HP Pavilion 15 Laptop PC

Maintenance and Service Guide
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First Edition: September 2017

Document Part Number: 942330-001

Product notice

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

Not all features are available in all editions of Windows 10. This computer may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 10 functionality. See for http://www.microsoft.com details.

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 defined by the International Standard for Safety of Information Technology Equipment (IEC 60950).

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1 Product description

Category	Description
Product Name	HP Pavilion 15 Laptop PC (model numbers 15-ck001 through 15-ck099)
Processors	• Intel® Core™ i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W) • Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W) • Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz, 3.0-MB L3 cache, 15-W)
Chipset	Integrated soldered-on-circuit (SoC)
Graphics	**Hybrid graphics:** NVIDIA™ N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps) NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps) **Internal graphics:** Intel UHD Graphics 620 with universal memory architecture (UMA) video memory (on computer models equipped with an Intel Core i7-8550U or Intel Core i5-8250U processor) Intel HD Graphics 620 graphics subsystem with UMA video memory (on computer models equipped with an Intel Core i5-7200U processor) Support for HD decode, DX12, and high-definition multimedia interface (HDMI) Support for Optimus Support for GPU Performance Scaling (GPS)
Panel	• 15.6-in, full high-definition (FHD), white light-emitting (WLED), AntiGlare (1920×1080), slim-flat (3.2-mm) UWVA, eDP1.3, color gummer 45%, 250 nits, 16:9 ultra wide aspect ratio, narrow bezel, display assembly • 15.6-in, FHD, WLED, BrightView (1920×1080), slim-flat (3.2-mm), UWVA, eDP1.3, 220 nits, color gummer 45%, 16:9 ultra wide aspect ratio, display assembly • 15.6-in, HD, WLED, AntiGlare (1366×768), slim-flat (3.2-mm), SVA, eDP, 220 nits, 16:9 ultra wide aspect ratio, display assembly
Memory	Two SODIMM memory module slots, non-customer-accessible/non-upgradable DDR4-2400 dual channel support (DDR4-2666 bridged to DDR4-2400; on computer models equipped with an Intel Core i7-8550U or Intel Core i5-8250U processor) DDR4-2133 dual channel support (DDR4-2400 downgraded to DDR4-2133, DDR4-2666 bridged to DDR4-2400; on computer models equipped with an Intel Core i5-7200U processor) Supports up to 16-GB of system memory Supports the following configurations: • 16384-MB (8192-MB × 2; not supported on computer models equipped with a 32-bit operating system or Windows 7 Home Basic) • 12288-MB (8192-MB + 4096-MB; not supported on computer models equipped with a 32-bit operating system or Windows 7 Home Basic)

Category	Description
Memory *(continued)*	• 8192-MB (8192-MB × 1 or 4096-MB × 2; not supported on computer models equipped with a 32-bit operating system) • 6144-MB (4096-MB × 1 + 2048-MB × 1; not supported on computer models equipped with a 32-bit operating system) • 4096-MB (4096-MB × 1)
Storage	Support for hard drive and solid-state drive **Hard drive:** Support for **6.35-cm** (2.5-in) hard drives in **7.0-** and **7.2-mm** (.28 in) thicknesses (all hard drives use the same bracket) Support for Accelerometer hard drive protection Support for the following single hard drives configurations: • 2-TB, 5400-rpm, 7.2-/7.0-mm hard drive • 1-TB, 5400-rpm, 7.2-/7.0-mm hard drive • 500-GB, 5400-rpm, 7.2-/7.0-mm hard drive **Solid-state drive:** Support for the following solid-state drives: • 512-GB, M.2, Peripheral Component Interconnect Express (PCIe), Non-Volatile Memory Express (NVMe) solid-state drive • 512-GB, M.2, SATA solid-state drive with triple level cell (TLC) • 360-GB, M.2, PCIe, NVMe solid-state drive with TLC • 256-GB, M.2, PCIe, NVMe solid-state drive • 256-GB, M.2, SATA solid-state drive with TLC • 128-GB, M.2, SATA solid-state drive with TLC **Dual storage configurations:** • 2-TB, 5400-rpm, 7.2-/7.0-mm hard drive + 128-GB, M.2, SATA solid-state drive with TLC • 1-TB, 5400-rpm, 7.2-/7.0-mm hard drive + 256-GB, M.2 2280, SATA-3, PCIe, MVMe, solid-state drive with TLC • 1-TB, 5400-rpm, 7.2-/7.0-mm hard drive + 256-GB, M.2 2280, PCIe, MVMe, solid-state drive • 1-TB, 5400-rpm, 7.2-/7.0-mm hard drive + 128-GB, M.2, SATA solid-state drive with TLC • 500-GB, 5400-rpm, 7.2-/7.0-mm hard drive + 128-GB, M.2, SATA solid-state drive with TLC
Optical drive	HP external DVD±RW DL SuperMulti Drive
Audio and video	**Audio:** Support for Bang & Olufsen Play Support for dual speakers Support for HP Audio Boost **Camera:** HP Wide Vision FHD infrared camera with indicator light, 2 infrared lights, USB 2.0, FHD Hybrid BSI sensor, f2.2, wide dynamic range (WDR), 88° WFOV, 1080p by 30 frames per second HP Wide Vision HD camera with indicator light, USB 2.0, HD BSI sensor, f2.0, WDR, 88° WFOV, 720p by 30 frames per second

Category	Description
Audio and video *(continued)*	Support for Windows Hello 3.0 **Microphones:** Dual array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software
Ethernet	Integrated 10/100/1000 network interface card (NIC)
Sensors	Accelerometer
Wireless	**WLAN:** Integrated wireless local area network (WLAN) options by way of wireless module Dual M.2/PCIe WLAN antennas built into display assembly Integrated wireless personal area network (PAN) supported by Bluetooth® 4.2 combo card Support for the following WLAN modules: • Intel Dual Band Wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) • Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) • Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter (in emerging markets only) Compatible with Miracast-certified devices
External media cards	Micro-Secure Digital (SD®) media reader slot
Ports	• AC Smart Pin adapter plug • Audio-out (headphone)/audio-in (microphone) combo jack • HDMI v1.4b supporting up to 1920×1080 @ 60Hz • RJ-45 (network) • USB 3.x port (2 ports) • USB Type-C port (support for data transfer)
Keyboard/pointing devices	Full-sized, backlit, island-style keyboard Full-sized, island-style keyboard TouchPad requirements: • ClickPad with image sensor • MultiTouch gestures enabled • Support for Modern TrackPad gestures • Taps enabled as default
Power requirements	Support for a 3-cell, 41-WHr, 3.6-AHr, Li-ion battery Support for the following AC adapters: • 90-W AC adapter (PFC, S-3P, 4.5-mm) • 65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm) • 65-W AC adapter (non-PFC, S-3P, 4.5-mm) • 45-W HP Smart AC adapter (non-PFC, RC, 4.5-mm, non-slim) Support for a 1.00-m power cord with a C5 connector.
Security	Support for Trusted Platform Module (TPM) 2.0
Operating system	**Preinstalled:** Windows 10 Home and Windows 10 Home Professional

Category	Description
Operating system *(continued)*	**For developed market (ML):** Windows 10 Home ML and Windows 10 Home Plus ML **For emerging market (EM/SL):** Windows 10 Home EM/SL and Windows 10 Home Plus EM/SL **For China market:** CPPP Windows 10 Home High End China Language Edition and CPPP Windows 10 Home China Language Edition FreeDOS 2.0
Serviceability	**End user replaceable part:** AC adapter

2 Getting to know your computer

The computer features top-rated components. This chapter provides details about the computer components, where they're 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

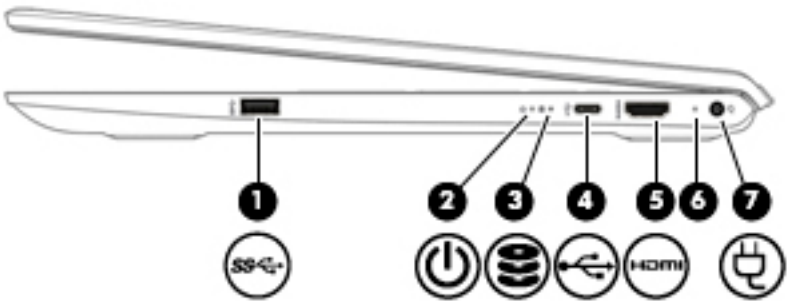
To find out what software is installed on the computer:

- Select the **Start** button.

  – or –

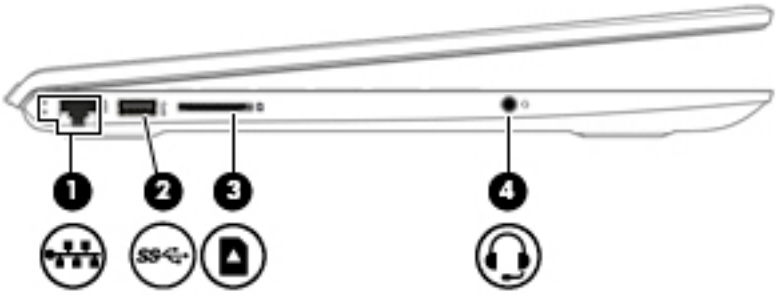
  Right-click the **Start** button, and then select **Apps and Features**.

Right side



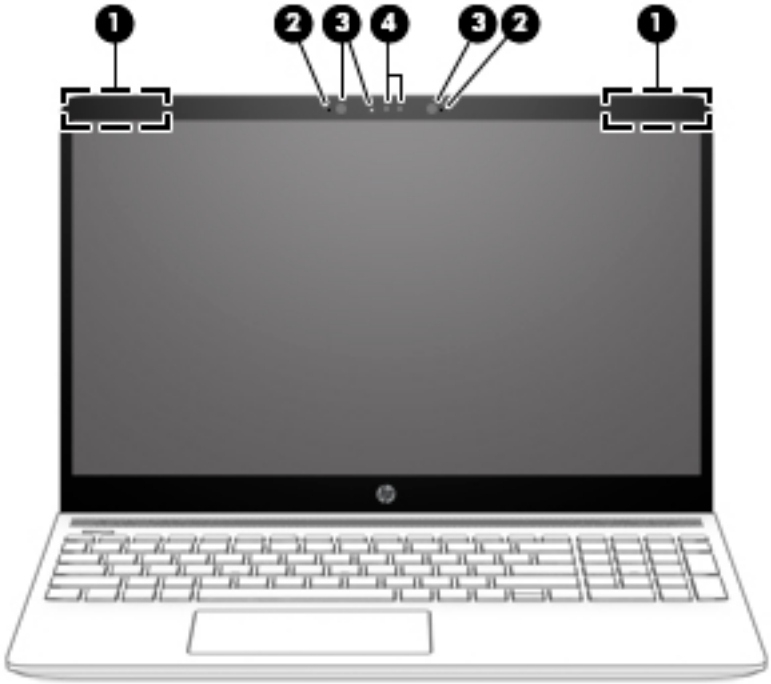
Component			Description
(1)	SS	USB 3.x SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(2)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(3)		Drive light	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(4)		USB Type-C port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. NOTE: Cables and/or adapters (purchased separately) may be required.
(5)	HDMI	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High-Definition Multimedia Interface (HDMI) device.
(6)		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.
(7)		Power connector	Connects an AC adapter.

Left side



Component			Description
(1)		RJ-45 (network) jack/status lights	Connects a network cable. • White: The network is connected. • Amber: Activity is occurring on the network.
(2)		USB 3.x SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(3)		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.
(4)		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, refer to 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.

Display



Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Internal microphones	Record sound.
(3)	Camera lights (2)	On: One or more cameras are in use.
(4)	Camera(s)	Allow 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 the computer.

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

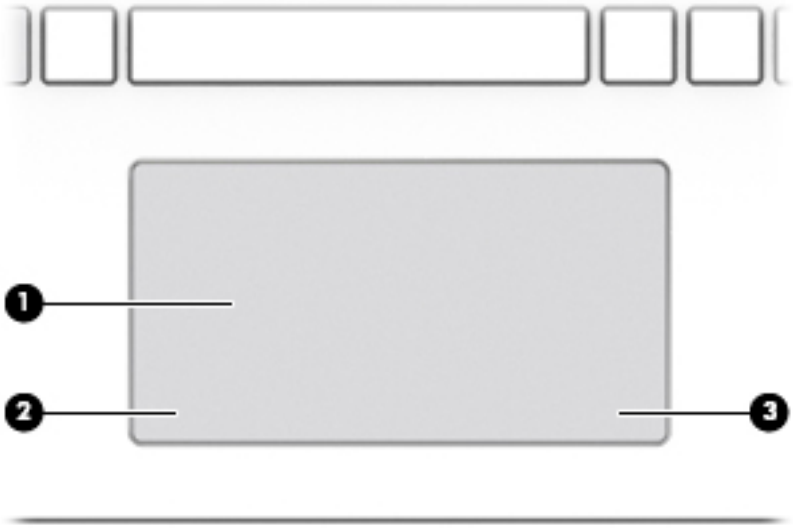
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

To access this guide:

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

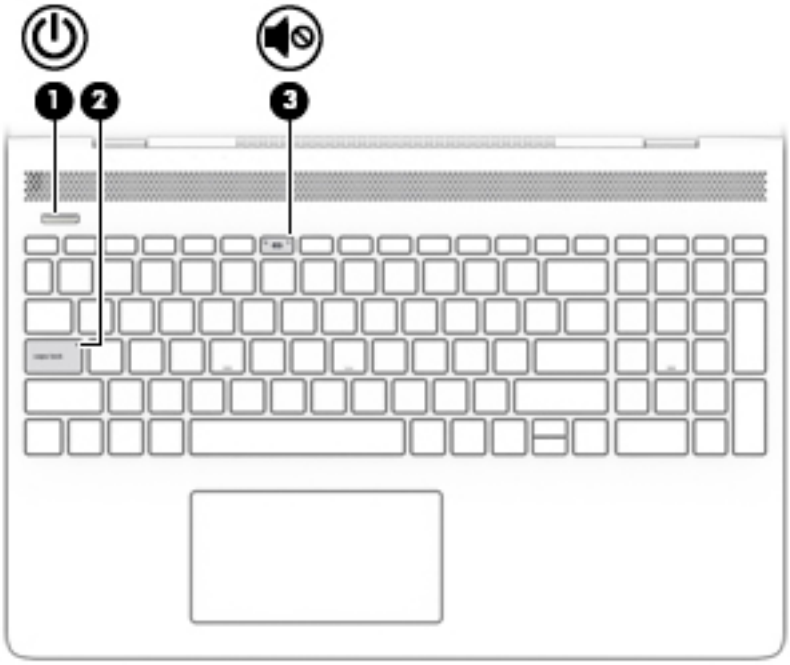
Keyboard area

TouchPad



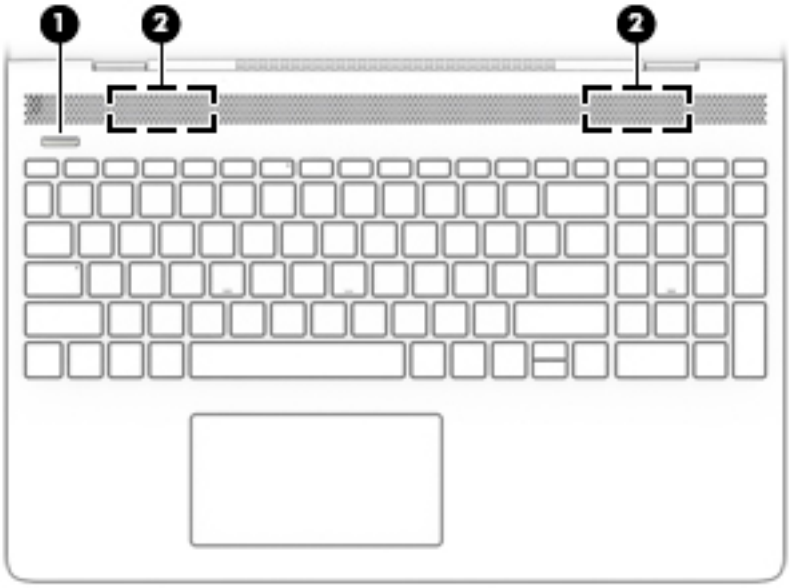
Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



