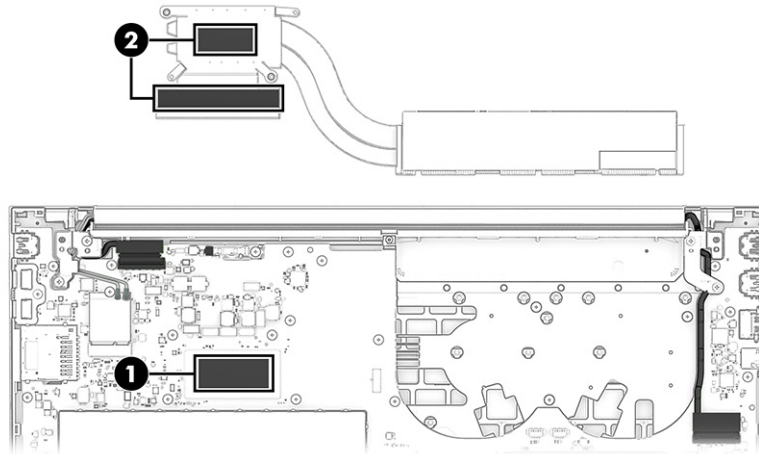
Reverse this procedure to install the heat sink.

Display assembly panel

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

Table 5-9 Display assembly panel description and part number

Description	Spare part number
43.9 (17.3), Ultra high definition (UHD) (3840 × 2160), antiglare, low blue light, UWVA DCI-P3. 400 nits, eDP 1.4 + PSR2, 60Hz	N13555-001
43.9 (17.3) FHD (1920x1080), antiglare, UWVA, sRGB, 300 nits, eDP 1.2 without PSR, DBCG, flat Panel	N13554-001
43.9 (17.3), Full high definition (FHD) (1920x1080), antiglare, UWVA, sRGB, 300 nits, eDP 1.2 without PSR, touch screen, flat panel, DBTS	N13553-001

Before removing the display assembly panel, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33)).

2. Remove the bottom cover (see Bottom cover on page 33).

3. Remove the battery (see Battery on page 34).

Remove the display assembly panel:

1. Remove the WLAN transparent cover **(1)**, and then carefully disconnect the two antenna cables from the WLAN module **(2)**.

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

2. Disconnect the camera module cable **(3)** from the system board.

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

4. Disengage the cables from the retention clips near the left and right hinges **(5)**.
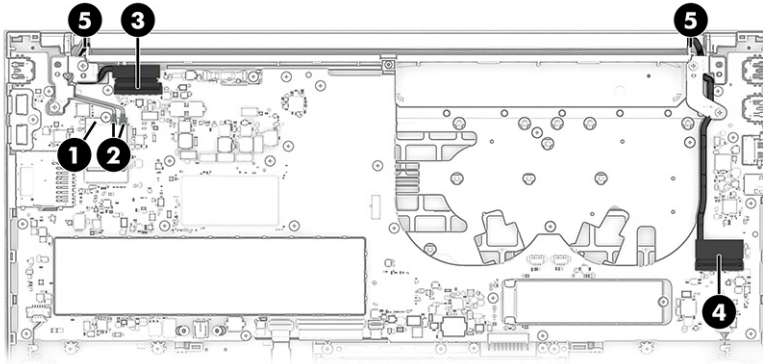
5. Remove the six Phillips M2.5 × 5.0 screws that secure the display assembly to the computer.
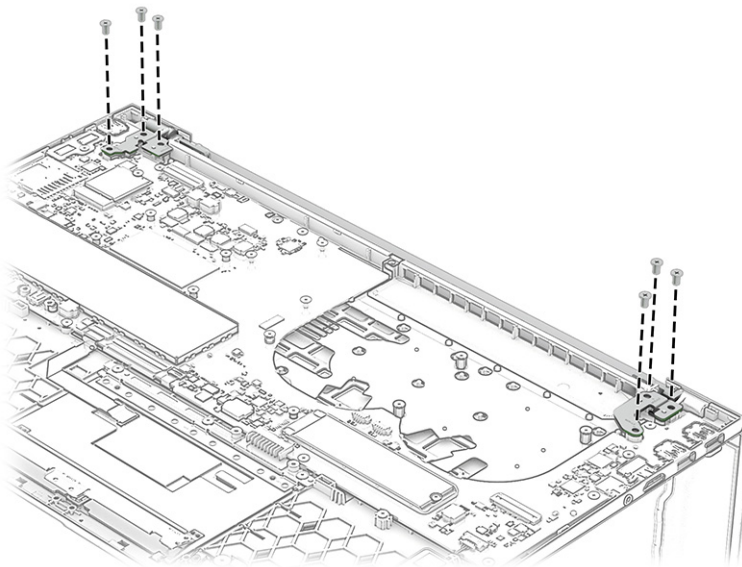
6. Swing the display hinges **(1)** up and then open the display assembly **(2)** to a 90-degree angle.

