



Maintenance and Service Guide

HP Pavilion Gaming 15 Laptop PC

© Copyright 2019 HP Development Company, L.P.

AMD, Ryzen, Radeon, and Radeon Vega are trademarks of Advanced Micro Devices, Inc. Bluetooth is a trademark owned by its proprietor and used by HP Inc. under license. Intel is a trademark of Intel Corporation or its subsidiaries in the U.S. and/or other countries. NVIDIA, GeForce, and Optimus are trademarks and/or registered trademarks of NVIDIA Corporation in the U.S. and other countries. SDHC, SDXC, and microSD are trademarks or registered trademarks of SD-3C LLC. Windows is either a registered trademark or trademark of Microsoft Corporation in the United States and/or other countries. Miracast is a registered trademark of the Wi-Fi Alliance.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: September 2019

Document Part Number: L83493-001

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 **User Guides**.

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.

Important Notice about Customer Self-Repair Parts

 **IMPORTANT:** Your computer includes Customer Self-Repair parts and parts that should be accessed by only an authorized service provider. See Chapter 5, "Removal and replacement procedures for Customer Self-Repair parts," for details. Accessing parts described in Chapter 6, "Removal and replacement procedures for authorized service provider parts," can damage the computer or void your warranty.

Safety warning notice

 **CAUTION:** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device 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 contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The device and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

Table of contents

1 Product description	1
2 Getting to know your computer	5
Right side	5
Left side	6
Display	7
Keyboard area	8
Touchpad	8
Touchpad settings	8
Lights	9
Button and speakers	10
Special keys	11
Bottom	12
Rear	12
Labels	13
3 Illustrated parts catalog	14
Computer major components	14
Display assembly subcomponents	17
Cables	18
Mass storage devices	19
Miscellaneous parts	20
4 Removal and replacement procedures preliminary requirements	22
Tools required	22
Service considerations	22
Plastic parts	22
Cables and connectors	22
Drive handling	23
Workstation guidelines	23
Electrostatic discharge information	23
Generating static electricity	24
Preventing electrostatic damage to equipment	24
Personal grounding methods and equipment	25
Grounding the work area	25
Recommended materials and equipment	25

Packaging and transporting guidelines	26
5 Removal and replacement procedures for Customer Self-Repair parts	27
Component replacement procedures	27
Preparation for disassembly	27
Bottom cover	28
Solid-state drive	30
Memory module	31
Hard drive assembly	33
6 Removal and replacement procedures for authorized service provider parts	35
Component replacement procedures	35
Feet	35
Battery	37
WLAN module	38
Touchpad	40
Fans	41
Heat sink	42
Power button/USB board	44
System board	45
Speakers	48
Display assembly	49
Power connector	57
Keyboard/top cover	58
7 Using Setup Utility (BIOS)	59
Starting Setup Utility (BIOS)	59
Updating Setup Utility (BIOS)	59
Determining the BIOS version	59
Downloading a BIOS update	60
8 Using HP PC Hardware Diagnostics	61
Using HP PC Hardware Diagnostics Windows (select products only)	61
Downloading HP PC Hardware Diagnostics Windows	61
Downloading the latest HP PC Hardware Diagnostics Windows version	62
Downloading HP Hardware Diagnostics Windows by product name or number (select products only)	62
Installing HP PC Hardware Diagnostics Windows	62
Using HP PC Hardware Diagnostics UEFI	62
Starting HP PC Hardware Diagnostics UEFI	63

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive	63
Downloading the latest HP PC Hardware Diagnostics UEFI version	63
Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only)	64
Using Remote HP PC Hardware Diagnostics UEFI settings (select products only)	64
Downloading Remote HP PC Hardware Diagnostics UEFI	64
Downloading the latest Remote HP PC Hardware Diagnostics UEFI version	64
Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number	64
Customizing Remote HP PC Hardware Diagnostics UEFI settings	64
9 Backing up, restoring, and recovering	66
Backing up information and creating recovery media	66
Using Windows tools	66
Using the HP Cloud Recovery Download Tool to create recovery media (select products only)	66
Restoring and recovery	67
Restoring, resetting, and refreshing using Windows tools	67
Recovering using HP Recovery media	67
Changing the computer boot order	67
Using HP Sure Recover (select products only)	68
10 Specifications	69
11 Power cord set requirements	70
Requirements for all countries	70
Requirements for specific countries and regions	71
12 Recycling	73
Index	74

1 Product description

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP Pavilion Gaming 15 Laptop PC Model numbers: 15-ec0xxx, 15z-ec000
Processor	AMD® Ryzen™ 7 3750H (2.3 GHz, turbo up to 4.0 GHz), 2400 MHz/6 MB L2 + L3 cache, quad core, 35 W AMD Ryzen 5 3550H (2.1 GHz, turbo up to 3.7 GHz), 2400 MHz/6 MB L2 + L3 cache, quad core, 35 W
Graphics	Internal graphics AMD Radeon™ RX Vega 10 Graphics (Ryzen 7 processor) AMD Radeon Vega™ 8 Graphics (Ryzen 5 processor) Hybrid graphics NVIDIA® GeForce® GTX 1660Ti with up to 6 GB of dedicated video memory NVIDIA GeForce GTX 1650 with up to 4 GB of dedicated video memory NVIDIA GeForce GTX 1050 with up to 3 GB of dedicated video memory Supports HD decode, DX12, and HDMI Supports Optimus™ Supports MR compatible (60 Hz frame)
Display panel	39.6 cm (15.6 in) full high-definition (FHD) (1920 × 1080), antiglare, narrow bezel SVA 45% NTSC, 220 nits, eDP 1.2 without PSR, slim UWVA 45% NTSC, 250 nits, eDP 1.2 without PSR, slim UWVA 72% NTSC, 300 nits, eDP 1.2 without PSR, ultraslim UWVA 72% NTSC, 300 nits, eDP 1.4 + PSR, 144 Hz, ultraslim
Memory	Two SODIMM slots, customer accessible/upgradeable DDR4-2400 dual channel support (DDR4-3200 bridge to DDR4-2666, DDR4-2666 downgrade to DDR4-2400) Supports up to 32 GB maximum system memory in the following configurations: <ul style="list-style-type: none">• 16 GB (16 GB × 1 or 8 GB × 2)• 12 GB (8 GB × 1 + 4 GB × 1)• 8 GB (8 GB × 1 or 4 GB × 2)
Storage	Supports 7.0 mm/7.2 mm, 2.5 in SATA hard drives Support for solid-state drive + hard drive Support for NGFF M.2 solid-state drive with SATA/PCIe co-layout port

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

Category	Description
	M.2 SSD expansion capability on single HDD SKU
	Accelerometer/hard drive protection support
	Single hard drive configurations
	1 TB, 5400 rpm, 7.2 mm
	Dual storage configurations
	256 GB, PCIe, NVMe, TLC, solid-state drive + 1 TB, 7200 rpm hard drive
	128 GB, PCIe, NVMe, TLC, solid-state drive + 1 TB, 7200 rpm hard drive
	128 GB, PCIe, NVMe, TLC, solid-state drive + 1 TB, 5400 rpm hard drive
	M.2, NVMe solid-state drive
	1 TB, PCIe-3 × 4, TLC
	512 GB, PCIe-3 × 4, TLC
	512 GB, PCIe, value
	256 GB, PCIe-3 × 4, TLC
	256 GB, PCIe, value
Audio	Audio brand: Bang & Olufsen Play
	Audio control panel: Bang & Olufsen Audio Control
	Supports HP Audio Boost
	Dual speakers
Video	HP TrueVision HD Camera - indicator LED, USB 2.0, HD BSI sensor, f2.0, WDR
	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
Sensors	Accelerometer
Wireless networking	Integrated wireless option with dual antennas (M.2/MIPI/BRI)
	Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth 5 (MU-MIMO supported)
	Support for Wi-Fi CERTIFIED Miracast™ devices
Ports	HP Smart Plug AC adapter
	Audio-out (headphone)/Audio-in (microphone) combo jack
	RJ-45 (network) jack
	High-definition multimedia interface (HDMI) v.2.0 + HDCP 2.2 supporting up to 4096 × 2160 at 60 Hz
	Hot plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected)

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

Category	Description
	USB 3.1 Gen 1 Type A port
	USB 3.1 Gen 1 Type-C port (supports data transfer only)
	USB 2.0 Type A port (supports HP Sleep & Charge)
Media card reader	Supports microSD™/SDHC™/SDXC™
	Push-push insertion/removal
Internal card expansion	One M.2 slot for WLAN
	One M.2 slot for solid-state drive
Keyboard/pointing devices	Keyboard
	Full-sized, backlit, island-style, keyboard with numeric keypad
	Full-sized, non-backlit, island-style, keyboard with numeric keypad
	Touchpad requirements
	Clickpad with image sensor
	Multitouch gestures enabled
	Support for Precision Touchpad
	Support for modern trackpad gestures
	Taps enabled as default
Power requirements	Battery
	Supports a 3-cell, 52.5 Whr, 4.55 Ahr, polymer battery
	Supports battery life enhancement
	Supports battery fast charge (45 minutes, 50% charged)
	Smart AC adapter (PRC, slim barrel, 4.5 mm)
	200 W
	150 W
	135 W
	Power cord (1 m, conventional)
	C13 (for adapters 200 W and greater)
	C5
Security	Trusted Platform Module (fTPM) 2.0, firmware based
Operating system	Preinstalled
	Windows® 10 Home 64
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language Africa Market PPP

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

Category	Description
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market PPP
	Windows 10 Home 64 Plus Single Language Indonesia Market PPP
	Windows 10 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.

Right side

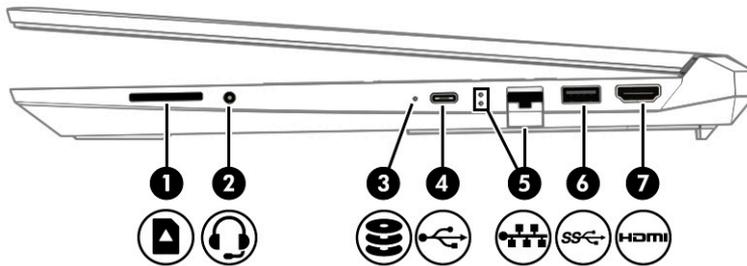


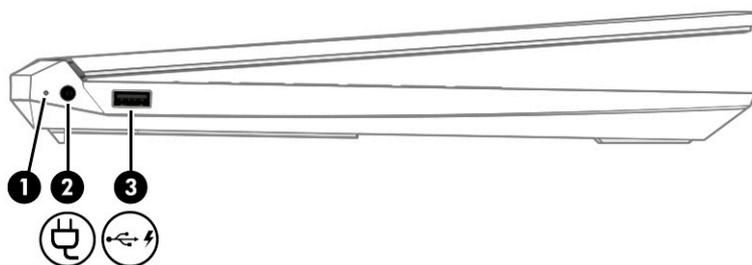
Table 2-1 Right-side components and their descriptions

Component	Description
(1)  Memory card reader	<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.
(2)  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. <p>NOTE: When a device is connected to the jack, the computer speakers are disabled.</p>
(3)  Drive light	<ul style="list-style-type: none">• Blinking white: The hard drive is being accessed.• Amber: HP 3D DriveGuard has temporarily parked the hard drive.

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

Component	Description
(4)  USB Type-C port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. NOTE: Cables and/or adapters (purchased separately) may be required.
(5)  RJ-45 (network) jack/status lights	Connects a network cable. <ul style="list-style-type: none"> • White: The network is connected. • Amber: Activity is occurring on the network.
(6)  USB SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(7)  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.

Left side

**Table 2-2 Left-side components and their descriptions**

Component	Description
(1) AC adapter and battery light	<ul style="list-style-type: none"> • White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.
(2)  Power connector	Connects an AC adapter.
(3)  USB port with HP Sleep and Charge	Connects a USB device, provides data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.

Display

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

⚠ WARNING! To reduce the risk of serious injury, read the *Safety & Comfort Guide*. It describes proper workstation setup and proper posture, health, and work habits for computer users. The *Safety & Comfort Guide* also provides important electrical and mechanical safety information. The *Safety & Comfort Guide* is available on the web at <http://www.hp.com/ergo>.

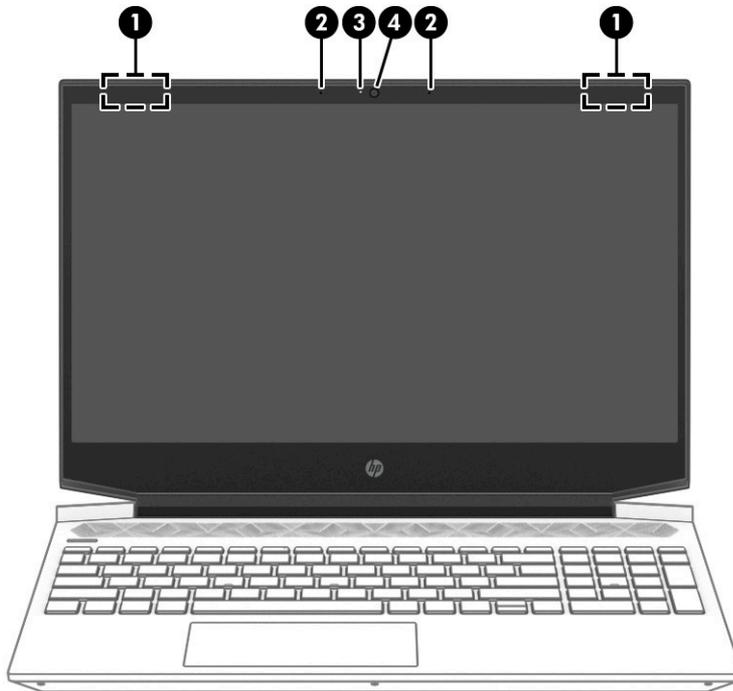


Table 2-3 Display components and their descriptions

Component	Description
(1) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2) Internal microphones	Record sound.
(3) Camera light	On: The camera is in use.
(4) 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.

*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

Touchpad

Touchpad settings

To adjust touchpad settings and gestures, or to turn off the touchpad:

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

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.

– or –

- ▲ Press the **Tab** key repeatedly until the pointer rests on the **touchpad** button. Then press the **spacebar** to select the button.

