Maintenance and Service Guide

SUMMARY

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

Legal information

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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 is automatically updated, which is always enabled. High-speed internet and Microsoft account required. ISP fees may apply and additional requirements may apply over time for updates. See http://www.windows.com. **If your product ships with Windows in S Mode:** Windows in S Mode works exclusively with apps from the Microsoft Store within Windows. Certain default settings, features, and apps cannot be changed. Some accessories and apps that are compatible with Windows may not work (including some antivirus, PDF writers, driver utilities, and accessibility apps), and performance may vary, even if you switch out of S Mode. If you switch to Windows, you cannot switch back to S Mode. Learn more at Windows.com/SmodeFAQ.

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

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 Pro x360 Fortis 11 inch G9 Notebook PC
Processors	● Intel™ Pentium® Silver N6000 1.10 GHz (burst up to 3.3 GHz) processor (quad core, 2933 MHz front side bus (FSB), 4 MB L3 cache, 6 W) ● Intel Celeron® N5100 1.10 GHz (burst up to 2.8 GHz) processor (quad core, 2933 MHz FSB, 4 MB L3 cache, 6 W) ● Intel Celeron N4500 1.10 GHz processor (burst up to 2.8 GHz) (dual core, 2933 MHz FSB, 4 MB L3 cache, 6 W)
Chipset	Intel integrated soldered-on-circuit (SoC)
Digital pen	HP Slim rechargeable pen
Display	29.6 cm (11.6 in), liquid crystal display (LCD), high definition (HD) (1368 × 768), BrightView, light-emitting diode (LED), ultrawide viewing angle (UWVA), 50% National Television Standards Committee (NTSC), Embedded DisplayPort™ (eDP), slim touchscreen display panel; typical brightness: 250 nits
	29.6 cm (11.6 in), LCD, HD (1368 × 768), BrightView, LED, super vertical alignment (SVA), 45% NTSC, eDP, slim touchscreen display panel; typical brightness: 250 nits
Memory	On-board (nonupgradeable) system memory supporting 8 GB
	Double Data Rate (DDR)4-3200 dual-channel support (DDR4-3200 downgrade to DDR4-2933)
	Supports the following configuration: 8 GB 3200 DDR4 1.2v IC 8GB × 16
Primary storage	embedded MultiMedia Controller (eMMC):
	On-board (eMMC v5.0) configurations (MLC/TLC)
	64 GB
Audio and video	**Integrated HD Camera**: one-piece, fixed, USB 2.0, 5 MP, auto focus, wide field of vision (WFOV)
	720p
	Dual-array digital microphone
Wireless	**Wireless Local Area Network (WLAN)**
	Intel 9560 ac 2×2 + Bluetooth® 5.0 MU-MIMO M.2 2230 non-vPro® 160 MHz MIPI+BRI WW WLAN module
	Intel Wi-Fi® 6 AX201 ax 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro 160 MHz MIPI+BRI WW WLAN module with two antennas

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

Category	Description
	Wireless Wide Area Network (WWAN)
	Intel XMM™ 7360 long-term evolution (LTE)-Advanced (Cat 9) WWAN
Ports	Audio-out (headphone)/audio-in (microphone) combo jack
	HDMI port
	Power connector
	RJ-45 (network) jack
	USB SuperSpeed 5 Gbps ports (2)
	USB Type-C® power connector and SuperSpeed 5 Gbps port
Keyboard/pointing devices	**Keyboard**
	Full size, not backlit, 3-coat paint, island style
	Touchpad
	Clickpad with image sensor
	Multitouch gestures enabled
	Precision touchpad support
	Support for Modern Trackpad Gestures
	Taps enabled as default
Power requirements	**Battery:**
	3 cell, 42 Whr, polymer, HP Long Life
	HP Fast Charge Technology
	Smart AC adapters:
	65 watt, HP Smart Adapter (non-power factor correcting (nPFC), EM barrel, 4.5 mm [0.18 in])
	45 watt, HP Smart Adapter (nPFC, standard C8 connector for 2-prong barrel, 4.5 mm [0.18 in] right angle)
	45 watt, HP Smart Adapter (nPFC, standard barrel, 4.5 mm [0.18 in] right angle 1.8 m [6.0 ft])
	45 watt, HP Smart Adapter (nPFC, standard barrel, 4.5 mm [0.18 in] right angle)
	45 watt AC adapter (nPFC, standard USB Type-C® straight 1.8 m [6.0 ft])
	Power cords:
	C7, 1.0 m (3.3 ft), conventional with sticker
	C5, 1.0 m (3.3 ft), conventional with sticker
Operating system	Windows® 10 Enterprise 64
	Windows 10 Enterprise 64 LTSC 2109 (21H2)
	Windows 11 Enterprise 64
	Windows 11 Home 64
	Windows 11 Home 64 Chinese Market CPPP
	Windows 11 Home 64 Single Language

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

Category	Description
	Windows 11 Home 64 Single Language Africa Market PPP
	Windows 11 Home 64 Single Language APAC EM PPP
	Windows 11 Home 64 Single Language APAC EM PPP
	Windows 11 Home 64 Single Language India Market PPP
	Windows 11 Home 64 Single Language Indonesia Market PPP
	Windows 11 Home 64 StF MSNA for Higher Education
	Windows 11 Home 64 StF MSNA for Higher Education Strategic
	Windows 11 Pro 64
	Windows 11 Pro 64 Chinese Market
	Windows 11 Pro 64 Downgrade Win 10 Pro 64
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 Chinese Market
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 Entry
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 Entry Chinese Market
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 StF MSNA Entry
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 StF MSNA Entry Emerging Market
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 StF MSNA Standard
	Windows 11 Pro 64 Downgrade Win 10 Pro 64 StF MSNA Strategic
	Windows 11 Pro 64 Entry
	Windows 11 Pro 64 Entry Chinese Market
	Windows 11 Pro 64 StF MSNA Entry
	Windows 11 Pro 64 StF MSNA Entry Emerging Market
	Windows 11 Pro 64 StF MSNA Standard
	Windows 11 Pro 64 StF MSNA Strategic
	FreeDOS
Serviceability	**End user replaceable part:** AC adapter

2   Components

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

Locating hardware

Use these instructions to find out what hardware is installed on your computer.

▲   Select the **Search** icon (select products only) in the taskbar, type `device manager` in the search box, and then select the **Device Manager** app.

A list displays all the devices installed on your computer.

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

Locating software

Use these instructions to find out what software is installed on your computer:

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

Right

Use the illustration and table to identify the components on the right side of the computer.
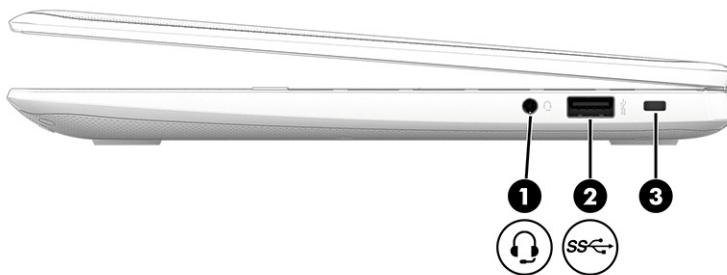
Table 2-1 Right-side components and their descriptions

Component		Description
(1)	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: ▲ Select the **Search** icon (select products only) in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.
(2)	USB SuperSpeed 5 Gbps port	Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode. **NOTE:** Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device.
(3)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it might not prevent the computer from being mishandled or stolen.

Left

Use the illustration and table to identify the components on the left side of the computer.
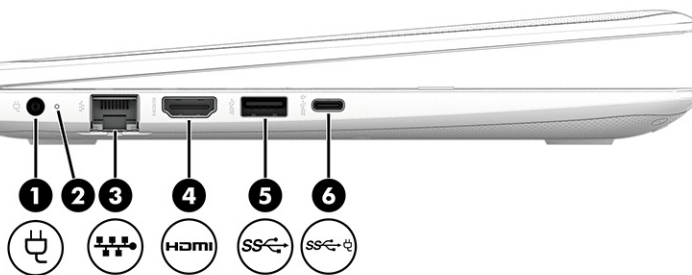
Table 2-2 Left-side components and their descriptions

Component		Description
(1)	Power connector	Connects an AC adapter.
(2)	Battery light	When AC power is connected: ● White: The battery charge is greater than 90%.

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

Component		Description
		• Amber: The battery charge is from 0 to 90%.
		• Off: The battery is not charging.
		When AC power is disconnected (battery not charging):
		• Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly.
		• Off: The battery is not charging.
(3)		RJ-45 (network) jack/status lights	Connects a network cable.

• Green (left): The network is connected.

• Amber (right): Activity is occurring on the network. |
| (4) | HDMI port | Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High Definition Multimedia Interface (HDMI) device. |
| (5) | USB SuperSpeed 5 Gbps port | Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.

NOTE: Use a standard USB Type-A charging cable or cable adapter (purchased separately) when charging a small external device. |
| (6) | USB Type-C power connector and SuperSpeed 5 Gbps port | Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery.

– and –

Connects a USB device, provides high-speed data transfer, and (for select products) charges small devices (such as a smartphone) when the computer is on or in Sleep mode.

NOTE: Use a standard USB Type-C charging cable or cable adapter (purchased separately) when charging a small external device. |

Display

Use the illustration and table to identify the display components.

Low blue light mode (select products only)

Your computer display is shipped from the factory in low blue light mode for improved eye comfort and safety. Also, blue light mode automatically adjusts blue light emissions when you are using the computer at night or for reading.

To reduce the risk of serious injury, read the Safety & Comfort Guide. It describes proper workstation setup and proper posture, health, and work habits for computer users. The Safety & Comfort Guide also provides

important electrical and mechanical safety information. The Safety & Comfort Guide is available on the web at http://www.hp.com/ergo.

Table 2-3 Display and top cover components and their descriptions

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

*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.

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

Component	Description
	To access this guide:

▲   Select the **Search** icon (select products only) in the taskbar, type `HP Documentation` in the search box, and then select **HP Documentation**.

Keyboard area

Keyboards can vary by language.

Touchpad

The touchpad settings and components are described here.

Touchpad settings

You learn how to adjust the touchpad settings and components here.

Adjusting touchpad settings

Use these steps to adjust touchpad settings and gestures.

1. Select the **Search** icon (select products only) in the taskbar, type `touchpad settings` in the search box, and then press enter.

2. Choose a setting.

Turning on the touchpad

Follow these steps to turn on the touchpad.

1. Select the **Search** icon (select products only) in the taskbar, type `touchpad settings` in the search box, and then press enter.

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

    If you are not using an external mouse, press the Tab key repeatedly until the pointer rests on the **touchpad** button. Then press the spacebar to select the button.