7. Separate the computer **(3)** from the display assembly.
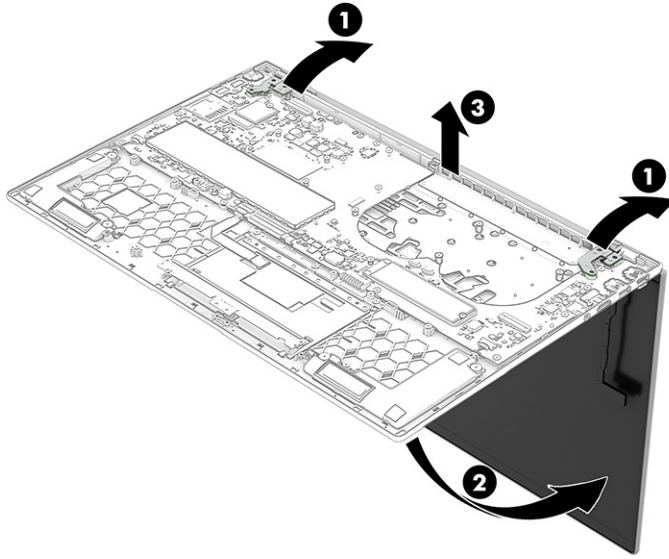
Reverse this procedure to install the display panel.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-10 Touchpad description and part number

Description	Spare part number
Touchpad	N13570-001
Touchpad cable	N13569-001

Before removing the touchpad and touchpad cable, 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. Remove the four Phillips M1.6 × 2.5 screws **(2)** that secure the touchpad bracket to the computer.

3. Remove the touchpad bracket from the computer **(3)**.

4. Remove the three Phillips M1.6 × 2.5 screws **(4)** that secure the touchpad to the computer.

5. Remove the touchpad from the computer **(5)**.
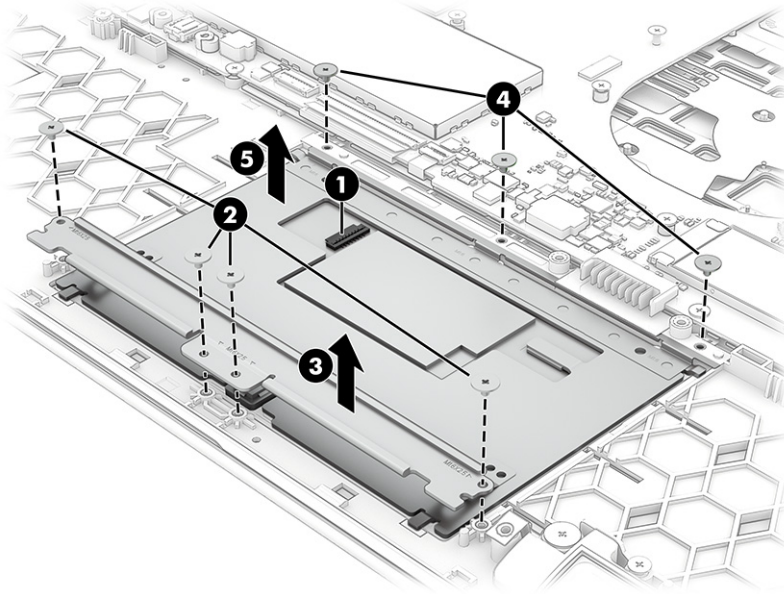
Reverse this procedure to install the touchpad.

System board

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

Table 5-11 System board descriptions and part numbers

Description	Spare part number
System board (includes processor):	
All system boards use the following part numbers:	
xxxxxx-001: Non-Windows operating system	
xxxxxx-601: Windows 10 operating system	
Intel Core i5-1240P processor with 4 GB of unified memory architecture (UMA) graphics memory	N13551-601
Intel Core i7-1260P processor with 4 GB of UMA graphics memory	N13552-601
Intel Core i5-1235U processor and 4 GB of discrete graphics memory	N13549-601
Intel Core i7-1255U processor and 4 GB of discrete graphics memory	N13550-601

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

📝 **NOTE:**

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. The heat sink can be removed with the defective system board.

- Memory modules (see Memory modules on page 36).

- WLAN module (see WLAN module on page 37).

- Fans (see Fan on page 42).

- Heat sink (see Heat sink on page 43).

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

Remove the system board:

