

HP 14 Laptop PC

Maintenance and Service Guide

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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.

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#### Safety warning notice

▲ WARNING! To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or 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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# **Product description**

Category	tegory Description	
Product Name	HP 14 Laptop PC	
	14-cm0xxx	
	14g-cx0xxx	
	14q-су0ххх	
	14z-cg000	
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 Dual-Core A4-Series Processor:	
	A4-9125 (2.3 GHz, turbo up to 2.6 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 5-2500U (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 3-2200U (2.5 GHz, turbo up to 3.4 GHz), 1-MB L2 cache, DDR4-2400 MHz, dual core, 15 V	
Graphics	Supports HD decode, DX12, HDMI, PX7	
	Internal graphics:	
	AMD Radeon™ Vega 8 Mobile Graphics (Ryzen 5 processor)	
	AMD Radeon Vega 3 Mobile Graphics (Ryzen 3 processor)	
	AMD Radeon R5 Graphics (A9 processor)	
	AMD Radeon R4 Graphics (A6 processor)	
	AMD Radeon R3 Graphics (A4 processor)	
	AMD Radeon R2 Graphics (E2 processor)	
	Switchable discrete graphics:	
	AMD Radeon 520 with up to 2 GB of dedicated video memory (R3 and A9 processors)	
Panel	35.6-cm (14.0-in), WLED, slim, 220 nits, eDP, non-touch:	
	High definition (HD)(1366×768), anti glare, SVA	
	HD (1366×768), BrightView, SVA	

Category	Description		
	Full high-definition (FHD)(1920×1080), anti glare, UWVA, narrow bezel		
	FHD (1920×1080), BrightView, UWVA, narrow bezel		
Memory	Two memory module slots (Ryzen, A9 processors)		
	Memory is non-customer accessible/non-upgradeable		
	DDR4-2400 dual channel support (Ryzen processors)		
	DDR4-1866 dual channel support (A9 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 or 4096 MB×2)		
	• 4096 MB (4096 MB×1)		
	One memory module slot (E2/A4/A6 processors)		
	Memory is non-customer accessible/non-upgradeable		
	DDR4-1866 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), 7.0/7.2 mm, SATA hard drives:		
	1 TB, 5400 rpm, 7.0 mm		
	500 GB, 5400 rpm, 7.0 mm		
	M.2, SATA-3, solid-state drives:		
	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		
	128 GB SATA, TLC solid-state drive + 1 TB, 5400 rpm hard drive		
	eMMC configurations: (E2 processors, UMA graphics)		
	64 GB		
	32 GB		
Camera	HP TrueVision HD Camera - indicator LED, USB2.0, HD BSI sensor, f2.0, WDR		
	720p by 30 frames per second		
	Single digital microphone		

Category	Description	
	HP Camera - 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	
thernet	Ethernet Integrated 10/100/1000 NIC	
Vireless networking	Compatible with Miracast-certified devices	
	Integrated Wireless options with dual antennas (M.2/PCIe):	
	Intel Dual band wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	
	Realtek RTL8822BE 802.11 ac 2×2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	
	Integrated Wireless options with single antenna (M.2/PCIe):	
	Realtek RTL8821CE 802.11 ac 1×1 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	
	Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter	
xternal media cards	HP Multi-Format Digital Media Card Reader	
	Supports SD/SDHC/SDXC	
	Push-pull insertion/removal	
nternal card expansion	One M.2 slot for solid-state drive	
	One M.2 slot for WLAN	
orts	USB 2.0 port (left side)	
	(2) USB 3.1 Gen 1 ports (right side)	
	HDMI v1.4b supporting: up to 1920×1080 @ 60Hz	
	RJ-45/Ethernet	
	Audio-out (headphone)/audio-in (microphone) combo jack	
	AC Smart Pin adapter plug	
eyboard/pointing	Keyboard:	
levices	Full-size, textured, island-style keyboard	
	Full-size, two coat paint, backlit, island-style keyboard	
	TouchPad:	
	Image sensor	
ower requirements	Battery:	
	3-cell Prismatic/Polymer battery, 41 Whr	
	Supports battery fast charge	
	AC adapter, barrel type:	
	65 W Smart, nPFC, right angle, 4.5 mm (models with discrete graphics)	

Category	Description
	65 W Smart, nPFC, 4.5 mm (Argentina) (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)
	45 W Smart, nPFC, 4.5 mm (Argentina) (models with UMA graphics)
	Power cord (C5):
	1 m, conventional
Security	Kensington Security Lock
	Supports Trusted Platform Module (TPM) 2.0 (Infineon, soldered down)
Operating system	FreeDOS 2.0
	Windows 10 Home 64
	Windows 10 Home 64 Chinese Market CPPP
	Windows 10 Home 64 Entry Notebook Compact (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Entry Notebook Compact Web/Kiosk (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 High-End Chinese Market CPPP
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market PPP
	Windows 10 Home 64 Single Language Indonesia Market PPP
	Windows 10 Home 64 Single Language
	Windows 10 Home 64 Single Language APAC EM PPP
	Windows 10 Home 64 Single Language Entry India Market PPP (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Single Language India Market PPP
	Windows 10 Home 64 Single Language Indonesia Market PPP
	Windows 10 Home 64 Single Language Value APAC EM PPP (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Single Language Value India Market PPP (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Single Language Value Indonesia Market PPP (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Value Notebook (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Value Notebook Compact (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Value Notebook Compact Web/Kiosk (E2/A4/A6/A9 processors and UMA graphics only)
	Windows 10 Home 64 Value Notebook Single Language (E2/A4/A6/A9 processors and UMA graphics onl

Category	Description	
	Windows 10 Home 64 Value Notebook Single Language SEAP (E2/A4/A6/A9 processors and UMA graphics only)	
	Windows 10 Home 64 Value Notebook Single Language select GEO (E2/A4/A6/A9 processors and UMA graphics only)	
	Windows 10 Home 64 Value Notebook Single Language select GEO (E2/A4/A6/A9 processors and UMA graphics only)Compact	
	Windows 10 Home 64 Web/Kiosk	
	Windows 10 Home 64	
Serviceability	End user replaceable parts:	
	AC adapter	

# 2 Getting to know your computer

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

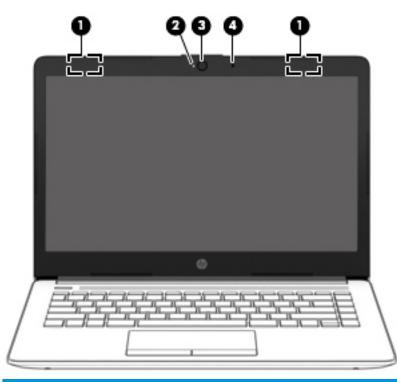
## **Right side**

E			
Comp	onent		Description
(1)	Q	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.
			<b>WARNING!</b> To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the <i>Regulatory, Safety, and Environmental Notices</i> .
			To access this guide:
			Select the Start button, select HP Help and Support, and then select HP Documentation.
			<b>NOTE:</b> When a device is connected to the jack, the computer speakers are disabled.
(2)	ss⇔	USB SuperSpeed ports (2)	Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.
(3)	ноти	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.
(4)		RJ-45 (network) jack/status lights	Connects a network cable.
	•••••		• White: The network is connected.
			• Amber: Activity is occurring on the network.
(5)		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.
(6)	ü	Power connector	Connects an AC adapter.

## Left side

Comp	onent		Description
(1)	Ω	Security cable slot	Attaches an optional security cable to the computer.
			<b>NOTE:</b> The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	• <del>4</del>	USB port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.
(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.
			<ol> <li>Insert the card into the memory card reader, and then press in on the card until it is firmly seated.</li> </ol>
			To remove a card:
			Pull the card to remove it from the memory card reader.
(4)	9	Drive light (select products only)	• Blinking white: The hard drive is being accessed.
(5)	ds	Power light	• On: The computer is on.
	U		<ul> <li>Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.</li> </ul>
			• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.

## Display



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.	
		<b>NOTE:</b> 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.

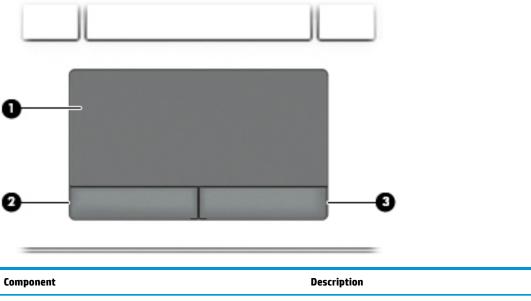
– or –

Click the question mark icon in the taskbar.

