Maintenance and Service Guide

HP Pavilion Gaming 15 Laptop PC
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Product notice

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

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

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

Safety warning notice

⚠ **WARNING!** 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.

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1 Product description

Table 1-1 Product components and descriptions

Category	Description
Product Name	HP Pavilion Gaming 15 Laptop PC (model numbers 15-dk0000 through 15-dk0999; CTO model number 15t-dk000)
Processors	Intel™ Core® i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W) Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W)
Chipset	Intel HM370
Graphics	**Graphics Card:** Intel UHD Graphics 630 **Graphics Controller:** • NVIDIA® GeForce® GTX 1660Ti with 6-MB discrete memory • NVIDIA GeForce GTX 1650 with 4-MB discrete memory • NVIDIA GeForce GTX 1050 with 4-MB discrete memory • NVIDIA GeForce GTX 1050 with 3-MB discrete memory
Panel	• 15.6-in., ultra high-definition (UHD) (3840×2160), AntiGlare, white light-emitting diode (WLED), liquid crystal display (LCD), UWVA, 72, 340, eDP 1.3+PSR, ultraslim display panel • 15.6-in, full high-definition (FHD) (1920×1080), AntiGlare, WLED, LCD, UWVA, 72, 300, eDP 1.4+PSR, ultraslim, 144-MHz display panel • 15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 72, 300, eDP 1.2, ultraslim display panel • 15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 45, 250, slim display panel
Memory	Support for DDR4-2666, 1.2 V system memory Support for up to 32-GB of system memory in the following configurations: • 32-GB (16-GB×2) • 16-GB (16-GB×1) • 16-GB (8-GB×2) • 12-GB (8-GB×1 + 4-GB×1) • 8-GB (8-GB×1) • 8-GB (4-GB×2) • 4-GB (4-GB×1)
Storage	**Hard drive:** • 1-TB, 7200-rpm, 7.2-mm hard drive • 1-TB, 5400-rpm, 7.2-mm hard drive • 1-TB, 7200-rpm, 7.2-mm hard drive + 16-GB, M.2, PCIe-3×2 3D Xpoint Optane® solid-state drive **Solid-state drive:** • 1-TB, 2280, PCIe-3×4, NVMe, solid-state drive with three-layer cell (TLC) DS

Table 1-1 Product components and descriptions (continued)

Category	Description
Storage *(continued)*	• 512-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC • 512-GB, 2280, PCIe-3×2×2, NVMe, solid-state drive + 32-GB 3D XPoint • 512-GB, 2280, PCIe, NVMe, solid-state drive • 256-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC • 256-GB, 2280, PCIe solid-state drive • 128-GB, M.2 2280, PCIe-3×2 solid-state drive • 16-GB, M.2 2280, PCIe-3×2 solid-state drive **Hard drive + solid-state drive combination:** • 2-TB, 5400-rpm, 7.2-mm hard drive + 256-GB, M.2, PCIe, NVMe solid-state drive with TLC • 1-TB, 7200-rpm, 7.2-mm hard drive + 512-GB, M.2, PCIe, NVMe solid-state drive with TLC • 1-TB, 7200-rpm, 7.2-mm hard drive + 512-GB, PCIe solid-state drive • 1-TB, 7200-rpm, 7.2-mm hard drive + 256-GB, M.2, PCIe, NVMe solid-state drive with TLC • 1-TB, 7200-rpm, 7.2-mm hard drive + 128-GB, M.2, PCIe, NVMe solid-state drive with TLC • 1-TB, 5400-rpm, 7.2-mm hard drive + 128-GB, M.2, PCIe, NVMe solid-state drive with TLC
Audio and video	**Audio:** Integrated dual B and O speakers Support for HP Audio Boost **Camera:** Integrated one-piece fixed HD 720p-VSF2 camera **Microphones:** Dual-array microphone
Ethernet	Integrated 10/100/1000 network interface card (NIC)
Wireless	**Wireless local area network (WLAN) options:** Intel 9560 ac 2×2 MU-MIMO + Bluetooth® 5.0 M.2 non-vPro MIPI+BRI WW with two antennas Realtek RTL8822BE ac 2×2 MU-MIMO + Bluetooth 4.2 M.2 PCI-e WW with two antennas
External media cards	HP MultiFormat microSD® media card reader
Internal card expansion	One M.2 slot for solid-state drive One M.2 slot for WLAN module
Ports	• Audio-out (headphone)/audio-in (microphone) combo jack • High-definition multimedia interface (HDMI) 2.0 connector • HP Smart AC adapter power connector • RJ-45 jack • USB 3.0 Type-A port (3) • USB 3.1 Type-C Gen. 2 port
Security	Trusted Platform Module (TPM) 2.0 - Firmware
Sensor	Accelerometer
Power requirements	• Support for a 3-cell, 52-Wh, 4.55-Ah, Li-ion, battery

Table 1-1 Product components and descriptions (continued)

Category	Description
Power requirements *(continued)*	• Support for the following AC adapters: – 200-W HP Smart AC adapter (PFC, slim, 4.5-mm) – 150-W HP Smart AC adapter (PFC, slim, 4.5-mm) – 135-W HP Smart AC adapter (PFC, RC, slim, 4.5-mm) • Support for 1.00-m power cords with a C13 or C5 connectors
Operating system	• Windows® Home 64-bit • Windows Home 64-bit Advanced • Windows Home 64-bit Advanced Single Language • Windows Home 64-bit High-End Chinese Market CPP • Windows Home 64-bit Plus • Windows Home 64-bit Plus Single Language • Windows Home 64-bit Plus Single Language Africa Market PPP • Windows Home 64-bit Plus Single Language APAC EM PPP • Windows Home 64-bit Plus Single Language India Market PPP • Windows Home 64-bit Plus Single Language Indonesia Market PPP • Windows Home 64-bit Single Language • Windows Professional 64-bit • FreeDOS 3.0

2 External component identification

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

Locating hardware

To find out what hardware is installed on the computer:

- Type `device manager` in the taskbar search box, and then select the **Device Manager** app.

  A list displays all the devices installed on the computer.

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

Locating software

To find out what software is installed on the computer:

- Right-click the **Start** button, and then select **Apps and Features**.

Right side

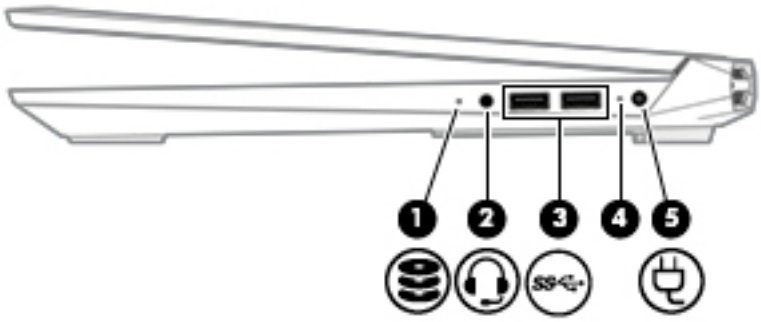


Table 2-1 Right-side components and their descriptions

Component		Description
(1)	Drive light	Blinking white: The hard drive is being accessed. Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. NOTE: When a device is connected to the jack, the computer speakers are disabled.
(3)	USB SuperSpeed ports	Connect USB devices, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.
(4)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.
(5)	Power connector	Connects an AC adapter.

Left side

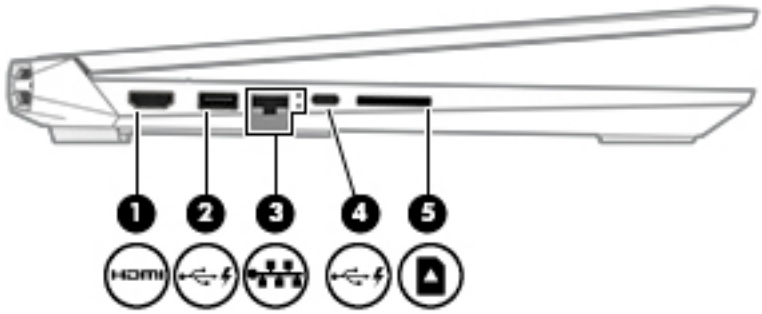


Table 2-2 Left-side components and their descriptions

Component		Description
(1)	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 HDMI device.
(2)	USB/audio 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.
(3)	RJ-45 (network) jack/status lights	• Connects a network cable. • White: The network is connected. • Amber: Activity is occurring on the network.
(4)	USB Type-C port with HP Sleep and Charge	Connects a USB device that has a Type-C connector, provides data transfer, and even when the computer is off,charges most products such as a cell phone, camera, activity tracker, or smartwatch. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort™ output. NOTE: Cables and/or adapters (purchased separately) may be required.
(5)	Memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.

Display

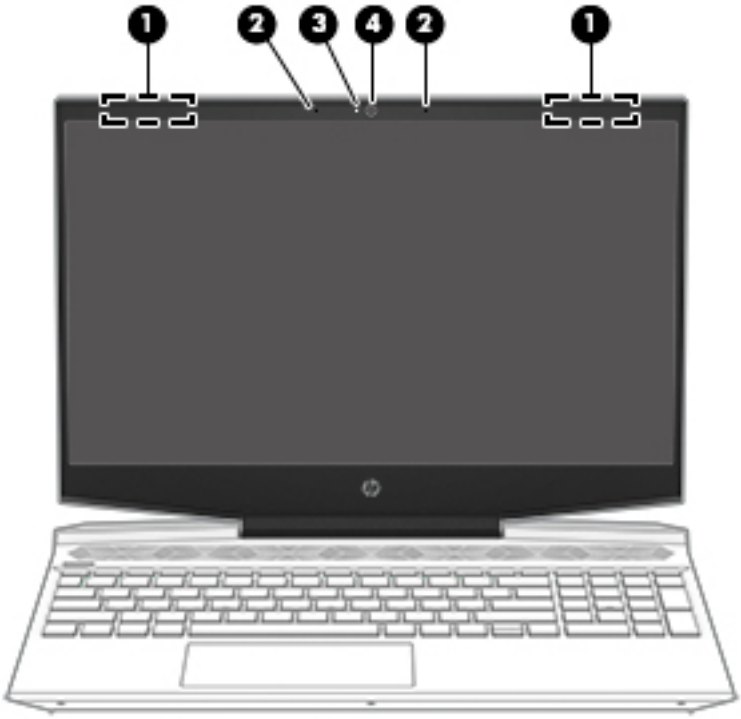


Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with WLANs.
(2)	Internal microphones (2)	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:

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

Keyboard area

Touchpad

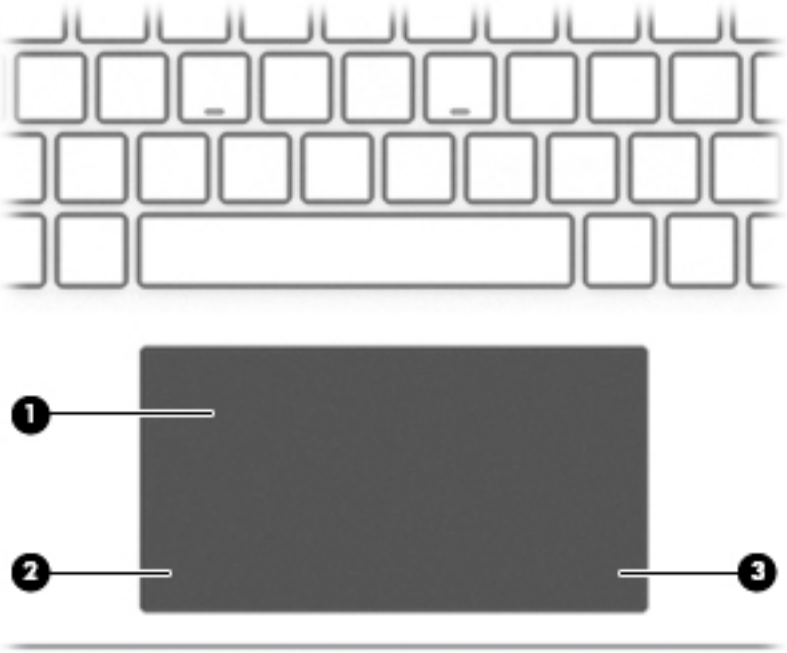


Table 2-4 Keyboard components and descriptions

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

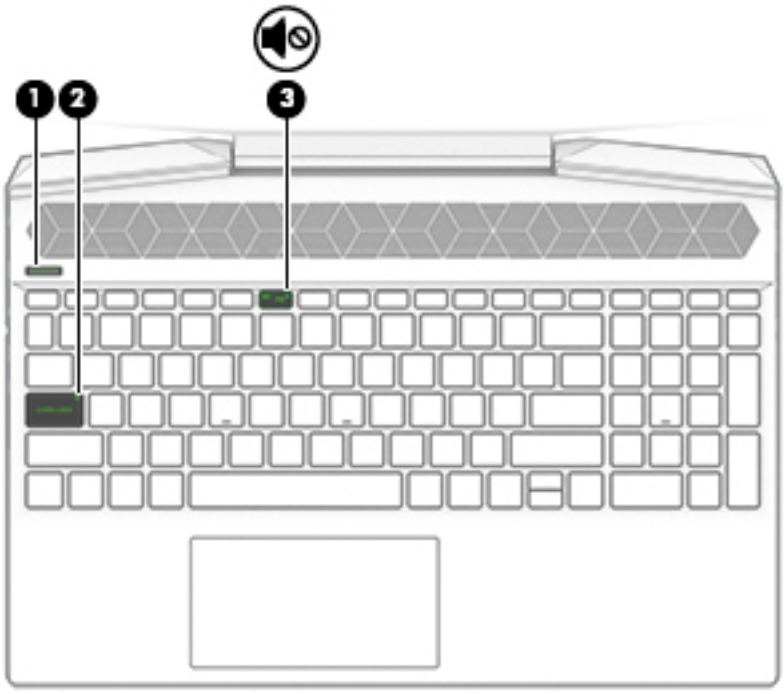


Table 2-5 Light components and their descriptions

Component		Description
(1)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.of power. • Off: The computer is off or in Hibernation. Hibernation is a 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	On: Computer sound is off. Off: Computer sound is on.

Button and speakers

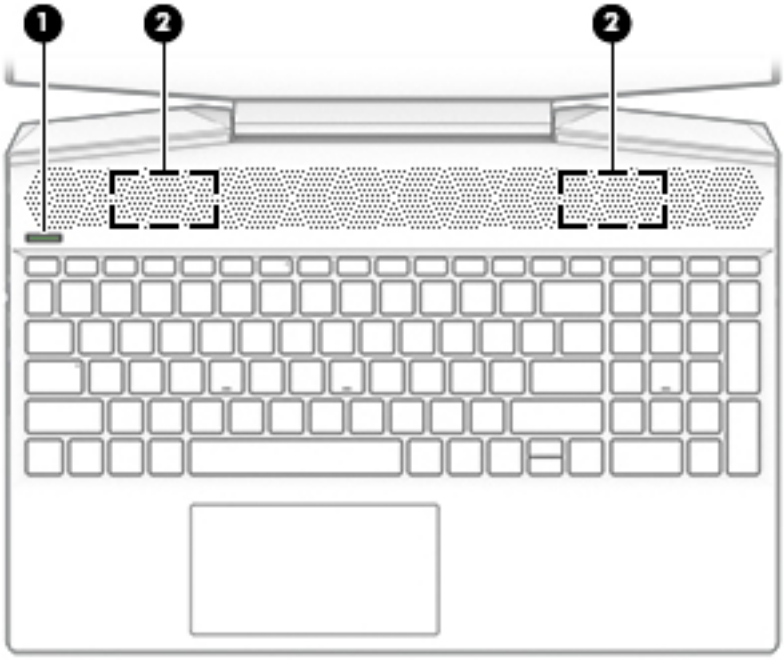


Table 2-6 Button and speakers components and their descriptions

Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only). • When the computer is in Hibernation, press the button briefly to exit Hibernation. CAUTION: Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.
(2)	Speakers (2)	Produce sound.

