Maintenance and Service Guide

HP ProBook x360 11 G5 Education Edition
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Product notice

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

To access the latest user guides, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **User Guides**.

Software terms

By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

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 the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

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1 Product description

Table 1-1 Product description

Category	Description
Product Name	HP ProBook x360 11 G5 Education Edition
Processor	• Intel® Pentium™ Silver N5030 1.1 GHz (SC turbo up to 3.1 GHz) quad core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W) • Intel Pentium Silver N5000 1.1 GHz (SC turbo up to 2.7 GHz) quad core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W) • Intel Celeron™ N4120 1.1 GHz (SC turbo up to 2.6 GHz) quad core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W) • Intel Celeron N4100 1.1 GHz (SC turbo up to 2.4 GHz) quad core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W) • Intel Celeron N4020 1.1 GHz (SC turbo up to 2.8 GHz) dual core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W) • Intel Celeron N4000 1.1 GHz (SC turbo up to 2.6 GHz) dual core processor (4.0 MB L2 cache, 2400 MHz FSB, 6 W)
Chipset	Intel integrated with processor
Graphics	Internal Graphics:
	Intel ultra high-definition (UHD) Graphics 600 unified memory architecture (UMA)
	Intel high-definition (HD) Graphics 600 UMA Supports HD decode, DX12, and HDMI 1.4b
Panel	11.6-inch, HD (1368×768), antiglare, white light emitting diode (WLED) backlight, UWVA, touchscreen display panel; typical brightness: 220 nits 11.6-inch, HD (1368×768), antiglare, WLED backlight, SVA, touchscreen display panel; typical brightness: 220 nits
Memory	Supports DDR4-2400, 1.2 V, non-upgradeable, on-board system memory in 8-GB and 4-GB configurations
Storage	Embedded Multimedia Controller (eMMC): Supports MO-76 v 5.0 in 64-GB and 32-GB configurations Solid-state drive: Supports a 256-GB PCIE, NVME, value solid-state drive and a 128-GB M2, SATA-3, solid-state drive with triple level cell (TLC)
Audio and video	Fixed (no tilt), 1280×720p HD camera with 75-degree field of vision integrated into display assembly Fixed (no tilt), 5-MP, 2560×1920p HD camera with 88-degree field of vision integrated into top cover
	Primary camera privacy shutter
	Dual array microphones with appropriate echo-cancellation, noise-suppression software
	Dual speakers
	Dual speakers
	HP HD Audio
Ethernet	Realtek GBE Ethernet controller (non-dash, QFN32)

Table 1-1 Product description (continued)

Category	Description
Ethernet *(continued)*	Support S3/ S4/S5 wake on LAN with enbedded network interface card (NIC)
Security	HP Trusted Platform Module (TPM) Configuration Utility
Wireless	Integrated wireless local area network (WLAN) with two built-in antennas
	Support for the following WLAN modules: Intel Wi-Fi 6 AX200 ax 2×2 + Bluetooth 5.0® MU-MIMO M.2 2230 non-vPro Intel 9560 ac 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro
Ports	• AC Smart Pin adapter plug • HDMI v1.4b supporting up to 3840×2160 @ 30Hz • Headphone/microphone combo jack • RJ-45/Ethernet • USB 3.1 Gen 1 Ports (2) • USB Type-C (data and power)
Sensors	Combination chip: • Accelerometer • Magnetometer • Gyro Hall sensor
Keyboard/pointing devices	Spill-resistant standard notebook keyboard in chalkboard gray and dusk blue finishes
	Clickpad
Power requirements	Supports a 3-cell, 48-WHr, 4.21-AHr, Li-Ion battery
	Supports the following AC adapters: • 65-W, HP Smart Adapter (non-PFC, EM, RC, 4.5-mm) • 45-W, HP Smart Adapter (non-PFC, RC, 4.5-mm, non-slim) • 45-W, AC Adapter (non-PFC, USB Type-C, 1.8-m, 3-pin) • 45-W, AC Adapter (non-PFC, SB, 4.5-mm) for use only in Argentina
	Supports a 1-meter C5 power cord
Operating system	**Preinstalled:** • Windows® 10 Home 64-bit • Windows 10 Home 64-bit Chinese Market CPPP • Windows 10 Home 64-bit Single Language • Windows 10 Home 64-bit Single Language Africa Market PPP • Windows 10 Home 64-bit Single Language APAC EM PPP • Windows 10 Home 64-bit Single Language India Market PPP • Windows 10 Home 64-bit Single Language Indonesia Market PPP • Windows 10 Home 64-bit StF MSNA for Higher Education

Table 1-1 Product description (continued)

Category	Description
Operating system *(continued)*	• Windows 10 Home 64-bit StF MSNA for Higher Education Strategic • Windows 10 Professional 64-bit • Windows 10 Professional 64-bit CBB • Windows 10 Professional 64-bit Chinese Market • Windows 10 Professional 64-bit Entry • Windows 10 Professional 64-bit Entry Chinese Market • Windows 10 Professional 64-bit StF MSNA • Windows 10 Professional 64-bit StF MSNA Emerging Market • Windows 10 Professional 64-bit StF MSNA Entry • Windows 10 Professional 64-bit StF MSNA Standard • Windows 10 Professional 64-bit StF MSNA Strategic • Windows 10 Professional S 64-bit Entry • Windows 10 Professional S 64-bit Entry Chinese Market • Windows 10 Professional S 64-bit StF MSNA • Windows 10 Professional S 64-bit StF MSNA Emerging Market • Windows 10 Professional S 64-bit StF MSNA Entry • Windows 10 Professional S 64-bit StF MSNA Standard • Windows 10 Professional S 64-bit StF MSNA Strategic • FreeDOS 3.0 **OS - Recovery kit:** Windows 10 Driver DVD and Windows 10 Driver USB **Restore Media:** Windows 10 Professional 64-bit OS DVD and Windows 10 Professional 64-bit OS USB
Serviceability	**End user replaceable parts:** AC adapter

2 Components

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

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

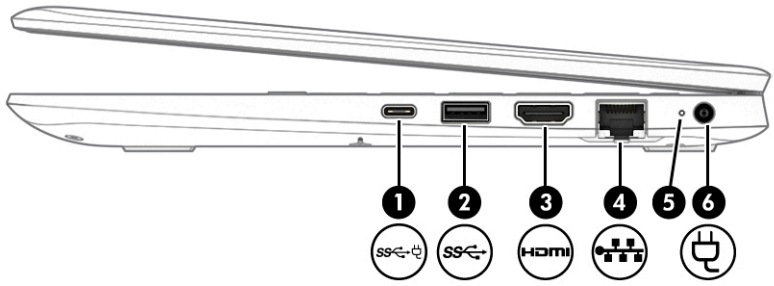

Table 2-1 Right-side components and their descriptions

Component		Description
(1)	USB Type-C power connector and SuperSpeed port	Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connects a USB device that has a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. NOTE: Cables and/or adapters (purchased separately) may be required.
(2)	USB SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(3)	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 High Definition Multimedia Interface (HDMI) device.
(4)	RJ-45 (network) jack/status lights	Connects a network cable. • Green (left): The network is connected. • Amber (right): Activity is occurring on the network.
(5)	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.
(6)	Power connector	Connects an AC adapter.

Left

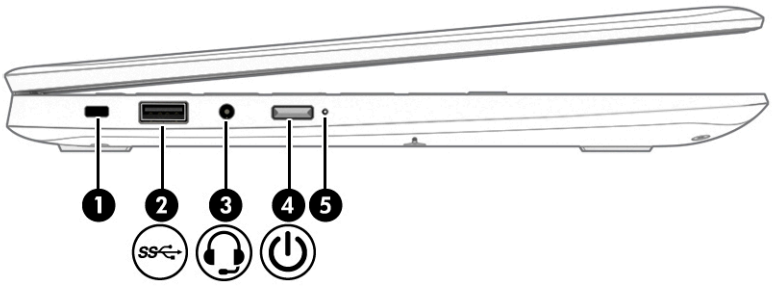

Table 2-2 Left-side components and their descriptions

Component		Description
(1)	Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	USB SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(3)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, see the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Type `HP Documentation` in the taskbar search box, and then select **HP Documentation**. NOTE: When a device is connected to the jack, the computer speakers are disabled.
(4)	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 for at least 5 seconds to turn off the computer.
(5)	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 unnecessary components.

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

Component	Description
	• Off: Depending on your computer model, the computer is off, in Hibernation, or in Sleep. Hibernation is a power-saving state that uses the least amount of power.

Display

Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas (select products only)*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(2)	Internal microphones (2)	Record sound.
(3)	Camera light	On: The camera is in use.
(4)	Camera privacy cover	By default, the camera lens is uncovered, but you can slide the camera privacy cover to block the camera's view. To use the camera, slide the camera privacy cover in the opposite direction to reveal the lens. NOTE: If you have both front-facing and rear-facing cameras, when one camera lens is revealed and ready to use, the other is concealed.
(5)	Camera	Allows 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.

Table 2-3 Display components and their descriptions (continued)

Component		Description
		NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(6)	Camera light (select products only)	On: The camera is in use.
(7)	Camera (select products only)	Allows you to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. NOTE: Camera functions vary depending on the camera hardware and software installed on your product.

*The antennas are not visible from the outside of the computer. 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.

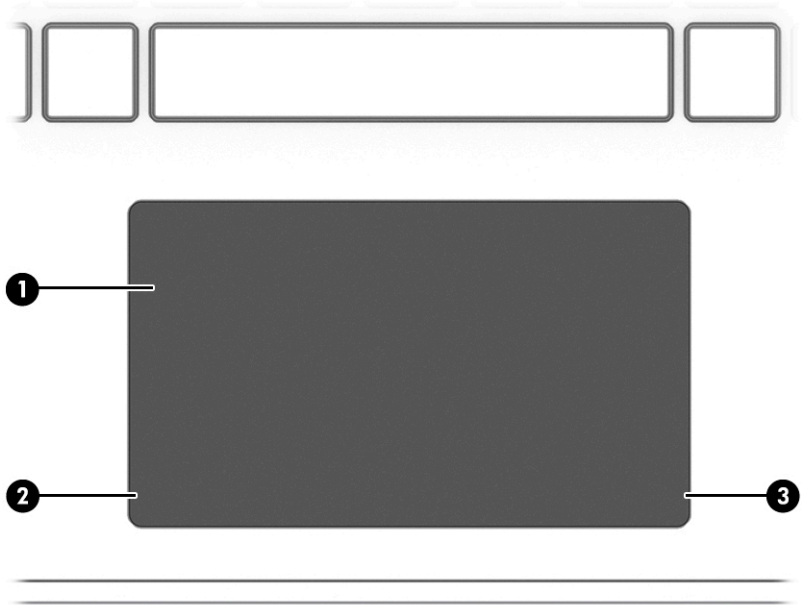

Table 2-4 Touchpad components and their descriptions

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

Lights

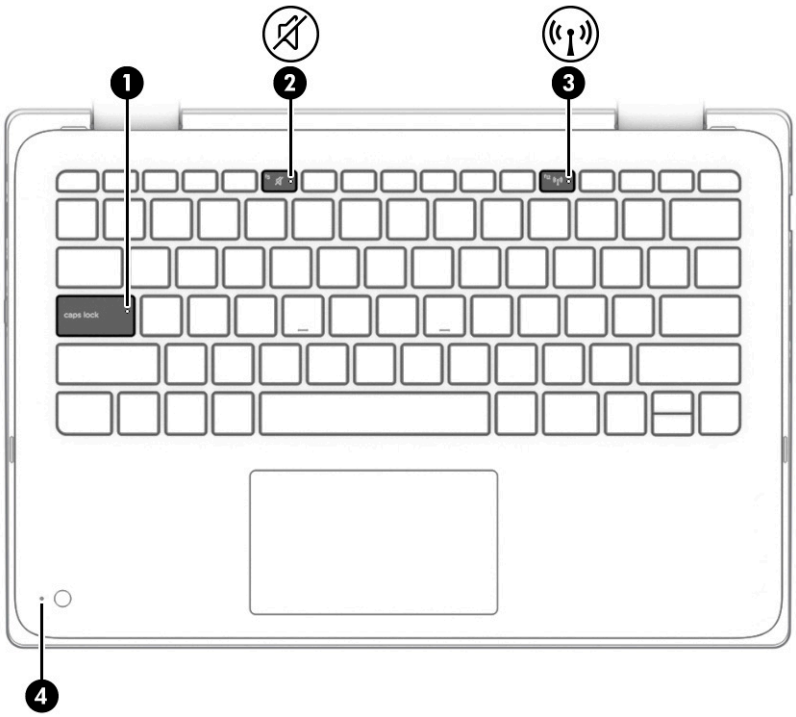

Table 2-5 Lights and their descriptions

Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Mute light	• On: Computer sound is off. • Off: Computer sound is on.
(3)	Wireless light	On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. NOTE: On some models, the wireless light is amber when all wireless devices are off.
(4)	Camera light (select products only)	On: The camera is in use.

