HP Pavilion 15 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 Pavilion 15 Laptop PC (model numbers 15-cc100 through 15-cc199 and 15-cc600 through 15-cc699)
	HP Pavilion 15 Laptop PC (model numbers 15-cc500 through 15-cc599 and 15-cc700 through 15-cc799)
Processors	For use only on computer models with model numbers 15-cc100 through 15-cc199 and 15-cc600 through 15-cc699:
	• Intel® Core™ i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W)
	• Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W)
	For use on all computer models:
	• Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W)
	• Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W
	• Intel Core i3-7100U 2.40-GHz dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W
	• Intel Pentium™ 4415U 2.30-GHz dual core processor (2133-MHz FSB, 2.0-MB L3 cache, 15-W
Chipset	Integrated soldered-on-circuit (SoC)
Graphics	**Hybrid graphics:**
	NVIDIA™ N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz)
	NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz)
	Internal graphics:
	Intel HD Graphics 620
	Intel HD Graphics 610
	Support for HD decode, DX12, and high-definition multimedia interface (HDMI)
	Support for Optimus
	Support for GPU Performance Scaling (GPS)
Panel	• 15.6-in, full high-definition (FHD), white light-emitting (WLED), BrightView (1920×1080), slim-flat (3.2-mm), UWVA, eDP, 220 nits, 16:9 ultra wide aspect ratio, TouchScreen display assembly
	• 15.6-in, high-definition (HD), WLED, BrightView (1366×768), slim-flat (3.2-mm), SVA, eDP, 200 nits, 16:9 ultra wide aspect ratio, TouchScreen display assembly
	• 15.6-in, FHD, WLED, AntiGlare (1920×1080), slim-flat (3.2-mm), UWVA, eDP, 220 nits, 16:9 ultra wide aspect ratio non-TouchScreen display assembly
	• 15.6-in, FHD, WLED, BrightView (1920×1080), slim-flat (3.2-mm), UWVA, eDP, 220 nits, 16:9 ultra wide aspect ratio non-TouchScreen display assembly
	• 15.6-in, FHD, WLED, AntiGlare (1920×1080), slim-flat (3.2-mm), SVA, eDP, 220 nits, 16:9 ultra wide aspect ratio non-TouchScreen display assembly

Category	Description
Panel *(continued)*	• 15.6-in, HD, WLED, AntiGlare (1366×768), slim-flat (3.2-mm), SVA, eDP, 220 nits, 16:9 ultra wide aspect ratio non-TouchScreen display assembly
	• 15.6-in, HD, WLED, BrightView (1366×768), slim-flat (3.2-mm), SVA, eDP, 220 nits, 16:9 ultra wide aspect ratio non-TouchScreen display assembly
Memory	Two SODIMM memory module slots, non-customer-accessible/non-upgradable
	Supports up to 16-GB of system memory
	DDR4-2133 channel support (DDR4-2400 downgrade to DDR4-2133)
	Supports the following configurations:
	• 16384-MB (8192-MB × 2)
	• 12288-MB (8192-MB + 4096-MB)
	• 8192-MB (8192-MB × 1 or 4096-MB × 2)
	• 6144-MB (4096-MB × 1 + 2048-MB × 1)
	• 4096-MB (4096-MB × 1 or 2048-MB × 2)
Storage	Support for hard drive and solid-state drive
	Hard drive:
	Support for **6.35-cm** (2.5-in) hard drives in **7.2-mm** (.28 in) and **7.0-mm** (.28 in) thicknesses (all hard drives use the same bracket)
	Support for Accelerometer hard drive protection
	Support for the following single hard drive configurations:
	• 2-TB, 5400-rpm, 7.2-mm
	• 1-TB, 5400-rpm, 7.2-mm
	• 500-GB, 5400-rpm, 7.0-mm
	Solid-state drive:
	• 512-GB, 2280 M.2 SATA-3 solid-state drive
	• 128-GB, 2280 M.2 SATA-3 solid-state drive with TLC
	• 256-GB, 2280 M.2 SATA-3 solid-state drive
	Dual-storage configurations:
	• 2-TB, 5400-rpm, 7.2-mm hard drive + 128-GB, 2280 M.2 SATA-3 solid-state drive
	• 1-TB, 5400-rpm, 7.2-mm hard drive + 256-GB, 2280 M.2 SATA-3 solid-state drive
	• 1-TB, 5400-rpm, 7.2-mm hard drive + 128-GB, 2280 M.2 SATA-3 solid-state drive
Optical drive	• Support for 9.0-mm tray load, SATA, fixed (not modular)
	• Support for DVD±RW DL Drive
	• Support for M-disc
	• Support for zero-power optical drive
Audio and video	**Audio:**
	Support for B&O Play
	Support for B&O Play Audio Control
	Support for dual speakers

Category	Description
Audio and video *(continued)*	Support for HP Audio Boost
	Support for dual-array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software.
	Camera:
	HP Wide Vision FHD infrared camera with indicator light and 2 infrared lights, USB 2.0, FHD hybrid BSI sensor, f2.2, WDR, 88° wide field of vision, 1080p by 30 frames per second
	HP Wide Vision HD camera with indicator light, USB 2.0, HD BSI sensor, f2.0, WDR, 88° wide field of vision, 720p by 30 frames per second
	Support for wide dynamic range (WDR)
Ethernet	Integrated 10/100/1000 network interface card (NIC)
Wireless	**WLAN:**
	Integrated wireless local area network (WLAN) options by way of wireless module
	Single M.2/PCIe WLAN antenna built into display assembly
	Integrated wireless personal area network (PAN) supported by Bluetooth® 4.0/4.2 combo card
	Support for the following WLAN formats:
	• Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)
	• Intel Dual Band Wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)
	• Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter
	Compatible with Miracast-certified devices
External media cards	Micro-Secure Digital (SD®) media reader slot
Ports	• AC Smart Pin adapter plug
	• Audio-out (headphone)/audio-in (microphone) combo jack
	• HDMI v1.4b supporting up to 1920×1080 @ 60Hz
	• RJ-45 network
	• USB 3.x ports (2)
	• USB Type-C port
Keyboard/pointing devices	Full-sized, island-style keyboard
	TouchPad requirements:
	• ClickPad with image sensor
	• MultiTouch gestures enabled
	• Support for Modern TrackPad gestures
	• Taps enabled as default
Power requirements	Support for a 3-cell, 41-WHr, 3.6-AHr, Li-ion battery
	Support for the following AC adapters:
	• 65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm)
	• 65-W AC adapter (non-PFC, S-3P, 4.5-mm)
	• 45-W HP Smart AC adapter (non-PFC, RC, 4.5-mm, non-slim)
	Support for a 1.00-m power cord

Category	Description
Security	Security cable lock slot
	Support for Trusted Platform Module (TPM) 2.0
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
	• Windows 10 Home Plus EM/SL
	• Windows 10 Home Value Notebook EM/SL
	• Windows 10 Home Value Notebook Select Geo EM/SL
	For China market: CPPP Windows 10 Home China Language Edition and CPPP Windows 10 Home China High-End Language Edition
	For Asia SEAP market (EM/SL): SEAP Windows 10 Home EM/SL and SEAP Windows 10 Home Plus
	FreeDOS 2.0
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).
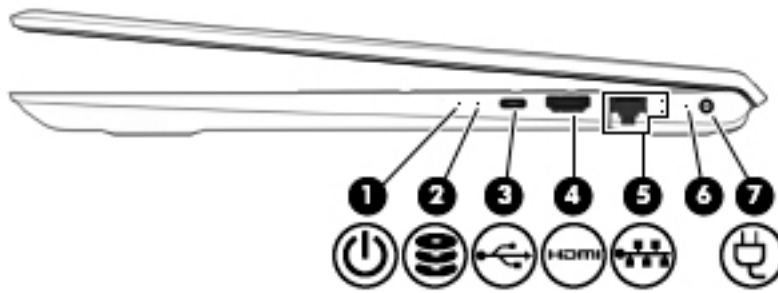
Locating software

To find out what software is installed on your computer:

▲ Select the **Start** button.

– or –

Right-click the **Start** button, and then select **Apps & features**.

Right side

Component			Description
(1)	⏻	Power light	• On: The computer is on.
			• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.
			• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)	🗄	Drive light	• Blinking white: The hard drive is being accessed.
			• Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(3)	⇌	USB Type-C port	When the computer is on, connects and charges a USB device that has a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
			– or –
			Connects to various USB, video, HDMI, and LAN devices.
			NOTE: Cables and/or adapters (purchased separately) may be required.
(4)	HDMI	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or an HDMI device.
(5)	⊶	RJ-45 (network) jack/status lights	Connects a network cable.
			• White: The network is connected.
			• Amber: Activity is occurring on the network.
(6)		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.
(7)	⊔	Power connector	Connects an AC adapter.

Left side

Component			Description
(1)	🔒	Security cable slot	Attaches an optional security cable to the computer.
			NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	SS⇇	USB 3.x SuperSpeed ports (2)	Connect a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provide high-speed data transfer.
(3)	🎧	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.
(4)	▲	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
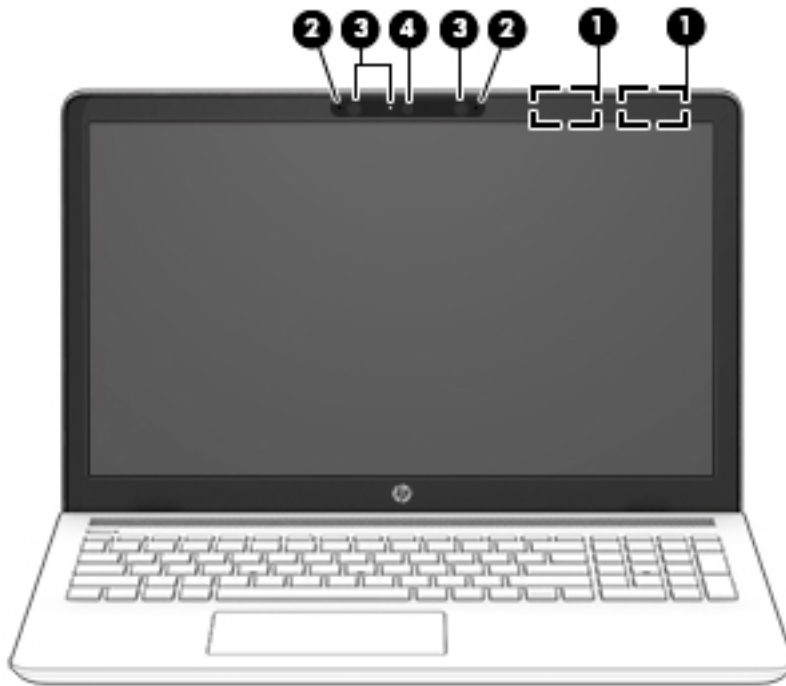
Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Internal microphones	Record sound.
(3)	Camera light(s)	On: One or more cameras are in use.
(4)	Camera(s)	Allow you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon.
		NOTE: Camera functions vary depending on the camera hardware and software installed on your product.

*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)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights

Component			Description
(1)		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 and your power options:
		▲ Right-click the **Start** button, and then select **Power Options**.
(2)	Speakers	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.
(5)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When num lock is pressed, the keypad can be used like an external numeric keypad. **NOTE:** If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

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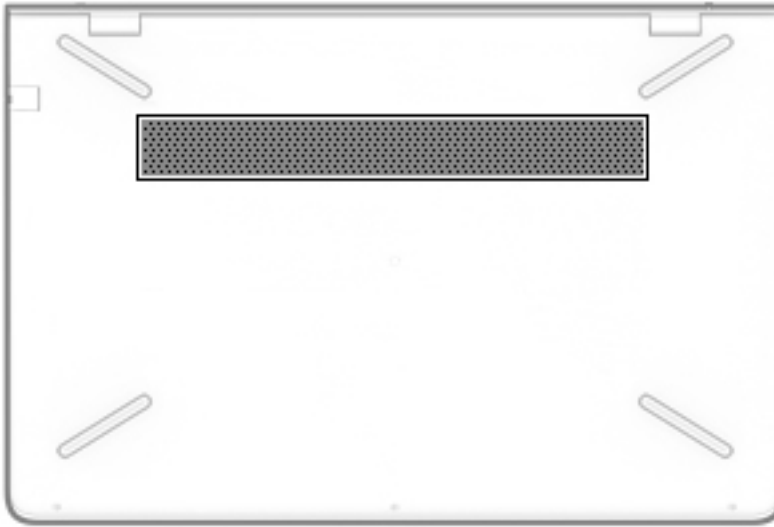
Component	Description
Vent	Enables airflow to cool internal components.
	NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

3 Illustrated parts catalog

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

Labels

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

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

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

    Your service label will resemble one of the examples shown below. Refer to the illustration that most closely matches the service label on your computer.
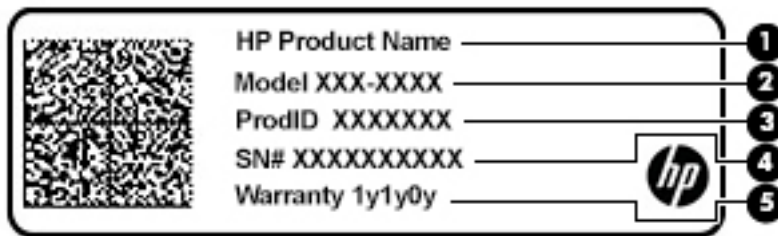
	Component
(1)	HP product name (select products only)
(2)	Model number
(3)	Product number
(4)	Serial number
(5)	Warranty period
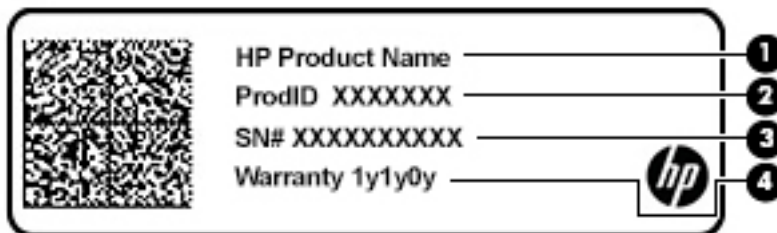
Component	
(1)	HP product name (select products only)
(2)	Product number
(3)	Serial number
(4)	Warranty period

