Maintenance and Service Guide

SUMMARY

This guide provides information about spare parts, removal and replacement of parts, security, backing up, and more.

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Product notice

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

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

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

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

Reduce the possibility of heat-related injuries or of overheating the computer by following the practices described.

⚠ WARNING! To reduce the possibility of heat-related injuries or of overheating the computer, do not place the computer directly on your lap or obstruct the computer air vents. Use the computer 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 come into contact with the skin or a soft surface, such as pillows or rugs or clothing, during operation. The computer and the AC adapter comply with the user-accessible surface temperature limits defined by applicable safety standards.

Table of contents

1 Product description

This table provides detailed product information.

Table 1-1 Product components and their descriptions

Category	Description
Product Name	HP EliteBook x360 1040 G7 Notebook PC
	Model number: 14-xxxxxx
	CTO model number: 14t-xx0xxx, 14t-xx1xxx
Processors	Intel® Core® i7-10810U 1.1 GHz (6 cores, 2666 MHz, 15 W)
	Intel Core i7-10710U 1.1 GHz (6 cores, 2666 MHz, 15 W)
	Intel Core i7-10610U 1.8 GHz (4 cores, 2666 MHz, 15 W)
	Intel Core i5-10310U 1.7 GHz (4 cores, 2666 MHz, 15 W)
	Intel Core i5-10210U 1.7 GHz (4 cores, 2666 MHz, 15 W)
Display	**39.6 cm (14.0 in), UWVA**
	Liquid crystal display (LCD), 14.0 in, ultra high-definition (UHD) (3840×2160), BrightView, white light-emitting diode (WLED), sRGB 95%, 550, eDP 1.4+PSR2, ultraslim touchscreen display panel; typical brightness: 400 nits
	LCD, 14.0 in, full high-definition (FHD) (1920×1080) BrightView, WLED, 72%, eDP+PSR, Sure View Reflect, ultraslim touchscreen display panel; typical brightness: 1000 nits
	LCD, 14.0 in, FHD (1920×1080), BrightView, WLED, 72%, eDP 1.4+PSR2 bent, low power (LP), touchscreen display panel; typical brightness: 400 nits
	LCD, 14.0 in, FHD (1920×1080) antiglare, WLED, 72%, eDP 1.4+PSR2, bent, LP touchscreen display panel; typical brightness: 400 nits
	LCD, 14.0 in, FHD (1920×1080), antiglare, WLED, 72%, eDP+PSR, Sure View Reflect, ultraslim touchscreen display panel; typical brightness: 1000 nits
Memory	Supports the following configurations:
	• 64 GB 3733 LPDDR4× 0.6 V IC FBGA200
	• 32 GB 3733 LPDDR4× 0.6 V IC FBGA200
	• 16 GB 3733 LPDDR4× 0.6 V IC FBGA200
Primary storage	**Storage – eMMC** (embedded Multi-Media Controller): eMMC 32 GB MO-276 MMC v 5.0
	Storage – M.2 solid-state drive: 256 GB, M.2 2280, Peripheral Component Interconnect Express (PCIe)-3×4, Non-Volatile Memory Express (NVMe), self-encrypted drive (SED) solid state drive with three-layer cell (TLC) and OPAL2

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

Category	Description
	Storage – solid state drive:
	• 2 TB, M.2 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC
	• 1 TB, M.2 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC
	• 512 GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC
	• 512 GB, M.2 2280, PCIe-3×4, NVMe, SED solid-state drive with TLC and OPAL2
	• 512 GB, M.2 2280, PCIe, NVMe, value solid-state drive
	• 256 GB, M.2 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC
	• 256 GB, M.2 2280, PCIe, NVMe, value solid-state drive
	• 128 GB, M.2 2280, SATA-3 solid-state drive with TLC
	• 512 GB, M.2 2280, PCIe-3×2×2, NVMe + 32 GB, 3D Xpoint solid-state drive
	• 256 GB, M.2 2280, PCIe-3×2×2, NVMe + 16 GB, 3D Xpoint solid-state drive
Audio and video	**HP Camera**: Integrated HD 720p one-piece, fixed, camera, with infrared and shutter // DualAryMic USB2
	Dual-array digital microphone
Wireless	**Wireless Local Area Network (WLAN)**
	Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth 5 MU-MIMO M.2 1216 vPro 160 MHz MIPI + BRI WW with 2 antenna
	Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth 5 MU-MIMO M.2 1216 non-vPro 160 MHz MIPI + BRI WW with 2 antenna
	Wireless Wide Area Network (WWAN)
	Intel XMM™ 7360 LTE-Advanced (Cat 9)
	Qualcomm® X55 LTE+5G
Near field communication (NFC)	NFC Mirage WNC XRAV-1
Keyboard/pointing devices	**Keyboard**
	Backlit, spill-resistant, quiet. notebook keyboard for WWAN with clickpad
	Backlit, spill-resistant, quiet. privacy, notebook keyboard for WWAN with clickpad
	Backlit, spill-resistant, quiet, notebook keyboard with clickpad
Power requirements	**Battery:** 4 cell, 78 Whr, polymer, HP Long Life
	AC adapters:
	65 W AC adapter (non-PFC, slim, USB Type-C®, straight)
	65 W AC adapter (non-PFC, standard USB Type-C, straight, 1.8 m)
	Power cord
	C5, 1.0 m power cord
	Premium with sticker
Operating system	Windows® 10 Enterprise 64
	Windows 10 Enterprise 64 LTSC 1809 (RS5)

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

Category	Description
	Windows 10 Home 64
	Windows 10 Home 64 Advanced
	Windows 10 Home 64 Advanced Single Language
	Windows 10 Home 64 High-End Chinese Market CPPP
	Windows 10 Home 64 Plus
	Windows 10 Home 64 Plus Single Language
	Windows 10 Home 64 Plus Single Language Africa Market PPP
	Windows 10 Home 64 Plus Single Language APAC EM PPP
	Windows 10 Home 64 Plus Single Language India Market PPP
	Windows 10 Home 64 Plus Single Language Indonesia Market PPP
	Windows 10 Professional 64
	Windows 10 Professional 64 CBB 1903
	Windows 10 Professional 64 Chinese Market
	Windows 10 Professional 64 StF MSNA Plus
	FreeDOS
Serviceability	**End user replaceable part:** AC adapter

2 Components

Right

Use the illustration and table to identify the components on the right side of the computer.

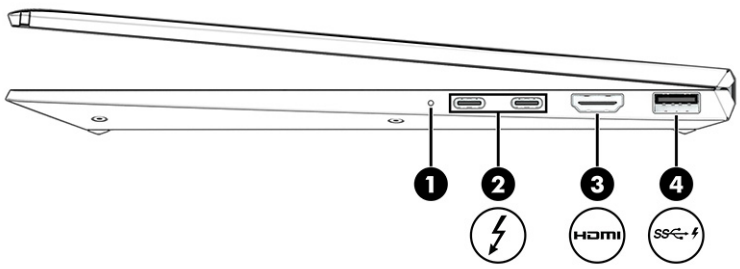


Table 2-1 Right-side components and their descriptions

Component		Description
(1)	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.

Table 2-1 Right-side components and their descriptions (continued)

Component		Description
(2)	USB Type-C Thunderbolt™ ports with HP Sleep and Charge (2)	Connect an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connect USB devices, provide high-speed data transfer, and charge small devices, even when the computer is off. – and – Connect display devices that has a USB Type-C connector, providing DisplayPort™ output. NOTE: Your computer might also support a Thunderbolt docking station. NOTE: Cables, adapters, or both (purchased separately) might be required.
(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)	USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off.

Left

Use the illustration and table to identify the components on the left side of the computer.

NOTE: Your computer might look slightly different from the following illustration.

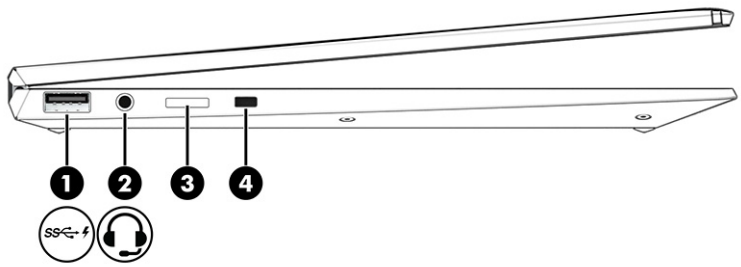


Table 2-2 Left-side components and their descriptions

Component		Description
(1)	USB SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and charges small devices, even when the computer is off.

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

Component		Description
(2)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, 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.
(3)	Nano SIM card slot (select products only)	Supports a wireless subscriber identity module (SIM) card.
(4)	Security cable slot	Attaches an optional security cable to the computer. NOTE: The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen.

Display

Use the illustration and table to identify the display components.

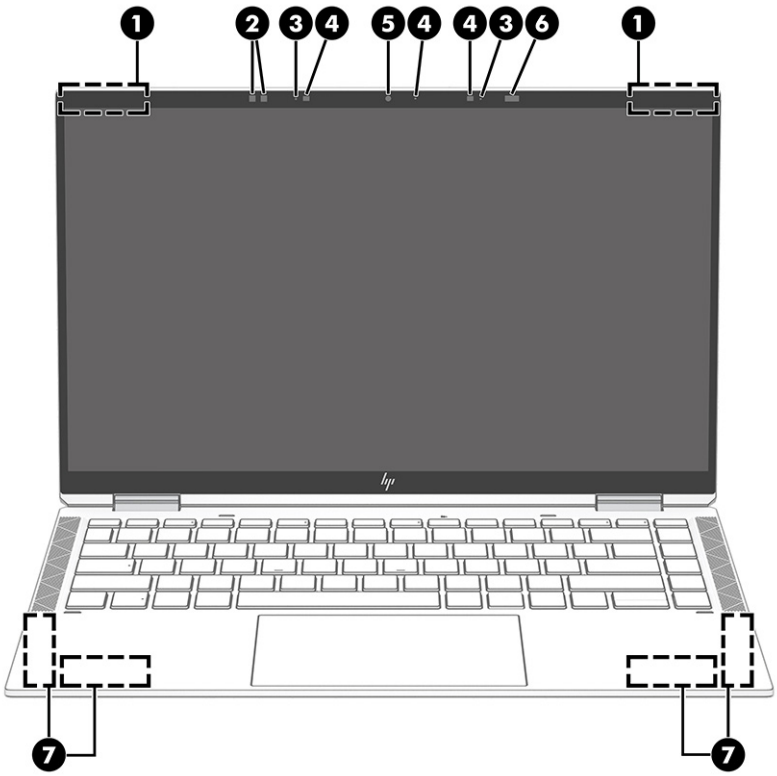


Table 2-3 Display components and their descriptions

Component		Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks.
(2)	Ambient light sensor	Adjusts the brightness of the display, depending on the ambient light.
(3)	Internal microphones (2)	Record sound.
(4)	Camera light(s)	On: One or more cameras are in use.
(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. NOTE: Camera functions vary depending on the camera hardware and software installed on your product.
(6)	User-proximity sensor	Uses facial recognition to monitor your presence in front of the computer to save power and add security. When you step away from the computer, the sensor puts the computer into the Sleep state. When you return to your computer, the sensor recognizes you and wakes the computer without a key press or mouse movement.
(7)	WWAN antennas (select products only)*	Send and receive wireless signals to communicate with wireless wide area networks.

*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

Use the illustration and table to identify the touchpad components.

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. 2. Using an external mouse, click the **Touchpad** button.

– or –

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

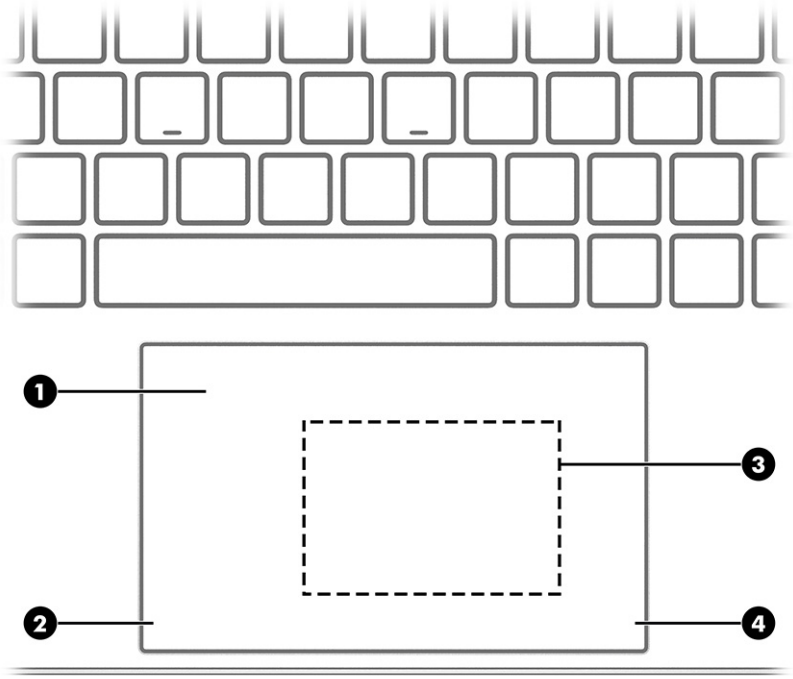


Table 2-4 Touchpad components and their descriptions

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

Lights

Use the illustration and table to identify the lights on the computer.

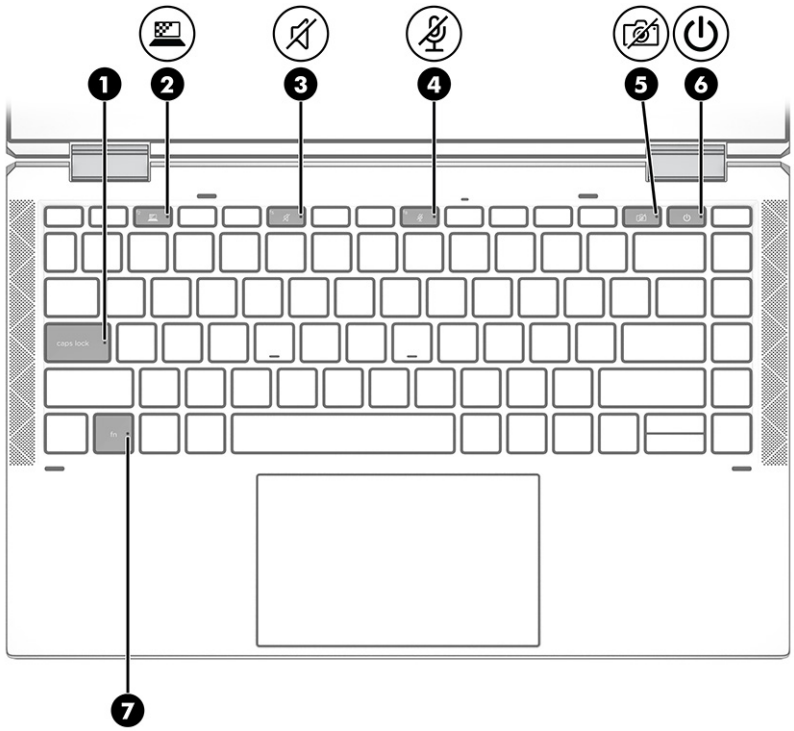


Table 2-5 Lights and their descriptions

Component		Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Privacy key light	On: Privacy screen is on, which helps prevent side-angle viewing.
(3)	Mute light	• On: Computer sound is off. • Off: Computer sound is on.
(4)	Microphone mute light	• On: Microphone is off. • Off: Microphone is on.
(5)	Camera privacy light	• On: The camera is off. • Off: The camera is on.
(6)	Power light	• On: The computer is on. • Blinking (select products only): The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unnecessary components. • Off: Depending on your computer model, the computer is off, in Hibernation, or in Sleep. Hibernation is the power-saving state that uses the least amount of power.
(7)	Fn lock light	On: The fn key is locked.