Special keys

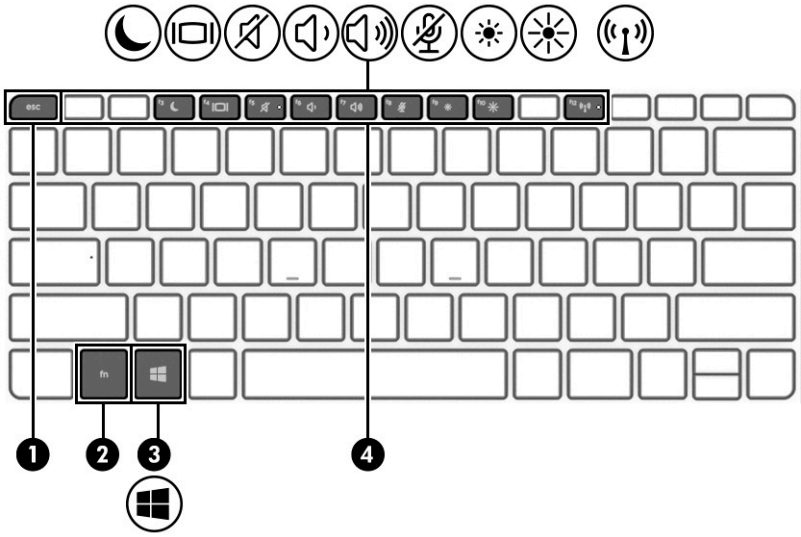

Table 2-6 Special keys and their descriptions

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.
(3)	Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start .
(4)	Action keys	Execute frequently used system functions when pressed in combination with the fn key.

Top cover

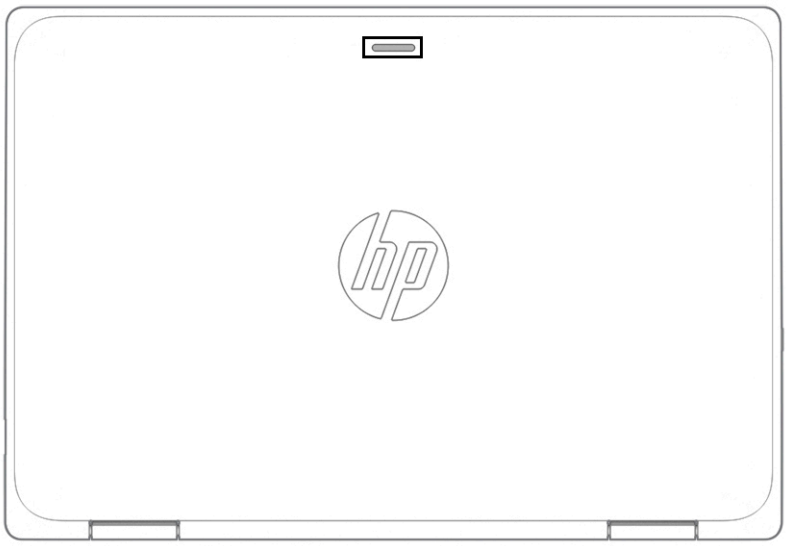

Table 2-7 Top cover components and their descriptions

Component	Description
HP Interactive Light	Allows students and teachers to interact in several ways through the light located on the top cover. In addition to the Help, Test, Quiz, and Group options, the light also communicates information about the status of the Internet connection and the battery power level.

Bottom

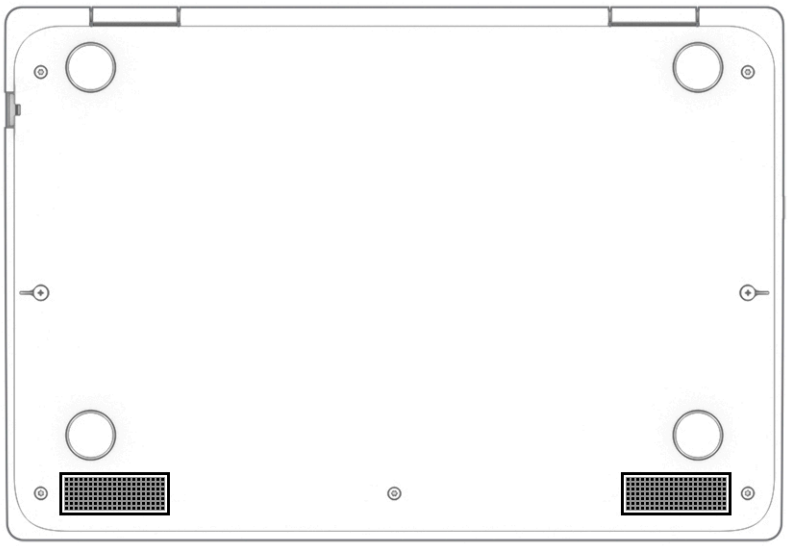

Table 2-8 Bottom components and their descriptions

Component	Description
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 your computer. When contacting support, you may be asked for the serial number, the product number, or the model number. Locate this information before you contact support.

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

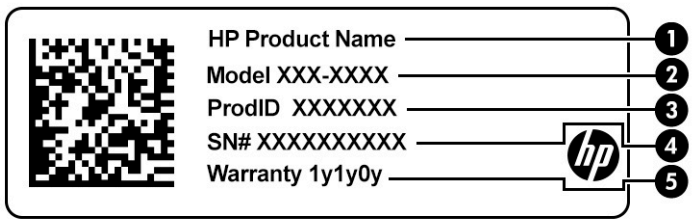

Table 2-9 Service label components

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

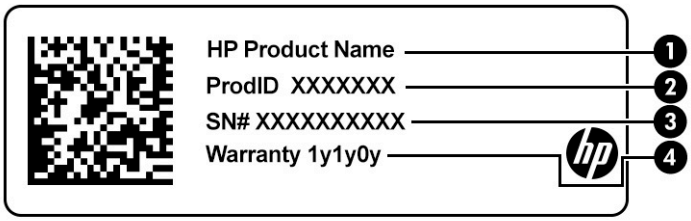

Table 2-10 Service label components

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

Table 2-10 Service label components (continued)

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

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

Computer major components

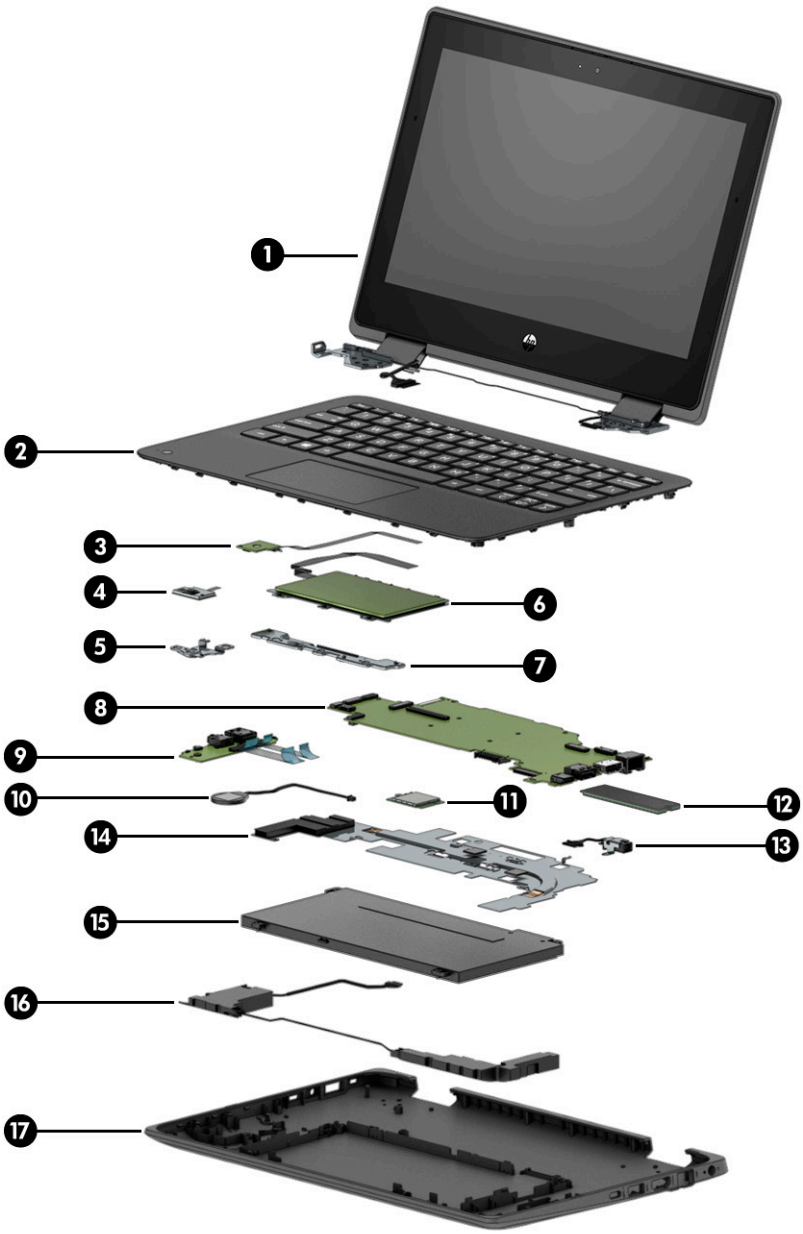

Table 3-1 Major component spare part information

Item	Component	Spare part number
(1)	**Display assembly**	
	11.6-in, HD, LED, UWVA, TouchScreen display assembly with HD webcam (220 nits) in dusk blue finish	L83963-001
	11.6-in, HD, LED, UWVA, TouchScreen display assembly with HD webcam (220 nits) in chalkboard gray finish	L83961-001
	11.6-in, HD, LED, SVA, TouchScreen display assembly with non-HD webcam (220 nits) in dusk blue finish	L83961-001
	11.6-in, HD, LED, SVA, TouchScreen display assembly with non-HD webcam (220 nits) in chalkboard gray finish	L83960-001
(2)	**Keyboard/top cover** with webcamera in dusk blue finish (includes keyboard cable):	
	For use in Belgium	L83986-A41
	For use in Bulgaria	L83986-261
	For use in Canada	L83986-DB1
	For use in the Czech Republic and Slovakia	L83986-FL1
	For use in Denmark	L83986-081
	F`r use in Denmark, Finland, and Norway	L83986-DH1
	For use in France	L83986-051
	For use in Germany	L83986-041
	For use in Greece	L83986-151
	For use in Hungary	L83986-211
	For use in Iceland	L83986-DD1
	For use in India	L83986-D61
	For use in Israel	L83986-BB1
	For use in Italy	L83986-061
	For use in Latin America	L83986-161
	For use in the Netherlands	L83986-B31
	For use in Northwest Africa	L83986-FP1
	For use in Norway	L83986-091
	For use in Portugal	L83986-131
	For use in Romania	L83986-271
	For use in Russia	L83986-251
	For use in Saudi Arabia	L83986-171
	For use in Slovenia	L83986-BA1
	For use in South Korea	L83986-AD1
	For use in Spain	L83986-071
	For use in Sweden and Finland	L83986-B71

Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
	For use in Switzerland	L83986-BG1
	For use in Taiwan	L83986-AB1
	For use in Thailand	L83986-281
	For use in Turkey	L83986-141
	For use in the United Kingdom	L83986-031
	For use in the United States	L83986-001
	Keyboard/top cover without webcamera in dusk blue finish (includes keyboard cable):	
	For use in Belgium	L83984-A41
	For use in Bulgaria	L83984-261
	For use in Canada	L83984-DB1
	For use in the Czech Republic and Slovakia	L83984-FL1
	For use in Denmark	L83984-081
	For use in Denmark, Finland, and Norway	L83984-DH1
	For use in France	L83984-051
	For use in Germany	L83984-041
	For use in Greece	L83984-151
	For use in Hungary	L83984-211
	For use in Iceland	L83984-DD1
	For use in India	L83984-D61
	For use in Israel	L83984-BB1
	For use in Italy	L83984-061
	For use in Latin America	L83984-161
	For use in the Netherlands	L83984-B31
	For use in Northwest Africa	L83984-FP1
	For use in Norway	L83984-091
	For use in Portugal	L83984-131
	For use in Romania	L83984-271
	For use in Russia	L83984-251
	For use in Saudi Arabia	L83984-171
	For use in Slovenia	L83984-BA1
	For use in South Korea	L83984-AD1
	For use in Spain	L83984-071
	For use in Sweden and Finland	L83984-B71

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	For use in Taiwan	L83984-AB1
	For use in Thailand	L83984-281
	For use in Turkey	L83984-141
	For use in the United Kingdom	L83984-031
	For use in the United States	L83984-001
	Keyboard/top cover with webcamera in chalkboard gray finish (includes keyboard cable):	
	For use in Belgium	L83985-A41
	For use in Bulgaria	L83985-261
	For use in Canada	L83985-DB1
	For use in the Czech Republic and Slovakia	L83985-FL1
	For use in Denmark	L83985-081
	For use in Denmark, Finland, and Norway	L83985-DH1
	For use in France	L83985-051
	For use in Germany	L83985-041
	For use in Greece	L83985-151
	For use in Hungary	L83985-211
	For use in Iceland	L83985-DD1
	For use in India	L83985-D61
	For use in Israel	L83985-BB1
	For use in Italy	L83985-061
	For use in Latin America	L83985-161
	For use in the Netherlands	L83985-B31
	For use in Northwest Africa	L83985-FP1
	For use in Norway	L83985-091
	For use in Portugal	L83985-131
	For use in Romania	L83985-271
	For use in Russia	L83985-251
	For use in Saudi Arabia	L83985-171
	For use in Slovenia	L83985-BA1
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	For use in Turkey	L83985-141
	For use in the United Kingdom	L83985-031
	For use in the United States	L83985-001
	Keyboard/top cover without webcamera in chalkboard gray finish (includes keyboard cable):	
	For use in Belgium	L83983-A41
	For use in Bulgaria	L83983-261
	For use in Canada	L83983-DB1
	For use in the Czech Republic and Slovakia	L83983-FL1
	For use in Denmark	L83983-081
	For use in Denmark, Finland, and Norway	L83983-DH1
	For use in France	L83983-051
	For use in Germany	L83983-041
	For use in Greece	L83983-151
	For use in Hungary	L83983-211
	For use in Iceland	L83983-DD1
	For use in India	L83983-D61
	For use in Israel	L83983-BB1
	For use in Italy	L83983-061
	For use in Latin America	L83983-161
	For use in the Netherlands	L83983-B31
	For use in Northwest Africa	L83983-FP1
	For use in Norway	L83983-091
	For use in Portugal	L83983-131
	For use in Romania	L83983-271
	For use in Russia	L83983-251
	For use in Saudi Arabia	L83983-171
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	For use in South Korea	L83983-AD1
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Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
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	For use in Taiwan	L83983-AB1
	For use in Thailand	L83983-281
	For use in Turkey	L83983-141
	For use in the United Kingdom	L83983-031
	For use in the United States	L83983-001
(3)	**Transfer board**	L83968-001
	Transfer board cable (included in the Cable Kit, spare part number L83959-001)	
(4)	**Webcam module**	L83975-001
(5)	**Webcam module bracket** (not illustrated, included in the Bracket Kit, spare part number L83966-001)	
(6)	**Touchpad:**	
	In dusk blue finish	L83980-001
	In chalkboard gray finish	L83979-001
	Touchpad cable (included in the Cable Kit, spare part number L83959-001)	
(7)	**Touchpad bracket** (included in the Bracket Kit, spare part number L83966-001)	
(8)	**System board** (includes replacement thermal material):	
	Equipped with an Intel Pentium Silver N5030 processor, 8 GB of system memory, and the Windows 10 operating system	L83951-601
	Equipped with an Intel Pentium Silver N5030 processor, 8 GB of system memory, and a non-Windows operating system	L83951-001
	Equipped with an Intel Pentium Silver N5030 processor, 4 GB of system memory, and the Windows 10 operating system	L83950-001
	Equipped with an Intel Pentium Silver N5030 processor, 4 GB of system memory, and a non-Windows operating system	L83950-001
	Equipped with an Intel Pentium N5000 processor, 8 GB of system memory, and the Windows 10 operating system	L83957-601
	Equipped with an Intel Pentium N5000 processor, 8 GB of system memory, and a non-Windows operating system	L83957-001
	Equipped with an Intel Pentium N5000 processor, 4 GB of system memory, and the Windows 10 operating system	L83956-601
	Equipped with an Intel Pentium N5000 processor, 4 GB of system memory, and a non-Windows operating system	L83956-001
	Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83948-601
	Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83948-001
	Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, and the Windows 10 operating system	L83949-601

Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
	Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, and a non-Windows operating system	L83949-001
	Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83954-601
	Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83954-001
	Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, and the Windows 10 operating system	L83955-601
	Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, and a non-Windows operating system	L83955-001
	Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83946-601
	Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83946-001
	Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, and the Windows 10 operating system	L83947-601
	Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, and a non-Windows operating system	L83947-001
	Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83952-601
	Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83952-001
	Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, and the Windows 10 operating system	L83953-601
	Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, and a non-Windows operating system	L83952-001
(9)	**USB/audio board** (includes audio jack and USB port and rubber bumper)	L84410-001
	Audio cable (included in the Cable Kit, spare part number L83959-001)	
	USB cable (included in the Cable Kit, spare part number L83959-001)	
	USB port bracket (included in the Bracket Kit, spare part number L83966-001)	
	USB hub thermal pad (included in the Miscellaneous Kit, spare part number L83978-001)	
(10)	**RTC battery** (includes cable and double-sided adhesive)	L43797-001
(11)	**WLAN module:**	
	Intel Wi-Fi 6 AX200 ax 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro	L22634-002
	Intel 9560 ac 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro	L35282-002
(12)	**Solid-state drive:**	
	256-GB PCIE, NVME, value solid-state drive	L83965-001
	128-GB M2, SATA-3, solid-state drive with TLC	L83964-001
(13)	**Power connector cable** (included in the Cable Kit, spare part number L83959-001)	

Table 3-1 Major component spare part information (continued)

Item	Component	Spare part number
	Power connector cable bracket (included in the Bracket Kit, spare part number L83966-001)	
(14)	**Heat sink** (includes replacement thermal material)	L83958-001
(15)	**Battery** (3-cell, 48-WHr, 4.21-AHr, Li-ion; includes cable)	L12791-852
(16)	**Speaker Kit** (includes left and right speakers, cables, and four rubber isolators)	L83971-001
(17)	**Bottom cover:**	
	In dusk blue finish	L83973-001
	In chalkboard gray finish	L83972-001

Miscellaneous parts

Table 3-2 Miscellaneous spare part information

Component	Spare part number
AC adapter:	
65-W, HP Smart Adapter (non-PFC, EM, RC, 4.5-mm)	913691-850
45-W, HP Smart Adapter (non-PFC, RC, 4.5-mm, non-slim)	L741727-001
45-W, AC Adapter (non-PFC, USB Type-C, 1.8-m, 3-pin)	L43407-001
45-W, AC Adapter (non-PFC, SB, 4.5-mm) for use only in Argentina	L741553-852
Bracket Kit (includes power connector cable bracket, touchpad bracket, USB board bracket, and webcamera bracket)	L83966-001
Cable Kit (includes audio board cable, power connector cable, touchpad cable, transfer board cable, and USB board cable)	L83959-001
Miscellaneous Parts Kit (includes USB hub thermal pad and bumper)	L83978-001
Power cord (C5, 1.0-m, conventional with sticker):	
For use in Argentina	L19357-001
For use in Australia	L19358-001
For use in Brazil	L19359-001
For use in Denmark	L19360-001
For use in Europe	L19361-001
For use in India	L19363-001
For use in Israel	L19362-001
For use in Italy	L19364-001
For use in Japan	L19365-001
For use in North America	L19367-001
For use in the People's Republic of China	L19368-001
For use in South Africa	L19369-001
For use in South Korea	L19366-001
For use in Switzerland	L19370-001
For use in Taiwan	L19371-001
For use in Thailand	L19372-001
For use in the United Kingdom	L19373-001
Screw Kit	L83974-001

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 T8 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. Use care when handling the plastic.

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 (one in.) 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.”

Electrostatic discharge damage

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

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

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

IMPORTANT: To prevent damage to the tablet when you are removing or installing internal components, observe these precautions:

- Keep components in their electrostatic-safe containers until you are ready to install them.
- Before touching an electronic component, discharge static electricity by using the guidelines described in this section.
- Avoid touching pins, leads, and circuitry. Handle electronic components as little as possible.
- If you remove a component, place it in an electrostatic-safe container.

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

IMPORTANT: A product can be degraded by as little as 700 V.

Table 4-1 Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

- Cover the workstation with approved static-shielding material.
- Use a wrist strap connected to a properly grounded work surface and use properly grounded tools and equipment.
- Use conductive field service tools, such as cutters, screw drivers, and vacuums.
- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.
- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and 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.

Equipment guidelines

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

- When seated, wear a wrist strap connected to a grounded system. Wrist straps are flexible straps with a minimum of 1 MΩ ±10% resistance in the ground cords. To provide proper ground, wear a strap snugly against the skin at all times. On grounded mats with banana-plug connectors, use alligator clips to connect a wrist strap.
- When standing, use foot straps and a grounded floor mat. Foot straps (heel, toe, or boot straps) can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use foot straps on both feet with a minimum of 1 MΩ ±10% resistance between the operator and ground. To be effective, the conductive must be worn in contact with the skin.

The following grounding equipment is recommended to prevent electrostatic damage:

- Antistatic tape
- Antistatic smocks, aprons, and sleeve protectors
- Conductive bins and other assembly or soldering aids
- Nonconductive foam
- Conductive tabletop workstations with ground cords of 1 MΩ ±10% resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

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

Table 4-2 Shielding protection provided by antistatic bags and floor mats

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

5 Removal and replacement procedures

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

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

Component replacement procedures

There are as many as 53 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Keyboard/top cover

Table 5-1 Keyboard/top cover spare part information

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Keyboard/top cover with webcam in dusk blue finish (includes keyboard cable):		For use in Iceland	L83986-DD1	For use in Saudi Arabia	L83986-171
For use in Belgium	L83986-A41	For use in India	L83986-D61	For use in Slovenia	L83986-BA1
For use in Bulgaria	L83986-261	For use in Israel	L83986-BB1	For use in South Korea	L83986-AD1
For use in Canada	L83986-DB1	For use in Italy	L83986-061	For use in Spain	L83986-071
For use in the Czech Republic and Slovakia	L83986-FL1	For use in Latin America	L83986-161	For use in Sweden and Finland	L83986-B71
For use in Denmark	L83986-081	For use in the Netherlands	L83986-B31	For use in Switzerland	L83986-BG1
For use in Denmark, Finland, and Norway	L83986-DH1	For use in Northwest Africa	L83986-FP1	For use in Taiwan	L83986-AB1
For use in France	L83986-051	For use in Norway	L83986-091	For use in Thailand	L83986-281
For use in Germany	L83986-041	For use in Portugal	L83986-131	For use in Turkey	L83986-141
For use in Greece	L83986-151	For use in Romania	L83986-271	For use in the United Kingdom	L83986-031
For use in Hungary	L83986-211	For use in Russia	L83986-251	For use in the United States	L83986-001
Keyboard/top cover without webcam in dusk blue finish (includes keyboard cable):		For use in Iceland	L83984-DD1	For use in Saudi Arabia	L83984-171
For use in Belgium	L83984-A41	For use in India	L83984-D61	For use in Slovenia	L83984-BA1
For use in Bulgaria	L83984-261	For use in Israel	L83984-BB1	For use in South Korea	L83984-AD1
For use in Canada	L83984-DB1	For use in Italy	L83984-061	For use in Spain	L83984-071