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

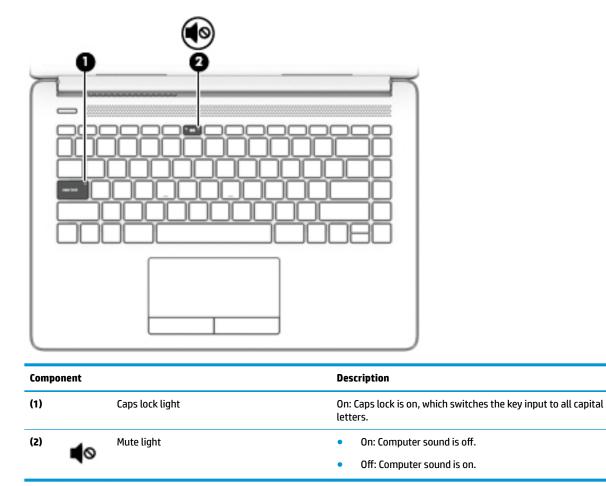
# **Keyboard area**

#### TouchPad



(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.

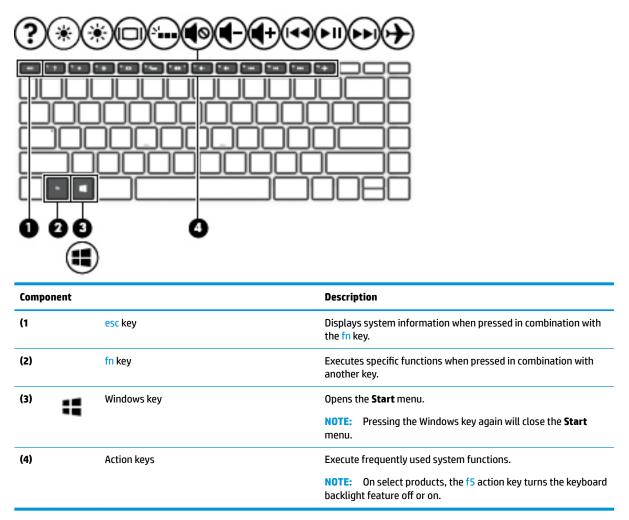
### Lights



#### **Button and speakers**

Component		Description
") ")	Power button	<ul> <li>When the computer is off, press the button to turn on the computer.</li> <li>When the computer is on, press the button briefly to initiate Sleep.</li> <li>When the computer is in the Sleep state, press the button briefly to exit Sleep.</li> <li>When the computer is in Hibernation, press the button briefly to exit Hibernation.</li> <li>CAUTION: Pressing and holding down the power button results in the loss of unsaved information.</li> <li>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.</li> <li>To learn more about your power settings, see your power options:</li> </ul>
		Options.
(2)	Vent	Enables airflow to cool internal components.
		<b>NOTE:</b> The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)	Speakers (2)	Produce sound.

#### **Special keys**



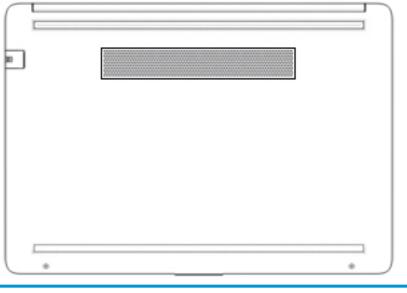
#### **Action keys**

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

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

lcon	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.
2	Turns the keyboard backlight off or on. <b>NOTE:</b> To conserve battery power, turn off this feature.
<b>4</b> 0	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).
►II	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
••1	Plays the next track of an audio CD or the next section of a DVD or a BD.
<b>≁</b>	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**



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.



#### Component

- (1)
   HP product name

   (2)
   Model number

   (3)
   Product ID

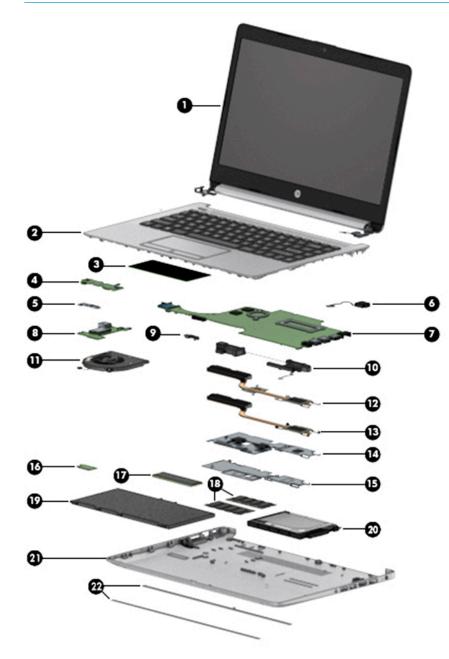
   (4)
   Serial number

   (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 <a href="http://partsurfer.hp.com">http://partsurfer.hp.com</a>, 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 <u>Labels on page 15</u> for details.



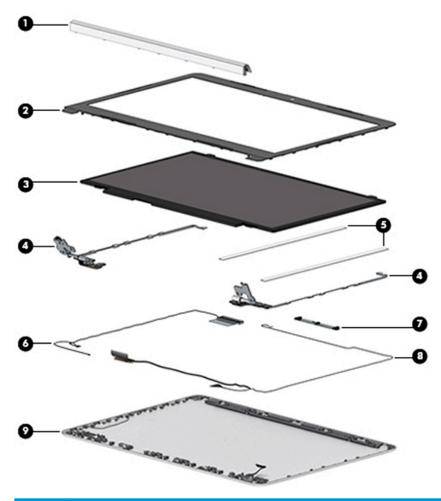
ltem	Component	Spare part number	
(1)	Display	Not spared	
	<b>NOTE:</b> Displays are not spared as whole units. Display subcomponent spare parts are available. For spare part information, see <u>Display assembly subcomponents on page 20</u> .		
(2)	Top cover/keyboard		
	<b>NOTE:</b> For a detailed list of country codes, see <u>Top cover with keyboard on page 63</u> .		
	Keyboard, no backlight, jet black	L23239-xx1	
	Keyboard, no backlight, snow white	L23240-xx1	
	Keyboard, no backlight, ash silver	L23241-xx1	
	Keyboard, backlit, ash silver	L23242-xx1	
(3)	TouchPad module	L22586-001	
(4)	TouchPad button board	L23197-001	
(5)	TouchPad button board bracket	L23193-001	
(6)	Power connector cable (DC-in)	L23188-001	
(7)	System board		
	<b>NOTE:</b> 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 3-2200U processor	L23396-xx1	
	AMD A9-9425 processor	L23395-xx1	
	For use in models with UMA graphics memory:		
	AMD Ryzen 5-2500U processor	L23394-xx1	
	AMD Ryzen 3-2200U processor	L23393-xx1	
	AMD A9-9425 processor	L23392-xx1	
	AMD A6-9225 processor	L23391-xx1	
	AMD A4-9125 processor	L23390-xx1	
	AMD E2-9000e processor	L23389-xx1	
(8)	USB/card reader/power button board	L23196-001	
(9)	System board hook	L23206-001	
(10)	Speakers (includes cable)	L23221-001	
(11)	Fan	L23189-001	
	Heat sink		
(12)	For use in models with AMD Ryzen processors and discrete graphics	L23192-001	

ltem	Component	Spare part number	
	For use in models with AMD A4/A6/A9 processors and discrete graphics	L23386-001	
(13)	For use in models with AMD Ryzen processors and integrated UMA graphics	L23191-001	
	For use in models with AMD A4/A6/A9 processors and integrated UMA graphics	L23385-001	
(14)	For use in fanless models with AMD E2-9000e processors	L23384-001	
(15)	Fan insert (for use in fanless models)	L23198-001	
(16)	WLAN module		
	Intel Dual band wireless-AC 3168 802.11AC 1x1 WiFi + Bluetooth 4.2 Combo Adaptor (non-vPro)	863934-855	
	Realtek RTL8822BE 802.11 ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	924813-855	
	Realtek RTL8821CE 802.11 ac 1x1 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	L17365-005	
	Realtek RTL8723DE 802.11 bgn 1x1 WiFi + Bluetooth 4.2 Combo Adapter	L21480-005	
(17)	Solid-state drive		
	<b>NOTE:</b> For spare part information, see <u>Mass storage devices on page 22</u> .		
(18)	Memory modules (2400 MHz DDR4)		
	8 GB	862398-855	
	4 GB	862397-855	
(19)	Battery (3-cell, 48 WHr, 4.212 Ahr)	L11119-855	
(20)	Hard drive		
(24)	<b>NOTE:</b> For spare part information, see <u>Mass storage devices on page 22</u> .		
(21)	Bottom cover		
	Jet black	L23174-001	
	Natural silver	L23175-001	
	Pale gold	L23176-001	
	Scarlet red	L23177-001	
	Twilight blue	L23178-001	
	Smoke gray	L23179-001	
	Snow white	L23180-001	
(22)	Rubber feet		
	Jet black	L23212-001	
	Natural silver	L23213-001	
	Pale gold	L23214-001	
	Scarlet red	L23215-001	
	Twilight blue	L23216-001	
	Twilight blue Smoke gray	L23216-001 L23217-001	

