HP ENVY x360 15m Convertible PC

Maintenance and Service Guide
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Product notice

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

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

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP ENVY x360 15m Convertible PC (model numbers 15m-bp0xx through 15m-bp1xx) HP ENVY x360 15 Convertible PC (model numbers 15-bp0xx through 15-bp1xx)
Processors	**For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:** • Intel® Core™ i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W) • Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W **For use on all computer models:** • Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W) • Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W
Chipset	Integrated soldered-on-circuit (SoC)
Graphics	**Hybrid graphics:** NVIDIA™ N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz) **Internal graphics:** Intel HD Graphics 620 graphics subsystem with UMA video memory Support for DX12, high-definition multimedia interface (HDMI), and HD decode (only on computer models equipped with graphics subsystems with discrete memory) Support for Optimus (only on computer models equipped with a graphics subsystem with discrete video memory) Support for GPU Performance Scaling (GPS, only on computer models equipped with a graphics subsystem with discrete video memory)
Panel	15.6-in, ultra high-definition (UHD), white light-emitting (WLED), BrightView (3840×2160), uslim-flat (2.6-mm), UWVA, eDP1.3+PSR, 340 nits, 16:9 ultra wide aspect ratio, color gummer 45%, narrow bezel, TouchScreen display assembly 15.6-in, full high-definition (FHD), WLED, BrightView (1920×1080), slim-flat (3.2-mm), UWVA, eDP, 220 nits, 16:9 ultra wide aspect ratio, color gummer 72%, narrow bezel, TouchScreen display assembly
Memory	**Computer models with model numbers 15m-bp1xx through 15-bp1xx:** Support for DDR4-2400 dual channel (8-GB DDR4 2666 SODIMM bridge to 8-GB DDR4 2400 1.2v SODIMM) One SODIMM memory module slot, non-customer-accessible/non-upgradable Support for 4-GB on-board system memory (512-MB×16×4pieces) Supports up to 16-GB of system memory in the following configurations: • 16384-MB (16384-MB × 1; 16-GB DDR4 2666 SODIMM bridge to 16-GB DDR4 2400 1.2v SODIMM; only available on computer models equipped with an Intel i7 processor and a graphics subsystem with UMA memory) • 12288-MB (8192-MB + 4096-MB on-board system memory [512-MB×16×4 pieces]; 8-GB DDR4 2666 SODIMM bridge to 8-GB DDR4 2400 1.2v SODIMM; not available on computer models equipped with an Intel i7 processor and a graphics subsystem with discrete memory)

Category	Description
Memory *(continued)*	• 8192-MB (4096-MB + 4096-MB on-board system memory [512-MB×16×4 pieces]; 8-GB DDR4 2666 SODIMM bridge to 8-GB DDR4 2400 1.2v SODIMM; only available on computer models equipped with an Intel i7 processor and a graphics subsystem with UMA memory) • 8192-MB (8192-MB × 1; 8-GB DDR4 2666 SODIMM bridge to 8-GB DDR4 2400 1.2v SODIMM; only available on computer models equipped with an Intel i7 processor and a graphics subsystem with UMA memory) **Computer models with model numbers 15m-bp0xx through 15-bp0xx:** Two SODIMM memory module slots, non-customer-accessible/non-upgradable DDR4-2133 dual channel support (DDR4-2400 downgrade to DDR4-2133) Supports up to 16-GB of system memory Supports the following configurations: • 16384-MB (8192-MB × 2) • 12288-MB (8192-MB + 4096-MB) • 8192-MB (8192-MB × 1 or 4096-MB × 2) • 4096-MB (4096-MB × 1)
Storage	Support for hard drive and solid-state drive **Hard drive:** Support for **6.35-cm** (2.5-in) hard drives in **7.0-** and **7.2-mm** (.28 in) and **9.5-mm** (.37 in) thicknesses (all hard drives use the same bracket) Support for Accelerometer hard drive protection Support for a 1-TB, 7200-rpm, 9.5-mm hard drive **Solid-state drive:** Support for the following solid-state drives: **For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:** • 512-GB, 2280, Peripheral Component Interconnect Express (PCIe), Non-Volatile Memory Express (NVMe) solid-state drive • 256-GB, 2280, PCIe, NVMe solid-state drive **For use on all computer models:** • 512-GB, 2280 M.2, PCIe-3×4, SuperSpeed (SS), Non-Volatile Memory Express (NVMe) solid-state drive with triple level cell (TLC) • 360-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC • 256-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC • 256-GB, 2280 M.2 SATA-3 solid-state drive with TLC • 128-GB, 2280 M.2 SATA-3 solid-state drive **Dual-storage configurations:** • 1-TB, 7200-rpm, 9.5-mm hard drive + 256-GB, PCIe, NVMe solid-state drive with TLC • 1-TB, 7200-rpm, 9.5-mm hard drive + 128-GB, M.2 SATA-3 solid-state drive with TLC • 1-TB, 7200-rpm, 9.5-mm hard drive + 128-GB, SATA-3 solid-state drive
Optical drive	HP external DVD±RW DL SuperMulti Drive
Audio and video	**Audio:** Bang & Olufsen

Category	Description
Audio and video *(continued)*	Support for Bang & Olufsen Audio Control Support for dual speakers Support for HP Audio Boost 2.0 (with discrete amplifier) **Camera:** HP Wide Vision FHD infrared camera with indicator light, 2 infrared lights, USB 2.0, FHD Hybrid BSI sensor, f2.2, wide dynamic range (WDR), 88° WFOV, 1080p by 30 frames per second Support for Windows Hello 3.0 **Microphones:** Dual array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software
Sensors	• Accelerometer (2: 1 for hard drive protection/CoolSense , 1 for display panel rotation detection to lock keyboard and ClickPad function; STMicro HP2DCTR×2) • Gyroscope / E-compass / Accelerometer (ST Micro HP9DS1TR) • Sensor hub (integrated in SoC)
Wireless	**WLAN:** Integrated wireless local area network (WLAN) options by way of wireless module Dual M.2/PCIe WLAN antennas built into display assembly Integrated wireless personal area network (PAN) supported by Bluetooth® 4.2 combo card Support for the Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) WLAN format Compatible with Miracast-certified devices
External media cards	Micro-Secure Digital (SD®) media reader slot
Ports	• AC Smart Pin adapter plug • Audio-out (headphone)/audio-in (microphone) combo jack • HDMI v1.4 supporting up to 1920×1080 @ 60Hz • USB 3.x ports (2) • USB Type-C port
Keyboard/pointing devices	Full-sized, backlit, island-style keyboard with numeric keypad ClickPad requirements: • ClickPad with image sensor • MultiTouch gestures enabled • Support for Modern TrackPad gestures • Taps enabled as default
Power requirements	Support for a 3-cell, 55-WHr, 4.8-AHr, Li-ion battery Support for the following AC adapters: • 90-W AC adapter (PFC, S-3P, 4.5-mm) • 65-W HP Smart AC adapter (non-PFC, 4.5-mm, with mount) • 65-W HP Smart AC adapter (non-PFC, 4.5-mm, with mount) • 45-W HP Smart AC adapter (non-PFC, 4.5-mm, with mount)

Category	Description
Power requirements *(continued)*	Support for a 1.00-m power cord with a C5 connector.
Operating system	**Preinstalled:** Windows 10 and Windows 10 Pro **For developed market (ML):** Windows 10 Home Plus ML **For emerging market (EM/SL):** Windows 10 Home Plus EM/SL **For China market:** CPPP Windows 10 Home High-End China Language Edition and CPPP Windows 10 Home China Lanaguage Edition
Serviceability	**End user replaceable part:** AC adapter

2 Getting to know your computer

Locating hardware

To find out what hardware is installed on the computer:

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

  A list displays all the devices installed on the computer.

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

Locating software

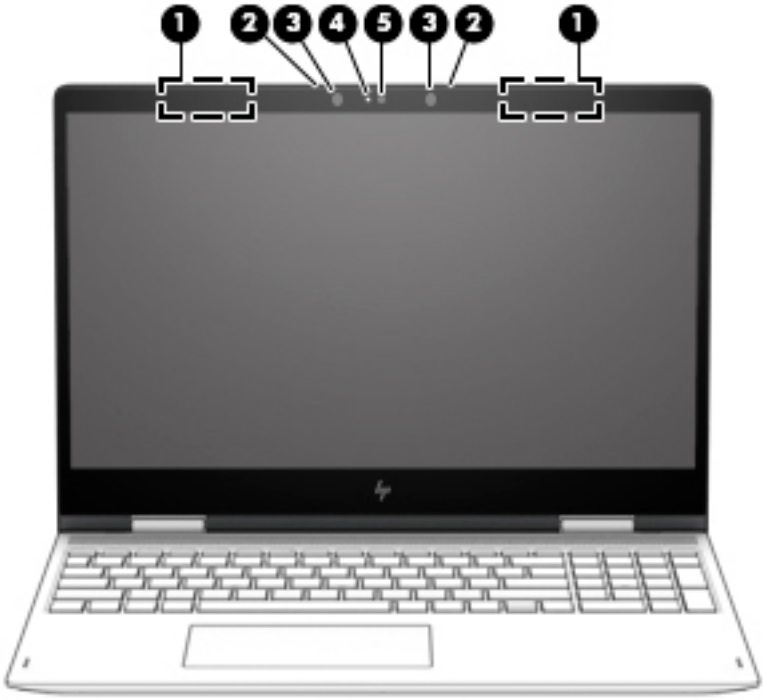
To find out what software is installed on your computer:

- Select the **Start** button.

  – or –

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

Display



Item	Component	Description
(1)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs.
(2)	Internal microphones (2)	Record sound.
(3)	Infrared camera lights (2)	On: The infrared camera is in use.
(4)	Camera light	On: The camera is in use.
(5)	Camera\Infrared camera	Allows you to video chat, record video, and record still images. Some cameras also allow a facial recognition login to Windows, instead of a password login. **NOTE:** The camera functions camera may vary depending on the type of camera and the software installed on the computer.

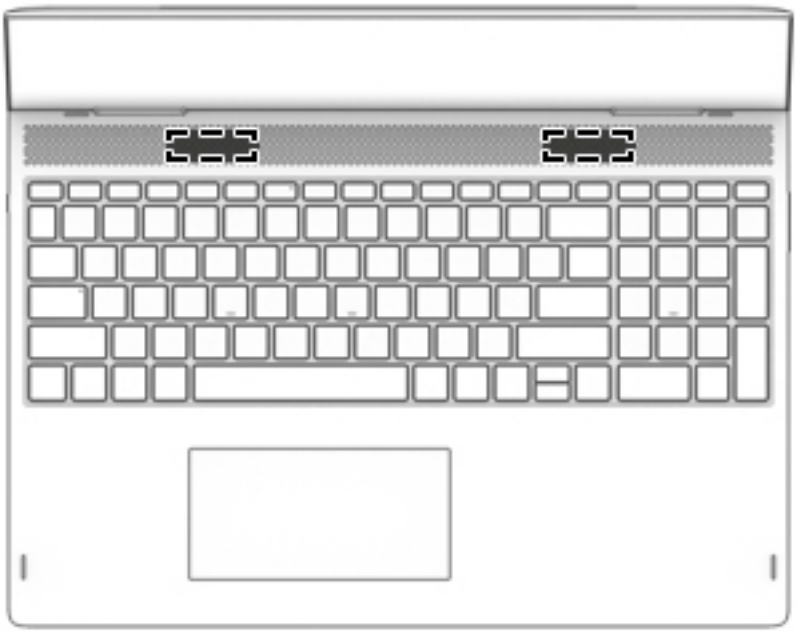
*The antennas are not visible from the outside of the computer, and antenna location varies. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

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

To access this guide:

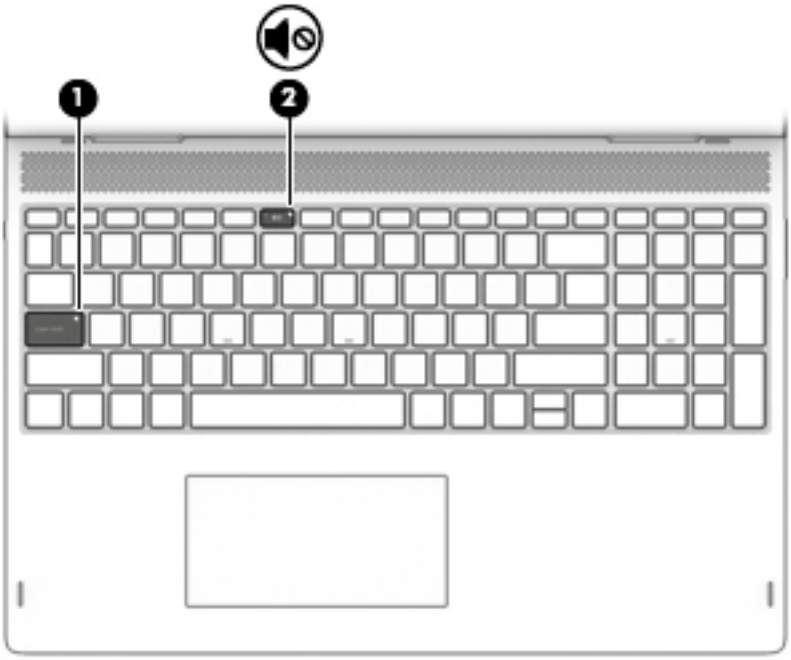
▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.

