



Maintenance and Service Guide

SUMMARY

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

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Product notice

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

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

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

Software terms

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

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

Safety warning notice

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


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

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1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	OMEN by HP 16 Laptop PC Model numbers: 16-b0xxx CTO model: 16t-b000
Processors	Intel® processors Intel Core® i7-11800H (2.4 GHz, turbo up to 4.6 GHz), 3200 MHz/24 MB L3 cache, 8 core, TDP 45W Intel Core i5-11400H (2.7 GHz, turbo up to 4.5 GHz), 3200 MHz/12 MB L3 cache, 6 core, TDP 45W Intel Core i5-11260H (2.6 GHz, turbo up to 4.4 GHz), 2933 MHz/12 MB L3 cache, 6 core, TDP 45W
Chipset	Intel HM570
Graphics	Internal graphics Intel Ultra High Definition (UHD) Graphics Hybrid graphics NVIDIA® GeForce® RTX3070 graphics NVIDIA GeForce RTX3060 graphics NVIDIA GeForce RTX3050 graphics NVIDIA GeForce RTX3050Ti graphics NVIDIA GeForce 1650 graphics Supports HD Decode, DX12, and HDMI Supports Optimus® Supports FPS (GPU Performance Scaling) Mixed reality (MR) compatible (60 Hz frame rate)
Display	16.1 in (40.9 cm), antiglare, ultrawide viewing angle (UWVA), WLED, narrow bezel, flicker free Full high-definition (FHD) (1920 × 1080), flat (3.2 mm), 45% NTSC, eDP 1.3 + PSR, 250 nits, 144 Hz FHD, flat (3.2 mm), 45% NTSC, eDP 1.2 without PSR, 250 nits FHD, flat (3.2 mm), sRGB 100, low blue light, eDP 1.3 + PSR, 300 nits, 144 Hz FHD, flat (3.2 mm), sRGB 100, eDP 1.2 without PSR, 300 nits Quad high-definition (QHD) (2560 × 1440), slim (2.6 mm), sRGB 100, low blue light, eDP 1.4 + PSR, 300 nits, 165 Hz
Memory	Customer accessible or upgradeable Two SODIMM slots, dual-channel support

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

Category	Description
	DDR4-3200 (11800H, 11400H) or DDR-2933 (11260H)
	Supports the following configurations:
	<ul style="list-style-type: none"> • 32 GB (16 × 2) • 16 GB (8 × 2) • 8 GB (4 × 2 or 8 × 1)
Primary storage	PCIe, NVMe, M.2 2280 solid-state drives
	1 TB, PCIe-4 × 4, TLC
	1 TB, PCIe-3 × 4, TLC
	1 TB, PCIe-3 × 2 × 2 + 32 GB Optane™ memory
	512 GB, PCIe-4 × 4, TLC
	512 GB, PCIe-3 × 4, TLC
	512 GB, PCIe-3 × 2 × 2 + 32 GB Optane memory
	Multiple storage configurations
	(1 TB, PCIe, TLC + 1 TB, PCIe, TLC) RAID 0
	(512 GB, PCIe, TLC + 512 GB, PCIe, TLC) RAID 0
Audio and video	BANG & OLUFSEN
	OMEN Audio Control
	Dual speakers
	Support for HP Audio Boost 2.0 with discrete amplifier
	Support for DTS: X Ultra
	HP Wide Vision HD Camera: indicator LED, USB 2.0, HD BSI sensor, f2.0, WDR, 88° WFOV
	720p by 30 frames per second
	Dual-array digital microphone with appropriate software: beam forming, echo cancellation, noise suppression
RJ-45/network jack	Integrated 10/100/1000 NIC (supports network booster)
Sensor	IR thermal sensor
Wireless	Compatible with Miracast® devices
	Integrated wireless options with dual antennas
	Intel Wi-Fi 6 AX201-W + Bluetooth® 5 (non-vPro®) (802.11ax 2 × 2, MU-MIMO, supporting gigabit file transfer speeds)
	Intel Wi-Fi 6 AX210 + Bluetooth 5.2 (non-vPro) (802.11ax 2 × 2, MU-MIMO, supporting gigabit file transfer speeds)
Media card reader	HP Multi-Format Digital Media Card Reader
	Supports microSD™, SDHC™, SDXC™
	Push-push insertion/removal

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

Category	Description
Ports	HDMI v2.1 + HDCP 2.2 supporting: up to 4096 × 2160 @ 60 Hz
	HDMI v2.1 + HDCP 2.2 supporting: up to 8192 × 4320 @ 60 Hz (models with the following graphics: RTX 3050, RTX 3050Ti, RTX 3060)
	Audio-out (headphone)/audio-in (microphone) combo jack
	RJ-45 connector
	USB 4 Type-C Thunderbolt® 4 (supports data transfer, Power Delivery 3.0; HP Sleep & Charge; DisplayPort™ 1.4 out up to 7680 × 3840 @ 60 Hz and HDMI 1.4 out through adapter; HDMI 2.1 out up to 8K @ 60 Hz with HDCP 2.2 through adapter)
	(3) USB 3.2 Gen 1 Type-A (left port supports HP Sleep & Charge)
	AC Smart Pin adapter plug
Keyboard/pointing devices	Keyboard
	Full size, backlit, 3-coat paint, island-style with numeric keypad, 1-zone lighting
	Full size, backlit, 3-coat paint, island-style with numeric keypad, 4-zone lighting
	Full size, backlit, 3-coat paint, island-style, 1-zone lighting
	Full size, backlit, 3-coat paint, island-style, 4-zone lighting
	Full size, backlit, 3-coat paint, island-style, RGB per key lighting
	Clickpad
	Image sensor
	Multitouch gestures enabled
	Precision touchpad support
	Support for modern trackpad gestures
Taps enabled as default	
Power requirements	Battery
	6 cell, 83 Whr, lithium-polymer
	4 cell, 70 Whr, lithium-polymer
	HP long life
	HP Fast Charge Technology
	Smart AC adapters (PFC, 4.5 mm)
	230 W, right angle
	200 W, right angle
	150 W
	Power cord
	C13, premium, 1 m (3.3 ft)
C5, premium, 1 m (3.3 ft)	
Security	Supports Trusted Platform Module (fTPM) 2.0, firmware based

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

Category	Description
Operating system	Windows® 10 Home 64
	Windows 10 Home 64 Advanced
	Windows 10 Home 64 Advanced Single Language
	Windows 10 Home 64 Chinese Market CPPP
	Windows 10 Home 64 High-end Chinese Market CPPP
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language Africa Market
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market
	Windows 10 Home 64 Plus Single Language Indonesia Market
	Windows 10 Home 64 Single Language
	Windows 10 Home 64 Single Language Africa Market
	Windows 10 Home 64 Single Language APAC EM PPP
	Windows 10 Home 64 Single Language India Market
	Windows 10 Home 64 Single Language Indonesia Market
	Windows 10 Pro 64
FreeDOS 3.0	
Serviceability	End user replaceable parts
	AC adapter

2 Getting to know your computer

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

Actual computer color, features, feature locations, and icon labels might vary from the images depicted.

Right side

Identify the components on the right side of the computer.

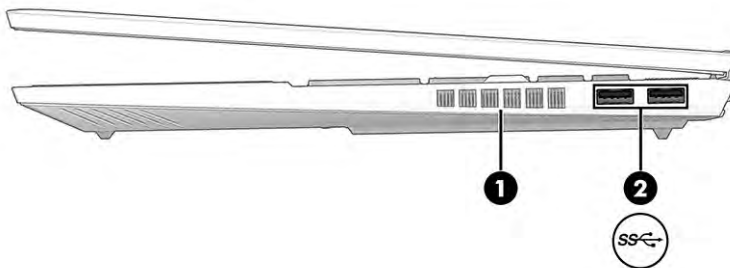



Table 2-1 Right-side components and their descriptions

Component	Description
(1) 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.
(2)  USB SuperSpeed ports (2)	Connect a USB device, 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.

Left side

Identify the components on the left side of the computer.

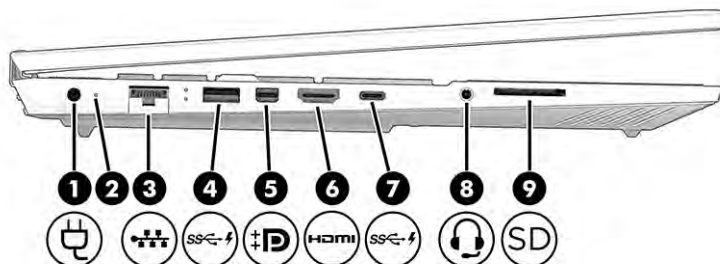


Table 2-2 Left-side components and their descriptions








Component	Description
(1)  Power connector	Connects an AC adapter.
(2) AC adapter and battery light	<ul style="list-style-type: none"> • 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.
(3)  RJ-45 (network) jack/status lights	<p>Connects a network cable.</p> <ul style="list-style-type: none"> • White: The network is connected. • Amber: Activity is occurring on the network.
(4)  USB SuperSpeed port with HP Sleep and Charge	<p>Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off.</p> <p>NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.</p>
(5)  Dual-Mode DisplayPort™ connector	Connects an optional digital display device, such as a high-performance monitor or projector.
(6)  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.
(7)  USB Type-C® SuperSpeed port with HP Sleep and Charge - or - USB Type-C Thunderbolt® port with HP Sleep and Charge	<p>Connects a USB device, provides high-speed data transfer, and charges small devices (such as a smartphone), even when the computer is off.</p> <p>NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device.</p> <p>– and –</p> <p>Connects a display device that has a USB Type-C connector, providing DisplayPort output.</p>
(8)  Audio-out (headphone)/Audio-in (microphone) combo jack	<p>Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety, and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> ▲ Type HP Documentation in the taskbar search box, and then select HP Documentation.

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

Component	Description
(9) SD Memory card reader	<p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p> <p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none">1. Hold the card label-side up, with connectors facing the computer.2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none">▲ Press in on the card, and then remove it from the memory card reader.

Rear

Identify the rear component.




Table 2-3 Rear component and its description

Component	Description
Vent	<p>Enables airflow to cool internal components.</p> <p>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.</p>


Display

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

 **NOTE:** Your computer might look slightly different from the illustration in this section.

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>.

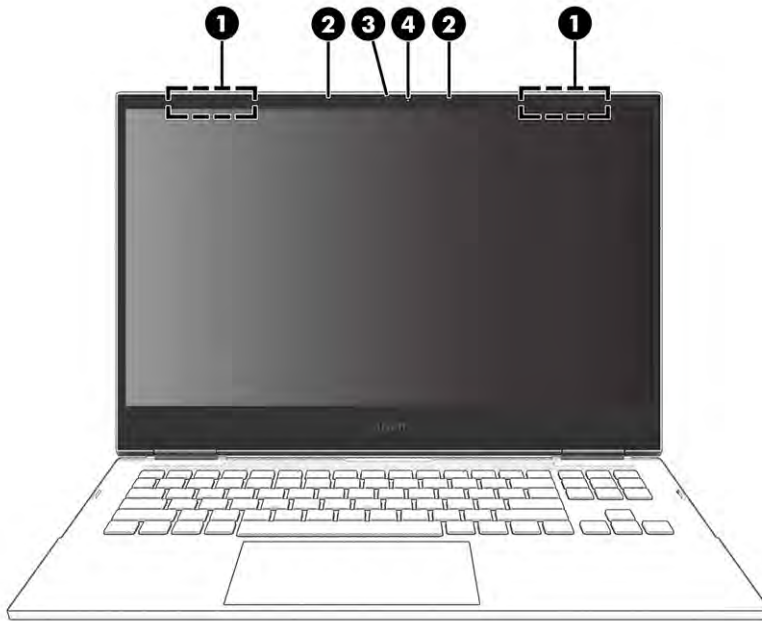


Table 2-4 Display components and their descriptions

Component	Description
(1) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2) Internal microphones (2)	Record sound.
(3) Camera	Allows you to video chat, record video, and record still images. 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) Camera light	On: The camera is in use.

*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:

- ▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

Keyboard area

Keyboards can vary by language.

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. Type `touchpad settings` in the taskbar search box, and then press **enter**.
2. Choose a setting.

Turning on the touchpad

Follow these steps to turn on the touchpad.

1. Type `touchpad settings` in the taskbar search box, and then press **enter**.
2. Using an external mouse, click the **touchpad** button.

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

Touchpad components

Identify the touchpad components.

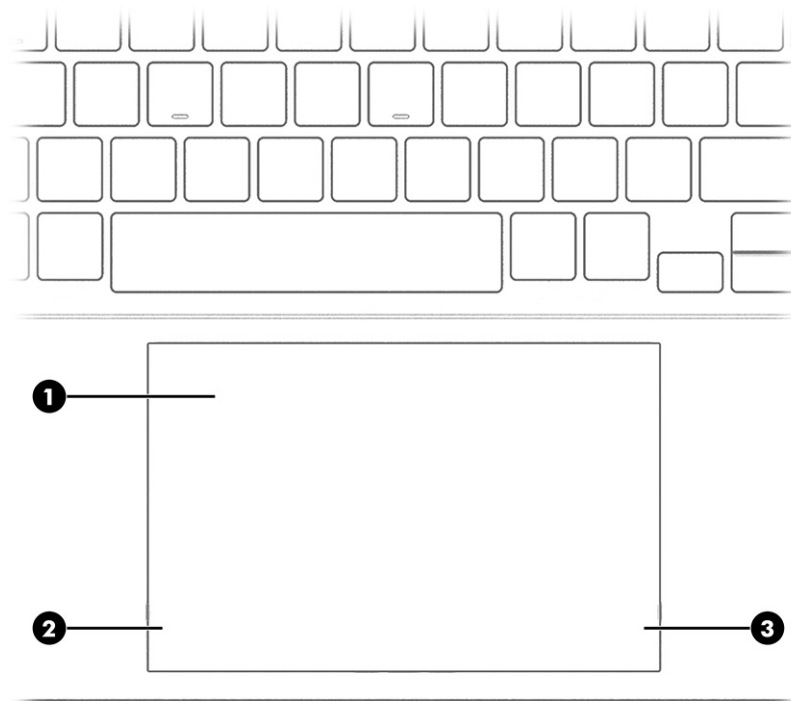


Table 2-5 Touchpad components and their descriptions

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.