Computer components
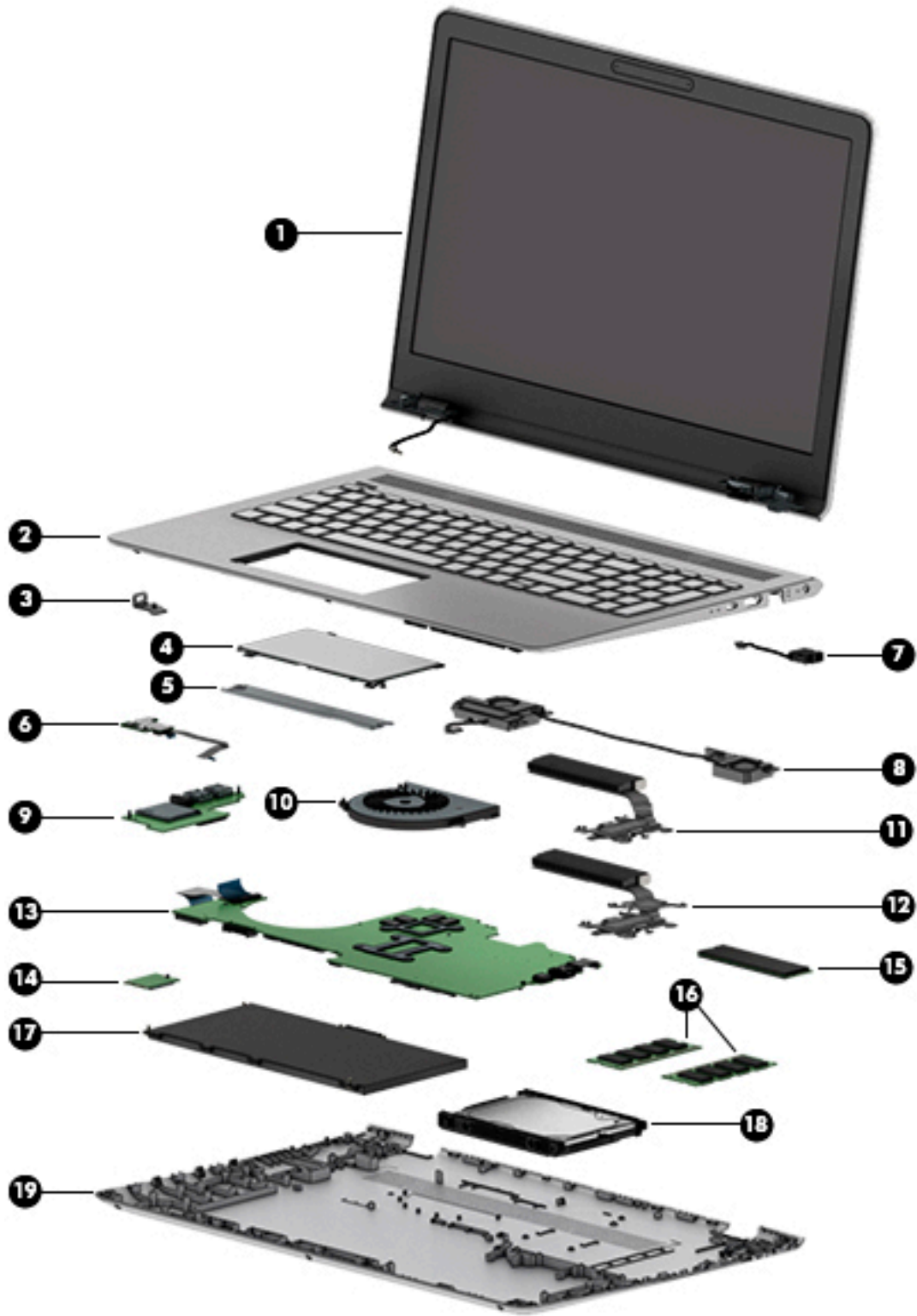
Item	Component	Spare part number
(1)	**Display assembly**: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly components on page 29.	
(2)	**Keyboard/top cover in empress red finish with speaker grille in natural silver finish with backlight** (includes backlight cable and keyboard cable):	
	For use in Belgium	929869-A41
	For use in Bulgaria	929869-261
	For use in Canada	929868-DB1
	For use in the Czech Republic and Slovakia	929869-FL1
	For use in Denmark, Finland, and Norway	929869-DH1
	For use in France	929869-051
	For use in Germany	929869-041
	For use in Greece	929869-151
	For use in Hungary	929869-211
	For use in India	929869-002
	For use in Israel	929869-BB1
	For use in Italy	929869-061
	For use in Latin America	929869-161
	For use in the Netherlands	929869-B31
	For use in Northwest Africa	929869-FP1
	For use in Portugal	929869-131
	For use in Romania	929869-271
	For use in Russia	929869-251
	For use in Saudi Arabia	929869-171
	For use in Slovenia	929869-BA1
	For use in South Korea	929869-AD1
	For use in Spain	929869-071
	For use in Switzerland	929869-BG1
	For use in Taiwan	929869-AB1
	For use in Thailand	929869-281
	For use in Turkey	929869-141
	For use in the United Kingdom	929869-031
	For use in the United States	929869-001
	Keyboard/top cover in empress red finish with speaker grille in natural silver finish (includes keyboard cable):	
	For use in Belgium	929868-A41
	For use in Bulgaria	929868-261

Item	Component	Spare part number
	For use in Canada	929868-DB1
	For use in the Czech Republic and Slovakia	929868-FL1
	For use in Denmark, Finland, and Norway	929868-DH1
	For use in France	929868-051
	For use in Germany	929868-041
	For use in Greece	929868-151
	For use in Hungary	929868-211
	For use in India	929868-002
	For use in Israel	929868-BB1
	For use in Italy	929868-061
	For use in Latin America	929868-161
	For use in the Netherlands	929868-B31
	For use in Northwest Africa	929868-FP1
	For use in Portugal	929868-131
	For use in Romania	929868-271
	For use in Russia	929868-251
	For use in Saudi Arabia	929868-171
	For use in Slovenia	929868-BA1
	For use in South Korea	929868-AD1
	For use in Spain	929868-071
	For use in Switzerland	929868-BG1
	For use in Taiwan	929868-AB1
	For use in Thailand	929868-281
	For use in Turkey	929868-141
	For use in the United Kingdom	929868-031
	For use in the United States	929868-001
	Keyboard/top cover in mineral silver finish with speaker grille in natural silver finish with backlight (includes backlight cable and keyboard cable):	
	For use in Belgium	928952-A41
	For use in Bulgaria	928952-261
	For use in Canada	928952-DB1
	For use in the Czech Republic and Slovakia	928952-FL1
	For use in Denmark, Finland, and Norway	928952-DH1
	For use in France	928952-051
	For use in Germany	928952-041

Item	Component	Spare part number
	For use in Greece	928952-151
	For use in Hungary	928952-211
	For use in India	928952-002
	For use in Israel	928952-BB1
	For use in Italy	928952-061
	For use in Latin America	928952-161
	For use in the Netherlands	928952-B31
	For use in Northwest Africa	928952-FP1
	For use in Portugal	928952-131
	For use in Romania	928952-271
	For use in Russia	928952-251
	For use in Saudi Arabia	928952-171
	For use in Slovenia	928952-BA1
	For use in South Korea	928952-AD1
	For use in Spain	928952-071
	For use in Switzerland	928952-BG1
	For use in Taiwan	928952-AB1
	For use in Thailand	928952-281
	For use in Turkey	928952-141
	For use in the United Kingdom	928952-031
	For use in the United States	928952-001
	Keyboard/top cover in mineral silver finish with speaker grille in natural silver finish (includes keyboard cable):	
	For use in Belgium	928951-A41
	For use in Bulgaria	928951-261
	For use in Canada	928951-DB1
	For use in the Czech Republic and Slovakia	928951-FL1
	For use in Denmark, Finland, and Norway	928951-DH1
	For use in France	928951-051
	For use in Germany	928951-041
	For use in Greece	928951-151
	For use in Hungary	928951-211
	For use in India	928951-002
	For use in Israel	928951-BB1
	For use in Italy	928951-061

Item	Component	Spare part number
	For use in Latin America	928951-161
	For use in the Netherlands	928951-B31
	For use in Northwest Africa	928951-FP1
	For use in Portugal	928951-131
	For use in Romania	928951-271
	For use in Russia	928951-251
	For use in Saudi Arabia	928951-171
	For use in Slovenia	928951-BA1
	For use in South Korea	928951-AD1
	For use in Spain	928951-071
	For use in Switzerland	928951-BG1
	For use in Taiwan	928951-AB1
	For use in Thailand	928951-281
	For use in Turkey	928951-141
	For use in the United Kingdom	928951-031
	For use in the United States	928951-001
	Keyboard/top cover in opulent blue finish with speaker grille in natural silver finish with backlight (includes backlight cable and keyboard cable):	
	For use in Belgium	929867-A41
	For use in Bulgaria	929867-261
	For use in Canada	929867-DB1
	For use in the Czech Republic and Slovakia	929867-FL1
	For use in Denmark, Finland, and Norway	929867-DH1
	For use in France	929867-051
	For use in Germany	929867-041
	For use in Greece	929867-151
	For use in Hungary	929867-211
	For use in India	929867-002
	For use in Israel	929867-BB1
	For use in Italy	929867-061
	For use in Latin America	929867-161
	For use in the Netherlands	929867-B31
	For use in Northwest Africa	929867-FP1
	For use in Portugal	929867-131
	For use in Romania	929867-271

Item	Component	Spare part number
	For use in Russia	929867-251
	For use in Saudi Arabia	929867-171
	For use in Slovenia	929867-BA1
	For use in South Korea	929867-AD1
	For use in Spain	929867-071
	For use in Switzerland	929867-BG1
	For use in Taiwan	929867-AB1
	For use in Thailand	929867-281
	For use in Turkey	929867-141
	For use in the United Kingdom	929867-031
	For use in the United States	929867-001
	Keyboard/top cover in opulent blue finish with speaker grille in natural silver finish (includes keyboard cable):	
	For use in Belgium	929866-A41
	For use in Bulgaria	929866-261
	For use in Canada	929866-DB1
	For use in the Czech Republic and Slovakia	929866-FL1
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	For use in France	929866-051
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	For use in the Netherlands	929866-B31
	For use in Northwest Africa	929866-FP1
	For use in Portugal	929866-131
	For use in Romania	929866-271
	For use in Russia	929866-251
	For use in Saudi Arabia	929866-171
	For use in Slovenia	929866-BA1
	For use in South Korea	929866-AD1
	For use in Spain	929866-071

Item	Component	Spare part number
	For use in Switzerland	929866-BG1
	For use in Taiwan	929866-AB1
	For use in Thailand	929866-281
	For use in Turkey	929866-141
	For use in the United Kingdom	929866-031
	For use in the United States	929866-001
	Keyboard/top cover in orchid pink finish with speaker grille in natural silver finish with backlight (includes backlight cable and keyboard cable):	
	For use in Belgium	929871-A41
	For use in Bulgaria	929871-261
	For use in Canada	929871-DB1
	For use in the Czech Republic and Slovakia	929871-FL1
	For use in Denmark, Finland, and Norway	929871-DH1
	For use in France	929871-051
	For use in Germany	929871-041
	For use in Greece	929871-151
	For use in Hungary	929871-211
	For use in India	929871-002
	For use in Israel	929871-BB1
	For use in Italy	929871-061
	For use in Latin America	929871-161
	For use in the Netherlands	929871-B31
	For use in Northwest Africa	929871-FP1
	For use in Portugal	929871-131
	For use in Romania	929871-271
	For use in Russia	929871-251
	For use in Saudi Arabia	929871-171
	For use in Slovenia	929871-BA1
	For use in South Korea	929871-AD1
	For use in Spain	929871-071
	For use in Switzerland	929871-BG1
	For use in Taiwan	929871-AB1
	For use in Thailand	929871-281
	For use in Turkey	929871-141
	For use in the United Kingdom	929871-031

Item	Component	Spare part number
	For use in the United States	929871-001
	Keyboard/top cover in orchid pink finish with speaker grille in natural silver finish (includes keyboard cable):	
	For use in Belgium	929870-A41
	For use in Bulgaria	929870-261
	For use in Canada	929870-DB1
	For use in the Czech Republic and Slovakia	929870-FL1
	For use in Denmark, Finland, and Norway	929870-DH1
	For use in France	929870-051
	For use in Germany	929870-041
	For use in Greece	929870-151
	For use in Hungary	929870-211
	For use in India	929870-002
	For use in Israel	929870-BB1
	For use in Italy	929870-061
	For use in Latin America	929870-161
	For use in the Netherlands	929870-B31
	For use in Northwest Africa	929870-FP1
	For use in Portugal	929870-131
	For use in Romania	929870-271
	For use in Russia	929870-251
	For use in Saudi Arabia	929870-171
	For use in Slovenia	929870-BA1
	For use in South Korea	929870-AD1
	For use in Spain	929870-071
	For use in Switzerland	929870-BG1
	For use in Taiwan	929870-AB1
	For use in Thailand	929870-281
	For use in Turkey	929870-141
	For use in the United Kingdom	929870-031
	For use in the United States	929870-001
	Keyboard/top cover in silk gold finish with speaker grille in natural silver finish with backlight (includes backlight cable and keyboard cable):	
	For use in Belgium	929865-A41
	For use in Bulgaria	929865-261
	For use in Canada	929865-DB1

Item	Component	Spare part number
	For use in the Czech Republic and Slovakia	929865-FL1
	For use in Denmark, Finland, and Norway	929865-DH1
	For use in France	929865-051
	For use in Germany	929865-041
	For use in Greece	929865-151
	For use in Hungary	929865-211
	For use in India	929865-002
	For use in Israel	929865-BB1
	For use in Italy	929865-061
	For use in Latin America	929865-161
	For use in the Netherlands	929865-B31
	For use in Northwest Africa	929865-FP1
	For use in Portugal	929865-131
	For use in Romania	929865-271
	For use in Russia	929865-251
	For use in Saudi Arabia	929865-171
	For use in Slovenia	929865-BA1
	For use in South Korea	929865-AD1
	For use in Spain	929865-071
	For use in Switzerland	929865-BG1
	For use in Taiwan	929865-AB1
	For use in Thailand	929865-281
	For use in Turkey	929865-141
	For use in the United Kingdom	929865-031
	For use in the United States	929865-001
	Keyboard/top cover in silk gold finish with speaker grille in natural silver finish (includes keyboard cable):	
	For use in Belgium	929864-A41
	For use in Bulgaria	929864-261
	For use in Canada	929864-DB1
	For use in the Czech Republic and Slovakia	929864-FL1
	For use in Denmark, Finland, and Norway	929864-DH1
	For use in France	929864-051
	For use in Germany	929864-041
	For use in Greece	929864-151

