Maintenance and Service Guide

HP EliteBook x360 1040 G6 Notebook PC

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Product notice

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

Not all features are available in all editions or versions of Windows. Systems may require upgraded and/or separately purchased hardware, drivers, software or BIOS update to take full advantage of Windows functionality. Windows 10 is automatically updated, which is always enabled. ISP fees may apply and additional requirements may apply over time for updates. Go to http://www.microsoft.com for details.

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For any further information or to request a full refund of the price of the computer, please contact your seller.

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 applicable safety standards.

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1 Product description

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP EliteBook x360 1040 G6 Notebook PC
Processors	• Intel® Core™ i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W) • Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W) • Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W) • Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W)
Graphics	**Internal graphics:** Intel ultrahigh-definition (UHD) Graphics 620 and Intel high-definition (HD) Graphics 620
Panel	• 14.0 inch, ultrahigh-definition (UHD) (3840×2160), brightview, liquid crystal diode (LCD), white light-emitting diode (WLED), UWVA, 72, 500 nits, eDP+PSR, ultraslim touch screen display assembly • 14.0 inch, full high-definition (FHD) (1920×1080), antiglare, WLED, UWVA, 72, 950 nits, eDP+PSR, ultraslim touch screen display assembly with privacy filter • 14.0 inch, FHD (1920×1080), brightview, WLED, UWVA, 72, 950 nits, eDP+PSR, ultraslim touch screen display assembly with privacy filter • 14.0 inch, FHD (1920×1080), antiglare, WLED, UWVA, 72, 400 nits, eDP+PSR, ultraslim touch screen display assembly • 14.0 inch, FHD (1920×1080), brightview, WLED, UWVA, 72, 400 nits, eDP+PSR, ultraslim touch screen display assembly
Memory	Support for DDR4-2400, 1.2 V system memory Support for up to 32 GB of system memory in the following configurations: • 32768 MB (32 GB) • 16384 MB (16 GB) • 8192 MB (8 GB)
Storage	**Support for the following solid-state drives:** • 2 TB, Peripheral Component Interconnect Express (PCIe), Non-Volatile Memory Express (NVMe), solid-state drive with triple level cell (TLC) • 1 TB, PCIe, NVMe, solid-state drive with TLC • 512 GB, PCIe, NVMe, SED solid-state drive with TLC and OPAL2 • 256 GB, PCIe, NVMe, solid-state drive with TLC • 256 GB, M.2, SATA-3, PCIe, NVMe, SED solid-state drive with TLC and OPAL2 • 256 GB, PCIe, NVMe, value solid-state drive • 128 GB, M.2, SATA-3 solid-state drive with TLC
Audio and video	**Camera:** HP FHD 1080p infrared camera

Table 1-1 Product components and their descriptions (continued)

Category	Description
Audio and video *(continued)*	**Microphones:** Dual-array microphone
Wireless	**Near-field communcations (NFC) options:** NFC module attaches to keyboard/top cover Single antenna built into touchpad Support for the Mirage WNC XRAV-1 NFC module with 1 antenna Support for Out-of-Band Manageability and AMT enabled **Wireless local area network (WLAN) options:** WLAN module integrated onto the system board Dual PCIe WLAN antennas built into display assembly Support for the Intel 8265 ac 2×2 +Bluetooth® 4.2 M.2 non-vPro PCI-e+USB WW WLAN module with 2 antennas **Wireless wid area network (WWAN) options:** WWAN module slot built onto the system board Dual PCIe WWAN antennas built into display assembly Support for the HP IT4210 LTE/HSPA+ M.2 WWAN module with GPS and Intel XMM™ 7360 LTE Advanced M.2 WWAN module with GPS WWAN modules
Power requirements	Support for a 4 cell, 56 Wh, 3.75 Ah, Li-Ion battery Support for 65 W (non-PFC, slim, USB Type-C, straight, 1.8 m) and 65 W (non-PFC, USB Type-C, RC, 1.8 m) AC adapters Support for a 1.00 m, FDH, Prime, Sticker power cord with a C5 connector in 15 countries and regions Support for a 1.00 m, FX, Prime, Sticker power cord with a C5 connector in Japan
Operating system	• Windows 10 Enterprise 64-bit • Windows 10 Enterprise 64-bit LTSC • Windows 10 Home 64-bit Advanced • Windows 10 Home 64-bit Advanced Single Language • Windows 10 Home 64-bit High-End Chinese Market CPPP • Windows 10 Home 64-bit Plus • Windows 10 Home 64-bit Plus Single Language • Windows 10 Home 64-bit Plus Single Language APAC EM PPP • Windows 10 Home 64-bit Plus Single Language India Market PPP • Windows 10 Home 64-bit Plus Single Language Indonesia Market PPP • Windows 10 Professional 64-bit • Windows 10 Professional 64-bit CBB • Windows 10 Professional 64-bit Chinese Market • Windows 10 Professional 64-bit StF MSNA Plus • FreeDOS 3.0

2 External component identification

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

NOTE: Actual computer color, features, feature locations, and icon labels may vary from images depicted.

Locating hardware

To find out what hardware is installed on the computer:

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

  A list displays all the devices installed on the computer.

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

Locating software

To find out what software is installed on the computer:

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

Right side

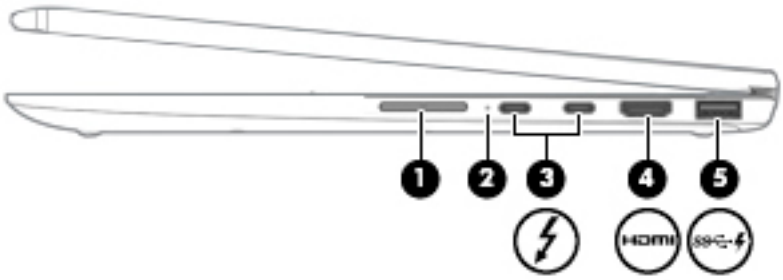


Table 2-1 Right-side components and their descriptions

Component		Description
(1)	Volume button	Controls speaker volume on the computer.
(2)	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. • Off: The battery is not charging.
(3)	USB Type-C power connector and Thunderbolt™ ports with HP Sleep and Charge (2)	Connect AC adapters that have a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Even when the computer is off, connect and charge most USB devices that have a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer. – and – Connect display devices that have a USB Type-C connector, providing DisplayPort™ output. NOTE: The computer may also support a Thunderbolt docking station. NOTE: Cables and/or adapters (purchased separately) may be required.
(4)	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.
(5)	USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.

Left side

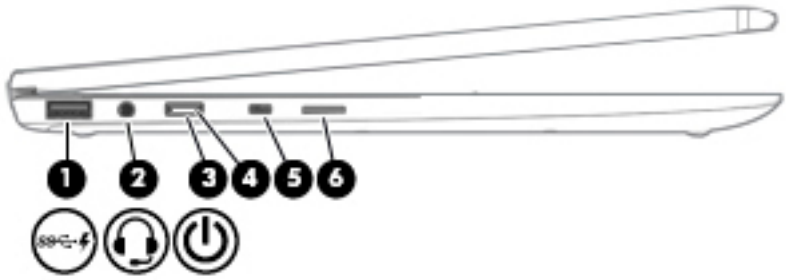


Table 2-2 Left-side components and their descriptions

Component		Description
(1)	USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(2)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**. NOTE: When a device is connected to the jack, the computer speakers are disabled.
(3)	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 (select products only). • When the computer is in Hibernation, press the button briefly to exit Hibernation. IMPORTANT: Pressing and holding down the power button results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.
(4)	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.

Table 2-2 Left-side components and their descriptions (continued)

Component		Description
(5)	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.
(6)	Nano SIM card slot (select products only)	Supports a wireless subscriber identity module (SIM) card.

Display

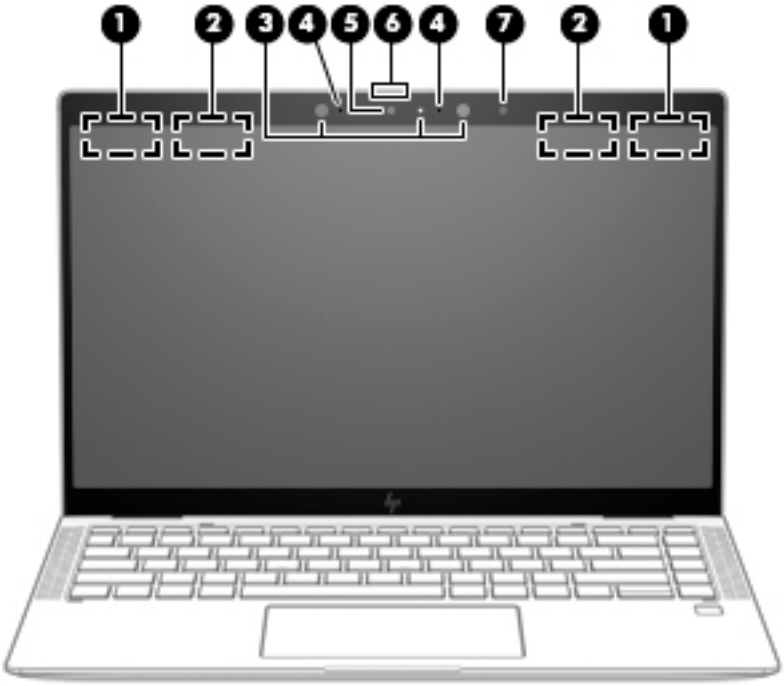


Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with WLANs.
(2)	WWAN antennas* (select products only)	Send and receive wireless signals to communicate with WWANs.
(3)	Camera light(s)	On: One or more cameras are in use.
(4)	Internal microphones (2)	Record sound.
(5)	Camera(s)	Allow(s) you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(6)	Camera privacy cover	When closed, the camera privacy cover conceals the camera. • To reveal the camera, slide the cover to the left. • To conceal the camera, slide the cover to the right.
(7)	Ambient light sensor	Adjusts the brightness of the display, depending on the ambient light.

*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:

▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.

Keyboard area

Touchpad

Touchpad settings

To adjust touchpad settings and gestures, or to turn off the touchpad:

1. Type `touchpad settings` in the taskbar search box, and then press enter.
2. Choose a setting.

To turn on the touchpad:

1. Type `touchpad settings` in the taskbar search box, and then press enter.
2. Using an external mouse, click the **Touchpad** button.

– or –

- Press the Tab key repeatedly until the pointer rests on the **Touchpad** button. Then press the spacebar to select the button.