Speakers



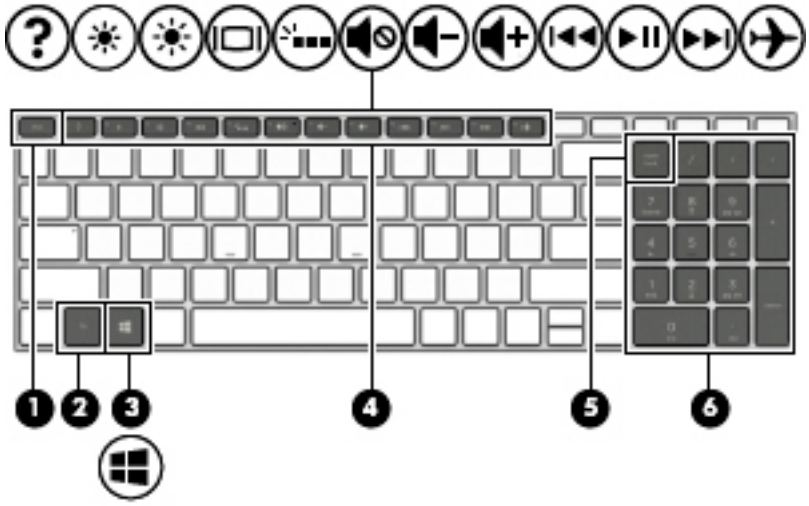
Component	Description
Speakers (2)	Produce sound.

Lights



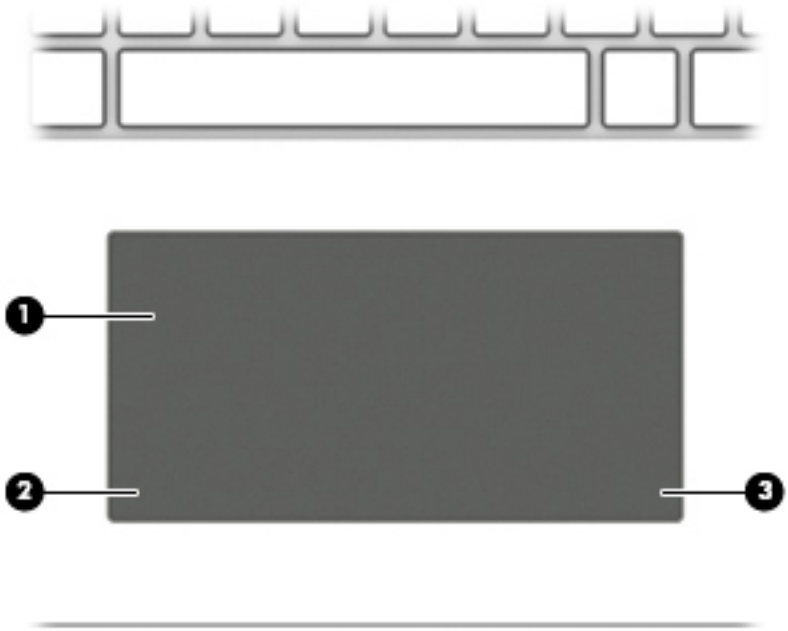
Item	Icon	Component	Description
(1)		Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)		Mute light	• On: Computer sound is off. • Off: Computer sound is on.

Special keys



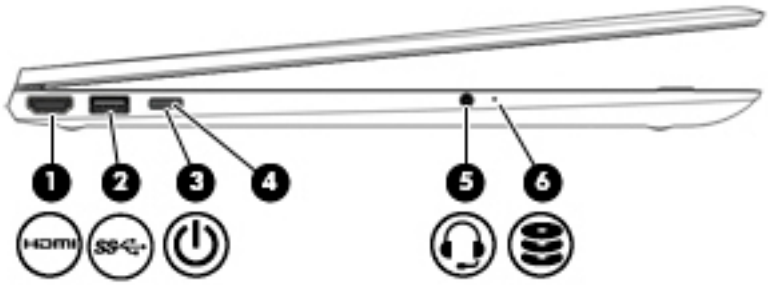
Item	Icon	Component	Description
(1)		esc key	Displays system information when pressed in combination with the fn key.
(2)		fn key	Executes specific functions when pressed in combination with another key.
(3)		Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the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

ClickPad



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

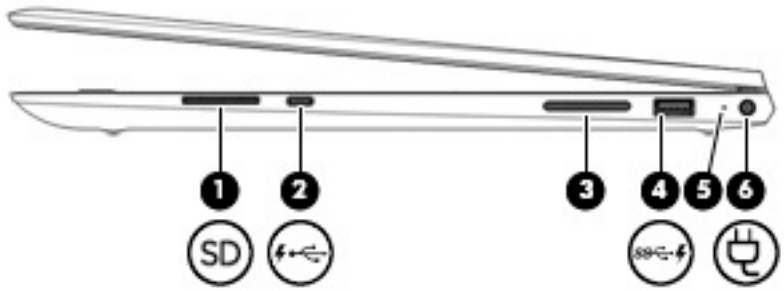
Left side



Item	Icon	Component	Description
(1)		HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or an HDMI device.
(2)		USB 3.x SuperSpeed port	Connects USB devices, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(3)		Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep mode, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer. To learn more about power settings, see power options. ▲ Type `power` in the taskbar search box, and then select **Power & sleep settings**. – or – Right click the **Start** button, and then select **Power Options**.
(4)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts power off to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(5)		Audio-out (headphone)/Audio-in (microphone) 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 devices.

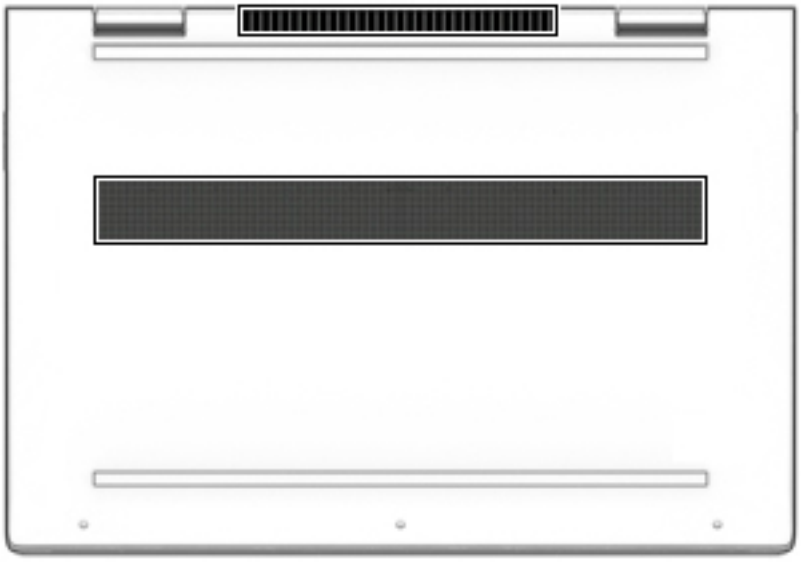
Item	Icon	Component	Description
(5)		Audio-out (headphone)/Audio-in (microphone) jack *(continued)*	**WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Select the **Start** menu, select **HP Help and Support**, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.
(6)		Drive light	Blinking white: The hard drive is being accessed. Amber: HP 3D DriveGuard has temporarily parked the hard drive.

Right side



Item	Icon	Component	Description
(1)	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 the connectors facing the computer. 2. Insert the card into the memory card reader, and then press the card until it is firmly seated. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.
(2)		USB Type-C port with HP Sleep and Charge	Connects a USB device that has a Type-C connector, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch. – or – Connects to various USB, video, HDMI, and LAN devices. **NOTE:** Cables and/or adapters (purchased separately) may be required.
(3)		Volume button	Controls speaker volume on the computer.
(4)		USB 3.x port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(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)		Power connector	Connects an AC adapter.

Bottom



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

3 Illustrated parts catalog

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

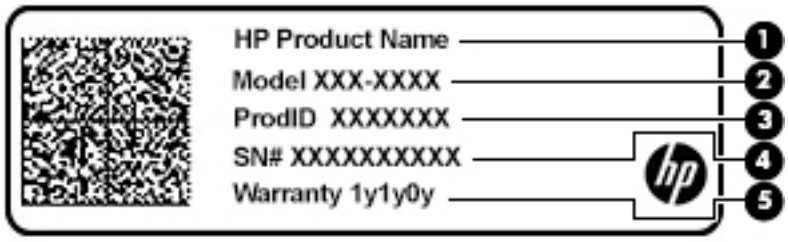
Labels

The labels affixed to the computer provide information that may be needed when troubleshooting system problems or travelling internationally with the computer.

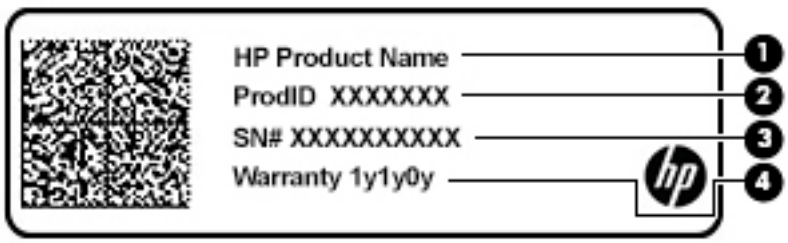
IMPORTANT: Check the following locations for the labels described in this section: the bottom of the computer, inside the battery bay, under the service door, on the back of the display, or on the bottom of a tablet kickstand.

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

  Your service label will resemble one of the examples shown below. Refer to the illustration that most closely matches the service label on your computer.

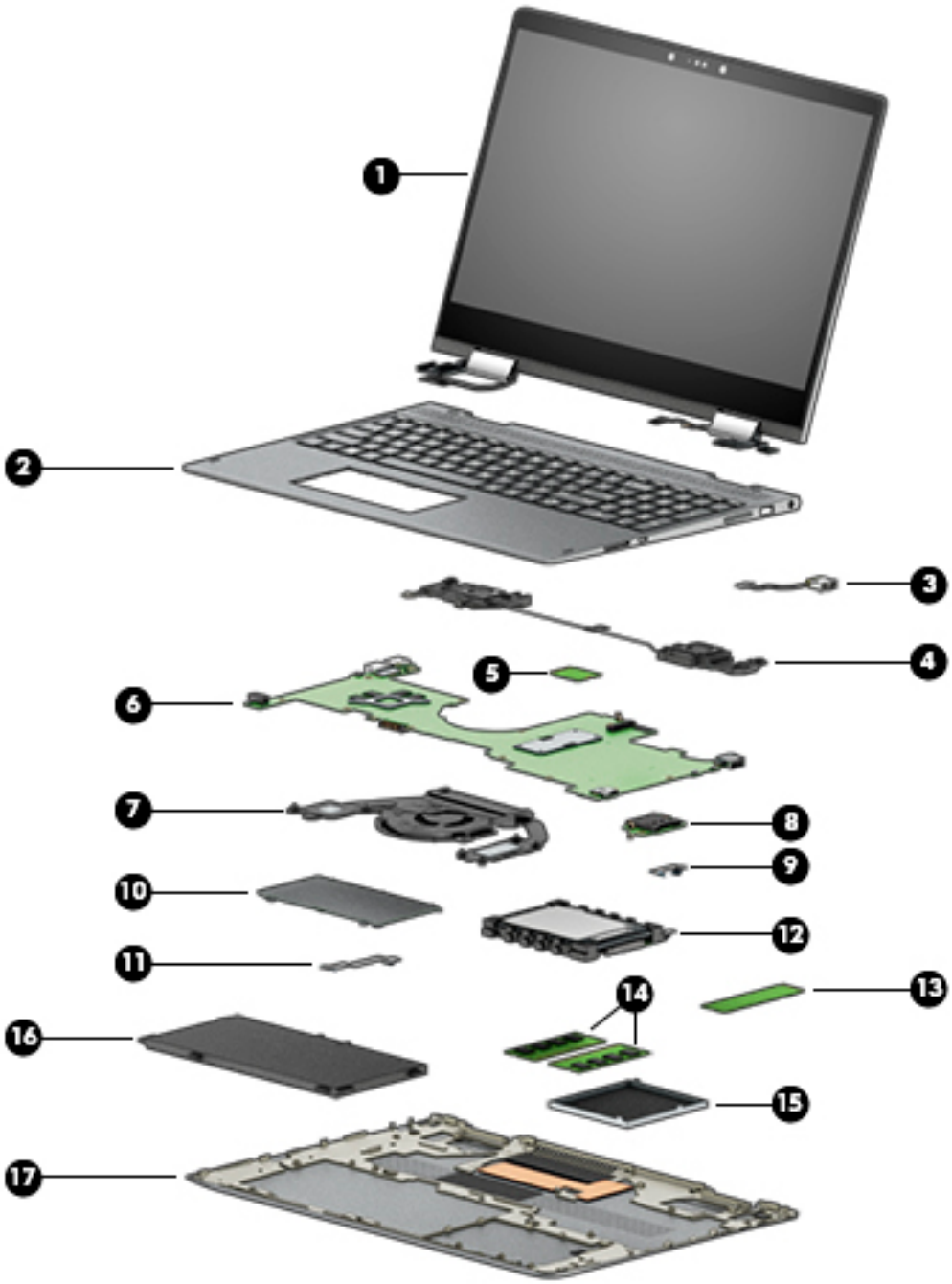


Component	
(1)	HP product name (select products only)
(2)	Model number
(3)	Product number
(4)	Serial number
(5)	Warranty period



Component	
(1)	HP product name (select products only)
(2)	Product number
(3)	Serial number
(4)	Warranty period

Computer components



Item	Component	Spare part number
(1)	**Display assembly**: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly components on page 22.	
(2)	**Keyboard/top cover in natural silver finish** (includes backlight cable and keyboard cable):	
	For use only on computer models equipped with a graphics subsystem with discrete video memory:	
	For use in Belgium	924353-A41

