HP EliteBook x360 1030 G2

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
http://www.microsoft.com for details.

Safety warning notice

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

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1   Product description

Category	Description
Product Name	HP EliteBook x360 1030 G2
Processors	- Intel® Core™ i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W) - Intel Core i5-7300U 2.60-GHz (SC turbo up to 3.50-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W) - Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W)
Chipset	Intel premium chipset integrated with processor
Graphics	**Internal graphics**: Intel universal memory architecture (UMA) Graphics GT2 with shared video memory
Panel	13.3-in, ultra high-definition (UHD), BrightView (3840×2160), UWVA, 72% color gamut, typical brightness 340 nits, ultraslim (2.0-mm), eDP+PSR, 16:9 ultra wide aspect ratio, TouchScreen display panel assembly 13.3-in, full high-definition (FHD), BrightView (1920×1080), UWVA, 72% color gamut, typical brightness 300 nits, ultraslim (2.0-mm), eDP+PSR, 16:9 ultra wide aspect ratio, TouchScreen display panel assembly
Memory module	Memory soldered to system board Support for DDR4 PC4 2133 dual channel Support for up to 16-GB maximum system memory in the following configurations: 16384-MB: (512 MB × 16) 8 pieces (available only on computer models equipped with an Intel i7 processor) 8192-MB: (512 MB × 16) 8 pieces 4096-MB: (256 MB × 16 × 2) 8 pieces (available only on computer models equipped with an Intel i5 processor)
Storage	Support for M.2 2280 solid-state drives 512-GB Turbo Drive G2 solid-state drive supporting triple level cell (TLC) 256-GB Turbo Drive G2 solid-state drive supporting TLC 256-GB M.2 SATA self-encrypting drive (SED) solid-state drive supporting Opal2 and TLC 128-GB M.2 SATA-3 solid-state drive
Audio and video	Infrared/RGB 720p camera supports Windows Hello facial recognition software via Windows 10 operating system HP Bang & Olufsen Audio Stereo speakers Integrated dual-array microphones
Wireless	**Integrated wireless personal area network (WPAN) options by way of Bluetooth 4.2 combination card** **Integrated wireless local area network (WLAN) options by way of wireless module**

Category	Description
Wireless *(continued)*	Two built-in M.2 / PCIe WLAN antennas
	WLAN module is soldered to the system board
	Support for the Intel 802.11 2×2ac + Bluetooth 4.2 1216 vPro and Intel 802.11 2×2ac + Bluetooth 4.2 1216 non-vPro Combo Adapter WLAN modules
	Bluetooth disabled IOPT
	Support for S3/S4 wake on Wireless LAN
	Support for Miracast
	Support for WiFi SAR in BIOS
	Support for HP Sure Connect
	Integrated wireless wide area network (WWAN) options by way of wireless module (select models only)
	NFC antenna
	Integrated NFC
	Support for no NFC option
	Near field communication (NFC) options by way of module
	Two built-in M.2 / PCIe WLAN antennas
	Support for the HP lt4132 LTE/HSPA+ 4G with GPS M.2 WWAN module and HP hs3210 WW HSPA+ without GPS WWAN module
	Support for no WWAN option
External media cards	Micro-Secure Digital (SD®) media reader slot
Ports	● Audio-in (mono microphone)/audio-out (stereo headphone) combination
	● AC Smart Pin adapter plug
	● HDMI v1.4
	● SIM slot (select models only)
	● USB 3.0 port with Type-A connector (2)
	● USB 3.0 port with Type-C connector
Power requirements	Support for the following AC adapters:
	● 65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm)
	● 65-W AC adapter (non-PFC, S-3P, 4.5-mm)
	● 65-W USB Type-C AC adapter (non-PFC, RC, 3-pin)
	Support for the following power cords:
	● C5 connector, 3-pin, black, 1.83-m power cord
	● C5 connector, 3-pin, black, 1.83-m, 5–15 power cord
	● C5 connector, 3-pin, black, 1.00-m power cord
	● C5 connector, 3-pin, black, 0.50-m power cord
	● Option-917, 3-cord, 1.83-m, RoHS power cord
	● Option-917, 3-cord, 1.00-m, RoHS power cord
	Support for a 3-cell, 57-WHr, 4.94-AHr, Li-ion battery

Category	Description
Security	• Support for Trusted Platfom Module (TPM) 1.2/2.0 (default) (Infineon; soldered to system board)
	• Support for drive encryption preboot (password)
	• Support for power-on authentication (password)
	• Support for integrated active smart card reader
	• Support for security cable lock
	• Support for fingerprint reader (landed, touch, with 8×8 sensor)
	• Support for preboot authentication (password, smart card)
Operating system	**Preinstalled:**
	• Windows Home 64-bit (not available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and not available on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Home 64-bit Chinese Market – CPPP (only available in the People's Republic of China, but not available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and not available on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Home 64-bit Chinese Market – CPPP-High-End (only available in the People's Republic of China on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Home 64-bit High-End (only available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Home 64-bit High-End Single Language (only available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Home 64-bit Single Language (not available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and not available on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Professional 64-bit
	• Windows Professional 64-bit StF MSNA High-End (only available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and on computer models equipped with more than or equal to 8-GB of system memory)
	• Windows Professional 64-bit StF MSNA Standard (not available on computer models equipped with an Intel i7 processor and more than 4-GB of system memory and not available on computer models equipped with more than or equal to 8-GB of system memory)
	Restore media: DRDVD/SRDVD: DRDVD Windows 10 64-bit
	Certified: Microsoft WHQL: Windows 10 64-bit
	Web-only support: Windows 10 Enterprise 64-bit and Windows 10 Enterprise 64-bit LTSB 1507
Serviceability	**End user replaceable part**: AC adapter and pen

2 External component identification

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, and then select **All apps**.

– or –

Select the **Start** button.

– or –

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

Display
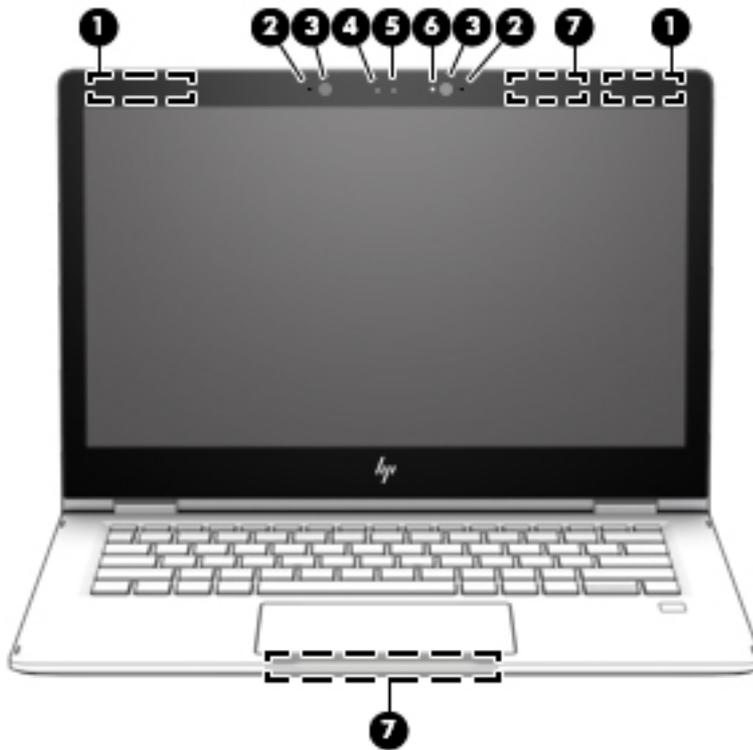
Item	Component	Description
(1)	WWAN antennas (2)* (select products only)	Send and receive wireless signals to communicate with WWANs.
(2)	Internal microphones (2)	Record sound.
(3)	Infrared camera lights (2)	On: The infrared camera is in use.
(4)	Webcam	Records video and captures photographs. Some models allow you to video conference and chat online using streaming video. To use the webcam: ▲ Type `camera` in the taskbar box, and then select **Camera**.
(5)	Infrared camera	Allows a facial recognition logon to Windows, instead of a password logon.
(6)	Webcam light	On: The webcam is in use.
(7)	WLAN antennas (2)*	Send and receive wireless signals to communicate with WLANs. **NOTE:** The position of the WLAN antennas may differ, depending on model.

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

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

To access this guide:

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

   – or –

Item	Component	Description
		Click the question mark icon in the taskbar.
2.	Select **My PC**, select the **Specifications** tab, and then select **User Guides**.	

Fingerprint reader

Component	Description
Fingerprint reader (select models only)	Allows a fingerprint logon to Windows, instead of a password logon.

Lights
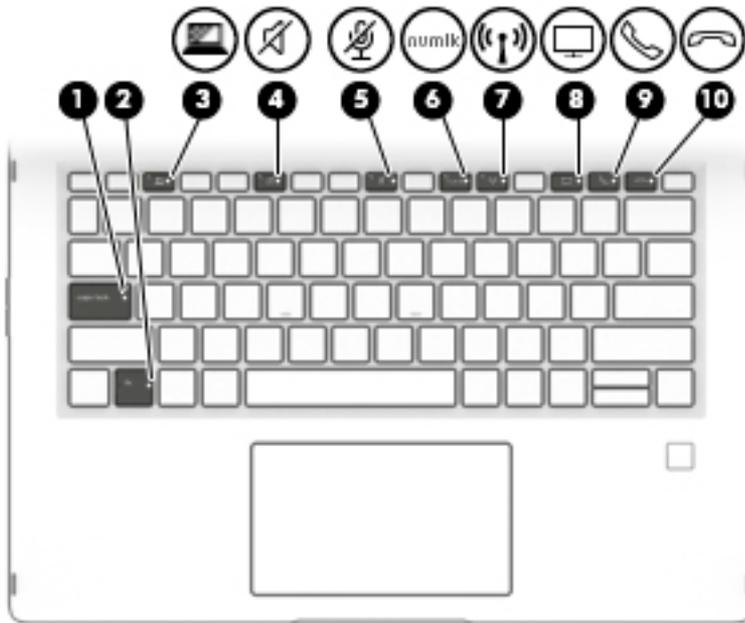
Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	fn lock light	On: The fn key is locked.
(3)	Privacy key light	On: Privacy zone is on, which helps prevent side-angle viewing.
(4)	Mute light	• On: Computer sound is off. • Off: Computer sound is on.
(5)	Microphone mute light	• On: Microphone sound is off. • Off: Microphone sound is on.
(6)	num lk light	On: Num lock is on.
(7)	Wireless light	On: An integrated wireless device, such as a WLAN, WWAN, and/or a Bluetooth device, is on. **NOTE:** On some models, the wireless light is amber when all wireless devices are off.
(8)	Sharing or presenting light	On: Sharing is on.
(9)	Call answer light	On: Call answer is on.
(10)	Call end light	On: Call end is on.

Special keys

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes frequently used system functions when pressed in combination with the esc key, or other key. These key combinations are called *hot keys*.
(3)	Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the **Start** menu.
(4)	Actions keys	Execute frequently used system functions.
(5)	Embedded numeric keypad	A numeric keypad superimposed over the keyboard alphabet keys. When num lk is pressed, the keypad can be used like an external numeric keypad. Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key. **NOTE:** If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.
(6)	num lk key	Turns the embedded numeric keypad on and off.

