Maintenance and Service Guide

HP 17 Laptop PC

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Product notice

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

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

Software terms

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

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

Important Notice about Customer Self-Repair Parts

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

Safety warning notice

⚠ **CAUTION:** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

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1 Product description

Table 1-1 Product components and their descriptions

Category	Description
Product Name	**HP 17 Laptop PC**
	Model numbers:
	17-ca1000 ~ 17-ca1999
	17-ca0000 ~ 17-ca0999
	17g-cr0000~17g-cr0999
	17q-cs0000~17q-cs0999
	17z-ca100
	17z-ca000
Processor	**AMD® Dual-Core A9-Series Processor**
	A9-9425 (3.1 GHz, turbo up to 3.7 GHz), 2133 MHz/1 MB L2 cache, dual core, 15 W
	AMD Dual-Core A6-Series Processor
	A6-9225 (2.6 GHz, turbo up to 3.0 GHz), 2133 MHz/1 MB L2 cache, dual core, 15 W
	AMD Quad-Core E2-Series Processor
	E2-9000e (1.5 GHz, turbo up to 2.0 GHz), 1866 MHz/1 MB L2 cache, dual core, 6 W
	AMD Quad-Core R5-Series Accelerated Processor
	Ryzen™ 5-3500U (2.1 GHz, turbo up to 3.7 GHz), 6 MB L2 + L3 cache, 2400 MHz, quad core, 15 W
	Ryzen 5-2500U (2.0 GHz, turbo up to 3.6 GHz), 6 MB L2 + L3 cache, 2400 MHz, quad core, 15 W
	AMD Dual-Core R3-Series Accelerated Processor
	Ryzen 3-3300U (2.1 GHz, turbo up to 3.5 GHz), 6 MB L2 + L3 cache, DDR4-2400 MHz, quad core, 15 W
	Ryzen 3-3200U (2.6 GHz, turbo up to 3.5 GHz), 6 MB L2 + L3 cache, DDR4-2400 MHz, dual core, 15 W
	Ryzen 3-2300U (2.0 GHz, turbo up to 3.4 GHz), 6 MB L2 + L3 cache, DDR4-2400 MHz, quad core, 15 W
	Ryzen 3-2200U (2.5 GHz, turbo up to 3.4 GHz), 5 MB L2 + L3 cache, DDR4-2400 MHz, dual core, 15 W
Graphics	Supports HD decode, DX12, HDMI
	Supports MR ready
	Internal graphics
	AMD Radeon™ Vega 8 Mobile Graphics (Ryzen 5 3500U processor)
	AMD Radeon Vega 6 Mobile Graphics (Ryzen 3 3300U, 2300U processors)
	AMD Radeon Vega 3 Mobile Graphics (Ryzen 3 3200U, 2200U processor)
	AMD Radeon R5 Graphics (A9 processor)

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

Category	Description
	AMD Radeon R4 Graphics (A6 processor)
	AMD Radeon R2 Graphics (E2 processor)
	External graphics
	AMD Radeon 530 with up to 4 GB of dedicated video memory
	AMD Radeon 530 with up to 2 GB of dedicated video memory
Panel	**43.9 cm (17.3-in), WLED, eDP, flat**
	High definition+ (HD+) (1600 × 900), BrightView, SVA, 220 nits
	HD+ (1600 × 900), anti glare, SVA, 220 nits
	HD+ (1600 × 900), BrightView, SVA, 220 nits, Touch on Panel (TOP)
	Full high-definition (FHD) (1920 × 1080), anti glare, UWVA, 300 nits
	Touch solution with bezel, multi-touch enabled
Memory	**Two memory module slots** (Ryzen, A9/A6 processors)
	Memory is non-customer accessible/non-upgradeable
	DDR4-2400 dual channel support (Ryzen processors)
	DDR4-1866 dual channel support (A9/A6 processors)
	Supports up to 16 GB of system RAM in the following configurations:
	• 16384 MB (8192 MB × 2)
	• 12288 MB (8192 MB × 1 + 4096 MB × 1)
	• 8192 MB (8192 MB × 1)
	• 4096 MB (4096 MB × 1)
	One memory module slot (E2/A6 processors)
	Memory is non-customer accessible/non-upgradeable
	DDR4-2400 dual channel support
	Supports up to 8 GB of system RAM in the following configurations:
	• 8192 MB (8192 MB × 1)
	• 4096 MB (4096 MB × 1)
Primary storage	**Single hard drive configurations, 6.35 cm (2.5-in), 7.0 mm/7.2 mm/9.5 mm, SATA hard drives**
	2 TB, 5400 rpm, 9.5 mm
	2 TB, 5400 rpm, 7.2 mm
	1 TB, 5400 rpm, 9.5 mm
	1 TB, 5400 rpm, 7.2 mm
	500 GB, 5400 rpm, 7.0 mm
	M.2, SATA-3, solid-state drives

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

Category	Description
	256 GB, TLC
	128 GB, TLC
	PCIe, NVMe, M.2 solid-state drives
	256 GB
	Dual storage configurations
	256 GB, PCIe, solid-state drive + 1 TB, 5400 rpm hard drive
	256 GB, SATA-3, TLC, solid-state drive + 1 TB, 5400 rpm hard drive
	128 GB, SATA-3, TLC, solid-state drive + 1 TB, 5400 rpm hard drive
Optical drive	9.0 mm tray load - SATA - Fixed (not modular)
	DVD+/-RW Double-Layer Writer
Camera	**HP TrueVision HD Camera** - indicator LED, USB2.0, HD BSI sensor, f2.0, WDR
	720p by 30 frames per second
	Single digital microphone
	HP Webcam - VGA camera, indicator LED, USB 2.0, f2.4
	640 × 480 by 30 frames per second
	Single digital microphone
Audio	**Audio Application Name**: HP Audio Control
	Dual speakers
Ethernet	Ethernet Integrated 10/100/1000 NIC
Wireless networking	**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)
	Integrated Wireless options with single antenna (M.2/PCIe)
	Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)
	Realtek RTL8723DE 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter
Media card reader	Supports SD/SDHC/SDXC
	Push-pull insertion/removal
Internal card expansion	One M.2 slot for solid-state drive
	One M.2 slot for WLAN
Ports	Hot plug/unplug and auto detect for correct output to wide-aspect vs standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected).
	HDMI v1.4b supporting: up to 1920 × 1080 @ 60Hz
	(2) USB 3.1 Gen 1 ports (left side)
	USB 2.0 port (right side)
	RJ-45/Ethernet

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

Category	Description
	Audio-out (headphone)/audio-in (microphone) combo jack
	AC Smart Pin adapter plug
Keyboard/pointing devices	**Keyboard**
	Full-size, textured, island-style keyboard with numeric keypad
	Full-size, two coat paint, island-style keyboard with numeric keypad
	Full-size, four coat paint, backlit, island-style keyboard with numeric keypad
	TouchPad
	Multitouch gestures enabled
	Support Modern Trackpad Gestures
	Taps enabled by default
Power requirements	**Battery**
	3-cell Prismatic/Polymer long-life battery, 41 Whr
	Supports battery fast charge
	AC adapter, barrel type
	65 W Smart, nPFC, right angle, 4.5 mm (models with discrete graphics)
	65 W Smart, nPFC, 4.5 mm, EM
	45 W Smart, nPFC, right angle, 4.5 mm (models with UMA graphics)
	Power cord (C5)
	1 m, conventional
Security	Kensington Mini Security Lock
	Supports Firmware Trusted Platform Module (fTPM) 2.0
Operating system	FreeDOS 2.0
	Windows® 10 Home 64
	Windows 10 Home 64 Web/Kiosk
	Windows 10 Home 64 Chinese Market CPPP
	Windows 10 Home 64 High-End Chinese Market CPPP
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Web/Kiosk
	Windows 10 Home 64 Plus QVC
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	Windows 10 Home 64 Plus Single Language India Market PPP
	Windows 10 Home 64 Plus Web/Kiosk

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

Category	Description
	Windows 10 Home 64 QVC
	Windows 10 Home 64 Single Language
	Windows 10 Home 64 Single Language Africa Market PPP
	Windows 10 Home 64 Single Language India Market PPP
	Windows 10 Home 64 Single Language Value India Market PPP
	Windows 10 Home 64 Value Notebook Single Language
	Windows 10 Home 64 Value Notebook Single Language SEAP
Serviceability	**End user replaceable parts**
	AC adapter
	Optical drive

2 Getting to know your computer

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

Right side

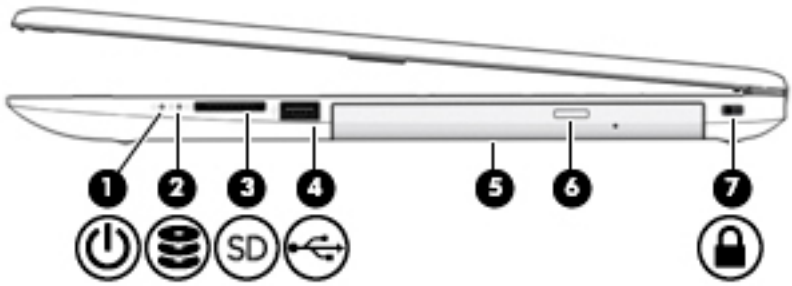


Table 2-1 Right-side components and their descriptions

Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Drive light	• Blinking white: The hard drive is being accessed.
(3)	SD	Memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information. To insert a card: 1. Hold the card label-side up, with connectors facing the computer. 2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. To remove a card: ▲ Pull to remove the card from the memory card reader.
(4)		USB port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.
(5)		Optical drive	Depending on your computer model, reads an optical disc or reads and writes to an optical disc.
(6)		Optical drive eject button	Releases the optical drive disc tray.
(7)		Security cable slot	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.

Left side

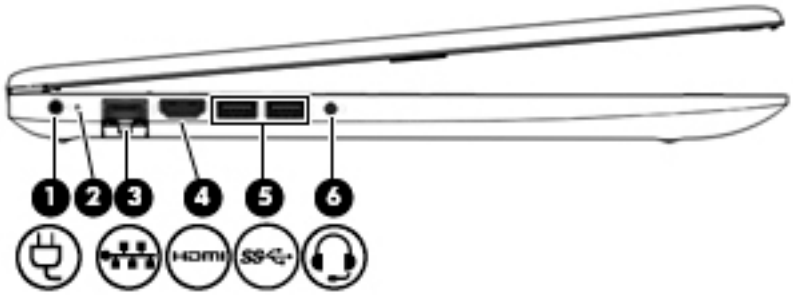


Table 2-2 Left-side components and their descriptions

Component		Description
(1)	Power connector	Connects an AC adapter.
(2)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.
(3)	RJ-45 (network) jack/status lights	Connects a network cable. • White: The network is connected. • Amber: Activity is occurring on the network.
(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)	USB SuperSpeed ports (2)	Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.
(6)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.

Display

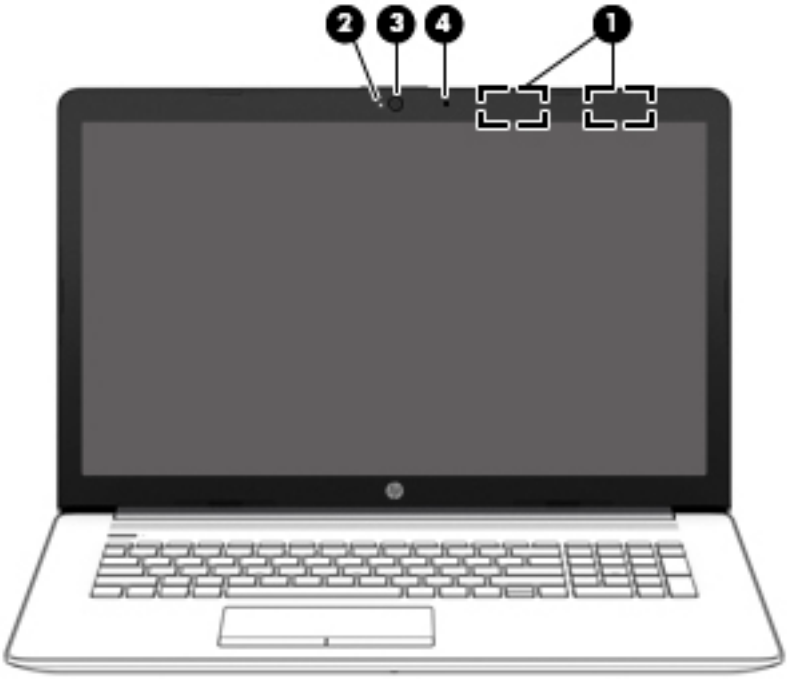


Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas* (1 or 2 depending on model)	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(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)	Internal microphone	Records sound.

*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:

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

   – or –

   Click the question mark icon in the taskbar.

2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

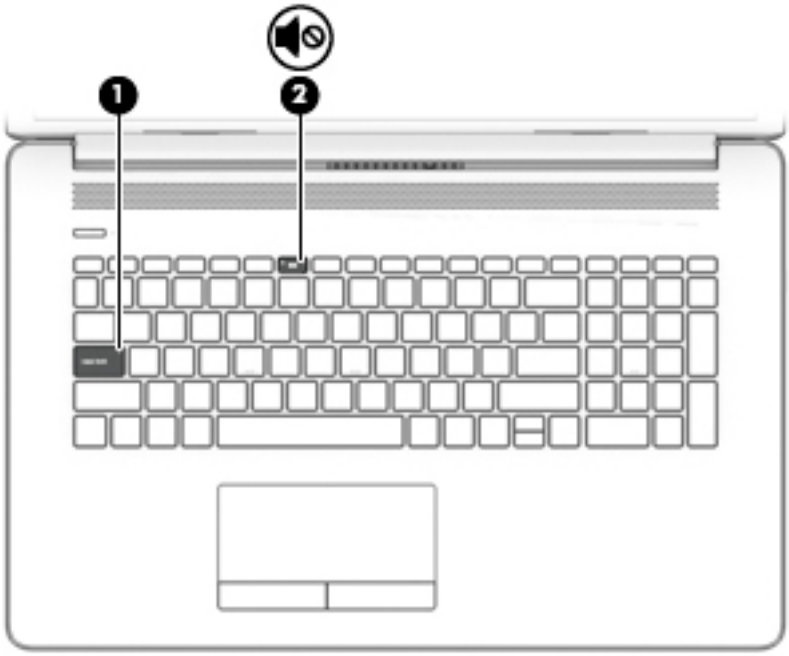
Keyboard area

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 TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Mute light	• On: Computer sound is off. • Off: Computer sound is on.

Button and speakers

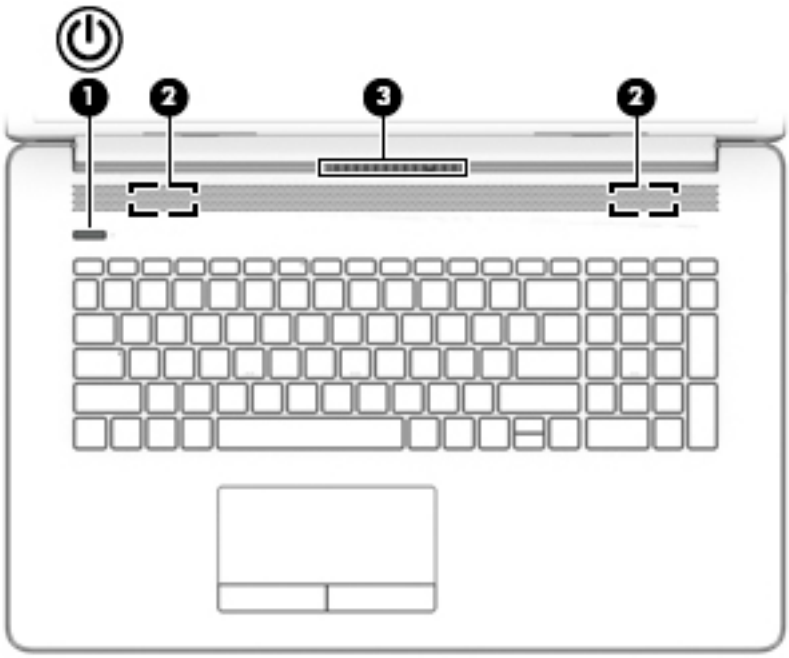


Table 2-5 Button and speakers and their descriptions

Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. To learn more about your power settings, see your power options: ▲ Right-click the **Power** icon, and then select **Power Options**.
(2)	Speakers (2)	Produce sound.
(3)	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.

Special keys

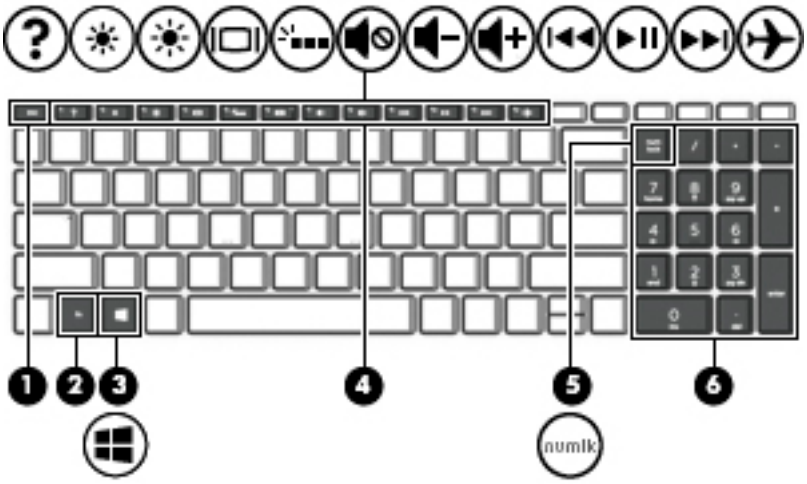


Table 2-6 Special keys and their descriptions

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

Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see Special keys on page 12.