Touchpad components

Use the illustration and table to identify the touchpad components.
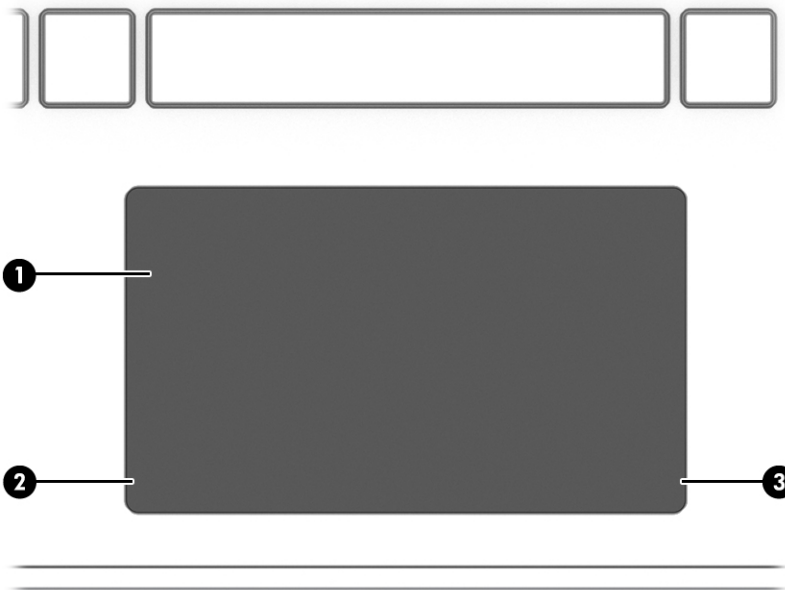
Table 2-4 Touchpad components and their descriptions

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

Special keys

Use the illustration and table to identify the special keys.
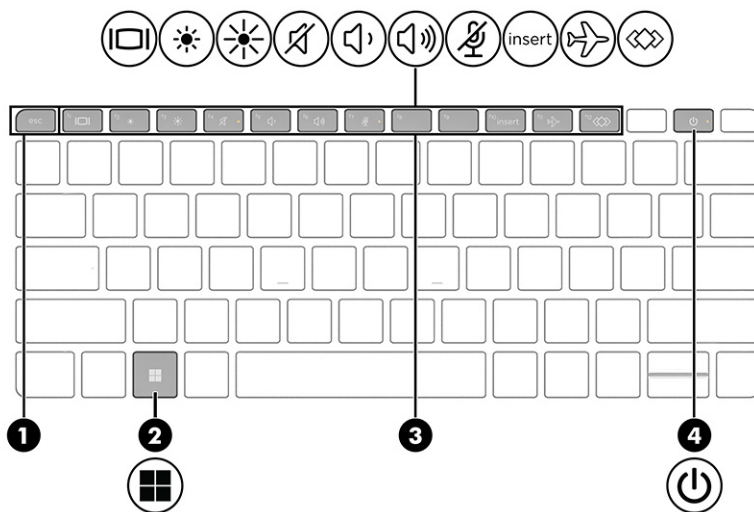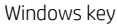
Table 2-5 Special keys and their descriptions

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	Windows key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(3)	Action keys	Execute frequently used system functions.
(4) ⏻	Power key	● When the computer is off, press the key briefly to turn on the computer. ● When the computer is on, press the key briefly to initiate Sleep. ● When the computer is in the Sleep state, press the key briefly to exit Sleep (select products only). ● When the computer is in Hibernation, press the key briefly to exit Hibernation. IMPORTANT: Pressing and holding down the power key results in the loss of unsaved information. If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power key for at least 4 seconds to turn off the computer. To learn more about your power settings, use the Power icon. ● Right-click the **Power** icon and then, depending on your product, select **Power and sleep settings** or **Power Options**.

Bottom

Use the illustration and table to identify the bottom components.
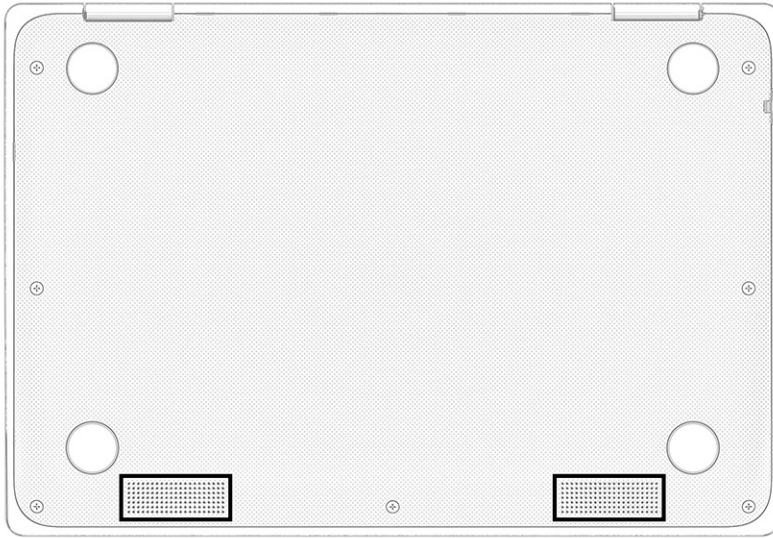
Table 2-6 Bottom component and its description

Component	Description
Speakers	Produce sound.

Labels

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

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

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

  Your service label will resemble one of the following examples. Refer to the illustration that most closely matches the service label on your computer.
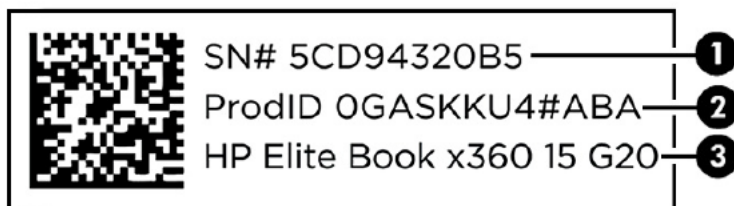
SN# 5CD9432OB5 — ❶
ProdID 0GASKKU4#ABA — ❷
HP Elite Book x360 15 G20 — ❸

Table 2-7 Service label components and their descriptions

Component	
(1)	Serial number
(2)	Product ID

Table 2-7 Service label components and their descriptions (continued)

Component	
(3)	HP product name
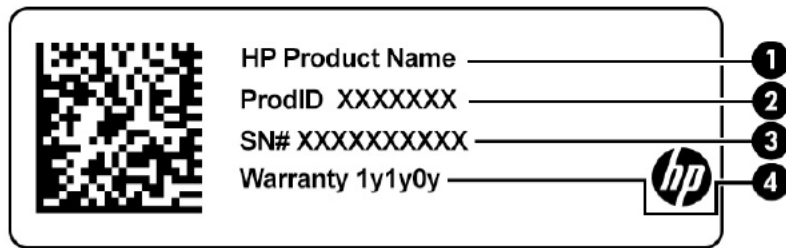
Table 2-8 Service label components and their descriptions

Component	
(1)	HP product name
(2)	Product ID
(3)	Serial number
(4)	Warranty period
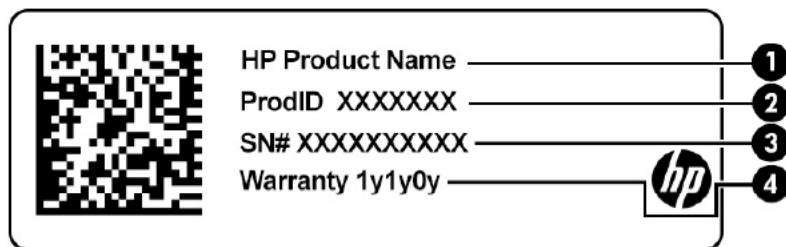
Table 2-9 Service label components and their descriptions

Component	
(1)	HP product name
(2)	Product ID
(3)	Serial number
(4)	Warranty period
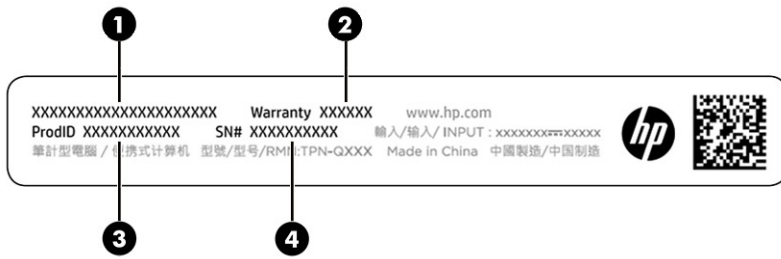
Table 2-10 Service label components and their descriptions

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

- Regulatory labels—Provide regulatory information about the computer.

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

3 Illustrated parts catalog

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 at the bottom of your computer.
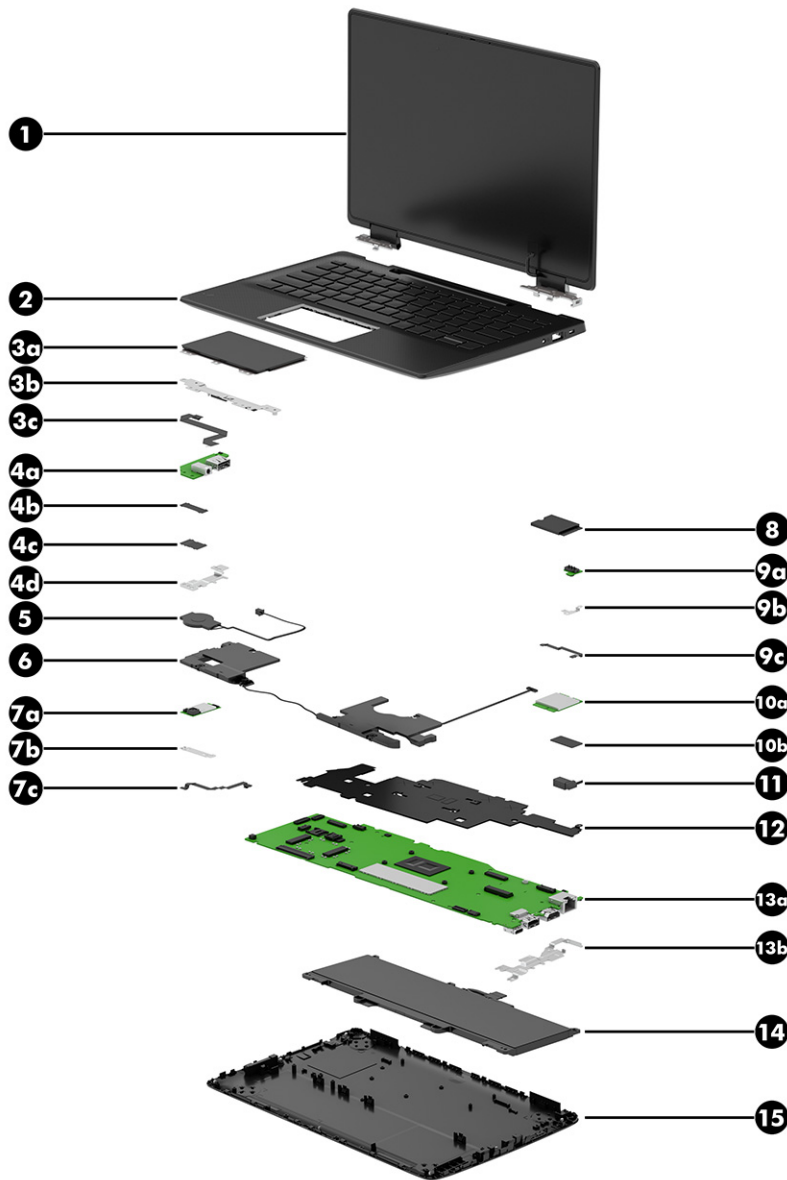
Table 3-1 Computer major component descriptions and part numbers

Item	Component	Spare part number
(1)	**29.6 cm (11.6 in), LCD, LED, BrightView, touchscreen display assembly with slim panel:**	
	Display assemblies in jellyfish blue finish:	
	HD (1366×768), UWVA, 50% CG, eDP display assembly with HD webcam for use on computer models with WWAN capability; typical brightness: 250 nits	N00430-001
	HD (1366×768), SVA, 45% CG, eDP, display assembly with HD webcam for use on computer models without WWAN capability; typical brightness: 250 nits	N00431-001
	Display assemblies in jet black finish:	
	HD (1366×768), UWVA, 50% CG, eDP display assembly with HD webcam for use on computer models with WWAN capability; typical brightness: 250 nits	N00432-001