NOTE: Your computer might look slightly different from the illustration in this section.

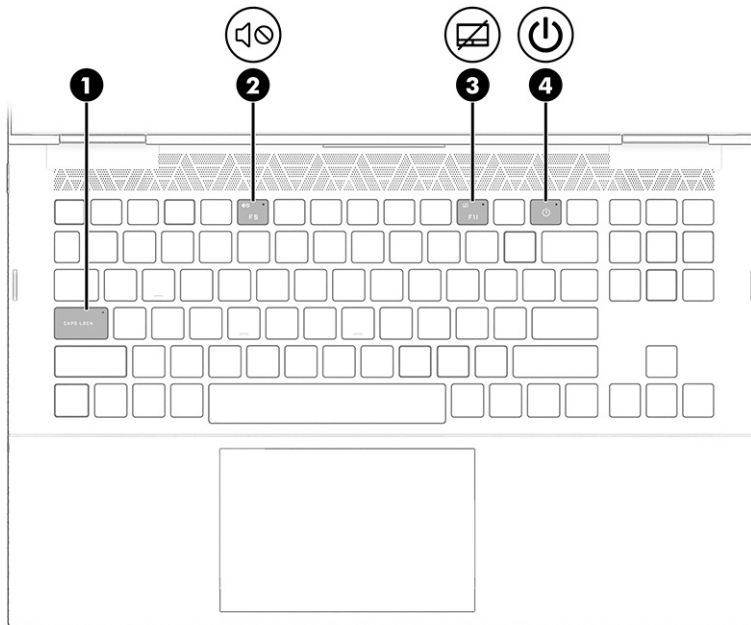





Table 2-6 Lights and their descriptions

Component	Description
(1) Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)  Mute light	<ul style="list-style-type: none">On: Computer sound is off.Off: Computer sound is on.
(3)  Touchpad light	<ul style="list-style-type: none">On: The touchpad is off.Off: The touchpad is on.
(4)  Power light	<ul style="list-style-type: none">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.

Special keys

Identify the special keys.



NOTE: Refer to the illustration that most closely matches your computer.

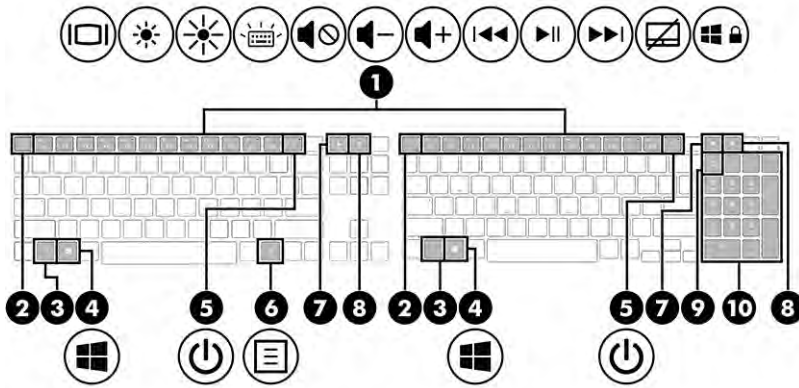


Table 2-7 Special keys and their descriptions







Component	Description
(1) Action keys	Execute frequently used system functions when pressed in combination with the fn key. Action keys are defined by the icon symbols on f1 through f12 function keys.
(2) esc key	Displays system information when pressed in combination with the fn key.
(3) fn key	Executes specific functions when pressed in combination with another key.
(4)  Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(5)  Power button	<ul style="list-style-type: none"> 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. <p>IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 10 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options:</p> <ul style="list-style-type: none"> ▲ Right-click the Power icon , and then select Power Options.
(6)  Windows application key	Displays options for a selected object.
(7)  OMEN key	Opens the OMEN Gaming Hub software. See HP OMEN Gaming Hub on page 13 for more information.

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

Component	Description
(8)  Calculator key	Opens the calculator.
(9) num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(10) 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.

Bottom

Identify the bottom components.



NOTE: Your computer might look slightly different from the illustration in this section.

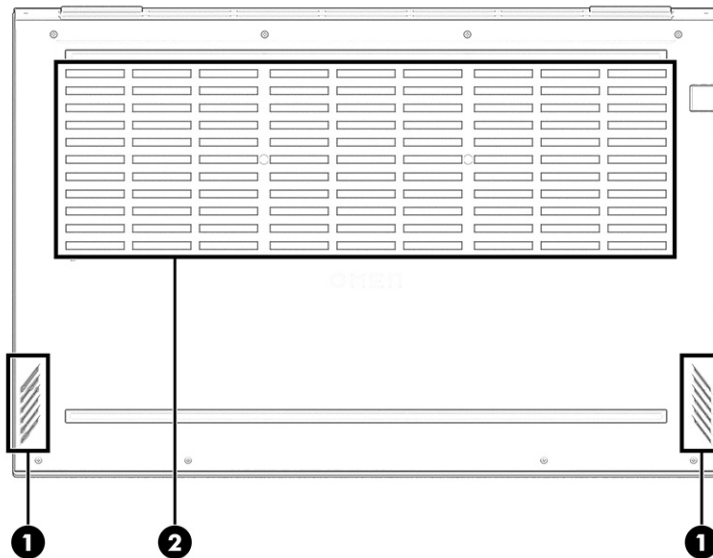


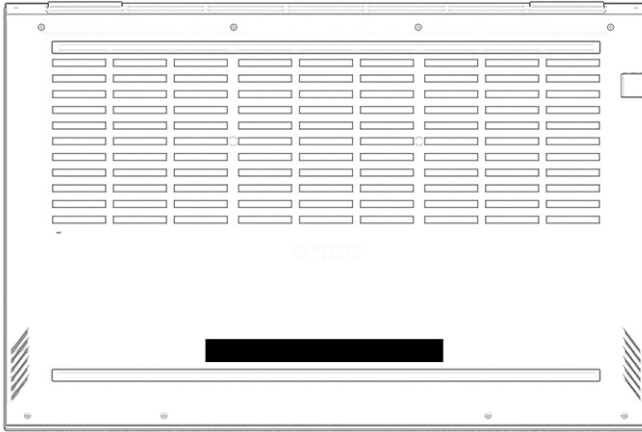
Table 2-8 Bottom components and their descriptions

Component	Description
(1) Speakers (2)	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.

The label is located on the computer as shown in the following illustration.



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



Table 2-9 Service label components

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


- Regulatory label—Provide regulatory information about the computer.
- Warranty information—Included in the regulatory information.
- 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.

HP OMEN Gaming Hub


HP OMEN Gaming Hub allows you to customize your computer for your specific gaming needs.

- ▲ To open HP OMEN Gaming Hub, select the **Start** button, select **OMEN Gaming Hub**, and then follow the on-screen instructions.


– or –

Press the **OMEN** key  at the top right side of the keyboard.

The HP OMEN Gaming Hub dashboard provides a central location to access and configure the following features:

 **NOTE:** Some features are available on select products only.

- **System Vitals:** Monitor the computer status and performance.
- **Undervolting:** Adjust the voltage of the computer to use less power and decrease the amount of heat generated.
- **Light Studio:** Coordinate your color scheme and easily sync your lighting effects across your OMEN devices.
- **Rewards:** Join daily challenges to win in-game items and exclusive prizes.
- **Lighting:** Customize the keyboard lighting.
- **Network Booster:** View and adjust network priorities and settings.
- **Performance Control:** Optimize the performance of your computer for the task you are performing.
- **Gaming Device Lighting and Macros:** Configure the lighting and macro keys when an external supported gaming device is connected (select products only).
- **Remote Play:** Manage and access your game library from one location.
- **OMEN Game Stream:** Provide the ability to stream games to other devices.
- **Help:** Access “How to” information and frequently asked questions.

 **NOTE:** To minimize the dashboard, select the arrow button ◀ at the top of the dashboard.

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.

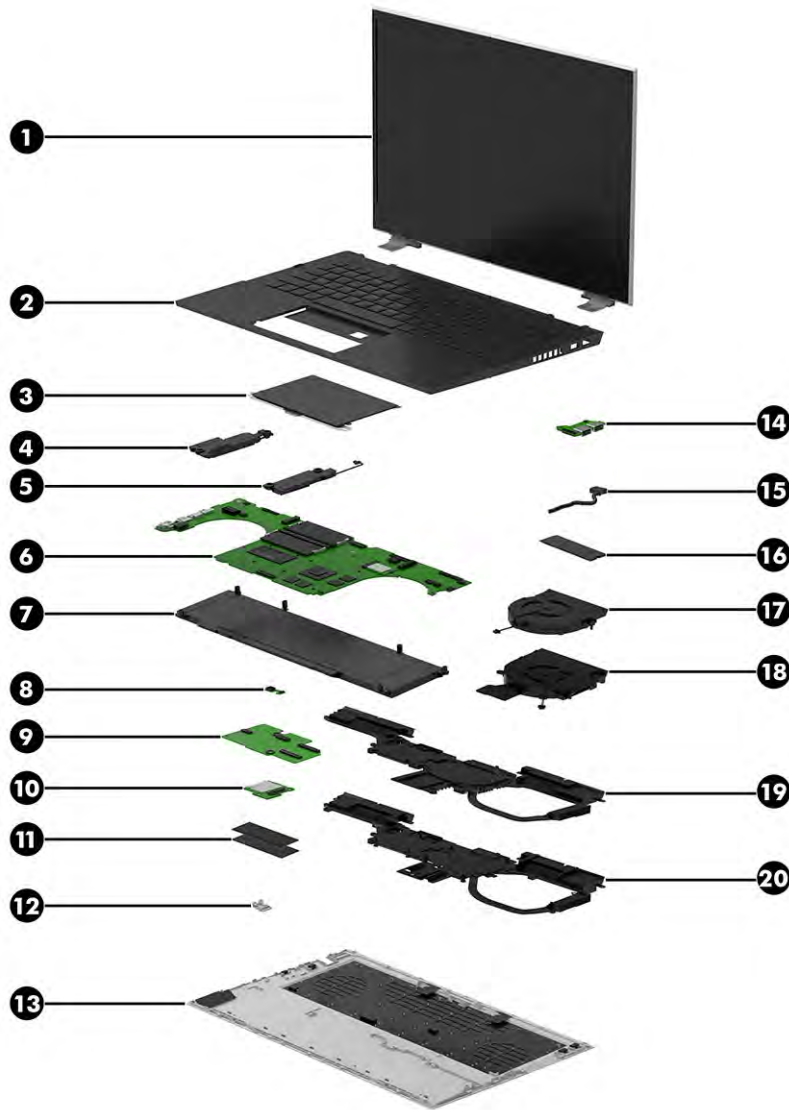


Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	Display assembly	not available as a spare part
<p>NOTE: Display assemblies are offered as spare parts only at a subcomponent level. For more information, see Display assembly subcomponents on page 18.</p>		

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

Item	Component	Spare part number
(2)	Top cover with keyboard	
	For a detailed list of country codes, see Top cover with keyboard on page 61 .	
	For use in models with RTX graphics:	
	<ul style="list-style-type: none"> Ceramic white, 1 zone RGB lighting, without numeric keypad 	M62252-001
	<ul style="list-style-type: none"> Ceramic white, 4 zone RGB lighting, without numeric keypad 	M62253-001
	<ul style="list-style-type: none"> Ceramic white, per key RGB lighting, without numeric keypad 	M62254-001
	<ul style="list-style-type: none"> Shadow black, 4 zone RGB lighting, without numeric keypad 	M62260-001
	<ul style="list-style-type: none"> Shadow black, 1 zone RGB lighting, without numeric keypad 	M62261-001
	<ul style="list-style-type: none"> Shadow black, per key RGB lighting, without numeric keypad 	M62262-001
	<ul style="list-style-type: none"> Shadow black, 1 zone RGB lighting, with numeric keypad 	M62263-001
	<ul style="list-style-type: none"> Shadow black, 4 zone RGB lighting, with numeric keypad 	M62264-001
	For use in models with GTX graphics:	
	<ul style="list-style-type: none"> Shadow black, 4 zone RGB lighting, without numeric keypad 	M62255-001
	<ul style="list-style-type: none"> Shadow black, 1 zone RGB lighting, without numeric keypad 	M62256-001
	<ul style="list-style-type: none"> Shadow black, 1 zone RGB lighting, with numeric keypad 	M62258-001
	<ul style="list-style-type: none"> Shadow black, 4 zone RGB lighting, with numeric keypad 	M62259-001
(3)	Touchpad (does not include bracket)	M62229-001
	NOTE: The touchpad cable is available using spare part number M57157-001.	
(4)	Speaker, right	M57164-001
(5)	Speaker, left	M82283-001
(6)	System board (includes processor; for use in models with discrete graphics memory)	
	All system boards use the following part numbers:	
	xxxxxx-001: Non-Windows operating system	
	xxxxxx-601: Windows 10 operating system	
	Intel Core i7-11800H processor and NVIDIA GeForce RTX 3070MQ graphics	M62250-xx1
	Intel Core i7-11800H processor and NVIDIA GeForce RTX 3070MQ graphics, G-Sync	M62251-xx1
	Intel Core i7-11800H processor and NVIDIA GeForce RTX 3060 graphics	M62249-xx1
	Intel Core i7-11800H processor and NVIDIA GeForce RTX 3060 graphics, G-Sync	M78465-xx1
	Intel Core i7-11800H processor and NVIDIA GeForce RTX 3050Ti graphics	M62247-xx1
	Intel Core i7-11800H processor and NVIDIA GeForce RTX 3050 graphics	M62244-xx1
	Intel Core i5-11400H processor and NVIDIA GeForce RTX 3060 graphics	M62248-xx1
	Intel Core i5-11400H processor and NVIDIA GeForce RTX 3050Ti graphics	M62246-xx1
	Intel Core i5-11400H processor and NVIDIA GeForce RTX 3050 graphics	M62243-xx1
	Intel Core i5-11400H processor and NVIDIA GeForce 1650 graphics	M62241-xx1