Item	Component	Spare part number
	For use in Hungary	929864-211
	For use in India	929864-002
	For use in Israel	929864-BB1
	For use in Italy	929864-061
	For use in Latin America	929864-161
	For use in the Netherlands	929864-B31
	For use in Northwest Africa	929864-FP1
	For use in Portugal	929864-131
	For use in Romania	929864-271
	For use in Russia	929864-251
	For use in Saudi Arabia	929864-171
	For use in Slovenia	929864-BA1
	For use in South Korea	929864-AD1
	For use in Spain	929864-071
	For use in Switzerland	929864-BG1
	For use in Taiwan	929864-AB1
	For use in Thailand	929864-281
	For use in Turkey	929864-141
	For use in the United Kingdom	929864-031
	For use in the United States	929864-001
(3)	**TouchPad cable** (included with the TouchPad spare part kit; includes double-sided adhesive)	
(4)	**TouchPad**	L01118-001
(5)	**TouchPad bracket**	926879-001
(6)	**Power button board** (does not include power button board cable):	
	For use only on computer models equipped with a graphics subsystem with 4096-MB of discrete video memory	928946-001
	For use only on computer models equipped with a graphics subsystem with 2048-MB of discrete video memory or a graphics subsystem with UMA video memory	928947-001
	Power button board cable (not illustrated, includes double-sided adhesive)	928942-001
(7)	**Power connector cable**	808155-026
(8)	**Speakers** (include cables)	928949-001
(9)	**USB port board** (includes power light actuator, hard drive light actuator, card reader slot, and USB port; does not include USB port board cable):	
	For use only on computer models equipped with a graphics subsystem with 4096-MB of discrete video memory	927924-001

Item	Component	Spare part number
	For use only on computer models equipped with a graphics subsystem with 2048-MB of discrete video memory or a graphics subsystem with UMA video memory	927925-001
	USB port board cable (not illustrated, includes double-sided adhesive)	928941-001
(10)	**Fan** (includes cable)	927918-001
	Heat sink (includes replacement thermal material):	
(11)	For use only on computer models equipped with a graphics subsystem with UMA memory	927919-001
(12)	For use only on computer models equipped with a graphics subsystem with discrete memory	927920-001
(13)	**System board** (includes processor and replacement thermal material):	
	For use only on computer models with model numbers 15-cc100 through 15-cc199 and 15-cc600 through 15-cc699:	
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	935949-601
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	935949-001
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	935946-601
	Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	935946-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	935952-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	935952-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and the Windows 10 operating system	935951-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	935951-001
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	935947-601
	Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	935947-001
	For use on all computer models:	

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 NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927269-601
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	927269-001
	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 NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927268-601
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	927268-001
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	927264-601
	Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	927264-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927271-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	927271-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927270-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	927270-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	927265-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	927265-001
	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, and the Windows 10 operating system	927266-601
	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, and a non-Windows operating system	927266-001

Item	Component	Spare part number
	Equipped with an Intel Pentium 4415U 2.30-GHz dual core processor (2133-MHz FSB, 2.0-MB L3 cache, 15-W), an Intel HD Graphics 610 graphics subsystem with UMA video memory, and the Windows 10 operating system	927267-601
	Equipped with an Intel Pentium 4415U 2.30-GHz dual core processor (2133-MHz FSB, 2.0-MB L3 cache, 15-W), an Intel HD Graphics 610 graphics subsystem with UMA video memory, and a non-Windows operating system	927267-001
(14)	**WLAN module:**	
	Intel Dual Band Wireless-AC 7265 802.11 AC 2×2 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	901229-855
	Intel Dual Band Wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	863934-855
	Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter	927230-001
(15)	**Solid-state drive** (2280 M.2, SATA-3):	
	512-GB with TLC	763008-020
	256-GB with TLC	760615-039
	128-GB with TLC	759848-019
	256-GB	865902-020
	128-GB	827560-051
(16)	**Memory modules** (2, DDR4-2400, 1.2-V):	
	8-MB	862398-855
	4-MB	862397-855
	2-MB	864271-855
(17)	**Battery** (3-cell, 41-WHr, 3.6-AHr, Li-ion)	920070-855
(18)	**Hard drive** (does not include hard drive bracket or hard drive cable):	
	2-TB, 5400-rpm, SATA, 7.0-mm hard drive	912487-855
	1-TB, 5400-rpm, SATA, 7.0-mm, Hybrid 8.0-GB hard drive	924036-855
	1-TB, 5400-rpm, SATA, 7.0-mm hard drive	762990-005
	500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778186-005
	NOTE: The hard drive spare part kit does not include the hard drive bracket or the hard drive cable. The hard drive bracket is available using spare part number 933608-001. The hard drive cable is available using spare part number 928944-001.	
(19)	**Bottom cover**	928932-001
	Rubber Foot Kit (not illustrated, includes Mylar screw cover)	926855-001

Display assembly components
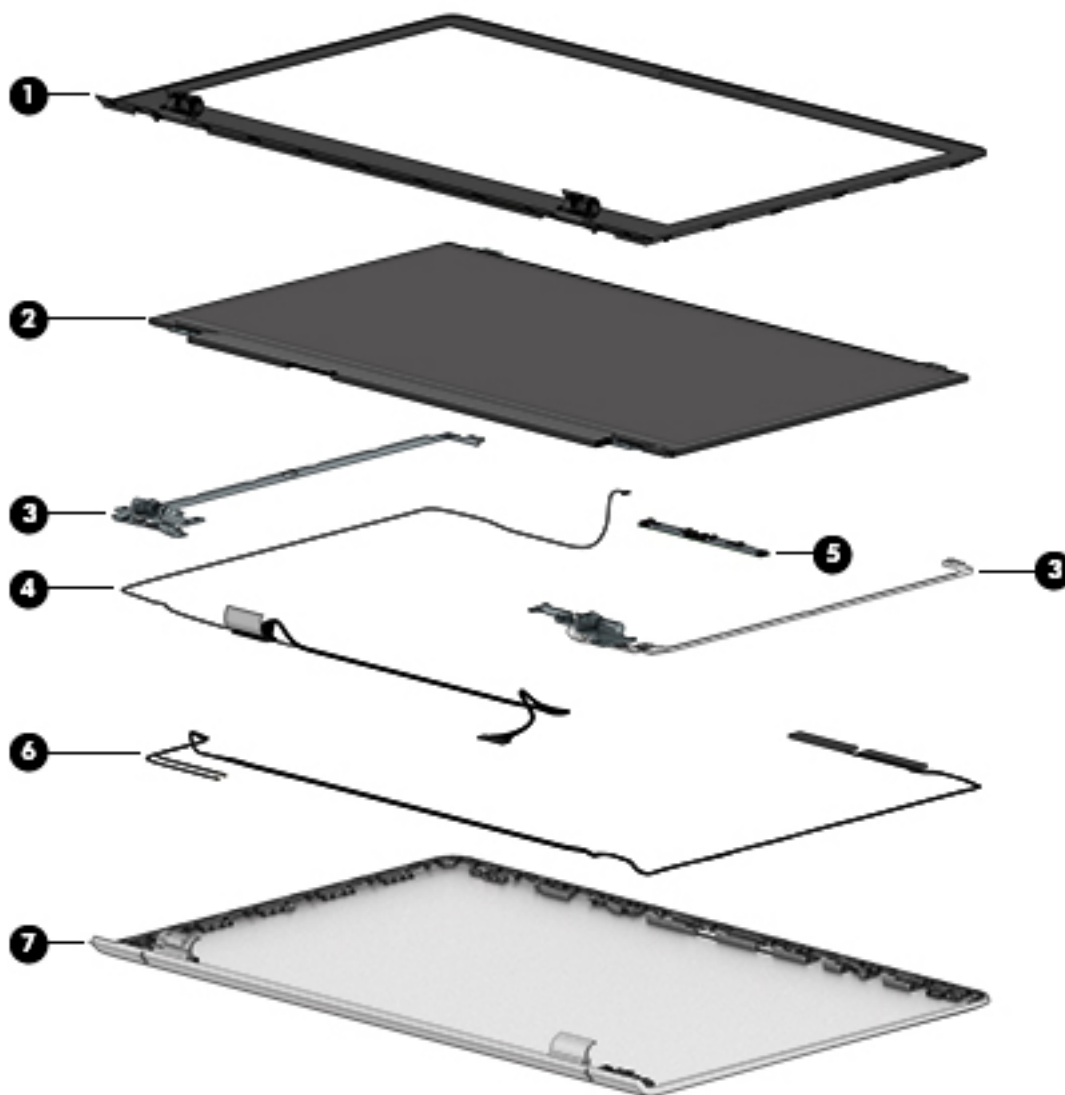
Item	Component	Spare part number
(1)	**Display bezel:**	
	For use on computer models equipped with a FHD infrared webcam	928934-001
	For use on computer models equipped with an HD non-infrared webcam	928933-001
(2)	**Display panel:**	
	15.6-in, FHD, BrightView (1920×1080), WLED, UWVA, TouchScreen	847651-004
	15.6-in, HD, BrightView (1366×768), WLED, SVA, TouchScreen	809612-015
	15.6-in, FHD, BrightView (1920×1080), WLED, UWVA, non-TouchScreen	842463-009
	15.6-in, FHD, AntiGlare (1920×1080), WLED, UWVA, non-TouchScreen	752920-016
	15.6-in, FHD, AntiGlare (1920×1080), WLED, SVA, non-TouchScreen	798933-013
	15.6-in, HD, BrightView (1366×768), WLED, SVA, non-TouchScreen	847654-009

Item	Component	Spare part number
	15.6-in, HD, AntiGlare (1366×768), WLED, SVA, non-TouchScreen	909185-007
(3)	**Hinges** (2, include left and right display hinges)	928945-001
(4)	**Display panel cable** (includes the webcam/microphone module cable)	
	For use on computer models equipped with an FHD TouchScreen display assembly and an FHD infrared webcam	928938-001
	For use on computer models equipped with an FHD TouchScreen display assembly and an HD non-infrared webcam	928937-001
	For use on computer models equipped with an FHD/HD non-TouchScreen display assembly and an FHD infrared webcam	928935-001
	For use on computer models equipped with an FHD/HD non-TouchScreen display assembly and an HD non-infrared webcam	928936-001
	For use on computer models equipped with an HD TouchScreen display assembly and an FHD infrared webcam	928940-001
	For use on computer models equipped with an HD TouchScreen display assembly and an HD non-infrared webcam	928939-001
(5)	**Webcam/microphone module** (includes Mylar and double-sided adhesive):	
	FHD infrared webcam/microphone module	926727-001
	HD non-infrared webcam/microphone module	919573-005
(6)	**Wireless Antenna Kit** (includes left and right wireless antenna cables and transceivers)	928953-001
(7)	**Display back cover** (includes left and right wireless antenna cables and transceivers and rubber padding and shielding):	
	In empress red finish	928957-001
	In mineral silver finish	928954-001
	In opulent blue finish	928956-001
	In orchid pink finish	928958-001
	In silk gold finish	928955-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
90-W AC adapter (PFC, S-3P, 4.5-mm)	710413-001
65-W HP Smart AC adapter (non-PFC, EM, RC, 4.5-mm)	913691-850
65-W AC adapter (non-PFC, S-3P, 4.5-mm)	710412-001
45-W HP Smart AC adapter (non-PFC, RC, 4.5-mm, non-slim)	741553-850
HP HDMI-to-VGA adapter	701943-001
HP USB–C-to-USB–A dongle	833960-001
Power cord (C5 connector, 1.00-m):	
For use in Argentina	920688-003
For use in Australia	920688-011
For use in Denmark	920688-007
For use in Europe	920688-005
For use in India	920688-016
For use in Israel	920688-008
For use in Italy	920688-002
For use in North America	920688-001
For use in the People's Republic of China	920688-014
For use in South Africa	920688-010
For use in South Korea	920688-013
For use in Switzerland	920688-009
For use in Taiwan	920688-015
For use in Thailand	920688-012
For use in the United Kingdom and Singapore	920688-006
Rubber Foot Kit (includes bottom cover rear feet)	926855-001
Screw Kit	928948-001

4 Removal and replacement preliminary requirements

Tools required

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

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

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

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

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

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

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

Avoid dropping drives from any height onto any surface.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures

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

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

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

Component replacement procedures

📝 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Labels on page 14 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

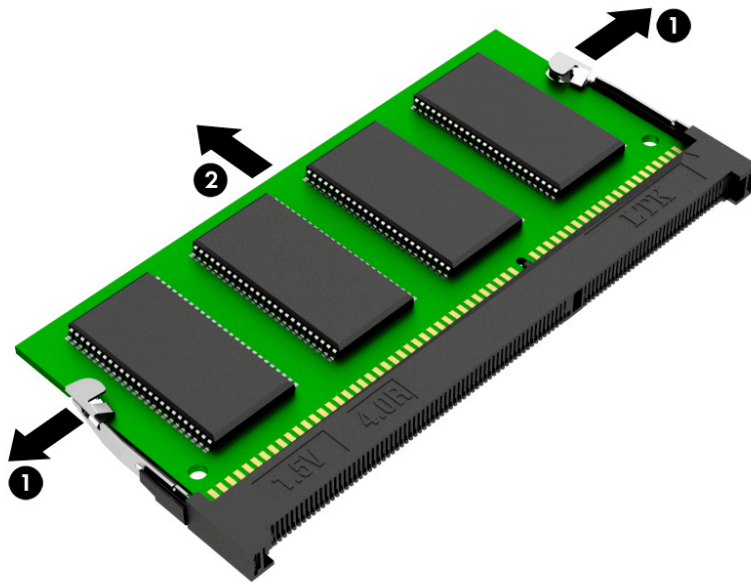| Description	Spare part number
Bottom cover	928932-001

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 feet **(1)**.