TouchPad
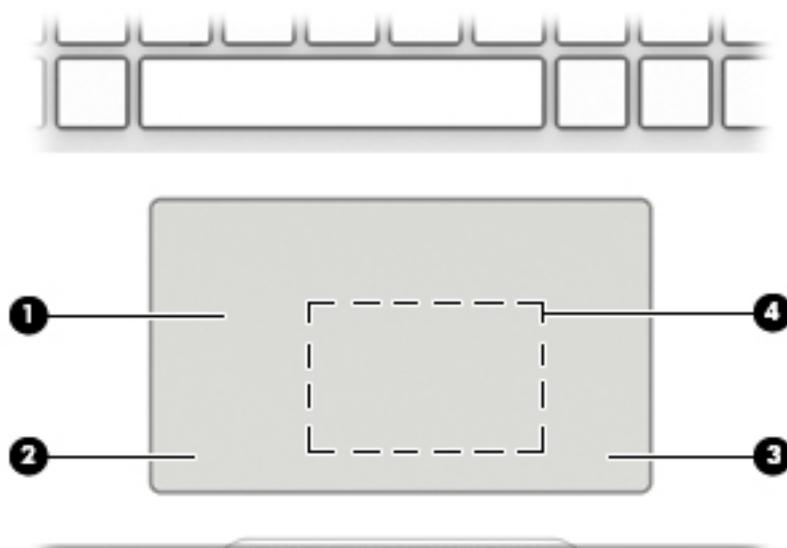
Item	Component	Description
(1)	TouchPad zone	Reads finger gestures to move the pointer to activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.
(4)	Near field communications (NFC) tapping area (select models only)	Allows you to touch an NFC-compatible device to this area to wirelessly connect and communicate with the computer and transfer data back and forth.

Left side

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 for at least 5 seconds to turn off the computer.
		To learn more about your power settings, see your power options.
		▲ Type `power options` in the taskbar search box, and then select **Power Options**.
		– or –
		Right click the **Power icon** meter and then select **Power Options**.
(2)	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 unnedded components.
		• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(3)	USB 3.x charging port	When the computer is on, connects and charges a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(4)	Audio-out (headphone)/Audio-in (microphone) jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone 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:

Component			Description
(4)		Audio-out (headphone)/Audio-in (microphone) jack *(continued)*	**1.** Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
			– or –
			Click the question mark icon in the taskbar.
			2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.
			NOTE: When a device is connected to the jack, the computer speakers are disabled.
(5)		Volume button	Controls speaker volume on the computer.
(6)	SIM	SIM card slot (select models only)	Supports a wireless SIM card.
(7)	SC	Smart card reader	Support optional smart cards.

Right side

Component		Description
(1)	microSD memory card reader	Reads optional memory cards that store, manage, share or access information.
		To insert a card:
		1. Hold the card label-side up, with the connectors facing the computer.
		2. Inser 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.
(2)	USB Type-C Thunderbolt port	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 a display device that has a USB Type-C connector, providing display output.
		NOTE: The computer may also support a Thunderbolt docking station.
(3)	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.
(4)	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a HDMI device.
(5)	USB 3.x charging port	When the computer is on, connects and charges a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(6)	Battery light	When AC power is connected:
		● White: The battery charge is greater than 90 percent.
		● Amber: The battery charge is from 0 to 90 percent.
		● Off: The battery is not charging.
		When AC power is disconnected (battery not charging):
		● Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly.

Component		Description
(6)	⚡ Battery light *(continued)*	• Off: The battery is not charging.
(7)	🔌 Power connector	Connects an AC adapter.

Bottom
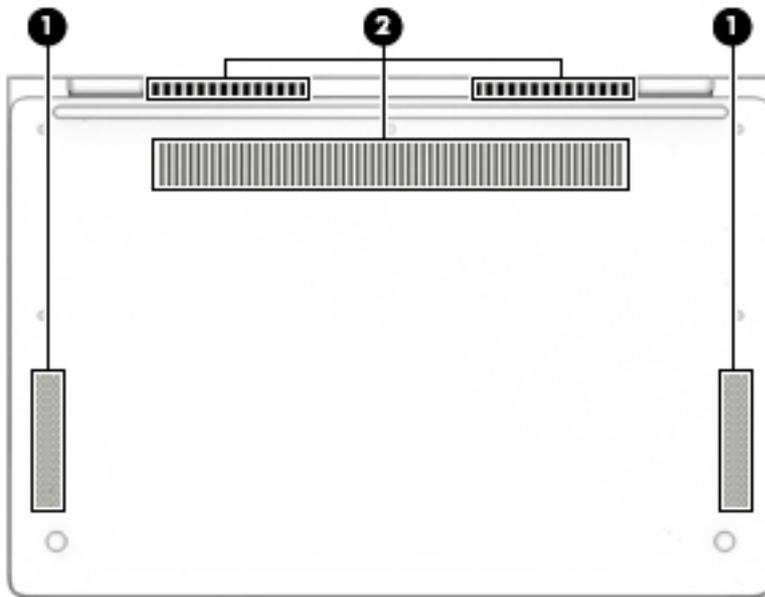
Item	Component	Description
(1)	Speakers (2)	Produce sound.
(2)	Vents (3)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

3 Illustrated parts catalog

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

Service label

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.

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, or on the back of the display.

- Service label—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

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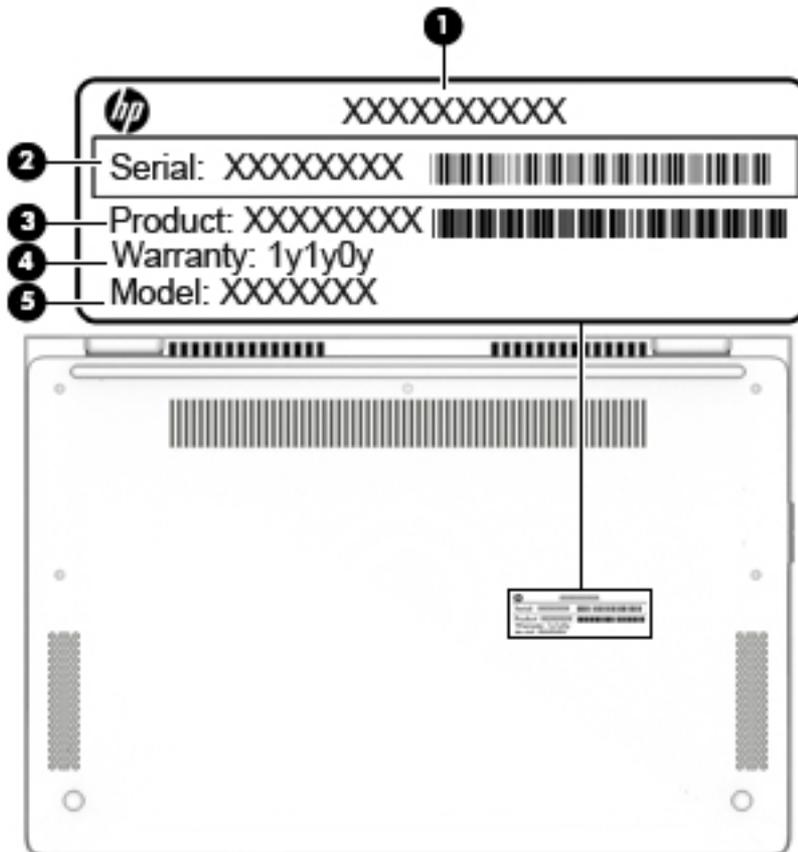
Component	
(1)	HP product name (select products only)
(2)	Serial number
(3)	Product number
(4)	Warranty period
(5)	Model name (select products only)

- Regulatory label(s)—Provide(s) regulatory information about the computer.

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

Computer major components
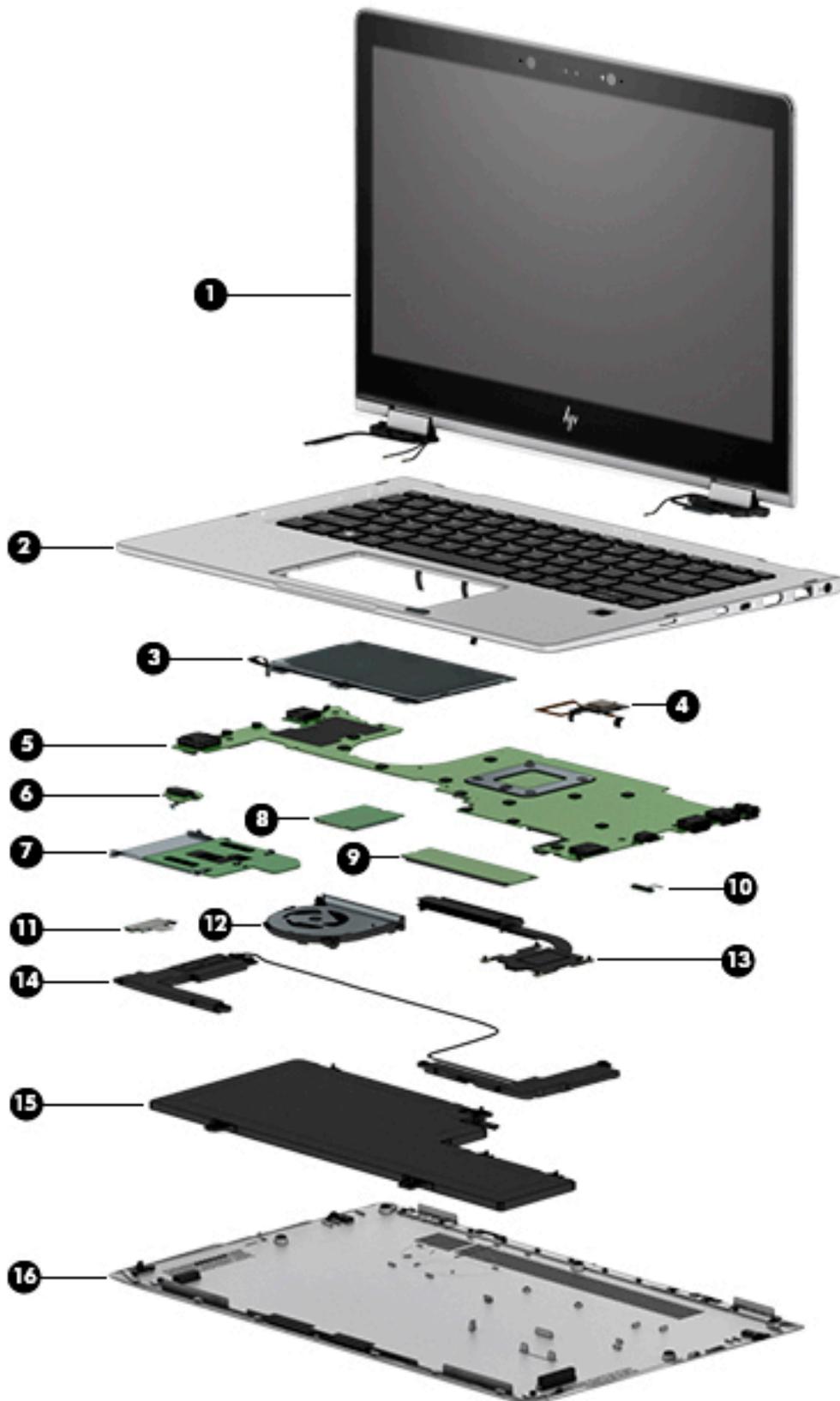
Item	Component	Spare part number
(1)	**Display assembly**: The TouchScreen display is spared only as an entire assembly.	
	13.3-in, UHD, BrightView (3840×2160), UWVA TouchScreen display panel assembly	917928-001
	13.3-in, FHD, BrightView (1920×1080), LED, UWVA TouchScreen display panel assembly	917927-001
(2)	**Keyboard/top cover** (includes keyboard cable, top cover shielding, and magnets):	
	For use in Belgium	920484-A41
	For use in Brazil	920484-201
	For use in Bulgaria	920484-261
	For use in Canada	920484-DB1
	For use in the Czech Republic and Slovakia	920484-FL1
	For use in Denmark	920484-081
	For use in France	920484-051
	For use in Germany	920484-041
	For use in Greece	920484-151
	For use in Hungary	920484-211
	For use in Iceland	920484-DD1
	For use in India	920484-D61
	For use in Israel	920484-BB1
	For use in Italy	920484-061
	For use in Japan	920484-291
	For use in Latin America	920484-161
	For use in the Netherlands	920484-B31
	For use in Norway	920484-091
	For use in the Northwest Africa	920484-FP1
	For use in Portugal	920484-131
	For use in Romania	920484-271
	For use in Russia	920484-251
	For use in Saudi Arabia	920484-171
	For use in Slovenia	920484-BA1
	For use in South Korea	920484-AD1
	For use in Spain	920484-071
	For use in Sweden and Finland	920484-B71
	For use in Switzerland	920484-BG1
	For use in Taiwan	920484-AB1
	For use in Thailand	920484-281