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

Item	Component	Spare part number
	Intel Core i5-11260H processor and NVIDIA GeForce RTX 3050Ti graphics	M62245-xx1
	Intel Core i5-11260H processor and NVIDIA GeForce RTX 3050 graphics	M62242-xx1
	Intel Core i5-11260H processor and NVIDIA GeForce 1650 graphics	M62240-xx1
(7)	Battery	
	6 cell, 83 Whr	M41711-005
	4 cell, 70 Whr	M39179-005
(8)	IR sensor board	M82291-001
	NOTE: The IR sensor board cable is available as spare part number M82287-001.	
(9)	RGB (per key) board	M64294-001
	NOTE: The RGB board keyboard cable is available as spare part number M62224-001. The RGB board LED cable is available as spare part number M62225-001.	
(10)	Card reader board	M82357-001
	NOTE: The card reader board cable is available as spare part number M57155-001.	
(11)	Memory modules (DDR4-3200)	
	16 GB	L67710-001
	8 GB	L46598-001
	4 GB	L83673-001
(12)	RJ-45 door	
	Ceramic white, models with RTX graphics	M62233-001
	Shadow black, models with GTX graphics	M62234-001
	Shadow black, models with RTX graphics	M75755-001
(13)	Bottom cover	
	For use in ceramic white models with RTX graphics	M62221-001
	For use in shadow black models with RTX graphics	M62222-001
	For use in shadow black models with GTX graphics	M62223-001
(14)	USB board	M82292-001
	NOTE: The USB board cable is available using spare part number M82286-001.	
(15)	Power connector (DC-in) cable	M57215-001
(16)	Solid-state drive	
	1 TB, PCIe	M16560-001
	512 GB, PCIe	M17436-001
	1 TB + 32 GB Optane memory	L85374-001
	512 GB + 32 GB Optane memory	L85366-001
	Fans	

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

Item	Component	Spare part number
(17)	80 W	M57161-001
(18)	60 W	M57160-001
	Heat sink (includes replacement thermal material)	M54774-001
	NOTE: Thermal gel is available as spare part number M57182-001. Thermal grease is available as spare part number M57183-001.	
(19)	Models with RTX graphics	M62226-001
(20)	Models with GTX graphics	M62227-001
	WLAN module (not illustrated)	
	NOTE: WLAN module protective shielding is available as spare part number M14330-001.	
	Intel Wi-Fi 6 AX201-W + Bluetooth 5 (non-vPro)	L92724-006
	Intel Wi-Fi 6 AX210 + Bluetooth 5.2 (non-vPro)	M27269-006

Display assembly subcomponents

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

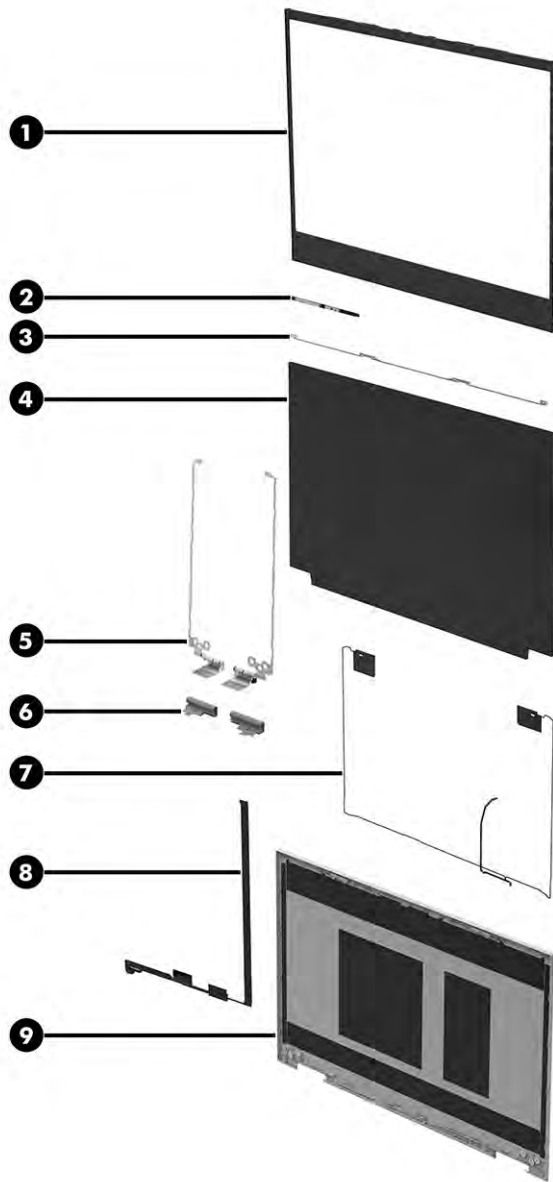


Table 3-2 Display component descriptions and part numbers

Item	Component	Spare part number
(1)	Display bezel	M82290-001
(2)	Camera module (includes display cover adhesive and display bezel adhesive)	M82294-001
(3)	Top bracket	not available as a spare part
(4)	Display panel (includes display cover adhesive and display bezel adhesive)	
	FHD, 250 nits	M62236-001
	QHD	M62235-001
	FHD, low blue light, 300 nits, 144 Hz	M62239-001
	FHD, 300 nits	M62238-001

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

Item	Component	Spare part number
	FHD, 250 nits, 144 Hz	M62237-001
(5)	Hinges (includes left and right display hinges and rubber caps; includes display cover adhesive and display bezel adhesive)	M82293-001
(6)	Hinge covers (includes display cover adhesive and display bezel adhesive) Hinge cover rubber pieces are available as spare part number M64296-001.	
	Ceramic white	M62230-001
	Shadow black	M62231-001
(7)	Wireless antenna kit (includes display cover adhesive and display bezel adhesive)	M82285-001
(8)	Display panel cable (includes display cover adhesive and display bezel adhesive)	
	FHD, 60 Hz	M82288-001
	FHD, 144 Hz	M82289-001
	QHD, 165 Hz	M83233-001
(9)	Display back cover (includes display cover adhesive and display bezel adhesive)	
	FHD, ceramic white	M62219-001
	FHD, shadow black	M62220-001
	QHD, ceramic white	M83829-001
	QHD, shadow black	M83830-001
	Adhesive kit (includes display cover adhesive and display bezel adhesive)	M57184-001

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-3 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapters (PFC, 4.5 mm)	
230 W HP Smart AC adapter	M41303-001
200 W HP Smart AC adapter	M42546-001
150 W HP Smart AC adapter	L32661-001
Screw Kit	M62232-001
Thermal pad (between system board and top cover/keyboard)	M57181-001
HP HDMI-to-VGA adapter	701943-001
HP USB-C-to-VGA adapter	831751-001
USB-C-to-USB-A adapter	833960-001
HP USB-C-to-RJ-45 adapter	918779-001

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

Component	Spare part number
HP USB-C-to-HDMI 2.0 adapter	935325-001
HP USB 3.0-to-Gigabit adapter	914031-001
Hub, HP USB-C-to-USB-A	916838-001
Hub, HP USB-C-to-multiport	919666-001
Hub, HP Elite USB-C multiport	L39572-001
Mouse, HP OMEN Gen2	L77374-001
Adhesive Kit	M57184-001
External DVD±RW drive	747080-001
Power cords (C5, premium, 1.0 m [3.3 ft])	
Argentina	L30811-001
Australia	L22327-001
Brazil	L30812-001
Denmark	L22322-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L22321-001
India	L22624-001
Israel	L22323-001
Italy	L30813-001
Japan	L22330-001
North America	L22319-001
People's Republic of China	L21930-001
South Africa	L22325-001
South Korea	L22328-001
Switzerland	L22324-001
Taiwan	L22329-001
Thailand	L22326-001
United Kingdom	L22320-001
Power cords (C13, premium, 1.0 m [3.3 ft])	
Argentina	L22104-001
Australia	L22339-001
Brazil	L57198-001
Chile/Italy	L22103-001
Denmark	L22334-001
Europe (Austria, Belgium, Finland, France, Germany, the Netherlands, Norway, and Sweden)	L22333-001

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

Component	Spare part number
India	L22343-001
Israel	L22335-001
Japan	L22344-001
North America	L22331-001
People's Republic of China	L22341-001
South Africa	L22337-001
South Korea	L22340-001
Switzerland	L22336-001
Taiwan	L22342-001
Thailand	L22338-001
United Kingdom	L22332-001

4 Removal and replacement procedures preliminary requirements

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


Tools required

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

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

Service considerations

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


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

Plastic parts

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

Cables and connectors

Handle cables with extreme care to avoid damage.

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

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

Drive handling

Note the following guidelines when handling drives.



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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Electrostatic discharge information

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

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



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

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

Before touching an electronic component, discharge static electricity by using the guidelines described [Personal grounding methods and equipment on page 25](#).

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

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

Generating static electricity

Follow these static electricity guidelines.

- Different activities generate different amounts of static electricity.
- Static electricity increases as humidity decreases.

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

Event	Relative humidity		
	55%	40%	10%
Walking across carpet	7,500 V	15,000 V	35,000 V

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

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

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

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

Preventing electrostatic damage to equipment

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

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

Personal grounding methods and equipment

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

- **Wrist straps** are flexible straps with a maximum of 1 M Ω \pm 10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- **Heel straps/Toe straps/Boot straps** can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of 1 M Ω \pm 10% resistance between the operator and ground.

Table 4-2 Static shielding protection levels

Static shielding protection levels	
Method	Voltage
Antistatic plastic	1,500

Table 4-2 Static shielding protection levels (continued)

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

Grounding the work area

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

- Cover the work surface with approved static-dissipative material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.
- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.
- Avoid contact with pins, leads, or circuitry.

Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity.

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of $1\text{ M}\Omega \pm 10\%$ resistance
- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing $1\text{ M}\Omega \pm 10\%$ resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags

- Transparent metallized shielding bags
- Transparent shielding tubes

Cleaning your computer

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

Enabling HP Easy Clean (select products only)

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


1. Start HP Easy Clean in one of the following ways:
 - Select the **Start** menu, and then select **HP Easy Clean**.
– or –
 - Select the **HP Easy Clean** icon in the taskbar.
– or –
 - Select **Start**, and then select the **HP Easy Clean** tile.
2. Now that your device is disabled for a short period, see [Removing dirt and debris from your computer on page 27](#) 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 28](#) 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 29](#).


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 28](#) 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 27](#), [Caring for wood veneer \(select products only\) on page 29](#), 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 27](#) 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 28](#) for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment.

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.
- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.
- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.
- Place items on a grounded surface before removing items from their containers.
- Always be properly grounded when touching a component or assembly.
- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.


Accessing support information

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

Table 4-3 Support information locations


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


Table 4-3 Support information locations (continued)

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

5 Removal and replacement procedures for authorized service provider parts


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

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

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

Component replacement procedures

To remove and replace computer components, use these procedures.

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

You must remove, replace, or loosen as many as 71 screws when you service the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

To remove and replace computer components, use these procedures.

See [Removal and replacement procedures preliminary requirements on page 23](#) 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.

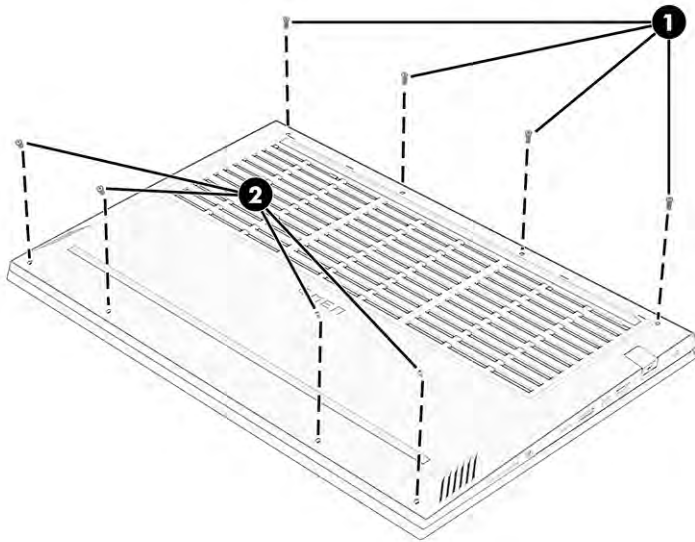
Table 5-1 Bottom cover descriptions and part numbers

Description	Spare part number
Bottom cover for use in ceramic white models with RTX graphics	M6221-001
Bottom cover for use in shadow black models with RTX graphics	M6222-001
Bottom cover for use in shadow black models with GTX graphics	M6223-001

Before removing the bottom cover, prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).