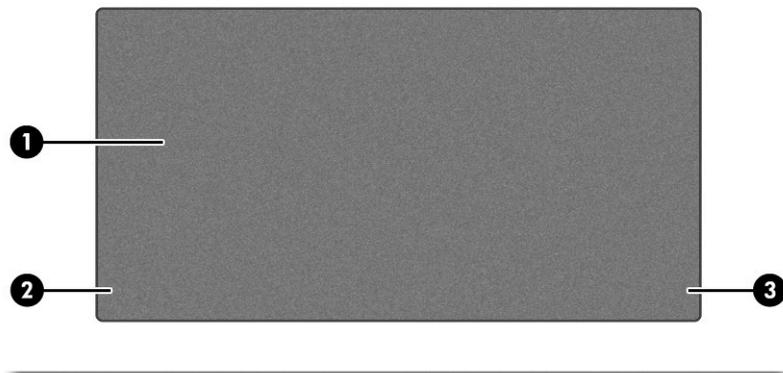
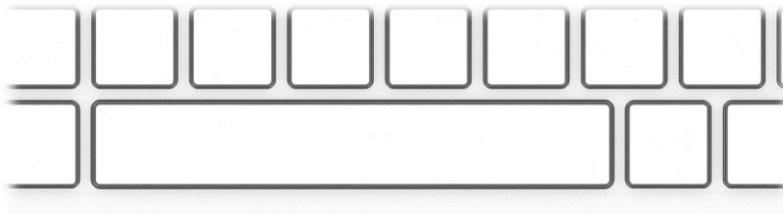


Table 2-4 Touchpad components and their descriptions

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

Lights

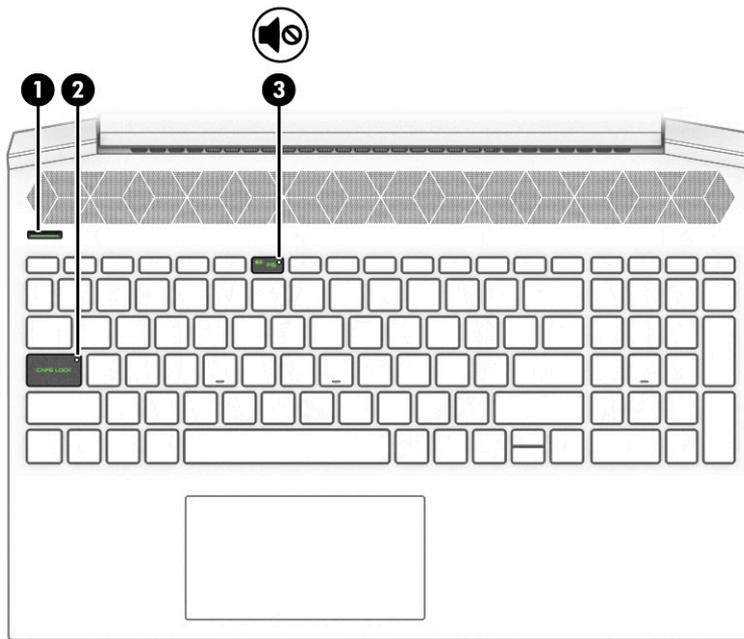


Table 2-5 Lights and their descriptions

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

Button and speakers

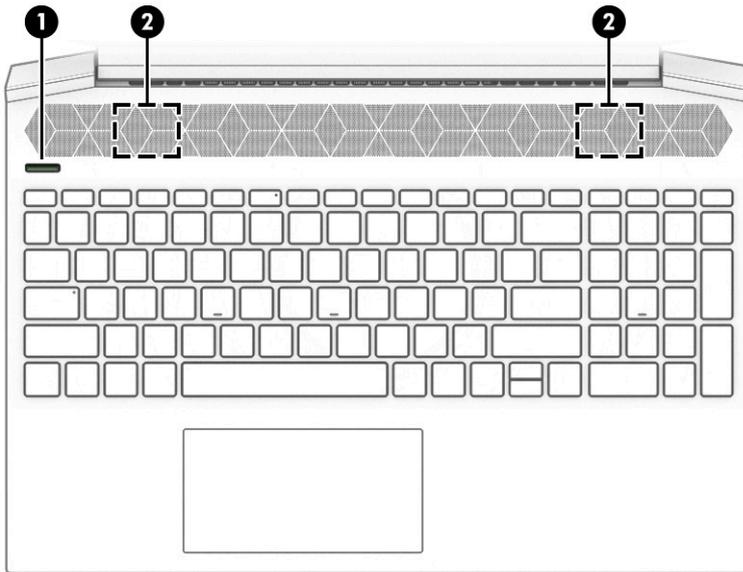


Table 2-6 Button and speakers and their descriptions

Component	Description
(1) Power button	<ul style="list-style-type: none"> • When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only). • When the computer is in Hibernation, press the button briefly to exit Hibernation. <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 5 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.
(2) Speakers	Produce sound.

Special keys

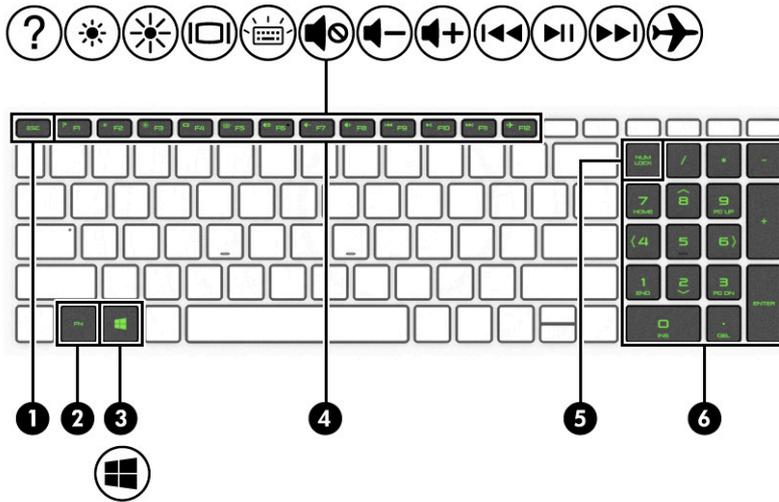


Table 2-7 Special keys and their descriptions

Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes specific functions when pressed in combination with another key.
(3)  Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4) Action keys	Execute frequently used system functions.
(5) <code>num lock</code> key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6) Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When <code>num lock</code> 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

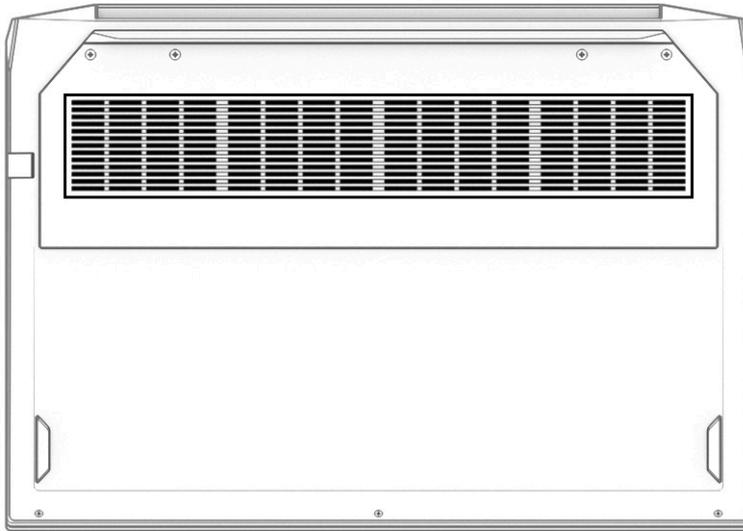


Table 2-8 Bottom components and their descriptions

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

Rear



Table 2-9 Rear components and their descriptions

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

Labels

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

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

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

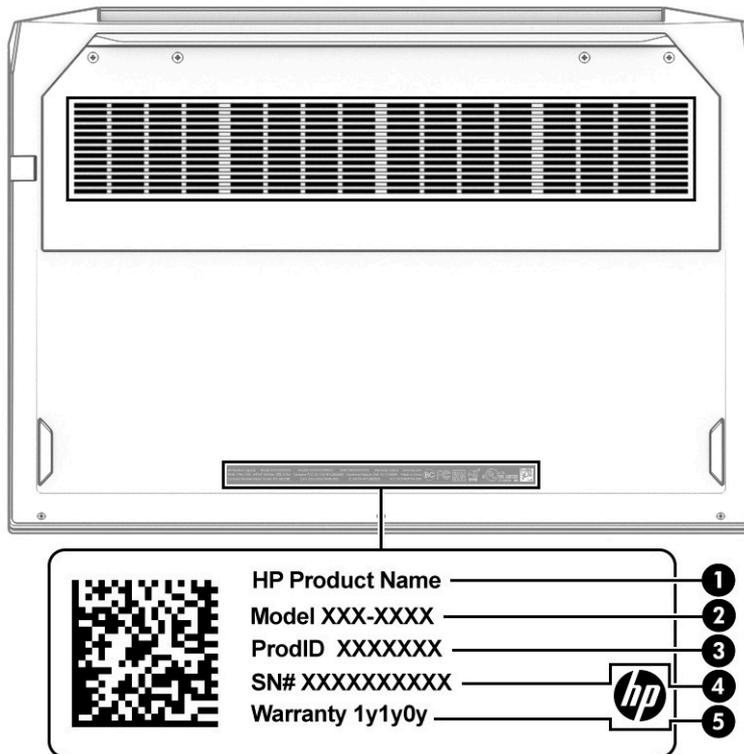


Table 2-10 Service label components

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

- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3 Illustrated parts catalog

Computer major components

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 13](#) for details.

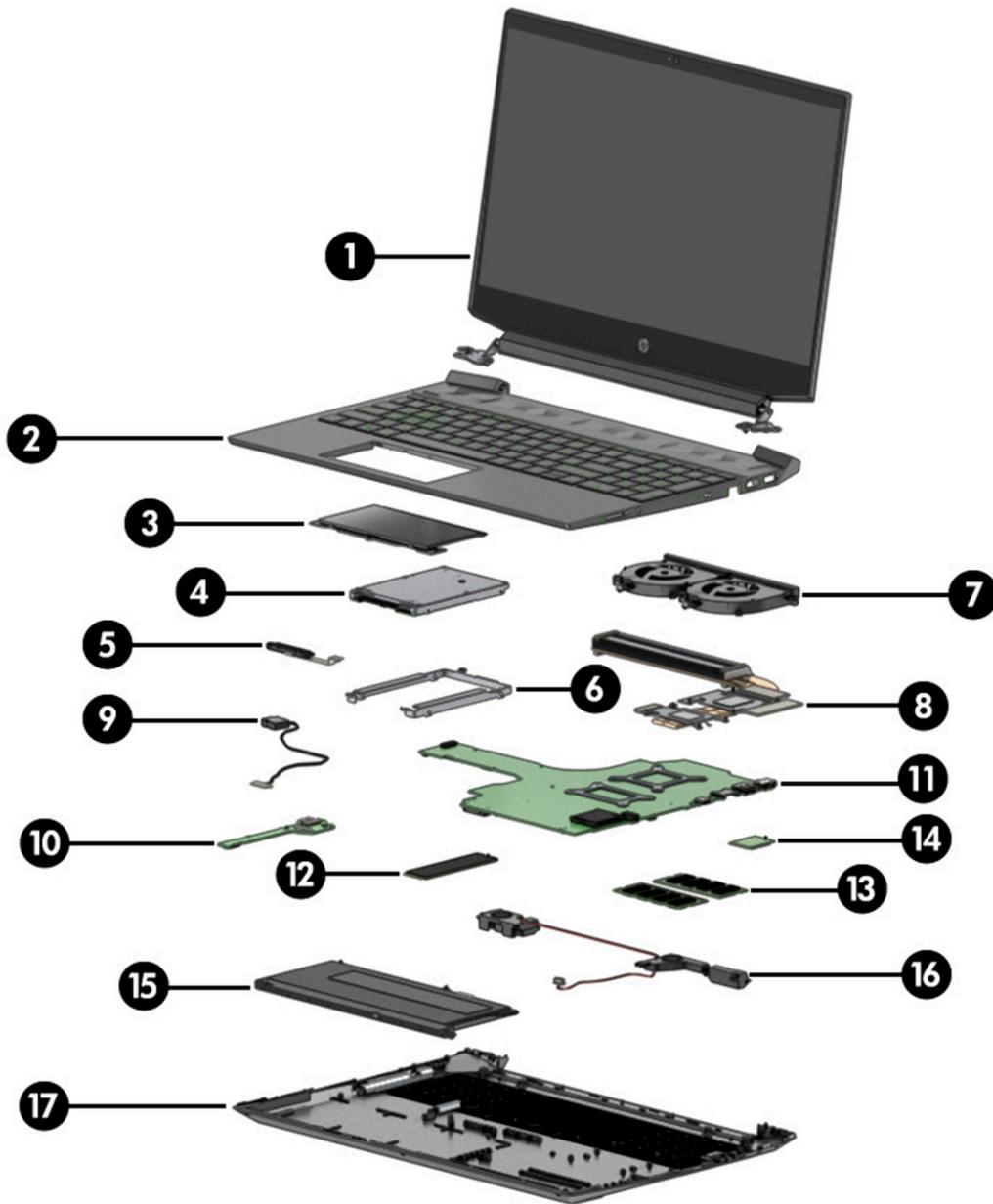


Table 3-1 Computer major components and their descriptions

Item	Component	Spare part number
(1)	Display assembly NOTE: Spare parts for display assemblies are available only at a subcomponent level.	
(2)	Keyboard/top cover backlit): For a detailed list of country codes, see Keyboard/top cover on page 58 .	
	For use in acid green models	L72597-xx1
	For use in ghost white models with a backlit keyboard	L72598-xx1
	For use in ghost white models with a non-backlit keyboard	L72599-xx1
	For use in ultra violet models	L72600-xx1
(3)	Touchpad NOTE: The touchpad cable is available using spare part number L72707-001.	L72709-001
(4)	Hard drive	
	1 TB, 7200 rpm	766644-005
	1 TB, 5400 rpm	762990-005
(5)	Hard drive connector cable	L72698-001
(6)	Hard drive bracket	not available as spare part
(7)	Fan	L72702-001
(8)	Heat sink for use in models with GeForce GTX 1660 Ti graphics	L81917-001
	Heat sink for use in models with GeForce GTX 1650 graphics	L72701-001
	Heat sink for use in models with GeForce GTX 1050 graphics	L72700-001
	Thermal grease (not illustrated)	L65268-001
(9)	Power connector cable	
	200 W	L72704-001
	150 W	L72703-001
(10)	Power button/USB board NOTE: The power button board cable is available using spare part number L72697-001.	
	For use in ghost white models	L72694-001
	For use in acid green models	L72695-001
	For use in ultra violet models	L72696-001
(11)	System board (includes processor and replacement thermal material): All system boards use the following part numbers: xxxxxx-001: Non-Windows operating system xxxxxx-601: Windows 10 operating system	
	AMD Ryzen 7 3750H processor and 6 GB of discrete graphics memory (GeForce GTX 1660 Ti)	L71932-xx1
	AMD Ryzen 7 3750H processor and 4 GB of discrete graphics memory (GeForce GTX 1650)	L71930-xx1