▲ To use an action key, press and hold the key.

Table 2-7 Action keys and their descriptions

Icon	Description
	Opens the “How to get help in Windows 10” webpage.
	Decreases the screen brightness incrementally as long as you hold down the key.
	Increases the screen brightness incrementally as long as you hold down the key.
	Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor.
	Turns the keyboard backlight off or on. **NOTE:** To conserve battery power, turn off this feature.
	Mutes or restores speaker sound.
	Decreases speaker volume incrementally while you hold down the key.
	Increases speaker volume incrementally while you hold down the key.
	Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
	Plays the next track of an audio CD or the next section of a DVD or a BD.
	Turns the airplane mode and wireless feature on or off. **NOTE:** The airplane mode key is also referred to as the wireless button. **NOTE:** A wireless network must be set up before a wireless connection is possible.

Bottom

Table 2-8 Bottom component and its description

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

Labels

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

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

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

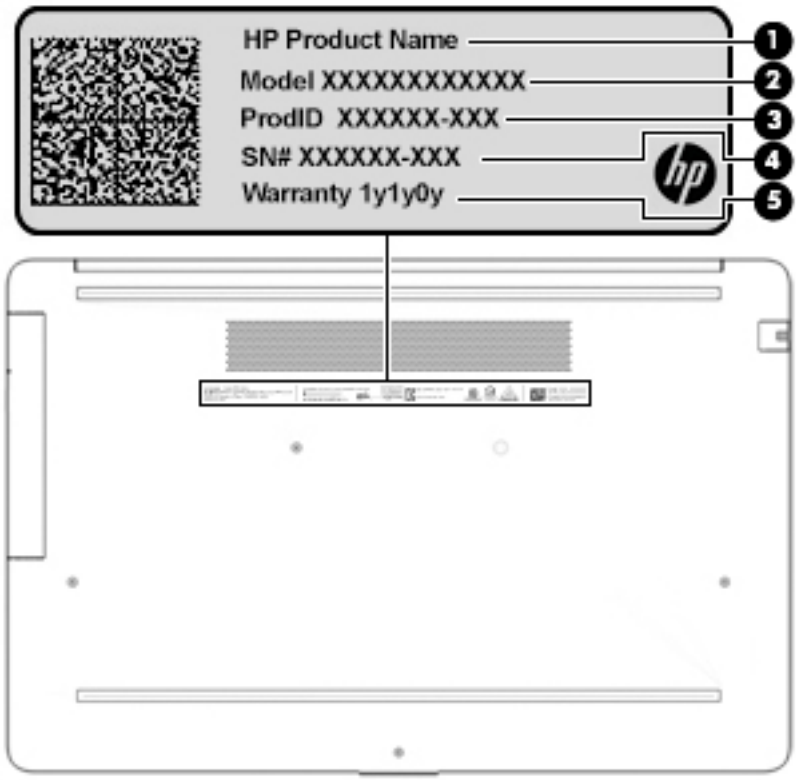


Table 2-9 Service label components

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

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

3 Illustrated parts catalog

Computer major components

NOTE: HP continually improves and changes product parts. For complete and current information 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 15 for details.

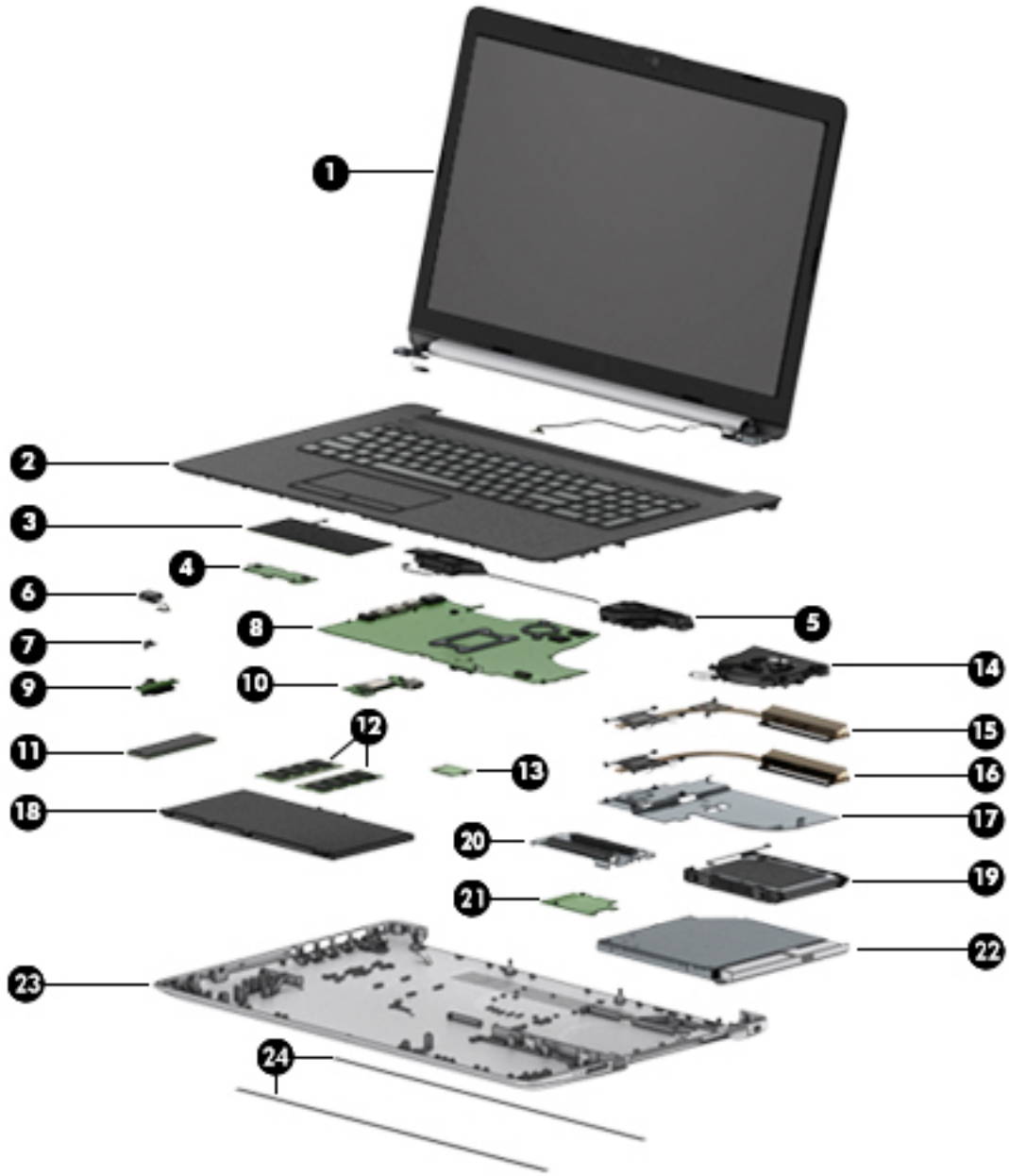


Table 3-1 Computer major components and their descriptions

Item	Component	Spare part number
(1)	**Display** **NOTE:** Displays are not spared as whole units. Display subcomponent spare parts are available. For spare part information, see Display assembly subcomponents on page 21.	Not spared
(2)	**Top cover/keyboard** **NOTE:** For a detailed list of country codes, see Top cover with keyboard on page 75.	
	Keyboard, no backlight, jet black	L22751-xx1
	Keyboard, no backlight, snow white	L22752-xx1
	Keyboard, no backlight, ash silver	L22750-xx1
	Keyboard, no backlight, jet black, mesh knit pattern	L48409-xx1
	Keyboard, no backlight, snow white, mesh knit pattern	L48410-xx1
	Keyboard, backlit, ash silver (available only with -001 United States keyboards)	L22749-001
	Keyboard, no backlight, tranquil pink (available only with -001 United States keyboards)	L26985-001
	Keyboard, no backlight, iridescent pale rose gold (available only with -001 United States keyboards)	L26986-001
	Keyboard, no backlight, iridescent ceramic white (available only with -001 United States keyboards)	L26987-001
	Keyboard, backlit, tranquil pink (available only with -001 United States keyboards)	L28089-001
	Keyboard, backlit, iridescent pale rose gold (available only with -001 United States keyboards)	L28090-001
	Keyboard, backlit, iridescent ceramic white (available only with -001 United States keyboards)	L28091-001
(3)	**TouchPad module**	L28085-001
(4)	**TouchPad button board**	L22539-001
(5)	**Speakers** (includes cable)	L22580-001
(6)	**Power connector cable (DC-in)**	L22528-001
(7)	**System board hook**	L22748-001
(8)	**System board** **NOTE:** All system board spare part kits include replacement thermal material. All system boards use the following part numbers: xxxxxx-001: Non-Windows operating systems xxxxxx-601: Windows operating system	
	For use in models with discrete graphics memory:	
	• AMD Ryzen 3-3200U processor	L46462-xx1
	• AMD Ryzen 3-2200U processor	L22725-xx1
	• AMD A9-9425 processor	L22726-xx1

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

Item	Component	Spare part number
	• AMD A6-9225 processor	L22727-xx1
	For use in models with UMA graphics memory:	
	• AMD Ryzen 5-3500U processor	L46461-xx1
	• AMD Ryzen 3-3300U processor	L46460-xx1
	• AMD Ryzen 3-3200U processor	L46459-xx1
	• AMD Ryzen 5-2500U processor	L22717-xx1
	• AMD Ryzen 3-2300U processor	L22718-xx1
	• AMD Ryzen 3-2200U processor	L22719-xx1
	• AMD A9-9425 processor	L22720-xx1
	• AMD A6-9225 processor	L22721-xx1
	• AMD E2-9000e processor	L22722-xx1
(9)	**Optical drive board**	L22540-001
(10)	**USB board**	L22538-001
(11)	**Solid-state drive** **NOTE:** For spare part information, see Mass storage devices on page 24.	
(12)	**Memory modules** (2400 MHz DDR4)	
	8 GB	862398-855
	4 GB	862397-855
(13)	**WLAN module**	
	Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	924813-855
	Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	L17365-005
	Realtek RTL8723DE 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter	L21480-005
(14)	**Fan**	L22529-001
	Fan insert (for use in models without a fan; not illustrated)	L29669-001
	Heat sink	
(15)	For use in models with discrete graphics	L22531-001
(16)	For use in models with integrated UMA graphics	L22530-001
(17)	For use in fanless models	L22532-001
(18)	**Battery** (3-cell, 48 Whr)	L11119-855
(19)	**Hard drive** **NOTE:** For spare part information, see Mass storage devices on page 24.	
(20)	**Solid-state drive bracket**	L22535-001

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

Item	Component	Spare part number
(21)	**Solid-state drive board**	L24487-001
(22)	**DVD+/-RW Double-Layer Writer**	L22537-001
(23)	**Bottom cover**	
	Jet black	L22515-001
	Natural silver	L22508-001
	Pale gold	L22509-001
	Scarlet red	L22510-001
	Twilight blue	L22513-001
	Smoke gray	L22512-001
	Snow white	L22516-001
	Serenity mint	L22511-001
	Maroon burgundy	L22514-001
	Tranquil pink	L25492-001
	Iridescent pale rose gold	L25493-001
	Iridescent ceramic white	L25494-001
	Chalkboard gray	L47072-001
	Lumiere blue	L47073-001
	Berry mauve	L47074-001
	Pale rose gold	L56246-001
	Jet black; Pattern: mesh knit	L48405-001
	Snow white; Pattern: mesh knit	L48406-001
(24)	**Rubber feet**	
	Front feet:	
	• Jet black	L22565-001
	• Snow white	L22567-001
	• Serenity mint	L22569-001
	• Pale gold	L22571-001
	• Scarlet red	L22573-001
	• Twilight blue	L22575-001
	• Maroon burgundy	L22577-001
	• Tranquil pink	L25501-001
	• Lumiere blue	L47083-001
	• Berry mauve	L47085-001

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

Item	Component	Spare part number
	Rear feet:	
	• Jet black	L22566-001
	• Snow white	L22568-001
	• Serenity mint	L22570-001
	• Pale gold	L22572-001
	• Scarlet red	L22574-001
	• Twilight blue	L22576-001
	• Maroon burgundy	L22578-001
	• Tranquil pink	L25502-001
	• Lumiere blue	L47084-001
	• Berry mauve	L47086-001

Cables

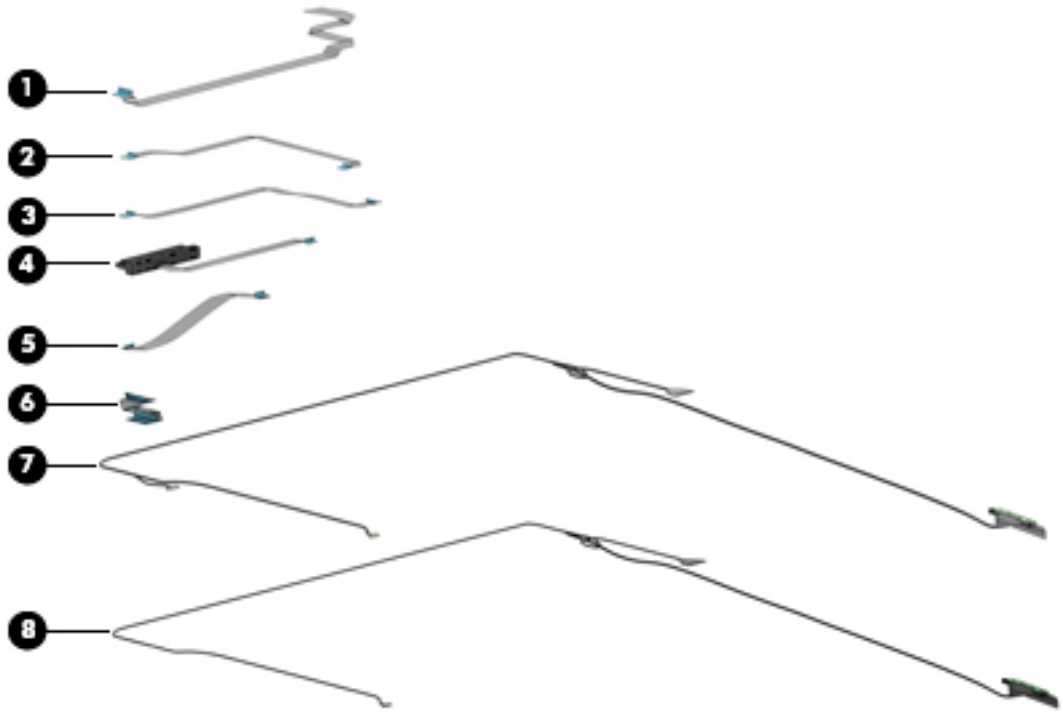


Table 3-2 Cables and their descriptions

Item	Component	Spare part number
(1)	**USB board cable**	L22522-001
(2)	**TouchPad cable**	L22525-001

Table 3-2 Cables and their descriptions (continued)

Item	Component	Spare part number
(3)	**TouchPad button board cable**	L22523-001
(4)	**Hard drive cable**	L22526-001
(5)	**Solid-state drive cable**	L22527-001
(6)	**Optical drive board cable**	L22524-001
(7)	**Display cable, touch, HD** (not illustrated)	L22521-001
(8)	**Display cable, non-touch**	
	FHD panel	L22520-001
	HD panel	L22519-001