1. Disconnect the following cables from the system board:

    - Camera module cable (ZIF) **(1)**

    - Antenna cables **(2)**

    - Display panel cable (ZIF) **(3)**

    - Speaker cable (ZIF) **(4)**

    - Backlight cable (ZIF) **(5)**

    - Keyboard cable (ZIF) **(6)**

    - Touchpad cable (ZIF) **(7)**
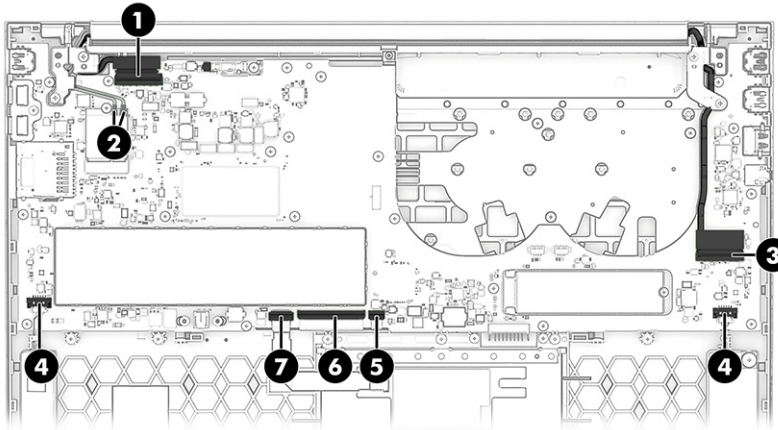
2. Remove the eleven Phillips M2.0 × 3.5 screws **(1)** that secure the system board to the computer.
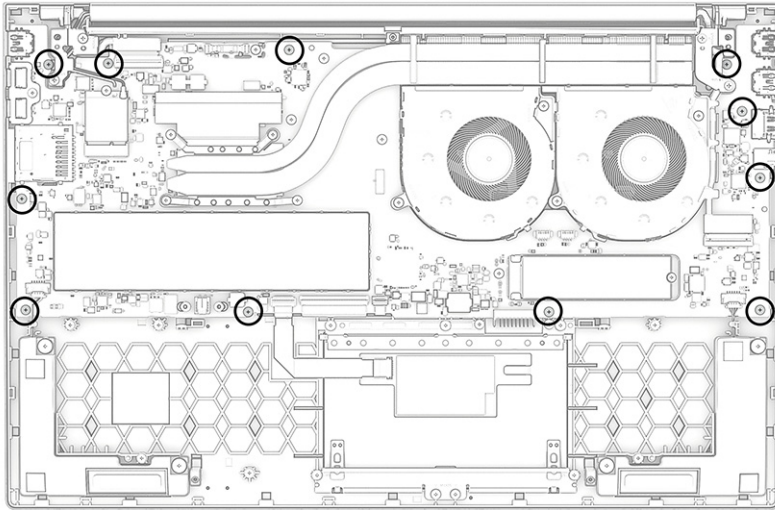
3. Rotate the left side of the system board upward **(1)**, and then pull the system board away from the connectors on the side of the chassis to remove it from the computer **(2)**.
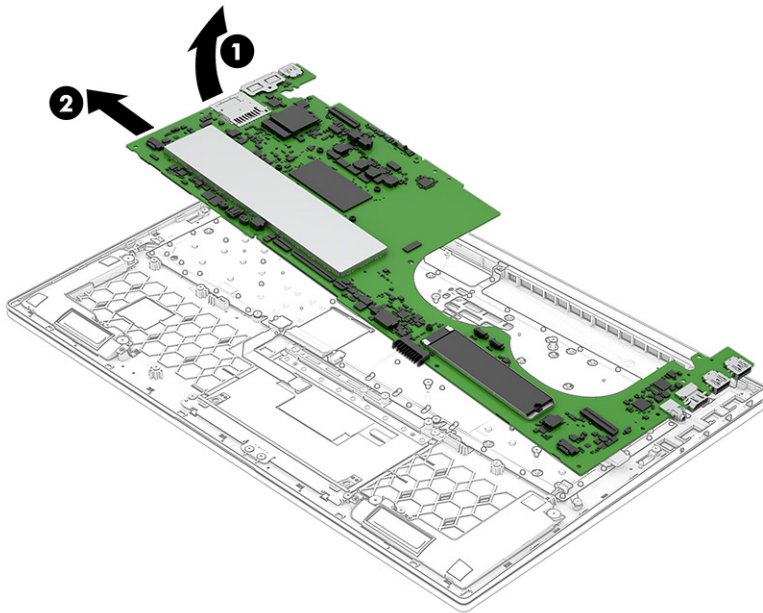
Reverse this procedure to install the system board.

IR board cable

To remove the IR board cable, use this procedure and illustration.

Table 5-12 IR board cable description and part number

Description	Spare part number
IR board cable	N13565-001

Before removing the IR board cable, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 33).

2. Remove the bottom cover (see Bottom cover on page 33).

3. Remove the battery (see Battery on page 34).

Remove the IR board cable:

1. Open the IR board cable's two ZIF connectors **(1)**, and then remove the IR board cable **(2)**.
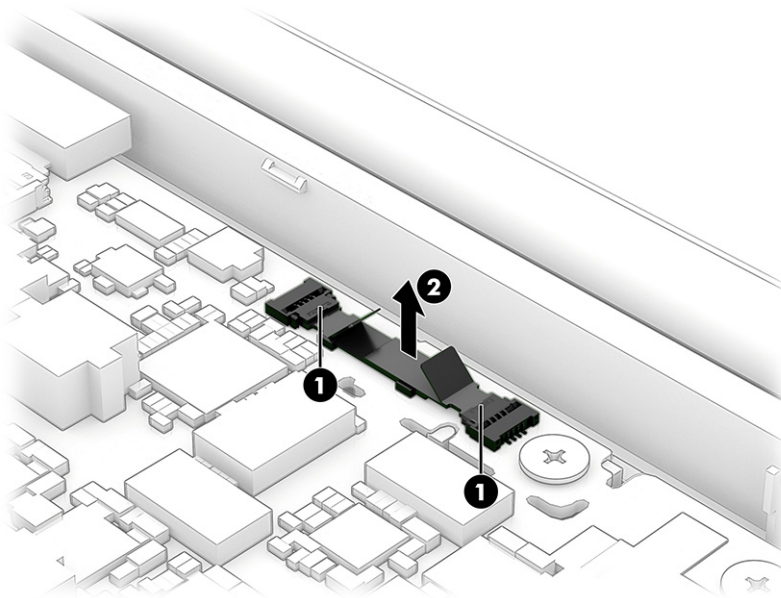
2. To replace the IR board cable, open each ZIF connector **(1)**, insert the IR board cable into each connector **(2)**, and then close each connector **(3)** to secure the cable in place.