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

Item	Component	Spare part number
	AMD Ryzen 5 3550H processor and 6 GB of discrete graphics memory (GeForce GTX 1660 Ti)	L71931-xx1
	AMD Ryzen 5 3550H processor and 4 GB of discrete graphics memory (GeForce GTX 1650)	L71929-xx1
	AMD Ryzen 5 3550H processor and 3 GB of discrete graphics memory (GeForce GTX 1050)	L71928-xx1
(12)	Solid-state drive (M.2):	
	1 TB, PCIe, Gen 3 × 4	L72515-001
	512 GB, PCIe, Gen 3 × 4	L71936-001
	512 GB, PCIe, Gen 3 × 2	L71934-001
	256 GB, PCIe, Gen 3 × 4	L71935-001
	256 GB, PCIe, Gen 3 × 2	L71933-001
	128 GB, PCIe, Gen 3 × 2	L71937-001
	Thermal plate for solid-state drive	L84067-001
(13)	Memory modules (DDR4-2666):	
	8 GB	937236-855
	4 GB	L10598-855
(14)	WLAN module (Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth 5)	L44796-005
(15)	Battery (3 cell, 52 Whr)	L48495-005
(16)	Speakers	L72708-001
(17)	Bottom cover	
	For use in ghost white models	L72705-001
	For use in acid green and ultra violet models	L72706-001

Display assembly subcomponents

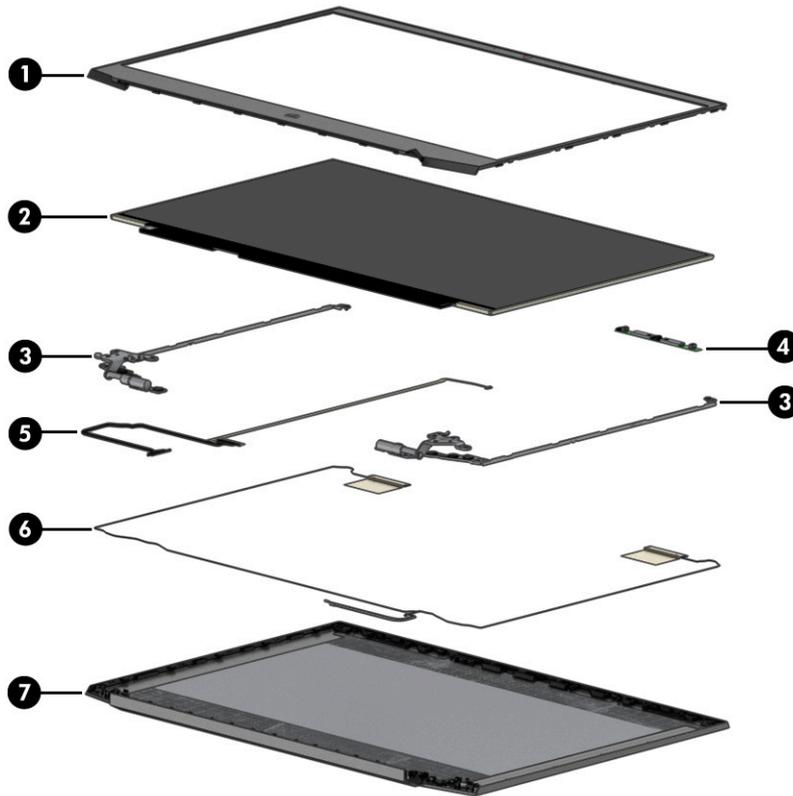


Table 3-2 Display components and their descriptions

Item	Component	Spare part number
(1)	Display bezel	L72717-001
(2)	Display panel (includes display cover adhesive and bezel tape):	
	220 nits, slim (3.2 mm)	L71938-001
	250 nits, slim (3.2 mm)	L71939-001
	300 nits, eDP 1.2, ultraslim (2.6 mm)	L71940-001
	300 nits, eDP 1.4, ultraslim (2.6 mm)	L71941-001
(3)	Display hinges (includes left and right hinges)	L72710-001
(4)	Webcam/microphone module (includes display cover adhesive and bezel tape)	L72721-001
(5)	Display panel and camera cable (includes display cover adhesive and bezel tape):	
	For use in models without a 144 Hz display	L72719-001
	For use in models with a 144 Hz display	L72720-001
(6)	Wireless antennas (includes display cover adhesive and bezel tape)	L75188-001
(7)	Display back cover (includes bezel tape)	
	For use in ghost white models with a 3.2 mm display panel	L72711-001
	For use in acid green models with a 3.2 mm display panel	L72713-001

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

Item	Component	Spare part number
	For use in ultra violet models with a 3.2 mm display panel	L72715-001
	For use in ghost white models with a 2.6 mm display panel	L72712-001
	For use in acid green models with a 2.6 mm display panel	L72714-001
	For use in ultra violet models with a 2.6 mm display panel	L72716-001

Cables

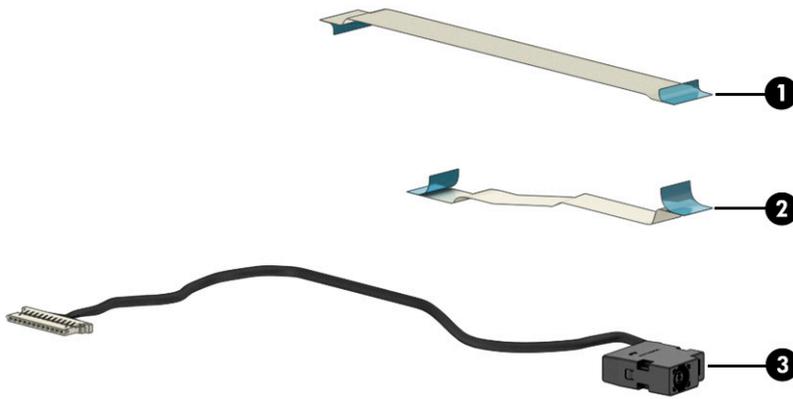


Table 3-3 Cables and their descriptions

Item	Component	Spare part number
(1)	Touchpad cable	L72707-001
(2)	Power button/USB board cable	L72697-001
(3)	Power connector cable	
	200 W models	L72704-001
	150 W models	L72703-001

Mass storage devices

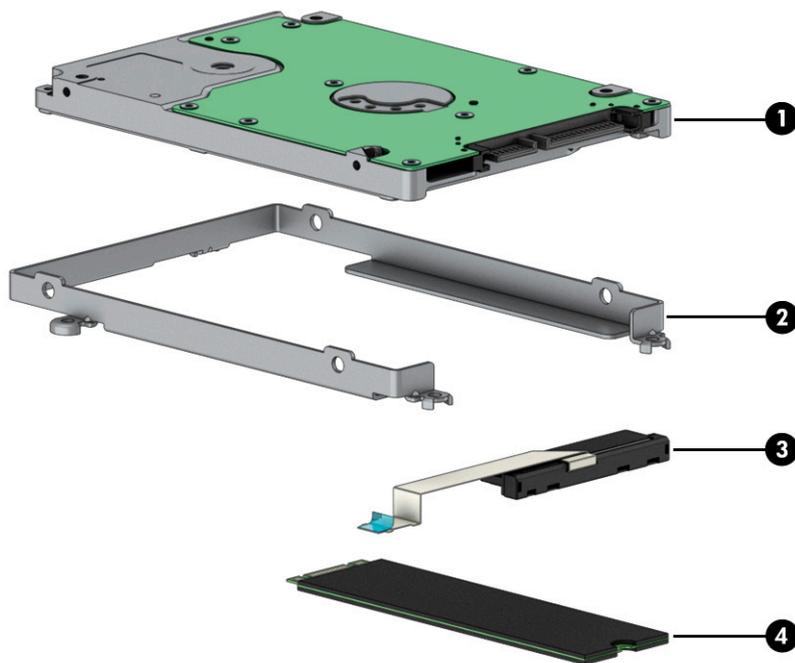


Table 3-4 Mass storage devices and their descriptions

Item	Component	Spare part number
(1)	Hard drive	
	1 TB, 7200 rpm	766644-005
	1 TB, 5400 rpm	762990-005
(2)	Hard drive brackets	not available as spare part
(3)	Hard drive connector/cable	L72698-001
(4)	Solid-state drive (M.2)	
	1 TB, PCIe, Gen 3 × 4	L72515-001
	512 GB, PCIe, Gen 3 × 4	L71936-001
	512 GB, PCIe, Gen 3 × 2	L71934-001
	256 GB, PCIe, Gen 3 × 4	L71935-001
	256 GB, PCIe, Gen 3 × 2	L71933-001
	128 GB, PCIe, Gen 3 × 2	L71937-001

Miscellaneous parts

Table 3-5 Miscellaneous parts and their descriptions

Component	Spare part number
AC adapter (PFC, slim, 4.5 mm):	
200 W	L00818-850
150 W	L32661-001
135 W	L15534-001
Rubber Foot Kit (left and right)	L72718-001
External optical drive	747080-001
HDMI-to-VGA adapter	701943-001
Thermal grease	L65268-001
Thermal plate for solid-state drive	L84067-001
Screw Kit	L72722-001
Power cord (C5, 1.0 m):	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Denmark	L19360-001
For use in Europe	L19361-001
For use in India	L19363-001
For use in Israel	L19362-001
For use in Italy	L19364-001
For use in Japan	L19365-001
For use in North America	L19367-001
For use in the People's Republic of China	L19368-001
For use in South Africa	L19369-001
For use in South Korea	L19366-001
For use in Switzerland	L19370-001
For use in Taiwan	L19372-001
For use in Thailand	L19371-001
For use in the United Kingdom	L19373-001
Power cord (C13, 1.0 m):	
For use in Argentina	L22104-001
For use in Australia	L22339-001
For use in Denmark	L22334-001
For use in Europe	L22333-001

Table 3-5 Miscellaneous parts and their descriptions (continued)

Component	Spare part number
For use in India	L22343-001
For use in Israel	L22335-001
For use in Italy/Chile	L22103-001
For use in Japan	L22344-001
For use in North America	L22331-001
For use in the People's Republic of China	L22341-001
For use in South Africa	L22337-001
For use in South Korea	L22340-001
For use in Switzerland	L22336-001
For use in Taiwan	L22342-001
For use in Thailand	L22338-001
For use in the United Kingdom	L22332-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Tweezers
- Non-conductive, non-marking 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



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

Cables and connectors



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.

Cables must be handled with extreme care to avoid damage. 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 in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

Drive handling



IMPORTANT: Drives are fragile components that must be handled 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."

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screw drivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

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 are removing or installing internal components, observe these precautions:

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

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

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

Note the following:

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

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

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

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



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

Preventing electrostatic damage to equipment

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

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

- Avoid contact with pins, leads, or circuitry.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

Use the following equipment to prevent static electricity damage to electronic components:

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

Table 4-2 Static shielding protection levels

Static shielding protection levels	
Method	Voltage
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the work area

To prevent static damage at the work area, use the following precautions:

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and 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 work area free of nonconductive materials such as ordinary plastic assembly aids and polystyrene foam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended materials and equipment

HP recommends the following 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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

5 Removal and replacement procedures for Customer Self-Repair parts

This chapter provides removal and replacement procedures for Customer Self-Repair parts.

 **NOTE:** The Customer Self-Repair program is not available in all locations. Installing a part not supported by the Customer Self-Repair program may void your warranty. Check your warranty to determine if Customer Self-Repair is supported in your location.

Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 13](#) for details.

 **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.

There are as many as 16 screws that must be removed, replaced, and/or loosened when servicing Customer Self-Repair parts. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

See [Removal and replacement procedures preliminary requirements on page 22](#) 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

Table 5-1 Bottom cover descriptions and part numbers

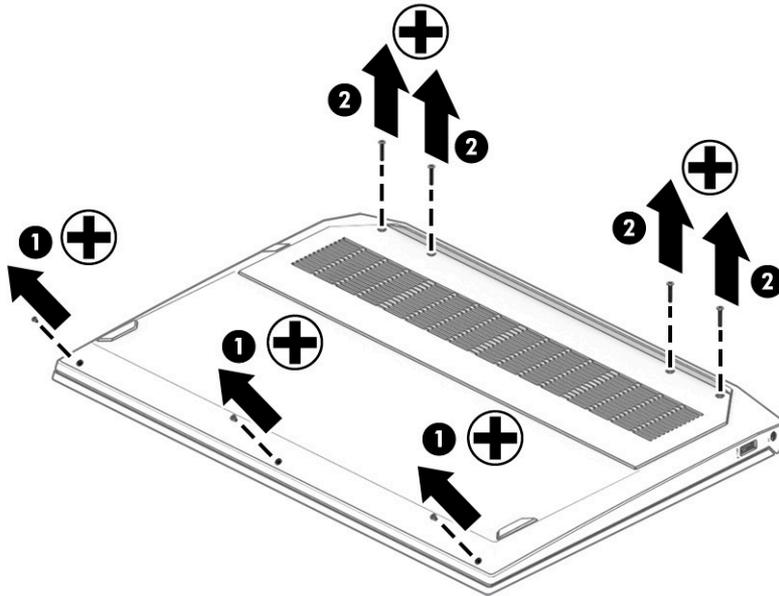
Description	Spare part number
Bottom cover for use in acid green models	L72705-001
Bottom cover for use in ghost white and ultra violet models	L72706-001

Before removing the bottom cover, follow this step:

- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).

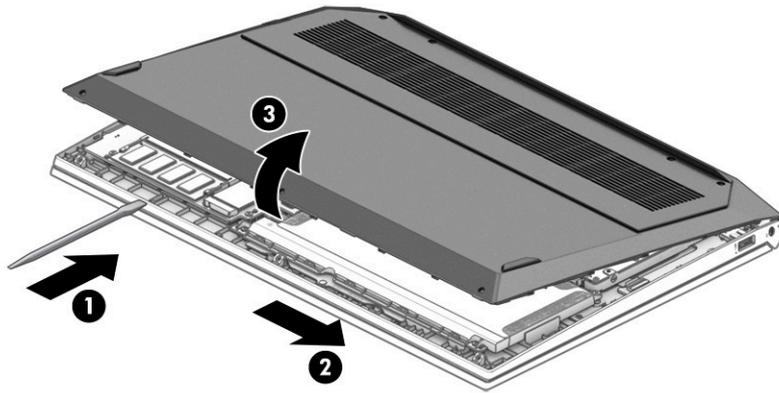
Remove the bottom cover:

1. Remove the three Phillips M2.0 × 5.0 screws **(1)** from the bottom edge of the bottom cover.
2. Remove the four Phillips M2.5 × 12.0 screws **(2)** from the top edge of the bottom cover.