Button, speakers, and fingerprint reader

Use the illustration and table to identify the button, speakers, and fingerprint reader on the computer.

IMPORTANT: To verify that your computer supports fingerprint reader sign-in, type `Sign-in options` in the taskbar search box and follow the on-screen instructions. If **Fingerprint reader** is not listed as an option, then your notebook does not include a fingerprint reader.

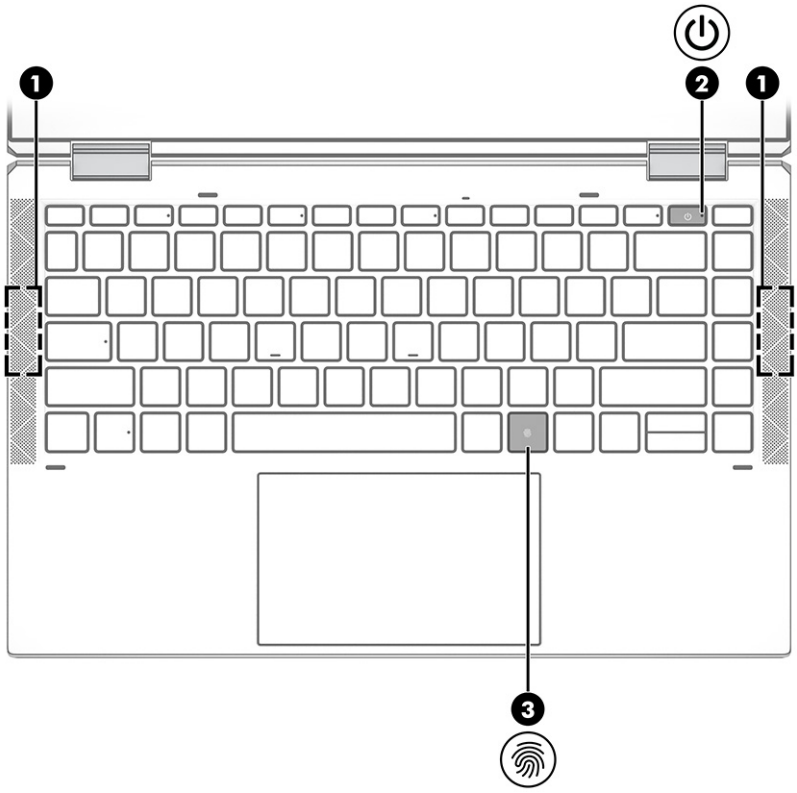


Table 2-6 Button, speaker, and fingerprint reader components and their descriptions

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

Table 2-6 Button, speaker, and fingerprint reader components and their descriptions (continued)

Component		Description
(2)	Power button	• When the computer is off, press the button briefly 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 4 seconds to turn off the computer. To learn more about your power settings, see your power options. ▲ Right-click the **Power meter** icon and then select **Power Options**.
(3)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon. ▲ Touch your finger to the fingerprint reader. IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.

Special keys

Use the illustration and table to identify the special keys on the computer.

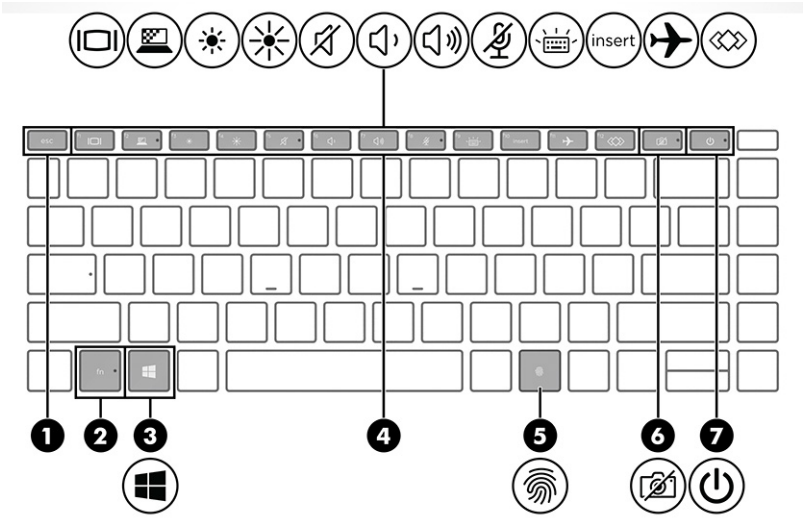


Table 2-7 Special keys and their descriptions

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. Such key combinations are called *hot* keys.
(3)	Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4)	Action keys	Execute frequently used system functions as defined by the icon symbols on f1 through f12 function keys.
(5)	Fingerprint reader	Allows a fingerprint logon to Windows, instead of a password logon. ▲ Touch your finger to the fingerprint reader. IMPORTANT: To prevent fingerprint logon issues, make sure when you register your fingerprint that all sides of your finger are registered by the fingerprint reader.
(6)	Camera privacy key	Turns the camera off (shutter closed) and on.If you record video when the camera is off (shutter closed), audio will still record.
(7)	Power button	• When the computer is off, press the button briefly 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 4 seconds to turn off the computer. To learn more about your power settings, see your power options. ▲ Right-click the **Power meter** icon and then select **Power Options**.

Hot keys (select products only)

Use the illustration and table to identify the hot keys on the computer.

A hot key is the combination of the fn key and another key.

To use a hot key:

▲ Press the fn key, and then press one of the keys listed in the following table.

Table 2-8 Hot keys and their descriptions

Key	Description
C	Turns on scroll lock.
R	Breaks the operation.
S	Sends a programming query.
W	Pauses the operation.

Bottom

Use the illustration and table to identify the bottom components.

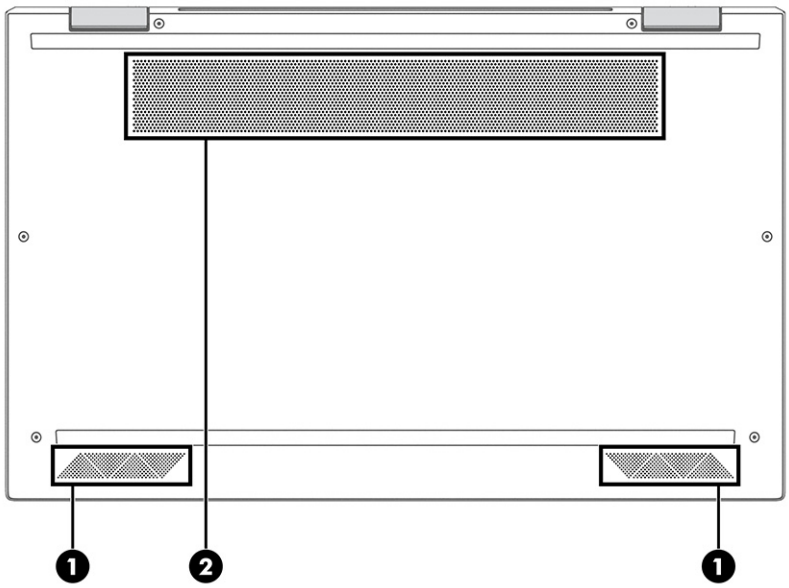


Table 2-9 Bottom components and their descriptions

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

Top cover

Use the illustration and table to identify the top cover components.

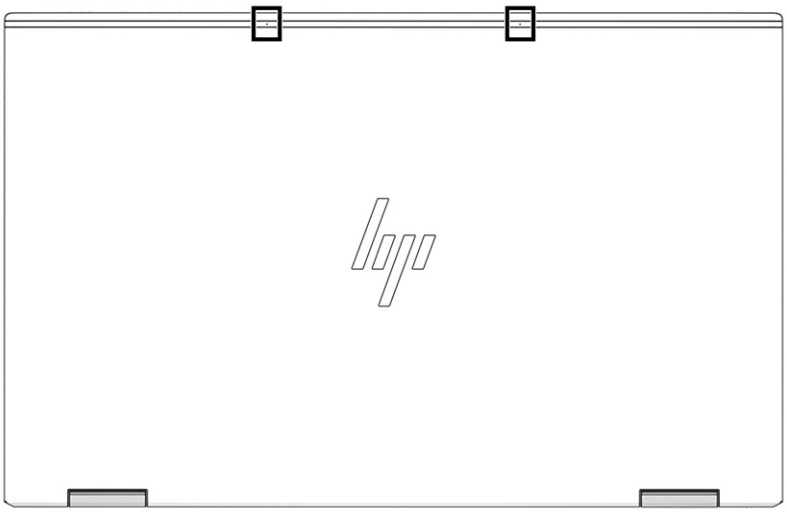


Table 2-10 Top cover component and its description

Component	Description
Internal microphones (2)	Record sound.

Rear

Use the illustration and table to identify the rear components.

Table 2-11 Rear component and its description

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

Labels

Use the illustration and table to identify the label location and components.

The labels affixed to the computer provide information you might need when you troubleshoot system problems or travel internationally with the computer. Labels might 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 might 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.

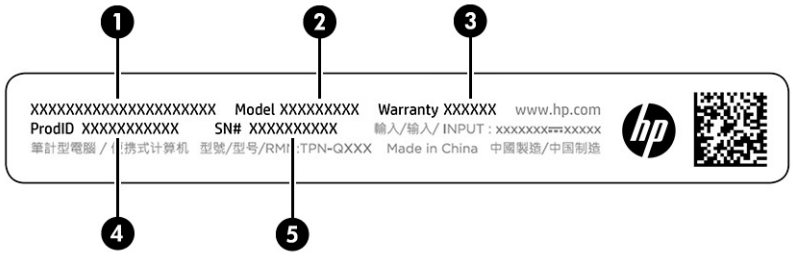


Table 2-12 Service label components and their descriptions

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

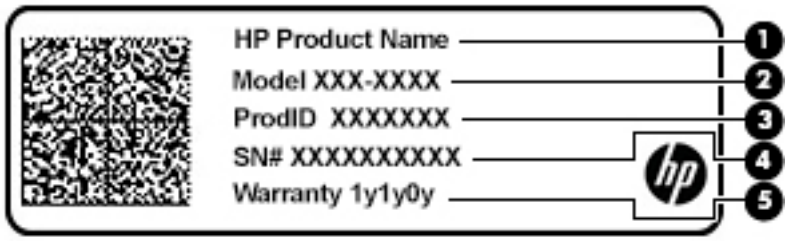


Table 2-13 Service label components and their descriptions

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

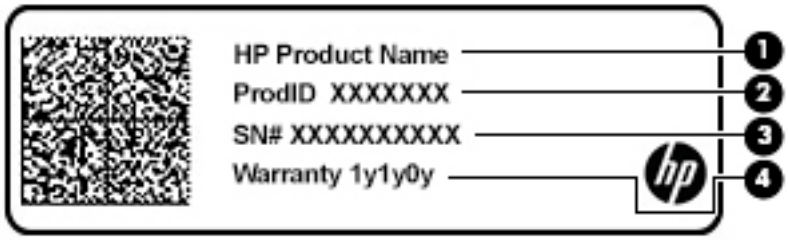


Table 2-14 Service label components and their descriptions

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

Inserting a nano SIM card (select products only)

To insert a SIM card, follow these steps.

IMPORTANT: Inserting a SIM card of the wrong size or inserting the SIM tray in the wrong direction could damage the SIM card, damage internal components, or cause the SIM card to become stuck in the slot. Do not use SIM card adapters. To prevent damage to the SIM tray and internal connectors of the computer, use minimal force when you insert or remove a SIM tray. Be sure to insert the SIM tray in the same orientation as it was when you removed it.

Before purchasing a SIM card, follow these instructions to determine the correct SIM card size for your computer:

1. Go to http://www.hp.com/support, and then search for your computer by product name or number.
2. Select **Product Information**.
3. Refer to the listed options to determine which card to purchase.

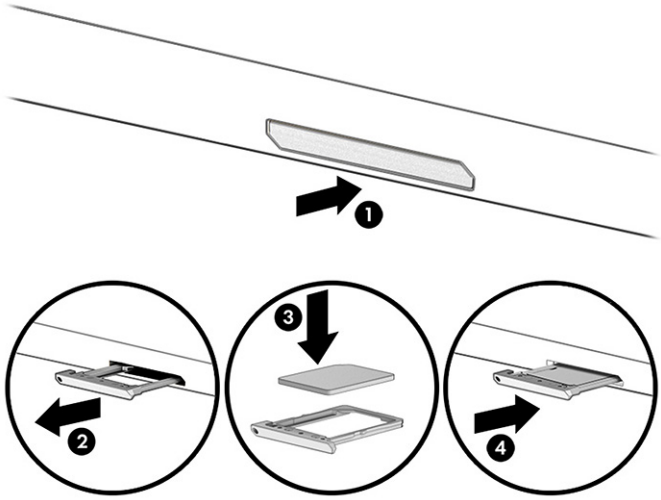
To insert a SIM card, follow these steps:

1. Position the computer display-side up on a flat surface.
2. Press in gently on the SIM tray **(1)** to release the tray.
3. Holding the end of the tray, pull the tray **(2)** straight out from the computer, and then insert the SIM card **(3)**.

NOTE: Be sure that the SIM card and SIM tray are properly aligned.

4. Replace the tray in the computer with the same orientation as it was when you removed it. Press in gently on the tray **(4)** until it is firmly seated.

NOTE: The SIM tray in your computer might look slightly different from the illustration in this section.



To remove the card:

1. Release the SIM tray as described previously, and then remove the card.
2. Replace the tray in the computer. Press in gently on the tray until it is firmly seated.

3 Illustrated parts catalog

Use this table to determine the spare parts that are available for the computer.

Computer major components

To identify the computer major components, use this illustration and table.

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

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag on the bottom of your computer.