   The rubber feet are available using spare part numbers 926855-001

2. Remove the two Phillips PM2.5×5.6 screws **(2)** and the three Phillips PM2.0×5.8 screws **(3)** and the that secure the bottom cover to the computer:
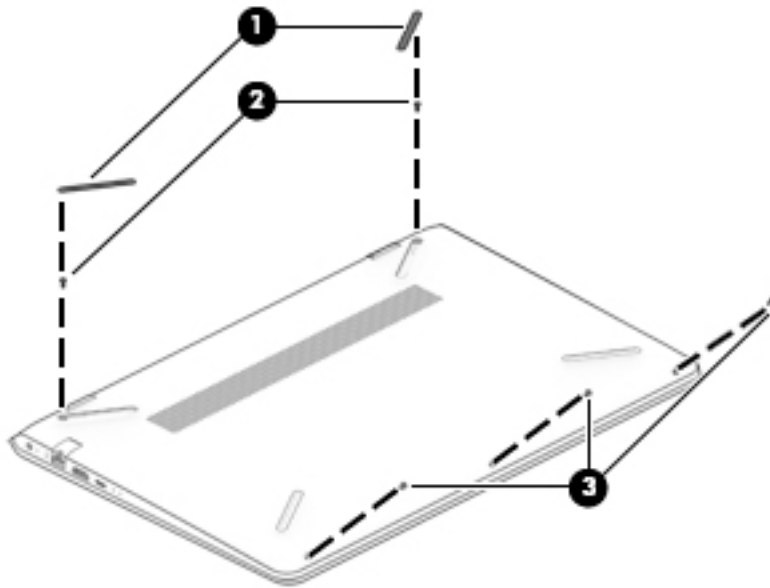
3. Insert a case utility tool **(1)** or similar thin, plastic tool into the display hinge areas of the bottom cover.
4. Separate the rear edge **(2)** of the bottom cover from the keyboard/top cover.
5. Separate the left **(3)** and right sides of the bottom cover from the keyboard/top cover.
6. Remove the bottom cover **(4)**.
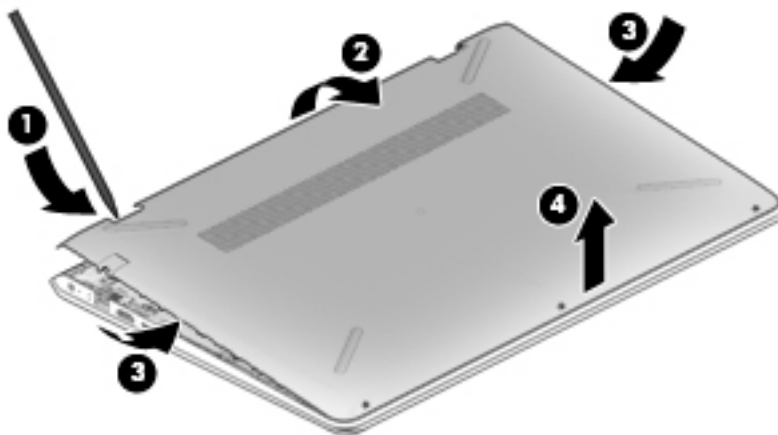
Reverse this procedure to install the bottom cover.

Battery

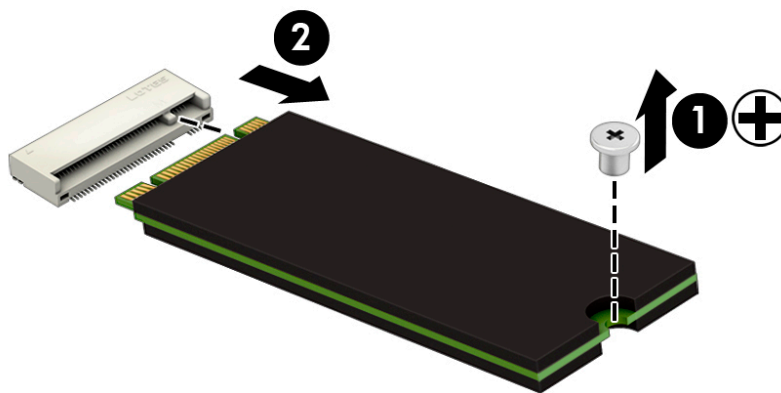| Description	Spare part number
3-cell, 41-WHr, 3.6-AHr, Li-ion battery	920070-855

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 37).

Remove the battery:

1. Remove the five Phillips PM2.0×5.7 screws **(1)** that secure the battery to the keyboard/top cover.

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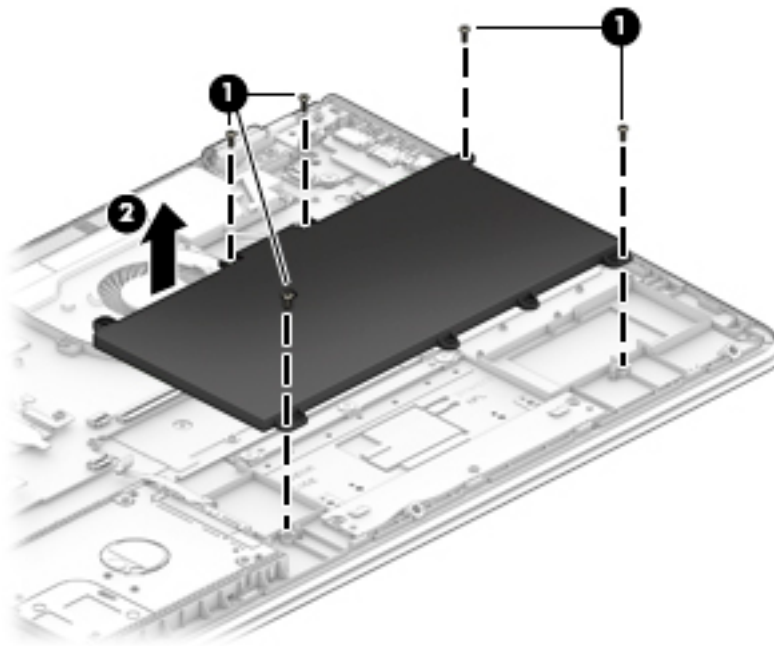
Reverse this procedure to install the battery.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive bracket or the hard drive cable. The hard drive bracket is available using spare part number 933608-001. The hard drive cable is available using spare part number 928944-001.

Description	Spare part number
2-TB, 5400-rpm, SATA, 7.2-mm hard drive	912487-855
1-TB, 5400-rpm, SATA, 7.0-mm, Hybrid 8.0-GB hard drive	924036-005
1-TB, 5400-rpm, SATA, 7.2-mm hard drive	762990-005
500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778185-005

Before removing the hard drive, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the bottom cover (see Bottom cover on page 37).

5. Remove the battery (see Battery on page 39).

Remove the hard drive:

1. Release the zero insertion force (ZIF) connector **(1)** to which the hard drive cable is connected, and then disconnect the hard drive cable from the system board.

2. Lift the right side of the hard drive **(2)** to release it from the hard drive bay, and then remove the hard drive.
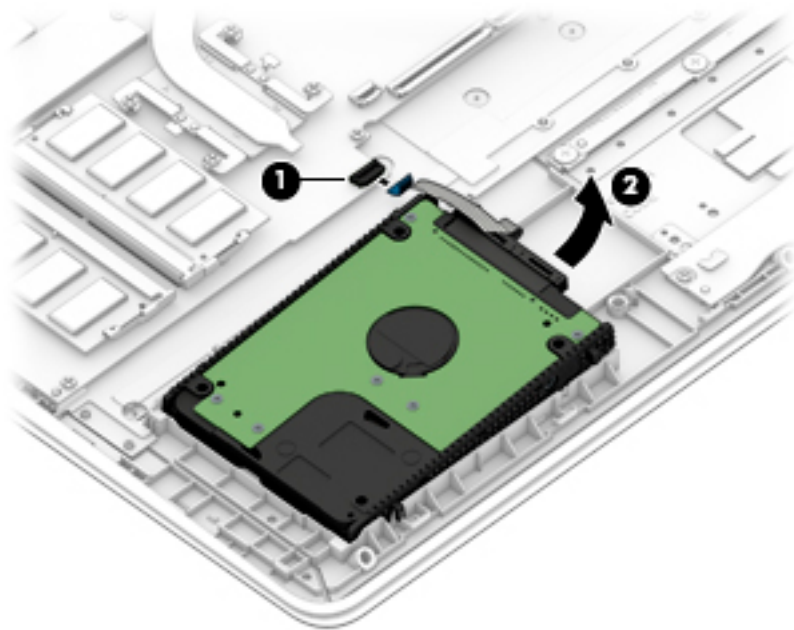
3. If it is necessary to disassemble the hard drive, remove the hard drive brackets **(1)** from the hard drive, and then disconnect the hard drive cable **(2)** from the hard drive.
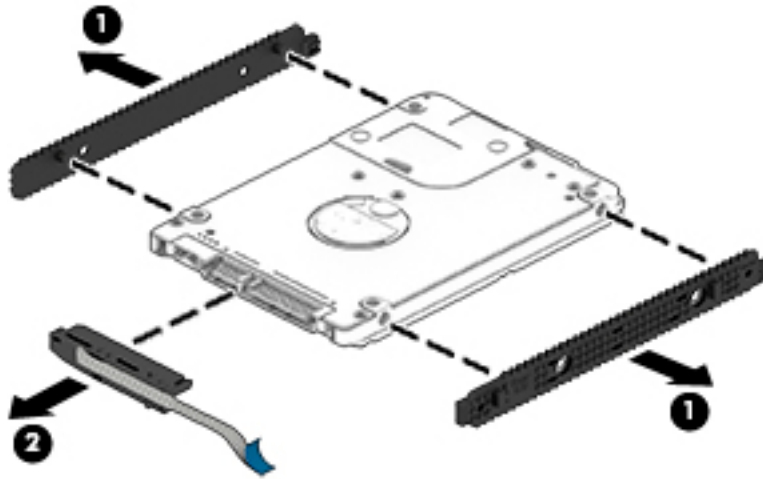
Reverse this procedure to reassemble and install the hard drive.

Memory module

📝 **NOTE:** Primary and expansion memory is installed in a side-by-side configuration in the bottom of the computer. If only one memory module is installed, it must be installed in the socket labeled 1.

Description	Spare part number
8-MB, DDR4-2400, 1.2-V	862398-855
4-MB, DDR4-2400, 1.2-V	862397-855
2-MB, DDR4-2400, 1.2-V	864271-855

Update BIOS before adding memory modules

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

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

To update BIOS:

1. Navigate to www.hp.com.

2. Click **Support & Drivers**, and then click **Drivers & Software**.

3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.

4. Click the link for the computer model.

5. Select the operating system, and then click **Next**.

6. Under **Step 2: Select a Download**, click the **BIOS** link.

7. Click the link for the most recent BIOS.

8. Click the **Download** button, and then follow the on-screen instructions.

Before removing the memory module, follow these steps:

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

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

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 37).

5. Remove the battery (see Battery on page 39).

Remove the memory module:

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

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

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

Reverse this procedure to install a memory module.

Solid-state drive

Description	Spare part number
512–GB, 2280 M.2, SATA-3, solid-state drive with TLC	763008-020
256–GB, 2280 M.2, SATA-3, solid-state drive with TLC	760615-039
128–GB, 2280 M.2, SATA-3, solid-state drive with TLC	759848-020
256–GB, 2280 M.2, SATA-3, solid-state drive	865902-019
128–GB, 2280 M.2, SATA-3, solid-state drive	827560-051

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. Remove the battery (see).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×2.3 screw **(1)** that secures the drive to the system board.

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)	901229-855
Intel Dual Band Wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro)	863934-855
Realtek RTL8723DE 802.11 bgn 1×1 WiFi + Bluetooth 4.2 Combo Adapter	927230-001

⚠ **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).

5. Remove the battery (see).

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 PM2.0×3.0 screw **(2)** that secures the WLAN module to the computer. (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.
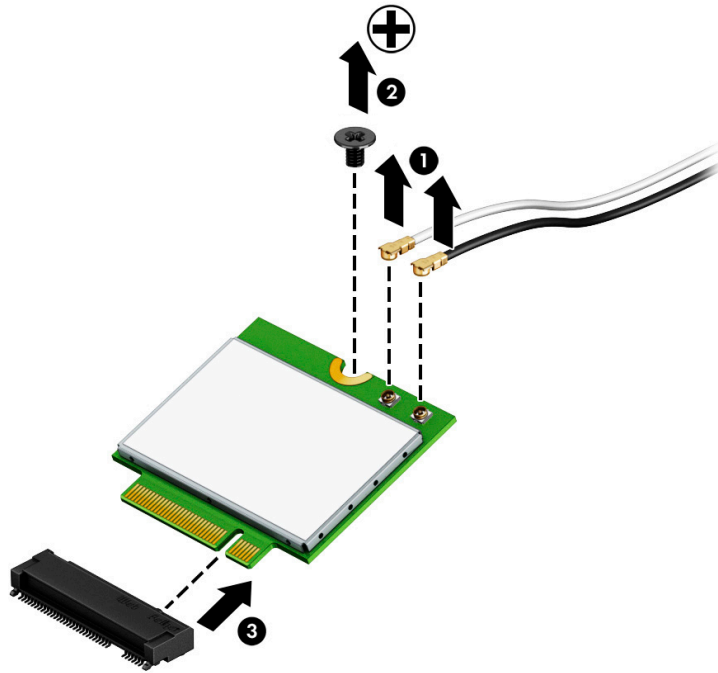
Reverse this procedure to install the WLAN module.

TouchPad cable

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).

