HP ENVY 13 Laptop PC

Maintenance and Service Guide
IMPORTANT! This document is intended for HP authorized service providers only.

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).

Table of contents

1   Product description

Category	Description
Product Name	HP ENVY 13 Laptop PC (model numbers 13-ad001 through 13-ad199)
Processors	**For use only on computer models with model numbers 13-ad001 through 13-ad099:** • 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) • Intel Core i3-7100U 2.40-GHz dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W) **For use only on computer models with model numbers 13-ad100 through 13-ad199:** • Intel® Core™ i7-8550U 1.8-GHz (turbo up to 4.0-GHz) dual core processor (2133-MHz FSB, 8.0-MB L3 cache, Quad 15-W) • Intel Core i5-8250U 1.6-GHz (turbo up to 3.4-GHz) dual core processor (2133-MHz FSB, 60-MB L3 cache, Quad 15-W)
Chipset	Integrated soldered-on-circuit (SoC)
Graphics	**Hybrid graphics:** NVIDIA™ N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5V/7-Gbps, downgrade to 1.36V/5-Gbps) **Internal graphics:** Intel HD Graphics 620 graphics subsystem with UMA video memory (available only on computer models equipped with an Intel Core i3 or Intel Pentium processor) Support for HD decode, DX12, and high-definition multimedia interface (HDMI) Support for Optimus Support for GPU Performance Scaling (GPS)
Panel	• 13.3-in, ultra high-definition (UHD), white light-emitting (WLED), BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, 340 nits, 16:9 ultra wide aspect ratio, narrow bezel (DBTS), 72% color gamut, TouchScreen display assembly • 13.3-in, UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, 340 nits, 16:9 ultra wide aspect ratio, narrow bezel (DBCG), 72% color gamut, flush glass, non-TouchScreen display assembly • 13.3-in, UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, 340 nits, 16:9 ultra wide aspect ratio, narrow bezel, 72% color gamut, non-TouchScreen display assembly • 13.3-in, full high-definition (FHD), WLED, BrightView (1920×1080), slim-flat (2.4-mm), UWVA, eDP1.3+PSR, 300 nits, 16:9 ultra wide aspect ratio, narrow bezel (DBTS), 72% color gamut, TouchScreen display assembly • 13.3-in, FHD, WLED, BrightView (1920×1080), slim-flat (2.4-mm), UWVA, eDP1.3+PSR, 300 nits, 16:9 ultra wide aspect ratio, narrow bezel (DBCG), 72% color gamut, flush glass, non-TouchScreen display assembly • 13.3-in, FHD, WLED, BrightView (1920×1080), slim-flat (2.4-mm), UWVA, eDP1.3+PSR, 300 nits, 16:9 ultra wide aspect ratio, narrow bezel, 72% color gamut, non-TouchScreen display assembly
Memory	Support for LPDDR3-1866 dual channel Supports up to 16-GB of system memory Supports the following configurations:

Category	Description
	• 16384-MB (256-MB×32×4, 4 pieces, only on computer models equipped with an Intel i7 processor)
	• 8192-MB (256-MB×16×4, 4 pieces, only on computer models equipped with an Intel i7 or i5 processor)
	• 4096-MB (128-MB×32×2, 4 pieces, only on computer models equipped with an Intel i5 or i3 processor)
Storage	Support for next-generation form factor (NGFF), 2280 M.2 solid-state drives, with SATA/Peripheral Component Interconnect Express (PCIe-3×4), Non-Volatile Memory Express (NVMe) co-layout port:
	M.2 SATA-3 TLC solid-state drive
	• 128-GB
	• 256-GB
	• 512-GB
	M.2 PCIe NVMe TLC solid-state drive
	• 256-GB
	• 360-GB
	• 512-GB
	• 1-TB
	PCIe NVMe Value M.2 solid-state drive
	• 256-GB
	• 512-GB
Optical drive	HP external DVD±RW DL SuperMulti Drive
Audio and video	Support for an HP Wide Vision HD camera with indicator light, USB 2.0, HD hybrid BSI sensor, f2.2, WDR, 88° wide field of vision, 720p by 30 frames per second
	Bang & Olufsen
	Support for quad speakers
	Support for HP Audio Boost 2.0 with discrete amplifier
	Support for dual-array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software.
Ethernet	Integrated 10/100/1000 network interface card (NIC)
Sensors	Accelerometer
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module
	Dual M.2/PCIe WLAN antennas built into computer
	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
	• Display Port (DP1.2+ HDCP 2.2 supporting up to 4096x2160 @ 60Hz)
	• RJ-45 network

Category	Description
	• USB 3.x ports (2)
	• USB Type-C port
Keyboard/pointing devices	Full-sized, backlit, island-style keyboard
	TouchPad requirements:
	• ClickPad with image sensor
	• SecurePad with image sensor and fingerprint reader
	• MultiTouch gestures enabled
Keyboard/pointing devices *(continued)*	• Support for Modern TrackPad gestures
	• Taps enabled as default
Power requirements	Support for 6-cell, 53-WHr, 2.55-AHr, Li-ion and 3-cell, 51-WHr, 4.45-AHr, Li-ion batteries
	Support for the following AC adapters:
	• 65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm)
	• 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)
	Support for a 1.00-m power cord with a C5 connector in 15 countries/regions.
Security	Support for Trusted Platform Module (TPM) 2.0
	Fingerprint reader (only on computer models equipped with a SecurePad)
Operating system	**Preinstalled:** Windows 10 and Windows 10 Professional
	For developed market (ML): Windows 10 Home ML and Windows 10 Home Plus ML
	For emerging market (EM/SL): Windows 10 Home EM/SL and Windows 10 Home Plus EM/SL
	For China market: CPPP Windows 10 Home High-End China Language Edition and CPPP Windows 10 Home China Language Edition
	For Asia-Pacific/Japan SEAP market (EM/SL): SEAP Windows 10 Home EM/SL and SEAP Windows 10 Home Plus
Serviceability	**End user replaceable part:** AC adapter

2   Getting to know your computer

Locating hardware

To find out what hardware is installed on your computer:

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

A list displays all the devices installed on your 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**.

Right side

Component			Description
(1)	←←·/	USB Type-C port with HP Sleep and Charge	Connects a USB device that has a Type-C connector, provides data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
			– and –
			Connects a display device that has a USB Type-C connector, providing DisplayPort output.
			NOTE: Cables and/or adapters (purchased separately) may be required.
(2)	⚡	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 products such as a cell phone, camera, activity tracker, or smartwatch.
(3)		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.
(4)	🔌	Power connector	Connects an AC adapter.

Left side

| Component		Description
(1) $SS\overleftarrow{\cdot}$	USB 3.x SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(2)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.
		WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*.
		To access this guide:
		▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.
		NOTE: When a device is connected to the jack, the computer speakers are disabled.
(3)	USB Type-C port with HP Sleep and Charge	Connects a USB device that has a Type-C connector, provides data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
		– and –
		Connects a display device that has a USB Type-C connector, providing DisplayPort output.
		NOTE: Cables and/or adapters (purchased separately) may be required.
(4) SD	MicroSD memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information.
		To insert a card:
		1. Hold the card label-side up, with connectors facing the computer.
		2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated.
		To remove a card:
		▲ Press in on the card, and then remove it from the memory card reader.

Display
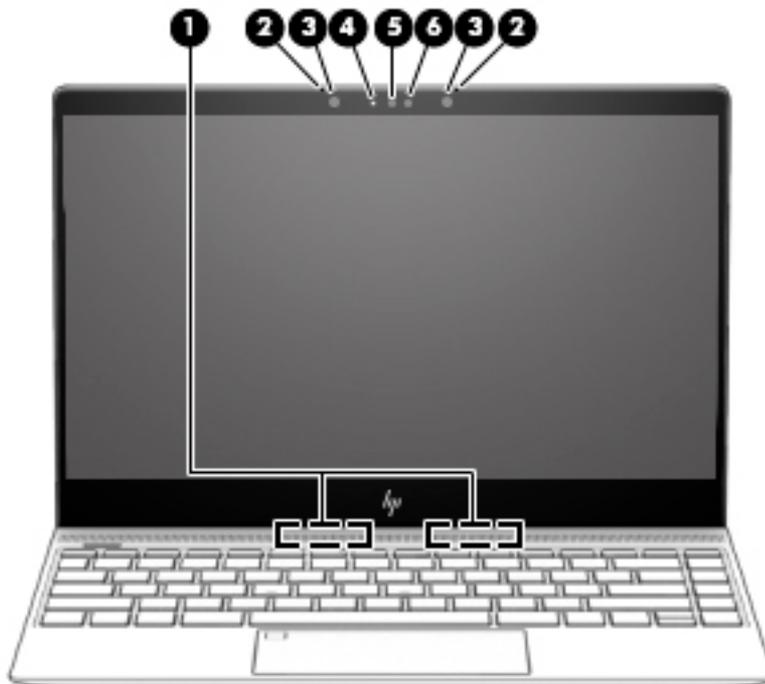
Component		Description
(1)	WLAN antennas* (2)	Send and receive wireless signals to communicate with WLANs.
(2)	Internal microphones (2)	Record sound.
(3)	Infrared camera lights (2, select products only)	On: The infrared camera is in use.
(4)	Camera light	On: The camera is in use.
(5)	Camera	Allows you to video chat, record video, and record still images.
(6)	Infrared camera (select products only)	Allows a facial recognition logon to Windows, instead of a password logon.

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

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

To access this guide:

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

Keyboard area

TouchPad
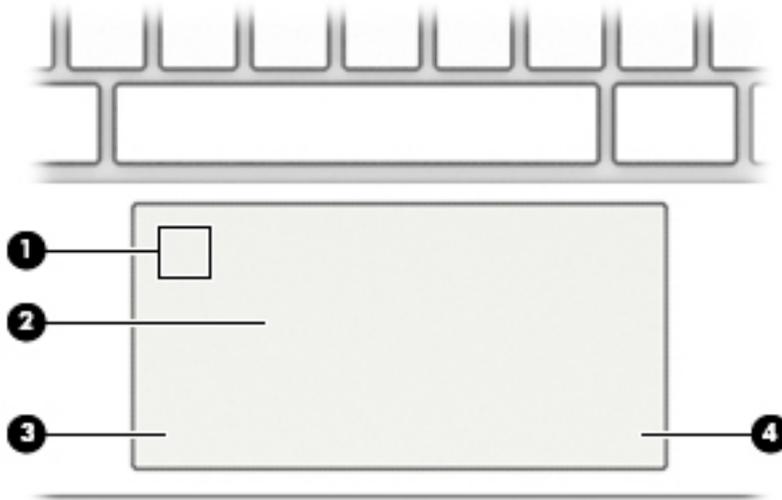
Component		Description
(1)	Fingerprint reader (select products only)	Allows a fingerprint logon to Windows, instead of a password logon.
		▲ To use the fingerprint reader, tap or swipe the upper-left corner of the TouchPad.
		NOTE: Select products also support online payments through the fingerprint reader.
(2)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(3)	Left TouchPad button	Functions like the left button on an external mouse.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

Lights

Component			Description
(1)		Power light	• On: The computer is on.
			• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.
			• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(3)		Mute light	• On: Computer sound is off.
			• Off: Computer sound is on.

Button and speakers

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

Special keys

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the **Start** menu.
(4)	Action keys	Execute frequently used system functions. **NOTE:** On select products, the f5 action key turns the keyboard backlight feature off or on.