Remove the bottom cover:

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



3. Use a tool to release side of the bottom cover from the computer **(1)**.
4. Remove the bottom cover from the computer **(2)**.




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
6 cell, 83 Whr	M41711-005
4 cell, 70 Whr	M39179-005


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

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

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the right solid-state drive (see [Solid-state drive on page 34](#)).

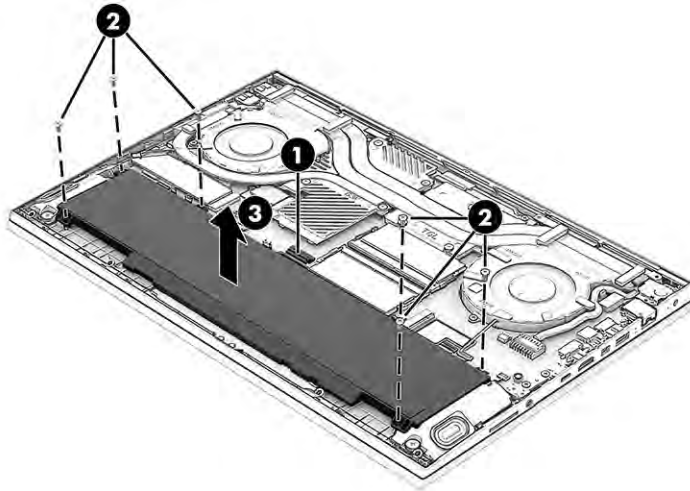
 **WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

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

Remove the battery:

1. Disconnect the battery cable from the system board **(1)**.
2. Remove the six Phillips M2.0 × 5.0 screws **(2)** that secure the battery to the computer.

3. Remove the battery from the computer (3).



To replace the battery, reverse the removal procedures.

Solid-state drive

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

Table 5-3 Solid-state drive descriptions and part numbers

Description	Spare part number
1 TB, PCIe	M16560-001
512 GB, PCIe	M17436-001
1 TB + 32 GB Optane memory	L85374-001
512 GB + 32 GB Optane memory	L85366-001

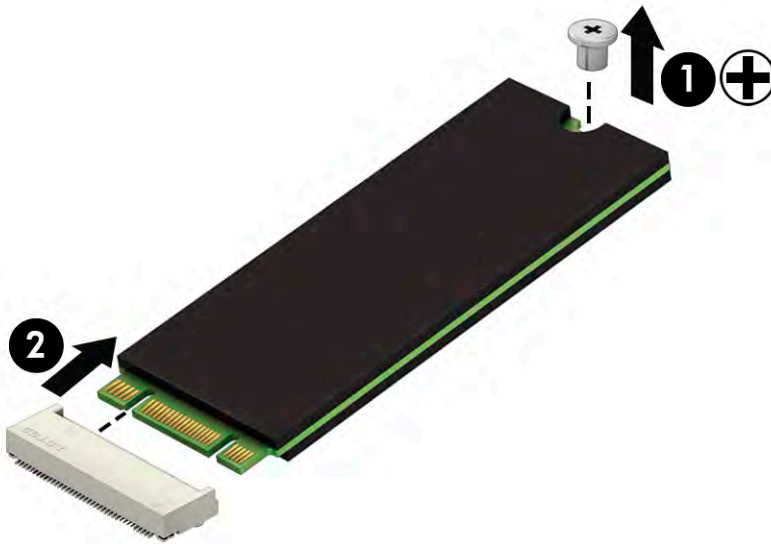
Before removing the solid-state drive, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 32](#)).

Remove the solid-state drive:

1. Remove the Phillips M2.0 × 2.5 screw (1) that secures the drive to the computer.

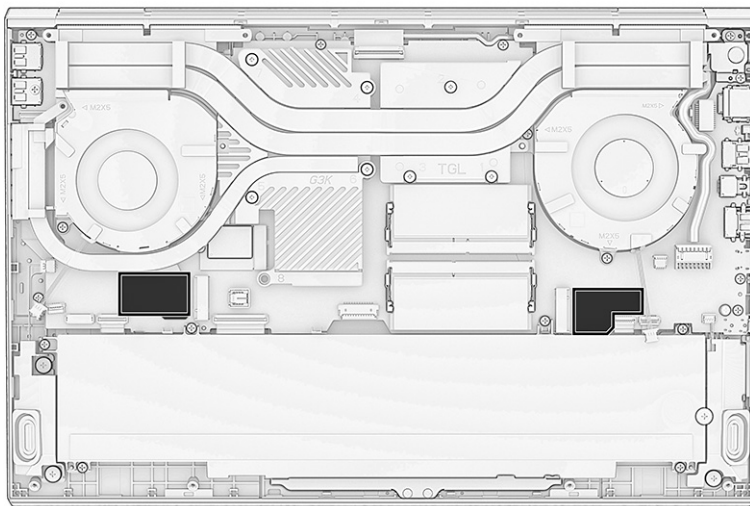
2. Pull the drive out of the socket to remove it from the computer (2).



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

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

The computer offers two solid-state drive slots. Both drives require that you install a thermal pad on the drive. See the following illustration for drive locations and associated thermal pad shapes.



Memory modules

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

Table 5-4 Memory module descriptions and part numbers

Description	Spare part number
Memory module, 16 GB (DDR4-3200)	L67710-001

Table 5-4 Memory module descriptions and part numbers (continued)


Description	Spare part number
Memory module, 8 GB (DDR4-3200)	L46598-001
Memory module, 4 GB (DDR4-3200)	L83673-001

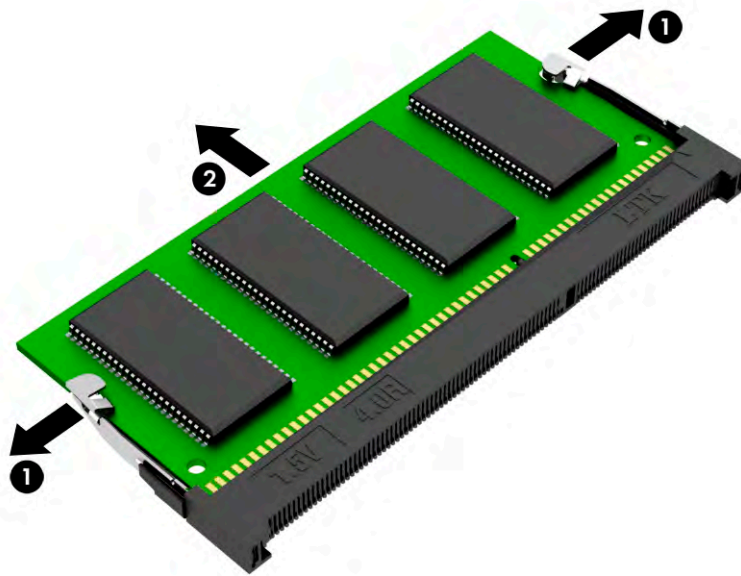
Before removing the memory, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 32](#)).

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

- ▲ 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.

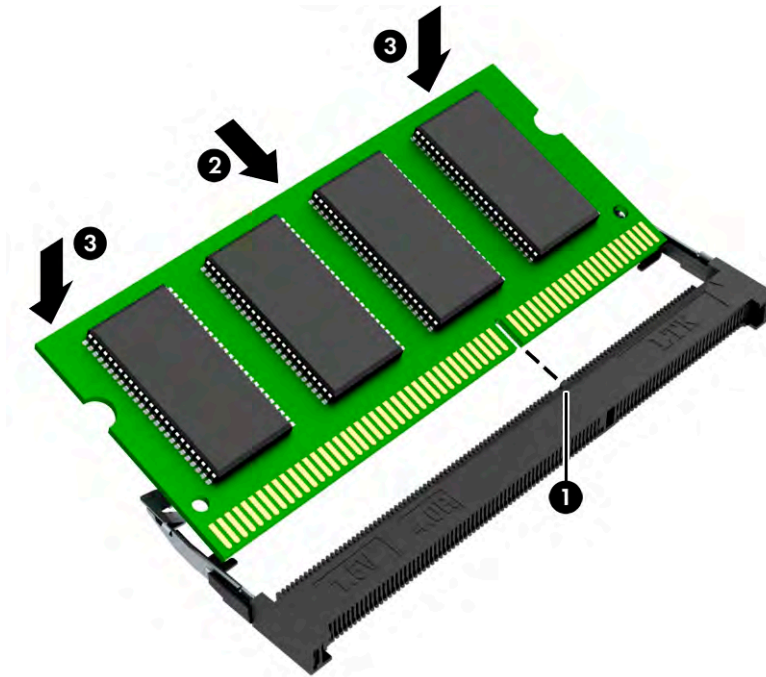


To protect a memory module after removal, place it in an electrostatic-safe container.

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)**.



Speaker, right

To remove the right speaker, use this procedure and illustration.

Table 5-5 Right speaker description and part number

Description	Spare part number
Speaker, right	M57164-001


Before removing the right speaker, follow these steps:

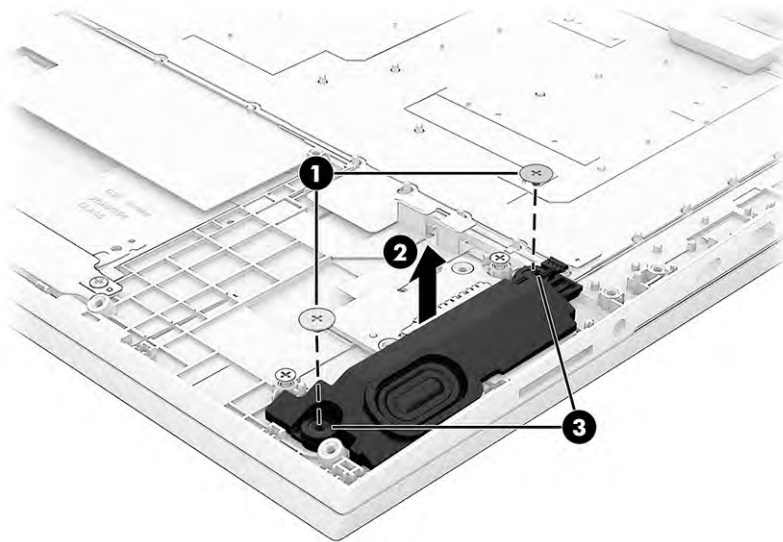
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 32](#)).

Remove the right speaker:

1. Remove the two Phillips M2.0 × 2.5 screws from the speaker **(1)**.

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

 **NOTE:** Be sure that the rubber gaskets are installed in the mounting holes in the speaker **(3)** before installation.



Reverse this procedure to install the right speaker.

Power connector cable

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

Table 5-6 Power connector cable description and part number

Description	Spare part number
Power connector cable	M57215-001

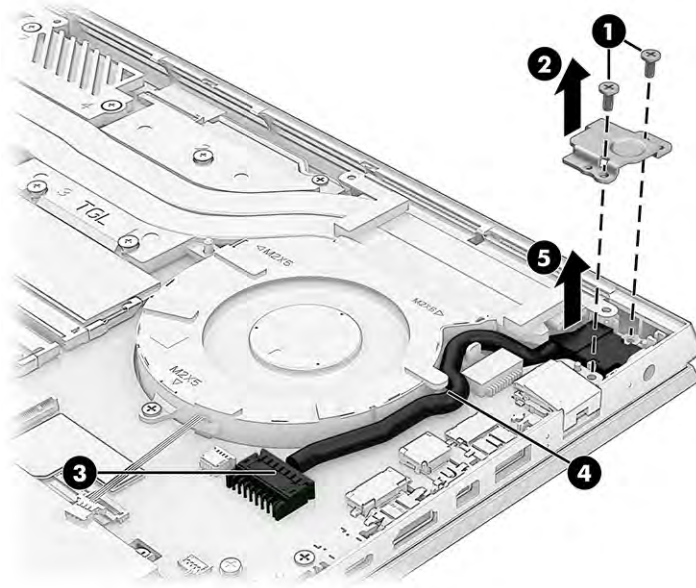
Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 32](#)).

Remove the power connector cable:

1. Remove the two Phillips M2.0 × 5.0 screws **(1)** from the power connector bracket.
2. Remove the bracket **(2)**.
3. Disconnect the cable from the system board **(3)**.
4. Remove the cable from the clip on the side of the fan **(4)**.

- Remove the power connector cable from the computer (5).



Reverse this procedure to install the power connector cable.