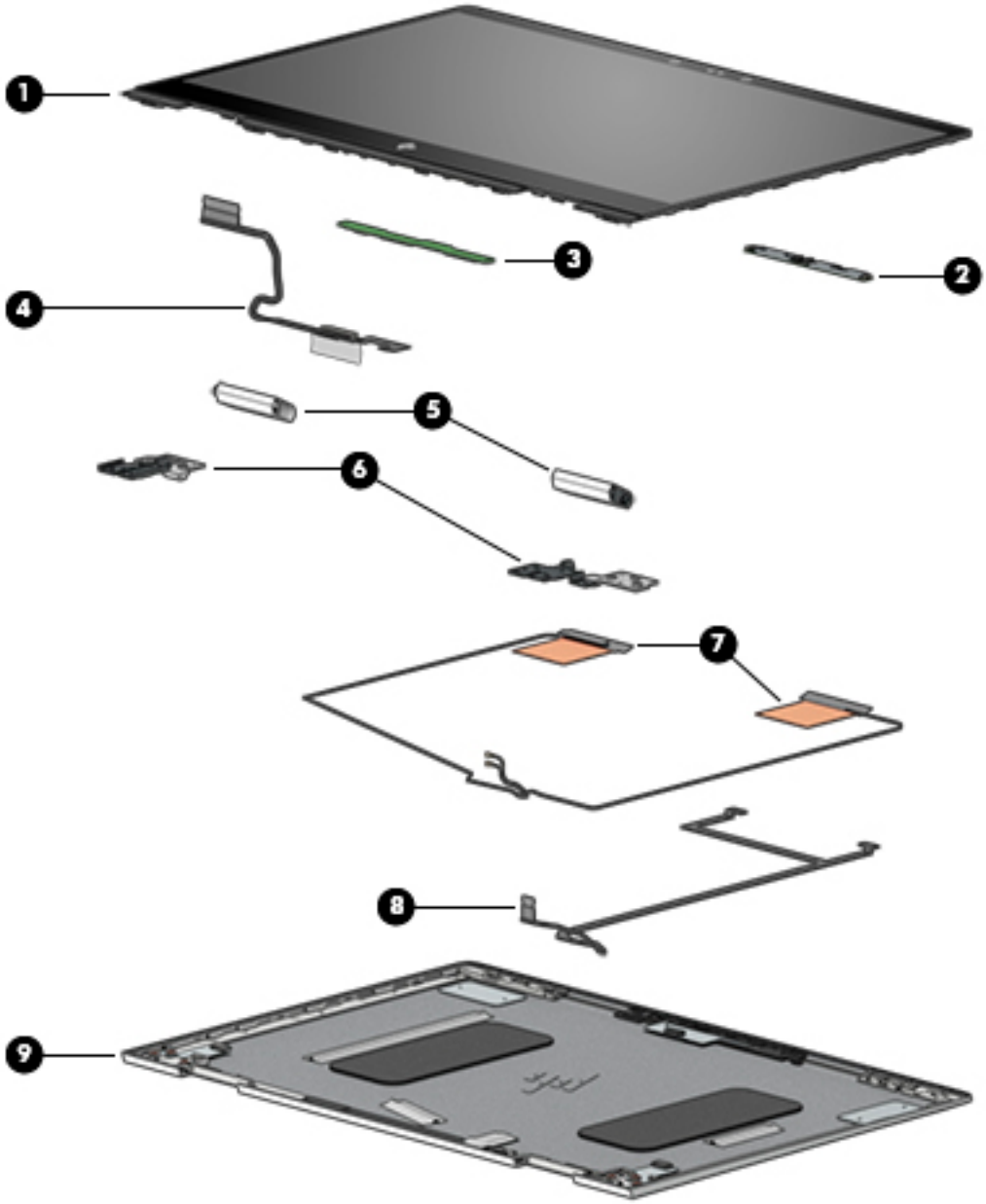
Item	Component	Spare part number
	For use in Canada	924353-DB1
	For use in the Czech Republic and Slovakia	924353-FL1
	For use in Denmark, Finland, and Norway	924353-DH1
	For use in France	924353-051
	For use in Germany	924353-041
	For use in Hungary	924353-211
	For use in Italy	924353-061
	For use in the Netherlands	924353-B31
	For use in Portugal	924353-131
	For use in Russia	924353-251
	For use in Saudi Arabia	924353-171
	For use in Spain	924353-071
	For use in Switzerland	924353-BG1
	For use in Turkey	924353-141
	For use in the United Kingdom	924353-031
	For use in the United States	924353-001
	For use only on computer models equipped with a graphics subsystem with UMA video memory:	
	For use in Belgium	934640-A41
	For use in Canada	934640-DB1
	For use in the Czech Republic and Slovakia	934640-FL1
	For use in Denmark, Finland, and Norway	934640-DH1
	For use in France	934640-051
	For use in Germany	934640-041
	For use in Hungary	934640-211
	For use in Italy	934640-061
	For use in the Netherlands	934640-B31
	For use in Portugal	934640-131
	For use in Russia	934640-251
	For use in Saudi Arabia	934640-171
	For use in Spain	934640-071
	For use in Switzerland	934640-BG1
	For use in Thailand	934640-281
	For use in Turkey	934640-141
	For use in the United Kingdom	934640-031

Item	Component	Spare part number
	For use in the United States	934640-001
(3)	**Power connector cable**	933523-001
(4)	**Speakers** (includes cables and four rubber isolators)	924343-001
(5)	**Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) WLAN module**	901229-855
(6)	**System board** (includes processor and replacement thermal material):	
	For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:	
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and the Windows 10 operating system	935001-601
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and a non-Windows operating system	935001-001
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	934998-601
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	934998-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and the Windows 10 operating system	935000-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and a non-Windows operating system	935000-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	934999-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	934999-001
	For use on all computer models:	
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	924311-601
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	924311-001
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	924309-601

Item	Component	Spare part number
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	924309-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	924310-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	924310-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	924308-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	924308-001
(7)	**Fan/heat sink assembly** (includes replacement thermal material):	
	For use only on computer models equipped with an Intel Core i7-8550U or Intel Core i5-8250U processor and a graphics subsystem with discrete memory	936170-001
	For use only on computer models equipped with an Intel Core i7-8550U or Intel Core i5-8250U processor and a graphics subsystem with UMA memory	936169-001
	For use only on computer models equipped with an Intel Core i7-7500U or Intel Core i5-7200U processor and a graphics subsystem with discrete memory	924349-001
	For use only on computer models equipped with an Intel Core i7-7500U or Intel Core i5-7200U processor and a graphics subsystem with UMA memory	924348-001
(8)	**SD card board** (includes memory card reader; does not include cable):	
	For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx equipped with a graphics subsystem with discrete memory	L01821-001
	For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx equipped with a graphics subsystem with UMA memory	L01917-001
	For use only on computer models with model numbers 15m-bp0xx through 15-bp0xx	924336-001
(9)	**SD card board cable** (includes double-sided adhesive)	924325-001
(10)	**ClickPad** (does not include ClickPad bracket or ClickPad cable):	
	For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx	L00656-001
	For use only on computer models with model numbers 15m-bp0xx through 15-bp0xx	924354-001
	ClickPad bracket (not illustrated)	924352-001
(11)	**ClickPad cable** (includes double-sided adhesive)	924351-001
(12)	**1-TB, 7200-rpm, SATA, 9.5-mm hard drive** (does not include hard drive bracket or hard drive cable)	766457-857
	NOTE: The hard drive bracket is available using spare part number 924350-001. The hard drive cable is available using spare part number 924326-001.	
(13)	**Solid-state drive:**	

Item	Component	Spare part number
	For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:	
	512-GB, 2280, PCIe, NVMe solid-state drive	L01301-002
	256-GB, 2280, PCIe, NVMe solid-state drive	L01300-002
	For use on all computer models:	
	512-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC	847110-015
	360-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC	917818-002
	256-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC	847109-018
	256-GB, 2280 M.2, SATA-3 with solid-state drive TLC	759848-028
	256-GB, 2280 M.2, SATA-3 solid-state drive	827560-038
	Solid-state drive gasket (not illustrated)	936448-001
(14)	**Memory modules** (2, SODIMM, DDR4-2400, 1.2-V):	
	8-MB	862398-855
	4-MB	862397-855
(15)	**Memory module shield**	924355-001
(16)	**Battery** (3-cell, 55-WHr, 4.8-AHr, Li-ion)	916814-855
(17)	**Bottom cover:**	
	For use only on computer models equipped with a graphics subsystem with discrete memory	924345-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	934639-001
	Rubber Foot Kit (not illustrated, includes bottom cover rear foot strip)	924891-001

Display assembly components



Item	Component	Spare part number
(1)	**Display panel assembly** (includes display panel and display bezel):	
	15.6-in, UHD, WLED, BrightView (3840×2160), UWVA, ultraslim-flat (2.6-mm), eDP1.3+PSR TouchScreen display panel assembly	924357-001
	15.6-in, FHD, WLED, BrightView (1920×1080), UWVA, slim-flat (3.2-mm), eDP1.3 TouchScreen display panel assembly	925736-001
(2)	**Webcam/microphone module** (includes double-sided adhesive)	933520-001
(3)	**Touchscreen control board** (includes double-sided adhesive)	932790-001
(4)	**Display panel cable** (includes TouchScreen control board cable):	

Item	Component	Spare part number
	For use only on computer models equipped with a UHD display assembly	924346-001
	For use only on computer models equipped with an FHD display assembly	924323-001
(5)	**Hinge covers** (2):	
	Left hinge cover	924331-001
	Right hinge cover	924332-001
(6)	**Hinges** (2, include left and right display hinges)	925202-001
(7)	**Wireless Antenna Kit** (includes left and right wireless antenna cables and transceivers)	924307-001
(8)	**Webcam/microphone module cable** (includes double-sided adhesive)	924324-001
(9)	**Display back cover** (includes rubber padding and shielding)	924344-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:	
90-W AC adapter (PFC, S-3P, 4.5-mm)	710413-001
For use on all computer models:	
65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm)	913691-850
65-W HP Smart AC adapter (non-PFC, 4.5-mm, with mount)	854117-850
45-W HP Smart AC adapter (non-PFC, 4.5-mm, with mount)	854116-850
HP external DVD±RW DL SuperMulti Drive	747080-00
HP HDMI-to-VGA adapter	701943-001
HP USB-to-Gigabit RJ45 adapter	829941-001
HP USB Type-C adapter:	
USB Type-C–to–HDMI adapter	831752-001
USB Type-C–to–HDMI 2.0 adapter	935325-001
USB Type-C–to–MultiPort hub	919666-001
USB Type-C–to–RJ45 adapter	855560-001
USB Type-C–to–USB Type-A dongle	833960-001
USB Type-C–to–USB Type-A hub	916838-001
USB Type-C–to–VGA adapter	831751-001
Power cord (C5 connector, 1.00-m):	
For use in Australia	213356-013
For use in Denmark	213353-013

Component	Spare part number
For use in Europe	213350-014
For use in North America	213349-015
For use in South Africa	361240-007
For use in Switzerland	213354-013
For use in the United Kingdom	213351-013
Power cord (C5 connector, Tag Prm, 1.00-m):	
For use in Australia	920689-011
For use in Denmark	920689-007
For use in Europe	920689-005
For use in North America	920689-001
For use in the People's Republic of China	920689-014
For use in South Africa	920689-010
For use in Switzerland	920689-009
For use in the United Kingdom	920689-006
Rubber Foot Kit (includes bottom cover rear foot strip)	924891-001
Screw Kit	924359-001
Stylus pen (active)	910942-001

4 Removal and replacement preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

After removing drive, place it in a static-proof bag.

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screw drivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures

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

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

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

Component replacement procedures

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

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

There are as many as 55 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
For use only on computer models equipped with a graphics subsystem with discrete memory	924345-001
For use only on computer models equipped with a graphics subsystem with UMA memory	934639-001

Before disassembling the computer, follow these steps:

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

Remove the bottom cover:

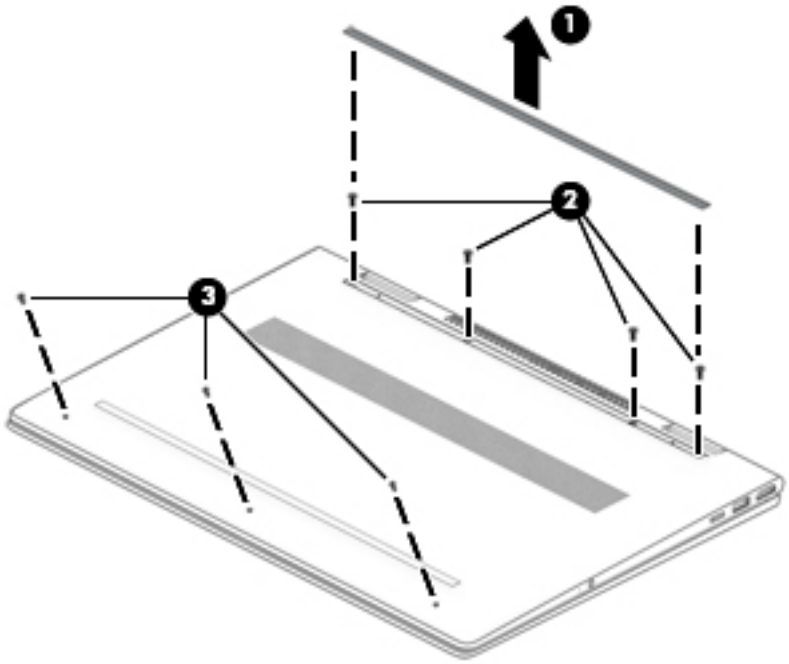
1. Remove the computer rear rubber foot strip **(1)**.

   The rubber foot is included in the Rubber Foot Kit, spare part number 924891-001.

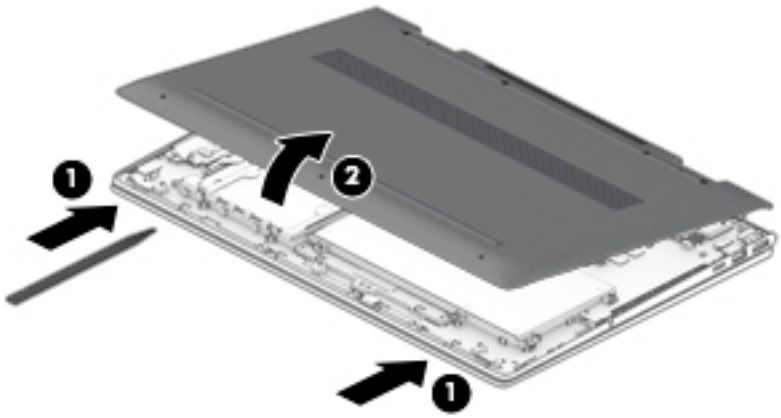
2. Remove the following screws that secure the bottom cover to the computer:

   (2) Four Torx5 M2.5×6.7 screws under the rear rubber foot strip

   (3) Three Phillips PM2.0×5.2 screws on the front edge



3. Insert a case utility tool **(1)** or similar thin, plastic tool between the front edge of the bottom cover and the keyboard/top cover.
4. Remove the bottom cover **(2)**.