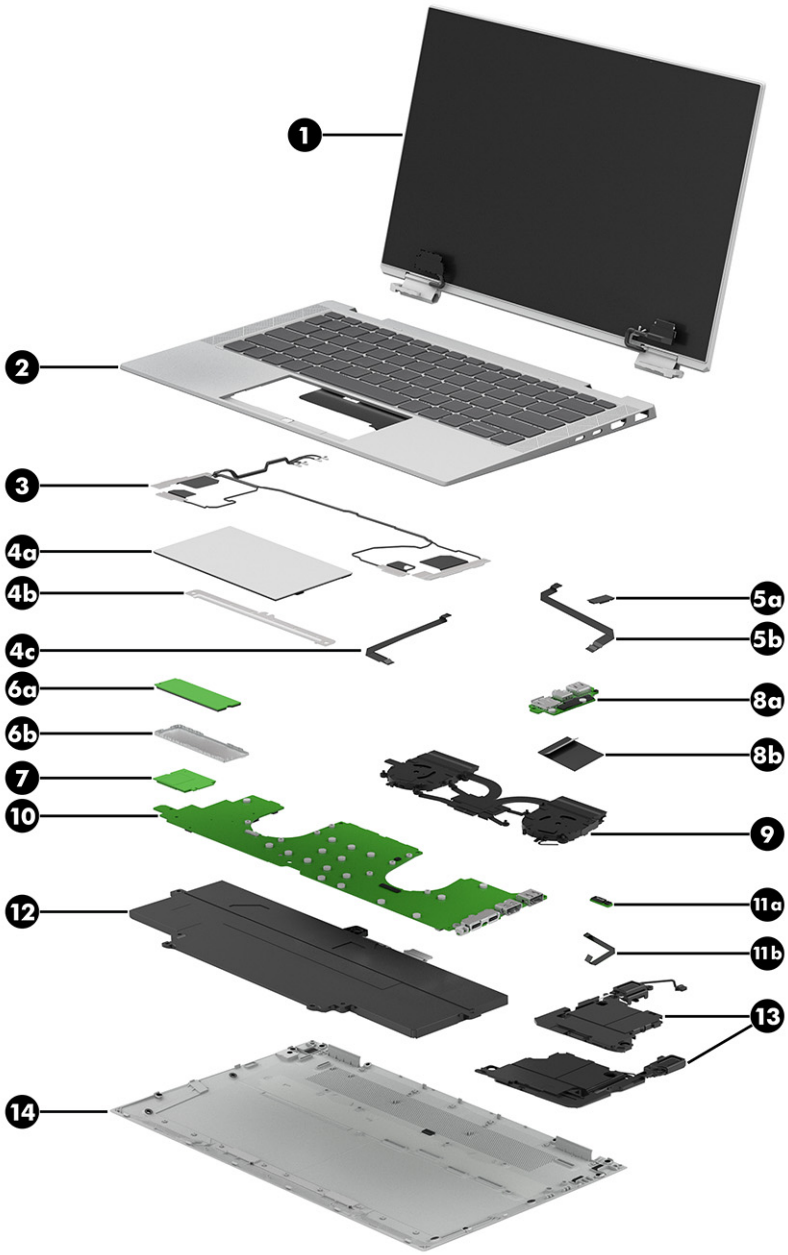


Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**Touchscreen display assembly:**	
	14.0 in, LCD, UHD (3840×1980), BrightView, LED, UWVA, HDR 550; typical brightness: 400 nits	M16039-001
	14.0 in, LCD, FHD (1980×1080), BrightView, LED, UWVA, SVR; typical brightness: 1000 nits	M16041-001
	14.0 in, LCD, FHD (1980×1080), BrightView, LED, UWVA, LP; typical brightness: 400 nits	M16038-001
	14.0 in, LCD, FHD (1980×1080), BrightView, LED, UWVA, SVR; typical brightness: 1000 nits	M16040-001
	14.0 in, LCD, FHD (1980×1080), antiglare, LED, UWVA, LP; typical brightness: 400 nits	M16037-001
(2)	**Top cover/keyboard**	

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	Top cover/keyboard equipped with backlight and privacy filter for use only on computer models with WWAN capability (includes backlight cable and keyboard cable):	
	For use in Belgium	M16933-A41
	For use in Brazil	M16933-211
	For use in Bulgaria	M16933-261
	For use in Canada	M16933-DB1
	For use in the Czech Republic and Slovakia	M16933-FL1
	For use in Denmark	M16933-081
	For use in Denmark, Finland, and Norway	M16933-DH1
	For use in France	M16933-051
	For use in Germany	M16933-041
	For use in Greece	M16933-151
	For use in Hungary	M16933-201
	For use in Iceland	M16933-DD1
	For use in India	M16933-D61
	For use in Israel	M16933-BB1
	For use in Italy	M16933-061
	For use in Japan	M16933-291
	For use in Latin America	M16933-161
	For use in the Netherlands	M16933-B31
	For use in Northwest Africa	M16933-FP1
	For use in Norway	M16933-091
	For use in Portugal	M16933-131
	For use in Romania	M16933-271
	For use in Russia	M16933-251
	For use in Saudi Arabia	M16933-171
	For use in Slovenia	M16933-BA1
	For use in South Korea	M16933-AD1
	For use in Spain	M16933-071
	For use in Sweden and Finland	M16933-B71
	For use in Switzerland	M16933-BG1
	For use in Taiwan	M16933-AB1
	For use in Thailand	M16933-281
	For use in Turkey	M16933-141

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	For use in Turkey-F	M16933-541
	For use in the Ukraine	M16933-BD1
	For use in the United Kingdom	M16933-031
	For use in the United States	M16933-001
	Top cover/keyboard equipped with backlight and privacy filter for use only on computer models not equipped with WWAN capability (includes backlight cable and keyboard cable):	
	For use in Belgium	M16931-A41
	For use in Brazil	M16931-211
	For use in Bulgaria	M16931-261
	For use in Canada	M16931-DB1
	For use in the Czech Republic and Slovakia	M16931-FL1
	For use in Denmark	M16931-081
	For use in Denmark, Finland, and Norway	M16931-DH1
	For use in France	M16931-051
	For use in Germany	M16931-041
	For use in Greece	M16931-151
	For use in Hungary	M16931-201
	For use in Iceland	M16931-DD1
	For use in India	M16931-D61
	For use in Israel	M16931-BB1
	For use in Italy	M16931-061
	For use in Japan	M16931-291
	For use in Latin America	M16931-161
	For use in the Netherlands	M16931-B31
	For use in Northwest Africa	M16931-FP1
	For use in Norway	M16931-091
	For use in Portugal	M16931-131
	For use in Romania	M16931-271
	For use in Russia	M16931-251
	For use in Saudi Arabia	M16931-171
	For use in Slovenia	M16931-BA1
	For use in South Korea	M16931-AD1
	For use in Spain	M16931-071
	For use in Sweden and Finland	M16931-B71

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	For use in Switzerland	M16931-BG1
	For use in Taiwan	M16931-AB1
	For use in Thailand	M16931-281
	For use in Turkey	M16931-141
	For use in Turkey-F	M16931-541
	For use in the Ukraine	M16931-BD1
	For use in the United Kingdom	M16931-031
	For use in the United States	M16931-001
	Top cover/keyboard equipped with backlight for use only on computer models with WWAN capability (includes backlight cable and keyboard cable):	
	For use in Belgium	M16932-A41
	For use in Brazil	M16932-211
	For use in Bulgaria	M16932-261
	For use in Canada	M16932-DB1
	For use in the Czech Republic and Slovakia	M16932-FL1
	For use in Denmark	M16932-081
	For use in Denmark, Finland, and Norway	M16932-DH1
	For use in France	M16932-051
	For use in Germany	M16932-041
	For use in Greece	M16932-151
	For use in Hungary	M16932-201
	For use in Israel	M16932-BB1
	For use in Italy	M16932-061
	For use in Japan	M16932-291
	For use in Latin America	M16932-161
	For use in the Netherlands	M16932-B31
	For use in Northwest Africa	M16932-FP1
	For use in Norway	M16932-091
	For use in Portugal	M16932-131
	For use in Romania	M16932-271
	For use in Russia	M16932-251
	For use in Saudi Arabia	M16932-171
	For use in Slovenia	M16932-BA1
	For use in South Korea	M16932-AD1

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	For use in Spain	M16932-071
	For use in Sweden and Finland	M16932-B71
	For use in Switzerland	M16932-BG1
	For use in Thailand	M16932-281
	For use in Turkey	M16932-141
	For use in Turkey-F	M16932-541
	For use in the Ukraine	M16932-BD1
	For use in the United Kingdom	M16932-031
	For use in the United States	M16932-001
	Top cover/keyboard equipped with backlight for use only on computer models not equipped with WWAN capability (includes backlight cable and keyboard cable):	
	For use in Belgium	M16930-A41
	For use in Brazil	M16930-211
	For use in Bulgaria	M16930-261
	For use in Canada	M16930-DB1
	For use in the Czech Republic and Slovakia	M16930-FL1
	For use in Denmark	M16930-081
	For use in Denmark, Finland, and Norway	M16930-DH1
	For use in France	M16930-051
	For use in Germany	M16930-041
	For use in Greece	M16930-151
	For use in Hungary	M16930-201
	For use in Iceland	M16930-DD1
	For use in India	M16930-D61
	For use in Israel	M16930-BB1
	For use in Italy	M16930-061
	For use in Japan	M16930-291
	For use in Latin America	M16930-161
	For use in the Netherlands	M16930-B31
	For use in Northwest Africa	M16930-FP1
	For use in Norway	M16930-091
	For use in Portugal	M16930-131
	For use in Romania	M16930-271
	For use in Russia	M16930-251

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	For use in Saudi Arabia	M16930-171
	For use in Slovenia	M16930-BA1
	For use in South Korea	M16930-AD1
	For use in Spain	M16930-071
	For use in Sweden and Finland	M16930-B71
	For use in Switzerland	M16930-BG1
	For use in Thailand	M16930-281
	For use in Turkey	M16930-141
	For use in Turkey-F	M16930-541
	For use in the Ukraine	M16930-BD1
	For use in the United Kingdom	M16930-031
	For use in the United States	M16930-001
(3)	**WWAN antenna** (includes left and right antenna cables and transceivers)	M20836-001
(4a)	**Touchpad**: NOTE: The touchpad spare part kit does not include the touchpad bracket or touchpad cable. The touchpad bracket is not available as a spare part. The touchpad cable is available in the Cable Kit, spare part number M20835-001.	
	For use only on computer models equipped with NFC capability	M16010-001
	For use only on computer models not equipped with NFC capability	M16005-001
(4b)	**Touchpad bracket**: The touchpad bracket is not available as a spare part.	
(4c)	**Touchpad cable**: The touchpad cable is available in the Cable Kit, spare part number M20835-001.	
(5a)	**NFC module**: NOTE: The NFC module spare part kit does not include the NFC module cable. The NFC module cable is available in the Cable Kit, spare part number M20835-001.	M16045-001
(5b)	**NFC module cable**: The NFC module cable is available in the Cable Kit, spare part number M20835-001.	
(6a)	**Solid-state drive:**	
	2 TB, M.2 2280, PCIe-NVMe 3×4, SS solid-state drive with TLC	L85358-005
	1 TB, M.2 2280, PCIe-NVMe 3×4, SS solid-state drive with TLC	L85348-005
	512 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85360-005
	512 GB, M.2 2280, PCIe, NVMe, SED solid-state drive with TLC	L85368-005
	512 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85364-005
	256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
	256 GB, M.2 2280, PCIe, NVMe, SED solid-state drive with TLC	M07245-005
	256 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85354-005
	128 GB, M.2 2280, SATA-3 solid-state drive with TLC	L85346-005

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85366-005
	256 GB, M.2 2280, PCIe + 16 GB, 3D Xpoint solid-state drive	L85356-005
(6b)	**Solid-state drive bracket**: The solid-state drive bracket is not available as a spare part.	
(7)	**WWAN module:**	
	Intel XMM 7360 LTE-Advanced (Cat 9)	L70670-005
	Qualcomm X55 LTE+5G	L83053-005
(8a)	**Connector board** (includes audio-out (headphone)/audio-in (microphone) combo jack, nano SIM card slot (select products only), and USB SuperSpeed port) NOTE: The connector board spare part kit does not include the connector board cable. The connector board cable is available in the Cable Kit, spare part number M20835-001.	M16050-001
(8b)	**Connector board cable**: The connector board cable is available in the Cable Kit, spare part number M20835-001.	
	Nano SIM tray (not illustrated, for use only on computer models equipped with WWAN capability)	M16053-001
(9)	**Fan/heat sink assembly** (include replacement thermal material)	M16006-001
(10)	**System board** (includes integrated processor): NOTE: All system board spare part kits include replacement thermal material.	
	Equipped with an Intel Core i7-10810U processor, 32 GB of system memory, and the Windows 10 OSR operating system	M16024-601
	Equipped with an Intel Core i7-10810U processor, 32 GB of system memory, and a non-Windows OSR operating system	M16024-001
	Equipped with an Intel Core i7-10810U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16023-601
	Equipped with an Intel Core i7-10810U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16023-001
	Equipped with an Intel Core i7-10810U processor, 8 GB of system memory, and the Windows 10 OSR operating system	M16025-601
	Equipped with an Intel Core i7-10810U processor, 8 GB of system memory, and a non-Windows OSR operating system	M16025-001
	Equipped with an Intel Core i7-10710U processor, 32 GB of system memory, and the Windows 10 operating system	M16021-601
	Equipped with an Intel Core i7-10710U processor, 32 GB of system memory, and a non-Windows operating system	M16021-001
	Equipped with an Intel Core i7-10710U processor, 16 GB of system memory, and the Windows 10 operating system	M16020-601
	Equipped with an Intel Core i7-10710U processor, 16 GB of system memory, and a non-Windows operating system	M16020-001
	Equipped with an Intel Core i7-10710U processor, 8 GB of system memory, and the Windows 10 operating system	M16022-601
	Equipped with an Intel Core i7-10710U processor, 8 GB of system memory, and a non-Windows operating system	M16022-001

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
	Equipped with an Intel Core i7-10610U processor, 32 GB of system memory, and the Windows 10 OSR operating system	M16018-601
	Equipped with an Intel Core i7-10610U processor, 32 GB of system memory, and a non-Windows OSR operating system	M16018-001
	Equipped with an Intel Core i7-10610U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16017-601
	Equipped with an Intel Core i7-10610U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16017-001
	Equipped with an Intel Core i7-10610U processor, 8 GB of system memory, and the Windows 10 OSR operating system	M16019-601
	Equipped with an Intel Core i7-10610U processor, 8 GB of system memory, and a non-Windows OSR operating system	M16019-001
	Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16014-601
	Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16014-001
	Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and the Windows 10 operating system	M16013-601
	Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and a non-Windows operating system	M16013-001
	Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and the Windows 10 OSR operating system	M16016-601
	Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and a non-Windows OSR operating system	M16016-001
	Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and the Windows 10 operating system	M16015-601
	Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and a non-Windows operating system	M16015-001
	Equipped with an Intel Core i5-10210U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16011-601
	Equipped with an Intel Core i5-10210U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16011-001
	Equipped with an Intel Core i5-10210U processor, 8 GB of system memory, and the Windows 10 operating system	M16012-601
	Equipped with an Intel Core i5-10210U processor, 8 GB of system memory, and a non-Windows operating system	M16012-001
	Nano SIM tray (not illustrated, for use only on computer models equipped with WWAN capability)	M16053-001
(11a)	**Sensor board:** NOTE: The sensor board spare part kit does not include the sensor board cable. The sensor board cable is available in the Cable Kit, spare part number M20835-001.	
	For use only on computer models equipped with a microphone	M16047-001
	For use only on computer models not equipped with a microphone	M16046-001

Table 3-1 Computer major component descriptions and part numbers (continued)

Item	Component	Spare part number
(11b)	**Sensor board cable**: The sensor board cable is available in the Cable Kit, spare part number M20835-001.	
(12)	**Battery** (4 cell, 78 Whr, 5.09 Ahr, LI)	L84352-005
(13)	**Speakers** (includes left and right speakers, cables, and rubber isolators)	M16007-001
(14)	**Bottom cover**	
	For use only on computer models equipped with WWAN capability	M16004-001
	For use only on computer models not equipped with WWAN capability	M16003-001

Mass storage devices

To identify the mass storage devices, use this illustration and table.