Special keys

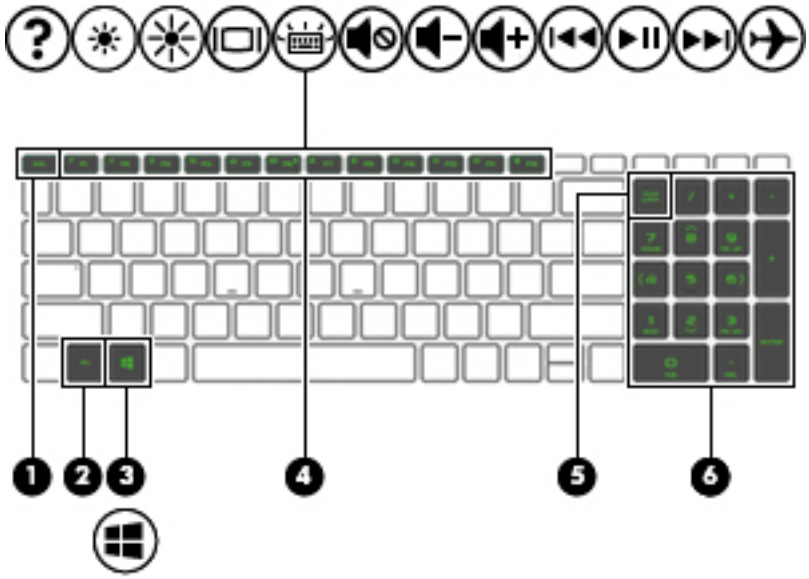


Table 2-7 Special key components and descriptions

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with another key. Such key combinations are called *hot keys*.
(3)	Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4)	Action keys	Execute frequently used system functions.
(5)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keyboard	A separate keypad to the right of the alphabet keyboard. When num lock is pressed, the keypad can be used like an external numeric keypad. NOTE: If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

Bottom

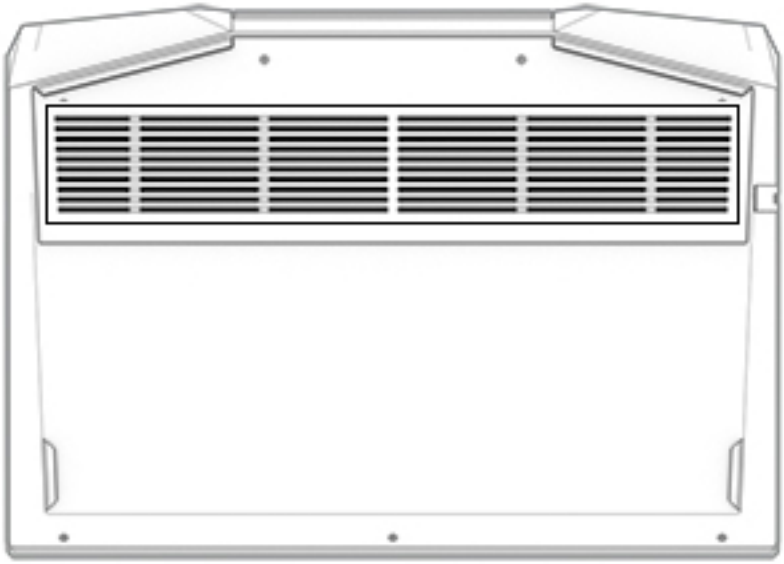


Table 2-8 Bottom component and description

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

Labels

The labels affixed to the computer provide information that may be needed when troubleshooting system problems or traveling internationally with the computer. Labels may be in paper form or imprinted on the product.

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

  The service label will resemble the example shown below:

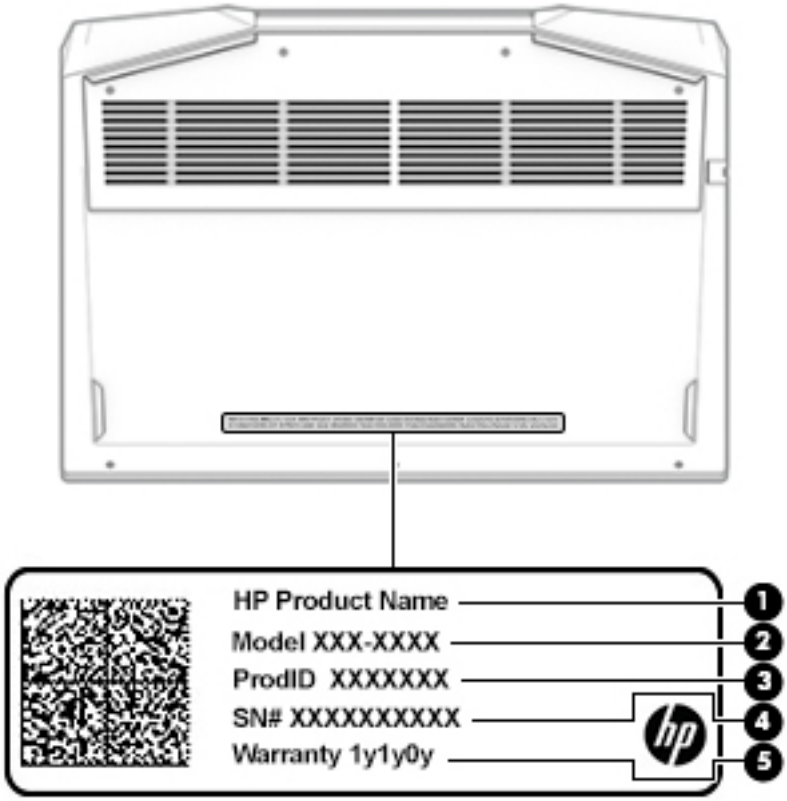


Table 2-9 Service label components and descriptions

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

3 Illustrated parts catalog

Computer major components

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

NOTE: Details about the computer, including model number, serial number, product identification, and length of warranty, are on the service tag at the bottom of the computer. See Labels on page 13 for details.

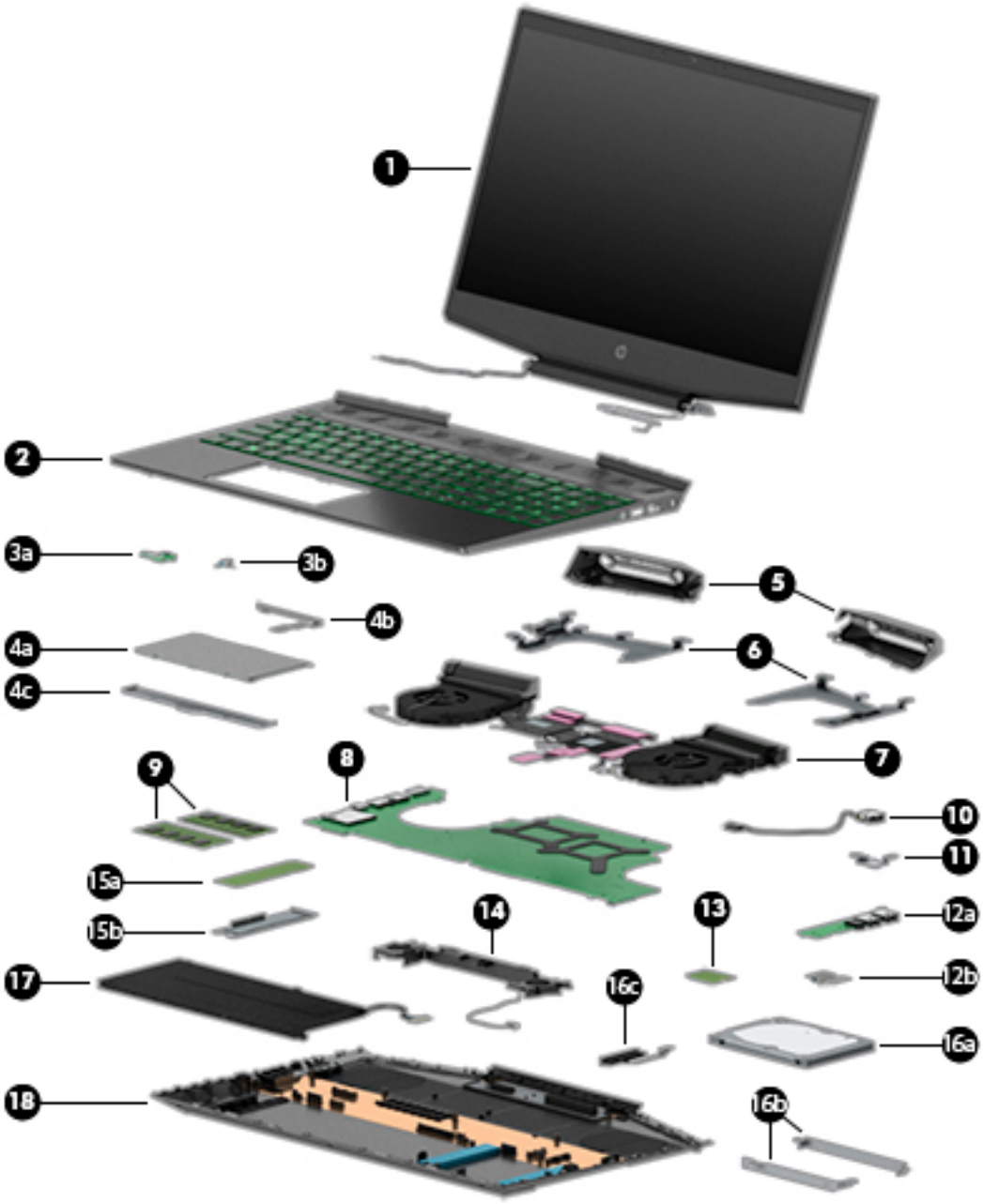


Table 3-1 Computer component descriptions and spare part information

Item	Component	Spare part number
(1)	**Display assembly:** The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display components on page 22.	
(2)	**Keyboard/top cover with backlight** (includes backlight cable and keyboard cable):	
	In acid green finish:	
	For use in Belgium	L57593-A41
	For use in Bulgaria	L57593-261
	For use in Canada	L57593-DB1

Table 3-1 Computer component descriptions and spare part information (continued)

Item	Component	Spare part number
	For use in the Czech Republic and Slovakia	L57593-FL1
	For use in Denmark, Finland, and Norway	L57593-DH1
	For use in France and Africa	L57593-FM1
	For use in Germany	L57593-041
	For use in Greece	L57593-151
	For use in Hungary	L57593-211
	For use in Israel	L57593-BB1
	For use in Italy	L57593-061
	For use in Latin America	L57593-161
	For use in the Netherlands	L57593-331
	For use in Portugal	L57593-131
	For use in Romania	L57593-271
	For use in Russia	L57593-251
	For use in Saudi Arabia	L57593-171
	For use in Slovenia	L57593-F81
	For use in South Korea	L57593-AD1
	For use in Spain	L57593-071
	For use in Switzerland	L57593-BG1
	For use in Taiwan	L57593-AB1
	For use in Thailand	L57593-281
	For use in Turkey	L57593-141
	For use in Uruguay	L57593-BD1
	For use in the United Kingdom	L57593-031
	For use in the United States	L57593-001
	In ghost white finish:	
	For use in Belgium	L57594-A41
	For use in Bulgaria	L57594-261
	For use in Canada	L57594-DB1
	For use in the Czech Republic and Slovakia	L57594-FL1
	For use in Denmark, Finland, and Norway	L57594-DH1
	For use in France and Africa	L57594-FM1
	For use in Germany	L57594-041
	For use in Greece	L57594-151

Table 3-1 Computer component descriptions and spare part information (continued)

Item	Component	Spare part number
	For use in Hungary	L57594-211
	For use in Israel	L57594-BB1
	For use in Italy	L57594-061
	For use in Japan	L57594-291
	For use in Latin America	L57594-161
	For use in the Netherlands	L57594-331
	For use in Portugal	L57594-131
	For use in Romania	L57594-271
	For use in Russia	L57594-251
	For use in Saudi Arabia	L57594-171
	For use in Slovenia	L57594-F81
	For use in South Korea	L57594-AD1
	For use in Spain	L57594-071
	For use in Switzerland	L57594-BG1
	For use in Taiwan	L57594-AB1
	For use in Thailand	L57594-281
	For use in Turkey	L57594-141
	For use in Uruguay	L57594-BD1
	For use in the United Kingdom	L57594-031
	For use in the United States	L57594-001
	In ultraviolet finish:	
	For use in South Korea	L57596-AD1
	For use in Taiwan	L57596-AB1
	For use in Thailand	L57596-281
	For use in the United States	L57596-001
	Keyboard/top cover without backlight (includes keyboard cable):	
	In ghost white finish:	
	For use in Belgium	L57595-A41
	For use in Bulgaria	L57595-261
	For use in Canada	L57595-DB1
	For use in the Czech Republic and Slovakia	L57595-FL1
	For use in Denmark, Finland, and Norway	L57595-DH1
	For use in France and Africa	L57595-FM1

Table 3-1 Computer component descriptions and spare part information (continued)

Item	Component	Spare part number
	For use in Germany	L57595-041
	For use in Greece	L57595-151
	For use in Hungary	L57595-211
	For use in Israel	L57595-BB1
	For use in Italy	L57595-061
	For use in Japan	L57595-291
	For use in Latin America	L57595-161
	For use in the Netherlands	L57595-331
	For use in Portugal	L57595-131
	For use in Romania	L57595-271
	For use in Russia	L57595-251
	For use in Saudi Arabia	L57595-171
	For use in Slovenia	L57595-F81
	For use in South Korea	L57595-AD1
	For use in Spain	L57595-071
	For use in Switzerland	L57595-BG1
	For use in Taiwan	L57595-AB1
	For use in Thailand	L57595-281
	For use in Turkey	L57595-141
	For use in Uruguay	L57595-BD1
	For use in the United Kingdom	L57595-031
	For use in the United States	L57595-001
(3a)	**Power button board** (does not include cable):	
	In acid green finish	L56907-001
	In ghost green finish	L57172-001
	In ultraviolet finish	L57173-001
(3b)	**Power button board cable** (not illustrated)	L56908-001
(4a)	**Touchpad** (includes touchpad bracket, does not include cable)	L56905-001
(4b)	**Touchpad cable** (not illustrated, includes double-sided adhesive)	L56906-001
(4c)	**Touchpad bracket** (included in the touchpad spare part kit)	
(5)	**Hinge trunks** (2)	L56911-001
(6)	**Hinge brackets** (2, not available as a spare part)	
(7)	**Fan/heat sink assembly:**	