Reverse this procedure to install the bottom cover.

Battery

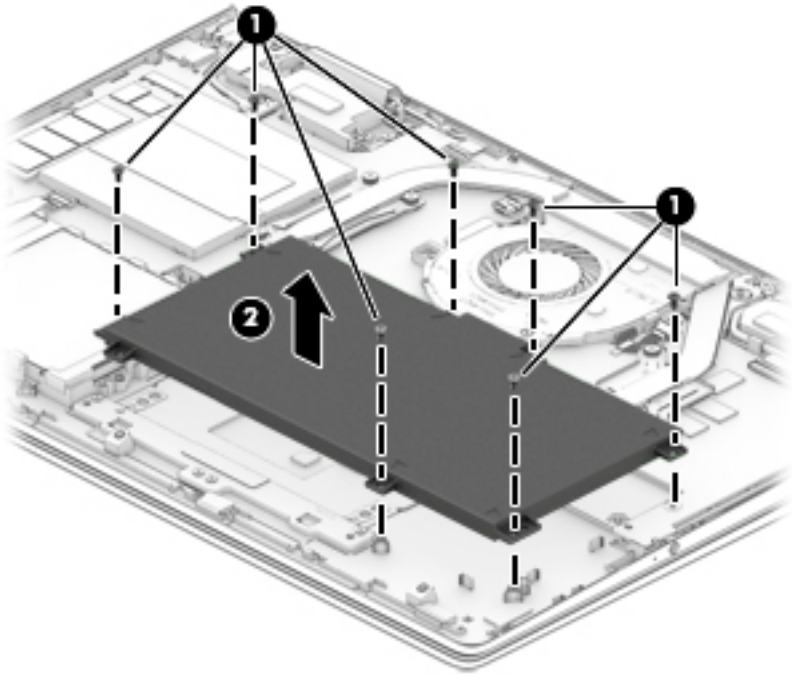
Description	Spare part number
3-cell, 55-WHr, 4.8-AHr, Li-ion battery	916814-855

Before removing the battery, follow these steps:

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

Remove the battery:

1. Remove the seven Phillips PM2.0×4.7 screws **(1)** that secure the battery to the keyboard/top cover.
2. Remove the battery **(2)**.



Reverse this procedure to install the battery.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive bracket or the hard drive cable. The hard drive bracket is available using spare part number 924350-001. The hard drive cable is available using spare part number 924326-001.

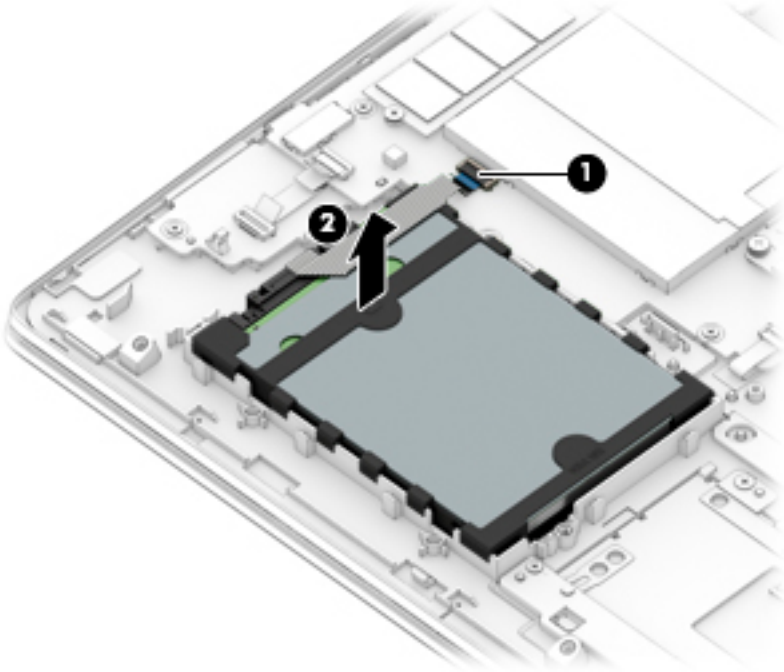
Description	Spare part number
1-TB, 7200-rpm, SATA, 9.5-mm hard drive	766457-857

Before removing the hard drive, follow these steps:

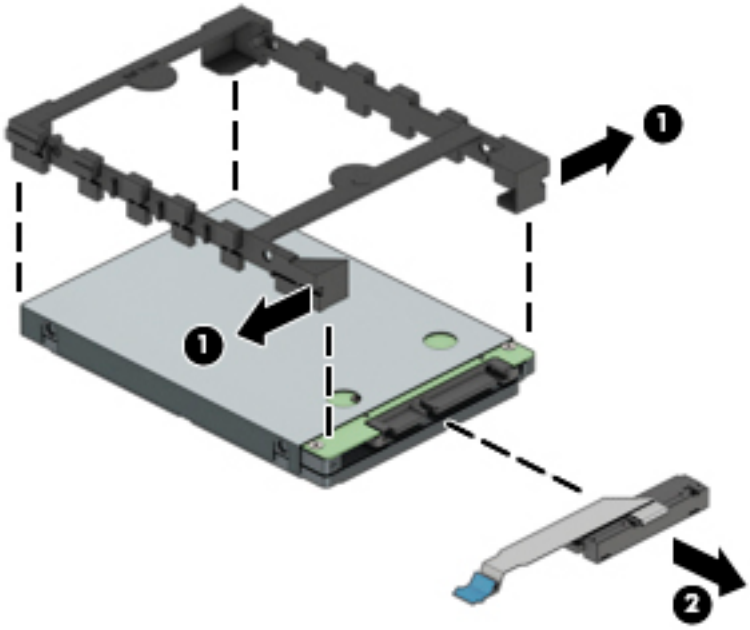
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

Remove the hard drive:

1. Release the zero insertion force (ZIF) connector **(1)** to which the hard drive cable is connected, and then disconnect the hard drive cable from the system board.
2. Use the tab built into the hard drive rubber sleeve to remove the hard drive **(2)**.



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



Reverse this procedure to reassemble and install the hard drive.

Solid-state drive

Description	Spare part number
For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:	
512-GB, 2280, PCIe, NVMe solid-state drive	L01301-002
256-GB, 2280, PCIe, NVMe solid-state drive	L01300-002
For use on all computer models:	
512-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC	847110-015
360-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC	917818-002
256-GB, 2280 M.2, PCIe3×4, SS, NVMe solid-state drive with TLC	847109-018
256-GB, 2280 M.2, SATA-3, with solid-state drive TLC	759848-028
128-GB, 2280 M.2, SATA-3 solid-state drive	827560-038

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

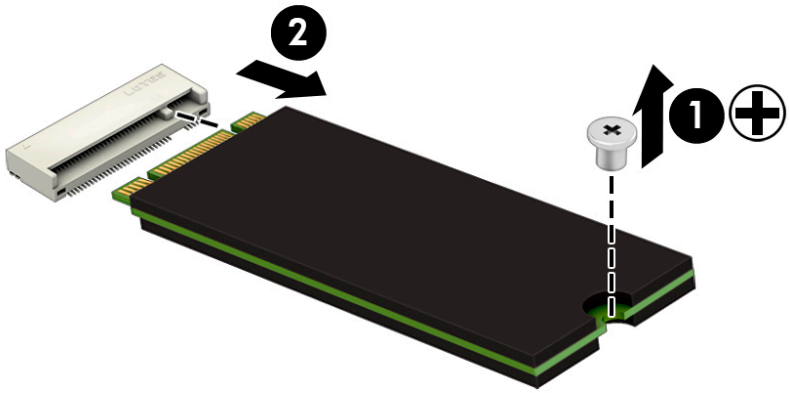
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord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

4. Remove the bottom cover (see Bottom cover on page 30).
5. Remove the battery (see Battery on page 32).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×2.4 broad head screw **(1)** that secures the solid-state drive to the system board.
2. Remove the solid-state drive **(2)** by pulling it away from the connector.

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



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

Memory module

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

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

Update BIOS before adding memory modules

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

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

To update BIOS:

1. Navigate to www.hp.com.
2. Click **Support & Drivers**, and then click **Drivers & Software**.
3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.

4. Click the link for the computer model.
5. Select the operating system, and then click **Next**.
6. Under **Step 2: Select a Download**, click the **BIOS** link.
7. Click the link for the most recent BIOS.
8. Click the **Download** button, and then follow the on-screen instructions.

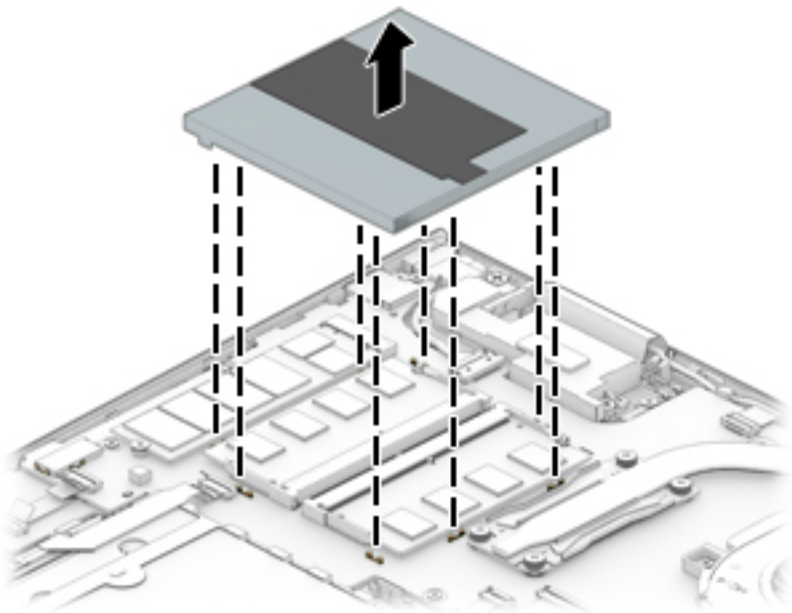
Before removing the memory module, follow these steps:

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

Remove the memory module:

1. Remove the memory module shield.

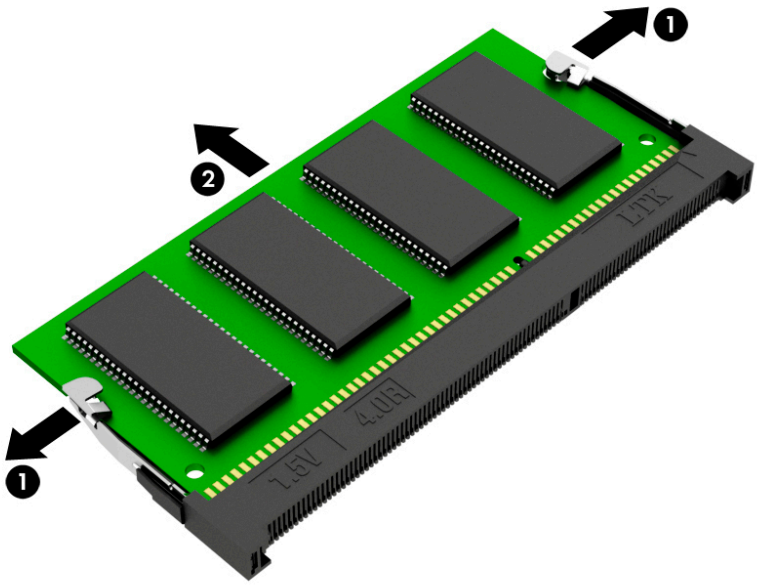
   The memory module shield is available using spare part number 924355-001.



2. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

3. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

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



Reverse this procedure to install a memory module.

SD card board cable

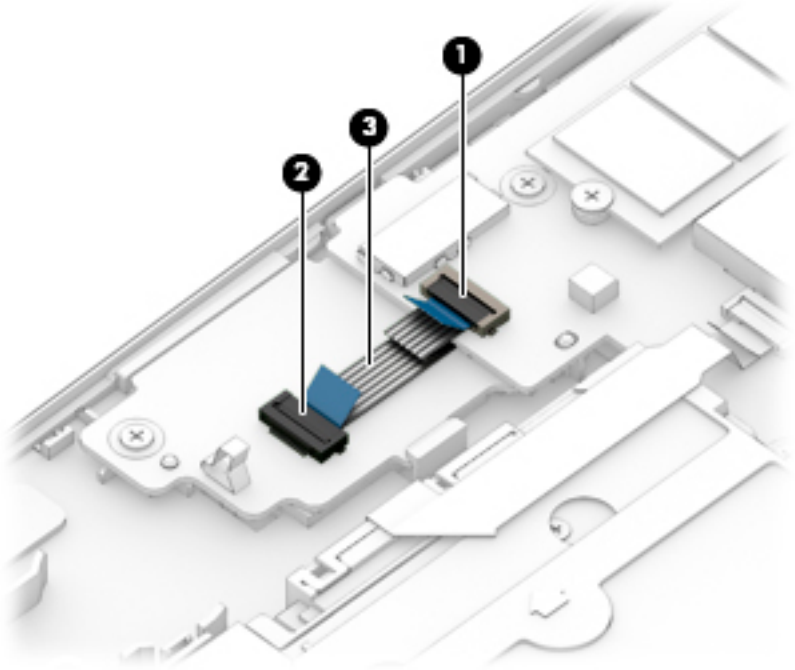
NOTE: The SD card board spare part kit does not include the SD card board cable. The SD card board cable is available using spare part number 924325-001.

Before removing the SD card board cable, follow these steps:

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

Remove the SD card board cable:

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



4. Remove the SD card board cable.

Reverse this procedure to install the SD card board cable.