USB Type-C bracket

To remove the USB Type-C bracket, use this procedure and illustration.

Table 5-13 USB Type-C bracket description and part number

Description	Spare part number
USB Type-C bracket	Not available as a spare part
USB Type-C bracket foil	N13566-001

Before removing the USB Type-C bracket, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

4. Remove the display assembly (see).

5. Remove the heat sink (see).

6. Remove the fans (see).

7. Remove the IR board (see).

8. Remove the system board (see).

Remove the USB Type-C bracket:

1. Remove the Phillips M2.0 × 3.5 screw **(1)** that secures the bracket to the system board.

2. Remove the bracket from the system board **(2)**.

Reverse this procedure to install the USB Type-C bracket.

Display assembly

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

Full hinge-up displays are not available as spare parts. Spare parts for displays are available only at the subcomponent level.
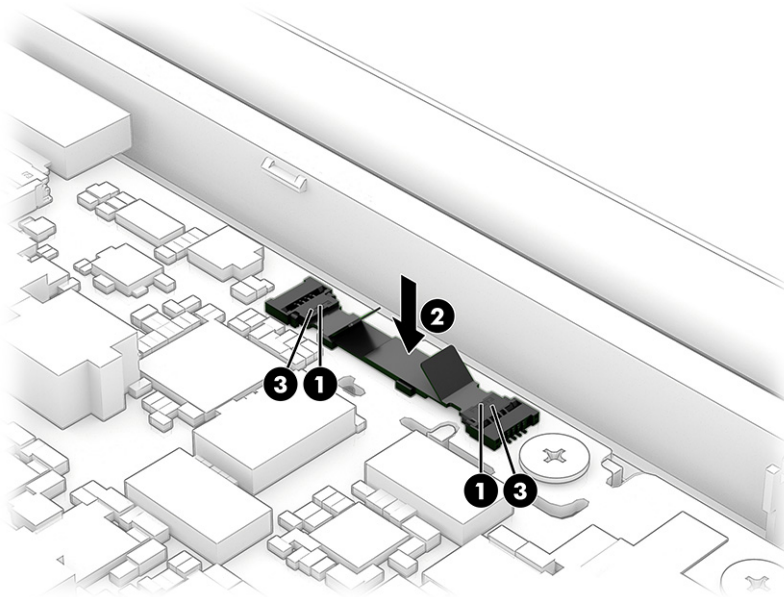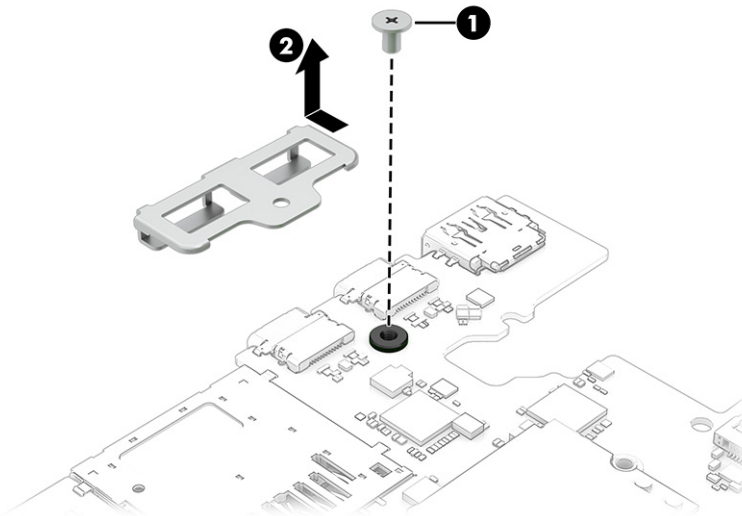
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see <u>Preparation for disassembly on page 33</u>).

2. Remove the bottom cover (see <u>Bottom cover on page 33</u>).

3. Remove the battery (see <u>Battery on page 34</u>).

4. Remove the display assembly panel (<u>Display assembly panel on page 45</u>).

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

📝 **IMPORTANT:** After replacing the display panel assembly, it is necessary to reload the calibration data. Refer to Service Advisory c06640672 for details on reloading the HP Display Control Panel Color Calibration Data Reload Process.

📝 **IMPORTANT:** After replacing the display panel assembly, it is necessary to update the Touch Panel Firmware. Navigate to Help and Support at <u>http://www.hp.com</u>. Select **Support**, and then select **Software & Drivers** to download and install the Touch Panel Firmware.