Display assembly subcomponents

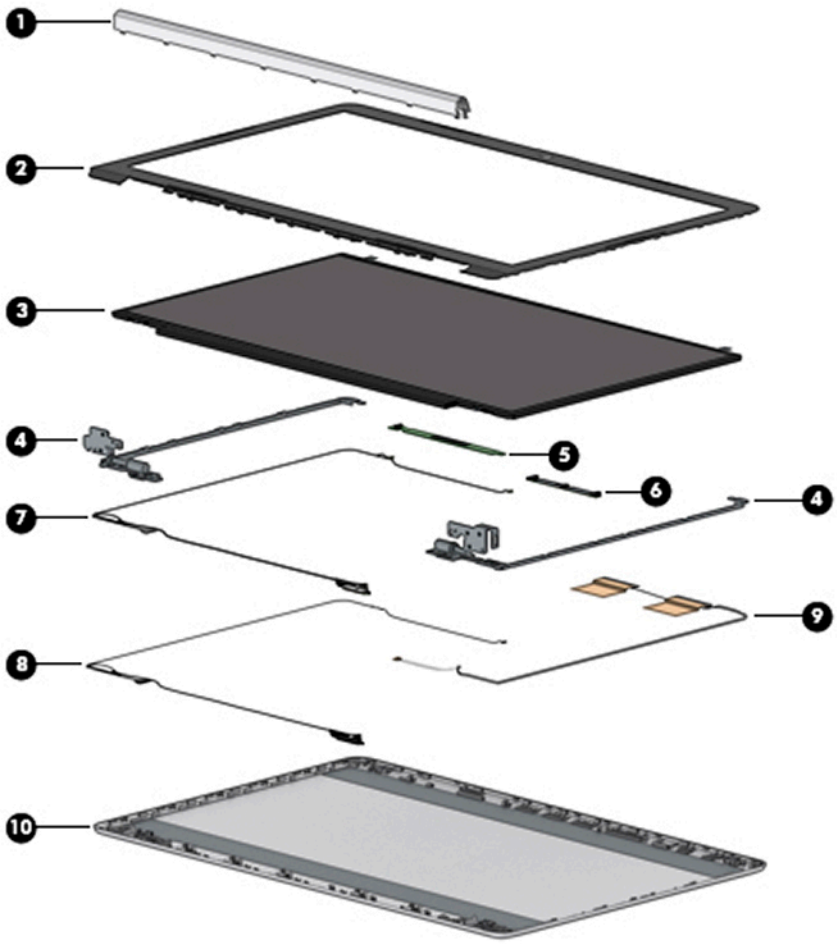


Table 3-3 Display assembly components and their descriptions

Item	Component	Spare part number
(1)	**Hinge cover**	

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

Item	Component	Spare part number
	Jet black	L22559-001
	Natural silver	L22552-001
	Pale gold	L22553-001
	Scarlet red	L22554-001
	Twilight blue	L22557-001
	Smoke gray	L22556-001
	Snow white	L22560-001
	Serenity mint	L22555-001
	Maroon burgundy	L22558-001
	Tranquil pink	L25498-001
	Iridescent pale rose gold	L25499-001
	Iridescent ceramic white	L25500-001
	Chalkboard gray	L47078-001
	Lumiere blue	L47079-001
	Berry mauve	L47080-001
(2)	**Display bezel**	
	Non-touch models	L22517-001
	Touch models	L22518-001
(3)	**Display panel**	
	HD, BrightView, SVA, non-touch	L22731-001
	HD, anti glare, SVA, non-touch	L22732-001
	HD, BrightView, SVA, touch-on panel (TOP)	L22733-001
	FHD, anti glare, UWVA, non-touch	L22734-001
(4)	**Hinge Kit** (includes left and right hinges)	L22536-001
(5)	**Touch control board**	L22541-001
(6)	**Camera module**	
	HD camera	L22587-001
	VGA camera	L22588-001
	Display cable	
(7)	**Non-touch, HD**	L22519-001
	Non-touch, FHD (not illustrated)	L22520-001
(8)	**Touch, HD** (not illustrated)	L22521-001
(9)	**WLAN antenna cable** (included in Antenna Kit)	

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

Item	Component	Spare part number
	Single antenna	L22498-001
	Dual antennas	L22497-001
(10)	**Back cover**	
	Jet black	L22506-001
	Natural silver	L22499-001
	Pale gold	L22500-001
	Scarlet red	L22501-001
	Twilight blue	L22504-001
	Smoke gray	L22503-001
	Snow white	L22507-001
	Serenity mint	L22502-001
	Twilight blue	L22504-001
	Maroon burgundy	L22505-001
	Tranquil pink	L25489-001
	Iridescent pale rose gold	L25490-001
	Iridescent ceramic white	L25491-001
	Chalkboard gray	L47069-001
	Lumiere blue	L47070-001
	Berry mauve	L47071-001
	Pale rose gold	L56245-001
	Jet black; Pattern: Mesh knit	L48403-001
	Show white; Pattern: Mesh knit	L48404-001

Mass storage devices

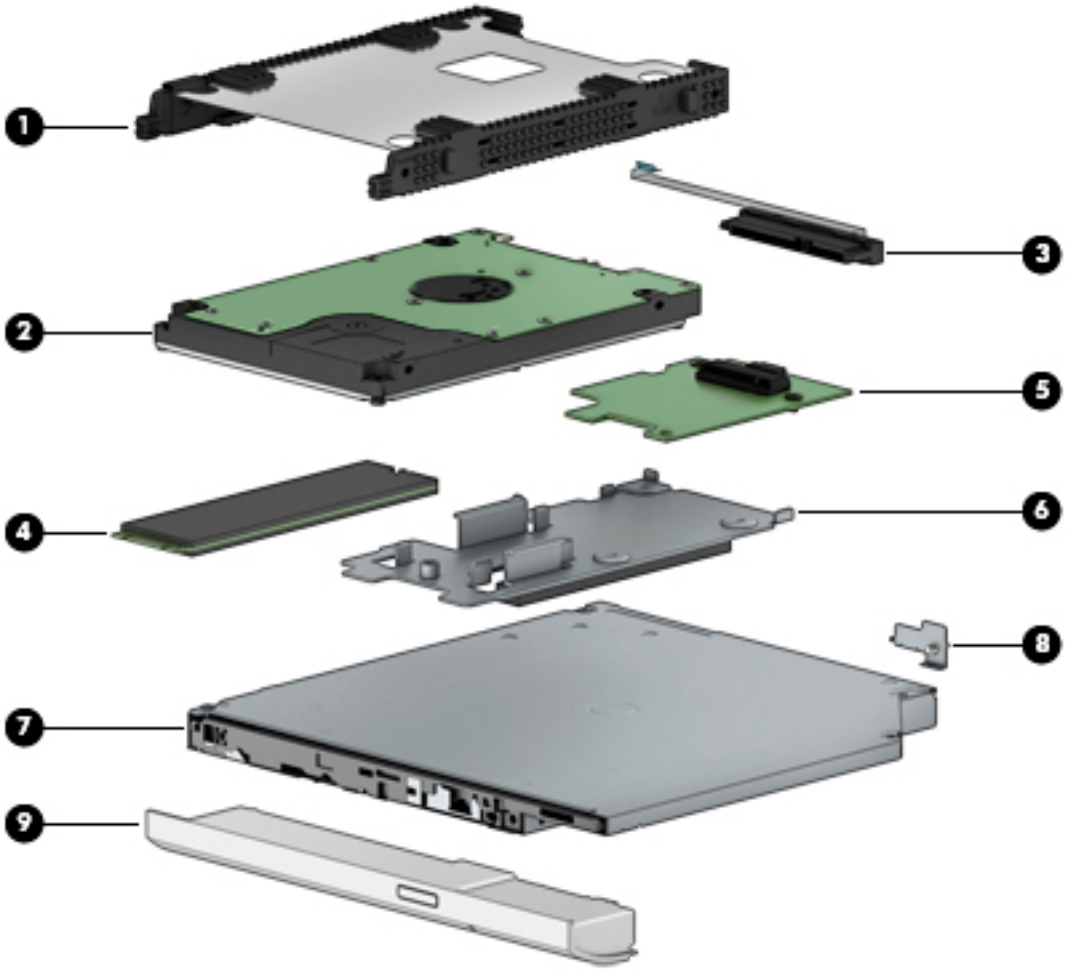


Table 3-4 Mass storage devices and their descriptions

Item	Component	Spare part number
(1)	**Hard drive cover**	L22534-001
(2)	**Hard drive**, 7 mm	
	2 TB, 5400 rpm	912487-855
	1 TB, 5400 rpm	762990-005
	500 GB, 5400 rpm	778186-005
(3)	**Hard drive cable**	L22526-001
(4)	**Solid-state drive** (M.2)	
	256 GB, PCIe, NVMe	L22730-001
	256 GB, SATA-3, TLC	L22729-001
	128 GB, SATA-3, TLC	L22728-001
(5)	**Solid-state drive board**	L24487-001
(6)	**Solid-state drive bracket**	L22535-001

Table 3-4 Mass storage devices and their descriptions (continued)

Item	Component	Spare part number
(7)	**DVD+/-RW Double-Layer Writer**	L22537-001
(8)	**Optical drive bracket**	L22533-001
(9)	**Optical drive bezel**	
	Natural silver	L22543-001
	Pale gold	L22544-001
	Scarlet red	L22545-001
	Serenity mint	L22546-001
	Smoke gray	L22547-001
	Twilight blue	L22548-001
	Maroon burgundy	L22549-001
	Jet black	L22550-001
	Snow white	L22551-001
	Tranquil pink	L25495-001
	Iridescent pale rose gold	L25496-001
	Iridescent ceramic white	L25497-001
	Chalkboard gray	L47075-001
	Lumiere blue	L47076-001
	Berry mauve	L47077-001
	Jet black; Pattern: mesh knit	L48407-001
	Snow white; Pattern: mesh knit	L48408-001

Miscellaneous parts

Table 3-5 Miscellaneous parts and their descriptions

Component	Spare part number
AC adapter	
65 W AC adapter, nPFC, S-3P, 4.5 mm	710412-001
65 W AC adapter, nPFC, SMART, RC, 4.5 mm, EM	913691-850
45 W AC adapter, nPFC, SMART, RC, 4.5 mm, non-slim	741727-001
Power cord, C5, conventional, 1.0 m	
For use in Australia	L19358-001
For use in Denmark	L19360-001
For use in Europe	L19361-001
For use in North America	L19367-001

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

Component	Spare part number
For use in Switzerland	L19370-001
For use in the United Kingdom	L19373-001
Screw Kit	L22579-001
HP Sleeve	777944-001
HP HDMI to VGA Adapter	701943-001

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 plastic 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) may not appear to be affected at all and can work perfectly throughout a normal cycle. The device may 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

	Relative humidity		
Event	**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
Electronic components are then multi-packaged inside 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 one-megohm ± 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 one-megohm ± 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

Materials and equipment that are recommended for use in preventing static electricity include:

- 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 one-megohm +/- 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 one-megohm +/- 10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

5 Removal and replacement procedures for Customer Self-Repair parts

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

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

Component replacement procedures

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Labels on page 15 for details.

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

Preparation for disassembly

See Removal and replacement procedures preliminary requirements on page 27 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.

Optical drive

Table 5-1 Spare part description and number

Description	Spare part number
DVD+/-RW Double-Layer Writer	L22537-001
Optical drive bracket	L22533-001
Optical drive bezel	
Natural silver	L22543-001
Pale gold	L22544-001
Scarlet red	L22545-001
Serenity mint	L22546-001
Smoke gray	L22547-001
Twilight blue	L22548-001
Maroon burgundy	L22549-001
Jet black	L22550-001
Snow white	L22551-001
Tranquil pink	L25495-001
Iridescent pale rose gold	L25496-001
Iridescent ceramic white	L25497-001
Chalkboard gray	L47075-001
Lumiere blue	L47076-001
Berry mauve	L47077-001
Jet black; Pattern: mesh knit	L48407-001
Snow white; Pattern: mesh knit	L48408-001

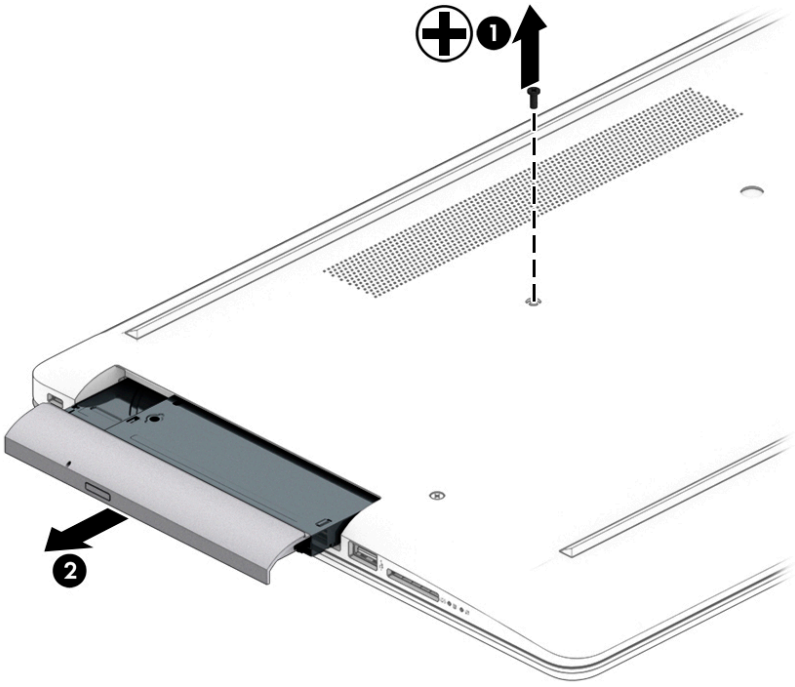
Before removing the optical drive, follow these steps:

▲ Prepare the computer for disassembly (Preparation for disassembly on page 32).

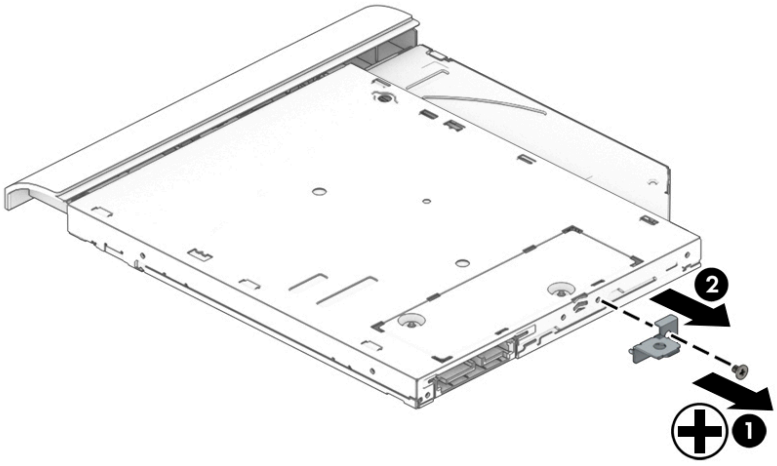
Remove the optical drive:

1. Remove the Phillips M2.5 × 6.0 screw **(1)** that secures the drive to the computer.

2. Slide the optical drive out of the computer **(2)**.



3. If it necessary to remove the bracket from the rear of the optical drive, remove the Phillips M2.0 × 3.0 screw **(1)**, and the remove the bracket from the drive **(2)**.

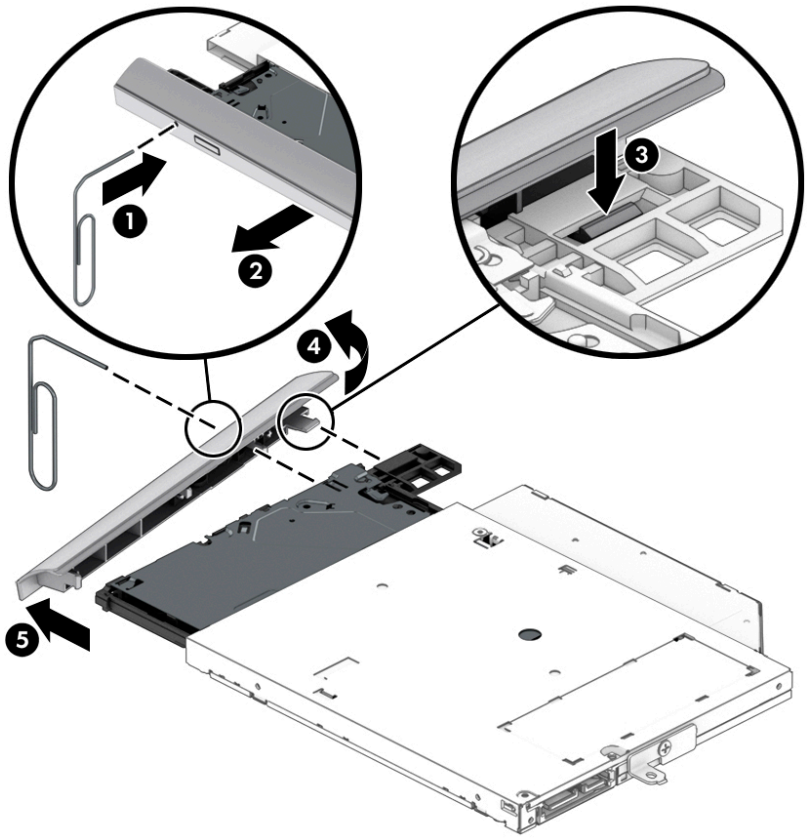


4. If it necessary to remove the bezel from the front of the optical drive:

   a. Insert a paper clip into the release hole on the front of the bezel **(1)**. The left side of the bezel rotates outward **(2)**.

   b. Press the tab to release the bezel from the drive **(3)**.

   c. Rotate the side of the bezel **(4)**, and then remove it **(5)**.



Reverse this procedure to reassemble and install the optical drive.

6 Removal and replacement procedures for authorized service provider parts

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

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

Component replacement procedures

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Labels on page 15 for details.