Table 3-2 Mass storage device descriptions and part numbers

Item	Component	Spare part number
(1)	**Solid-state drives:**	
	2 TB, M.2 2280, PCIe-NVMe 3×4, SS solid-state drive with TLC	L85358-005
	1 TB, M.2 2280, PCIe-NVMe 3×4, SS solid-state drive with TLC	L85348-005
	512 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85360-005
	512 GB, M.2 2280, PCIe, NVMe, SED solid-state drive with TLC	L85368-005
	512 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85364-005
	256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
	256 GB, M.2 2280, PCIe, NVMe, SED solid-state drive with TLC	M07245-005
	256 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85354-005
	128 GB, M.2 2280, SATA-3 solid-state drive with TLC	L85346-005
	512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85366-005
	256 GB, M.2 2280, PCIe + 16 GB, 3D Xpoint solid-state drive	L85356-005

Cables

To identify the cables, use this illustration and table.

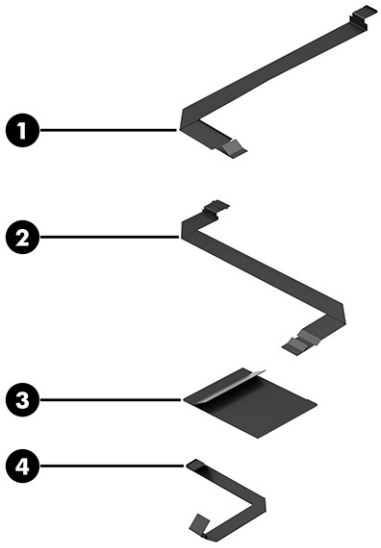


Table 3-3 Cable descriptions and part numbers

Item	Component
	NOTE: The following cables are available in the Cable Kit, spare part number M20835-001.
(1)	Touchpad cable
(2)	NFC module cable
(3)	Connector board cable
(4)	Sensor board cable

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-4 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapter:	
90 W AC adapter, (PFC, S-3P, 4.5 mm)	710413-001
65 W AC adapter, (non-PFC, slim, USB Type-C, straight, 1.8 m)	L04650-850
65 W AC adapter (non-PFC, USB Type-C, RC, 1.8 m)	L32392-001
65 W AC adapter (non-PFC, USB Type-C, 1.8 m)	L67440-001
HP USB Type-C–to–RJ45 adapter	855560-001
Bracket Kit (includes the WWAN bracket)	M16009-001
HP USB Type-C male–to–USB Type-C male cable (1 m)	L65253-001
Cable Kit (includes the connector board cable, NFC module cable, sensor board cable, and touchpad cable)	M20835-001
Dock:	

Table 3-4 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
Thunderbolt® dock (120 W with cable)	L15809-001
HP USB Type-C dock	L16133-001
HP USB Type-A/C universal dock (includes cable)	L64087-001
HP USB Type-C mini dock	935327-001
Thunderbolt dock (120 W with cable)	L15809-001
Duckhead adapter:	
C5NS, premium, sticker, black, for use in North America	L50818-002
C5NS, premium, sticker, black, for use in South Korea	L50818-001
HP USB stereo headset	840340-001
HP nano lock	918431-001
Miscellaneous Kit (includes battery gaskets [2], battery support sponges [2], and keyboard support rubber)	M16036-001
Mouse:	
HP comfort grip wireless mouse	691922-001
HP USB laser mouse	674318-001
HP USB travel mouse	757770-001
HP AES 2.0 pen with app button	L57041-001
Power cord (C5, conventional, with sticker, 1.8 m):	
Argentina	L19357-002
Australia	L19358-002
Brazil	L19359-002
Denmark	L19360-002
Europe	L19361-002
India	L19363-002
Israel	L19362-002
Italy	L19364-002
Japan	L19365-002
North America	L19367-002
The People's Republic of China	L19368-002
South Africa	L19369-002
South Korea	L19366-002
Switzerland	L19370-002
The United Kingdom	L19373-002
Power cord (C5, premium, 1.8 m):	

Table 3-4 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
Argentina	L30811-001
Australia	L22327-001
Brazil	L30812-001
Denmark	L22322-001
Europe	L22321-001
India	L22624-001
Israel	L22323-001
Italy	L30813-001
Japan	L22330-001
North America	L22319-001
The People's Republic of China	L21930-001
South Africa	L22325-001
South Korea	L22328-001
Switzerland	L22324-001
Taiwan	L22329-001
Thailand	L22326-001
The United Kingdom	L22320-001
Power cord (C5, FDH, premium, 1.0 m):	
Argentina	L36815-001
Australia	L36816-001
Brazil	L44789-001
Denmark	L36817-001
Europe	L36818-001
India	L36820-001
Israel	L36819-001
Italy	L44788-001
North America	L36822-001
The People's Republic of China	L36823-001
South Africa	L36824-001
Switzerland	L36825-001
Taiwan	L36827-001
Thailand	L36826-001
The United Kingdom	L36828-001

Table 3-4 Miscellaneous part descriptions and part numbers (continued)

Component	Spare part number
Power cord (C5, conventional, with sticker, 1.0 m):	
Argentina	L19357-001
Australia	L19358-001
Brazil	L19359-001
Denmark	L19360-001
Europe	L19361-001
India	L19363-001
Israel	L19362-001
Italy	L19364-001
North America	L19365-001
The People's Republic of China	L19367-001
South Africa	L19368-001
Switzerland	L19369-001
Taiwan	L19366-001
Thailand	L19370-001
The United Kingdom	L19373-001
Power cord for use in Brazil (C5, 1.0 m)	438722-001
Screw Kit	M16008-001

4 Removal and replacement procedures preliminary requirements

Use this information to properly prepare to disassemble and reassemble the computer.

Tools required

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

- Magnetic Phillips P1 screwdriver
- Nonconductive, nonmarking pry tool
- Torx T6 screwdriver
- Tweezers

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

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

Cables and connectors

Handle cables with extreme care to avoid damage.

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.

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 so that they cannot be caught or snagged as you remove or replace parts. Handle flex cables with extreme care; these cables tear easily.

Drive handling

Note the following guidelines when handling drives.

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

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

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

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

Handle drives on surfaces covered with at least 2.54 cm (1 inch) of shock-proof foam.

Avoid dropping drives from any height onto any surface.

After removing a hard drive or an optical drive, place it in a static-proof bag.

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

Avoid exposing a drive to temperature extremes or liquids.

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Electrostatic discharge information

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

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

IMPORTANT: To prevent damage to the device when you remove or install 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 Personal grounding methods and equipment on page 39.

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

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

Generating static electricity

Follow these static electricity guidelines.

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

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

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

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

Preventing electrostatic damage to equipment

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

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

Personal grounding methods and equipment

Using certain equipment can prevent static electricity damage to electronic components.

- **Wrist straps** are flexible straps with a maximum of 1 MΩ ±10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.
- **Heel straps/Toe straps/Boot straps** can be used at standing workstations and are compatible with most types of shoes or boots. On conductive floors or dissipative floor mats, use them on both feet with a maximum of 1 MΩ ±10% resistance between the operator and ground.

Table 4-2 Static shielding protection levels

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

Grounding the work area

To prevent static damage at the work area, follow these precautions.

- Cover the work surface with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, foot straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free work areas.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.

- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and polystyrene foam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.

Recommended materials and equipment

HP recommends certain materials and equipment to prevent static electricity.

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of 1 MΩ ±10% resistance
- Static-dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing 1 MΩ ±10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment.

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

- Store reusable ESD-sensitive parts from assemblies in protective packaging or nonconductive foam.
- Use transporters and conveyors made of antistatic belts and roller bushings. Be sure that mechanized equipment used for moving materials is wired to ground and that proper materials are selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

5 Removal and replacement procedures for authorized service provider parts

This chapter provides removal and replacement procedures for authorized service provider parts.

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

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

Component replacement procedures

To remove and replace computer components, use these procedures.

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

You must remove, replace, or loosen as many as 42 screws when you service the parts described in this chapter. Make special note of each screw size and location during removal and replacement.

Preparation for disassembly

To remove and replace computer components, use these procedures.

See Removal and replacement procedures preliminary requirements on page 35 for initial safety procedures.

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

Bottom cover

To remove the bottom cover, use this procedure and illustration.

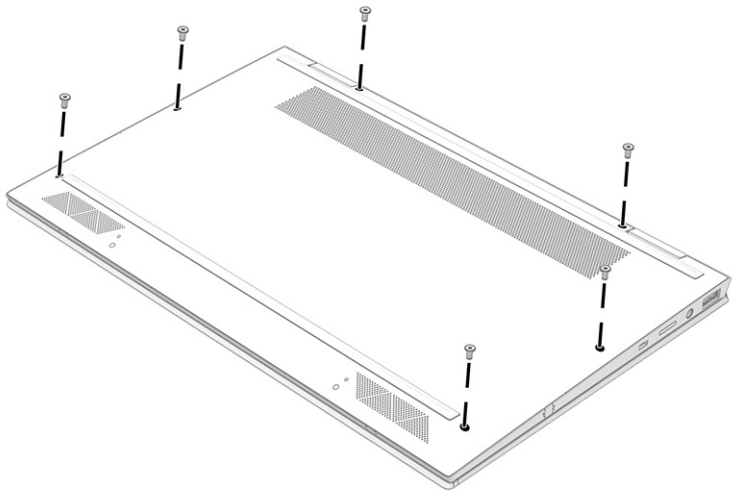
Table 5-1 Bottom cover description and part number

Description	Spare part number
For use only on computer models equipped with WWAN capability	M16004-001
For use only on computer models not equipped with WWAN capability	M16003-001

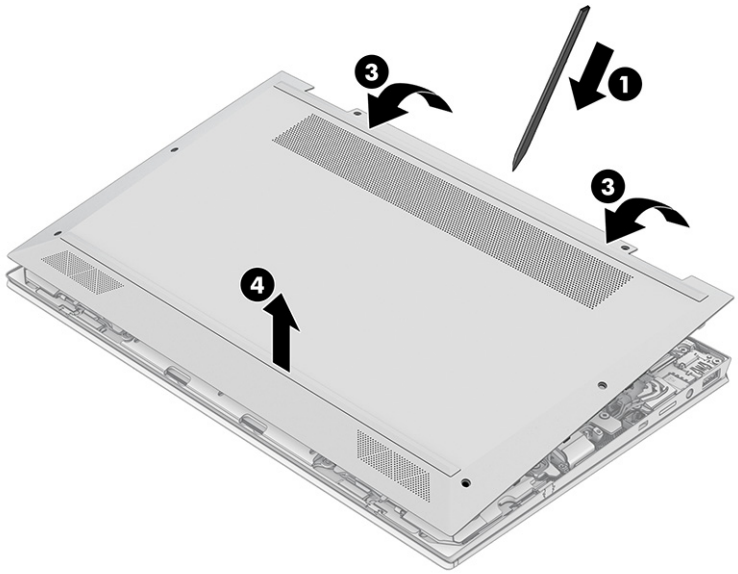
Before removing the bottom cover, prepare the computer for disassembly (Preparation for disassembly on page 44).

Remove the bottom cover:

1. Remove the six Torx T6M2.0 × 5.0 screws that secure the bottom cover to the computer.



2. Use a nonmarking, nonconductive tool **(1)** to release the rear edge **(2)** of the bottom cover from the computer.
3. Remove the bottom cover **(3)** from the computer.



To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 **Battery description and part number**

Description	Spare part number
Battery (4 cell, 78 Whr, 5.09 Ahr, LI)	L84352-005

WARNING! To avoid personal injury and damage to the product:

- Do *not* puncture, twist, or crack the battery.
- Do *not* cause an external puncture or rupture to the battery. They can cause a short inside the battery, which can result in battery thermal runaway.
- Do *not* handle or touch the battery enclosure with sharp objects such as tweezers or pliers, which might puncture the battery.
- Do *not* compress or squeeze the battery case with tools or heavy objects stacked on top of the case. These actions can apply undue force on the battery.
- Do *not* touch the connectors with any metallic surface or object, such as metal tools, screws, or coins, which can cause shorting across the connectors.

Before removing the battery, follow these steps:

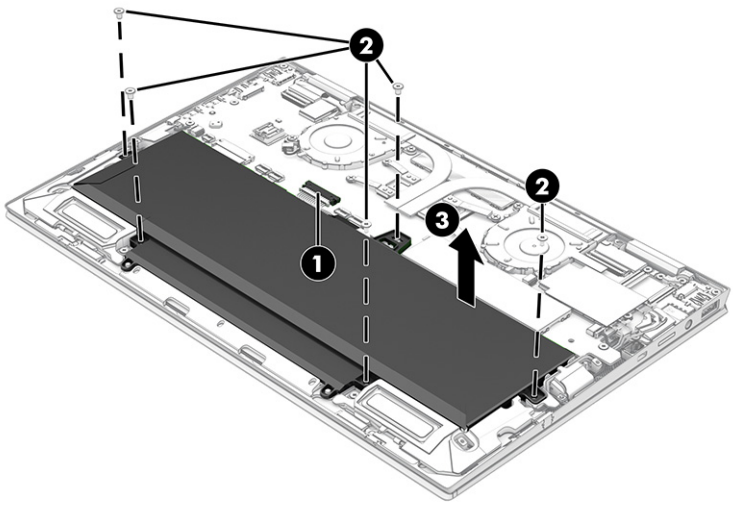
1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).

WARNING! To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.

IMPORTANT: Removing a battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before you remove the battery.

Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.
2. Remove the five Phillips M2.0 × 3.0 screws **(2)** that secure the battery to the computer.
3. Remove the battery **(3)** from the computer.



To install the battery, reverse the removal procedures.

Solid-state drive

To remove the M.2 solid-state drive, use this procedure and illustration.