## Cables

ItemComponentSpare part number(1)USB/card reader/power button board cableL23186-001(2)Display cable, HD panelL23182-001(3)Display cable, FHD panel (not illustrated)L23183-001(3)TouchPad cableL23184-001(4)TouchPad button board cableL23185-001(5)Hard drive cableL23187-001(5)eMMC board cable (not illustrated)L2307-001	0- 0- 0- 0-		
(2)Display cable, HD panelL23182-001Display cable, FHD panel (not illustrated)L23183-001(3)TouchPad cableL23184-001(4)TouchPad button board cableL23185-001(5)Hard drive cableL23187-001	ltem	Component	Spare part number
Display cable, FHD panel (not illustrated)L23183-001(3)TouchPad cableL23184-001(4)TouchPad button board cableL23185-001(5)Hard drive cableL23187-001	(1)	USB/card reader/power button board cable	L23186-001
(3)       TouchPad cable       L23184-001         (4)       TouchPad button board cable       L23185-001         (5)       Hard drive cable       L23187-001	(2)	Display cable, HD panel	L23182-001
(4)         TouchPad button board cable         L23185-001           (5)         Hard drive cable         L23187-001		Display cable, FHD panel (not illustrated)	L23183-001
(5) Hard drive cable L23187-001	(3)	TouchPad cable	L23184-001
	(4)	TouchPad button board cable	L23185-001
eMMC board cable (not illustrated) L23397-001	(5)	Hard drive cable	L23187-001
		eMMC board cable (not illustrated)	L23397-001

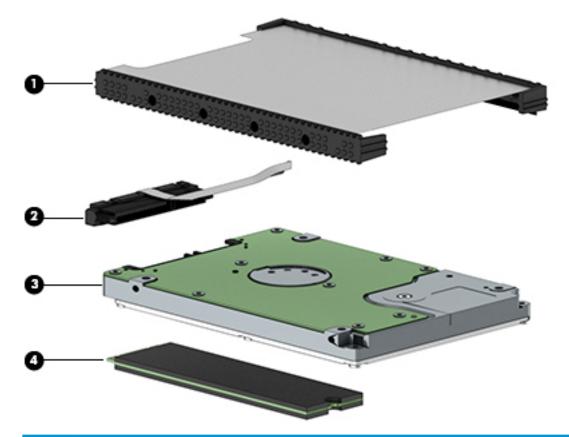
# Display assembly subcomponents



ltem	Component	Spare part number
(1)	Hinge cover	
	Jet black	L23199-001
	Natural silver	L23200-001
	Pale gold	L23201-001
	Scarlet red	L23202-001
	Twilight blue	L23203-001
	Smoke gray	L23204-001
	Snow white	L23205-001
(2)	Display bezel	L23181-001
(3)	Display panel	
	FHD, anti glare	L23208-001
	FHD, BrightView	L23209-001
	HD, anti glare	L23210-001

ltem	Component	Spare part number			
	HD, BrightView	L23211-001			
(4)	Hinge Kit (includes left and right hinges)				
	For use in models with an HD panel	L23194-001			
	For use in models with an FHD panel	L23195-001			
(5)	Display panel stretchable adhesive tape (not illustrated)	L23207-001			
(6)	WLAN antenna cable (included in Antenna Kit)				
	Single antenna, for use in models with an HD panel	L23158-001			
	Dual antennas, for use in models with an HD panel	L23159-001			
	Single antenna, for use in models with an FHD panel	L24037-001			
	Dual antennas, for use in models with an FHD panel	L24038-001			
(7)	Camera module				
	HD camera	L23237-001			
	VGA camera	L23238-001			
(8)	Display cable				
	For use with HD panels	L23182-001			
	For use with FHD panels	L23183-001			
(9)	Back cover				
	For use in models with an HD panel:				
	Jet black	L23160-001			
	Natural silver	L23161-001			
	• Pale gold	L23162-001			
	Scarlet red	L23163-001			
	Twilight blue	L23164-001			
	Smoke gray	L23165-001			
	Snow white	L23166-001			
	For use in models with an FHD panel:				
	Jet black	L23167-001			
	Natural silver	L23168-001			
	• Pale gold	L23169-001			
	Scarlet red	L23170-001			
	• Twilight blue	L23171-001			
	Smoke gray	L23172-001			
	Snow white	L23173-001			

# Mass storage devices



ltem	Component	Spare part number
(1)	Hard drive cover	L23219-001
(2)	Hard drive cable	L23187-001
(3)	Hard drive, 7 mm	
	1 TB, 5400 rpm	762990-005
	500 GB, 5400 rpm	778186-005
(4)	Solid-state drive (M.2)	
	256 GB, PCIe, NVMe	L23224-001
	256 GB, SATA-3, TLC	L23223-001
	128 GB, SATA-3, TLC	L23222-001
	eMMC module (not illustrated)	
	64 GB	L23398-001
	32 GB	L23388-001
	eMMC bracket (not illustrated)	L23387-001
	eMMC cable (not illustrated)	L23397-001

# Miscellaneous parts

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
65 W AC adapter, nPFC, 4.5 mm, for use in Argentina	710340-850
45 W AC adapter, nPFC, SMART, RC, 4.5 mm, non-slim	741727-001
45 W AC adapter, nPFC, for use in Argentina	741553-852
Power cord, C5, conventional, 1.0 m	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Denmark	L19360-001
For use in Europe	L19361-001
For use in India	L19363-001
For use in Israel	L19362-001
For use in Italy	L19364-001
For use in North America	L19367-001
For use in the People's Republic of China	L19368-001
For use in South Africa	L19369-001
For use in Thailand	L19371-001
For use in the United Kingdom	L19373-001
Screw Kit	L23220-001

# 4 Removal and replacement procedures preliminary requirements

### **Tools required**

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

- Phillips P1 magnetic screwdriver
- Plastic, non-marking pry tool

### **Service considerations**

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

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

#### **Plastic parts**

**CAUTION:** Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic

#### **Cables and connectors**

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

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

#### **Drive handling**

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

## **Grounding guidelines**

#### Electrostatic discharge damage

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

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

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

**CAUTION:** To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

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

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

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

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

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

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

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

#### **Packaging and transporting guidelines**

Follow these grounding guidelines when packaging and transporting equipment:

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

#### **Workstation guidelines**

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screwdrivers, 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 plastic foam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these
  items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

#### **Equipment guidelines**

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

# 5 Removal and replacement procedures for Authorized Service Provider parts

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

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

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

## **Component replacement procedures**

- NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See <u>Labels on page 15</u> for details.
- NOTE: HP continually improves and changes product parts. For complete and current information on supported parts for your computer, go to <a href="http://partsurfer.hp.com">http://partsurfer.hp.com</a>, 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**

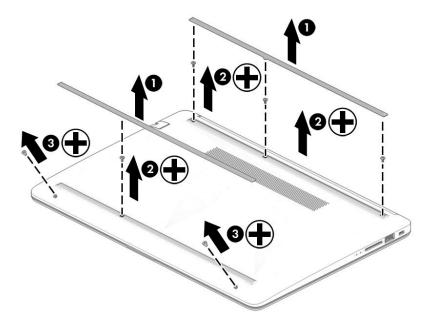
Description	Spare part number
Bottom cover, jet black	L23174-001
Bottom cover, natural silver	L23175-001
Bottom cover, pale gold	L23176-001
Bottom cover, scarlet red	L23177-001
Bottom cover, twilight blue	L23178-001
Bottom cover, smoke gray	L23179-001
Bottom cover, snow white	L23180-001
Rubber feet, jet black	L23212-001
Rubber feet, natural silver	L23213-001
Rubber feet, pale gold	L23214-001
Rubber feet, scarlet red	L23215-001
Rubber feet, twilight blue	L23216-001
Rubber feet, smoke gray	L23217-001
Rubber feet, snow white	L23218-001

- 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.