ClickPad cable

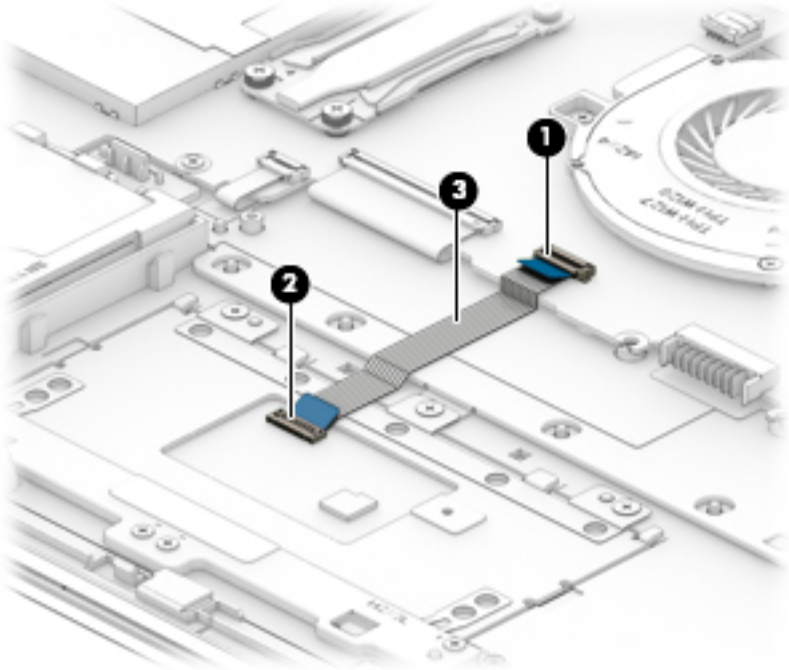
NOTE: The ClickPad spare part kit does not include the ClickPad cable. The ClickPad cable is available using spare part number 924351-001.

Before removing the ClickPad cable, follow these steps:

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

Remove the ClickPad cable:

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



4. Remove the ClickPad cable.

Reverse this procedure to install the ClickPad cable.

ClickPad

NOTE: The ClickPad spare part kit does not include the ClickPad bracket or ClickPad cable. The ClickPad bracket is available using spare part number 924352-001. The ClickPad cable is available using spare part number 924351-001.

Description	Spare part number
For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx	L00656-001
For use only on computer models with model numbers 15m-bp0xx through 15-bp0xx	924354-001

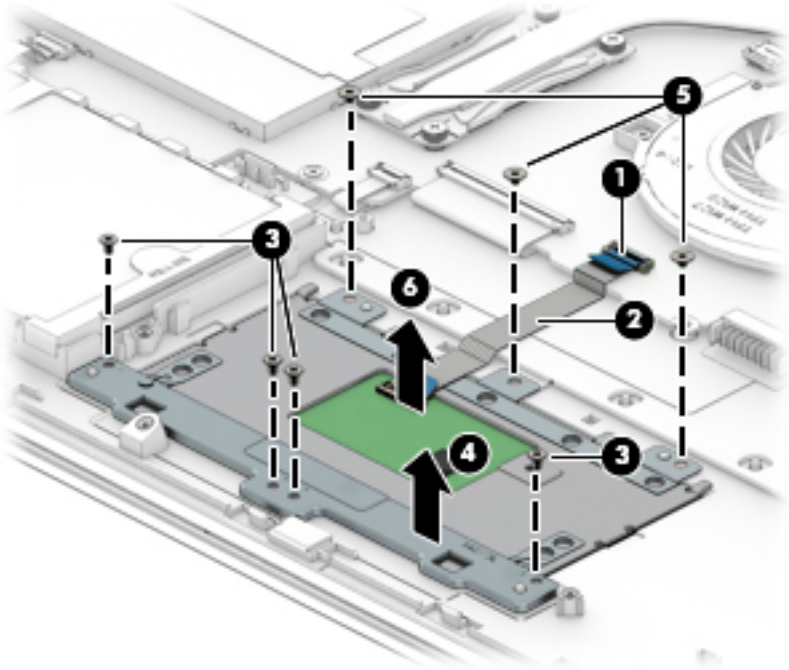
Before removing the ClickPad, follow these steps:

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

Remove the ClickPad:

1. Release the ZIF connector **(1)** to which ClickPad cable is connected, and then disconnect the ClickPad cable from the system board.
2. Detach the ClickPad cable **(2)** from the keyboard/top cover. (The ClickPad cable is attached to the keyboard/top cover with double-sided adhesive.)
3. Remove the four Phillips PM2.0×3.4 **(3)** that secure the ClickPad bracket to the keyboard/top cover.
4. Remove the ClickPad bracket **(4)**.
5. Remove the three Phillips PM2.0×2.2 broad head screws **(5)** that secure the ClickPad to the keyboard/top cover.

6. Remove the ClickPad **(6)**.



Reverse this procedure to install the ClickPad.

System board

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

Description	Spare part number
For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx:	
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and the Windows 10 operating system	935001-601
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and a non-Windows operating system	935001-001
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	934998-601
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	934998-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and the Windows 10 operating system	935000-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N17S-G1 (GeForce MX150) graphics subsystem with up to 4096-	935000-001

Description	Spare part number
MB of discrete video memory (512-MB×16 GDDR3×4 pieces, 1.35-V/3-GHz), and a non-Windows operating system	
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	934999-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.40-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	934999-001
For use on all computer models:	
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	924311-601
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	924311-001
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	924309-601
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	924309-001
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	924310-601
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	924310-001
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	924308-601
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	924308-001

Before removing the system board, follow these steps:

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

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

- Memory module (see Memory module on page 35)
- Fan/heat sink assembly (see Fan/heat sink assembly on page 45)
- WLAN module (see WLAN module on page 49)

Remove the system board:

1. Disconnect the following cables from the system board:

   (1) Power connector cable

   (2) WLAN antenna cables

   NOTE: The #1/white WLAN antenna cable connects to the WLAN module "#1/Main" terminal. The #2/black WLAN antenna cable connects to the WLAN module "#2/Aux" terminal.

   (3) Webcam/microphone module ZIF connector cable

   (4) Display panel ZIF connector cable

   (5) Speaker cable

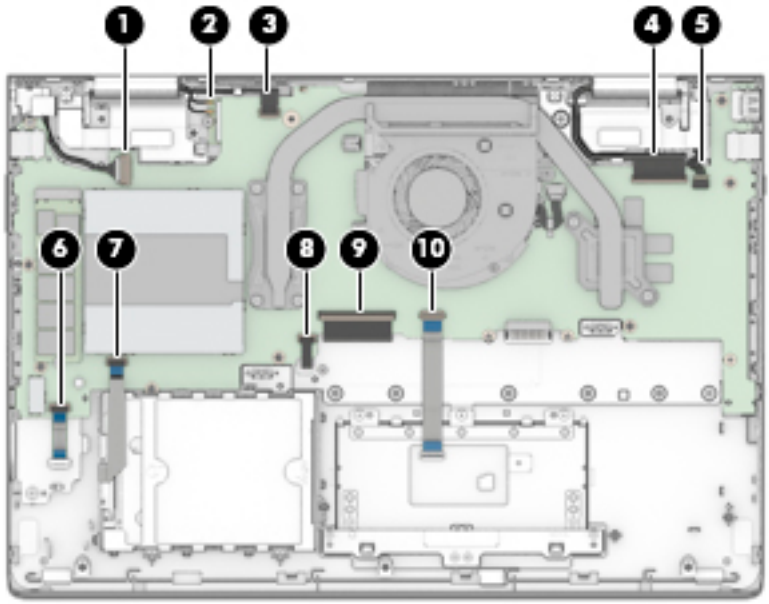
   (6) SD card board ZIF connector cable

   (7) Hard drive ZIF connector cable

   (8) Backlight ZIF connector cable

   (9) Keyboard ZIF connector cable

   (10) ClickPad ZIF connector cable

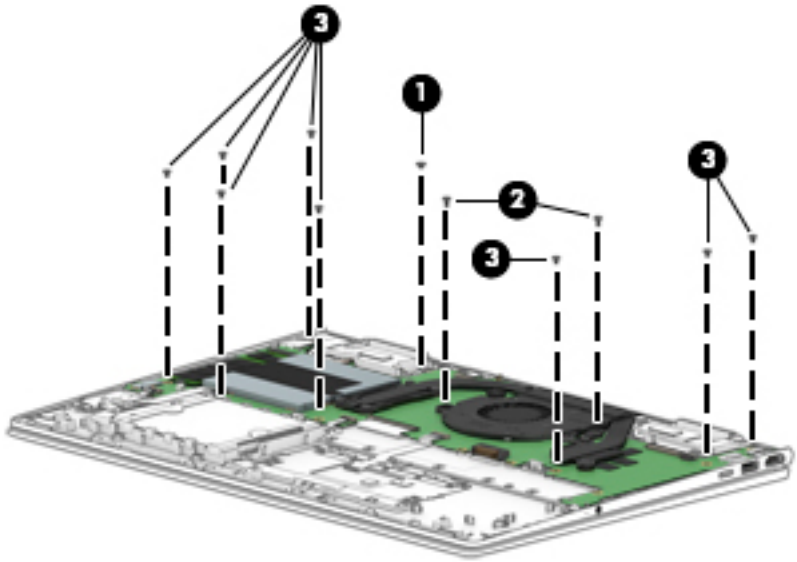


2. Remove the following screws:

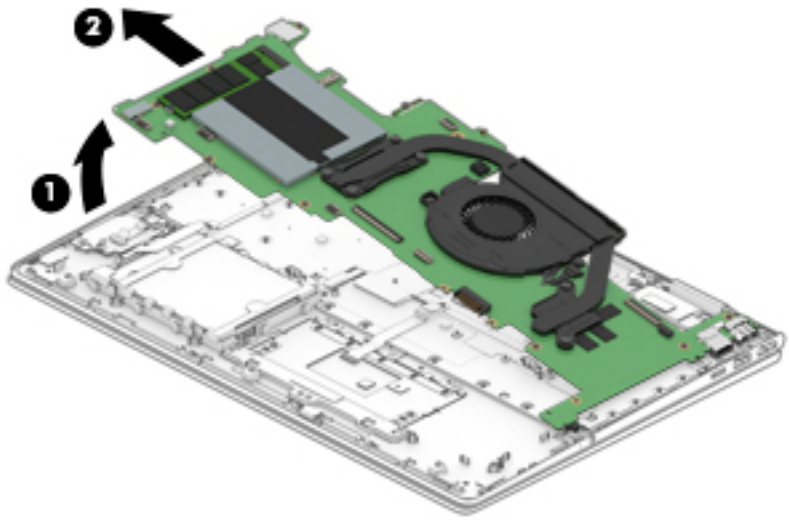
   (1) One Phillips PM2.0×2.2 broad head screw that secures the WLAN module to the keyboard/top cover

   (2) Two Phillips PM2.0×4.6 screws that secure the system board to the keyboard/top cover

   (3) Eight Phillips PM2.0×3.3 screws that secure the system board to the keyboard/top cover



3. Lift the left side of the system board **(1)** until it rests at an angle.
4. Remove the system board **(2)** by sliding it up and to the left at an angle.



Reverse this procedure to install the system board.

Fan/heat sink assembly

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

Description	Spare part number
For use only on computer models equipped with an Intel Core i7-8550U or Intel Core i5-8250U processor and a graphics subsystem with discrete memory	936170-001
For use only on computer models equipped with an Intel Core i7-8550U or or Intel Core i5-8250U processor and a graphics subsystem with UMA memory	936169-001
For use only on computer models equipped with an Intel Core i7-7500U or Intel Core i5-7200U processor and a graphics subsystem with discrete memory	924349-001
For use only on computer models equipped with an Intel Core i7-7500U or Intel Core i5-7200U processor and a graphics subsystem with UMA memory	924348-001

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

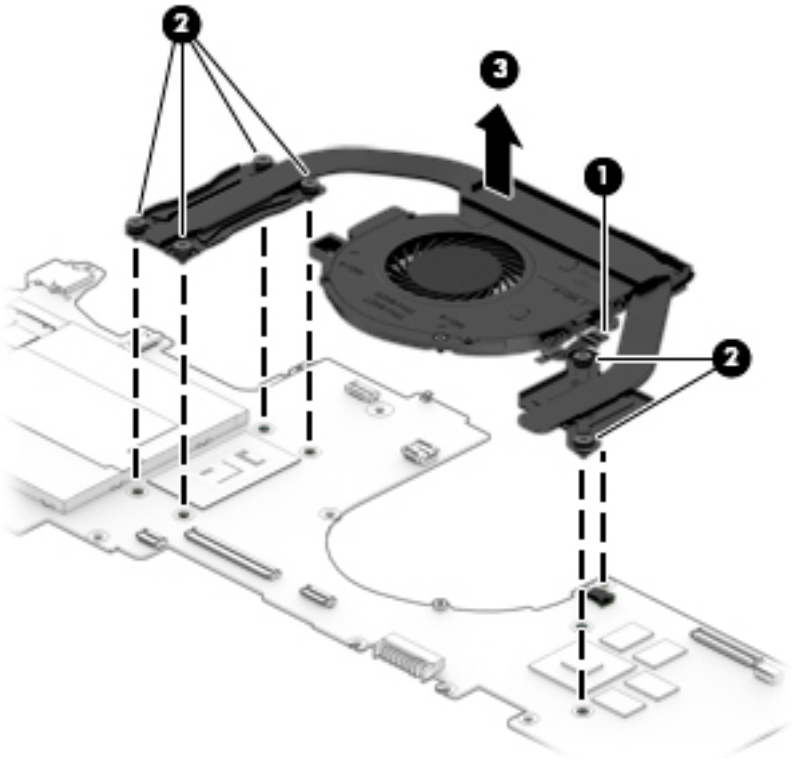
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 30).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 41).

Remove the fan/heat sink assembly:

NOTE: Steps 1 through 3 apply to computer models equipped with a graphics subsystem with discrete memory. See Steps 4 through 6 for fan/heat sink assembly removal information for computer models equipped with a graphics subsystem with UMA memory.