Remove the display assembly:

1. If you need to remove the display panel assembly, display panel cable, or any of the internal display components, follow these steps.

a. Remove the display assembly panel from the base enclosure (see Display assembly panel on page 45).

b. Position the display assembly with the panel facing down and the bottom edge of the assembly toward you.

c. Attach two suction cups **(1)** to the display assembly. away from the camera module and bezel to avoid damage **(1)**, and then rotate the locking lever down to lock the cup **(2)**.

d. Use the suction cups and a case utility tool **(3)** to carefully separate the display panel assembly from the display back cover **(4)**. When releasing the display panel assembly, be sure not to attach the suction cups to or insert the case utility tool into the area near the camera module in the center of the display panel assembly.
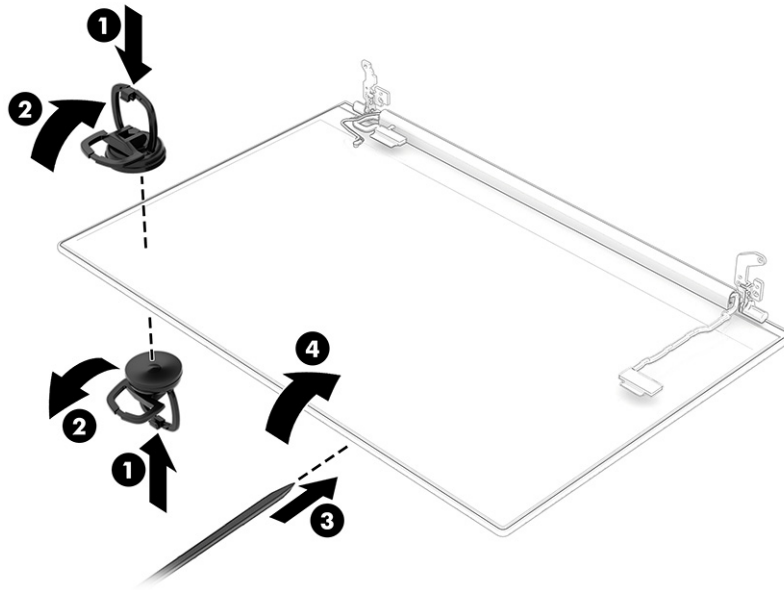
e. The display panel is secured to the display enclosure with tape that is installed under the left and right sides of the panel. To remove the panel, use a utility tool to open the gap further **(1)**. Use tweezers to grasp the end of the tape **(2)**. While turning the tweezers, wrap the tape around the tweezers **(3)** as you continue to pull the tape out from behind the display panel **(3)**. You must pull the tape multiple times before it is completely removed.

f. Rotate the display panel and place it next to the display enclosure and remove the panel **(4)**. The panel should be lifted about 15° from the bottom side.

Display panels are available as the following spare part numbers:

N13554-001: FHD, UWVA, antiglare, non touch screen, 300 nits

N13555-001: UHD, UWVA, antiglare, non touch screen, 400 nits

N13553-001: FHD, UVWA, antiglare, touch screen, 300 nits
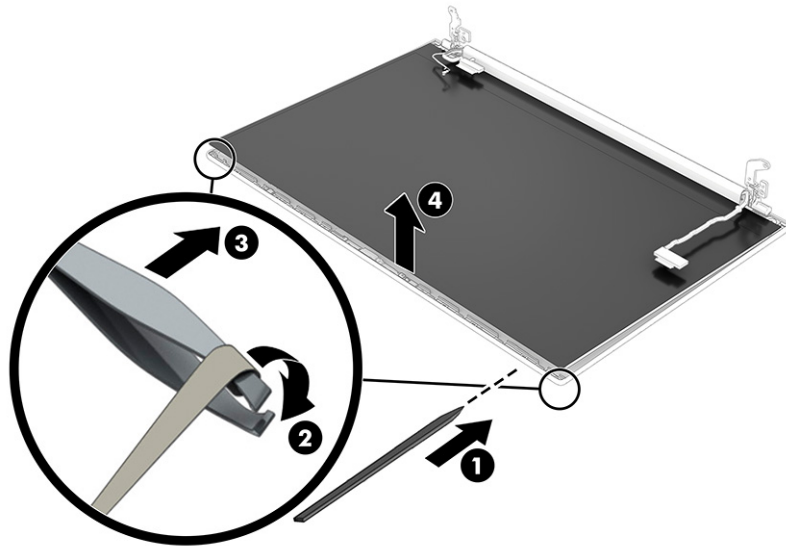
2. Before replacing the display panel assembly, thoroughly clean all adhesive residue from the display panel. Remove the protective backing from the new adhesive strips, align the holes **(1)** on the strips with the pins **(2)** on the display panel assembly, and then attach the strips to the display panel assembly.
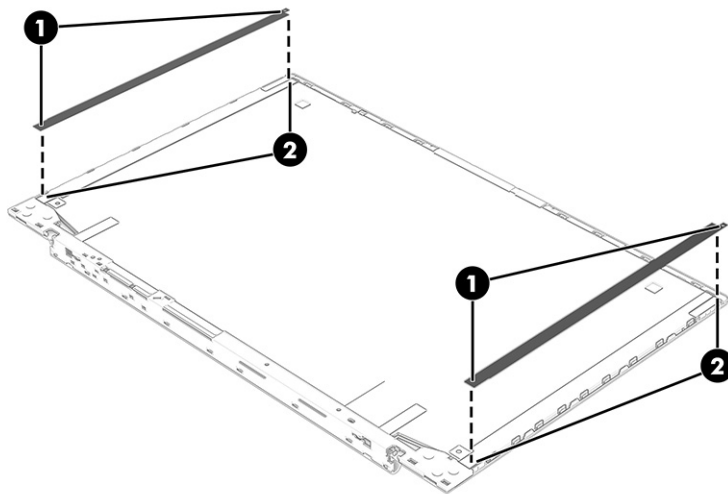
3. If you need to remove the camera module:

    ▲   Using a utility tool, lift up evenly across the camera module **(1)**, and then peel the module up from the display back cover **(2)**. Disconnect the cable from the reverse ZIF connector on the module **(3)**,

Peel the camera module cable from the display back cover **(4)**, and then remove the camera module cable **(5)**. The camera module is available as spare part number N13571-001.
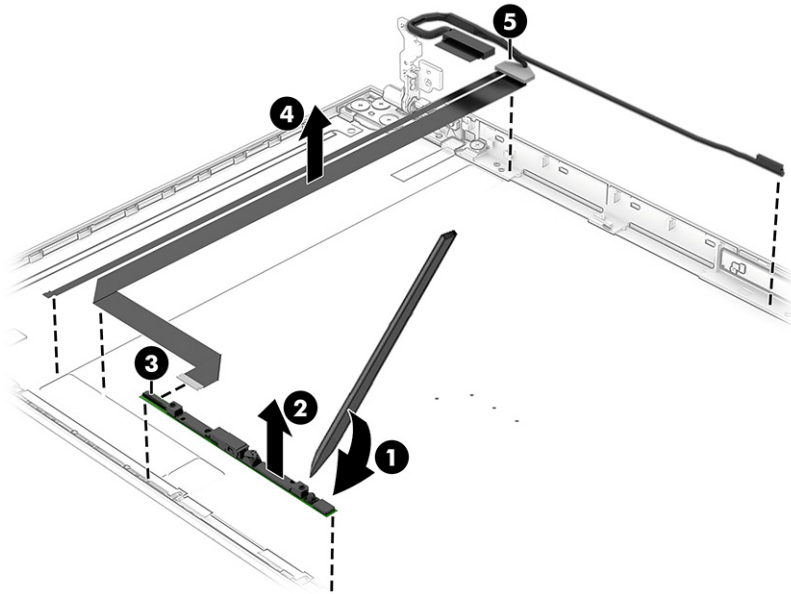
4. If you need to replace the camera module, thoroughly clean all gasket adhesive residue from the display panel assembly before installing a new gasket. Remove the protective backing from the new gasket, align the holes **(1)** on the gasket with the pins **(2)** on the display panel assembly, and then attach the gasket to the display panel assembly.
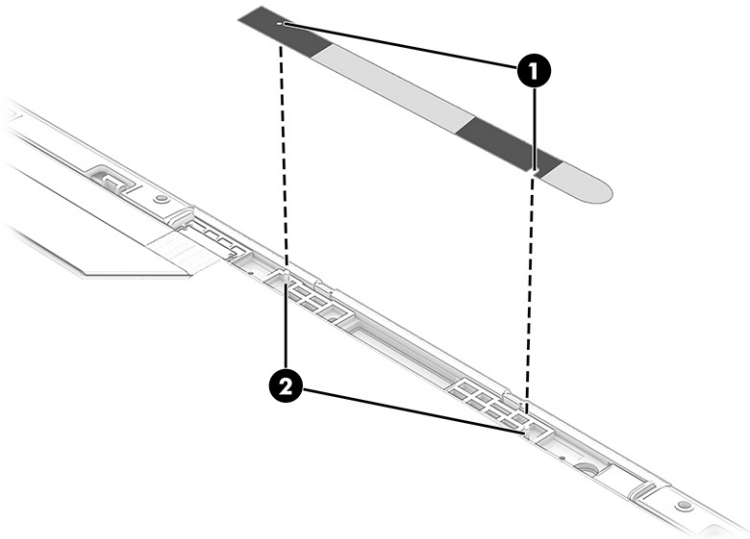
5. If you need to remove the display/camera cable, use a utility tool to peel the cable off the inside of the display back cover **(1)**, and then pull back the tape that covers the display panel connector **(2)**.