Remove the bottom cover:

1. Peel the rubber feet off the bottom of the computer (1).

2. Remove the three black Phillips M2.5×6.0 screws (2) from under the rubber feet and the two silver Phillips M2.5×6.0 screws (3) from the bottom corners of the bottom cover.



3. Starting near the power connector, use a plastic tool (1) to pry the bottom cover up to remove it (2).



Reverse this procedure to install the bottom cover.

#### Battery

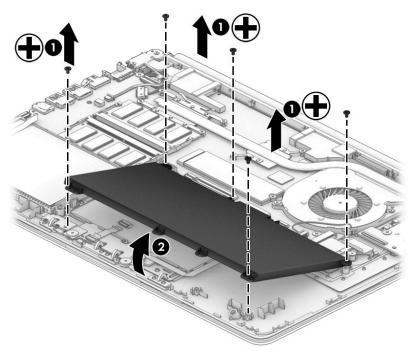
Description	Spare part number
Battery (3-cell, 48 WHr, 4.212 Ahr)	L11119-855

Before removing the battery, follow these steps:

- 1. Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- 3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).

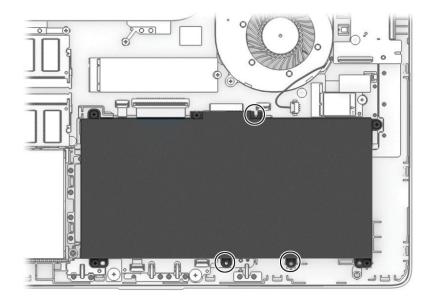
Remove the battery:

- 1. Remove the five 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

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

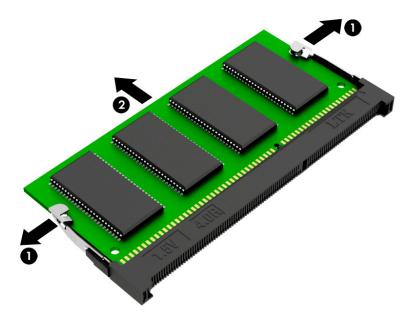
Before removing the memory modules, follow these steps:

- 1. Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

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.

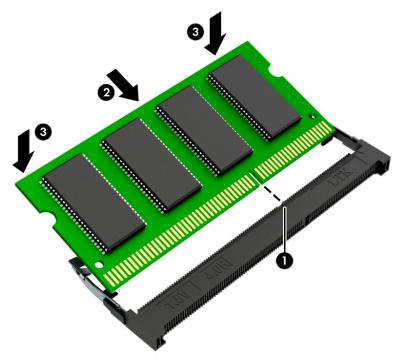
To protect a memory module after removal, place it in an electrostatic-safe container.



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

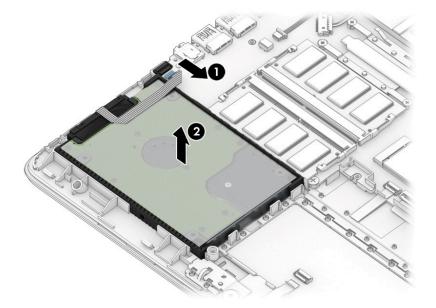
Description	Spare part number
Hard drive, 1 TB, 5400 rpm	762990-005
Hard drive, 500 GB, 5400 rpm	778186-005
Hard drive cover	L23219-001

Before removing the hard drive, follow these steps:

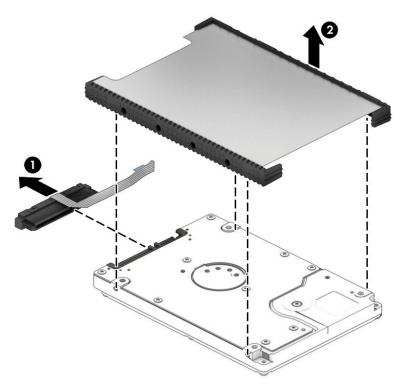
- **1.** Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

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

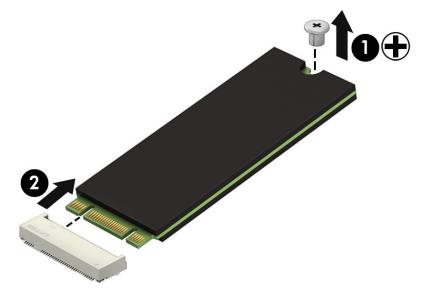
Description	Spare part number
256 GB, PCIe, NVMe	L23224-001
256 GB, SATA-3, TLC	L23223-001
128 GB, SATA-3, TLC	L23222-001

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

- 1. Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- 3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

Remove the solid-state drive:

A 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.

### WLAN module

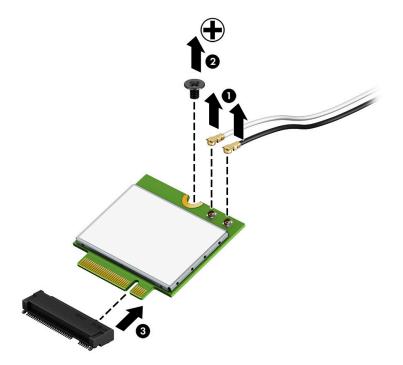
Description	Spare part number
Intel Dual band wireless-AC 3168 802.11AC 1x1 WiFi + Bluetooth 4.2 Combo Adaptor (non-vPro)	863934-855
Realtek RTL8822BE 802.11 ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	924813-855
Realtek RTL8821CE 802.11 ac 1x1 WiFi + Bluetooth 4.2 Combo Adapter (MU-MIMO supported)	L17365-005
Realtek RTL8723DE 802.11 bgn 1x1 WiFi + Bluetooth 4.2 Combo Adapter	L21480-005

Before removing the WLAN, follow these steps:

- **1.** Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

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

Description	Spare part number
System board hook	L23206-001

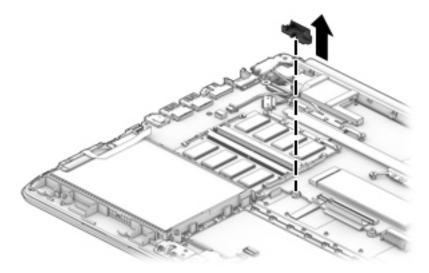
**NOTE:** Located under the battery, a black plastic piece fits around the screw boss next to the memory modules. This "hook" is unsecured and can fall out if you tilt the computer. Use the following image to determine where the hook is properly installed.

Before removing the system board hook, follow these steps:

- 1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2. Disconnect the power from the computer by unplugging the power cord from the computer.
- 3. Disconnect all external devices from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

Remove the system board hook:

A Remove the system board hook from the computer.



Reverse this procedure to install the system board hook.

#### **Speakers**

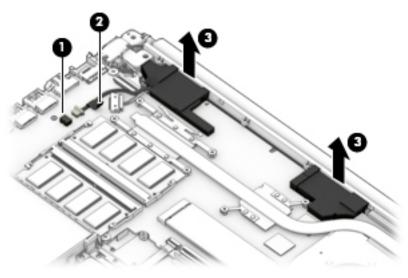
Description	Spare part number
Speaker Kit	L23221-001

Before removing the speakers, follow these steps:

- **1.** Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

Remove the speakers:

- 1. Disconnect the speaker cable from the system board (1).
- 2. Lift the tape that secures the speaker cable to the system board (2), and then lift the speakers from the computer (3).



Reverse this procedure to install the speakers.