Table 3-1 Computer component descriptions and spare part information (continued)

Item	Component	Spare part number
	For use only on computer models equipped with an NVIDIA GeForce GTX 1660Ti graphics controller	L57171-001
	For use only on computer models equipped with an NVIDIA GeForce GTX 1650 graphics controller	L57170-001
	For use only on computer models equipped with an NVIDIA GeForce GTX 1050 graphics controller	L56900-001
	Thermal Grease Replacement Kits (not illustrated):	
	Includes Liquid Metal thermal grease and normal thermal grease	L65923-001
	Includes only normal thermal grease	L65268-001
	Thermal Pad Replacement Kit (not illustrated)	L56901-001
(8)	**System board** (includes processor and replacement thermal material):	
	Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and the Windows 10 operating system	L58867-601
	Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and a non-Windows 10 operating system	L58867-001
	Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58865-601
	Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58865-001
	Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58868-601
	Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58868-001
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and the Windows 10 operating system	L58866-601
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and a non-Windows 10 operating system	L58866-001
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58864-601
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58864-001
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58863-601

Table 3-1 Computer component descriptions and spare part information (continued)

Item	Component	Spare part number
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58863-001
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 3-GB of discrete memory, and the Windows 10 operating system	L58862-601
	Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 3-GB of discrete memory, and a non-Windows 10 operating system	L58862-001
	Thermal Grease Replacement Kits (not illustrated):	
	Includes Liquid Metal thermal grease and normal thermal grease	L65923-001
	Includes only normal thermal grease	L65268-001
	Thermal Pad Replacement Kit (not illustrated)	L56901-001
(9)	**Memory modules** (2, DDR4, 2666 MHz, 1.2 V):	
	16 GB	937438-855
	8 GB	937236-855
	4 GB	L10598-855
(10)	**Power connector cable** (includes AC adapter and battery light)	L56904-001
(11)	**I/O bracket** (not available as a spare part)	
(12a)	**USB/audio board** (includes 2 USB ports and 1 audio combo jack; does not include cable)	L56902-001
(12b)	**USB/audio board cable**	L56903-001
(13)	**WLAN module:**	
	Intel 9560 ac 2×2 MU-MIMO + Bluetooth 5.0 M.2 non-vPro MIPI+BRI WW with two antenna	L22634-005
	Realtek RTL8822BE ac 2×2 MU-MIMO + Bluetooth 4.2 M.2 PCI-e WW with two antenna	924813-855
(14)	**Speakers** (includes left and right speakers, cables, and rubber isolator)	L56909-001
(15a)	**Solid-state drive:**	
	512-GB, 2280, PCIe-3×2×2, NVMe, solid-state drive + 32-GB 3D XPoint	L56896-001
	512-GB, PCIe-3×4 solid-state drive	L57003-001
	512-GB, 2280, PCIe, NVMe, solid-state drive	L56895-001
	256-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC	L56894-001
	256-GB, PCIe-3×2 solid-state drive	L57002-001
	128-GB, M.2 2280, PCIe-3×2 solid-state drive	L56893-001
	16-GB, M.2 2280, PCIe-3×2 solid-state drive	L56897-001
(15b)	**Solid-state drive shield**	L56903-001
(16a)	**Hard drive** (does not include hard drive bracket or hard drive cable):	
	2-TB, 5400-rpm, 7.2-mm	912487-855

Table 3-1 Computer component descriptions and spare part information (continued)

Item	Component	Spare part number
	1-TB, 7200-rpm, 7.2-mm	L06427-855
	1-TB, 5400-rpm, 7.2-mm	L30422-005
(16b)	Hard drive bracket (not available as a spare part)	
(16c)	Hard drive cable	L56898-001
(17)	**Battery** (3-cell, 52-Wh, 4.55-Ah, Li-Ion, includes cable)	L48495-005
(18)	**Bottom cover** (includes shielding, heat sink grounding pads, and the RJ-45 cover):	
	For use only on computer models in acid green or ultraviolet finish	L65255-001
	For use only on computer models in ghost white finish	L56892-001

Display components

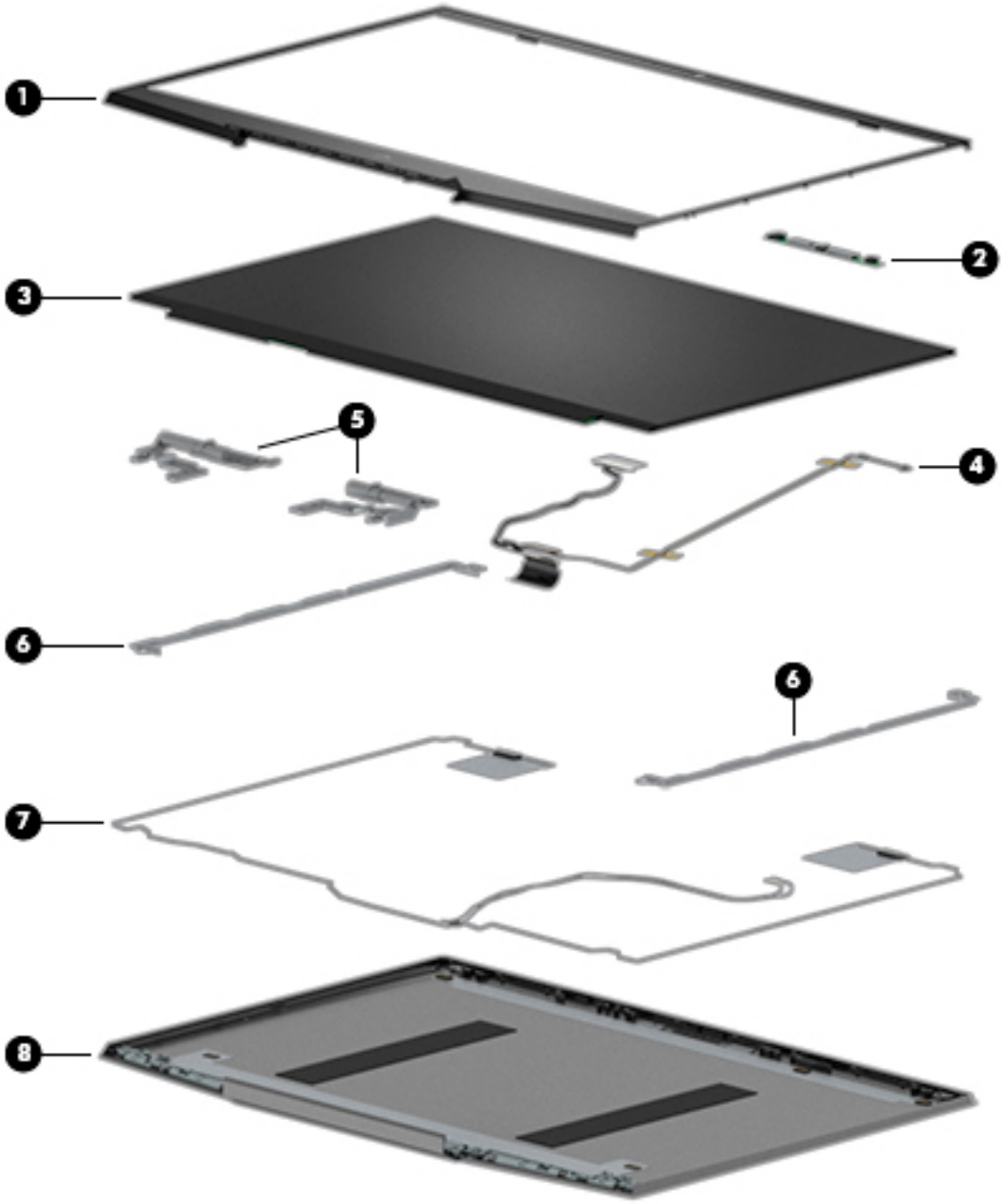


Table 3-2 Display component descriptions and spare part information

Item	Component	Spare part number
(1)	Display bezel	L58774-001
(2)	Webcam/microphone module (includes double-sided adhesive)	L56916-001
(3)	Display panel:	
	15.6-in, UHD (3840×2160), AntiGlare, WLED, LCD, UWVA, 72, 340, eDP 1.3+PSR, ultraslim	L56920-001
	15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 72, 300, eDP 1.4+PSR, ultraslim, 144-MHz	L56919-001

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

Item	Component	Spare part number
	15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 72, 300, eDP 1.2, ultraslim	L56918-001
	15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 45, 250, slim	L56917-001
(4)	**Display panel cable:**	
	40-pin	L58775-001
	30-pin	L56912-001
(5)	**Display Hinge Kit** (includes left and right hinges)	L56910-001
(6)	**Display brackets** (not available as a spare part)	
(7)	**Wireless Antenna Kit** (includes auxiliary and main wireless antenna cables and transceivers and adhesive)	L56913-001
(8)	**Display back cover** (includes auxiliary and main wireless antenna cables):	
	In acid green finish	L56914-001
	In ghost white finish	L56915-001
	In ultraviolet finish	L57174-001

Miscellaneous parts

Table 3-3 Miscellaneous components and descriptions

Component	Spare part number
AC adapter:	
200-W HP Smart AC adapter (PFC, slim, 4.5-mm)	L00818-850
150-W HP Smart AC adapter (PFC, slim, 4.5-mm)	L32661-001
135-W HP Smart AC adapter (PFC, RC, slim, 4.5-mm)	L15534-001
HP HDMI–to–VGA adapter	701943-001
HP optical drive	747080-001
Power cord (C13 connector, 1.00-m, premium with sticker):	
For use in Argentina	L22104-001
For use in Australia	L22339-001
For use in Chile	L22103-001
For use in Denmark	L22334-001
For use in Europe	L22333-001
For use in India	L22343-001
For use in Israel	L22335-001
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
Power cord (C5 connector, 1.00-m, conventional with sticker):	
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

Table 3-3 Miscellaneous components and descriptions (continued)

Component	Spare part number
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
Screw Kit	L57175-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

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

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. Use care when handling the plastic.

Cables and connectors

⚠ CAUTION: 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

⚠ CAUTION: 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 one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Electrostatic discharge damage

Electronic components are sensitive to electrostatic discharge (ESD). Circuitry design and structure determine the degree of sensitivity. Networks built into many integrated circuits provide some protection, but in many cases, ESD contains enough power to alter device parameters or melt silicon junctions.

A discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Even if the spark is neither felt nor heard, damage may have occurred.

An electronic device exposed to ESD may not be affected at all and can work perfectly throughout a normal cycle. Or the device may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

⚠ CAUTION: To prevent damage to the tablet 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.

The following table shows how humidity affects the electrostatic voltage levels generated by different activities.

⚠ CAUTION: A product can be degraded by as little as 700 V.

Table 4-1 Typical electrostatic voltage levels

Typical electrostatic voltage levels			
	Relative humidity		
Event	10%	40%	55%
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

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.

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 Styrofoam.
- 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.

Equipment guidelines

Grounding equipment must include either a wrist strap or a foot strap at a grounded workstation.

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or 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 foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

The following table lists the shielding protection provided by antistatic bags and floor mats.

Table 4-2 Shielding protection provided by antistatic bags and floor mats

Material	Use	Voltage protection level
Antistatic plastics	Bags	1,500 V
Carbon-loaded plastic	Floor mats	7,500 V
Metallized laminate	Floor mats	5,000 V

5 Removal and replacement procedures

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

⚠ CAUTION: 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.

CAUTION: This computer does not have user-replaceable parts. Only HP authorized service providers should perform the removal and replacement procedures described here. Accessing the internal part could damage the computer or void the warranty.

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 on 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 71 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Bottom cover

NOTE: The bottom cover spare part kit includes shielding, fan/heat sink assembly grounding pads, and the RJ-45 cover.

Table 5-1 Bottom cover description and spare part number information

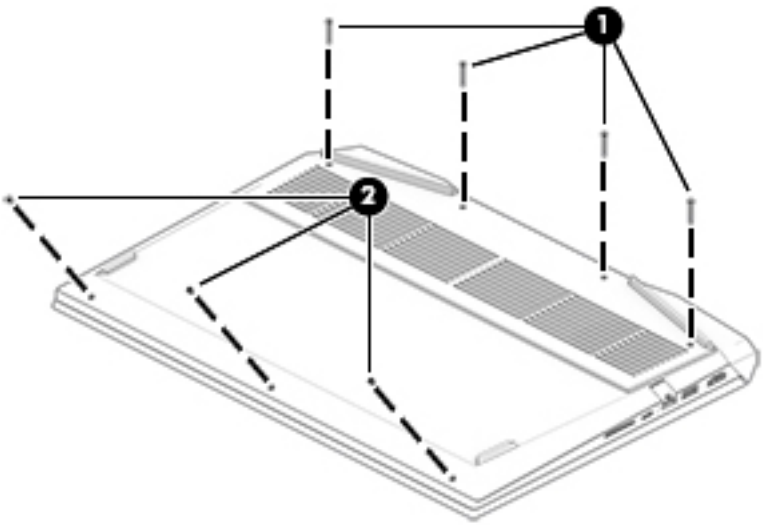
Description	Spare part number
For use only on computer models in acid green and ultraviolet finish	L65255-001
For use only on computer models in ghost white finish	L56892-001

Before disassembling the computer, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

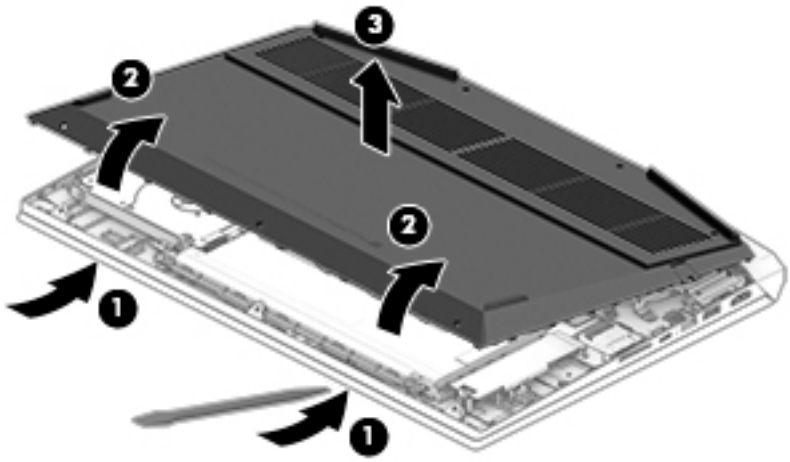
Remove the bottom cover:

1. Turn the computer upside down with the front toward you.
2. Remove the four Phillips M2.0×14.6 screws (1) that secure the bottom cover to the computer.
3. Remove the three Phillips M2.0×3.0 screws (2) that secure the bottom cover to the computer.



4. Use a case utility tool (1) or similar thin plastic tool to separate the left and right front edges of the bottom cover from the keyboard/top cover.
5. Disengage the left and right sides (2) of the bottom cover from the keyboard/top cover.

6. Remove the bottom cover (3).



Reverse this procedure to install the bottom cover.

Memory module

Table 5-2 Memory module description and spare part number information

Description	Spare part number
16-GB memory module (DDR4, 2666 MHz, 1.2 V)	937438-855
8-GB memory module (DDR4, 2666 MHz, 1.2 V)	937236-855
4-GB memory module (DDR4, 2666 MHz, 1.2 V)	L10598-855

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.