Disconnect the display panel cable by opening the metal locking bar and then releasing the cable in a horizontal direction **(3)**. Remove the cable **(4)**.
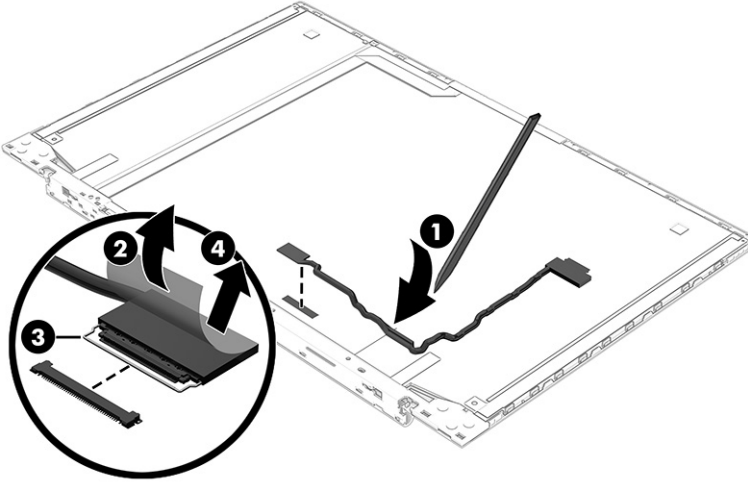
6. If you need to remove the antenna cables, peel and remove the auxiliary antenna **(1)**, and the main antenna **(2)**. Disengage the cables from the clips at the bottom of the cover and then remove the antennas and cables **(3)**.

    Antenna cables are available as spare part number N13572-001.
    Display back covers with antennas are available as spare part number N13573-001 in natural silver finish.
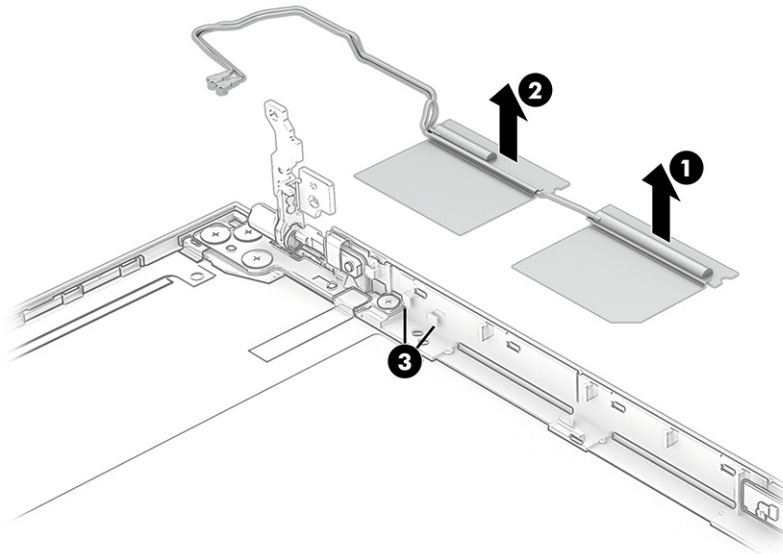
7. If you need to remove the hinges from the display enclosure:

    a. Release the right antenna from the display hinge **(1)**.

    b. Remove the six Phillips broadhead M2.5 × 2.5 screws **(2)** from each hinge.

    c. Remove the two Phillips broadhead M2.5 × 4.0 screws **(3)** from each hinge.

d. Remove the hinges from the display **(4)**.

The display hinges are available as spare part number N13563-001.
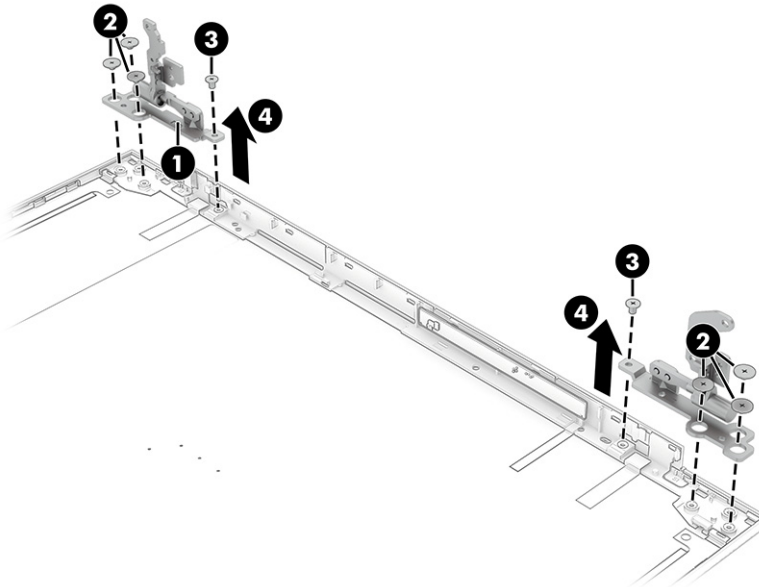
Reverse this procedure to reassemble and replace the display assembly.

Keyboard with top cover

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

Table 5-14 Keyboard with top cover descriptions and part numbers

Description	Spare part number
Keyboard with top cover in natural silver finish	N13556-001

Table 5-15 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	Iceland	-DD1	Saudi Arabia	-171
Brazil	-201	India	-D61	Slovenia	-BA1
Bulgaria	-261	Israel	-BB1	South Korea	-AD1
Chile	-161	Italy	-061	Spain	-071
Czech Republic/Slovakia	-FL1	Japan	-291	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	Kazakhstan	-DF1	Taiwan	-AB1
French Canada	-DB1	The Netherlands	-B31	Thailand	-281
France	-051	Northern Africa	-FP1	Turkey	-141

Table 5-15 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
Germany	–041	Portugal	–131	Ukraine	–BD1
Greece	–151	Romania	–271	United Kingdom	–031
Hungary	–211	Russia	–251	United States	–001

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

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

▲ Turn on or restart the computer and quickly press f10.