#### **TouchPad button board**

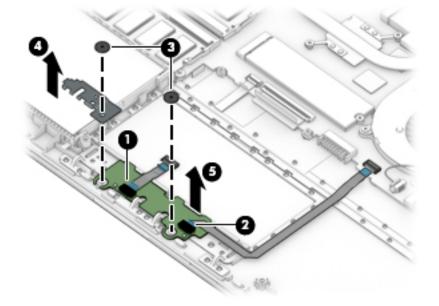
Description	Spare part number
TouchPad button board	L23197-001
TouchPad button board bracket	L23193-001
TouchPad button board cable	L23185-001

Before removing the TouchPad button board, follow these steps:

- **1.** Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

Remove the TouchPad button board:

- 1. Disconnect the TouchPad ZIF cable from the TouchPad button board (1).
- 2. Disconnect the system board ZIF cable from the TouchPad button board (2).
- 3. Remove the two Phillips M2.0×2.0 screws (3) that secure the board to the computer.
- 4. Lift the bracket from on top of the TouchPad button board (4).
- 5. Remove the TouchPad button board from the computer (5).



Reverse this procedure to install the TouchPad button board.

#### Fan

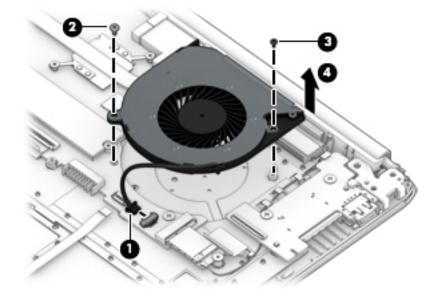
Description	Spare part number
Fan	L23189-001

Before removing the fan, follow these steps:

- **1.** Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

Remove the fan:

- 1. Disconnect the fan cable from the system board (1).
- 2. Remove the silver Phillips M2.0×5.0 screw (2) that secures the fan to the computer.
- 3. Remove the black Phillips M2.0×3.0 screw (3) that secures the fan to the computer.
- 4. Lift the fan from the computer (4).



Reverse this procedure to install the fan.

### **Heat sink assembly**

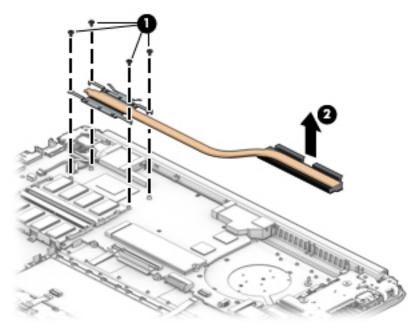
Description	Spare part number
Heat sink for use in models with AMD Ryzen processors and discrete graphics	L23192-001
Heat sink for use in models with AMD A4/A6/A9 processors and discrete graphics	L23386-001
Heat sink for use in models with AMD Ryzen processors and integrated UMA graphics	L23191-001
Heat sink for use in models with AMD A4/A6/A9 processors and integrated UMA graphics	L23385-001
Heat plate for use in fanless models with AMD E2-9000e processors	L23384-001

Before removing the heat sink, follow these steps:

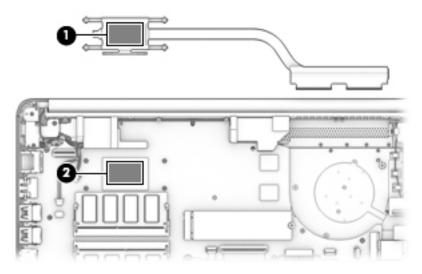
- 1. Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

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).

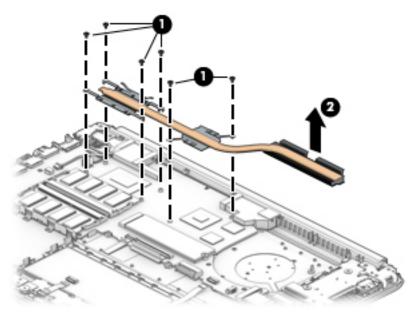


**3.** Thoroughly clean the thermal material from the surface of the heat sink **(1)** and associated system board component **(2)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

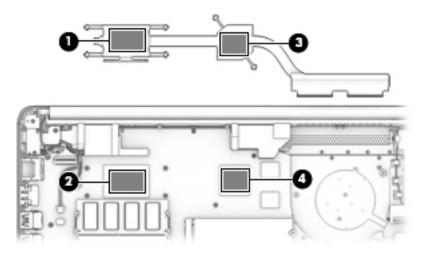


To remove the heat sink assembly from products with discrete graphics:

- 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)**.

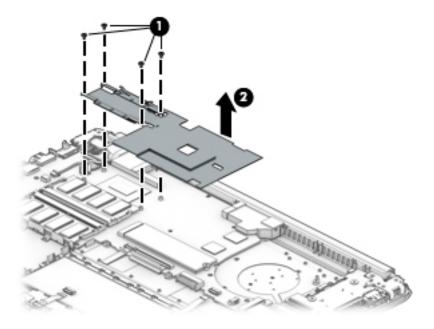


**3.** Thoroughly clean the thermal material from the surfaces of the heat sink **(1)(3)** and associated system board components **(2)(4)** each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

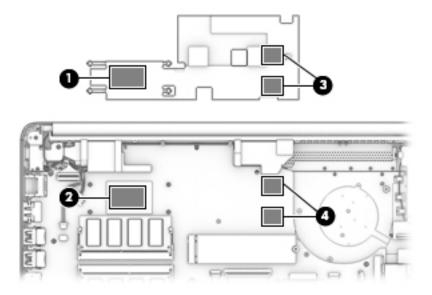


To remove the heat plate from fanless models:

- 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 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.



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

#### **TouchPad module**

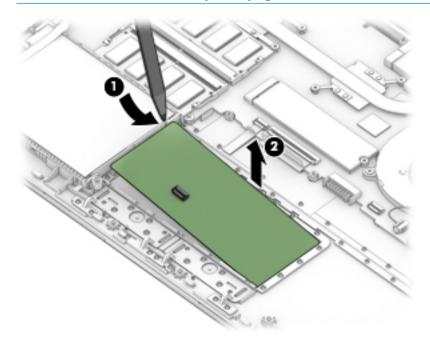
Description	Spare part number
TouchPad module	L22586-001
TouchPad module cable	L23184-001

Before removing the TouchPad module, follow these steps:

- 1. Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

To remove the TouchPad module:

- 1. 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)
- 2. 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.

## 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

Description	Spare part number			
System board for use in models with discrete graphics memory:				
AMD Ryzen 3-2200U processor	L23396-xx1			
AMD A9-9425 processor	L23395-xx1			
System board for use in models with UMA graphics	nemory:			
AMD Ryzen 5-2500U processor	L23394-xx1			
AMD Ryzen 3-2200U processor	L23393-xx1			
AMD A9-9425 processor	L23392-xx1			
AMD A6-9225 processor	L23391-xx1			
AMD A4-9125 processor	L23390-xx1			
AMD E2-9000e processor	L23389-xx1			

Before removing the system board, follow these steps:

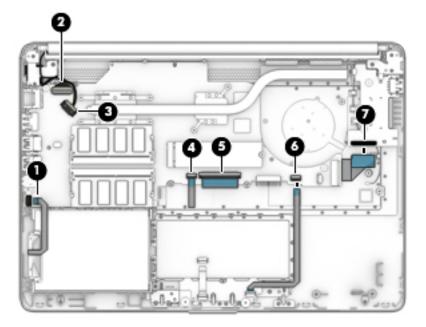
- 1. Shut down the computer.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
- 4. Remove the following components:
  - a. Bottom cover (see <u>Bottom cover on page 30</u>)
  - **b.** Battery (see <u>Battery on page 32</u>)
  - c. Hard drive (see <u>Hard drive on page 36</u>)
  - d. Solid-state drive (see <u>Solid-state drive on page 38</u>)
  - e. WLAN module (see <u>WLAN module on page 39</u>)
  - f. Memory modules (see Memory on page 34)

Remove the system board:

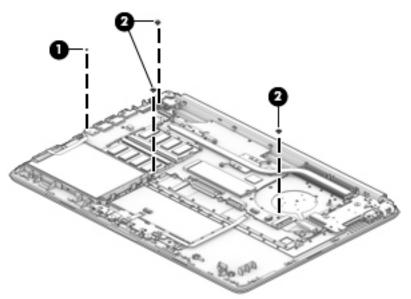
**IMPORTANT:** Make special note of each screw size and location during removal and replacement

- 1. Disconnect the following cables from the system board:
  - (1): Hard drive cable
  - (2): Display cable

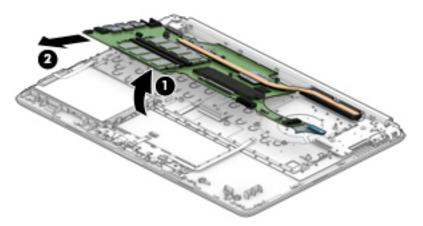
- (3): Power connector cable
- (4): Keyboard backlight cable
- (5): Keyboard cable
- (6): TouchPad button board cable
- (7): USB board cable



2. Remove the black Phillips M2.0×3.0 screw (1), and the three silver Phillips M2.0×2.0 screws (2) that secure the system board to the computer.