5. Remove the battery (see).

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. Remove the TouchPad cable **(3)**.
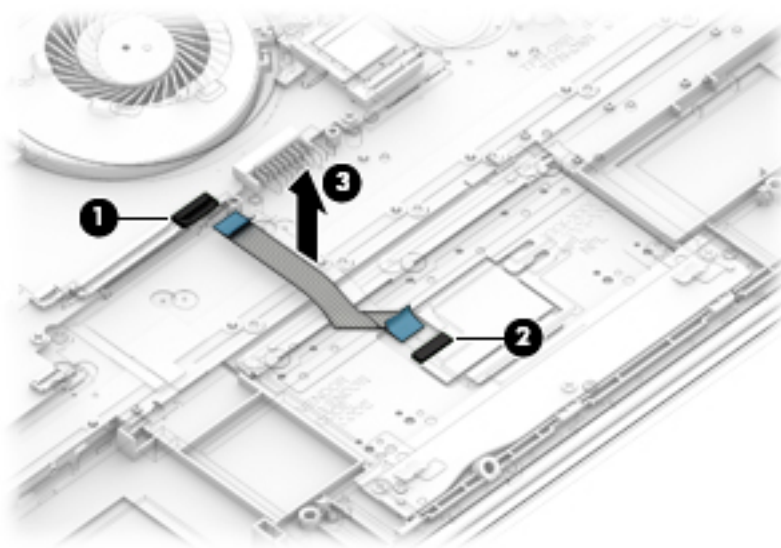
Reverse this procedure to install the TouchPad cable.

TouchPad

NOTE: The TouchPad spare part kit includes the TouchPad cable, but does not include the TouchPad bracket. The TouchPad bracket is available using spare part number 926879-001.

Description	Spare part number
TouchPad	L01118-001

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 37).

5. Remove the battery (see Battery on page 39).

Remove the TouchPad:

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

2. Remove the three Phillips PM2.0×3.0 screws **(2)** that secure the TouchPad and TouchPad bracket to the keyboard/top cover.

3. Remove the TouchPad bracket **(3)** .

4. Remove the three Phillips PM2.0×3.0 broad head screws **(4)** that secure the TouchPad to the keyboard/top cover.

5. Remove the TouchPad **(5)**.
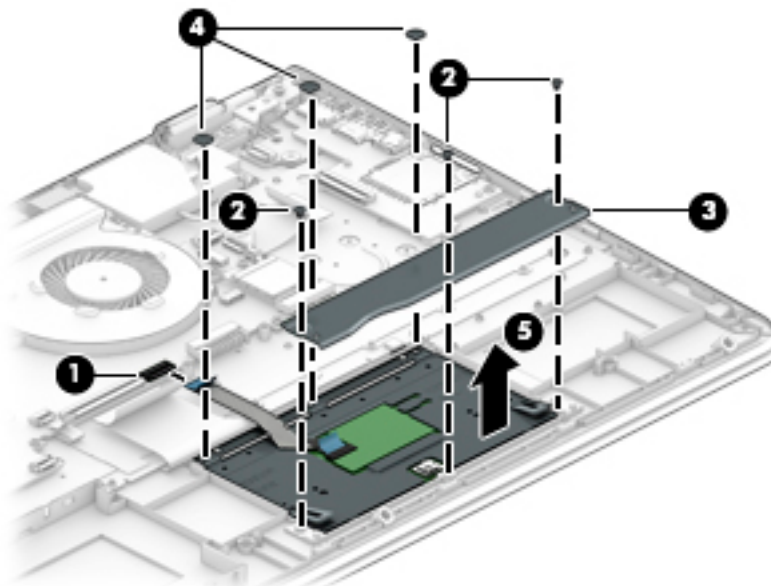
Reverse this procedure to install the TouchPad.

Power connector cable

Description	Spare part number
Power connector cable	808155-026

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 37).

5. Remove the Battery (see Battery on page 39).

Remove the power connector cable:

1. Remove the three Phillips PM2.5×5.8 screws **(1)** that secure the right display hinge and power connector cable to the keyboard/top cover.

2. Swing the right display hinge **(2)** up and back.
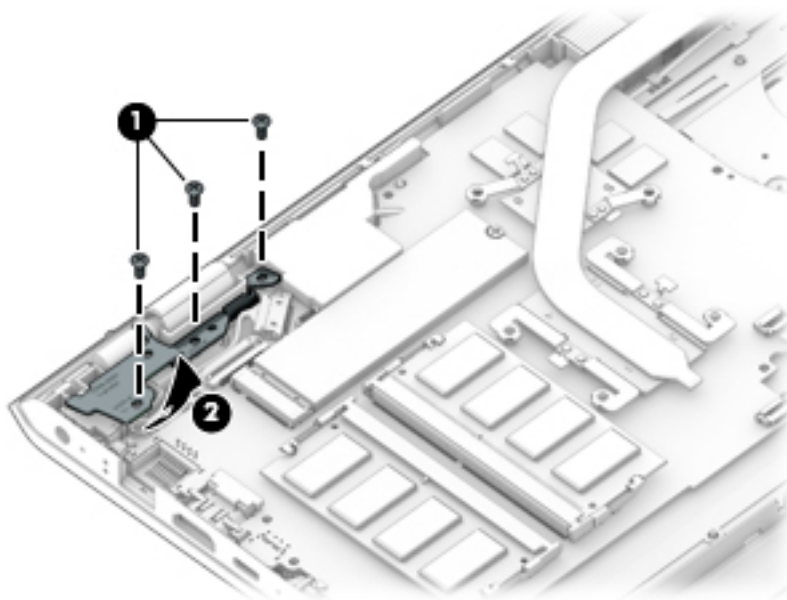
3. Disconnect the power connector cable **(1)** from the system board.

4. Remove the power connector cable **(2)**.
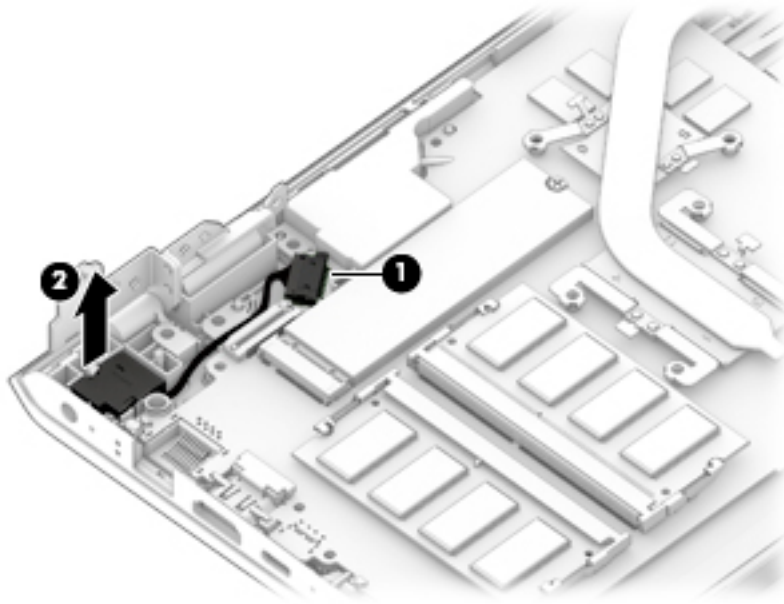
Reverse this procedure to install the power connector cable.

Fan

Description	Spare part number
Fan (includes cable)	927918-001

Before removing the fan, 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 37).

5. Remove the battery (see Battery on page 39).

Remove the fan:

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

2. Remove the three Phillips PM2.0×5.8 screws **(2)** that secure the fan to the keyboard/top cover.

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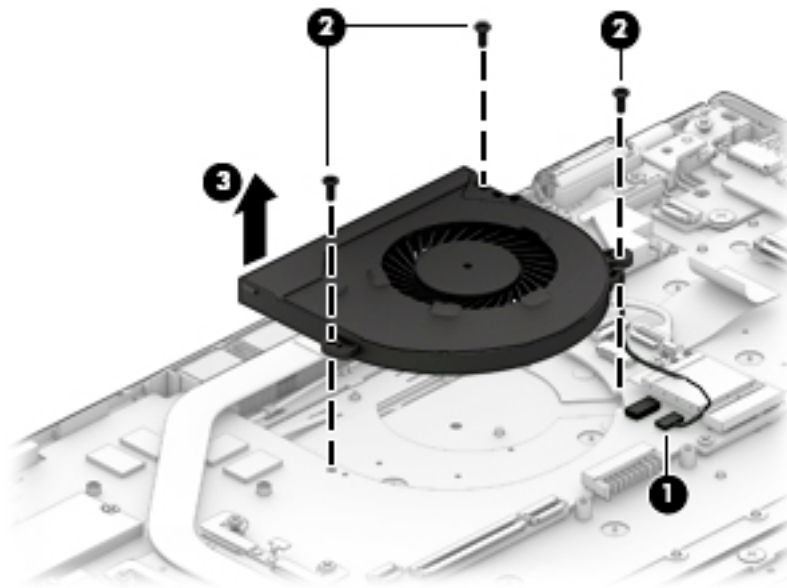
Reverse this procedure to install the fan.

USB port board

NOTE: The USB port board spare part kit includes the power light actuator, hard drive light actuator, card reader slot, and USB port. It does not include the USB port board cable. The USB port board cable is available using spare part number 928941-001.

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with 4096-MB of discrete video memory	927924-001
For use only on computer models equipped with a graphics subsystem with 2048-MB of discrete video memory or a graphics subsystem with UMA video memory	927925-001

Before removing the USB port 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).

5. Remove the battery (see).

Remove the USB port board:

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

2. Remove the two Phillips PM2.0×5.8 screws **(2)** that secure the USB port board to the keyboard/top cover.

3. Remove the USB port board **(3)**.
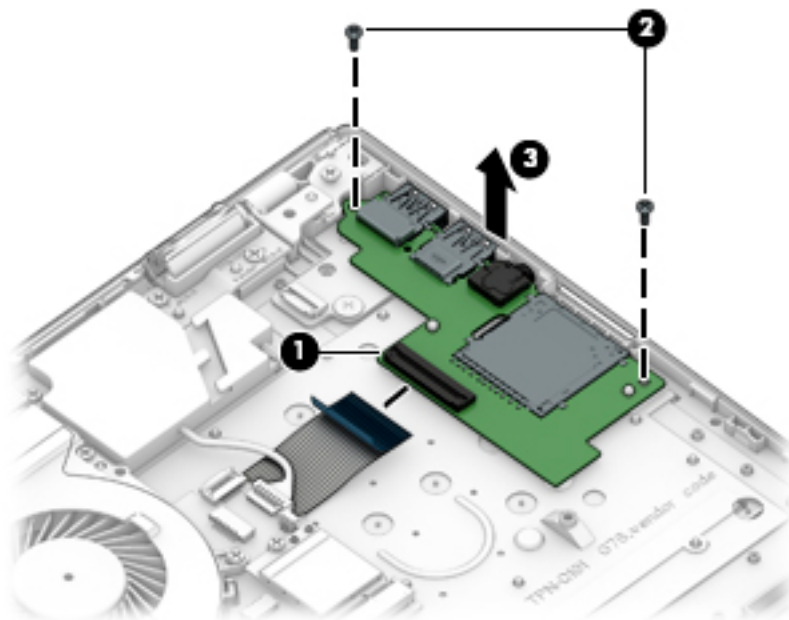
Reverse this procedure to install the USB port board.

System board

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

Description	Spare part number
For use only on computer models with model numbers 15-cc100 through 15-cc199 and 15-cc600 through 15-cc699:	
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	935949-601
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	935949-001
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	935946-601
Equipped with an Intel Core i7-8550U 1.80-GHz (turbo up to 4.00-GHz) quad core processor (2400-MHz FSB, 8.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	935946-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	935952-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	935952-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and the Windows 10 operating system	935951-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with up to 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	935951-001
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), a graphics subsystem with UMA video memory, and the Windows 10 operating system	935947-601
Equipped with an Intel Core i5-8250U 1.66-GHz (turbo up to 3.60-GHz) quad core processor (2400-MHz FSB, 6.0-MB L3 cache, 15-W), a graphics subsystem with UMA video memory, 1.5V/1-GHz), and a non-Windows operating system	935947-001
For use on all computer models:	
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927269-601

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 N16S-GTR (GeForce 940MX) graphics subsystem with 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and a non-Windows operating system	927269-001
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 NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927268-601
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	927268-001
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	927264-601
Equipped with an Intel Core i7-7500U 2.70-GHz (turbo up to 3.50-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	927264-001
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 4096-MB of discrete video memory (256-MB×16 DDR3×8 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927271-601
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 4096-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	927271-001
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and the Windows 10 operating system	927270-601
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an NVIDIA N16S-GTR (GeForce 940MX) graphics subsystem with 2048-MB of discrete video memory (256-MB×16 DDR3×4 pieces, 1.5V/1-GHz), and a non-Windows operating system	927270-001
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 3.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and the Windows 10 operating system	927265-601
Equipped with an Intel Core i5-7200U 2.50-GHz (turbo up to 3.10-GHz) dual core processor (2133-MHz FSB, 4.0-MB L3 cache, 15-W), an Intel HD Graphics 620 graphics subsystem with UMA video memory, and a non-Windows operating system	927265-001
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, and the Windows 10 operating system	927266-601
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, and a non-Windows operating system	927266-001

Description	Spare part number
Equipped with an Intel Pentium 4415U 2.30-GHz dual core processor (2133-MHz FSB, 2.0-MB L3 cache, 15-W), an Intel HD Graphics 610 graphics subsystem with UMA video memory, and the Windows 10 operating system	927267-601
Equipped with an Intel Pentium 4415U 2.30-GHz dual core processor (2133-MHz FSB, 2.0-MB L3 cache, 15-W), an Intel HD Graphics 610 graphics subsystem with UMA video memory, and a non-Windows operating system	927267-001

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 37).