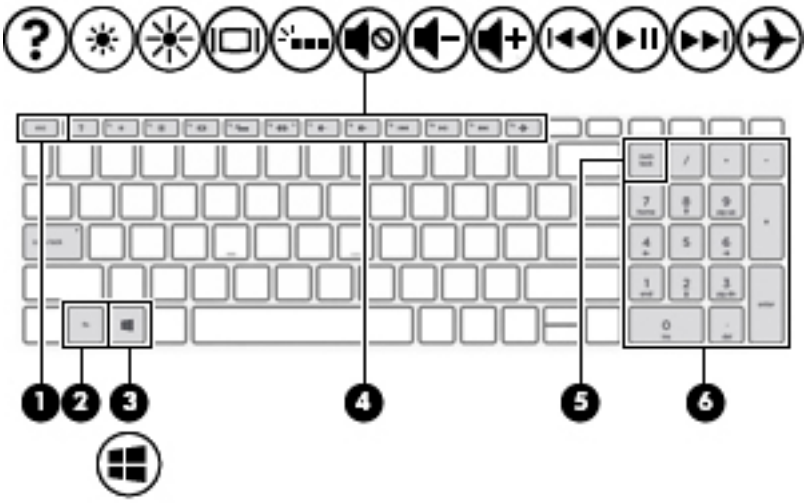
Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses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



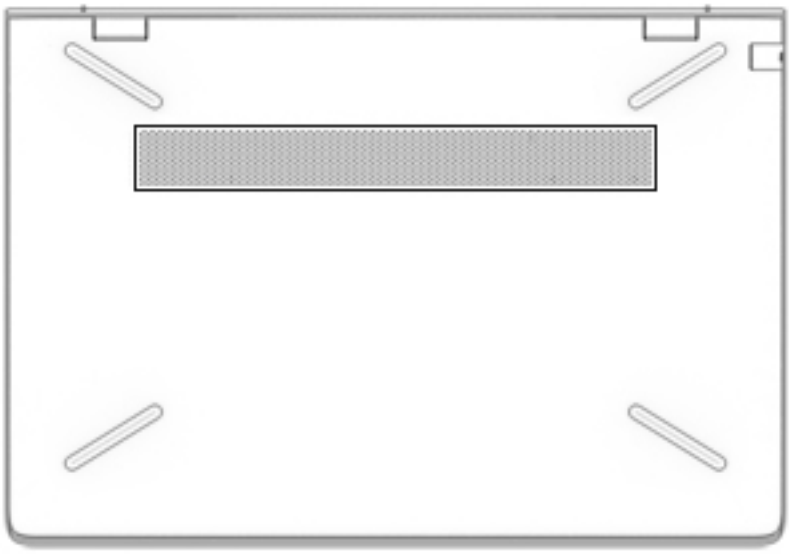
Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, 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. To learn more about your power settings, see your power options: ▲ Right-click the **Power** icon, and then select **Power Options**.
(2)	Speakers	Produce sound.

Special keys



Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows® key	Opens the **Start** menu. NOTE: Pressing the Windows key again will close the **Start** menu.
(4)	Action keys	Execute frequently used system functions. NOTE: On select products, the f5 action key turns the keyboard backlight feature off or on.
(5)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When 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



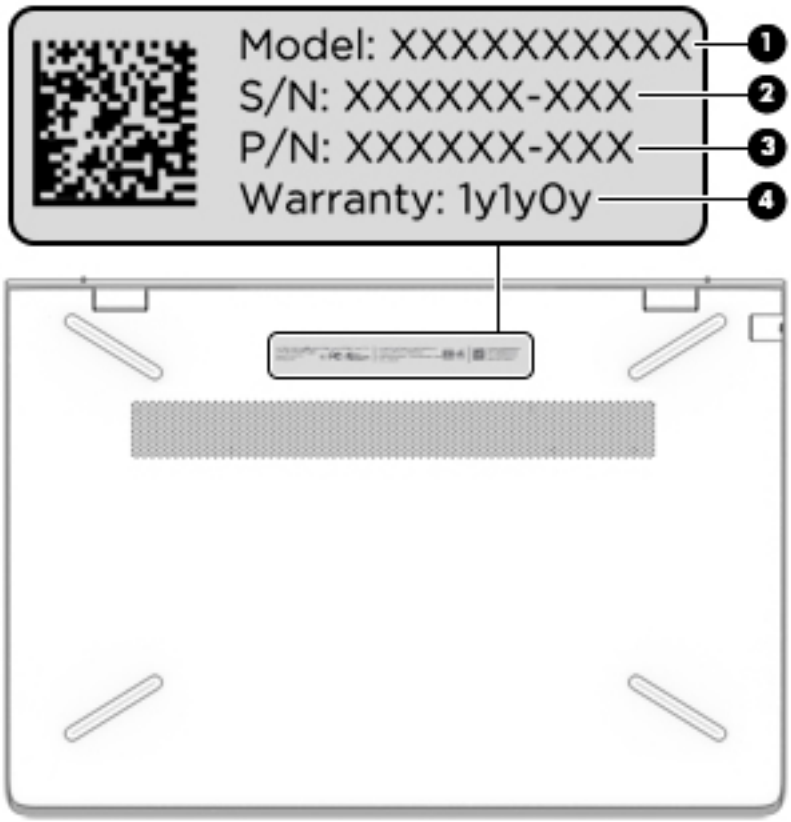
Component	Description
Vent	Enables airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

3 Illustrated parts catalog

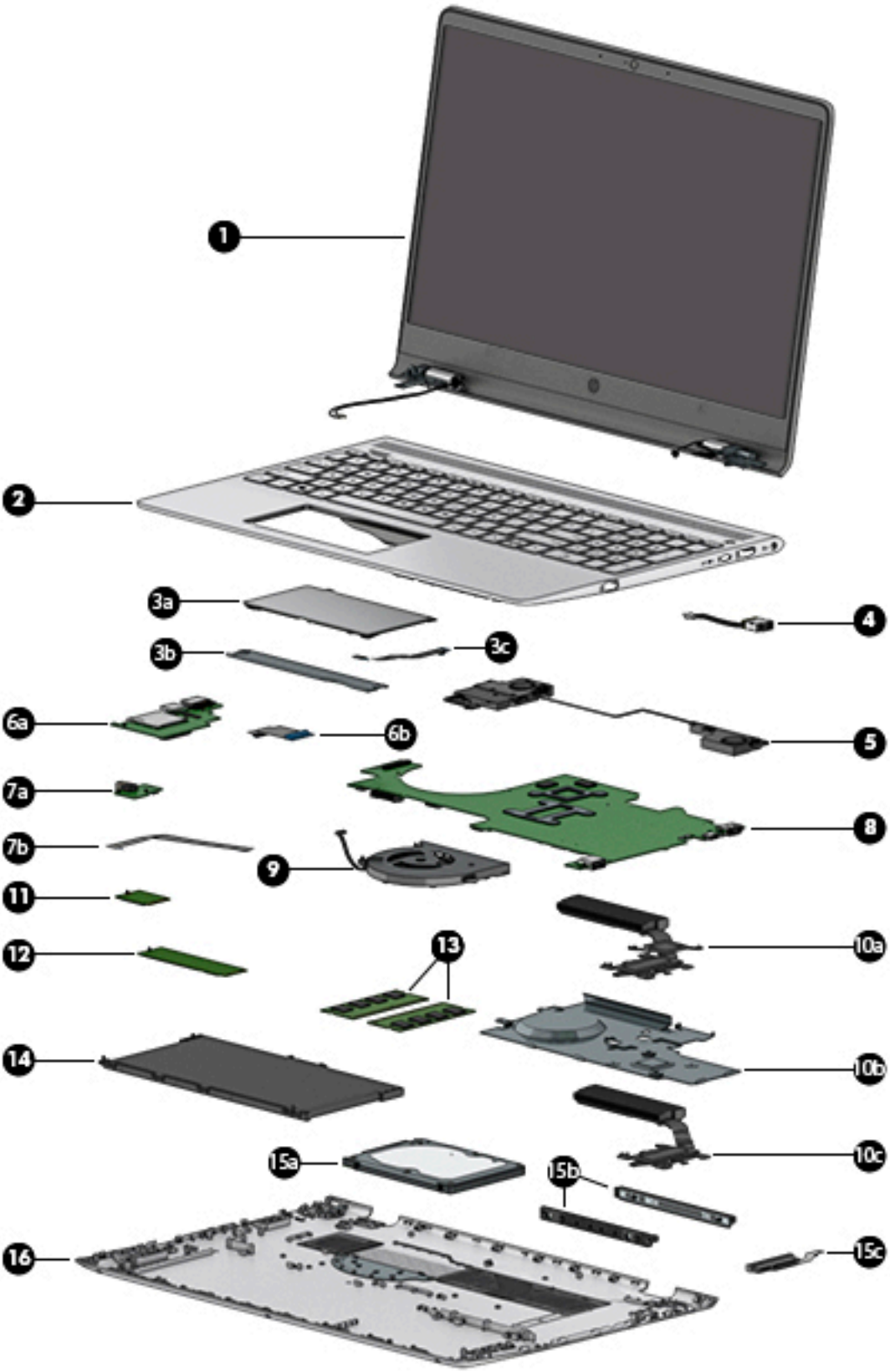
NOTE: HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to http://partsurfer.hp.com, select your country or region, and then follow the on-screen instructions.

Locating the model number, serial number, product number, and warranty information

The model number (1), serial number (2), product number (3), and warranty information (4) are located on the bottom of the computer. This information may be needed when travelling internationally or when contacting support.



Computer components



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 assembly components on page 23.	
(2)	**Keyboard/top cover with backlight** (includes backlight cable and keyboard cable):	
	In mineral silver finish with speaker grille in natural silver finish:	
	For use in Belgium	L01924-A41
	For use in Bulgaria	L01924-261
	For use in the Czech Republic and Slovakia	L01924-FL1
	For use in Denmark, Finland, and Norway	L01924-DH1
	For use in France	L01924-051
	For use in Germany	L01924-041
	For use in Greece	L01924-151
	For use in Hungary	L01924-211
	For use in Israel	L01924-BB1
	For use in Italy	L01924-061
	For use in the Netherlands	L01924-B31
	For use in Portugal	L01924-131
	For use in Romania	L01924-271
	For use in Russia	L01924-251
	For use in Saudi Arabia	L01924-171
	For use in Slovenia	L01924-BA1
	For use in South Korea	L01924-AD1
	For use in Spain	L01924-071
	For use in Switzerland	L01924-BG1
	For use in Taiwan	L01924-AB1
	For use in Thailand	L01924-281
	For use in Turkey	L01924-141
	For use in the United Kingdom	L01924-031
	For use in the United States	L01924-001
	Keyboard/top cover with backlight (includes backlight cable and keyboard cable):	
	In silk gold finish with speaker grille in natural silver finish:	
	For use in Belgium	L01925-A41
	For use in Bulgaria	L01925-261
	For use in the Czech Republic and Slovakia	L01925-FL1
	For use in Denmark, Finland, and Norway	L01925-DH1

Item	Component	Spare part number
	For use in France	L01925-051
	For use in Germany	L01925-041
	For use in Greece	L01925-151
	For use in Hungary	L01925-211
	For use in Israel	L01925-BB1
	For use in Italy	L01925-061
	For use in the Netherlands	L01925-B31
	For use in Portugal	L01925-131
	For use in Romania	L01925-271
	For use in Russia	L01925-251
	For use in Saudi Arabia	L01925-171
	For use in Slovenia	L01925-BA1
	For use in South Korea	L01925-AD1
	For use in Spain	L01925-071
	For use in Switzerland	L01925-BG1
	For use in Taiwan	L01925-AB1
	For use in Thailand	L01925-281
	For use in Turkey	L01925-141
	For use in the United Kingdom	L01925-031
	For use in the United States	L01925-001
	Keyboard/top cover with backlight (includes backlight cable and keyboard cable):	
	In snowflake white with speaker grille in snowflake white finish:	
	For use in Belgium	L01926-A41
	For use in Bulgaria	L01926-261
	For use in the Czech Republic and Slovakia	L01926-FL1
	For use in Denmark, Finland, and Norway	L01926-DH1
	For use in France	L01926-051
	For use in Germany	L01926-041
	For use in Greece	L01926-151
	For use in Hungary	L01926-211
	For use in Israel	L01926-BB1
	For use in Italy	L01926-061
	For use in the Netherlands	L01926-B31
	For use in Portugal	L01926-131

Item	Component	Spare part number
	For use in Romania	L01926-271
	For use in Russia	L01926-251
	For use in Saudi Arabia	L01926-171
	For use in Slovenia	L01926-BA1
	For use in South Korea	L01926-AD1
	For use in Spain	L01926-071
	For use in Switzerland	L01926-BG1
	For use in Taiwan	L01926-AB1
	For use in Thailand	L01926-281
	For use in Turkey	L01926-141
	For use in the United Kingdom	L01926-031
	For use in the United States	L01926-001
	Keyboard/top cover without backlight (includes keyboard cable):	
	In mineral silver finish with speaker grille in natural silver finish:	
	For use in Belgium	L01927-A41
	For use in Bulgaria	L01927-261
	For use in the Czech Republic and Slovakia	L01927-FL1
	For use in Denmark, Finland, and Norway	L01927-DH1
	For use in France	L01927-051
	For use in Germany	L01927-041
	For use in Greece	L01927-151
	For use in Hungary	L01927-211
	For use in Israel	L01927-BB1
	For use in Italy	L01927-061
	For use in the Netherlands	L01927-B31
	For use in Portugal	L01927-131
	For use in Romania	L01927-271
	For use in Russia	L01927-251
	For use in Saudi Arabia	L01927-171
	For use in Slovenia	L01927-BA1
	For use in South Korea	L01927-AD1
	For use in Spain	L01927-071
	For use in Switzerland	L01927-BG1
	For use in Taiwan	L01927-AB1