Table 5-3 Solid-state drive descriptions and part numbers

Description	Spare part number
2 TB, M.2 2280, PCIe-NVMe 3×4, SS solid-state drive with TLC	L85358-005
1 TB, M.2 2280, PCIe-NVMe 3×4, SS solid-state drive with TLC	L85348-005
512 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85360-005
512 GB, M.2 2280, PCIe, NVMe, SED solid-state drive with TLC	L85368-005
512 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85364-005
256 GB, M.2 2280, PCIe-3×4, SS solid-state drive with TLC	L85350-005
256 GB, M.2 2280, PCIe, NVMe, SED solid-state drive with TLC	M07245-005
256 GB, M.2 2280, PCIe, NVMe, value solid-state drive	L85354-005
128 GB, M.2 2280, SATA-3 solid-state drive with TLC	L85346-005
512 GB, M.2 2280, PCIe + 32 GB, 3D Xpoint solid-state drive	L85366-005
256 GB, M.2 2280, PCIe + 16 GB, 3D Xpoint solid-state drive	L85356-005

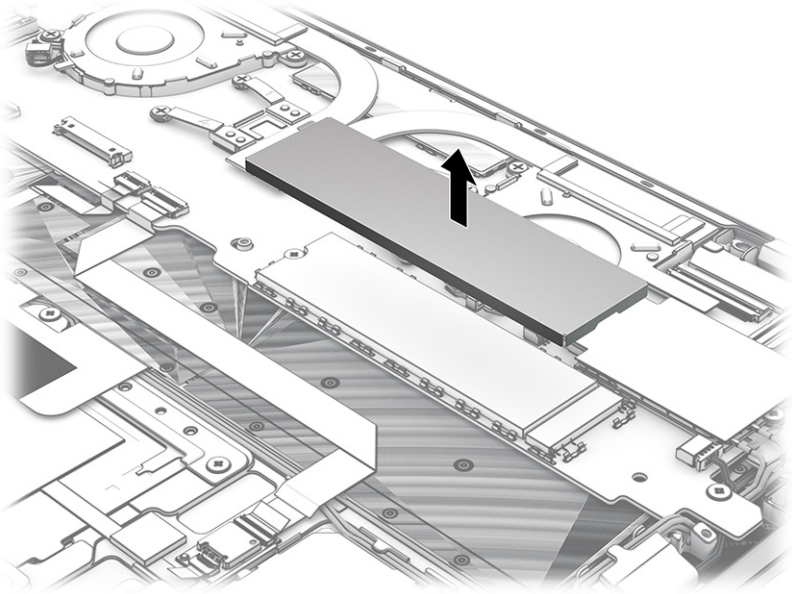
Before removing the solid-state drive, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board the battery (see Battery on page 45).

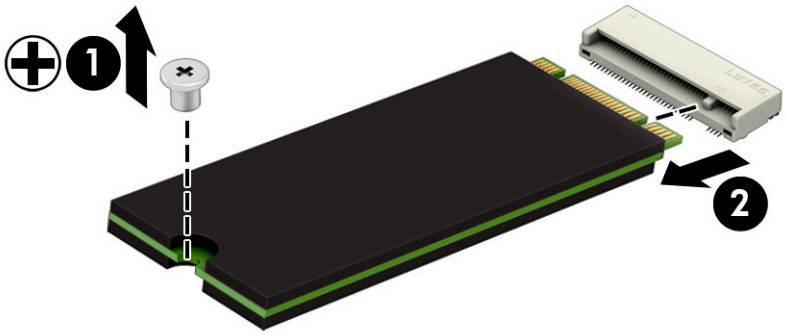
Remove the solid-state drive:

1. Remove the solid-state drive from the system board.

NOTE: The solid-state drive shield is not available as a spare part.



2. Remove the Phillips PM2.0 × 3.0 screw **(1)** that secures the solid-state drive to the system board.
3. Pull the drive **(2)** away from the socket to remove it.



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

WWAN module

To remove the WWAN module, use this procedure and illustration.

Table 5-4 WWAN module descriptions and part numbers

Description	Spare part number
Intel XMM 7360 LTE-Advanced (Cat 9)	L70670-005
Qualcomm X55 LTE+5G	L83053-005

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

Before removing the WWAN module, follow these steps:

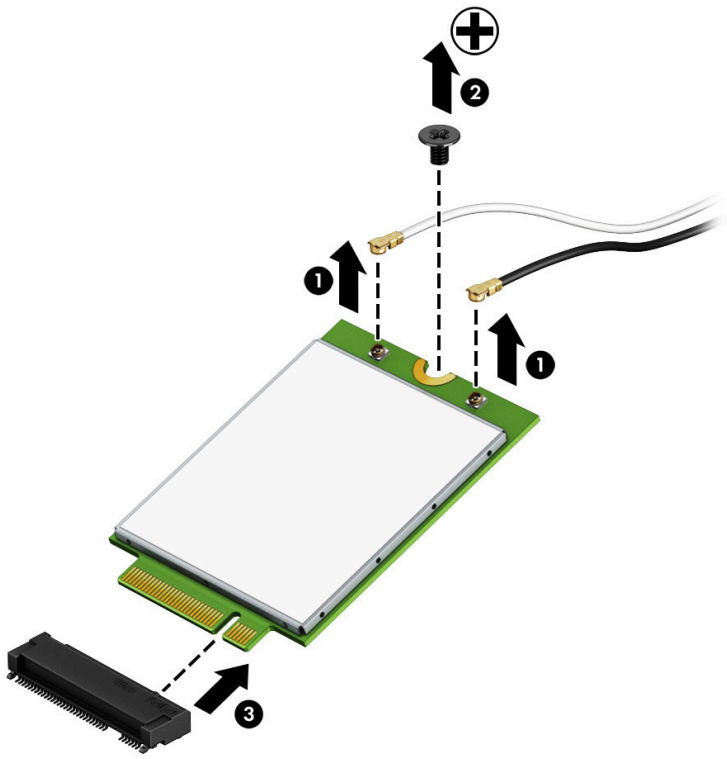
1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board the battery (see Battery on page 45).

Remove the WWAN module:

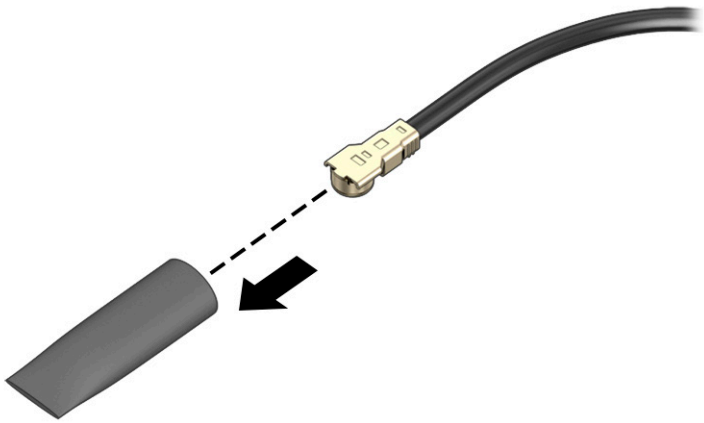
1. Disconnect the WWAN antenna cables **(1)** from the terminals on the WWAN module.

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

2. Remove the Phillips M2.0 × 3.0 screw **(2)** that secures the WWAN module to the top cover/keyboard. (The WWAN module tilts up.)
3. Remove the WWAN module **(3)** by pulling the module away from the slot at an angle.



4. If the WWAN antenna is not connected to the terminal on the WWAN module, a protective sleeve must be installed on the antenna connector, as shown in the following illustration.



Reverse this procedure to install the WWAN module.

Connector board cable

To remove the connector board cable, use this procedure and illustration.

NOTE: The connector board cable is available in the Cable Kit, spare part number M20833-001.

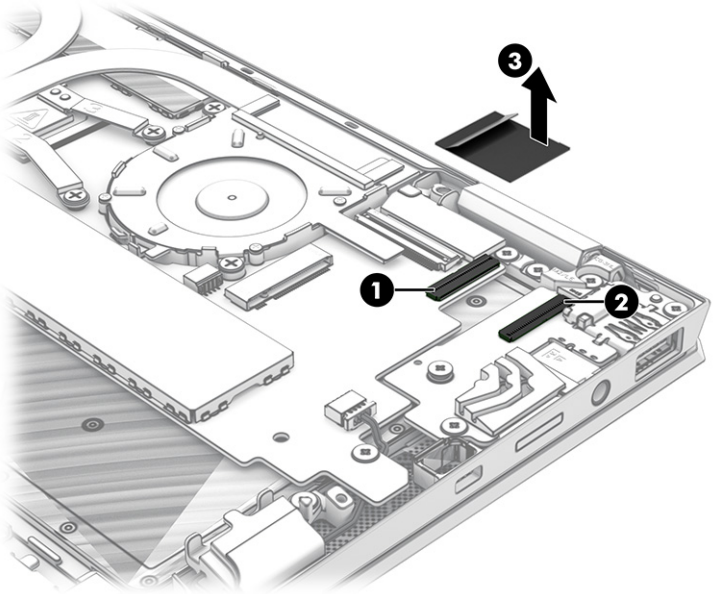
Before removing the connector board cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board the battery (see Battery on page 45).

Remove the connector board cable:

1. Release the zero insertion force (ZIF) connector **(1)** to which the connector board cable is connected, and then disconnect the cable from the system board.
2. Release the ZIF connector **(2)** to which the connector board cable is connected, and then disconnect the cable from the connector board.

3. Remove the connector board cable **(3)**.



Reverse this procedure to install the connector board cable.

Connector board

To remove the connector board, use this procedure and illustration.

Table 5-5 **Connector board description and part number**

Description	Spare part number
Connector board (includes audio-out (headphone)/audio-in (microphone) combo jack, nano SIM card slot (select products only), and USB SuperSpeed port) NOTE: The connector board spare part kit does not include the connector board cable. The connector board cable is available in the Cable Kit, spare part number M20835-001.	M16050-001

Before removing the connector board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board the battery (see Battery on page 45).
4. Remove the WWAN module (see WWAN module on page 48).

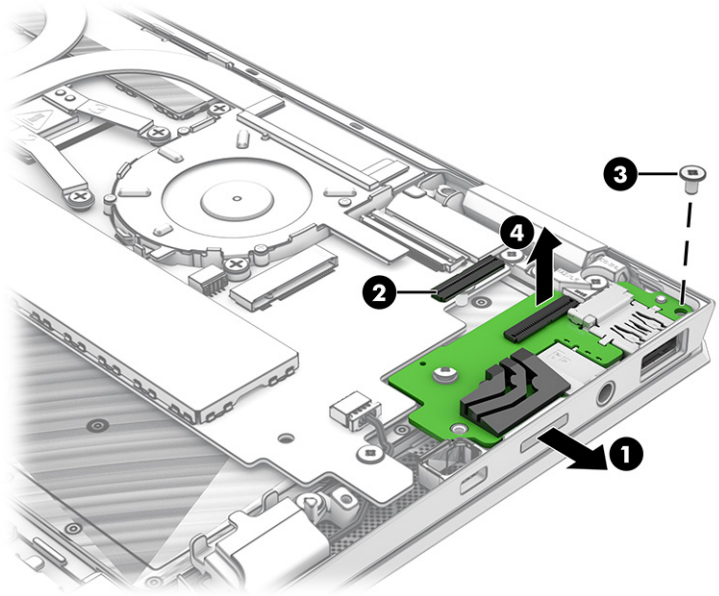
Remove the connector board:

1. Remove the nano SIM tray **(1)** from the mini media card reader slot.

   The nano SIM tray is available using spare part number M16053-001.

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

3. Remove the two Phillips M2.0 × 5.0 screws **(3)** that secure the connector board to the computer.
4. Remove the connector board **(4)** and cable.



Reverse this procedure to install the connector board.

Display assembly

To remove the display assembly, use these procedures and illustrations.

Table 5-6 Connector board description and part number

Description	Spare part number
Touchscreen display assembly:	
14.0 in, LCD, UHD (3840×1980), brightview, LED, UWVA, HDR 550; typical brightness: 400 nits	M16039-001
14.0 in, LCD, FHD (1980×1080), brightview, LED, UWVA, SVR; typical brightness: 1000 nits	M16041-001
14.0 in, LCD, FHD (1980×1080), brightview, LED, UWVA, LP; typical brightness: 400 nits	M16038-001
14.0 in, LCD, FHD (1980×1080), brightview, LED, UWVA, SVR; typical brightness: 1000 nits	M16040-001
14.0 in, LCD, FHD (1980×1080), antiglare, LED, UWVA, LP; typical brightness: 400 nits	M16037-001

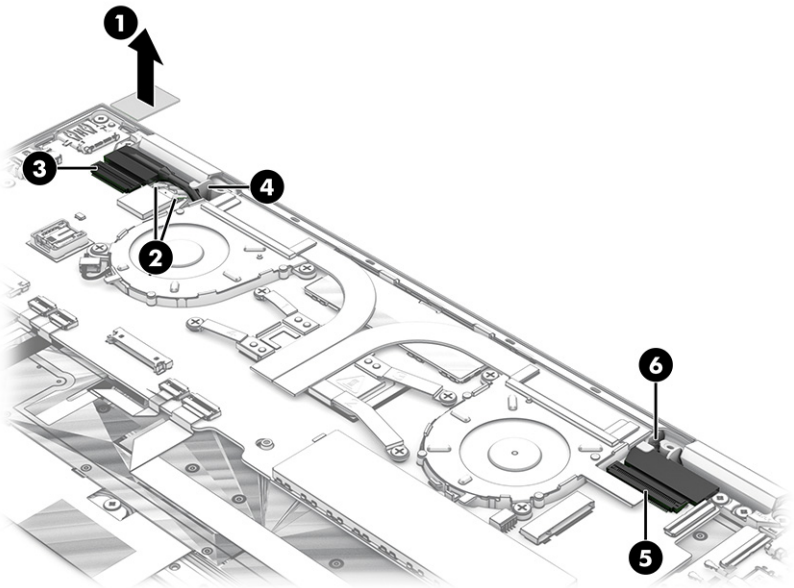
Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board the battery (see Battery on page 45).

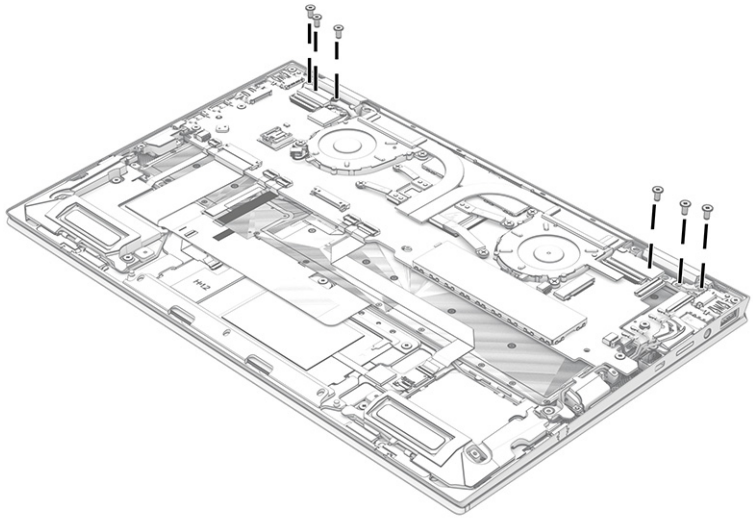
Remove the display assembly:

1. Remove the WWAN module shield **(1)**.
2. Disconnect the WLAN antenna cables **(2)** from the WLAN module terminals.

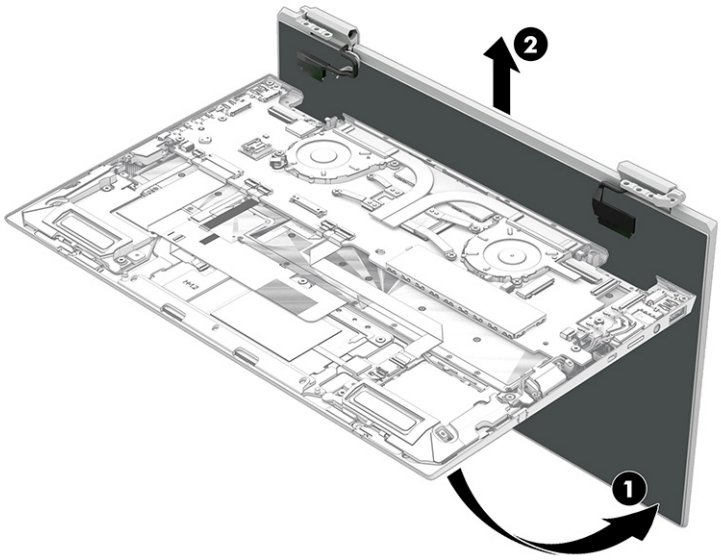
   The #1/white WLAN antenna cable connects to the WLAN module **#1/Main** terminal. The #2/black WLAN antenna cable connects to the WLAN module **#2/Aux** terminal.
3. Release the ZIF connector **(3)** to which the webcam/microphone module cable is connected, and disconnect the cable from the system board.
4. Release the WLAN antenna cables and the webcam/microphone module cable from the retention clip **(4)** built into the top cover/keyboard.
5. Release the ZIF connector **(5)** to which the display panel cable is connected, and disconnect the cable from the system board.
6. Release the display panel cable from the retention clip **(6)** built into the top cover/keyboard.