3. Insert a non-marking, non-conductive tool into the seam at the bottom of the computer **(1)**, and then pull the tool along the seam to release the bottom cover **(2)**.

4. Pull the bottom cover off the computer (3).



Reverse this procedure to install the bottom cover.

Solid-state drive

Table 5-2 Solid-state drive descriptions and part numbers

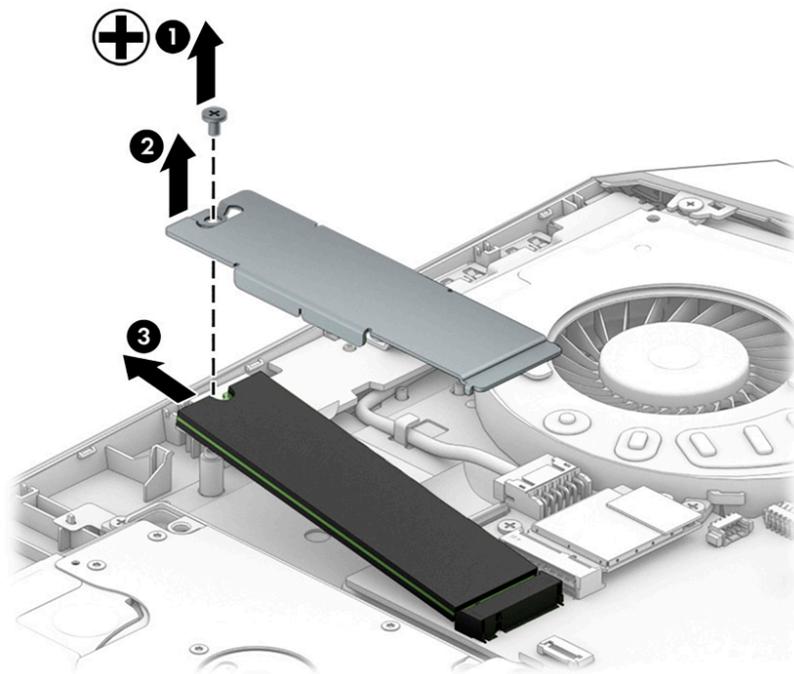
Description	Spare part number
1 TB, PCIe, Gen 3 × 4	L72515-001
512 GB, PCIe, Gen 3 × 4	L71936-001
512 GB, PCIe, Gen 3 × 2	L71934-001
256 GB, PCIe, Gen 3 × 4	L71935-001
256 GB, PCIe, Gen 3 × 2	L71933-001
128 GB, PCIe, Gen 3 × 2	L71937-001
Thermal plate for solid-state drive	L84067-001

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).

Remove the solid-state drive:

- ▲ Remove the Phillips M2.0 × 3.0 screw **(1)**, lift the metal cover off the drive **(2)**, and then pull the drive from the socket **(3)**.



Reverse this procedure to install the solid-state drive.

Memory module

Table 5-3 Memory descriptions and part numbers

Description	Spare part number
Memory module, 8 GB	937236-855
Memory module, 4 GB	L10598-855

Before removing the memory modules, follow these steps:

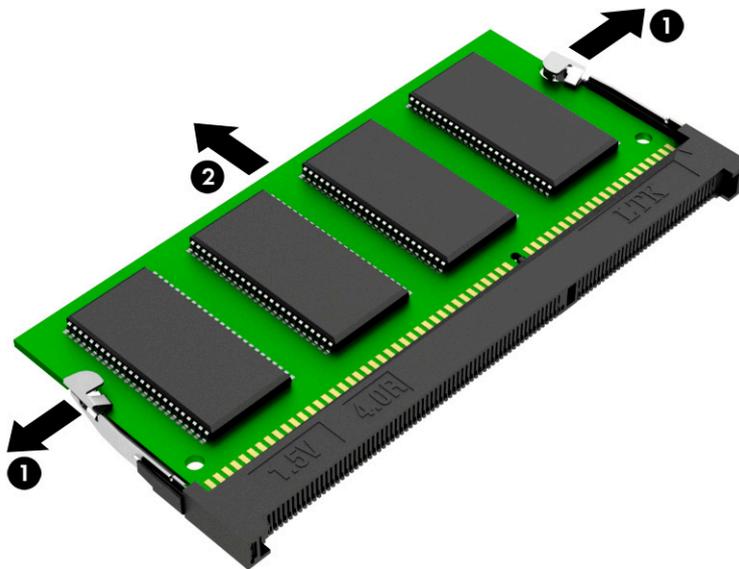
1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Remove the battery (see [Battery on page 37](#)).

Remove the memory modules:

1. Spread the two retention clips outward **(1)** until the memory module tilts up at a 45° angle.
2. Grasp the edge of the memory module **(2)**, and then gently pull the module out of the slot. Use the same procedure to remove both 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. Do not bend the memory module.

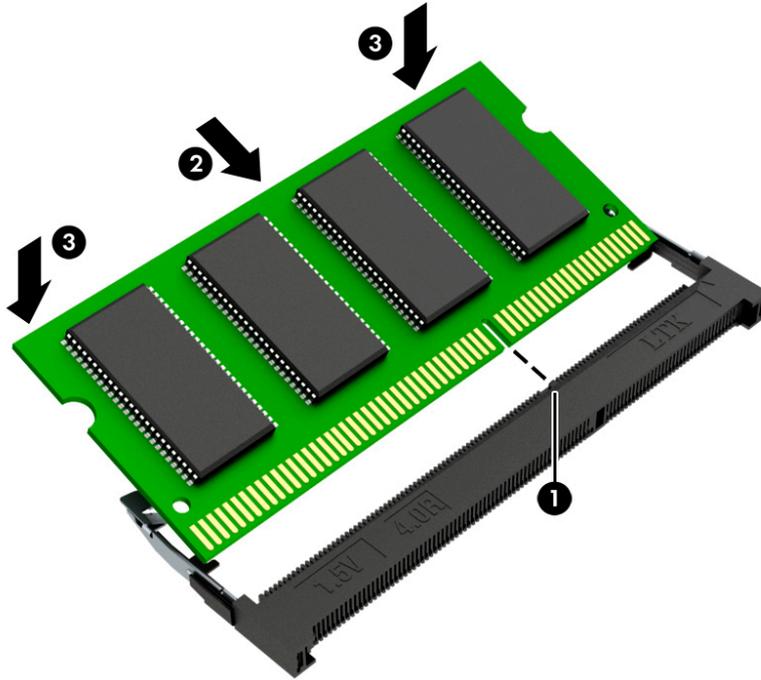
To protect a memory module after removal, place it in an electrostatic-safe container.



Install the memory modules:

1. Align the notched edge of the memory module with the tab in the memory module slot **(1)**.
2. Press the module into the slot until seated **(2)**.

3. Gently press down on the module edges until the side retention clips snap into place **(3)**.



Hard drive assembly

Table 5-4 Hard drive and connector descriptions and part numbers

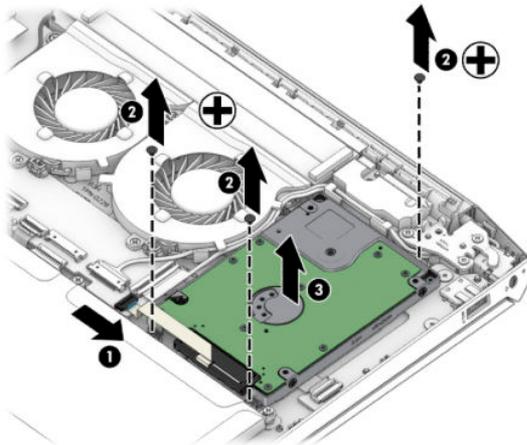
Description	Spare part number
Hard drive, 1 TB, 7200 rpm	766644-005
Hard drive, 1 TB, 5400 rpm	762990-005
Hard drive connector/cable	L72698-001

Before removing the hard drive assembly, follow these steps:

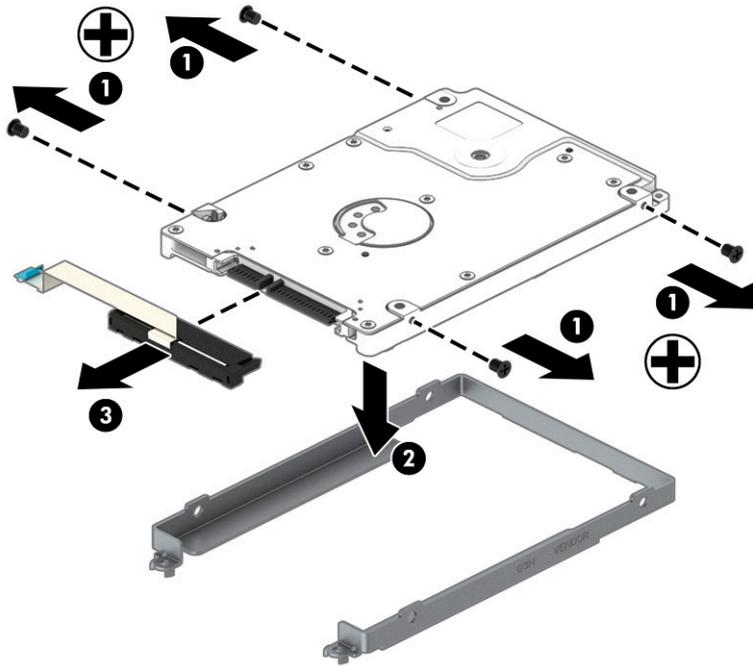
1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).

Remove the hard drive assembly:

1. Disconnect the hard drive cable from the system board ZIF connector **(1)**.
2. Remove the three Phillips M2.0 × 2.5 screws **(2)** that secure the hard drive assembly to the computer.
3. Lift the hard drive assembly out of the computer **(3)**.



4. If it is necessary to disassemble the hard drive, remove the four Phillips M3.0 × 3.0 screws (1) from the bracket, and then remove the bracket from the hard drive (2). Disconnect the connector from the drive (3).



Reverse this procedure to reassemble and install the hard drive.

6 Removal and replacement procedures for authorized service provider parts

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

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

Component replacement procedures

There are as many as 49 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Feet

Table 6-1 Feet description and part number

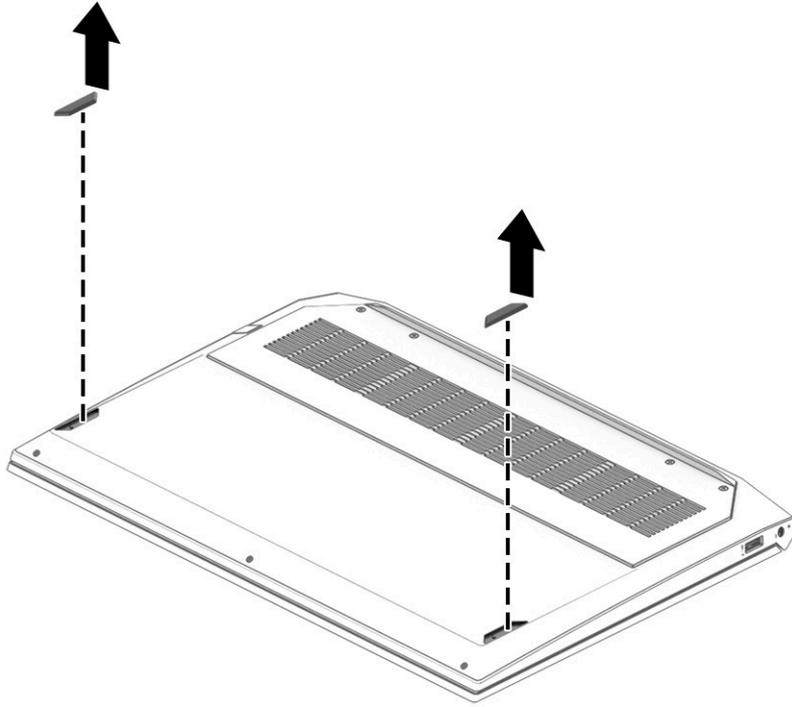
Description	Spare part number
Rubber Foot Kit	L72718-001

Before removing the feet, follow these steps:

- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).

Remove the feet:

- ▲ Peel the feet off the bottom of the computer.



Reverse this procedure to install the feet.

Battery

Table 6-2 Battery description and part number

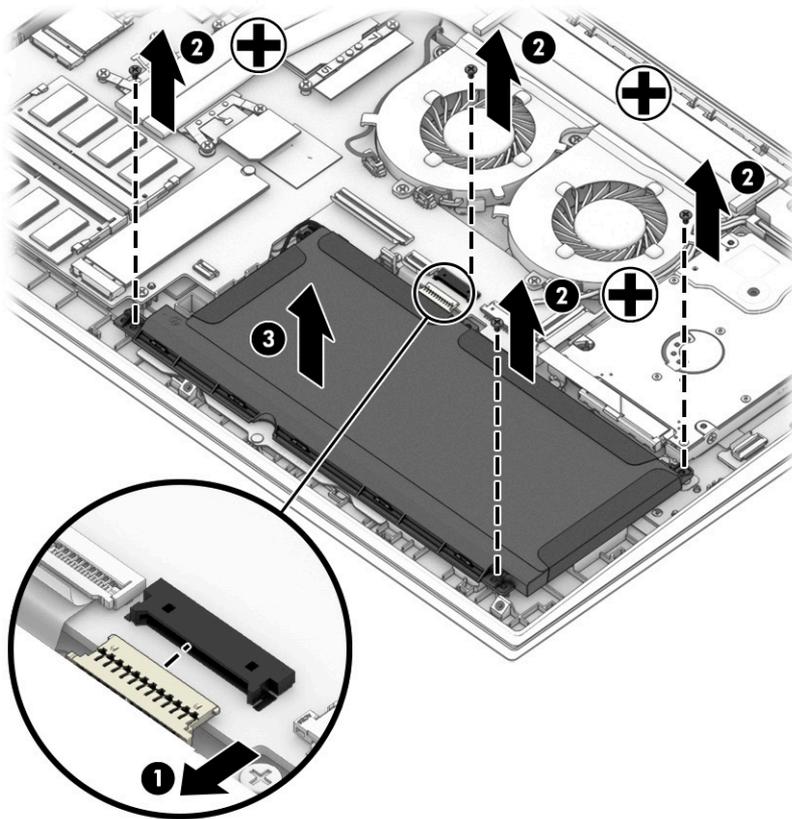
Description	Spare part number
Battery (3 cell, 52 Whr)	L48495-005

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).