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

There are as many as 42 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Bottom cover

Table 6-1 Bottom covers, feet, and their descriptions and part numbers

Description	Spare part number
Bottom cover:	
• Jet black	L22515-001
• Natural silver	L22508-001
• Pale gold	L22509-001
• Scarlet red	L22510-001
• Twilight blue	L22513-001
• Smoke gray	L22512-001
• Snow white	L22516-001
• Serenity mint	L22511-001
• Maroon burgundy	L22514-001
• Tranquil pink	L25492-001
• Iridescent pale rose gold	L25493-001
• Iridescent ceramic white	L25494-001
• Chalkboard gray	L47072-001
• Lumiere blue	L47073-001
• Berry mauve	L47074-001
• Pale rose gold	L56246-001
• Jet black; Pattern: mesh knit	L48405-001
• Snow white; Pattern: mesh knit	L48406-001
Front feet:	
• Jet black	L22565-001
• Snow white	L22567-001
• Serenity mint	L22569-001
• Pale gold	L22571-001
• Scarlet red	L22573-001
• Twilight blue	L22575-001
• Maroon burgundy	L22577-001
• Tranquil pink	L25501-001
• Lumiere blue	L47083-001
• Berry mauve	L47085-001
Rear feet:	
• Jet black	L22566-001

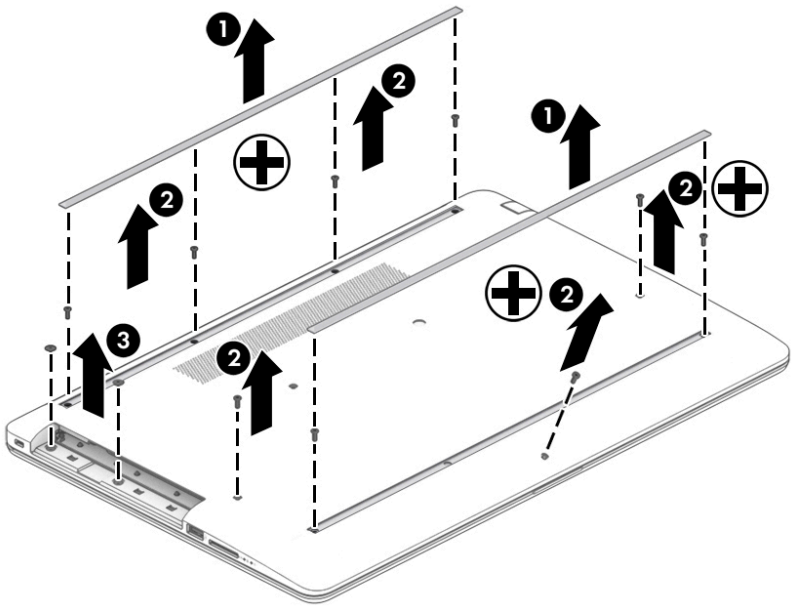
Table 6-1 Bottom covers, feet, and their descriptions and part numbers (continued)

Description	Spare part number
• Snow white	L22568-001
• Serenity mint	L22570-001
• Pale gold	L22572-001
• Scarlet red	L22574-001
• Twilight blue	L22576-001
• Maroon burgundy	L22578-001
• Tranquil pink	L25502-001
• Lumiere blue	L47084-001
• Berry mauve	L47086-001

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).

Remove the bottom cover:

1. Peel the rubber feet off the bottom of the computer **(1)**.
2. Remove the nine Phillips M2.5 × 6.0 screws **(2)** and the two Phillips broad head M2.0 × 2.0 screws **(3)** from the optical drive bay.



3. Starting near the optical drive bay **(1)**, pry the bottom cover up to remove it **(2)**.

Reverse this procedure to install the bottom cover.

Battery

Table 6-2 Battery description and part number

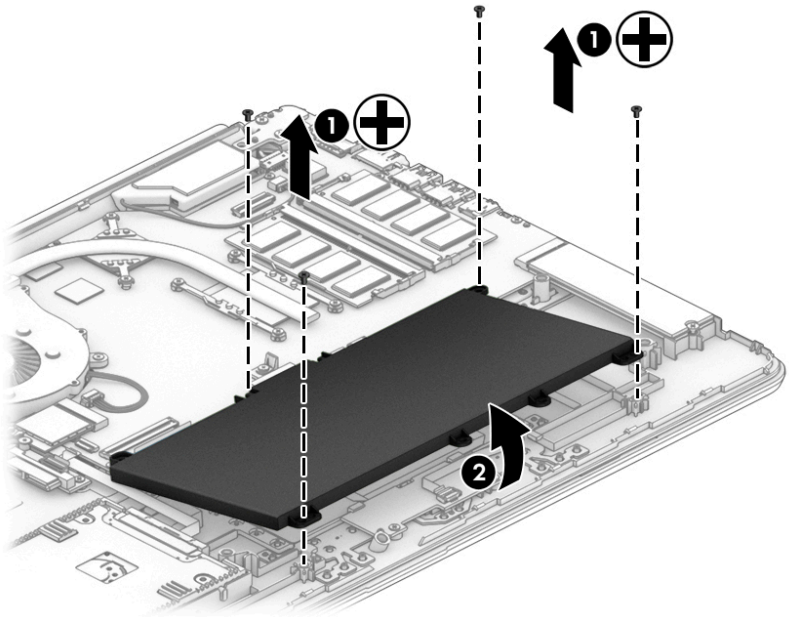
Description	Spare part number
Battery (3-cell, 48 Whr)	L11119-855

Before removing the battery, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).

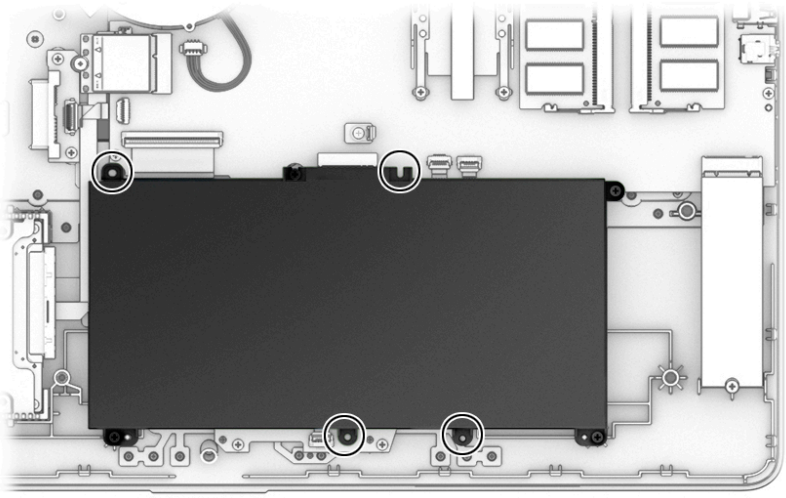
Remove the battery:

1. Remove the four Phillips M2.0 × 3.0 screws **(1)** that secure the battery to the computer.
2. Remove the battery from the computer **(2)**.



Reverse this procedure to install the battery.

When installing the battery, be sure to install screws in the proper locations. The following image shows the locations around the battery that have holes but do NOT require screws.



Memory module

Table 6-3 Memory module descriptions and part numbers

Description	Spare part number
Memory module, 8 GB	862398-855
Memory module, 4 GB	862397-855

Before removing the memory modules, follow these steps:

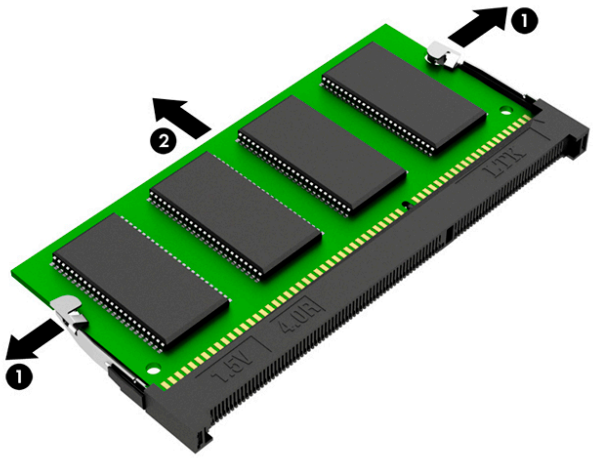
1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the memory modules:

1. Spread the two retention clips outward **(1)** until the memory module tilts up at a 45-degree angle.
2. Grasp the edge of the memory module **(2)**, and then gently pull the module out of the slot. Use the same procedure to remove both memory modules.

CAUTION: 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.

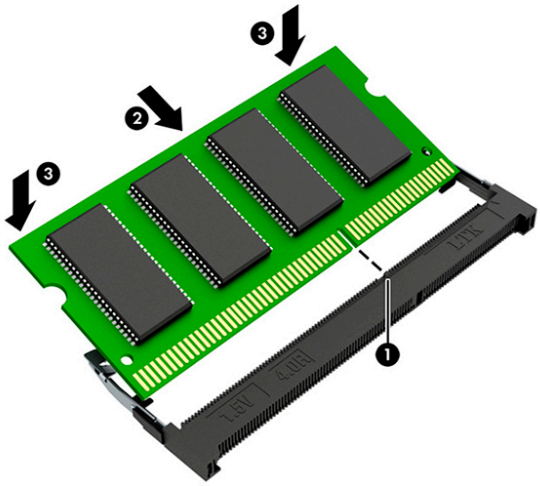


Install the memory modules:

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

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

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



Hard drive

Table 6-4 Hard drive and drive cover descriptions and part numbers

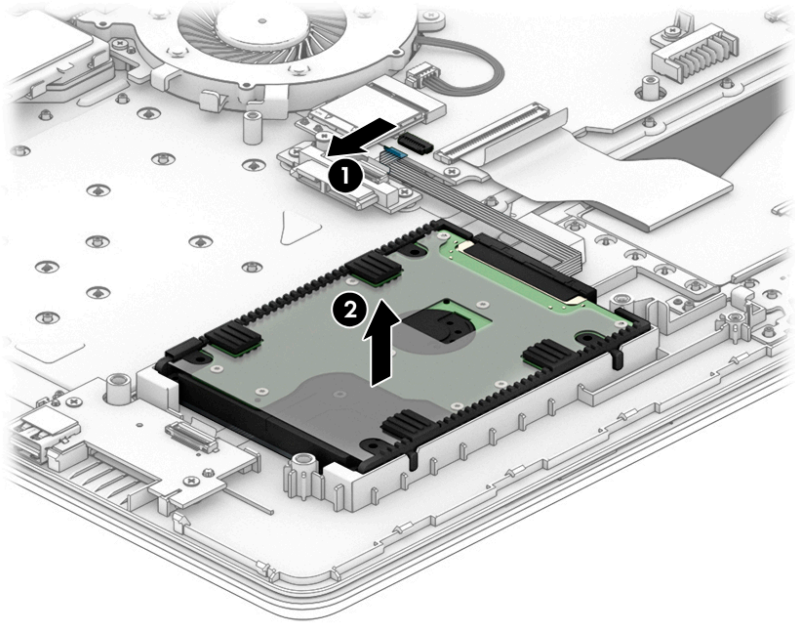
Description	Spare part number
Hard drive, 2 TB, 5400 rpm, 7 mm	912487-855
Hard drive, 1 TB, 5400 rpm, 7 mm	762990-005
Hard drive, 500 GB, 5400 rpm, 7 mm	778186-005
Hard drive cover	L22534-001

Before removing the hard drive, follow these steps:

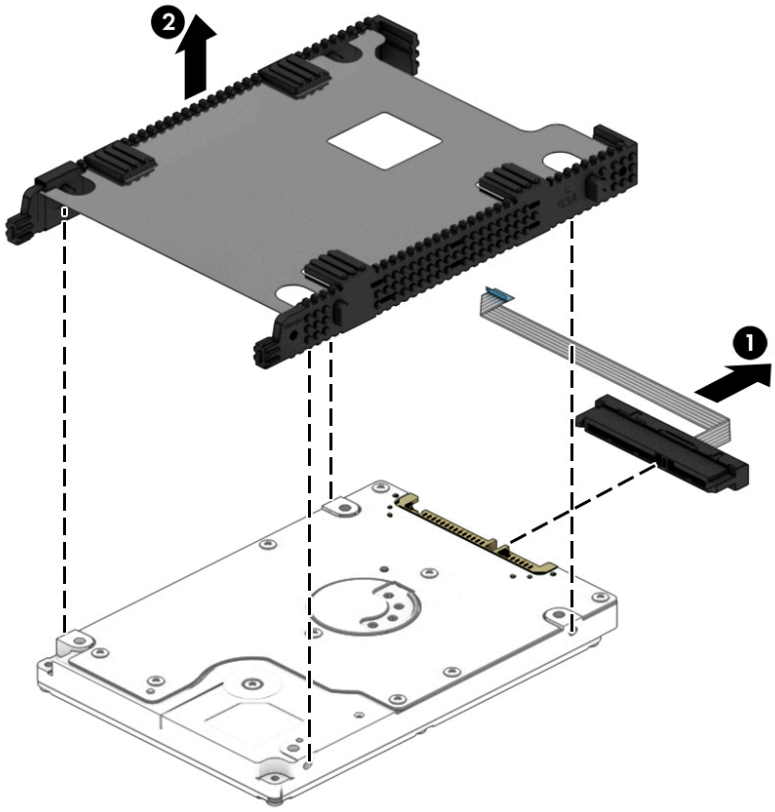
1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the hard drive:

1. Disconnect the hard drive cable from the system board ZIF connector **(1)**.
2. Lift the hard drive out of the computer **(2)**.



3. If it is necessary to disassemble the hard drive, pull the connector off the rear of the drive **(1)**, and then lift the cover off the drive **(2)**.



Reverse this procedure to reassemble and install the hard drive.

Solid-state drive

Table 6-5 Solid-state drive descriptions and part numbers

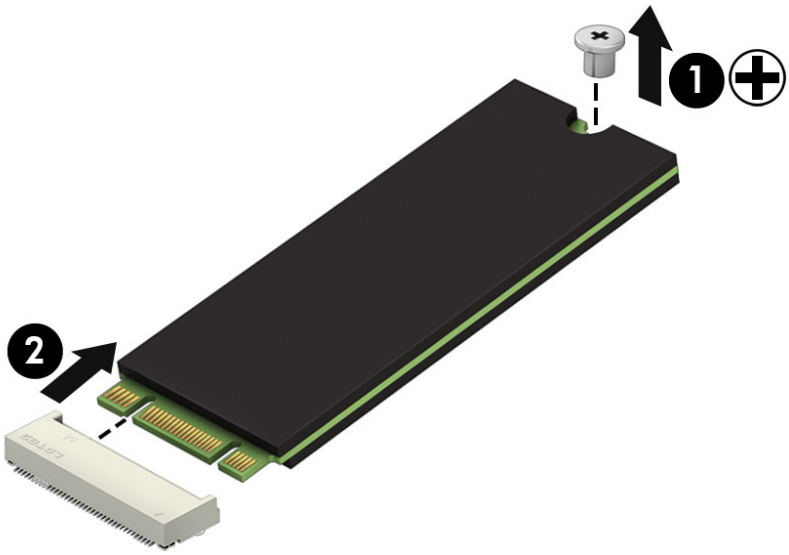
Description	Spare part number
256 GB, PCIe, NVMe	L22730-001
256 GB, SATA-3, TLC	L22729-001
128 GB, SATA-3, TLC	L22728-001

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

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the solid-state drive:

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



Reverse this procedure to install the solid-state drive.

Solid-state drive bracket and connector board

Table 6-6 Solid-state drive bracket, connector board, and cable descriptions and part numbers

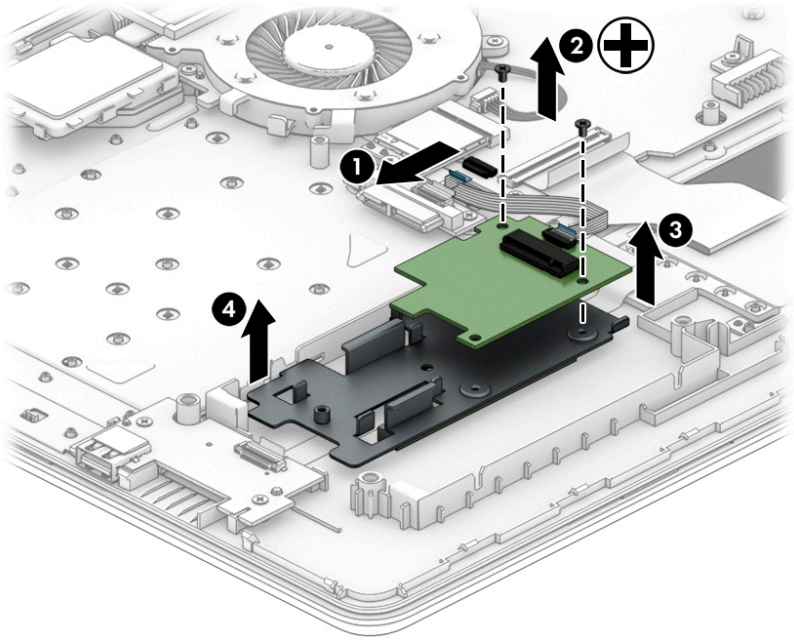
Description	Spare part number
Solid-state drive bracket	L22535-001
Solid-state drive connector board	L22542-001
Solid-state drive cable	L22527-001

Before removing the solid-state drive bracket and connector board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).
5. Remove the solid-state drive (see Solid-state drive on page 46).

Remove the solid-state drive bracket and connector board:

1. Disconnect the cable from the system board ZIF connector **(1)**.
2. Remove the two Phillips M2.0 × 3.0 screws **(2)** that secure the board and bracket to the computer.
3. Remove the board from the computer **(3)**.
4. Remove the bracket from the computer **(4)**.