Heat sink

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

Table 5-7 Heat sink descriptions and part numbers

Description	Spare part number
Heat sink, models with RTX graphics	M62226-001
Heat sink, models with GTX graphics	M62227-001
Thermal grease	M57183-001
Thermal gel	M57182-001

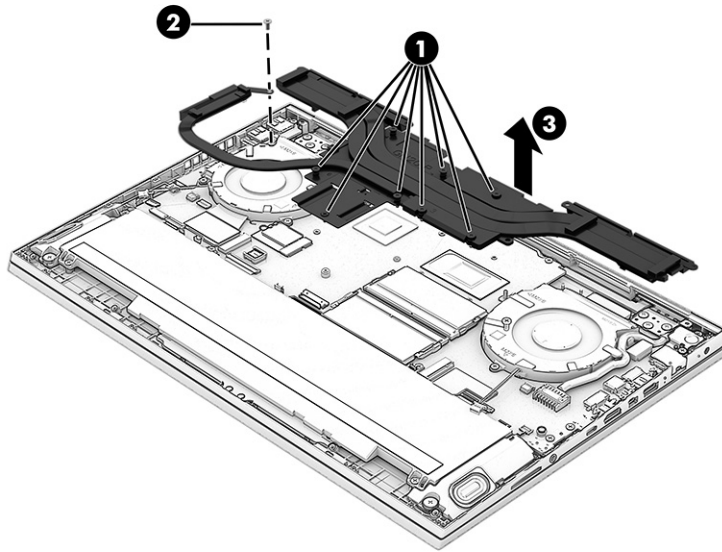
Before removing the heat sink, follow these steps:

- Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
- Remove the bottom cover (see [Bottom cover on page 31](#)).
- Remove the battery (see [Battery on page 32](#)).

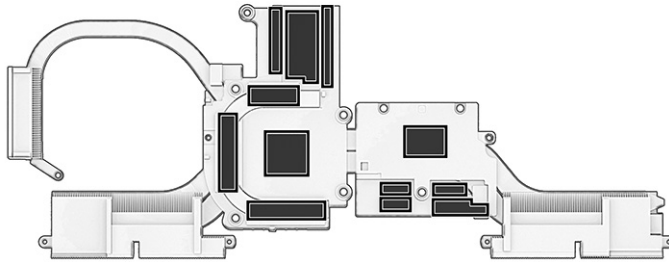
Remove the heat sink:

- In the order indicated on the heat sink, loosen the eight captive Phillips screws (1) that secure the heat sink to the system board.
- Remove the noncaptive Phillips M2.0 × 5.0 screw (2) that secures the heat sink to the system board.

3. Remove the heat sink (3).



4. The following illustration shows thermal material locations on the bottom of the heat sink.



Please note the following information for correctly applying thermal gel:

- CLG-3500 white thermal gel has better thermal performance than thermal pads used between the thermal module and system board on video RAM chip, MOSFET, and choke components. The thermal grease used on CPUs and GPUs is different than CLG-3500 thermal gel in color and cannot be mismatched.
- **Heat sink (thermal module) replacement:** (1) Clean the thermal gel residue from the system board with alcohol after removing the thermal module. (2) Install the new thermal module onto the system board (thermal gel is preapplied on the thermal module).
- **System board replacement:** Do not clean the thermal gel residue from the thermal module after removing it from the system board. A thermal gel syringe is provided with the system board. (1) After replacing the system board, squeeze two rows of thermal gel slowly and evenly out of the syringe onto the video RAM ICs. Apply one row of thermal gel onto the chokes and power MOSFET components. The areas to apply thermal gel are noted by small square brackets in white on the board. (2) Reinstall the thermal module onto the system board.
- **Part replacement that requires thermal module or system board removal and reassembly:** Do not clean thermal gel residue from the thermal module after removal from the system board. (1) Clean thermal gel residue from the system board with alcohol after the thermal module is removed. A thermal gel syringe is provided with the system board. (2) After replacing the system board, squeeze two rows of thermal gel slowly and evenly out of the syringe onto the video RAM ICs. Apply one row of thermal gel onto the chokes and power MOSFET components. The areas to

apply thermal gel are noted by small square brackets in white on the board. (3) Reinstall the thermal module onto the system board.

Reverse this procedure to install the heat sink.

Fans

To remove the fans, use this procedure and illustration.

Table 5-8 Fans description and part number

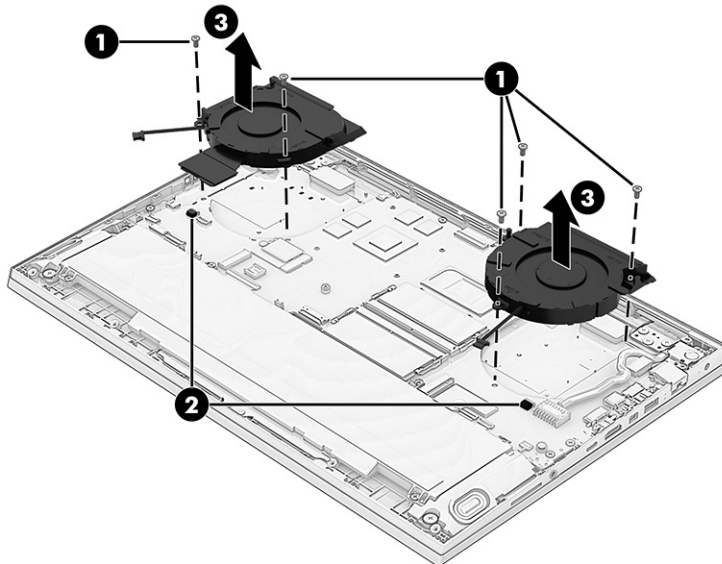
Description	Spare part number
Fan, 80 W	M57161-001
Fan, 60 W	M57160-001

Before removing the fans, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the heat sink (see [Heat sink on page 39](#)).

Remove the fans:

1. Remove the two Phillips M2.0 × 5.0 screws **(1)** from the right fan and three Phillips M2.0 × 5.0 screws **(1)** from the left fan.
2. Disconnect the fan cables from the system board **(2)**.
3. Remove the fans from the computer **(3)**.



Reverse this procedure to install the fans.

WLAN module

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

Table 5-9 WLAN module descriptions and part numbers

Description	Spare part number
Intel Wi-Fi 6 AX201-W + Bluetooth 5 (non-vPro)	L92724-006
Intel Wi-Fi 6 AX210 + Bluetooth 5.2 (non-vPro)	M27269-006
WLAN module protective shielding	M14330-001



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


Before removing the WLAN module, follow these steps:

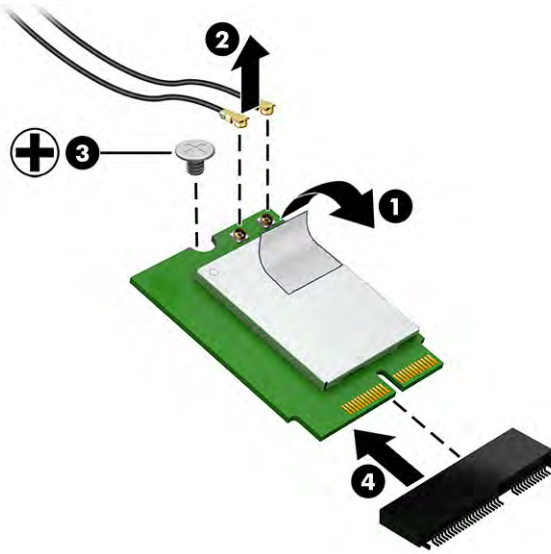
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the left solid-state drive (see [Solid-state drive on page 34](#)).
5. Remove the heat sink (see [Heat sink on page 39](#)).

Remove the WLAN module:

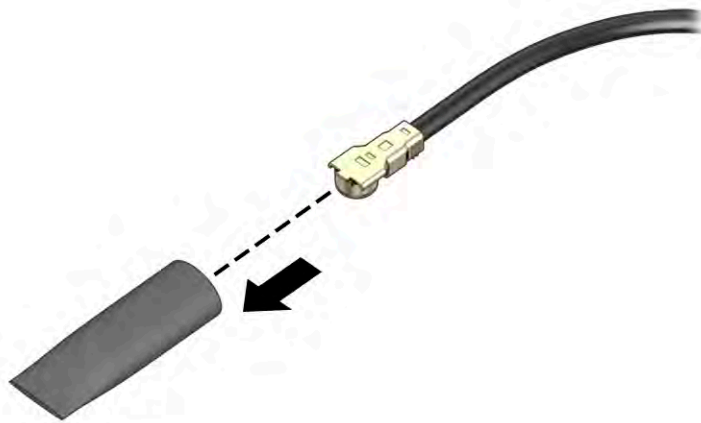
1. Remove the plastic antenna protector from the module **(1)**.
2. Carefully disconnect the antenna cables from the module **(2)**.

3. Remove the Phillips M2.0 × 2.5 screw **(3)**, and then remove the WLAN module from the computer **(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, you must install a protective sleeve on the antenna connector, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

USB board

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

Table 5-10 USB board description and part number

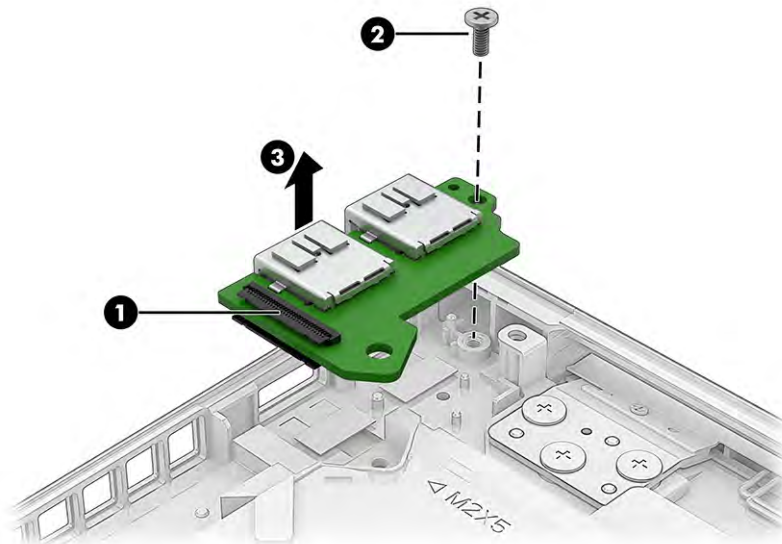
Description	Spare part number
USB board	M82292-001
USB board cable	M82286-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the heat sink (see [Heat sink on page 39](#)).
6. Remove the left fan (see [Fans on page 41](#)).

Remove the USB board:

1. Disconnect the cable from the ZIF connector on the board (**1**).
2. Remove the Phillips M2.0 × 5.0 screw (**2**) that secures the board to the computer.
3. Lift the board straight up to remove it (**3**).



Reverse this procedure to install the USB board.

RGB (per key) board

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

Table 5-11 RGB board description and part number

Description	Spare part number
RGB board	M64294-001

Table 5-11 RGB board description and part number (continued)

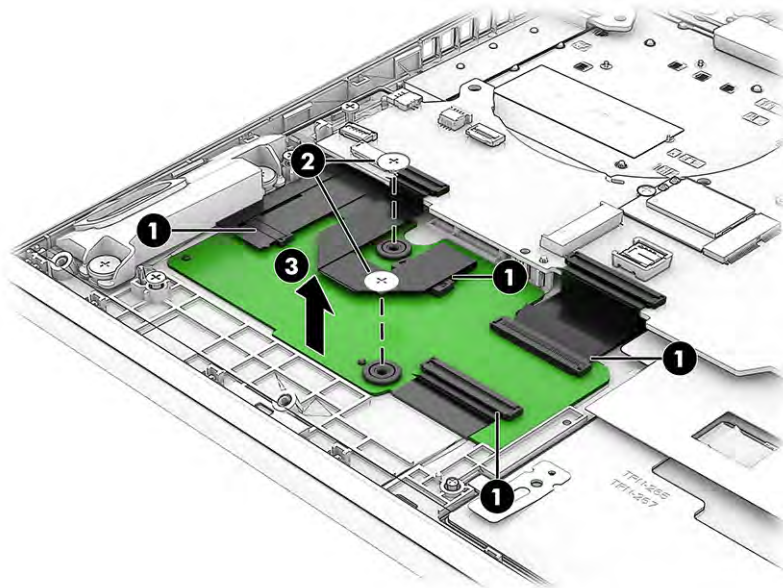
Description	Spare part number
RGB board keyboard cable	M62224-001
RGB board LED cable	M62225-001

Before removing the RGB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).

Remove the RGB board:

1. Disconnect the three cables from the ZIF connectors on the RGB board (1).
2. Remove the two Phillips M2.0 × 2.8 screws (2) that secure the board to the computer.
3. Remove the board from the computer (3).



Reverse this procedure to install the RGB board.

System board

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

Table 5-12 System board descriptions and part numbers

Description	Spare part number
System board (includes processor):	
All system boards use the following part numbers:	
xxxxxx-001: Non-Windows operating system	
xxxxxx-601: Windows 10 operating system	

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

Description	Spare part number
Intel Core i7-11800H processor and NVIDIA GeForce RTX 3070MQ graphics	M62250-xx1
Intel Core i7-11800H processor and NVIDIA GeForce RTX 3070MQ graphics, G-Sync	M62251-xx1
Intel Core i7-11800H processor and NVIDIA GeForce RTX 3060 graphics	M62249-xx1
Intel Core i7-11800H processor and NVIDIA GeForce RTX 3060 graphics, G-Sync	M78465-xx1
Intel Core i7-11800H processor and NVIDIA GeForce RTX 3050Ti graphics	M62247-xx1
Intel Core i7-11800H processor and NVIDIA GeForce RTX 3050 graphics	M62244-xx1
Intel Core i5-11400H processor and NVIDIA GeForce RTX 3060 graphics	M62248-xx1
Intel Core i5-11400H processor and NVIDIA GeForce RTX 3050Ti graphics	M62246-xx1
Intel Core i5-11400H processor and NVIDIA GeForce RTX 3050 graphics	M62243-xx1
Intel Core i5-11400H processor and NVIDIA GeForce 1650 graphics	M62241-xx1
Intel Core i5-11260H processor and NVIDIA GeForce RTX 3050Ti graphics	M62245-xx1
Intel Core i5-11260H processor and NVIDIA GeForce RTX 3050 graphics	M62242-xx1
Intel Core i5-11260H processor and NVIDIA GeForce 1650 graphics	M62240-xx1

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the power connector cable (see [Power connector cable on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).
7. Remove the fans (see [Fans on page 41](#)).