Bottom
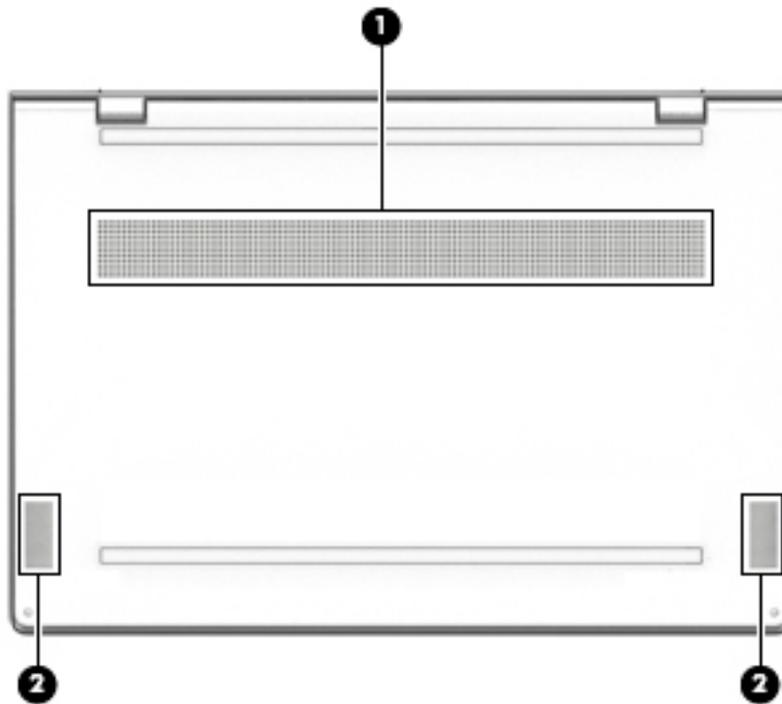
Component		Description
(1)	Vent	Enables airflow to cool internal components.
		NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(2)	Speakers (2)	Produce sound.

3   Illustrated parts catalog

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

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

The model number **(1)**, serial number **(2)**, product number **(3)**, and warranty information **(4)** are located on the bottom of the computer. This information may be needed when travelling internationally or when contacting support.
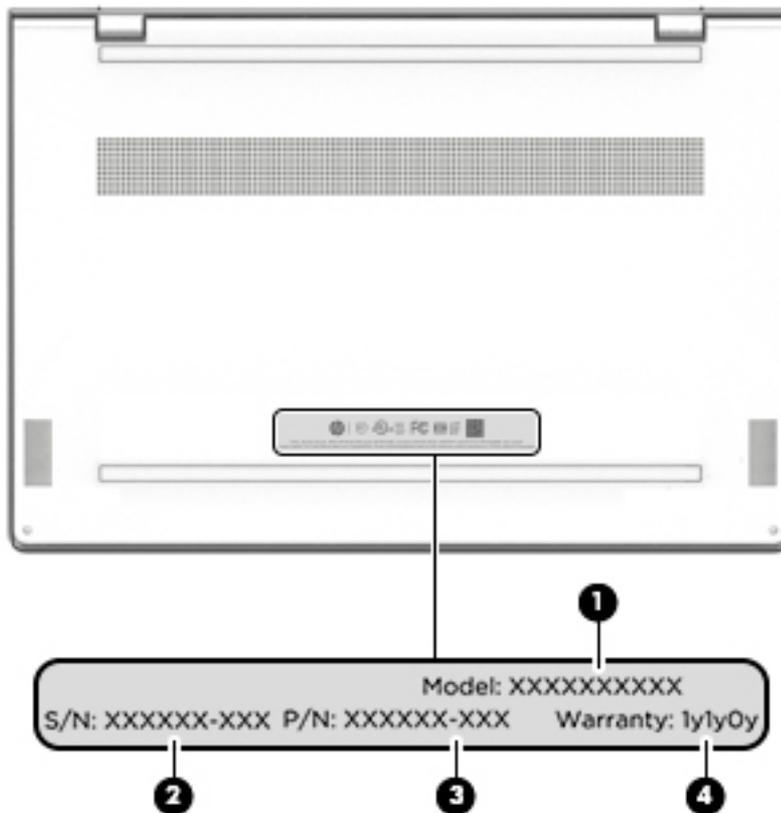
Computer components
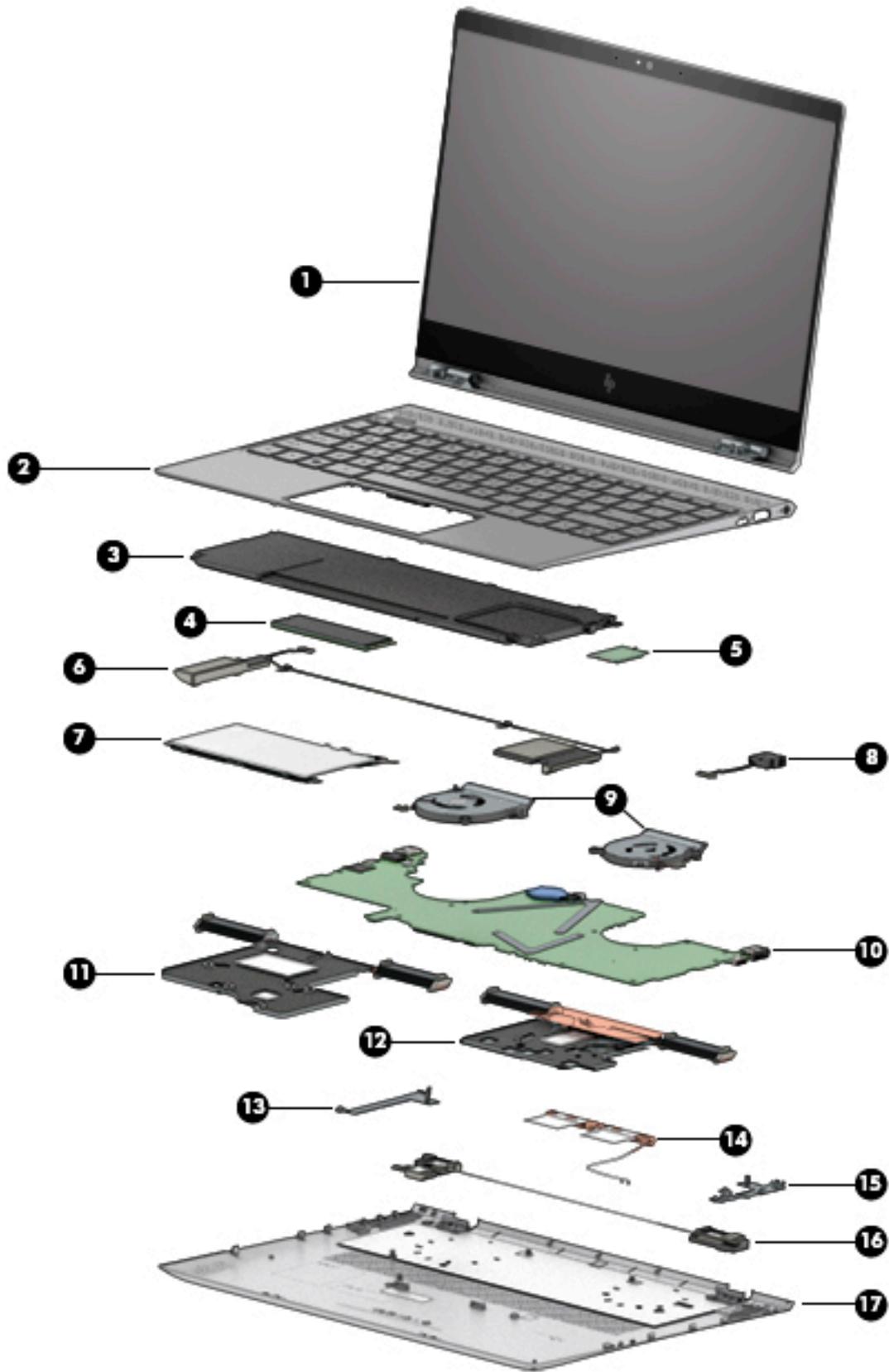
Item	Component	Spare part number
(1)	**13.3-in display assembly:**	
	In natural silver finish:	
	UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (340 nits, 72% color gamut)	928479-001
	FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (300 nits, 72% color gamut)	928478-001
	UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (340 nits, 72% color gamut)	928483-001
	UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen, flush glass display assembly (340 nits, 72% color gamut)	928475-001
	FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (300 nits, 72% color gamut)	928482-001
	FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen display assembly (300 nits, 72% color gamut)	928474-001
	In silk gold finish:	
	FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (300 nits, 72% color gamut)	928476-001
	UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (340 nits, 72% color gamut)	928477-001
	UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (340 nits, 72% color gamut)	928481-001
	UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen, flush glass display assembly (340 nits, 72% color gamut)	928473-001
	FHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (340 nits, 72% color gamut)	928480-001
	FHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen, flush glass display assembly (340 nits, 72% color gamut)	928472-001
(2)	**Keyboard/top cover in natural silver finish with backlight** (includes backlight cable and keyboard cable):	
	For use only on computer models equipped with a graphics subsystem with discrete memory:	
	For use in Belgium	928504-A41
	For use in Canada	928504-DB1
	For use in the Czech Republic and Slovakia	928504-FL1
	For use in Denmark, Finland, and Norway	928504-DH1
	For use in France	928504-051
	For use in Germany	928504-041
	For use in Greece	928504-151
	For use in Israel	928504-BB1
	For use in Italy	928504-061
	For use in Latin America	928504-161

Item	Component	Spare part number
	For use in the Netherlands	928504-B31
	For use in Portugal	928504-131
	For use in Russia	928504-251
	For use in Saudi Arabia	928504-171
	For use in Slovenia	928504-BA1
	For use in South Korea	928504-AD1
	For use in Spain	928504-071
	For use in Switzerland	928504-BG1
	For use in Taiwan	928504-AB1
	For use in Thailand	928504-281
	For use in Turkey	928504-141
	For use in the United Kingdom	928504-031
	For use in the United States	928504-001
	Keyboard/top cover in natural silver finish with backlight (includes backlight cable and keyboard cable):	
	For use only on computer models equipped with a graphics subsystem with UMA memory:	
	For use in Belgium	928505-A41
	For use in Canada	928505-DB1
	For use in the Czech Republic and Slovakia	928505-FL1
	For use in Denmark, Finland, and Norway	928505-DH1
	For use in France	928505-051
	For use in Germany	928505-041
	For use in Greece	928505-151
	For use in Israel	928505-BB1
	For use in Italy	928505-061
	For use in Japan	928505-291
	For use in Latin America	928505-161
	For use in the Netherlands	928505-B31
	For use in Portugal	928505-131
	For use in Russia	928505-251
	For use in Saudi Arabia	928505-171
	For use in Slovenia	928505-BA1
	For use in South Korea	928505-AD1
	For use in Spain	928505-071
	For use in Switzerland	928505-BG1

Item	Component	Spare part number
	For use in Taiwan	928505-AB1
	For use in Thailand	928505-281
	For use in Turkey	928505-141
	For use in the United Kingdom	928505-031
	For use in the United States	928505-001
	Keyboard/top cover in silk gold finish with backlight (includes backlight cable and keyboard cable):	
	For use only on computer models equipped with a graphics subsystem with discrete memory:	
	For use in Belgium	928502-A41
	For use in Canada	928502-DB1
	For use in the Czech Republic and Slovakia	928502-FL1
	For use in Denmark, Finland, and Norway	928502-DH1
	For use in France	928502-051
	For use in Germany	928502-041
	For use in Greece	928502-151
	For use in Israel	928502-BB1
	For use in Italy	928502-061
	For use in Latin America	928502-161
	For use in the Netherlands	928502-B31
	For use in Portugal	928502-131
	For use in Russia	928502-251
	For use in Saudi Arabia	928502-171
	For use in Slovenia	928502-BA1
	For use in South Korea	928502-AD1
	For use in Spain	928502-071
	For use in Switzerland	928502-BG1
	For use in Taiwan	928502-AB1
	For use in Thailand	928502-281
	For use in Turkey	928502-141
	For use in the United Kingdom	928502-031
	For use in the United States	928502-001
	Keyboard/top cover in silk gold finish with backlight (includes backlight cable and keyboard cable):	
	For use only on computer models equipped with a graphics subsystem with UMA memory:	
	For use in Belgium	928503-A41
	For use in Canada	928503-DB1