Item	Component	Spare part number
	For use in Turkey	920484-141
	For use in the United Kingdom	920484-031
	For use in the United States	920484-001
(3)	**TouchPad** (includes NFC board cable)	924936-001
	NOTE: The TouchPad spare part kit does not include the TouchPad bracket or TouchPad cable. The TouchPad cable is included in the Cable Kit, spare part number 917893-001, which also includes the NFC board cable. The TouchPad bracket is not spared as a separate component.	
(4)	**Fingerprint reader board** (includes double-sided adhesive)	917891-001
	NOTE: The fingerprint reader board spare part kit does not include the fingerprint reader board cable. The fingerprint reader board cable is included in the Cable Kit, spare part number 917893-001.	
(5)	**System board** (includes processor, graphics subsystem with UMA memory, and replacement thermal material):	
	Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 16.0-GB of system memory, and the Windows 10 operating system	920054-601
	Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 16.0-GB of system memory, and a non-Windows 10 operating system	920054-001
	Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and the Windows 10 operating system	920055-601
	Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and a non-Windows 10 operating system	920055-001
	Equipped with an Intel Core i5-7300U 2.60-GHz (SC turbo up to 3.50-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and the Windows 10 operating system	917102-601
	Equipped with an Intel Core i5-7300U 2.60-GHz (SC turbo up to 3.50-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and a non-Windows 10 operating system	917102-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and the Windows 10 operating system	917103-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and a non-Windows 10 operating system	917103-001
	Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 4.0-GB of system memory, and the Windows 10 operating system	917101-601
	Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 4.0-GB of system memory, and a non-Windows 10 operating system	917101-001
(6)	**Audio jack board** (includes cable)	917890-001
(7)	**WWAN module:**	
	HP lt4132 LTE/HSPA+ 4G with GPS M.2 WWAN module	845710-001

Item	Component	Spare part number
	HP hs3210 WW HSPA+ without GPS WWAN module	860726-001
(8)	**Solid-state drive:**	
	512-GB Turbo Drive G2 solid-state drive with TLC	917926-001
	256-GB Turbo Drive G2 solid-state drive with TLC	917925-001
	256-GB M.2 SATA SED solid-state drive with Opal2 and TLC	917924-001
	128-GB M.2 SATA-3 solid-state drive	917923-001
(9)	**Thermal sensor board** (includes cable and double-sided adhesive)	917887-001
(10)	**Card reader board**	917892-001
	NOTE: The card reader board spare part kit does not include the card reader board cable. The card reader board cable is included in the Cable Kit, spare part number 917893-001.	
(11)	**NFC board**	917894-001
	NOTE: The NFC board spare part kit does not include the NFC board cable. The NFC board cable is included in the Cable Kit, spare part number 917893-001.	
(12)	**Fan** (includes cable)	917886-001
(13)	**Heat sink** (includes replacement thermal material)	919415-001
(14)	**Speakers** (includes cables, left and right speakers, and two rubber isolators)	924935-001
(15)	**3-cell, 57-WHr, 4.94-AHr, Li-ion battery** (includes cable)	863280-855
(16)	**Bottom cover** (includes two rubber feet, one rear rubber foot strip, speaker grilles, vent grille, and magnets)	917895-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm)	714635-850
65-W AC adapter (non-PFC, S-3P, 4.5-mm)	710412-001
65-W USB Type-C AC adapter (non-PFC, RC, 3-pin)	860209-850
Duck head adapter:	
For use in South Korea	854073-001
For use in the United States	854702-001
Hinge Kit (includes left and right display hinges)	917888-001
HP Active Pen with app launch	846410-001
Power cord – C5 connector, 3-pin, black, 1.83-m:	
For use in Argentina	401300-001
For use in Australia	213356-001
For use in Brazil	438772-001

Component	Spare part number
For use in Denmark	213353-001
For use in Europe	213350-001
For use in India	404827-001
For use in Israel	398063-001
For use in Italy	213352-001
For use in Japan	226768-001
For use in North America	213349-001
For use in the People's Republic of China	286497-001
For use in South Korea	267836-001
For use in Switzerland	213354-001
For use in Taiwan	393313-001
For use in the United Kingdom and Singapore	213351-001
Power cord – C5 connector, 3-pin, black, 1.83-m, 5–15, for use only in Thailand	285096-001
Power cord – C5 connector, 3-pin, black, 1.00-m:	
For use in Argentina	401300-011 and 401300-007
For use in Australia	213356-013 and 213356-008
For use in Brazil	438772-008 and 438772-004
For use in Denmark	213353-013 and 213353-008
For use in Europe	213350-014 and 213350-009
For use in India	404827-008 and 404827-003
For use in Israel	398063-008 and 398063-003
For use in Italy	213352-013 and 213352-008
For use in North America	213349-015 and 213349-009
For use in the People's Republic of China	286497-013 and 286497-008
For use in South Korea	361240-007 and 267836-008
For use in Switzerland	213354-013 and 213354-008
For use in Taiwan	393313-007 and 393313-003

Component	Spare part number
For use in Thailand	285096-012 and 285096-006
For use in the United Kingdom and Singapore	213351-013 and 213351-008
Power cord – C5 connector, 3-pin, black, 0.50-m, for use only in Europe	213350-011
Power cord – Option-917, 3-cord, 1.83-m, RoHS	361240-00
Power cord – Option-917, 3-cord, 1.00-m, RoHS	361240-002
Screw Kit	917889-001

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
- T4 Torx 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

⚠ **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.

📝 **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.

Component replacement procedures

There are as many as 44 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Bottom cover

Description	Spare part number
Bottom cover (includes two rubber feet, one rear rubber foot strip, speaker grilles, vent grille, and magnets)	917895-001

Before removing the bottom cover, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

Remove the bottom cover:

1. Remove the five Torx-4 T4M2.0×7.4 shoulder screws that secure the bottom cover to the computer.
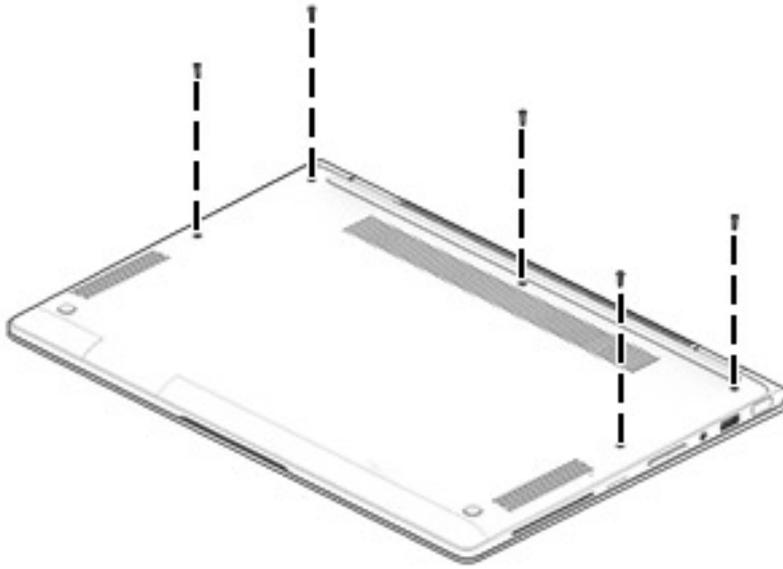
2. Use a case utility tool **(1)** or similar thin plastic tool to separate the rear edge **(2)** of the bottom cover and the keyboard/top cover.

3. Remove the bottom cover **(3)** by sliding it up and back at an angle.
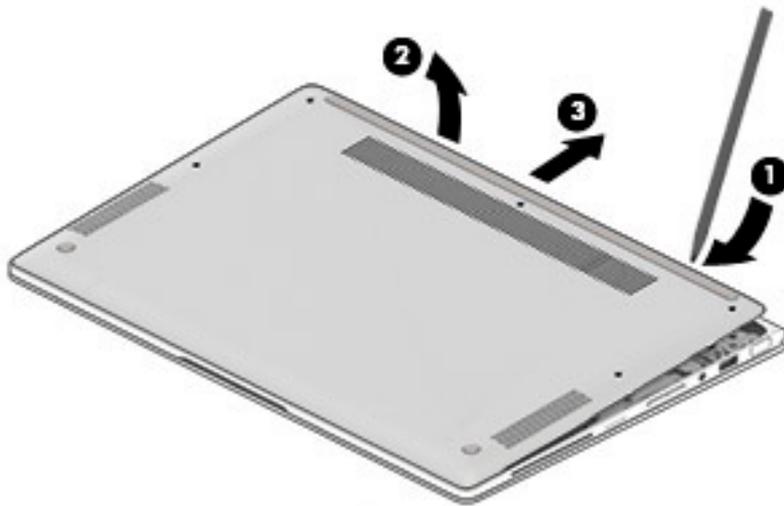
Reverse this procedure to install the bottom cover.

Battery

Description	Spare part number
3-cell, 57-WHr, 4.94-AHr, Li-ion battery (includes cable)	863280-855

Before removing the battery, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see).

Remove the battery:

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

2. Remove the six Phillips PM2.0×5.3 screws **(2)** that secure the battery to the keyboard/top cover.

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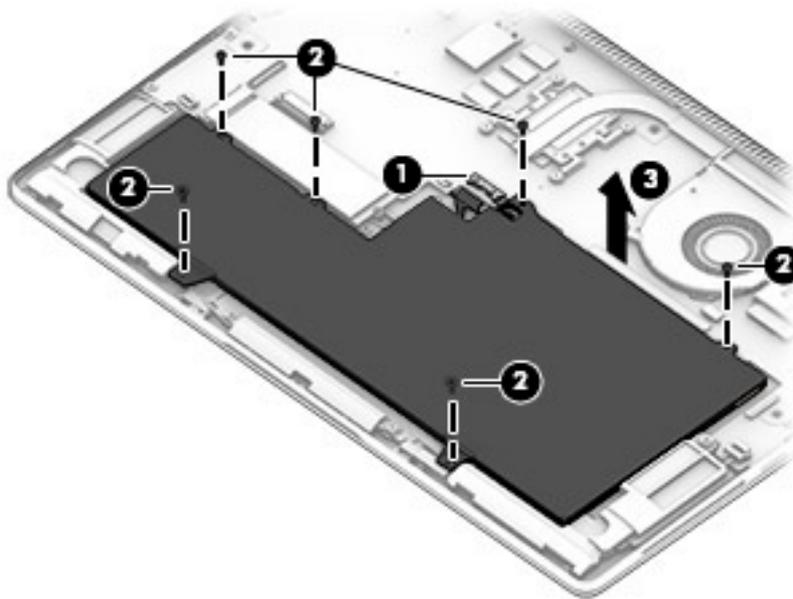
Reverse this procedure to install the battery.

Solid-state drive

Description	Spare part number
512-GB Turbo Drive G2 solid-state drive supporting TLC	917926-001
256-GB Turbo Drive G2 solid-state drive supporting TLC	917925-001
256-GB M.2 SATA SED solid-state drive supporting Opal2 and TLC	917924-001
128-GB M.2 SATA-3 solid-state drive	917923-001

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

1. Shut down the computer.

2. Disconnect all external devices connected to the computer.

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

4. Remove the bottom cover (see Bottom cover on page 27).

5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×2.4 screw **(1)** that secures the solid-state drive to the system board. (The solid-state drive tilts up.)