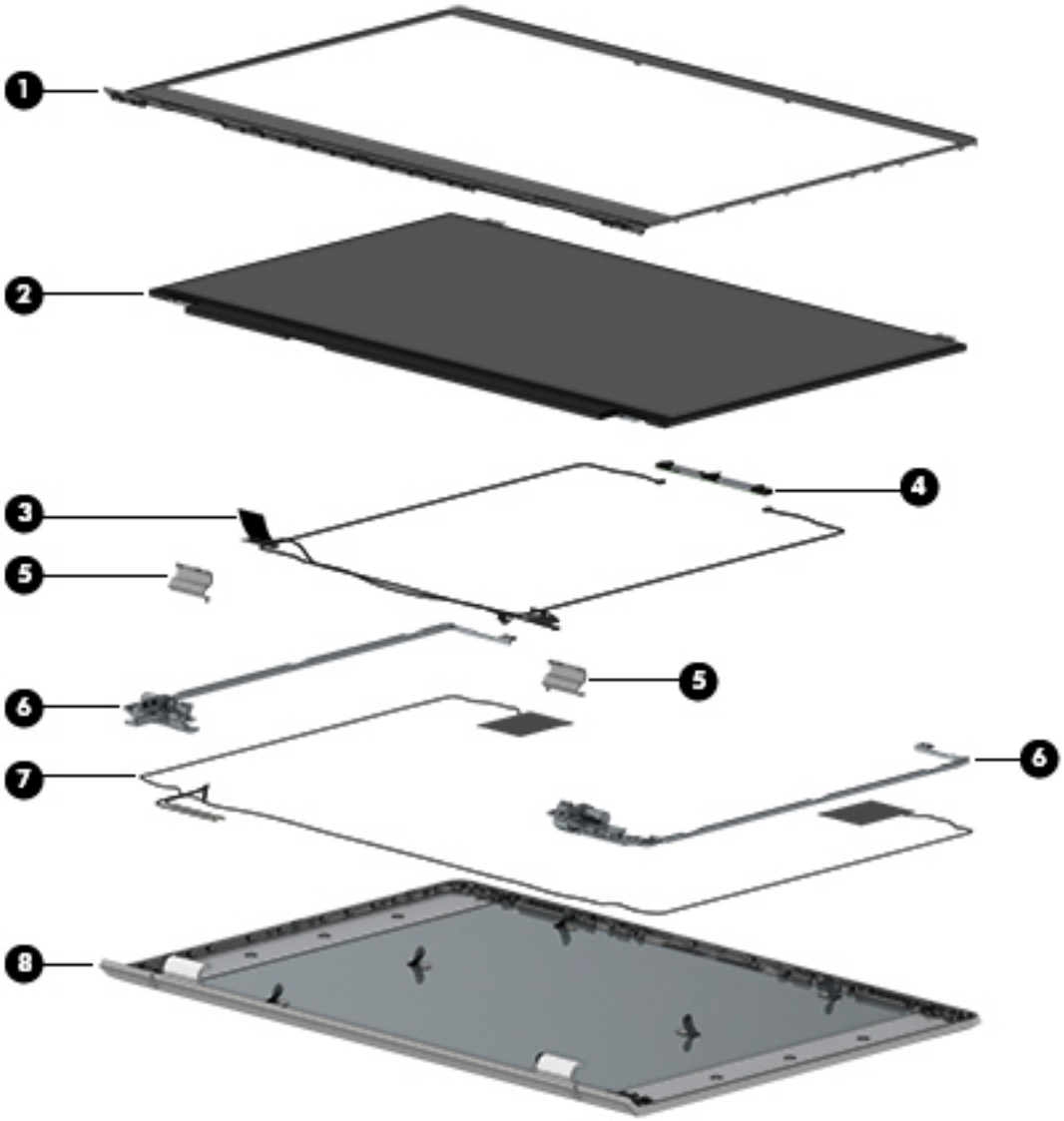
Item	Component	Spare part number
	For use in Thailand	L01927-281
	For use in Turkey	L01927-141
	For use in the United Kingdom	L01927-031
	For use in the United States	L01927-001
	Keyboard/top cover without backlight (includes keyboard cable):	
	In silk gold with speaker grille in natural silver finish:	
	For use in Belgium	L01928-A41
	For use in Bulgaria	L01928-261
	For use in the Czech Republic and Slovakia	L01928-FL1
	For use in Denmark, Finland, and Norway	L01928-DH1
	For use in France	L01928-051
	For use in Germany	L01928-041
	For use in Greece	L01928-151
	For use in Hungary	L01928-211
	For use in Israel	L01928-BB1
	For use in Italy	L01928-061
	For use in the Netherlands	L01928-B31
	For use in Portugal	L01928-131
	For use in Romania	L01928-271
	For use in Russia	L01928-251
	For use in Saudi Arabia	L01928-171
	For use in Slovenia	L01928-BA1
	For use in South Korea	L01928-AD1
	For use in Spain	L01928-071
	For use in Switzerland	L01928-BG1
	For use in Taiwan	L01928-AB1
	For use in Thailand	L01928-281
	For use in Turkey	L01928-141
	For use in the United Kingdom	L01928-031
	For use in the United States	L01928-001
	Keyboard/top cover without backlight (includes keyboard cable):	
	In snowflake white with speaker grille in snowflake white finish:	
	For use in Belgium	L01929-A41
	For use in Bulgaria	L01929-261

Item	Component	Spare part number
	For use in the Czech Republic and Slovakia	L01929-FL1
	For use in Denmark, Finland, and Norway	L01929-DH1
	For use in France	L01929-051
	For use in Germany	L01929-041
	For use in Greece	L01929-151
	For use in Hungary	L01929-211
	For use in Israel	L01929-BB1
	For use in Italy	L01929-061
	For use in the Netherlands	L01929-B31
	For use in Portugal	L01929-131
	For use in Romania	L01929-271
	For use in Russia	L01929-251
	For use in Saudi Arabia	L01929-171
	For use in Slovenia	L01929-BA1
	For use in South Korea	L01929-AD1
	For use in Spain	L01929-071
	For use in Switzerland	L01929-BG1
	For use in Taiwan	L01929-AB1
	For use in Thailand	L01929-281
	For use in Turkey	L01929-141
	For use in the United Kingdom	L01929-031
	For use in the United States	L01929-001
(3a)	**TouchPad** (does not include TouchPad cable)	L02816-001
(3b)	**TouchPad bracket**	926879-001
(3c)	**TouchPad cable**	L01851-001
(4)	**Power connector cable**	L01853-001
(5)	**Speakers** (include left and speakers and cables)	L01850-001
(6a)	**Connector board** (does not include connector board cable)	L01845-001
(6c)	**Connector board cable**	L01846-001
(7a)	**Audio jack board** (does not include audio jack board cable)	L01847-001
(7c)	**Audio jack board cable** (includes double-sided adhesive)	L01848-001
(8)	**System board** (includes processor and replacement thermal material):	
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics	L01683-601

Item	Component	Spare part number
	subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and the Windows 10 operating system	
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and a non-Windows operating system	L01683-001
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and the Windows 10 operating system	L01687-601
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and a non-Windows operating system	L01687-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and the Windows 10 operating system	L01681-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and a non-Windows operating system	L01681-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and the Windows 10 operating system	L01685-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and a non-Windows operating system	L01685-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an Intel UHD 620 graphics subsystem with UMA video memory, 8-GB of system memory, and the Windows 10 operating system	L01691-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an Intel UHD 620 graphics subsystem with UMA video memory, 8-GB of system memory, and a non-Windows operating system	L01691-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz, 3.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	L01689-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	L01689-001
	USB Type-C bracket (not illustrated)	L01852-001
(9)	**Fan** (includes cable)	927918-001
	Heat sink (includes replacement thermal material):	

Item	Component	Spare part number
(10a)	For use only on computer models equipped with an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem	927920-001
(10a)	For use only on computer models equipped with an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem	L02817-001
(10b)	For use only on computer models equipped with a graphics subsystem with UMA memory	927919-001
(11)	**WLAN module**	
	Intel Dual Band Wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	863934-855
	Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	901229-855
	Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter	927230-855
(12)	**Solid-state drive:**	
	512-GB, M.2 2280, SATA-3, PCIe, MVMe, solid-state drive with TLC	L01680-001
	512-GB, M.2 2280, PCIe, MVMe, solid-state drive	L03090-001
	360-GB, M.2 2280, PCIe, MVMe, solid-state drive with TLC	L01678-001
	256-GB, M.2 2280, SATA-3, PCIe, MVMe, solid-state drive with TLC	L01679-001
	256-GB, M.2 2280, PCIe, MVMe, solid-state drive	L03089-001
	128-GB, M.2 2280, PCIe, MVMe, solid-state drive with TLC	L01677-001
(13)	**Memory modules** (2, SODIMM, DDR4-2400, 1.2-V):	
	8-MB	862398-855
	4-MB	862397-855
	2-MB	864271-855
(14)	**Battery** (3-cell, 41-WHr, 3.6-AHr, Li-ion)	920070-855
(15a)	**Hard drive** (does not include hard drive bracket or hard drive cable):	
	2-TB, 5400-rpm, SATA, 7.0-mm hard drive	912487-855
	1-TB, 5400-rpm, SATA, 7.0-mm hard drive	762990-005
	500-GB, 5400-rpm, SATA, 7.0-mm hard drive	788186-005
(15b)	**Hard drive bracket**	933608-001
(15c)	**Hard drive cable**	L01855-001
(16)	**Bottom cover**	L01849-001
	Rubber Kit (not illustrated, includes bottom cover rear foot strip)	L01856-001

Display assembly components



Item	Component	Spare part number
(1)	**Display bezel**:	
	For use only on computer models equipped with an infrared webcam	L01843-001
	For use only on computer models equipped with a non-infrared webcam	L01842-001
(2)	**Display panel**:	
	15.6-in, FHD, AntiGlare, LED, UWVA, TouchScreen display panel assembly	L01675-001
	15.6-in, FHD, BrightView, LED, UWVA, display panel assembly	L01674-001
	15.6-in, HD, AntiGlare, LED, SVA, display panel assembly	L01676-001
(3)	**Display panel cable** (includes TouchScreen control board cable and webcam/microphone module cable):	
	For use only on computer models equipped with a TouchScreen display assembly and an infrared webcam/microphone module	L04970-001

Item	Component	Spare part number
	For use only on computer models equipped with a TouchScreen display assembly and a non-infrared webcam/microphone module	L04972-001
	For use only on computer models equipped with a non-TouchScreen display assembly and an infrared webcam/microphone module	L02663-001
	For use only on computer models equipped with a non-TouchScreen display assembly and a non-infrared webcam/microphone module	L01858-001
(4)	**Webcam/microphone module** (includes double-sided adhesive):	
	FDHC infrared webcam/microphone module	L01859-001
	HDC non-infrared webcam/microphone module	L01860-001
(5)	**Hinge caps** (2, includes left and right hinge caps)	L01854-001
(6)	**Hinges** (2, include left and right display hinges)	L01844-001
(7)	**Wireless Antenna Kit** (includes left and right wireless antenna cables and transceivers)	L04971-001
(9)	**Display back cover** (includes rubber padding and shielding):	
	In mineral silver finish	L01839-001
	In silk gold finish	L01840-001
	In snowflake white finish	L01841-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
90-W AC adapter (PFC, S-3P, 4.5-mm)	710413-001
65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm)	913691-850
65-W AC adapter (non-PFC, S-3P, 4.5-mm)	710412-001
45-W HP Smart AC adapter (non-PFC, RC, 4.5-mm, non-slim)	741727-001
HP external DVD±RW DL SuperMulti Drive	747080-00
HP HDMI-to-VGA adapter	701943-001
HP USB-C–to–USB-A dongle	914936-001
HP USB Type-C adapter:	
USB Type-C–to–HDMI adapter	831752-001
USB Type-C–to–HDMI 2.0 adapter	935325-001
USB Type-C–to–MultiPort hub	919666-001
USB Type-C–to–RJ45 adapter	855560-001
USB Type-C–to–USB Type-A dongle	833960-001
USB Type-C–to–USB Type-A hub	916838-001

Component	Spare part number
USB Type-C–to–VGA adapter	831751-001
Power cord (C5 connector, 1.00-m):	
For use in Australia	920688-011
For use in Brazil	920688-004
For use in Denmark	920688-007
For use in Europe	920688-005
For use in India	920688-016
For use in Israel	920688-008
For use in Italy	920688-002
For use in Japan	920688-017
For use in North America	920688-001
For use in the People's Republic of China	920688-014
For use in South Africa	920688-010
For use in South Korea	920688-013
For use in Switzerland	920688-009
For use in Taiwan	920688-015
For use in Thailand	920688-012
For use in the United Kingdom	920688-006
Rubber Kit (includes bottom cover rear foot strip)	L01856-001
Screw Kit	L04973-001

4 Removal and replacement preliminary requirements

Tools required

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

- Flat-bladed screw driver
- Magnetic screw driver
- Phillips P0 screw driver

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

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

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 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 a diskette drive or optical drive, be sure that a diskette or 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 drive, place it in a static-proof bag.

Avoid exposing a 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.”

Grounding guidelines

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 computer 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.

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 computerop 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.

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 Locating the model number, serial number, product number, and warranty information on page 14 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 58 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

Description	Spare part number
Bottom cover	L01849-001

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:

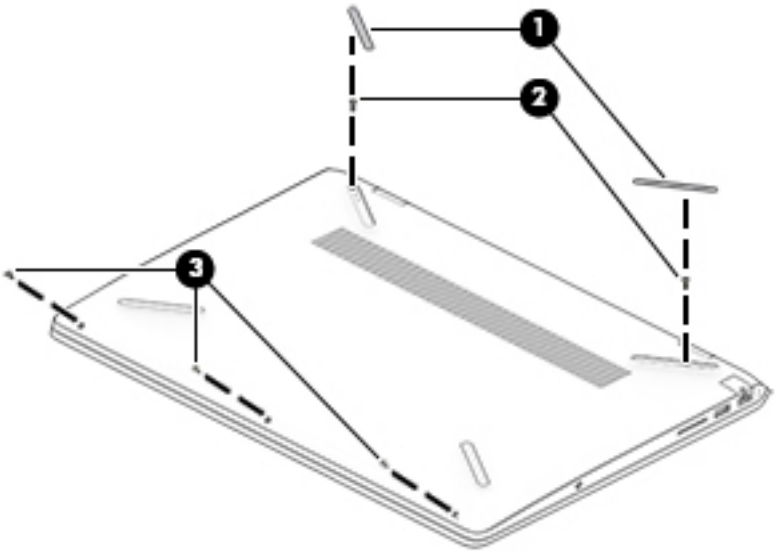
1. Remove the computer rear rubber feet (1).

   The rubber feet are included in the Rubber Kit, spare part number L01856-001.

2. Remove the following screws that secure the bottom cover to the computer:

   (2) Four Phillips M2.5×6.7 screws under the rubber feet

   (3) Three Phillips M2.0×5.7 screws on the front edge



3. Insert a case utility tool (1) or similar thin, plastic tool into the hinge areas of the bottom cover.
4. Lift up on the rear edge of the bottom cover (2) until it separates from the keyboard/top cover.
5. Remove the bottom cover (3).

Reverse this procedure to install the bottom cover.