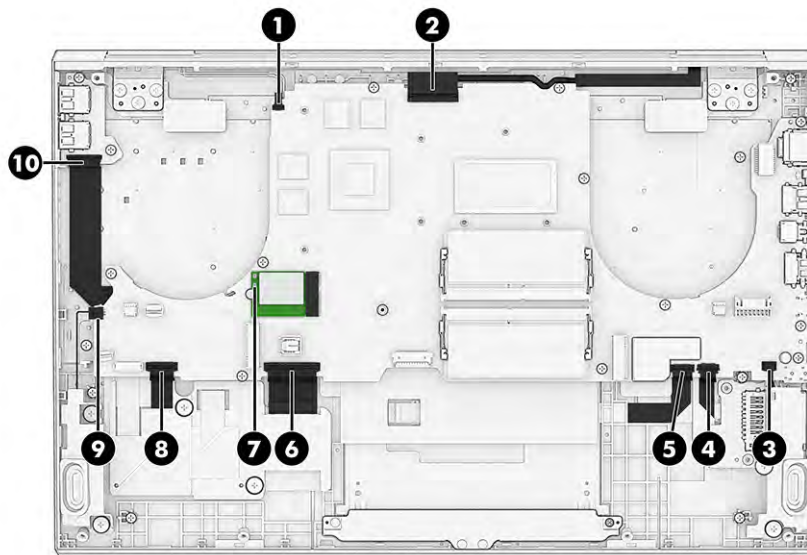
When you replace the system board, be sure to remove the following components (as applicable) from the defective system board and install them on the replacement system board:

- Memory modules (see [Memory modules on page 35](#)).
- Solid-state drive (see [Solid-state drive on page 34](#)).
- WLAN module (see [WLAN module on page 42](#)).

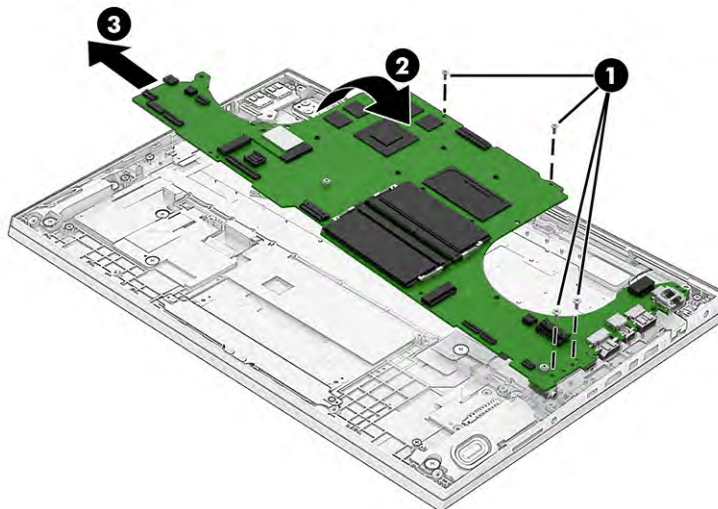
Remove the system board:

1. Disconnect the following cables from the system board:
 - IR board (ZIF) **(1)**
 - Display cable (ZIF) **(2)**
 - Right speaker cable **(3)** (cable is taped down)
 - Card reader cable (ZIF) **(4)**

- Touchpad cable (ZIF) **(5)**
- Keyboard cable (ZIF) **(6)**
- WLAN antennas from the WLAN module **(7)**
- Keyboard backlight cable (ZIF) **(8)** (connector location might vary)
- Left speaker cable **(9)**
- USB board cable (ZIF) **(10)**

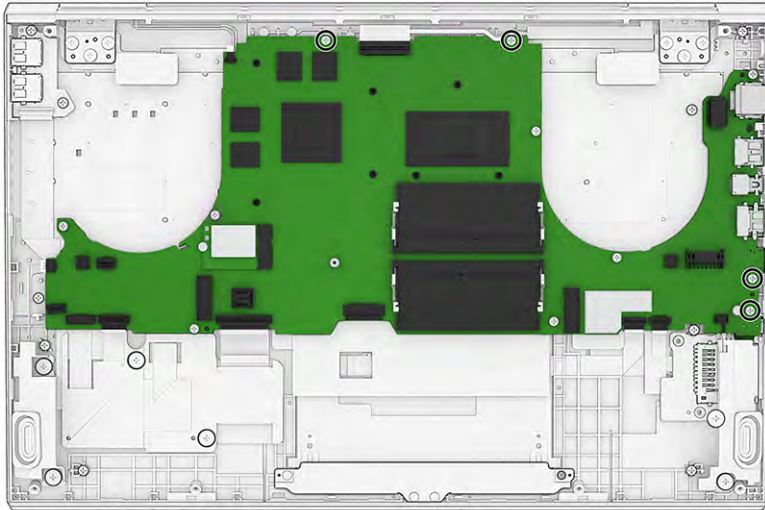



2. Remove the four Phillips M2.0 × 5.0 screws that secure the system board to the computer.
3. Lift the left side of system board **(2)**, and then pull the system board left and away from the connectors to remove it from the computer **(3)**.



Reverse this procedure to install the system board.

When installing the system board, use the following illustration to locate the system board screws.



 **NOTE:** The thermal pad between the system board and top cover/keyboard is available as spare part number M57181-001.

Speaker, right

To remove the right speaker, use this procedure and illustration.

Table 5-13 Right speaker description and part number

Description	Spare part number
Right speaker	M57164-001


Before removing the right speaker, follow these steps:

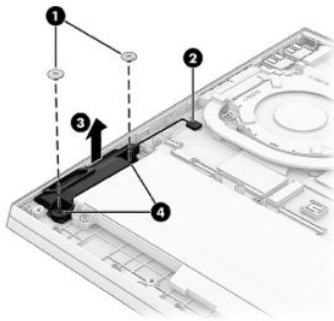
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Disconnect the battery cable from the system board (see [Battery on page 32](#)).

Remove the right speaker:

1. Remove the Phillips M2.0 × 2.5 screw from the speaker **(1)**.
2. Disconnect the speaker cable from the system board **(2)**.

3. Remove the speaker from the computer (3).

 **NOTE:** Make sure the rubber gaskets are installed in the mounting holes in the speaker **(4)** before installation.



Reverse this procedure to install the right speaker.

IR sensor board

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

Table 5-14 IR sensor board description and part number

Description	Spare part number
IR sensor board	M82291-001
IR sensor board cable	M82287-001

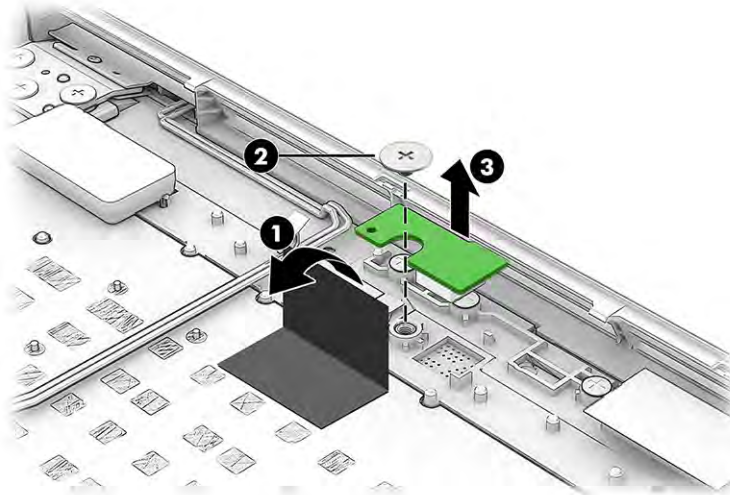
Before removing the IR sensor board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the power connector cable (see [Power connector cable on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).
7. Remove the fans (see [Fans on page 41](#)).
8. Remove the system board (see [System board on page 45](#)).

Remove the IR sensor board:

1. Remove the protective tape from the board **(1)**.
2. Remove the Phillips M2.0 × 2.5 screw **(2)** that secures the board to the computer.

3. Remove the board from the computer (3).



Reverse this procedure to install the IR sensor board.

Card reader

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

Table 5-15 Card reader description and part number

Description	Spare part number
Card reader	M82357-001
Card reader cable	M57155-001

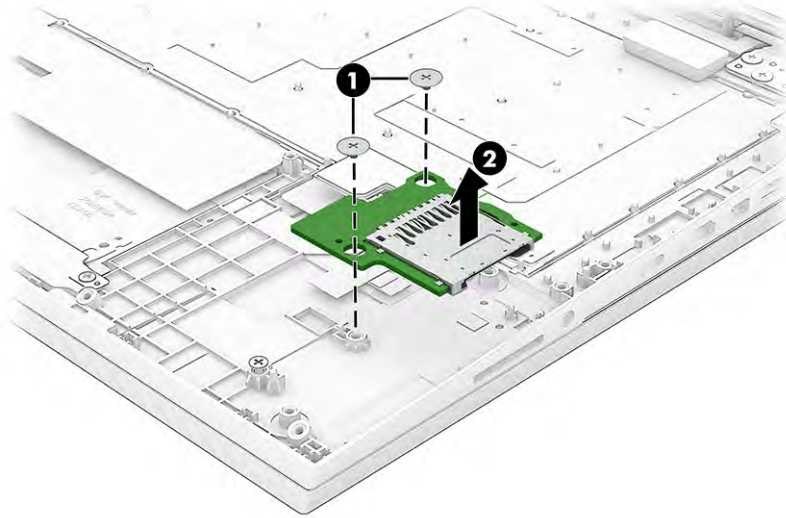
Before removing the card reader, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the power connector cable (see [Power connector cable on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).
7. Remove the fans (see [Fans on page 41](#)).
8. Remove the system board (see [System board on page 45](#)).
9. Remove the left speaker (see [Speaker, right on page 37](#)).

Remove the card reader:

1. Remove the two Phillips M2.0 × 2.5 screws (1) that secure the card reader to the computer.

2. Remove the card reader from the computer **(2)**.



Reverse this procedure to install the card reader.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-16 Touchpad description and part number

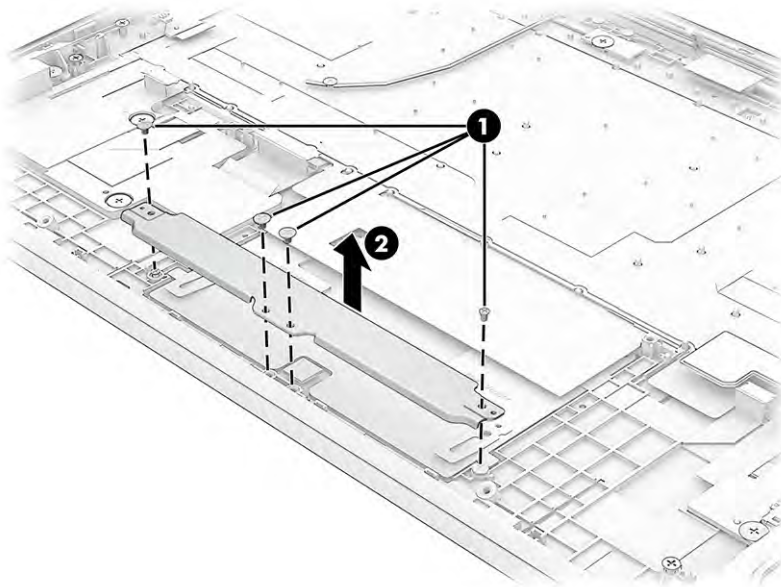
Description	Spare part number
Touchpad	M62229-001
Touchpad cable	M57157-001

Before removing the touchpad, follow these steps:

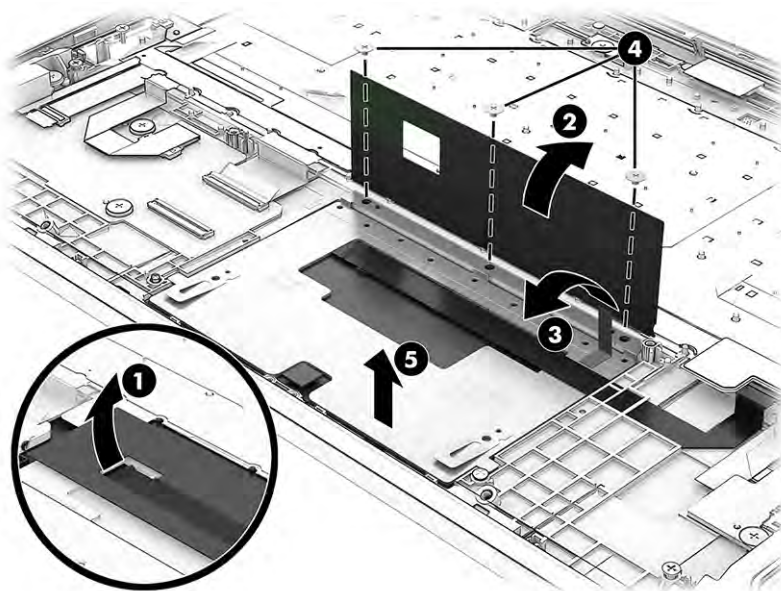
1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the power connector cable (see [Power connector cable on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).
7. Remove the fans (see [Fans on page 41](#)).
8. Remove the system board (see [System board on page 45](#)).