1. Disconnect the fan cable **(1)** from the system board.
2. Loosen the six Phillips PM2.0×6.2 captive screws **(2)** that secure the fan/heat sink assembly to the system board.

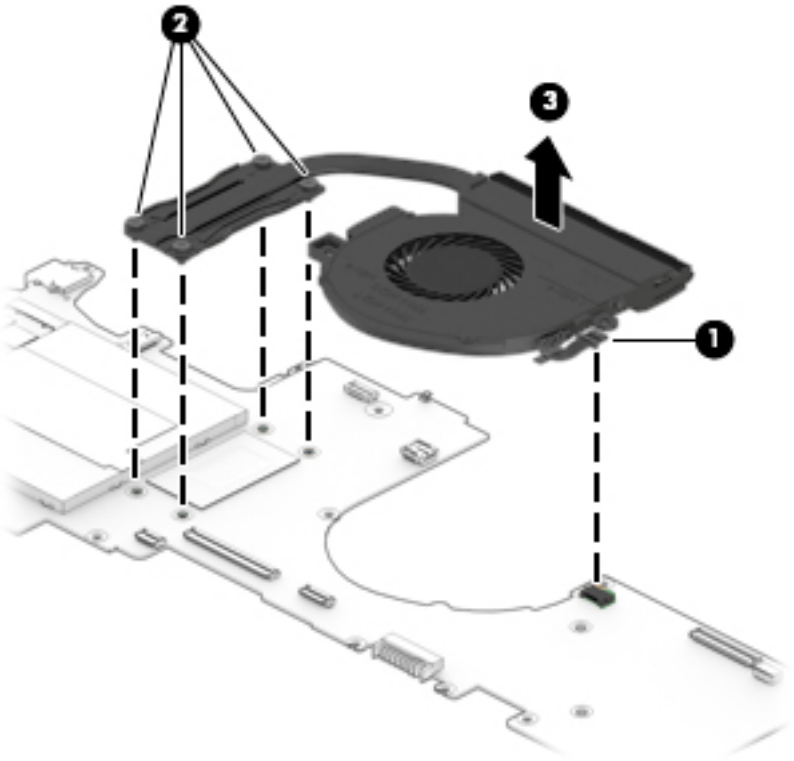
3. Remove the fan/heat sink assembly **(3)**.



NOTE: Steps 4 through 6 apply to computer models equipped with a graphics subsystem with UMA memory. See Steps 1 through 3 for fan/heat sink assembly removal information for computer models equipped with a graphics subsystem with discrete memory.

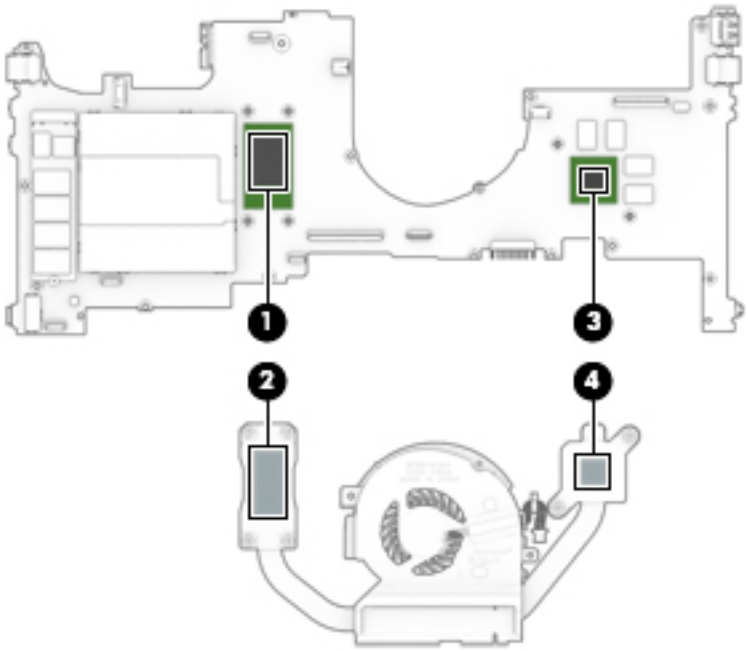
4. Disconnect the fan cable **(1)** from the system board.
5. Loosen the four Phillips PM2.0×6.2 captive screws **(2)** that secure the fan/heat sink assembly to the system board.

6. Remove the fan/heat sink assembly **(2)**.

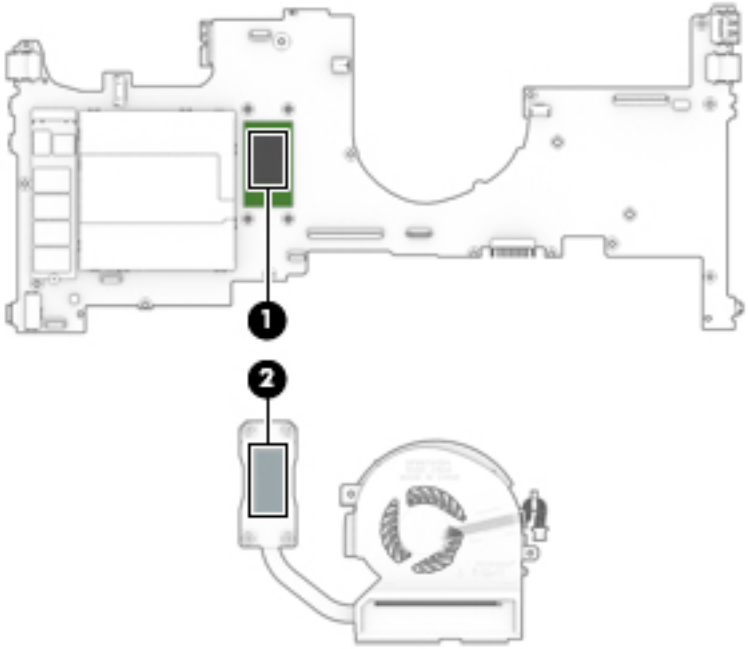


NOTE: The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is included with the fan/heat sink assembly and system board spare part kits.

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



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



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

WLAN module

Description	Spare part number
Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	901229-855

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

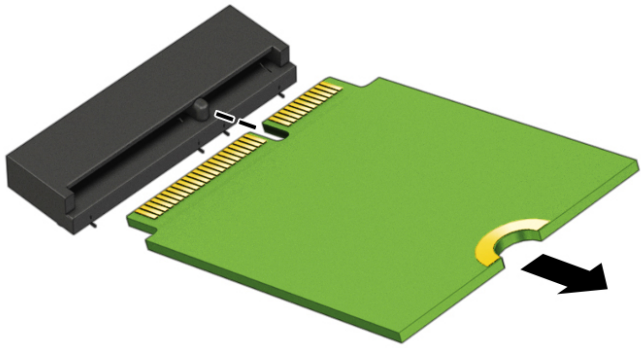
Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 30).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 41).

Remove the WLAN module:

1. Turn the system board upside down with the front facing toward you.
2. Remove the WLAN module by pulling the module away from the slot at an angle.

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



Reverse this procedure to install the WLAN module.

SD card board

NOTE: The SD card board includes the power light actuator, hard drive light actuator, card reader slot, and SD card. The SD card board spare kit does not include the SD card board cable. The SD card board cable is available using spare part number 924325-001.

Description	Spare part number
For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx equipped with a graphics subsystem with discrete memory	L01821-001
For use only on computer models with model numbers 15m-bp1xx through 15-bp1xx equipped with a graphics subsystem with UMA memory	L01917-001
For use only on computer models with model numbers 15m-bp0xx through 15-bp0xx	924336-001

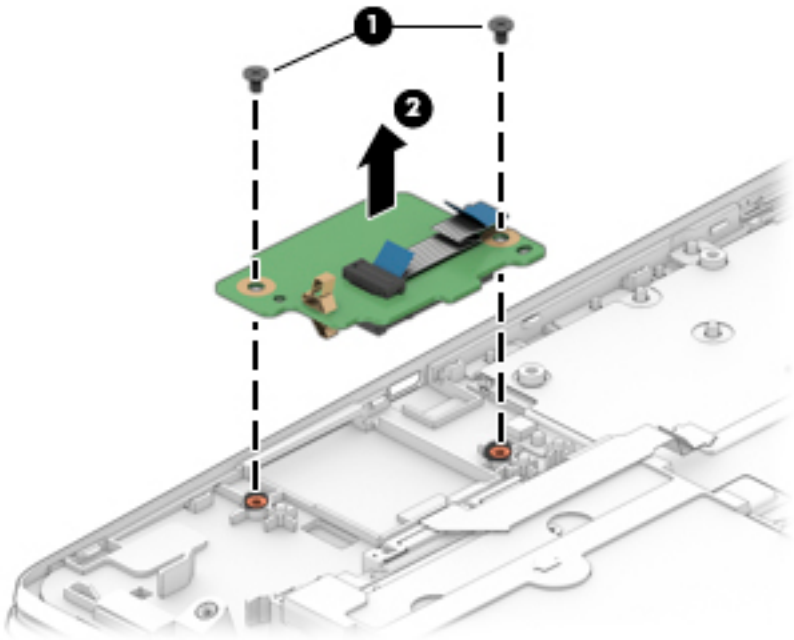
Before removing the SD card board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 30).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 41).

Remove the SD card board:

1. Remove the two Phillips PM2.0×3.3 screws **(1)** that secure the SD card board to the keyboard/top cover.

2. Remove the SD card board **(2)**.



Reverse this procedure to install the SD card board.

Speakers

Description	Spare part number
Speakers (includes cables and four rubber isolators)	924343-001

Before removing the speakers, follow these steps:

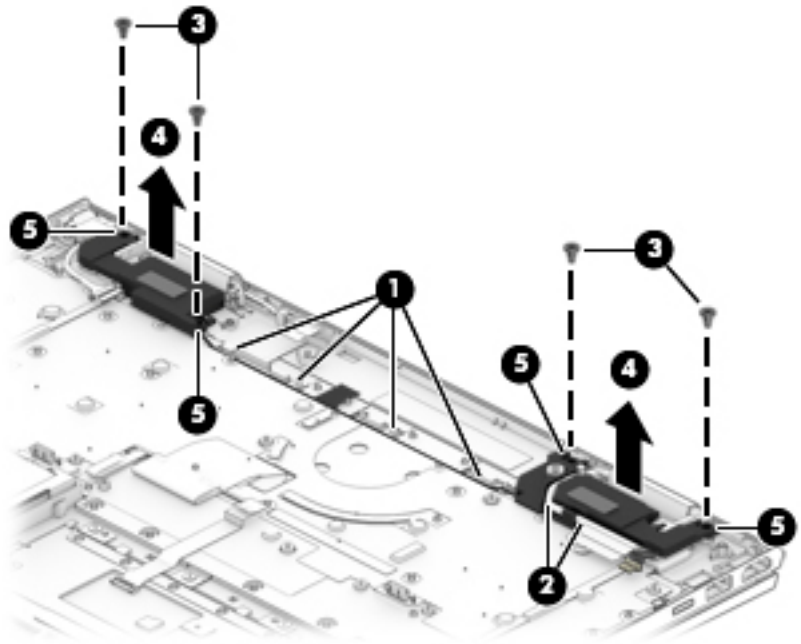
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 30).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 41).

Remove the speakers:

1. Release the speaker cable from the retention clips **(1)** and routing channel built into the keyboard/top cover.
2. Remove the display panel cable from the retention clips **(2)** and routing channel built into the left speaker.
3. Remove the four Phillips PM2.0×6.3 broad head shoulder screws **(3)** that secure the speakers to the keyboard/top cover.

4. Remove the speakers **(4)**.

IMPORTANT: When removing the speakers, make note of the location of the four rubber isolators **(5)**. Failure to properly install or damage to these isolators can result in degraded speaker performance.



Reverse this procedure to install the speakers.

Display assembly

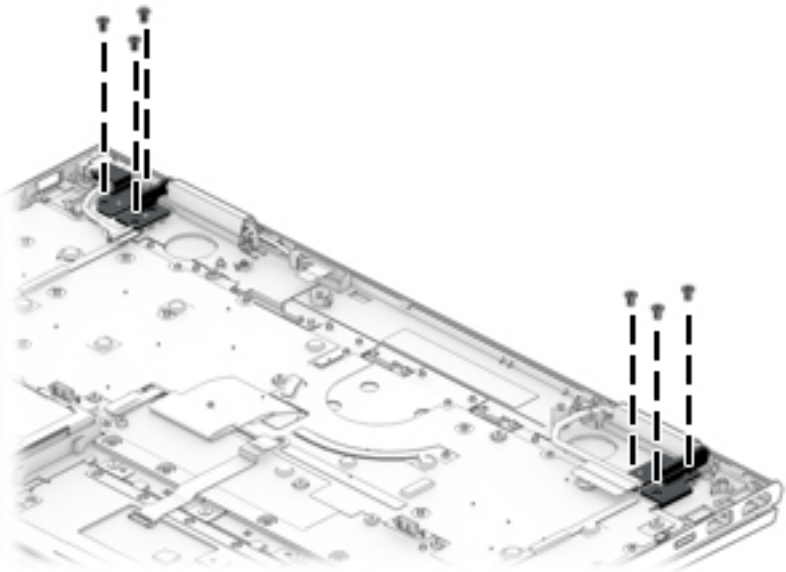
NOTE: The display assembly is spared at the subcomponent level. For display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 30), and then remove the following components:
   a. Battery (see Battery on page 32)
   b. System board (see System board on page 41)
   c. Speakers (see Speakers on page 51)

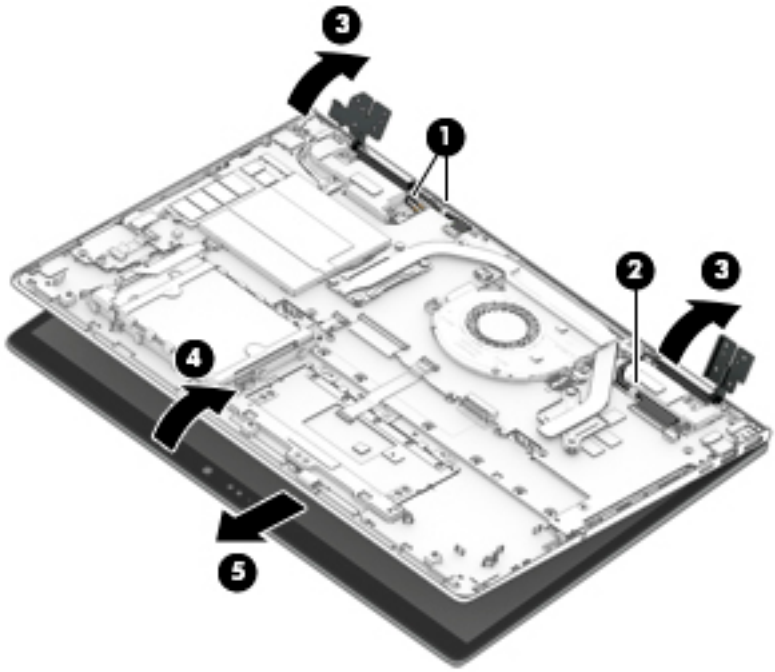
Remove the display assembly:

1. Remove the six Phillips PM2.5×4.3 screws that secure the display assembly to the keyboard/top cover.



2. Release the WLAN antenna cables **(1)** and the webcam/microphone module cable from the retention clip built into the keyboard/top cover.
3. Release the display panel cable **(2)** from the retention clip built into the keyboard/top cover.
4. Swing the display hinges **(3)** up and back.
5. Swing the keyboard/top cover **(4)** up and back until it separates from the display assembly.