Battery

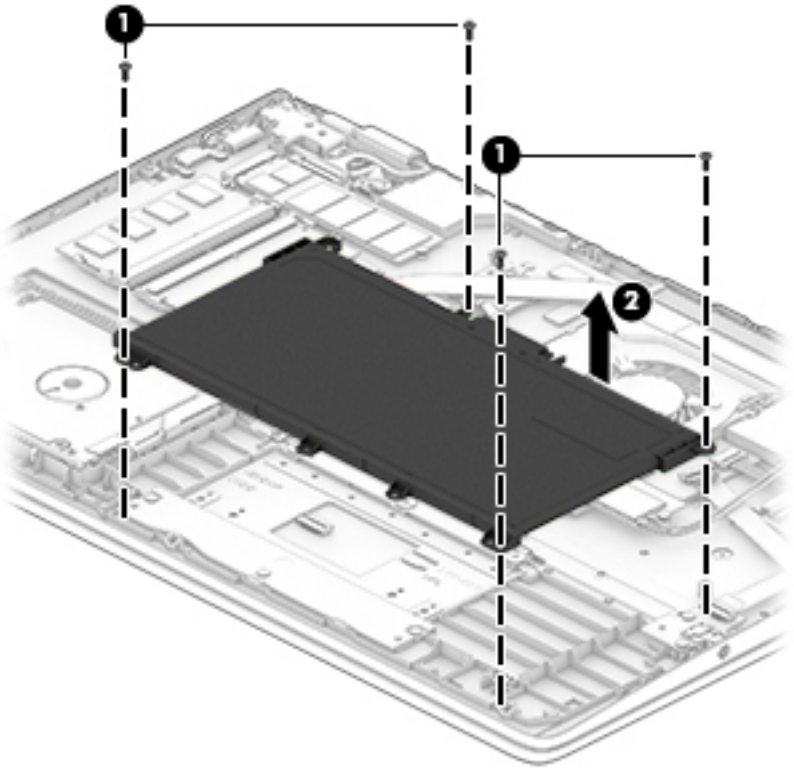
Description	Spare part number
3-cell, 41-WHr, 3.6-AHr, Li-ion battery	920070-855

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 31).

Remove the battery:

1. Remove the four Phillips M2.0×5.7 screws **(1)** that secure the battery to the keyboard/top cover.
2. Remove the battery **(2)**.



Reverse this procedure to install the battery.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive bracket or the hard drive cable. The hard drive bracket is available using spare part number 933608-001. The hard drive cable is available using spare part number L01855-001.

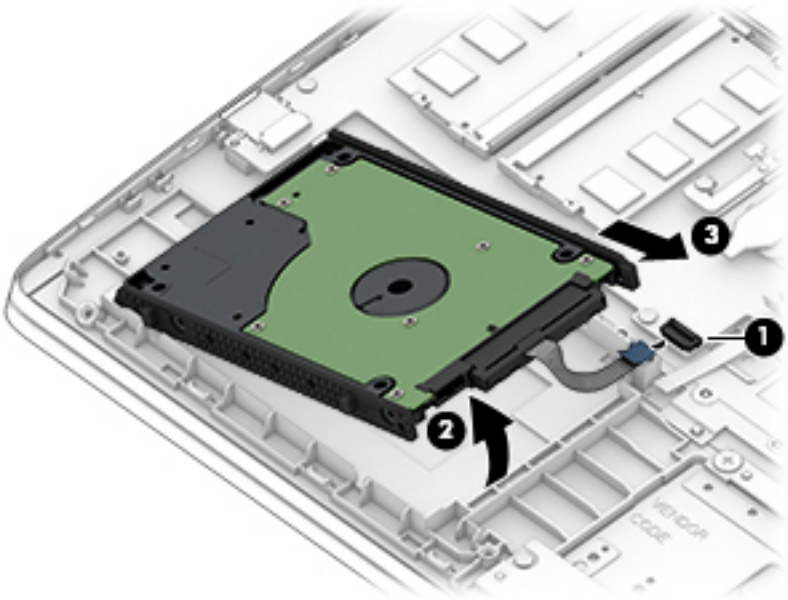
Description	Spare part number
2-TB, 5400-rpm, SATA, 7.0-mm hard drive	912487-855
1-TB, 5400-rpm, SATA, 7.0-mm hard drive	762990-005
500-GB, 5400-rpm, SATA, 7.0-mm hard drive	788186-005

Before removing the hard drive, follow these steps:

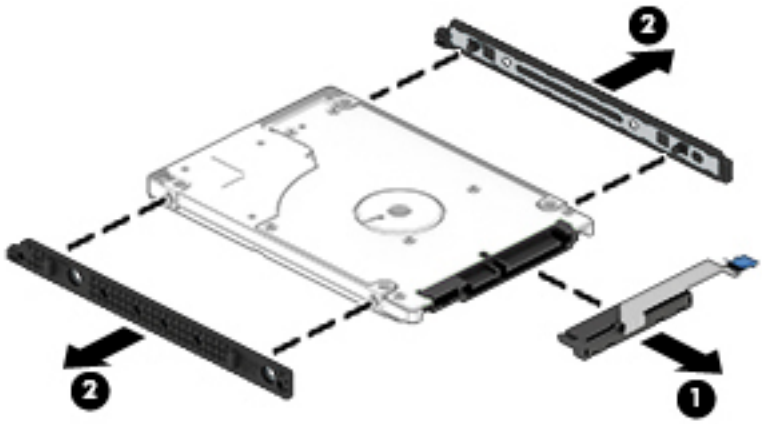
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).

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. Lift the right side of the hard drive **(2)** until it rests at an angle.
3. Remove the hard drive **(3)** by sliding it up and to the right at an angle.



4. If it is necessary to disassemble the hard drive, disconnect the hard drive cable **(1)** from the hard drive, and then remove the hard drive brackets **(2)** from the hard drive.



Reverse this procedure to reassemble and install the hard drive.

Memory module

NOTE: Primary and expansion memory is installed in a side-by-side configuration on the system board. If only one memory module is installed, it must be installed in the socket labeled 1.

Description	Spare part number
8-MB, SODIMM, DDR4-2400, 1.2-V	862398-855
4-MB, SODIMM, DDR4-2400, 1.2-V	862397-855
2-MB, SODIMM, DDR4-2400, 1.2-V	864271-855

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.

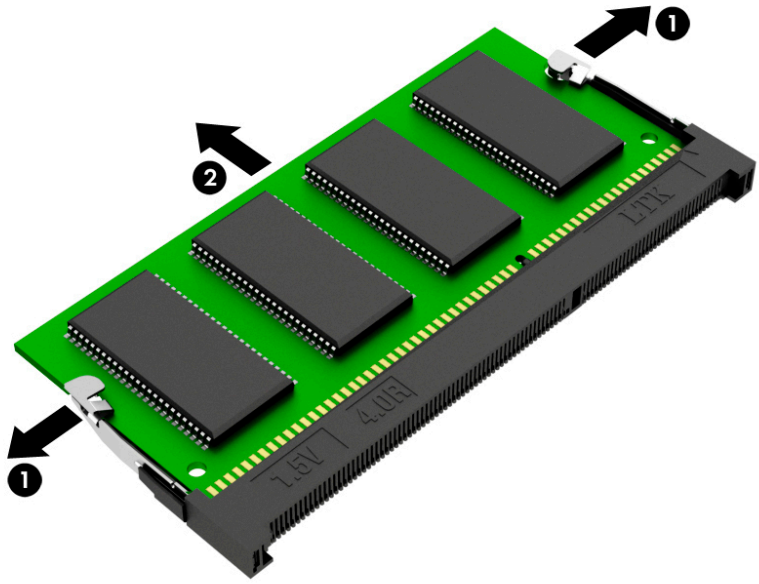
Before removing the memory module, follow these steps:

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 31).
5. Remove the battery (see Battery on page 33).

Remove the memory module:

1. 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.)
2. 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 a memory module.

WLAN module

Description	Spare part number
Intel Dual Band Wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	863934-855
Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	901229-855
Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter	927230-855

⚠ 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 31).
5. Remove the battery (see Battery on page 33).

Remove the WLAN module:

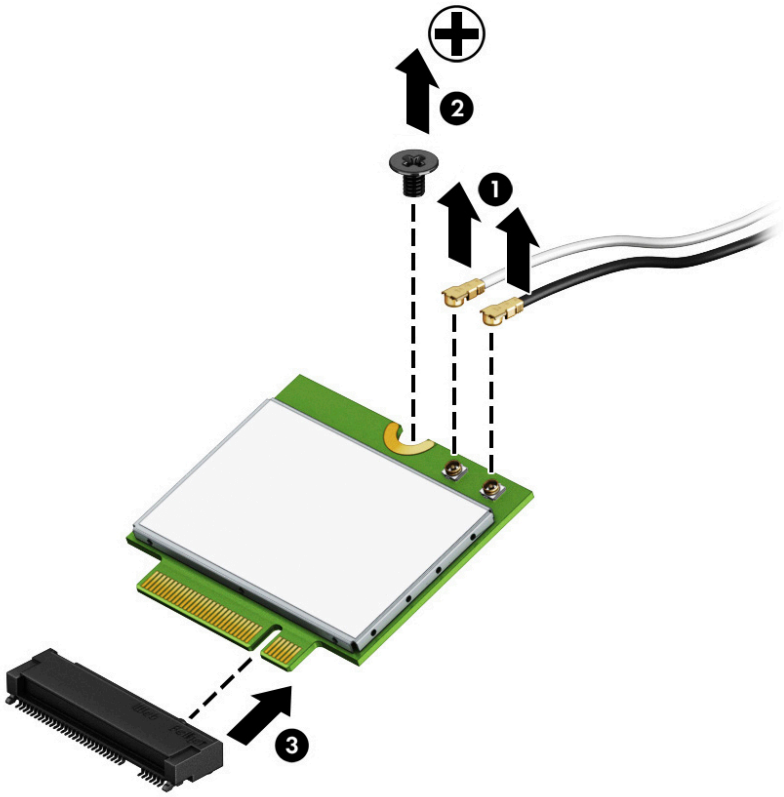
1. Disconnect the wireless antenna cables **(1)** from the terminals on the WLAN module.

NOTE: The wireless antenna cable labeled "1/MAIN" connects to the WLAN module "Main" terminal. The wireless antenna cable labeled "2/AUX" connects to the WLAN module "Aux" terminal.

2. Remove the Phillips M2.0×3.0 screw **(2)** that secures the WLAN module to the computer. (The WLAN module tilts up.)

3. Remove the WLAN module 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

Description	Spare part number
512-GB, M.2 2280, SATA-3, PCIe, MVMe, solid-state drive with TLC	L01680-001
512-GB, M.2 2280, PCIe, MVMe, solid-state drive	L03090-001
360-GB, M.2 2280, PCIe, MVMe, solid-state drive with TLC	L01678-001
256-GB, M.2 2280, SATA-3, PCIe, MVMe, solid-state drive with TLC	L01679-001
256-GB, M.2 2280, PCIe, MVMe, solid-state drive	L03089-001
128-GB, M.2 2280, PCIe, MVMe, solid-state drive with TLC	L01677-001

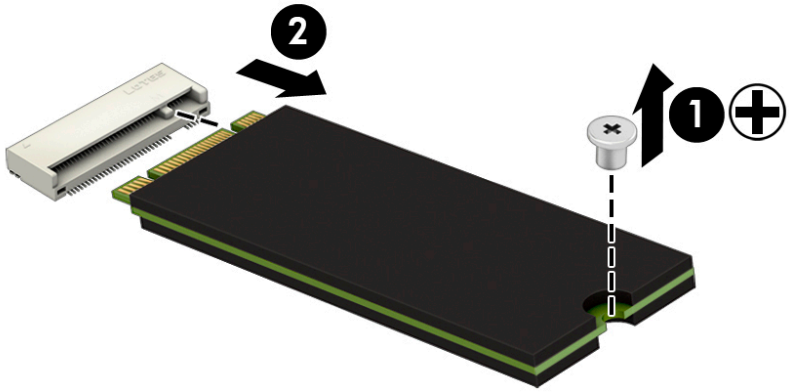
Before removing the solid-state drive, follow these steps:

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 31).
5. Remove the battery (see Battery on page 33).

Remove the solid-state drive:

1. Remove the Phillips M2.0×3.0 screw **(1)** that secures the solid-state drive to the system board.
2. Remove the solid-state drive **(2)** by pulling it away from the slot at an angle.

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



Reverse this procedure to reassemble and install the solid-state drive.

TouchPad cable

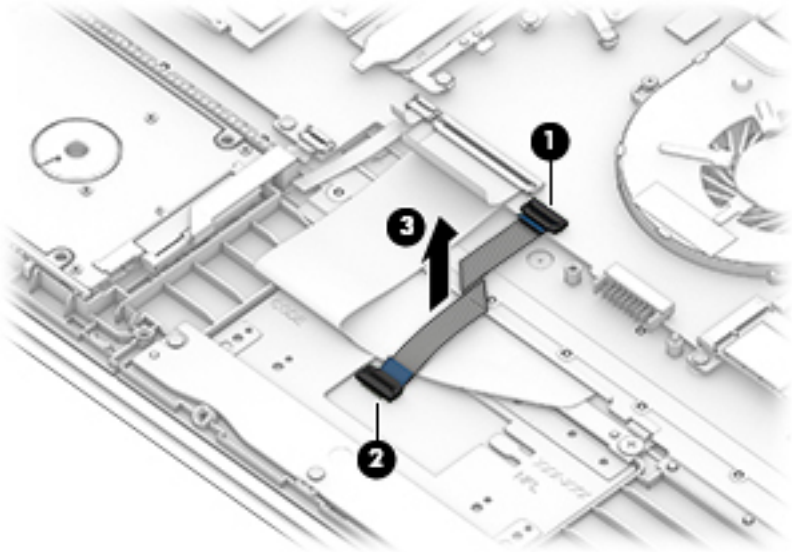
Description	Spare part number
TouchPad cable	L01851-001

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 31).
5. Remove the battery (see Battery on page 33).

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. Remove the TouchPad cable **(3)**.



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 bracket or TouchPad cable. The TouchPad bracket is available using spare part number 926879-001. The TouchPad cable is available using spare part number L01851-001.

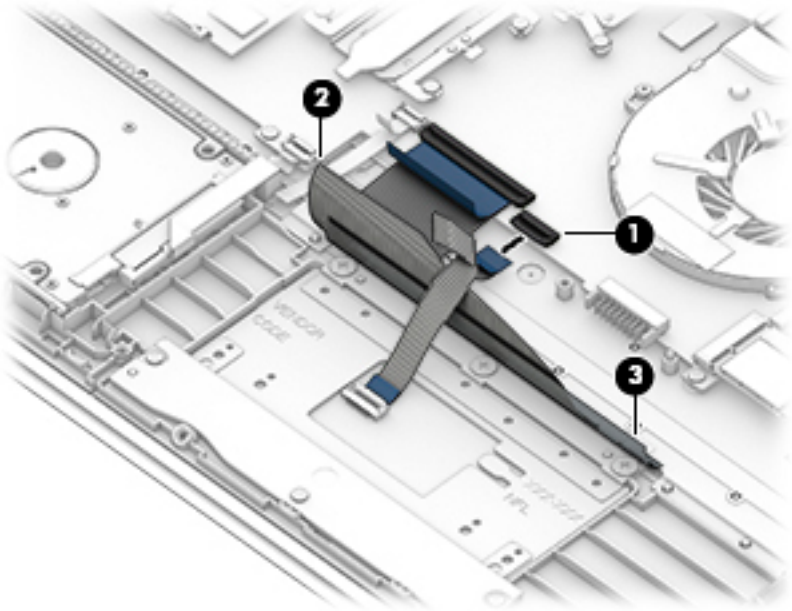
Description	Spare part number
TouchPad	L02816-001

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 31).
5. Remove the battery (see Battery on page 33).