7. Remove the six Phillips M2.0 × 6.0 screws that secure the display assembly to the computer.



8. Swing the top edge of the display assembly **(1)** away from the top cover/keyboard. (The top cover/keyboard disengages from the display assembly hinges.)
9. Separate the display assembly **(2)** from the top cover/keyboard.



Reverse this procedure to install the display assembly.

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-7 Speaker description and part number

Description	Spare part number
Speakers (includes left and right speakers, cables, and rubber isolators)	M16007-001

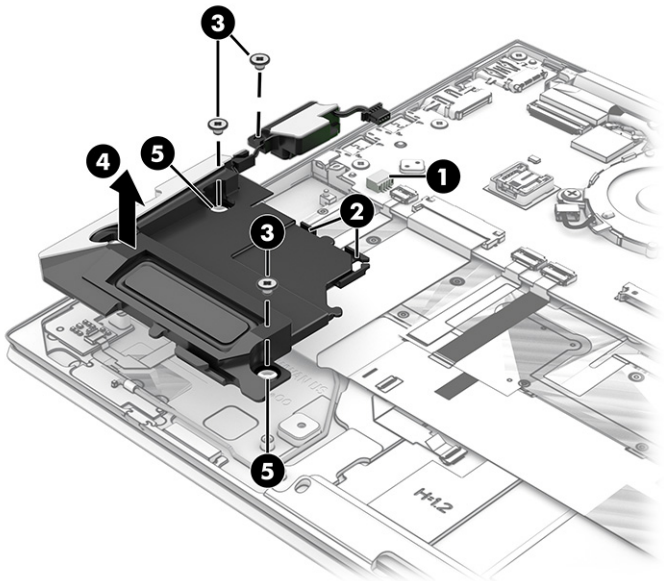
Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).

Remove the speakers:

1. Detach the keyboard cable from the right speaker. (The keyboard cable is attached to the right speaker with double-side adhesive.)
2. Disconnect the right speaker cable **(1)** from the system board.
3. Release the WWAN antenna cable from the retention channel **(2)** built into the right speaker.
4. Remove the three Phillips M2.0 × 3.5 screws **(3)** that secure the right speaker to the computer.
5. Remove the right speaker **(4)** .

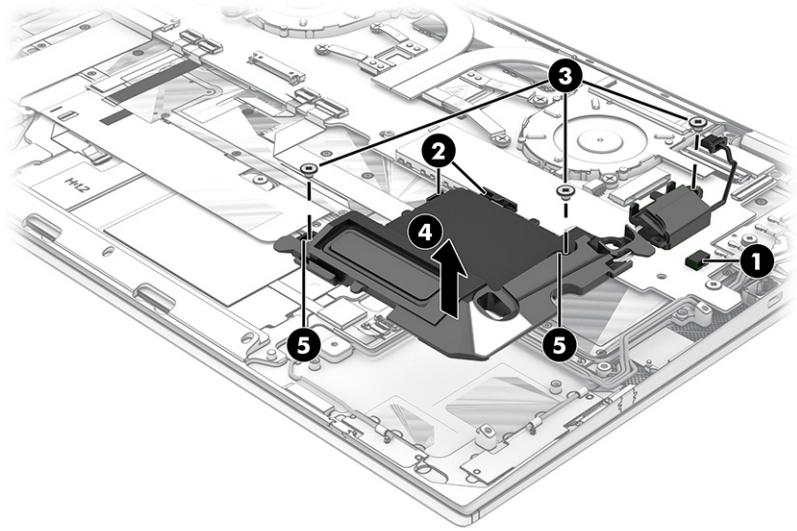
NOTE: When removing the right speaker, make note of the location of the rubber isolator **(5)**. The absence of or damage to this isolator can result in degraded right speaker performance.



6. Disconnect the left speaker cable **(1)** from the system board.
7. Release the WWAN antenna cable from the retention channel **(2)** built into the left speaker.
8. Remove the three Phillips M2.0 × 3.5 screws **(3)** that secure the left speaker to the computer.

9. Remove the left speaker **(4)** .

NOTE: When removing the left speaker, make note of the location of the rubber isolator **(5)**. The absence of or damage to this isolator can result in degraded left speaker performance.



Reverse this procedure to install the speakers.

Touchpad cable

To remove the touchpad cable, use this procedure and illustration.

NOTE: The touchpad cable is available in the Cable Kit, spare part number M20833-001.

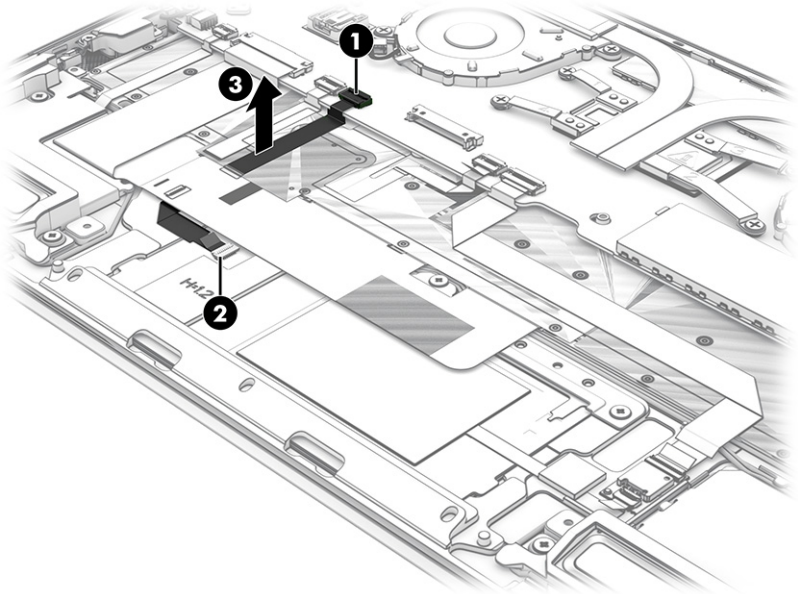
Before removing the touchpad cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).

Remove the touchpad cable:

1. Release the ZIF connector **(1)** to which the touchpad cable is connected, and then disconnect the cable from the system board.
2. Release the ZIF connector **(2)** to which the touchpad cable is connected, and then disconnect the cable from the touchpad.

3. Remove the touchpad cable **(3)**.



Reverse this procedure to install the touchpad cable.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-8 **Touchpad description and part number**

Description	Spare part number
For use only on computer models equipped with NFC capability	M16010-001
For use only on computer models not equipped with NFC capability	M16005-001
NOTE: The touchpad spare part kit does not include the touchpad bracket or touchpad cable. The touchpad bracket is not available as a spare part. The touchpad cable is available in the Cable Kit, spare part number M20835-001.	
Touchpad bracket: The touchpad bracket is not available as a spare part.	

Before removing the touchpad, follow these steps:

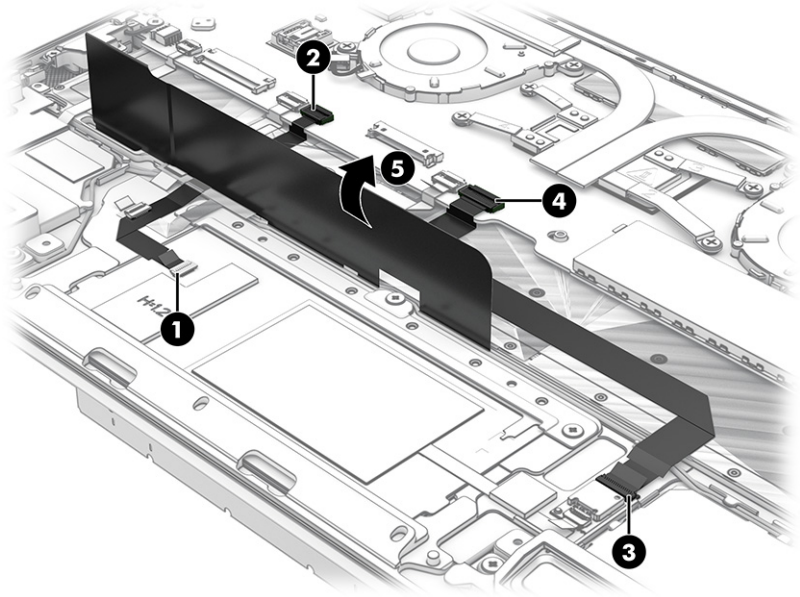
1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).

Remove the touchpad:

1. Detach the touchpad cable **(1)** from the top cover/keyboard. (The touchpad cable is attached to the top cover/keyboard with double-sided adhesive.)
2. Release the ZIF connector **(2)** to which the touchpad cable is connected, and then disconnect the cable from the system board.

   Steps 3 and 4 apply only to computer models equipped with an NFC module and cable.

3. Detach the NFC module cable **(3)** from the top cover/keyboard. (The NFC module cable is attached to the top cover/keyboard with double-sided adhesive.).
4. Release the ZIF connector **(4)** to which the NFC module cable is connected, and then disconnect the cable from the system board.
5. Fold back the keyboard cable **(5)** until the touchpad screws are accessible.

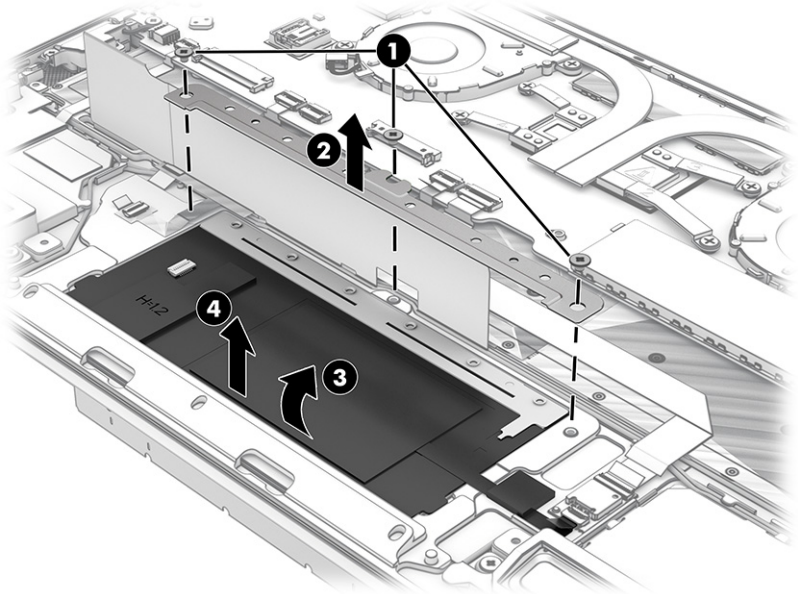


6. Remove the three Phillips M2.0 × 2.0 broad head screws **(1)** that secure the touchpad to the computer.
7. Remove the touchpad bracket **(2)**.

NOTE: The touchpad bracket is not available as a spare part component.

8. Lift the front edge **(3)** of the touchpad until it clears the top cover/keyboard.

9. Remove the touchpad from the computer **(4)**.



Reverse this procedure to install the touchpad.

NFC module cable

To remove the NFC module cable, use this procedure and illustration.

NOTE: The NFC module cable is available in the Cable Kit, spare part number M20835-001.

Table 5-9 NFC module cable description and part number

Description	Spare part number
NFC module cable:	M16045-001
NOTE: The NFC module cable spare part kit does not include the NFC module cable cable. The NFC module cable cable is available in the Cable Kit, spare part number M20835-001.	

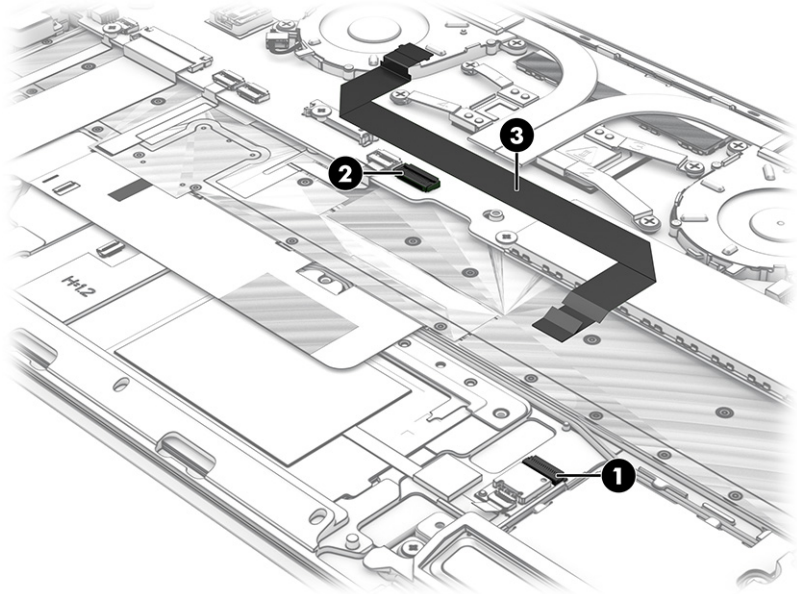
Before removing the NFC module cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).

Remove the NFC module cable:

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

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



4. Remove the NFC module cable.

Reverse this procedure to install the NFC module cable.

NFC module

To remove the NFC module, use this procedure and illustration.

Table 5-10 **NFC module cable description and part number**

Description	Spare part number
NFC module cable:	M16045-001
NOTE: The NFC module cable spare part kit does not include the NFC module cable cable. The NFC module cable cable is available in the Cable Kit, spare part number M20835-001.	