Remove the battery:

1. Disconnect the battery cable from the system board (1).
2. Remove the four Phillips M2.0 × 3.5 screws (2) that secure the battery to the computer.
3. Remove the battery from the computer (3).



Reverse this procedure to install the battery.

WLAN module

Table 6-3 WLAN module description and part number

Description	Spare part number
Realtek RTL8822CE 802.11ac 2 × 2 Wi-Fi + Bluetooth 5	L44796-005

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

Before removing the WLAN module, follow these steps:

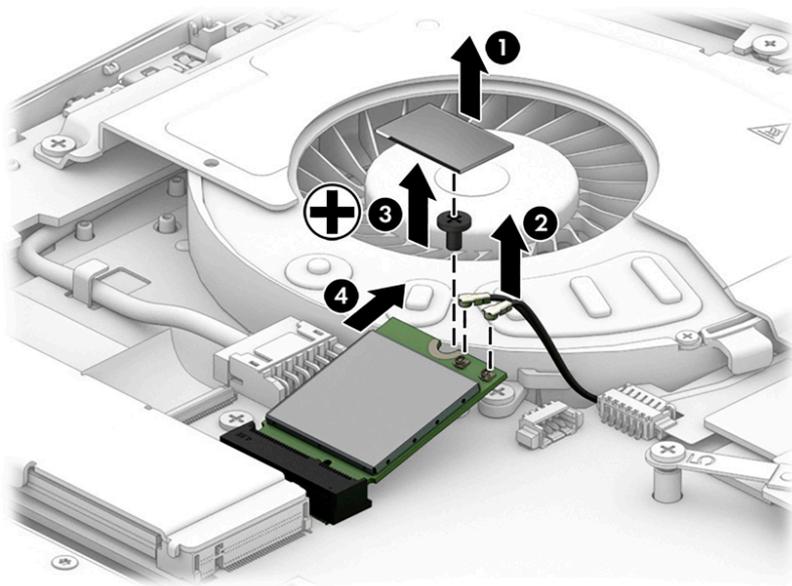
1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).

Remove the WLAN module:

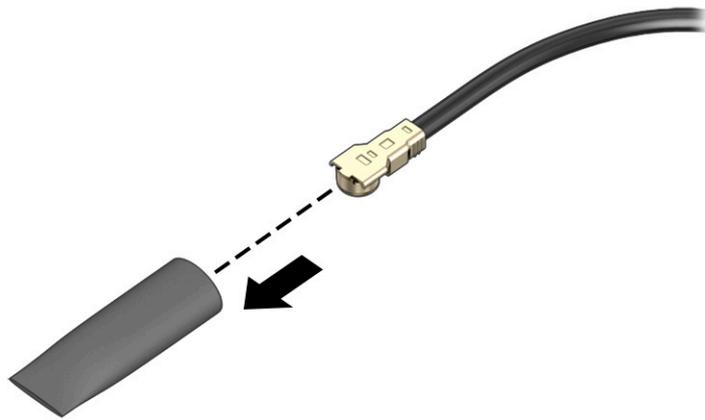
1. Remove the plastic protector from on top of the antenna terminals on the WLAN module **(1)**.
2. Disconnect the WLAN antenna cables **(2)** from the terminals on the WLAN module.

 **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.

3. Remove the Phillips M2.0 × 2.5 screw **(3)** that secures the WLAN module to the bottom cover. (The WLAN module tilts up.)
4. Remove the WLAN module **(4)** by pulling the module away from the slot at an angle.



 **NOTE:** If the WLAN antenna is not connected to the terminal on the WLAN module, a protective sleeve must be installed on the antenna connector, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

Touchpad

 **NOTE:** The touchpad spare part kit does not include the touchpad cable. The touchpad cable is available using spare part number L72707-001.

Table 6-4 Touchpad description and part number

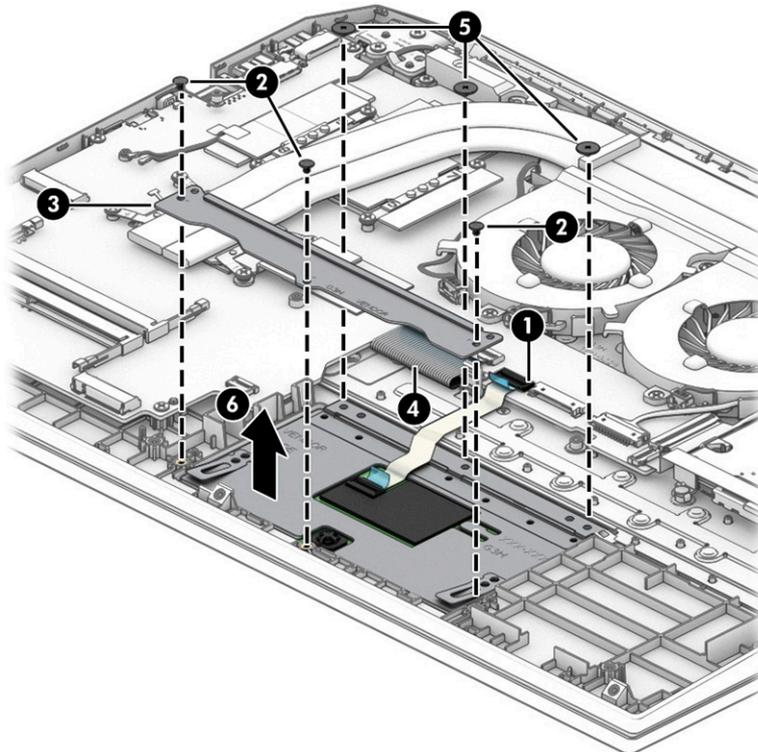
Description	Spare part number
Touchpad	L72709-001

Before removing the touchpad , follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Remove the battery (see [Battery on page 37](#)).

Remove the touchpad:

1. Disconnect the cable from the ZIF connector on the system board **(1)**.
2. Remove the three Phillips M2.0 × 2.5 screws **(2)** that secure the touchpad bracket to the computer.
3. Remove the touchpad bracket from the computer **(3)**.
4. Move the keyboard cable out of the way from on top of the touchpad **(4)**.
5. Remove the three broadhead Phillips M2.0 × 2.0 screws **(5)** that secure the touchpad to the computer.
6. Remove the touchpad from the computer **(6)**.



Reverse this procedure to install the touchpad.

Fans

Table 6-5 Fan description and part number

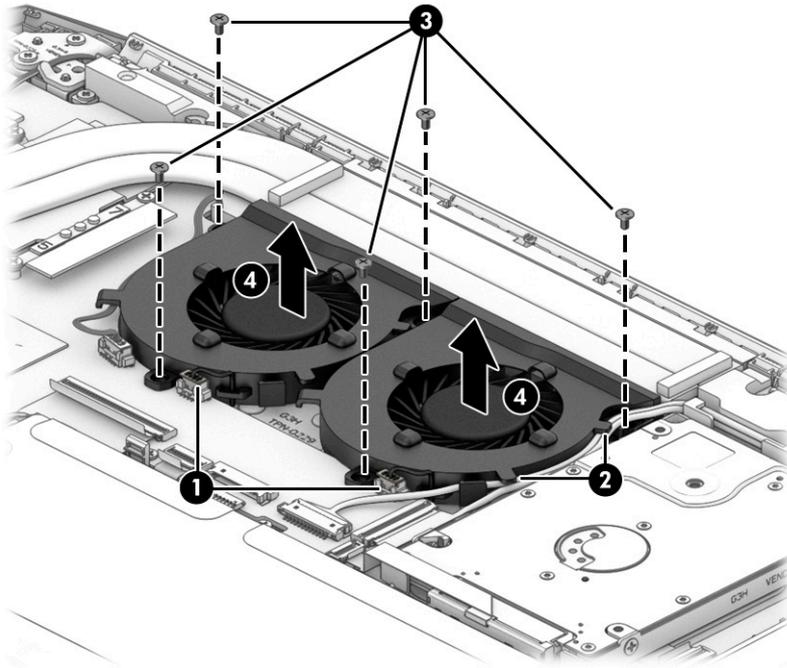
Description	Spare part number
Fans	L72702-001

Before removing the fans, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).

Remove the fans:

1. Disconnect the fan cables from the system board **(1)**.
2. Remove the power connector cable from the clips in the right fan **(2)**.
3. Remove the five Phillips M2.0 × 3.5 screws **(3)** that secure the fans to the computer.
4. Remove the fans from the computer **(4)**.



Reverse this procedure to install the fans.

Heat sink

Table 6-6 Heat sink and thermal pad descriptions and part numbers

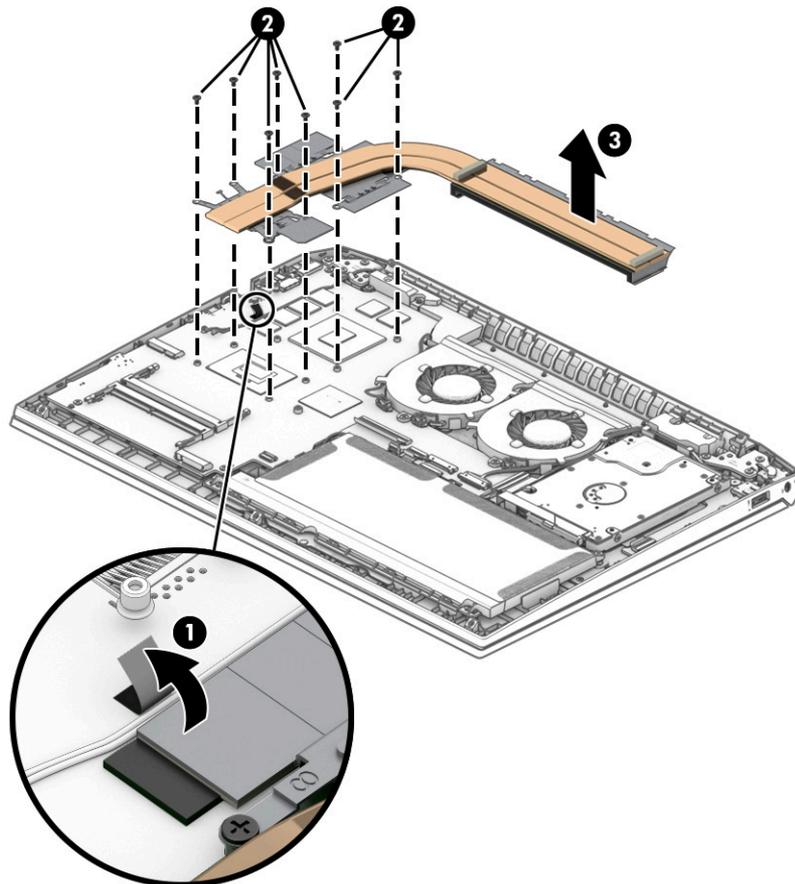
Description	Spare part number
Heat sink for use in models with GeForce GTX 1660 Ti graphics	L81917-001
Heat sink for use in models with GeForce GTX 1650 graphics	L72701-001
Heat sink for use in models with GeForce GTX 1050 graphics	L72700-001
Thermal grease	L65268-001

Before removing the heat sink, follow these steps:

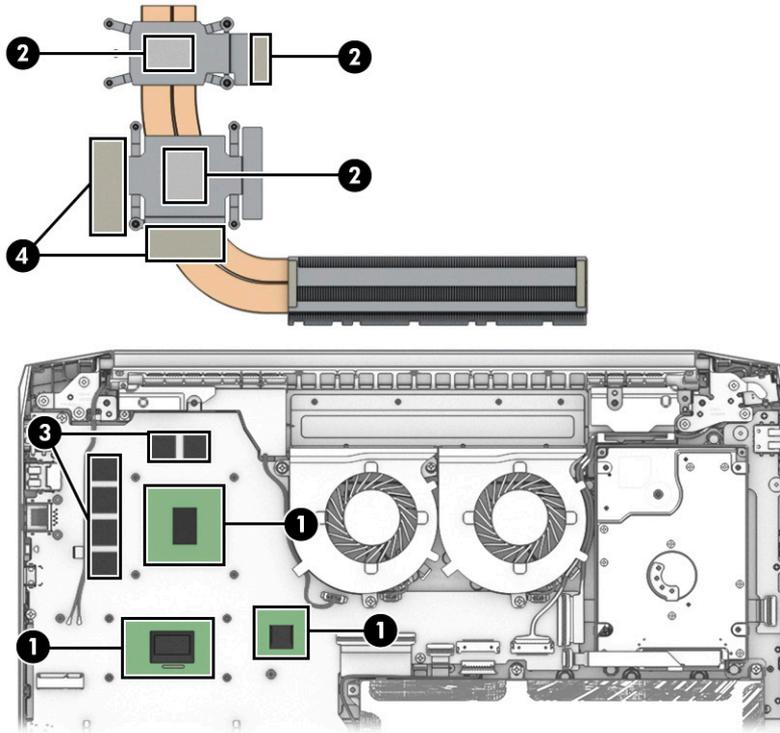
1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).

Remove the heat sink:

1. Remove the WLAN antenna cable tape from the heat sink **(1)**.
2. Remove the eight Phillips M2.0 × 3.5 screws **(2)** in the order indicated on the heat sink.
3. Remove the heat sink from the computer **(3)**.



4. Clean and reapply thermal grease to the surfaces of the heat sink **(2)** and system board components **(1)** each time the heat sink is removed. Replace the thermal pads on the heat sink **(4)**, noting their associated locations on the system board **(3)**.



Reverse this procedure to install the heat sink.

Power button/USB board

Table 6-7 USB board description and part number

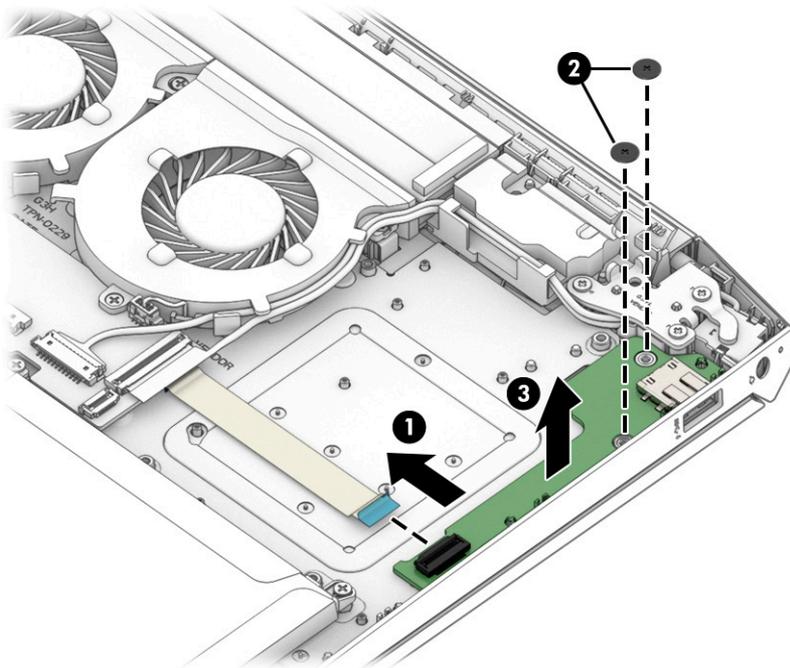
Description	Spare part number
Power button/USB board for use in ghost white models	L72694-001
Power button/USB board for use in acid green models	L72695-001
Power button/USB board for use in ultra violet models	L72696-001

Before removing the power button/USB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).
4. Remove the hard drive (see [Hard drive assembly on page 33](#)).