Item	Component	Spare part number
	HD (1366×768), SVA, 45% CG, eDP, display assembly with HD webcam for use on computer models without WWAN capability; typical brightness: 250 nits	N00433-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jellyfish blue finish for use on computer models equipped with a digital pen and a top cover webcam:	
	For use in Belgium	N00447-A41
	For use in Bulgaria	N00447-261
	For use in the Czech Republic and Slovakia	N00447-FL1
	For use in Denmark	N00447-081
	For use in Denmark, Finland, and Norway	N00447-DH1
	For use in France	N00447-051
	For use in French Canada	N00447-DB1
	For use in Germany	N00447-041
	For use in Greece	N00447-151
	For use in Hungary	N00447-211
	For use in Iceland	N00447-DD1
	For use in India	N00447-D61
	For use in Israel	N00447-BB1
	For use in Italy	N00447-061
	For use in Kazakhstan	N00447-DF1
	For use in Latin America	N00447-161
	For use in the Netherlands	N00447-B31
	For use in North Africa	N00447-FP1
	For use in Norway	N00447-091
	For use in Portugal	N00447-131
	For use in Romania	N00447-271
	For use in Russia	N00447-251
	For use in Saudia Arabia	N00447-171
	For use in Slovenia	N00447-BA1
	For use in South Korea	N00447-AD1
	For use in Spain	N00447-071
	For use in Sweden and Finland	N00447-B71
	For use in Switzerland	N00447-BG1
	For use in Taiwan	N00447-AB1
	For use in Thailand	N00447-281
	For use in Turkey	N00447-141

Item	Component	Spare part number
	For use in the United Kingdom	N00447-031
	For use in the United States	N00447-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jellyfish blue finish for use on computer models equipped with a digital pen, but not equipped with a top cover webcam:	
	For use in Belgium	N00448-A41
	For use in Bulgaria	N00448-261
	For use in Canada	N00448-DB1
	For use in the Czech Republic and Slovakia	N00448-FL1
	For use in Denmark	N00448-081
	For use in Denmark, Finland, and Norway	N00448-DH1
	For use in France	N00448-051
	For use in Germany	N00448-041
	For use in Greece	N00448-151
	For use in Hungary	N00448-211
	For use in Iceland	N00448-DD1
	For use in India	N00448-D61
	For use in Israel	N00448-BB1
	For use in Italy	N00448-061
	For use in Kazakhstan	N00448-DF1
	For use in Latin America	N00448-161
	For use in the Netherlands	N00448-B31
	For use in Northwest Africa	N00448-FP1
	For use in Norway	N00448-091
	For use in Portugal	N00448-131
	For use in Romania	N00448-271
	For use in Russia	N00448-251
	For use in Saudia Arabia	N00448-171
	For use in Slovenia	N00448-BA1
	For use in South Korea	N00448-AD1
	For use in Spain	N00448-071
	For use in Sweden and Finland	N00448-B71
	For use in Switzerland	N00448-BG1
	For use in Taiwan	N00448-AB1
	For use in Thailand	N00448-281
	For use in Turkey	N00448-141

Item	Component	Spare part number
	For use in the United Kingdom	N00448-031
	For use in the United States	N00448-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jellyfish blue finish for use on computer models equipped with a top cover webcam, but not equipped with a digital pen:	
	For use in Belgium	N00446-A41
	For use in Bulgaria	N00446-261
	For use in Canada	N00446-DB1
	For use in the Czech Republic and Slovakia	N00446-FL1
	For use in Denmark	N00446-081
	For use in Denmark, Finland, and Norway	N00446-DH1
	For use in France	N00446-051
	For use in Germany	N00446-041
	For use in Greece	N00446-151
	For use in Hungary	N00446-211
	For use in Iceland	N00446-DD1
	For use in India	N00446-D61
	For use in Israel	N00446-BB1
	For use in Italy	N00446-061
	For use in Kazakhstan	N00446-DF1
	For use in Latin America	N00446-161
	For use in the Netherlands	N00446-B31
	For use in Northwest Africa	N00446-FP1
	For use in Norway	N00446-091
	For use in Portugal	N00446-131
	For use in Romania	N00446-271
	For use in Russia	N00446-251
	For use in Saudia Arabia	N00446-171
	For use in Slovenia	N00446-BA1
	For use in South Korea	N00446-AD1
	For use in Spain	N00446-071
	For use in Sweden and Finland	N00446-B71
	For use in Switzerland	N00446-BG1
	For use in Taiwan	N00446-AB1
	For use in Thailand	N00446-281
	For use in Turkey	N00446-141

Item	Component	Spare part number
	For use in the United Kingdom	N00446-031
	For use in the United States	N00446-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jellyfish blue finish for use on computer models not equipped with a digital pen or a top cover webcam:	
	For use in Belgium	N00445-A41
	For use in Bulgaria	N00445-261
	For use in Canada	N00445-DB1
	For use in the Czech Republic and Slovakia	N00445-FL1
	For use in Denmark	N00445-081
	For use in Denmark, Finland, and Norway	N00445-DH1
	For use in France	N00445-051
	For use in Germany	N00445-041
	For use in Greece	N00445-151
	For use in Hungary	N00445-211
	For use in Iceland	N00445-DD1
	For use in India	N00445-D61
	For use in Israel	N00445-BB1
	For use in Italy	N00445-061
	For use in Kazakhstan	N00445-DF1
	For use in Latin America	N00445-161
	For use in the Netherlands	N00445-B31
	For use in Northwest Africa	N00445-FP1
	For use in Norway	N00445-091
	For use in Portugal	N00445-131
	For use in Romania	N00445-271
	For use in Russia	N00445-251
	For use in Saudia Arabia	N00445-171
	For use in Slovenia	N00445-BA1
	For use in South Korea	N00445-AD1
	For use in Spain	N00445-071
	For use in Sweden and Finland	N00445-B71
	For use in Switzerland	N00445-BG1
	For use in Taiwan	N00445-AB1
	For use in Thailand	N00445-281
	For use in Turkey	N00445-141

Item	Component	Spare part number
	For use in the United Kingdom	N00445-031
	For use in the United States	N00445-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jet black finish for use on computer models equipped with a digital pen and a top cover webcam:	
	For use in Belgium	N00451-A41
	For use in Bulgaria	N00451-261
	For use in Canada	N00451-DB1
	For use in the Czech Republic and Slovakia	N00451-FL1
	For use in Denmark	N00451-081
	For use in Denmark, Finland, and Norway	N00451-DH1
	For use in France	N00451-051
	For use in Germany	N00451-041
	For use in Greece	N00451-151
	For use in Hungary	N00451-211
	For use in Iceland	N00451-DD1
	For use in India	N00451-D61
	For use in Israel	N00451-BB1
	For use in Italy	N00451-061
	For use in Japan	N00451-291
	For use in Kazakhstan	N00451-DF1
	For use in Latin America	N00451-161
	For use in the Netherlands	N00451-B31
	For use in Northwest Africa	N00451-FP1
	For use in Norway	N00451-091
	For use in Portugal	N00451-131
	For use in Romania	N00451-271
	For use in Russia	N00451-251
	For use in Saudia Arabia	N00451-171
	For use in Slovenia	N00451-BA1
	For use in South Korea	N00451-AD1
	For use in Spain	N00451-071
	For use in Sweden and Finland	N00451-B71
	For use in Switzerland	N00451-BG1
	For use in Taiwan	N00451-AB1
	For use in Thailand	N00451-281

Item	Component	Spare part number
	For use in Turkey	N00451-141
	For use in the United Kingdom	N00451-031
	For use in the United States	N00451-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jet black finish for use on computer models equipped with a digital pen, but not equipped with a top cover webcam:	
	For use in Belgium	N00452-A41
	For use in Bulgaria	N00452-261
	For use in Canada	N00452-DB1
	For use in the Czech Republic and Slovakia	N00452-FL1
	For use in Denmark	N00452-081
	For use in Denmark, Finland, and Norway	N00452-DH1
	For use in France	N00452-051
	For use in Germany	N00452-041
	For use in Greece	N00452-151
	For use in Hungary	N00452-211
	For use in Iceland	N00452-DD1
	For use in India	N00452-D61
	For use in Israel	N00452-BB1
	For use in Italy	N00452-061
	For use in Japan	N00450-291
	For use in Kazakhstan	N00452-DF1
	For use in Latin America	N00452-161
	For use in the Netherlands	N00452-B31
	For use in Northwest Africa	N00452-FP1
	For use in Norway	N00452-091
	For use in Portugal	N00452-131
	For use in Romania	N00452-271
	For use in Russia	N00452-251
	For use in Saudia Arabia	N00452-171
	For use in Slovenia	N00452-BA1
	For use in South Korea	N00452-AD1
	For use in Spain	N00452-071
	For use in Sweden and Finland	N00452-B71
	For use in Switzerland	N00452-BG1
	For use in Taiwan	N00452-AB1

Item	Component	Spare part number
	For use in Thailand	N00452-281
	For use in Turkey	N00452-141
	For use in the United Kingdom	N00452-031
	For use in the United States	N00452-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jet black finish for use on computer models equipped with a top cover webcam, but not equipped with a digital pen:	
	For use in Belgium	N00450-A41
	For use in Bulgaria	N00450-261
	For use in Canada	N00450-DB1
	For use in the Czech Republic and Slovakia	N00450-FL1
	For use in Denmark	N00450-081
	For use in Denmark, Finland, and Norway	N00450-DH1
	For use in France	N00450-051
	For use in Germany	N00450-041
	For use in Greece	N00450-151
	For use in Hungary	N00450-211
	For use in Iceland	N00450-DD1
	For use in India	N00450-D61
	For use in Israel	N00450-BB1
	For use in Italy	N00450-061
	For use in Japan	N00450-291
	For use in Kazakhstan	N00450-DF1
	For use in Latin America	N00450-161
	For use in the Netherlands	N00450-B31
	For use in Northwest Africa	N00450-FP1
	For use in Norway	N00450-091
	For use in Portugal	N00450-131
	For use in Romania	N00450-271
	For use in Russia	N00450-251
	For use in Saudia Arabia	N00450-171
	For use in Slovenia	N00450-BA1
	For use in South Korea	N00450-AD1
	For use in Spain	N00450-071
	For use in Sweden and Finland	N00450-B71
	For use in Switzerland	N00450-BG1

Item	Component	Spare part number
	For use in Taiwan	N00450-AB1
	For use in Thailand	N00450-281
	For use in Turkey	N00450-141
	For use in the United Kingdom	N00450-031
	For use in the United States	N00450-001
(2)	**Spill-resistant top cover/keyboard** with touchpad in jet black finish for use on computer models not equipped with a digital pen or a top cover webcam:	
	For use in Belgium	N00449-A41
	For use in Bulgaria	N00449-261
	For use in Canada	N00449-DB1
	For use in the Czech Republic and Slovakia	N00449-FL1
	For use in Denmark	N00449-081
	For use in Denmark, Finland, and Norway	N00449-DH1
	For use in France	N00449-051
	For use in Germany	N00449-041
	For use in Greece	N00449-151
	For use in Hungary	N00449-211
	For use in Iceland	N00449-DD1
	For use in India	N00449-D61
	For use in Israel	N00449-BB1
	For use in Italy	N00449-061
	For use in Japan	N00450-291
	For use in Kazakhstan	N00449-DF1
	For use in Latin America	N00449-161
	For use in the Netherlands	N00449-B31
	For use in Northwest Africa	N00449-FP1
	For use in Norway	N00449-091
	For use in Portugal	N00449-131
	For use in Romania	N00449-271
	For use in Russia	N00449-251
	For use in Saudia Arabia	N00449-171
	For use in Slovenia	N00449-BA1
	For use in South Korea	N00449-AD1
	For use in Spain	N00449-071
	For use in Sweden and Finland	N00449-B71