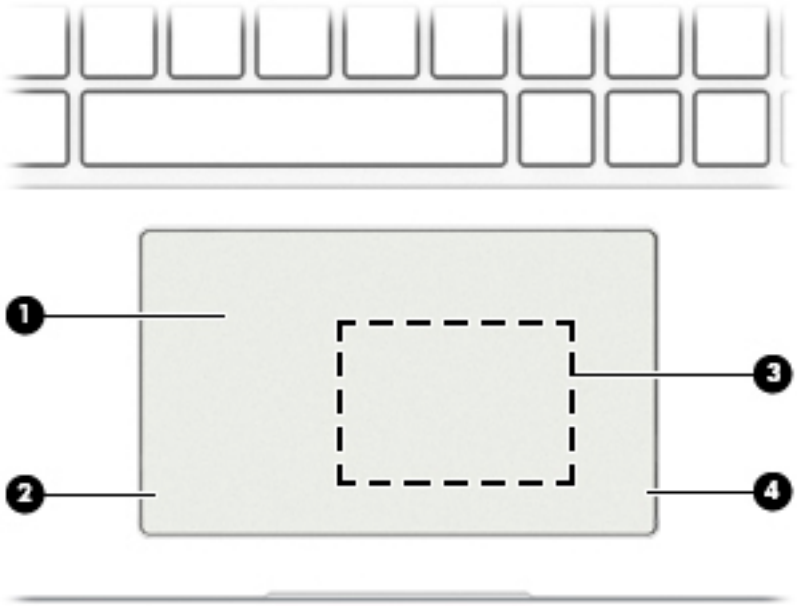


Table 2-4 Touchpad components and their descriptions

Component		Description
(1)	Touchpad zone	Reads finger gestures to move the pointer or activate items on the screen.
(2)	Left touchpad button	Functions like the left button on an external mouse.
(3)	NFC tapping area and antenna* (select products only)	Allows information to be shared wirelessly when this area is tapped with an NFC-enabled device.
(4)	Right touchpad button	Functions like the right button on an external mouse.

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

Table 2-4 Touchpad components and their descriptions (continued)

Component	Description
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: ▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**.	

Lights

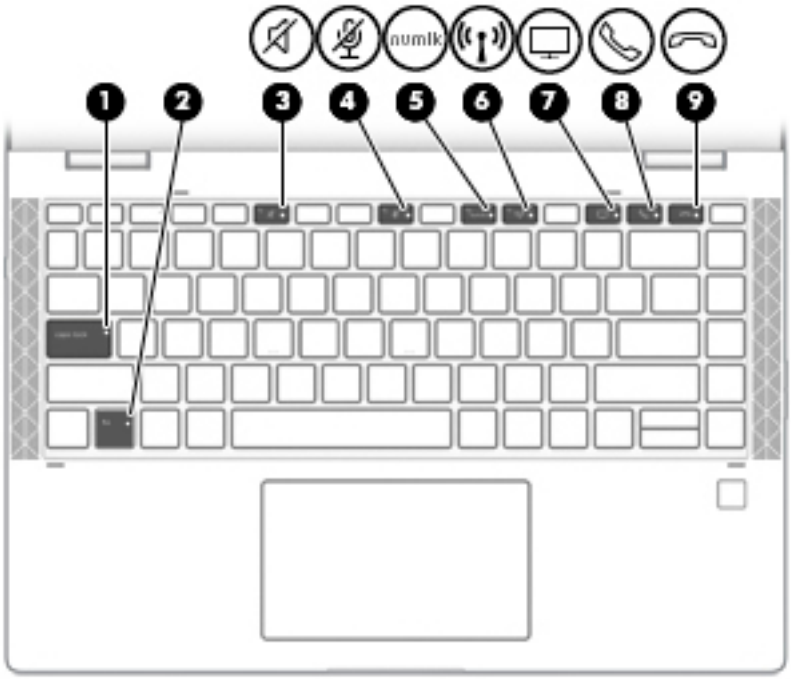


Table 2-5 Light components and their descriptions

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)		Mute light	• On: Computer sound is off. • Off: Computer sound is on.
(4)		Microphone mute light	• On: Microphone is off. • Off: Microphone is on.
(5)	num lk	Num lk light	On: Num lock is on.
(6)		Wireless light	On: An integrated wireless device, such as a WLAN device and/or a Bluetooth device, is on. NOTE: On some models, the wireless light is amber when all wireless devices are off.
(7)		Sharing or presenting light	On: Sharing is on.
(8)		Call answer light	On: Call answer is on.
(9)		Call end light	On: Call end is on.

Speaker and fingerprint

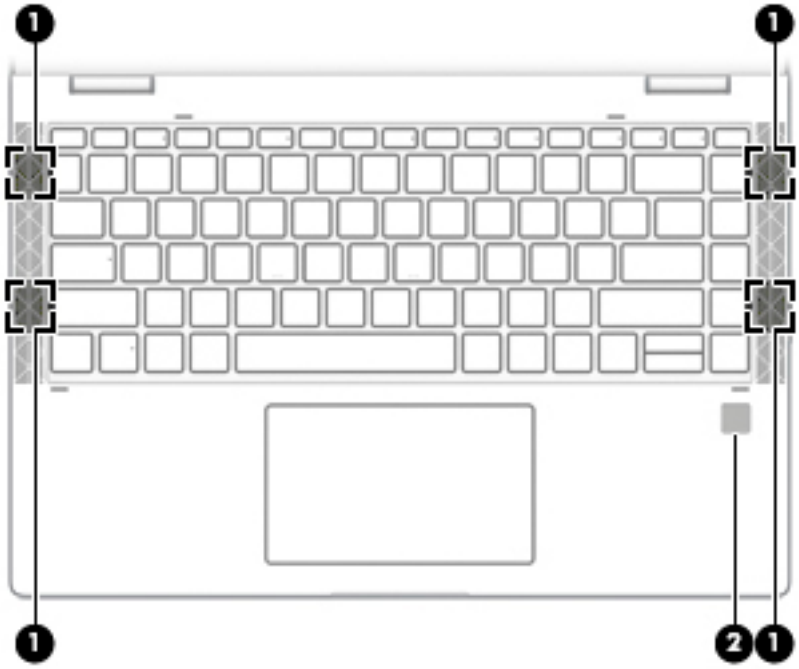


Table 2-6 Speaker and fingerprint components and their descriptions

Component		Description
(1)	Speakers	Produce sound.
(2)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon. ▲ Touch your finger to the fingerprint reader. IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.

Special keys

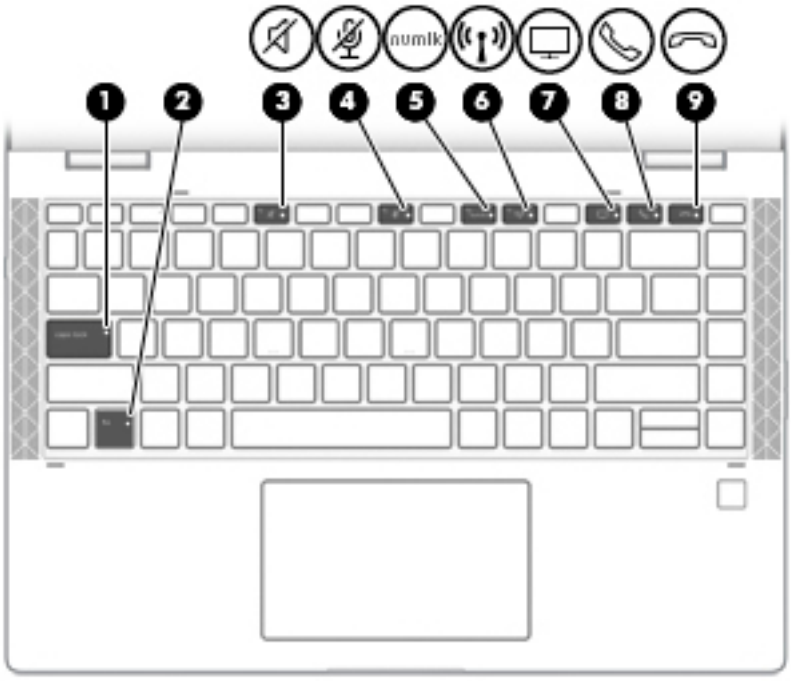


Table 2-7 Special key components and their descriptions

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 another key. Such 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)	Action keys	Execute frequently used system functions.
(5)	Embedded numeric keypad	A numeric keypad superimposed over the keyboard alphabet keys. When fn+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)	Windows application key	Displays options for a selected object.
(7)	num lk key	Turns the embedded numeric keypad on and off.

Bottom

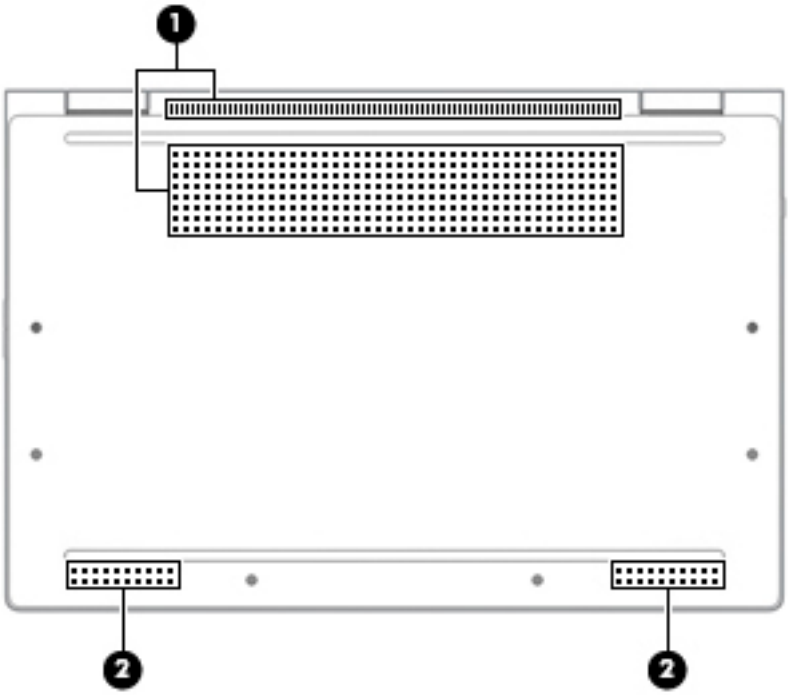


Table 2-8 Bottom components and their descriptions

Component		Description
(1)	Vents (2)	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.
(2)	Speakers (2)	Produce sound.

Labels

The labels affixed to the computer provide information you may need when you troubleshoot system problems or travel internationally with the computer. Labels may be in paper form or imprinted on the product.

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

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

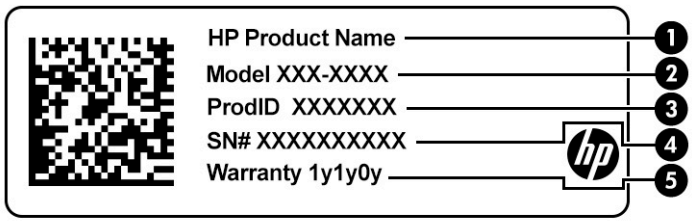


Table 2-9 Service label components

Item	Component
(1)	HP product name
(2)	Model number
(3)	Product ID
(4)	Serial number
(5)	Warranty period

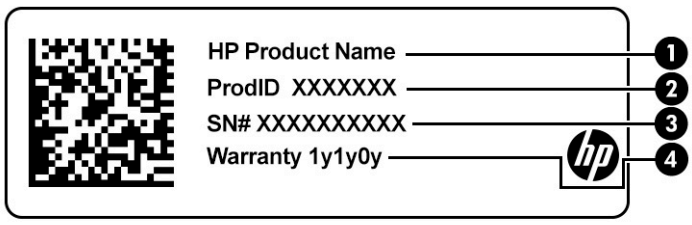


Table 2-10 Service label components

Item	Component
(1)	HP product name
(2)	Product ID

Table 2-10 Service label components (continued)

Item	Component
(3)	Serial number
(4)	Warranty period

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

3 Illustrated parts catalog

Computer major components

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

NOTE: Details about the computer, including model number, serial number, product identification, and length of warranty, are on the service tag at the bottom of the computer. See Labels on page 14 for details.