⚠ CAUTION: Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

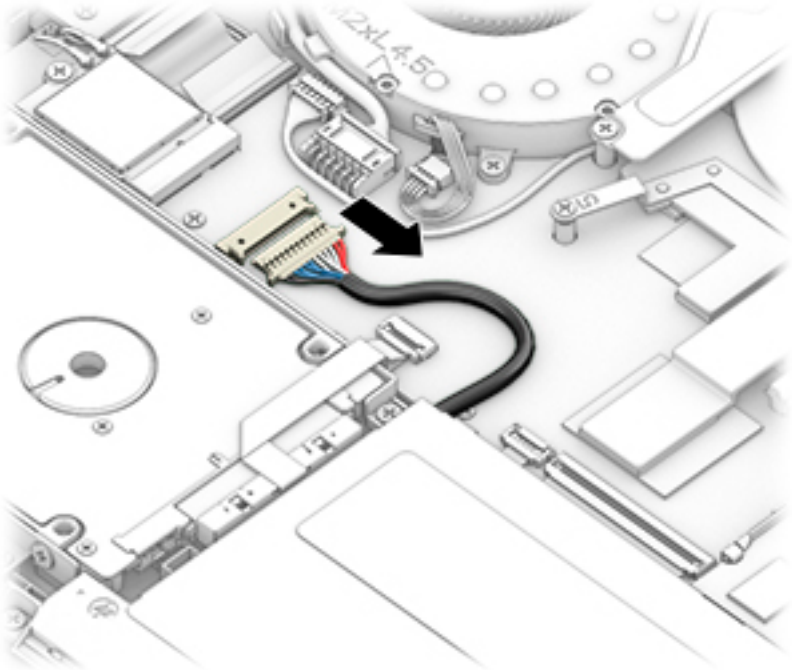
1. Navigate to www.hp.com.
2. Click **Support & Drivers**, and then click **Drivers & Software**.
3. In the **Enter a product name/number box**, type the computer model information, and then click **Search**.
4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. Under **Step 2: Select a Download**, click the **BIOS** link.
7. Click the link for the most recent BIOS.
8. Click the **Download** button, and then follow the on-screen instructions.

Before removing the memory module, follow these steps:

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 first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).

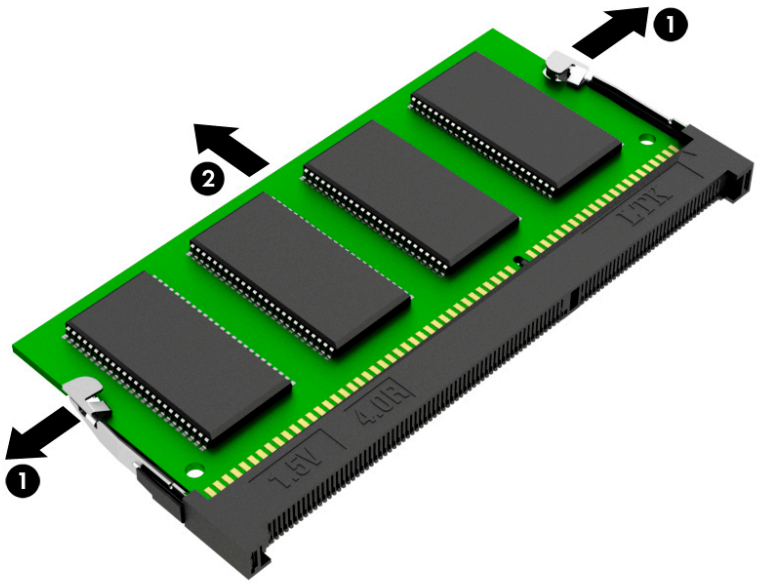
Remove the memory module:

1. Disconnect the battery cable from the system board.



2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)
3. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the memory module.

Battery

Table 5-3 Battery description and spare part number information

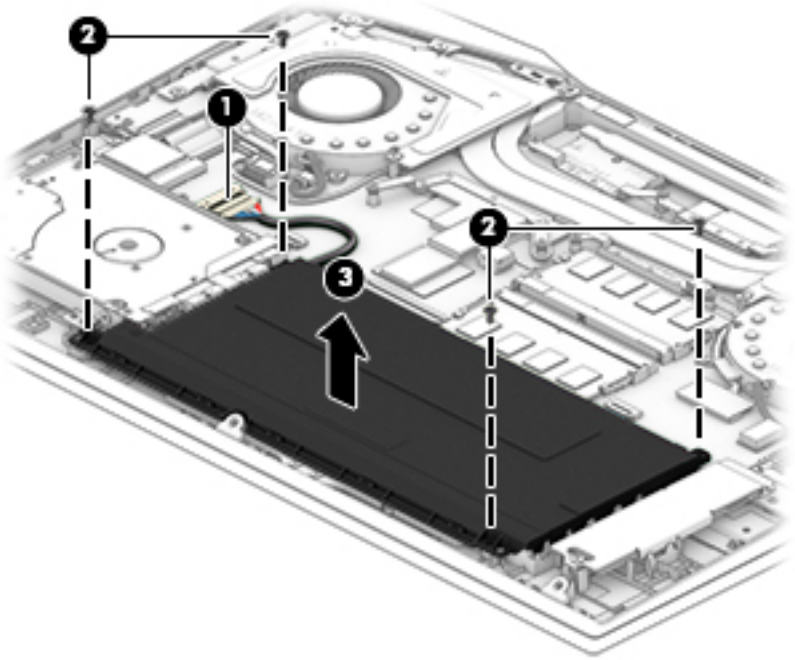
Description	Spare part number
3-cell, 52-Wh, 4.55-Ah, Li-Ion battery (includes cable)	L48495-005

Before removing the battery, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Remove the front memory module (see Memory module on page 34).

Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.
2. Remove the four Phillips M2.0×4.5 screws **(2)** that secure the battery to the keyboard/top cover.
3. Remove the battery **(3)**.



Reverse this procedure to install the battery.

Hard drive

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

Table 5-4 Hard drive description and spare part number information

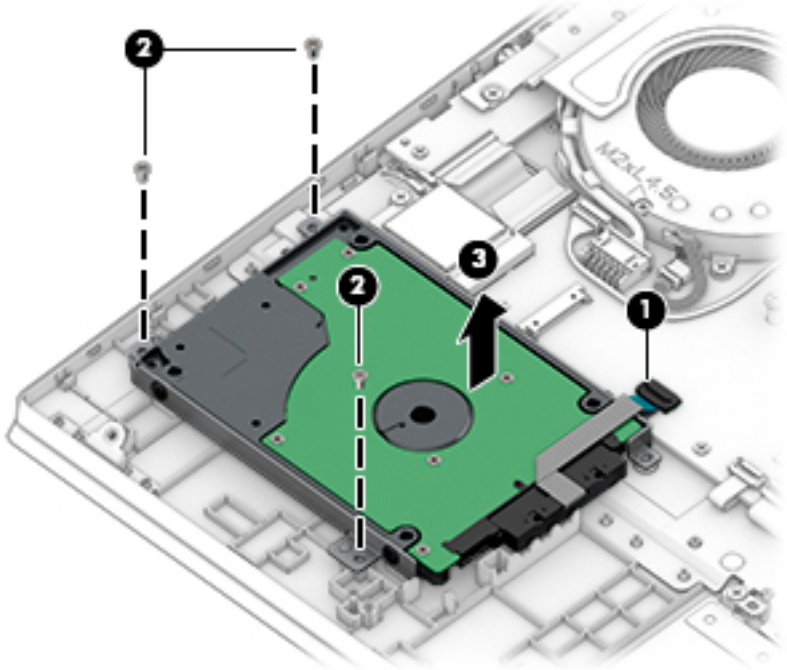
Description	Spare part number
2-TB, 5400-rpm, 7.2-mm	912487-855
1-TB, 7200-rpm, 7.2-mm	L06427-855
1-TB, 5400-rpm, 7.2-mm	L30422-005

Before removing the hard drive, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).

Remove the hard drive:

1. Release the zero insertion force (ZIF) connector **(1)** to which the hard drive cable is connected, and then disconnect the hard drive cable from the system board.
2. Remove the three Phillips M2.0×3.5 screws **(2)** that secure the hard drive to the keyboard/top cover.
3. Remove the hard drive **(3)**.

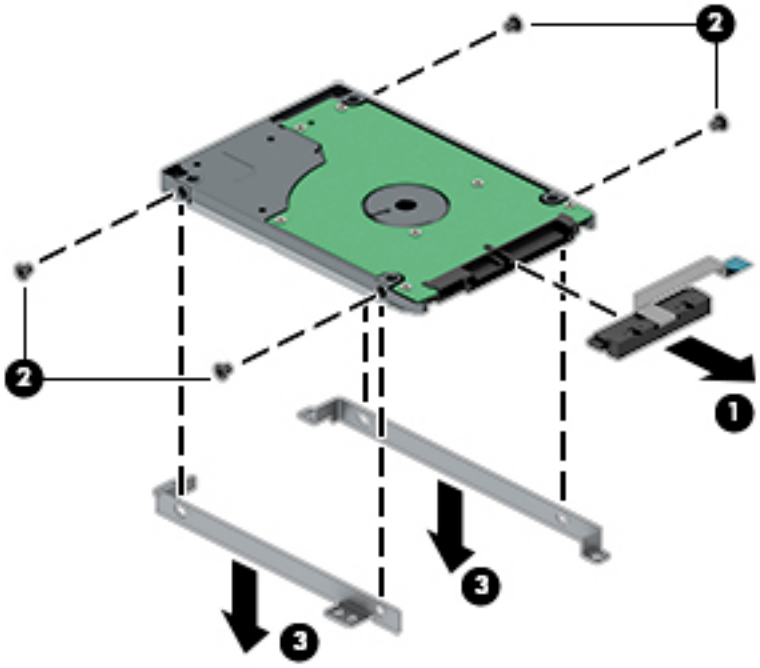


4. If it is necessary to disassemble the hard drive, disconnect the hard drive cable **(1)** from the hard drive.

   The hard drive cable is available using spare part number L56898-001.
5. Remove the four Phillips M3.0×3.0 screws **(2)** that secure the hard drive brackets to the hard drive.

6. Remove the hard drive brackets **(3)**.

   The hard drive brackets are not available as a spare part.



Reverse this procedure to reassemble and install the hard drive.

WLAN module

Table 5-5 WLAN module description and spare part number information

Description	Spare part number
Intel 9560 ac 2×2 MU-MIMO + Bluetooth 5.0 M.2 non-vPro MIPI+BRI WW with two antenna	L22634-005
Realtek RTL8822BE ac 2×2 MU-MIMO + Bluetooth 4.2 M.2 PCI-e WW with two antenna	924813-855

⚠ CAUTION: 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. 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 first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).

Remove the WLAN module:

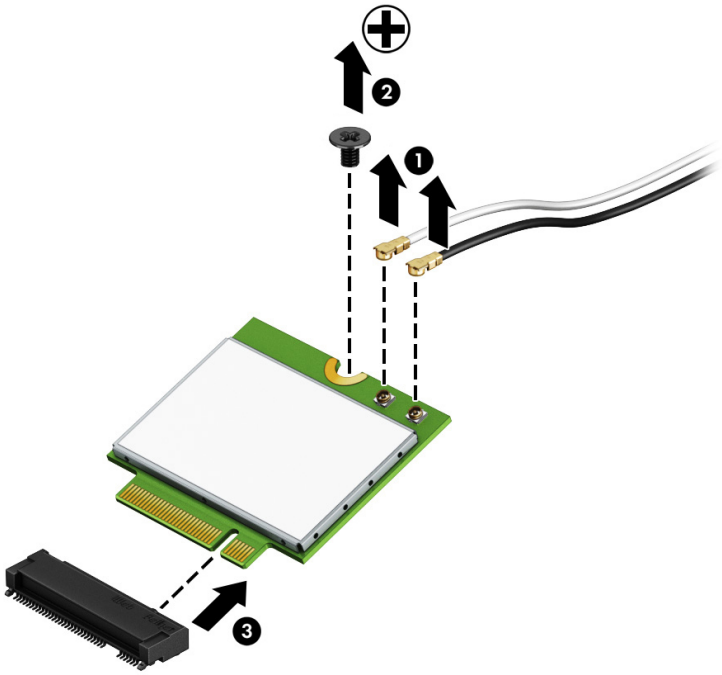
1. Disconnect the WLAN antenna cables **(1)** from the WLAN module.

NOTE: 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 "#2/Aux" terminal.

2. Remove the Phillips M2.0×4.5 screw **(2)** that secures the WLAN module to the keyboard/top cover.

3. Remove the WLAN module **(3)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WLAN module.

Solid-state drive

Table 5-6 Solid-state drive description and spare part number information

Description	Spare part number
512-GB, 2280, PCIe-3×2×2, NVMe, solid-state drive + 32-GB 3D XPoint	L56896-001
512-GB, PCIe-3×4 solid-state drive	L57003-001
512-GB, 2280, PCIe, NVMe, solid-state drive	L568985-001
256-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC	L56894-001
256-GB, PCIe-3×2 solid-state drive	L57002-001
128-GB, M.2 2280, PCIe-3×2 solid-state drive	L56893-001
16-GB, M.2 2280, PCIe-3×2 solid-state drive	L56897-001

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

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).

Remove the solid-state drive:

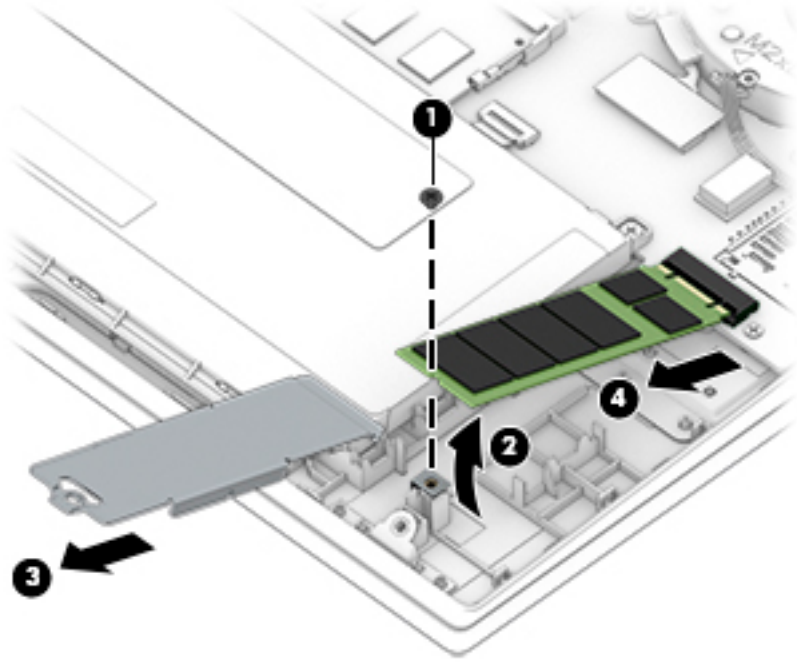
1. Remove the Phillips M2.0×4.5 screw **(1)** that secures the solid-state drive and shield to the keyboard/top cover.