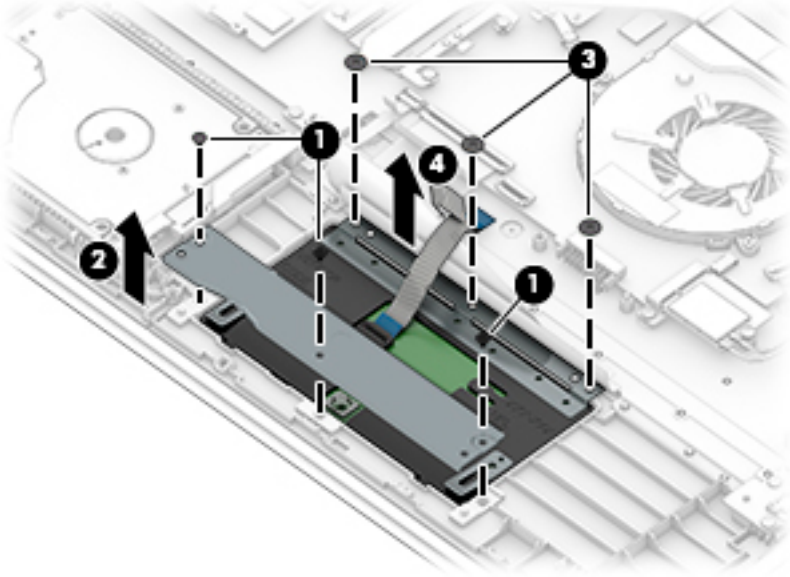
Remove the TouchPad:

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 shielding **(2)** and tape **(3)** that cover the TouchPad.



3. Remove the three Phillips M2.0×3.0 screws **(1)** that secure the TouchPad bracket to the keyboard/top cover.
4. Remove the TouchPad bracket **(2)**.
5. Remove the three Phillips M2.0×2.4 broad head screws **(3)** that secure the TouchPad to the keyboard/top cover.

6. Remove the TouchPad **(4)**.



Reverse this procedure to install the TouchPad.

Power connector cable

Description	Spare part number
Power connector cable	L01853-001

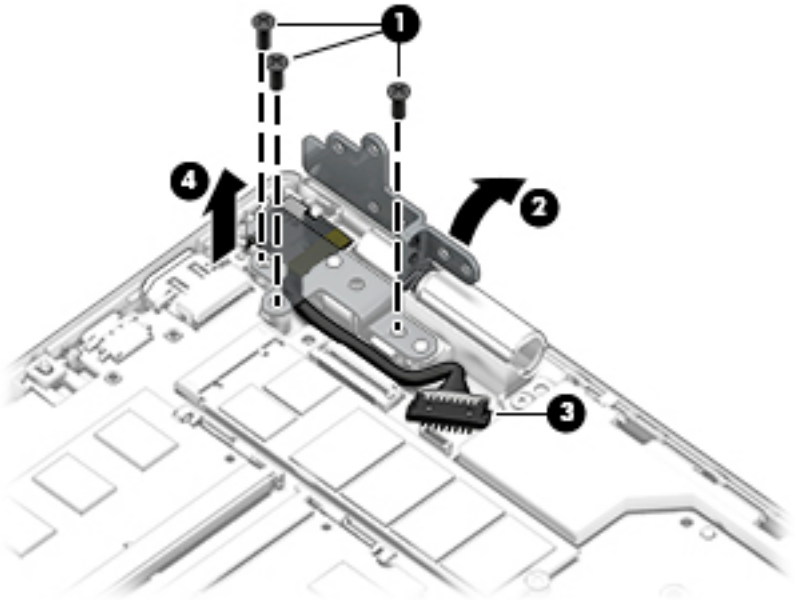
Before removing the power connector cable, follow these steps:

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 31).
5. Remove the battery (see Battery on page 33).

Remove the power connector cable:

1. Remove the three Phillips M2.5×6.7 screws **(1)** that secure the right display hinge to the keyboard/top cover.
2. Swing the right display hinge **(2)** up and back until the power connector cable is accessible.
3. Disconnect the power connector cable **(3)** from the system board

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



Reverse this procedure to install the power connector cable.

Audio jack board cable

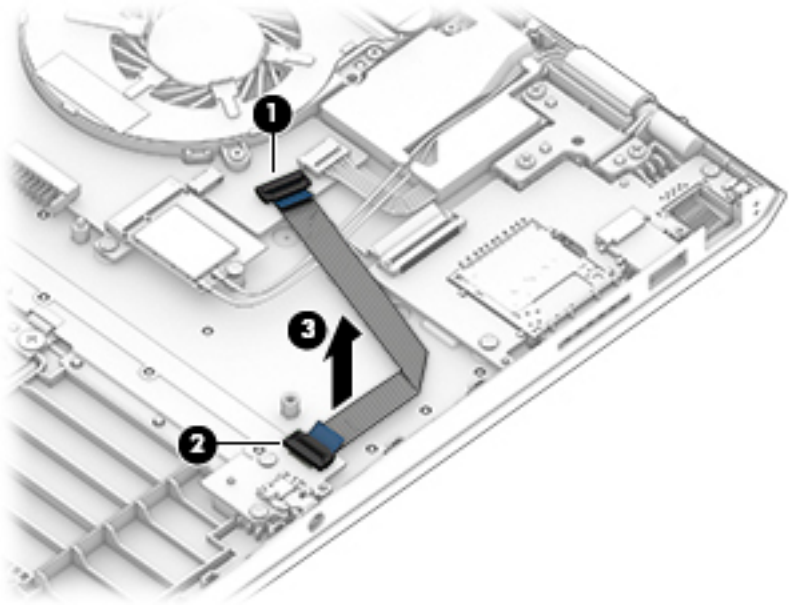
Description	Spare part number
Audio jack board cable	L01848-001

Before removing the audio jack 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 31).
5. Remove the battery (see Battery on page 33).

Remove the audio jack board cable:

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



Reverse this procedure to install the audio jack board cable.

Audio jack board

NOTE: The audio jack board spare part kit does not include the audio jack board cable. The audio jack board cable is available using spare part number L01848-001.

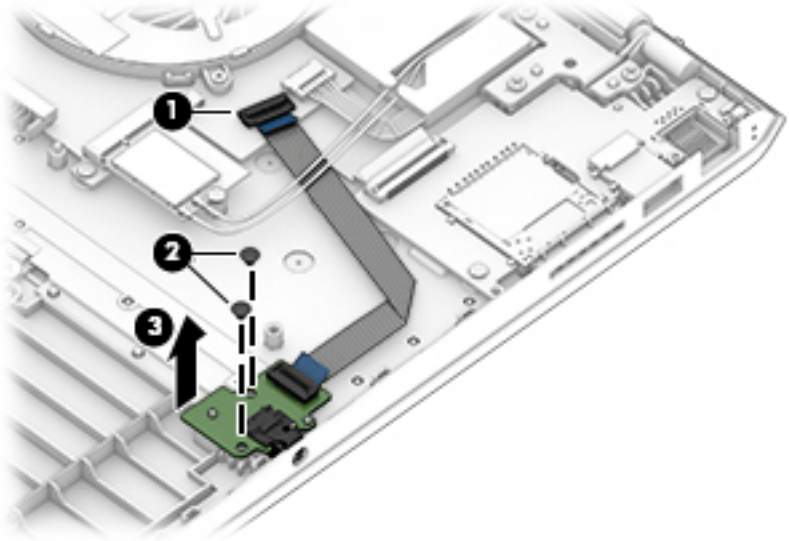
Description	Spare part number
Audio jack board	L01847-001

Before removing the audio jack 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 31).
5. Remove the battery (see Battery on page 33).

Remove the audio jack board:

1. Release the ZIF connector **(1)** to which audio jack board cable is connected, and then disconnect the audio jack board cable from the system board.
2. Remove the two Phillips M2.0×3.0 screws **(2)** that secure the audio jack board to the keyboard/top cover.
3. Remove the audio jack board **(3)** and cable.



Reverse this procedure to install the audio jack board.

Fan

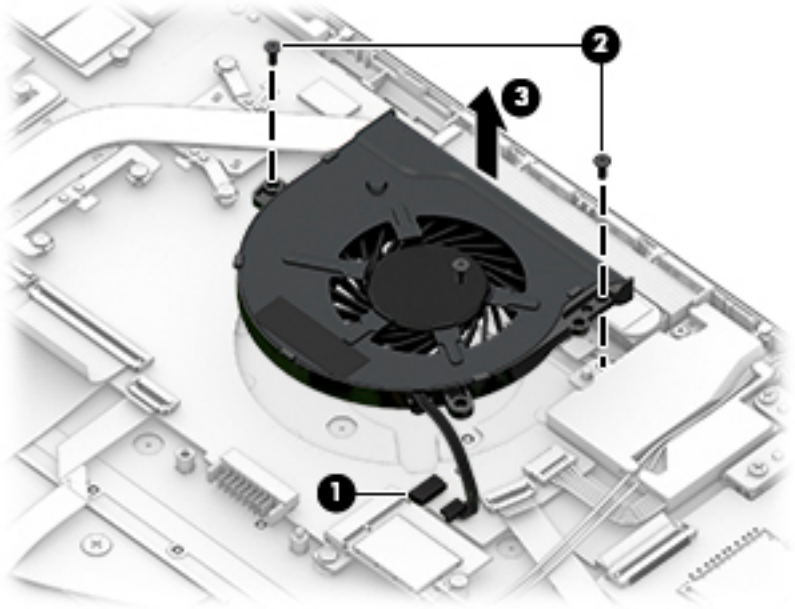
Description	Spare part number
Fan (includes cable)	927918-001

Before removing the fan, 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 31).
5. Remove the battery (see Battery on page 33).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the two Phillips M2.0×5.7 screws **(2)** that secure the fan to the keyboard/top cover.
3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

Connector board

NOTE: The connector board spare part kit does not include the connector board cable. The connector board cable is available using spare part number L01846-001.

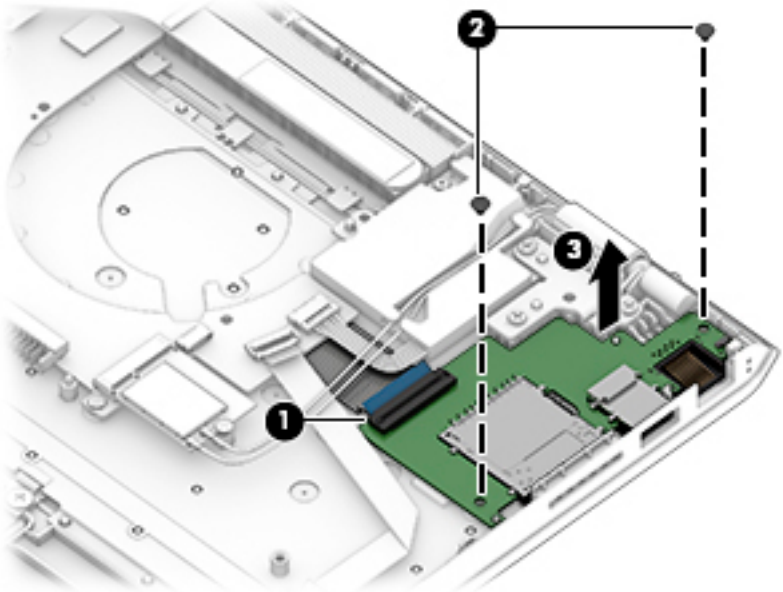
Description	Spare part number
Connector board (includes the card reader slot, USB port, and RJ45 jack)	L01845-001

Before removing the connector 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 31).
5. Remove the battery (see Battery on page 33).

Remove the connector board:

1. Release the ZIF connector **(1)** to which connector board cable is connected, and then disconnect the connector board cable from the connector board.
2. Remove the two Phillips M2.0×3.0 screws **(2)** that secure the connector board to the keyboard/top cover.
3. Remove the connector board **(3)**.



Reverse this procedure to install the connector board.

System board

NOTE: All system board spare part kits include a processor and replacement thermal material.

Description	Spare part number
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and the Windows 10 operating system	L01683-601
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and a non-Windows operating system	L01683-001
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and the Windows 10 operating system	L01687-601
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and a non-Windows operating system	L01687-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and the Windows 10 operating system	L01681-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V 7-Gbps downgrade to 1.35-V 5-Gbps), and a non-Windows operating system	L01681-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and the Windows 10 operating system	L01685-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.35-V/3-GHz, 1.5-V 7-Gbps downgrade to 1.35-V 7-Gbps), and a non-Windows operating system	L01685-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an Intel UHD 620 graphics subsystem with UMA video memory, 8-GB of system memory, and the Windows 10 operating system	L01691-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz, 6.0-MB L3 cache, 15-W), an Intel UHD 620 graphics subsystem with UMA video memory, 8-GB of system memory, and a non-Windows operating system	L01691-001
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz, 3.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	L01689-601
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	L01689-001

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 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Fan (see Fan on page 46)

When replacing the system board, be sure to remove the following components from the defective system board and install them on the replacement system board:

- Memory module (see Memory module on page 35)
- Solid-state drive (see Solid-state drive on page 39)
- Heat sink (see Heat sink on page 51)

Remove the system board:

1. Disconnect the following cables:

   (1) Display panel ZIF connector cable

   (2) Power connector cable

   (3) Webcam/microphone module cable

   (4) Speaker cable

   (5) Connector board ZIF connector cable

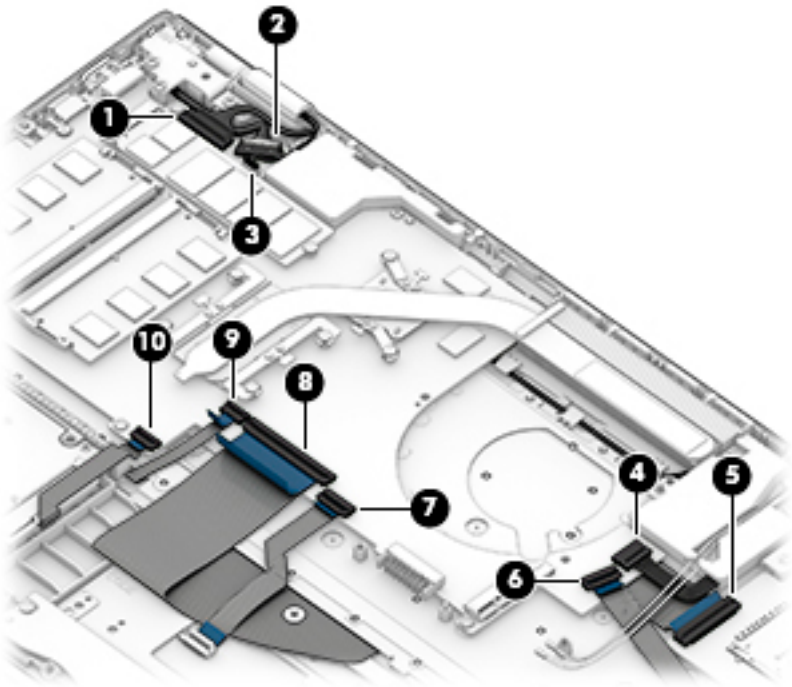
   (6) Audio jack board ZIF connector cable