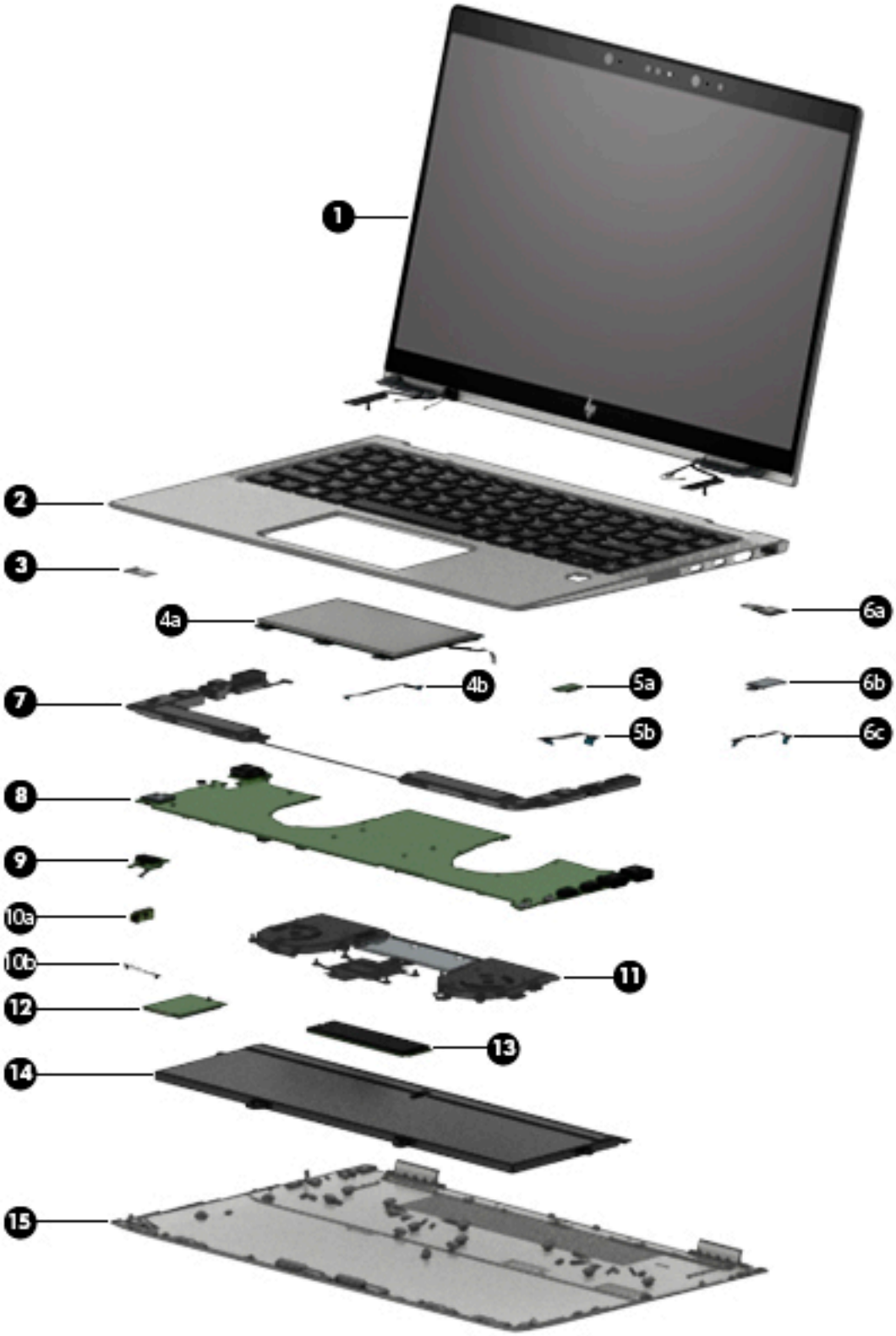

1
2
3
4a
4b
5a
5b
6a
6b
6c
7
8
9
10a
10b
11
12
13
14
15

Table 3-1 Computer components and spare part information

Item	Component	Spare part number
(1)	**14.0 inch touch screen, LCD, WLED, UWVA, 72, eDP+PSR, ultraslim display assembly:**	
	UHD (3840×2160), brightview, 550 nits display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62993-001
	FHD (1920×1080), antiglare, 950 nits display assembly with privacy filter for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62989-001
	FHD (1920×1080), antiglare, 950 nits display assembly with privacy filter for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62992-001
	FHD (1920×1080), antiglare, 400 nits low power display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62988-001
	FHD (1920×1080), antiglare, 400 nits low power display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62987-001
	FHD (1920×1080), antiglare display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62984-001
	FHD (1920×1080), antiglare display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62983-001
	FHD (1920×1080), brightview, 950 nits display assembly with privacy filter for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62991-001
	FHD (1920×1080), brightview, 950 nits display assembly with privacy filter for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62990-001
	FHD (1920×1080), brightview, 400 nits low power display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62986-001
	FHD (1920×1080), brightview, 400 nits low power display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62985-001
	FHD (1920×1080), brightview display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62982-001
	FHD (1920×1080), brightview display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62981-001
(2)	**Keyboard/top cover** with backlight and privacy filter (includes backlight cable and keyboard cable):	
	For use in Belgium	L66882-A41
	For use in Brazil	L66882-201
	For use in Bulgaria	L66882-261
	For use in Canada	L66882-DB1
	For use in the Czech Republic and Slovakia	L66882-FL1
	For use in Denmark	L66882-081

Table 3-1 Computer components and spare part information (continued)

Item	Component	Spare part number
	For use in Denmark, Finland, and Norway	L66882-DH1
	For use in France	L66882-051
	For use in Germany	L66882-041
	For use in Greece	L66882-151
	For use in Hungary	L66882-211
	For use in Iceland	L66882-DD1
	For use in India	L66882-D61
	For use in Israel	L66882-BB1
	For use in Italy	L66882-061
	For use in Japan	L66882-291
	For use in Latin America	L66882-161
	For use in the Netherlands	L66882-B31
	For use in Northwest Africa	L66882-FP1
	For use in Norway	L66882-091
	For use in Portugal	L66882-B31
	For use in Romania	L66882-271
	For use in Russia	L66882-251
	For use in Saudi Arabia	L66882-171
	For use in Slovenia	L66882-BA1
	For use in South Korea	L66882-AD1
	For use in Spain	L66882-071
	For use in Sweden and Finland	L66882-B71
	For use in Switzerland	L66882-BG1
	For use in Taiwan	L66882-AB1
	For use in Thailand	L66882-281
	For use in Turkey	L66882-141
	For use in Turkey-F	L66882-541
	For use in the United Kingdom	L66882-031
	For use in the United States	L66882-001
	Keyboard/top cover with backlight (includes backlight cable and keyboard cable):	
	For use in Belgium	L66881-A41
	For use in Brazil	L66881-201
	For use in Bulgaria	L66881-261

Table 3-1 Computer components and spare part information (continued)

Item	Component	Spare part number
	For use in Canada	L66881-DB1
	For use in the Czech Republic and Slovakia	L66881-FL1
	For use in Denmark	L66881-081
	For use in Denmark, Finland, and Norway	L66881-DH1
	For use in France	L66881-051
	For use in Germany	L66881-041
	For use in Greece	L66881-151
	For use in Hungary	L66881-211
	For use in Iceland	L66881-DD1
	For use in India	L66881-D61
	For use in Israel	L66881-BB1
	For use in Italy	L66881-061
	For use in Japan	L66881-291
	For use in Latin America	L66881-161
	For use in the Netherlands	L66881-B31
	For use in Northwest Africa	L66881-FP1
	For use in Norway	L66881-091
	For use in Portugal	L66881-B31
	For use in Romania	L66881-271
	For use in Russia	L66881-251
	For use in Saudi Arabia	L66881-171
	For use in Slovenia	L66881-BA1
	For use in South Korea	L66881-AD1
	For use in Spain	L66881-071
	For use in Sweden and Finland	L66881-B71
	For use in Switzerland	L66881-BG1
	For use in Taiwan	L66881-AB1
	For use in Thailand	L66881-281
	For use in Turkey	L66881-141
	For use in Turkey-F	L66881-541
	For use in the United Kingdom	L66881-031
	For use in the United States	L66881-001
(3)	**SIM slot bezel** (included in the Hardware Kit, spare part number L63022-001)	

Table 3-1 Computer components and spare part information (continued)

Item	Component	Spare part number
(4a)	**Touchpad** (includes rubber padding, does not include cable):	
	Equipped with NFC module antenna (includes adhesive)	L62975-001
	Not equipped with NFC module antenna	L62974-001
(4b)	**Touchpad cable** (included in the Cable Kit, spare part number L62980-001; includes adhesive)	
(5a)	**NFC module** (does not include cable; includes adhesive)	L41023-001
(5b)	**NFC module cable** (included in the Cable Kit, spare part number L62980-001; includes adhesive)	
(6a)	**Fingerprint reader module** (does not include bracket or cable)	L62996-001
(6b)	**Fingerprint reader module bracket** (included in the Hardware Kit, spare part number L63022-001)	
(6c)	**Fingerprint reader module cable** (included in the Cable Kit, spare part number L62980-001; includes adhesive)	
(7)	**Speaker Kit** (includes left and right speakers, cables, and rubber isolators)	L62976-001
(8)	**System board** (includes processor and replacement thermal material):	
	Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 32 GB of system memory, and the Windows 10 and OSR operating systems	L63010-601
	Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 32 GB of system memory, and the OSR operating system	L63010-001
	Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L63009-601
	Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows operating system	L63009-001
	Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63008-601
	Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and a non-Windows operating system	L63008-001
	Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 32 GB of system memory, and the Windows 10 and OSR operating systems	L70102-601
	Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 32 GB of system memory, and the OSR operating system	L70102-001
	Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L63007-601
	Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows operating system	L63007-001

Table 3-1 Computer components and spare part information (continued)

Item	Component	Spare part number
	Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63003-601
	Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and a non-Windows operating system	L63003-001
	Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L63000-601
	Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows 10 operating system	L63000-001
	Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 and OSR operating systems	L70103-601
	Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the OSR operating system	L70103-001
	Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63001-601
	Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63001-001
	Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L62998-601
	Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows 10 operating system	L62998-001
	Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63006-601
	Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and a non-Windows 10 operating system	L63006-001
(9)	**Power button board** (includes cable and spacer)	L62997-001
(10a)	**Audio jack board** (includes cable)	L63023-001
(10b)	**Audio jack board cable** (included in the audio jack board spare part kit, spare part number L63023-001)	
(11)	**Fan/heat sink assembly** (includes fan cables and replacement thermal material)	L62995-001
(12)	**WWAN module:**	
	HP IT4210 LTE/HSPA+ M.2 WWAN module with GPS	L15398-006
	Intel XMM 7360 LTE Advanced M.2 WWAN module with GPS	L27188-005
(13)	**Solid-state drive:**	

Table 3-1 Computer components and spare part information (continued)

