



Maintenance and Service Guide

HP Pavilion Notebook PC

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Sixth Edition: May 2019

First Edition: April 2016

Document Part Number: 854539-006

Product notice

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

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

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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 applicable safety standards.

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1 Product description

Model numbers: 15-bc300~15-bc399

Category	Description
Product Name	HP Pavilion Notebook PC
	Model numbers: 15-bc300~15-bc399
	CTO Model: 15t-bc300
Processors	Intel® Core™ i7-7500U (2.7 GHz, turbo up to 3.5 GHz), 2133 MHz/4 MB L3, dual core, 15 W
	Intel Core i5-7200U (2.5 GHz, turbo up to 3.1 GHz), 2133 MHz/3 MB L3, dual core, 15 W
Chipset	Intel SoC
Graphics	Internal graphics
	Intel HD Graphics 620
	Hybrid graphics
	NVIDIA® GeForce® GTX 950M with up to 2 GB of dedicated video memory
	NVIDIA GeForce GTX 950M with up to 4 GB of dedicated video memory
	Supports HD Decode, DX12, and HDMI
	Supports Optimus™
Supports GPS (GPU Performance Scaling)	
Panels	16:9 Aspect Ratio
	15.6 inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), SVA, eDP, 220 nits
Memory	Two SODIMM slots - customer non-accessible/non-upgradeable
	DDR4-2133 Dual Channel Support (DDR4-2400 bridge to DDR4-2133) (for 4 GB/6 GB memory)
	DDR4-2133 Dual Channel Support (DDR4-2400/2666 bridge to DDR4-2133) (for 8 GB memory)
	Supports up to 8 GB max system memory
	4 GB (4 GB × 1)
	6 GB (2 GB × 1 + 4 GB × 1)
8 GB (8 GB × 1)	
Hard drive	Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives
	Supports M.2 SATA storage
	Accelerometer/Hard drive protection support
	Single hard drive configurations
	1 TB, 5400 rpm, 9.5 mm/7.2 mm
	Dual storage configurations

Category	Description
	1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive
Optical drive (External USB)	9.5 mm tray load, SATA, external USB optical drive (aluminium material) DVD+/-RW Double-Layer SuperMulti
Camera and microphone	HP Wide Vision HD Camera HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV 720p by 30 frames per second Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression HP Noise Cancellation
Audio	Audio Brand: B&O Play Audio control panel: B&O Play Audio Control Supports HP Audio Boost Dual speakers
RJ-45 (network)	Integrated 10/100/1000 NIC
Wireless	Integrated Wireless options with dual antennas (M.2/PCIe) Intel Dual Band Wireless-AC 7265 802.11ac 2 × 2 Wi-Fi + Bluetooth® 4.2 Combo Adapter (non vPRO) Compatible with Wi-Fi CERTIFIED Miracast™-certified devices
External media cards	Supports microSD™/SDHC™/SDXC™ Push-push insertion/removal
Internal card expansion	One M.2 slot for WLAN module One M.2 slot for solid-state drives
Ports	Hot Plug/unplug and autodetect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected) HDMI v2.0 supporting up to 4096 × 2160 @ 60 Hz Audio-out (headphone)/Audio-in (microphone) combo jack USB 2.0 port 1 (left side) USB 3.0 ports 2 (1 on the left side; 1 on the right side) RJ-45 (network) AC Smart Pin adapter plug
Keyboard/pointing devices	Keyboard Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black) Touchpad requirements Touchpad with image sensor

Category	Description
	Multitouch gestures enabled
	Support Modern Trackpad Gestures
	Taps enabled as default
Power requirements	Battery
	3-cell prismatic battery (61.5 Wh, 5.36 Ah)
	Battery life enhancement
	Supports battery fast charge (90 minutes = 90% charged)
	AC adapter
	120 W with power cords
	1 m (3.3 ft) conventional power cord with sticker label (C5)
Security	TPM 2.0 (firmware)
	Mini security slot
Operating system	Preinstalled
	Windows® 10
	Windows 10 Professional
	For Developed Market (ML)
	Windows 10 Home ML
	Windows 10 Home Plus ML
	For Emerging Market (EM/SL)
	Windows 10 Home EM/SL
	Windows 10 Home Plus EM/SL
	For the People's Republic of China market
	CPPP Windows 10 Home High End China Language Edition
	CPPP Windows 10 Home China Language Edition
	For Indonesia Market
	Windows 10 Home Plus EM/SL Indonesia PPP
	Windows 10 Home EM/SL Indonesia PPP
	For APAC Market
	Windows 10 Home Plus EM/SL APAC PPP
	Windows 10 Home EM/SL APAC PPP
	FreeDOS 2.0 (select products only)
Serviceability	End user replaceable parts
	AC adapter

Model numbers: 15-bc400~15-bc499

Category	Description
Product Name	HP Pavilion Notebook PC Model numbers: 15-bc400~15-bc499 CTO Model: 15t-bc400
Processors	8th generation Intel Core processors Intel Core i7-8750H (2.2 GHz, turbo up to 4.1 GHz), 2666 MHz/9 MB L3, hexa core, 45 W Intel Core i7-8550U (1.8 GHz, turbo up to 4.0 GHz), 2400 MHz/8 MB L3, quad core, 15 W Intel Core i5-8300H (2.3 GHz, turbo up to 4.0 GHz), 2666 MHz/8 MB L3, hexa core, 45 W Intel Core i5-8250U (1.6 GHz, turbo up to 3.4 GHz), 2400 MHz/6 MB L3, quad core, 15 W
Chipset	Intel SoC Intel HM370
Graphics	Internal graphics Intel UHD Graphics 630 Intel UHD Graphics 620 Hybrid graphics NVIDIA GeForce GTX 1050 with up to 2 GB of dedicated video memory NVIDIA GeForce GTX 1050 with up to 3 GB of dedicated video memory NVIDIA GeForce GTX 1050 with up to 4 GB of dedicated video memory NVIDIA GeForce GTX 1050 Ti with up to 4 GB of dedicated video memory Supports HD Decode, DX12, and HDMI Supports Optimus Supports FPS (GPU Performance Scaling) Supports MR ready
Panels	16:9 Aspect Ratio 15.6-inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), SVA, eDP, 220 nits 15.6-inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), UWVA, eDP, 220 nits
Memory	Two SODIMM slots - customer non-accessible/non-upgradeable DDR4-2400 Dual Channel Support (DDR4-2666 bridge to DDR4-2400) Supports up to 8 GB max system memory 4 GB (4 GB × 1) 6 GB (2 GB × 1 + 4 GB × 1) 8 GB (8 GB × 1)
Hard drive	Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives Supports M.2 SATA storage

Category	Description
	Accelerometer/Hard drive protection support
	Single hard drive configurations
	1 TB, 5400 rpm, 9.5 mm/7.2 mm
	Dual storage configurations
	1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive
	Intel Optane™ (3D Xpoint) Solution PCIe Gen3x2 M.2
	16 GB (Optane memory) + 1 TB (5400) 9.5mm/7.2mm
Optical drive (External USB)	9.5 mm tray load, SATA, external USB optical drive (aluminium material)
	DVD+/-RW Double-Layer SuperMulti
Camera and microphone	HP Wide Vision HD Camera
	HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV
	720p by 30 frames per second
	Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression
	HP Noise Cancellation
Audio	Audio brand: B&O Play
	Audio control panel: B&O Play Audio Control
	Supports HP Audio Boost
	Dual speakers
RJ-45 (network)	Integrated 10/100/1000 NIC
Wireless	Integrated Wireless options with dual antennas (M.2/PCIe)
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)
	Compatible with Wi-Fi CERTIFIED Miracast-certified devices
External media cards	Supports microSD/SDHC/SDXC
	Push-push insertion/removal
Internal card expansion	One M.2 slot for WLAN module
	One M.2 slot for solid-state drives
Ports	Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video
	HDMI v2.0 supporting up to 4096 × 2160 @ 60 Hz
	Audio-out (headphone)/Audio-in (microphone) combo jack
	USB 2.0 port
	1 (left side)
	USB 3.0 ports
	2 (1 on the left side; 1 on the right side)
	RJ-45 (network)

Category	Description
	AC Smart Pin adapter plug
Keyboard/pointing devices	Keyboard
	Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black, acid green)
	Backlit, full size, 3-coat paint, island-style keyboard with numeric keypad (acid green)
	Touchpad requirements
	Touchpad with image sensor
	Multitouch gestures enabled
	Support Modern Trackpad Gestures
	Taps enabled as default
Power requirements	Battery
	4-cell prismatic battery - 63.3 Whr, 4.175 Ahr
	Battery life enhancement
	Supports battery fast charge
	AC adapter
	120 W with power cords
	135 W with power cords
	150 W with power cords
	Power cord
	1 m (3.3 ft) conventional power cord with sticker label (C5)
Security	TPM 2.0 (firmware)
	Mini security slot
Operating system	Preinstalled
	Windows 10
	Windows 10 Professional
	FreeDOS 2.0 (select products only)
	For Developed Market (ML)
	Windows 10 Home ML
	Windows 10 Home Plus ML
	Windows 10 Home Advanced
	For Emerging Market (EM/SL)
	Windows 10 Home EM/SL
	Windows 10 Home Plus EM/SL
	Windows 10 Home Advanced SL
	Windows 10 Home 64 Single Language Africa Market PPP

Category	Description
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	For the People's Republic of China market
	CPPP Windows 10 Home High End China Language Edition
	CPPP Windows 10 Home China Language Edition
	For Indonesia Market
	Windows 10 Home Plus EM/SL Indonesia PPP
	Windows 10 Home EM/SL Indonesia PPP
	For APAC Market
	Windows 10 Home Plus EM/SL APAC PPP
	Windows 10 Home EM/SL APAC PPP
Serviceability	End user replaceable parts
	AC adapter

Model numbers: 15-bc500~15-bc599

Category	Description
Product Name	HP Pavilion Notebook PC Model numbers: 15-bc500~15-bc599 CTO Model: 15t-bc500
Processors	8th generation Intel Core processors Intel Core i7-9750H (2.6 GHz, turbo up to 4.5 GHz), 2666 MHz/12 MB L3, hexa core, TDP 45 W, cTDP 35 W Intel Core i5-9300H (2.4 GHz, turbo up to 4.1 GHz), 2666 MHz/8 MB L3, quad core, TDP 45 W, cTDP 35 W
Chipset	Intel SoC Intel HM370
Graphics	Internal graphics Intel UHD Graphics 630 Hybrid graphics NVIDIA GeForce GTX 1650 with up to 4 GB of dedicated video memory NVIDIA GeForce GTX 1050 with up to 4 GB of dedicated video memory NVIDIA GeForce GTX 1050 with up to 3 GB of dedicated video memory Supports HD Decode, DX12, and HDMI Supports Optimus Supports GPS (GPU Performance Scaling) MR compatible (60 Hz frame rate)

Category	Description
Panels	16:9 Aspect Ratio
	15.6 inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), SVA, eDP, 220 nits 15.6 inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), UWVA, eDP, 220 nits
Memory	Two SODIMM slots - customer non-accessible/non-upgradeable
	DDR4-2666 Dual Channel Support
	Supports up to 8 GB max system memory
	8 GB (8 GB × 1)
	12 GB (8 GB × 1 + 4 GB × 1) 16 GB (8 GB × 2)
Hard drive	Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives
	Support for SSD + HDD
	Supports M.2 SATA storage
	Accelerometer/Hard drive protection support
	Single hard drive configurations
	1 TB, 5400 rpm, 9.5 mm/7.2 mm
	Dual storage configurations
	2 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 256 GB SATA, TLC, M.2 solid-state drive
	1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 512 GB SATA, TLC, M.2 solid-state drive
	1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive
	PCIe NVMe TLC M.2 solid-state drive
512 GB, NVMe, TLC	
Optical drive (External USB)	9.5 mm tray load, SATA, external USB optical drive (aluminium material) DVD+/-RW Double-Layer SuperMulti
Camera and microphone	HP Wide Vision HD Camera
	HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV 720p by 30 frames per second
	Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression
Audio	Audio brand: B&O Play
	Audio control panel: B&O Play Audio Control
	Supports HP Audio Boost
	Dual speakers
RJ-45 (network)	Integrated 10/100/1000 NIC
Wireless	Integrated Wireless options with dual antennas (M.2/PCIe)
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)

Category	Description
	Compatible with Wi-Fi CERTIFIED Miracast-certified devices
External media cards	Support microSD/SDHC/SDXC Push-push insertion/removal
Internal card expansion	One M.2 slot for WLAN module One M.2 slot for solid-state drives
Ports	Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video HDMI v2.0 supporting up to 4096 × 2160 @ 60 Hz Audio-out (headphone)/Audio-in (microphone) combo jack USB 2.0 port 1 (left side) USB 3.0 ports 2 (1 on the left side; 1 on the right side) RJ-45 (network) AC Smart Pin adapter plug
Keyboard/pointing devices	Keyboard Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black, acid green) Backlit, full size, 3-coat paint, island-style keyboard with numeric keypad (acid green) Touchpad requirements Touchpad with image sensor Multitouch gestures enabled Support Modern Trackpad Gestures Taps enabled as default
Power requirements	Battery 4-cell prismatic battery - 63.3 Whr, 4.175 Ahr Battery life enhancement Supports battery fast charge AC adapter 135 W with power cords 150 W with power cords Power cord 1 m (3.3 ft) conventional power cord with sticker label (C5)
Security	TPM 2.0 (firmware) Mini security slot
Operating system	Preinstalled

Category	Description
	Windows 10
	Windows 10 Professional
	FreeDOS 2.0
	For Developed Market (ML)
	Windows 10 Home Plus ML
	Windows 10 Home Advanced ML
	For Emerging Market (EM/SL)
	Windows 10 Home Plus EM/SL
	Windows 10 Home Advanced SL
	For the People's Republic of China Market
	CPPP Windows 10 Home High End China Language Edition
	For India Market
	Windows 10 Home Plus SL India PPP (IPPP)
	For Indonesia Market
	Windows 10 Home Plus EM/SL Indonesia PPP
	For APAC Market
	Windows 10 Home Plus EM/SL APAC PPP
	For Africa CCC Market
	Windows 10 Home Plus SL Africa PPP
Serviceability	End user replaceable parts
	AC adapter

Model numbers: 15-dp0000~15-dp0099

Category	Description
Product Name	HP Pavilion Notebook PC
	Model numbers: 15-dp0000~15-dp0099
	CTO model: 15t-dp0000
Processors	8th generation Intel Core processors
	Intel Core i7-8750H (2.2 GHz, turbo up to 4.1 GHz), 2666 MHz/9 MB L3, hexa core, 45 W
	Intel Core i5-8300H (2.3 GHz, turbo up to 4.0 GHz), 2666 MHz/8 MB L3, hexa core, 45 W
Chipset	Intel SoC
	Intel HM370
Graphics	Internal graphics

Category	Description
	Intel UHD Graphics 630
	Hybrid graphics
	NVIDIA GeForce GTX 1060 with up to 6 GB MB of dedicated video memory
	NVIDIA GeForce GTX 1060 with up to 3 GB of dedicated video memory
	Supports HD Decode, DX12, and HDMI
	Supports Optimus
	Supports GPS (GPU Performance Scaling)
	MR ready (only on models with > 128 GB of memory)
Panels	16:9 Aspect Ratio
	15.6 inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), SVA, eDP, 220 nits
	15.6 inch, FHD (1920 × 1080), WLED, antiglare, slim-flat (3.2 mm), UWVA, eDP, 220 nits
Memory	Two SODIMM slots - customer non-accessible/non-upgradeable
	DDR4-2666 Dual Channel Support
	Supports up to 16 GB max system memory
	16 GB (8 GB × 2)
	8 GB (8 GB × 1)
Hard drive	Supports all 7.0 mm/7.2 mm/9.5 mm, SATA, 2.5-inch hard drives
	Supports M.2 SATA storage
	Accelerometer/Hard drive protection support
	Single hard drive configurations
	1 TB, 5400 rpm, 9.5 mm/7.2 mm
	Dual storage configurations
	1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 256 GB PCIe, M.2 solid-state drive
	1 TB, 5400 rpm, 9.5 mm/7.2 mm hard drive + 128 GB SATA, TLC, M.2 solid-state drive
	Intel Optane (3D Xpoint) Solution PCIe Gen3 × 2 M.2
	16 GB (Optane memory) + 1 TB (5400) 9.5mm/7.2mm
Optical drive (External USB)	9.5 mm tray load, SATA, external USB optical drive (aluminium material)
	DVD+/-RW Double-Layer SuperMulti
Camera and microphone	HP Wide Vision HD Camera
	HP Wide Vision HD Camera - indicator LED, USB2.0, BSI sensor, f2.0, 88° WFOV
	720p by 30 frames per second
	Dual array digital microphones with appropriate software - beam forming, echo cancellation, noise suppression
	HP Noise Cancellation
Audio	Audio brand: B&O Play