6. Slide the keyboard/top cover **(5)** up and away at an angle and separate it from the display assembly.

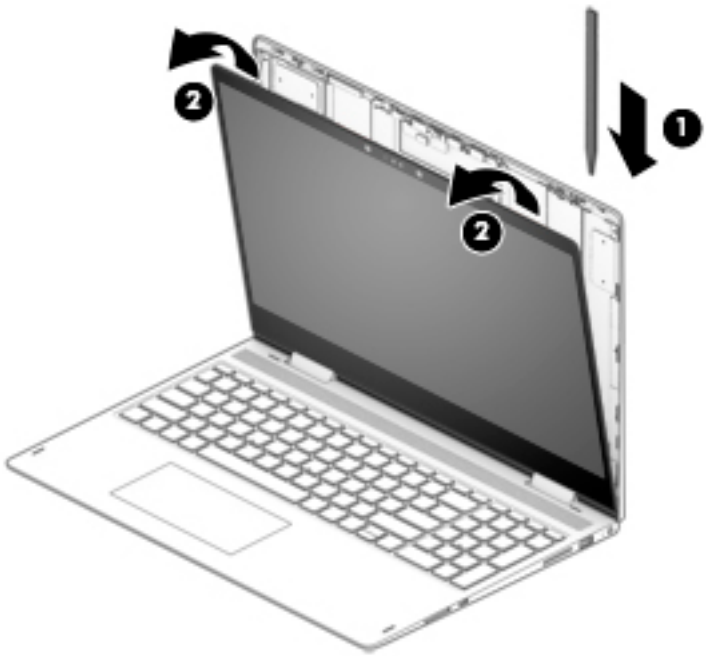


7. If it is necessary to replace the display panel assembly or any of the display assembly subcomponents:

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

   a. Insert a case utility tool **(1)** or similar thin, plastic tool between the top edge of the display panel assembly and the back cover.

   b. Swing the display panel assembly **(2)** forward until it rests on the keyboard.



c. Release the adhesive strip **(1)** that secures the display panel cable connector to the display panel.

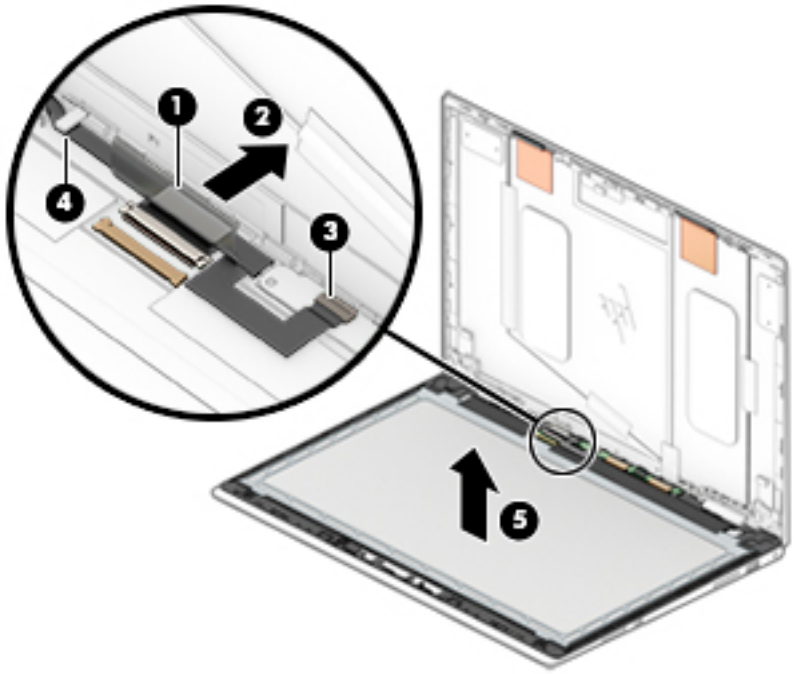
d. Disconnect the display panel cable **(2)** from the display panel assembly.

e. Release the ZIF connector **(3)** to which the TouchScreen control board cable is connected, and then disconnect the TouchScreen control board cable from the TouchScreen control board.

f. Release the display panel cable **(4)** from the retention clip built into the display panel assembly.

g. Remove the display panel assembly **(5)**.

The display panel assembly is available using spare part numbers 924357-001 (15.6-in, UHD, WLED, BrightView (3840×2160), UWVA, ultraslim-flat (2.6-mm), eDP1.3+PSR with TouchScreen) and 925736-001 (15.6-in, FHD, WLED, BrightView (1920×1080), UWVA, slim-flat (3.2-mm), eDP1.3 with TouchScreen).



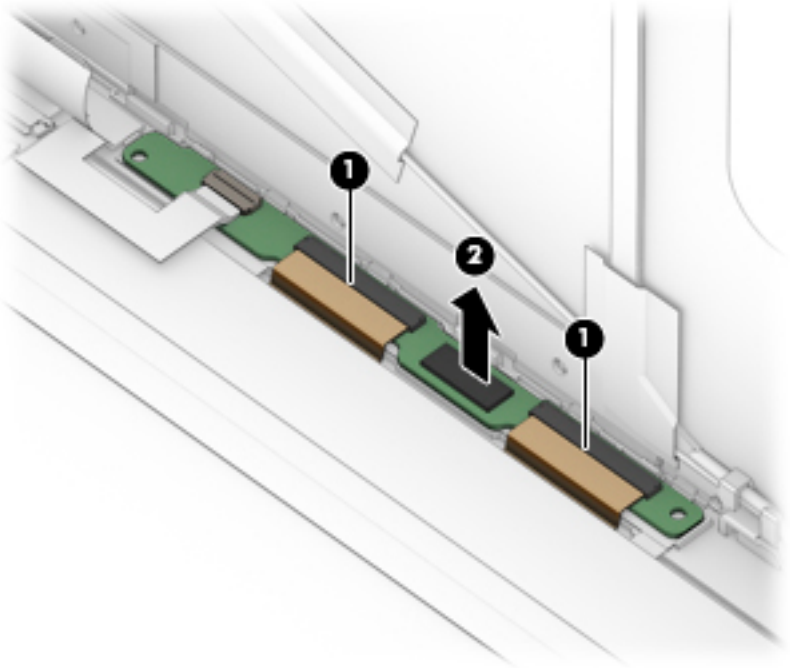
8. If it is necessary to replace the TouchScreen control board:

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

a. Remove the display panel assembly.

b. Release the ZIF connectors **(1)** to which the TouchScreen control board cables are connected, and then disconnect the TouchScreen control board cables from the TouchScreen control board.

c. Detach the TouchScreen control board **(2)** from the display panel assembly. (The TouchScreen control board is attached to the display panel assembly with double-sided adhesive.)



d. Remove the TouchScreen control board.

The TouchScreen control board is available using spare part number 932790-001.

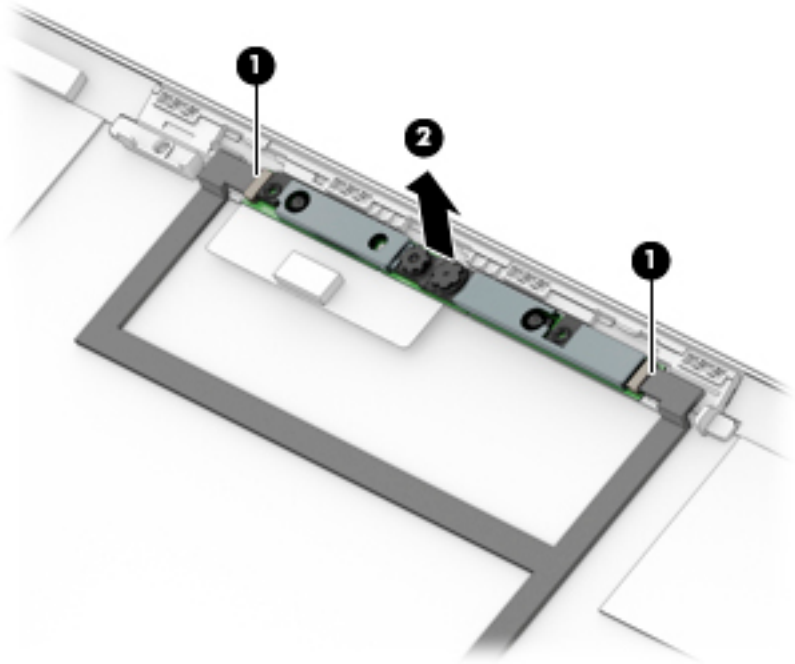
9. If it is necessary to replace the webcam/microphone module:

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

a. Remove the display panel assembly.

b. Disconnect the webcam/microphone module cables **(1)** from the webcam/microphone module.

c. Detach the webcam/microphone module **(2)** from the display back cover. (The webcam/microphone module is attached to the display back cover with double-sided adhesive.)



d. Remove the webcam/microphone module.

   The webcam/microphone module is available using spare part number 933520-001.

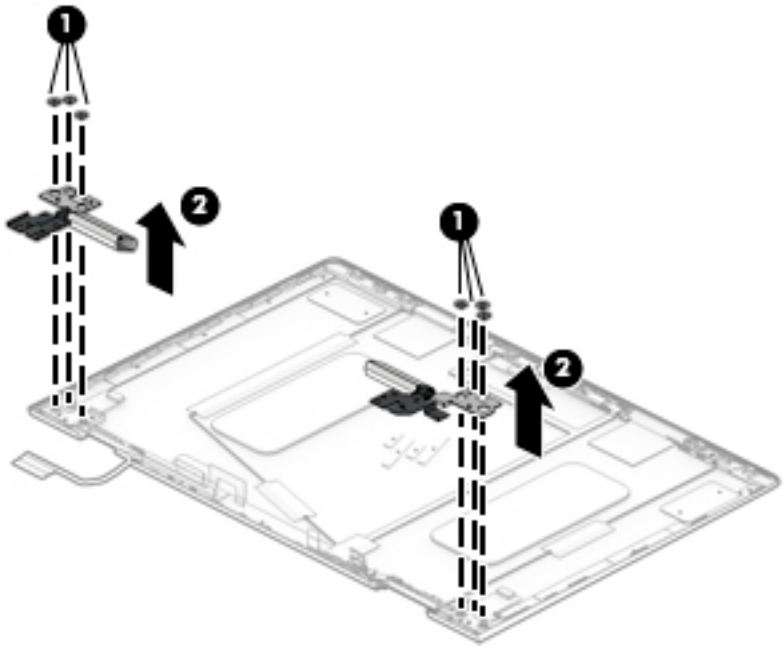
10. If it is necessary to replace the display hinges:

    a. Remove the display panel assembly.

    b. Remove the six Phillips PM2.5×3.0 broad head screws **(1)** that secure the hinges to the display back cover.

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

The display hinges are available using spare part number 925202-001.



11. If it is necessary to replace the display hinge covers:

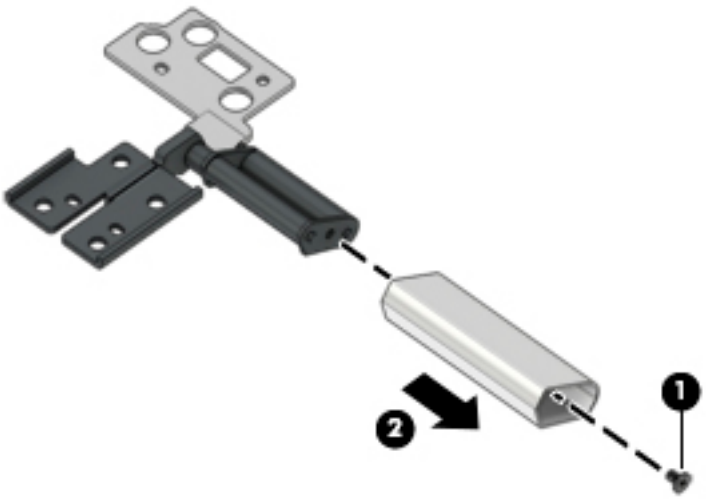
a. Remove the display panel assembly.

b. Remove the display hinges.

c. Remove the two Phillips PM2.0×3.3 screws **(1)** that secure the hinge covers to the display hinge.

d. Remove the display hinge covers **(2)**.

The display hinge covers are available using spare part numbers 924331-001 (left hinge cover) and 924332-001 (right hinge cover).