Item	Component	Spare part number
	2 TB, PCIe, NVMe solid-state drive with TLC	L63021-001
	1 TB, PCIe, NVMe solid-state drive with TLC	L63020-001
	512 GB, PCIe, NVMe solid-state drive with TLC	L63017-001
	512 GB, PCIe, NVMe, value solid-state drive	L63018-001
	512 GB, PCIe, NVMe, SED solid-state drive with TLC and OPAL2	L63016-001
	512 GB, PCIe, NVMe solid-state drive with 32 GB 3D XP	L63019-001
	256 GB, PCIe, NVMe solid-state drive with TLC	L63013-001
	256 GB, PCIe, NVMe, value solid-state drive	L63015-001
	256 GB, M.2 SATA-3, SED solid-state drive with TLC and OPAL2	L63014-001
	128 GB, M.2 SATA-3 solid-state drive with TLC	L63012-001
(14)	**Battery** (4 cell, 56 Wh, 3.75 Ah, Li-Ion; includes cable)	L07041-855
(15)	**Bottom cover** (includes magnets and front and rear rubber foot strips):	
	For use only on computer models equipped with WLAN capability	L62977-001
	For use only on computer models equipped with WWAN capability	L62978-001

Miscellaneous parts

Table 3-2 Miscellaneous components and spare part information

Component	Spare part number
AC adapter:	
65 W AC adapter (non-PFC, slim, USB Type-C, straight, 1.8 m)	L04650-850
65 W AC adapter (non-PFC, USB Type-C, RC, 1.8 m)	L32392-001
Cable Kit (includes fingerprint reader module cable, NFC module cable, and touchpad cable)	L62980-001
Duck head adapter:	
For use in Europe and South Korea	854703-001
For use in North America	L44792-001
For use in South Korea	L44793-001
For use in the United States	L854702-001
Hardware Kit (includes fingerprint reader module bracket, SIM slot bezel, speaker insulator, and acetate cloth tape)	L63022-001
Pen (Wacom AES 2.0 with application launch button)	L63024-001
Power cord (C5 connector, 1.00 m, FDH, Prime, Sticker):	
For use in Argentina	L36815-001
For use in Australia	L36816-001
For use in Brazil	L44789-001
For use in Denmark	L36817-001
For use in Europe	L36818-001
For use in India	L36820-001
For use in Israel	L36819-001
For use in Italy	L44788-001
For use in North America	L36822-001
For use in the People's Republic of China	L36823-001
For use in South Africa	L36824-001
For use in Switzerland	L36825-001
For use in Taiwan	L36827-001
For use in Thailand	L36826-001
For use in the United Kingdom	L36828-001
Power cord (C5 connector, 1.00 m, FX, Prime, Sticker) for use in Japan	L19347-001
Screw Kit	L62979-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Torx T5 screwdriver

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

IMPORTANT: Using excessive force during disassembly and reassembly can damage plastic parts.

Cables and connectors

IMPORTANT: 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

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

- Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
- Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.
- Before removing an optical drive, be sure that a disc is not in the drive and be sure that the optical drive tray is closed.
- Handle drives on surfaces covered with at least 2.54 cm (1 inch) of shock-proof foam.
- Avoid dropping drives from any height onto any surface.
- After removing a hard drive or an optical drive, place it in a static-proof bag.
- Avoid exposing an internal hard drive to products that have magnetic fields, such as monitors or speakers.
- Avoid exposing a drive to temperature extremes or liquids.
- If a drive must be mailed, place the drive in a bubble pack mailer or other suitable form of protective packaging and label the package “FRAGILE.”

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 polystyrene foam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Electrostatic discharge information

A sudden discharge of static electricity from your finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not appear to be affected at all and can work perfectly throughout a normal cycle. The device may function normally for a while, but it has been degraded in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

IMPORTANT: To prevent damage to the device 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.

Generating static electricity

Note the following:

- Different activities generate different amounts of static electricity.
- Static electricity increases as humidity decreases.

Table 4-1 Static electricity occurrence based on activity and humidity

	Relative humidity		
Event	**55%**	**40%**	**10%**
Walking across carpet	7,500 V	15,000 V	35,000 V
Walking across vinyl floor	3,000 V	5,000 V	12,000 V
Motions of bench worker	400 V	800 V	6,000 V
Removing DIPs from plastic tube	400 V	700 V	2,000 V
Removing DIPs from vinyl tray	2,000 V	4,000 V	11,500 V
Removing DIPs from polystyrene foam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 V
Electronic components can then be packaged together inside plastic tubes, trays, or polystyrene foam.			

NOTE: As little as 700 V can degrade a product.

Preventing electrostatic damage to equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following packaging and grounding precautions are necessary to prevent static electricity damage to electronic components.

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.
- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.

- Avoid contact with pins, leads, or circuitry.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Personal grounding methods and equipment

Use the following equipment to prevent static electricity damage to electronic components:

- **Wrist straps** are flexible straps with a maximum of 1 MΩ ±10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- **Heel straps/Toe straps/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 them on both feet with a maximum of 1 MΩ ±10% resistance between the operator and ground.

Table 4-2 **Static shielding protection levels**

Static shielding protection levels	
Method	**Voltage**
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

Grounding the work area

To prevent static damage at the work area, use the following precautions:

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and polystyrene foam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended materials and equipment

Materials and equipment that are recommended for use in preventing static electricity include:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of 1 MΩ ±10% resistance
- Static-dissipative table or floor mats with hard tie to ground

- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing 1 MΩ ±10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes

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.

5 Removal and replacement procedures

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

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

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

Component replacement procedures

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

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

There are as many as 49 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Bottom cover

NOTE: The bottom cover spare part kit includes magnets and front and rear rubber foot strips.

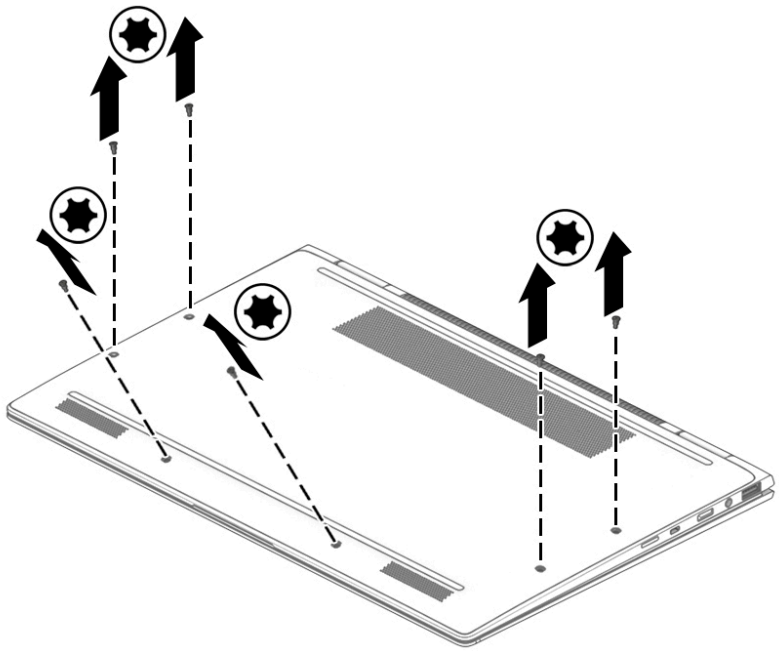
Description	Spare part number
For use only on computer models equipped with WLAN capability	L62977-001
For use only on computer models equipped with WWAN capability	L62978-001

Before disassembling the computer, follow these steps:

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

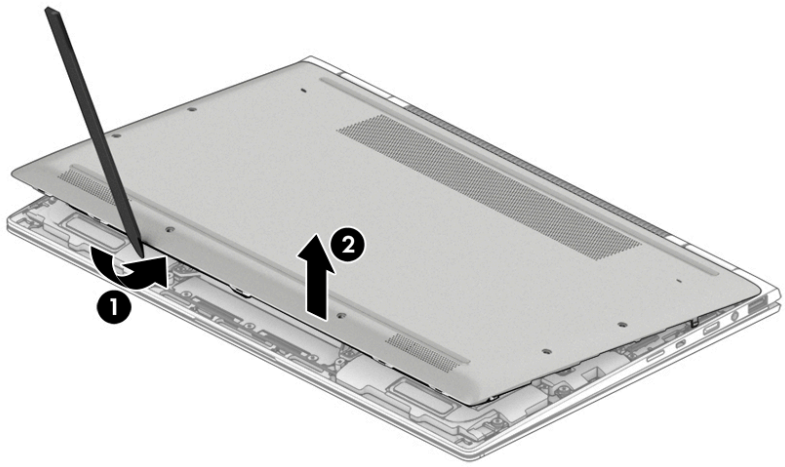
Remove the bottom cover:

1. Turn the computer upside down with the front toward you.
2. Remove the six Torx5 M2.0×5.0 screws that secure the bottom cover to the computer.



3. Use a case utility tool **(1)** or similar thin plastic tool to separate the front edge of the bottom cover from the keyboard/top cover.

4. Remove the bottom cover **(2)**.



Reverse this procedure to install the bottom cover.

Battery

Description	Spare part number
4 cell, 56 WHr, 3.75 AHr, Li-ion battery (includes cable)	L07041-855

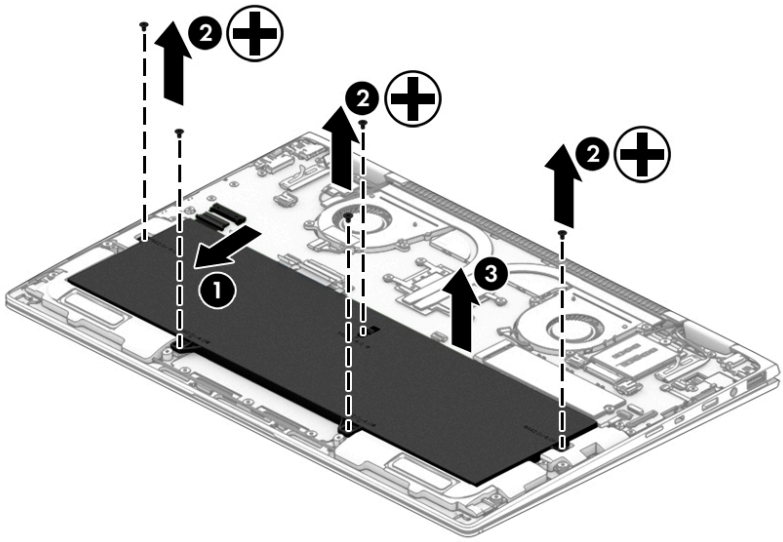
Before removing the battery, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).

Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.
2. Remove the five Phillips M2.0×4.2 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
2 TB, PCIe, NVMe solid-state drive with TLC	L63021-001
1 TB, PCIe, NVMe solid-state drive with TLC	L63020-001
512 GB, PCIe, NVMe solid-state drive with TLC	L63017-001
512 GB, PCIe, NVMe, value solid-state drive	L63018-001
512 GB, PCIe, NVMe, SED solid-state drive with TLC and OPAL2	L63016-001
512 GB, PCIe, NVMe solid-state drive with 32 GB 3D XP	L63019-001
256 GB, PCIe, NVMe solid-state drive with TLC	L63013-001
256 GB, PCIe, NVMe, value solid-state drive	L63015-001
256 GB, M.2 SATA-3, SED solid-state drive with TLC and OPAL2	L63014-001
128 GB, M.2 SATA-3 solid-state drive with TLC	L63012-001

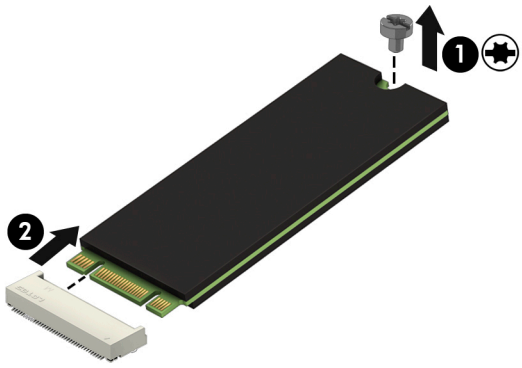
Before removing the solid-state drive, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Disconnect the battery cable from the system board (see Battery on page 32).