5. Remove the battery (see Battery on page 39).

6. Remove the fan (see Fan on page 50).

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

- Memory module (see Memory module on page 41)

- Solid-state drive (see Solid-state drive on page 43)

- WLAN module (see WLAN module on page 44)

- Heat sink (see Heat sink on page 56)

- USB port board cable (see USB port board cable on page 59)

Remove the system board:

1. Disconnect the following cables from the system board:

   (1) Display panel ZIF connector cable

   (2) Power connector cable

   (3) Power button board ZIF connector cable

   (4) USB port board ZIF connector cable

   (5) WLAN antenna cables

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

   (6) Speaker cable

   (7) TouchPad ZIF connector cable

   (8) Keyboard ZIF connector cable

   (9) Backlight ZIF connector cable

(10) Hard drive ZIF connector cable

2. Detach the USB port board cable **(9)** from the keyboard/top cover. (The USB port board cable is attached to the keyboard/top cover with double-sided adhesive.)
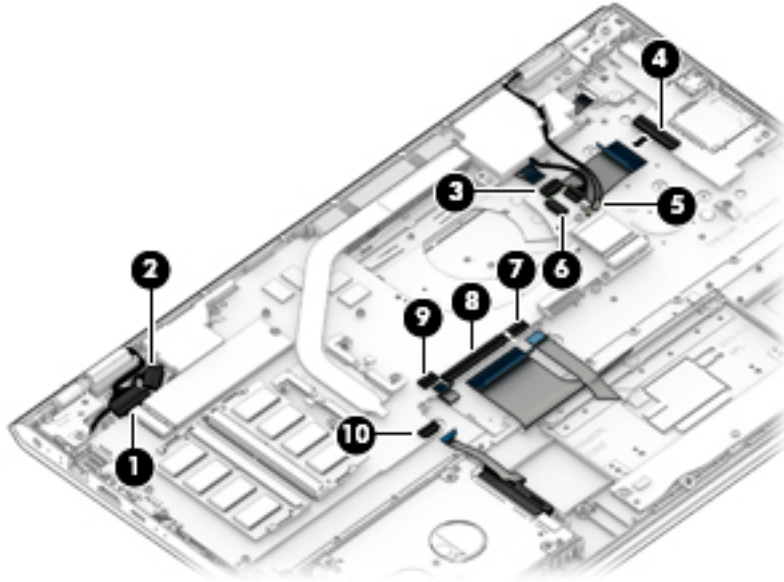
3. Remove the five Phillips PM2.0×5.8 screws **(1)** and the two Phillips PM2.0×3.0 screws **(2)** that secure the system board to the keyboard/top cover.

4. Swing the display left hinge **(3)** up and back.
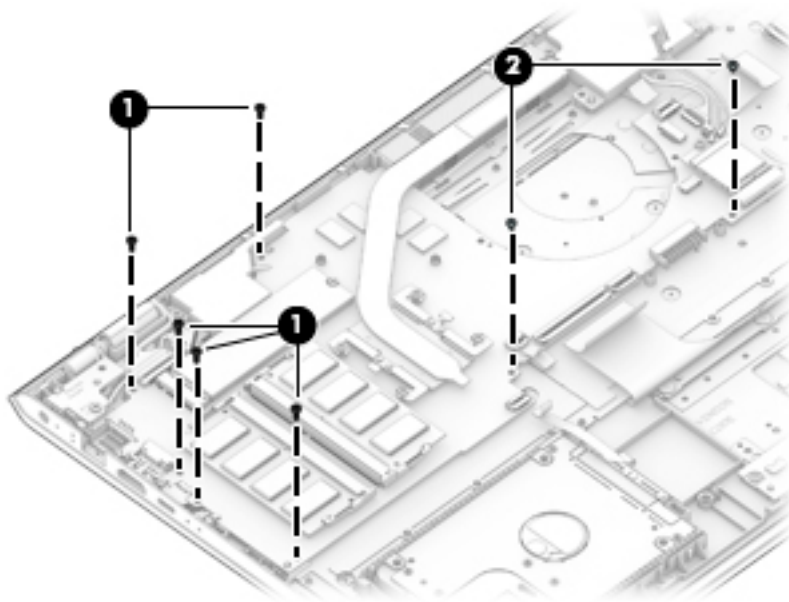
5. Lift the right side of the system board **(1)** until it rests at an angle.

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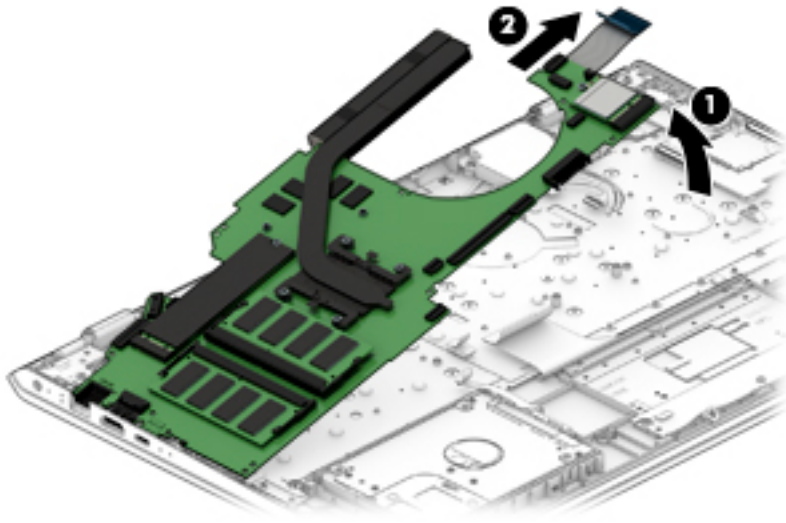
Reverse this procedure to install the system board.

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), and then remove the following components:

   a. Battery (see)

   b. Fan (see)

   c. System board (see)

Remove the heat sink:

📝 **NOTE:** Steps 1 and 2 apply to computer models equipped with a graphics subsystem with discrete memory. See Steps 3 and 4 for heat sink removal information for computer models equipped with a graphics subsystem with UMA memory.

1. Remove the six Phillips PM2.0×3.0 screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink **(2)**.
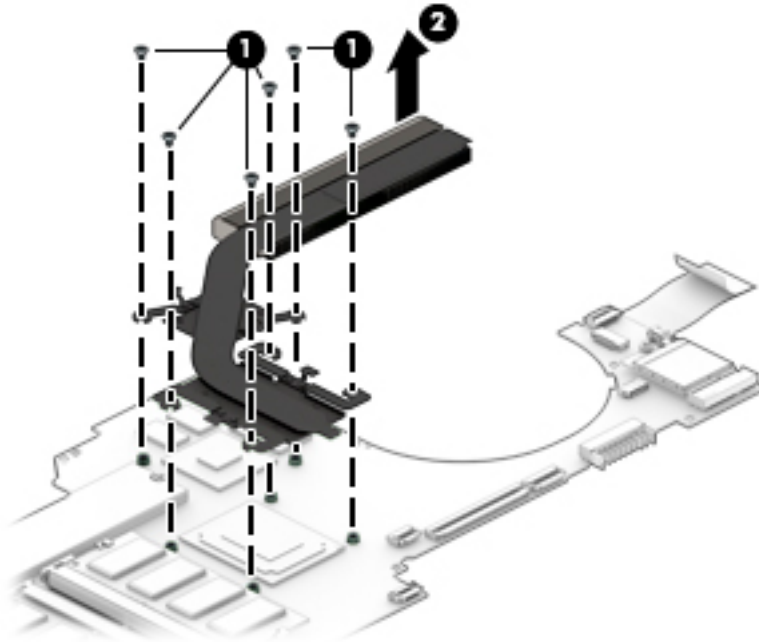
> **NOTE:** Steps 3 and 4 apply to computer models equipped with a graphics subsystem with UMA memory. See Steps 1 and 2 for heat sink removal information for computer models equipped with a graphics subsystem with discrete memory.

3. Remove the four Phillips PM2.0×6.0 screws **(1)** that secure the heat sink to the system board.

4. Remove the heat sink **(2)**.
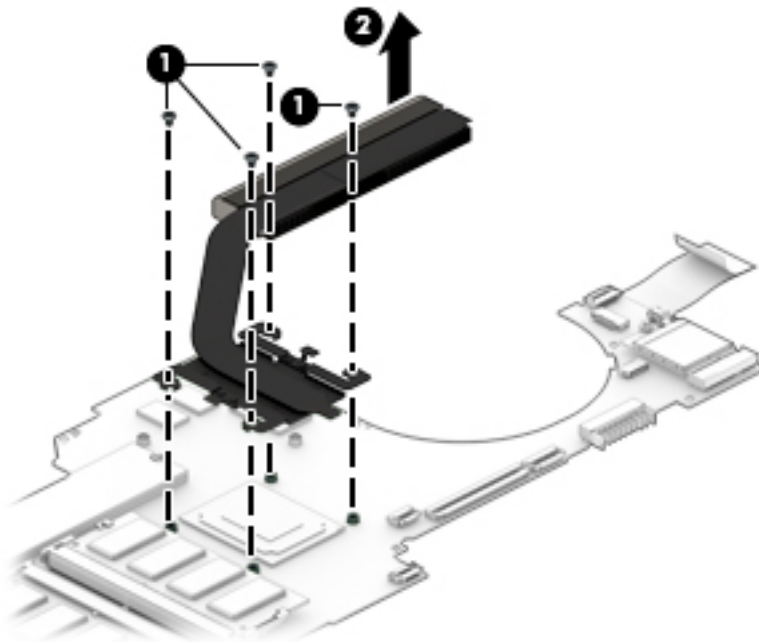
NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

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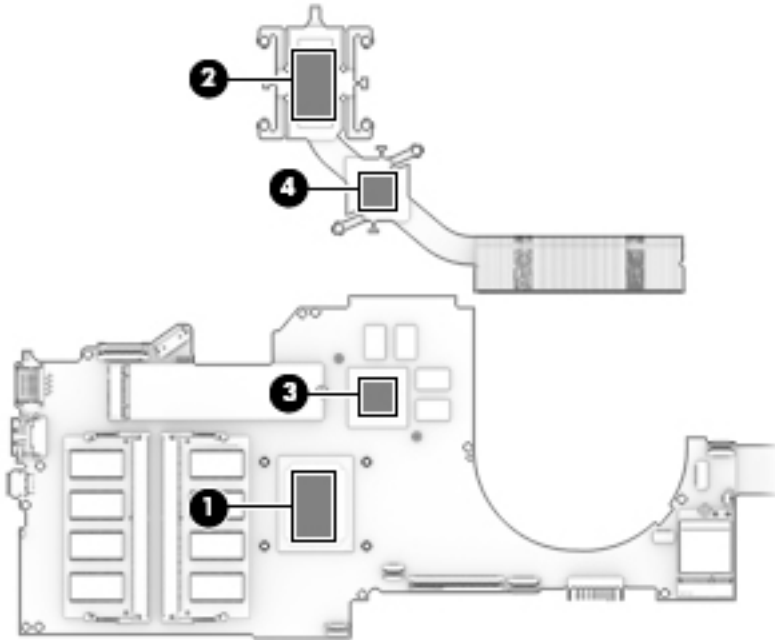
On computer models equipped with a graphics subsystem with UMA memory: Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.
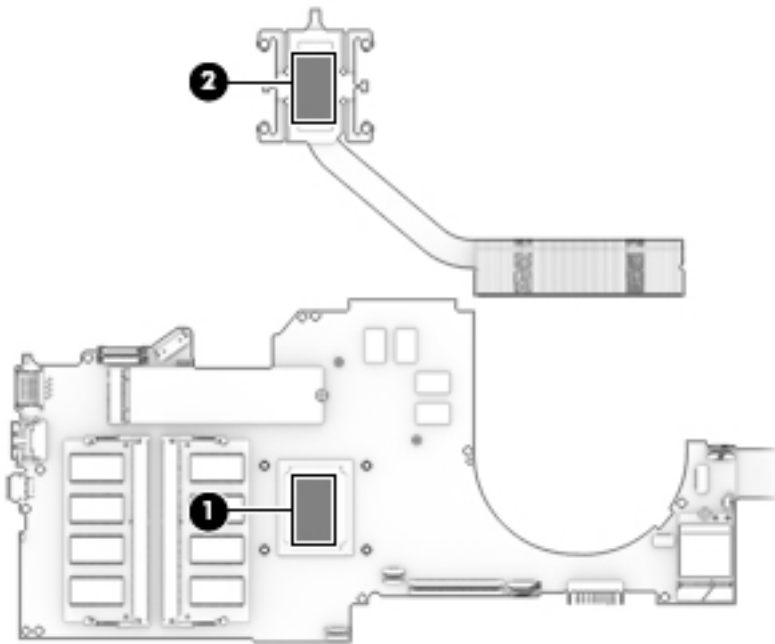
Reverse this procedure to install the heat sink.

USB port board cable

NOTE: The USB port board spare part kit does not include the USB port board cable. The USB port board cable is available using spare part number 928941-001.

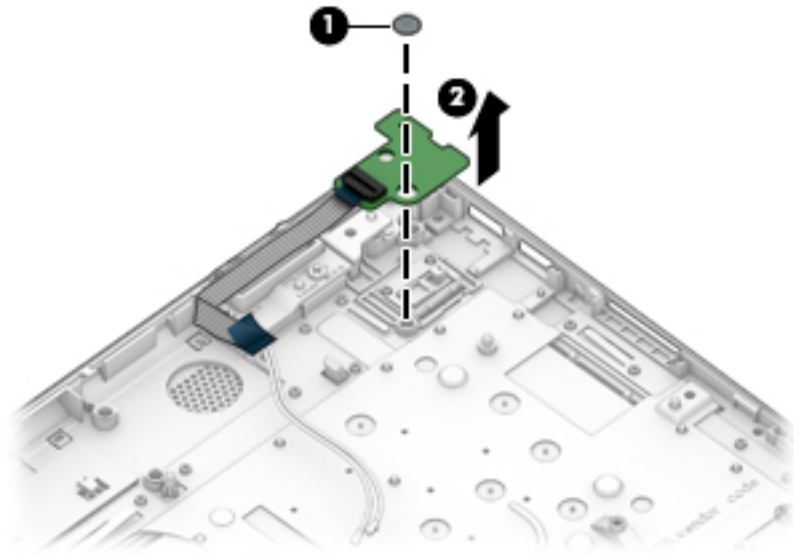Before removing the USB port board cable, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the bottom cover (see Bottom cover on page 37), and then remove the following components:

   a. Battery (see Battery on page 39)

   b. Fan (see Fan on page 50)

   c. System board (see System board on page 52)

Remove the USB port board cable:

1. Turn the system board upside down with the front toward you.

2. Release the ZIF connector **(1)** to which USB port board cable is connected, and then disconnect the USB port board cable **(2)** from the audio jack board.
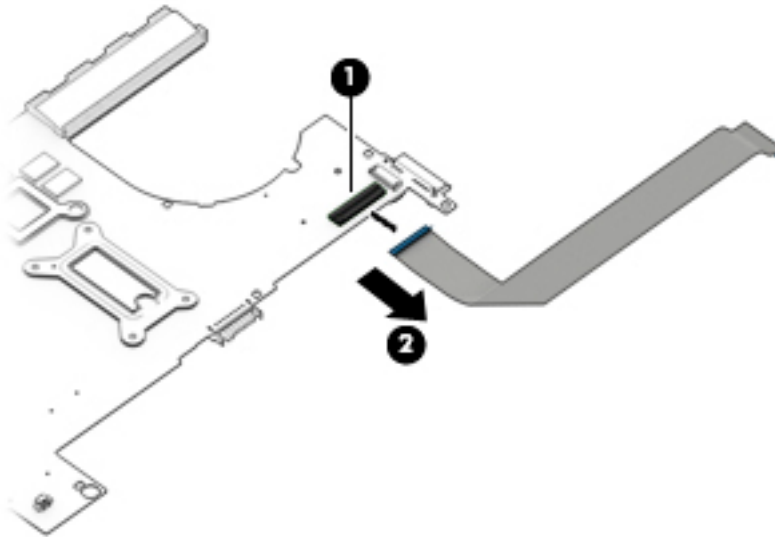
3. Remove the USB port board cable.