Item	Component	Spare part number
	For use in the Czech Republic and Slovakia	928503-FL1
	For use in Denmark, Finland, and Norway	928503-DH1
	For use in France	928503-051
	For use in Germany	928503-041
	For use in Greece	928503-151
	For use in Israel	928503-BB1
	For use in Italy	928503-061
	For use in Japan	928503-291
	For use in Latin America	928503-161
	For use in the Netherlands	928503-B31
	For use in Portugal	928503-131
	For use in Russia	928503-251
	For use in Saudi Arabia	928503-171
	For use in Slovenia	928503-BA1
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	For use in Spain	928503-071
	For use in Switzerland	928503-BG1
	For use in Taiwan	928503-AB1
	For use in Thailand	928503-281
	For use in Turkey	928503-141
	For use in the United Kingdom	928503-031
	For use in the United States	928503-001
(3)	**Battery:**	
	6-cell, 53-WHr, 2.55-AHr, Li-ion	921438-855
	3-cell, 51-WHr, 4.45-AHr, Li-ion	921439-855
(4)	**Solid-state drive**:	
	1-TB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	865697-007
	512-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	847110-017
	512-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive	933706-002
	360-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	917818-003
	256-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	847109-021
	256-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive	933705-002
	128-GB, 2280 M.2, SATA-3 solid-state drive with TLC	759848-016
	128-GB, 2280 M.2, SATA-3 solid-state drive	827560-044

Item	Component	Spare part number
(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)	**Front speakers** (include cables):	
	For use only on computer models equipped with a graphics subsystem with discrete memory	928527-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	928528-001
(7)	**TouchPad** (does not include TouchPad bracket or TouchPad cable):	
	ClickPad in natural silver finish	928488-001
	ClickPad in silk gold finish	928487-001
	SecurePad in natural silver finish	928490-001
	SecurePad in silk gold finish	928489-001
	TouchPad bracket (not illustrated)	928466-001
	TouchPad cable (not illustrated; includes double-sided adhesive):	
	For use only on computer models equipped with a graphics subsystem with discrete memory	928451-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	928452-001
(8)	**Power connector cable**	808155-020
(9)	**Fan**s (2, include cables):	
	Left fan for use only on computer models equipped with a graphics subsystem with discrete memory	928459-001
	Right fan for use only on computer models equipped with a graphics subsystem with discrete memory	928460-001
	Left fan for use only on computer models equipped with a graphics subsystem with UMA memory	928461-001
	Right fan for use only on computer models equipped with a graphics subsystem with UMA memory	928462-001
(10)	**System board** (includes processor and replacement thermal material):	
	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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and the Windows 10 operating system	926318-601
	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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and a non-Windows operating system	926318-001
	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 memory, 16-GB of system memory, and the Windows 10 operating system	926315-601
	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 memory, 16-GB of system memory, and a non-Windows operating system	926315-001
	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 memory, 8-GB of system memory, and the Windows 10 operating system	926314-601

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 memory, 8-GB of system memory, and a non-Windows operating system	926314-001
	Equipped with an Intel Core i7-8550U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a Windows operating system	939648-601
	Equipped with an Intel Core i7-8550U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows operating system	939648-001
	Equipped with an Intel Core i7-8550U processor, graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a Windows operating system	939651-601
	Equipped with an Intel Core i7-8550U processor, MX150 graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a non-Windows operating system	939651-001
	Equipped with an Intel Core i7-8550U processor, graphics subsystem with 2-GB discrete memory, 16-GB of system memory, and a Windows operating system	939652-601
	Equipped with an Intel Core i7-8550U processor, MX150 graphics subsystem with 2-GB discrete memory, 16-GB of system memory, and a non-Windows operating system	939652-001
	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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and the Windows 10 operating system	926317-601
	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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and a non-Windows operating system	926317-001
	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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 4-GB of system memory, and the Windows 10 operating system	926316-601
	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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 4-GB of system memory, and a non-Windows operating system	926316-001
	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 memory, 8-GB of system memory, and the Windows 10 operating system	926313-601
	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 memory, 8-GB of system memory, and a non-Windows operating system	926313-001
	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 memory, 4-GB of system memory, and the Windows 10 operating system	926312-601
	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 memory, 4-GB of system memory, and a non-Windows operating system	926312-001
	Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 4-GB of system memory, and a Windows operating system	939646-601
	Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 4-GB of system memory, and a non-Windows operating system	939646-001

Item	Component	Spare part number
	Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a Windows operating system	939647-601
	Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows operating system	939647-001
	Equipped with an Intel Core i5-8250U processor, graphics subsystem with 2-GB discrete memory, 4-GB of system memory, and a Windows operating system	939649-601
	Equipped with an Intel Core i5-8250U processor, MX150 graphics subsystem with 2-GB discrete memory, 4-GB of system memory, and a non-Windows operating system	939649-001
	Equipped with an Intel Core i5-8250U processor, graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a Windows operating system	939650-601
	Equipped with an Intel Core i5-8250U processor, MX150 graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a non-Windows operating system	939650-001
	Equipped with an Intel Core i3-7100U 2.40-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, 4-GB of system memory, and the Windows 10 operating system	926311-601
	Equipped with an Intel Core i3-7100U 2.40-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, 4-GB of system memory, and a non-Windows operating system	926311-001
	System board retention hooks (2, not illustrated)	928493-001
	Heat sink (includes replacement thermal material):	
(11)	For use only on computer models equipped with a graphics subsystem with discrete memory	939283-001
(12)	For use only on computer models equipped with a graphics subsystem with UMA memory	939284-001
(13)	**I/O bracket, left side**	928467-001
(15)	**I/O bracket, right side**	928468-001
(14)	**Wireless Antenna Kit** (includes left and right wireless antenna cables and transceivers):	
	For use only on computer models equipped with a graphics subsystem with discrete memory	937093-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	936025-001
(16)	**Rear speakers** (include cables):	
	For use only on computer models equipped with a graphics subsystem with discrete memory	928527-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	928528-001
(17)	**Bottom cover**:	
	In natural silver finish for use only on computer models equipped with a graphics subsystem with discrete memory	928446-001
	In natural silver finish for use only on computer models equipped with a graphics subsystem with UMA memory	928448-001
	In silk gold finish for use only on computer models equipped with a graphics subsystem with discrete memory	928445-001
	In silk gold finish for use only on computer models equipped with a graphics subsystem with UMA memory	928447-001
	Bottom cover retention hooks (2, not illustrated):	
	For use only on computer models equipped with a graphics subsystem with discrete memory	928491-001

Item	Component	Spare part number
	For use only on computer models equipped with a graphics subsystem with UMA memory	928492-001
	Rubber Foot Kit (not illustrated, includes bottom cover rubber foot strip):	
	In natural silver finish	928496-001
	In silk gold finish	928495-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
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
Duck head adapter for use in Europe and South Korea	854703-001
Gasket Kit	937332-001
HP external DVD±RW DL SuperMulti Drive	747080-001
HP USB–to–Gigabit RJ45 adapter	829941-001
HP USB Type-C–to–HDMI adapter	831752-001
HP USB Type-C–to–RJ45 adapter	855560-001
HP USB Type-C–to–USB-A dongle	833960-001
HP USB Type-C–to–VGA adapter	831751-001
Power cord (C5 connector, 1.00-m):	
For use in Argentina	920689-003
For use in Australia	213356-013
For use in Denmark	213353-013
For use in Europe	213350-014
For use in India	920689-016
For use in Israel	398063-008
For use in Italy	213352-013
For use in Japan	349756-006
For use in North America	213349-015
For use in the People's Republic of China	920689-014
For use in South Africa	361240-007
For use in Switzerland	213354-013
For use in Taiwan	393313-007
For use in Thailand	285096-012
For use in the United Kingdom and Singapore	213351-013
Rubber Foot Kit (includes bottom cover rubber foot strip):	
In natural silver finish	928496-001
In silk gold finish	928495-001
Screw Kit:	

Component	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	928499-001
For use only on computer models equipped with a graphics subsystem with UMA memory	928500-001

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
- Torx5 screw driver

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

- To avoid hand contact, transport products in static-safe tubes, bags, or boxes.

- Protect ESD-sensitive parts and assemblies with conductive or approved containers or packaging.

- Keep ESD-sensitive parts in their containers until the parts arrive at static-free workstations.

- Place items on a grounded surface before removing items from their containers.

- Always be properly grounded when touching a component or assembly.

- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.

- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.

- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.

- Use conductive field service tools, such as cutters, screw drivers, and vacuums.

- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.

- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and Styrofoam.

- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.

- Avoid contact with pins, leads, or circuitry.

- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of one megohm ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.

- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of one megohm resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape

- Antistatic smocks, aprons, and sleeve protectors

- Conductive bins and other assembly or soldering aids

- Nonconductive foam

- Conductive computerop workstations with ground cords of one megohm resistance

- Static-dissipative tables or floor mats with hard ties to the ground

- Field service kits

- Static awareness labels

- Material-handling packages

- Nonconductive plastic bags, tubes, or boxes

- Metal tote boxes

- Electrostatic voltage levels and protective materials

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

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

5 Removal and replacement procedures

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

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

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

Component replacement procedures

📝 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Locating the model number, serial number, product number, and warranty information on page 13 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 56 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
In natural silver finish for use only on computer models equipped with a graphics subsystem with discrete memory	928446-001
In natural silver finish for use only on computer models equipped with a graphics subsystem with UMA memory	928448-001
In silk gold finish for use only on computer models equipped with a graphics subsystem with discrete memory	928445-001
In silk gold finish for use only on computer models equipped with a graphics subsystem with UMA memory	928447-001

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 rubber foot strip **(1)**.

    The rubber foot strip is available using spare part numbers 928496-001 (in natural silver finish) and 928495-001 (in silk gold finish).

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

    (2) Four Phillips PM2.0×6.1 screws

    (3) Two Torx5 M2.0×3.2 screws
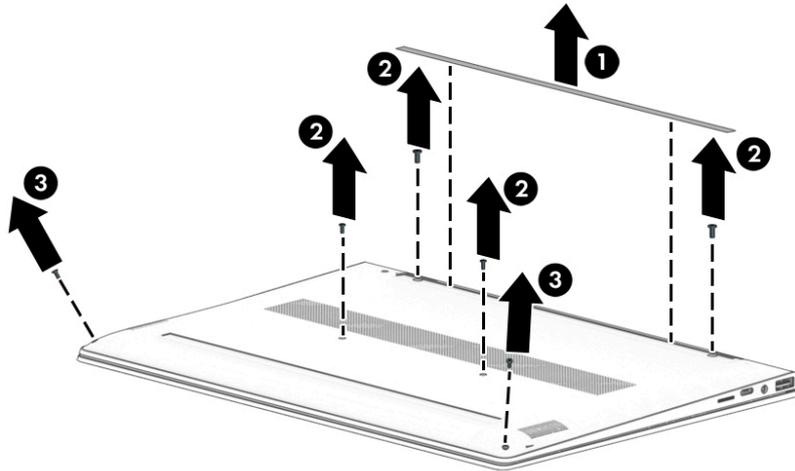
3. Insert a case utility tool **(1)** or similar thin, plastic tool into the front corners of the bottom cover.

4. Separate the bottom cover **(2)** from the keyboard/top cover.

5. Remove the bottom cover **(3)**.
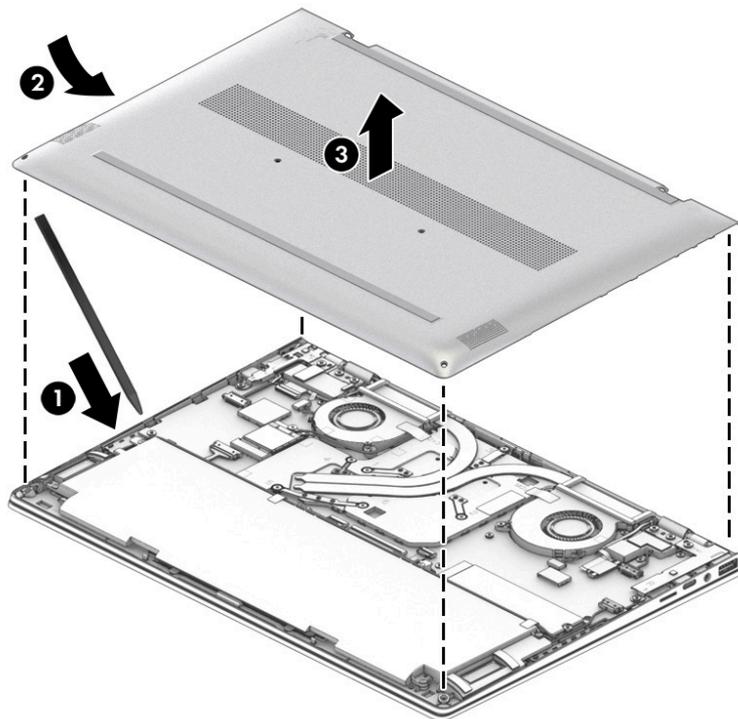
Reverse this procedure to install the bottom cover.