2. Remove the solid-state drive **(2)** by pulling the drive away from the slot at an angle.
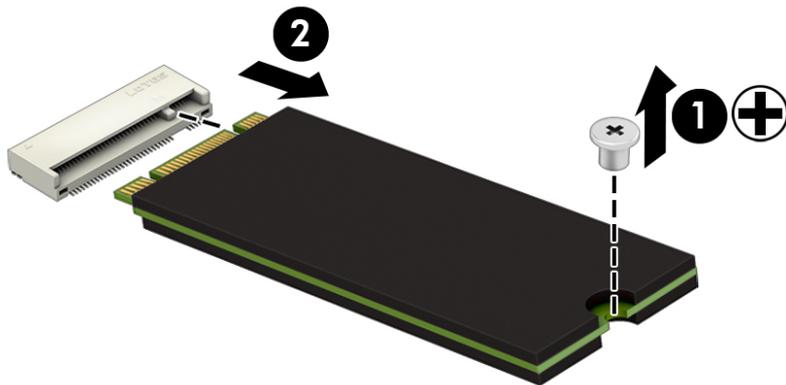
Reverse this procedure to install the solid-state drive.

WWAN module

Description	Spare part number
HP lt4132 LTE/HSPA+ 4G with GPS M.2 WWAN module	845710-001
HP hs3210 WW HSPA+ without GPS WWAN module	860726-001

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

Before removing the WWAN module, 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 27).

5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the WWAN module:

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

   📝 **NOTE:** The #5/red WWAN antenna cable connects to the WWAN module #5/Main terminal. The #6/blue WWAN antenna cable connects to the WWAN module #6/Aux terminal.

2. Remove the Phillips PM2.0×2.4 screw **(2)** that secures the WWAN module to the system board. (The WWAN module tilts up.)

3. Remove the WWAN module **(3)** by pulling the board away from the slot at an angle.
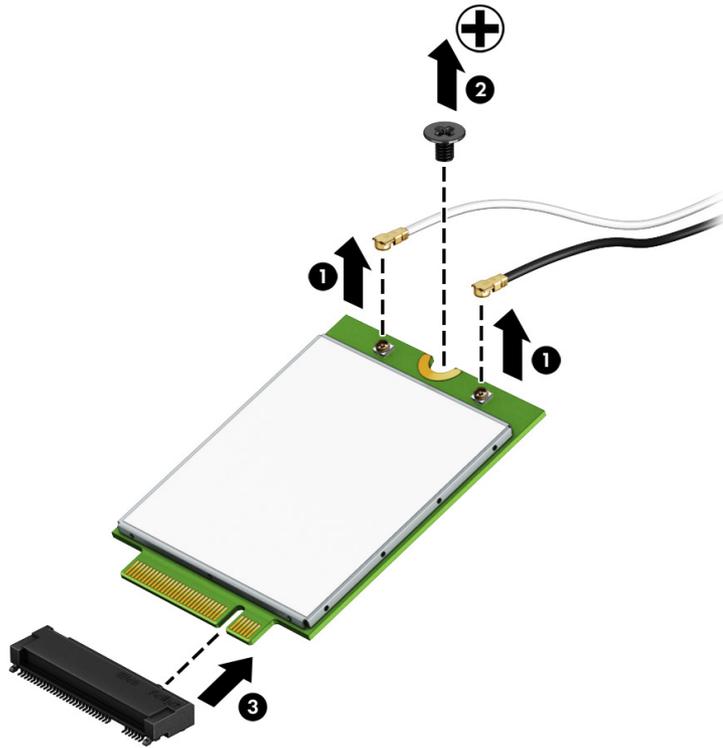
NOTE: If the WWAN antenna is not connected to the terminal on the WWAN module, a protective sleeve must be installed on the antenna connector, as shown in the following illustration.
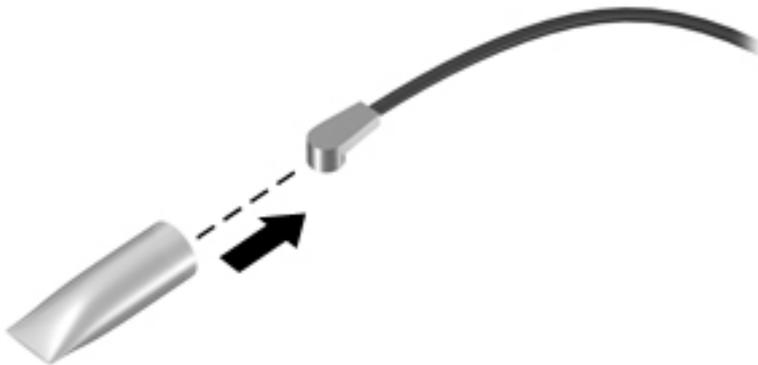
Reverse this procedure to install the WWAN module.

Thermal sensor board

Description	Spare part number
Thermal sensor board (includes cable and double-sided adhesive)	917887-001

Before removing the thermal sensor 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 27).

5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the thermal sensor board:

1. Release the zero insertion force (ZIF) connector **(1)** to which the thermal sensor board cable is attached, and then disconnect the thermal sensor board cable from the system board.

2. Detach the thermal sensor board **(2)** from the system board. (The thermal sensor board is attached to the system board with double-sided adhesive.)
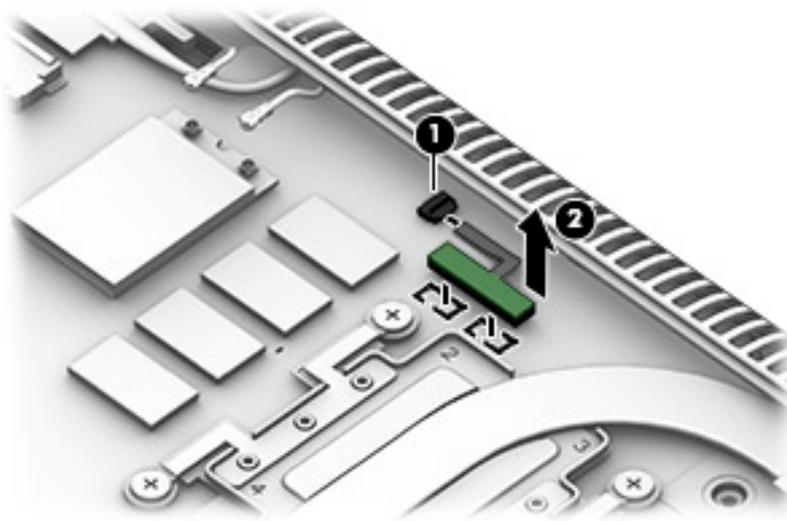
3. Remove the thermal sensor board.

Reverse this procedure to install the thermal sensor board.

Fan

Description	Spare part number
Fan (includes cable and foam padding)	917886-001

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 27).

5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the fan:

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

2. Loosen the two Phillips PM2.0×6.3 captive screws **(2)** that secure the fan to the keyboard/top cover.

3. Remove the fan **(3)**.
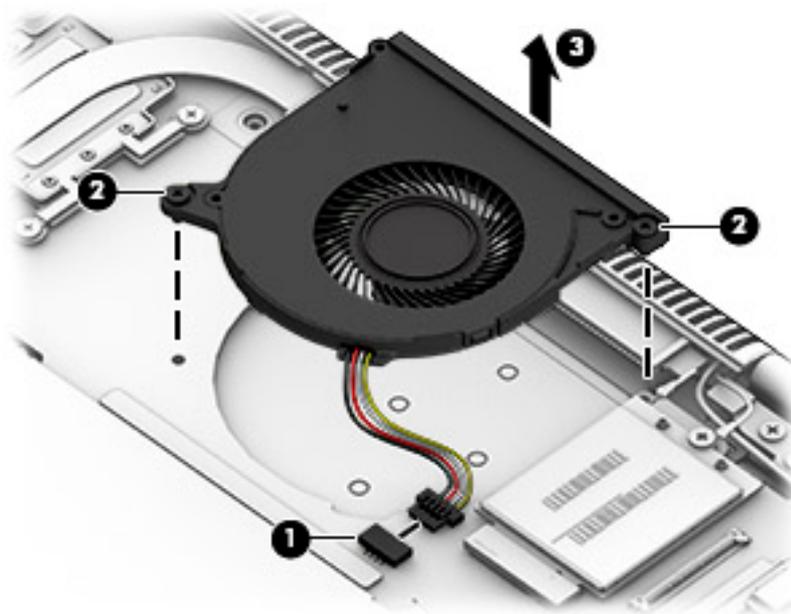
4. Remove the fan.

Reverse this procedure to install the fan.

Speakers

Description	Spare part number
Speakers (includes cables, left and right speakers, and two rubber isolators)	924935-001

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 unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27).

5. Remove the battery (see Battery on page 29).

Remove the speakers:

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

2. Release the ZIF connector **(2)** to which the card reader board cable is attached, and then disconnect the card reader board cable from the card reader board.

3. Release the retention tabs **(3)** that secure the speaker cable to the keyboard/top cover.

4. Release the speaker cable **(4)** from underneath the card reader board cable and the retention tabs.
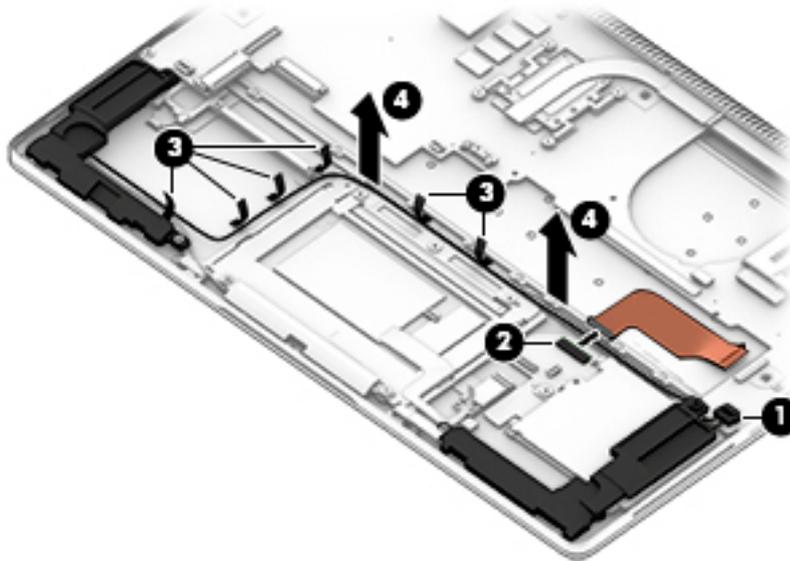
5. Remove the two Phillips PM2.0×2.4 screws **(1)** that secure the speakers to the keyboard/top cover.

6. Remove the right speaker **(2)**.

7. Slide the left speaker forward **(3)**, and then remove the left speaker.

> **⚠ CAUTION:** When removing the speakers, make note of the location of the two rubber isolators **(4)**. Failure to properly install or damage to these isolators can result in degraded speaker performance.
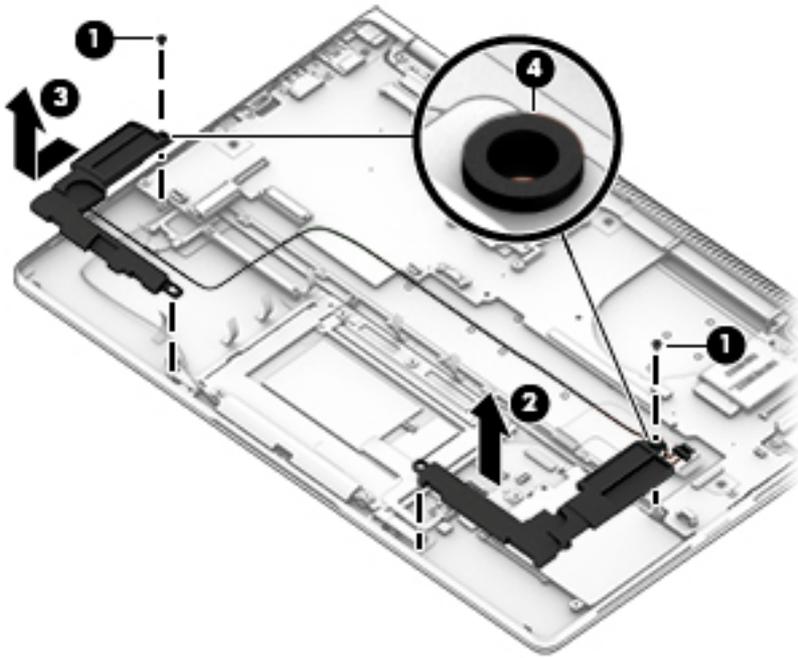
Reverse this procedure to install the speakers.