   The solid-state drive **(2)** and shield rise up.
2. Remove the solid-state drive shield **(3)**.

   The solid-state drive shield is available using spare part number L56903-001.

3. Remove the solid-state drive **(4)** by pulling it away from the connector at an angle.

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



Reverse this procedure to install the solid-state drive.

USB/audio board cable

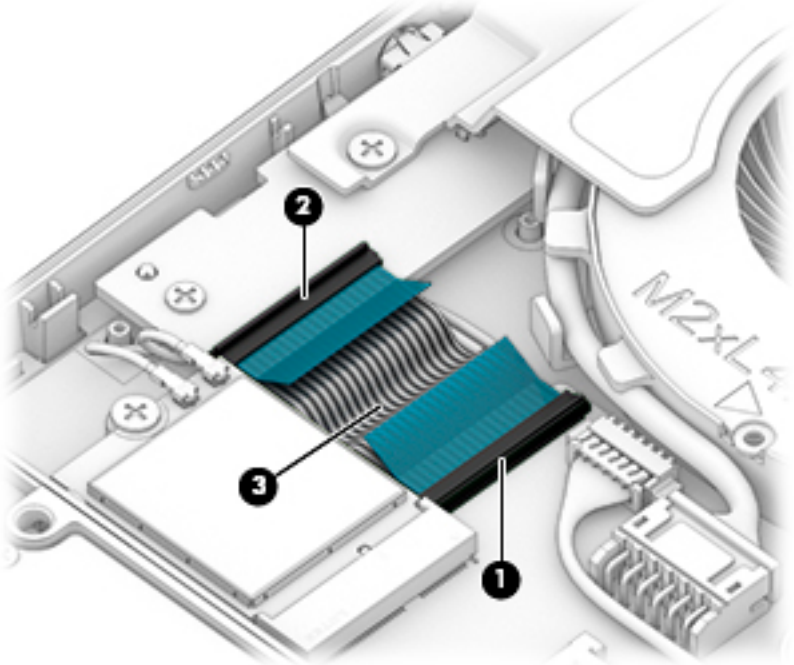
NOTE: The USB/audio board cable is available using spare part number L56903-001.

Before removing the USB/audio board cable, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).

Remove the USB/audio board cable:

1. Release the ZIF connector **(1)** to which USB/audio board cable is connected, and then disconnect the USB/audio board cable from the system board.
2. Release the ZIF connector **(2)** to which USB/audio board cable is connected, and then disconnect the USB/audio board cable from the USB/audio board.
3. Remove the USB/audio board cable **(3)**.



Reverse this procedure to install the USB/audio board cable.

Hinge trunks

Table 5-7 Hinge trunks description and spare part number information

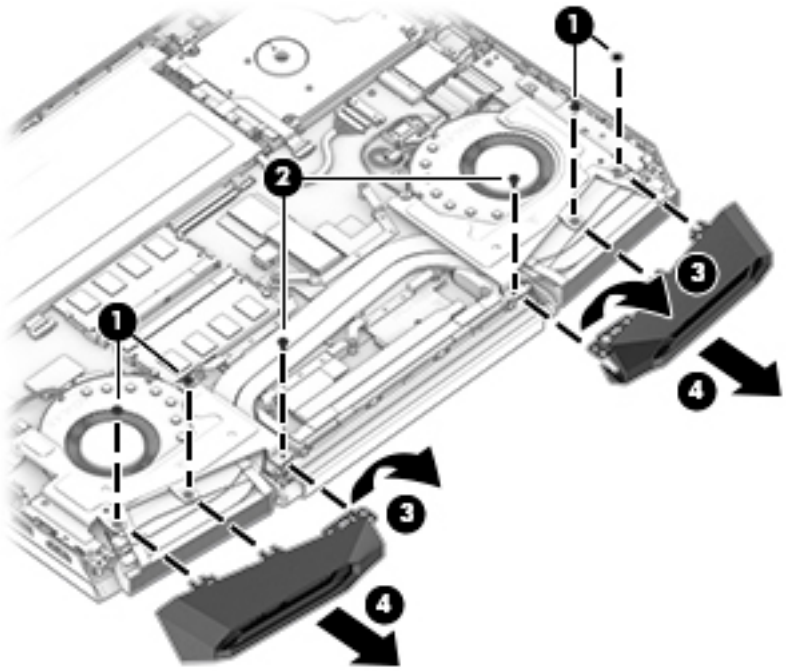
Description	Spare part number
Hinge trunks (2)	L56911-001

Before removing the hinge trunks, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).

Remove the hinge trunks:

1. Remove the four Phillips M2.0×1.6 broad head screws **(1)** that secure the hinge trunks to the fan brackets.
2. Remove the two Phillips M2.0×4.5 screws **(2)** that secure the hinge trunks to the fan brackets.
3. Flex the top edges **(3)** of the hinge trunks to disengage them from the keyboard/top cover.
4. Remove the hinge trunks **(4)** by sliding them away from the keyboard/top cover.



Reverse this procedure to install the hinge trunks.

Fan brackets

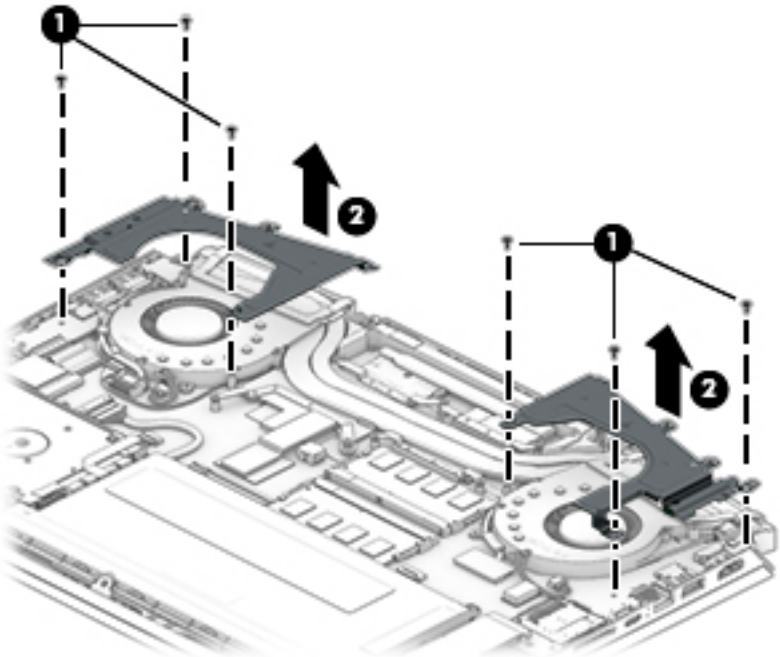
NOTE: The fan brackets are not available as a spare part.

Before removing the fan brackets, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).
6. Remove the hinge trunks (see Hinge trunks on page 44).

Remove the fan brackets:

1. Remove the six Phillips M2.0×4.5 screws **(1)** that secure the fan brackets to the keyboard/top cover.
2. Remove the fan brackets **(2)**.



Reverse this procedure to install the fan brackets.

Fan/heat sink assembly

NOTE: The thermal grease and thermal pads must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is available using the following spare part number:

- L65923-001 – Thermal Grease Replacement Kit including Liquid Metal thermal grease and normal thermal grease
- L65268-001 – Thermal Grease Replacement Kit including normal grease
- L56901-001 – Thermal Pad Replacement Kit

Table 5-8 Fan/heat sink assembly description and spare part number information

Description	Spare part number
For use only on computer models equipped with an NVIDIA GeForce GTX 1660Ti graphics controller	L57171-001
For use only on computer models equipped with an NVIDIA GeForce GTX 1650 graphics controller	L57170-001
For use only on computer models equipped with an NVIDIA GeForce GTX 1050 graphics controller	L56900-001

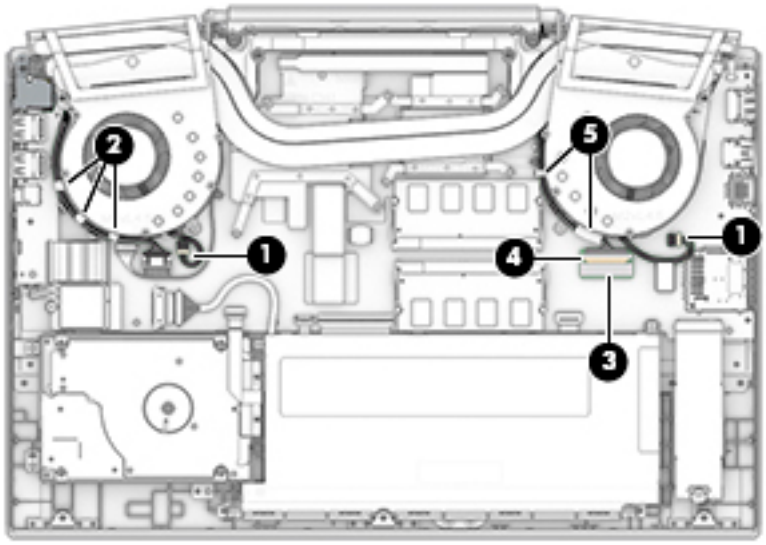
Before removing the fan/heat sink assembly, follow these steps:

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 first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).
6. Remove the hinge trunks (see Hinge trunks on page 44).
7. Remove the fan brackets (see Fan brackets on page 45).

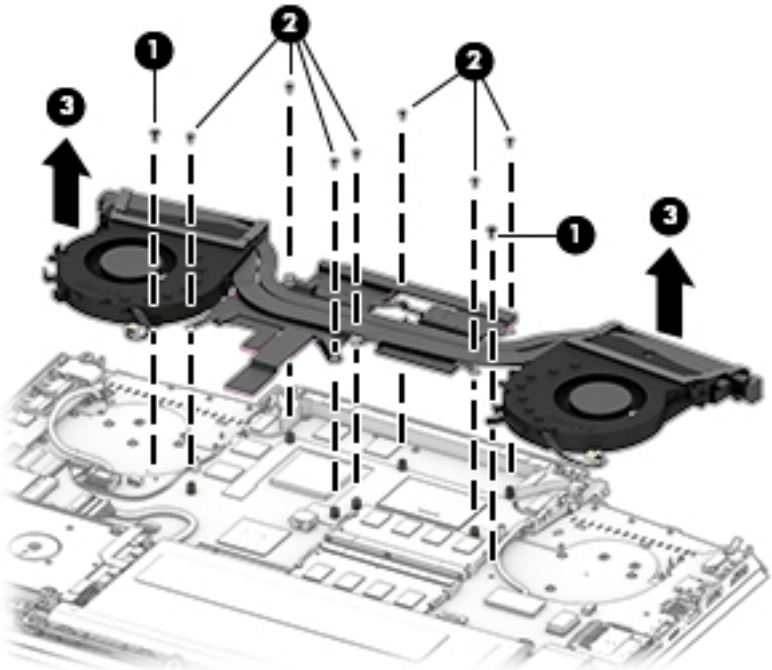
Remove the fan/heat sink assembly:

1. Disconnect the fan cables **(1)** from the system board.
2. Release the power connector cable **(2)** from the retention clips built into the right fan.
3. Release the adhesive support strip **(3)** that secures the display panel cable to its connector.
4. Disconnect the display panel cable **(4)** from the system board.

5. Release the display panel cable **(5)** from the retention clips built into the left fan.



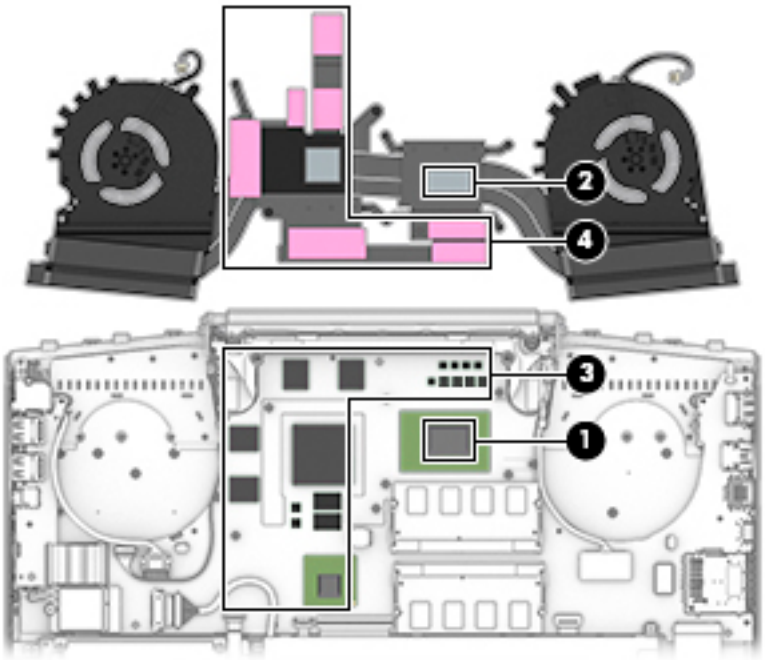
6. Remove the two Phillips M2.0×4.5 screws **(1)** that secure the fan/heat sink assembly to the system board.
7. Remove the seven Phillips M2.0×3.8 screws **(2)** that secure the fan/heat sink assembly to the system board.
8. Remove the fan/heat sink assembly **(3)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board components each time the fan/heat sink assembly is removed.

Thermal grease is used on the processor **(1)** and the fan/heat sink assembly section **(2)** that services it. Replacement thermal grease is available in the Thermal Grease Replacement Kits, spare part numbers L65923-001 (includes Liquid Metal thermal grease and normal thermal grease) and L65268-001 (includes only normal thermal grease).

An assortment of thermal pads are used on the other system board components **(3)** and the fan/heat sink assembly sections **(4)** that service them. Replacement thermal pads are available in the Thermal Pad Replacement Kit (spare part number L56901-001).



Reverse this procedure to install the fan/heat sink assembly.

USB/audio board

NOTE: The USB/audio board spare part kit does not include the USB/audio board cable. The USB/audio board cable is available using spare part number L56903-001.

Table 5-9 USB/audio board description and spare part number information

Description	Spare part number
USB/audio board (includes 2 USB ports and 1 audio combo jack)	L56902-001

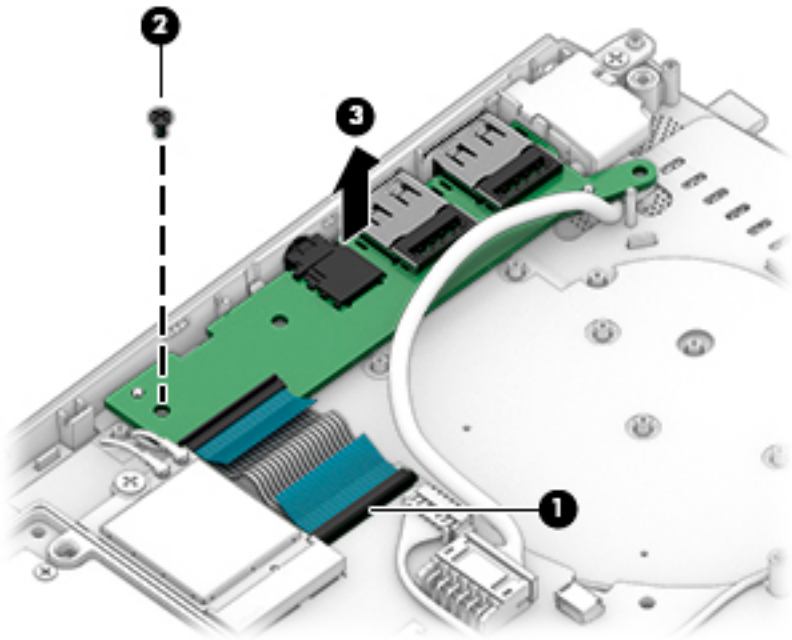
Before removing the USB/audio board, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).
6. Remove the hinge trunks (see Hinge trunks on page 44).
7. Remove the fan brackets (see Fan brackets on page 45).
8. Remove the fan/heat sink assembly (see Fan/heat sink assembly on page 46).