Category	Description
	Audio control panel: B&O Play Audio Control
	Supports HP Audio Boost
	Dual speakers
RJ-45 (network)	Integrated 10/100/1000 NIC
Wireless	Integrated Wireless options with dual antennas (M.2/PCIe)
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)
	Compatible with Wi-Fi CERTIFIED Miracast-certified devices
External media cards	Support microSD/SDHC/SDXC
	Push-push insertion/removal
Internal card expansion	One M.2 slot for WLAN module
	One M.2 slot for solid-state drives
Ports	Hot Plug/unplug and auto detect for correct output to wide-aspect vs. standard aspect video
	HDMI v2.0 supporting up to 4096 × 2160 @ 60 Hz
	Audio-out (headphone)/Audio-in (microphone) combo jack
	USB 2.0 port
	1 (left side)
	USB 3.0 ports
	2 (1 on the left side; 1 on the right side)
	RJ-45 (network)
	AC Smart Pin adapter plug
Keyboard/pointing devices	Keyboard
	Full size, 3-coat paint, island-style keyboard with numeric keypad (shadow black and acid green)
	Backlit, full size, 3-coat paint, island-style keyboard with numeric keypad (acid green)
	Touchpad requirements
	Touchpad with image sensor
	Multitouch gestures enabled
	Support Modern Trackpad Gestures
	Taps enabled as default
Power requirements	Battery
	4-cell prismatic battery - 63.3 Whr, 4.175 Ahr
	Battery life enhancement
	Supports battery fast charge
	AC adapter
	200 W Smart, PFC, slim barrel, 4.5 mm

Category	Description
	Power cord
	1 m (3.3 ft) power cord with sticker label (C13)
Security	TPM 2.0 (firmware)
	Mini security slot
Operating system	Preinstalled
	Windows 10
	Windows 10 Professional
	FreeDOS 2.0 (select products only)
	For Developed Market (ML)
	Windows 10 Home ML
	Windows 10 Home Plus ML
	Windows 10 Home Advanced
	For Emerging Market (EM/SL)
	Windows 10 Home EM/SL
	Windows 10 Home Plus EM/SL
	Windows 10 Home Advanced SL
	For the People's Republic of China market
	CPPP Windows 10 Home High End China Language Edition
	CPPP Windows 10 Home China Language Edition
	For Indonesia Market
	Windows 10 Home Plus EM/SL Indonesia PPP
	Windows 10 Home EM/SL Indonesia PPP
	For APAC Market
	Windows 10 Home Plus EM/SL APAC PPP
	Windows 10 Home EM/SL APAC PPP
Serviceability	End user replaceable parts
	AC adapter

2 Getting to know your computer

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

Right side

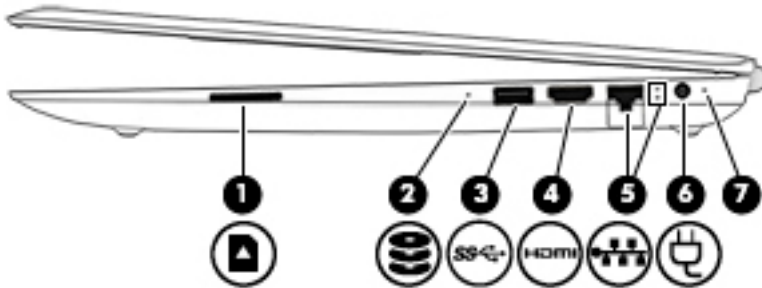


Table 2-1 Right-side components and their descriptions







Component	Description
(1)  Memory card reader	<p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none">1. Hold the card label-side up, with connectors facing the computer.2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none">▲ Press in on the card, and then remove it from the memory card reader.
(2)  Drive light	<ul style="list-style-type: none">• Blinking white: The hard drive is being accessed.• Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(3)  USB SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(4)  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.
(5)  RJ-45 (network) jack/status lights	Connects a network cable. <ul style="list-style-type: none">• White: The network is connected.• Amber: Activity is occurring on the network.
(6)  Power connector	Connects an AC adapter.
(7) AC adapter and battery light	<ul style="list-style-type: none">• White: The AC adapter is connected and the battery is fully charged.

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

Component	Description
	<ul style="list-style-type: none">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.

Left side

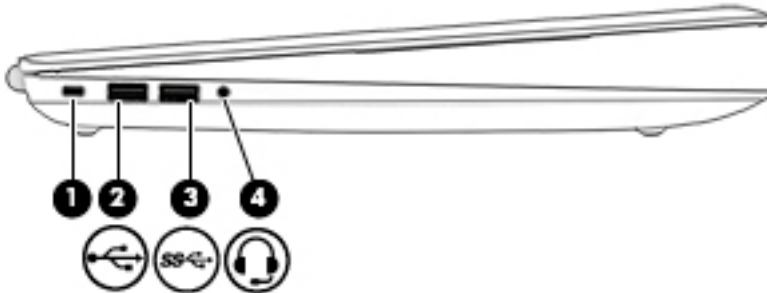


Table 2-2 Left-side components and their descriptions

Component	Description
(1)	Security cable slot
(2)	USB port
(3)	USB SuperSpeed port
(4)	Audio-out (headphone)/Audio-in (microphone) combo jack

Attaches an optional security cable to the computer.

NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.

Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.

Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.

Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.

WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*.

To access this guide:

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

NOTE: When a device is connected to the jack, the computer speakers are disabled.

Display

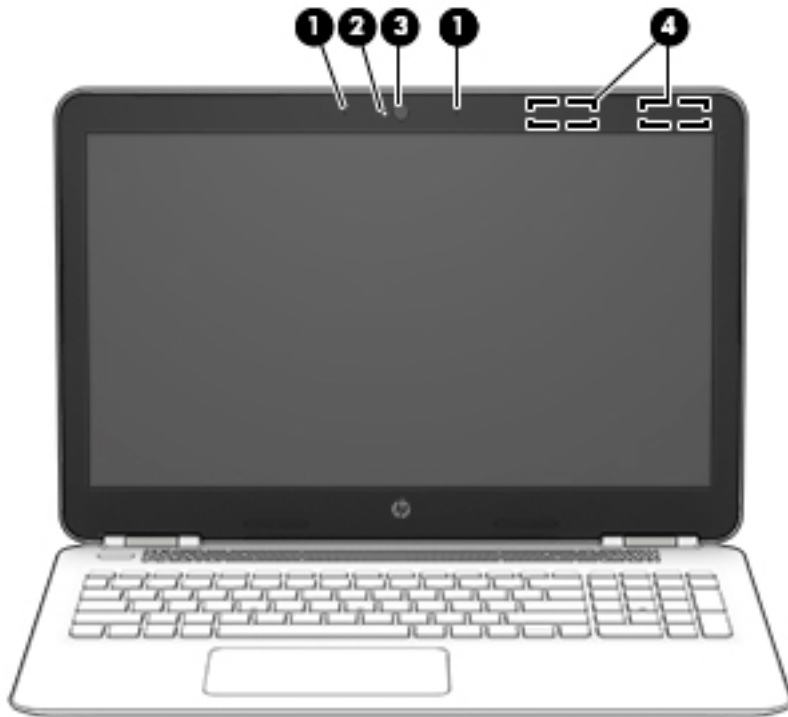


Table 2-3 Display components and their descriptions

Component	Description
(1) Internal microphones	Record sound.
(2) Camera light	On: The camera is in use.
(3) Camera	Allows you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(4) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

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

To access this guide:

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

Keyboard area

Touchpad

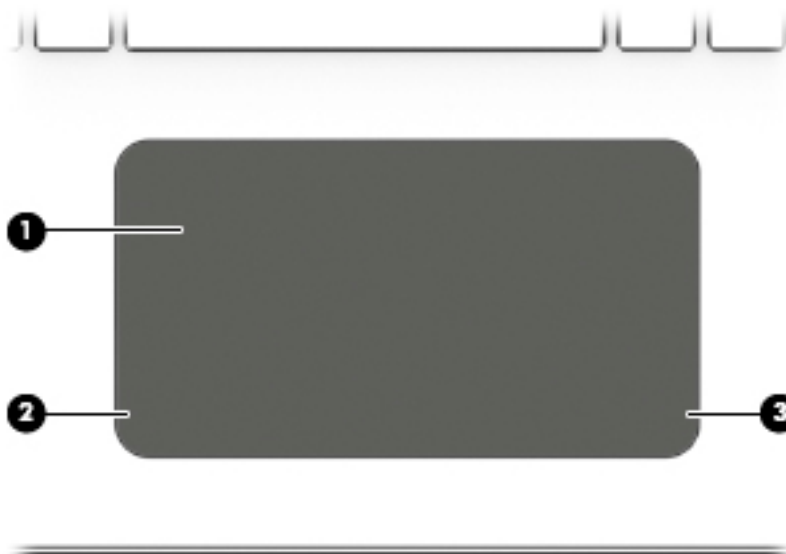


Table 2-4 Touchpad components and their descriptions

Component	Description
(1) Touchpad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2) Left control zone	Textured area that allows you to perform additional gestures.
(3) Right control zone	Textured area that allows you to perform additional gestures.

Lights

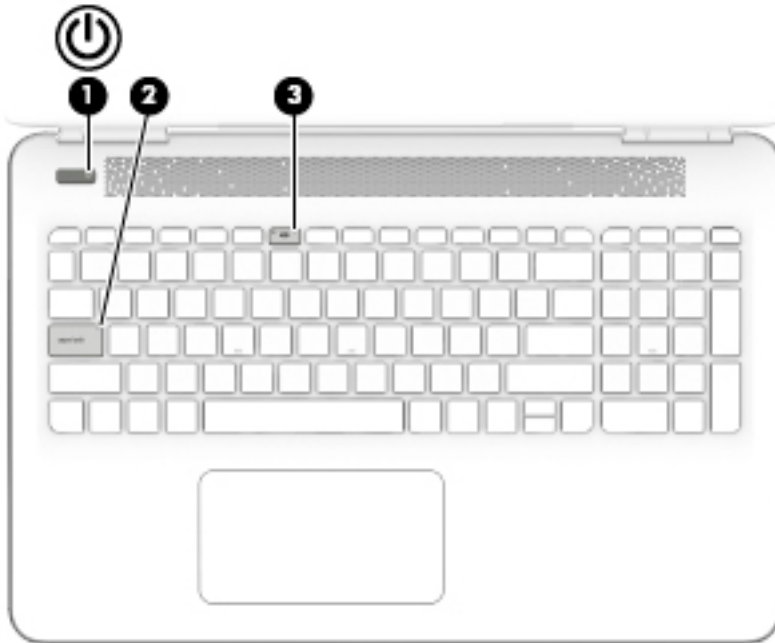




Table 2-5 Lights and their descriptions

Component	Description
(1)  Power light	<ul style="list-style-type: none">• On: The computer is on.• Blinking: 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	<ul style="list-style-type: none">• On: Computer sound is off.• Off: Computer sound is on.

Button and speaker

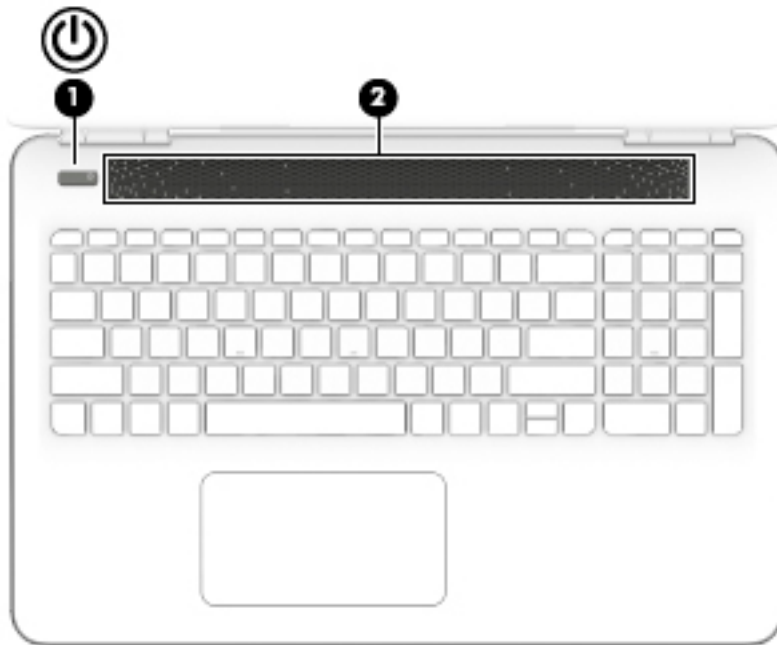




Table 2-6 Button and speaker and their descriptions

Component	Description
<p>(1)  Power button</p>	<ul style="list-style-type: none"> • When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep (select products only). • When the computer is in Hibernation, press the button briefly to exit Hibernation. <p>IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information.</p> <p>If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.</p> <p>To learn more about your power settings, see your power options:</p> <ul style="list-style-type: none"> ▲ Right-click the Power icon , and then select Power Options.
<p>(2) Speaker</p>	<p>Produces sound.</p>

Special keys

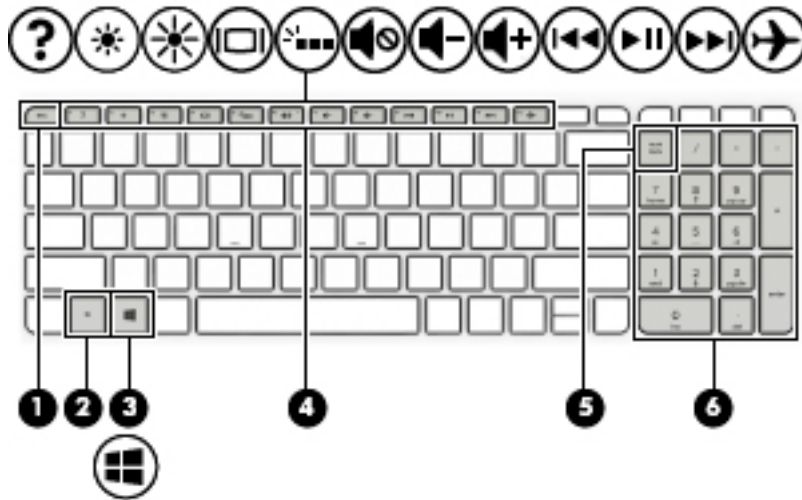



Table 2-7 Special keys and their descriptions

Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes specific functions when pressed in combination with another key.
(3)  Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4) Action keys	Execute frequently used system functions. NOTE: On select products, the <code>f5</code> action key turns the keyboard backlight feature off or on.
(5) <code>num lock</code> key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6) Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When <code>num lock</code> is pressed, the keypad can be used like an external numeric keypad. NOTE: If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

Bottom

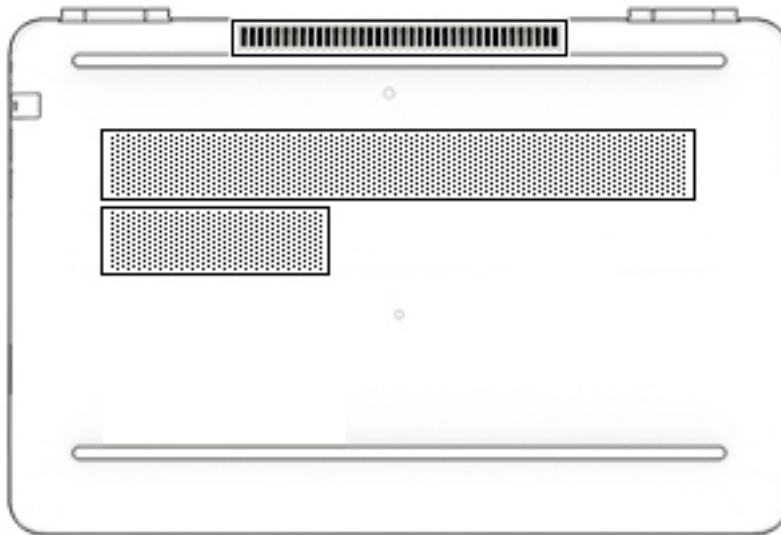


Table 2-8 Bottom components and their descriptions

Component	Description
Vents (3)	Enable airflow to cool internal components. NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

Rear



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

Labels

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

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

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

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

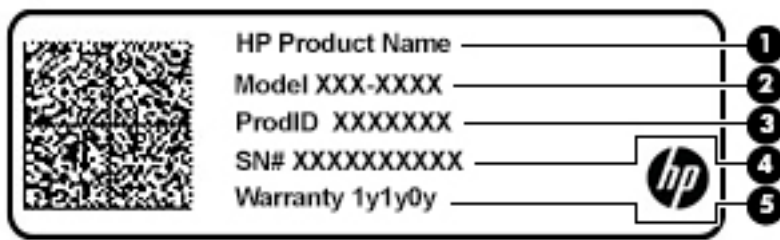


Table 2-9 Service label components

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

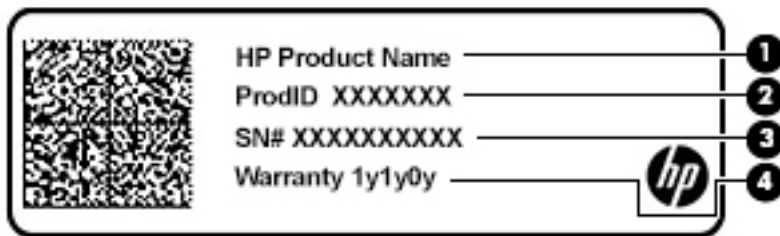


Table 2-10 Service label components

Component
(1) HP product name
(2) Product ID

Table 2-10 Service label components (continued)


Component	
(3)	Serial number
(4)	Warranty period

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

3 Illustrated parts catalog

Computer major components

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 22](#) for details.