Remove the solid-state drive:

1. Remove the slotted Torx M2.0×2.4 screw **(1)** that secures the solid-state drive to the system board.
2. Remove the solid-state drive **(2)** by pulling it away from the connector.

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



Reverse this procedure to install the solid-state drive.

WWAN module

Description	Spare part number
HP IT4210 LTE/HSPA+ M.2 WWAN module with GPS	L15398-006
Intel XMM 7360 LTE Advanced M.2 WWAN module with GPS	L27188-005

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

Before removing the 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 31).
5. Disconnect the battery cable from the system board (see Battery on page 32).

Remove the WWAN module:

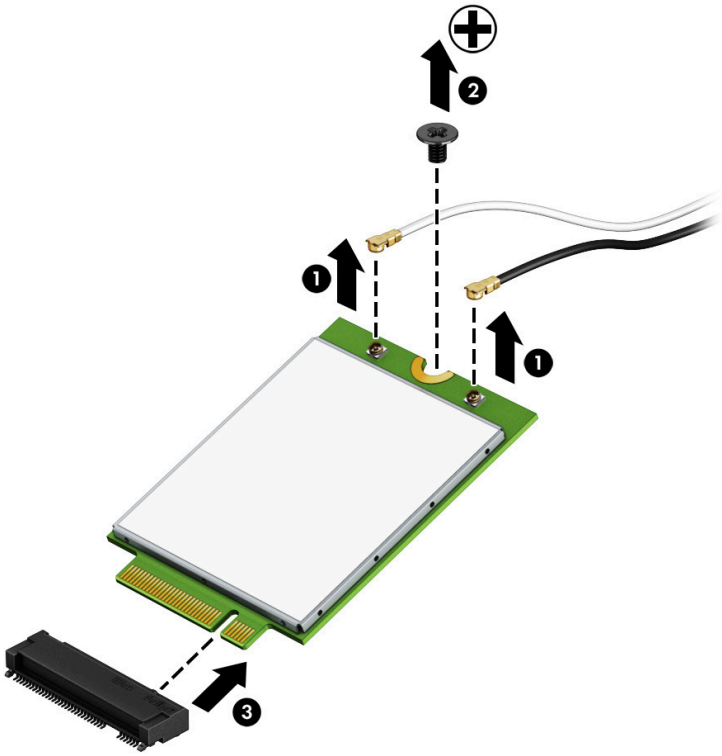
1. Disconnect the WWAN antenna cables **(1)** from the terminals on the WWAN module.

NOTE: The WWAN antenna cable labeled **5/MAIN** connects to the WWAN module **Main** terminal. The WWAN antenna cable labeled **6/AUX** connects to the WWAN module **Aux** terminal.

2. Remove the Phillips M2.0×2.4 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 module away from the slot at an angle.

NOTE: WWAN modules are designed with notches to prevent incorrect insertion.



Reverse this procedure to install the WWAN module.

Speakers

Description	Spare part number
Speaker Kit (includes left and right speakers, cables, and rubber isolators)	L62976-001

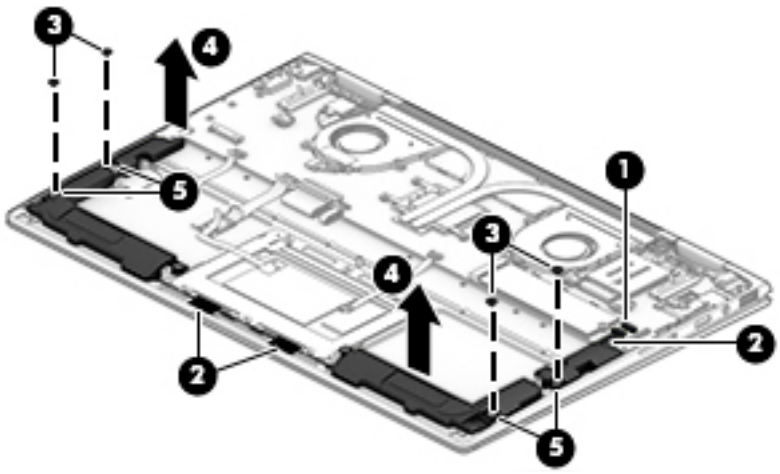
Before removing the speakers, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the system board.
2. Detach the speaker cable **(2)** from the keyboard/top cover. (The speaker cable is attached to the system board with tape.)
3. Remove the four Phillips M2.0×2.4 screws **(3)** that secure the speakers to the keyboard/top cover.
4. Remove the speakers **(4)**.

NOTE: When removing the speakers, make note of the location and condition of the four rubber isolators **(5)**. These isolators are critical to the performance of the speakers. The absence of these isolators or damage to them can degrade the speaker performance.



Reverse this procedure to install the speakers.

Fingerprint reader module cable

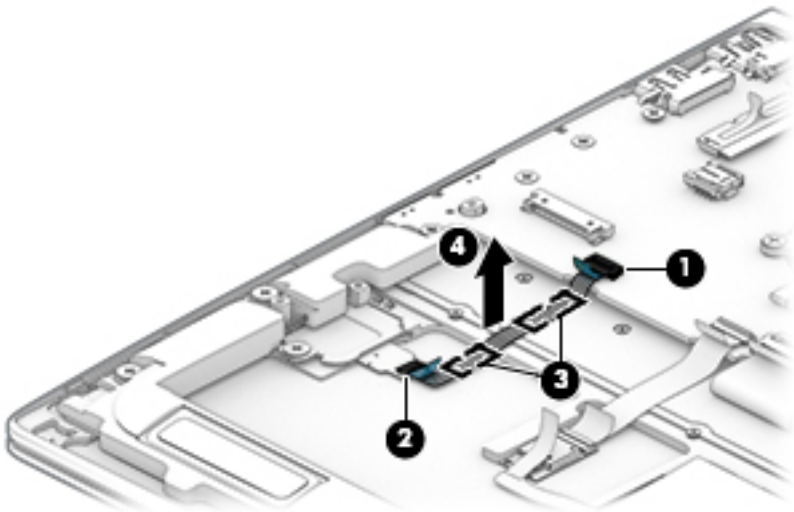
NOTE: The fingerprint reader module cable is included in the Cable Kit, spare part number L62980-001.

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

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).

Remove the fingerprint reader module cable:

1. Release the zero insertion force (ZIF) connector **(1)** to which fingerprint reader module cable is connected, and then disconnect the fingerprint reader module cable from the system board.
2. Release the ZIF connector **(2)** to which fingerprint reader module cable is connected, and then disconnect the fingerprint reader module cable from the fingerprint reader module.
3. Detach the fingerprint reader module cable **(3)** from the keyboard/top cover. (The fingerprint reader module cable is attached to the system board with adhesive.)
4. Remove the fingerprint reader module cable **(4)**.



Reverse this procedure to install the fingerprint reader module cable.

Fingerprint reader module

NOTE: The fingerprint reader module spare part kit does not include the fingerprint reader module cable. The fingerprint reader module cable is included in the Cable Kit, spare part number L62980-001.

Description	Spare part number
Fingerprint reader module	L62996-001

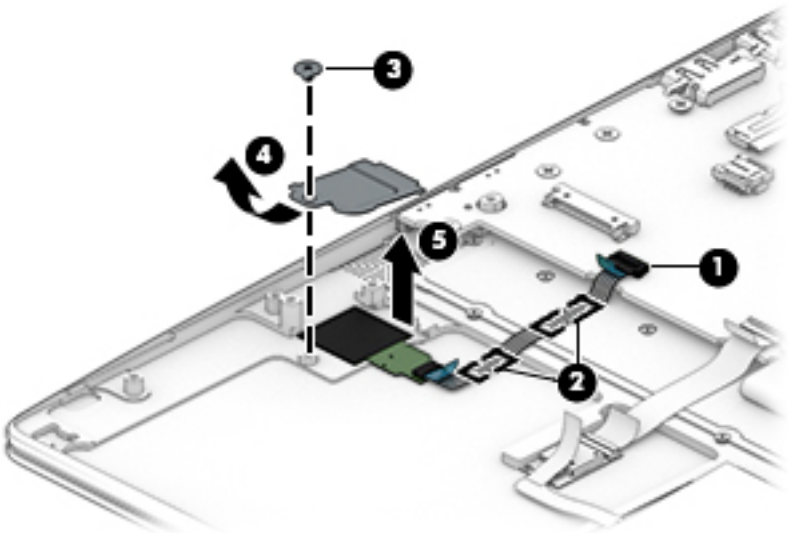
Before removing the fingerprint reader module, follow these steps:

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 31).
5. Remove the battery (see Battery on page 32).

Remove the fingerprint reader module:

1. Release the ZIF connector **(1)** to which the fingerprint reader module cable is connected, and then disconnect the fingerprint reader module cable from the system board.
2. Detach the fingerprint reader module cable **(2)** from the keyboard/top cover. (The fingerprint reader module cable is attached to the keyboard/top cover with adhesive.)
3. Remove the Phillips M2.0×2.4 screw **(3)** that secures the fingerprint reader module and bracket to the keyboard/top cover.
4. Remove the fingerprint reader module bracket **(4)**.

   The fingerprint reader module bracket is included in the Hardware Kit, spare part number L63022-001.
5. Remove the fingerprint reader module **(5)** and cable.



Reverse this procedure to install the fingerprint reader module.

NFC module cable

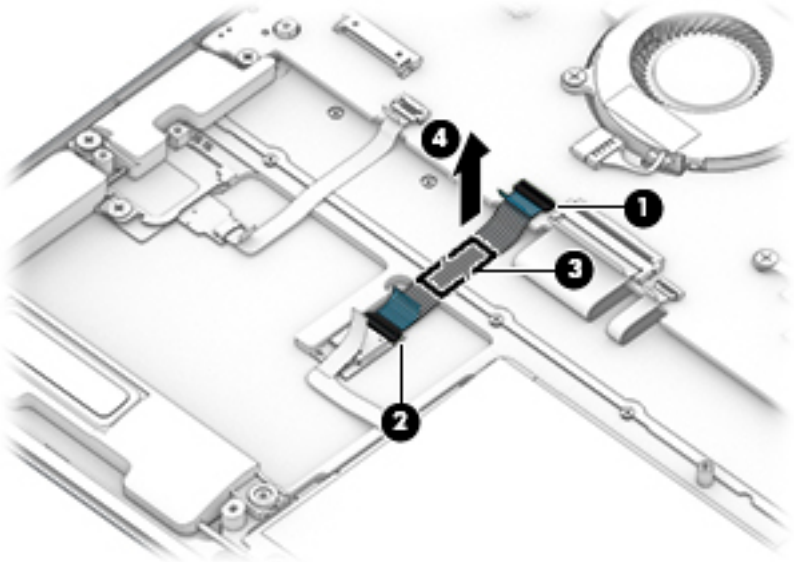
NOTE: The NFC module cable is included in the Cable Kit, spare part number L62980-001.