Reverse this procedure to install the solid-state drive bracket and connector board.

WLAN module

Table 6-7 WLAN module descriptions and part numbers

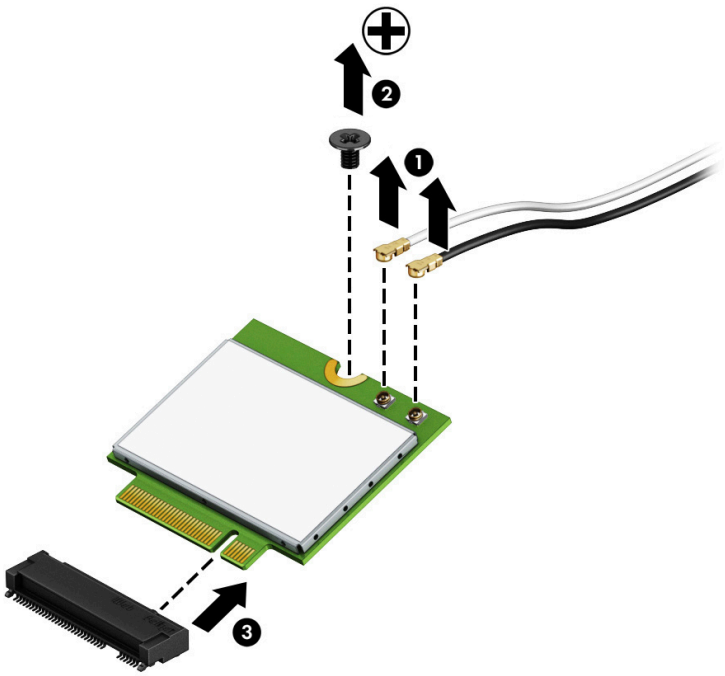
Description	Spare part number
Realtek RTL8822BE 802.11ac 2 × 2 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	924813-855
Realtek RTL8821CE 802.11ac 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	L17365-005
Realtek RTL8723DE 802.11bgn 1 × 1 Wi-Fi + Bluetooth 4.2 Combo Adapter	L21480-005

Before removing the WLAN, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the WLAN module:

1. Disconnect the two antenna cables from the module **(1)**.
2. Remove the Phillips M2.0 × 3.0 screw **(2)**, and then pull the module out of the socket **(3)**.



Reverse this procedure to install the WLAN module.

System board hook

Table 6-8 System board hook description and part number

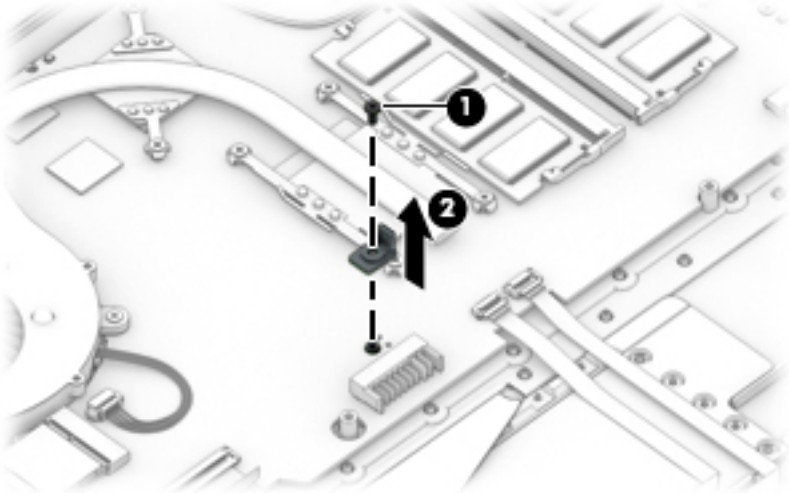
Description	Spare part number
System board hook	L22748-001

Before removing the system board hook, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the system board hook:

1. Remove the Phillips M2.0 × 3.0 screw **(1)** that secures the hook to the computer.
2. Remove the system board hook from the computer **(2)**.



Reverse this procedure to install the system board hook.

USB board

Table 6-9 USB board description and part number

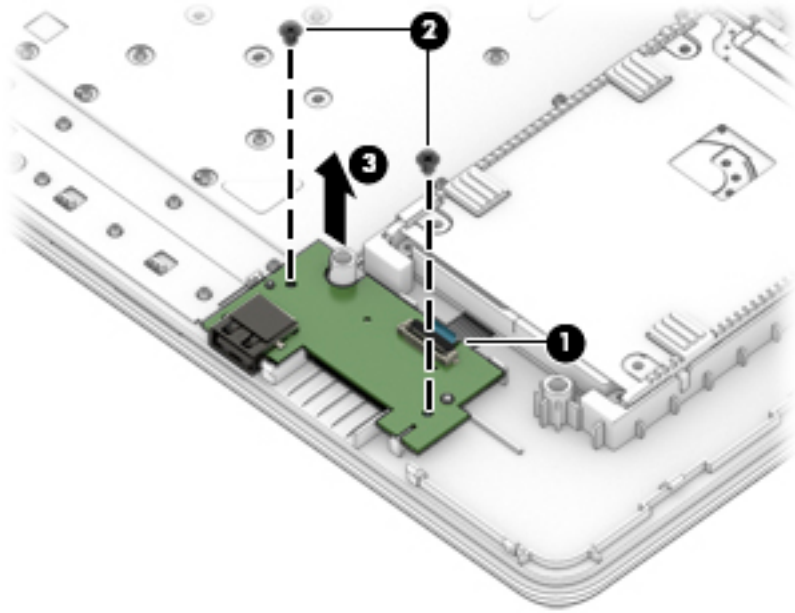
Description	Spare part number
USB board	L22538-001
USB board cable	L22522-001

Before removing the USB board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the USB board:

1. Disconnect the cable from the ZIF connector on the USB board **(1)**.
2. Remove the two Phillips M2.0 × 3.0 screws **(2)**, and then remove the board from the computer **(3)**.



Reverse this procedure to replace the USB board.

Optical drive board

Table 6-10 Optical drive board and cable descriptions and part numbers

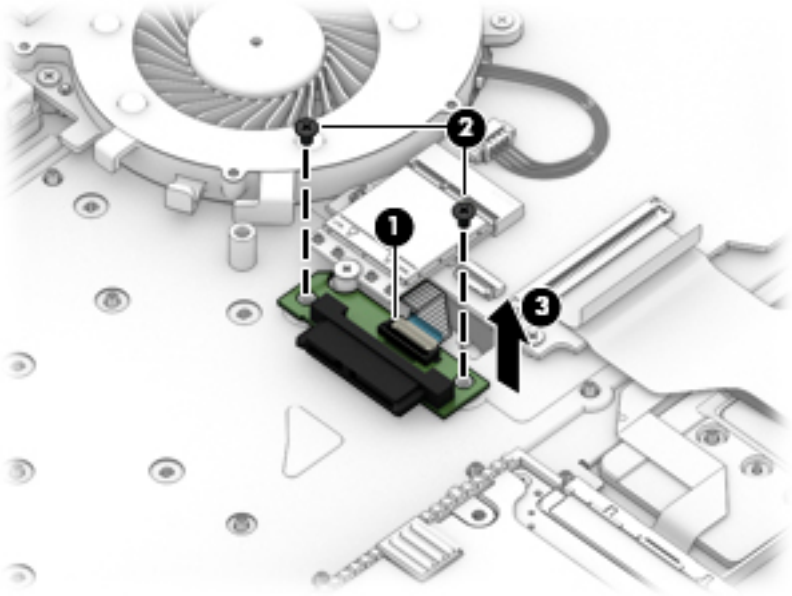
Description	Spare part number
Optical drive board	L22540-001
Optical drive board cable	L22524-001

Before removing the optical drive board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the optical drive board:

1. Disconnect the cable from the ZIF connector on the optical drive board **(1)**.
2. Remove the two Phillips M2.0 × 3.0 screws **(2)**, and then remove the board from the computer **(3)**.



Reverse this procedure to replace the optical drive board.

TouchPad button board

Table 6-11 TouchPad button board and cable descriptions and part numbers

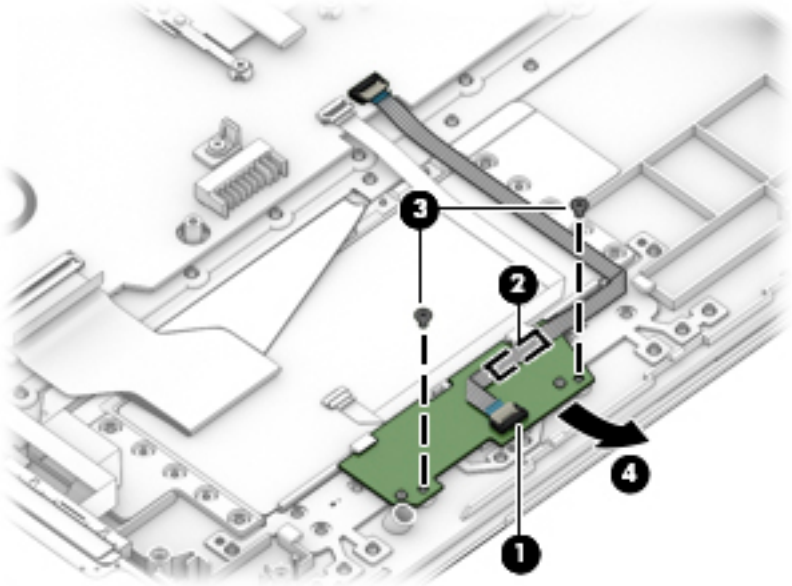
Description	Spare part number
TouchPad button board	L22539-001
TouchPad button board cable	L22523-001

Before removing the TouchPad button board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the TouchPad button board:

1. Disconnect the cable from the ZIF connector on the TouchPad button board **(1)**.
2. Lift the cable to remove it from the adhesive that secures it to the board **(2)**.
3. Remove the two Phillips M2.0 × 2.0 screws **(3)** that secure the board to the computer.
4. Remove the TouchPad button board from the computer **(4)**.



Reverse this procedure to install the TouchPad button board.

TouchPad module

Table 6-12 TouchPad module and cable descriptions and part numbers

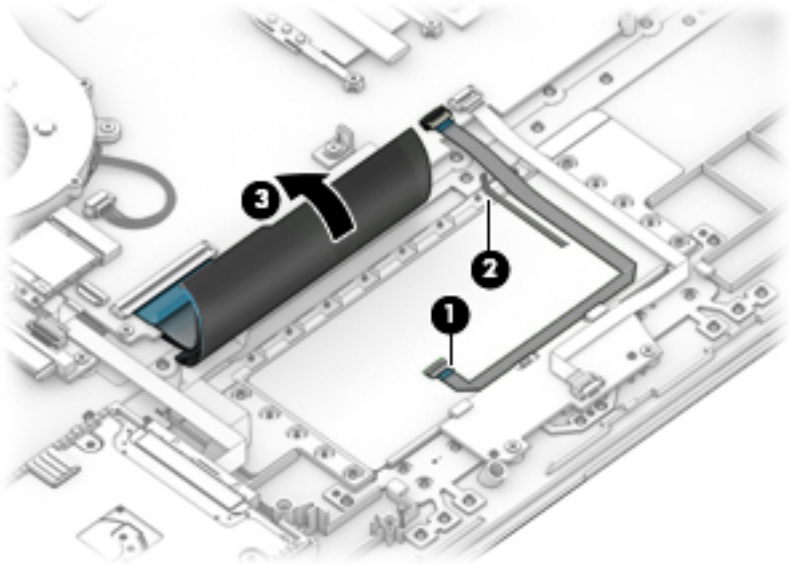
Description	Spare part number
TouchPad module	L28085-001
TouchPad module cable	L22525-001

Before removing the TouchPad module, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

To remove the TouchPad module:

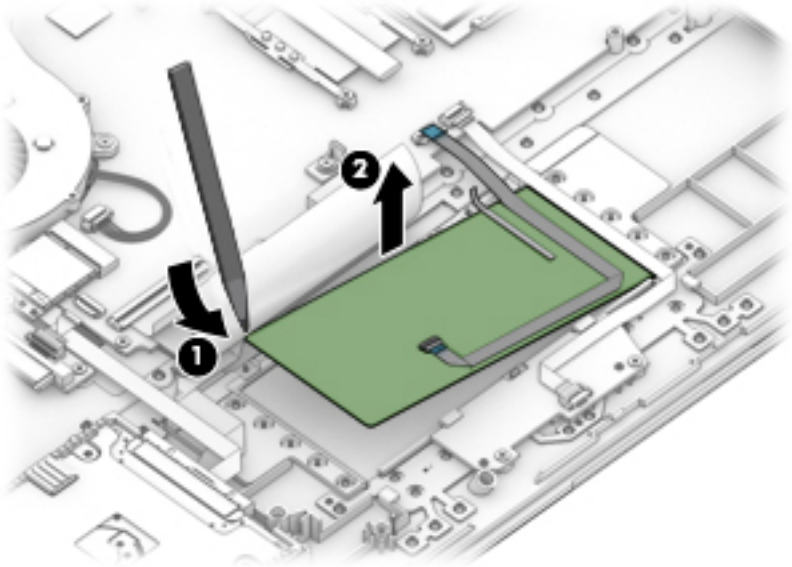
1. Disconnect the cable from the ZIF connector on the TouchPad **(1)**.
2. Lift the tape from the TouchPad **(2)**.
3. Lift the tape up to gain access to the TouchPad **(3)**.



4. Starting in the corner, use a plastic, non-marking tool to pry up the TouchPad module to disengage the adhesive that secures it to the top cover **(1)**

5. Working around each edge, pry the TouchPad module loose, and then remove it from the computer **(2)**.

NOTE: The TouchPad module may be very tight and difficult to remove.



Reverse this procedure to install the TouchPad module.

Power connector cable (DC-in)

Table 6-13 Power connector cable description and part number

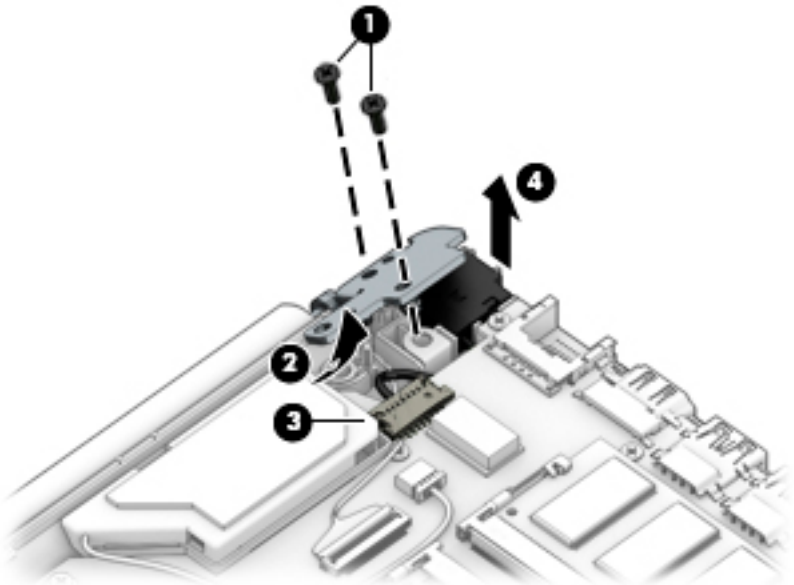
Description	Spare part number
Power connector cable	L22528-001

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the power connector cable:

1. Remove the two Phillips M2.5 × 6.0 screws from the right display hinge **(1)**, and then rotate the hinge up from on top of the power connector **(2)**.
2. Disconnect the power connector cable from the system board **(3)**.
3. Remove the power connector cable from the computer **(4)**.



Reverse this procedure to install the power connector cable.

Fan

Table 6-14 Fan description and part number

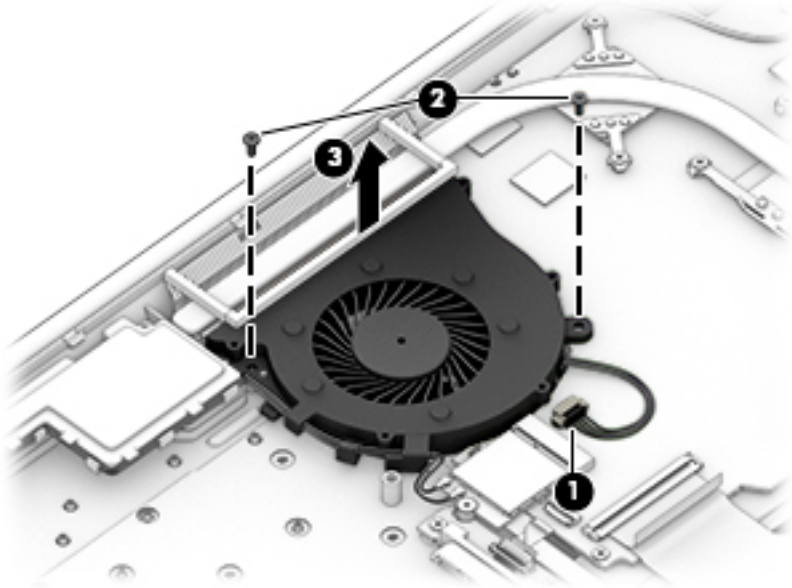
Description	Spare part number
Fan	L22529-001

Before removing the fan, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

Remove the fan:

1. Disconnect the fan cable from the system board **(1)**.
2. Remove the two Phillips M2.5 × 3.0 screws **(2)** that secure the fan to the computer.
3. Lift the fan from the computer **(3)**.