TouchPad cable

NOTE: The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is included in the Cable Kit, spare part number 917893-001, which also includes the NFC board cable.

Before removing the TouchPad cable, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27).

5. Remove the battery (see Battery on page 29).

Remove the TouchPad cable:

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

2. Release the ZIF connector **(2)** to which the TouchPad cable is attached, and then disconnect the TouchPad cable from the card reader board.

3. Detach the TouchPad cable **(3)** from the TouchPad and card reader board. (The TouchPad cable is attached to the TouchPad and card reader board with double-sided adhesive at two locations.)

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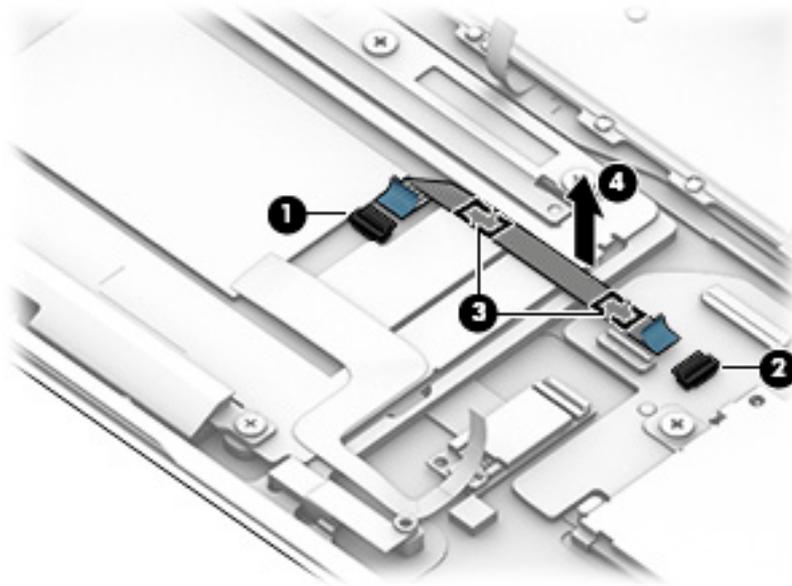
Reverse this procedure to install the TouchPad cable.

TouchPad

Description	Spare part number
TouchPad (includes NFC board cable)	924936-001

NOTE: The TouchPad spare part kit does not include the TouchPad bracket or TouchPad cable.
The TouchPad cable is included in the Cable Kit, spare part number 917893-001, which also includes the
NFC board cable. The TouchPad bracket is not spared as a separate component.

Before removing the TouchPad, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27).

5. Remove the battery (see Battery on page 29).

Remove the TouchPad:

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

2. Detach the TouchPad cable **(2)** from the TouchPad and card reader board. (The TouchPad cable is attached to the TouchPad and card reader board with double-sided adhesive at two locations.)

3. Release the grounding tape **(3)** that secures the NFC board cable to the NFC board.

4. Release the ZIF connector **(4)** to which the NFC board cable is attached, and then disconnect the NFC board cable from the NFC board.

5. Remove the two Phillips PM2.0×3.4 screws **(5)** that secure the WLAN auxiliary transceiver and the TouchPad to the keyboard/top cover.

6. Release the WLAN auxiliary transceiver **(6)**.
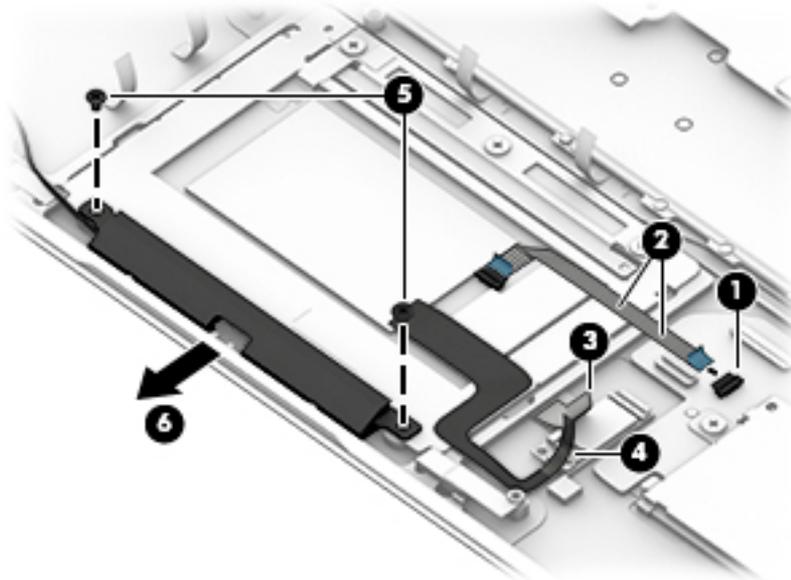
7. Remove the four Phillips PM2.0×2.4 screws **(1)** that secure the TouchPad to the keyboard/top cover.

8. Remove the TouchPad **(2)** and cable.
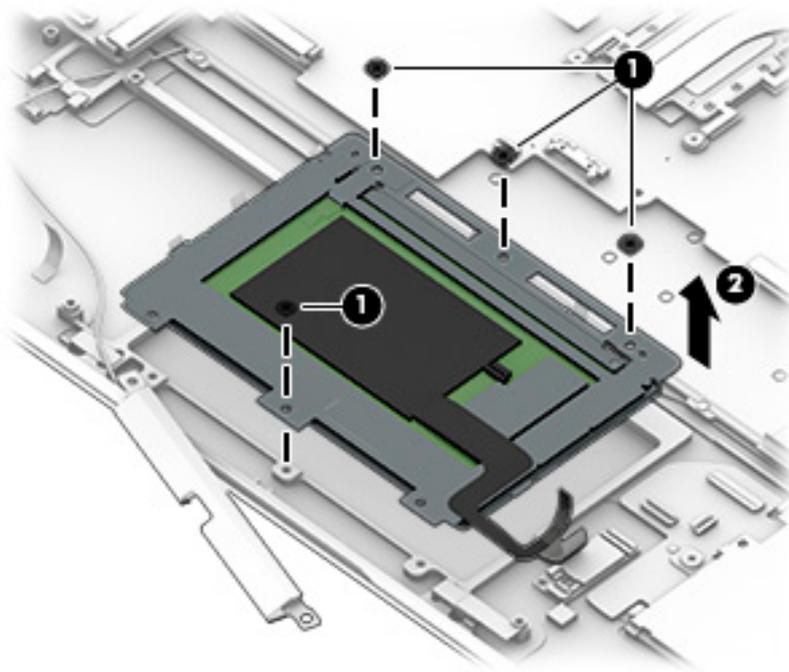
Reverse this procedure to install the TouchPad.

NFC board

Description	Spare part number
NFC board	917894-001

NOTE: The NFC board spare part kit does not include the NFC board cable. The NFC board cable is included in the Cable Kit, spare part number 917893-001.

Before removing the NFC board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see).

5. Remove the battery (see).

Remove the NFC board:

1. Release the ZIF connector **(1)** to which the NFC board cable is attached, and then disconnect the NFC board cable from the card reader board.

2. Release the grounding tape **(2)** that secures the NFC board cable to the NFC board.

3. Release the ZIF connector **(3)** to which the NFC board cable is attached, and then disconnect the NFC board cable from the NFC board.

4. Detach the NFC board **(4)** from the keyboard/top cover. (The NFC board is attached to the keyboard/top cover with double-sided adhesive.)
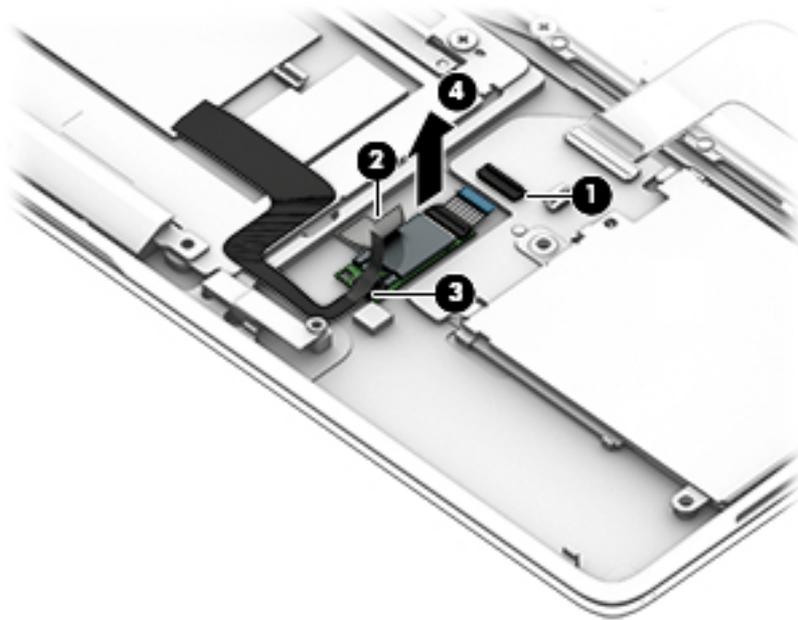
5. Remove the NFC board.

Reverse this procedure to install the NFC board.

Card reader board cable

NOTE: The card reader board cable is included in the Cable Kit, spare part number 917893-001.

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

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27).

5. Remove the battery (see Battery on page 29).

Remove the card reader board cable:

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

2. Release the ZIF connector **(2)** to which the card reader board cable is attached, and then disconnect the card reader board cable from the card reader board.

3. Detach the card reader board cable **(3)** from the card reader board. (The card reader board cable is attached to the card reader board with double-sided adhesive.)

4. Remove the card reader board cable **(4)**.
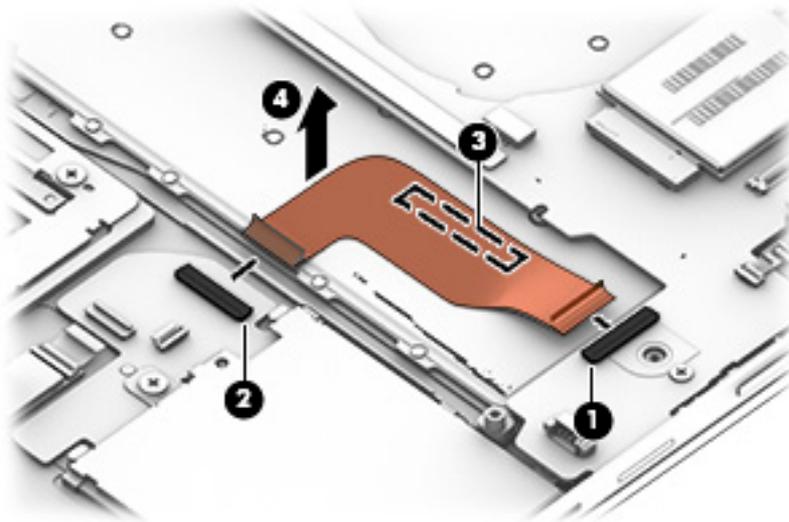
Reverse this procedure to install the card reader board cable.

Card reader board

Description	Spare part number
Card reader board	917892-001

NOTE: The card reader board spare part kit does not include the card reader board cable. The card reader board cable is included in the Cable Kit, spare part number 917893-001.

Before removing the card reader board, follow these steps:

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

2.   Disconnect the power from the computer by unplugging the power cord from the computer.

3.   Disconnect all external devices from the computer.

4.   Remove the bottom cover (see).

5.   Remove the battery (see).

Remove the card reader board:

1.   Release the ZIF connector **(1)** to which the NFC board cable is attached, and then disconnect the NFC board cable from the card reader board.

2.   Release the ZIF connector **(2)** to which the card reader board cable is attached, and then disconnect the card reader board cable from the card reader board.