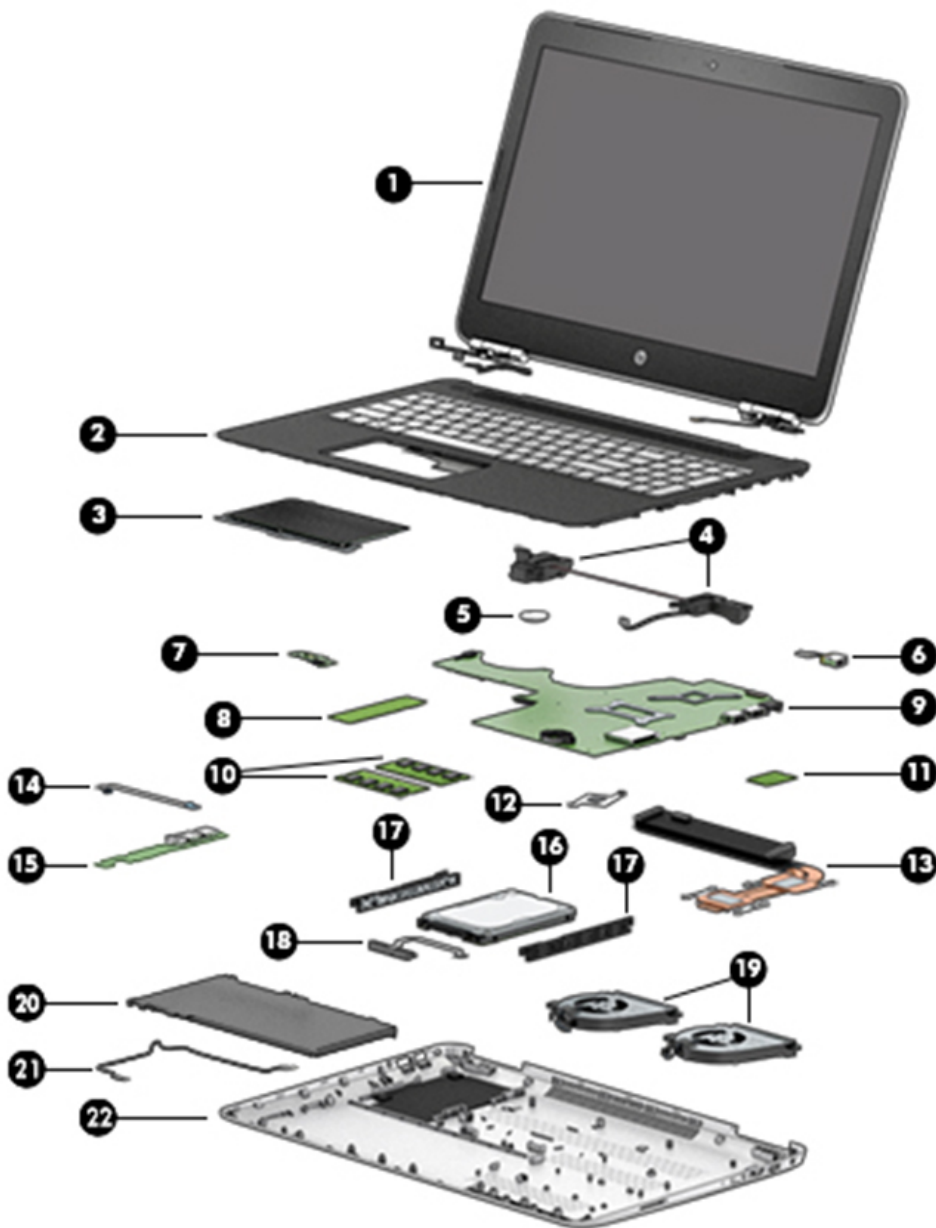


Table 3-1 Computer major components and their descriptions

Item	Component	Spare part number
(1)	Display panel (see Display assembly on page 60)	not spared
(2)	Top cover with touchpad and keyboard (see Touchpad on page 52 for a detailed list of country codes)	
	For use in the following models: 15-dp000~0999	
	<ul style="list-style-type: none"> Shadow black 	L43008-xx1
	<ul style="list-style-type: none"> Acid green 	L43007-xx1
	<ul style="list-style-type: none"> Acid green, backlit 	L43006-xx1
	For use in the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599	
	<ul style="list-style-type: none"> Shadow black 	L03595-xx1
	For use in the following models: 15-bc400~499, 15-bc500~599	
	<ul style="list-style-type: none"> Acid green 	L22937-xx1
	<ul style="list-style-type: none"> Acid green, backlit 	L22938-xx1
(3)	Touchpad (included with top cover)	
	For use in model numbers: 15-dp0000~15-dp0999	860364-001
	For use in model numbers: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	L06001-001
	Touchpad cable for use in models: 15-dp0000~15-dp0999 (not illustrated)	L42995-001
	Touchpad cable for use in models: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599 (not illustrated)	858967-001
(4)	Speaker Kit	
	For use in model numbers: 15-dp0000~15-dp0999	L43001-001
	For use in model numbers: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	858976-001
(5)	RTC battery	741976-001
(6)	Power connector (includes cable)	
	For use in model numbers: 15-dp0000~15-dp0999	L42996-001
	For use in model numbers: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	858021-001
(7)	Power button board	
	For use in model numbers: 15-dp0000~15-dp0999	L42998-001
	For use in model numbers: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	858974-001
	Power button board cable (not illustrated)	858966-001
(8)	Solid-state drive (M.2)	
	For use in model numbers: 15-dp0000~15-dp0999	
	<ul style="list-style-type: none"> Optane memory module, 16 GB, PCIe 	L43005-001

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

Item	Component	Spare part number
	<ul style="list-style-type: none"> 128 GB, SATA-3 	L43004-001
	<ul style="list-style-type: none"> 256 GB, PCIe 	L44430-001
	For use in the following models:	
	<ul style="list-style-type: none"> Optane memory module, 16 GB, PCIe (15-bc400~499 models) 	L27067-001
	<ul style="list-style-type: none"> 128 GB, SATA-3, TLC (15-bc300~399 models, 15-bc400~499 models, 15-bc500~599 models) 	759848-032
	<ul style="list-style-type: none"> 256 GB, PCIe 3 × 4 SS, TLC (15-bc500~599 models) 	847109-005
	<ul style="list-style-type: none"> 512 GB, PCIe 3 × 4 SS, TLC (15-bc500~599 models) 	847110-002
(9)	System board (see System board on page 55)	
(10)	Memory module	
	DDR4, 2133 MHz (15-bc300~15-bc399 models)	
	<ul style="list-style-type: none"> 4 GB 	820569-005
	<ul style="list-style-type: none"> 8 GB 	820570-005
	<ul style="list-style-type: none"> 2 GB 	851379-005
	DDR4, 2400 MHz (15-bc400~15-bc499 models)	
	<ul style="list-style-type: none"> 4 GB 	862397-855
	<ul style="list-style-type: none"> 8 GB 	862398-855
	<ul style="list-style-type: none"> 2 GB 	864271-855
	DDR4, 2666 MHz	
	<ul style="list-style-type: none"> 4 GB (15-bc400~15-bc499 models) 	L10598-855
	<ul style="list-style-type: none"> 8 GB (15-bc400~15-bc499, 15-dp0000~0999 models) 	937236-855
(11)	WLAN module	
	Intel Dual Band wireless-AC 7265 802.11ac, 2 × 2, Wi-Fi + Bluetooth 4.2 Combo Adapter (non-vPro) (15-bc300~15-bc399 models)	793840-005
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (15-bc400~15-bc499, 15-bc500~15-bc599, 15-dp0000~0999 models)	924813-855
(12)	PCH heat sink	725625-001
(13)	Heat sink	
	For use in models with GeForce GTX1050M graphics (only for 15-bc400~499, 15-bc500~599 models)	920563-001
	For use in models with GeForce GTX 950M graphics (only for 15-bc300~399 models)	L03383-001
	For use in models with GeForce GTX 1050 graphics (only for 15-bc400~499 models)	L22941-001
	For use in models with GeForce GTX 1060 graphics (only for 15-dp0000~0999 models)	L43000-001
(14)	USB board cable	
	For use in model numbers: 15-dp0000~15-dp0999	L42994-001

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

Item	Component	Spare part number
	For use in model numbers: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~599	856729-001
(15)	USB board	
	For use in models: 15-dp0000~15-dp0999	L42997-001
	For use in models: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	L06098-001
(16)	Hard drive	
	1 TB, 5400 rpm, 2.5 in	778192-005
	1 TB, 5400 rpm, 7.0 mm	L30422-005
	2 TB, 5400 rpm 7.0 mm	912487-855
(17)	Hard drive bracket	913937-001
(18)	Hard drive cable	858969-001
(19)	Fans	
	For use in models: 15-dp0000~15-dp0999	L42999-001
	For use in models: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	L18458-001
(20)	Battery	
	3-cell, 61 Wh, 5.37 Ah (15-bc300~15-bc399, 15-bc400~15-bc499 models)	849910-850
	4-cell, 63 Wh, 4.11 Ah (15-bc400~15-bc499, 15-bc500~15-bc599, 15-dp0000~0999 models)	905277-855
(21)	Battery cable	858968-001
(22)	Base enclosure	
	For use in models: 15-dp0000~15-dp0999	
	<ul style="list-style-type: none"> • Shadow black 	L42993-001
	<ul style="list-style-type: none"> • Acid green 	L42992-001
	For use in models: 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	
	<ul style="list-style-type: none"> • Shadow black 	L03593-001
	For use in models: 15-bc400~15-bc499, 15-bc500~15-bc599	
	<ul style="list-style-type: none"> • Acid green 	L22940-001

Display assembly subcomponents

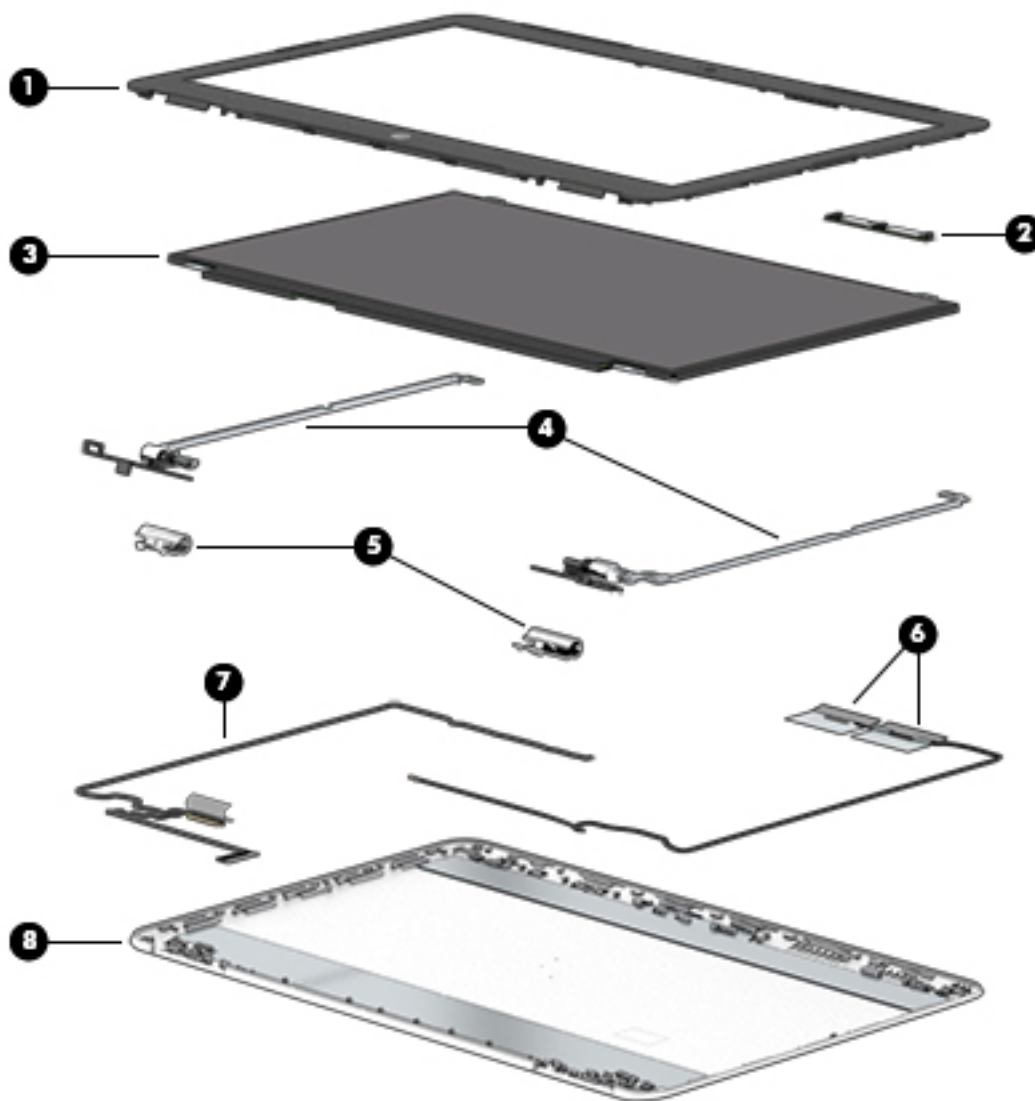


Table 3-2 Display components and their descriptions

Item	Component	Spare part number
(1)	Bezel	
	For non-touch screens	856725-001
	For non-touch 3D screens	856726-001
(2)	Camera (used in all models)	L02666-001
(3)	Raw display panel	
	Non-touch for use in the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599	
	• FHD, UWVA	752920-012
	• FHD, SVA	798933-015
	Non-touch for use in the following models: 15-dp0000~0999	

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

Item	Component	Spare part number
	FHD, SVA	L43002-001
	FHD, UWVA	L43003-001
(4)	Hinge assembly	856741-001
(5)	Hinge cap assembly for touch screens	856748-001
(6)	Hinge cap assembly for non-touch screen models	859737-001
(7)	WLAN antenna	856923-001
(8)	Display cable	856733-001
(9)	Back cover (includes antenna)	
	In shadow black finish for non-touch screens	L03594-001
	In acid green finish for non-touch screens	L22939-001

Miscellaneous parts

Table 3-3 Miscellaneous parts and their descriptions

Component	Spare part number
AC adapter for use in the following models: 15-dp000~0999	
200 W adapter, PFC, SMART, 4.5 mm, slim	L00818-850
AC adapter for use in the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599	
120 W adapter, PFC S-3P, 4.5 mm, slim	710415-001
150 W adapter, PFC, SMART, 4.5 mm, slim	776620-001
	917649-850
135 W adapter, PFC, SMART, 4.5 mm, slim	L15534-001
135 W adapter, PFC, SMART, 4.5 mm, slim (for LA MERCO only)	L15534-101
Hard drive bracket	913937-001
HP HDMI to VGA adapter	701943-001
HP USB external DVD/RW optical drive	747080-001
Power cord (C5, 1.0 m) for use in the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599	
For use in Argentina	401300-007
For use in Australia	213356-008
For use in Denmark	213353-008
For use in Europe	213350-009
For use in India	404827-003
For use in Israel	398063-003
For use in Italy	213352-008

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

Component	Spare part number
For use in North America	213349-009
For use in the People's Republic of China	286497-008
For use in South Africa	361240-002
For use in South Korea	267836-008
For use in Switzerland	213354-008
For use in Taiwan	393313-003
For use in Thailand	285096-006
For use in the United Kingdom	213351-008
Power cord (C13, 1.0 m) for use in the following models: 15-dp0000~0999	
For use in Australia	L22339-001
For use in Denmark	L22334-001
For use in Europe	L22333-001
For use in India	L22343-001
For use in Israel	L22335-001
For use in the People's Republic of China	L22341-001
For use in South Africa	L22337-001
For use in Switzerland	L22336-001
For use in Taiwan	L22342-001
For use in Thailand	L22338-001
For use in the United Kingdom	L22332-001
Screw Kit	856752-001

4 Removal and replacement procedures preliminary requirements


Tools required

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

- Non-conductive, non-marking pry tool
- Magnetic Phillips P1 screwdriver

Service considerations


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

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

Plastic parts

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

Cables and connectors

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

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

Drive handling



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

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

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

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

Handle drives on surfaces covered with at least one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

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.