Before removing the NFC module cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).

Remove the NFC module cable:

1. Release the ZIF connector **(1)** to which NFC module cable is connected, and then disconnect the NFC module cable from the system board.
2. Release the ZIF connector **(2)** to which NFC module cable is connected, and then disconnect the NFC module cable from the NFC module.
3. Detach the NFC module cable **(3)** from the keyboard/top cover. (The NFC module cable is attached to the system board with adhesive.)
4. Remove the NFC module cable **(4)**.



Reverse this procedure to install the NFC module cable.

NFC module

NOTE: The NFC module spare part kit does not include the NFC module cable. The NFC module cable is included in the Cable Kit, spare part number L62980-001.

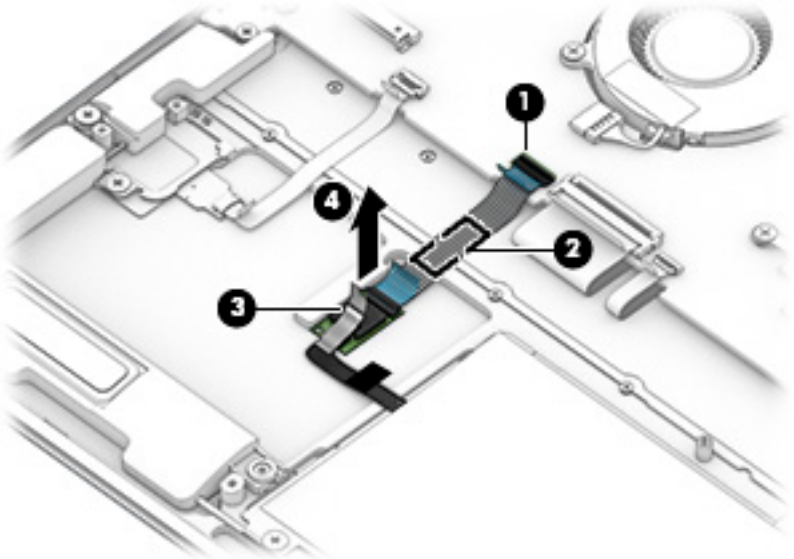
Description	Spare part number
NFC module	L41023-001

Before removing the NFC 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 31).
5. Remove the battery (see Battery on page 32).

Remove the NFC module:

1. Release the ZIF connector **(1)** to which the NFC module cable is connected, and then disconnect the NFC module cable from the system board.
2. Detach the NFC module cable **(2)** from the keyboard/top cover. (The NFC module cable is attached to the keyboard/top cover with adhesive.)
3. Release the ZIF connector **(3)** to which the NFC module antenna cable is connected, and then disconnect the NFC module antenna cable from the NFC module.
4. Detach the NFC module **(4)** from the keyboard/top cover. (The NFC module is attached to the keyboard/top cover with adhesive.)



5. Remove the NFC module and cable.

Reverse this procedure to install the NFC module.

Touchpad cable

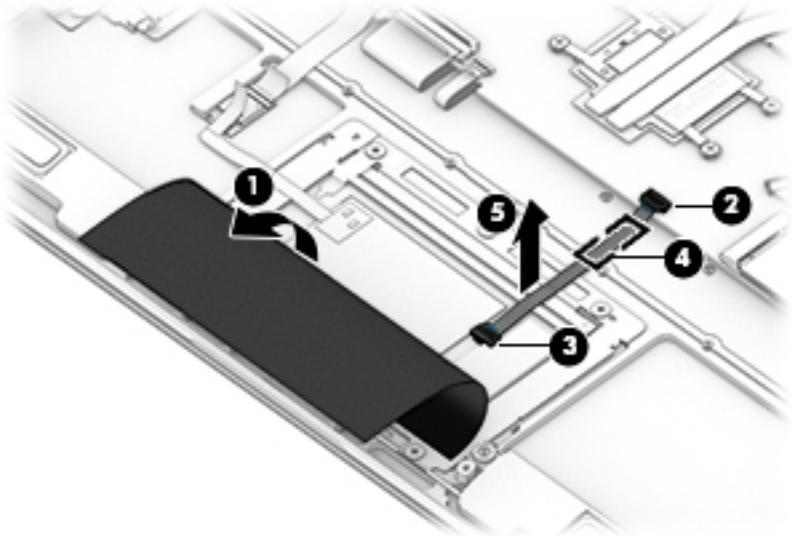
NOTE: The touchpad cable is included in the Cable Kit, spare part number L62980-001.

Before removing the touchpad cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).

Remove the touchpad cable:

1. Fold back the padding **(1)** the covers the touchpad.
2. Release the ZIF connector **(2)** to which touchpad cable is connected, and then disconnect the touchpad cable from the system board.
3. Release the ZIF connector **(3)** to which touchpad cable is connected, and then disconnect the touchpad cable from the touchpad.
4. Detach the touchpad cable **(4)** from the keyboard/top cover. (The touchpad cable is attached to the keyboard/top cover with adhesive.)
5. Remove the touchpad cable **(3)**.



Reverse this procedure to install the touchpad cable.

Touchpad

NOTE: The touchpad spare part kit does not include the touchpad cable. The touchpad cable is included in the Cable Kit, spare part number L62980-001.

NOTE: The touchpad spare part includes rubber padding.

Description	Spare part number
Equipped with NFC module antenna (includes adhesive)	L62975-001
Not equipped with NFC module antenna	L62974-001

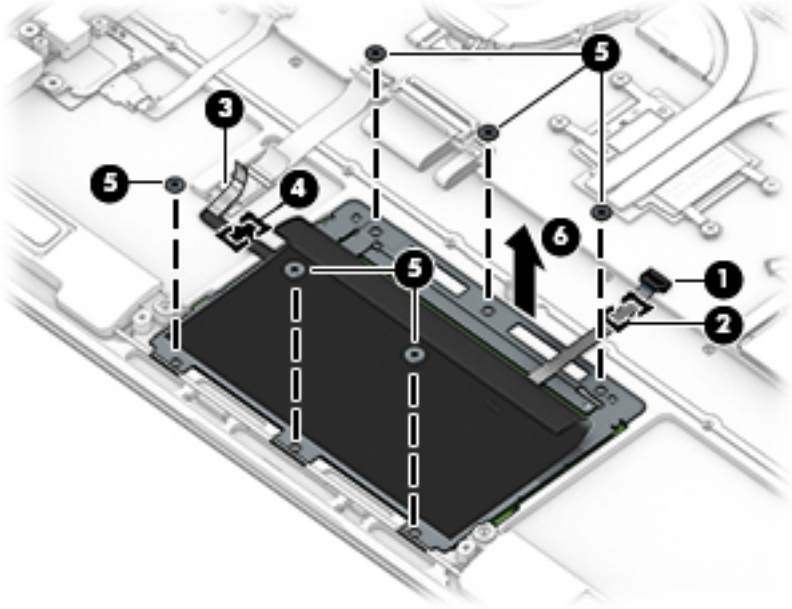
Before removing the touchpad, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).

Remove the touchpad:

1. Release the ZIF connector **(1)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.
2. Detach the touchpad cable **(2)** from the keyboard/top cover. (The touchpad cable is attached to the keyboard/top cover with adhesive.)
3. Release the ZIF connector **(3)** to which the NFC module antenna cable is connected, and then disconnect the NFC module antenna cable from the NFC module.
4. Detach the NFC module antenna cable **(4)** from the keyboard/top cover. (The NFC module antenna cable is attached to the keyboard/top cover with adhesive.)
5. Remove the six Phillips M2.0×2.4 screws **(5)** that secure the touchpad to the keyboard/top cover.

6. Remove the touchpad (6).



Reverse this procedure to install the touchpad.

System board

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

Description	Spare part number
Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 32 GB of system memory, and the Windows 10 and OSR operating systems	L63010-601
Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 32 GB of system memory, and the OSR operating system	L63010-001
Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L63009-601
Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows operating system	L63009-001
Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63008-601
Equipped with an Intel Core i7-8665U 1.90 GHz (turbo up to 4.80 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and a non-Windows operating system	L63008-001
Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 32 GB of system memory, and the Windows 10 and OSR operating systems	L70102-601
Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 32 GB of system memory, and the OSR operating system	L70102-001
Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L63007-601
Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows operating system	L63007-001
Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63003-601
Equipped with an Intel Core i7-8565U 1.80 GHz (turbo up to 4.60 GHz) quad-core processor (2400 MHz, 8.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and a non-Windows operating system	L63003-001
Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L63000-601
Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows 10 operating system	L63000-001
Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 and OSR operating systems	L70103-601

Description	Spare part number
Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the OSR operating system	L70103-001
Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63001-601
Equipped with an Intel Core i5-8365U 1.60 GHz (turbo up to 4.10 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 UHD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63001-001
Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and the Windows 10 operating system	L62998-601
Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 16 GB of system memory, and a non-Windows 10 operating system	L62998-001
Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and the Windows 10 operating system	L63006-601
Equipped with an Intel Core i5-8265U 1.60 GHz (turbo up to 3.90 GHz) quad-core processor (2400 MHz, 6.0 MB L3 cache, 15 W), the Intel 620 HD graphics subsystem controller with UMA memory, 8 GB of system memory, and a non-Windows 10 operating system	L63006-001

Before removing the system board, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).

When replacing the system board, be sure to remove the solid-state drive (see Solid-state drive on page 34) and the fan/heat sink assembly (see Fan/heat sink assembly on page 49) from the defective system board and install them on the replacement system board.

Remove the system board:

1. Disconnect the following cables from the system board:

   (1) Webcam 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.

   NOTE: Release the WLAN antenna cables from the retention clips **(3)** built into the fan/heat sink assembly.