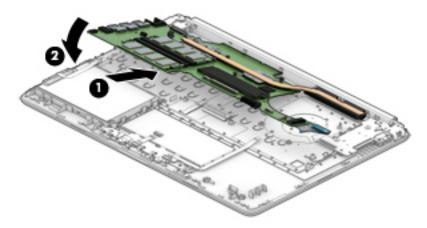


3. Lift the left side of the system board (1), and then remove it from the computer (2).



Reverse this procedure to install the system board.

When installing the system board, first insert the bottom (side closest to the display hinge cover) down and into the computer. Make sure to place the system board under the two tabs/clips, and to insert the plastic post into the hole in the system board.



#### Power connector cable (DC-in)

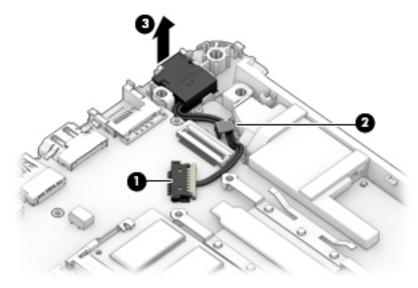
Description	Spare part number		
Power connector cable	L23188-001		

Before removing the power connector cable, follow these steps:

- 1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2. Disconnect the power from the computer by unplugging the power cord from the computer.
- 3. Disconnect all external devices from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).
- 6. Remove the display (see <u>Display assembly on page 54</u>).

Remove the power connector cable:

- 1. Disconnect the power connector cable from the system board (1).
- 2. Remove the cable from the clip (2).
- 3. Remove the power connector cable out of the computer (3).



Reverse this procedure to install the power connector cable.

### USB/card reader/power button board

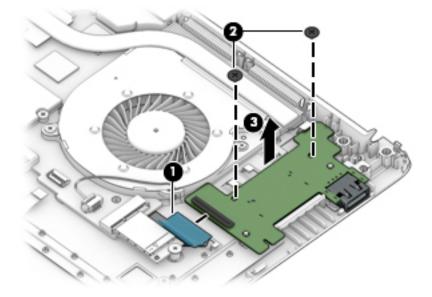
Description	Spare part number
USB/card reader/power button board	L23196-001
USB/card reader/power button board cable	L23186-001

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

- 1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2. Disconnect the power from the computer by unplugging the power cord from the computer.
- 3. Disconnect all external devices from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).
- 6. Remove the display (see <u>Display assembly on page 54</u>).

Remove the USB/card reader/power button board:

- 1. Disconnect the cable from the ZIF connector on the USB/card reader/power button 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/card reader/power button board.

#### **Display assembly**

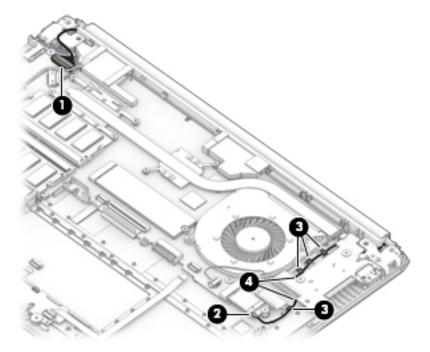
Full hinge-up displays are not spared. Displays are spared only at the subcomponent level.

Before removing the display panel, follow these steps:

- 1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- 2. Disconnect all external devices connected to the computer.
- **3.** Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
- 4. Remove the bottom cover (see <u>Bottom cover on page 30</u>).
- 5. Remove the battery (see <u>Battery on page 32</u>).

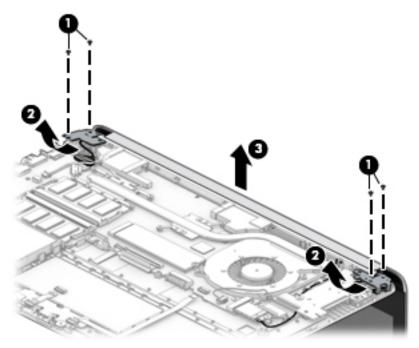
Remove the display assembly:

- 1. Disconnect the display cable from the system board (1).
- 2. Disconnect the antenna cables from the WLAN module (2).
- 3. Remove the antenna cables from the clips in the speaker (3).
- 4. Pull the antenna cables under USB/card reader/power button board (4).



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

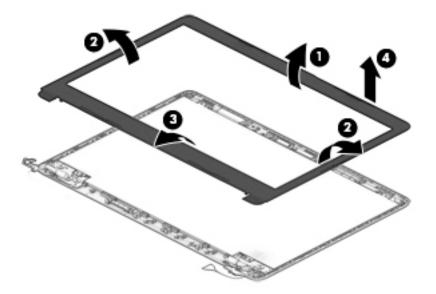
7. Separate the display from the computer (3).



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 L23181-001.



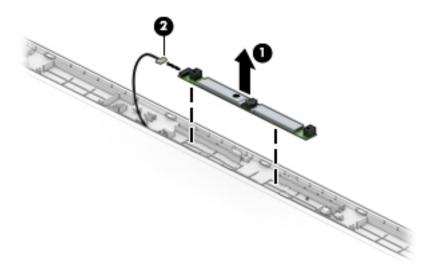
2. If it is necessary to replace the camera module:

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

The HD camera module is available using spare part number L23237-001.

The VGA camera module is available using spare part number L23238-001.

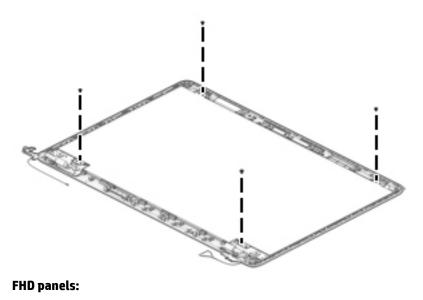
**b.** Disconnect the cable **(2)** from the camera/microphone module.



- 3. If it is necessary to replace the display panel:
  - **IMPORTANT:** HD panels are secured to the display enclosure with screws. FHD panels are secured with tape.
    - a. HD panels:

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

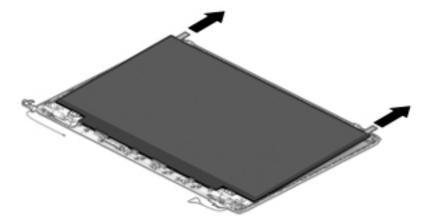
Lift the bottom of the panel upward (2).



**b.** Pull the tape out from behind the left and right sides of the panel.

**NOTE:** You have to pull on the tape multiple times before it is completely removed.

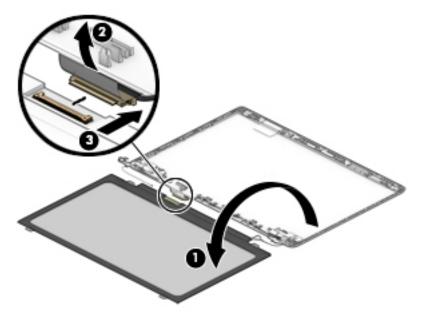
Display panel stretchable adhesive tape is available using spare part number L23207-001.



#### c. HD and FHD panels:

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

- **d.** Release the adhesive support strip (2) that secures the display panel cable connector to the display panel.
- e. Disconnect the display panel cable (3) from the display panel.

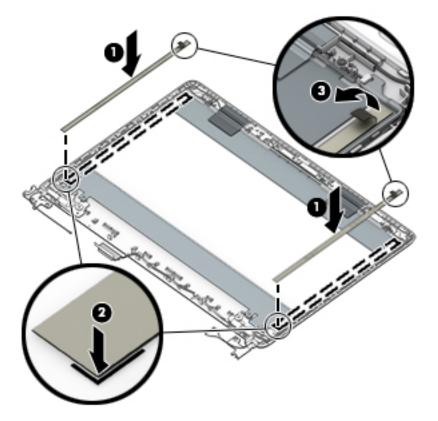


**f.** Remove the display panel.

Raw display panels are available using the following spare part numbers: L23208-001: FHD, anti glare L23209-001: FHD, BrightView L23210-001: HD, anti glare L23211-001: HD, BrightView

g. To correctly install the stretchable adhesive tape when replacing a narrow bezel FHD display panel, install the tape on the left and right sides of the display enclosure (1) with the end of the tape at the right angle marks (2), and then remove the paper from the tape (3).