Remove the USB/audio board:

1. Release the ZIF connector **(1)** to which the USB/audio board cable is connected, and then disconnect the USB/audio board cable from the system board.
2. Remove the Phillips M2.0×2.8 screw **(2)** that secures the USB/audio board to the keyboard/top cover.

3. Remove the USB/audio board **(3)**.



Reverse this procedure to install the USB/audio board and cable.

Power connector cable

Table 5-10 Power connector cable description and spare part number information

Description	Spare part number
Power connector cable (includes AC adapter and battery light)	L56904-001

Before removing the power connector cable, follow these steps:

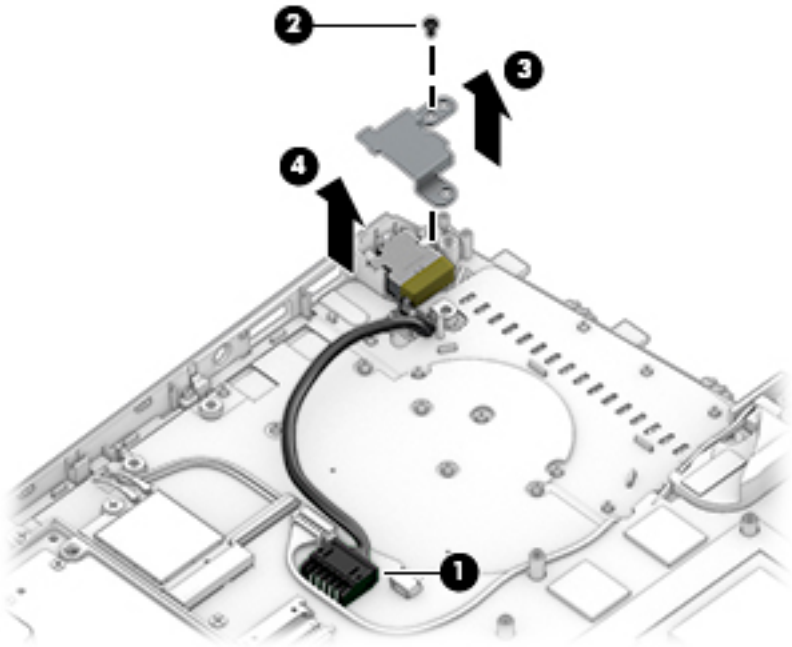
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Disconnect the battery cable from the system board (see Battery on page 36).
6. Remove the hinge trunks (see Hinge trunks on page 44).
7. Remove the fan brackets (see Fan brackets on page 45).
8. Remove the fan/heat sink assembly (see Fan/heat sink assembly on page 46).
9. Remove the USB/audio board (see USB/audio board on page 49).

Remove the power connector cable:

1. Disconnect the power connector cable **(1)** from the system board.
2. Remove the Phillips M2.0×3.8 screw **(2)** that secures the power connector and I/O bracket to the keyboard/top cover.
3. Remove the I/O bracket **(3)**.

   The I/O bracket is not available as a spare part.

4. Remove the power connector cable **(4)**.



Reverse this procedure to install the power connector cable.

Touchpad cable

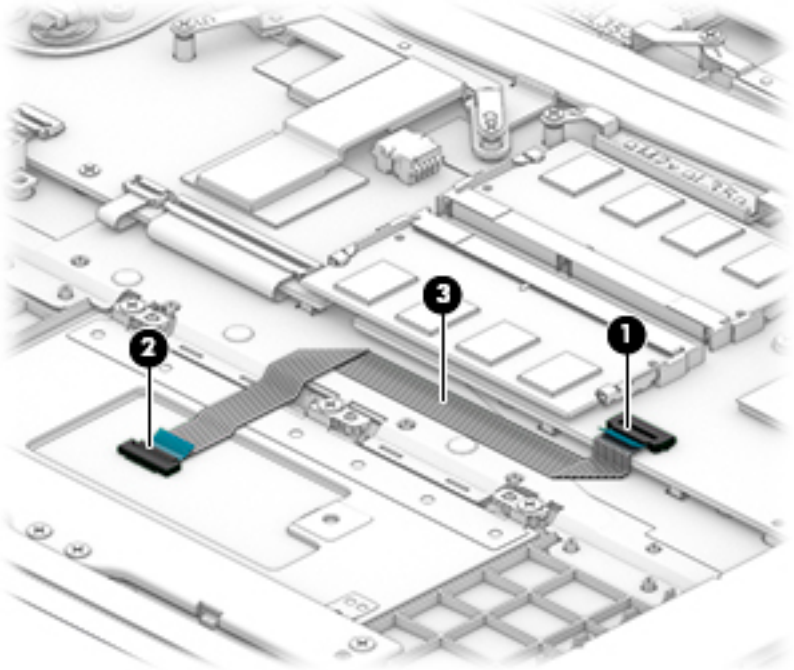
NOTE: The touchpad cable is available using spare part number L56906-001.

Before removing the touchpad cable, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Remove the battery (see Battery on page 36).

Remove the touchpad cable:

1. Release the ZIF connector **(1)** to which touchpad cable is connected, and then disconnect the touchpad cable from the system board.
2. Release the ZIF connector **(2)** to which touchpad cable is connected, and then disconnect the touchpad cable from the touchpad.
3. Detach the touchpad cable **(3)** from the keyboard/top cover. (The touchpad cable is attached to the keyboard/top cover with adhesive.)



4. Remove the touchpad cable.

Reverse this procedure to install the touchpad cable.

Touchpad

NOTE: The touchpad spare part kit does not include the touchpad cable. The touchpad cable is available using spare part number L56906-001.

Table 5-11 Touchpad description and spare part number information

Description	Spare part number
Touchpad (includes touchpad bracket)	L56905-001

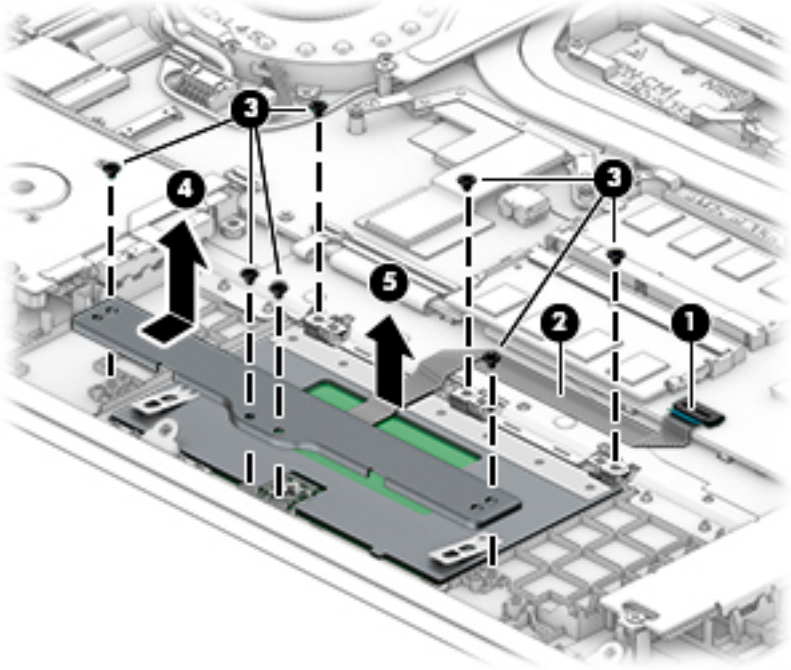
Before removing the touchpad, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32).
5. Remove the battery (see Battery on page 36).

Remove the touchpad:

1. Release the ZIF connector **(1)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.
2. Detach the touchpad cable **(2)** from the keyboard/top cover. (The touchpad cable is attached to the keyboard/top cover with adhesive.)
3. Remove the seven Phillips M2.0×2.7 screws **(3)** that secure the touchpad and bracket to the keyboard/top cover.
4. Slide the touchpad bracket **(4)** back, and then remove the touchpad bracket.

5. Remove the touchpad **(5)**.



Reverse this procedure to install the touchpad and cable.

System board

NOTE: The thermal grease and thermal pads must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is available using the following spare part number:

- L65923-001 – Thermal Grease Replacement Kit including Liquid Metal thermal grease and normal grease
- L65268-001 – Thermal Grease Replacement Kit including normal grease
- L56901-001 – Thermal Pad Replacement Kit

Table 5-12 System board description and spare part number information

Description	Spare part number
Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and the Windows 10 operating system	L58867-601
Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and a non-Windows 10 operating system	L58867-001
Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58865-601
Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58865-001
Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58868-601
Equipped with an Intel Core i7-9750H 2.6-GHz (turbo up to 4.5-GHz) processor (2666-MHz FSB, 12-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58868-001
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and the Windows 10 operating system	L58866-601
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1660Ti graphics controller with 6-GB of discrete memory, and a non-Windows 10 operating system	L58866-001
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58864-601
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1650 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58864-001
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and the Windows 10 operating system	L58863-601
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 4-GB of discrete memory, and a non-Windows 10 operating system	L58863-001

Table 5-12 System board description and spare part number information (continued)

Description	Spare part number
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 3-GB of discrete memory, and the Windows 10 operating system	L58862-601
Equipped with an Intel Core i5-9300H 2.4-GHz (turbo up to 4.1-GHz) processor (2666-MHz FSB, 8-MB L3 cache, six cores, 45 W), an NVIDIA GeForce GTX 1050 graphics controller with 3-GB of discrete memory, and a non-Windows 10 operating system	L58862-001

Before removing the system board, follow these steps:

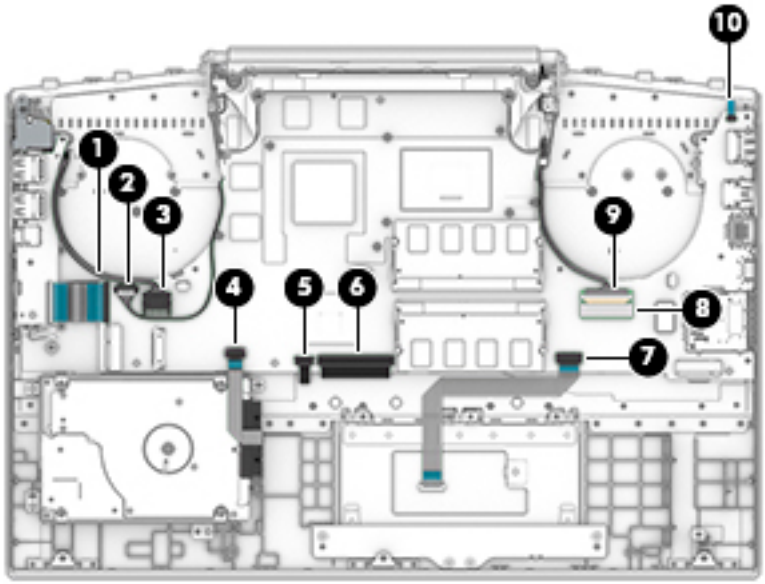
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32), and then remove the following components:
   a. Battery (see Battery on page 36)
   b. WLAN module (see WLAN module on page 39)
   c. Solid-state drive (see Solid-state drive on page 41)
   d. Hinge trunks(see Hinge trunks on page 44)
   e. Fan brackets (see Fan brackets on page 45)
   f. Fan/heat sink assembly (see Fan/heat sink assembly on page 46)

When replacing the system board, be sure to remove the memory modules (see Memory module on page 34) from the defective system board and install them on the replacement system board.

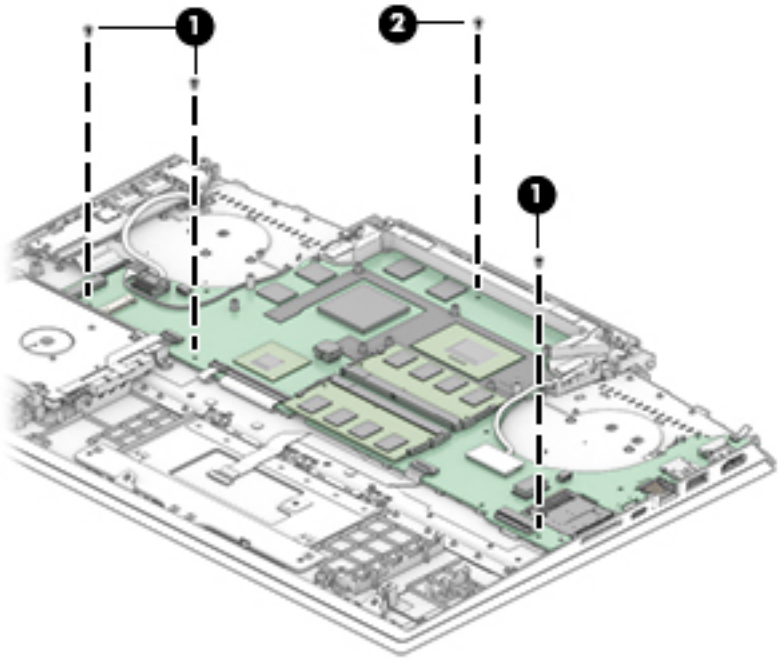
Remove the system board:

1. Disconnect the following cables from the system board:
   (1) USB/audio board ZIF connector cable
   (2) Speaker cable
   (3) Power connector cable
   (4) Hard drive ZIF connector cable
   (5) Keyboard backlight ZIF connector cable
   (6) Keyboard ZIF connector cable
   (7) Touchpad ZIF connector cable
2. Release the adhesive support strip **(8)** that secures the display panel cable to its connector.
3. Disconnect the display panel cable **(9)** from the system board.

4. Release the ZIF connector **(10)** to which the power button board cable is connected, and then disconnect the power button board cable from the system board.