Electrostatic discharge information

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

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



IMPORTANT: To prevent damage to the device when you are removing or installing internal components, observe these precautions:

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

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

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

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

Generating static electricity

Note the following:

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

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

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

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



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

Preventing electrostatic damage to equipment

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

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

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

Personal grounding methods and equipment

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

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

Table 4-2 Static shielding protection levels

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

Grounding the work area

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

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

Recommended materials and equipment

HP recommends the following materials and equipment to prevent static electricity:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of $1\text{ M}\Omega \pm 10\%$ resistance
- Static-dissipative table or floor mats with hard tie to ground


- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing 1 M Ω \pm 10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes


Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

5 Removal and replacement procedures for authorized service provider parts

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

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 22](#) for details.

Component replacement procedures

 **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 the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

See [Removal and replacement procedures preliminary requirements on page 31](#) for initial safety procedures.

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer

Base enclosure

Table 5-1 Base enclosure descriptions and part numbers

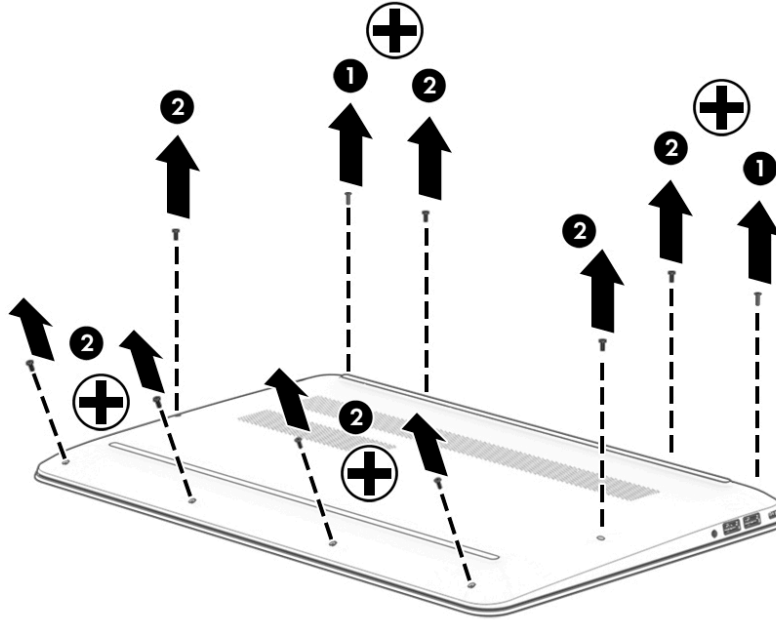
Description	Spare part number
Base enclosure for use in the following models: 15-dp0000~0999	
<ul style="list-style-type: none">• Shadow black finish	L42993-001
<ul style="list-style-type: none">• Acid green finish	L42992-001
Base enclosure for use in the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599	
<ul style="list-style-type: none">• Shadow black finish	L03593-001
Base enclosure for use in the following models: 15-bc400~499, 15-bc500~599	
<ul style="list-style-type: none">• Acid green finish	L22940-001

Before disassembling the computer, follow these steps:

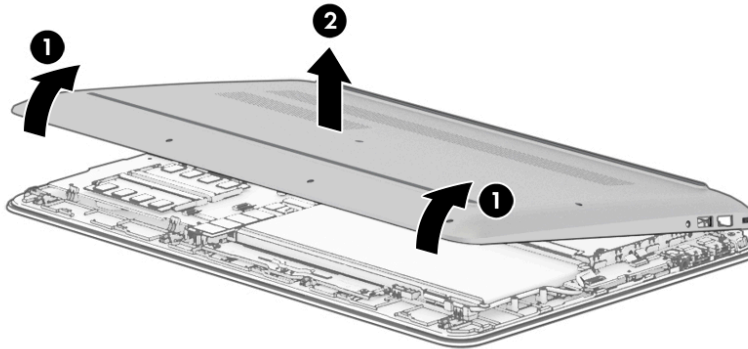
- ▲ Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).

Remove the base enclosure:

1. Position the computer upside down on a flat surface.
2. Remove the two Phillips M2.5 × 6.0 screws (1) and the eight Phillips M2.0 × 5.0 screws (2) that secure the base enclosure to the computer.




3. Slide a non-marking, non-conductive pry tool around the edge of the base enclosure to loosen it (1), taking care not to damage the internal clips, and then remove the base enclosure (2).




Battery

Table 5-2 Battery descriptions and part numbers

Description	Spare part number
Battery, 3-cell, 61 Wh, 5.37 Ah (15-bc300~15-bc399, 15-bc400~15-bc499 models)	849910-850
Battery, 4-cell, 63 Wh, 4.11 Ah (15-bc400~15-bc499, 15-bc500~15-bc599, 15-dp0000~0999 models)	905277-855
Battery cable	858968-001

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


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

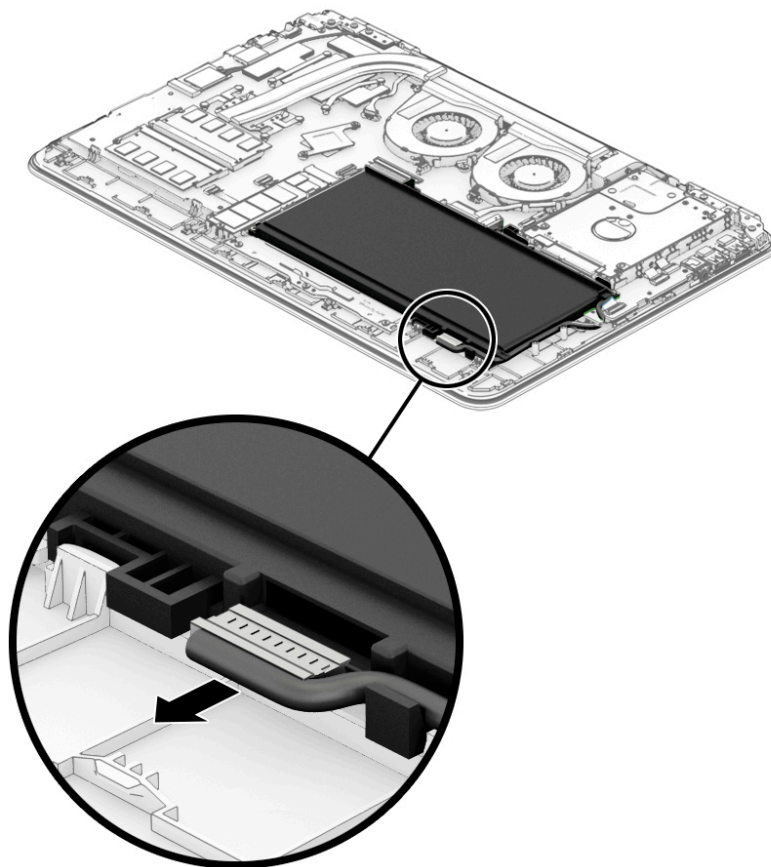
Before removing the battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).

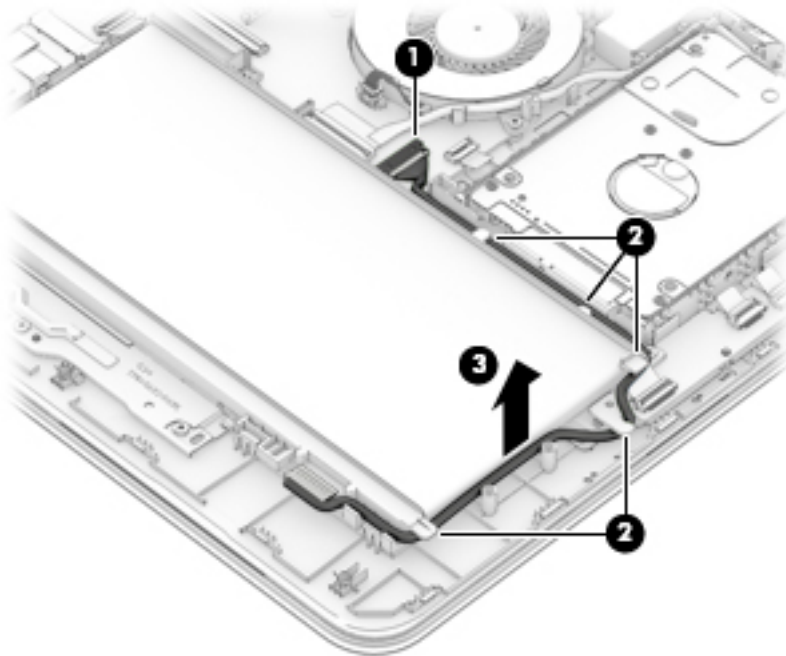
Remove the battery:

1. Disconnect the cable from the battery.

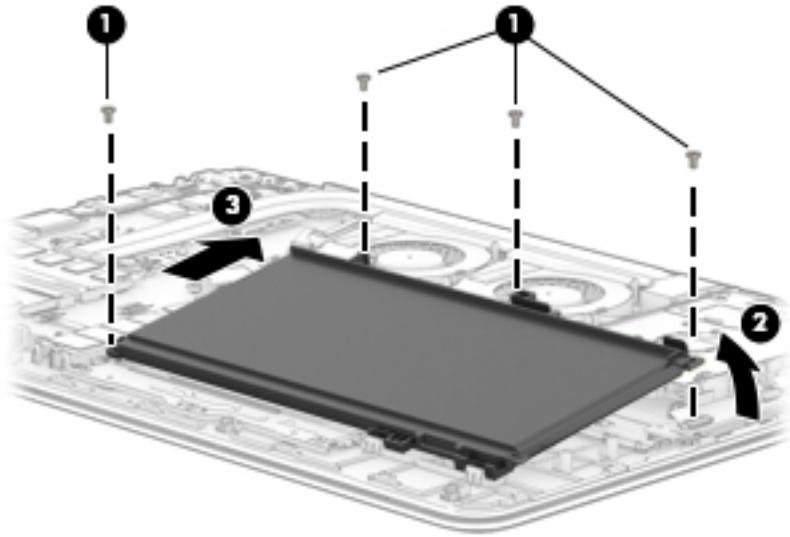
 **IMPORTANT:** Be sure to disconnect the cable from the battery before removing any internal components.



2. To remove the battery, disconnect the battery cable from the system board (1), release the battery cable from the routing channels (2), and then lift the battery cable to remove it (3).



3. Remove four Phillips M2.0 × 4.0 screws (1) that secure the battery to the computer, lift the front of the battery (2), and then slide the battery up and away to remove it from the computer (3).



To insert the battery, reverse the removal procedures.

Hard drive

Table 5-3 Hard drive, bracket, and cable descriptions and part numbers

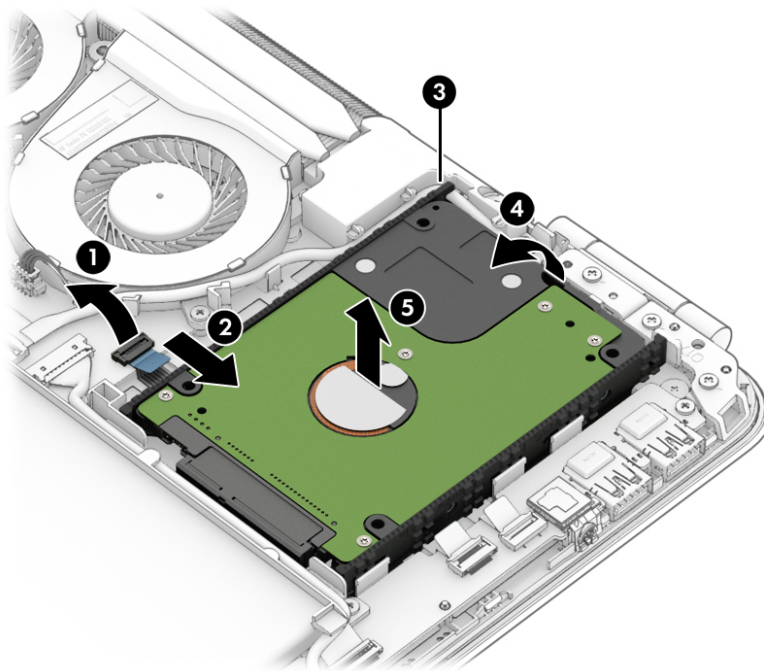
Description	Spare part number
Hard drive, 1 TB, 5400 rpm, 2.5 inch	778192-005
Hard drive, 1 TB, 5400 rpm, 7.0 mm	L30422-005
Hard drive, 2 TB, 5400 rpm, 7.0 mm	912487-855
Hard drive bracket	913937-001
Hard drive cable	858969-001

Before removing the hard drive, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

Remove the hard drive:

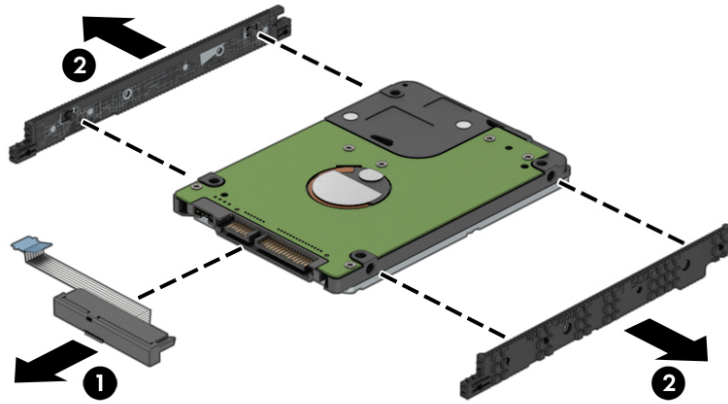
1. Open the ZIF connector latch on the system board **(1)**, and then disconnect the hard drive cable **(2)**.
2. Loosen the side brackets **(3)**, lift the front of the hard drive upward **(4)**, and then lift the hard drive from the computer **(5)**.



Reverse this procedure to install the hard drive.

If it is necessary to disassemble the hard drive, follow these steps:

- ▲ Remove the hard drive connector **(1)**, and then remove the side brackets **(2)**.



Reverse this procedure to reassemble the hard drive.

Solid-state drive (M.2)

Table 5-4 Solid-state drive descriptions and part numbers

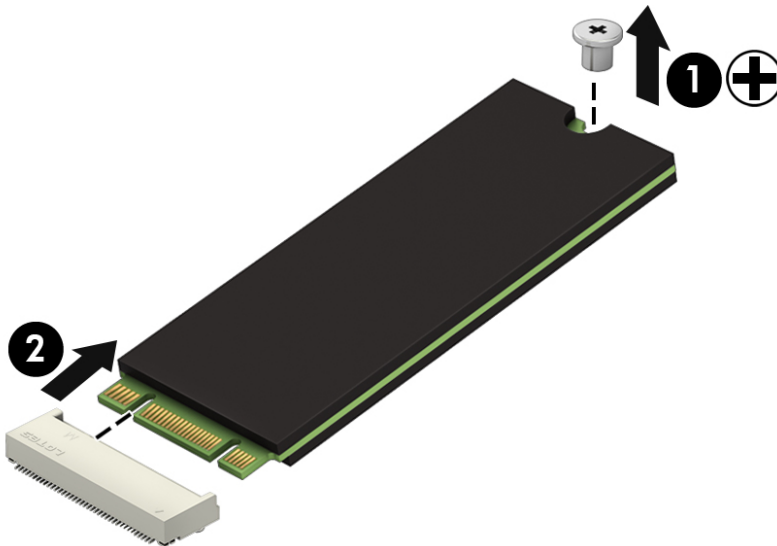
Description	Spare part number
Solid state drive for use in the following models: 15-dp0000~0999	
<ul style="list-style-type: none">• Optane memory module, 16 GB, PCIe	L43005-001
<ul style="list-style-type: none">• 256 GB, PCIe	L44430-001
<ul style="list-style-type: none">• 128 GB, SATA-3	L43004-001
Solid state drive for use in the following models:	
<ul style="list-style-type: none">• Optane memory module, 16 GB, PCIe (15-bc400~499 models)	L27067-001
<ul style="list-style-type: none">• 128 GB, SATA-3. TLC (15-bc300~399 models, 15-bc400~499 models, 15-bc500~599 models)	759848-032
<ul style="list-style-type: none">• 256 GB, PCIe 3 × 4 SS, TLC (15-bc500~599 models)	847109-005
<ul style="list-style-type: none">• 512 GB, PCIe 3 × 4 SS, TLC (15-bc500~599 models)	847110-002

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

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

Remove the solid-state drive:

- ▲ Remove the Phillips M2.0 × 3.0 screw **(1)**, and then pull the solid-state drive away from the connector **(2)**.



Reverse this procedure to install the solid-state drive.