Table 5-1 Keyboard/top cover spare part information (continued)

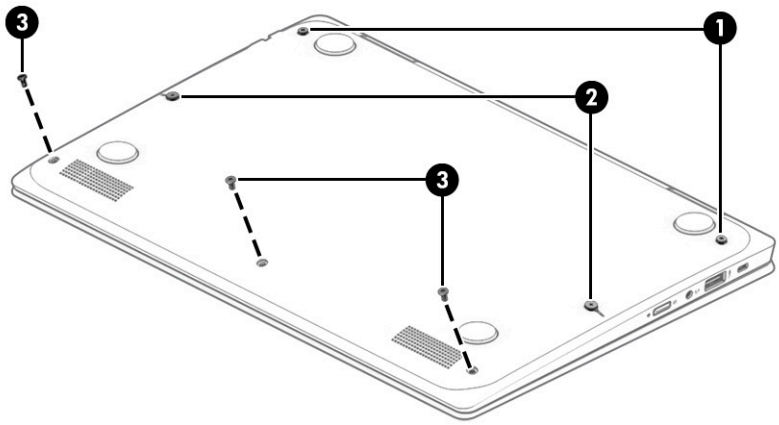
For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
For use in the Czech Republic and Slovakia	L83984-FL1	For use in Latin America	L83984-161	For use in Sweden and Finland	L83984-B71
For use in Denmark	L83984-081	For use in the Netherlands	L83984-B31	For use in Switzerland	L83984-BG1
For use in Denmark, Finland, and Norway	L83984-DH1	For use in Northwest Africa	L83984-FP1	For use in Taiwan	L83984-AB1
For use in France	L83984-051	For use in Norway	L83984-091	For use in Thailand	L83984-281
For use in Germany	L83984-041	For use in Portugal	L83984-131	For use in Turkey	L83984-141
For use in Greece	L83984-151	For use in Romania	L83984-271	For use in the United Kingdom	L83984-031
For use in Hungary	L83984-211	For use in Russia	L83984-251	For use in the United States	L83984-001
Keyboard/top cover with webcam in chalkboard gray finish (includes keyboard cable):		For use in Iceland	L83985-DD1	For use in Saudi Arabia	L83985-171
For use in Belgium	L83985-A41	For use in India	L83985-D61	For use in Slovenia	L83985-BA1
For use in Bulgaria	L83985-261	For use in Israel	L83985-BB1	For use in South Korea	L83985-AD1
For use in Canada	L83985-DB1	For use in Italy	L83985-061	For use in Spain	L83985-071
For use in the Czech Republic and Slovakia	L83985-FL1	For use in Latin America	L83985-161	For use in Sweden and Finland	L83985-B71
For use in Denmark	L83985-081	For use in the Netherlands	L83985-B31	For use in Switzerland	L83985-BG1
For use in Denmark, Finland, and Norway	L83985-DH1	For use in Northwest Africa	L83985-FP1	For use in Taiwan	L83985-AB1
For use in France	L83985-051	For use in Norway	L83985-091	For use in Thailand	L83985-281
For use in Germany	L83985-041	For use in Portugal	L83985-131	For use in Turkey	L83985-141
For use in Greece	L83985-151	For use in Romania	L83985-271	For use in the United Kingdom	L83985-031
For use in Hungary	L83985-211	For use in Russia	L83985-251	For use in the United States	L83985-001
Keyboard/top cover without webcam in chalkboard gray finish (includes keyboard cable):		For use in Iceland	L83983-DD1	For use in Saudi Arabia	L83983-171
For use in Belgium	L83983-A41	For use in India	L83983-D61	For use in Slovenia	L83983-BA1
For use in Bulgaria	L83983-261	For use in Israel	L83983-BB1	For use in South Korea	L83983-AD1
For use in Canada	L83983-DB1	For use in Italy	L83983-061	For use in Spain	L83983-071
For use in the Czech Republic and Slovakia	L83983-FL1	For use in Latin America	L83983-161	For use in Sweden and Finland	L83983-B71

Table 5-1 Keyboard/top cover spare part information (continued)

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
For use in Denmark	L83983-081	For use in the Netherlands	L83983-B31	For use in Switzerland	L83983-BG1
For use in Denmark, Finland, and Norway	L83983-DH1	For use in Northwest Africa	L83983-FP1	For use in Taiwan	L83983-AB1
For use in France	L83983-051	For use in Norway	L83983-091	For use in Thailand	L83983-281
For use in Germany	L83983-041	For use in Portugal	L83983-131	For use in Turkey	L83983-141
For use in Greece	L83983-151	For use in Romania	L83983-271	For use in the United Kingdom	L83983-031
For use in Hungary	L83983-211	For use in Russia	L83983-251	For use in the United States	L83983-001

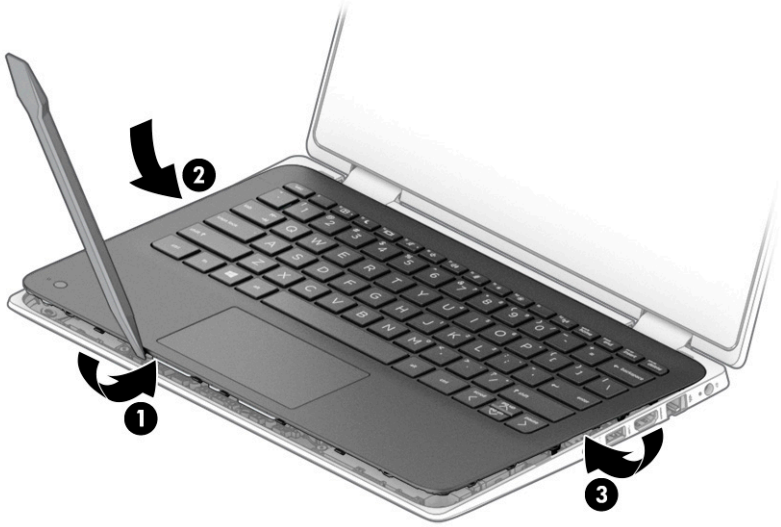
Remove the keyboard/top cover:

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. Close the computer and position it upside down.
5. Remove the two Torx8 M2.5×9.2 screws (1) that secure the keyboard/top cover to the bottom cover.
6. Remove the two Phillips M2.5×6.8 screws (2) that secure the keyboard/top cover to the bottom cover.
7. Remove the three Torx8 M2.5×5.2 screws (3) that secure the keyboard/top cover to the bottom cover.

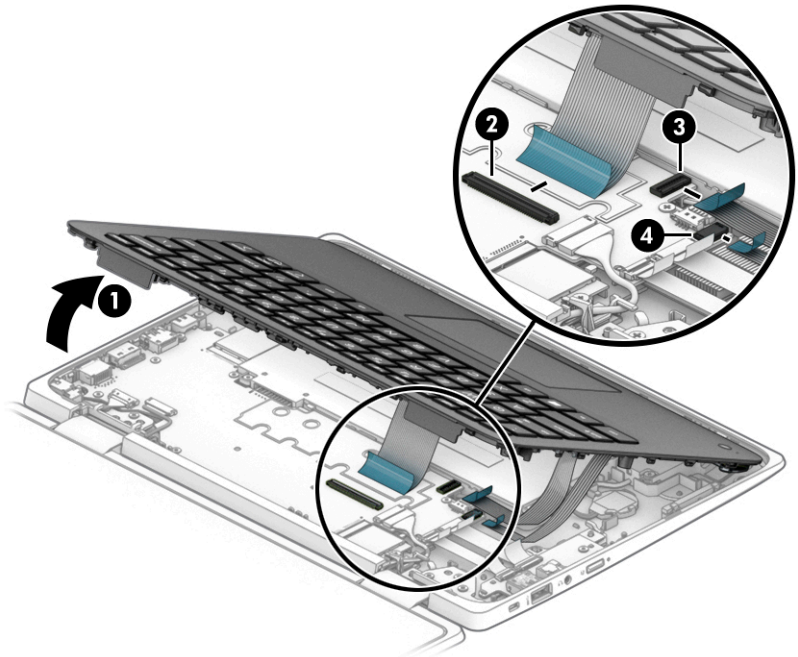


8. Turn the computer right side up with the front toward you.
9. Open the computer.
10. Use a case utility tool (1) or similar thin plastic tool to separate the front edge of the keyboard/top cover from the bottom cover.
11. Use a case utility tool or similar thin plastic tool to separate the left side (2) of the keyboard/top cover from the bottom cover.

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

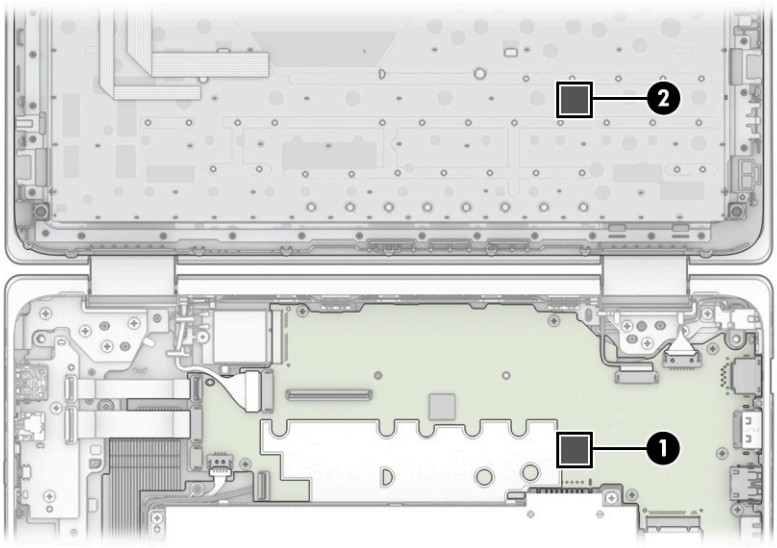


13. Lift the rear edge of the keyboard/top cover **(1)** as far as the keyboard cable, transfer board cable, and touchpad cable allow.
14. Release the zero insertion force (ZIF) connector **(2)** to which the keyboard cable is connected, and then disconnect the keyboard cable from the system board.
15. Release the ZIF connector **(3)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the system board.
16. Release the ZIF connector **(4)** to which the transfer board cable is connected, and then disconnect the transfer board cable from the system board.

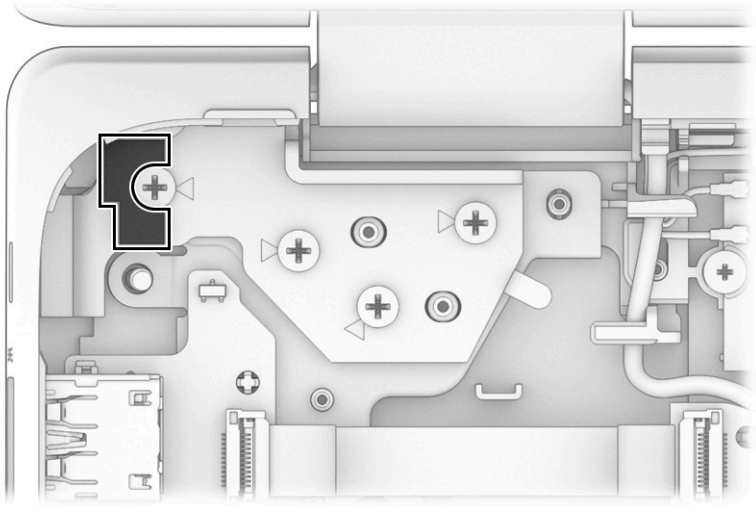


17. Remove the keyboard/top cover.

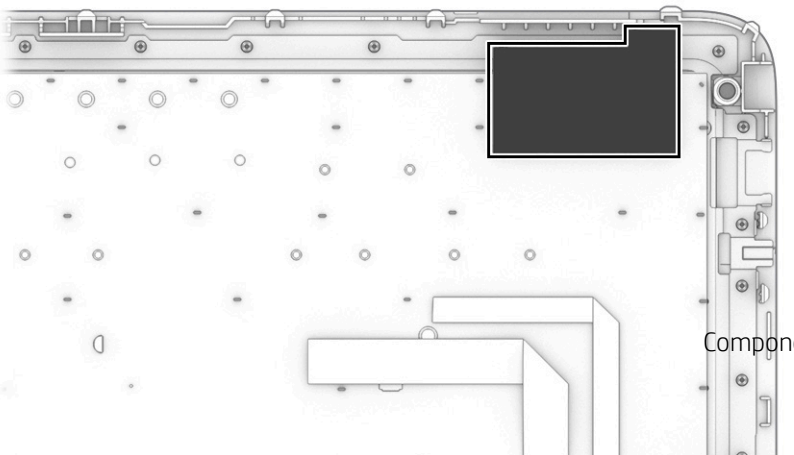
Each time the keyboard/top cover is removed, thoroughly clean the thermal pad material from the USB hub **(1)** and the keyboard/top cover **(2)**. Replacement USB hub thermal pads are available in the Miscellaneous Kit, spare part number L83978-001.