Bottom cover retention hooks

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	928491-001
For use only on computer models equipped with a graphics subsystem with UMA memory	928492-001

Before removing the bottom cover retention hooks, 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 bottom cover retention hooks:

1. Turn the bottom cover right side up.

2. Remove the two Phillips PM2.0×2.0 screws **(1)** that secure the bottom cover retention hooks to the bottom cover.

3. Remove the bottom cover retention hooks **(2)**.
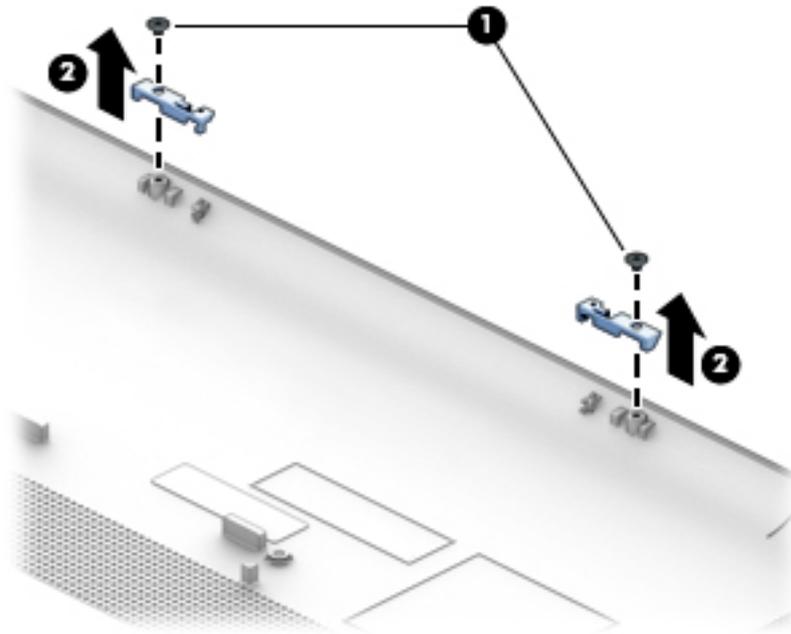
Reverse this procedure to install the bottom cover retention hooks.

Battery

| Description	Spare part number
6-cell, 53-WHr, 2.55-AHr, Li-ion	921438-855
3-cell, 51-WHr, 4.45-AHr, Li-ion	921439-855

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. Disconnect the battery cable **(1)** from the system board.

2. Detach the grounding tape **(2)** that secures the battery to the computer.

3. Remove the four Phillips PM2.0×3.4 screws **(3)** that secure the battery cover retention hooks to the keyboard/top cover.

4. Remove the battery **(4)**.
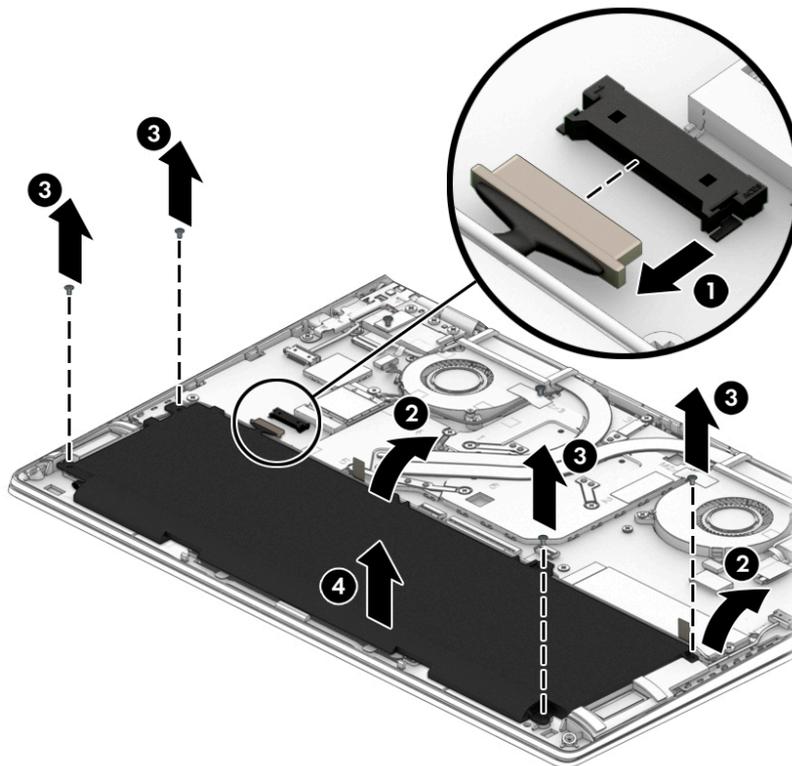
Reverse this procedure to install the battery.

Solid-state drive

Description	Spare part number
1-TB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	865697-007
512-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	847110-017
512-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive	933706-002
360-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	917818-003
256-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive with TLC	847109-021
256-GB, 2280 M.2, PCIe3×4, NVMe solid-state drive	933705-002
128-GB, 2280 M.2, SATA-3 solid-state drive with TLC	759848-016
128-GB, 2280 M.2, SATA-3 solid-state drive	827560-044

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).

5. Disconnect the battery cable from the system board (see).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×3.4 screw **(1)** that secures the drive to the keyboard/top cover.

2. Remove the drive **(2)** by pulling it away from the connector.

> **NOTE:** Solid-state drives are designed with notches to prevent incorrect insertion.
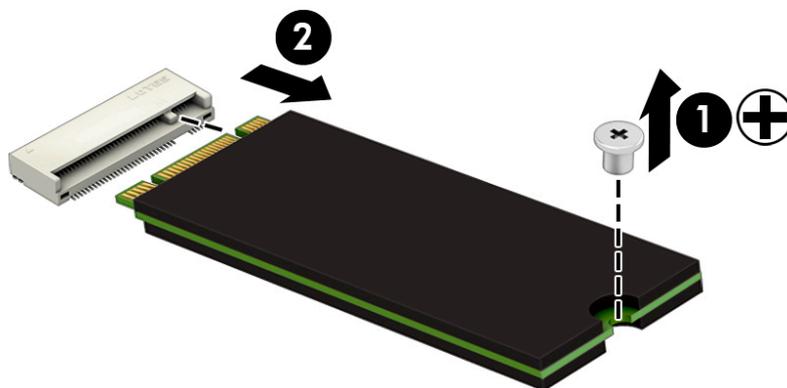
Reverse this procedure to reassemble and install the solid-state drive.

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) WLAN module	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. Disconnect the battery cable from the system board (see Battery on page 33).

Remove the WLAN module:

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

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

2. Remove the Phillips PM2.0×2.3 broad head screw **(2)** that secures the WLAN module to the keyboard/top cover. (The WLAN module tilts up.)

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

> **NOTE:** WLAN modules are designed with a notch to prevent incorrect insertion.
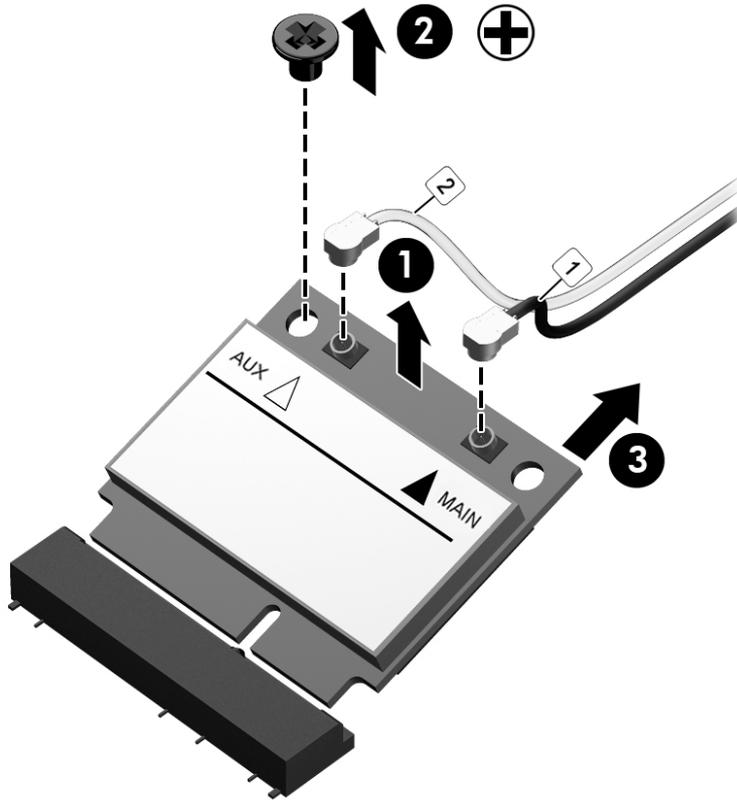
Reverse this procedure to install the WLAN module.

Front speakers

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	928527-001
For use only on computer models equipped with a graphics subsystem with UMA memory	928528-001

Before removing the front 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. Disconnect the battery cable from the system board (see Battery on page 33).

Remove the front speakers:

1. Disconnect the front speaker cable **(1)** from the system board.

2. Release the tape **(2)** that secures the front speaker cable to the battery.

3. Remove the front speakers **(3)**.
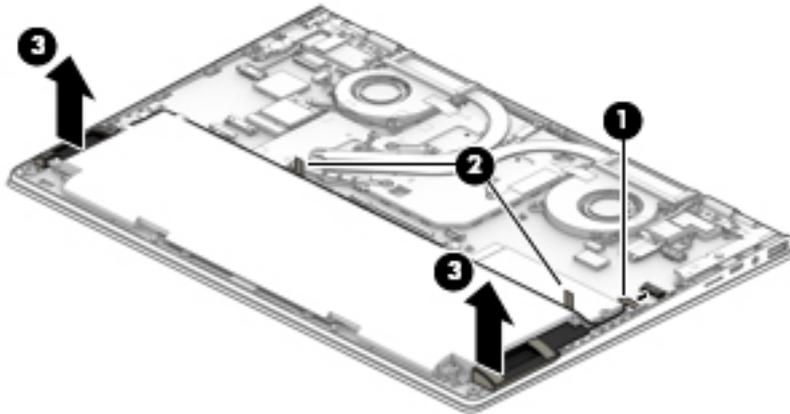
Reverse this procedure to install the front speakers.

Fans

📝 **NOTE:** The fan spare part kit includes the fan cable.

Description	Spare part number
Left fan for use only on computer models equipped with a graphics subsystem with discrete memory	928459-001
Right fan for use only on computer models equipped with a graphics subsystem with discrete memory	928460-001
Left fan for use only on computer models equipped with a graphics subsystem with UMA memory	928461-001
Right fan for use only on computer models equipped with a graphics subsystem with UMA memory	928462-001

Before removing the fans, 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).