3.   Remove the three Philllips PM2.0×2.4 screws **(3)** that secure the card reader board to the keyboard/top cover.

4.   Remove the card reader board cable **(4)**.
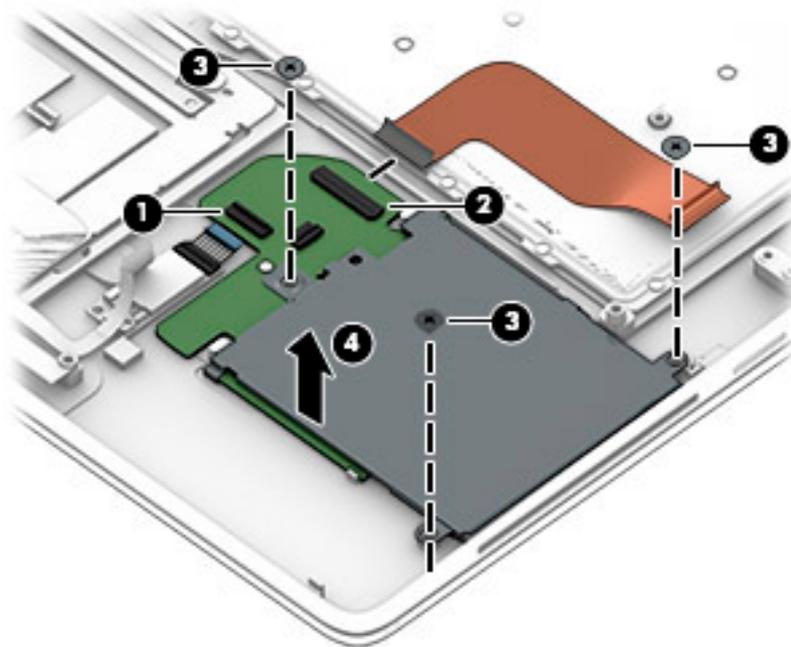
Reverse this procedure to install the card reader board.

System board

NOTE: The system board spare part kit includes the processor, a graphics subsystem with UMA memory, and replacement thermal material.

Description	Spare part number
Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 16.0-GB of system memory, and the Windows 10 operating system	920054-601
Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 16.0-GB of system memory, and a non-Windows 10 operating system	920054-001
Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and the Windows 10 operating system	920055-601
Equipped with an Intel Core i7-7600U 2.80-GHz (SC turbo up to 3.90-GHz) processor (4.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and a non-Windows 10 operating system	920055-001
Equipped with an Intel Core i5-7300U 2.60-GHz (SC turbo up to 3.50-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and the Windows 10 operating system	917102-601
Equipped with an Intel Core i5-7300U 2.60-GHz (SC turbo up to 3.50-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and a non-Windows 10 operating system	917102-001
Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and the Windows 10 operating system	917103-601
Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 8.0-GB of system memory, and a non-Windows 10 operating system	917103-001
Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 4.0-GB of system memory, and the Windows 10 operating system	917101-601
Equipped with an Intel Core i5-7200U 2.50-GHz (SC turbo up to 3.10-GHz) processor (3.0-MB SmartCache, dual core, 7.5-W), 4.0-GB of system memory, and a non-Windows 10 operating system	917101-001

Before removing the system board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27), and then remove the following components:

   a. Battery (see Battery on page 29)

   b. Solid-state drive (see Solid-state drive on page 30)

   c. Fan (see Fan on page 34)

   d. Speakers (see Speakers on page 35)

NOTE: When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board

- WWAN module (see WWAN module on page 31)

- Thermal sensor board (see Thermal sensor board on page 33)

- Heat sink (see Heat sink on page 46)

Remove the system board:

1.   Disconnect the following cables from the system board:

     (1) Display infrared camera cable

     (2) WLAN antenna cables

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

     (3) WWAN antenna cables

     📝 **NOTE:**   The #5/red WWAN antenna cable connects to the WWAN module #5/Main terminal. The #6/blue WWAN antenna cable connects to the WWAN module #6/Aux terminal.

     (4) Display panel cable

     (5) Audio jack ZIF connector cable

     (6) Card reader board ZIF connector cable

     (7) Speaker cable

     (8) Keyboard backlight ZIF connector cable

     (9) Keyboard ZIF connector cable

     (10) Fingerprint reader board ZIF connector cable
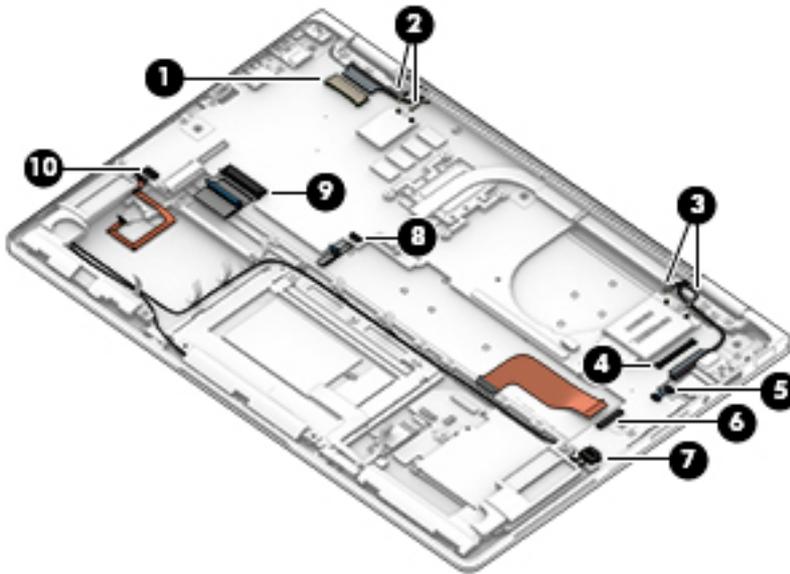
2.   Remove the SIM card slot insert **(1)** (if present).

3. Remove the five Philllips PM2.0×3.4 screws **(2)** and the Philllips PM2.0×2.4 screw **(3)** that secure the system board to the keyboard/top cover.
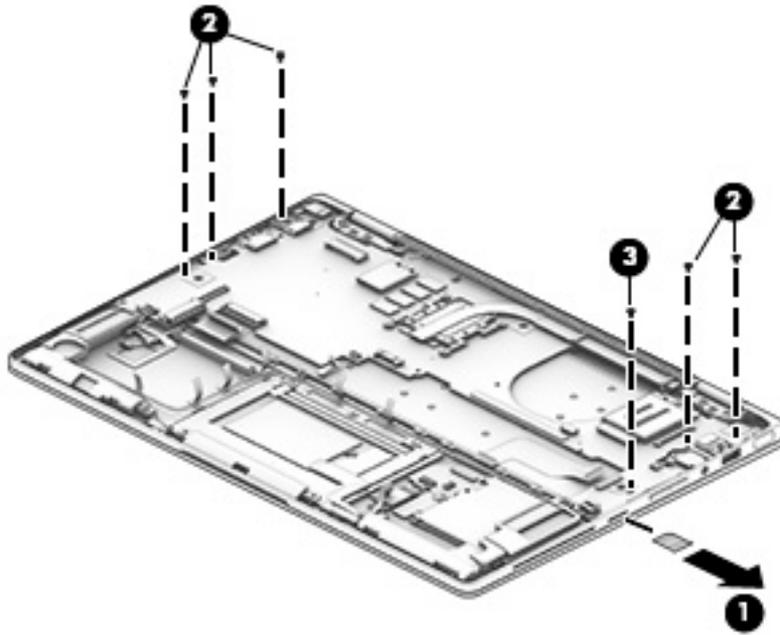
4. Lift the front edge of the system board **(1)** until it rests at an angle.

5. Rotate the left side of the system board **(2)** counterclockwise until the entire left side of the system board is clear of the keyboard/top cover.

6. Slide the system board **(3)** up and forward at an angle and remove the system board.
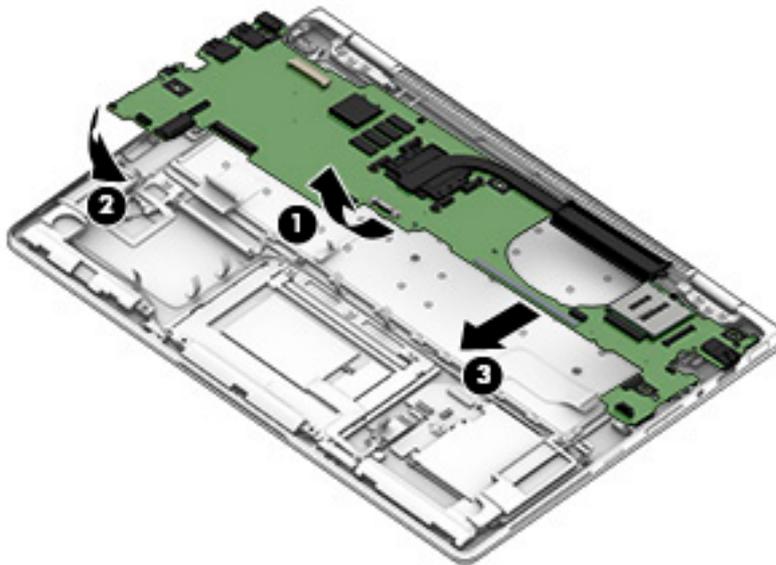
Reverse this procedure to install the system board.

Heat sink

| Description	Spare part number
Heat sink (includes replacement thermal material)	(see WWAN module on page 31)-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 unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27), and then remove the following components:

   a. Battery (see Battery on page 29)

   b. Solid-state drive (see Solid-state drive on page 30)

   c. Fan (see Fan on page 34)

   d. Speakers (see Speakers on page 35)

   e. System board (see System board on page 43)

Remove the heat sink:

1. Loosen the four Phillips PM2.0×2.8 captive screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink **(2)**.
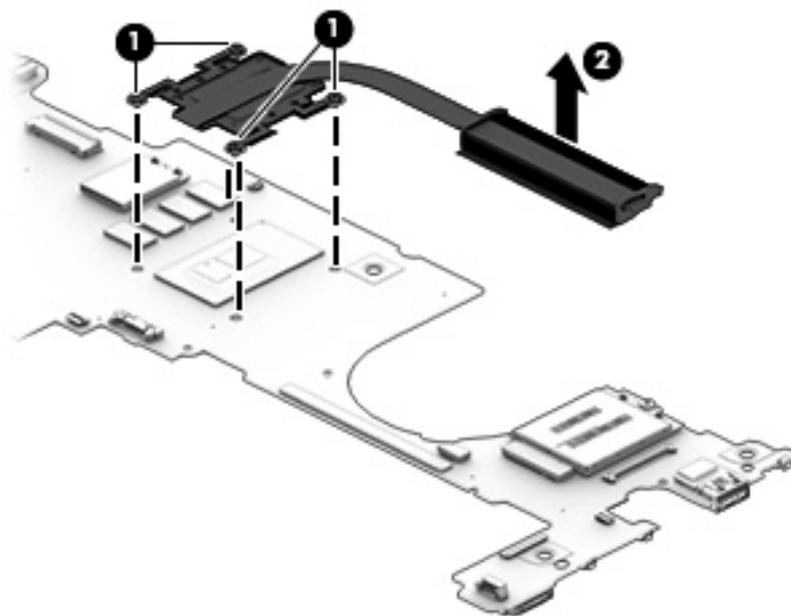
NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed. Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it.
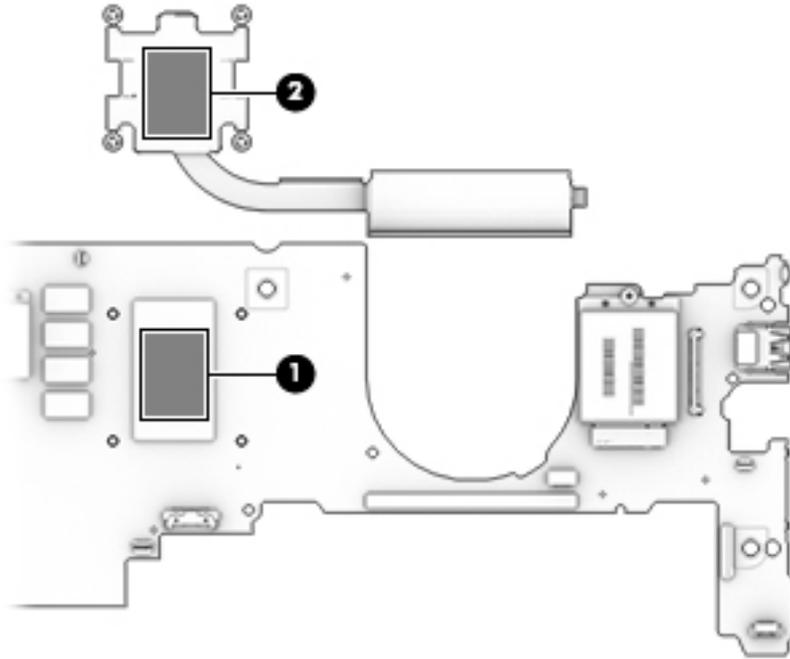
Reverse this procedure to install the heat sink.