Memory module

Table 5-5 Memory module descriptions and part numbers


Description	Spare part number
Memory module, DDR4, 2133 MHz (15-bc300~399 models)	
<ul style="list-style-type: none">8 GB	820570-005
<ul style="list-style-type: none">4 GB	820569-005
<ul style="list-style-type: none">2 GB	851379-005
Memory module, DDR4, 2400 MHz (15-bc400~499 models)	
<ul style="list-style-type: none">8 GB	862398-855
<ul style="list-style-type: none">4 GB	862397-855
<ul style="list-style-type: none">2 GB	864271-855
Memory module, DDR4, 2666 MHz	
<ul style="list-style-type: none">4 GB (15-bc400~499 models)	L10598-855
<ul style="list-style-type: none">8 GB (15-dp0000~0999, 15-bc400~499 models)	937236-855

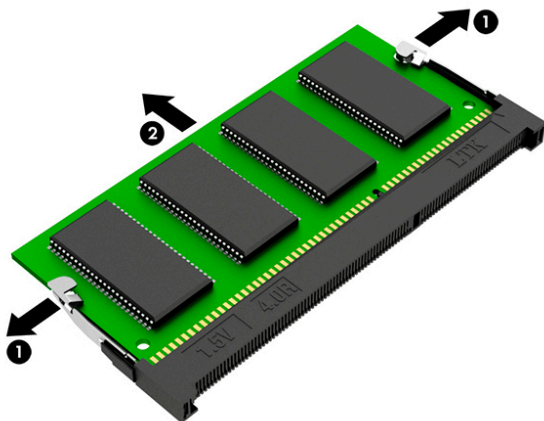
Before removing the memory, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

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


1. Lift the clear film covering the memory module.
2. Spread the two retention clips outward (**1**) until the memory module tilts up at a 45-degree angle, and then remove the module (**2**). Use the same procedure to remove all memory modules.

 **IMPORTANT:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.

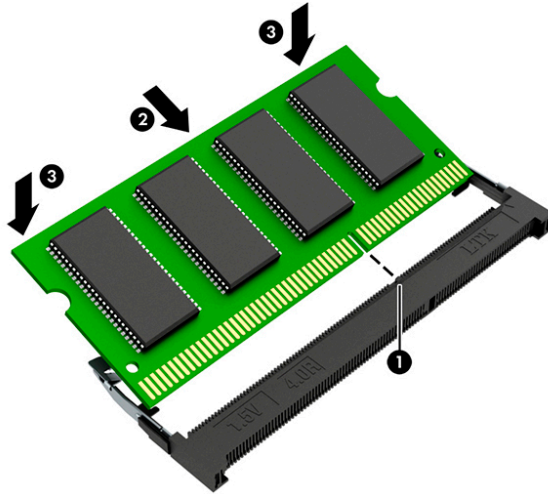


To protect a memory module after removal, place it in an electrostatic-safe container.

To install a memory module:

 **IMPORTANT:** To prevent damage to the memory module, hold the memory module by the edges only. Do not touch the components on the memory module.


1. Align the notched edge of the module with the tab in the slot **(1)**, and then press the module into the slot at an angle until it is seated **(2)**.
2. Press down on the module until the side retention clips snap into place **(3)**.



WLAN module

Table 5-6 WLAN module descriptions and part numbers

Description	Spare part number
Intel Dual Band wireless-AC 7265 802.11ac, 2 × 2, Wi-Fi + Bluetooth 4.2 Combo Adapter (non-vPro) (15-bc300~15-bc399 models)	793840-005
Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (15-bc400~15-bc499, 15-bc500~15-bc599, 15-dp0000~0999 models)	924813-855

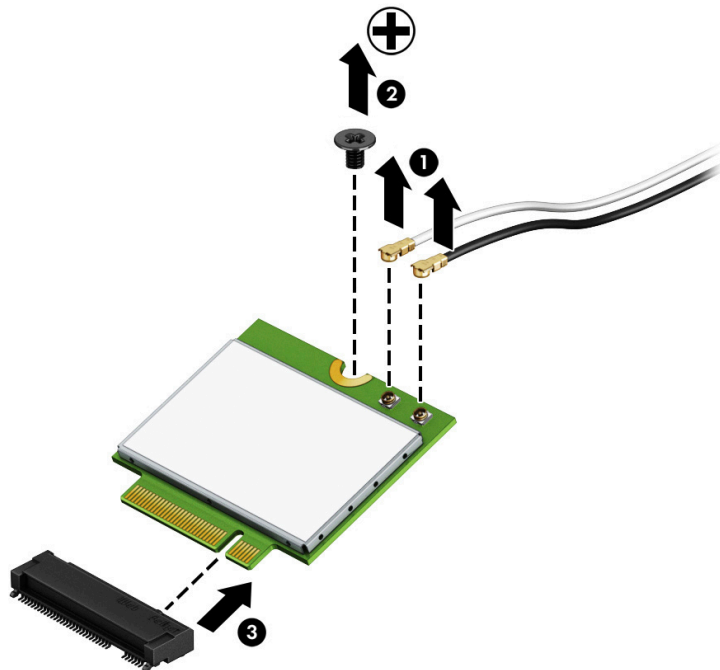
 **IMPORTANT:** To prevent an unresponsive system, replace the wireless module only with a wireless module authorized for use in the computer by the governmental agency that regulates wireless devices in your country or region. If you replace the module and then receive a warning message, remove the module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

Before removing the WLAN module, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

Remove the WLAN module:

1. Carefully disconnect the two antenna cables from the module **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)**, and then remove the WLAN module from the socket **(3)**.



Reverse this procedure to install the WLAN module.

Heat sink

Table 5-7 Heat sink descriptions and part numbers

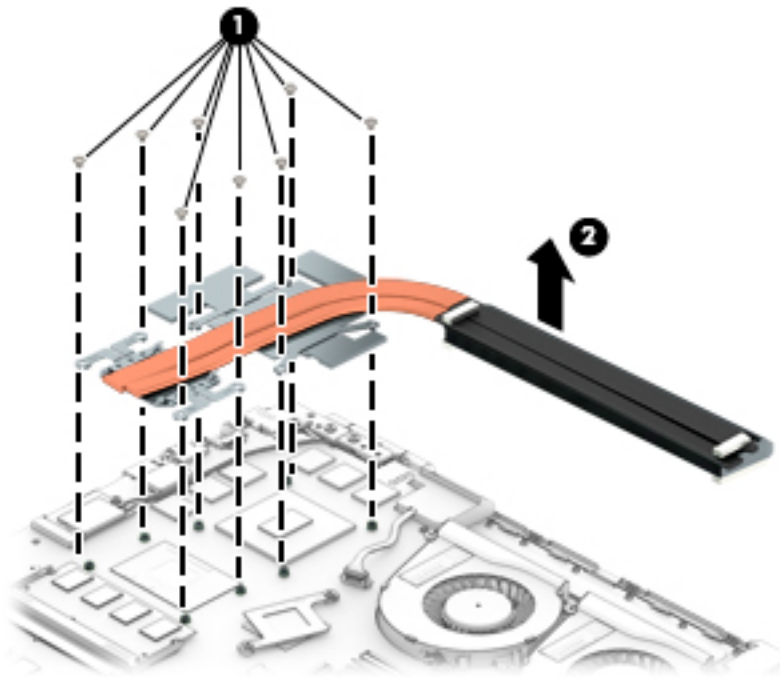
Description	Spare part number
Heat sink for use in products with GeForce GTX1050M graphics (15-bc400~499, 15-bc500~599 models)	920563-001
Heat sink for use in products with GeForce GTX 950M graphics (15-bc500~599 models)	L03383-001
Heat sink for use in products with GeForce GTX 1050 graphics (15-bc400~499 models)	L22941-001
Heat sink for use in products with GeForce GTX 1060 graphics (15-dp0000~0999 models)	L43000-001

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

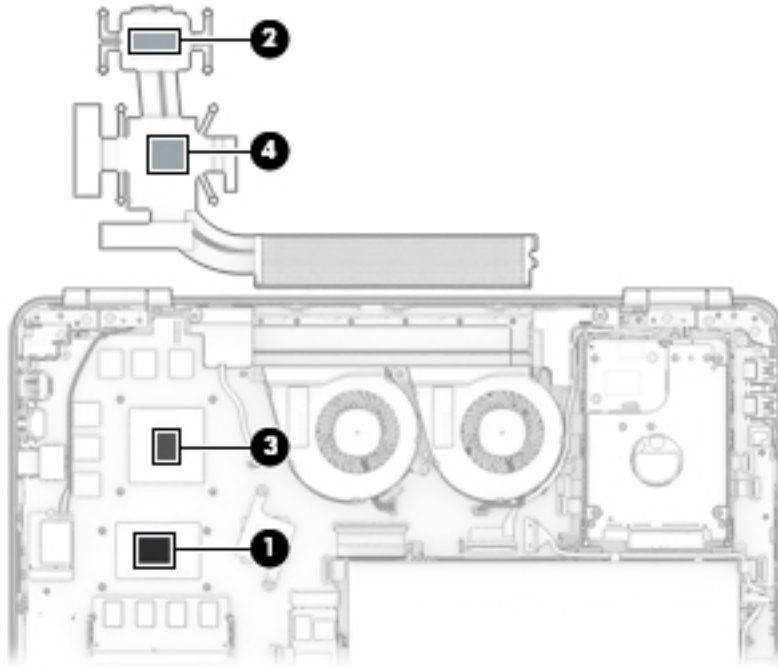
Remove the heat sink:

1. Remove the eight Phillips M2.0 × 2.5 screws **(1)** and then carefully lift the heat sink **(2)** to remove it from the system board.



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

Thermal paste is used on the system board components **(1), (3)** and on the heat sink areas **(2), (4)** that service them.



Reverse this procedure to install the heat sink.

PCH heat sink

Table 5-8 PCH heat sink description and part number

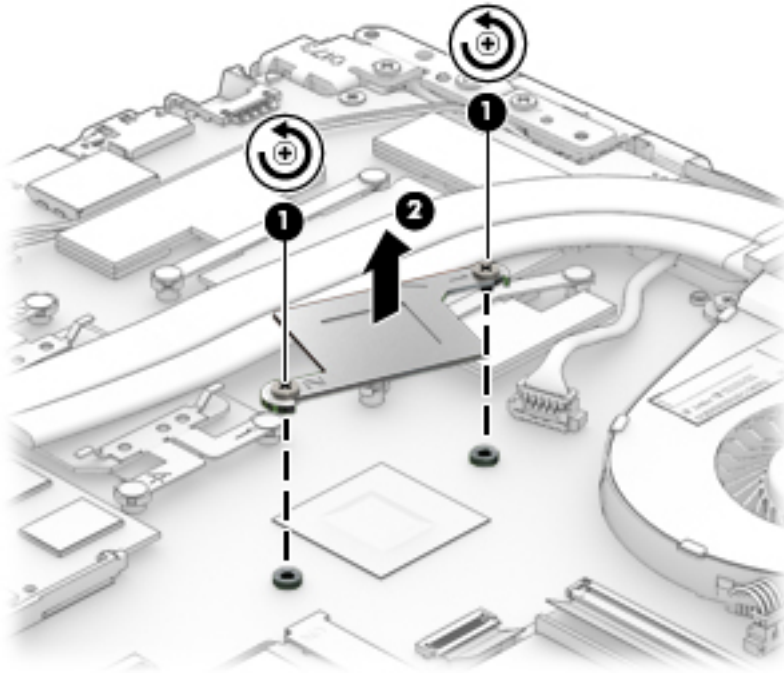
Heat sink	Spare part number
PCH heat sink	725625-001

Before removing the platform controller hub (PCH) heat sink, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

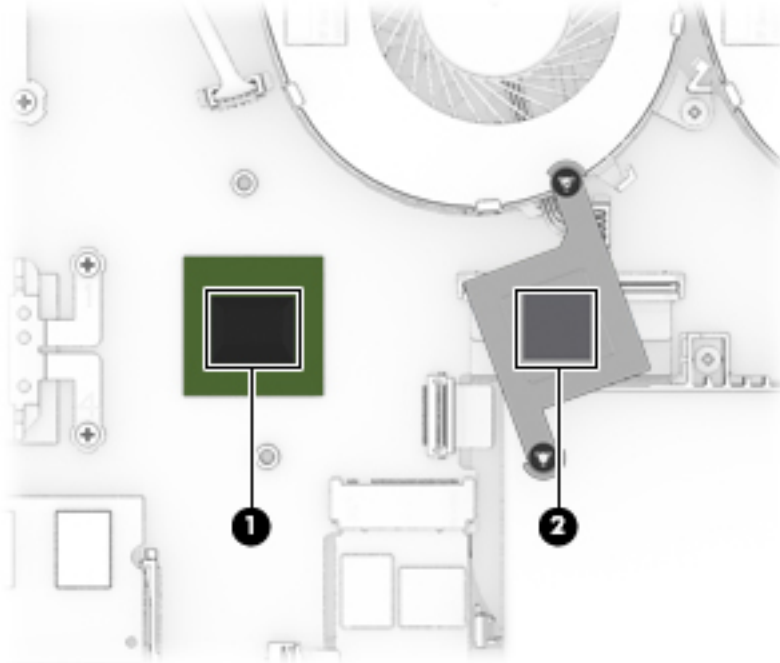
Remove the PCH heat sink:

1. Loosen the two captive Phillips screws **(1)**, and then remove the heat sink from the system board **(2)**.



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

Thermal paste is used on the system board PCH component **(1)** and on the heat sink **(2)**.



Reverse this procedure to install the PCH heat sink.

USB board

Table 5-9 USB board and cable descriptions and part numbers

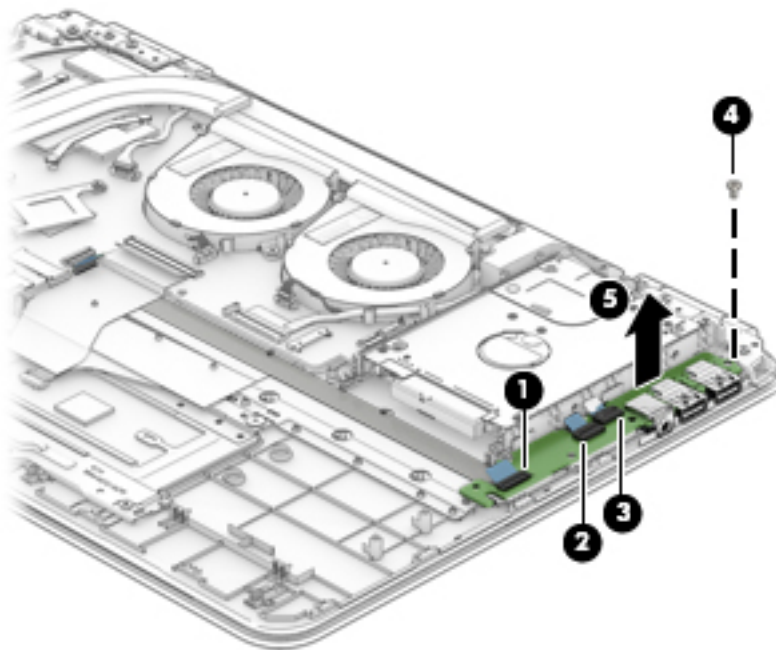
Description	Spare part number
USB board for use in models 15-dp0000~15-dp0999	L42997-001
USB board for use in models 15-bc300~bc399, 15-bc400~bc499, 15-bc500~bc599	L06098-001
USB board cable for use in models 15-dp0000~15-dp0999	L42994-001
USB board cable for use in models 15-bc300~bc399, 15-bc400~bc499, 15-bc500~bc599	856729-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

Remove the USB board:

1. Disconnect the USB board cable from the zero-insertion force (ZIF) connector **(1)** on the USB board.
2. Disconnect the cables from the two ZIF connectors on the USB board **(2)** and **(3)**.
3. Remove the Phillips M2.0 × 4.0 screw **(4)**, and then lift the USB board to remove it **(5)**.



Reverse this procedure to install the USB board.

Touchpad

Table 5-10 Touchpad and cable descriptions and part numbers

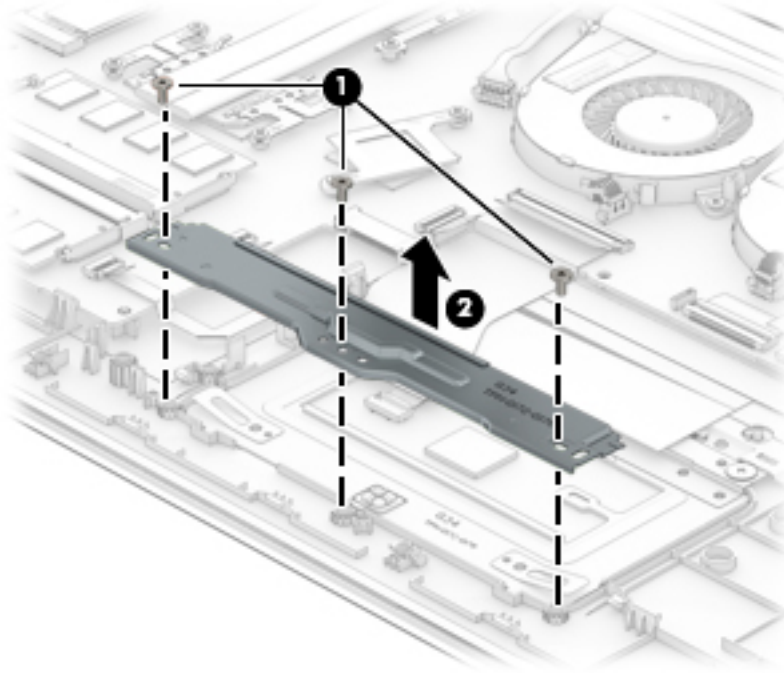
Description	Spare part number
Touchpad board for use in models 15-dp0000~15-dp0999	860364-001
Touchpad board for use in models 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	L06001-001
Touchpad cable for use in models 15-dp0000~0999	L42995-001
Touchpad cable for use in models 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	858967-001

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Remove the battery (see [Battery on page 38](#)).