   (4) WWAN antenna cables

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

(5) Display panel cable cable

(6) Audio jack board ZIF connector cable

(7) Power button board ZIF connector cable

(8) Speaker cable

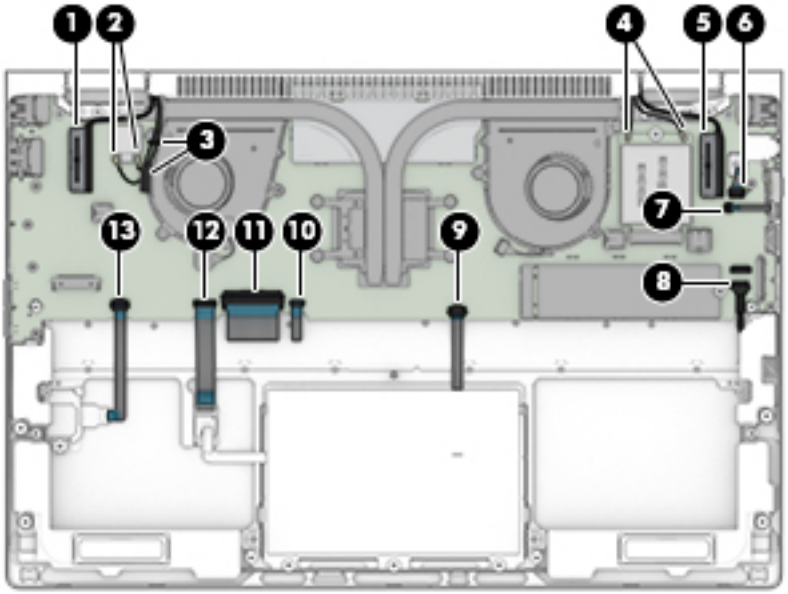
(9) Touchpad ZIF connector cable

(10) Keyboard backlight ZIF connector cable

(11) Keyboard ZIF connector cable

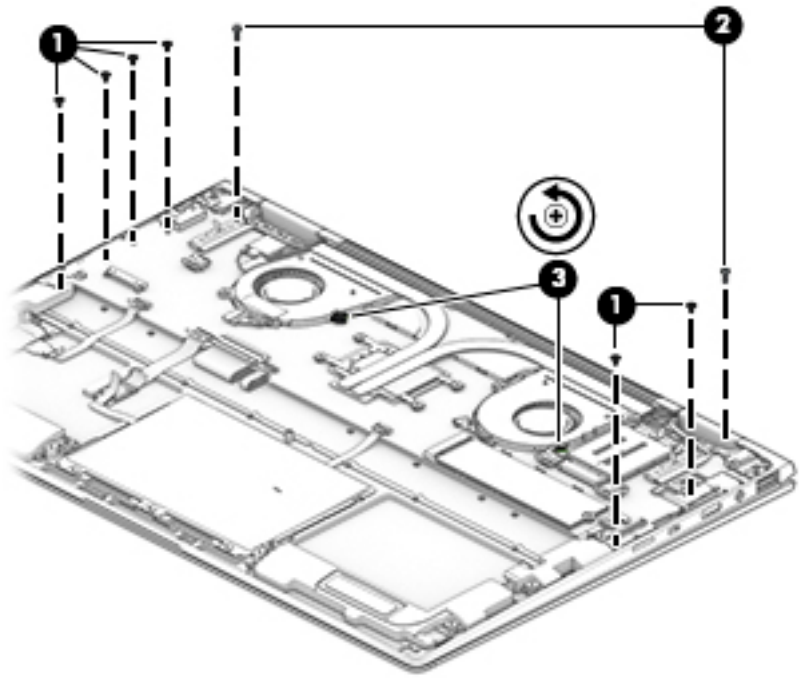
(12) NFC module ZIF connector cable

(13) Fingerprint reader module ZIF connector cable

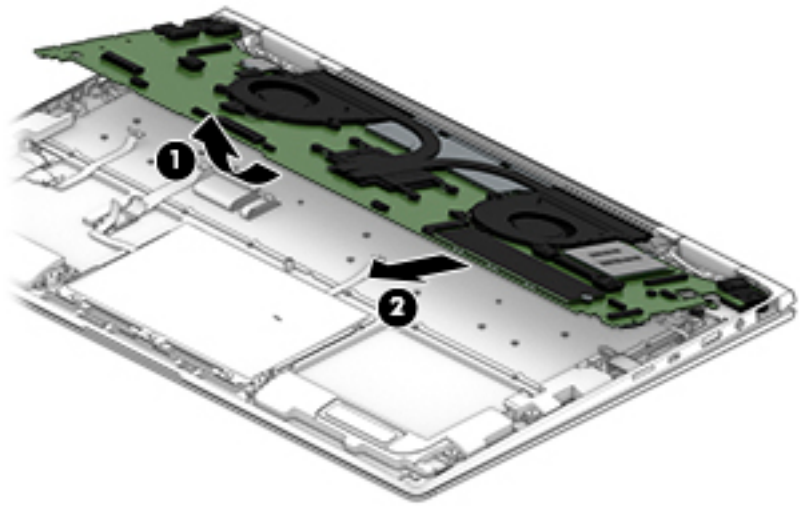


2. Remove the six Phillips M2.0×4.2 screws **(1)** that secure the system board to the keyboard/top cover.
3. Remove the two Phillips M2.0×5.7 screws **(2)** that secure the system board to the keyboard/top cover.

4. Loosen the two Phillips M2.0×5.8 captive screws **(3)** that secure the system board to the keyboard/top cover.



5. Lift the front edge of the system board **(1)** until it rests at an angle.
6. Slide the system board **(2)** up and forward until it is clear of the keyboard/top cover.



7. Remove the system board.

Reverse this procedure to install the system board.

Fan/heat sink assembly

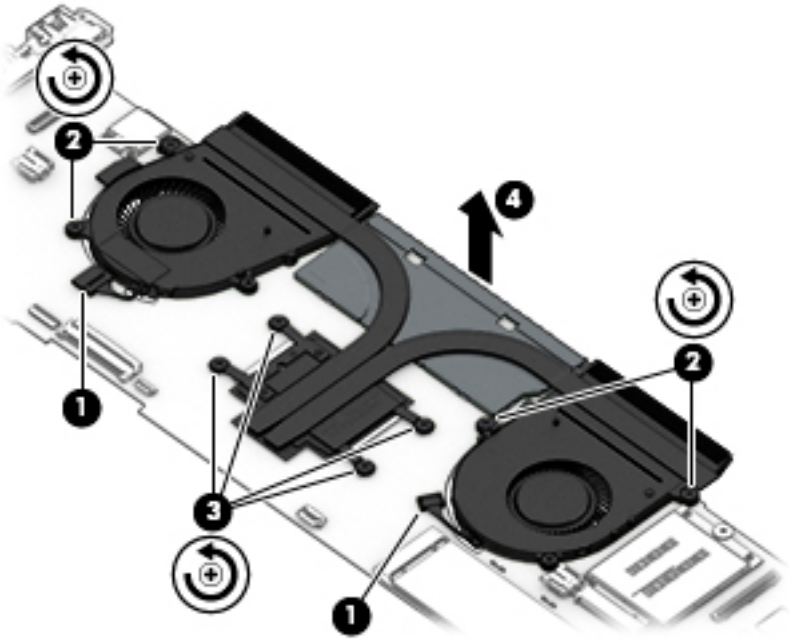
Description	Spare part number
Fan/heat sink assembly (includes fan cables and replacement thermal material)	L62995-001

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

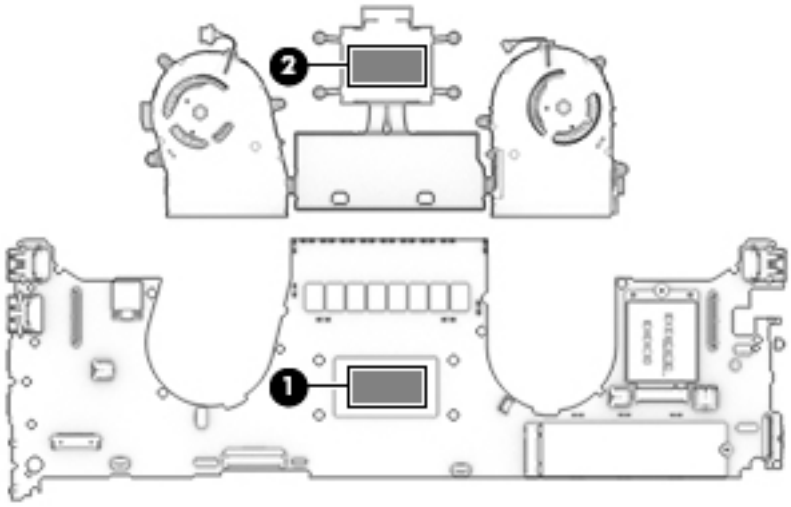
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 45).

Remove the fan/heat sink assembly:

1. Disconnect the fan cables **(1)** from the system board.
2. Loosen the four Phillips M2.0×5.8 captive screws **(2)** that secure the fan/heat sink assembly to the system board.
3. Loosen the four Phillips M2.0×3.4 captive screws **(3)** that secure the fan/heat sink assembly to the system board.
4. Remove the fan/heat sink assembly **(4)**.



NOTE: The thermal material must be thoroughly cleaned from the surfaces of the fan/heat sink assembly and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is included with the fan/heat sink assembly and system board spare part kits. Thermal paste is used on the processor (1) and the fan/heat sink assembly section (2) that services it.



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

Audio jack board

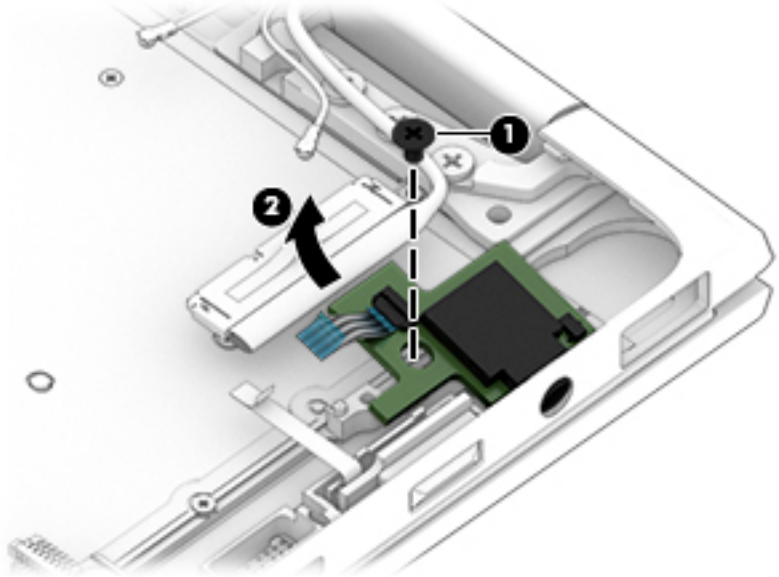
Description	Spare part number
Audio jack board (includes cable)	L63023-001

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 31).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 45).

Remove the audio jack board:

1. Remove the Phillips M2.0×2.4 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 and cable.

Reverse this procedure to install the audio jack board and cable.

Power button board

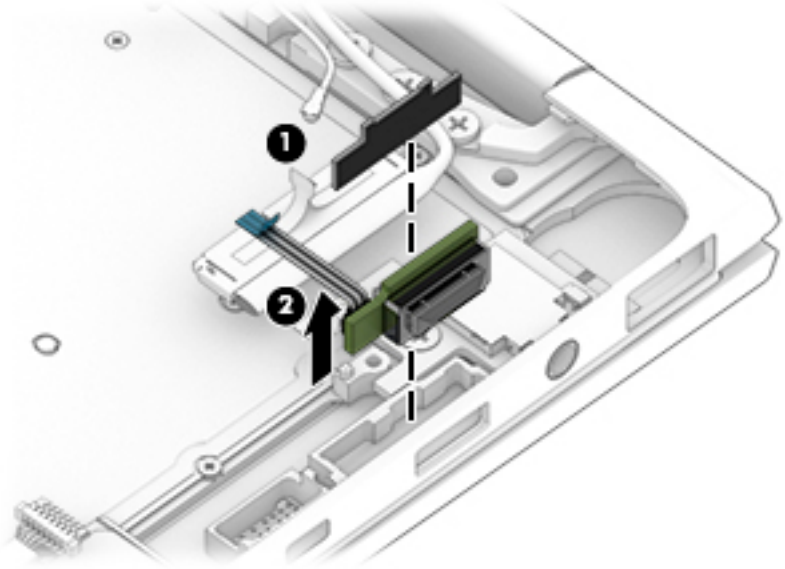
Description	Spare part number
Power button board (includes cable and spacer)	L62997-001

Before removing the power button 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 31).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 45).

Remove the power button board:

1. Remove the power button board spacer **(1)**.
2. Remove the power button board **(2)** and cable.



Reverse this procedure to install the power button board.