Item	Component	Spare part number
	For use in Switzerland	N00449-BG1
	For use in Taiwan	N00449-AB1
	For use in Thailand	N00449-281
	For use in Turkey	N00449-141
	For use in the United Kingdom	N00449-031
	For use in the United States	N00449-001
(3a)	Touchpad:	
	NOTE: The touchpad spare part kit does not include the touchpad bracket or touchpad cable. The touchpad bracket is included in the Bracket Kit, spare part number N00429-001. The touchpad cable is included in the Cable Kit, spare part number N05697-001.	
	In jellyfish blue finish	N00443-001
	In jet black finish	N00442-001
(3b)	**Touchpad bracket** (included in the Bracket Kit, spare part number N00429-001)	
(3c)	**Touchpad cable** (included in the Cable Kit, spare part number N05697-001)	
(4a)	**Connector board** (includes audio jack and USB port)	N02669-001
	NOTE: The connector board spare part kit does not include the connector board I/O bracket or the audio jack and USB port cables. The bracket is included in the Bracket Kit, spare part number N00429-001. The cables are available using spare part number N05860-001.	
(4b)	**Audio jack cable**	N05860-001
(4c)	**USB port cable**	N05860-001
(4d)	**Connector board I/O bracket** (included in the Bracket Kit, spare part number N00429-001)	
(5)	**RTC battery** (includes cable and double-sided adhesive)	L43797-001
(6)	**Speakers** (includes cables and 4 rubber isolator grommets)	N02671-001
(7a)	**Top cover webcam**	N00444-001
	NOTE: The top cover webcam spare part kit does not include the top cover webcam bracket or top cover webcam cable. The top cover webcam bracket is included in the Bracket Kit, spare part number N00429-001. The top cover webcam cable is included in the Cable Kit, spare part number N05697-001.	
(7b)	**Top cover webcam bracket** (included in the Bracket Kit, spare part number N00429-001)	
(7c)	**Top cover webcam cable** (included in the Cable Kit, spare part number N05697-001)	
(8)	**Solid-state drive:**	
	256 GB, 2230, PCIe, NVMe solid-state drive	M11042-002
	128 GB, 2230, PCIe, NVMe solid-state drive	M11040-002
(9a)	**Sensor board**	N02670-001
	NOTE: The sensor board spare part kit does not include the sensor board bracket or sensor board cable. The sensor board bracket is included in the Bracket Kit, spare part number N00429-001. The sensor board cable is available using spare part number N02670-001.	
(9b)	**Sensor board bracket** (included in the Bracket Kit, spare part number N00429-001)	

Item	Component	Spare part number
(9c)	Sensor board cable	N02670-001
(10a)	WLAN module:	
	Intel 9560 ac 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro 160 MHz MIPI+BRI WW WLAN module	L22634-002
	Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro 160 MHz MIPI+BRI WW WLAN module with two antennas	L92724-002
(10b)	**WLAN module shield** (included in the Bracket Kit, spare part number N00429-001)	
	Intel XMM 7360 LTE-Advanced (Cat 9) WWAN module (not illustrated)	M53545-001
(11)	**Power connector cable**	M22011-001
(12)	**Heat sink** (includes replacement thermal material)	N00428-001
(13a)	**System board** (includes integrated processor, UMA graphics subsystem, and replacement thermal material)	
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, WWAN capability, and the Windows 11 operating system	N02676-601
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, WWAN capability, and a non-Windows operating system	N02676-001
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00437-601
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and a non-Windows operating system	N00437-001
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, WWAN capability, and the Windows 11 operating system	N02675-601
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, WWAN capability, and a non-Windows operating system	N02675-001
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and the Windows 11 operating system	N00435-601
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and a non-Windows operating system	N00435-001
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00436-601
	Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and a non-Windows operating system	N00436-001
	Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, WWAN capability, and the Windows 11 operating system	N02677-601
	Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, WWAN capability, and a non-Windows operating system	N02677-001
	Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and the Windows 11 operating system	N00438-601
	Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and a non-Windows operating system	N00438-001
	Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00439-601
	Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and a non-Windows operating system	N00439-001

Item	Component	Spare part number
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, WWAN capability, and the Windows 11 operating system	N02679-601
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, WWAN capability, and a non-Windows operating system	N02679-001
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00441-601
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and a non-Windows operating system	N00441-001
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, WWAN capability, and the Windows 11 operating system	N02678-601
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, WWAN capability, and a non-Windows operating system	N02678-001
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and the Windows 11 operating system	N00440-601
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and a non-Windows operating system	N00440-001
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00436-601
	Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and a non-Windows operating system	N00436-001
(13b)	**System board I/O bracket** (included in the Bracket Kit, spare part number N00429-001)	
(14)	**Battery** (3 cell, 41 Whr)	M73474-006
(15)	**Bottom cover:**	
	In jellyfish blue finish	N00427-001
	In jet black finish	N00426-001

Brackets
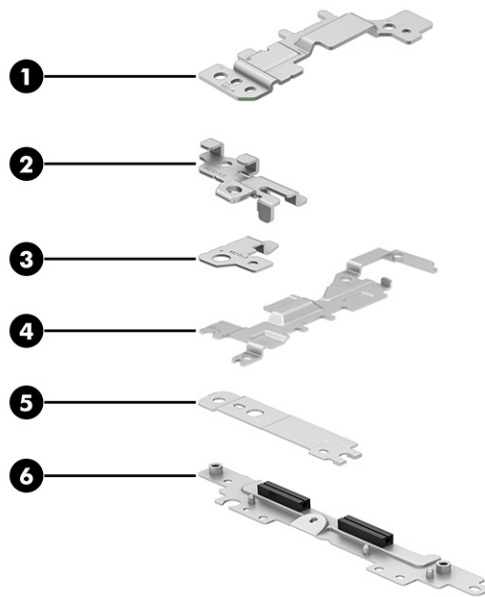
To identify the brackets, use this illustration and table.

Table 3-2 Bracket descriptions

Item	Component
	The following cables are included in the Bracket Kit, spare part number N00429-001.
(1)	Connector board I/O bracket
(2)	Power connector cable bracket
(3)	Sensor board bracket
(4)	System board I/O bracket
(5)	Top cover webcam bracket
(6)	**Touchpad bracket** (includes rubber retention clips for speaker cable)

Cables
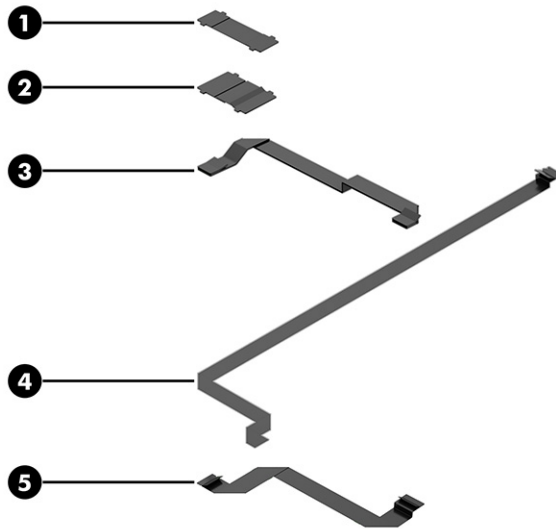
To identify the cables, use this illustration and table.

Table 3-3 Cable descriptions and part numbers

Item	Component	Spare part number
(1)	Connector board audio jack cable	N05860-001
(2)	Connector board USB port cable	N05860-001
(3)	Sensor board cable	N02670-001
(4)	**Top cover webcam cable** (included in the Cable Kit, spare part number N05697-001)	
(5)	**Touchpad cable** (included in the Cable Kit, spare part number N05697-001)	

Miscellaneous parts

To identify the miscellaneous parts, use this table.

Table 3-4 Miscellaneous part descriptions and part numbers

Component	Spare part number
AC adapters:	
120 W HP Smart adapter (PFC, RC, slim barrel, 4.5 mm [0.17 in])	L41856-001
65 W HP Smart adapter (non-PFC, RC, EM, 4.5 mm [0.17 in])	913691-850
65 W AC adapter (non-PFC, S-3P, 4.5 mm [0.17 in])	710412-001
65 W AC adapter (non-PFC, USB Type-C, RC, 1.8 m [0.17 in])	L32392-001
65 W travel AC adapter (non-PFC, USB Type-C)	L21487-001
45 W HP Smart adapter (non-PFC, RC, 2P, 4.5 mm [0.17 in])	742436-001
45 W HP Smart adapter (non-PFC, RC, non-slim, 4.5 mm [0.17 in])	741727-001
45 W AC adapter (non-PFC, USB Type-C, 1.8 m [6.0 ft], 3 pin)	L43407-001

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

Component	Spare part number
45 W AC adapter (non-PFC, USB PD, 3 pin)	934739-850
C5 AC adapter for use in Japan	226768-001
65 W USB Type-C AC adapter + C5, black, duck head adapter bundle for use in South Korea	L43181-001
AC adapter + power cord bundles:	
AC adapter + C5, FDH, 1.0 m (3.3 ft) power cord bundle for use in Thailand	M85416-001
65 W USB Type-C AC adapter + FDH, 1.8 m (6.0 ft) power cord bundle:	
For use in Argentina	L43180-001
For use in Australia	L43180-002
For use in Denmark	L43180-004
For use in Europe	L43180-005
For use in India	L43180-007
For use in Israel	L43180-006
For use in Italy	L43180-008
For use in North America	L43180-010
For use in the People's Republic of China	L43180-011
For use in South Africa	L43180-012
For use in Switzerland	L43180-013
For use in Taiwan	L43180-015
For use in Thailand	L43180-014
For use in the United Kingdom	L43180-016
HP Smart adapter (7.4 mm [0.29 in])	734734-001
Adapters:	
HDMI–to–DVI-D connector adapter	691227-001
HDMI–to–VGA adapter	701943-001
USB 3.0–to–Gigabit FD adapter	914031-001
USB Type-C–to–DisplayPort adapter	831753-001
USB Type-C–to–HDMI 2.0 adapter	935325-001
USB Type-C–to–RJ45 FD adapter	918779-001
USB Type-C–to–USB 3.0 adapter	814618-001
USB Type-C–to–VGA adapter	831751-001
USB Type-C–to–USB Type-A connector adapter	L65254-001
Backpacks and bags:	
HP business 43.9 cm (17.3 in) laptop backpack	M55004-001
HP Prelude Pro 39.6 cm (15.6 in) backpack	M03617-001