Reverse this procedure to install the fan.

Heat sink assembly

Table 6-15 Heat sink assembly descriptions and part numbers

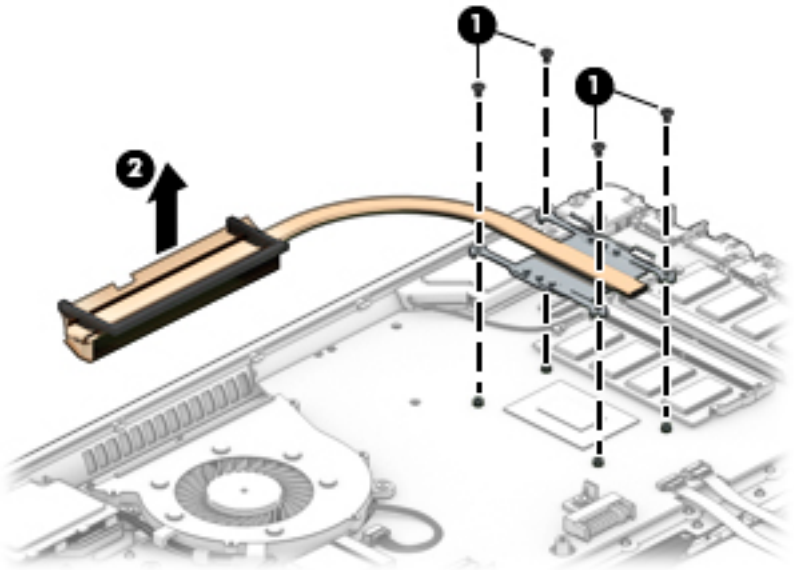
Description	Spare part number
Heat sink for use in models with discrete graphics	L22531-001
Heat sink for use in models with integrated UMA graphics	L22530-001
Heat plate for use in fanless models	L22532-001

Before removing the heat sink, follow these steps:

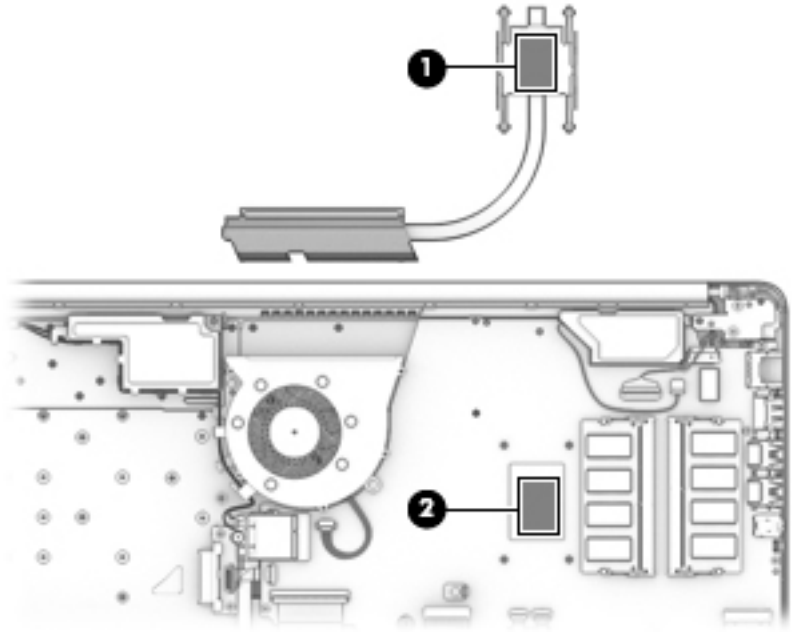
1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

To remove the heat sink assembly from products with integrated UMA graphics:

1. In the order indicated on the heat sink assembly, remove the four Phillips M2.0 × 3.0 screws **(1)** that secure the heat sink to the computer.
2. Lift the heat sink assembly from the computer **(2)**.

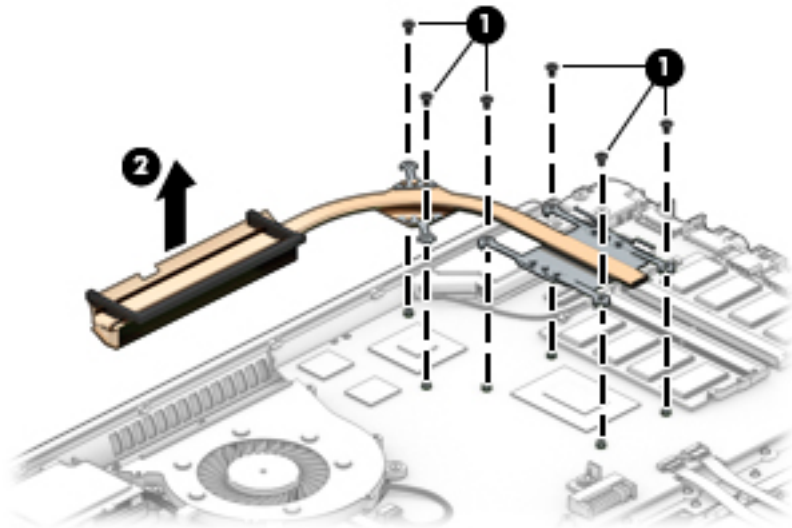


3. Thoroughly clean the thermal material from the surface of the heat sink **(1)** and its associated system board component **(2)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

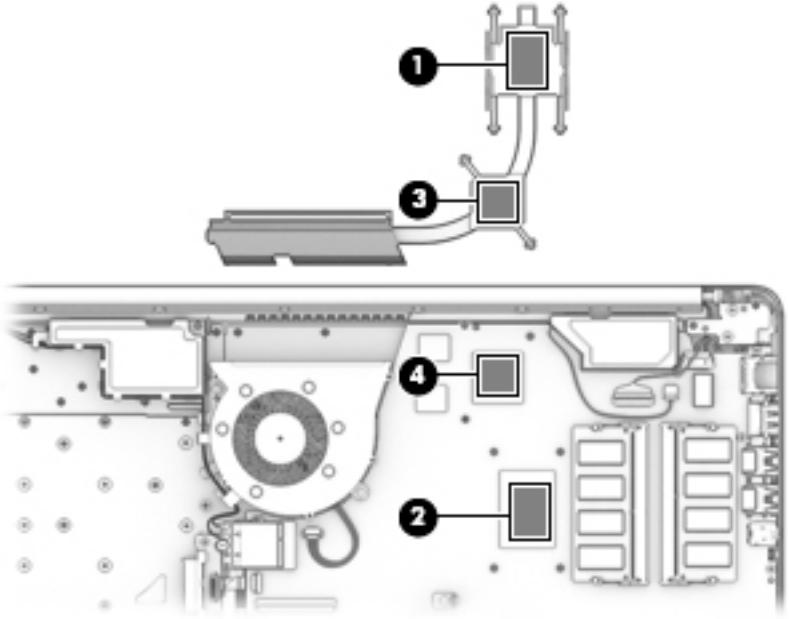


To remove the heat sink assembly from products with discrete graphics:

1. In the order indicated on the heat sink assembly, remove the six Phillips M2.0 × 3.0 screws **(1)** that secure the heat sink to the computer.
2. Lift the heat sink assembly from the computer **(2)**.

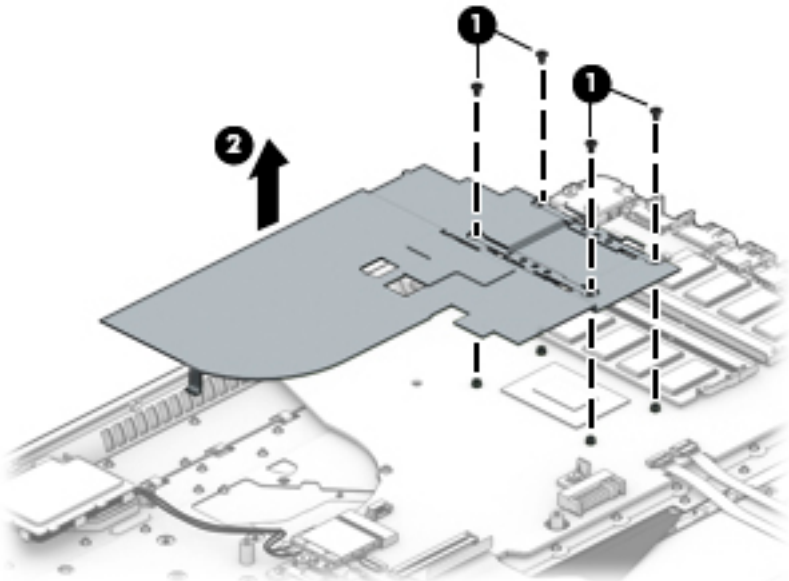


3. Thoroughly clean the thermal material from the surfaces of the heat sink **(1) (3)** and associated system board components **(2) (4)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

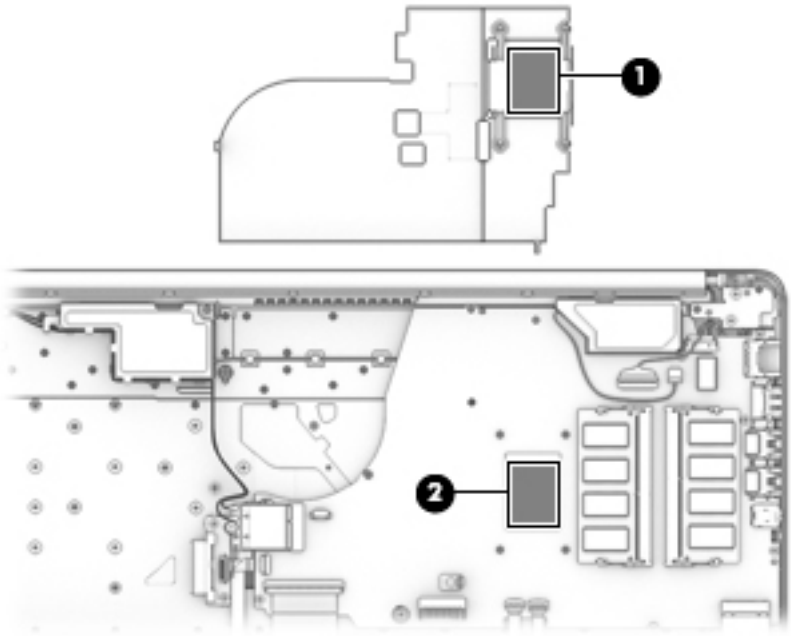


To remove the heat plate from fanless models:

1. In the order indicated on the heat plate, remove the four Phillips M2.0 × 3.0 screws **(1)** that secure the heat plate to the computer.
2. Lift the heat plate from the computer **(2)**.



3. Thoroughly clean the thermal material from the surface of the heat plate **(1)** and associated system board component **(2)** each time the heat plate is removed. Replacement thermal material is included with the heat pltae and system board spare part kits.



Reverse this procedure to install the heat plate or heat sink assembly.

System board

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

All system boards use the following part numbers:

xxxxxx-001: Non-Windows operating systems

xxxxxx-601: Windows operating system

Table 6-16 System board descriptions and part numbers

Description	Spare part number
System board for use in models with discrete graphics memory:	
• AMD Ryzen 3-3200U processor	L46462-xx1
• AMD Ryzen 3-2200U processor	L22725-xx1
• AMD A9-9425 processor	L22726-xx1
• AMD A6-9225 processor	L22727-xx1
System board for use in models with UMA graphics memory:	
• AMD Ryzen 5-3500U processor	L46461-xx1
• AMD Ryzen 3-3300U processor	L46460-xx1
• AMD Ryzen 3-3200U processor	L46459-xx1
• AMD Ryzen 5-2500U processor	L22717-xx1
• AMD Ryzen 3-2300U processor	L22718-xx1
• AMD Ryzen 3-2200U processor	L22719-xx1
• AMD A9-9425 processor	L22720-xx1
• AMD A6-9225 processor	L22721-xx1
• AMD E2-9000e processor	L22722-xx1

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the following components:
   a. Optical drive (see Optical drive on page 33)
   b. Bottom cover (see Bottom cover on page 37)
   c. Battery (see Battery on page 40)
   d. Hard drive (see Hard drive on page 44)
   e. Solid-state drive (see Solid-state drive on page 46)
   f. WLAN module (see WLAN module on page 48)
   g. Memory modules (see Memory module on page 42)
   h. Fan (see Fan on page 56)

Remove the system board:

IMPORTANT: Make special note of each screw size and location during removal and replacement

1. Disconnect the following cables from the system board:

   (1) Backlight cable

   (2) Optical drive board cable

   (3) Hard drive cable

   (4) Keyboard cable

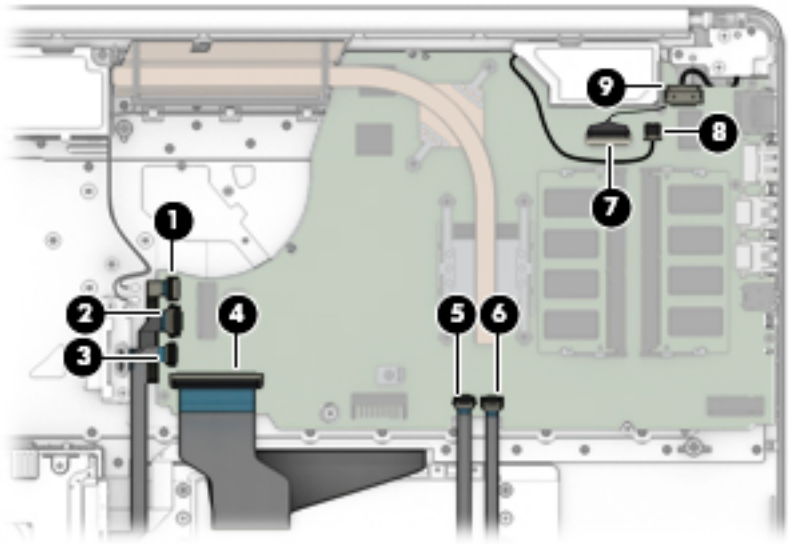
   (5) TouchPad cable

   (6) TouchPad button board cable

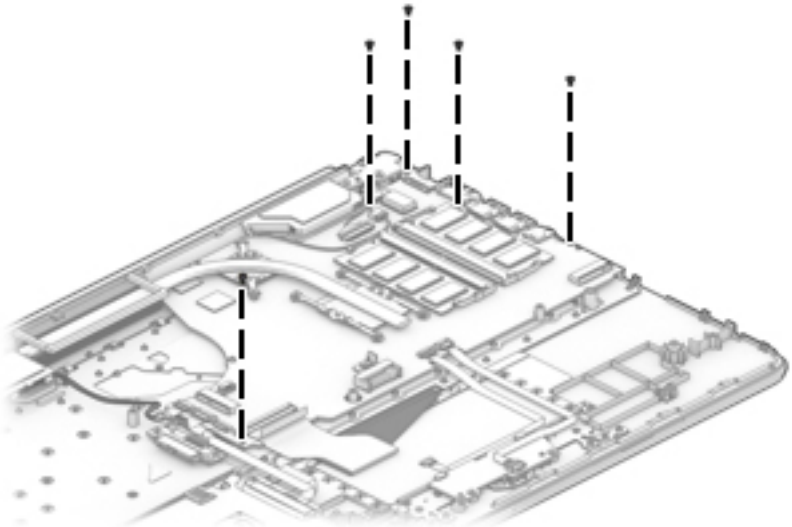
   (7) Display cable

   (8) Speaker cable

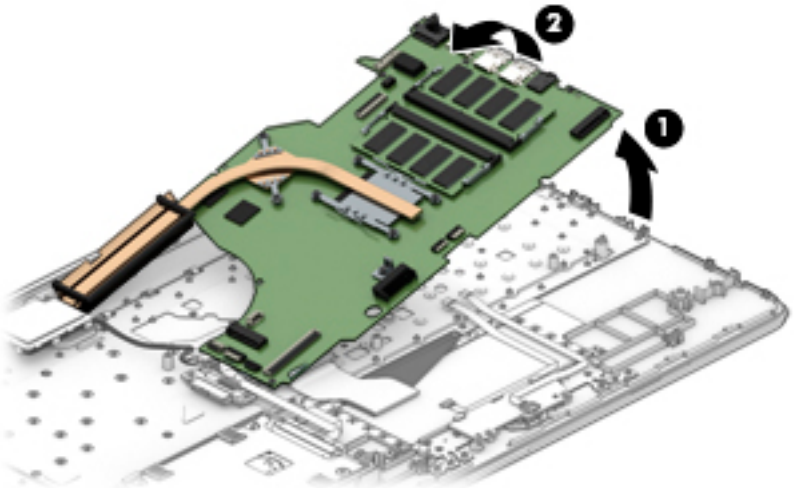
   (9) Power connector cable



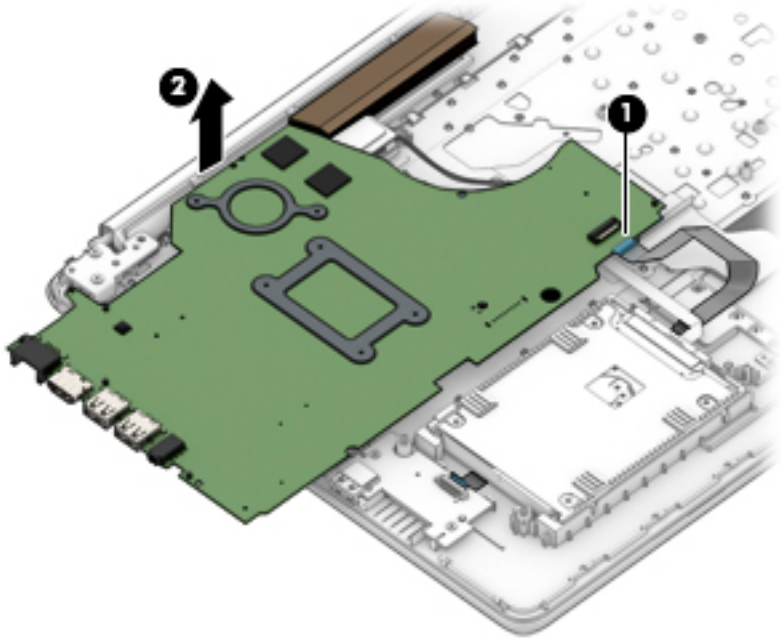
2. Remove the five Phillips M2.0 × 3.0 screws that secure the system board to the computer.