5. Disconnect the battery cable from the system board (see).

Remove the left fan:

1. Disconnect the left fan cable **(1)** from the system board.

2. Release the tape **(2)** that secures the left fan to the system board.

3. Remove the two Phillips PM2.0×3.4 screws **(3)** that secure the left fan to the keyboard/top cover.

4. Remove the left fan **(4)**.
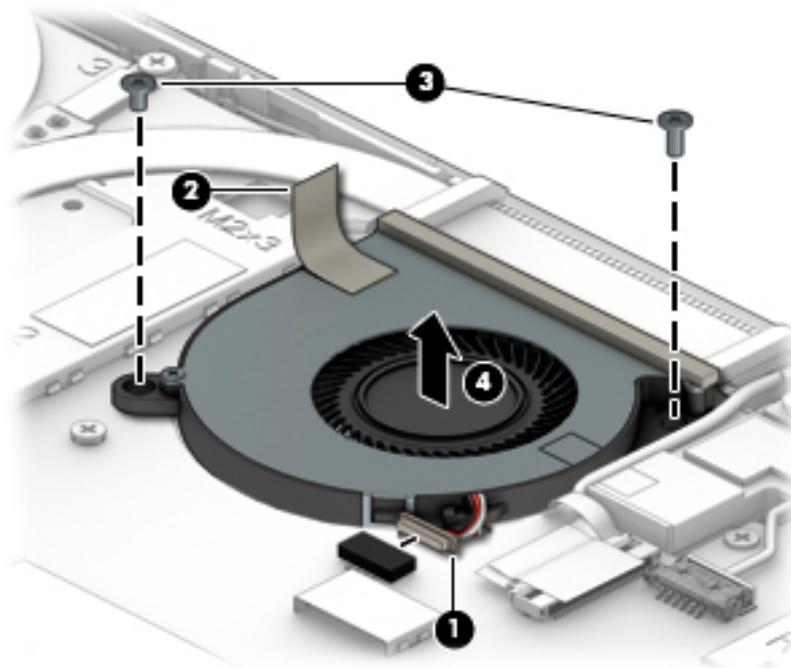
Remove the right fan:

1. Disconnect the right fan cable **(1)** from the system board.

2. Release the tape **(2)** that secures the right fan to the system board.

3. Remove the Phillips PM2.5×5.7 screw **(3)** that secures the right fan to the keyboard/top cover.

4. Remove the Phillips PM2.0×2.3 broad head screw **(4)** that secures the right fan to the keyboard/top cover.

5. Remove the right fan **(5)**.
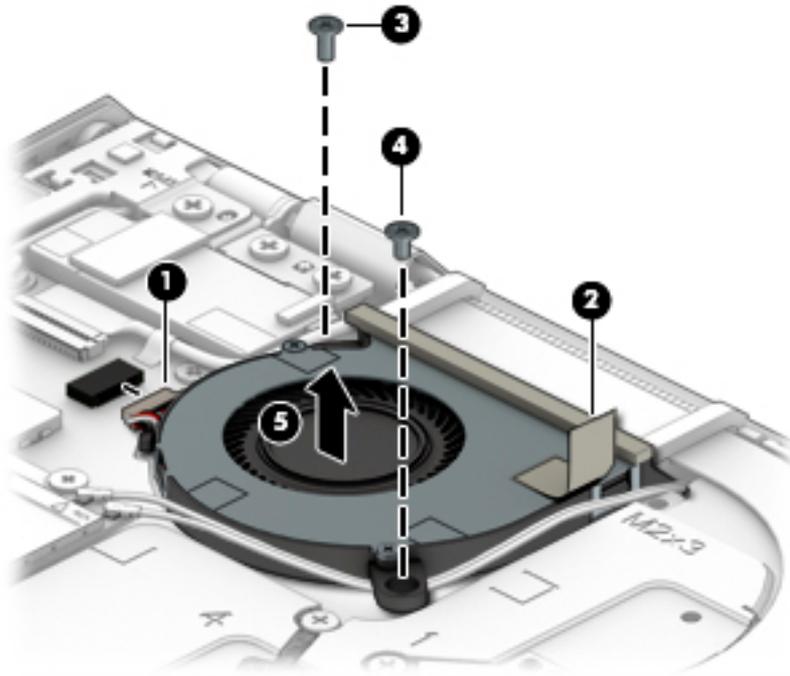
Reverse this procedure to install the fans.

Power connector cable

| Description	Spare part number
Power connector cable	808155-020

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).

5. Disconnect the battery cable from the system board (see Battery on page 33).

Remove the power connector cable:

1. Disconnect the power connector cable **(1)** from the system board.

2. Remove the Phillips PM2.5×5.7 screw **(2)** that secures the right I/O bracket to the keyboard/top cover.

3. Remove the two Phillips PM2.0×2.0 broad head screws **(3)** that secure the right I/O bracket to the keyboard/top cover.

4. Remove the right I/O bracket **(4)**.

   The right I/O bracket is available using spare part number 928468-001.

5. Remove the power connector cable **(5)**.
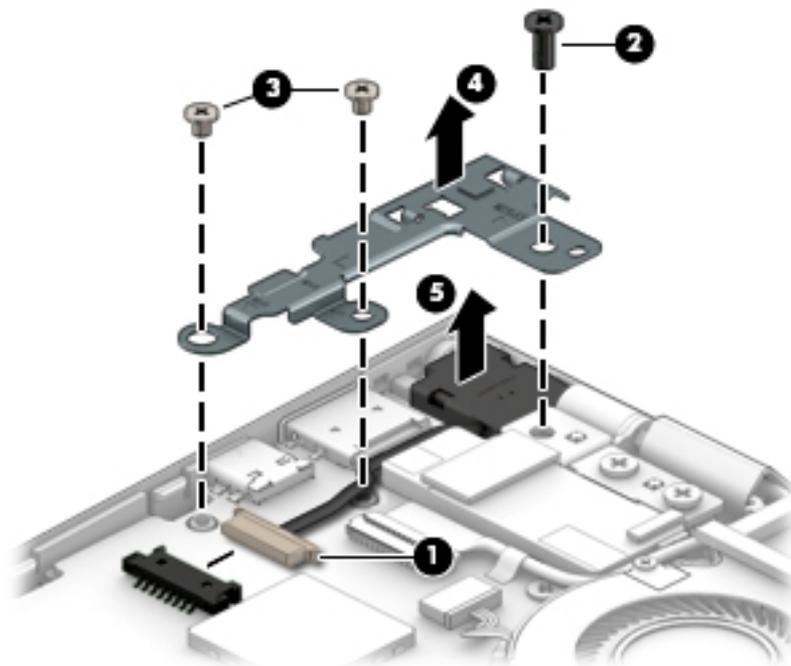
Reverse this procedure to install the power connector cable.

Display assembly

Description	Spare part number
In natural silver finish:	
UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (340 nits, 72% color gamut)	928479-001
FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (300 nits, 72% color gamut)	928478-001
UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (340 nits, 72% color gamut)	928483-001
UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen, flush glass display assembly (340 nits, 72% color gamut)	928475-001
FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (300 nits, 72% color gamut)	928482-001
FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen display assembly (300 nits, 72% color gamut)	928474-001
In silk gold finish:	
FHD, WLED, BrightView (1920×1080), uslim-flat (2.4-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (300 nits, 72% color gamut)	928476-001
UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBTS), TouchScreen display assembly (340 nits, 72% color gamut)	928477-001
UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (340 nits, 72% color gamut)	928481-001
UHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen, flush glass display assembly (340 nits, 72% color gamut)	928473-001
FHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel, non-TouchScreen display assembly (340 nits, 72% color gamut)	928480-001
FHD, WLED, BrightView (3840×2160), uslim-flat (2.0-mm), UWVA, eDP1.3+PSR, narrow bezel (DBCG), non-TouchScreen, flush glass display assembly (340 nits, 72% color gamut)	928472-001

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).

5. Disconnect the battery cable from the system board (see).

Remove the display assembly:

1. Release the ZIF connector **(1)** to which webcam/microphone module cable is connected, and then disconnect the webcam/microphone module from the system board.

2. Release the piece of tape **(2)** that secures the webcam/microphone module cable to the system board.

3. Release the adhesive support strip **(3)** that secures the display panel cable to the system board.

4. Release the ZIF connector **(4)** to which display panel cable is connected, and then disconnect the display panel cable from the system board.

5. Release the piece of tape **(5)** that secures the display panel cable to the system board.
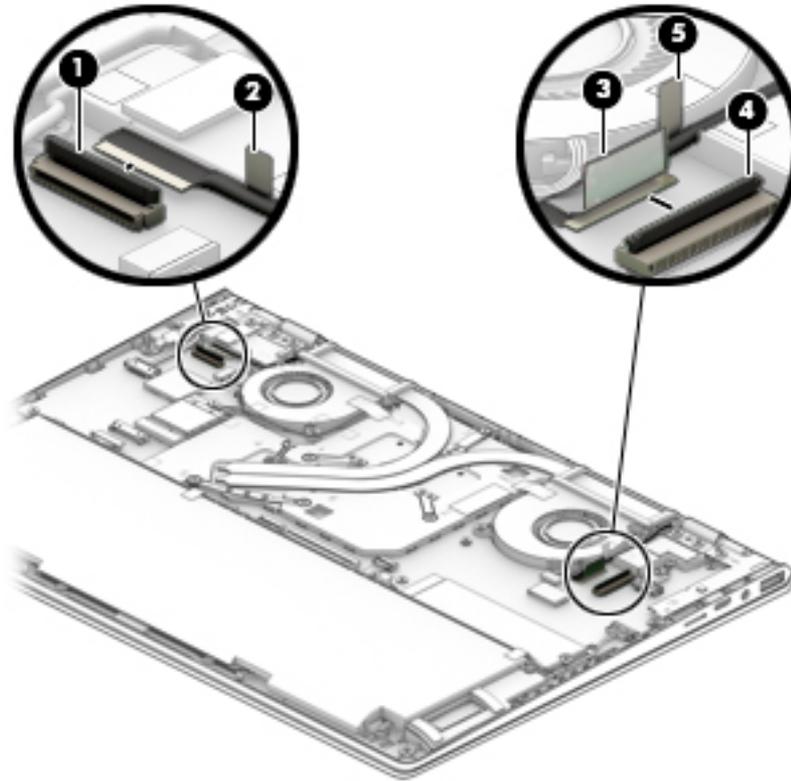
6. Remove the two Phillips PM2.5×5.7 screws **(1)** that secure the left and right I/O brackets to the keyboard/top cover.

7. Remove the three Phillips PM2.0×2.0 broad head screws **(2)** that secure the left and right I/O brackets to the keyboard/top cover.

8. Remove the right I/O bracket **(3)**.

   The right I/O bracket is available using spare part number 928468-001.

9. Remove the left I/O bracket **(4)**.

   The left I/O bracket is available using spare part number 928467-001.
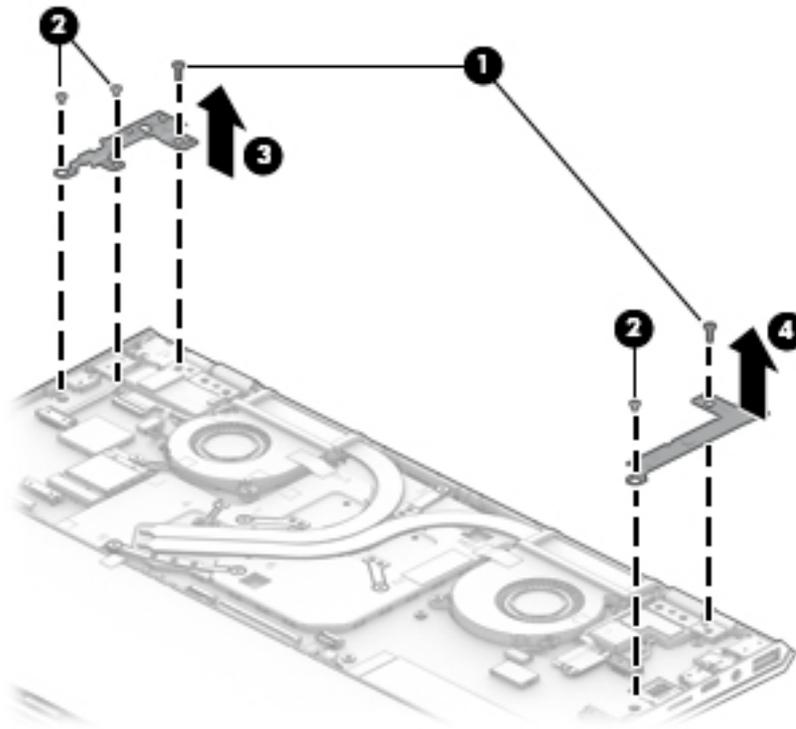
10. Remove the four Phillips PM2.5×5.7 screws **(1)** that secure the display assembly to the keyboard/top cover.