Remove the power button/USB board:

1. Disconnect the cable from the ZIF connector on the power button/USB board **(1)**.
2. Remove the two Phillips M2.0 × 2.0 screws **(2)** that secure the board to the computer.
3. Remove the power button/USB board from the computer **(3)**.



Reverse this procedure to install the power button/USB board.

System board

All system boards use the following part numbers:

xxxxxx-001: Non-Windows operating system

xxxxxx-601: Windows 10 operating system

Table 6-8 System board descriptions and part numbers

Description	Spare part number
AMD Ryzen 7 3750H processor and 6 GB of discrete graphics memory (GeForce GTX 1660 Ti)	L71932-xx1
AMD Ryzen 7 3750H processor and 4 GB of discrete graphics memory (GeForce GTX 1650)	L71930-xx1
AMD Ryzen 5 3550H processor and 6 GB of discrete graphics memory (GeForce GTX 1660 Ti)	L71931-xx1
AMD Ryzen 5 3550H processor and 4 GB of discrete graphics memory (GeForce GTX 1650)	L71929-xx1
AMD Ryzen 5 3550H processor and 3 GB of discrete graphics memory (GeForce GTX 1050)	L71928-xx1

Before removing the system board, follow these steps:

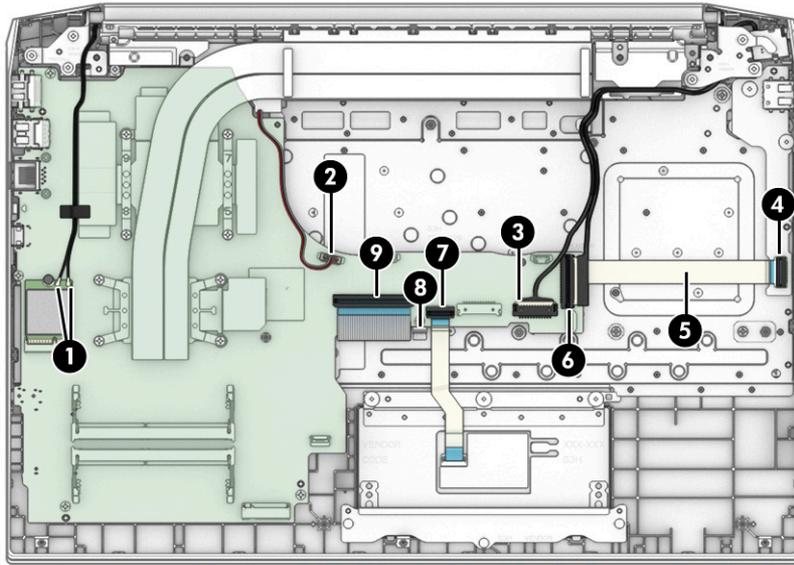
1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).
4. Remove the hard drive (see [Hard drive assembly on page 33](#)).
5. Remove the fans (see [Fans on page 41](#)).

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

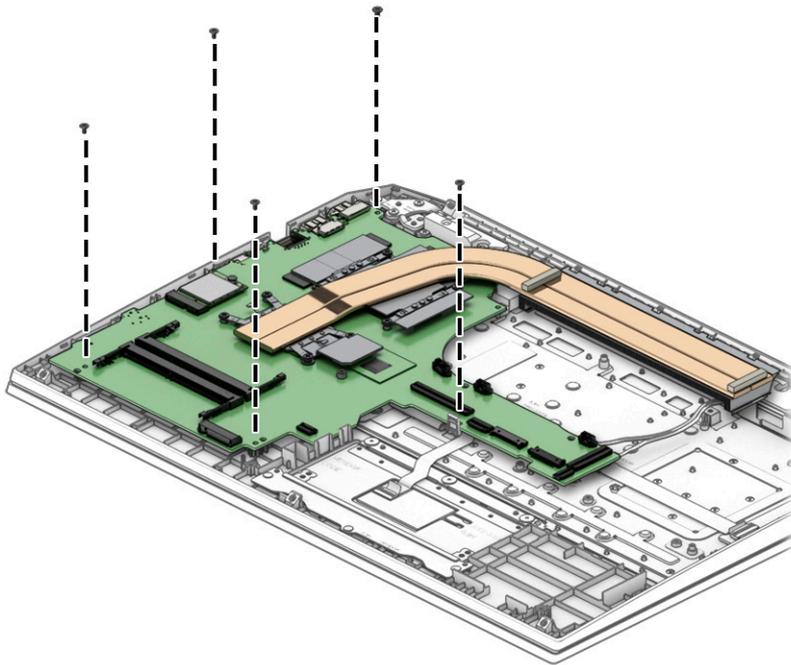
- Memory modules ([Memory module on page 31](#))
- Solid-state drive ([Solid-state drive on page 30](#))
- WLAN/Bluetooth module ([WLAN module on page 38](#))
- Heat sink ([Heat sink on page 42](#))

Remove the system board:

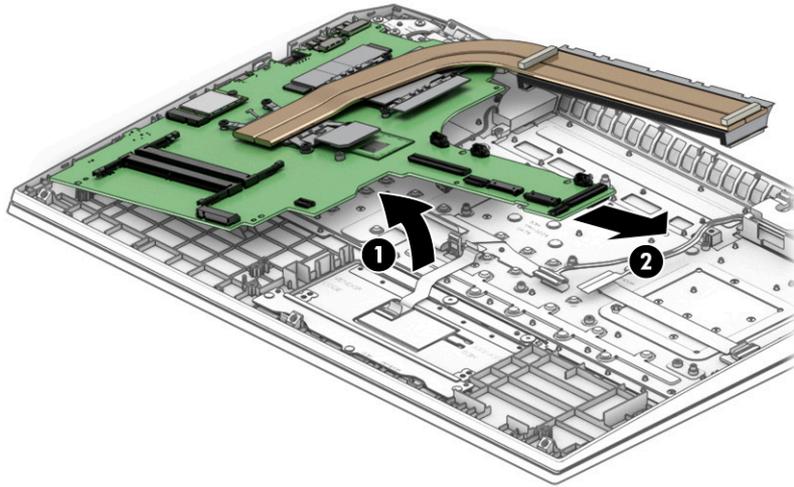
1. Disconnect the following cables from the system board:
 - (1) WLAN module antennas
 - (2) Speaker cable
 - (3) Power connector cable
 - (4) Power button/USB board cable (ZIF) (from power button/USB board)
 - (5) Release the power button/USB board cable from adhesive to chassis
 - (6) Display cable (ZIF)
 - (7) Touchpad cable (ZIF)
 - (8) Keyboard backlight (ZIF)
 - (9) Keyboard cable (ZIF)



2. Remove the five Phillips M2.0 × 3.5 screws that secure the system board to the computer.



3. Lift the right side of the system board (1), and then pull the system board to the right to remove it from the computer (2).



Reverse this procedure to install the system board.

Speakers

Table 6-9 Speaker description and part number

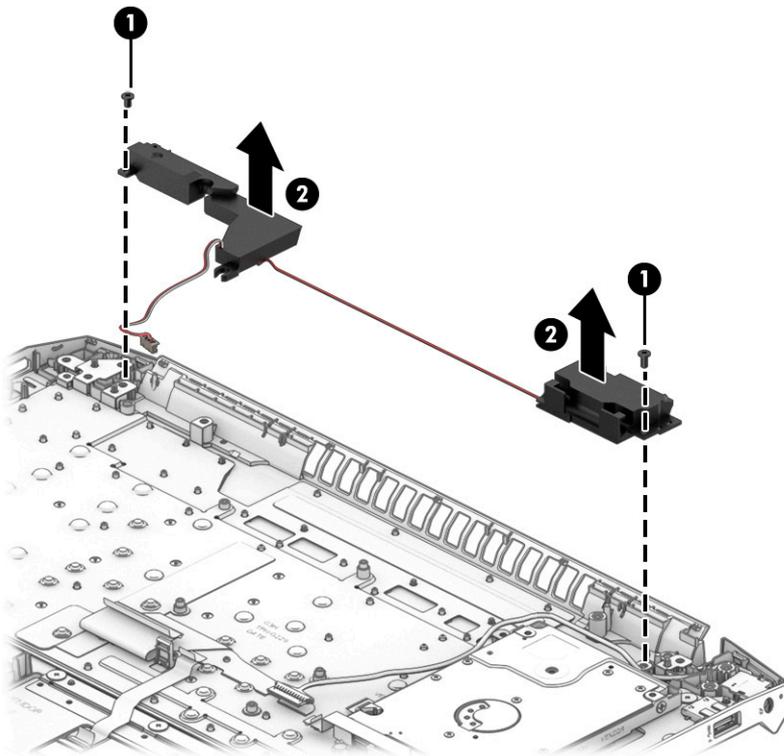
Description	Spare part number
Speakers	L72708-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).
4. Remove the fans (see [Fans on page 41](#)).
5. Remove the system board (see [System board on page 45](#)).

Remove the speakers:

1. Remove the two broadhead Phillips M2.0 × 2.0 screws (1) that secure the speakers to the computer.
2. Remove the speakers from the computer (2).



Reverse this procedure to install the speakers.

Display assembly



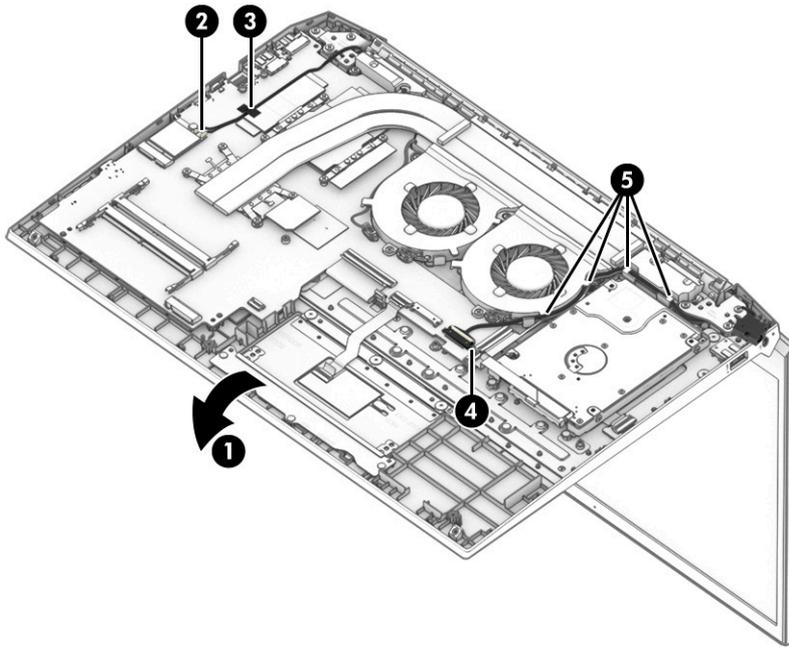
NOTE: The display assembly is available as a spare part only at the subcomponent level.

Before removing the display assembly, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).

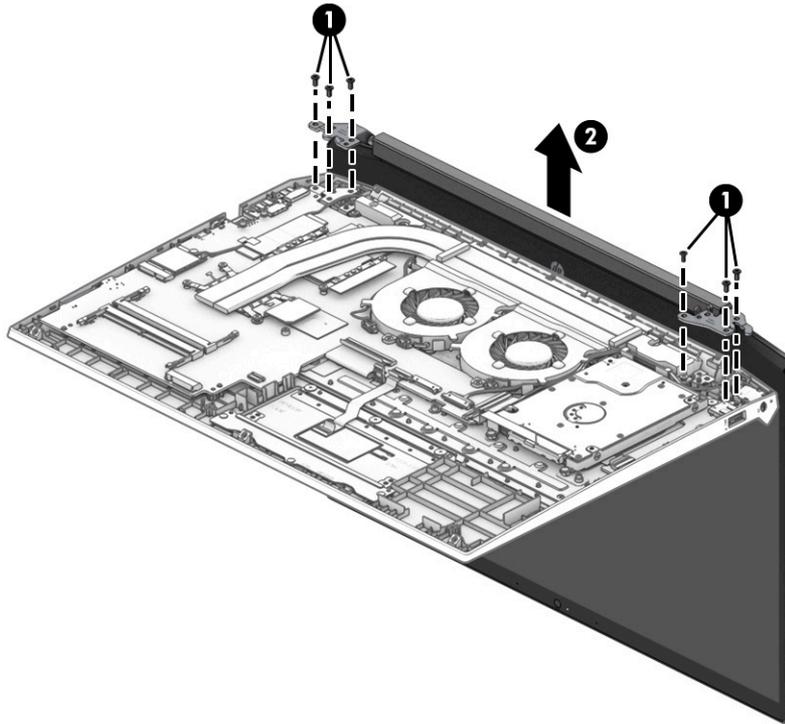
Remove the display assembly:

1. Open the display and position it hanging down off side of a table **(1)**.
2. Disconnect the antenna cables from the WLAN module **(2)**, and then remove the antenna cables from the tape that secure them to the heat sink **(3)**.
3. Disconnect the display cable from the system board ZIF connector **(4)**, and then remove the display cable from its routing path around the fan and hard drive **(5)**.