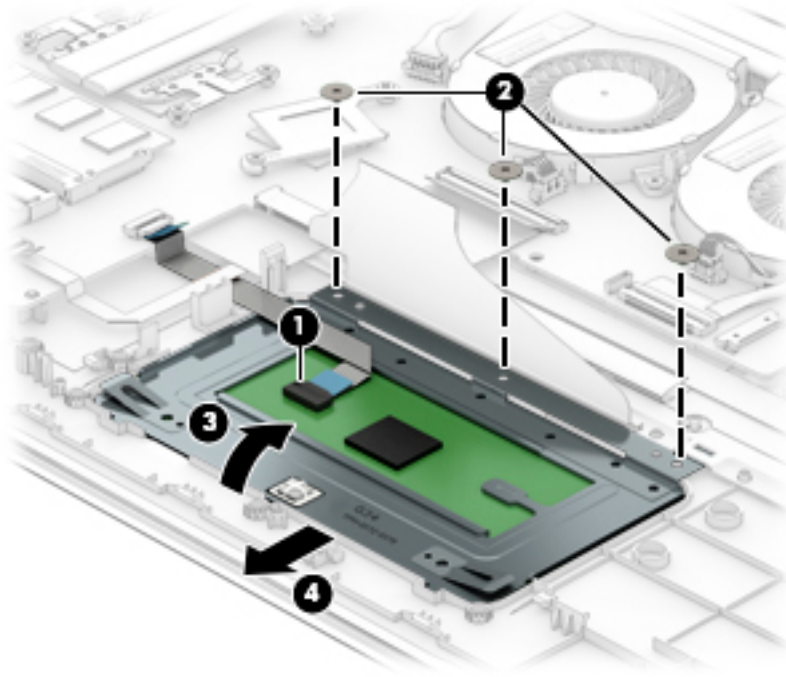
Remove the touchpad:

1. Remove the three Phillips M2.0 × 2.0 screws that secure the touchpad bracket (1), and then remove the touchpad bracket from the computer (2).



2. Disconnect the touchpad cable from the ZIF connector (1) on the touchpad.
3. If tape secures the touchpad to the computer, remove the.
4. Remove the three Phillips M2.0 × 2.5 screws (2) that secure the touchpad to the computer.

5. Rotate the bottom of the touchpad upward **(3)**, and then remove it from the computer **(4)**.



Reverse this procedure to install the touchpad.

Fan assembly

Table 5-11 Fan descriptions and part numbers


Description	Spare part number
Fan assembly for use in models 15-dp0000~0999	L42999-001
Fan assembly for use in models 15-bc300~bc399, 15-bc400~bc499, 15-bc500~bc599	L18458-001

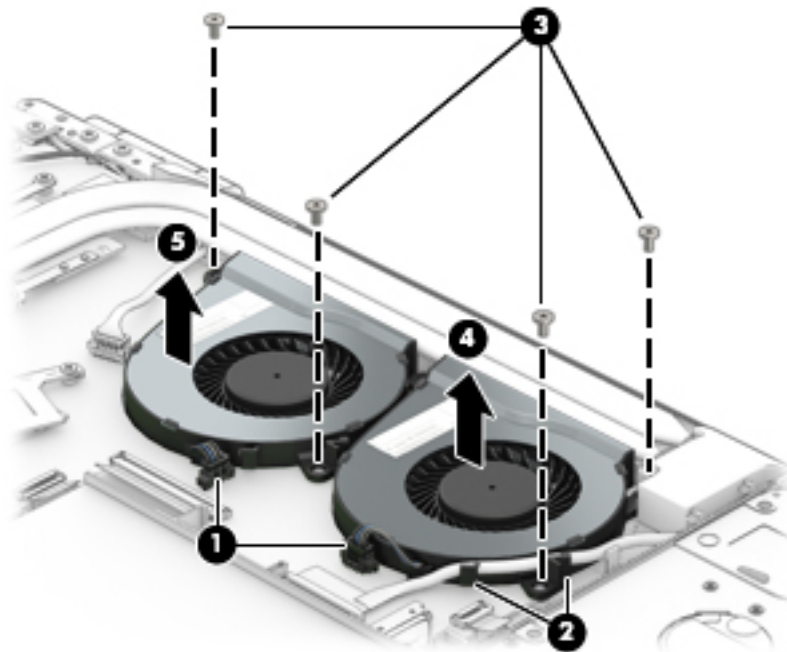
Before removing the fan assembly, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).


Remove the fan assembly:

1. Disconnect the fan cables from the system board (**1**), and then release the display cable from the threading channel in the right fan (**2**).
2. Remove the four Phillips M2.0 × 4.0 screws from the fans (**3**), and then remove the right fan (**4**) and the left fan (**5**) from the computer.

 **TIP:** The right fan sits on top of the left fan on the shared post between the fans near the heat sink.



Reverse this procedure to install the fan assembly.

 **IMPORTANT:** When replacing the fans, you must install the left fan first.

System board

Table 5-12 System board descriptions and part numbers

Description	Spare part number
System board (includes processor):	
All system boards use the following part numbers:	
xxxxxx-001: Non-Windows operating system	
xxxxxx-601: Windows 10 operating system	
Intel i7-9750H processor for use in models with 4 GB of GeForce GTX 1650 discrete graphics memory	L60207-xx1
Intel i7-9750H processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory	L60209-xx1
Intel i7-9750H processor for use in models with 3 GB of GeForce GTX 1050 discrete graphics memory	L60211-xx1
Intel i5-9300H processor for use in models with 4 GB of GeForce GTX 1650 discrete graphics memory	L60208-xx1
Intel i5-9300H processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory	L60210-xx1
Intel i5-9300H processor for use in models with 3 GB of GeForce GTX 1050 discrete graphics memory	L60212-xx1
Intel i5-8300H processor for use in models with 3 GB of GeForce GTX 1050 discrete graphics memory	L56248-xx1
Intel i7-7500U processor for use in models with 4 GB of GeForce GTX 950M discrete graphics memory	L03381-xxx
Intel i7-7200U processor for use in models with 4 GB of GeForce GTX 950M discrete graphics memory	L03382-xxx
Intel i7-7200U processor for use in models with 2 GB of GeForce GTX 950M discrete graphics memory	L03380-xxx
Intel i7-8550U processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory	L22035-xxx
Intel i7-8550U processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory	L22033-xxx
Intel i5-8250U processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory	L22036-xxx
Intel i5-8250U processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory	L22034-xxx
Intel i7-8750H processor for use in models with 4 GB of GeForce GTX 1050Ti discrete graphics memory	L30703-xxx
Intel i7-8750H processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory	L22039-xxx
Intel i7-8750H processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory	L22037-xxx
Intel i7-8750H processor for use in models with 6 GB of GeForce GTX 1060 discrete graphics memory	L42991-xxx
Intel i7-8750H processor for use in models with 3 GB of GeForce GTX 1060 discrete graphics memory	L42989-xxx
Intel i5-8300H processor for use in models with 4 GB of GeForce GTX 1050Ti discrete graphics memory	L30704-xxx
Intel i5-8300H processor for use in models with 4 GB of GeForce GTX 1050 discrete graphics memory	L22040-xxx
Intel i5-8300H processor for use in models with 2 GB of GeForce GTX 1050 discrete graphics memory	L22038-xxx
Intel i5-8300H processor for use in models with 6 GB of GeForce GTX 1060 discrete graphics memory	L42990-xxx
Intel i5-8300H processor for use in models with 3 GB of GeForce GTX 1060 discrete graphics memory	L42988-xxx

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).

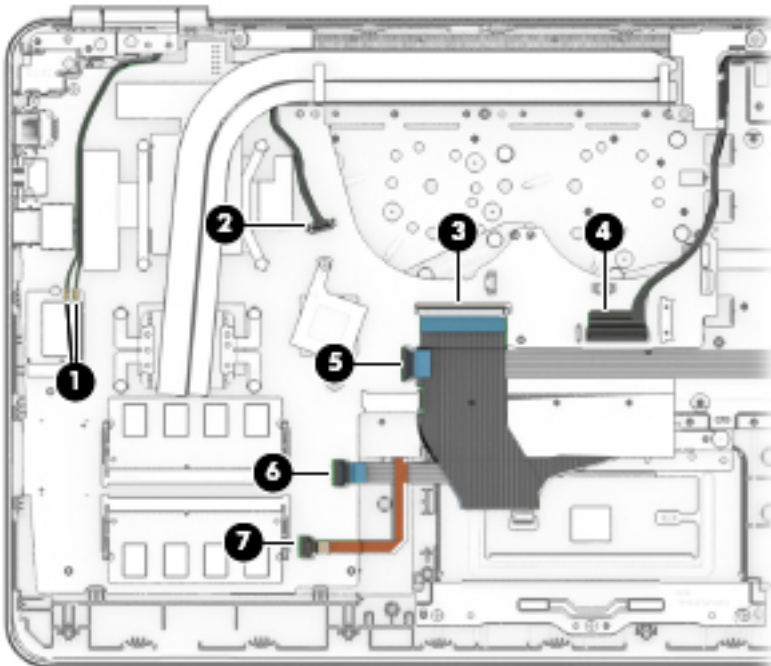
3. Disconnect the cable from the battery (see [Battery on page 38](#)).
4. Remove the fans (see [Fan assembly on page 54](#)).
5. Remove the solid-state drive (see [Solid-state drive \(M.2\) on page 43](#)).

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

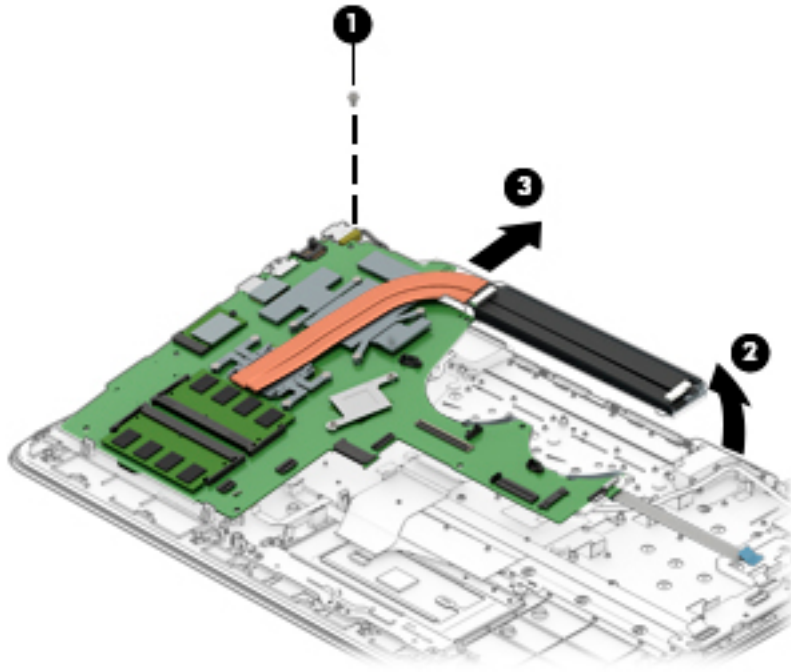
- Memory modules (see [Memory module on page 44](#)).
- WLAN module (see [WLAN module on page 46](#)).
- Heat sink (see [Heat sink on page 47](#)).
- PCH heat sink (see [PCH heat sink on page 49](#)).

Remove the system board:

1. Disconnect the following cables:
 - Wireless antenna cable **(1)**
 - Speaker cable **(2)**
 - Keyboard cable (ZIF) **(3)**
 - Display cable (ZIF) **(4)**
 - USB board cable (ZIF) **(5)**
 - Touchpad cable (ZIF) **(6)**
 - Keyboard backlight cable (ZIF) **(7)**



2. Remove Phillips M2.0 × 4.0 screw (1), lift the top of system board (2), and then remove it from the computer (3).



Reverse this procedure to install the system board.

RTC battery

Table 5-13 RTC battery description and part number

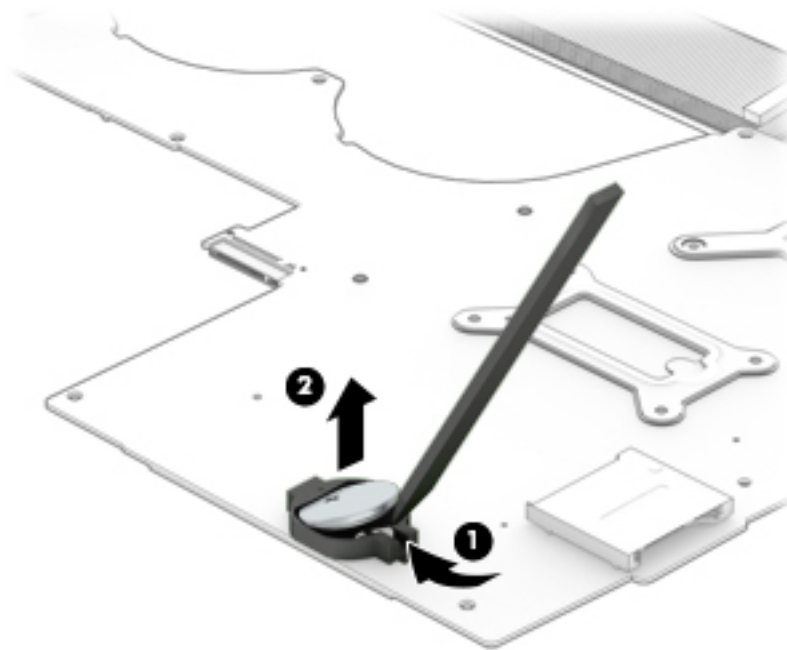
Description	Spare part number
RTC battery	741976-001

Before removing the RTC battery, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)), and then remove the following components:
 - a. Solid-state drive (see [Solid-state drive \(M.2\) on page 43](#)).
 - b. Fans (see [Fan assembly on page 54](#)).
 - c. System board (see [System board on page 55](#)).

Remove the RTC battery:

1. Position the removed system board upside down.
2. Use a non-conductive tool to pry the battery from the socket **(1)**, and then remove the battery from the system board socket **(2)**.



Reverse this procedure to install the RTC battery.

Power connector

Table 5-14 Power connector descriptions and part numbers

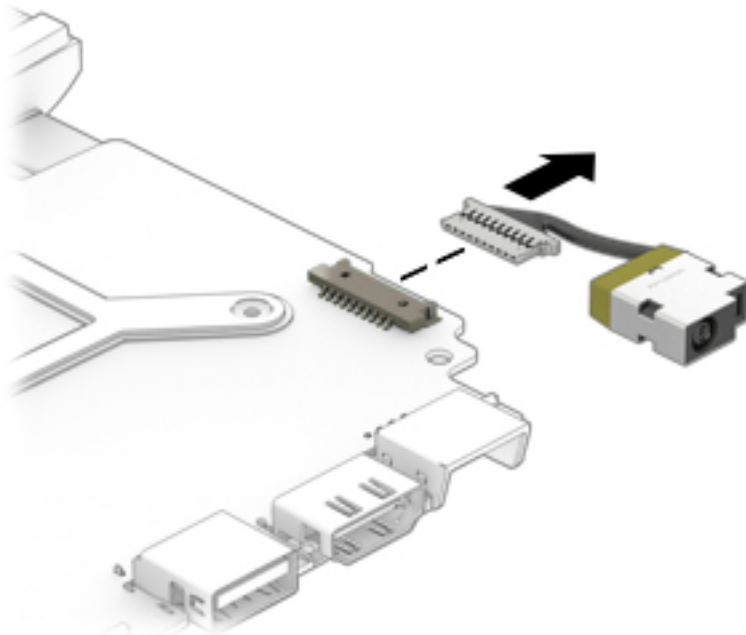
Description	Spare part number
Power connector cable for use in model numbers: 15-dp0000~0999	L42996-001
Power connector cable for use in model numbers: 15-bc300~399, 15-bc400~499, 15-bc500~599	858021-001

Before removing the power connector, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)), and then remove the following components:
 - a. Solid-state drive (see [Solid-state drive \(M.2\) on page 43](#)).
 - b. Fans (see [Fan assembly on page 54](#)).
 - c. System board (see [System board on page 55](#)).

Remove the power connector:

1. Position the removed system board upside down.
2. Disconnect the connector cable, and then remove the power connector.



Reverse this procedure to install the power connector.