11. Lift the front edge of the keyboard/top cover **(2)** until it rests at an angle.

12. Slide the keyboard/top cover **(3)** up and away at an angle and separate it from the display assembly.
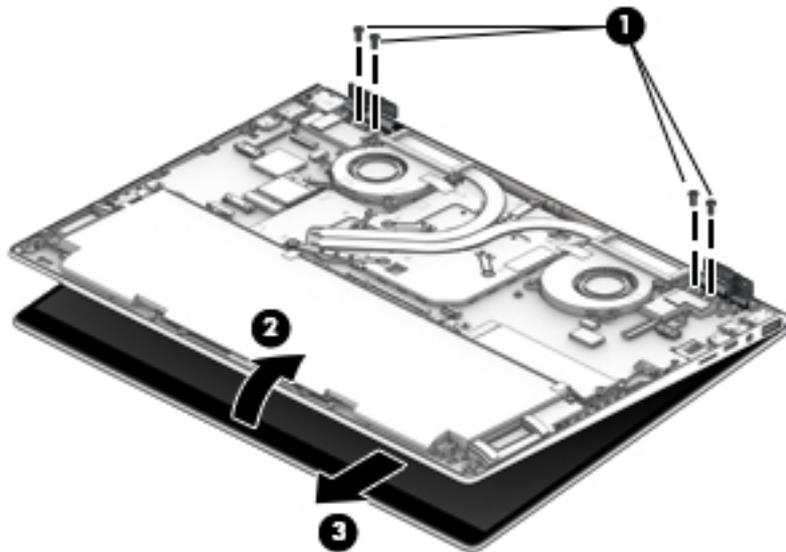
Reverse this procedure to install the display assembly.

TouchPad cable

NOTE: The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is available using spare part numbers 928451-001 (for use only on computer models equipped with a graphics subsystem with discrete memory) and 928452-001 (for use only on computer models equipped with a graphics subsystem with UMA memory).

Before removing the TouchPad cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the bottom cover (see Bottom cover on page 30).

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

Remove the TouchPad cable:

1. Release the ZIF connector **(1)** to which TouchPad cable is connected, and then disconnect the TouchPad cable from the system board.

2. Release the ZIF connector **(2)** to which TouchPad cable is connected, and then disconnect the TouchPad cable from the TouchPad.

3. Release the piece of tape **(3)** that secures the TouchPad cable to the keyboard/top cover.

4. Remove the TouchPad cable **(4)**.
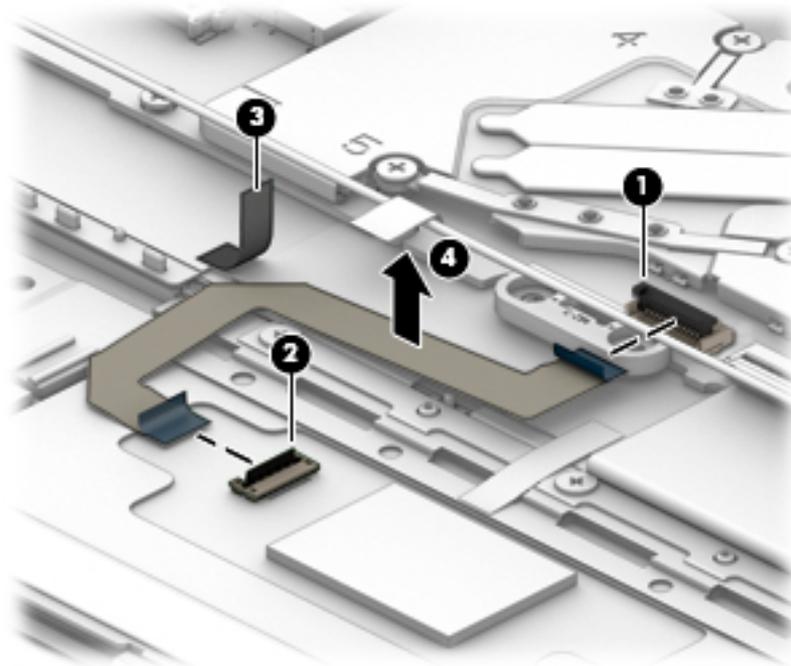
Reverse this procedure to install the TouchPad cable.

TouchPad

NOTE: The TouchPad spare part kit does not include the TouchPad bracket or TouchPad cable. The TouchPad bracket is available using spare part number 928466-001. The TouchPad cable is available using spare part numbers 928451-001 (for use only on computer models equipped with a graphics subsystem with discrete memory) and 928452-001 (for use only on computer models equipped with a graphics subsystem with UMA memory).

Description	Spare part number
ClickPad in natural silver finish	928488-001
ClickPad in silk gold finish	928487-001
SecurePad in natural silver finish	928490-001
SecurePad in silk gold finish	928489-001

Before removing the TouchPad, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the bottom cover (see Bottom cover on page 30).

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

Remove the TouchPad:

1. Release the ZIF connector **(1)** to which TouchPad cable is connected, and then disconnect the TouchPad cable from the system board.

2. Release the piece of tape **(2)** that secures the TouchPad cable to the keyboard/top cover.

3. Release the piece of tape **(3)** that secures the TouchPad to the keyboard/top cover.

4. Remove the five Phillips PM2.0×2.3 broad head screws **(4)** that secure the TouchPad to the keyboard/top cover.

5. Remove the TouchPad bracket **(5)** .

6. Remove the TouchPad **(6)**.
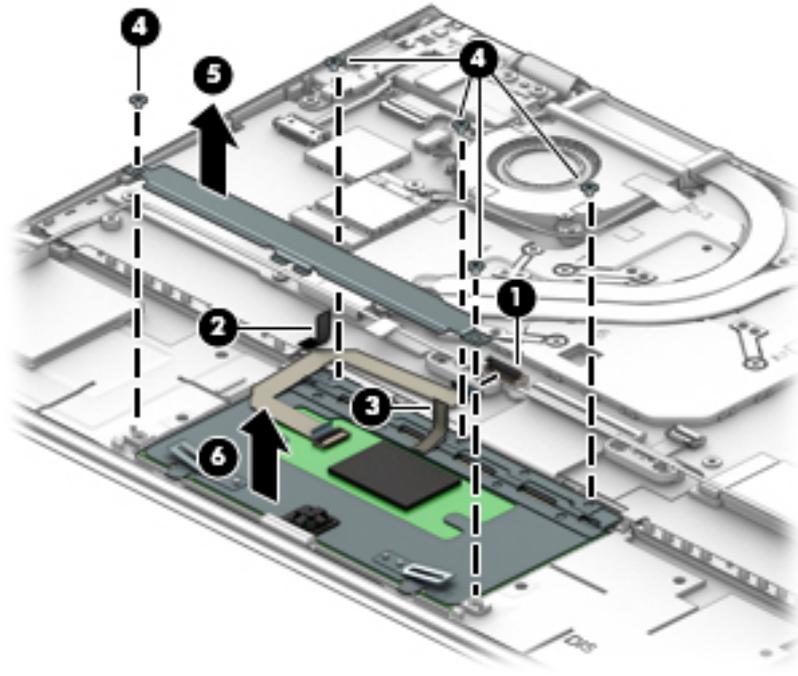
Reverse this procedure to install the TouchPad.

System board

NOTE: The system board spare part kit includes a processor and replacement thermal material.

Description	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 NVIDIA N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and the Windows 10 operating system	926318-601
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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and a non-Windows operating system	926318-001
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 memory, 16-GB of system memory, and the Windows 10 operating system	926315-601
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 memory, 16-GB of system memory, and a non-Windows operating system	926315-001
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 memory, 8-GB of system memory, and the Windows 10 operating system	926314-601
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 memory, 8-GB of system memory, and a non-Windows operating system	926314-001
Equipped with an Intel Core i7-8550U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a Windows operating system	939648-601
Equipped with an Intel Core i7-8550U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows operating system	939648-001
Equipped with an Intel Core i7-8550U processor, graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a Windows operating system	939651-601
Equipped with an Intel Core i7-8550U processor, MX150 graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a non-Windows operating system	939651-001
Equipped with an Intel Core i7-8550U processor, graphics subsystem with 2-GB discrete memory, 16-GB of system memory, and a Windows operating system	939652-601
Equipped with an Intel Core i7-8550U processor, MX150 graphics subsystem with 2-GB discrete memory, 16-GB of system memory, and a non-Windows operating system	939652-001
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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and the Windows 10 operating system	926317-601
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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 8-GB of system memory, and a non-Windows operating system	926317-001
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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 4-GB of system memory, and the Windows 10 operating system	926316-601

Description	Spare part number
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 N17S-LG (GeForce MX150) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×32 GDDR5×2 pieces, 1.5-V/7-Gbps), 4-GB of system memory, and a non-Windows operating system	926316-001
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 memory, 8-GB of system memory, and the Windows 10 operating system	926313-601
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 memory, 8-GB of system memory, and a non-Windows operating system	926313-001
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 memory, 4-GB of system memory, and the Windows 10 operating system	926312-601
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 memory, 4-GB of system memory, and a non-Windows operating system	926312-001
Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 4-GB of system memory, and a Windows operating system	939646-601
Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 4-GB of system memory, and a non-Windows operating system	939646-001
Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a Windows operating system	939647-601
Equipped with an Intel Core i5-8250U processor, graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows operating system	939647-001
Equipped with an Intel Core i5-8250U processor, graphics subsystem with 2-GB discrete memory, 4-GB of system memory, and a Windows operating system	939649-601
Equipped with an Intel Core i5-8250U processor, MX150 graphics subsystem with 2-GB discrete memory, 4-GB of system memory, and a non-Windows operating system	939649-001
Equipped with an Intel Core i5-8250U processor, graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a Windows operating system	939650-601
Equipped with an Intel Core i5-8250U processor, MX150 graphics subsystem with 2-GB discrete memory, 8-GB of system memory, and a non-Windows operating system	939650-001
Equipped with an Intel Core i3-7100U 2.40-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, 4-GB of system memory, and the Windows 10 operating system	926311-601
Equipped with an Intel Core i3-7100U 2.40-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, 4-GB of system memory, and a non-Windows operating system	926311-001

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), and then remove the following components:

   a. Battery (see Battery on page 33)

   b. Solid-state drive (see Solid-state drive on page 34)

   c. WLAN module (see WLAN module on page 35)

   d. Fans (see Fans on page 38)

When replacing the system board, be sure to remove the heat sink (see Heat sink on page 52) from the defective system board and install it on the replacement system board.

Remove the system board:

1. Disconnect the following cables from the system board:

   (1) Power connector cable

   (2) Webcam/microphone module ZIF connector cable

   (3) Display panel ZIF connector cable

   (4) Rear speaker cable

   (5) Front speaker cable

   (6) Backlight ZIF connector cable

   (7) Keyboard ZIF connector cable

   (8) TouchPad ZIF connector cable
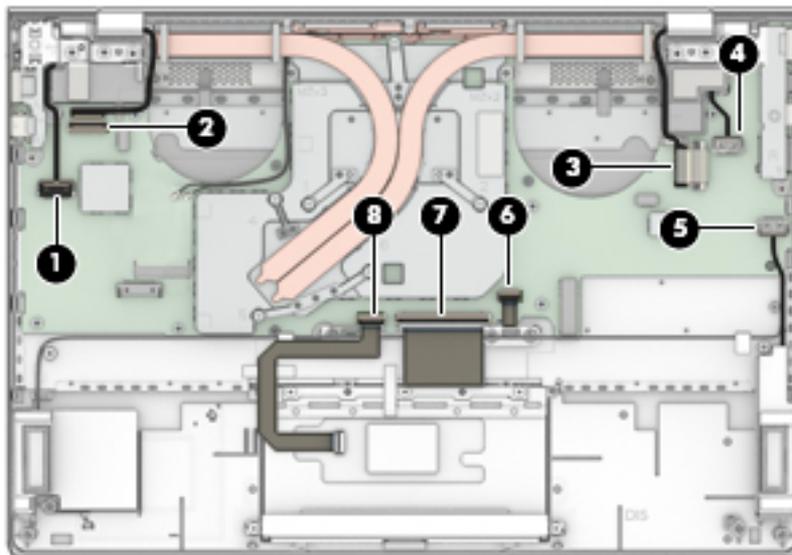
2. Remove the two Phillips PM2.5×5.7 screws **(1)** that secure the left and right I/O brackets to the keyboard/top cover.