Display panel stretchable adhesive tape is available using spare part number L23207-001.



4. If it is necessary to replace the hinge cover, use a plastic, non-marking tool to pull up on the side of the hinge cover (1), and then remove it (2).

Hinge covers are available using the following spare part numbers:

L23199-001: Jet black

L23200-001: Natural silver

L23201-001: Pale gold

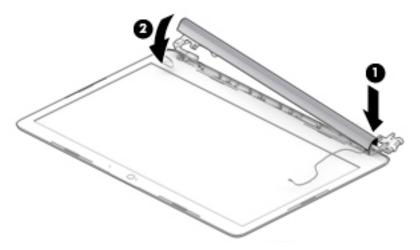
L23202-001: Scarlet red

L23203-001: Twilight blue

L23204-001: Smoke gray

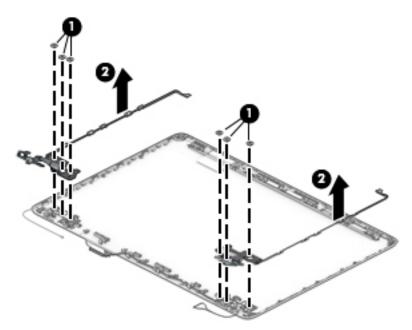
L23205-001: Snow white

5. When replacing the hinge cover, make sure the hinges rotate downward as far as they can go. Align the cover (1), and then start from above and rotate the cover downward onto the hinges (2). 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).

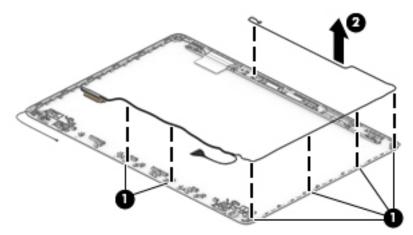
The display hinges are available using spare part number L23194-001 for models with an HD display panel and L23195-001 for models with an FHD display panel.



- 7. If it is necessary to replace the display panel cable:
  - **a.** Release the cable from the retention clips **(1)** and routing channel built into the bottom edge and sides of the display enclosure.
  - **b.** Remove the display panel cable (2).

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

- L23182-001 HD display panel
- L23183-001 FHD display panel



- 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 side of the display enclosure **(1)**.
  - **b.** Release the antenna from the display enclosure **(2)**.

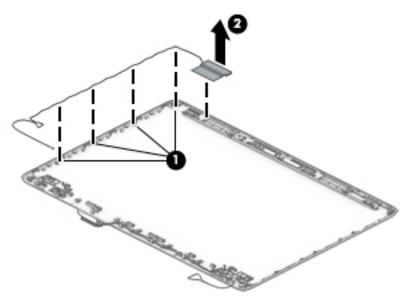
Antennas are available using the following spare part numbers:

L23158-001: Single antenna for use in models with an HD panel

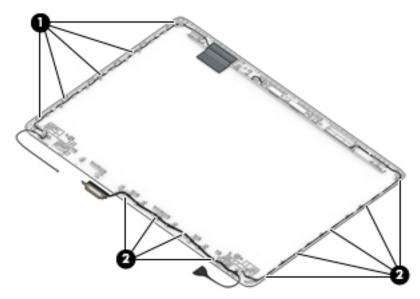
L23159-001: Dual antennas for use in models with an HD panel

L24037-001: Single antenna for use in models with an FHD panel

L24038-001: Dual antennas for use in models with an FHD panel



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: L23160-001: Jack black, for models with an HD display panel L23161-001: Natural silver, for models with an HD display panel L23162-001: Pale gold, for models with an HD display panel L23163-001: Scarlet red, for models with an HD display panel L23164-001: Twilight blue, for models with an HD display panel L23165-001: Smoke gray, for models with an HD display panel L23166-001: Snow white, for models with an HD display panel L23167-001: Jack black, for models with an FHD display panel L23168-001: Natural silver, for models with an FHD display panel L23169-001: Pale gold, for models with an FHD display panel L23170-001: Scarlet red, for models with an FHD display panel L23171-001: Twilight blue, for models with an FHD display panel L23172-001: Smoke gray, for models with an FHD display panel L23173-001: Snow white, for models with an FHD display panel 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.

Description	Spare part number
Keyboard, no backlight, jet black	L23239-xx1
Keyboard, no backlight, snow white	L23240-xx1
Keyboard, no backlight, ash silver	L23241-xx1
Keyboard, backlit, ash silver	L23242-xx1

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	Israel	-BB1	Spain	-071
Canada	-DB1	Italy	-061	Thailand	-281
The Czech Republic and Slovakia	-FL1	Latin America	-161	Turkey	-141
Denmark, Finland, and Norway	-DH1	The Netherlands	-B31	United Kingdom	-031
France	-051	Russia	-251	United States	-001
Germany	-041	Saudi Arabia	-171		

# 6 Using Setup Utility (BIOS)

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

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

# **Starting Setup Utility (BIOS)**

- **CAUTION:** Use extreme care when making changes in Setup Utility (BIOS). Errors can prevent the computer from operating properly.
  - ▲ Turn on or restart the computer, quickly press esc, and then press f10.

## **Updating Setup Utility (BIOS)**

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

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

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

#### **Determining the BIOS version**

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

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

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

– or –

Click the question mark icon in the taskbar.

- 2. Select My PC, and then select Specifications.
- Setup Utility (BIOS)
  - 1. Start Setup Utility (BIOS) (see <u>Starting Setup Utility (BIOS) on page 64</u>).
  - 2. Select Main, select System Information, and then make note of the BIOS version.
  - 3. Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see <u>Downloading a BIOS update on page 65</u>.

### **Downloading a BIOS update**

- ▲ CAUTION: To reduce the risk of damage to the computer or an unsuccessful installation, download and install a BIOS update only when the computer is connected to reliable external power using the AC adapter. Do not download or install a BIOS update while the computer is running on battery power, docked in an optional docking device, or connected to an optional power source. During the download and installation, follow these instructions:
  - Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
  - Do not shut down the computer or initiate Sleep.
  - Do not insert, remove, connect, or disconnect any device, cable, or cord.

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

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

– or –

Click the question mark icon in the taskbar.

- 2. Click Updates, and then click Check for updates and messages.
- **3.** Follow the on-screen instructions.
- 4. At the download area, follow these steps:
  - **a.** Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
  - **b.** Follow the on-screen instructions to download your selection to the hard drive.

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

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

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

The BIOS installation begins.

- 5. Complete the installation by following the on-screen instructions.
- NOTE: After a message on the screen reports a successful installation, you can delete the downloaded file from your hard drive.

# 7 Using HP PC Hardware Diagnostics

### **Using HP PC Hardware Diagnostics Windows**

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 <u>Downloading HP PC Hardware Diagnostics</u> <u>Windows on page 66</u>.

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.
- 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**.
- 3. When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24digit Failure ID code is generated. For assistance in correcting the problem, contact support, and then provide the Failure ID code.

### **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 <u>http://www.hp.com/go/techcenter/pcdiags</u>. The HP PC Diagnostics home page is displayed.
- 2. In the HP PC Hardware Diagnostics section, select Download, and then select the installation location:

To run the tool on your computer, download it to the computer desktop.

– or –

To run the tool from a USB flash drive, download it to a USB flash drive.

3. Select Run.

# 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 (select products only), follow these steps:

- 1. Go to <u>http://www.hp.com/support</u>.
- 2. Select **Get software and drivers**, and then enter the product name or number.
- 3. In the HP PC Hardware Diagnostics section, select Download, and then select the installation location:

To run the tool on your computer, download it to the computer desktop.

– or –

To run the tool from a USB flash drive, download it to a USB flash drive.

4. Select Run.

### **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 flash drive where the .exe file was downloaded, doubleclick the .exe file, and then follow the on-screen instructions.

### **Using HP PC Hardware Diagnostics UEFI**

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 UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, 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.

### 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 <u>Downloading the latest HP PC Hardware Diagnostics UEFI version on page 68</u>.
- b. Hard drive
- c. BIOS
- 3. When the diagnostic tool opens, select the type of diagnostic test you want to run, and then follow the on-screen instructions.