Each time the keyboard/top cover is removed, inspect the display left hinge area to ensure that the bumper is correctly installed on the display left hinge as shown in the following illustration. The bumper is included in the Miscellaneous Kit, spare part number L83978-001.



Each time the keyboard/top cover is removed, inspect the back of the keyboard to ensure that the keyboard sponge is correctly installed in the upper right corner as shown in the following illustration. The keyboard sponge is included in the Miscellaneous Kit, spare part number L83978-001.



Reverse this procedure to install the keyboard/top cover.

Touchpad cable

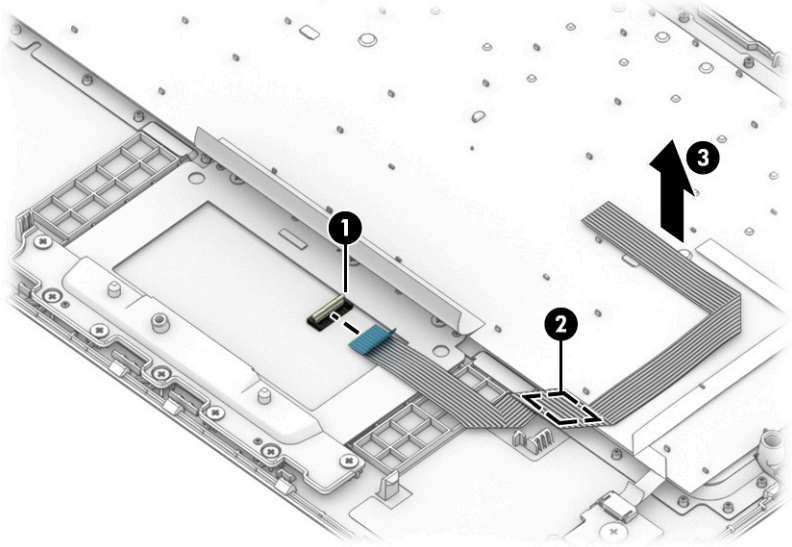
NOTE: The touchpad cable is included in the Cable Kit, spare part number L83959-001.

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 keyboard/top cover (see Keyboard/top cover on page 29).

Remove the touchpad cable:

1. Turn the keyboard/top cover upside down with the front toward you.
2. Release the ZIF connector **(1)** to which the touchpad cable is connected, and then disconnect the touchpad cable from the touchpad.
3. Detach the touchpad cable **(2)** from the keyboard/top cover. (The touchpad cable is attached to the keyboard/top cover with double-sided adhesive.)
4. Remove the touchpad cable **(3)**.



Reverse this procedure to install the touchpad cable.

Touchpad

Table 5-2 Touchpad spare part information

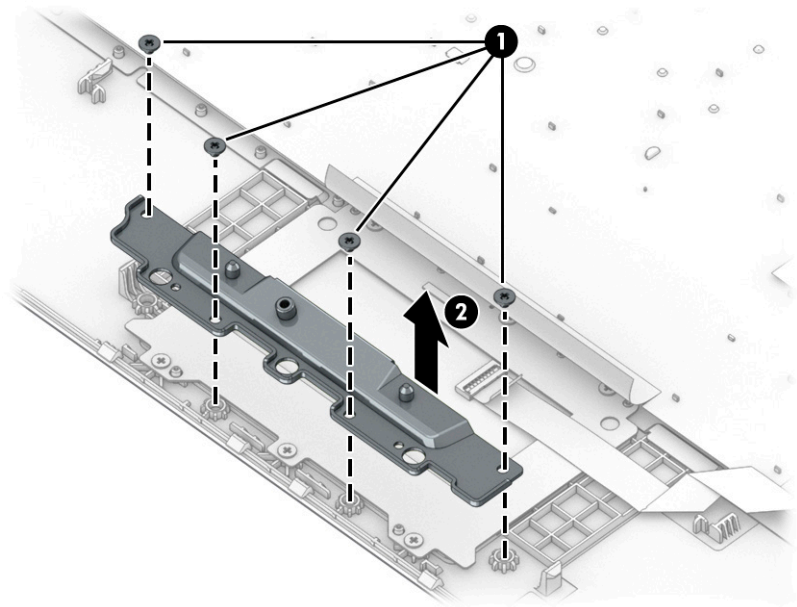
Description	Spare part number
Touchpad in dusk blue finish	L83980-001
Touchpad in chalkboard gray finish	L83979-001
Touchpad bracket (included in the Bracket Kit, spare part number L83966-001)	
Touchpad cable (included in the Cable Kit, spare part number L83959-001)	

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 keyboard/top cover (see Keyboard/top cover on page 29).

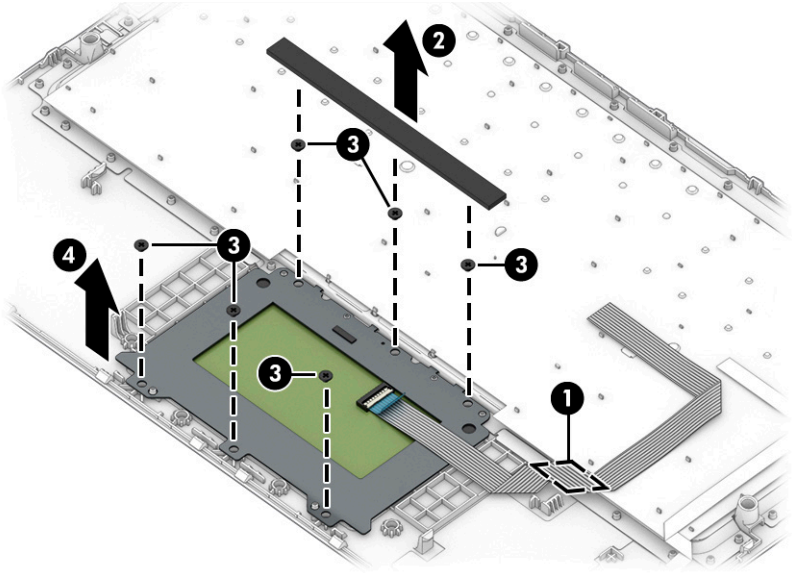
Remove the touchpad:

1. Turn the keyboard/top cover upside down with the front toward you.
2. Remove the four Phillips M2.0×2.8 screws **(1)** that secure the touchpad bracket to the touchpad, and then remove the touchpad bracket **(2)**.



3. Detach the touchpad cable **(1)** from the keyboard/top cover. (The touchpad cable is attached to the keyboard/top cover with double-sided adhesive.)
4. Remove the rubber pad **(2)** that covers the three touchpad screws.
5. Remove the six Phillips M2.0×3.2 screws **(3)** that secure the touchpad to the keyboard/top cover.

6. Remove the touchpad **(4)** and cable.



Reverse this procedure to install the touchpad.

Transfer board cable

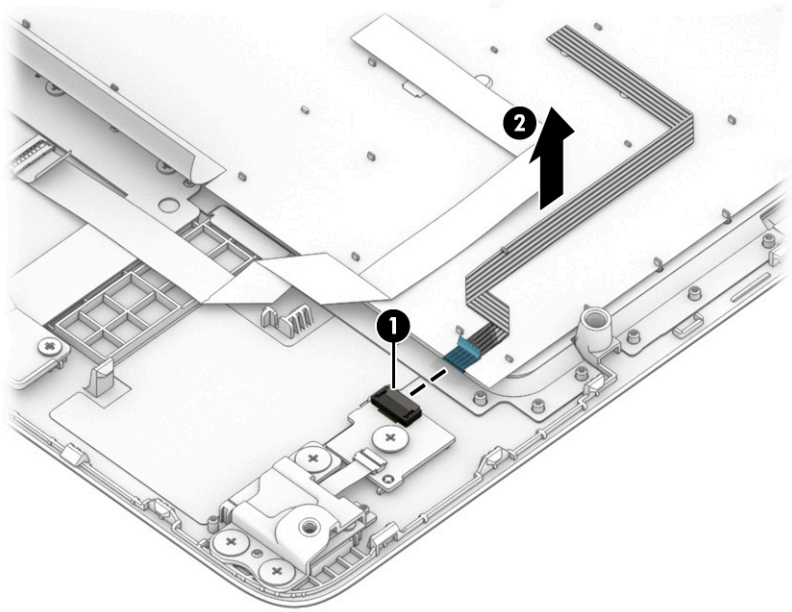
NOTE: The transfer board cable is included in the Cable Kit, spare part number L83959-001.

Before removing the transfer board cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the keyboard/top cover (see Keyboard/top cover on page 29).

Remove the transfer board cable:

1. Turn the keyboard/top cover upside down with the front toward you.
2. Release the ZIF connector **(1)** to which the transfer board cable is connected, and then disconnect the transfer board cable from the transfer board.
3. Remove the transfer board cable **(2)**.



Reverse this procedure to install the transfer board cable.

Transfer board and webcam module

Table 5-3 Transfer board and webcam module spare part information

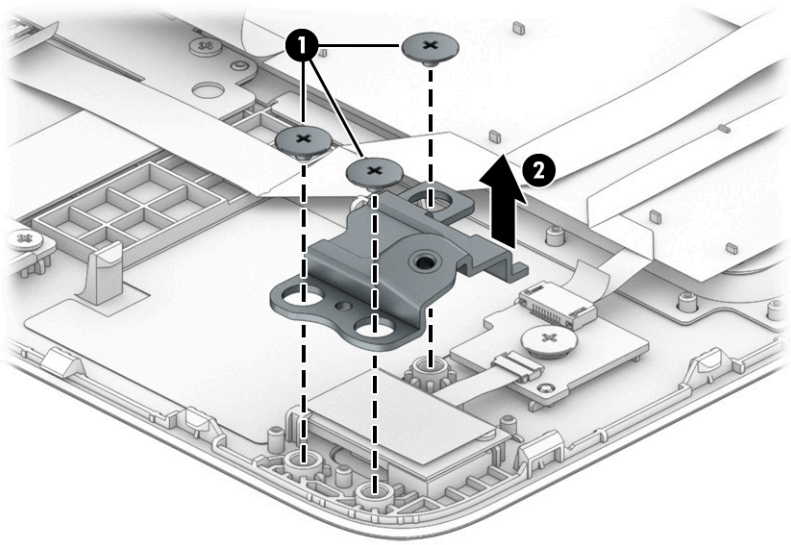
Description	Spare part number
Transfer board	L83968-001
Transfer board cable (included in the Cable Kit, spare part number L83959-001)	
Webcam module	L83975-001
Webcam module bracket (included in the Bracket Kit, spare part number L83966-001)	

Before removing the transfer board and webcam 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 keyboard/top cover (see Keyboard/top cover on page 29).