Fingerprint reader board cable

**NOTE:** The fingerprint reader board spare part kit does not include the fingerprint reader board cable. The fingerprint reader board cable is included in the Cable Kit, spare part number 917893-001.

Before removing the fingerprint reader board cable, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27), and then remove the following components:

   a. Battery (see Battery on page 29)

   b. Solid-state drive (see Solid-state drive on page 30)

   c. Fan (see Fan on page 34)

   d. Speakers (see Speakers on page 35)

   e. System board (see System board on page 43)

Remove the fingerprint reader board cable:

1. Release the ZIF connector **(1)** to which the fingerprint reader board cable is attached, and then disconnect the fingerprint reader board cable from the fingerprint reader board.

2. Detach the fingerprint reader board cable **(2)** from the keyboard/top cover. (The fingerprint reader board cable is attached to the keyboard/top cover with double-sided adhesive.)

3. Remove the fingerprint reader board cable **(3)**.
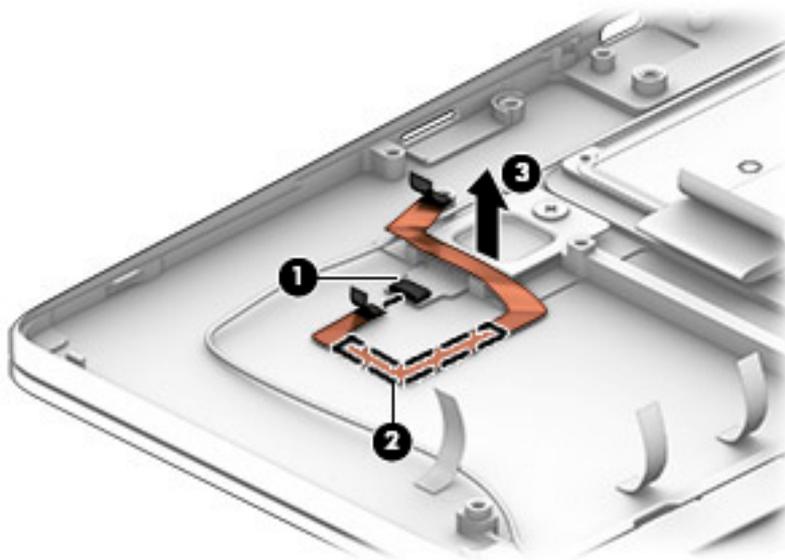
Reverse this procedure to install the fingerprint reader board cable.

Fingerprint reader board

Description	Spare part number
Fingerprint reader board (includes double-sided adhesive)	917891-001

NOTE: The fingerprint reader board spare part kit does not include the fingerprint reader board cable. The fingerprint reader board cable is included in the Cable Kit, spare part number 917893-001.

Before removing the fingerprint reader board, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27), and then remove the following components:

   a. Battery (see Battery on page 29)

   b. Solid-state drive (see Solid-state drive on page 30)

   c. Fan (see Fan on page 34)

   d. Speakers (see Speakers on page 35)

   e. System board (see System board on page 43)

Remove the fingerprint reader board:

1. Detach the fingerprint reader board cable **(1)** from the keyboard/top cover. (The fingerprint reader board cable is attached to the keyboard/top cover with double-sided adhesive.)

2. Remove the Phillips PM2.0×2.4 screw **(2)** that secures the fingerprint reader board and bracket to the keyboard/top cover.

3. Remove the fingerprint reader board bracket **(3)**.

4.   Detach the fingerprint reader board **(4)** from the keyboard/top cover. (The fingerprint reader board is attached to the keyboard/top cover with double-sided adhesive.)
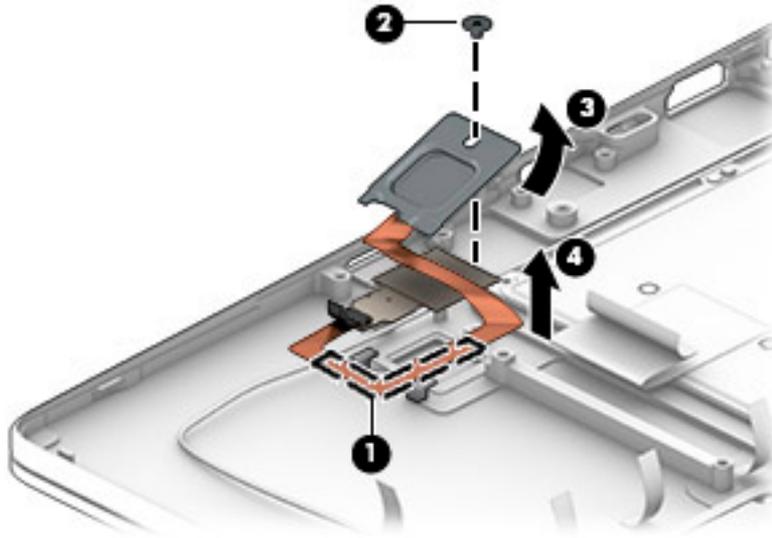
5.   Remove the fingerprint reader board.

Reverse this procedure to install the fingerprint reader board.

Audio jack board

Description	Spare part number
Audio jack board (includes cable)	917890-001

Before removing the audio jack 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 27), and then remove the following components:

   a.   Battery (see Battery on page 29)

   b.   Solid-state drive (see Solid-state drive on page 30)

   c.   Fan (see Fan on page 34)

   d.   Speakers (see Speakers on page 35)

   e.   System board (see System board on page 43)

Remove the audio jack board:

1.   Remove the Philllips PM2.0×2.4 screw **(1)** that secures the audio jack board to the keyboard/top cover.

2.   Lift the left side of the audio jack board **(2)** until it rests at an angle.

3. Remove the audio jack board **(3)** by sliding it up and to the left at an angle.
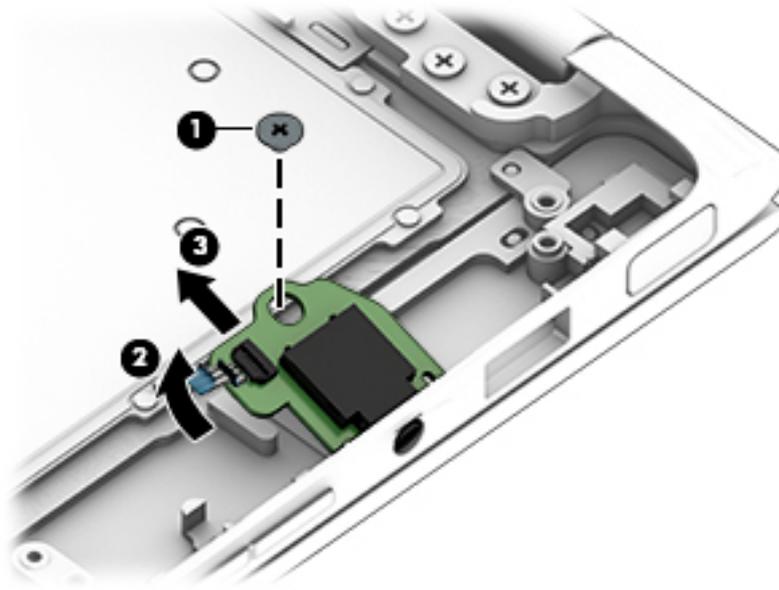
Reverse this procedure to install the audio jack board.

Display assembly

Description	Spare part number
13.3-in, UHD, BrightView (3840×2160), UWVA TouchScreen display panel assembly	917928-001
13.3-in, FHD, BrightView (1920×1080), LED, UWVA TouchScreen display panel assembly	917927-001

Before removing the display assembly, follow these steps:

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

2. Disconnect the power from the computer by unplugging the power cord from the computer.

3. Disconnect all external devices from the computer.

4. Remove the bottom cover (see Bottom cover on page 27).

5. Disconnect the battery cable from the system board (see Battery on page 29).

Remove the display assembly:

1. Disconnect the display infrared camera cable **(1)** from the system board.

2. Disconnect the WLAN antenna cables **(2)** from the terminals on the WLAN module.

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

3. Disconnect the WWAN antenna cables **(3)** from the terminals on the WWAN module (select models only).

    NOTE: The #5/red WWAN antenna cable connects to the WWAN module #5/Main terminal. The #6/blue WWAN antenna cable connects to the WWAN module #6/Aux terminal.

4. Disconnect the display infrared camera cable **(4)** from the system board.
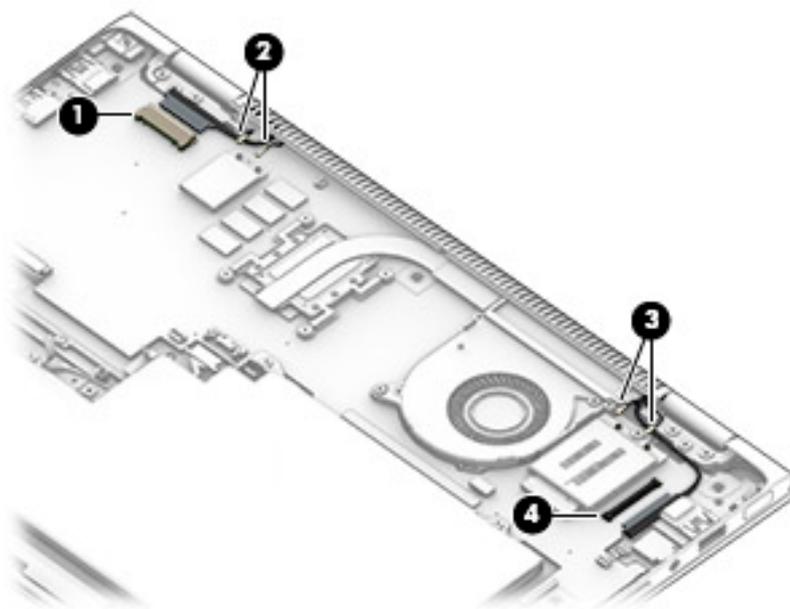
5. Remove the six Phillips PM2.5×5.6 screws that secure the display assembly to the keyboard/top cover.
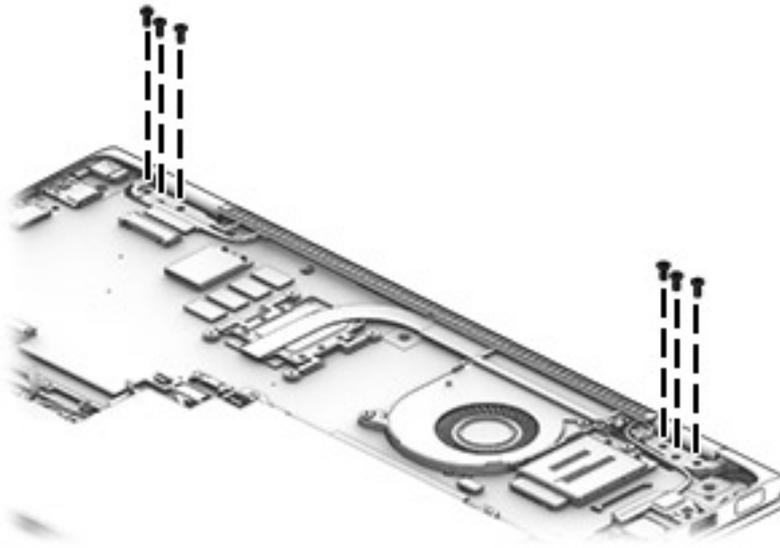
6. Rotate the display assembly into the entertainment mode **(1)**.