Display assembly

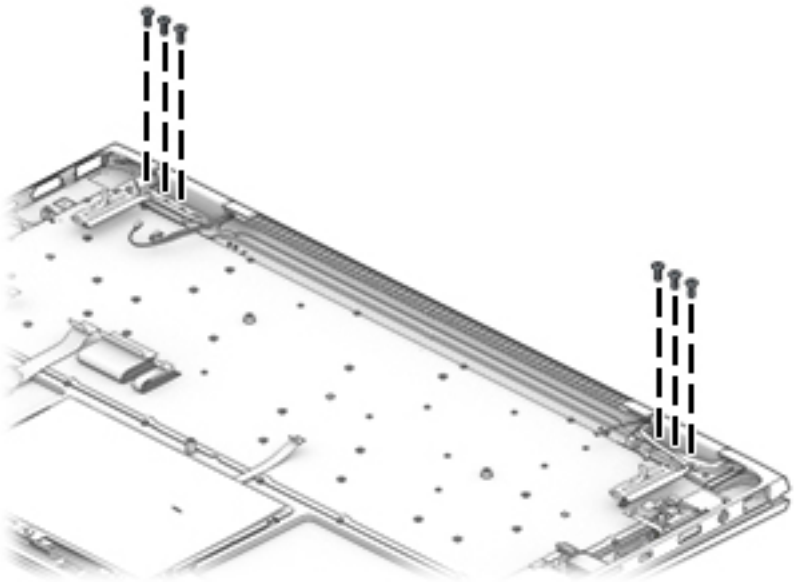
Description	Spare part number
14.0 inch touch screen, LCD, WLED, UWVA, 72, eDP+PSR, ultraslim display assembly:	
UHD (3840×2160), brightview, 550 nits display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62993-001
FHD (1920×1080), antiglare, 950 nits display assembly with privacy filter for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62989-001
FHD (1920×1080), antiglare, 950 nits display assembly with privacy filter for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62992-001
FHD (1920×1080), antiglare, 400 nits low power display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62988-001
FHD (1920×1080), antiglare, 400 nits low power display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62987-001
FHD (1920×1080), antiglare display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62984-001
FHD (1920×1080), antiglare display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62983-001
FHD (1920×1080), brightview, 950 nits display assembly with privacy filter for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62991-001
FHD (1920×1080), brightview, 950 nits display assembly with privacy filter for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62990-001
FHD (1920×1080), brightview, 400 nits low power display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62986-001
FHD (1920×1080), brightview, 400 nits low power display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62985-001
FHD (1920×1080), brightview display assembly for use with computer models equipped with WWAN capability (includes left and right WWAN antenna cables and transceivers)	L62982-001
FHD (1920×1080), brightview display assembly for use with computer models equipped with WLAN capability (includes left and right WLAN antenna cables and transceivers)	L62981-001

Before removing the display assembly, follow these steps:

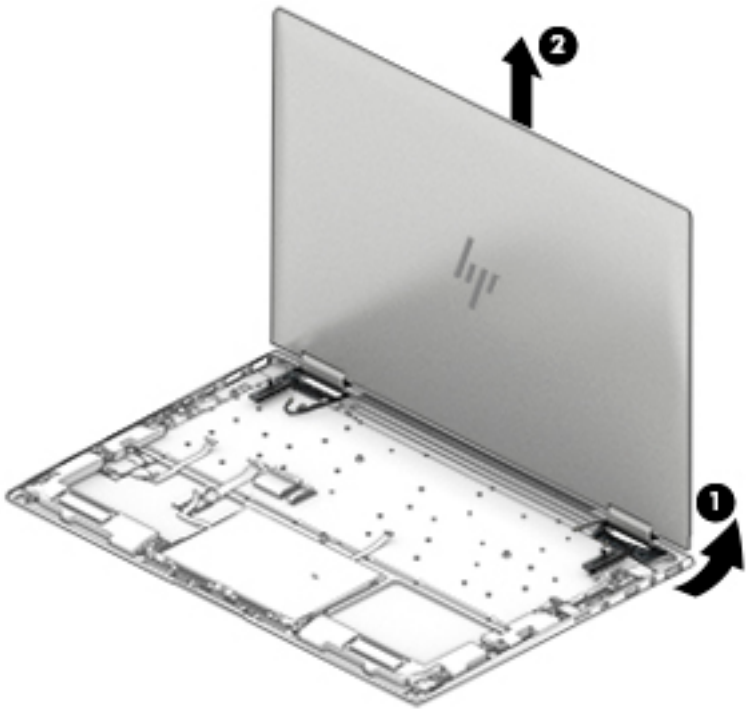
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 32).
6. Remove the system board (see System board on page 45).

Remove the display assembly:

1. Remove the six Phillips M2.5×5.7 screws that secure the display hinges to the keyboard/top cover.



2. Swing the display assembly **(1)** back and around until it is in the upright position.
3. Separate the display assembly **(2)** from the keyboard/top cover and remove the display assembly.



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 Starting Computer Setup on page 55.
2. Select **Main**, and then select **Apply Factory Defaults and Exit**.

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

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

   – or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Computer Setup. See Starting Computer Setup on page 55.
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 57.

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 55.
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 61.

   b. Hard drive

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

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

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

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

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

Download the latest UEFI version

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

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**.
3. Enter the product name or number.
4. Select your computer, and then select your operating system.
5. In the **Diagnostic** section, follow the on-screen instructions to select and download the UEFI version you want.

Using Remote HP PC Hardware Diagnostics (UEFI) settings (select products only)

Your computer supports Remote HP PC Hardware Diagnostics (UEFI). This is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer.

It executes the diagnostics on your computer, and then may upload results to a preconfigured server.

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

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

Customizing Remote HP PC Hardware Diagnostics (UEFI) settings

1. Turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.
2. Select **Advanced**, and then select **Settings**.
3. Make your customization selections.
4. Select **Main**, and then **Save Changes and Exit** to save your settings.

Your changes take effect when the computer restarts.

To access documentation on using Remote HP PC Hardware Diagnostics (UEFI) to configure a server for remote diagnostics or to customize which diagnostic tests are run, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.

8 Backing up, restoring, and recovering

This chapter provides information about the following processes, which are standard procedure for most products:

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see Using Windows tools on page 64).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 64).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 64.
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see Using Windows tools on page 64).

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.

Backing up information and creating recovery media

Using Windows tools

IMPORTANT: Windows is the only option that allows you to back up your personal information. Schedule regular backups to avoid information loss.

You can use Windows tools to back up personal information and create system restore points and recovery media.

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

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

1. Select the **Start** button, and then select the **Get Help** app.
2. Enter the task you want to perform.

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

Using the HP Cloud Recovery Download Tool to create recovery media (select products only)

You can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive, as follows:

1. Go to http://www.hp.com/support.
2. Select **Software and Drivers**, and then follow the on-screen instructions.

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, (see Using Windows tools on page 64).

Recovering using HP Recovery media

HP Recovery media is used to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 64.

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

To recover your system:

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

Changing the computer boot order

If your computer does not restart using the HP Recovery media, you can change the computer boot order. This 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, depending on the location of your HP Recovery media.

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, quickly hold down the volume up button, and then select f9.

     – or –

     Turn on or restart the tablet, quickly hold down the volume down button, and then select f9.
3. Select the optical drive or USB flash drive from which you want to boot, and then follow the on-screen instructions.

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**38.56 cm**	15.18 in
Depth	**25.8 cm**	10.15 in
Height (front to back)	**2.26 cm**	.89 in
Weight	**2.09 or 2.29 kg** (depending on configuration)	4.61 lb or 5.05 (depending on configuration)
Input power		
Operating voltage and current	19.5 V dc @ 3.33 A – 65 W 19 V dc @ 4.62 A – 90 W 19.5 V dc @ 2.31 – 45 W (select models only)	
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.

10 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 V ac, or from 220 to 240 V 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 or regions must meet the requirements of the country and 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 A and a nominal voltage rating of 125 or 250 V ac, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2
Chile	IMQ	1
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
India	BIS	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1
The United States	UL	2

1. The flexible cord must be Type H05VV-F, 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.
2. The flexible cord must be Type SVT/SJT 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 ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.

Country/region	Accredited agency	Applicable note number

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 VCTF, 3-conductor, 0.75 mm² or 1.25 mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V ac) 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 CCC certification mark.
5. The flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² conductor size. KTL logo and individual approval number must be on each element. Corset approval number and logo must be printed on a flag label.
6. The flexible cord must be Type HVCTF 3-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.
7. For 127 V ac, the flexible cord must be Type SVT or SJT 3-conductor, 18 AWG, with plug NEMA 5-15P (15 A, 125 V ac), with UL and CSA or C-UL marks. For 240 V ac, the flexible cord must be Type H05VV-F 3-conductor, 0.75 mm² or 1.00 mm2 conductor size, with plug BS 1363/A with BSI or ASTA marks.

11 Statement of memory volatility

The purpose of this chapter is to provide general information regarding nonvolatile memory in HP Business computers. 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 computer 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 computer 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 computer, including the nonvolatile memory found in Intel-based and AMD-based system boards.

NOTE: If your tablet has a keyboard base, connect to the keyboard base before beginning steps in this chapter.

Current BIOS steps

1. Follow steps (a) through (l) 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. Turn on or restart the computer, and then quickly press esc.

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

   b. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes** to load defaults.

      The computer will reboot.

   c. During the reboot, press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

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

   d. Select the **Security** menu, select **Restore Security Settings to Factory Defaults**, and then select **Yes** to restore security level defaults.

      The computer will reboot.

   e. During the reboot, press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

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

   f. 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.

   g. If a DriveLock password is set, select the **Security** menu, and scroll down to **Hard Drive Utilities** under the **Utilities** menu. Select **Hard Drive Utilities**, select **DriveLock**, then uncheck the checkbox for **DriveLock password on restart**. Select **OK** to proceed.

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

   The computer will reboot.

i. During the reboot, press esc while the “Press the ESC key for Startup Menu” message is displayed at the bottom of the screen.

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

j. Select the **Main** menu, select **Apply Factory Defaults and Exit**, select **Yes** to save changes and exit, and then select **Shutdown**.

k. 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.

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

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

   c. Select **Hard Drive Utilities**.

   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 using the following Disk Sanitizer commands 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. Turn on or restart the computer, and then quickly press esc.

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

   c. Select **Hard Drive Utilities**.

   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)	8 MBytes	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical computer configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select models only) on page 75.	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 & 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 module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a computer. The specific write-protection method varies by memory vendor.
System BIOS	9 MBytes	Yes	Yes	Stores system BIOS code and computer 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 computer 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. Select **Find your product**, and then follow

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?
						the on-screen instructions.
Intel Management Engine Firmware (present only in select Elite or Z models. For more information, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.)	1.5 MBytes or 7 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 (select products only)	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 WWAN EEPROM	4 Kbit to 8 Kbit	No	Yes	Stores configuration and calibration data.	802.11 WWAN 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 typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Webcam (select products only)	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 typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader (select products only)	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. Turn on or restart the computer, and then quickly press esc.

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

   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 module? How would this data be written?**

   The DIMM SPD memory contains information about the memory module, such as size, serial number, data width, speed/timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. This EEPROM cannot be written to when the memory module is installed in a computer. Third-party tools do exist that can write to the EEPROM when the memory module is not installed in a computer. 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 computer 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. Turn on or restart the computer, and then quickly press esc.

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

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

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. Select **Find your product**, and then follow the on-screen instructions.

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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