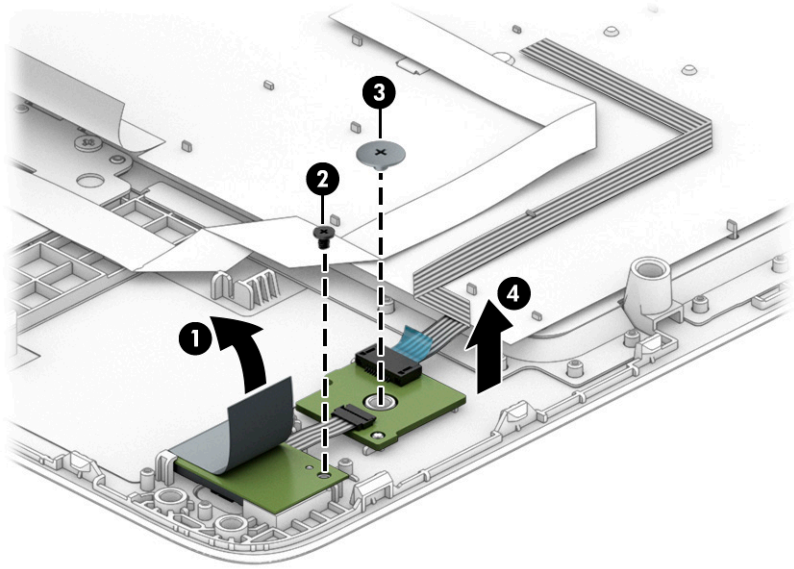
Remove the transfer board and webcam module:

1. Turn the keyboard/top cover upside down with the front toward you.
2. Remove the three Phillips M2.0×2.5 broad head screws **(1)** that secure the transfer board bracket to the keyboard/top cover.
3. Remove the transfer board bracket **(2)**.



4. Detach the shielding **(1)** that is attached to the webcam module.
5. Remove the Phillips M1.5×2.4 screw **(2)** that secures the webcam module to the keyboard/top cover.
6. Remove the Phillips M2.0×2.8 broad head screw **(3)** that secures the transfer board bracket to the keyboard/top cover.

7. Remove the webcam module **(4)** and cable and the transfer board and cable.



Reverse this procedure to install the transfer board and the webcam module.

Battery

Table 5-4 **Battery spare part information**

Description	Spare part number
Battery (3-cell, 48-WHr, 4.21-AHr, Li-Ion; includes cable)	L12791-852

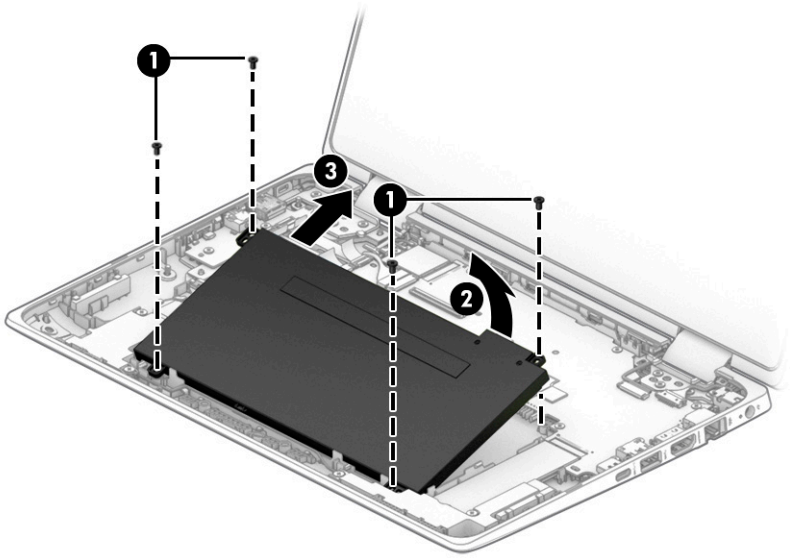
Before removing the battery, follow these steps:

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 keyboard/top cover (see Keyboard/top cover on page 29).

Remove the battery:

1. Remove the four Phillips M2.5×4.4 screws **(1)** that secure the battery to the bottom cover.
2. Lift the rear edge of the battery **(2)** and swing it up and forward until it disconnects from the system board.

3. Remove the battery (3) by sliding it back at an angle.



Reverse this procedure to install the battery.

WLAN module

Table 5-5 WLAN module spare part information

Description	Spare part number
Intel Wi-Fi 6 AX200 ax 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro	L22634-002
Intel 9560 ac 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro	L35282-002

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

Before removing the WLAN module, follow these steps:

1. 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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

Remove the WLAN module:

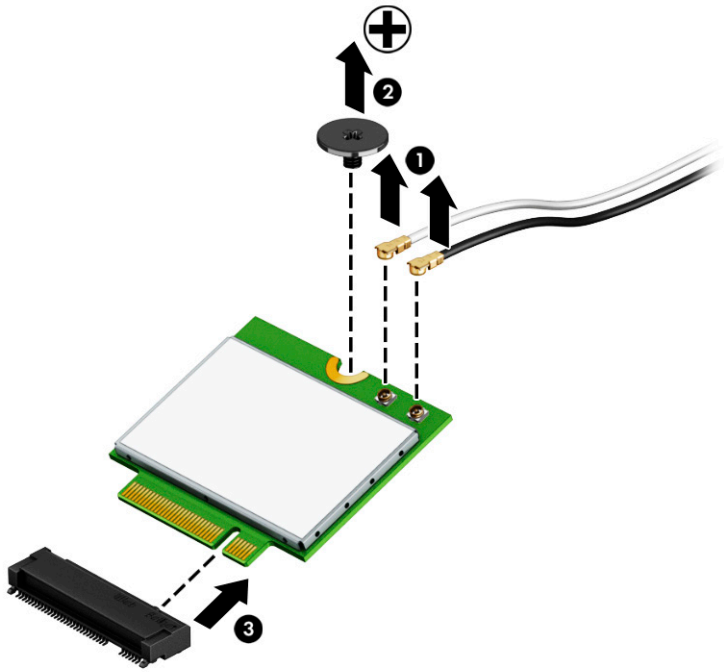
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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

2. Remove the Phillips M2.0×4.4 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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

NOTE: WLAN modules are notched to prevent incorrect installation.



Reverse this procedure to install the WLAN module.

Speakers

Table 5-6 Speaker spare part information

Description	Spare part number
Speakers (include left and right speakers, cables, and four rubber isolators)	L83971-001

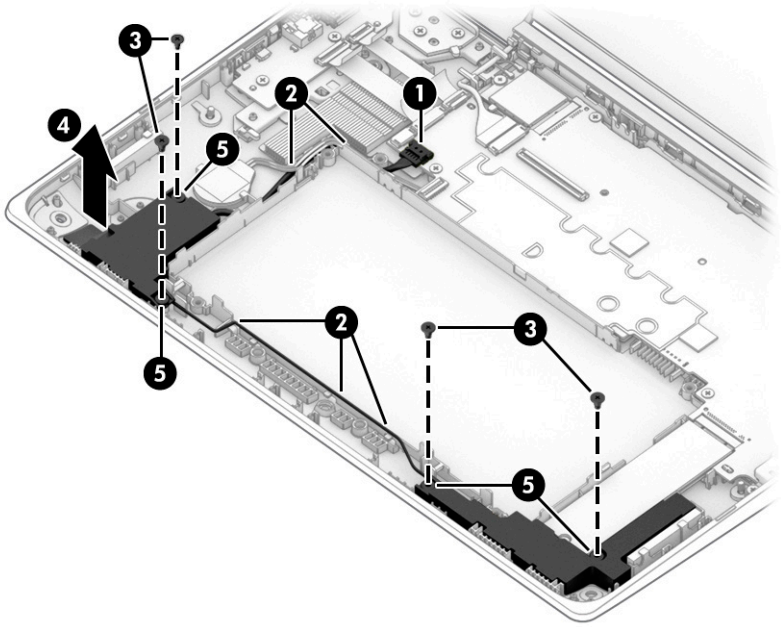
Before removing the speakers, follow these steps:

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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

Remove the speakers:

1. Disconnect the speaker cable **(1)** from the system board.
2. Release the speaker cables from the retention clips **(2)** and routing channel built into the bottom cover.
3. Remove the four Phillips M2.5×4.9 screws **(3)** that secure the speakers to the bottom cover.
4. Remove the speakers **(4)**.

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



Reverse this procedure to install the speakers.

RTC battery

Table 5-7 RTC battery spare part information

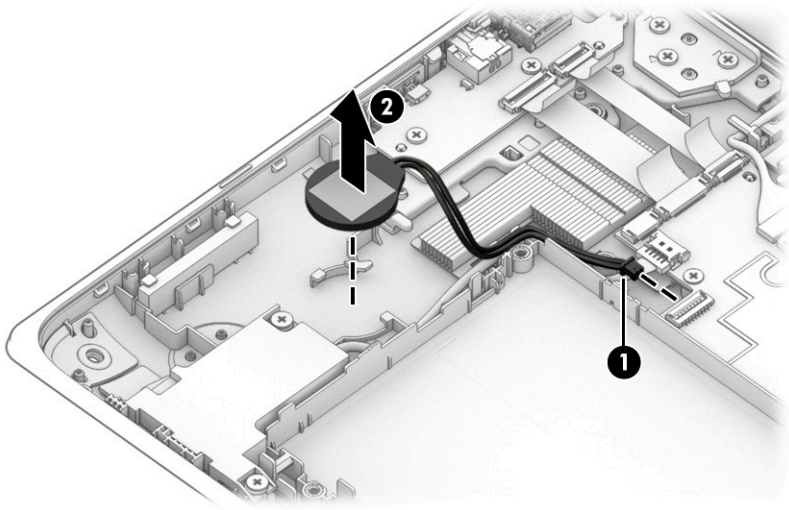
Description	Spare part number
RTC battery (includes cable and double-sided adhesive)	L43797-001

Before removing the RTC 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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

Remove the RTC battery:

1. Disconnect the RTC battery cable **(1)** from the system board.
2. Detach the RTC battery from the bottom cover **(2)**. (The RTC battery is attached to the bottom cover with double-sided adhesive.)



Reverse this procedure to install the RTC battery.

USB/audio board cables

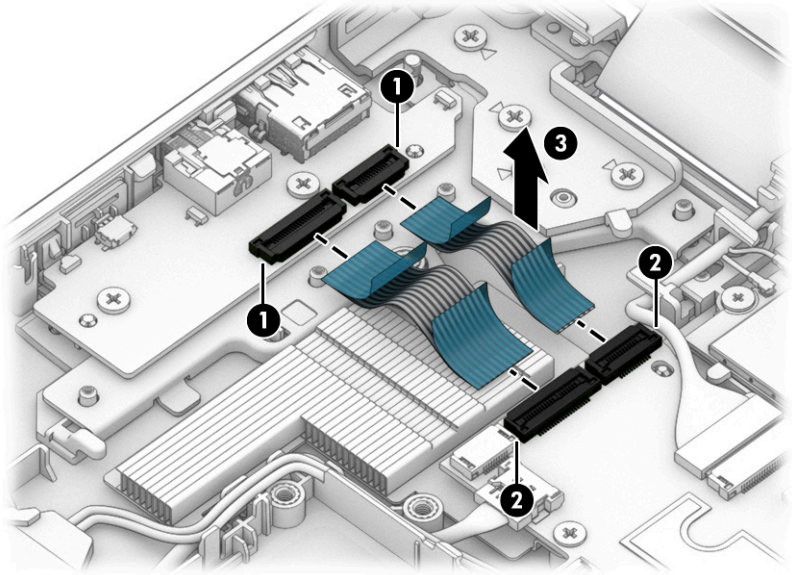
NOTE: The USB/audio board cables are included in the Cable Kit, spare part number L83959-001.

Before removing the USB/audio board cables, 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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

Remove the USB/audio board cables:

1. Release the ZIF connectors **(1)** to which the USB/audio board cables are connected, and then disconnect the USB/audio board cables from the USB/audio board.
2. Release the ZIF connectors **(2)** to which the USB/audio board cables are connected, and then disconnect the USB/audio board cables from the system board.
3. Remove the USB/audio board cables **(3)**.



Reverse this procedure to install the USB/audio board cables.