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

Component	Spare part number
HP Prelude Pro 15.6 top load backpack	M03618-001
HP business 35.8 cm (14.1 in) laptop bag	M55007-001
Docks:	
HP Thunderbolt dock with cable (120 W)	L15809-001
HP USB Type-C dock with cable	L64086-001
HP USB Type-C mini dock	935327-001
HP USB Type-A/Type-C universal dock with cable	L64087-001
HP dock audio module	L15811-001
Bracket Kit (includes connector board I/O bracket, power connector cable bracket, sensor board bracket, system board I/O bracket, top cover webcam bracket and touchpad bracket)	N00429-001
Cable Kit (includes connector board audio jack cable, connector board USB port cable, top cover webcam cable, and touchpad cable)	N05697-001
USB Type-C male–to–USB Type-C male cable, 1.0 m (3.3 ft)	L65253-001
Cases:	
HP Always On Case (black, 29.6 mm [11.6 in])	M16115-001
HP USB Type-C bottom case dock	L65256-001
Duckhead adapters:	
Duckhead adapter, C5NS, Premium with sticker, black for use in North America	L50818-002
Duckhead adapter, C5NS, Premium with sticker, black for use in South Korea	L50818-001
Duckhead adapter, C5, Premium, for use in Europe and South Korea	854703-001
Duckhead adapter, C5, Premium, for use in Japan	L33157-001
Duckhead adapter, C5, Premium, for use in North America	L50816-002
Duckhead adapter, C5, Premium, for use in South Korea	L50816-001
HP USB Type-C–to–USB Type-A hub	916838-001
HP USB Type-C travel hub	L65088-001
HP Nano security cable lock	918431-001
HP Sure Key cable lock	L65088-001
Mouse:	
HP Bluetooth travel mouse	L62043-001
HP USB laser mouse	674318-001
HP USB travel mouse	757770-001
HP Pro slim pen	M89498-001
Plastics Kit:	
For use on computer models equipped with WWAN capability only (includes Ni/Cu boss gasket [PRS, FR], WLAN module shield with adhesive, Ni/Cu gasket [PPW, 30 mm × 10 mm × 2.5 mm], Ni/Cu WWAN gasket [PPW, DFR, 117], and switch cover gasket)	N02672-001

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

Component	Spare part number
For use on computer models equipped with WLAN capability only (includes WLAN module shield with adhesive, Ni/Cu boss gasket [PRS, FR], and switch cover gasket)	N05694-001
Power cord with ground lead for use in Japan	349756-001
Power cord (Option 917, 3 cord, 1.8 m [6.0 ft], LG, Restriction of Hazardous Substances [RoHS])	361240-001
Power cord (C5, 1.0 m [3.3 ft], FX, DH, premium with sticker, for use in North America)	L30410-001
Power cords (C5, black):	
For use in Europe	213350-001
For use in Italy	213352-001
For use in North America	213349-001
For use in South Korea	267836-001
For use in Switzerland	213354-001
For use in the United Kingdom and Singapore	213351-001
Power cords (C5, 1.0 m [3.3 ft], conventional with sticker):	
For use in Argentina	931249-001 & L19357-001
For use in Australia	923430-001 & L19358-001
For use in Denmark	923430-003 & L19360-001
For use in Europe	923430-004 & L19361-001
For use in India	923430-006 & L19363-001
For use in Israel	923430-005 & L19362-001
For use in Italy	923430-007 & L19364-001
For use in Japan	931252-001 & L19365-001
For use in North America	923430-008 & L19367-001
For use in the People's Republic of China	931251-001 & L19368-001
For use in South Africa	923430-009 & L19369-001
For use in South Korea	931250-001 & L19366-001
For use in Switzerland	923430-010 & L19370-001
For use in Taiwan	923430-012 & L19372-001
For use in the United Kingdom	923430-013 & L19373-001
Power cords (C5, FDH, 1.0 m [3.3 ft], premium with sticker):	
For use in Argentina	L36815-001
For use in Australia	L36816-001
For use in Denmark	L36817-001
For use in Europe	L36818-001
For use in India	L36820-001
For use in Israel	L36819-001

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

Component	Spare part number
For use in Italy	L44788-001
For use in North America	L36822-001
For use in the People's Republic of China	L36823-001
For use in South Africa	L36824-001
For use in Switzerland	L36825-001
For use in Taiwan	L36827-001
For use in Thailand	L36826-001
For use in the United Kingdom	L36828-001
Power cords (C5, 1.8 m [6.0 ft], conventional with sticker):	
Power cord (C5, 1.8 m [6.0 ft]) for use in Israel	398063-001
Power cord (C5, 1.8 m [6.0 ft]) for use in Taiwan	393313-001
Power cord (C5, 1.8 m [6.0 ft], black) for use in Argentina	401300-001
Power cord (C5, 1.8 m [6.0 ft], conventional with sticker) for use in India	404827-101
Power cords (C5, 1.8 m [6.0 ft], conventional with sticker):	
For use in Argentina	931257-001 & L19357-002
For use in Australia	931265-001 & L19358-002
For use in Denmark	931261-001 & L19360-002
For use in Europe	931259-001 & L19361-002
For use in India	931270-001 & L19363-002
For use in Israel	931262-001 & L19362-002
For use in Italy	931256-001 & L19364-002
For use in Japan	L19365-002
For use in North America	L19367-002
For use in the People's Republic of China	931268-001 & L19368-002
For use in South Africa	931264-001 & L19369-002
For use in South Korea	931267-001 & L19366-002
For use in Switzerland	931263-001 & L19370-002
For use in Taiwan	931269-001 & L19372-002
For use in Thailand	L19371-002
For use in the United Kingdom	931260-001 & L19373-002
Power cord (C7, 1.0 m [3.3 ft], conventional with sticker) for use in Japan	931325-001 & L19375-001
Rubber Kit:	
For use only on computer models with WLAN capability	N05695-001
For use only on computer models with WWAN capability	N02673-001

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

Component	Spare part number
Screw Kit	L64089-001 & N00434-001
HP reversible 29.6 mm (11.6 in) sleeve	L81451-001

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:

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

Service considerations

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

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

Plastic parts

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."

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 in .

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

Event	Relative humidity		
	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.

- Use a wrist strap connected to a properly grounded work surface and use 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 the work area free of nonconductive materials, such as ordinary plastic assembly aids and polystyrene foam.

- Use conductive field service tools, such as cutters, screwdrivers, and vacuums.

- Avoid contact with pins, leads, or circuitry.

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

Cleaning your computer

Cleaning your computer regularly removes dirt and debris so that your device continues to operate at its best. Use the following information to safely clean the external surfaces of your computer.

Enabling HP Easy Clean (select products only)

HP Easy Clean helps you to avoid accidental input while you clean the computer surfaces. This software disables devices such as the keyboard, touch screen, and touchpad for a preset amount of time so that you can clean all computer surfaces.

1. Start HP Easy Clean in one of the following ways:

   - Select the **Start** menu, and then select **HP Easy Clean**.

     – or –

   - Select the **HP Easy Clean** icon in the taskbar.

     – or –

   - Select **Start**, and then select the **HP Easy Clean** tile.

2. Now that your device is disabled for a short period, see for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See for guidelines to help prevent the spread of harmful bacteria and viruses.

Removing dirt and debris from your computer

Here are the recommended steps to clean dirt and debris from your computer.

For computers with wood veneer, see .

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

   ⚠ CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with water. The cloth should be moist, but not dripping wet.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

See for recommended steps to clean the high-touch, external surfaces on your computer to help prevent the spread of harmful bacteria and viruses.

Cleaning your computer with a disinfectant

The World Health Organization (WHO) recommends cleaning surfaces, followed by disinfection, as a best practice for preventing the spread of viral respiratory illnesses and harmful bacteria.

After cleaning the external surfaces of your computer using the steps in , , or both, you might also choose to clean the surfaces with a disinfectant. A disinfectant that is within HP's cleaning guidelines is an alcohol solution consisting of 70% isopropyl alcohol and 30% water. This solution is also known as rubbing alcohol and is sold in most stores.

Follow these steps when disinfecting high-touch, external surfaces on your computer:

1. Wear disposable gloves made of latex (or nitrile gloves, if you are latex-sensitive) when cleaning the surfaces.

2. Turn off your device and unplug the power cord and other connected external devices. Remove any installed batteries from items such as wireless keyboards.

CAUTION: To prevent electric shock or damage to components, never clean a product while it is turned on or plugged in.

3. Moisten a microfiber cloth with a mixture of 70% isopropyl alcohol and 30% water. The cloth should be moist, but not dripping wet.

CAUTION: Do not use any of the following chemicals or any solutions that contain them, including spray-based surface cleaners: bleach, peroxides (including hydrogen peroxide), acetone, ammonia, ethyl alcohol, methylene chloride, or any petroleum-based materials, such as gasoline, paint thinner, benzene, or toluene.

IMPORTANT: To avoid damaging the surface, avoid abrasive cloths, towels, and paper towels.

4. Wipe the exterior of the product gently with the moistened cloth.

IMPORTANT: Keep liquids away from the product. Avoid getting moisture in any openings. If liquid makes its way inside your HP product, it can cause damage to the product. Do not spray liquids directly on the

product. Do not use aerosol sprays, solvents, abrasives, or cleaners containing hydrogen peroxide or bleach that might damage the finish.

5. Start with the display (if applicable). Wipe carefully in one direction, and move from the top of the display to the bottom. Finish with any flexible cables, like power cord, keyboard cable, and USB cables.

6. Be sure that surfaces have completely air-dried before turning the device on after cleaning.

7. Discard the gloves after each cleaning. Clean your hands immediately after you remove the gloves.

Caring for wood veneer (select products only)

Your product might feature high-quality wood veneer. As with all natural wood products, proper care is important for best results over the life of the product. Because of the nature of natural wood, you might see unique variations in the grain pattern or subtle variations in color, which are normal.

- Clean the wood with a dry, static-free microfiber cloth or chamois.

- Avoid cleaning products containing substances such as ammonia, methylene chloride, acetone, turpentine, or other petroleum-based solvents.

- Do not expose the wood to sun or moisture for long periods of time.

- If the wood becomes wet, dry it by dabbing with an absorbent, lint-free cloth.

- Avoid contact with any substance that might dye or discolor the wood.

- Avoid contact with sharp objects or rough surfaces that might scratch the wood.

See Removing dirt and debris from your computer on page 38 for the recommended steps to clean the high-touch, external surfaces on your computer. After you remove the dirt and debris, you can also clean the surfaces with a disinfectant. See Cleaning your computer with a disinfectant on page 39 for sanitizing guidelines to help prevent the spread of harmful bacteria and viruses.

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.

Accessing support information

Use this information to find the HP support that you need.

Table 4-3 Support information locations

Service consideration	Path to access information

Records of reported failure incidents stored on the computer	**Windows:**
	
	Pre-operating system failures are logged in the BIOS Event Log. To view the BIOS Event Log:
	
	1. Press the power button.
	
	2. Immediately and repeatedly press esc when the power button light turns white.
	
	    NOTE: If you do not press esc at the appropriate time, you must restart the computer and again repeatedly press esc when the power button light turns white to access the utility.
	
	3. Press f10 to enter the BIOS setup.
	
	4. (On commercial products) Under the **Main** tab, select **BIOS event log**, and then select **View BIOS Event Log**.
	
	    - or -
	
	    (On consumer products) Under the **Main** tab, select **System Log**.
	
	Post operating system failures are logged in the Event Viewer.
	
	1. Turn on the computer and allow the operating system to open.
	
	2. Click the search icon 🔍 in the taskbar.
	
	3. Type `Event Viewer`, and then press enter.
	
	4. Select the log from the left panel. Details display in the right panel.

Technical bulletins	To locate technical bulletins: 1. Go to www.hp.com. 2. Place the cursor over **Problem solving** to display more options. 3. Select **Support & Troubleshooting**. 4. Type the serial number, product number, or product name to go to the product support page. 5. Select **Advisories** to view technical bulletins.
Repair professionals	To locate repair professionals: 1. Go to www.hp.com. 2. Place the cursor over **Support resources** to display more options. 3. Select **Authorized service providers**.
Component and diagnosis information, failure detection, and required action	To locate diagnosis information and actions: 1. Go to http://www.hp.com/go/techcenter/pcdiags. 2. Select **Get Support**. 3. Near the bottom of the window, select **Notebook PCs**, and then select your location.