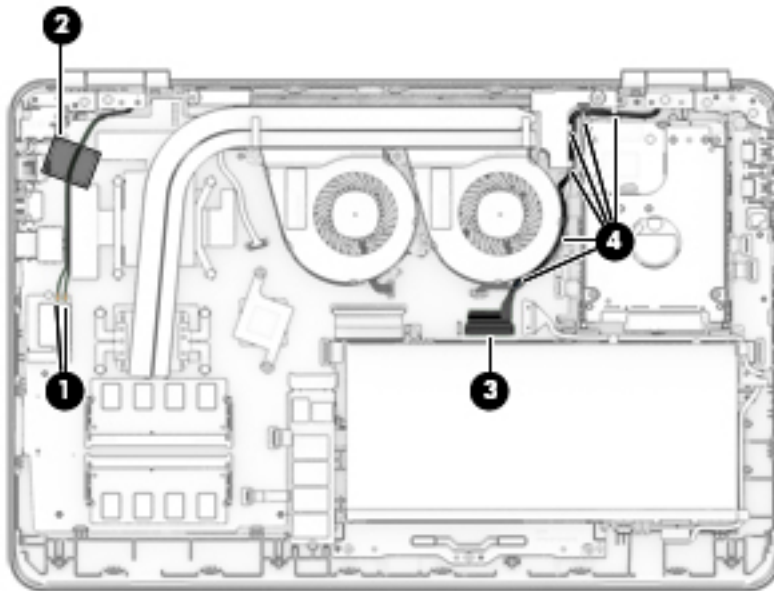
Display assembly

Before removing the display assembly, follow these steps:

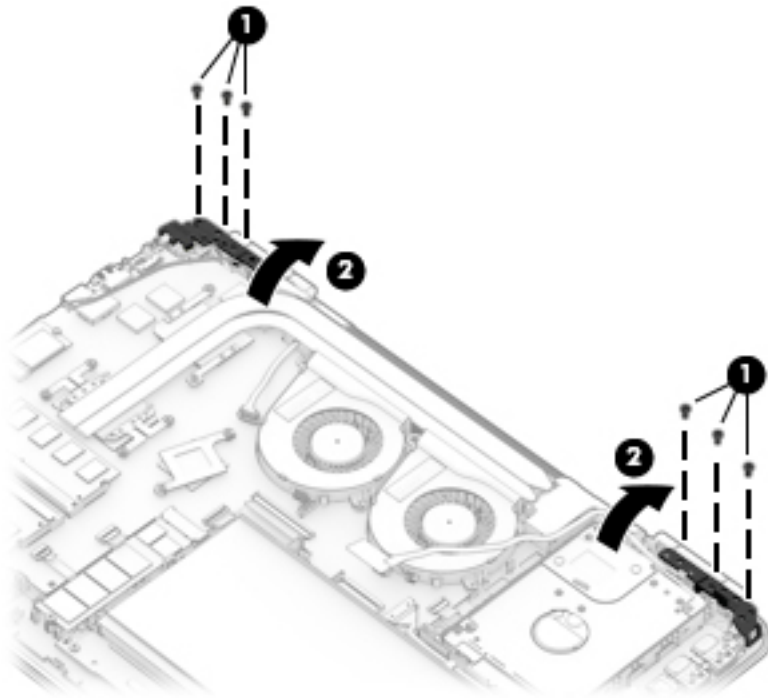
1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure.
3. Disconnect the cable from the battery (see [Battery on page 38](#)).

Remove and disassemble the display panel:

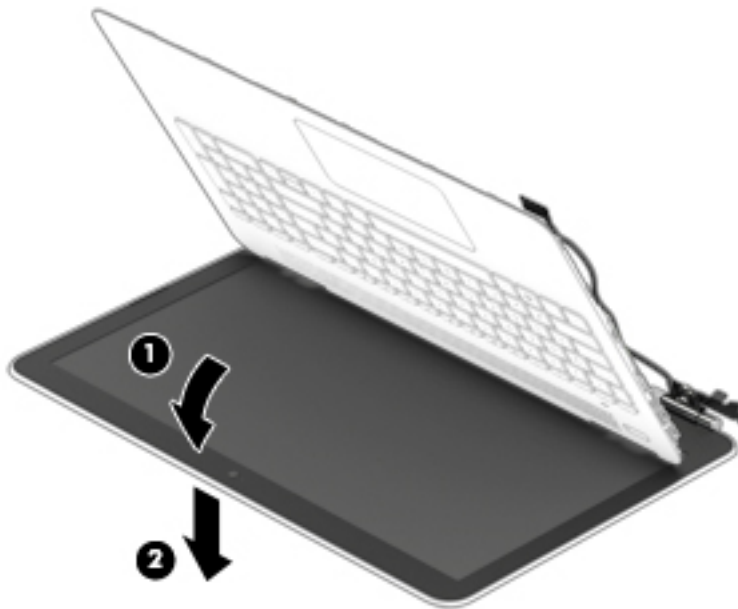
1. Disconnect the WLAN antenna cables from the WLAN module **(1)**, and then remove the tape the holding the antennas in place **(2)**.
2. Disconnect the display cable from the system board ZIF connector **(3)**, and then release the cable from the routing channels **(4)**.



3. Remove the three Phillips M2.5 × 5.0 screws from the left and right hinge brackets **(1)**, and then rotate the hinge brackets upward **(2)**.



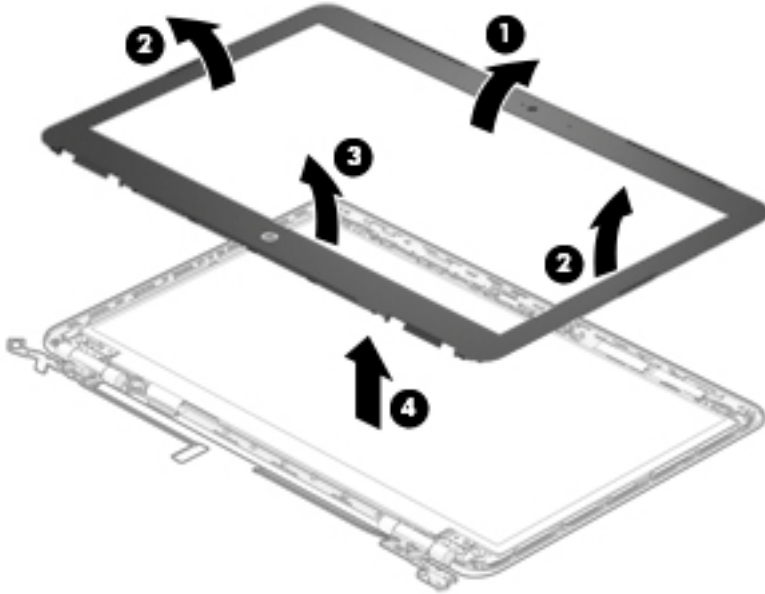
4. Position the computer upside-down on the display.
5. Rotate the display assembly **(1)**, and then separate the display assembly from the base enclosure **(2)**.



6. Position the display panel upright.

7. Using a non-marking, non-conductive pry tool, starting on the top edge **(1)**, loosen the display bezel, disconnecting the plastic clips to release the edge of the bezel. Continue on the left and right edges **(2)** and then bottom edge **(3)**, and then lift the display bezel **(4)** to remove it.

Display bezels are available as spare part number 856725-001 for non-touch panels and 856726-001 for touch panels.

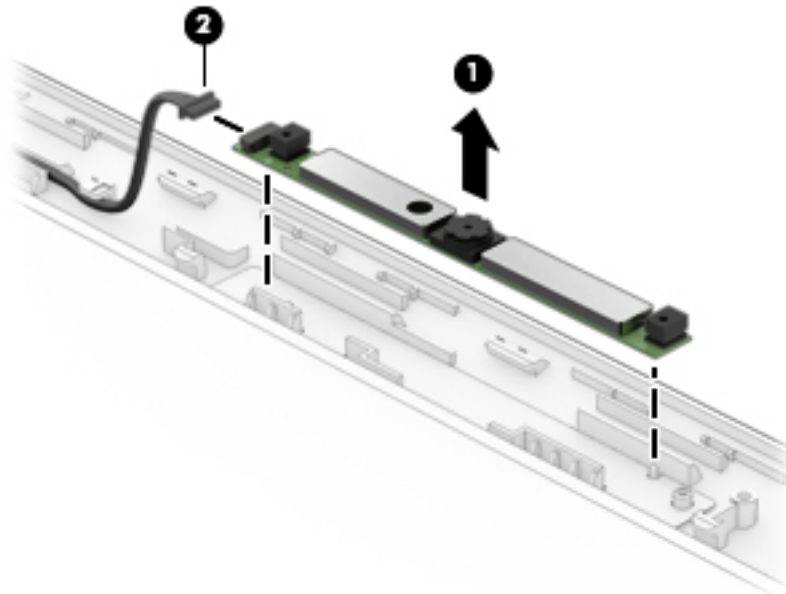


8. If it is necessary to remove the camera, use a tool and lift the camera module to disengage the adhesive that secures it to the enclosure **(1)**, and then disconnect the cable **(2)** from the module.


 **IMPORTANT:** The camera module is fragile. Use care not to damage it during removal.

Camera are available using the following spare part numbers:

L02666-001: DM USB 2.0, HD, Mjpeg, VDHC, TL (used in all models)



9. If it is necessary to remove the display panel from the enclosure, remove the four Phillips M2.0 × 2.5 screws from the display panel **(1)**, and then lift the top of the panel **(2)** over and place it next to the enclosure.

 **IMPORTANT:** A cable connects to the bottom of the back of the display panel. When lifting the panel, be sure not to accidentally pull the cable from the connector.

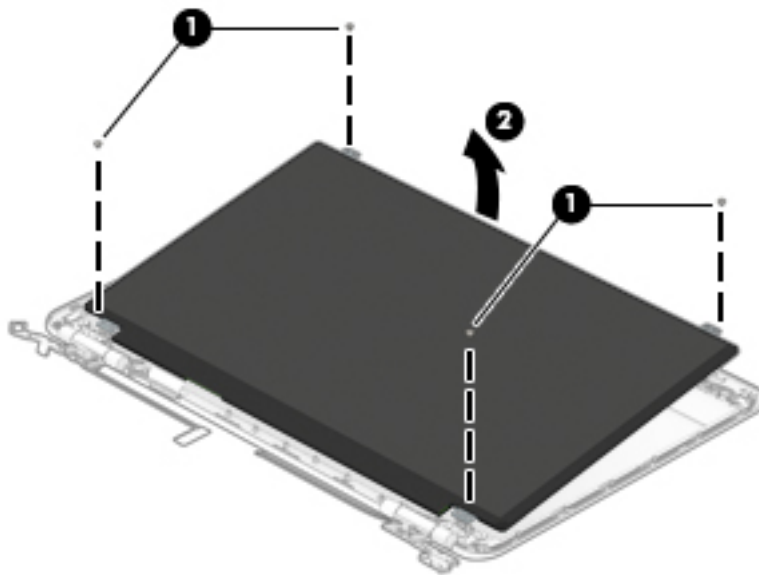
Display panels are available using the following spare part numbers:

Non-touch for use in the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599

- 752920-012: FHD, UWVA
- 798933-015: FHD, SVA

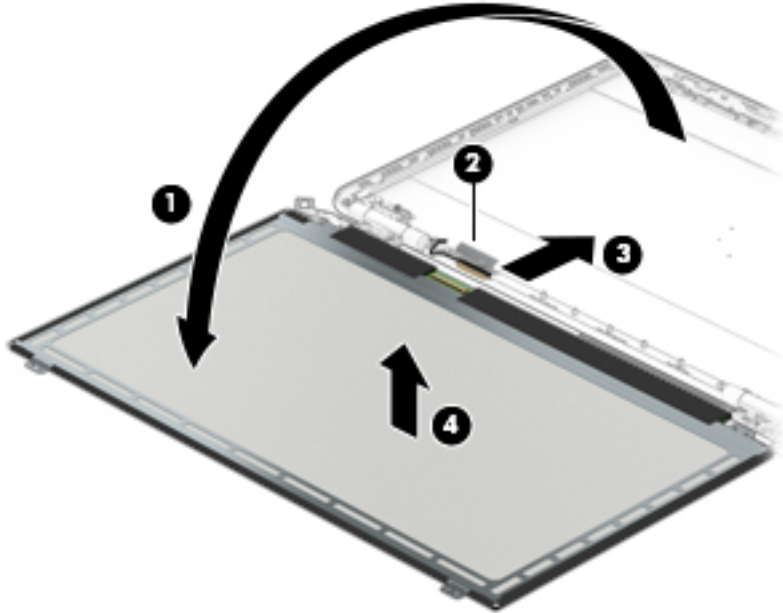
Non-touch for use in the following models: 15-dp000~0999

- L43002-001: FHD, SVA
- L43003-001: FHD, UWVA



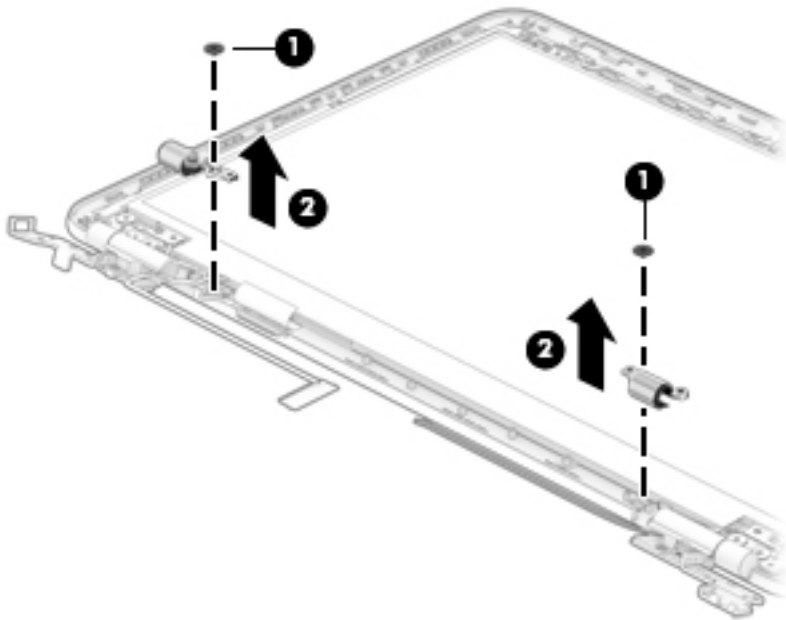
10. After rotating the display panel over next to the display enclosure **(1)**, lift the tape from the connector **(2)**, and then disconnect the display cable from the display panel **(3)**.

11. Remove the display panel from the enclosure (4).



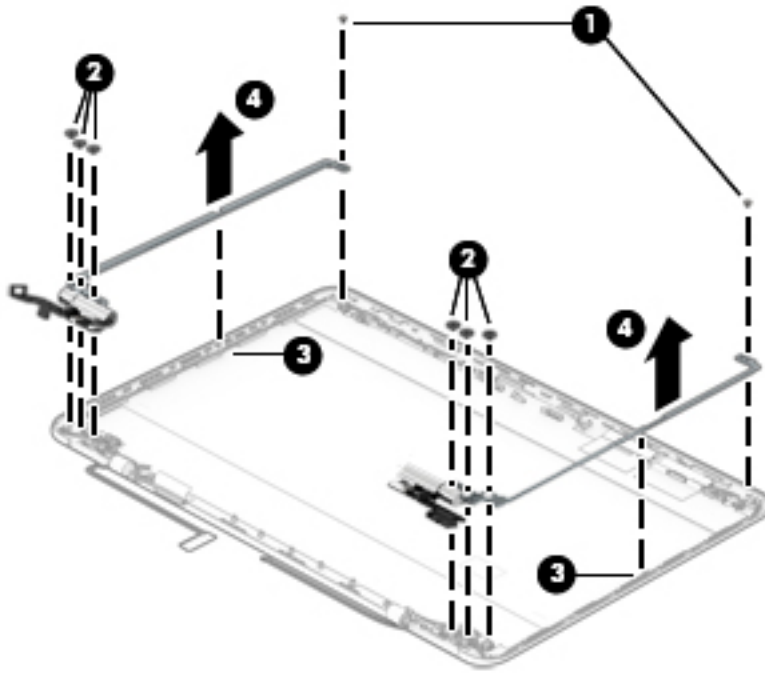
12. If it is necessary to remove the display hinges, remove the Phillips M2.0 × 2.0 screw from each hinge cover (1), and then remove the hinge covers from the enclosure (2).

All hinge covers and caps are available as spare part number 859737-001 for non-touch models and 856748-001 for touch models.