USB/audio board

Table 5-8 USB/audio board spare part information

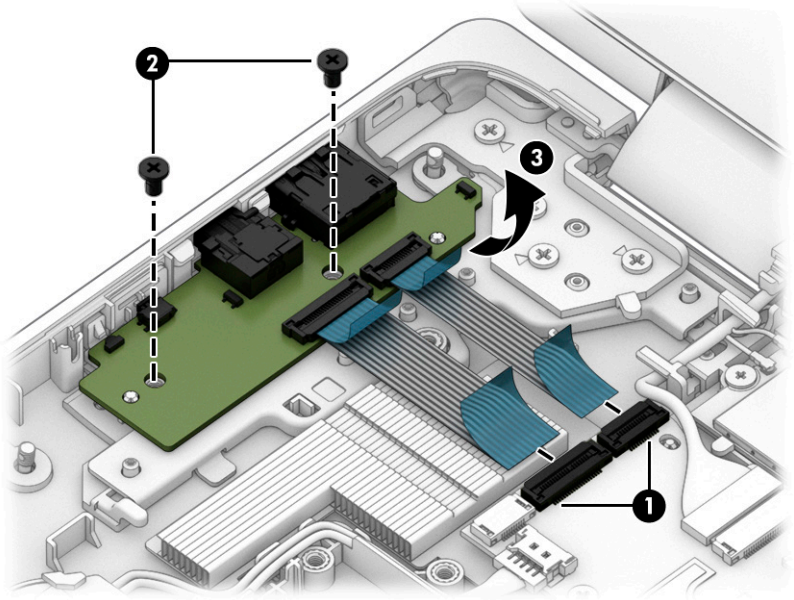
Description	Spare part number
USB/audio board (includes audio jack and USB port and rubber bumper)	L84410-001

Before removing the USB/audio 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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

Remove the USB/audio board:

1. Release the ZIF connectors **(1)** to which the USB/audio board cables are connected, and then disconnect the USB/audio board cables from the system board.
2. Remove the two Phillips M2.0×4.4 screws **(2)** that secure the USB/audio board to the bottom cover.
3. Lift the right side of the USB/audio board **(3)** and swing it up and to the left to remove it.



Reverse this procedure to install the USB/audio board.

Power connector cable

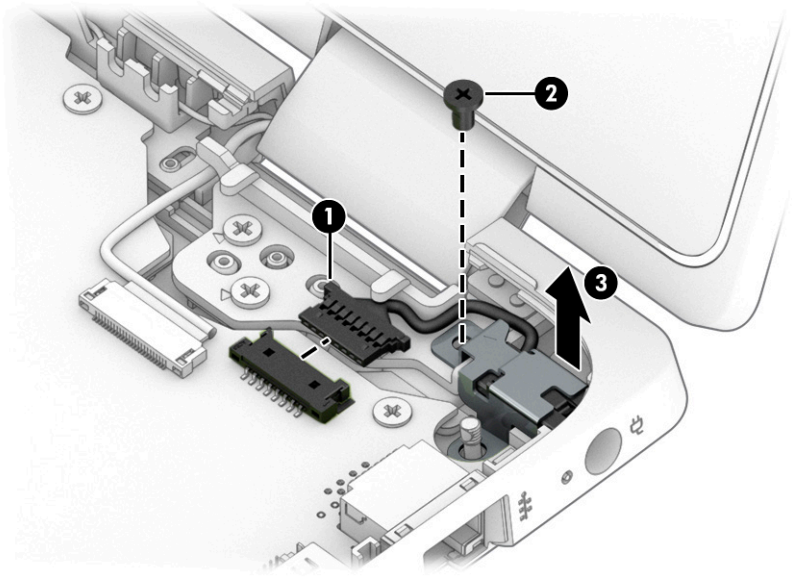
NOTE: The power connector cable is included in the Cable Kit, spare part number L83959-001.

Before removing the power connector cable, follow these steps:

1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

Remove the power connector cable:

1. Disconnect the power connector cable **(1)** from the system board.
2. Remove the Torx8 M2.5×5.2 screw **(2)** that secures the power connector cable to the bottom cover.
3. Remove the power connector cable **(3)** and bracket.



Reverse this procedure to install the power connector cable and bracket.

System board

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

Table 5-9 System board spare part information

Description	Spare part number
Equipped with an Intel Pentium Silver N5030 processor, 8 GB of system memory, and the Windows 10 operating system	L83951-601
Equipped with an Intel Pentium Silver N5030 processor, 8 GB of system memory, and a non-Windows operating system	L83951-001
Equipped with an Intel Pentium Silver N5030 processor, 4 GB of system memory, and the Windows 10 operating system	L83950-001
Equipped with an Intel Pentium Silver N5030 processor, 4 GB of system memory, and a non-Windows operating system	L83950-001
Equipped with an Intel Pentium N5000 processor, 8 GB of system memory, and the Windows 10 operating system	L83957-601
Equipped with an Intel Pentium N5000 processor, 8 GB of system memory, and a non-Windows operating system	L83957-001
Equipped with an Intel Pentium N5000 processor, 4 GB of system memory, and the Windows 10 operating system	L83956-601
Equipped with an Intel Pentium N5000 processor, 4 GB of system memory, and a non-Windows operating system	L83956-001
Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83948-601
Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83948-001
Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, and the Windows 10 operating system	L83949-601
Equipped with an Intel Celeron N4120 processor, 4 GB of system memory, and a non-Windows operating system	L83949-001
Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83954-601
Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83954-001
Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, and the Windows 10 operating system	L83955-601
Equipped with an Intel Celeron N4100 processor, 4 GB of system memory, and a non-Windows operating system	L83955-001
Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83946-601
Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83946-001
Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, and the Windows 10 operating system	L83947-601
Equipped with an Intel Celeron N4020 processor, 4 GB of system memory, and a non-Windows operating system	L83947-001
Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, 64 GB of eMMC system storage, and the Windows 10 operating system	L83952-601
Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, 64 GB of eMMC system storage, and a non-Windows operating system	L83952-001
Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, and the Windows 10 operating system	L83953-601
Equipped with an Intel Celeron N4000 processor, 4 GB of system memory, and a non-Windows operating system	L83952-001

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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

When replacing the system board, be sure to remove the WLAN module (see WLAN module on page 42) and heat sink (see Heat sink on page 52) 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) USB/audio board audio ZIF connector cable

   (2) Webcam ZIF connector cable

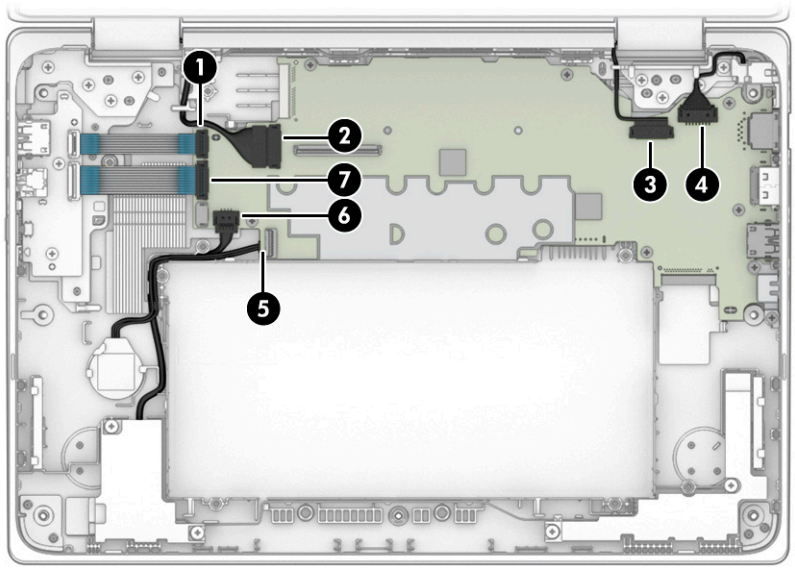
   (3) Display panel ZIF connector cable

   (4) Power connector cable

   (5) RTC battery cable

   (6) Speaker cable

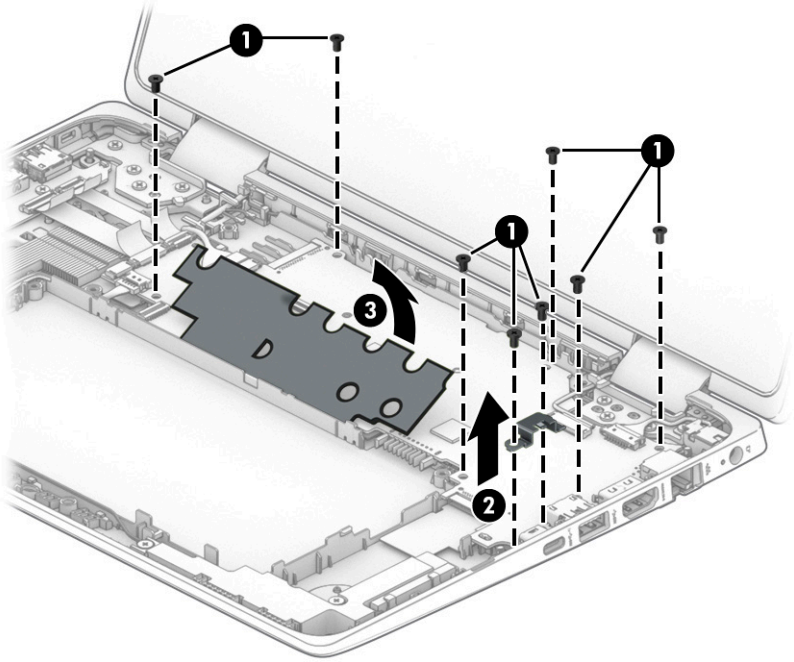
   (7) USB/audio board USB ZIF connector cable



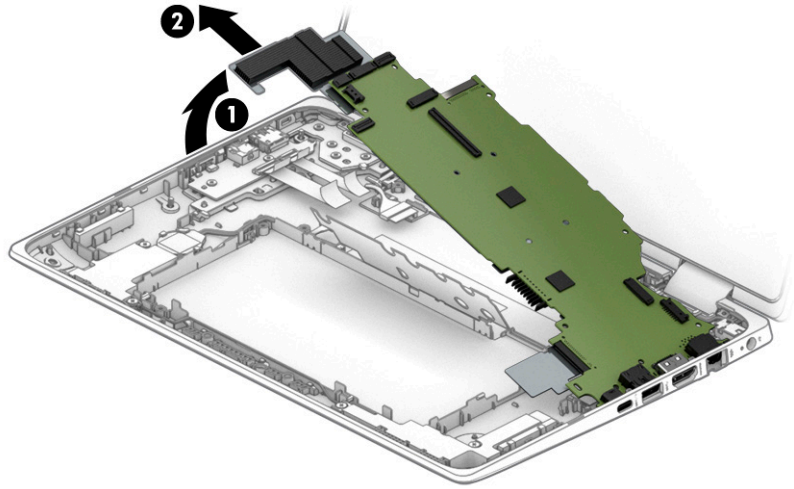
2. Remove the eight Phillips M2.5×4.4 screws **(1)** that secure the system board to the bottom cover.
3. Remove the USB port bracket **(2)**.

   The USB port bracket is included in the Bracket Kit, spare part number L83966-001.

4. Release the shielding (3) that secures the system board to the bottom cover.



5. Lift the left side the system board (1) until it rests at an angle.
6. Remove the system board (2) by sliding it up and to the left at an angle.



Reverse this procedure to install the system board.