4. Remove the three Phillips M2.5 × 5.0 screws **(1)** from each hinge.

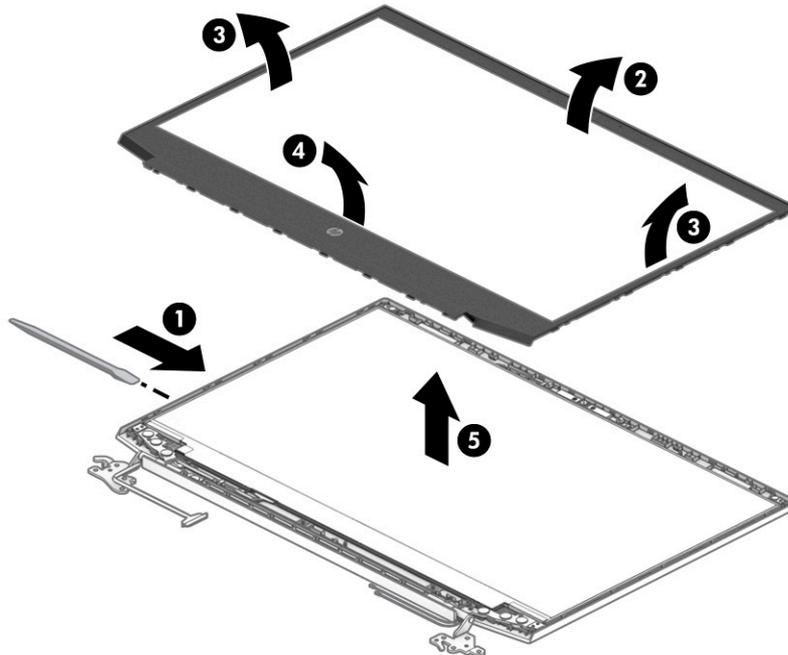
5. Separate the display from the computer (2).



6. If it is necessary to replace display assembly subcomponents, first remove the bezel:
- Insert a non-marking, non-conductive tool into the seam at the bottom of the bezel and pull to release the bezel from the display (1).
 - Release the top edge of the display bezel (2) from the display assembly.
-
-  **IMPORTANT:** Be careful not to bend or break the narrow sections of the bezel when removing.
- Release the left and right edges of the display bezel (3) from the display assembly.
 - Release the bottom edge of the display bezel (4) from the display assembly.

- e. Remove the display bezel **(5)**.

The display bezel is available using spare part number L72717-001.

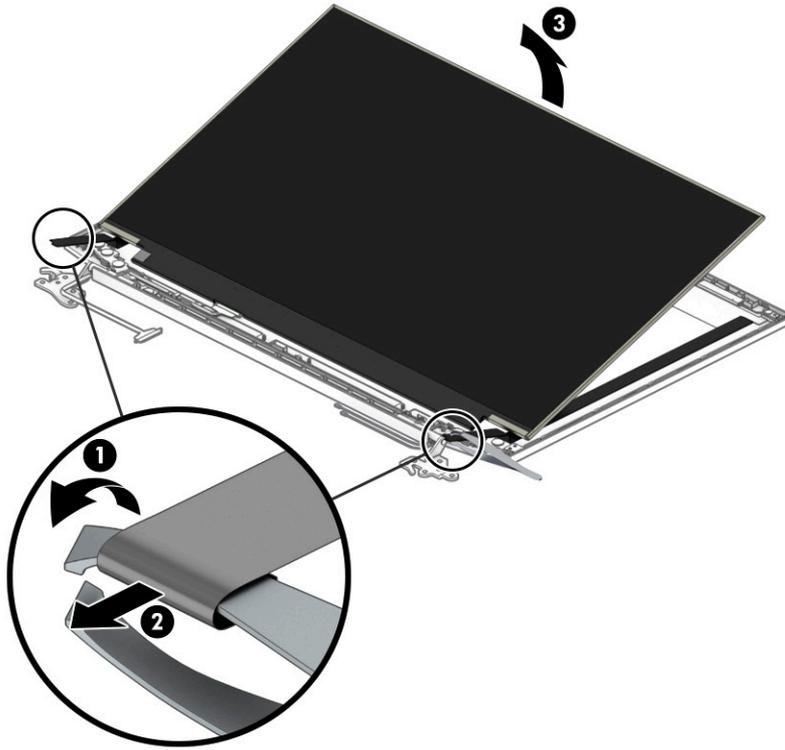


- 7. If it is necessary to remove the display panel:

- a. Use tweezers to pull and roll the tape that routes behind both the left and right sides of the display panel **(1)**.
- b. As you pull the tape out from behind the panel, roll the tape around the tweezers **(2)**.

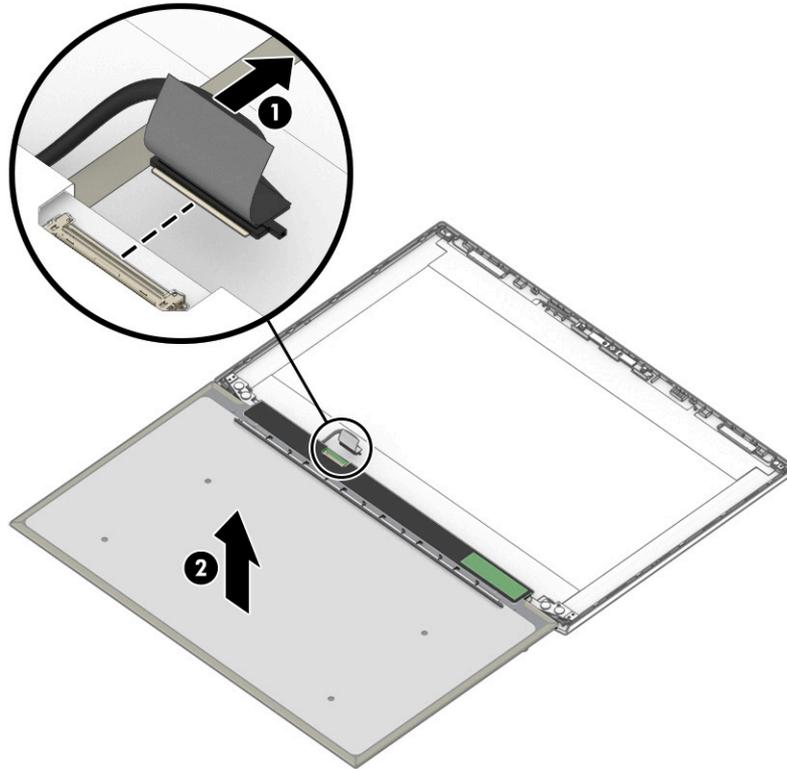
 **NOTE:** You have to pull on the tape multiple times before it is completely removed. To avoid tearing the tape, pull the tape evenly and carefully. Rolling the tape around the tweezers helps avoid tearing the tape.

- c. After tape is completely removed from behind both sides of the panel, rotate the panel over next to the display back cover **(3)**.



- d. Peel the tape off the connector on the back of the panel **(1)**, and then disconnect the cable from the display panel **(2)**.

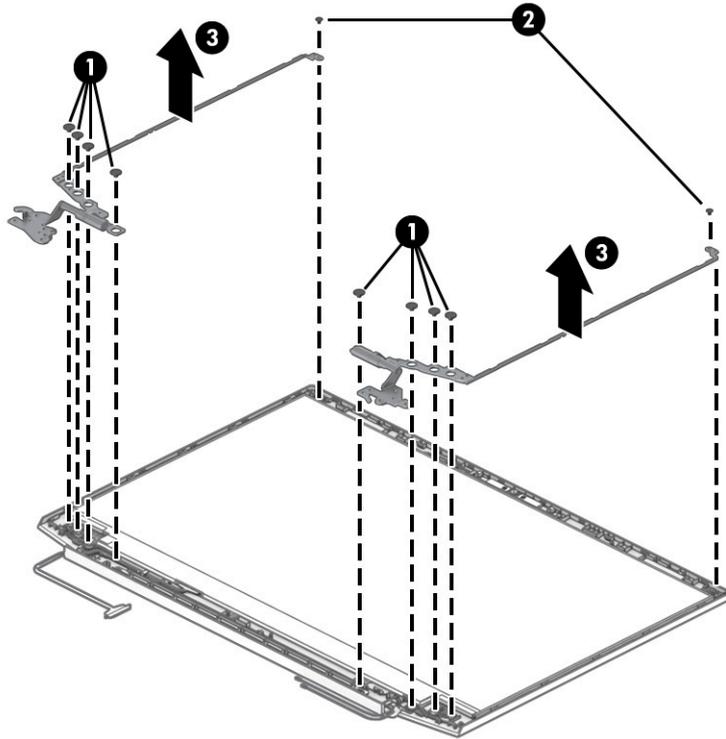
The display panel is available using spare part number L71938-001 for 220 nit, slim (3.2 mm) panels, L71939-001 for 250 nit, slim (3.2 mm) panels, L71940-001 for 300 nit, eDP 1.2, ultraslim (2.6 mm) panels, and L71941-001 for 300 nit, eDP 1.4, ultraslim (2.6 mm) panels.



8. If it is necessary to remove the display hinges:
 - a. Remove the four Phillips M2.0 × 2.5 screws **(1)** from the bottom of each hinge.
 - b. Remove the Phillips M2.0 × 2.5 screw **(1)** from the top of each hinge.

- c. Remove the display hinges from the display (3).

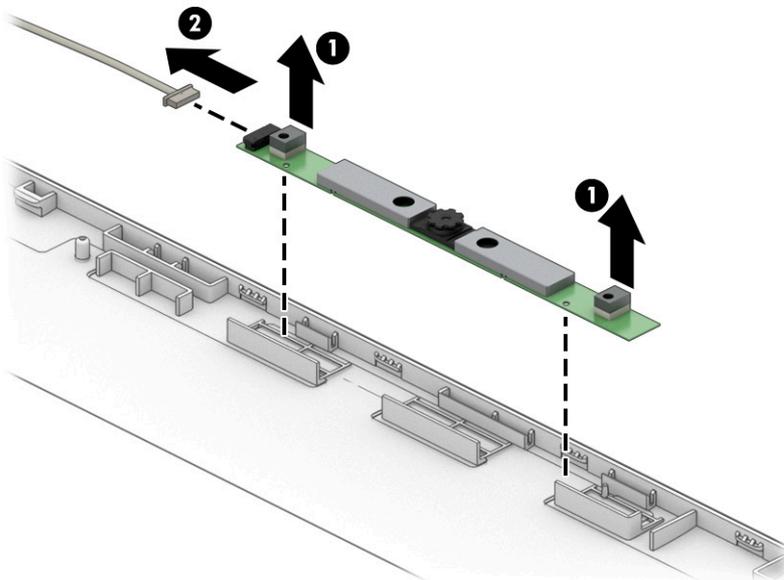
The display hinges are available using spare part number L72710-001.



9. If it is necessary to remove the webcam module:

- ▲ Lift evenly on both sides of the webcam module to detach it from the display back cover (1), and disconnect the cable from the module (2). (The webcam module is attached to the display back cover with double-sided adhesive.)

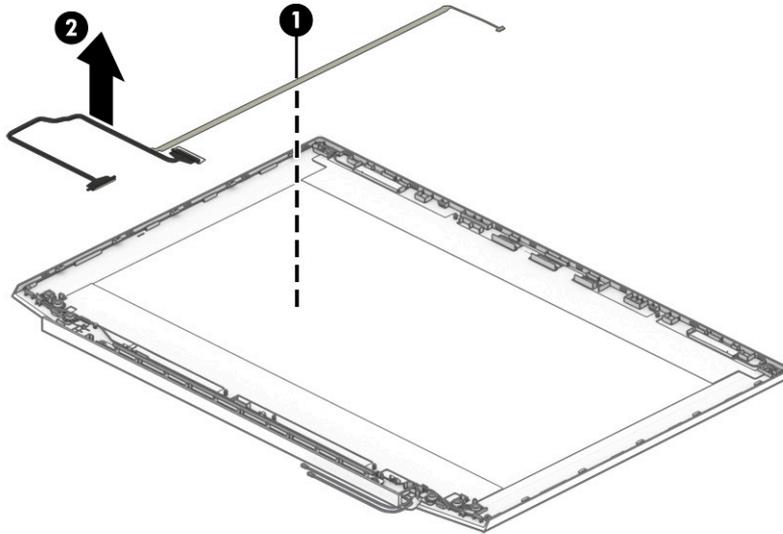
The webcam is available using spare part number L72721-001.



10. If it is necessary to remove the display panel cable:

- ▲ Peel the cable from the adhesive that secures it to the back of the display panel **(1)**, and then remove the cable **(2)**.

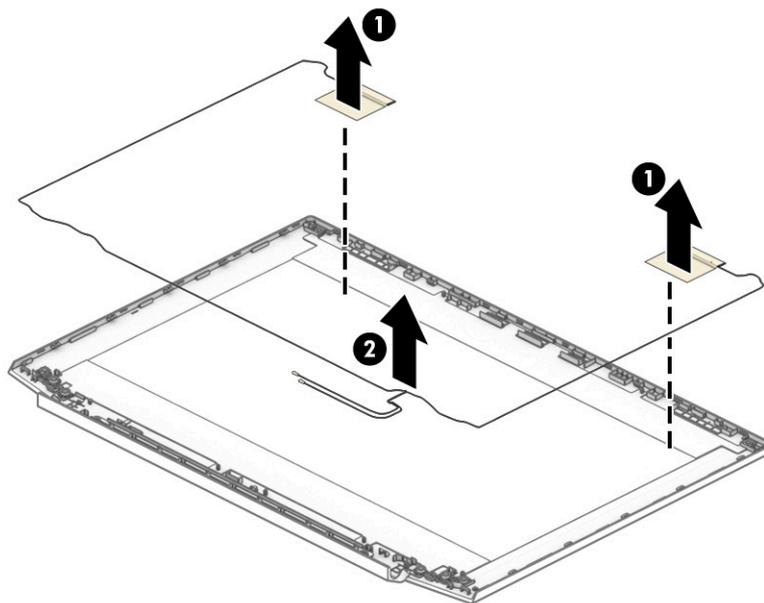
The display cable is available using spare part number L72719-001 for models without a 144 Hz display and L72720-001 for models with a 144 Hz display.



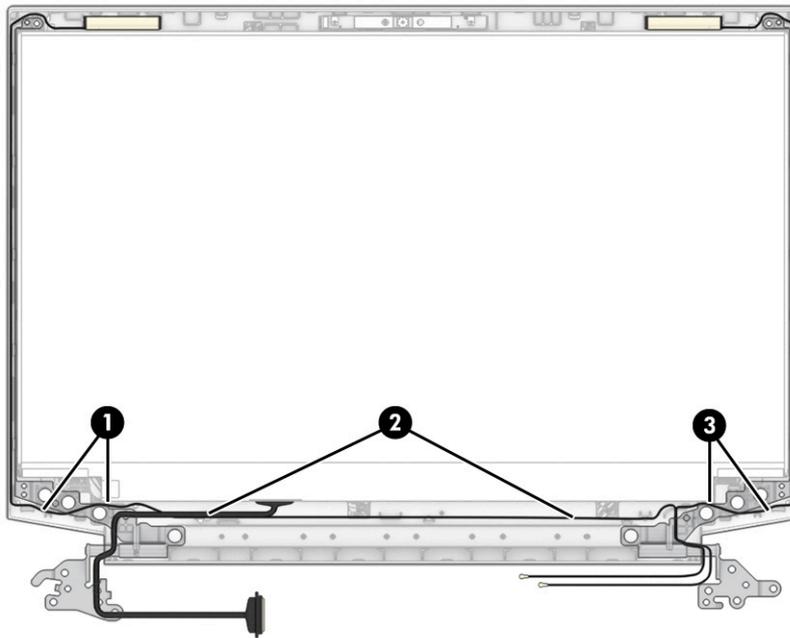
11. If it is necessary to remove the wireless antennas:

- a. Peel the antennas off the top of the display back cover **(1)**.
- b. Remove the antenna cables from the sides and bottom of the display back cover **(2)**.