7. Release the display assembly by sliding the hinges forward **(2)**.

8. Remove the display assembly **(3)**.

Reverse this procedure to install the display assembly.

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

Using Computer Setup

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

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

Starting Computer Setup

▲ Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

Using a USB keyboard or USB mouse to start Computer Setup (BIOS)

You can start Computer Setup by using a keyboard or mouse connected to a USB port, but you must first disable FastBoot.

1. Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.

2. Clear the check box for **Fast Boot**.

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

   – or –

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

   Your changes go into effect when the computer restarts.

Navigating and selecting in Computer Setup

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

- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.

- To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

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

- To exit Computer Setup menus without saving your changes:

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

  – or –

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

- To save your changes and exit Computer Setup menus:

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

  – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

1. Start Computer Setup. See .

2. Select **Main**, and then select **Apply Factory Defaults and Exit**.

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

3. Follow the on-screen instructions.

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

   – or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

Updated versions of the BIOS may be available on the HP website.

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

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

Determining the BIOS version

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

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

1. Start Computer Setup. See Starting Computer Setup on page 54.

2. Select **Main**, and then select **System Information**.

3. To exit Computer Setup without saving your changes, select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

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

   To check for later BIOS versions, see Downloading a BIOS update on page 56.

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

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

   – or –

   Select the question mark icon in the taskbar.

2. Select **Updates**, and then select **Check for updates and messages**.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

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

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

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

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

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

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

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

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

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

   The BIOS installation begins.

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

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

Changing the boot order using the f9 prompt

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

1. Access the Boot Device Options menu:

    - Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.

2. Select a boot device, press enter, and then follow the on-screen instructions.

TPM BIOS settings (select products only)

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

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

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

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Starting Computer Setup on page 54.

2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

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

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

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

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 58.

    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	**31.7 cm**	12.5 in
Depth	**21.9 cm**	8.6 in
Height	**1.5 cm**	0.6 in
Weight	**1.4 kg**	3.06 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 61. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 62.

- 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 63.

  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 .

- 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 .

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 63. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 61.

- 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 63.

- 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 66.

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 61.

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 61.

- 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 61.

- 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 65.

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 61.

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 Statement of memory volatility

The purpose of this chapter is to provide general information regarding nonvolatile memory in HP Business PCs. This chapter also provides general instructions for restoring nonvolatile memory that can contain personal data after the system has been powered off and the hard drive has been removed.

HP Business PC products that use Intel®-based or AMD®-based system boards contain volatile DDR memory. The amount of nonvolatile memory present in the system depends upon the system configuration. Intel-based and AMD-based system boards contain nonvolatile memory subcomponents as originally shipped from HP, assuming that no subsequent modifications have been made to the system and assuming that no applications, features, or functionality have been added to or installed on the system.

Following system shutdown and removal of all power sources from an HP Business PC system, personal data can remain on volatile system memory (DIMMs) for a finite period of time and will also remain in nonvolatile memory. Use the steps below to remove personal data from the PC, including the nonvolatile memory found in Intel-based and AMD-based system boards.

1. Follow steps (a) through (j) below to restore the nonvolatile memory that can contain personal data. Restoring or reprogramming nonvolatile memory that does not store personal data is neither necessary nor recommended.

    a. **ERROR! Target for reference type variable.varref, ID was not found! ERROR!**

    NOTE: If the system has a BIOS administrator password, enter the password at the prompt.

    b. Select **Main**, select **Restore Defaults**, and then select **Yes** to load defaults.

    c. Select the **Security** menu, select **Restore Security Level Defaults**, and then select **Yes** to restore security level defaults.

    d. If an asset or ownership tag is set, select the **Security** menu and scroll down to the **Utilities** menu. Select **System IDs**, and then select **Asset Tracking Number**. Clear the tag, and then make the selection to return to the prior menu.

    e. If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Tools** under the **Utilities** menu. Select **Hard Drive Tools**, select **DriveLock**, then clear the check box for **DriveLock password on restart**. Select **OK** to proceed.

    f. If an Automatic DriveLock password is set, select the **Security** menu, scroll down to **Hard Drive Tools** under the **Utilities** menu. Select **Hard Drive Tools**, scroll down to **Automatic DriveLock**, then select the desired hard drive and disable protection. At the automatic drive lock warning screen, select **Yes** to continue. Repeat this procedure if more than one hard drive has an Automatic DriveLock password.

    g. Select the **Main** menu, and then select **Reset BIOS Security to factory default**. Click **Yes** at the warning message.

    h. Select the **Main** menu, select **Save Changes and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.

i.   Reboot the system. If the system has a Trusted Platform Module (TPM) and/or fingerprint reader, one or two prompts will appear—one to clear the TPM and the other to Reset Fingerprint Sensor; press or tap F1 to accept or F2 to reject.

j.   Remove all power and system batteries for at least 24 hours.

2.   Complete one of the following:

●   Remove and retain the storage drive.

– or –

●   Clear the drive contents by using a third-party utility designed to erase data from an SSD.

– or –

●   Clear the contents of the drive by using the following BIOS Setup Secure Erase command option steps:

📝 **IMPORTANT:**   If you clear data using Secure Erase, it cannot be recovered.

a.   **ERROR! Target for reference type variable.varref, ID was not found! ERROR!**

b.   Select the **Security** menu and scroll down to the **Utilities** menu.

c.   Select **Hard Drive Tools**.

d.   Under **Utilities**, select **Secure Erase**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

– or –

●   Clear the contents of the drive by using the following Disk Sanitizer command steps:

📝 **IMPORTANT:**   If you clear data using Disk Sanitizer, it cannot be recovered.

📝 **NOTE:**   The amount of time it takes for Disk Sanitizer to run can take several hours. Plug the computer into an AC outlet before starting.

a.   **ERROR! Target for reference type variable.varref, ID was not found! ERROR!**

b.   Select the **Security** menu and scroll down to the **Utilities** menu.

c.   Select **Hard Drive Tools**.

d.   Under **Utilities**, select **Disk Sanitizer**, select the hard drive storing the data you want to clear, and then follow the on-screen instructions to continue.

Nonvolatile memory usage

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	2 MBytes	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical PC configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select models only) on page 72.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 Bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using the Computer Setup (BIOS), or changing the Microsoft Windows date and time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KBytes (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility is required to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory board, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory board information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the board is installed in a PC. The specific write-protection method varies by memory vendor.
System BIOS	4 MBytes to 5 MBytes	Yes	Yes	Stores system BIOS code and PC configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are input using the Computer Setup (BIOS) or a custom utility.	**NOTE:** Writing data to this ROM in an inappropriate manner can render the PC non-functional. A utility is required for writing data to this memory and is available on the HP website; go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then

Nonvolatile memory type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
						follow the on-screen instructions.
Intel Management Engine Firmware (present in only specific ZBook and EliteBook models. For more information, go to http://www.hp.com/support, and select your country. Select **Drivers & Downloads**, and then follow the on-screen instructions.)	1.5 MBytes or 5 MBytes	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third-party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	The Intel chipset is configured to enforce hardware protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash	2 Mbit	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility is required for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 Kbit to 8 Kbit	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility is required for writing data to this memory and is usually not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Web camera	64 Kbit	No	Yes	Stores webcam configuration and firmware.	Webcam memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility is required for writing data to this memory and is usually not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader	512 KByte flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

1. **How can the BIOS settings be restored (returned to factory settings)?**

   📝 **IMPORTANT:** Restore defaults does not securely erase any data on your hard drive. See question and answer 6 for steps to securely erase data.

   Restore defaults does not reset the Custom Secure Boot keys. See question and answer 7 for information about resetting the keys.

   a. ERROR! Target for reference type variable.varref, ID was not found! ERROR!

   b. Select **Main**, and then select **Restore defaults**.

   c. Follow the on-screen instructions.

   d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

2. **What is a UEFI BIOS, and how is it different from a legacy BIOS?**

   The Unified Extensible Firmware Interface (UEFI) BIOS is an industry-standard software interface between the platform firmware and an operating system (OS). It is a replacement for the older BIOS architecture, but supports much of the legacy BIOS functionality.

   Like the legacy BIOS, the UEFI BIOS provides an interface to display the system information and configuration settings and to change the configuration of your computer before an OS is loaded. BIOS provides a secure run-time environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (Touchscreen, TouchPad, pointing stick, or USB mouse) or the keyboard to navigate and make menu and configuration selections. The UEFI BIOS also contains basic system diagnostics.

   The UEFI BIOS provides functionality beyond that of the legacy BIOS. In addition, the UEFI BIOS works to initialize the computer's hardware before loading and executing the OS; the run-time environment allows the loading and execution of software programs from storage devices to provide more functionality, such as advanced hardware diagnostics (with the ability to display more detailed system information) and advanced firmware management and recovery software.

   HP has provided options in Computer Setup (BIOS) to allow you to run in legacy BIOS, if required by the operating system. Examples of this requirement would be if you upgrade or downgrade the OS.

3. **Where does the UEFI BIOS reside?**

   The UEFI BIOS resides on a flash memory chip. A utility is required to write to the chip.

4. **What kind of configuration data is stored on the DIMM Serial Presence Detect (SPD) memory board? How would this data be written?**

   The DIMM SPD memory contains information about the memory board, such as size, serial number, data width, speed/timing, voltage, and thermal information. This information is written by the board manufacturer and stored on an EEPROM. This EEPROM cannot be written to when the memory board is installed in a PC. Third-party tools do exist that can write to the EEPROM when the memory board is not installed in a PC. Various third-party tools are available to read SPD memory.

5. **What is meant by "Restore the nonvolatile memory found in Intel-based system boards"?**

   This message relates to clearing the Real Time Clock (RTC) CMOS memory that contains PC configuration data.

6. **How can the BIOS security be reset to factory defaults and data erased?**

> **IMPORTANT:** Resetting will result in the loss of information.

These steps will not reset Custom Secure Boot Keys. See question and answer 7 for information about resetting the keys.

a. **ERROR! Target for reference type variable.varref, ID was not found! ERROR!**

b. Select **Main**, and then select **Reset BIOS Security to Factory Default**.

c. Follow the on-screen instructions.

d. Select **Main**, select **Save Changes and Exit**, and then follow the on-screen instructions.

7. **How can the Custom Secure Boot Keys be reset?**

Secure Boot is a feature to ensure that only authenticated code can start on a platform. If you enabled Secure Boot and created Custom Secure Boot Keys, simply disabling Secure Boot will not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure you used to create the Custom Secure Boot Keys, but make the selection to clear or delete all Secure Boot Keys.

a. **ERROR! Target for reference type variable.varref, ID was not found! ERROR!**

b. Select the **Security** menu, select **Secure Boot Configuration**, and then follow the on-screen instructions.

c. At the **Secure Boot Configuration** window, select **Secure Boot**, select **Clear Secure Boot Keys**, and then follow the on-screen instructions to continue.

Using HP Sure Start (select models only)

Select computer models are configured with HP Sure Start, a technology that continuously monitors your computer's BIOS for attacks or corruption. If the BIOS becomes corrupted or is attacked, HP Sure Start restores the BIOS to its previously safe state, without user intervention. Those select computer models ship with HP Sure Start configured and enabled. HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. The default configuration can be customized by advanced users.

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

11 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).

- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.

- The power cord sets must have a minimum current capacity of 10 amps and a nominal voltage rating of 125 or 250 V AC, as required by the power system of each country or region.

- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer. Requirements for 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.

12 Recycling

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

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

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