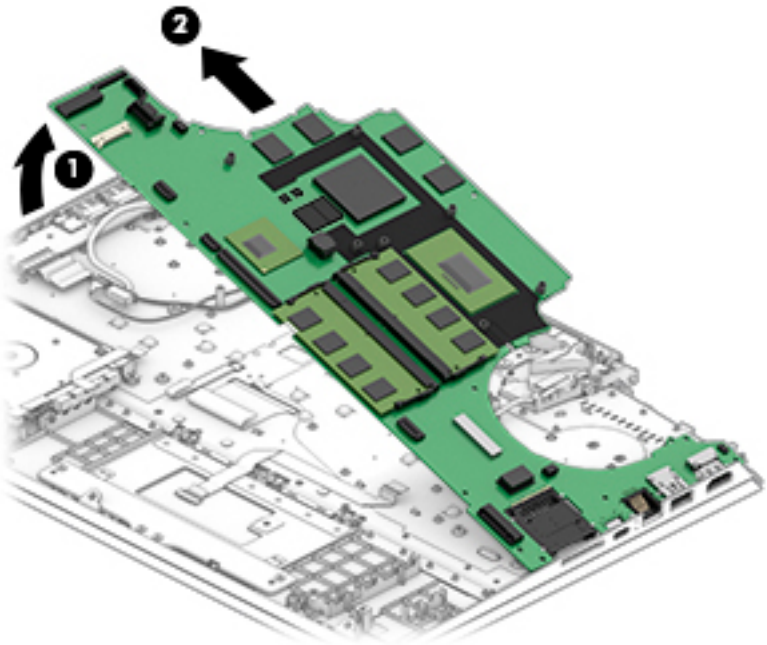


5. Remove the three Phillips M2.0×3.8 screws **(1)** that secure the system board to the keyboard/top cover.
6. Remove the Phillips M2.0×4.8 screw **(2)** that secures the system board to the keyboard/top cover.



7. Lift the left side **(1)** of the system board until it rests at an angle.

8. Remove the system board (2) by sliding it up and to the left at an angle.



9. Remove the system board.

Reverse this procedure to install the system board.

Speakers

Table 5-13 Speakers description and spare part number information

Description	Spare part number
Speaker Kit (includes left and right speakers, cables, and rubber isolator)	L56909-001

Before removing the speakers, follow these steps:

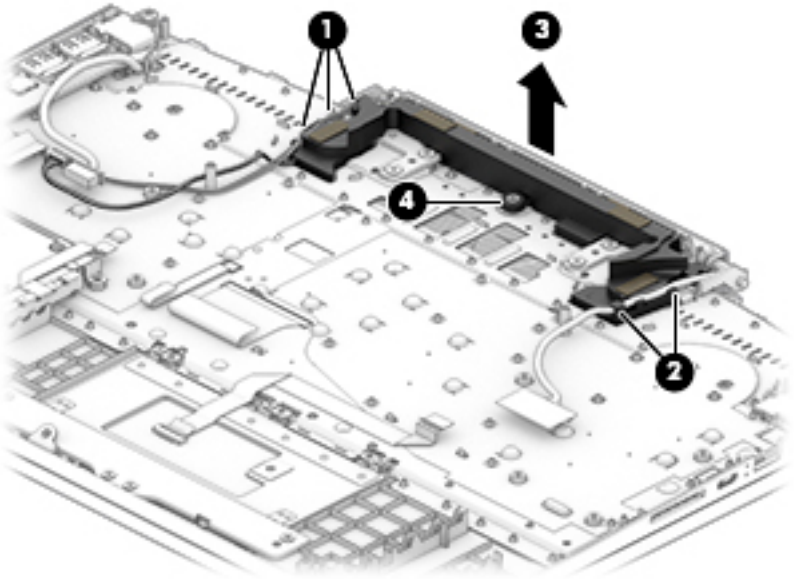
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 32), and then remove the following components:
   a. Battery (see Battery on page 36)
   b. WLAN module (see WLAN module on page 39)
   c. Solid-state drive (see Solid-state drive on page 41)
   d. Hinge trunks(see Hinge trunks on page 44)
   e. Fan brackets (see Fan brackets on page 45)
   f. Fan/heat sink assembly (see Fan/heat sink assembly on page 46)
   g. System board (see System board on page 56)

Remove the speakers:

1. Release the speaker cable and the wireless antenna cables from the retention clips **(1)** and routing channel built into the keyboard/top cover.
2. Release the display panel cable from the retention clips **(2)** and routing channel built into the speakers.

3. Remove the speakers **(3)**.

NOTE: When removing the speakers, make note of the location and condition of the rubber isolator **(4)**. This isolator is critical to the performance of the speakers. The absence of this isolator or damage to it can degrade the speakers performance.



Reverse this procedure to install the speakers.

Power button board

NOTE: The power button board spare part kit does not include the power button board cable. The power button board cable is available using spare part number L56908-001.

Table 5-14 Power button board description and spare part number information

Description	Spare part number
In acid green finish	L56907-001
In ghost white finish	L57172-001
In ultraviolet finish	L57173-001

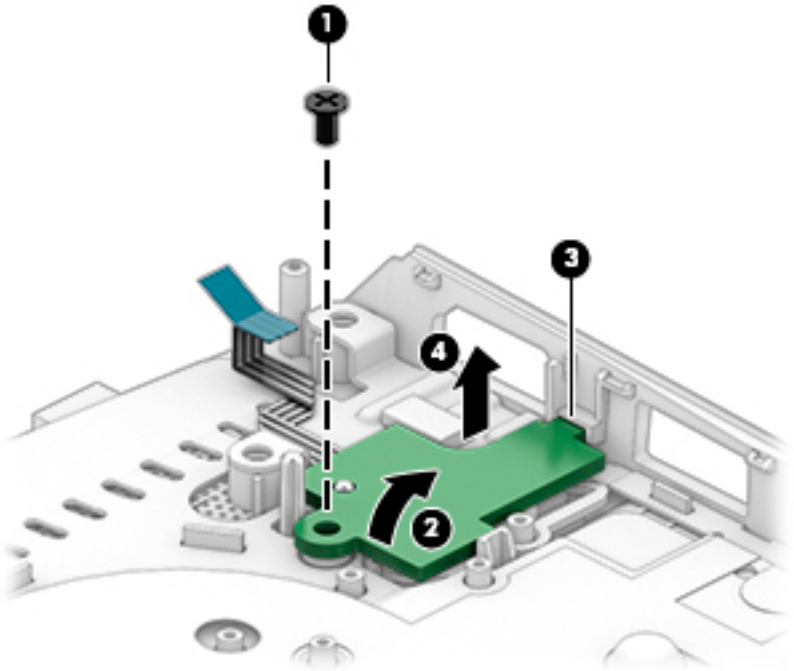
Before removing the power button board, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32), and then remove the following components:
   a. Battery (see Battery on page 36)
   b. WLAN module (see WLAN module on page 39)
   c. Solid-state drive (see Solid-state drive on page 41)
   d. Hinge trunks(see Hinge trunks on page 44)
   e. Fan brackets (see Fan brackets on page 45)
   f. Fan/heat sink assembly (see Fan/heat sink assembly on page 46)
   g. System board (see System board on page 56)

Remove the power button board:

1. Remove the Phillips M2.0×3.8 screw **(1)** that secures the power button board to the keyboard/top cover.
2. Lift the left side **(2)** of the power button board and swing it up and to the right until the tab on the right side of the board is clear of the slot **(3)** built into the keyboard/top cover.

3. Remove the power button board **(4)** and cable.



Reverse this procedure to install the power button board and cable.

Power button board cable

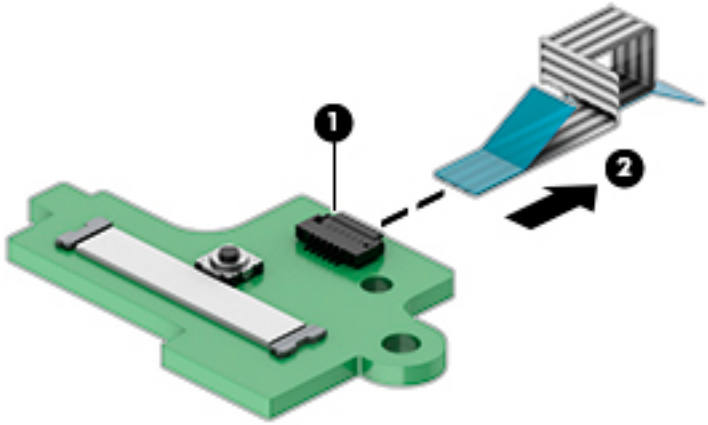
NOTE: The power button board cable is available using spare part number L56908-001.

Before removing the power button board cable, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32), and then remove the following components:
   a. Battery (see Battery on page 36)
   b. WLAN module (see WLAN module on page 39)
   c. Solid-state drive (see Solid-state drive on page 41)
   d. Hinge trunks(see Hinge trunks on page 44)
   e. Fan brackets (see Fan brackets on page 45)
   f. Fan/heat sink assembly (see Fan/heat sink assembly on page 46)
   g. System board (see System board on page 56)
   h. Power button board (see Power button board on page 62)

Remove the power button board cable:

1. Turn the power button board upside down with the front toward you.
2. Release the ZIF connector **(1)** to which power button board cable is connected, and then disconnect the power button board cable from the power button board.
3. Remove the power button board cable **(2)**.



Reverse this procedure to install the power button board cable.

Display assembly

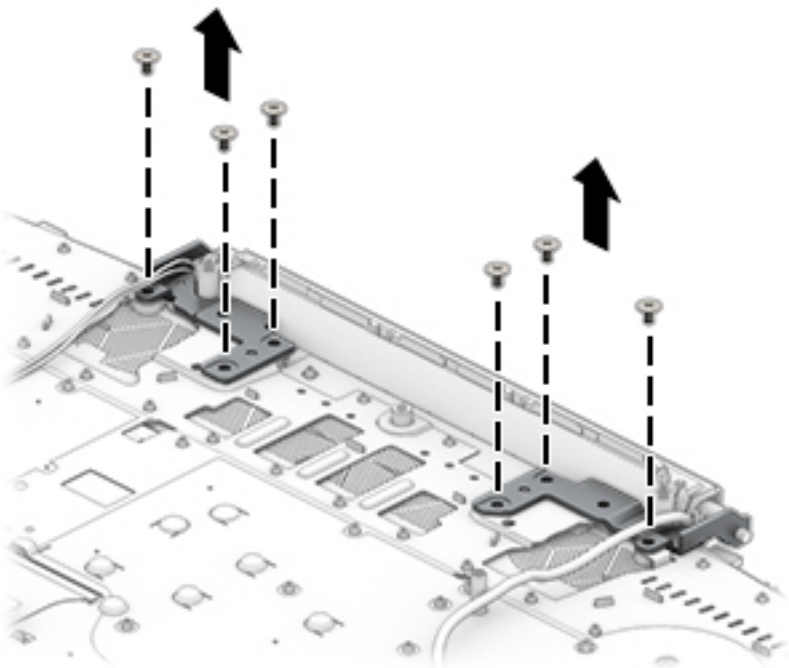
NOTE: The display assembly is spared at the subcomponent level. For display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

1. 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.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 32), and then remove the following components:
   a. Battery (see Battery on page 36)
   b. WLAN module (see WLAN module on page 39)
   c. Solid-state drive (see Solid-state drive on page 41)
   d. Hinge trunks(see Hinge trunks on page 44)
   e. Fan brackets (see Fan brackets on page 45)
   f. Fan/heat sink assembly (see Fan/heat sink assembly on page 46)
   g. System board (see System board on page 56)
   h. Speakers (see Speakers on page 60)

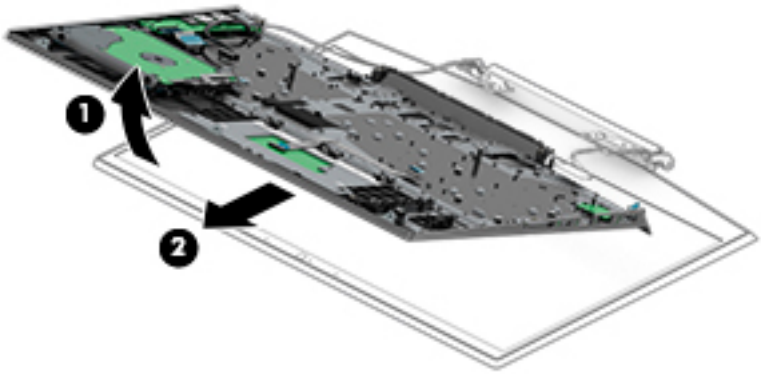
Remove the display assembly:

1. Remove the six Phillips M2.5×4.3 screws that secure the display assembly to the keyboard/top cover.



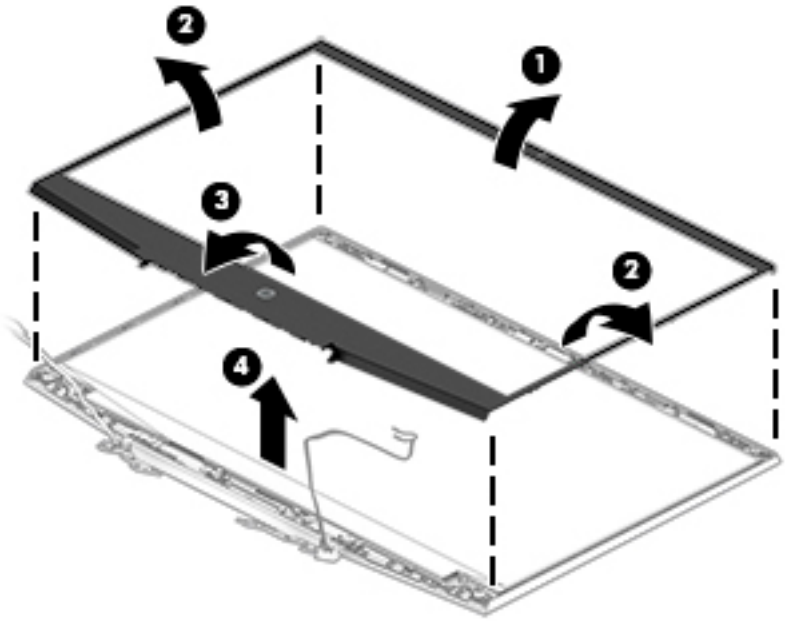
2. Swing the keyboard/top cover **(1)** up and away from the display assembly.

3. Slide the display assembly **(2)** away from the keyboard/top cover and remove the display assembly.



4. If it is necessary to replace the display bezel or any of the display assembly subcomponents:
   a. Release the top edge of the display bezel **(1)** from the display assembly.
   b. Release the left and right edges of the display bezel **(2)** from the display assembly.
   c. Release the bottom edge of the display bezel **(3)** from the display assembly.
   d. Remove the display bezel **(4)**.

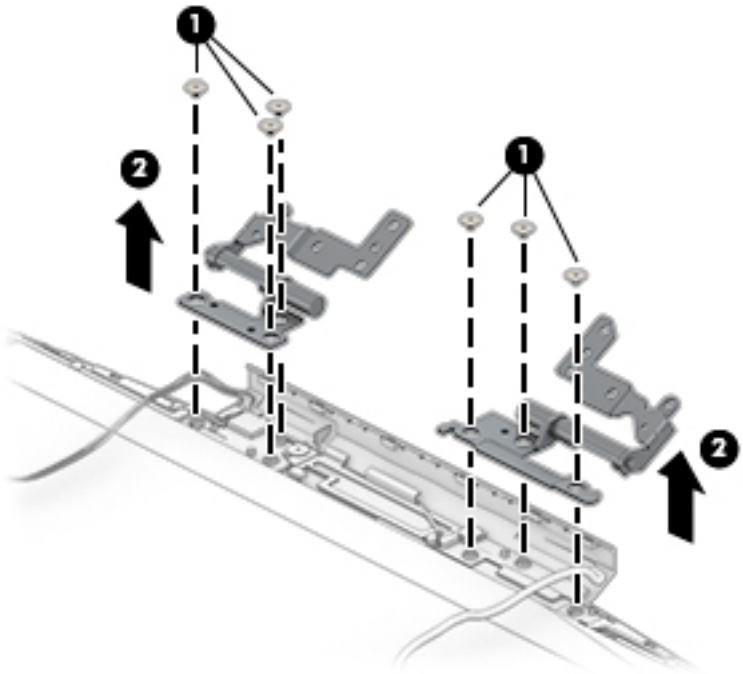
      The display bezel is available using spare part number L58774-001.