Heat sink

Table 5-10 Heat sink spare part information

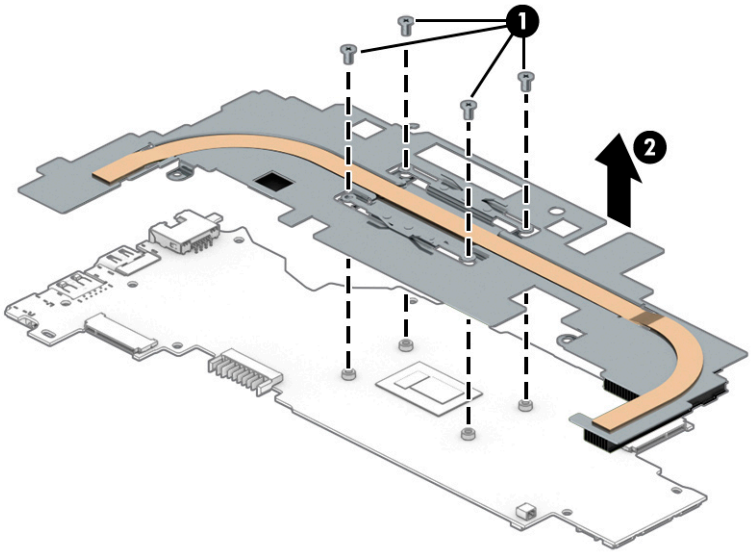
Description	Spare part number
Heat sink (includes replacement thermal material)	L83958-001

Before removing the heat sink, follow these steps:

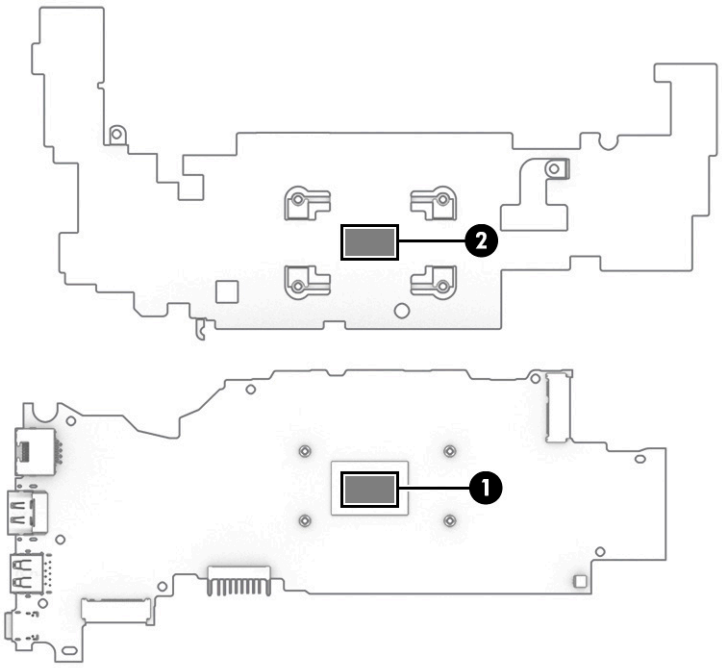
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).
6. Disconnect the system board (see System board on page 49).

Remove the heat sink:

1. Remove the four Phillips M2.0×3.3 screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.



Each time the heat sink is removed, thoroughly clean the thermal material from the processor component **(1)** and the surface of the heat sink **(2)**. Replacement thermal material is included with the heat sink and system board spare part kits.



Reverse this procedure to install the heat sink.

Display assembly

Table 5-11 Display assembly spare part information

Description	Spare part number
11.6-in, HD, LED, UWVA, TouchScreen display assembly with HD webcam (220 nits) in dusk blue finish	L83963-001
11.6-in, HD, LED, UWVA, TouchScreen display assembly with HD webcam (220 nits) in chalkboard gray finish	L83961-001
11.6-in, HD, LED, SVA, TouchScreen display assembly with non-HD webcam (220 nits) in dusk blue finish	L83961-001
11.6-in, HD, LED, SVA, TouchScreen display assembly with non-HD webcam (220 nits) in chalkboard gray finish	L83960-001

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 keyboard/top cover (see Keyboard/top cover on page 29).
5. Remove the battery (see Battery on page 40).

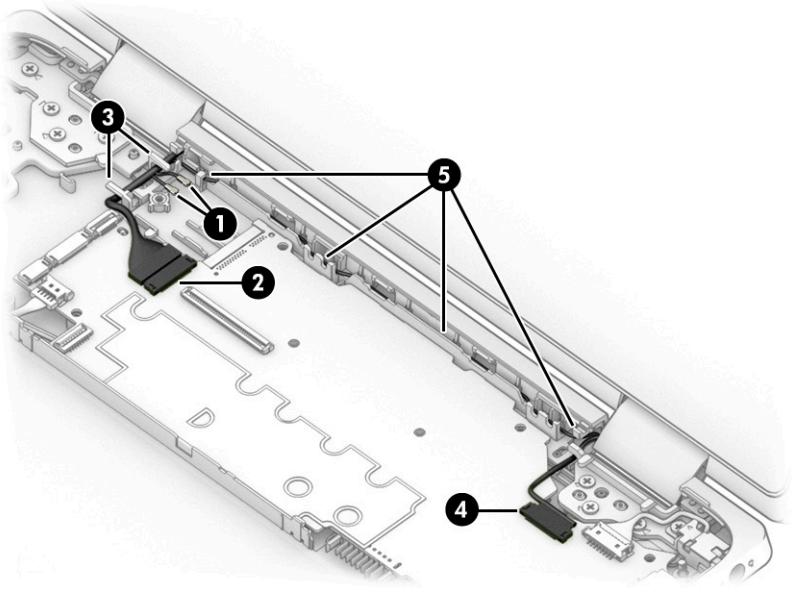
Remove the display assembly:

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

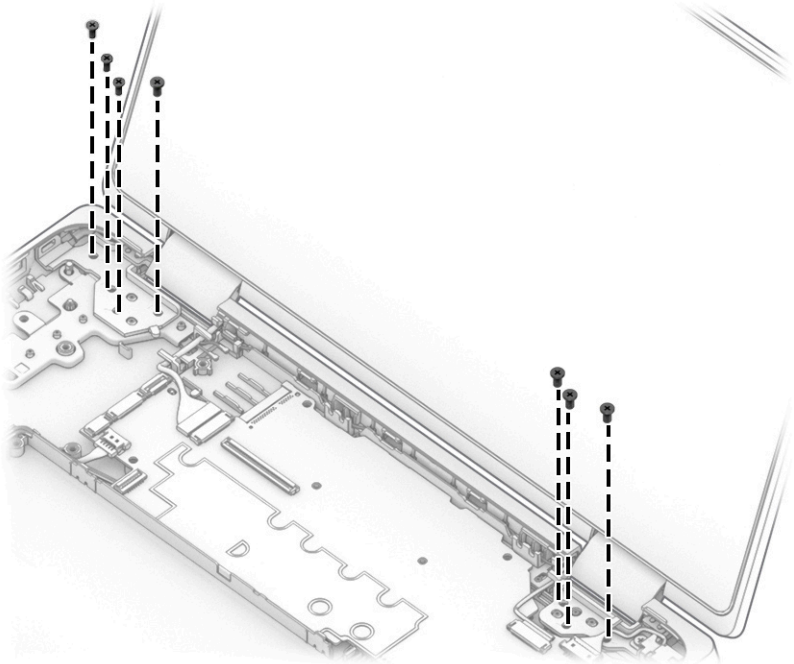
NOTE: The #1/white WLAN antenna cable connects to the WLAN module **#1/Main** terminal. The #2/ black WLAN antenna cable connects to the WLAN module **#2/Aux** terminal.

2. Release the ZIF connector **(2)** to which the webcam cable is connected, and then disconnect the webcam cable from the system board.
3. Release the webcam cable from the retention clips **(3)** built into the bottom cover.
4. Release the ZIF connector **(4)** to which the display panel cable is connected, and then disconnect the display panel cable from the system board.

5. Release the display panel cable from the retention clips **(5)** and routing channel built into the bottom cover.



6. Remove the seven Torx8 M2.5×5.2 screws that secure the display assembly to the bottom cover.



7. Rotate the display assembly **(1)** tclockwise until the display hinges separate from the bottom cover.

8. Remove the display assembly (2).

Reverse this procedure to install the display assembly.

6 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 57).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 57).
- **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 57).
- **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 57).

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.

To download the tool:

▲ Go to the Microsoft Store and search for HP Cloud Recovery.

For details, go to http://www.hp.com/support, search for HP Cloud Recovery, and then select "HP PCs – Using the Cloud Recovery Tool (Windows 10, 7)."

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 57.

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 57.

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.

Using HP Sure Recover (select products only)

Select computer models are configured with HP Sure Recover, a PC OS recovery solution built into the hardware and firmware. HP Sure Recover can fully restore the HP OS image without installed recovery software.

Using HP Sure Recover, an administrator or user can restore the system and install:

- Latest version of the operating system
- Platform-specific device drivers
- Software applications, in the case of a custom image

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

7 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.

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, choose one of the following methods:

- To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

- To save your changes and exit Computer Setup menus, select **Main**, select **Save Changes and Exit**, and then select **Yes**.

NOTE: If you are using arrow keys to highlight your choice, you must 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 60.
2. Select **Main**, select **Apply Factory Defaults and Exit**, and then select **Yes**.

NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Computer Setup. See Starting Computer Setup on page 60.
2. Select **Main**, and then select **System Information**.
3. To exit Computer Setup menus without saving your changes, select **Main**, select **Ignore Changes and Exit**, and then select **Yes**.

NOTE: If you are using arrow keys to highlight your choice, you must then press enter.

To check for later BIOS versions, see Downloading a BIOS update on page 61.

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 60.
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.

8 Specifications

Table 8-1 Specifications

	Metric	U.S.
Dimensions		
Width	**325.5 mm**	12.81 in
Depth	**227 mm**	8.93 in
Height	**16.05 mm**	0.63 in
Weight	**1680 g**	3.7 lb
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**–20°C to 60°C**	–4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**–15 m to 3,048 m**	–50 ft to 10,000 ft
Nonoperating	**–15 m to 12,192 m**	–50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

9 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

HP PC Hardware Diagnostics Windows is a Windows-based utility that allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs within the Windows operating system in order to diagnose hardware failures.

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 65.

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from HP Help and Support or HP Support Assistant.

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:

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

   b. Select **HP PC Hardware Diagnostics Windows**.

   – or –

   To access HP PC Hardware Diagnostics Windows from HP Support Assistant:

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

      – or –

      Select the question mark icon in the taskbar.

   b. Select **Troubleshooting and fixes**.

   c. Select **Diagnostics**, and then select **HP PC Hardware Diagnostics Windows**.

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

NOTE: If you need to stop a diagnostic test at any time, select **Cancel**.

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. The screen displays one of the following options:

- A Failure ID link is displayed. Select the link and follow the on-screen instructions.
- A Quick Response (QR) code is displayed. With a mobile device, scan the code and then follow the on-screen instructions.
- Instructions for calling support are displayed. Follow those instructions.

Downloading HP PC Hardware Diagnostics Windows

- The HP PC Hardware Diagnostics Windows download instructions are provided in English only.
- You must use a Windows computer to download this tool because only .exe files are provided.

Downloading the latest HP PC Hardware Diagnostics Windows version

To download HP PC Hardware Diagnostics Windows, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. Select **Download HP Diagnostics Windows**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

Downloading HP Hardware Diagnostics Windows by product name or number (select products only)

NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version to be downloaded to your computer or USB flash drive.

The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, follow these steps:

- Navigate to the folder on your computer or the USB flash drive where the .exe file was downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 67.

HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface) 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.

If your PC does not start in Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in solving the problem:

- Select **Get Support**, and then use a mobile device to scan the QR code that displays on the next screen. The HP Customer Support - Service Center page appears with your Failure ID and product number automatically filled in. Follow the on-screen instructions.

  – or –

  Contact support, and provide the Failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

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 flash drive

   NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 67.

   b. Hard drive

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in the following situations:

- HP PC Hardware Diagnostics UEFI is not included in the preinstallation image.
- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.
- The hard drive is damaged.

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 provided.

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive:

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

Downloading HP PC Hardware Diagnostics UEFI by product name or number (select products only)

NOTE: For some products, you might have to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics UEFI by product name or number (select products only) to a USB flash drive:

1. Go to http://www.hp.com/support.
2. Enter the product name or number, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

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

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it might upload results to a preconfigured server. For more information about Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

NOTE: HP Remote PC Hardware Diagnostics UEFI is also available as a Softpaq that can be downloaded to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

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

Downloading Remote HP PC Hardware Diagnostics UEFI by product name or number

NOTE: For some products, it may be necessary to download the software by using the product name or number.

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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.

To customize Remote HP PC Hardware Diagnostics UEFI settings, follow these steps:

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.

10 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

Table 10-1 Troubleshooting steps for 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 MB	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 Computer Setup (BIOS), or by changing the Microsoft® Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KB (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 must be used 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 MB	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 must be used for writing data to this memory and is available on the HP website; go to http://www.hp.com/support. Select **Find your**

Table 10-1 Troubleshooting steps for nonvolatile memory usage (continued)

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?
						product, and then follow 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 MB or 7 MB	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 must be used for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash (select products only)	2 Mb	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 must be used for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 Kb to 8 Kb	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility must be used 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 Kb	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 must be used 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 KB 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 must be used 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.

11 Power cord set requirements

The wide-range input feature of the computer permits it to operate from any line voltage from 100 to 120 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

Table 11-1 Power cord requirements

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.

Table 11-1 Power cord requirements (continued)

Country/region	Accredited agency	Applicable note number

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.
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.

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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