   (7) TouchPad ZIF connector cable

   (8) Keyboard ZIF connector cable

   (9) Backlight ZIF connector cable

   (10) Hard drive ZIF connector cable



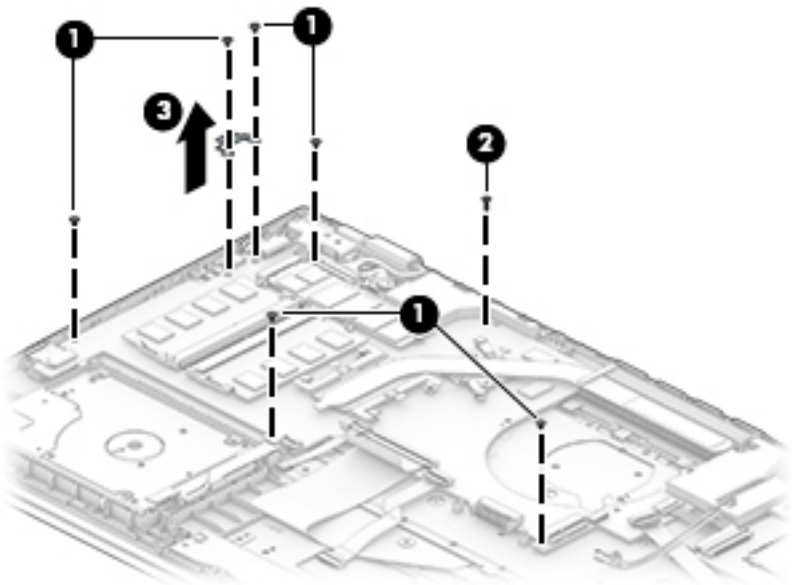
2. Remove the following:

   (1) Six Phillips M2.0×3.0 screws that secure the system board to the keyboard/top cover

   (2) One Phillips M2.0×5.7 screw that secures the system board to the keyboard/top cover

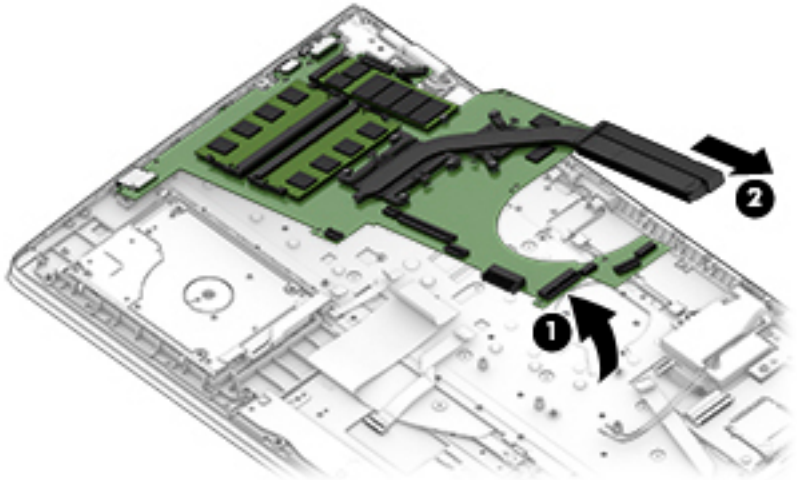
   (3) USB Type-C bracket

   The USB Type-C bracket is available using spare part number L01852-001.



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

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



Reverse this procedure to install the system board.

Heat sink

NOTE: The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
For use only on computer models equipped with an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem	927920-001
For use only on computer models equipped with an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem	L02817-001
For use only on computer models equipped with a graphics subsystem with UMA memory	927919-001

Before removing the heat sink, follow these steps:

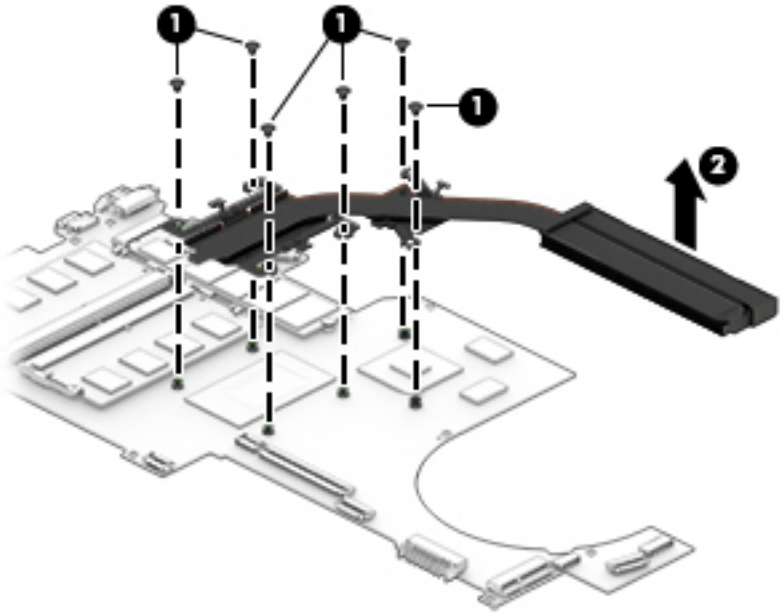
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Fan (see Fan on page 46)
   d. System board (see System board on page 48)

Remove the heat sink:

NOTE: Steps 1 and 2 apply to computer models equipped with a graphics subsystem with discrete memory.

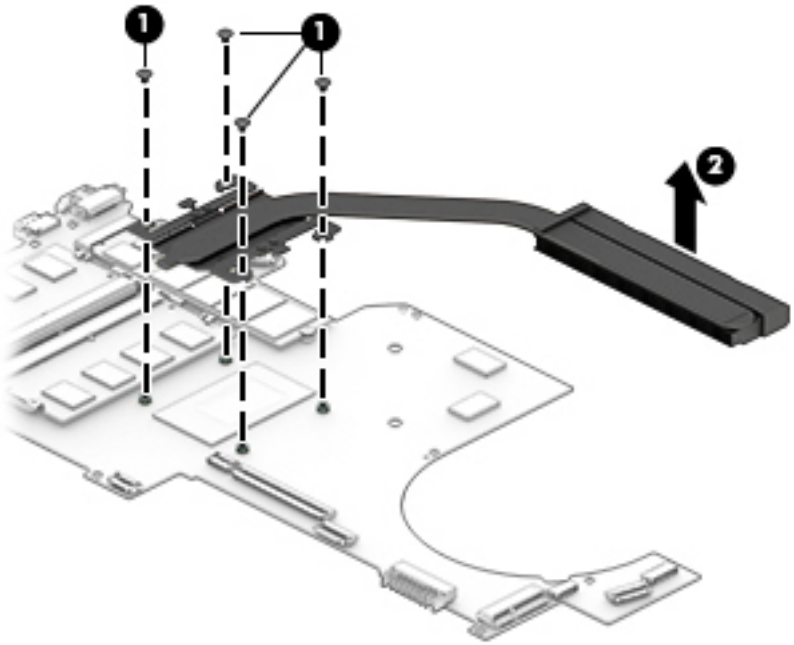
1. Remove the six Phillips M2.0×3.0 screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink (2).



NOTE: Steps 3 and 4 apply to computer models equipped with a graphics subsystem with UMA memory.

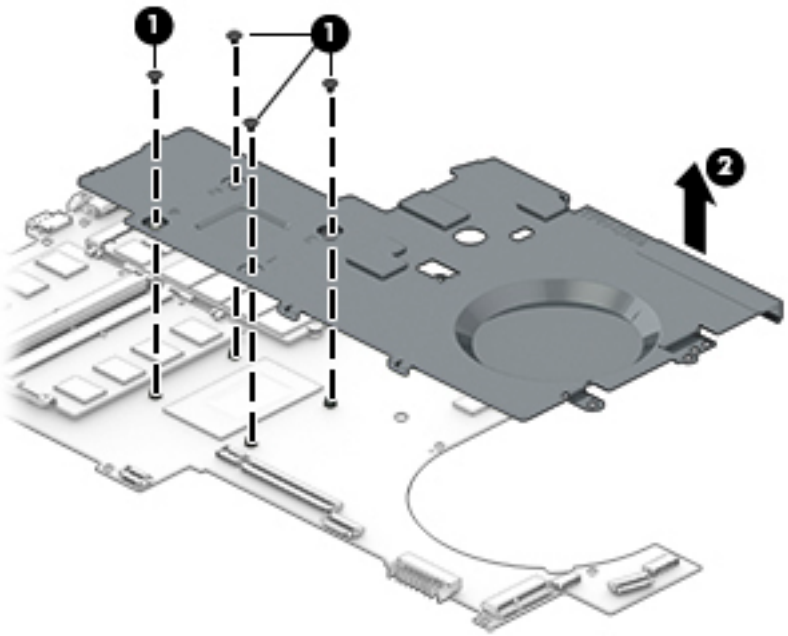
3. Remove the four Phillips M2.0×3.0 screws (1) that secure the heat sink to the system board.
4. Remove the heat sink (2).



NOTE: Steps 5 and 6 apply to computer models equipped with a fanless heat sink.

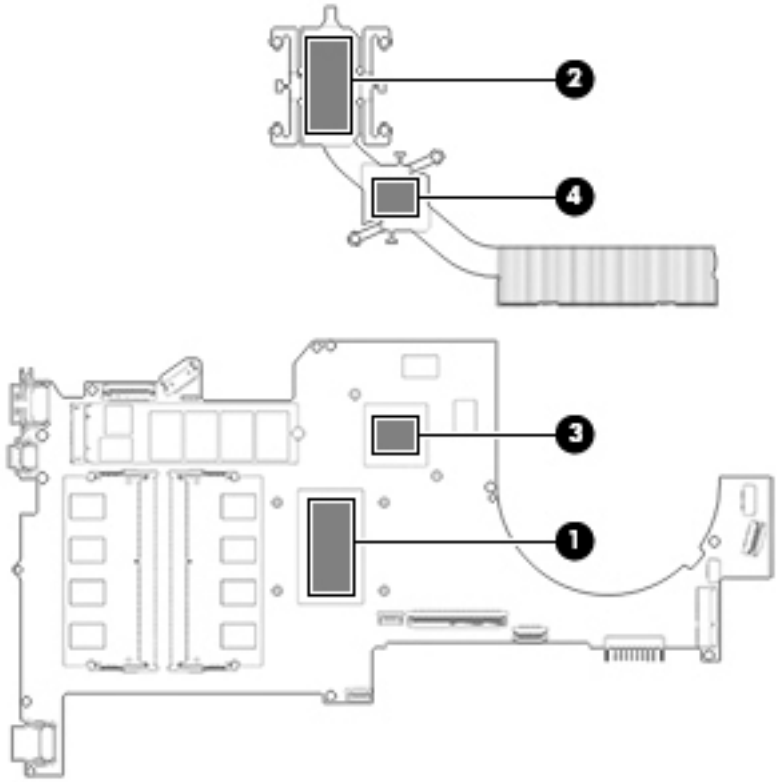
5. Remove the four Phillips M2.0×3.0 screws (1) that secure the heat sink to the system board.

6. Remove the heat sink (2).

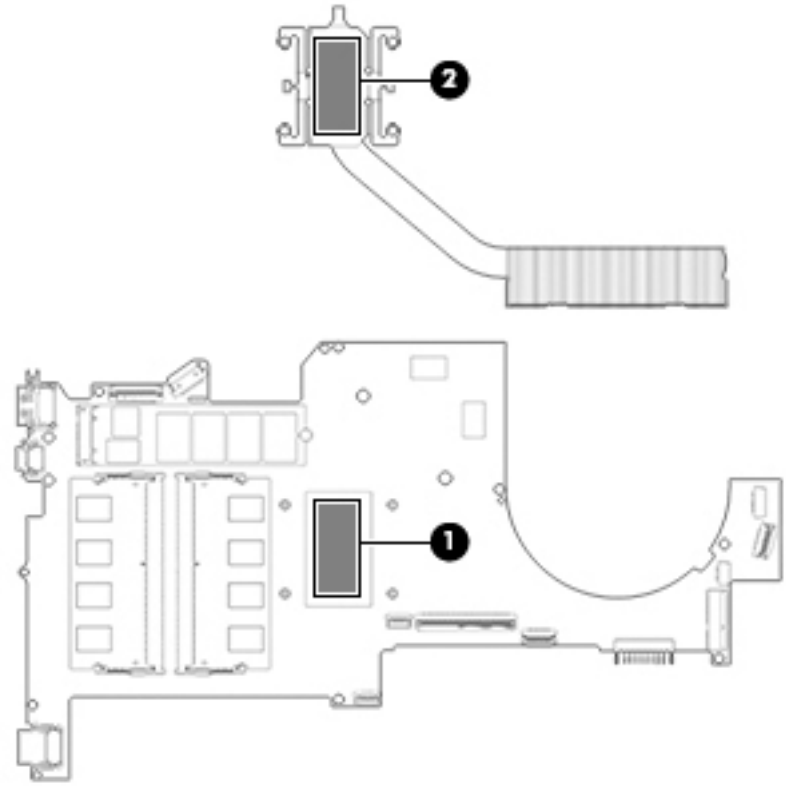


NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

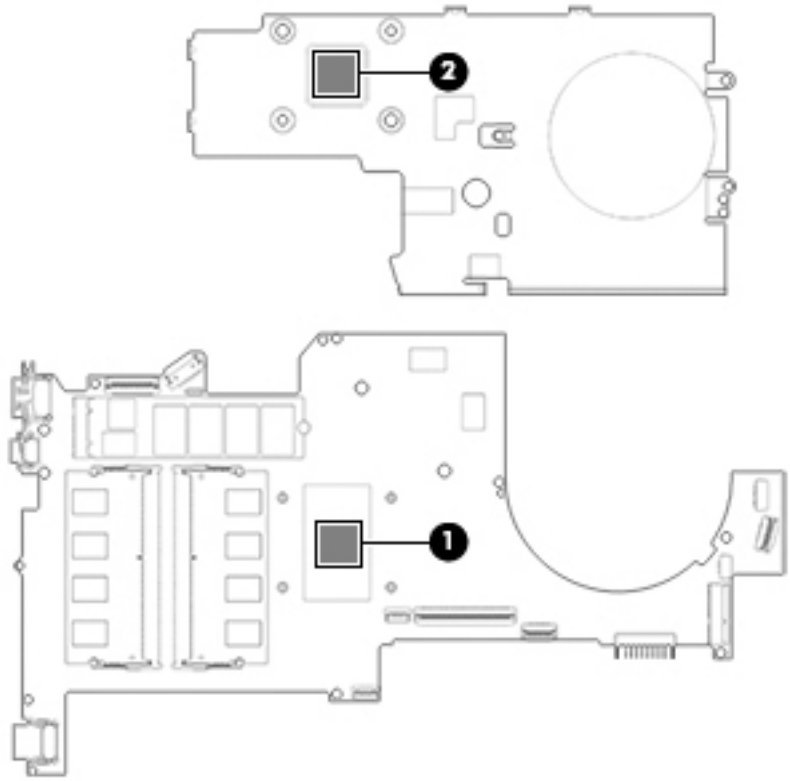
On computer models equipped with a graphics subsystem with discrete memory: Thermal paste is used on the processor (1) and the heat sink section (2) that services it. Thermal paste is also used on the VGA component (3) and the heat sink section (4) that services it.



On computer models equipped with a graphics subsystem with UMA memory: Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



On computer models equipped with a fanless heat sink: Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.



Reverse this procedure to install the heat sink.