Remove the touchpad:

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



2. Remove the touchpad cable from the hole in the protective tape **(1)**.
3. Lift the protective tape off the top of the touchpad **(2)**.
4. Remove the conductive tape from the right screw **(3)**.
5. Remove the three broad head Phillips M2.0 × 2.0 screws **(4)** from the touchpad.
6. Remove the touchpad from the computer **(5)**.



Reverse this procedure to install the touchpad.

RJ-45 door

To remove the RJ-45 door, use this procedure and illustration.

Table 5-17 RJ-45 door description and part number

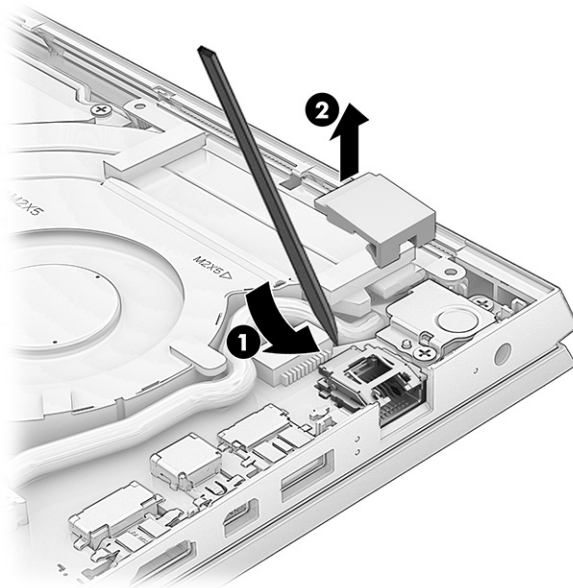
Description	Spare part number
RJ-45 door, ceramic white, RTX models	M62233-001
RJ-45 door, shadow black, GTX models	M62234-001
RJ-45 door, shadow black, RTX models	M75755-001

Before removing the RJ-45 door, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the power connector cable (see [Power connector cable on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).
7. Remove the fans (see [Fans on page 41](#)).
8. Remove the system board (see [System board on page 45](#)).

Remove the RJ-45 door:

- ▲ From the inside of the computer, insert a flat tool under the RJ-45 door **(1)**, and then lift the door up to remove it **(2)**.



Reverse this procedure to install the RJ-45 door.

Display assembly

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



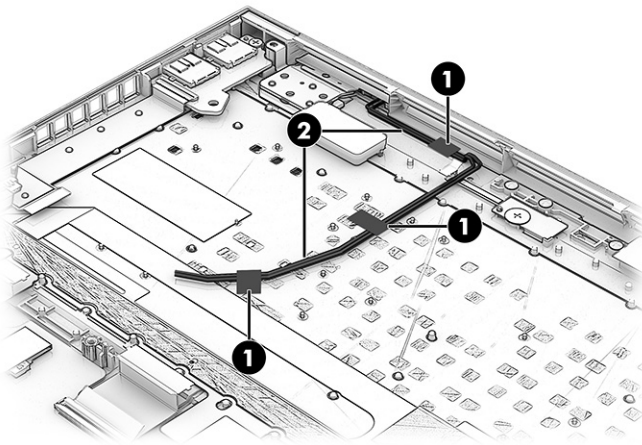
NOTE: The display assembly is available as a spare part only at the subcomponent level. For display assembly spare part information, see the individual removal subsections.

Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see [Preparation for disassembly on page 31](#)).
2. Remove the bottom cover (see [Bottom cover on page 31](#)).
3. Remove the battery (see [Battery on page 32](#)).
4. Remove the solid-state drives (see [Solid-state drive on page 34](#)).
5. Remove the power connector cable (see [Power connector cable on page 38](#)).
6. Remove the heat sink (see [Heat sink on page 39](#)).
7. Remove the fans (see [Fans on page 41](#)).
8. Remove the system board (see [System board on page 45](#)).

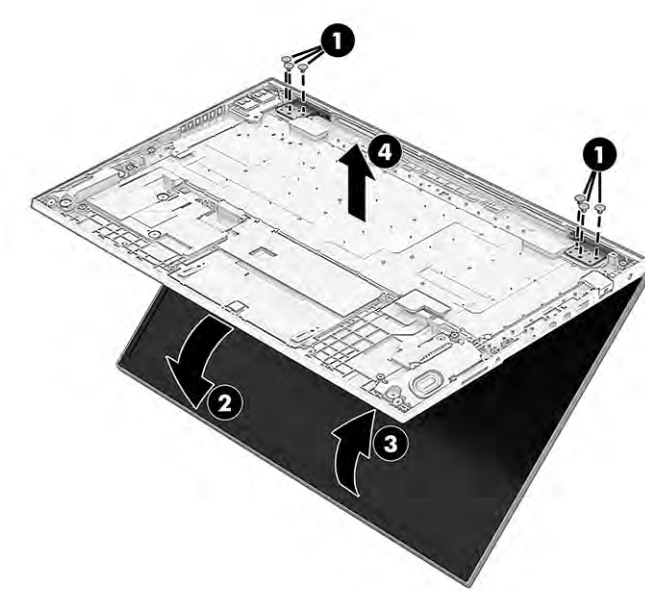
Remove the display assembly:

1. Remove the antenna cable from the computer by releasing the tape **(1)**, and then removing the antennas cable from the computer **(2)**.

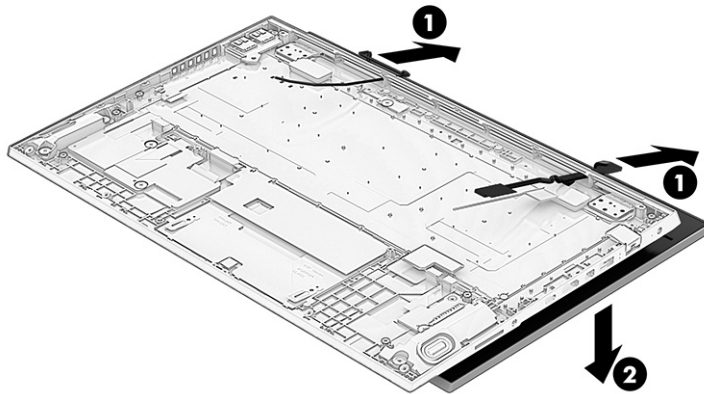


2. Remove the six Phillips M2.5 × 3.5 screws **(1)** that secure the display assembly to the computer.
3. Open the display to about 45° **(2)**, and the close the display **(3)**. This opens the hinges.

4. Separate the display from the computer (4). You must continue with the next step to completely remove the display assembly.



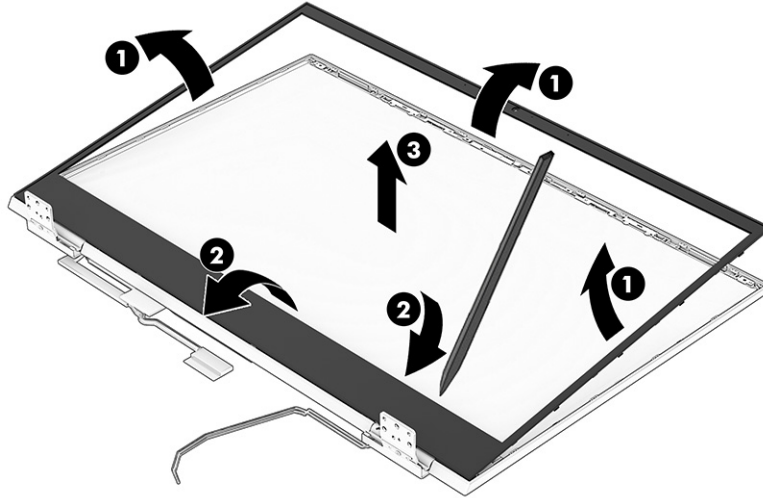
5. While pulling the display cable (1) and WLAN antenna cables (1) through the holes in the computer, pull display away from computer (2).



6. If you need to remove the display bezel:
- Release the top, left, and right edges of the display bezel (1) from the display assembly.
 - Run a tool along the bottom edge of the bezel to release it from the display assembly (2).
 - Remove the display bezel (3) from the display assembly.

Display adhesive is available in the Adhesive Kit as spare part number M57184-001.

The bezel is available as spare part number M82290-001.



7. If you need to remove the display panel:

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

- b. Rotate the display panel over and place it next to the display enclosure **(4)**.

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

Display panels are available as the following spare part numbers:

M62236-001: FHD, 250 nits

M62235-001: QHD

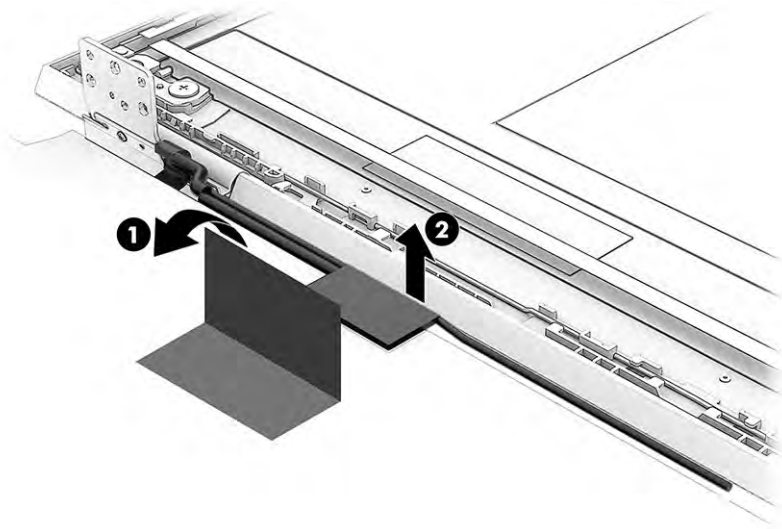
M62239-001: FHD, 300 nits, 144 Hz

M62238-001: FHD, 300 nits

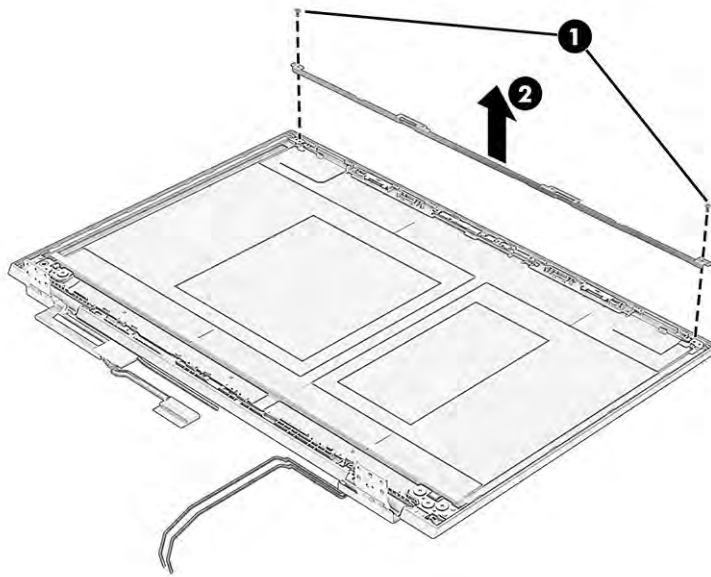
M62237-001: FHD, 250 nits, 144 Hz



- c. Release the adhesive support strip **(1)** that secures the display panel cable connector to the display panel.
- d. Disconnect the display panel cable **(2)** from the display panel.

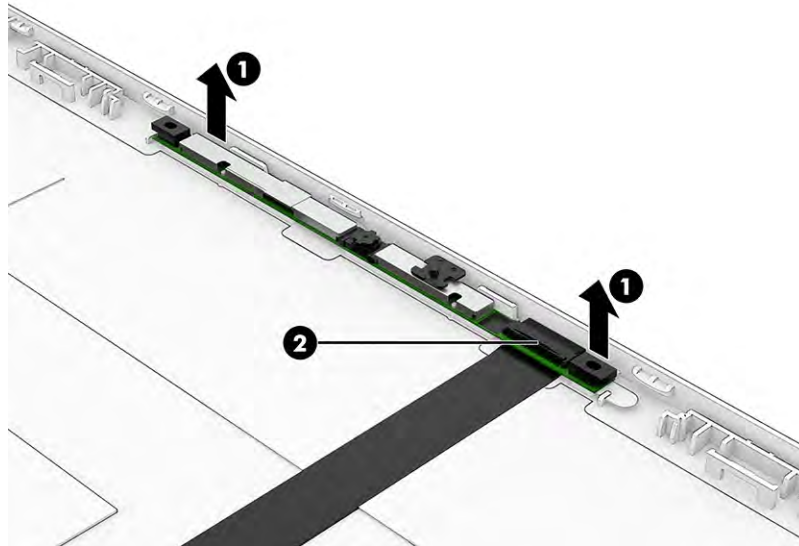


8. To remove the top bracket, remove the two Phillips M2.0 × 2.0 screws (1), and then remove the bracket (2).

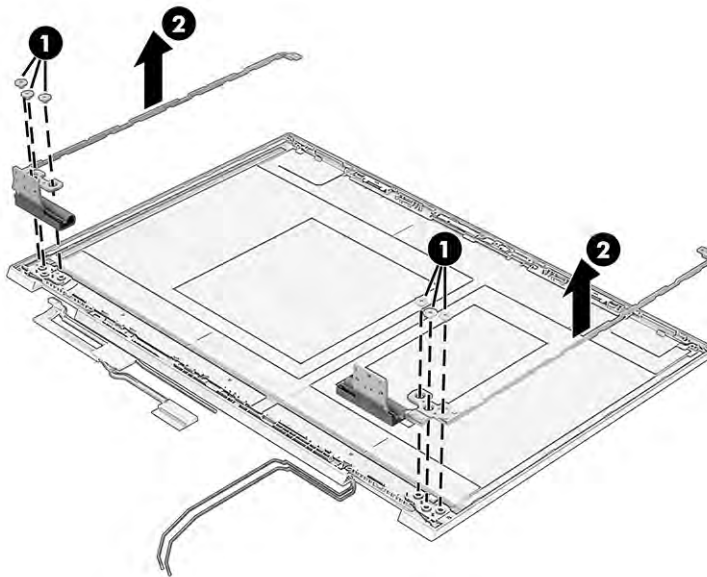


9. If you need to remove the camera module:
 - a. Use a tool to detach the camera module (1) from the display back cover. (The module is attached with double-sided adhesive.)