3. Remove the three Phillips PM2.0×2.0 broad head screws **(2)** that secure the left and right I/O brackets to the keyboard/top cover.

4. Remove the right I/O bracket **(3)**.

The right I/O bracket is available using spare part number 928468-001.

5. Remove the left I/O bracket **(4)**.

The left I/O bracket is available using spare part number 928467-001.
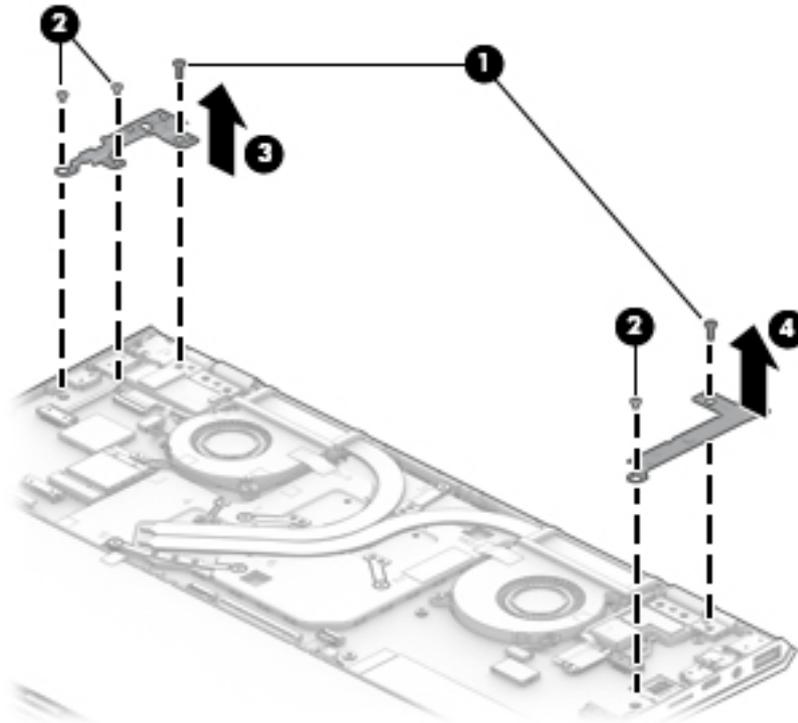
6. Remove the six Phillips PM2.0×3.4 screws **(1)** that secure the system board to the keyboard/top cover.

7. Remove the four Phillips PM2.0×2.0 broad head screws **(2)** that secure the system board and the system board retention hooks to the keyboard/top cover.

8. Remove the system board retention hooks **(3)**.

The system board retention hooks are available using spare part number 928493-001.
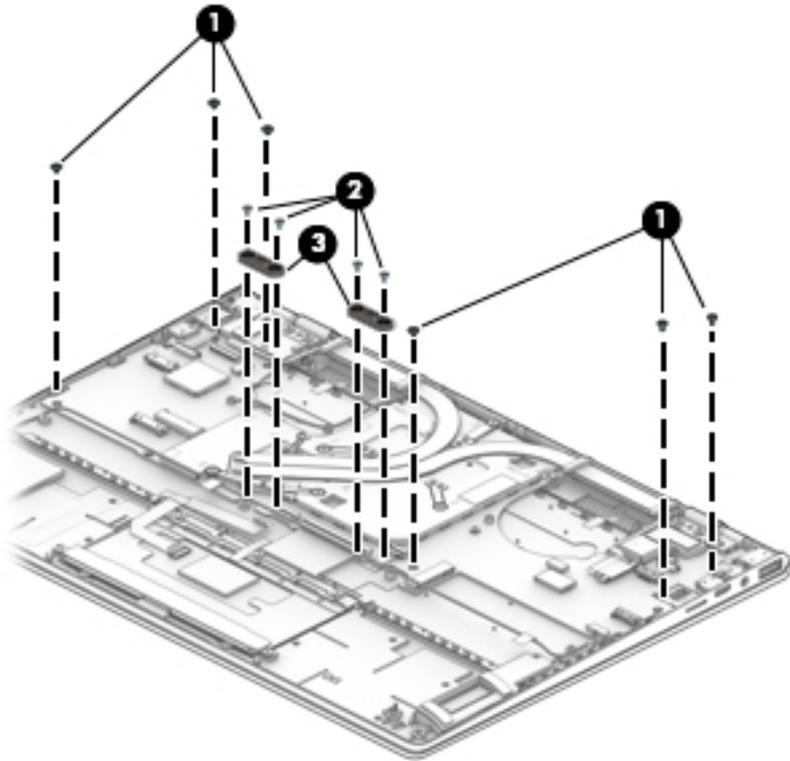
9. Lift the left side of the system board **(1)** until it rests at an angle.

10. Remove the system board **(2)** by sliding it up and to the left at an angle.
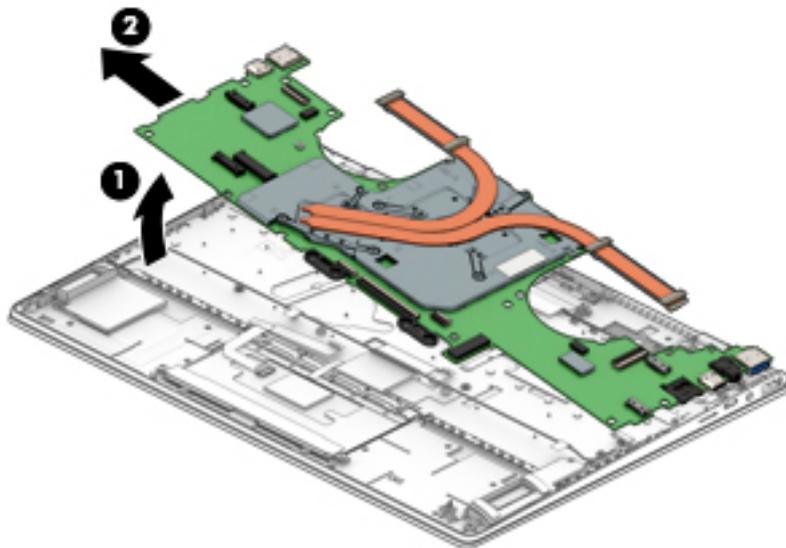
Reverse this procedure to install the system board.

Heat sink

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

| Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	927920-001
For use only on computer models equipped with a graphics subsystem with UMA memory	927919-001

Before removing the heat sink, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 30), and then remove the following components:

   a. Battery (see Battery on page 33)

   b. Solid-state drive (see Solid-state drive on page 34)

   c. WLAN module (see WLAN module on page 35)

   d. Fans (see Fans on page 38)

   e. System board (see System board on page 47)

Remove the heat sink:

NOTE: Steps 1 and 2 apply to computer models equipped with a graphics subsystem with discrete memory. See Steps 3 through 6 for heat sink removal information for computer models equipped with a graphics subsystem with UMA memory.

1. Loosen the six Phillips PM2.0×6.2 captive screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink **(2)**.
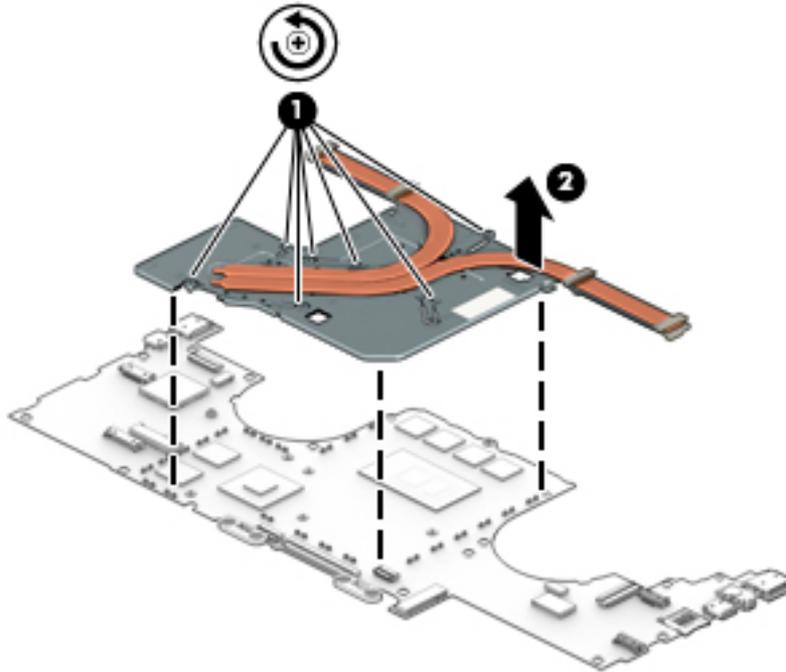
NOTE: Steps 3 through 6 apply to computer models equipped with a graphics subsystem with UMA memory. See Steps 1 and 2 for heat sink removal information for computer models equipped with a graphics subsystem with discrete memory.

3. Remove the Mylar shielding **(1)** that covers the heat sink screws.

4. Release the grounding foil **(2)** that covers the heat sink screws.

5. Loosen the three Phillips PM2.0×6.2 captive screws **(3)** that secure the heat sink to the system board.

6. Remove the heat sink **(4)**.
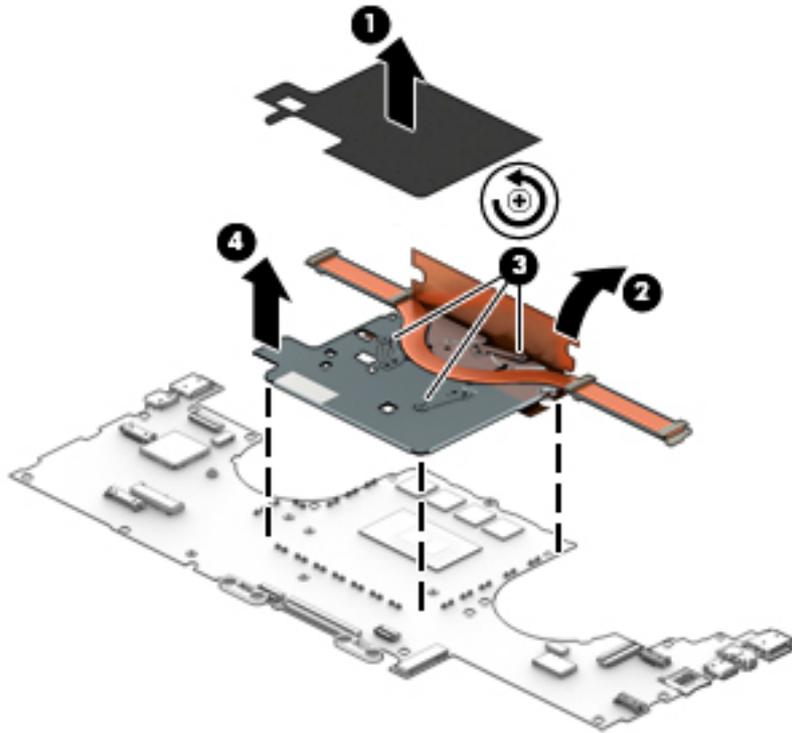
NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