### 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 <u>http://www.hp.com/go/techcenter/pcdiags</u>. The HP PC Diagnostics home page is displayed.
- 2. In the HP PC Hardware Diagnostics UEFI section, select Download UEFI Diagnostics, 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 <u>http://www.hp.com/support</u>.
- 2. Enter the product name or number, select your computer, and then select your operating system.
- 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 on Remote HP PC Hardware Diagnostics UEFI, go to <a href="http://www.hp.com/go/techcenter/pcdiags">http://www.hp.com/go/techcenter/pcdiags</a>, 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 <u>http://www.hp.com/go/techcenter/pcdiags</u>. The HP PC Diagnostics home page is displayed.
- In the HP PC Hardware Diagnostics UEFI section, 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 <u>http://www.hp.com/support</u>.
- 2. Select **Get software and drivers**, 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 **Remote UEFI** version for the product.

### Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

- Set a schedule for running diagnostics unattended. You can also start diagnostics immediately in interactive mode by selecting **Execute Remote HP PC Hardware Diagnostics**.
- Set the location for downloading the diagnostic tools. This feature provides access to the tools from the HP website or from a server that has been preconfigured for use. Your computer does not require the traditional local storage (such as a disk drive or USB flash drive) to run remote diagnostics.
- Set a location for storing the test results. You can also set the user name and password settings used for uploads.
- Display status information about the diagnostics run previously.

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

- **1.** Turn on or restart the computer, and when the HP logo appears, press **f10** to enter Computer Setup.
- 2. Select Advanced, and then select Settings.

- **3.** Make your customization selections.
- 4. Select Main, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

# 8 Backing up, restoring, and recovering

This chapter provides information about the following processes. The information in the chapter is standard procedure for most products.

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

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

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

– or –

Select the question mark icon in the taskbar.

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

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

### **Creating recovery media and backups**

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

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This
  step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall
  the original operating system in cases where the hard drive is corrupted or has been replaced. For
  information on creating recovery media, see <u>Creating HP Recovery media (select products only)</u>
  on page 71. For information on the recovery options that are available using the recovery media, see
  Using Windows tools on page 72.
- Use Windows tools to create system restore points and create backups of personal information.

For more information, see <u>Recovering using HP Recovery Manager on page 73</u>.

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

### Creating HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. From the **Start** menu, select **File Explorer**, and then select **This PC**.

If your computer does not list the Windows partition and the Recovery partition, you can obtain recovery
media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the
computer. You can also find contact information on the HP website. Go to <a href="http://www.hp.com/support">http://www.hp.com/support</a>,
select your country or region, and follow the on-screen instructions.

You can use Windows tools to create system restore points and create backups of personal information, see <u>Using Windows tools on page 72</u>.

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.
  - Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
  - HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
  - To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a highquality blank USB flash drive.
  - If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information on the HP website. Go to <a href="http://www.hp.com/support">http://www.hp.com/support</a>, select your country or region, and follow the on-screen instructions.
  - Be sure that the computer is connected to AC power before you begin creating the recovery media.
  - The creation process can take an hour or more. Do not interrupt the creation process.
  - If necessary, you can exit the program before you have finished creating all of the recovery DVDs.
     HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media:

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

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

2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see <u>Recovering using HP Recovery Manager on page 73</u>.

### **Using Windows tools**

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

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

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

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

### **Restore and recovery**

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

**IMPORTANT:** Not all methods are available on all products.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see the Get started app.
  - ▲ Select the **Start** button, and then select the **Get started** app.
- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option (select products only) of HP Recovery Manager to reinstall the individual application or driver.
  - ▲ Type recovery in the taskbar search box, select HP Recovery Manager, select Reinstall drivers and/or applications, and then follow the on-screen instructions.
- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see <u>Recovering using HP Recovery Manager on page 73</u>. If you have not already created recovery media, see <u>Creating HP Recovery media</u> (select products only) on page 71.
- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see <u>Recovering using HP Recovery Manager on page 73</u>.
- On select products, if you want to remove the Recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

For more information, see <u>Removing the HP Recovery partition (select products only) on page 76</u>.

### **Recovering using HP Recovery Manager**

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see <u>Creating HP Recovery media</u> (select products only) on page 71.

#### What you need to know before you get started

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided
  with this computer, you must either download the software from the manufacturer's website or reinstall
  the software from the media provided by the manufacturer.
- **IMPORTANT:** Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.
- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see <u>Creating HP Recovery media (select products only) on page 71</u>.
- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see <u>Creating HP Recovery media</u> (select products only) on page 71.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP

website. Go to <u>http://www.hp.com/support</u>, select your country or region, and follow the on-screen instructions.

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

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

- **NOTE:** Only the options available for your computer display when you start the recovery process.
  - System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
  - Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

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

### Using the HP Recovery partition (select products only)

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

To start HP Recovery Manager from the HP Recovery partition:

- **IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps (select products only).
  - 1. Type recovery in the taskbar search box, select **Recovery Manager**, and then select **HP Recovery Environment**.

– or –

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

For tablets without keyboards:

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

– or –

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

#### **Using HP Recovery media to recover**

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

- 1. If possible, back up all personal files.
- 2. Insert the HP Recovery media, and then restart the computer.
- **NOTE:** If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See <u>Changing the computer boot order on page 75</u>.
- **3.** Follow the on-screen instructions.

### Changing the computer boot order

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

To change the boot order:

- **IMPORTANT:** For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps.
  - 1. Insert the HP Recovery media.
  - 2. Access the system **Startup** menu.

For computers or tablets with keyboards attached:

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

For tablets without keyboards:

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

– or –

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

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

### Removing the HP Recovery partition (select products only)

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

IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see <u>Creating HP Recovery media</u> (select products only) on page 71.

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

Follow these steps to remove the HP Recovery partition:

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

# 9 Specifications

# **Computer specifications**

	Metric	U.S.	
Dimensions			
Length	234.0 mm	9.21 in	
Width	335.0 mm	13.19 in	
Height	19.9 mm	0.78 in	
Weight			
With solid-state drive or eMMC	1509.4 g	3.3 lbs	
With hard drive	1545.7 g	3.4 lbs	
With solid-state drive and hard drive	1554.0 g	3.43 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%	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.

### 35.6-cm (14.0-in) display specifications

	Metric	U.S.
Active diagonal size	35.6-cm	14.0-in
Resolution	FHD: 1920×1080	
	HD: 1366×768	
Surface treatment	Anti-glare	
	BrightView	
Brightness	220 nits	
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

	128-GB*	256-GB*	512-GB*
Height	1.35 mm	1.35 mm	1.35 mm
Weight	< 10 g	< 10 g	< 10 g
Form factor	M.2 2280-D2-B-M	M.2 2280-D2-B-M	M.2 2280-D2-B-M
Transfer rate	up to 540 MB/sec	up to 540 MB/sec	up to 540 MB/sec
Interface type	SATA-3	SATA-3	SATA-3
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms	< 1.0 ms
Access times, logical	0.1 ms	0.1 ms	0.1 ms
Total logical sectors	234,441,648	468,883,296	937,766,592
Operating temperature		0°C to 70°C (32°F to 158	3°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

	128-GB*	256-GB*	512-GB*
Dimensions			
Height	1 mm	1 mm	1 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	ATA-7	ATA-7	ATA-7
Transfer rate			
Sequential Read	Up to 520 MB/s	Up to 2150 MB/s	Up to 2150 MB/s
Random Read	Up to 60,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential Write	Up to 160 MB/s	Up to 1260 MB/s	Up to 1550 MB/s
Random Write	Up to 34,000 IOPs	Up to 100,000 IOPs	Up to 100,000 IOPs
Ready time, Maximum (to not busy)	1.0 s	1.0 s	1.0 s
Access times			
Logical	0.1 ms	0.1 ms	0.1 ms
Total logical sectors	250,069,680	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)	0° to 70°C (32°F to 158°F)
Non-operating	-40° to 95°C (-40°F to 203°F)	-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

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

**NOTE:** Certain restrictions and exclusions apply. Contact technical support for details.

# **10 Power cord set requirements**

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 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**

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
South Korea	EK	4

Country/region	Accredited agency	Applicable note number
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-mm<sup>2</sup> 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-mm<sup>2</sup> 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-mm<sup>2</sup> 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-mm<sup>2</sup> conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.

# 11 Recycling

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

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

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