- b. Disconnect the cable from the module **(2)**. Note that the cable routes under the module. The camera module is available as spare part number M82294-001.



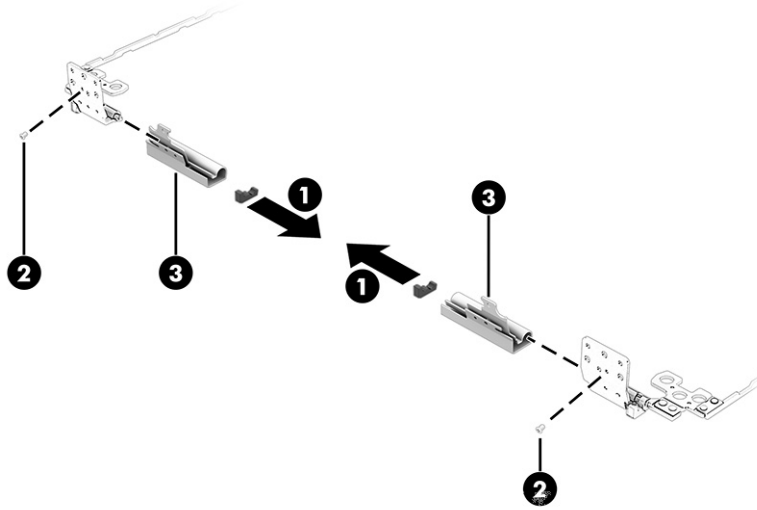
- 10.** If you need to remove the hinges and side brackets from the display rear cover:
- Remove the three Phillips M2.0 × 2.0 screws **(1)** from the bottom of each hinge.
 - Remove the display hinges and side brackets from the display back cover **(2)**.
- The display hinges are available as spare part number M82293-001.



- 11.** If you need to remove the hinge covers from the hinges:
- Remove the rubber piece from the inside of each hinge cover **(1)**.
 - Remove the Phillips M1.6 × 2.3 screw from the inside of each hinge cover **(2)**.
 - Slide the hinge covers off the hinges **(3)**.

The hinge covers are available as spare part number M62230-001 in ceramic white and M62231-001 in shadow black.

Hinge cover rubber pieces are available as spare part number M64296-001.



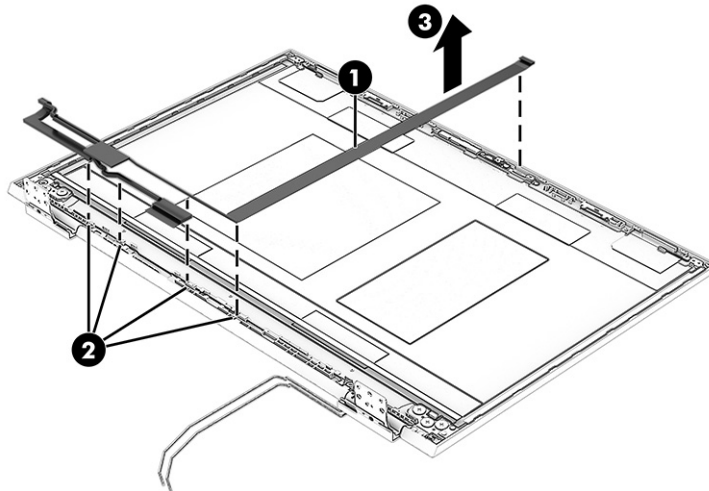
12. If you need to remove the display/camera cable, peel the cable off the inside of the display back cover (1), remove the cable from the routing along the bottom of the display rear cover (2), and then remove the cable from the display rear cover (3).

Display panel cables are available as the following spare part numbers:

M82288-001: FHD, 60 Hz

M82289-001: FHD, 144 Hz

M83233-001: QHD, 165 Hz



- 13.** Peel the wireless antennas **(1)** off the display back cover. The antennas are secured with adhesive. Release the wireless antenna cables from the retention clips and routing channels built into the bottom of the display back cover **(2)**, and then remove the antennas and cables **(3)**.

The wireless cables and antennas are available as spare part number M82285-001.

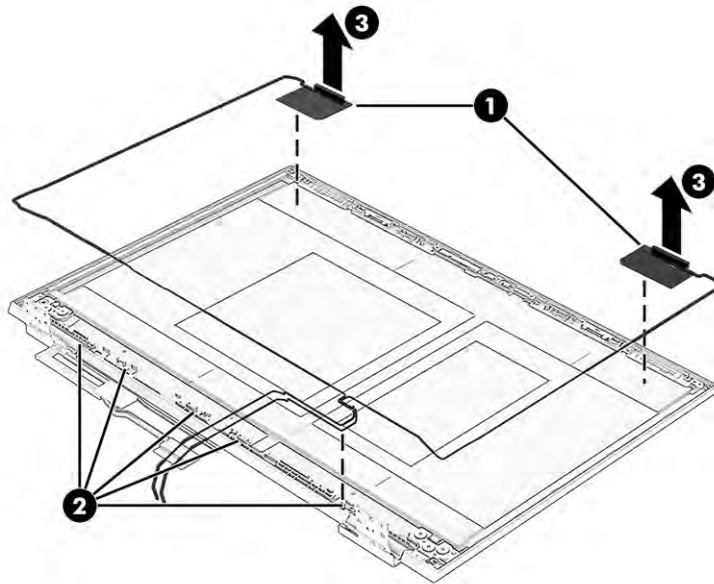
Display back covers are available as the following spare part numbers:

M62219-001: FHD, ceramic white

M62220-001: FHD, shadow black

M83829-001: QHD, ceramic white

M83830-001: QHD, shadow black



Reverse this procedure to reassemble and replace the display assembly.

Top cover with keyboard

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

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

Description	Spare part number
For use in models with RTX graphics:	
• Ceramic white, 1 zone RGB lighting, without numeric keypad	M62252-001
• Ceramic white, 4 zone RGB lighting, without numeric keypad	M62253-001
• Ceramic white, per key RGB lighting, without numeric keypad	M62254-001
• Shadow black, 4 zone RGB lighting, without numeric keypad	M62260-001
• Shadow black, 1 zone RGB lighting, without numeric keypad	M62261-001

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


Description	Spare part number
• Shadow black, per key RGB lighting, without numeric keypad	M62262-001
• Shadow black, 1 zone RGB lighting, with numeric keypad	M62263-001
• Shadow black, 4 zone RGB lighting, with numeric keypad	M62264-001
For use in models with GTX graphics:	
• Shadow black, 4 zone RGB lighting, without numeric keypad	M62255-001
• Shadow black, 1 zone RGB lighting, without numeric keypad	M62256-001
• Shadow black, 1 zone RGB lighting, with numeric keypad	M62258-001
• Shadow black, 4 zone RGB lighting, with numeric keypad	M62259-001

Table 5-19 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	Slovenia	-BA1
Brazil	-201	India	-D61	South Korea	-AD1
Bulgaria	-261	Israel	-BB1	Spain	-071
Chile	-161	Italy	-061	Switzerland	-BG1
Czech Republic/Slovakia	-FL1	Japan	-291	Taiwan	-AB1
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	Thailand	-281
French Canada	-DB1	Northern Africa	-FP1	Turkey	-141
France	-051	Portugal	-131	Ukraine	-BD1
Germany	-041	Romania	-271	United Kingdom	-031
Greece	-151	Russia	-251	United States	-001
Hungary	-211	Saudi Arabia	-171		


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. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
 2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
 1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 63](#)).
 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 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 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. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
 - a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. 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. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an `.exe` extension (for example, `filename.exe`).
The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.



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

7 Backing up, restoring, and recovering

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

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


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


Backing up information and creating recovery media

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

Using Windows tools for backing up

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

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


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


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

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

For details:

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

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

 **IMPORTANT:** HP recommends that you follow the [Restoring and recovery methods on page 67](#) 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 [Restoring and recovery methods on page 67](#).

Creating a system restore


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

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

Restoring and recovery methods

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


1. Run a Microsoft System Restore.
2. Run Reset this PC.

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

3. Recover using HP Recovery media. For more information, see [Recovering using HP Recovery media on page 67](#).

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


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

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

Recovering using HP Recovery media


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

For details, see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 66](#).

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


To recover your system:

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

 **NOTE:** HP recommends that you follow the [Restoring and recovery methods on page 67](#) to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Changing the computer boot order

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

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

To change the boot order:

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.
 - For computers or tablets with keyboards attached, turn on or restart the computer or tablet, quickly press **esc**, and then press **f9** for boot options.
 - For tablets without keyboards, turn on or restart the tablet, quickly press and hold the volume up button, and then select **f9**.
 - or –
 - Turn on or restart the tablet, quickly press and hold the volume down button, and then select **f9**.
3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

Using HP Sure Recover (select products only)

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

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

- Latest version of the operating system
- Platform-specific device drivers
- Software applications, in the case of a custom image

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

8 Using HP PC Hardware Diagnostics

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

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 70](#).

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 Help and Support, HP Support Assistant, or the Start menu.

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

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

1. Select the **Start** button, and then select **HP Help and Support**.
2. Select **HP PC Hardware Diagnostics Windows**.
3. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.



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

Accessing HP PC Hardware Diagnostics Windows from Support Assistant

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

1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
2. Select **Troubleshooting and fixes**.
3. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.
4. When the tool opens, select the type of diagnostic test that you want to run, and then follow the on-screen instructions.



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

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.
2. Right-click **HP PC Hardware Diagnostics for Windows**, select **More**, and then select **Run as administrator**.
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 enter `Microsoft Store` in the taskbar search box.
2. Enter `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.
3. Follow the on-screen directions.

The tool downloads to the selected location.

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

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

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

1. Go to <http://www.hp.com/support>.
2. Select **Software and Drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version to be downloaded to your computer or USB flash drive.


The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

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

Using HP PC Hardware Diagnostics UEFI

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

 **NOTE:** For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see [Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 72](#).

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 72](#).

- b. Hard drive

- c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

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

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



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

Downloading the latest HP PC Hardware Diagnostics UEFI version

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

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

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

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



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

1. Go to <http://www.hp.com/support>.
2. Enter the product name or number, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

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

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

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

Downloading Remote HP PC Hardware Diagnostics UEFI

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

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download Remote Diagnostics**, and then select **Run**.

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

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

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

1. Go to <http://www.hp.com/support>.
2. Select **Software and Drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a hard drive or USB flash drive) to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password that you use for uploads.
- Display status information about the diagnostics run previously.

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

1. Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.

3. Make your customization selections.
 4. Select **Main**, and then **Save Changes and Exit** to save your settings.
- Your changes take effect when the computer restarts.

9 Specifications

This chapter provides specifications for your computer.

Computer specifications

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

Table 9-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	369.2 mm	14.5 in
Depth	248.0 mm	9.8 in
Height (front to back)	23.0 mm	0.91 in
Weight		
	2323 g	5.12 lb
Input power		
Operating voltage and current	19.5 V dc @ 11.8 A – 230 W	
	19.5 V dc @ 10.3 A – 200 W	
	19.5 V dc @ 7.70 A – 150 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.		

40.9 cm (16.1 in) display specifications

This section provides specifications for your display.

Table 9-2 Display specifications

	Metric	U.S.
Active diagonal size	40.9 cm	16.1 in
Resolution	2560 × 1440 (QHD) 1920 × 1080 (FHD)	
Surface treatment	Antiglare	
Brightness	250 nits 300 nits	
Viewing angle	UWVA	
Backlight	WLED	
Display panel interface	eDP	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-3 Solid-state drive specifications

	512 GB*	1 TB*
Dimensions		
Height	1.0 mm	1.0 mm
Length	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g
Interface type		
Ready time, maximum (to not busy)	< 1.0 ms	1.0 ms
Access times, logical	0.1 ms	0.1 ms
Transfer rate		
Sequential read	up to 2150 MB/s	up to 2150 MB/s
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MB/s	up to 1550 MB/s
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs
Total logical sectors	1,000,215,216	1,500,336,388
Operating temperature	0°C to 70°C (32°F to 158°F)	
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications might differ slightly.		
NOTE: Certain restrictions and exclusions apply. Contact support for details.		

10 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 10-1 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 10-1 Power cord requirements for specific countries and regions (continued)

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

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

11 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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