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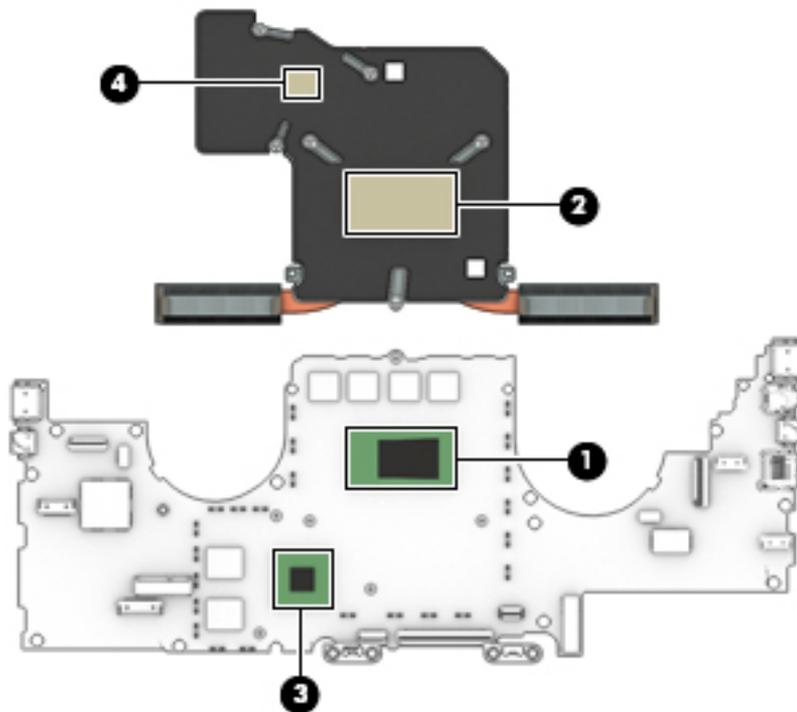
On computer models equipped with a graphics subsystem with UMA memory: Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.
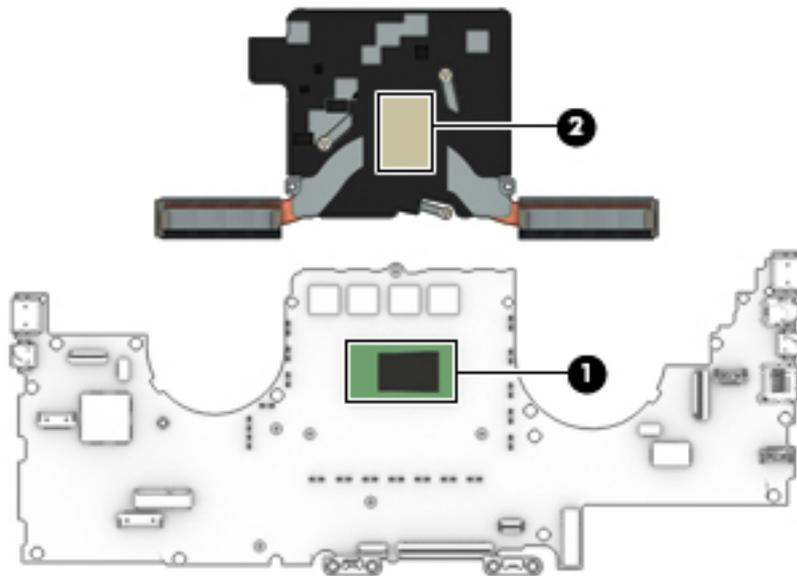
Reverse this procedure to install the heat sink.

Rear speakers

NOTE: The rear speaker spare part kit includes the cables.

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	928527-001
For use only on computer models equipped with a graphics subsystem with UMA memory	928528-001

Before removing the rear 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. Remove the bottom cover (see Bottom cover on page 30), and then remove the following components:

   a. Battery (see Battery on page 33)

   b. Solid-state drive (see Solid-state drive on page 34)

   c. WLAN module (see WLAN module on page 35)

   d. Fans (see Fans on page 38)

   e. System board (see System board on page 47)

Remove the rear speakers:

1. Release the Mylar shielding **(1)** and tape that secures the rear speaker cable to the keyboard/top cover.

2. Remove the rear speakers **(2)**.
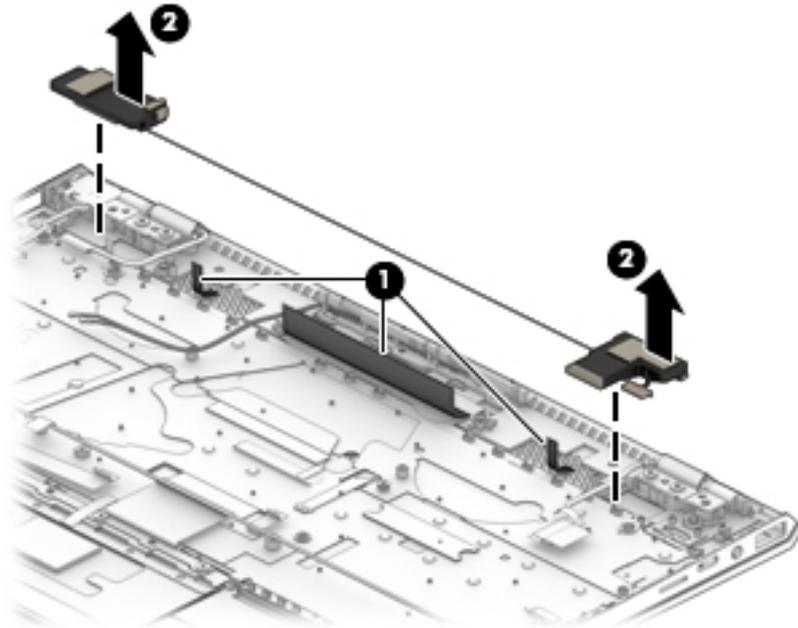
Reverse this procedure to install the rear speakers.

Wireless antenna

NOTE: The Wireless Antenna Kit includes the left and right wireless antenna cables and transceivers.

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	937093-001
For use only on computer models equipped with a graphics subsystem with UMA memory	936025-001

Before removing the wireless antenna, 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. Remove the bottom cover (see), and then remove the following components:

   a. Battery (see)

   b. Solid-state drive (see)

   c. WLAN module (see)

   d. Fans (see)

   e. System board (see)

Remove the wireless antenna:

1. Release the tape **(1)** that secures the wireless antenna cables to the keyboard/top cover.

2. Detach the wireless antenna transceivers **(2)** from the keyboard/top cover. (The wireless antenna transceivers are attached to the keyboard/top cover with double-sided adhesive.)

3. Remove the wireless antenna **(3)**.
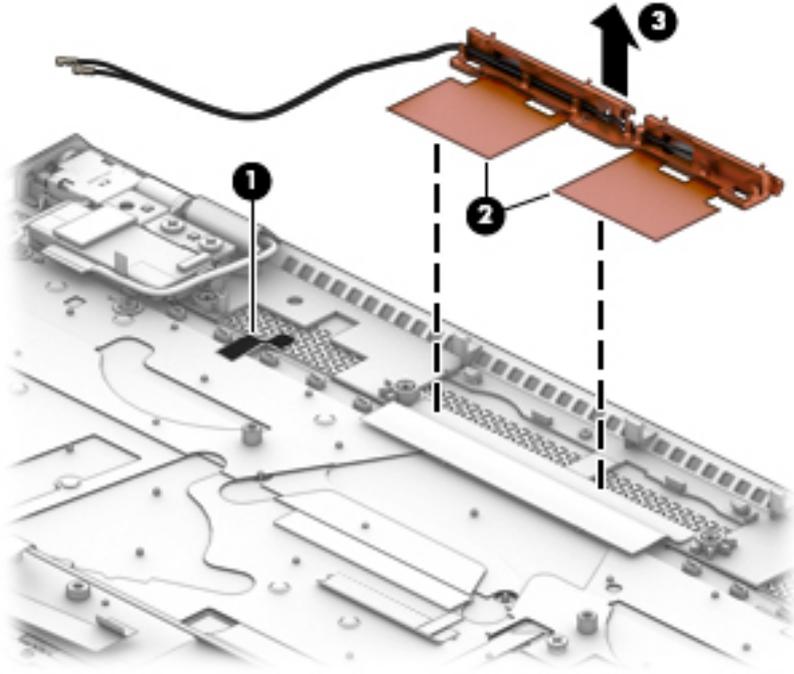
Reverse this procedure to install the wireless antenna.

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

▲ Turn on or restart the computer, quickly press esc, and then press f10.

Updating Setup Utility (BIOS)

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

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

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

Determining the BIOS version

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

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

- HP Support Assistant

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

       – or –

       Click the question mark icon in the taskbar.

    2. Select **My PC**, and then select **Specifications**.

- Setup Utility (BIOS)

    1. Start Setup Utility (BIOS) (see).

    2. Select **Main**, select **System Information**, and then make note of the BIOS version.

    3. Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see .

Downloading a BIOS update

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

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.

- Do not shut down the computer or initiate Sleep.

- Do not insert, remove, connect, or disconnect any device, cable, or cord.

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

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

   – or –

   Click the question mark icon in the taskbar.

2. Click **Updates**, and then click **Check for updates and messages**.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

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

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

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

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.

2. Click your hard drive designation. The hard drive designation is typically Local Disk (C:).

3. Using the hard drive path you recorded earlier, open the folder that contains the update.

4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.

5. Complete the installation by following the on-screen instructions.

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

7 Using HP PC Hardware Diagnostics (UEFI)

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

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

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

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

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

2. Press f2.

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

    a. Connected USB drive

        NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 62.

    b. Hard drive

    c. BIOS

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

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

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

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

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

Download the latest UEFI version

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. In the HP PC Hardware Diagnostics section, select the **Download** link, and then select **Run**.

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support.

2. Select **Get software and drivers**.

3. Enter the product name or number.

4. Select your computer, and then select your operating system.

5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

8   Specifications

	Metric	U.S.
Computer dimensions		
Width	**30.5 cm**	12.0 in
Depth	**21.6 cm**	8.5 in
Height	**1.4 cm**	0.6 in
Weight		
Computer models equipped with a graphics subsystem with discrete memory	**1.32 kg**	2.91 lbs
Computer models equipped with a graphics subsystem with UMA memory	**1.26 kg**	2.77 lbs
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

9 Backing up, restoring, and recovering

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

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

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

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

– or –

Select the question mark icon in the taskbar.

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

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

Creating recovery media and backups

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

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Using HP Recovery media (select products only) on page 64. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 65.

- Use Windows tools to create system restore points and create backups of personal information. See Using Windows tools on page 65.

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

- On select products, use the HP Cloud Recovery Download Tool to create a bootable USB flash drive for your HP recovery media. For more information, see Using the HP Cloud Recovery Download Tool (select products only) on page 66.

Using HP Recovery media (select products only)

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

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

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be

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

- Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.

- HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.

- To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.

- If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

- Be sure that the computer is connected to AC power before you begin creating the recovery media.

- The creation process can take an hour or more. Do not interrupt the creation process.

- If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media using HP recovery manager:

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

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

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

If you ever need to recover the system, see .

Using Windows tools

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

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

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

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

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

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

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

1. Go to http://www.hp.com/support.

2. Select **Software and Drivers**, and then follow the on-screen instructions.

Restore and recovery

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

IMPORTANT: Not all methods are available on all products.

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

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

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

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

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

*   If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 66. If you have not already created recovery media, see Using HP Recovery media (select products only) on page 64.

*   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 66.

*   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 68.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see Using HP Recovery media (select products only) on page 64.

What you need to know before you get started

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

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

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Using HP Recovery media (select products only) on page 64.

- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Using HP Recovery media (select products only) on page 64.

- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. You can find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

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

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

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

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.

- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

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

Using the HP Recovery partition (select products only)

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

To start HP Recovery Manager from the HP Recovery partition:

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

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

   – or –

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

   For tablets without keyboards:

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

   – or –

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

2. Select **Troubleshoot** from the boot options menu.

3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

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

1.   If possible, back up all personal files.

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

    📝 **NOTE:**   If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See .

3.   Follow the on-screen instructions.

Changing the computer boot order

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

To change the boot order:

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

1.   Insert the HP Recovery media.

2.   Access the system **Startup** menu.

    For computers or tablets with keyboards attached:

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

    For tablets without keyboards:

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

        – or –

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

3.   Select the optical drive or USB flash drive from which you want to boot.

4.   Follow the on-screen instructions.

Removing the HP Recovery partition (select products only)

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

📝 **IMPORTANT:**   After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see .

📝 **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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