The wireless antennas are available using spare part number L75188-001.



12. Use the following image to determine proper cable routing when reassembling the display.



The display back cover is available using the following spare part numbers:

L72711-001: Ghost white models with a 3.2 mm display panel

L72713-001: Acid green models with a 3.2 mm display panel

L72715-001: Ultra violet models with a 3.2 mm display panel

L72712-001: Ghost white models with a 2.6 mm display panel

L72714-001: Acid green models with a 2.6 mm display panel

L72716-001: Ultra violet models with a 2.6 mm display panel

Reverse these procedure to reassemble and install the display assembly.

Power connector

Table 6-10 Power connector description and part number

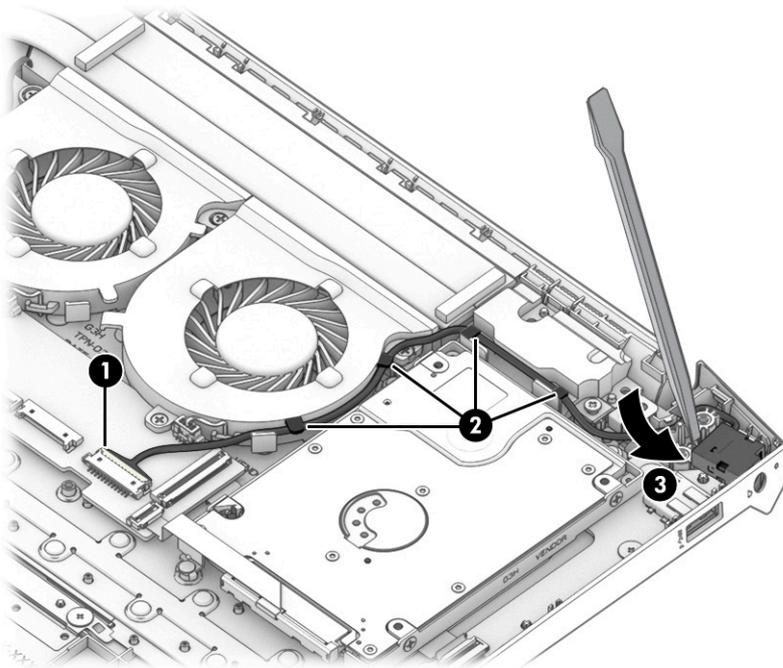
Description	Spare part number
Power connector for use in 200 W models	L72704-001
Power connector for use in 150 W models	L72703-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 27](#)).
2. Remove the bottom cover (see [Bottom cover on page 28](#)).
3. Disconnect the battery (see [Battery on page 37](#)).
4. Remove the display assembly (see [Display assembly on page 49](#)).

Remove the power connector cable:

1. Disconnect the cable from the system board **(1)**.
2. Remove the cable from its routing path around the hard drive and fan **(2)**.
3. Use a tool to release the connector **(3)**, and then remove it from the computer.



Reverse this procedure to install the power connector cable.

Keyboard/top cover

The top cover with keyboard remains after removing all other spare parts from the computer.

In this section, the first table provides the main spare part number for the top cover/keyboards. The second table provides the country codes.

Table 6-11 Keyboard/top cover description and part number

Description	Spare part number
Keyboard/top cover for use in acid green models	L72597-xx1
Keyboard/top cover for use in ghost white models with a backlit keyboard	L72598-xx1
Keyboard/top cover for use in ghost white models with a non-backlit keyboard	L72599-xx1
Keyboard/top cover for use in ultra violet models (available only for the following countries: -001, -281, -AB1, -AD1)	L72600-xx1

Table 6-12 Keyboard country codes

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	Israel	-BB1	South Korea	-AD1
Bulgaria	-261	Italy	-061	Spain	-071
Czech Republic and Slovakia	-FL1	Latin America	-161	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	Taiwan	-AB1
France	-051	Portugal	-131	Thailand	-281
French Canada	-DB1	Romania	-271	Turkey	-141
Germany	-041	Russia	-251	Ukraine	-BD1
Greece	-151	Saudi Arabia	-171	United Kingdom	-031
Hungary	-211	Slovenia	-BA1	United States	-001

7 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)

 **CAUTION:** 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) may 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 59](#)).
 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 [Downloading a BIOS update on page 60](#).

Downloading a BIOS update

 **CAUTION:** 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.

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 may 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.

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.

8 Using HP PC Hardware Diagnostics

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 61](#).

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

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:

- a. Select the **Start** button, and then select **HP Help and Support**.
- b. Select **HP PC Hardware Diagnostics Windows**.

– or –

To access HP PC Hardware Diagnostics Windows from HP Support Assistant:

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

– or –

Select the question mark icon in the taskbar.

- b. Select **Troubleshooting and fixes**.
- c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.

2. 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**.

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. The screen displays one of the following options:

- A Failure ID link is displayed. Select the link and follow the on-screen instructions.
- Instructions for calling support are displayed. Follow those instructions.

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

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

1. Go to <http://www.hp.com/go/techcenter/pcdiags>. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics Windows**, and then select a location on your computer or a USB flash drive.

The tool downloads to the selected location.

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

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

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to <http://www.hp.com/support>.
2. Select **Get 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.

- or -

You can use the following steps to download the HP PC Hardware Diagnostics Windows from the Microsoft Store:

1. Select the Microsoft 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.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, follow these steps:

- ▲ Navigate to the folder on your computer or the USB flash drive where the .exe file downloads, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

 **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 63](#).

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.

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

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 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 these steps:

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 63](#).

- 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 the following 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:

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)



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

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

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



NOTE: 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

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

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



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

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to <http://www.hp.com/support>.
2. Select **Get 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 the following 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 Backing up, restoring, and recovering

This chapter provides information about the following processes, which are standard procedure for most products:

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see [Using Windows tools on page 66](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 66](#)).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 66](#)).
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see [Using Windows tools on page 66](#)).

 **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

Using Windows tools

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

You can use Windows tools to back up personal information and create system restore points and recovery media.

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

For more information and steps, see the Get Help app.

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

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

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.

To download the tool:

- ▲ Go to the Microsoft Store and search for HP Cloud Recovery.

For details, go to <http://www.hp.com/support>, search for HP Cloud Recovery, and then select "HP PCs – Using the Cloud Recovery Tool (Windows 10, 7)."

 **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.

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see [Using Windows tools on page 66](#).

Recovering using HP Recovery media

HP Recovery media is used 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.

Changing the computer boot order

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

To change the boot order:

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

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 hold down the volume up button, and then select **f9**.

– or –

Turn on or restart the tablet, quickly hold down 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 OS recovery solution built into the hardware and firmware. 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>. Select **Find your product**, and then follow the on-screen instructions.

10 Specifications

Table 10-1 Computer specifications

	Metric	U.S.
Computer dimensions		
Width	360.0 mm	14.17 in
Depth	257.0 mm	10.12 in
Height	23.5 mm	0.93 in
Weight (solid-state drive models)	2252.0 g	4.96 lbs
Weight (hard drive models)	2342.0 g	5.16 lbs
Input power		
Rating		
Operating voltage and current	19.5 V dc @ 6.9 A – 135 W	
	19.5 V dc @ 7.70 A – 150 W	
	19.5 V dc @ 10.3 A – 200 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.

11 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 V ac, or from 220 to 240 V ac.

The 3-conductor power cord set included with the computer meets the requirements for use in the country or region where the equipment is purchased.

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

Requirements for all countries

The following 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 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

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

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The 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
The United Kingdom	ASTA	1
The United States	UL	2

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

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

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

12 Recycling

When a non-rechargeable 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 Web site at <http://www.hp.com/recycle>.

Index

- A**
 - AC adapter and battery light, identifying 6
 - action keys
 - identifying 11
 - antenna
 - removal 55
 - antennas
 - spare part number 55
 - audio, product description 2
 - audio-out (headphone)/audio-in (microphone) combo jack, identifying 5
- B**
 - back cover
 - spare part number 17
 - backup, creating 66
 - backups 66
 - battery
 - removal 37
 - spare part number 16, 37
 - bezel
 - spare part number 17, 51
 - BIOS
 - determining version 59
 - downloading an update 60
 - starting the Setup Utility 59
 - updating 59
 - Bluetooth label 13
 - boot order, changing 67
 - bottom components 12
 - bottom cover
 - removal 28
 - spare part number 28
 - bottom cover, spare part numbers 16
 - buttons
 - left touchpad 8
 - power 10
 - right touchpad 8
- C**
 - camera
 - identifying 7
 - camera light, identifying 7
 - caps lock light, identifying 9
 - cautions
 - electrostatic discharge 23
 - components
 - bottom 12
 - display 7
 - keyboard area 8
 - left side 6
 - rear 12
 - right side 5
 - computer major components 14
 - connectors
 - power 6
- D**
 - display assembly
 - removal 49
 - display back cover
 - spare part number 56
 - display cable
 - removal 55
 - display components 7
 - display panel
 - product description 1
 - removal 51
 - spare part numbers 17, 53
 - display panel cable
 - spare part numbers 17, 55
 - drive light, identifying 5
- E**
 - electrostatic discharge (ESD) 23
 - preventing damage 24
 - esc key, identifying 11
- F**
 - fans
 - removal 41
 - spare part number 15, 41
 - feet
 - removal 35
 - spare part number 35
 - fn key, identifying 11
- G**
 - graphics, product description 1
 - grounding methods 25
 - guidelines
 - packaging 26
 - transporting 26
 - workstation 23
- H**
 - hard drive
 - spare part number 15, 19
 - hard drive assembly
 - removal 33
 - spare part number 33
 - hard drive brackets
 - illustrated 19
 - hard drive connector
 - spare part number 15
 - hard drive connector/cable
 - spare part number 19, 33
 - HDMI port
 - identifying 6
 - heat sink
 - removal 42
 - spare part number 15, 42
 - hinge
 - removal 53
 - spare part number 54
 - hinges
 - spare part number 17
 - HP PC Hardware Diagnostics UEFI
 - downloading 63
 - starting 63
 - using 62
 - HP PC Hardware Diagnostics Windows
 - downloading 61
 - installing 62
 - using 61
 - HP Recovery media
 - recovery 67
 - HP Sure Recover 68
- I**
 - integrated numeric keypad, identifying 11

internal card expansion, product description 3
internal microphones, identifying 7

J

jacks
 audio-out (headphone)/audio-in (microphone) 5
 network 6
 RJ-45 (network) 6

K

keyboard/pointing devices, product description 3
keyboard/top cover
 removal 58
 spare part numbers 15, 58
keypad, integrated numeric 11
keys
 action 11
 esc 11
 fn 11
 num lock 11
 Windows 11

L

labels
 Bluetooth 13
 regulatory 13
 serial number 13
 service 13
 wireless certification 13
 WLAN 13
left side components 6
lights
 AC adapter and battery 6
 camera 7
 caps lock 9
 drive 5
 mute 9
 power 9
 RJ-45 (network) status 6

M

media card reader, product description 3
memory module
 removal 31
 spare part numbers 31
memory, product description 1

microphone
 product description 2
model name 1
mute light, identifying 9

N

network jack, identifying 6

O

operating system, product description 3

P

packaging guidelines 26
ports
 HDMI 6
 product description 2
 USB port with HP Sleep and Charge 6
 USB SuperSpeed 6
 USB Type-C 6
power button board
 spare part number 15
power button, identifying 10
power button/USB board
 removal 44
 spare part numbers 44
power connector
 identifying 6
power connector cable
 removal 57
 spare part number 15, 57
power cord
 requirements for all countries 70
 requirements for specific countries and regions 71
 set requirements 70
 spare part numbers 20
power lights, identifying 9
power requirements, product description 3
processor, product description 1
product description
 audio 2
 display panel 1
 graphics 1
 internal card expansion 3
 keyboard/pointing devices 3
 media card reader 3
 memory 1

microphone 2
operating system 3
ports 2
power requirements 3
processors 1
product name 1
RJ-45 (network) jack 2
security 3
sensors 2
serviceability 4
storage 1
video 2
 wireless networking 2
product name 1
product name and number, computer 13

R

recovery 66
 discs 67
 HP Recovery partition 67
 media 67
 USB flash drive 67
recovery media
 creating using HP Cloud Recovery Download Tool 66
 creating using Windows tools 66
regulatory information
 regulatory label 13
 wireless certification labels 13
Remote HP PC Hardware Diagnostics
UEFI settings
 customizing 64
 using 64
removal/replacement
 procedures 27
removal/replacement procedures 35
restoring 66
right side components 5
RJ-45 (network) jack, identifying 6
RJ-45 (network) jack, product description 2
RJ-45 (network) status lights, identifying 6

S

Screw Kit, spare part number 20
security, product description 3
sensors, product description 2

- serial number, computer 13
- service labels, locating 13
- serviceability, product description 4
- slots
 - memory card reader 5
- solid-state drive
 - removal 30
 - spare part number 16, 19
 - spare part numbers 30
- speakers
 - identifying 10
 - removal 48
 - spare part number 16, 48
- special keys, using 11
- static electricity 24
- storage, product description 1
- system board
 - removal 45
 - spare part numbers 45
- system restore point, creating 66

T

- touchpad
 - removal 40
 - settings 8
 - spare part numbers 15, 40
- touchpad buttons
 - identifying 8
- touchpad cable, spare part number 15, 40
- touchpad zone, identifying 8
- transporting guidelines 26
- traveling with the computer 13

U

- USB port with HP Sleep and Charge, identifying 6
- USB SuperSpeed port, identifying 6
- USB Type-C port, identifying 6

V

- vents, identifying 12
- video, product description 2

W

- webcam
 - spare part number 54
- webcam module
 - removal 54
- webcam/microphone module
 - spare part number 17

- Windows
 - backup 66
 - recovery media 66
 - system restore point 66
- Windows key, identifying 11
- Windows tools, using 66
- wireless antennas
 - spare part number 55
- wireless certification label 13
- wireless networking, product description 2
- WLAN antennas, identifying 7
- WLAN device 13
- WLAN label 13
- WLAN module
 - removal 38
 - spare part numbers 16, 38
- workstation guidelines 23