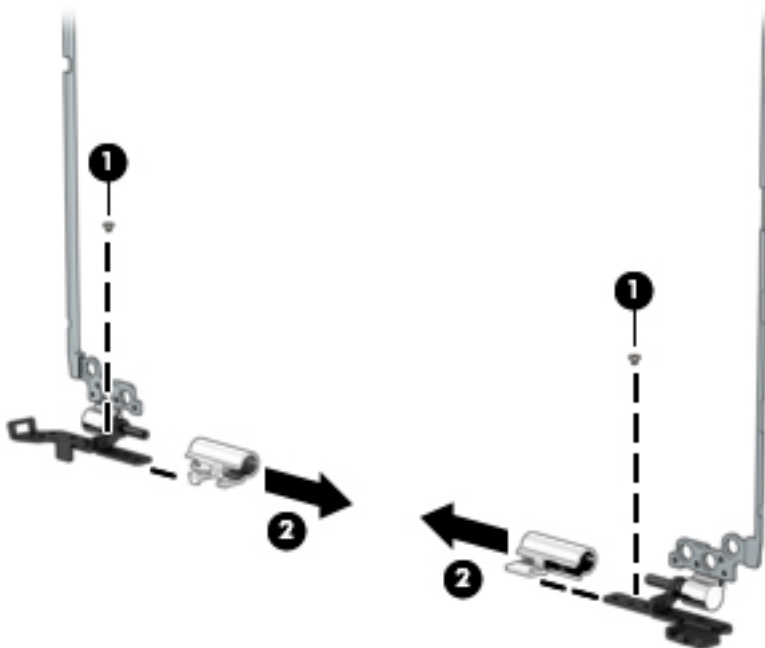
13. Remove Phillips M2.5 × 3.0 screw from the top of each hinge bracket (1) and three broad head Phillips M2.5 × 3.0 screws from each hinge (2). Remove the hinge brackets from the clips in the sides of the back cover (3), and then lift the hinge brackets (4) to remove them.

Hinges are available as spare part number 856741-001.



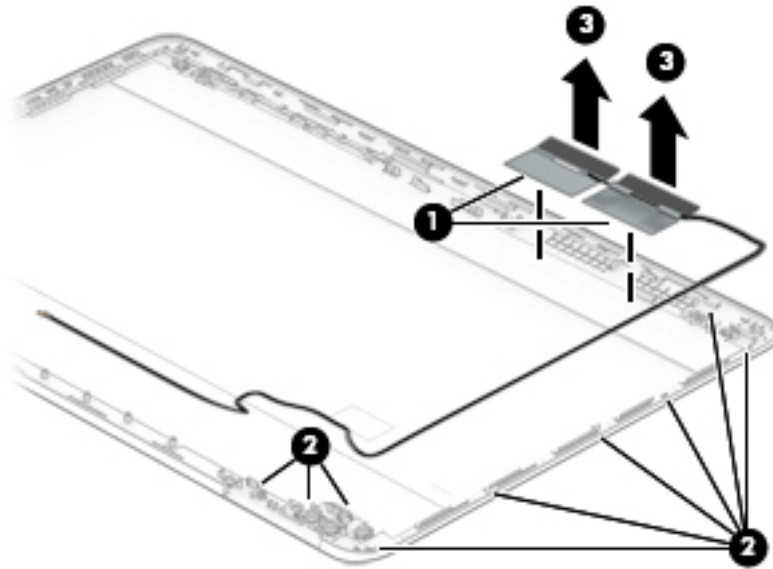
14. Remove the Phillips M2.0 × 2.0 screw from each hinge bracket (1), and then separate the hinge caps from the hinge brackets (2).

All hinge covers and caps are available as spare part number 859737-001 for non-touch models and 856748-001 for touch models.



15. If it is necessary to remove the WLAN antennas, peel the antennas from the top of the back cover (1), release the WLAN cable from the routing channels (2), and then remove the antennas and cables from the enclosure (3).

WLAN antennas and cables are available as spare part number 856923-001.



Display enclosures are available using the following spare part numbers:

L03594-001: In shadow black finish for non-touch screen

L22939-001: In acid green finish for non-touch screen

Reverse this procedure to install the display assembly.

Power button board

Table 5-15 Power button board and cable descriptions and part numbers

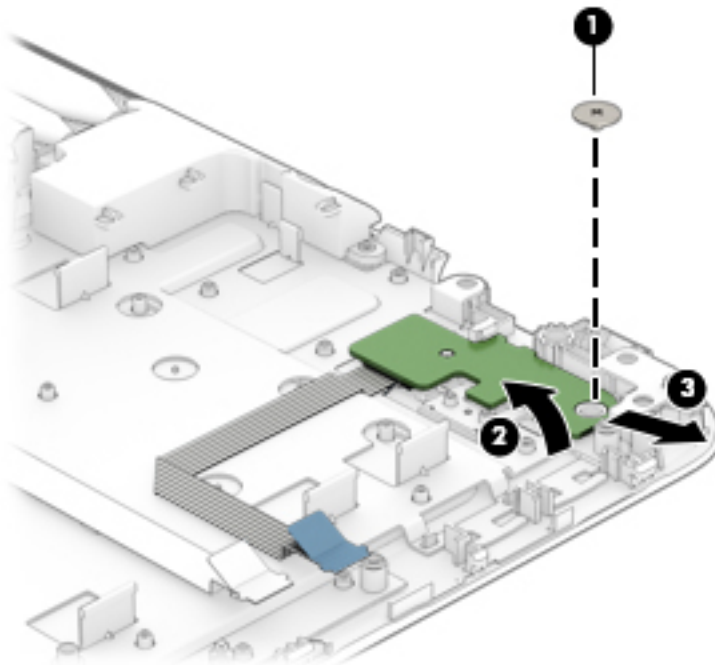
Description	Spare part number
Power button board for use in model numbers 15-dp000~0999	L42998-001
Power button board for use in model numbers 15-bc300~399, 15-bc400~499, 15-bc500~599	858974-001
Power button board cable	858966-001

Before removing the power button board, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).
4. Remove the hard drive (see [Hard drive on page 41](#)).
5. Remove the USB board (see [USB board on page 51](#)).
6. Remove the display (see [Display assembly on page 60](#)).

Remove the power button board:

- ▲ Remove the broad head Phillips M2.0 × 2.0 screw **(1)**, lift the power button board at an angle **(2)**, and then remove it **(3)**.



Reverse this procedure to install the power button board.

Speakers

 **NOTE:** The speaker spare part kit includes the cable.

Table 5-16 Speaker descriptions and part numbers

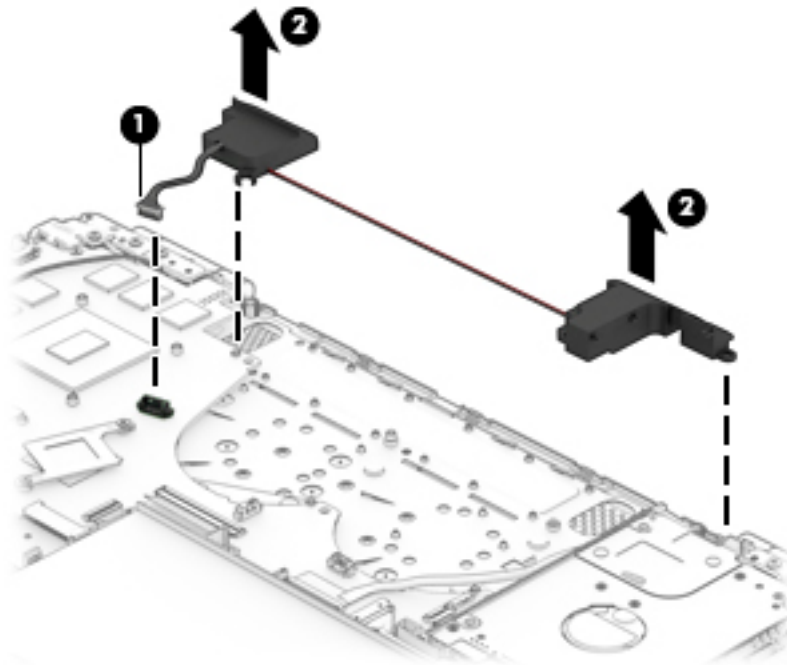
Description	Spare part number
Speaker Kit for use with the following models: 15-dp0000~0999	L43001-001
Speaker Kit for use with the following models: 15-bc300~399, 15-bc400~499, 15-bc500~599	858976-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly ([Preparation for disassembly on page 36](#)).
2. Remove the base enclosure (see [Base enclosure on page 36](#)).
3. Disconnect the cable from the battery (see [Battery on page 38](#)).
4. Remove the fans (see [Fan assembly on page 54](#)).
5. Remove the heat sink (see [Heat sink on page 47](#)).
6. Remove the display (see [Display assembly on page 60](#)).

Remove the speakers:

1. Disconnect the speaker cable from the system board **(1)**.
2. Lift and remove the speakers **(2)**.



Reverse this procedure to install the speakers.

Top cover with keyboard

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

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

Table 5-17 Top cover with keyboard descriptions and part numbers


Description	Spare part number
Top cover with non-backlit keyboard in shadow black finish for use in model numbers 15-bc300~15-bc399, 15-bc400~15-bc499, 15-bc500~15-bc599	L03595-001
Top cover with non-backlit keyboard in acid green finish for use in model numbers 15-bc400~15-bc499 and 15-bc500~15-bc599	L22937-xx1
Top cover with backlit keyboard in acid green finish for use in model numbers 15-bc400~15-bc499 and 15-bc500~15-bc599	L22938-xx1
Top cover with non-backlit keyboard in shadow black finish for use in model numbers 15-dp0000~15-dp0999	L43008-xx1
Top cover with non-backlit keyboard in acid green finish for use in model numbers 15-dp0000~15-dp0999	L43007-xx1
Top cover with backlit keyboard in acid green finish for use in model numbers 15-dp0000~15-dp0999	L43006-xx1

Table 5-18 Keyboard country codes


For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	India	-002	South Korea	-AD1
Bulgaria	-261	Israel	-BB1	Spain	-071
Canada	-DB1	Italy	-061	Switzerland	-BG1
Czech Republic and Slovakia	-FL1	The Netherlands	-B31	Taiwan	-AB1
Denmark, Norway, Finland, and Sweden	-DH1	Portugal	-131	Thailand	-281
France	-051	Romania	-271	Turkey	-141
Germany	-041	Russia	-251	United Kingdom	-031
Greece	-151	Saudi Arabia	-171	United States	-001
Hungary	-211	Slovenia	-BA1		

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

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

– or –

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

Updating Setup Utility (BIOS)

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

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

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

Determining the BIOS version


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

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


- HP Support Assistant
 1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
 2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
 1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 70](#)).
 2. Select **Main**, and then make note of the BIOS version.
 3. Select **Exit**, select one of the options, and then follow the on-screen instructions.
- In Windows, press **CTRL+Alt+S**.

To check for later BIOS versions, see [Downloading a BIOS update on page 71](#).

Downloading a BIOS update

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

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

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


1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
 - a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
 - b. Follow the on-screen instructions to download your selection to the hard drive.

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

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

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

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

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

7 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see [Downloading HP PC Hardware Diagnostics Windows on page 72](#).

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

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:
 - a. Select the **Start** button, and then select **HP Help and Support**.
 - b. Right-click **HP PC Hardware Diagnostics Windows**, select **More**, and then select **Run as administrator**.

– or –

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

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



NOTE: If you need to stop a diagnostic test at any time, select **Cancel**.

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

- A Failure ID link is displayed. Select the link and follow the on-screen instructions.
- A Quick Response (QR) code is displayed. With a mobile device, scan the code and then follow the on-screen instructions.
- Instructions for calling support are displayed. Follow those instructions.

Downloading HP PC Hardware Diagnostics Windows

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


Downloading the latest HP PC Hardware Diagnostics Windows version

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

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

The tool is downloaded to the selected location.

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

 **NOTE:** For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

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

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


The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

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

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

Using HP PC Hardware Diagnostics UEFI

 **NOTE:** For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see [Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 74](#).

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


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

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

- ▲ Select **Get Support**, and then use a mobile device to scan the QR code that displays on the next screen. The HP Customer Support - Service Center page displays, with your Failure ID and product number automatically filled in. Follow the on-screen instructions.

– or –

Contact support, and provide the Failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow these steps:

1. Turn on or restart the computer, and quickly press `esc`.
2. Press `f2`.

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

- a. Connected USB flash drive

 **NOTE:** To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see [Downloading the latest HP PC Hardware Diagnostics UEFI version on page 74](#).

- b. Hard drive


- c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in the following situations:

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


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

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive:

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

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

 **NOTE:** For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

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

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

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

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it may upload results to a preconfigured server. For more information about Remote HP PC Hardware Diagnostics UEFI, go to <http://www.hp.com/go/techcenter/pcdiags>, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI



NOTE: HP Remote PC Hardware Diagnostics UEFI is also available as a Softpaq that can be downloaded to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

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

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

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



NOTE: For some products, it may be necessary to download the software by using the product name or number.

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

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

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.

- Set a location for storing the test results. You can also set the user name and password settings used for uploads.
- Display status information about the diagnostics run previously.

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


1. Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.
3. Make your customization selections.
4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

8 Backing up, restoring, and recovering

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


- **Backing up your personal information**—You can use Windows tools to back up your personal information (see [Using Windows tools on page 77](#)).
- **Creating a restore point**—You can use Windows tools to create a restore point (see [Using Windows tools on page 77](#)).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 77](#)).
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see [Using Windows tools on page 77](#)).

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


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

Backing up information and creating recovery media

Using Windows tools


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

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

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

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

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

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

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

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

To download the tool:

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

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



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

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see [Using Windows tools on page 77](#).

Recovering using HP Recovery media

HP Recovery media is used to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see [Using the HP Cloud Recovery Download Tool to create recovery media \(select products only\) on page 77](#).



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

To recover your system:

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

Changing the computer boot order

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

To change the boot order:



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

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.

For computers or tablets with keyboards attached:

- ▲ Turn on or restart the computer or tablet, quickly press **esc**, and then press **f9** for boot options.

For tablets without keyboards:

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

– or –

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

3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

9 Specifications

Computer specifications

Table 9-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	382.4 mm	15.06 in
Depth	252.5 mm	9.94 in
Height	24.5 mm	0.96 in
Weight		
15-dp0000~0999	2.23 kg	4.92 lb
15-bc300~399, bc400~499, bc500~599	2.20 kg	4.85 lb
Input power		
Operating voltage and current	19.5 V dc @ 2.31 A – 45 W	
	19.5 V dc @ 3.33 A – 65 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

39.6 cm (15.6 in.) display specifications

Table 9-2 Display specifications

	Metric	U.S.
Dimensions		
Height	20.77 cm	8.18 in
Width	37.78 cm	14.88 in
Diagonal	39.62 cm	15.60 in
Number of colors	Up to 16.8 million	
Contrast ratio	500:1 (typical)	
Brightness	220, 250, or 300 nits	
Pixel resolution		
Pitch	0.252mm × 0.252mm	
Format	1920 × 1080 or 3840 × 2160	
Backlight	LED	
Total power consumption	2.0 W	
Viewing angle	±65° horizontal, ±50° vertical (typical)	

Hard drive specifications

Table 9-3 Hard drive specifications

	1 TB*	2 TB*
Dimensions		
Height	9.5 mm	9.5 mm
Width	69.85 mm	69.85 mm
Weight	102 g max	130 g max
Interface type	SATA 3.0	SATA 3.0
Transfer rate	600 MB/sec	600 MB/sec
Security	ATA-8 security	ATA-8 security
Seek times (typical read, including setting)		
Single track	2 ms	2 ms
Average	13.0 ms	12.0 ms
Maximum	15.0 ms	22.0 ms
Logical blocks	1,953,525,168	3,907,029,168
Disk rotational speed	5400 rpm	5400 rpm

Table 9-3 Hard drive specifications (continued)

	1 TB*	2 TB*
Operating temperature	0°C to 60°C (0°F to 140°F)	0°C to 60°C (0°F to 140°F)

*Size refers to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

M.2 PCIe solid-state drive specifications

Table 9-4 Solid-state drive specifications

	256 GB*	512 GB*
Dimensions		
Height	1 mm	1 mm
Length	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g
Interface type	ATA-7	ATA-7
Transfer rate		
Sequential Read	Up to 2150 MB/sec	Up to 2150 MB/sec
Random Read	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential Write	Up to 1260 MB/sec	Up to 1550 MB/sec
Random Write	Up to 100,000 IOPs	Up to 100,000 IOPs
Ready time, Maximum (to not busy)	1.0 sec	1.0 sec
Access times		
Logical	0.1	0.1
Total logical sectors	500,118,192	1,000,215,216
Operating temperature		
Operating	0° to 70°C (32°F to 158°F)	0° to 70°C (32°F to 158°F)
Non-operating	-40° to 80°C (-40°F to 176°F)	-40° to 85°C (-40°F to 185°F)
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.		
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.		

M.2 SATA solid-state drive specifications

Table 9-5 Solid-state drive specifications

	128 GB*	256 GB*
Height	1.35 mm	1.35 mm
Weight	< 10 g	< 10 g
Form factor	M.2 2280-D2-B-M	M.2 2280-D2-B-M
Transfer rate	up to 540 MB/sec	up to 540 MB/sec
Interface type	SATA-3	SATA-3
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms
Access times, logical	0.1 ms	0.1 ms
Total logical sectors	234,441,648	468,883,296
Operating temperature	0°C to 70°C (32°F to 158°F)	
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.		
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.		

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 or 250 V ac, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

Table 10-1 Power cord requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1
The United States	UL	2

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

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

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

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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