Connector board cable

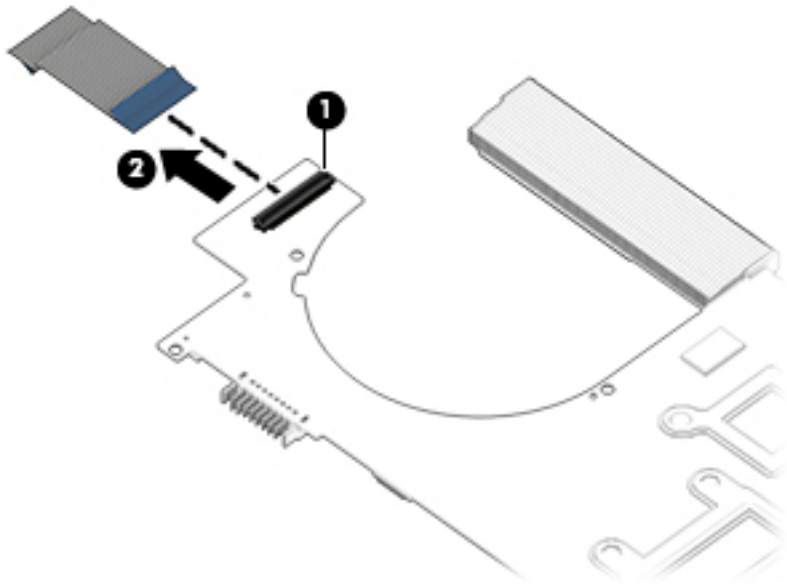
Description	Spare part number
Connector board cable	L01846-001

Before removing the connector 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 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Fan (see Fan on page 46)
   d. System board (see System board on page 48)

Remove the connector board cable:

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



Reverse this procedure to install the connector board cable.

Speakers

Description	Spare part number
Speakers (include left and right speakers and cables)	L01850-001

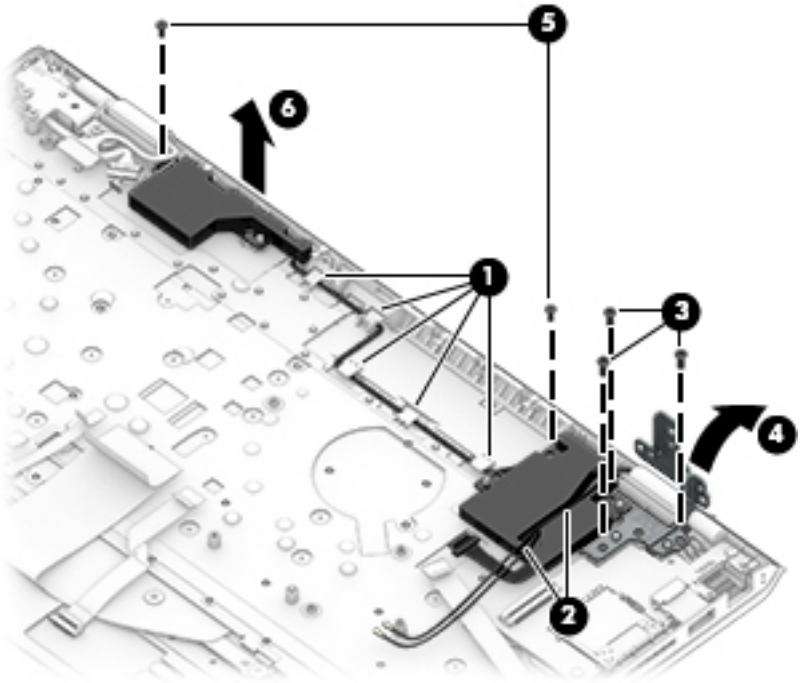
Before removing the speakers, follow these steps:

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 31).
5. Remove the bottom cover (see Bottom cover on page 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Fan (see Fan on page 46)
   d. System board (see System board on page 48)

Remove the speakers:

1. Release the speaker cable from the retention clips **(1)** and routing channel built into the keyboard/top cover.
2. Release the wireless antenna cables from the retention clips **(2)** and routing channel built into the left speaker.
3. Remove the three Phillips M2.5×6.7 screws **(3)** that secure the left display hinge to the keyboard/top cover.
4. Swing the left display hinge **(4)** up and back until the left speaker is accessible.
5. Remove the two Phillips M2.0×5.7 screws **(5)** that secure the speakers to the keyboard/top cover.

6. Remove the speakers (6).



Reverse this procedure to install the speakers.

Display assembly

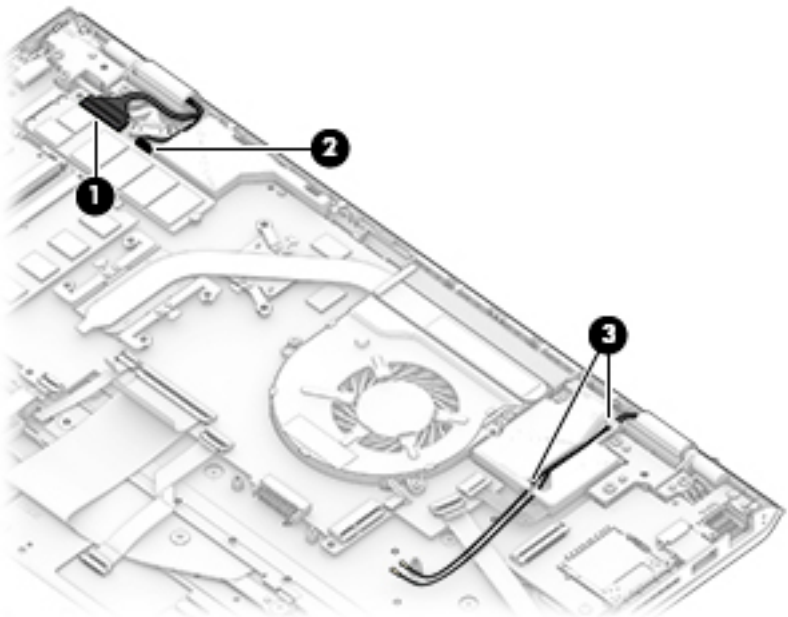
NOTE: The display assembly is spared at the subcomponent level. For display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

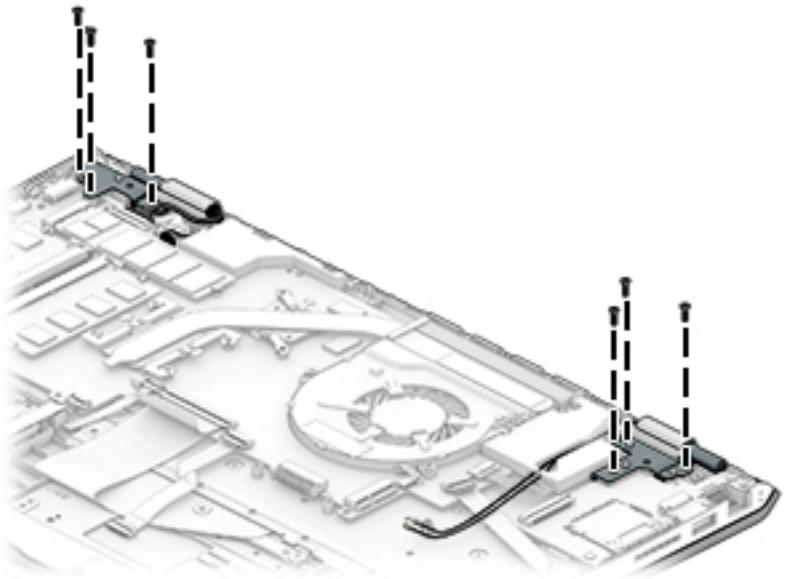
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).
6. Disconnect the wireless antenna cables from the WLAN module (see WLAN module on page 37).

Remove the display assembly:

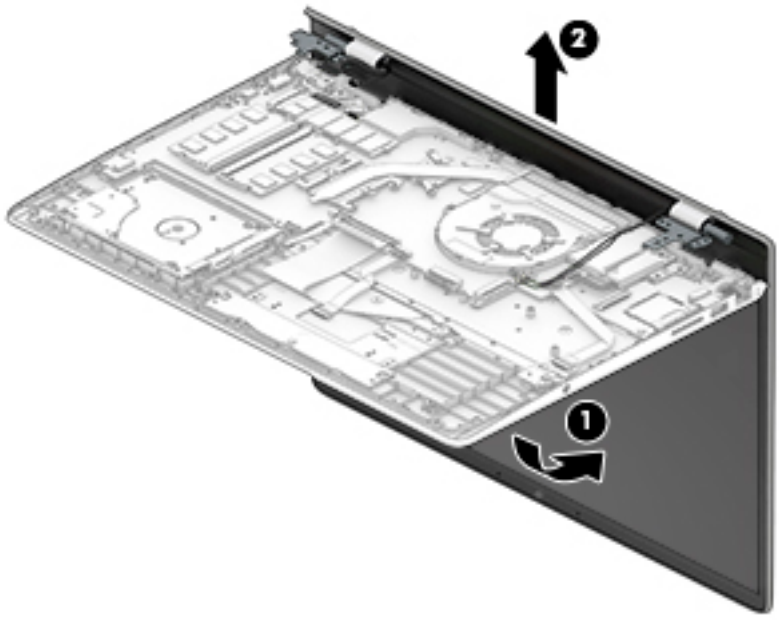
1. Release the ZIF connector **(1)** to which display panel cable is connected, and then disconnect the display panel cable from the system board.
2. Disconnect the webcam/microphone module cable **(2)** from the system board.
3. Release the wireless antenna cables from the retention clips **(3)** and routing channel built into the left speaker.



4. Remove the six Phillips M2.5×6.7 screws that secure the display assembly to the keyboard/top cover.



5. Swing the display assembly **(1)** up and back until it separates from the keyboard/top cover .
6. Remove the display assembly **(2)**.



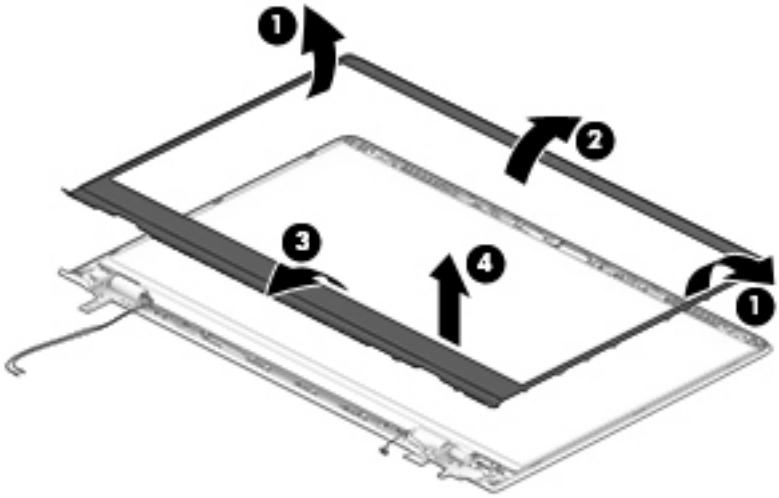
7. If it is necessary to replace the display bezel or any of the display assembly subcomponents:

NOTE: The display bezel can be removed and replaced without removing the display assembly from the keyboard/top cover.

a. Release the left and right edges of the display bezel **(1)** from the display assembly.
b. Release the top edge 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)** from the display assembly.

The display bezel is available using spare part numbers L01843-001 (for use only on computer models equipped with an FDHC infrared webcam/microphone module) and L01842-001 (for use only on computer models equipped with an HDC non-infrared webcam/microphone module).



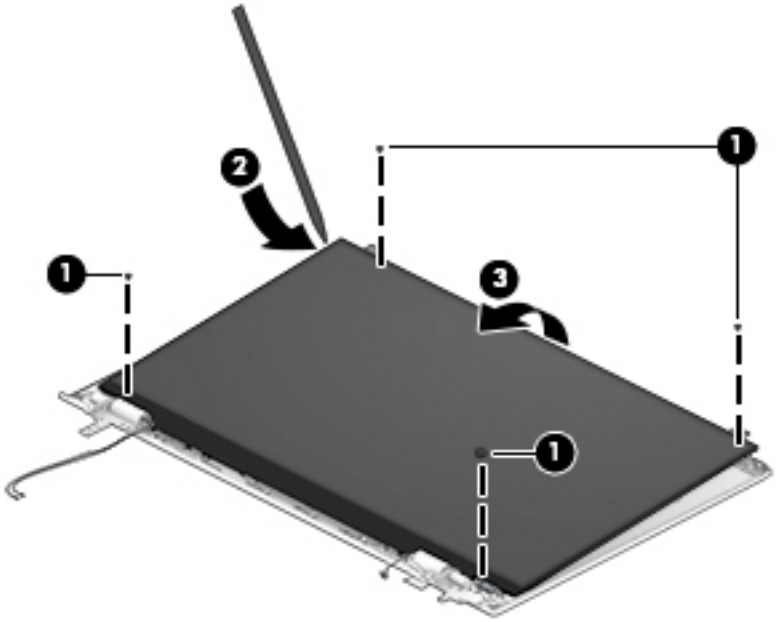
8. If it is necessary to replace the display panel:

NOTE: The display panel can be removed and replaced without removing the display assembly from the keyboard/top cover.

a. Remove the display bezel.

b. Remove the four Phillips M2.0×3.0 screws **(1)** that secure the display panel to the display back cover.

c. Use a case utility tool (2) or similar thin, plastic tool to separate the top edge of the display panel (3) from the display back cover.

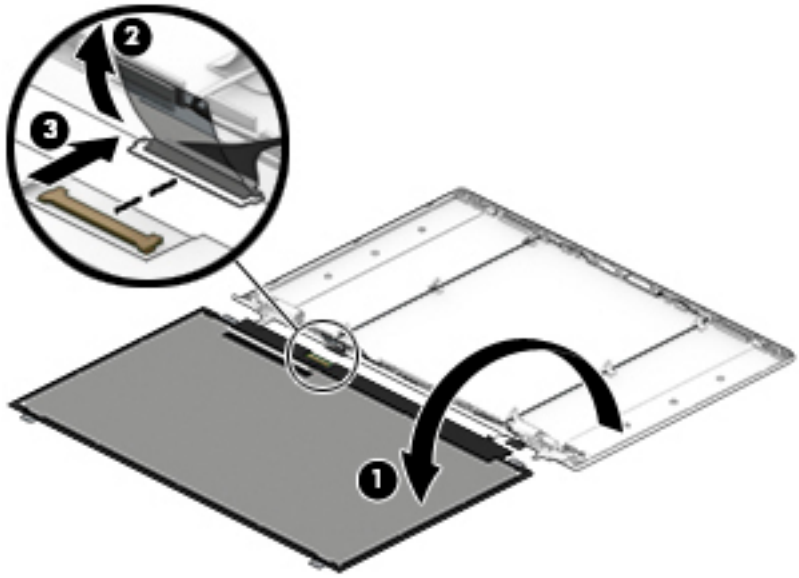


⚠ CAUTION: Before turning the display panel upside down, make sure the work surface is clear of tools, screws, and any other foreign objects. Failure to follow this caution can result in damage to the display panel.

d. Swing the top edge of the display panel (1) up and forward until it rests upside down in front of the display back cover.

e. Release the adhesive support strip (2) that secures the display panel cable connector to the display panel.

f. Disconnect the display panel cable (3) from the display panel.



g. Remove the display panel.