– or –

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

Updating Setup Utility (BIOS)

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

Determining the BIOS version

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

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

- HP Support Assistant

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

     – or –

     Select the question mark icon in the taskbar.

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

- Setup Utility (BIOS)

  1. Start Setup Utility (BIOS) (see).

  2. Select **Main**, and then make note of the BIOS version.

3. Select **Exit**, select one of the options, and then follow the on-screen instructions.

- In Windows, press ctrl+alt+s.

To check for later BIOS versions, see .

Preparing for a BIOS update

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

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

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

- Do not shut down the computer or initiate Sleep.

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

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

Downloading a BIOS update

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

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

   – or –

   Select the question mark icon in the taskbar.

2. Select **Updates**. The **Checking for Updates** window opens, and Windows checks for updates.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

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

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

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

Installing a BIOS update

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

1. Select the **Search** icon in the taskbar, type file in the search box, and then select **File Explorer**.

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

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

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

    The BIOS installation begins.

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

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

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

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

Using Computer Setup

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

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

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

Navigating and selecting in Computer Setup

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

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

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

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

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

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

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

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

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

1. Start Computer Setup. See Using Computer Setup on page 63.

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 Using Computer Setup on page 63.

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

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

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

To check for later BIOS versions, see Preparing for a BIOS update on page 64.

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 63.

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.

8 Backing up, restoring, and recovering

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

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

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

Backing up information and creating recovery media

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

Using Windows tools for backing up

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

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

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

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

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

For details:

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

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

IMPORTANT: HP recommends that you follow the 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 68</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 68</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 original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool.

For details, see <u>Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 67</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 68</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, 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.

9 Using HP PC Hardware Diagnostics

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

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 71.

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

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

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

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

  – or –

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

  – or –

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

Accessing HP PC Hardware Diagnostics Windows

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

Accessing HP PC Hardware Diagnostics Windows from HP Support Assistant

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

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

   – or –

   Select the question mark icon in the taskbar.

2. Select **Fixes & Diagnostics**.

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

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

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

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

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

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

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

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

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

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version from HP

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

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

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

   The tool downloads to the selected location.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

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

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

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

3. Follow the on-screen directions.

   The tool downloads to the selected location.

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

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

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

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

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

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

The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

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

Using HP PC Hardware Diagnostics UEFI

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

NOTE: For 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:

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

– or –

Contact support, and provide the failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

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

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

2. Press f2.

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

   a. Connected USB flash drive

      NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 73.

   b. Hard drive

   c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

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

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

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

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

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

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

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

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

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

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

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

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

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

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

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

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

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

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

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

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

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

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

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

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

- Display status information about the diagnostics run previously.

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

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

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

3. Make your customization selections.

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

Your changes take effect when the computer restarts.

10 Specifications

This chapter provides specifications for your computer.

Computer specifications

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

Table 10-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	**398.2 mm**	15.7 in
Depth	**259 mm**	10.15 in
Height (front to back)	**19.6 mm**	0.77 in
Weight		
For models with UMA graphics	**2489 g**	5.48 lbs
For models with discrete graphics	**2622 g**	5.78 lbs
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 4.62 A – 90 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.

43.9 cm (17.3 in) display specifications

This section provides specifications for your display.

Table 10-2 Display specifications

	Metric	U.S.
Active diagonal size	**39.6 cm**	15.6 in
Resolution	1920 × 1080 (FHD)	
	3840 × 2160 (UHD)	
Surface treatment	Antiglare (FHD, UHD panels)	
Brightness	300 nits (FHD, 72% NTSC/100% sRGB panels)	
	400 nits (UHD panel)	
Viewing angle	UWVA	
Backlight	WLED	
Display panel interface	eDP	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 10-3 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 MB/s	up to 2150 MB/s	up to 2150 MB/s
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MB/s	up to 1550 MB/s	up to 1550 MB/s
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs	Up to 100,000 IOPs
Total logical sectors	468,883,296	1,000,215,216	1,500,336,388
Operating temperature	**0°C to 70°C** (32°F to 158°F)		

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

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

Solid-state drive specifications (SATA-3)

This section provides specifications for your solid-state drive.

Table 10-4 Solid-state drive specifications

	128 GB*
Dimensions	
Height	1.35 mm
Weight	< 10 g
Interface type	SATA-3
Ready time, maximum (to not busy)	1.0 ms
Access times, logical	0.1 ms
Transfer rate	up to 540 MB/s
Total logical sectors	234,441,648
Operating temperature	**0°C to 70°C** (32°F to 158°F)

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

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

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
Germany	VDE	1

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

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

1. The flexible cord must be Type HO5VV-F, 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 HO5VV-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 HO5VV-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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