Reverse this procedure to install the USB port board cable.

Speakers

| Description	Spare part number
Speakers (includes cables)	928949-001

Before removing the speakers, follow these steps:

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

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

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 37), and then remove the following components:

   a. Battery (see Battery on page 39)

   b. Fan (see Fan on page 50)

   c. System board (see System board on page 52)

Remove the speakers:

1. Release the WLAN antenna cables from the retention clips **(1)** built into the left speaker.

2. Remove the five Phillips PM2.5×5.8 screws **(2)** that secure the speakers to the keyboard/top cover.

3. Swing the display hinges **(3)** up and back.
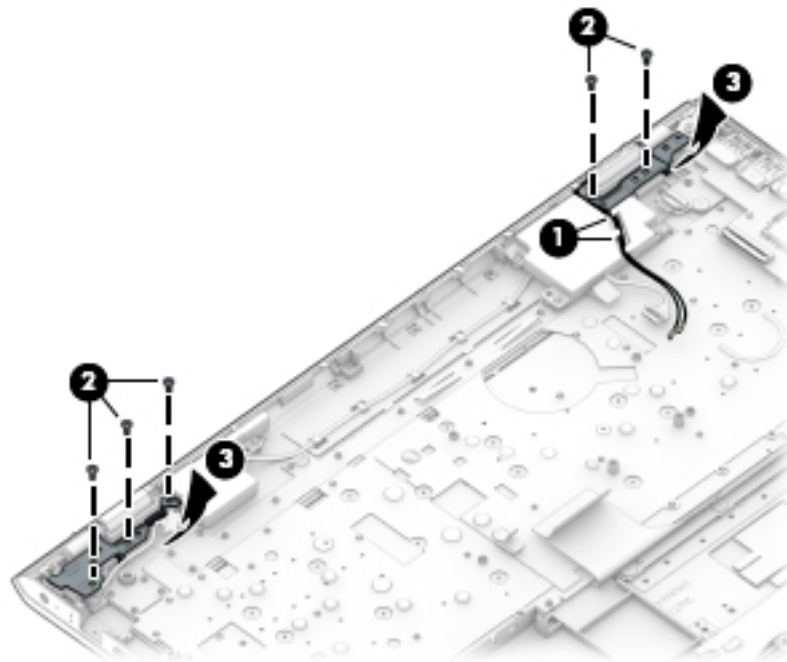
4. Release the speaker cable from the retention clips **(1)** built into the keyboard/top cover.

5. Remove the PM2.0×5.8 screw **(2)** that secures the left speaker to the keyboard/top cover.

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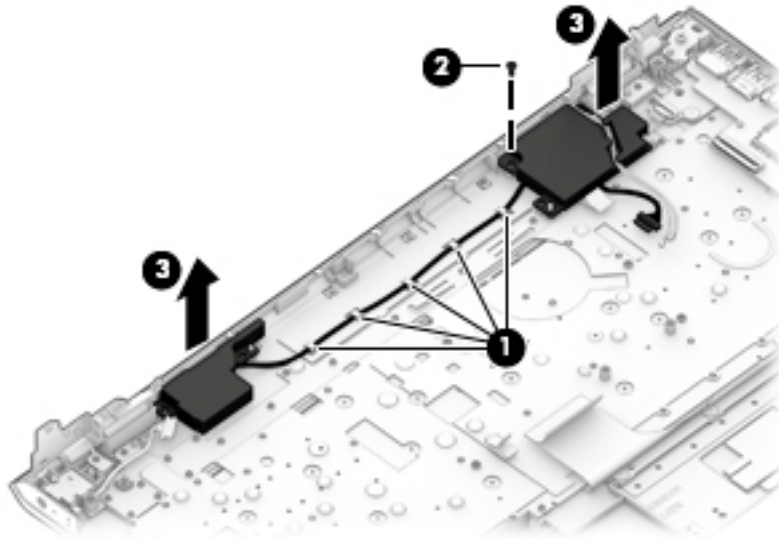
Reverse this procedure to install the speakers.

Power button board cable

> **NOTE:** The power button board spare part kit does not include the power button board cable. The power button board cable is available using spare part number 928942-001.

Before removing the power button board cable, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the bottom cover (see Bottom cover on page 37), and then remove the following components:

    a. Battery (see Battery on page 39)

    b. Fan (see Fan on page 50)

    c. USB port board (see USB port board on page 51)

    d. System board (see System board on page 52)

    e. Speakers (see Speakers on page 60)

Remove the power button board cable:

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

2. Remove the power button board cable **(2)**.
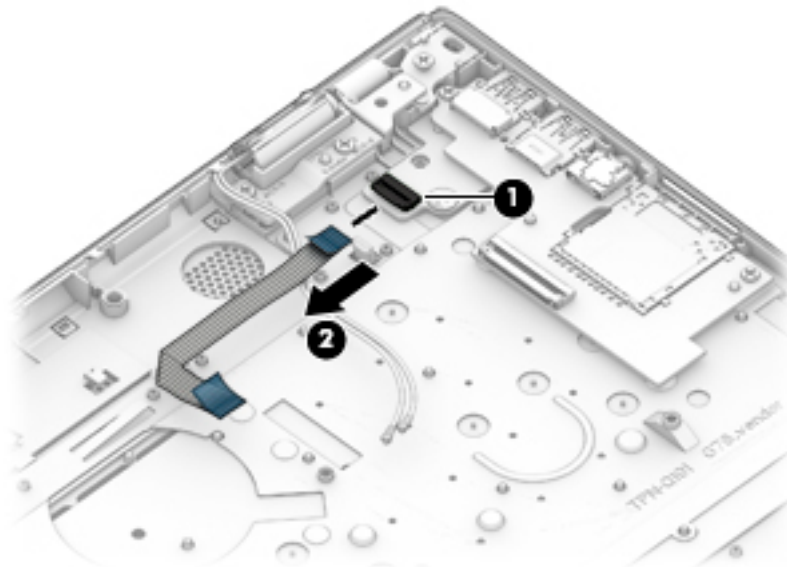
Reverse this procedure to install the power button board cable.

Power button board

NOTE: The power button board spare part kit does not include the power button board cable. The power button board cable is available using spare part number 928942-001.

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with 4096-MB of discrete video memory	928946-001
For use only on computer models equipped with a graphics subsystem with 2048-MB of discrete video memory or a graphics subsystem with UMA video memory	928947-001

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 37), and then remove the following components:

	a.	Battery (see Battery on page 39)

	b.	Fan (see Fan on page 50)

	c.	USB port board (see USB port board on page 51)

	d.	System board (see System board on page 52)

	e.	Speakers (see Speakers on page 60)

Remove the power button board:

1.	Remove the Phillips PM2.0×3.0 broad head screw **(1)** that secures the power button board to the keyboard/top cover.

2. Remove the power button board **(2)**.

Reverse this procedure to install the power button board.

Display assembly

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

Before removing the display assembly, follow these steps:

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

2. Disconnect all external devices connected to the computer.

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

4. Remove the bottom cover (see).

5. Remove the battery (see).

Remove the display assembly:

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

2. Disconnect the WLAN antenna cables **(2)** 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.

3. Release the WLAN antenna cables from the retention clips **(3)** built into the left speaker.
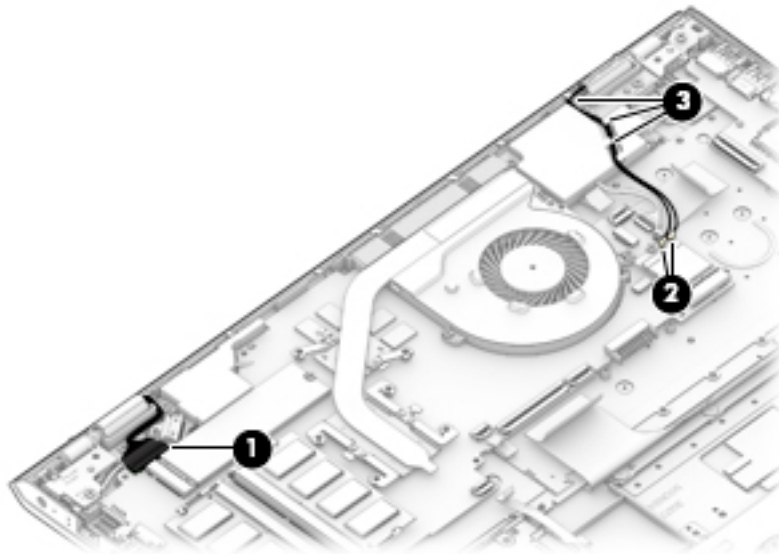
4. Remove the five Phillips PM2.5×5.8 screws **(1)** that secure the display assembly to the keyboard/top cover.

5. Swing the display hinges **(2)** up and back.
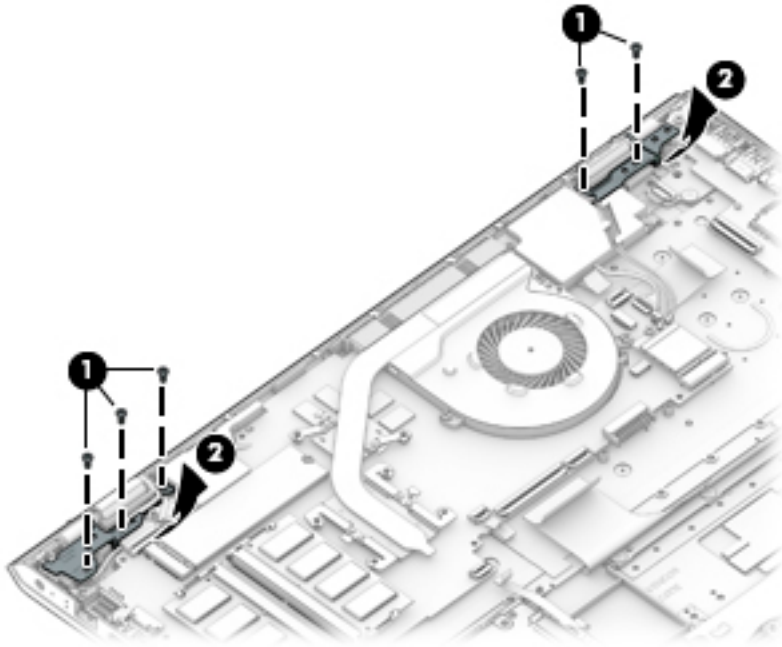
6. Lift the front edge of the keyboard/top cover **(1)** until it rests at an angle.

7. Slide the keyboard/top cover **(2)** up and away at an angle and separate it from the display assembly.
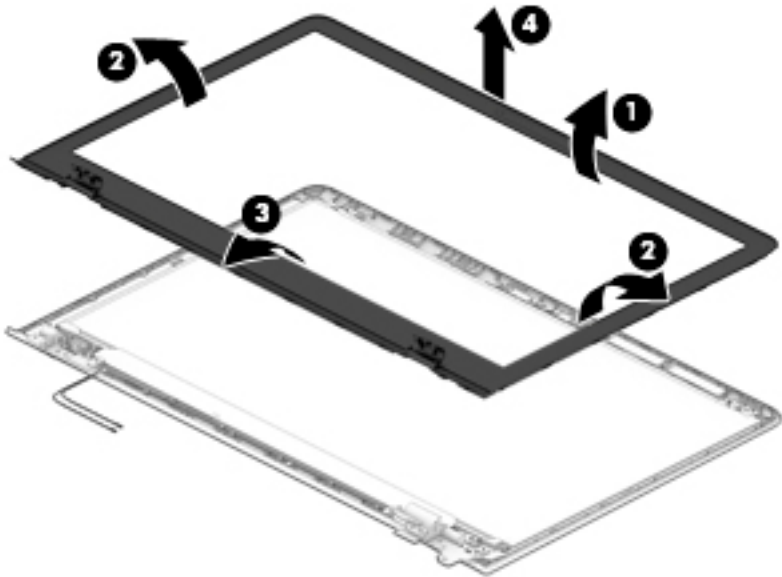
8. If it is necessary to replace the display bezel or any of the display assembly subcomponents:

   a. Release the top edge of the display bezel **(1)** from the display assembly.

   b. Release the left and right edges of the display bezel **(2)** from the display assembly.

   c. Release the bottom edge of the display bezel **(3)** from the display assembly.

d. Remove the display bezel **(4)** from the display assembly.