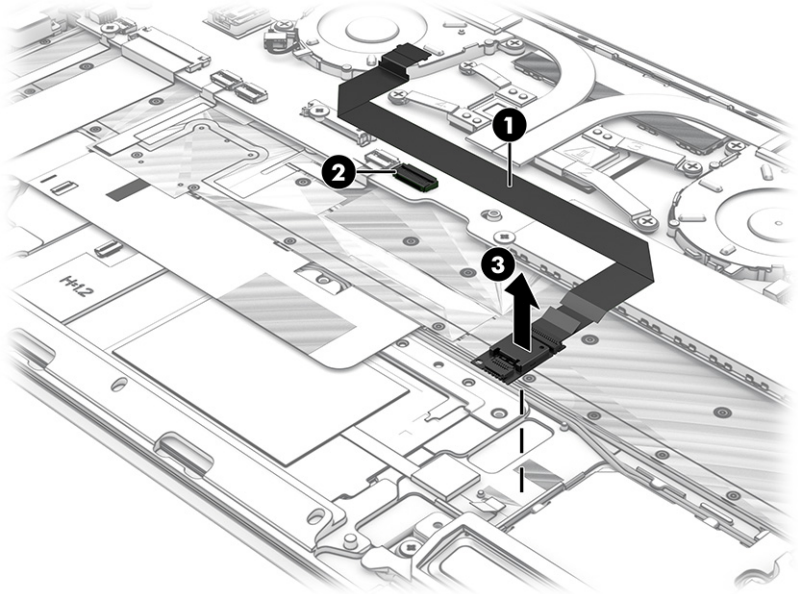
Before removing the NFC module, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).

Remove the NFC module:

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

3. Detach the NFC module **(3)** from the top cover/keyboard. (The NFC module is attached to the top cover/keyboard with double-sided adhesive.)



Reverse this procedure to install the NFC module.

System board

To remove the system board, use these procedures and illustrations.

Table 5-11 System board descriptions and part numbers

Description	Spare part number
NOTE: All system board spare part kits include an integrated processor and replacement thermal material.	
Equipped with an Intel Core i7-10810U processor, 32 GB of system memory, and the Windows 10 OSR operating system	M16024-601
Equipped with an Intel Core i7-10810U processor, 32 GB of system memory, and a non-Windows OSR operating system	M16024-001
Equipped with an Intel Core i7-10810U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16023-601
Equipped with an Intel Core i7-10810U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16023-001
Equipped with an Intel Core i7-10810U processor, 8 GB of system memory, and the Windows 10 OSR operating system	M16025-601
Equipped with an Intel Core i7-10810U processor, 8 GB of system memory, and a non-Windows OSR operating system	M16025-001
Equipped with an Intel Core i7-10710U processor, 32 GB of system memory, and the Windows 10 operating system	M16021-601
Equipped with an Intel Core i7-10710U processor, 32 GB of system memory, and a non-Windows operating system	M16021-001
Equipped with an Intel Core i7-10710U processor, 16 GB of system memory, and the Windows 10 operating system	M16020-601
Equipped with an Intel Core i7-10710U processor, 16 GB of system memory, and a non-Windows operating system	M16020-001
Equipped with an Intel Core i7-10710U processor, 8 GB of system memory, and the Windows 10 operating system	M16022-601

Table 5-11 System board descriptions and part numbers (continued)

Description	Spare part number
Equipped with an Intel Core i7-10710U processor, 8 GB of system memory, and a non-Windows operating system	M16022-001
Equipped with an Intel Core i7-10610U processor, 32 GB of system memory, and the Windows 10 OSR operating system	M16018-601
Equipped with an Intel Core i7-10610U processor, 32 GB of system memory, and a non-Windows OSR operating system	M16018-001
Equipped with an Intel Core i7-10610U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16017-601
Equipped with an Intel Core i7-10610U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16017-001
Equipped with an Intel Core i7-10610U processor, 8 GB of system memory, and the Windows 10 OSR operating system	M16019-601
Equipped with an Intel Core i7-10610U processor, 8 GB of system memory, and a non-Windows OSR operating system	M16019-001
Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16014-601
Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16014-001
Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and the Windows 10 operating system	M16013-601
Equipped with an Intel Core i5-10310U processor, 16 GB of system memory, and a non-Windows operating system	M16013-001
Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and the Windows 10 OSR operating system	M16016-601
Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and a non-Windows OSR operating system	M16016-001
Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and the Windows 10 operating system	M16015-601
Equipped with an Intel Core i5-10310U processor, 8 GB of system memory, and a non-Windows operating system	M16015-001
Equipped with an Intel Core i5-10210U processor, 16 GB of system memory, and the Windows 10 OSR operating system	M16011-601
Equipped with an Intel Core i5-10210U processor, 16 GB of system memory, and a non-Windows OSR operating system	M16011-001
Equipped with an Intel Core i5-10210U processor, 8 GB of system memory, and the Windows 10 operating system	M16012-601
Equipped with an Intel Core i5-10210U processor, 8 GB of system memory, and a non-Windows operating system	M16012-001
Nano SIM tray (not illustrated, for use only on computer models equipped with WWAN capability)	M16053-001

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board (see Battery on page 45).

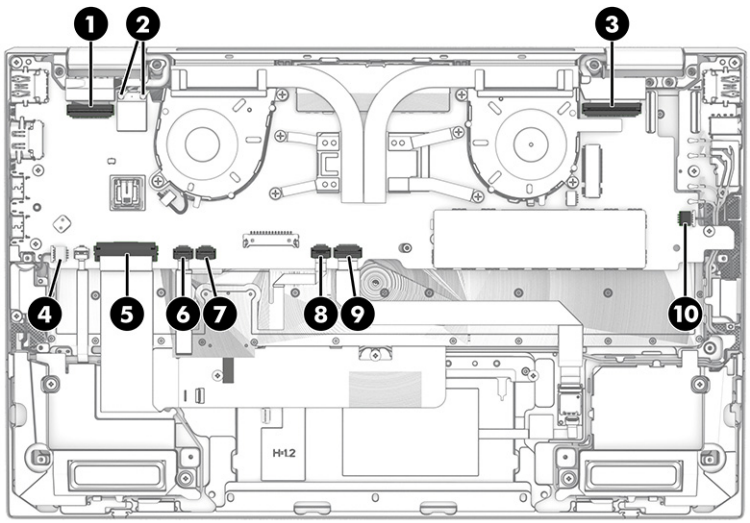
When you replace the system board, be sure to remove the following components (as applicable) from the defective system board and install them on the replacement system board:

- Solid-state drive and shield (see Solid-state drive on page 47).
- WWAN module (see WWAN module on page 48).
- Fan/heat sink assembly (see Fan/heat sink assembly on page 64).
- Sensor board and cable (see Sensor board on page 67).

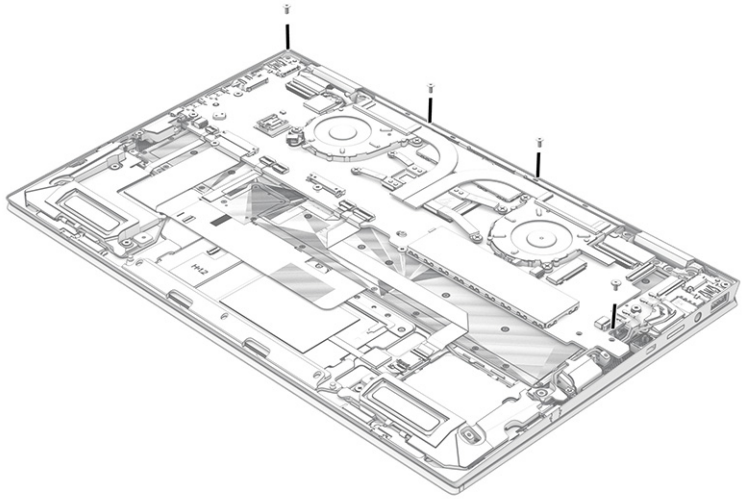
Remove the system board:

1. Release the ZIF connector **(1)** to which the webcam/microphone module cable is connected, and disconnect the cable from the system board.
2. Remove the WWAN module shield.
3. Disconnect the WLAN antenna cables **(2)** from the WLAN module terminals.

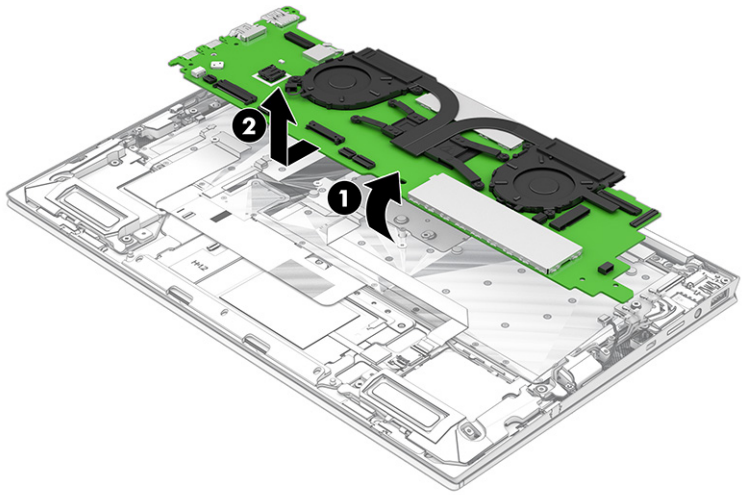
   The #1/white WLAN antenna cable connects to the WLAN module **#1/Main** terminal. The #2/black WLAN antenna cable connects to the WLAN module **#2/Aux** terminal.
4. Disconnect the following cables from the system board:
   - Display panel cable ZIF connector cable **(3)**
   - Right speaker cable **(4)**
   - Keyboard ZIF connector cable **(5)**
   - Touchpad ZIF connector cable **(6)**
   - Backlight ZIF connector cable **(7)**
   - Fingerprint reader ZIF connector cable **(8)**
   - NFC module ZIF connector cable **(9)**
   - Left speaker cable **(10)**



5. Remove the four Phillips M2.0 × 5.0 screws that secure the system board to the computer.



6. Lift the front edge of the system board **(1)** until it rests at an angle.
7. Remove the system board **(2)** by sliding it up and forward at an angle.



Reverse this procedure to install the system board.

Fan/heat sink assembly

To remove the fan/heat sink assembly, use these procedures and illustrations.

Table 5-12 **Fan/heat sink assembly descriptions and part numbers**

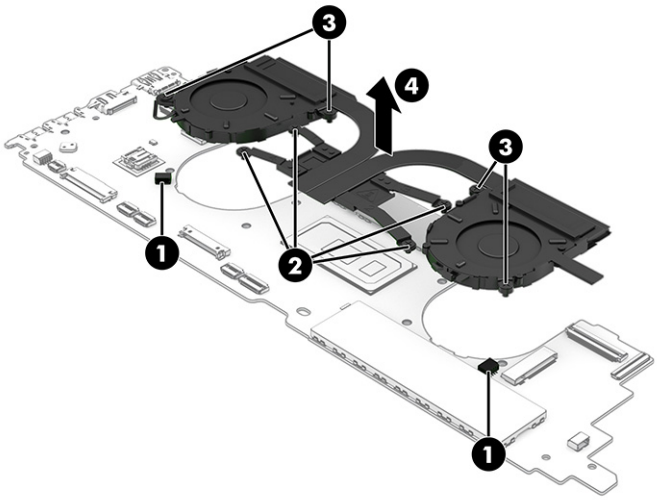
Description	Spare part number
Fan/heat sink assembly (includes replacement thermal material)	M16006-001

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

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Disconnect the battery cable from the system board the battery (see Battery on page 45).
4. Remove the system board (see System board on page 61).

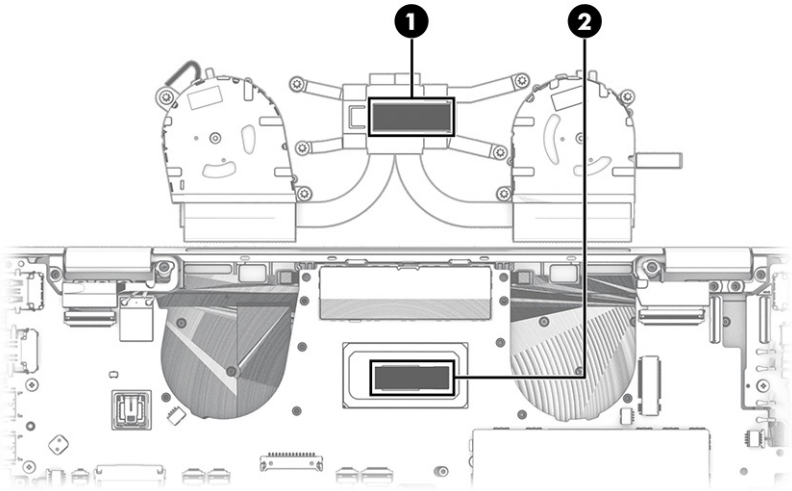
Remove the fan/heat sink assembly:

1. Disconnect the fan cables **(1)** from the system board.
2. In the order indicated on the heat sink, loosen the four captive Phillips screws **(2)** that secure the fan/heat sink assembly to the computer.
3. Loosen the four captive Phillips screws **(3)** that secure the fan/heat sink assembly to the computer.
4. Remove the fan/heat sink assembly from the system board **(4)**.



5. Thoroughly clean the thermal material from the surfaces of the fan/heat sink assembly and the system board components each time the fan/heat sink assembly is removed. Replacement thermal material is included with the fan/heat sink assembly and system board spare part kits. The following illustration shows the replacement thermal material locations.

   Thermal paste is used on the processor **(1)** and on the fan/heat sink assembly area **(2)** that services it.



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

Sensor board cable

To remove the sensor board cable, use this procedure and illustration.

NOTE: The sensor board cable is available in the Cable Kit, spare part number M20835-001.

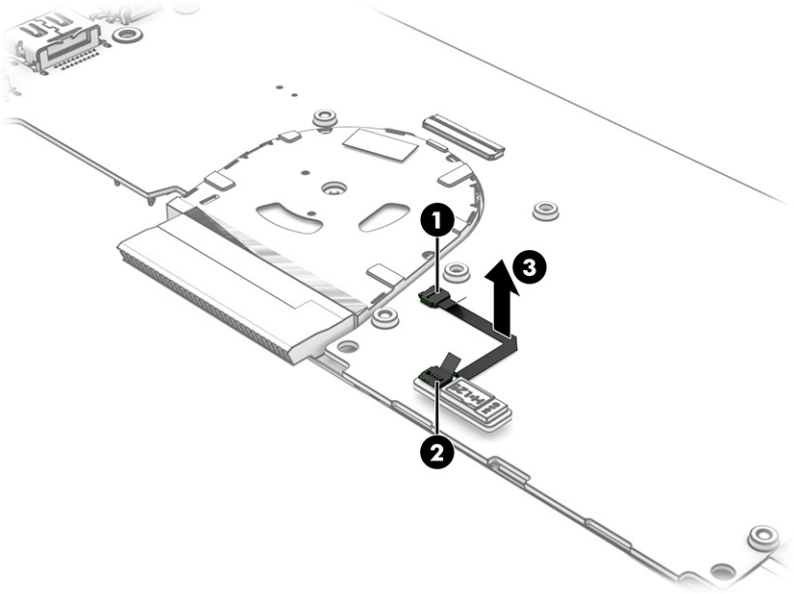
Before removing the sensor board cable, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).
4. Remove the system board (see System board on page 61).

Remove the sensor board cable:

1. Turn the system board upside down with the rear toward you.
2. Release the ZIF connector **(1)** to which the sensor board cable is connected, and then disconnect the cable from the system board.
3. Release the ZIF connector **(2)** to which the sensor board cable is connected, and then disconnect the cable from the sensor board.