5. If it is necessary to replace the display hinges:
   a. Remove the display bezel.
   b. Remove the six Phillips M2.5×2.7 broad head screws **(1)** that secure the display hinges to the display back cover.

c. Remove the display hinges (2).

The display hinges are available using spare part number L56910-001.



6. If it is necessary to replace the display panel:

a. Remove the display bezel.

b. Remove the display hinges.

c. Disconnect the webcam/microphone module cable (1) from the webcam/microphone module.

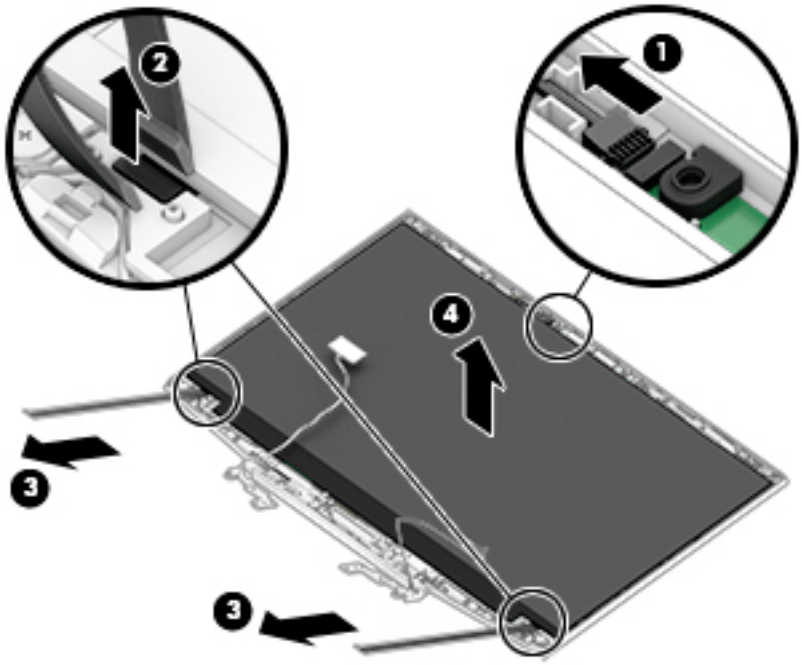
d. Use a pair of tweezers or similar thin tool to grasp the pull-to-release adhesive tabs (2) in the lower left and right corners of the display panel.

e. Using steady pressure, slowly pull the pull-to-release adhesive tabs (3) to detach the display panel from the display back cover.

f. Remove the display panel (4).

The display panel is available using the following spare part numbers:

- L56920-001 – 15.6-in, UHD (3840×2160), AntiGlare, WLED, LCD, UWVA, 72, 340, eDP 1.3+PSR, ultraslim
- L56919-001 – 15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 72, 300, eDP 1.4+PSR, ultraslim, 144-MHz
- L56918-001 – 15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 72, 300, eDP 1.2, ultraslim
- L56918-001 – 15.6-in, FHD, (1920×1080), AntiGlare, WLED, LCD, UWVA, 45, 250, slim



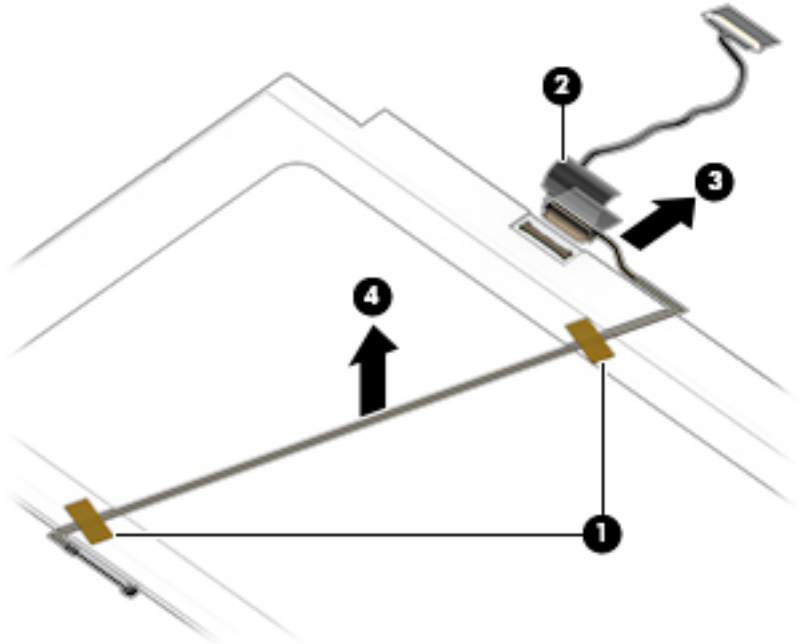
7. If it is necessary to replace the display panel cable:
   a. Remove the display bezel.
   b. Remove the display hinges.
   c. Remove the display panel.

   ⚠ CAUTION: Before placing the display panel with the panel facing down, make sure there are no foreign objects (tools, screws, etc.) on the work surface. Failure to follow this caution can lead to damage to the display panel.

   d. Position the display panel with the panel facing down.
   e. Release the tape (1) that secures the display panel cable to the display panel.
   f. Release the adhesive support strip (2) that secures the display panel cable to the display panel connector.
   g. Disconnect the display panel cable (3) from the display panel.

h. Remove the display panel cable **(4)**.

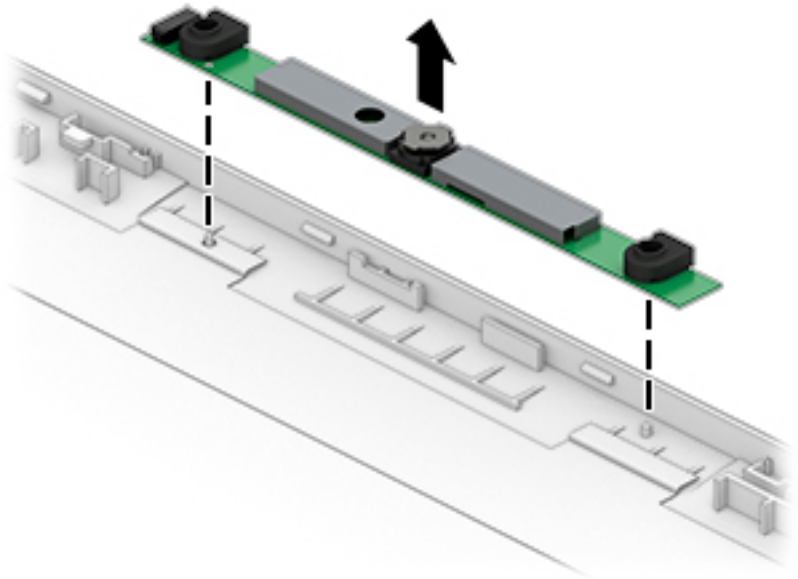
The display panel cable is available using spare part numbers L58775-001 (with 40-pin connector) and L56912-001 (with 30-pin connector).



8. If it is necessary to replace the webcam/microphone module:
   a. Remove the display bezel.
   b. Remove the display hinges.
   c. Remove the display panel.

d. Detach the webcam/microphone module from the display back cover. (The webcam/microphone module is attached to the display back cover with double-sided adhesive.)

   The webcam/microphone module is available using spare part number L56916-001.



9. If it is necessary to replace the wireless antenna:

   a. Remove the display bezel.

   b. Remove the display hinges.

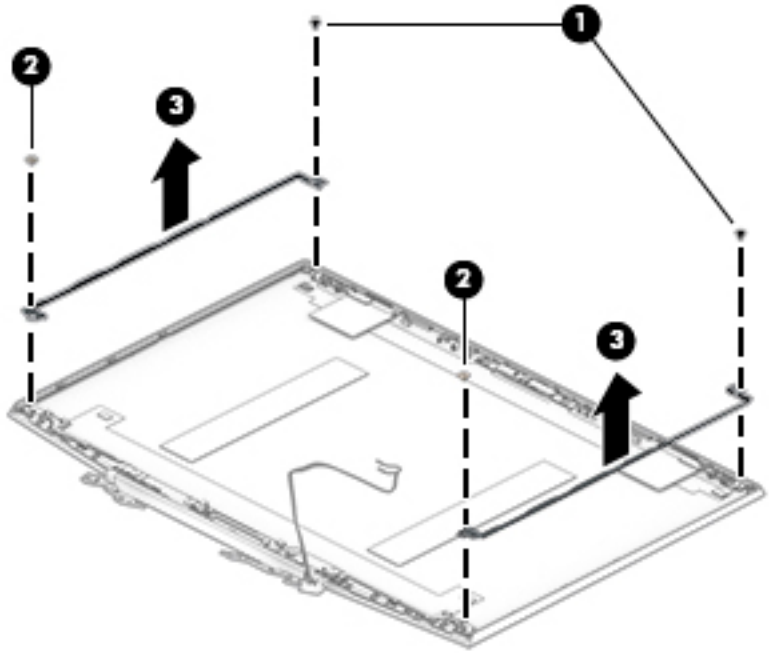
   c. Remove the display panel.

   d. Remove the two Phillips M2.0×2.6 screws **(1)** that secure the display brackets to the display back cover.

   e. Remove the two Phillips M2.5×2.7 broad head screws **(2)** that secure the display brackets to the display back cover.

f. Remove the display brackets (3).

The display brackets are not available as a spare part.

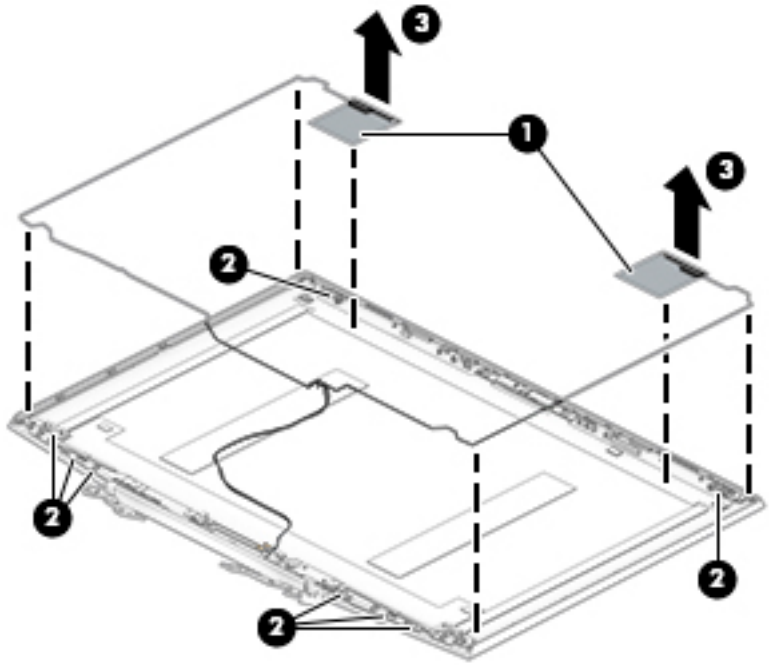


g. Detach the wireless antenna transceivers (1) from the display back cover.

h. Release the wireless antenna cables from the retention clips (2) and routing channels built into the top, left and right, and bottom edges of the display back cover.

i. Remove the wireless antenna transceivers and cables (3).

The wireless antenna transceivers and cables are available using spare part number L56913-001.



Reverse this procedure to install the display assembly.

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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 the 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).
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 74.

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 the 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 the computer. If the update is more recent than the BIOS version, make a note of the date, name, or other identifier. This information may be needed to locate the update later, after it has been downloaded to the computer.
   b. Follow the on-screen instructions to download the BIOS selection. Make a note of the path to the computer location where the BIOS update is downloaded. This path will need to be accessed when installing 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 the storage designation. The storage designation is typically Local Disk (C:).
3. Using the storage path 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, the downloaded BIOS file can be deleted from the computer.

7 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 in order to diagnose hardware failures.

If HP PC Hardware Diagnostics Windows is not installed on your computer, first first first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 76.

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. Right-click **HP PC Hardware Diagnostics Windows**, select **More**, and then select **Run as administrator**.

   – 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 you want to run, and then follow the on-screen instructions.

NOTE: If you need to stop a diagnostic test at any time, 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.
- A Quick Response (QR) code is displayed. With a mobile device, scan the code and then 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 download instructions are provided in English only.
- You must use a Windows computer to download this tool because only .exe files files 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 is downloaded to the selected location.

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

NOTE: For some products, it may be necessary 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 is downloaded 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 was downloaded, 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 78.

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 will not boot into Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in solving the problem:

- Select **Get Support**, and then use a mobile device to scan the QR code that displays on the next screen. The HP Customer Support - Service Center page displays, 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 78.

   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 preinstall 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 download 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, it may be necessary 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 may 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 can be downloaded 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, it may be necessary 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 disk 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 settings used 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.

8 Specifications

Computer specifications

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source that is supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. Operating voltage and current varies by platform. The voltage and current for your computer is located on the regulatory label.

Table 8-1 Computer specifications

	Metric	U.S.
Dimensions:		
Computer models equipped with a hard drive:		
Width	36.0 cm	14.2 in
Depth	25.6 cm	10.1 in
Height	2.3 cm	0.9 in
Weight	2.29 kg	5.04 lbs
Computer models equipped with a solid-state drive:		
Width	36.0 cm	14.2 in
Depth	25.6 cm	10.1 in
Height	2.3 cm	0.9 in
Weight	2.25 kg	4.96 lbs
Input power		
Operating voltage and current	5 V dc @ 2 A / 12 V dc @ 3 A /15 V dc @ 3 A – 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 3.75 A /15 V dc @ 3 A – 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 3.75 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A / 20 V dc @ 2.25 A – 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C 5 V dc @ 3 A / 9 V dc @ 3A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 5 A / 20 V dc @ 4.5 A – 90 W USB-C 19.5 V dc @ 2.31 A – 45 W 19.5 V dc @ 3.33 A – 65 W	

Table 8-1 Computer specifications (continued)

	Metric	U.S.
	19.5 V dc @ 4.62 A – 90 W	
	19.5 V dc @ 6.15 A – 120 W	
	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	
	19.5 V dc @ 11.8 A – 230 W	
	19.5 V dc @ 16.92 A – 330 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.		

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 83).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 83).
- **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 83).
- **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 83).

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 83.

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 83.

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.

10 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 10-1 Power cord requirements

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 10-1 Power cord requirements (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 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V AC) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the CCC certification mark.
5. The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
7. For 127 V AC, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V AC), with UL and CSA or C-UL marks. For 240 V AC, the flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² or 1.00 mm2 conductor size, with plug BS 1363/A with BSI or ASTA marks.

11 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.

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