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 60 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 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 descriptions and part numbers

Description	Spare part number
In jellyfish blue finish	N00427-001

Table 5-1 Bottom cover descriptions and part numbers (continued)

Description	Spare part number
In jet black finish	N00426-001

Before removing the bottom cover, prepare the computer for disassembly (see).

Remove the bottom cover:

1. Loosen the seven Phillips M2.0 × 5.6 captive screws **(1)** that secure the bottom cover to the computer.

2. Insert a nonmarking, nonconductive tool **(2)** or similar plastic, wedge-shaped tool into the rear edge of the bottom cover.

3. Separate the rear edge of the bottom cover **(3)** from the top cover/keyboard and lift it up and forward to release it from the top cover/keyboard.

4. Remove the bottom cover **(4)**.
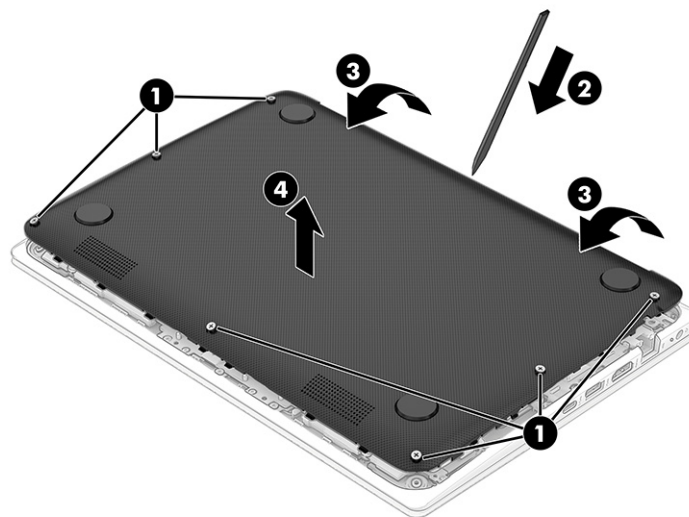
To replace the bottom cover, reverse the removal procedures.

Battery

To remove the battery, use this procedure and illustration.

Table 5-2 Battery description and part number

Description	Spare part number
Battery (3 cell, 41 Whr, includes cable)	M73474-006

⚠ **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 (see).

2. Remove the bottom cover (see).

⚠ 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 seven Phillips M2.5 × 5.1 screws **(2)** that secure the battery to the computer.

3. Remove the battery from the computer **(3)**.
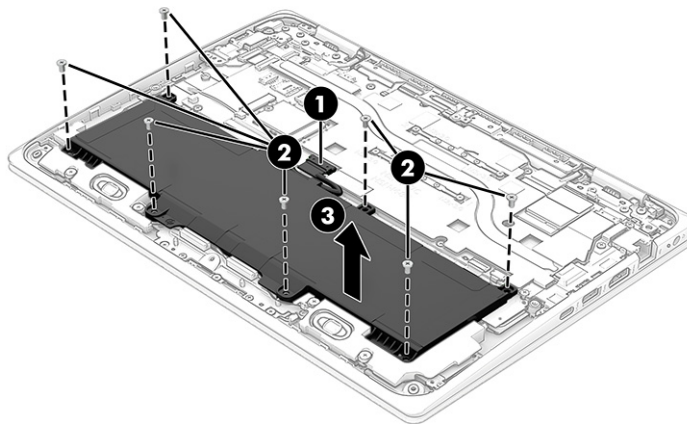
To insert the battery, reverse the removal procedures.

eMMC storage device

To remove the eMMC storage device, use this procedure and illustration.

Before removing the eMMC storage device, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Disconnect the battery cable from the system board (see).

Remove the eMMC storage device:

1. Remove the Phillips M2.0 × 4.5 screw **(1)** that secures the eMMC storage device to the computer.

2. Lift the edge of the eMMC storage device **(2)** opposite the socket until it rests at an angle.

3. Pull the eMMC storage device **(3)** away from the socket at an angle to remove it.

NOTE: eMMC storage devices are designed with a notch to prevent incorrect insertion.
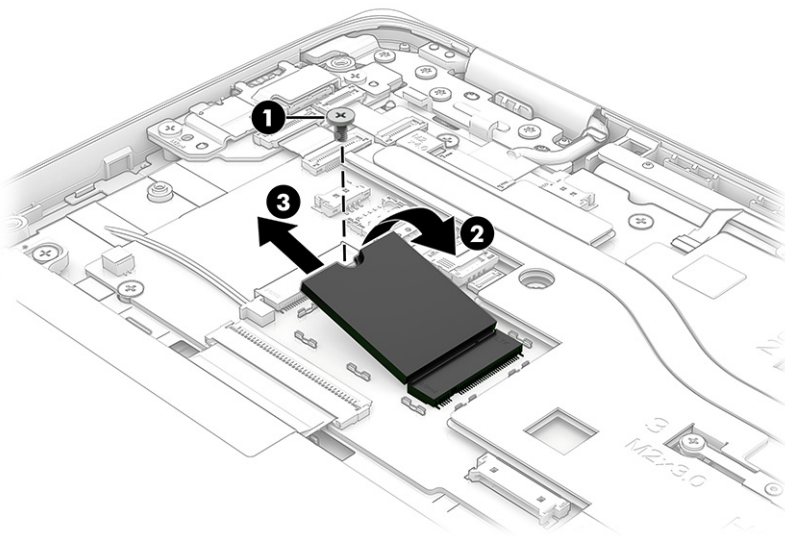
To install the eMMC storage device, reverse the removal procedures.

WLAN module

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

Table 5-3 WLAN module descriptions and part numbers

Description	Spare part number
Intel 9560 ac 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro 160 MHz MIPI+BRI WW WLAN module	L22634-002
Intel Wi-Fi 6 AX201 ax 2×2 + Bluetooth 5.0 MU-MIMO M.2 2230 non-vPro 160 MHz MIPI+BRI WW WLAN module with two antennas	L92724-002

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 WLAN module, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

Remove the WLAN module:

1. Remove the WLAN module shield **(1)**.

   The WLAN module shield is included in the Plastics Kit, spare part numbers N05694-001 and N02672-001.

2. Carefully disconnect the two antenna cables from the module **(2)**.

   > **NOTE:** Computer models can have multiple WLAN antennas. On models with two antennas, 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 #1 Aux terminal.

3. Remove the Phillips M2.0 × 4.5 screw **(3)** that secures the WLAN module to the system board.

4. Lift the edge of the WLAN module **(4)** opposite the socket until it rests at an angle.

5. Pull the WLAN module **(5)** away from the socket at an angle to remove it.
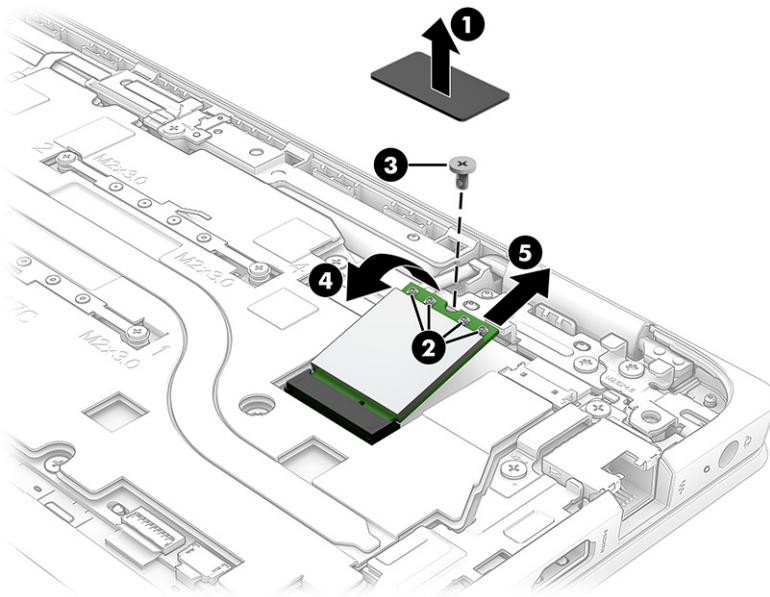
6. If the WLAN antenna is not connected to the terminal on the WLAN module, install a protective sleeve on the antenna connector, as shown in the following illustration.
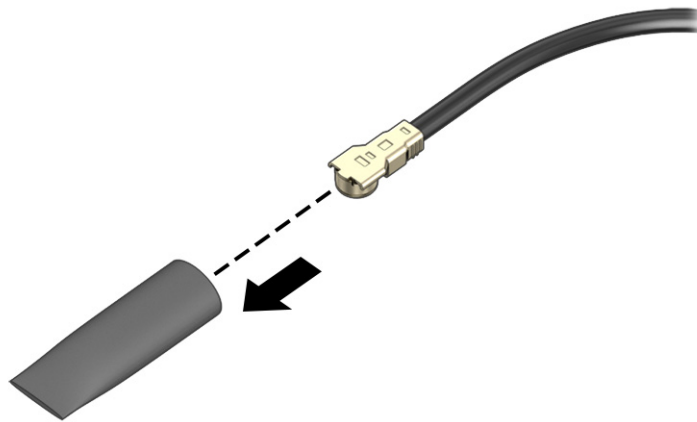
Reverse this procedure to install the WLAN module.

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) WWAN module	M53545-001

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:

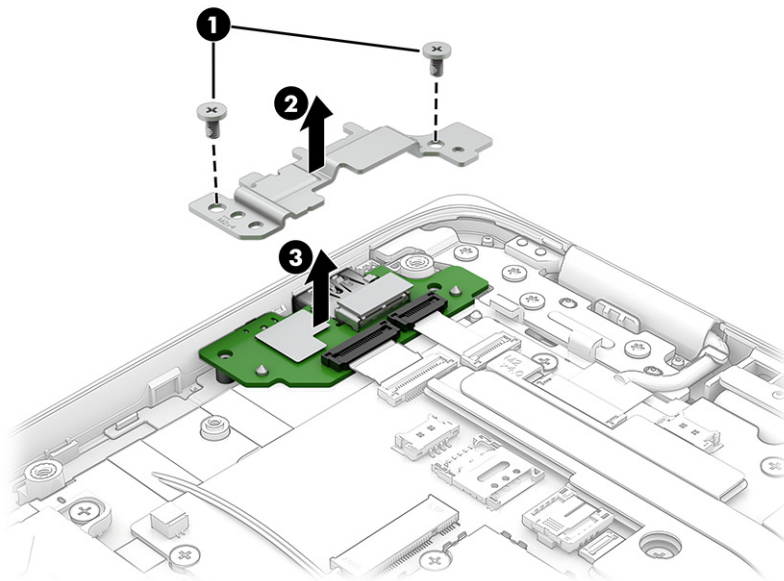1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

Remove the WWAN module:

1. Remove the WWAN module shield **(1)**.

   The WWAN module shield is included in the Plastics Kit, spare part numbers N05694-001 and N02672-001.

2. Carefully disconnect the two antenna cables from the module **(2)**.

📝 **NOTE:** Computer models can have multiple WWAN antennas. On models with two antennas, the #5 red WWAN antenna cable connects to the WWAN module #5 Main terminal. The #6 blue WWAN antenna cable connects to the WWAN module #6 Aux terminal.