The display bezel is available using spare part numbers 928934-001 (for use on computer models equipped with a FHD infrared webcam) and 928933-001 (for use on computer models equipped with an HD non-infrared webcam).
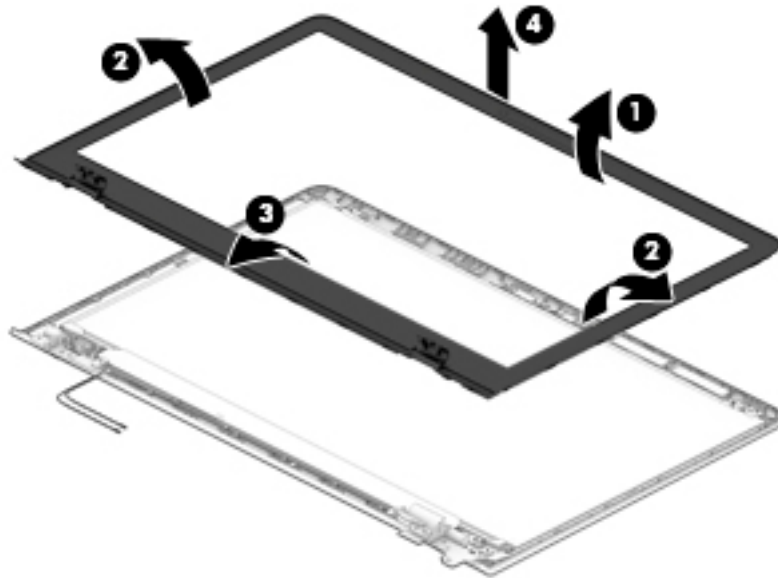
9. If it is necessary to replace the webcam/microphone module:

a. Remove the display bezel.

b. Detach the webcam/microphone module **(1)** from the display back cover. (The webcam/microphone module is attached to the display back cover with double-sided adhesive.)

c. Disconnect the webcam/microphone module cable **(2)** from the webcam/microphone module.
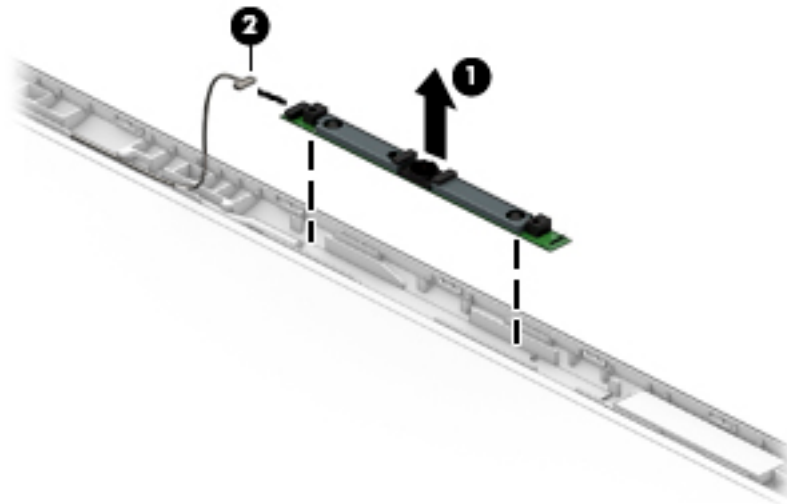
d. Remove the webcam/microphone module.

The webcam/microphone module is available using spare part numbers 926727-001 (FHD infrared webcam/microphone module) and 919573-005 (HD non-infrared webcam/microphone module).

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

a. Remove the display bezel.

b. Remove the four Phillips PM2.0×3.0 screws that secure the display panel to the display back cover.
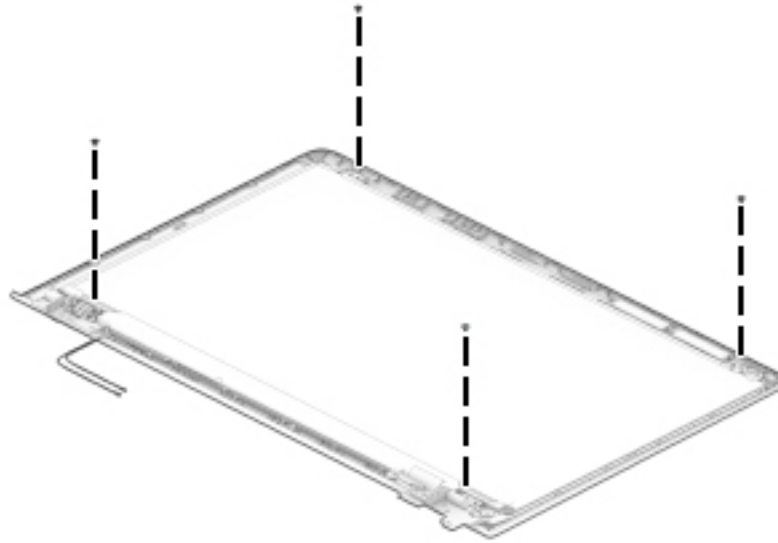
⚠ **CAUTION:** Before turning the display panel upside down, make sure the work surface is clear of tools, screws, and any other foreign objects. Failure to follow this caution can result in damage to the display panel.

c. Swing the top edge of the display panel **(1)** up and forward until the display panel rests upside down in front of the display back cover.

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

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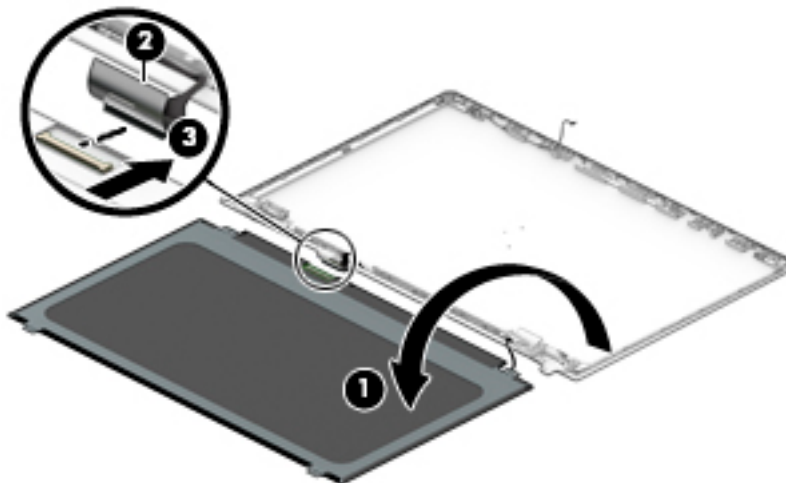
f. Remove the display panel.

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

- 847651-004 – 15.6-in, FHD, BrightView (1920×1080), WLED, UWVA, TouchScreen
- 809612-015 – 15.6-in, HD, BrightView (1366×768), WLED, SVA, TouchScreen

- 842463-009 – 15.6-in, FHD, BrightView (1920×1080), WLED, UWVA, non-TouchScreen

- 752920-016 – 15.6-in, FHD, AntiGlare (1920×1080), WLED, UWVA, non-TouchScreen

- 798933-013 – 15.6-in, FHD, AntiGlare (1920×1080), WLED, SVA, non-TouchScreen

- 847654-009 – 15.6-in, HD, BrightView (1366×768), WLED, SVA, non-TouchScreen

- 909185-007 – 15.6-in, HD, AntiGlare (1366×768), WLED, SVA, non-TouchScreen

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

    a. Remove the display bezel.

    b. Remove the two Phillips PM2.0×3. screws **(1)** and the six Phillips PM2.5×3.2 broad head screws **(2)** that secure the hinges to the display back cover.

    c. Remove the display hinges **(3)**.

    The display hinges are available using spare part number 928945-001.
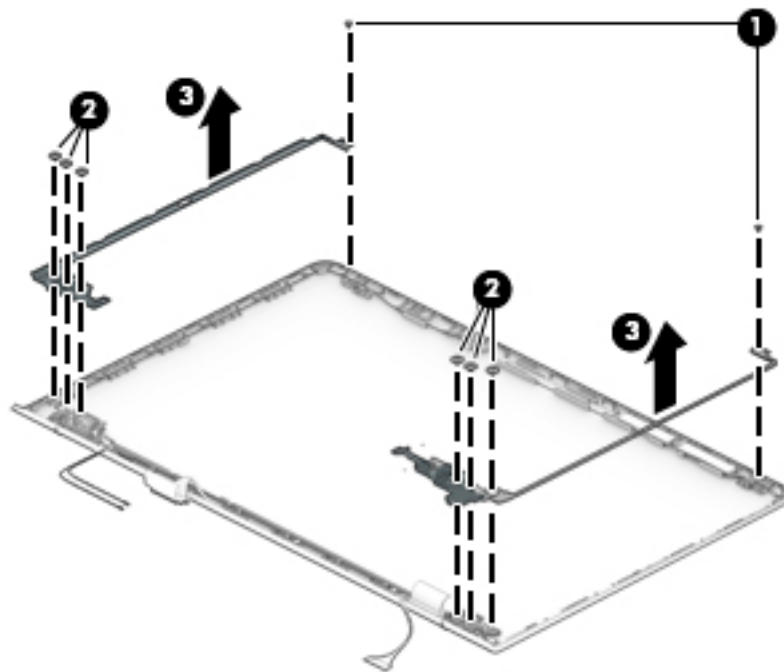
12. If it is necessary to replace the display panel cable:

    a. Remove the display bezel.

    b. Release the webcam/microphone module.

    c. Release the display panel.

    d. Release the display hinges.

    e. Release the display panel cable from the retention clips **(1)** and routing channels built into the top, left, and bottom edges of the display back cover.

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

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

- 928938-001 – For use on computer models equipped with an FHD TouchScreen display assembly and an FHD infrared webcam

- 928937-001 – For use on computer models equipped with an FHD TouchScreen display assembly and an HD non-infrared webcam

- 928935-001 – For use on computer models equipped with an FHD/HD non-TouchScreen display assembly and an FHD infrared webcam

- 928936-001 – For use on computer models equipped with an FHD/HD non-TouchScreen display assembly and an HD non-infrared webcam

- 928940-001 – For use on computer models equipped with an HD TouchScreen display assembly and an FHD infrared webcam

- 928939-001 – For use on computer models equipped with an HD TouchScreen display assembly and an HD non-infrared webcam
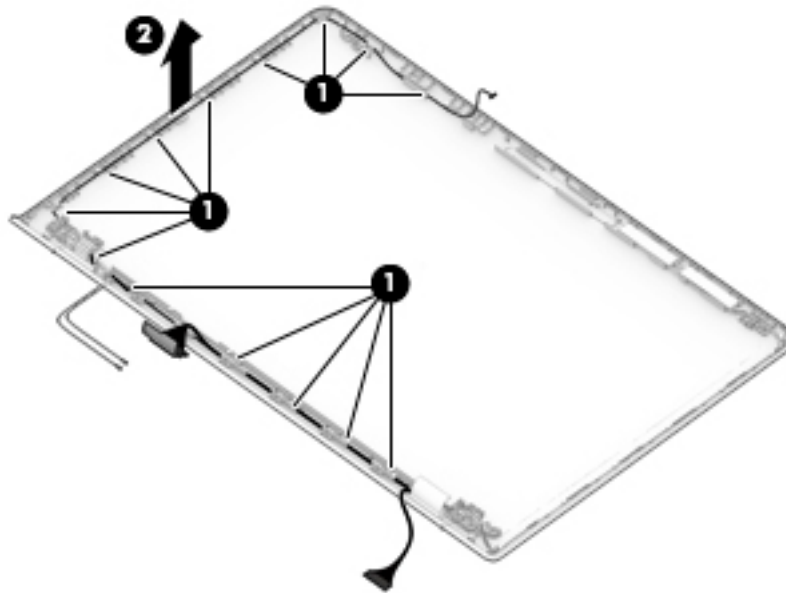
13. If it is necessary to replace the wireless antenna cables and transceivers:

    a. Remove the display bezel.

    b. Release the display panel.

    c. Release the display hinges.

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

    e. Release the wireless antenna cables from the retention clips **(2)** and routing channels built into the right and bottom edges of the display back cover.

f. Remove the wireless antenna cables and transceivers **(3)**.

The wireless antenna cables and transceivers are available using spare part number 928953-001.
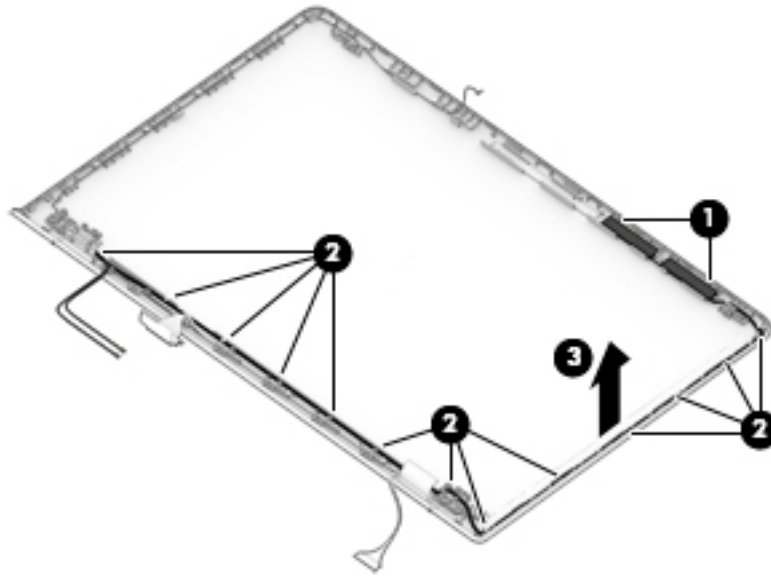
Reverse this procedure to reassemble and install the display assembly.

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 Starting Setup Utility (BIOS) on page 72).

  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 on page 73.

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 74.

   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.

   – or –

   Select **Identify now** to let HP automatically detect your product.

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

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

8 Specifications

	Metric	U.S.
Computer dimensions		
Width	**37.8 cm**	14.9 in
Depth	**25.2 cm**	9.9 in
Height	**1.9 cm**	0.8 in
Weight	**1.9 kg**	4.4 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 Creating HP Recovery media (select products only) on page 77. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 78.

- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Recovering using HP Recovery Manager on page 79.

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

Creating HP Recovery media (select products only)

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

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

You can use Windows tools to create system restore points and create backups of personal information, see Using Windows tools on page 78.

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

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

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

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

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

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

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

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

To create HP Recovery media:

IMPORTANT: For a tablet with a detachable keyboard, connect the 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 Recovering using HP Recovery Manager on page 79.

Using Windows tools

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

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

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

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

Restore and recovery

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

IMPORTANT: Not all methods are available on all products.

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

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

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

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

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 79. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 77.

- 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 79.

- 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 82.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 77.

What you need to know before you get started

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

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

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 77.

- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 77.

- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also find contact information from the HP

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

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

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

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

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

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

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

Using the HP Recovery partition (select products only)

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

To start HP Recovery Manager from the HP Recovery partition:

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

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

   – or –

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

   For tablets without keyboards:

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

   – or –

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

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

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

Using HP Recovery media to recover

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

1. If possible, back up all personal files.

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

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 81.

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 Creating HP Recovery media (select products only) on page 77.

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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