3. Lift the right side of the system board **(1)**, and then turn the system board upside down **(2)** to access the connector underneath.



4. Disconnect the USB board cable from the ZIF connector on the system board **(1)**, and then remove the system board from the computer **(2)**.



Reverse this procedure to install the system board.

Speakers

Table 6-17 Speaker description and part number

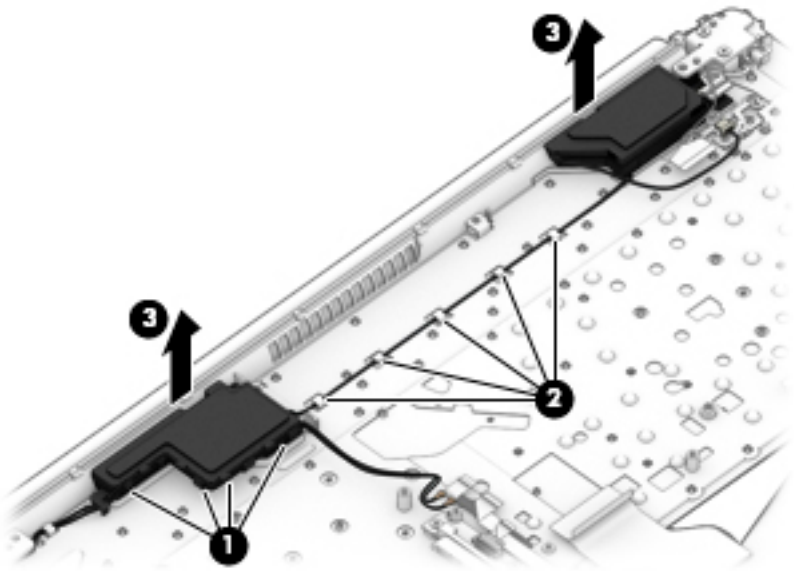
Description	Spare part number
Speaker Kit	L22580-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).
5. Remove the system board (see System board on page 61).

Remove the speakers:

1. Remove the antenna cables from the clips in the left speaker **(1)**.
2. Remove the speaker cable from the clips built into the computer **(2)**, and then remove the speakers from the computer **(3)**.



Reverse this procedure to install the speakers.

Display assembly

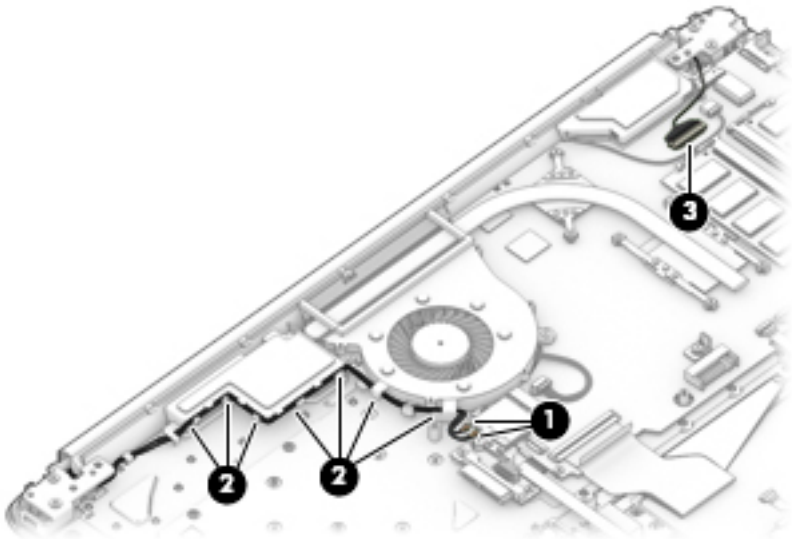
Full hinge-up displays are not spared. Displays are spared only at the subcomponent level.

Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 32).
2. Remove the optical drive (see Optical drive on page 33).
3. Remove the bottom cover (see Bottom cover on page 37).
4. Remove the battery (see Battery on page 40).

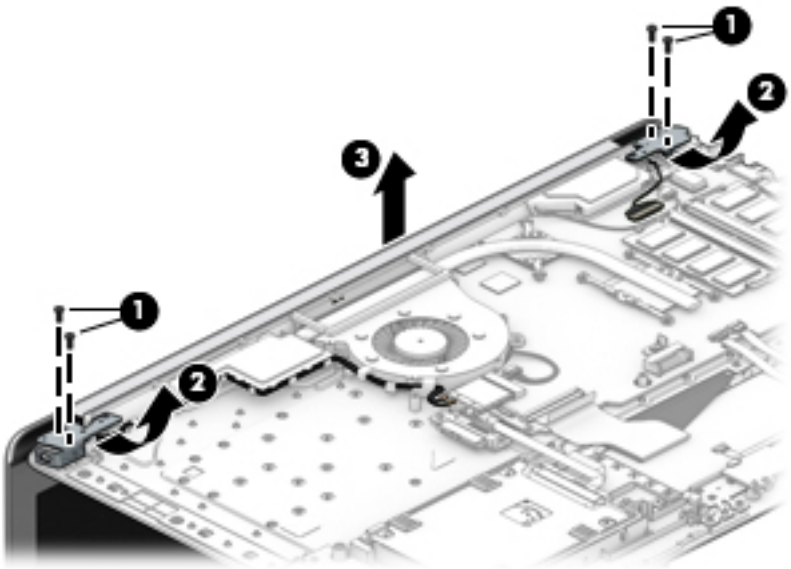
Remove the display assembly:

1. Disconnect the antenna cables from the WLAN module **(1)**.
2. Remove the antenna cables from the clips in the speaker and fan **(2)**.
3. Disconnect the display cable from the system board **(3)**.



4. Remove the four Phillips M2.5 × 6.0 screws **(1)** from the display hinges.
5. Rotate the hinges upward **(2)**.

6. Separate the display from the computer **(3)**.



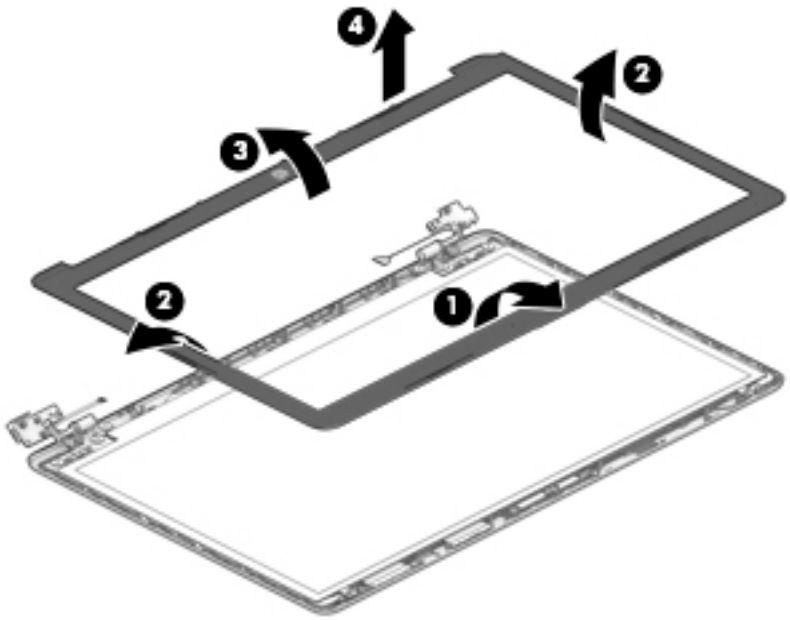
Remove the display assembly subcomponents:

1. If it is necessary to replace the display bezel:

   a. If you need to remove the display bezel, flex the top **(1)** of the bezel, the inside edges of the left and right sides **(2)**, and then the bottom **(3)** of the bezel until it disengages from the display enclosure.

   b. Remove the bezel **(4)**.

      The display bezel is available using spare part number L22517-001 for non-touch models and L22518-001 for touch models.

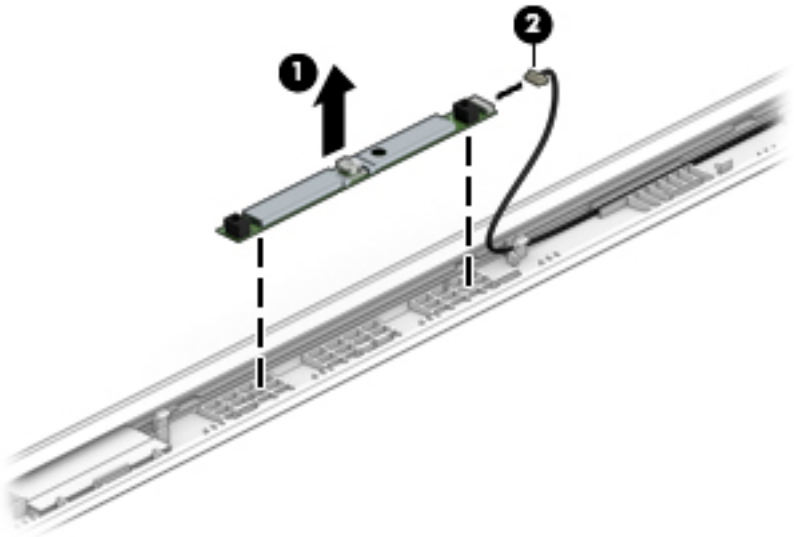


2. If it is necessary to replace the camera/microphone module:

a. Detach the camera module **(1)** from the display back cover. (The module is attached with double-sided adhesive.)

b. Disconnect the cable **(2)** from the camera/microphone module.

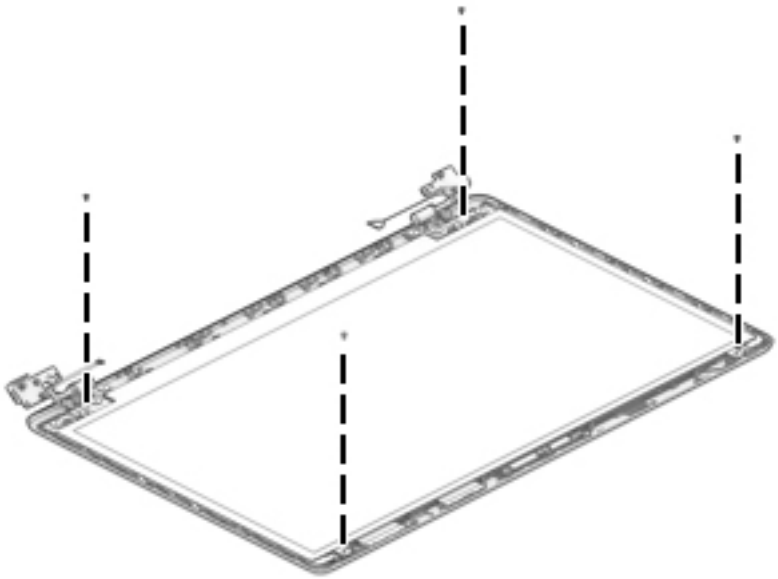
The HD camera module is available using spare part number L22587-001. The VGA camera module is available using spare part number L22588-001.



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

a. **Non-touch panel:**

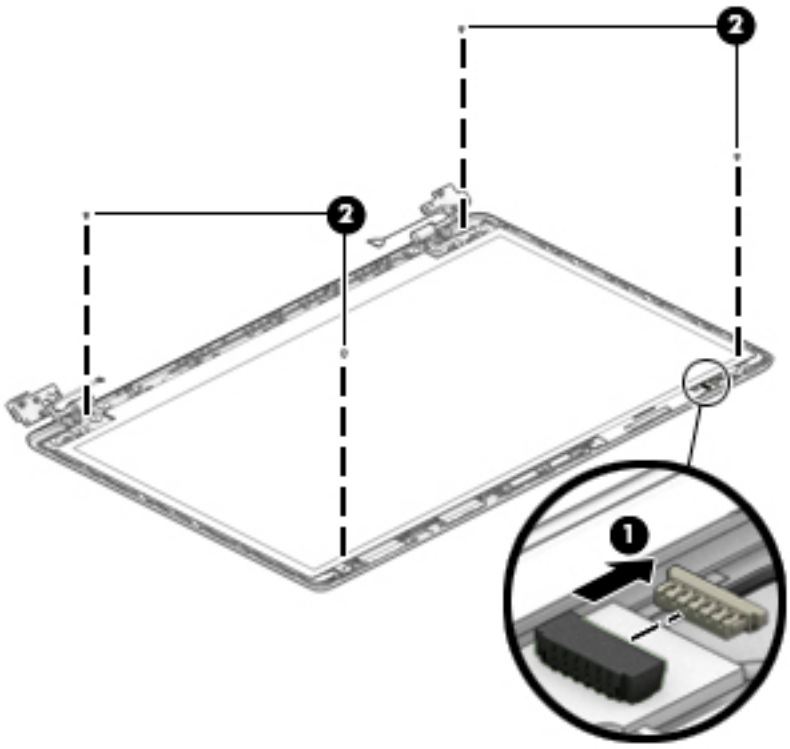
Remove the four Phillips M2.0 × 3.0 screws that secure the panel to the display enclosure.



Touch panel:

b. Disconnect the cable from the touch board **(1)**.

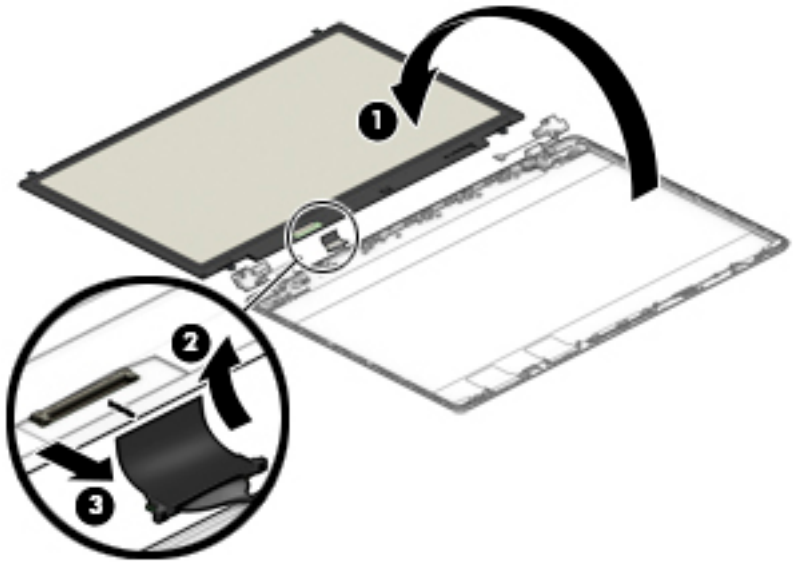
c. Remove the four Phillips M2.0 × 3.0 screws that secure the panel to the display enclosure **(2)**.



d. Swing the top edge of the display panel forward and position the panel upside down next to the display enclosure **(1)**.

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

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



g. Remove the display panel.

Raw display panels are available using the following spare part numbers:

L22731-001: HD, BrightView, non-touch

L22732-001: HD, anti glare, non-touch

L22733-001: HD, touch-on panel (TOP)

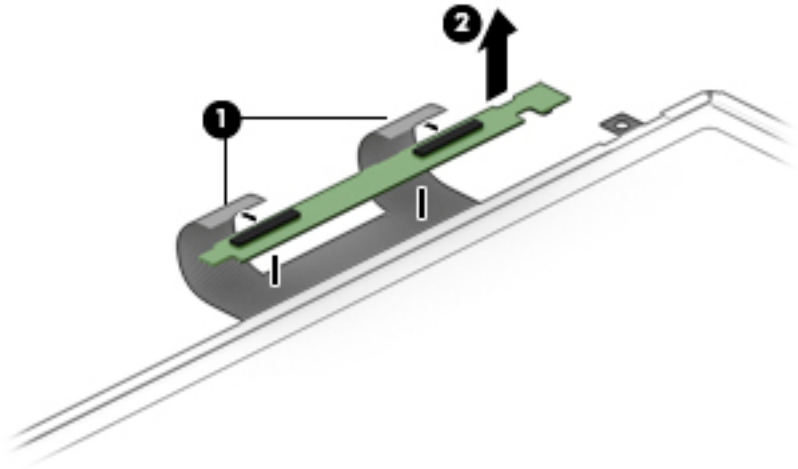
L22734-001: FHD, anti glare, non-touch

4. If it is necessary to replace the touch control board from the display:

   a. Disconnect the cables from the two ZIF connectors on the touch control board **(1)**.

   b. Pull the board to disengage it from the adhesive used to secure it to the cables **(2)**.