3. Remove the Phillips M2.0 × 4.5 screw **(3)** that secures the WWAN module to the system board.

4. Lift the edge of the WWAN module **(4)** opposite the socket until it rests at an angle.

5. Pull the WWAN module **(5)** away from the socket at an angle to remove it.
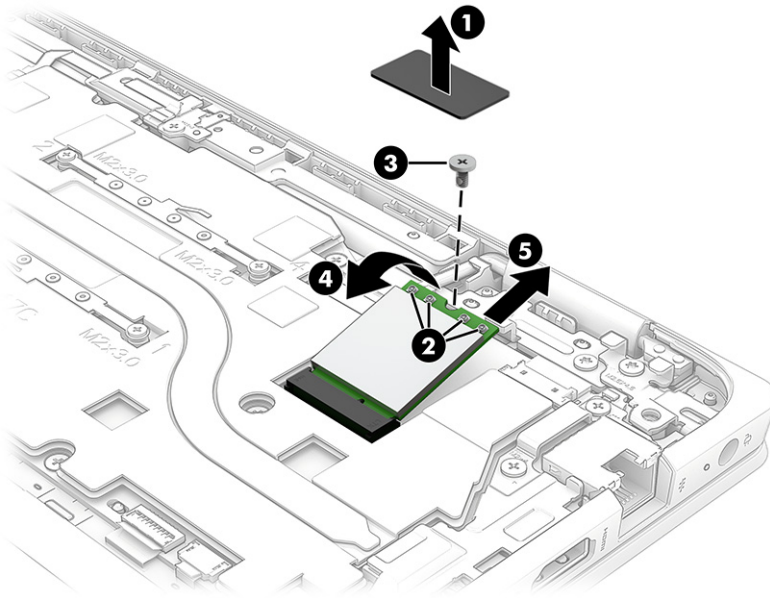
6. If the WWAN antenna is not connected to the terminal on the WWAN module, install a protective sleeve on the antenna connector, as shown in the following illustration.
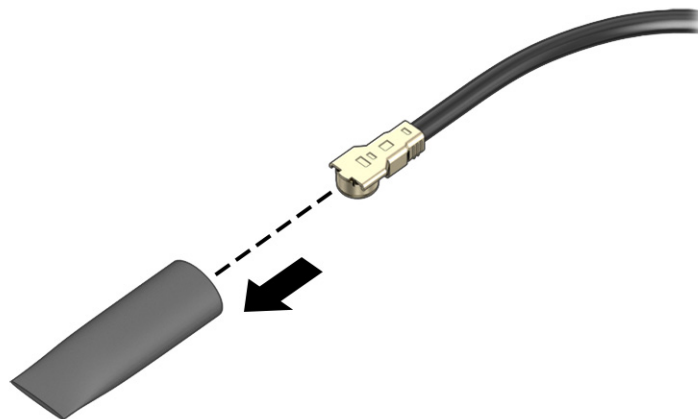
Reverse this procedure to install the WWAN module.

Connector board cables

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

NOTE: The connector board spare part kit does not include the audio jack cable or the USB port cable. These cables are available using spare part number N05860-001.

Before removing the connector board cables, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

Remove the connector board cables:

1. Release the zero insertion force (ZIF) connectors **(1)** to which the connector board cables are connected, and then disconnect the cables from the system board.

2. Release the ZIF connectors **(2)** to which the connector board cables are connected, and then disconnect the cables from the connector board.

3. Remove the connector board cables **(3)**.
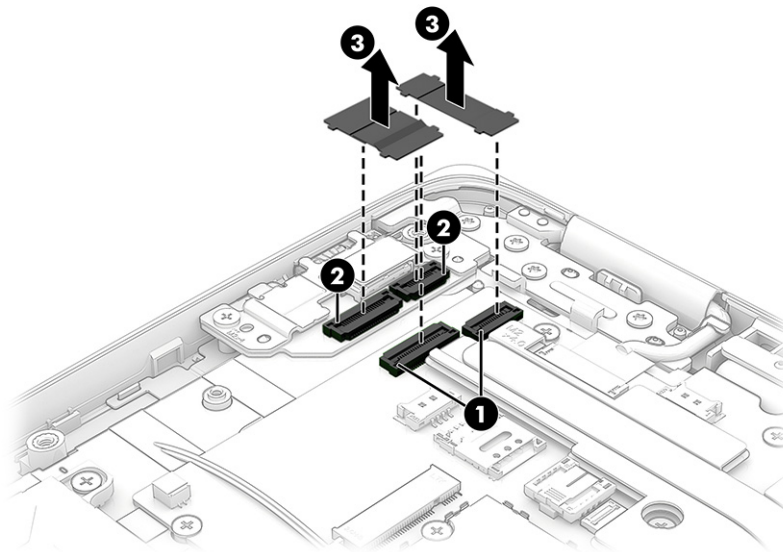
Reverse this procedure to install the connector board cables.

Connector board

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

Table 5-5 Connector board description and part number
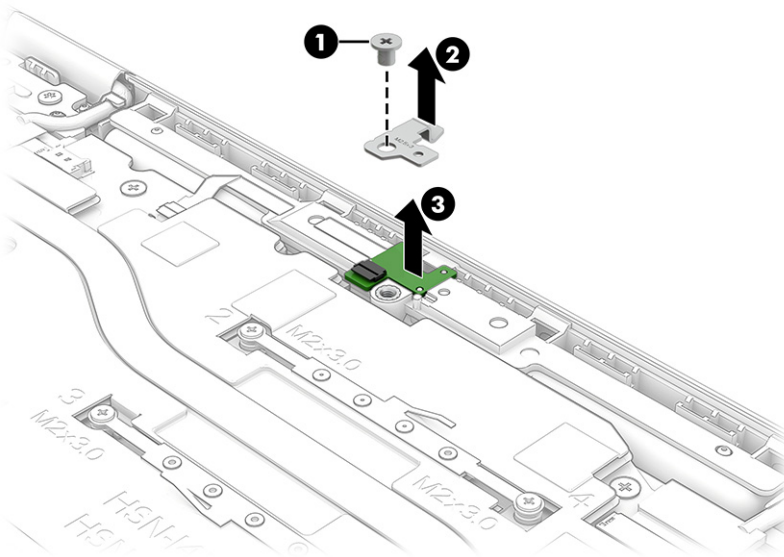
Description	Spare part number
Connector board (includes audio jack and USB port)	N02669-001

NOTE: The connector board spare part kit does not include the connector board I/O bracket or the audio jack and USB port cables. The bracket is included in the Bracket Kit, spare part number N00429-001. The cables are available using spare part number N05860-001.

Before removing the connector board, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

4. Remove the connector board cables (see Connector board cables on page 49).

Remove the connector board:

1. Remove the two Phillips M2.0 × 4.5 screws **(1)** that secure the connector board and I/O bracket to the computer.

2. Remove the I/O bracket **(2)**.

   The connector board I/O bracket is included in the Bracket Kit, spare part number N00429-001.

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

Reverse this procedure to install the connector board.

Sensor board cable

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

NOTE: The sensor board spare part kit does not include the sensor board cable. The sensor board cable is available using spare part number N02670-001.

Before removing the sensor board cable, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

Remove the sensor board cable:

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

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

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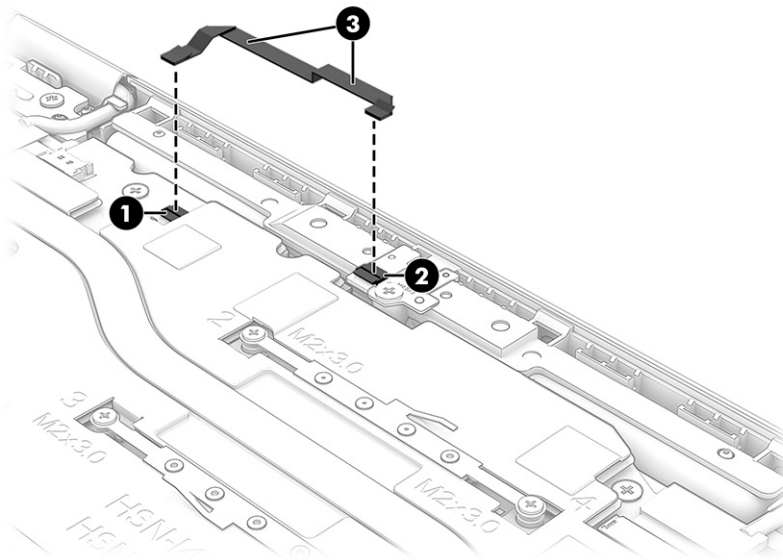
4. Remove the sensor board cable.

Reverse this procedure to install the sensor board cable.

Sensor board

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

Table 5-6 Sensor board description and part number

Description	Spare part number
Sensor board	N02670-001

NOTE: The sensor board spare part kit does not include the sensor board bracket or sensor board cable. The sensor board bracket is included in the Bracket Kit, spare part number N00429-001. The sensor board cable is available using spare part number N02670-001.

Before removing the sensor board, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Disconnect the battery cable from the system board (see).

4. Remove the sensor board cable (see).

Remove the sensor board:

1. Remove the Phillips M2.5 × 3.3 screw **(1)** that secures the sensor board and bracket to the computer.

2. Remove the sensor board bracket **(2)**.

    The sensor board bracket is included in the Bracket Kit, spare part number N00429-001.

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

Reverse this procedure to install the sensor board.

System board

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

Table 5-7 System board descriptions and part numbers

Description	Spare part number
Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, WWAN capability, and the Windows 11 operating system	N02676-601
Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, WWAN capability, and a non-Windows operating system	N02676-001
Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00437-601
Equipped with an Intel Celeron N5100 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and a non-Windows operating system	N00437-001
Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, WWAN capability, and the Windows 11 operating system	N02675-601
Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, WWAN capability, and a non-Windows operating system	N02675-001
Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and the Windows 11 operating system	N00435-601
Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and a non-Windows operating system	N00435-001
Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00436-601
Equipped with an Intel Celeron N5100 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and a non-Windows operating system	N00436-001
Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, WWAN capability, and the Windows 11 operating system	N02677-601
Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, WWAN capability, and a non-Windows operating system	N02677-001
Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and the Windows 11 operating system	N00438-601
Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and a non-Windows operating system	N00438-001
Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00439-601
Equipped with an Intel Celeron N4500 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and a non-Windows operating system	N00439-001
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, WWAN capability, and the Windows 11 operating system	N02679-601
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, WWAN capability, and a non-Windows operating system	N02679-001
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00441-601
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 8 GB of system memory, without WWAN capability, and a non-Windows operating system	N00441-001
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, WWAN capability, and the Windows 11 operating system	N02678-601
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, WWAN capability, and a non-Windows operating system	N02678-001

Table 5-7 System board descriptions and part numbers (continued)

Description	Spare part number
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and the Windows 11 operating system	N00440-601
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, 64 GB eMMC storage, without WWAN capability, and a non-Windows operating system	N00440-001
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and the Windows 11 operating system	N00436-601
Equipped with an Intel Pentium Silver N6000 1.1 GHz processor, 4 GB of system memory, without WWAN capability, and a non-Windows operating system	N00436-001

Before removing the system board, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Disconnect the battery cable from the system board (see).

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:

● eMMC storage device (see).

● WLAN module (see).

● Heat sink (see).

Remove the system board:

1. Disconnect the following cables from the system board:

   ● **(1)** Connector board low-speed ZIF connector cable

   ● **(2)** Connector board high-speed ZIF connector cable

   ● **(3)** Webcam/microphone module ZIF connector cable

   ● **(4)** Sensor board ZIF connector cable

   ● **(5)** Display panel cable ZIF connector cable

   ● **(6)** WLAN module shield

   The WLAN module shield is included in the Plastics Kit, spare part numbers N05694-001 and N02672-001.