4. Remove the sensor board cable **(3)**.



Reverse this procedure to install the sensor board cable.

Sensor board

To remove the sensor board, use this procedure and illustration.

Table 5-13 **Sensor board description and part number**

Description	Spare part number
Sensor board:	
NOTE: The sensor board spare part kit does not include the sensor board cable. The sensor board cable is available in the Cable Kit, spare part number M20835-001.	
For use only on computer models equipped with a microphone	M16047-001
For use only on computer models not equipped with a microphone	M16046-001

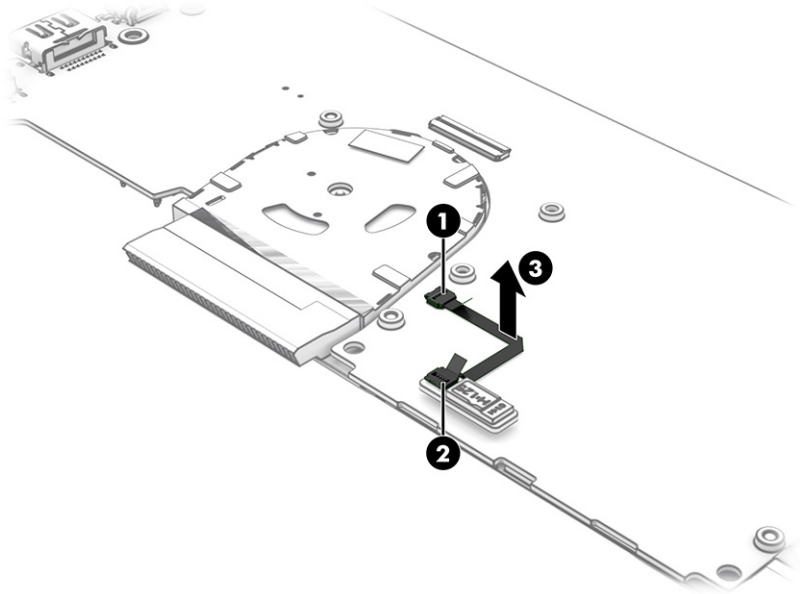
Before removing the sensor board, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).
4. Remove the system board (see System board on page 61).

Remove the sensor board:

1. Turn the system board upside down with the rear toward you.
2. Release the ZIF connector **(1)** to which the sensor board cable is connected, and then disconnect the cable from the system board.

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



Reverse this procedure to install the sensor board.

WWAN antenna

To remove the WWAN antenna, use this procedure and illustration.

Table 5-14 **WWAN antenna description and part number**

Description	Spare part number
WWAN antenna (includes left and right cables and transceivers and adhesive)	M20836-001

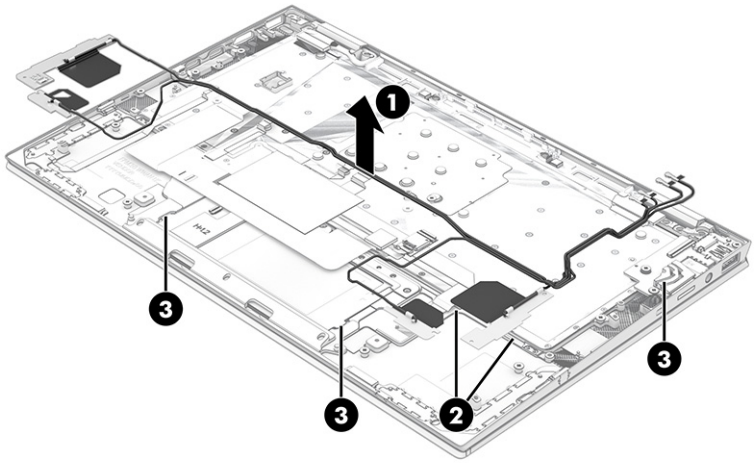
Before removing the WWAN antenna, follow these steps:

1. Prepare the computer for disassembly (Preparation for disassembly on page 44).
2. Remove the bottom cover (Bottom cover on page 44).
3. Remove the battery (see Battery on page 45).
4. Remove the speakers (see Speakers on page 54).

Remove the WWAN antenna:

1. Detach the transceivers **(1)** from the top cover/keyboard surface. (The transceivers are attached to the top cover/keyboard with double-sided adhesive.)
2. Release the cables **(2)** from the routing path to which they are formed in the top cover/keyboard.

3. Release the cables from the rubber retention molds (3).



4. Remove the WWAN antenna.

Reverse this procedure to install the WWAN antenna.

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

You have several ways to access the Setup Utility (BIOS).

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

- Turn on or restart the computer and quickly press f10.

  – or –

  Turn on or restart the computer, quickly press esc, and then press f10 when the Start menu is displayed.

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (BIOS) might be available on the HP website. Most BIOS updates on the HP website are packaged in compressed files called *SoftPaqs*. Some download packages contain a file named Readme.txt, which contains information regarding installing and troubleshooting the file.

Determining the BIOS version

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

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

- HP Support Assistant

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

     – or –

     Select the question mark icon in the taskbar.

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

- Setup Utility (BIOS)

  1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 71).
  2. Select **Main**, and then make note of the BIOS version.
  3. Select **Exit**, select one of the options, and then follow the on-screen instructions.

- In Windows, press ctrl+alt+s.

To check for later BIOS versions, see Preparing for a BIOS update on page 73.

Preparing for a BIOS update

Be sure to follow all prerequisites before downloading and installing a BIOS update.

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

- Do not disconnect power from the computer by unplugging the power cord from the AC outlet.
- Do not shut down the computer or initiate Sleep.
- Do not insert, remove, connect, or disconnect any device, cable, or cord.

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

Downloading a BIOS update

After you review the prerequisites, you can check for and download BIOS updates.

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. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You might 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.

Installing a BIOS update

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. 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.

7 Backing up, restoring, and recovering

You can use Windows tools or HP software to back up your information, create a restore point, reset your computer, create recovery media, or restore your computer to its factory state. Performing these standard procedures can return your computer to a working state faster.

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

These methods of creating recovery media and backups are available on select products only.

Using Windows tools for backing up

HP recommends that you back up your information immediately after initial setup. You can do this task either using Windows Backup locally with an external USB drive or using online tools.

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

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

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.

For details:

- Go to http://www.hp.com/support, search for HP Cloud Recovery, and then select the result that matches the type of computer that you have.

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.

IMPORTANT: HP recommends that you follow the Restoring and recovery methods on page 77 to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Restoring and recovering your system

You have several tools available to recover your system both within and outside of Windows if the desktop cannot load.

HP recommends that you attempt to restore your system using the Restoring and recovery methods on page 77.

Creating a system restore

System Restore is available in Windows. The System Restore software can automatically or manually create restore points, or snapshots, of the system files and settings on the computer at a particular point.

When you use System Restore, it returns your computer to its state at the time you made the restore point. Your personal files and documents should not be affected.

Restoring and recovery methods

After you run the first method, test to see whether the issue still exists before you proceed to the next method, which might now be unnecessary.

1. Run a Microsoft System Restore.
2. Run Reset this PC.
3. Recover using HP Recovery media. For more information, see Recovering using HP Recovery media on page 77.

For more information about the first two methods, see the Get Help app:

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

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

Recovering using HP Recovery media

You can use HP Recovery media 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 76.

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.

NOTE: HP recommends that you follow the Restoring and recovery methods on page 77 to restore your computer before you obtain and use the HP recovery discs. Using a recent backup can return your machine to a working state sooner than using the HP recovery discs. After the system is restored, reinstalling all the operating system software released since your initial purchase can be a lengthy process.

Changing the computer boot order

If your computer does not restart using the HP Recovery media, you can change the computer boot order, the order of devices listed in BIOS for startup information. You can select an optical drive or a USB flash drive, depending on the location of your HP Recovery media.

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

To change the boot order:

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 press and hold the volume up button, and then select **f9**.

     – or –

     Turn on or restart the tablet, quickly press and hold 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 software. 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. Follow the on-screen instructions to find your product and locate your documentation.

8 Using HP PC Hardware Diagnostics

You can use the HP PC Hardware Diagnostics utility to determine whether your computer hardware is running properly. The three versions are HP PC Hardware Diagnostics Windows, HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface), and (for select products only) Remote HP PC Hardware Diagnostics UEFI, a firmware feature.

Downloading the HP PC Hardware Diagnostics Windows from the Microsoft Store

You can download the HP PC Hardware Diagnostics Windows from the Microsoft Store.

1. Select the Microsoft Store app on your desktop or enter `Microsoft Store` in the taskbar search box.
2. Enter `HP PC Hardware Diagnostics Windows` in the **Microsoft Store** search box.
3. Follow the on-screen directions.

The tool downloads to the selected location.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

Using the Remote HP PC Hardware Diagnostics setting in Computer Setup (BIOS), you can perform several 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 hard 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 that you use 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.

9 Specifications

This chapter provides specifications for your computer.

Computer specifications

This section provides specifications for your computer. When traveling with your computer, the computer dimensions and weights, as well as input power ratings and operating specifications, provide helpful information.

Table 9-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	**385 mm**	15.18 in
Depth	**258 mm**	10.15 in
Height (front to back)	**23 mm**	0.89 in
Weight	**2.09 kg**	4.61 lb
Input power		
Operating voltage and current	19.5 V dc @ 2.31 A – 45 W	
	19.5 V dc @ 3.33 A – 65 W	
	19.5 V dc @ 4.62 A – 90 W	
	19.5 V dc @ 7.70 A – 150 W	
	19.5 V dc @ 10.3 A – 200 W	
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

Table 9-1 Computer specifications (continued)

	Metric	U.S.
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.		

35.6 cm (14.0 in) display specifications

This section provides specifications for your display.

Table 9-2 Display specifications

	Metric	U.S.
Active diagonal size	35.6 cm	14.0 in
Resolution	1920 × 1080 (FHD) 3840 × 2160 (UHD)	
Surface treatment	Antiglare (FHD, UHD panels) BrightView (OLED panel)	
Brightness	400 nits (UHD, sRGB 95% panel) 1000 nits (FHD, 72% NTSC panels) 400 nits (FHD, 72% NTSC panels)	
Viewing angle	UWVA	
Backlight	WLED	
Display panel interface	eDP 1.4 + PSR2 eDP + PSR2	

Solid-state drive specifications

This section provides specifications for your solid-state drives.

Table 9-3 Solid-state drive specifications

	256 GB*	512 GB*	1 TB*
Dimensions			
Height	1.0 mm	1.0 mm	1.0 mm
Length	50.8 mm	50.8 mm	50.8 mm
Width	28.9 mm	28.9 mm	28.9 mm
Weight	< 10 g	< 10 g	< 10 g
Interface type	PCIe	PCIe	PCIe
Ready time, maximum (to not busy)	1.0 ms	< 1.0 ms	1.0 ms

Table 9-3 Solid-state drive specifications (continued)

	256 GB*	512 GB*	1 TB*
Access times, logical	0.1 ms	0.1 ms	0.1 ms
Transfer rate			
Sequential read	up to 2150 MB/s	up to 2150 MB/s	up to 2150 MB/s
Random read	Up to 300,000 IOPs	Up to 300,000 IOPs	Up to 300,000 IOPs
Sequential write	up to 1550 MB/s	up to 1550 MB/s	up to 1550 MB/s
Random write	Up to 100,000 IOPs	Up to 100,000 IOPs	Up to 100,000 IOPs
Total logical sectors	468,883,296	1,000,215,216	1,500,336,388
Operating temperature	**0°C to 70°C** (32°F to 158°F)		

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact support for details.

Solid-state drive specifications (SATA-3)

This section provides specifications for your solid-state drive.

Table 9-4 Solid-state drive specifications

	128 GB*
Dimensions	
Height	1.35 mm
Weight	< 10 g
Interface type	SATA-3
Ready time, maximum (to not busy)	1.0 ms
Access times, logical	0.1 ms
Transfer rate	up to 540 MB/s
Total logical sectors	234,441,648
Operating temperature	**0°C to 70°C** (32°F to 158°F)

*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

NOTE: Certain restrictions and exclusions apply. Contact support for details.

10 Statement of memory volatility

For general information regarding nonvolatile memory in HP Business computers, and to restore nonvolatile memory that can contain personal data after the system has been turned off and the hard drive has been removed, use these instructions.

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, with the following assumptions:

- No subsequent modifications were made to the system.
- No applications, features, or functionality were 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 also remains in nonvolatile memory. Use the following steps 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

Use these instructions to restore nonvolatile memory.

1. Follow these steps 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 restarts.

   c. During the restart, 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 reboots.

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**, and then clear the check box 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 reboots.

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), fingerprint reader, or both, 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:

If you clear data using Secure Erase, you cannot recover it.

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

b. Select the **Security** menu and scroll down to the esc 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:

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

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

iii. Select **Hard Drive Utilities**.

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

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.

Nonvolatile memory usage

Use this table to troubleshooting 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 entered 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 products only) on page 91.	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 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.

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 entered into this memory?	How is this memory write-protected?
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 entered 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 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 **Identify your product for manuals and specific product information**, 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 megabits	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 kilobits to 8 kilobits	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.

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 entered into this memory?	How is this memory write-protected?
Camera (select products only)	64 kilobits	No	Yes	Stores camera configuration and firmware.	Camera 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

Use this section to answer your questions about nonvolatile memory.

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

IMPORTANT: The restore defaults feature does not securely erase any data on your hard drive. See question and answer 6 for steps to securely erase data.

The restore defaults feature 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 replaces 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 runtime environment that supports a Graphic User Interface (GUI). In this environment, you can use either a pointing device (touch screen, 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 runtime 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 is the UEFI BIOS located?**

   The UEFI BIOS is located on a flash memory chip. You must use a utility 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 and timing, voltage, and thermal information. This information is written by the module manufacturer and stored on an EEPROM. You cannot write to this EEPROM 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 erase the data?**

   IMPORTANT: Resetting results in the loss of information.

   These steps do 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, disabling Secure Boot does not clear the keys. You must also select to clear the Custom Secure Boot Keys. Use the same Secure Boot access procedure that you used to create the Custom Secure Boot Keys, but select 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 products 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. Advanced users can customize the default configuration.

To access the latest documentation on HP Sure Start, go to http://www.hp.com/support.

11 Power cord set requirements

This chapter provides power cord requirements for countries and regions.

The wide-range input feature of the computer permits it to operate from any line voltage from 100 V ac to 120 V ac, or from 220 V ac 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

These power cord 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 V ac 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

To determine power cord requirements for specific countries and regions, use this table.

Table 11-1 **Power cord requirements for specific countries and regions**

Country/region	Accredited agency	Applicable note number
Argentina	IRAM	1
Australia	SAA	1
Austria	OVE	1
Belgium	CEBEC	1
Brazil	ABNT	1
Canada	CSA	2

Table 11-1 Power cord requirements for specific countries and regions (continued)

Country/region	Accredited agency	Applicable note number
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

Table 11-1 Power cord requirements for specific countries and regions (continued)

Country/region	Accredited agency	Applicable note number
The United States	UL	2

1. The flexible cord must be Type H05VV-F, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.
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. 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 nonrechargeable 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 website at http://www.hp.com/recycle.

Index