   The touch control board is available using spare part number L22539-001 for models with an HD display panel and L23195-001 for models with an FHD display panel.



5. If it is necessary to replace the hinge cover, pull either side of hinge cover to disengage it from the display enclosure, and then remove the hinge cover from the display enclosure.

   Hinge covers are available using the following spare part numbers:

   L22559-001: Jet black

   L22552-001: Natural silver

   L22553-001: Pale gold

   L22554-001: Scarlet red

   L22557-001: Twilight blue

   L22556-001: Smoke gray

   L22560-001: Snow white

   L22555-001: Serenity mint

   L22558-001: Maroon burgundy

   L25498-001: Tranquil pink

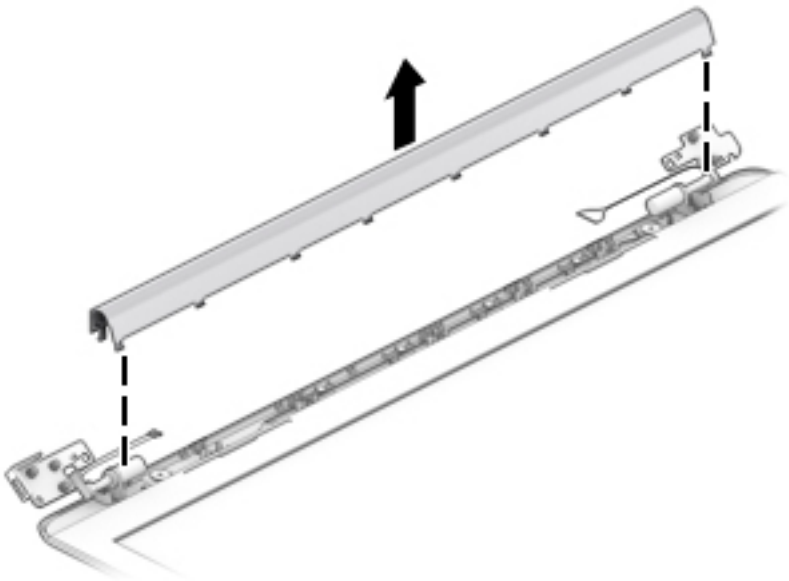
   L25499-001: Iridescent pale rose gold

   L25500-001: Iridescent ceramic white

   L47078-001: Chalkboard gray

   L47079-001: Lumiere blue

   L47080-001: Berry mauve



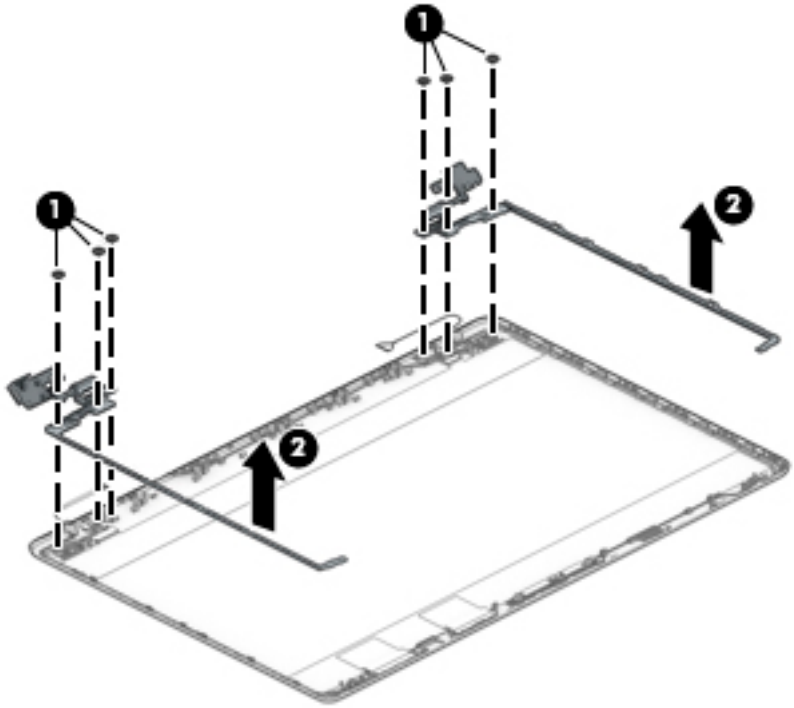
   When replacing the hinge cover, make sure the hinges rotate downward as far as they can go. Align the cover, and then start from above and rotate the cover downward onto the hinges. Make sure the clips snap into place along the bottom of the display cover.

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

   a. Remove the six Phillips M2.5 × 2.5 broad head screws **(1)** from the bottom of the hinges.

b. Remove the display hinges **(2)**.

The display hinges are available using spare part number L22536-001.



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

a. Release the cable from the retention clips and routing channel built into the bottom edge and side of the display enclosure **(1)**.

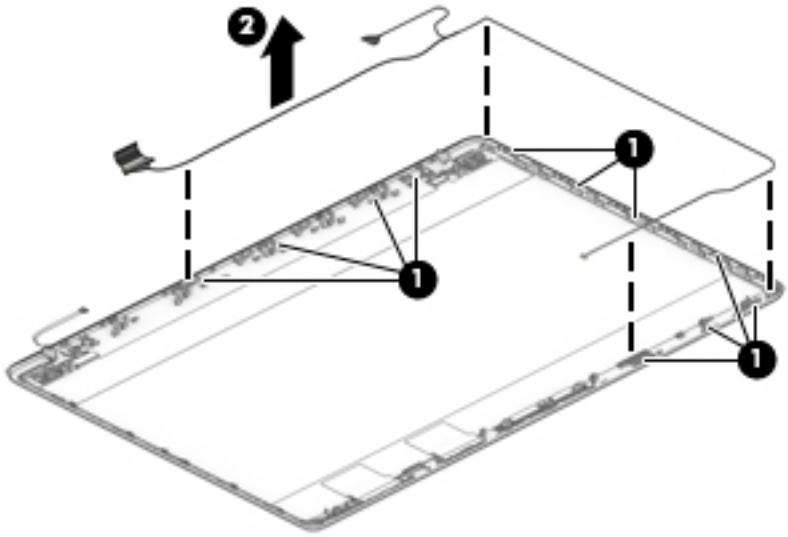
b. Remove the display panel cable **(2)**.

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

L22519-001: HD, non-touch display

L22520-001: FHD, non-touch display

L22521-001: HD, touch display

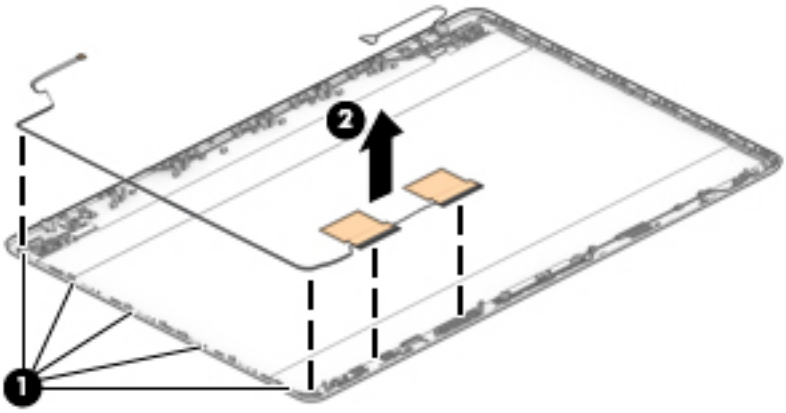


8. If it is necessary to replace the wireless antenna cables and transceivers:

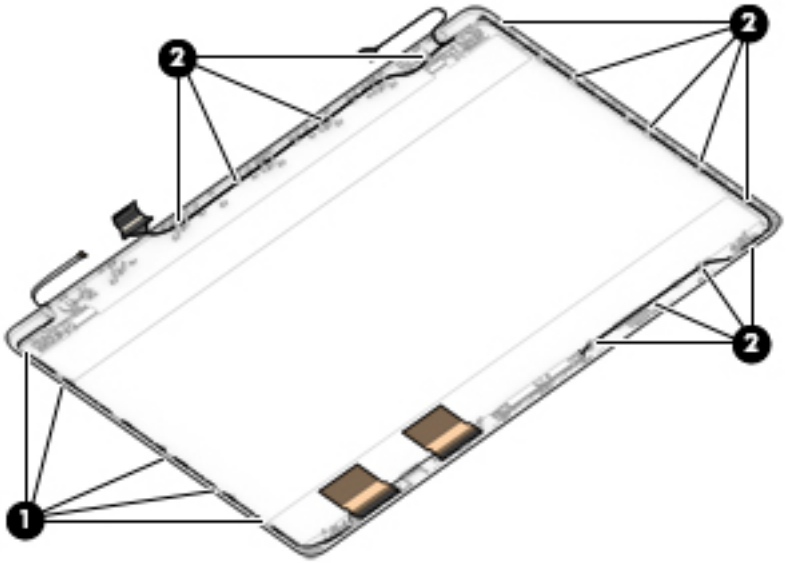
a. Release the wireless antenna cables from the retention clips and routing channel built into the sides of the display enclosure **(1)**.

b. Release the antenna from the display enclosure **(2)**.

Antennas are available using spare part number L22498-001 for single antenna models and L22497-001 for dual antenna models.



Use the following image to determine proper cable routing in the display of the antenna cable **(1)** and display cable **(2)**.



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

L22506-001: Jet black

L22499-001: Natural silver

L22500-001: Pale gold

L22501-001: Scarlet red, for models with an HD display panel

L22504-001: Twilight blue

L22503-001: Smoke gray

L22507-001: Snow white

L22502-001: Serenity mint

L22505-001: Maroon burgundy

L25489-001: Tranquil blue

L25491-001: Iridescent ceramic white

L25490-001: Iridescent pale rose gold

L47069-001: Chalkboard gray

L47070-001: Lumiere blue

L47071-001: Berry mauve

L56245-001: Pale rose gold

L48403-001: Jet black; Pattern: mesh knit

L48404-001: Snow white; Pattern: mesh knit

Reverse these procedures to reassemble and install the display assembly components.

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 6-18 Top cover descriptions and part numbers

Description	Spare part number
Keyboard, no backlight, jet black	L22751-xx1
Keyboard, no backlight, snow white	L22752-xx1
Keyboard, no backlight, ash silver	L22750-xx1
Keyboard, no backlight, jet black, mesh knit pattern	L48409-xx1
Keyboard, no backlight, snow white, mesh knit pattern	L48410-xx1
Keyboard, backlit, ash silver (available only with -001 United States keyboards)	L22749-001
Keyboard, no backlight, tranquil pink (available only with -001 United States keyboards)	L26985-001
Keyboard, no backlight, iridescent pale rose gold (available only with -001 United States keyboards)	L26986-001
Keyboard, no backlight, iridescent ceramic white (available only with -001 United States keyboards)	L26987-001
Keyboard, backlit, tranquil pink (available only with -001 United States keyboards)	L28089-001
Keyboard, backlit, iridescent pale rose gold (available only with -001 United States keyboards)	L28090-001
Keyboard, backlit, iridescent ceramic white (available only with -001 United States keyboards)	L28091-001

Table 6-19 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	Italy	-061	South Korea	-AD1
Bulgaria	-261	Latin America	-161	Spain	-071
Canada	-DB1	The Netherlands	-B31	Switzerland	-BG1
Denmark, Finland, and Norway	-DH1	Portugal	-131	Taiwan	-AB1
France	-051	Romania	-271	Thailand	-281
Germany	-041	Russia	-251	Turkey	-141
Greece	-151	Saudi Arabia	-171	United Kingdom	-031
Hungary	-211	Slovenia	-BA1	United States	-001
Israel	-BB1				

7 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

- Turn on or restart the computer and quickly press f10.

  – or –

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

Updating Setup Utility (BIOS)

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

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

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

Determining the BIOS version

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

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

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

     – or –

     Select the question mark icon in the taskbar.
  2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
  1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 76).
  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 77.

Downloading a BIOS update

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

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

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

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

   – or –

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

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

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

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

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

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

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

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

8 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

HP PC Hardware Diagnostics Windows is a Windows-based utility that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs within the Windows operating system 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 78.

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

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

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

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

   – or –

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

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

      – or –

      Select the question mark icon in the taskbar.

   b. Select **Troubleshooting and fixes**.

   c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.

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

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

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

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

Downloading HP PC Hardware Diagnostics Windows

- The HP PC Hardware Diagnostics Windows download instructions are provided in English only.
- You must use a Windows computer to download this tool because only .exe files 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 80.

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 80.

   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.

9 Backing up, restoring, and recovering

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

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see Using Windows tools on page 83).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 83).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 83).
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see Using Windows tools on page 83).

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

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

Backing up information and creating recovery media

Using Windows tools

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

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

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

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

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

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

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

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

To download the tool:

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

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

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

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, see Using Windows tools on page 83.

Recovering using HP Recovery media

HP Recovery media is used to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 83.

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

To recover your system:

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

Changing the computer boot order

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

To change the boot order:

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

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

   For computers or tablets with keyboards attached:

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

   For tablets without keyboards:

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

     – or –

     Turn on or restart the tablet, quickly hold down the volume down button, and then select **f9**.
3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

10 Specifications

Computer specifications

Table 10-1 Computer specifications

	Metric	U.S.
Dimensions		
Length	272.2 mm	10.72 in
Width	414.8 mm	16.33 in
Height	24.5 mm	0.97 in
Weight (lowest configuration)	2.45 kg	5.41 lbs
HDD: add 36.6 g (0.08 lbs)		
HDD+SSD: add 44.6 g (0.10 lbs)		
Fan: add 65.6 g (0.14 lbs)		
Touch display: add 100 g (0.22 lbs)		
Input power		
Operating voltage	19.0 V dc @ 4.74 A – 90 W or 18.5 V dc @ 3.5 A - 65 W or 45 W	
Operating current	4.74 A or 3.5 A	
Temperature		
Operating (not writing to optical disc)	0°C to 35°C	32°F to 95°F
Operating (writing to optical disc)	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity		
Operating	10% to 90%	
Nonoperating	5% to 95%	

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The computer operates well within this range of temperatures.

43.9 cm (17.3 in) display specifications

Table 10-2 Display specifications

	Metric	U.S.
Active diagonal size	43.9 cm	17.3 in
Resolution	FHD: 1920 × 1080 HD+: 1600 × 900	
Surface treatment	Anti-glare BrightView	
Brightness	220 nits (HD+) 300 nits (FHD)	
Viewing angle	SVA (HD+ panels) UWVA (FHD panels)	
Backlight	LED	
Aspect ratio	16:9	
Display panel interface	eDP	

M.2 SATA solid-state drive specifications

Table 10-3 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.

M.2 PCIe solid-state drive specifications

Table 10-4 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/s	Up to 2150 MB/s
Random Read	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential Write	Up to 1260 MB/s	Up to 1550 MB/s
Random Write	Up to 100,000 IOPs	Up to 100,000 IOPs
Ready time, Maximum (to not busy)	1.0 s	1.0 s
Access times		
Logical	0.1 ms	0.1 ms
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.

Hard drive specifications

Table 10-5 Hard drive specifications

	2-TB*	1-TB*	500-GB*
Dimensions			
Height	7.2 mm or 9.5 mm	7.2 mm or 9.5 mm	7.0 mm
Length	100.4 mm	100.4 mm	100.6 mm
Width	69.9 mm	69.9 mm	70.1 mm
Weight	130.0 g	107.0 g	92.0 g
Interface type	SATA	SATA	SATA
Transfer rate			
Synchronous (maximum)	300 MB/sec	300 MB/sec	300 MB/sec
Security	ATA security	ATA security	ATA security
Seek times (typical read, including setting)			
Single track	2.0 ms	2.0 ms	3 ms
Average (read/write)	12 ms	12 ms	13 ms
Maximum	22 ms	22 ms	24 ms
Logical blocks	3,907,029,168	1,953,525,168	1,048,576,000
Disk rotational speed	5400 rpm	5400 rpm	5400 rpm
Operating temperature		**0°C to 60°C** (32°F to 140°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.			

11 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

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

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SPT-3 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

12 Recycling

When a non-rechargeable or rechargeable battery has reached the end of its useful life, do not dispose of the battery in general household waste. Follow the local laws and regulations in your area for battery disposal.

HP encourages customers to recycle used electronic hardware, HP original print cartridges, and rechargeable batteries. For more information about recycling programs, see the HP Web site at http://www.hp.com/recycle.

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