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

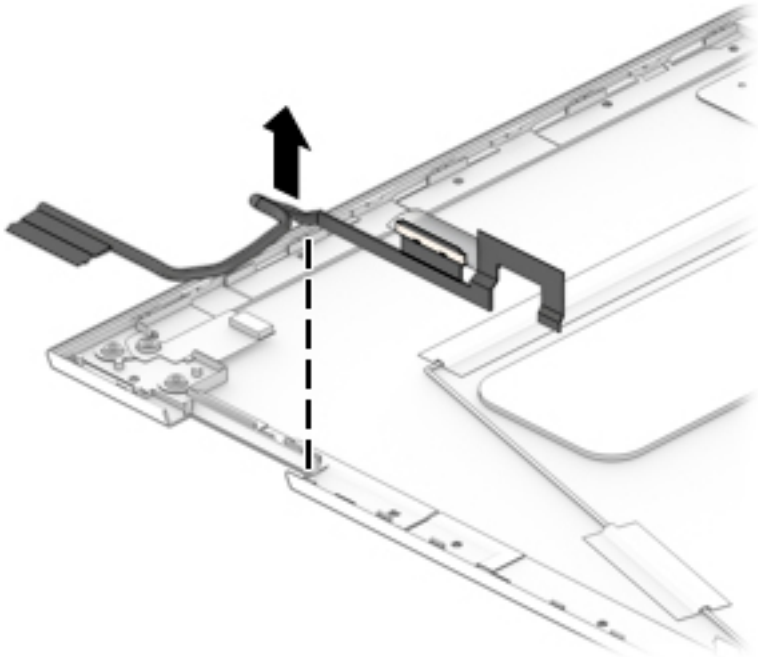
    a. Remove the display panel assembly.

    b. Remove the display hinges.

    c. Remove the display panel cable.

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

       - 924346-001 – For use only on computer models equipped with a UHD display panel assembly
       - 924323-001 – For use only on computer models equipped with an FHD display panel assembly



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

    a. Remove the display panel assembly.

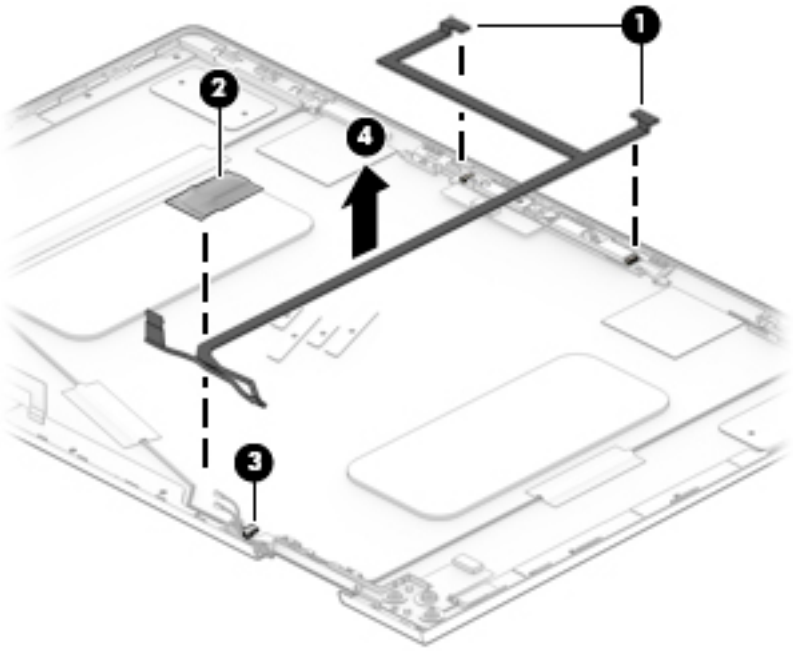
    b. Remove the display hinges.

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

    d. Remove the shielding material **(2)** that secures the webcam/microphone module cable to the display back cover.

    e. Release the webcam/microphone module cable from the retention clips **(3)** built into the display back cover.

f. Detach the webcam/microphone module cable **(4)** from the display back cover. (The webcam/microphone module cable is attached to the display back cover with double-sided adhesive.)



g. Remove the webcam/microphone module cable.

The webcam/microphone module cable is available using spare part number 924324-001.

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

a. Remove the display panel assembly.

b. Remove the display hinges.

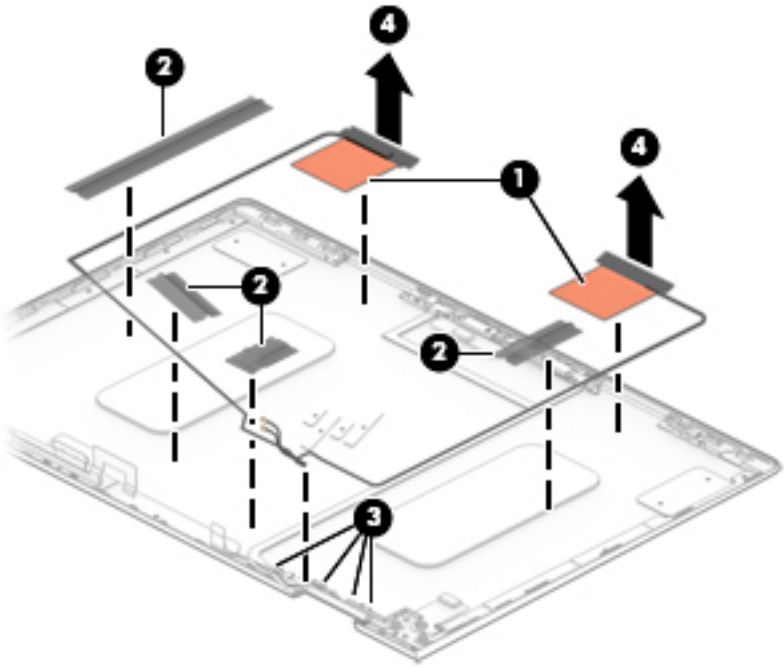
c. Detach the wireless antenna transceivers **(1)** from the display back cover. (The wireless antenna transceivers are attached to the display back cover with double-sided adhesive.)

d. Detach the four pieces of grounding tape **(2)** that secure the wireless antenna cables to the display back cover.

e. Release the wireless antenna cables from the retention clips **(3)** built into the bottom edge of the display back cover.

f. Remove the wireless antenna cables and transceivers **(4)**.

The wireless antenna cables and transceivers are available using spare part number 924307-001.



Reverse this procedure to reassemble and install the display assembly.

Power connector cable

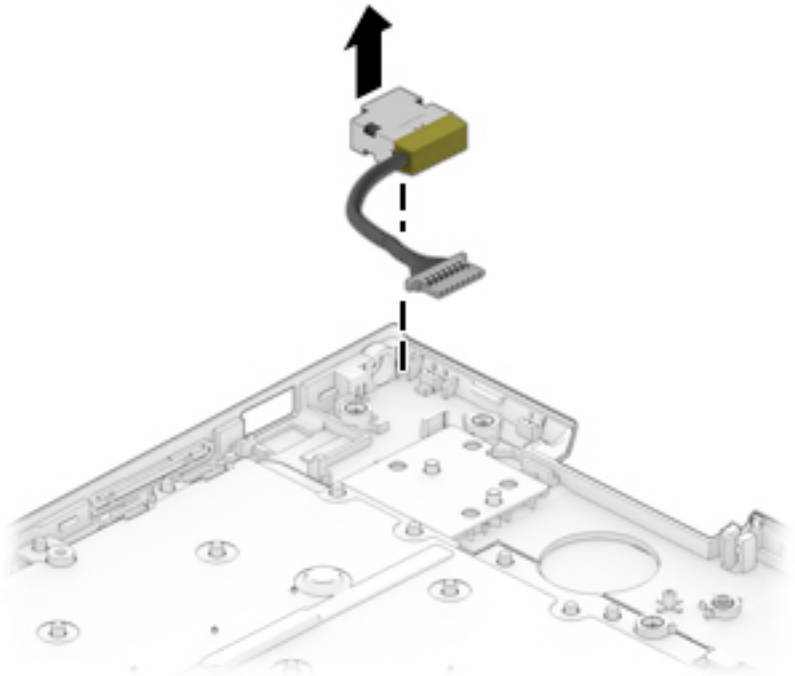
Description	Spare part number
Power connector cable	933523-001

Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 30), and then remove the following components:
   a. Battery (see Battery on page 32)
   b. System board (see System board on page 41)
   c. Speakers (see Speakers on page 51)
   d. Display assembly (see Display assembly on page 53)

Remove the power connector cable:

▲ Remove the power connector cable.



Reverse this procedure to install the power connector cable.

6 Computer Setup (BIOS), TPM, and HP Sure Start

Using Computer Setup

Computer Setup, 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). Computer Setup includes settings for the types of devices installed, the startup sequence of the computer, and the amount of system and extended memory.

NOTE: Use extreme care when making changes in Computer Setup. Errors can prevent the computer from operating properly.

Starting Computer Setup

NOTE: An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

▲ Start Computer Setup.

- Computers or tablets with keyboards:
  - ▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.
- Tablets without keyboards:
  - ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **F10** to enter Computer Setup.

Navigating and selecting in Computer Setup

- To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to select the item.

  NOTE: On tablets without keyboards, you can use your finger to make selections.

- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
- To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

To exit Computer Setup menus, choose one of the following methods:

- To exit Computer Setup menus without saving your changes:

  Select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

  – or –

  Select **Main**, select **Ignore Changes and Exit**, and then press enter.

- To save your changes and exit Computer Setup menus:

  Select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

  – or –

  Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

NOTE: Restoring defaults will not change the hard drive mode.

To return all settings in Computer Setup to the values that were set at the factory, follow these steps:

1. Start Computer Setup. See Starting Computer Setup on page 63.
2. Select **Main**, and then select **Apply Factory Defaults and Exit**.

   NOTE: On select products, the selections may display **Restore Defaults** instead of **Apply Factory Defaults and Exit**.

3. Follow the on-screen instructions.
4. To save your changes and exit, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Save Changes and Exit**, and then press enter.

Your changes go into effect when the computer restarts.

NOTE: Your password settings and security settings are not changed when you restore the factory settings.

Updating the BIOS

Updated versions of the 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 Computer Setup (BIOS), first determine the BIOS version on the computer.

BIOS version information (also known as *ROM date* and *System BIOS*) can be accessed by pressing fn+esc (if you are already in Windows) or by using Computer Setup.

1. Start Computer Setup. See Starting Computer Setup on page 63.
2. Select **Main**, and then select **System Information**.
3. To exit Computer Setup without saving your changes, select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

   Select **Main**, select **Ignore Changes and Exit**, and then press enter.

To check for later BIOS versions, see Downloading a BIOS update on page 65.

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 on 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.

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

   – or –

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

   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. 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.

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

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

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

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

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

Changing the boot order using the f9 prompt

To dynamically choose a boot device for the current startup sequence, follow these steps:

1. Access the Boot Device Options menu:
   - Computers or tablets with keyboards:
     - ▲ Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.
   - Tablets without keyboards:
     - ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **F9** to enter the Boot Device Options menu.
2. Select a boot device, then press enter.

TPM BIOS settings (select products only)

IMPORTANT: Before enabling Trusted Platform Module (TPM) functionality on this system, you must ensure that your intended use of TPM complies with relevant local laws, regulations and policies, and approvals or licenses must be obtained if applicable. For any compliance issues arising from your operation/usage of TPM which violates the above mentioned requirement, you shall bear all the liabilities wholly and solely. HP will not be responsible for any related liabilities.

TPM provides additional security for your computer. You can modify the TPM settings in Computer Setup (BIOS).

NOTE: If you change the TPM setting to Hidden, TPM is not visible in the operating system.

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Starting Computer Setup on page 63.
2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors the computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start automatically restores the BIOS to its previously safe state, without user intervention.

HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then follow the on-screen instructions.

7 HP PC Hardware Diagnostics (UEFI)

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

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

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

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

1. Turn on or restart the computer, quickly press esc.

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

2. Press or tap f2.

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

   a. Connected USB drive

      NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 69.

   b. Hard drive

   c. BIOS

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

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

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

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

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

Download the latest UEFI version

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

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support, and then select your country. The HP Support page is displayed.
2. Click **Drivers & Downloads**.
3. In the text box, enter the product name, and then click **Go**.

   – or –

   Click **Find Now** to let HP automatically detect your product.
4. Select your computer, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

8 Specifications

	Metric	U.S.
Computer dimensions		
Width	**35.6 cm**	14.0 in
Depth	**24.9 cm**	9.8 in
Height	**1.9 cm**	0.8 in
Weight		
Computer models equipped with a hard drive	**2.2 kg**	4.8 lbs
Computer models equipped with a solid-state drive	**2.1 kg**	4.6 lbs
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

9 Backing up 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 –

Click 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 keyboard to the keyboard dock 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 Creating HP Recovery media (select products only) on page 72. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 73.
- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Recovering using HP Recovery Manager on page 74.

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 http://www.hp.com/support, 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 Using Windows tools on page 73.

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.

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

To create HP Recovery media:

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

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

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 74.

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 Recovering using HP Recovery Manager on page 74. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 72.

- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 74.

- On select products, if you want to remove the recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

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

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 Creating HP Recovery media (select products only) on page 72.

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 Creating HP Recovery media (select products only) on page 72.
- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 72.
- 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 http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

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

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

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

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

Using the HP Recovery partition (select products only)

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

To start HP Recovery Manager from the HP Recovery partition:

IMPORTANT: For a tablet with a detachable keyboard, connect the keyboard to the keyboard dock 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 down button; then select f11.

   - or -

   Turn on or restart the tablet, and then quickly hold down the Windows button; then select f11.

2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

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

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

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 76.

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 keyboard to the keyboard dock before beginning these steps.

1. Insert the HP Recovery media.
2. Access BIOS:

   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 down button; then select **f9**.

   - or -

   Turn on or restart the tablet, and then quickly hold down the Windows 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 Creating HP Recovery media (select products only) on page 72.

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

Follow these steps to remove the HP Recovery partition:

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

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer. Requirements for all countries 113

Requirements for specific countries and regions

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

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

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

11 Recycling

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

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

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