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

- L01675-001 – 15.6-in, FHD, AntiGlare, LED, UWVA, TouchScreen display panel assembly
- L01674-001 – 15.6-in, FHD, BrightView, LED, UWVA, display panel assembly
- L01676-001 – 15.6-in, HD, AntiGlare, LED, SVA, display panel assembly

9. If it is necessary to replace the webcam/microphone module:

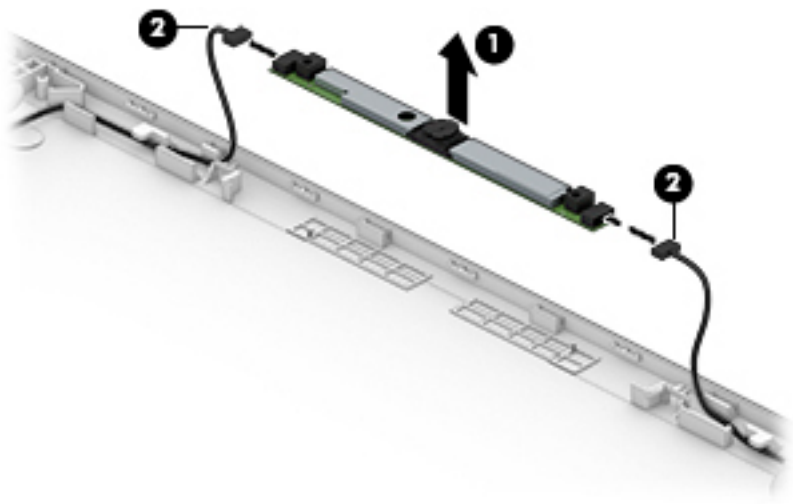
NOTE: The webcam/microphone module can be removed and replaced without removing the display assembly from the keyboard/top cover.

a. Remove the display bezel.

b. Remove the display panel.

c. Detach the webcam/microphone module (1) from the display back cover. (The webcam/microphone module is attached to the display back cover with double-sided adhesive.)

d. Disconnect the webcam/microphone module cables (2) from the webcam/microphone module.



e. Remove the webcam/microphone module.

   The webcam/microphone module is available using spare part numbers L01859-001 (FDHC infrared webcam/microphone module) and L01860-001 (HDC non-infrared webcam/microphone module).

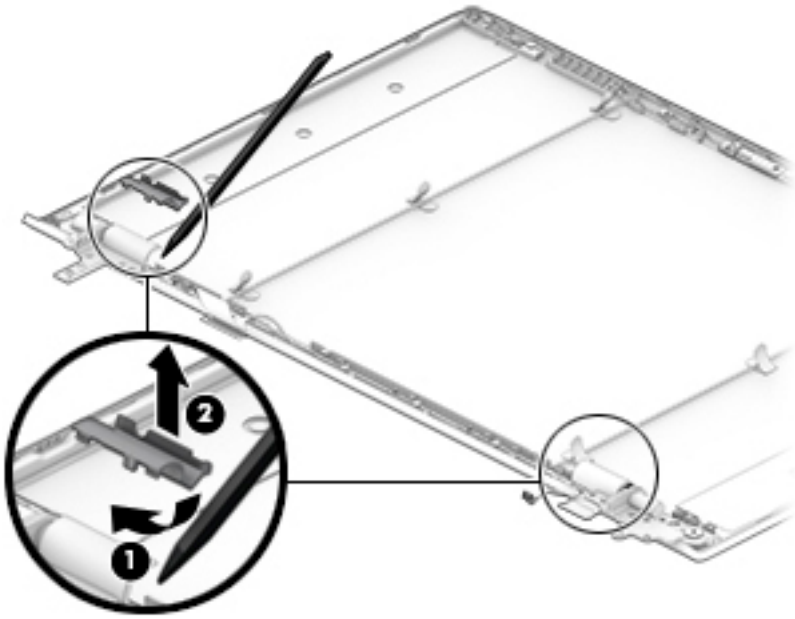
10. If it is necessary to replace the display hinges:

    a. Remove the display bezel.

    b. Remove the display panel.

    c. Use a case utility tool (1) or similar thin, plastic tool to remove the remove the hinge cap (2) from the display back cover.

       The display hinge caps are available using spare part number L01854-001.

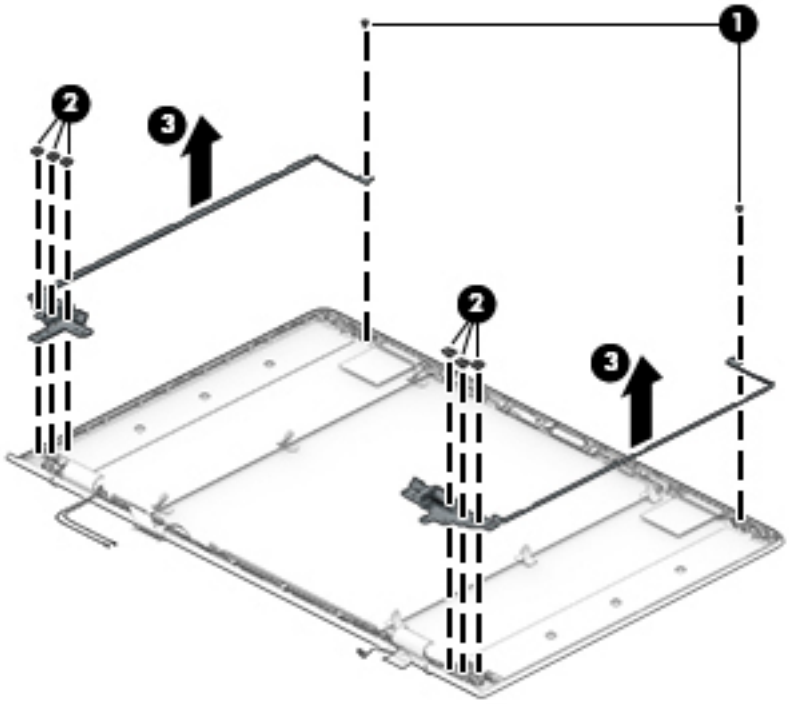


    d. Remove the two Phillips M2.0×3.0 screws (1) that secure the hinges to the display back cover.

e. Remove the six Phillips M2.5×3.1 broad head screws **(2)** that secure the hinges to the display back cover.

f. Remove the display hinges **(3)**.

The display hinges are available using spare part number L01844-001.



11. If it is necessary to replace the display panel cable:

a. Remove the display bezel.

b. Remove the display panel.

c. Remove the display hinges.

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

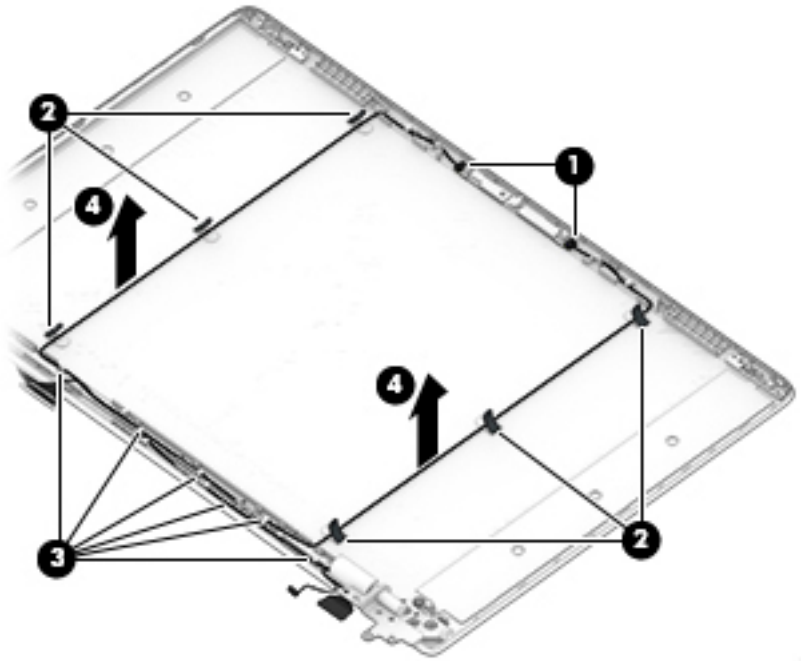
e. Release the retention tabs **(2)** that secure the webcam/microphone module cable to the display back cover.

f. Release the display panel cable from the retention clips **(3)** and routing channel built into the display back cover.

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

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

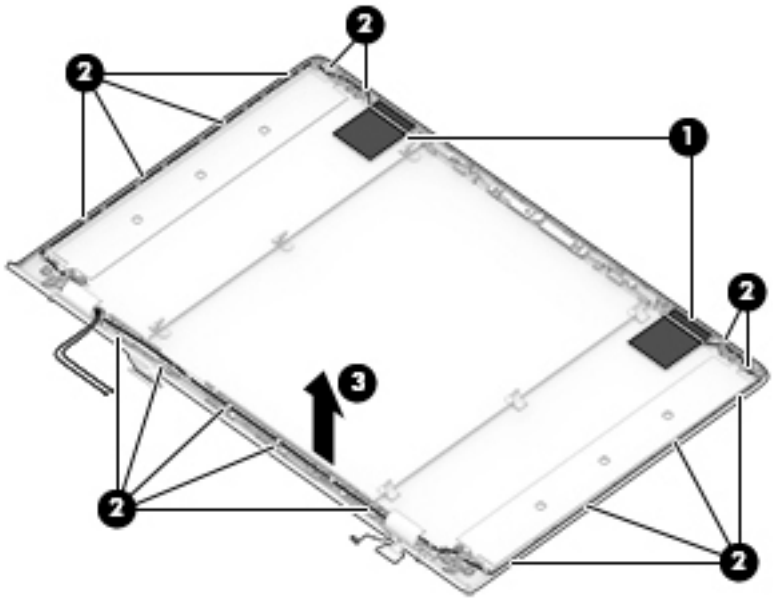
- L04970-001 – For use only on computer models equipped with a TouchScreen display assembly and an infrared webcam/microphone module
- L04972-001 – For use only on computer models equipped with a TouchScreen display assembly and a non-infrared webcam/microphone module
- L02663-001 – For use only on computer models equipped with a non-TouchScreen display assembly and an infrared webcam/microphone module
- L01858-001 – For use only on computer models equipped with a non-TouchScreen display assembly and a non-infrared webcam/microphone module



12. If it is necessary to replace the wireless antenna cables and transceivers:
    a. Remove the display bezel.
    b. Remove the display panel.
    c. Remove the display hinges.
    d. Detach the wireless antenna transceivers **(1)** from the display back cover. (The wireless antenna transceivers are attached to the display back cover with double-sided adhesive.)
    e. Release the wireless antenna cables from the retention clips **(2)** and routing channel built into the top, left, right, and bottom edges of the display back cover.

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

The wireless antenna cables and transceivers are available using spare part number L04971-001.



Reverse this procedure to reassemble and 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, quickly press esc, and then press f10.

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (BIOS) may be available on the HP website.

Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*.

Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

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

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

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

     – or –

     Click the question mark icon in the taskbar.
  2. Select **My PC**, and then select **Specifications**.
- Setup Utility (BIOS)
  1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 68).
  2. Select **Main**, select **System Information**, and then make note of the BIOS version.
  3. Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see Downloading a BIOS update on page 69.

Downloading a BIOS update

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

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
- Do not shut down the computer or initiate Sleep.
- Do not insert, remove, connect, or disconnect any device, cable, or cord.

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

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

   – or –

   Click the question mark icon in the taskbar.
2. Click **Updates**, and then click **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:

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

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

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

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

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

7 Using HP PC Hardware Diagnostics (UEFI)

HP PC Hardware Diagnostics is a Unified Extensible Firmware Interface (UEFI) that 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.

When HP PC Hardware Diagnostics (UEFI) detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. This ID code can then be provided to support to help determine how to correct the problem.

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

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 drive

      NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 71.

   b. Hard drive

   c. BIOS
3. When the diagnostic 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, press esc.

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device

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 offered.

There are two options to download HP PC Hardware Diagnostics to a USB device.

Download the latest UEFI version

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the HP PC Hardware Diagnostics section, select the **Download** link, and then select **Run**.

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**.
3. Enter the product name or number.
4. Select your computer, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

8 Specifications

	Metric	U.S.
Computer dimensions		
Width	**35.9 cm**	14.1 in
Depth	**24.7 cm**	9.7 in
Height	**2.0 cm**	0.8 in
Weight		
Computer models equipped with a hard drive	**1.89 kg**	4.2 lbs
Computer models equipped with a solid-state drive	**1.81 kg**	3.9 lbs
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. The information in the chapter is standard procedure for most products.

- Creating recovery media and backups
- Restoring and recovering your system

For additional information, refer to the HP Support Assistant app.

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

– or –

Select the question mark icon in the taskbar.

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.

Creating recovery media and backups

The following methods of creating recovery media and backups are available on select products only. Choose the available method according to your computer model.

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Using HP Recovery media (select products only) on page 73. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 74.
- Use Windows tools to create system restore points and create backups of personal information. See Using Windows tools on page 74.

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

- On select products, use the HP Cloud Recovery Download Tool to create a bootable USB flash drive for your HP recovery media. For more information, see Using the HP Cloud Recovery Download Tool (select products only) on page 75.

Using HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. Right-click the **Start** button, select **File Explorer**, and then select **This PC**.

- If your computer does not list the Windows partition and the Recovery partition, you can obtain recovery media for your system from support. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.
- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be

used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
- HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.
- Be sure that the computer is connected to AC power before you begin creating the recovery media.
- The creation process can take an hour or more. Do not interrupt the creation process.
- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media using HP recovery manager:

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

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 75.

Using Windows tools

You can create recovery media, system restore points, and backups of personal information using Windows tools.

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

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

▲ Select the **Start** button, and then select the **Get Help** app.

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

Using the HP Cloud Recovery Download Tool (select products only)

To create HP Recovery media using the HP Cloud Recovery Download Tool:

1. Go to http://www.hp.com/support.
2. Select **Software and Drivers**, and then follow the on-screen instructions.

Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:

IMPORTANT: Not all methods are available on all products.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see the Get Help app.

  ▲ Select the **Start** button, and then select the **Get Help** app.

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

- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option (select products only) of HP Recovery Manager to reinstall the individual application or driver.

  ▲ Type `recovery` in the taskbar search box, select **HP Recovery Manager**, select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 75. If you have not already created recovery media, see Using HP Recovery media (select products only) on page 73.
- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 75.
- On select products, if you want to remove the Recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

  For more information, see Removing the HP Recovery partition (select products only) on page 77.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see Using HP Recovery media (select products only) on page 73.

What you need to know before you get started

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.

IMPORTANT: Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Using HP Recovery media (select products only) on page 73.
- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Using HP Recovery media (select products only) on page 73.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. You can find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

IMPORTANT: HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you want to retain.

Using HP Recovery media, you can choose from one of the following recovery options:

NOTE: Only the options available for your computer display when you start the recovery process.

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select products only) allows System Recovery only.

Using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without the need for recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

To start HP Recovery Manager from the HP Recovery partition:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps (select products only).

1. Type `recovery` in the taskbar search box, select **HP Recovery Manager**, and then select **Windows Recovery Environment**.

   – or –

   For computers or tablets with keyboards attached, press f11 while the computer boots, or press and hold f11 as you press the power button.

   For tablets without keyboards:

   - Turn on or restart the tablet, and then quickly hold down the volume up button; then select **f11**.

   – or –

   - Turn on or restart the tablet, and then quickly hold down the volume down button; then select **f11**.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

1. If possible, back up all personal files.
2. Insert the HP Recovery media, and then restart the computer.

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 77.

3. Follow the on-screen instructions.

Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order, which 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.

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

   – or –

   Turn on or restart the tablet, and then quickly hold down the volume down button; then select **f9**.

3. Select the optical drive or USB flash drive from which you want to boot.
4. Follow the on-screen instructions.

Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.

IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Using HP Recovery media (select products only) on page 73.

NOTE: The Remove Recovery Partition option is only available on products that support this function.

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, 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 volts AC, or from 220 to 240 volts 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 and regions must meet the requirements of the country or 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 amps 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 all countries 113

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	COC	5

Country/region	Accredited agency	Applicable note number
South Korea	EK	4
Sweden	CEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 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) or NEMA 6-15P (15 A, 250 V) configuration.
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 VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) 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 certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 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.

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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