   ● **(7)** WLAN module antenna cables

   ● **(8)** Power connector cable

   ● **(9)** Speaker cable

   ● **(10)** RTC battery cable

   ● **(11)** Keyboard ZIF connector cable

- **(12)** Touchpad ZIF connector cable
- **(13)** Top cover webcam module ZIF connector cable
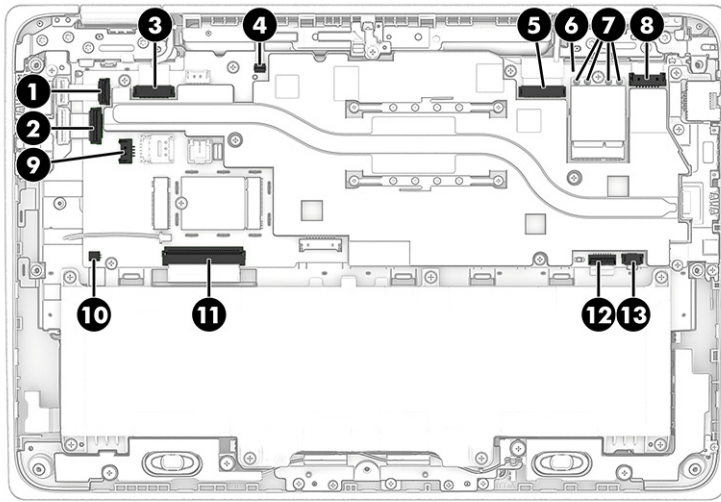
2. Remove the five Phillips M2.0 × 4.5 screws **(1)** that secure the system board and the system board I/O bracket to the computer.

3. Remove the six Phillips M2.5 × 3.3 screws **(2)** that secure the system board to the computer.

4. Remove the system board I/O bracket **(3)**.

   The system board I/O bracket is included in the Bracket Kit, spare part number N00429-001).
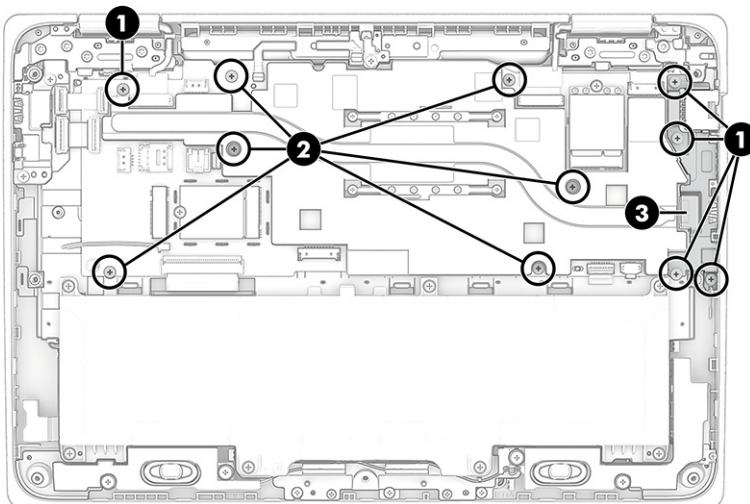
5. Lift the left side of the system board **(1)** until it rests at an angle.

6. Slide the system board **(2)** up and to the left at an angle to remove it.
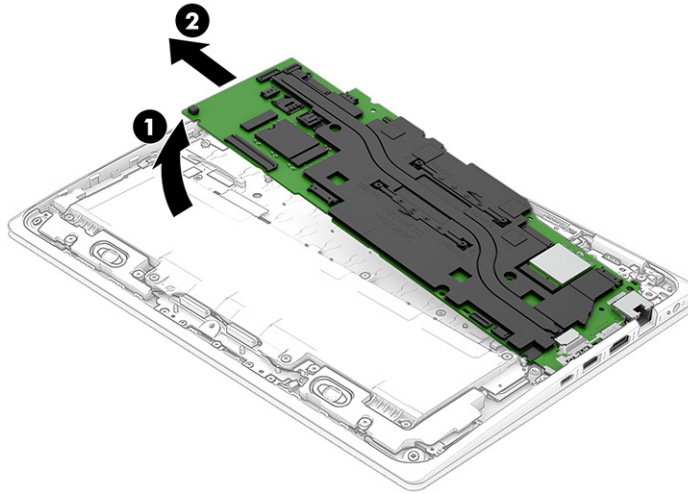
Reverse this procedure to install the system board.

Heat sink

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

Table 5-8 Heat sink description and part number

Description	Spare part number
Heat sink (includes replacement thermal material)	N00428-001

Before removing the heat sink, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

4. Remove the system board (see System board on page 52).

Remove the heat sink:

1. In the numeric sequence on the heat sink, remove the four Phillips M2.0 × 3.0 screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink **(2)**.
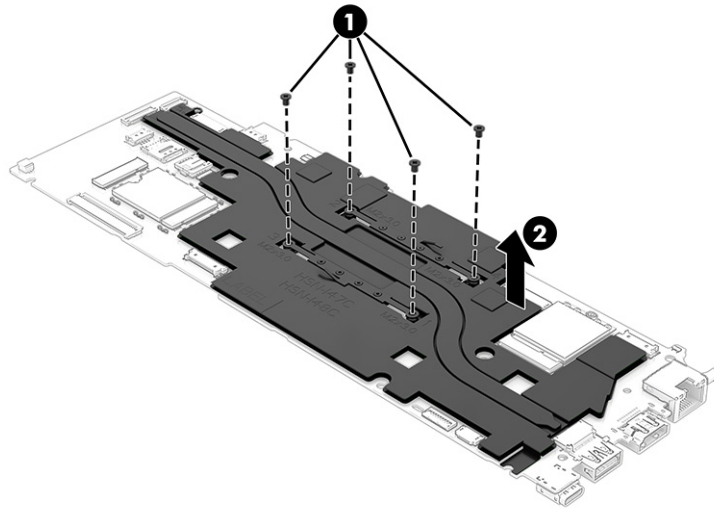
3. Thoroughly clean the thermal material from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits. The following illustration shows the replacement thermal material locations.

   Thermal paste is used on the system board components **(1)** and on the heat sink area **(2)** that services it.
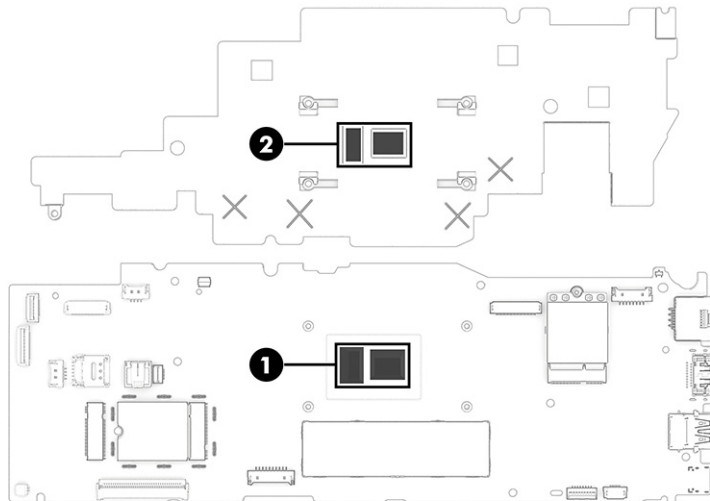
Reverse this procedure to install the heat sink.

Power connector cable

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

Table 5-9 Power connector cable description and part number

Description	Spare part number
Power connector cable	M22011-001

NOTE: The power connector cable spare part kit does not include the power connector cable bracket. The power connector cable bracket is included in the Bracket Kit, spare part number N00429-001.

Before removing the power connector cable, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

Remove the power connector cable:

1. Disconnect the power connector cable **(1)** from the system board.

2. Remove the Phillips M2.5 × 5.2 screw **(2)** that secures the power connector cable to the computer.

3. Remove the power connector cable bracket **(3)**.

NOTE: The power connector cable bracket is included in the Bracket Kit, spare part number N00429-001.

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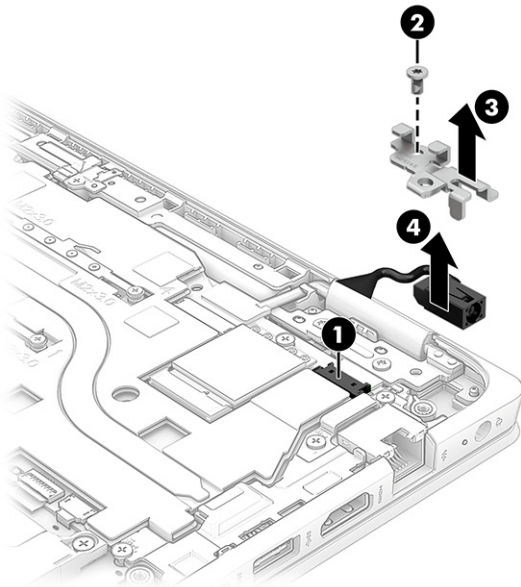
Reverse this procedure to install the power connector cable.

29.6 cm (11.6 in) touchscreen display assembly with slim panel:

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

Table 5-10 Display assembly descriptions and part numbers

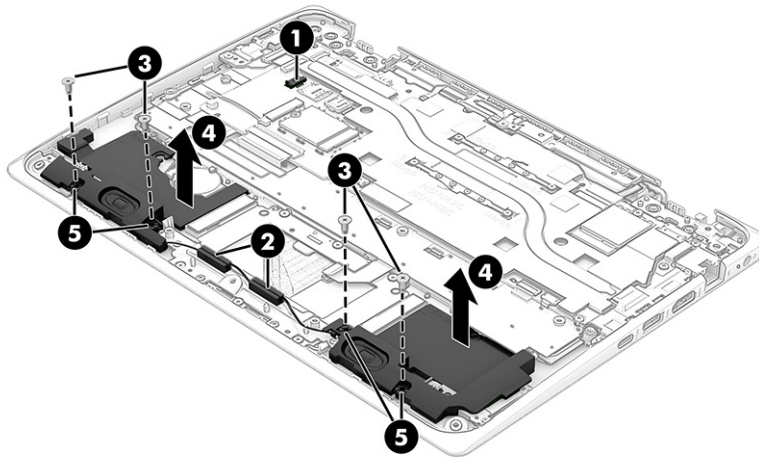| Description	Spare part number
Display assemblies in jellyfish blue finish:	
HD (1366×768), UWVA, 50% CG, eDP display assembly with HD webcam for use on computer models with WWAN capability; typical brightness: 250 nits	N00430-001
HD (1366×768), SVA, 45% CG, eDP, display assembly with HD webcam for use on computer models without WWAN capability; typical brightness: 250 nits	N00431-001
Display assemblies in jet black finish:	
HD (1366×768), UWVA, 50% CG, eDP display assembly with HD webcam for use on computer models with WWAN capability; typical brightness: 250 nits	N00432-001
HD (1366×768), SVA, 45% CG, eDP, display assembly with HD webcam for use on computer models without WWAN capability; typical brightness: 250 nits	N00433-001

Before removing the display panel, follow these steps:

1. Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2. Remove the bottom cover (see Bottom cover on page 42).

3. Disconnect the battery cable from the system board (see Battery on page 43).

4. Remove the power connector cable (see Power connector cable on page 57).

Remove the display assembly:

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

2. Release the webcam/microphone module cable from the retention clip **(2)** that is built into the top cover/keyboard.

3. Release the ZIF connector **(3)** to which the display panel cable is connected, and then disconnect the display panel cable from the system board.

4. Remove the WLAN module shield **(4)**.

   The WLAN module shield is included in the Plastics Kit, spare part numbers N05694-001 and N02672-001.

5. Carefully disconnect the two antenna cables from the module **(5)**.

📝 NOTE: Computer models may have multiple WLAN antennas. On models with two antennas, 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 #1 Aux terminal.

6.   Release the display panel cable and the wireless antenna cables from the retention clip **(6)** that is built into the top cover/keyboard.
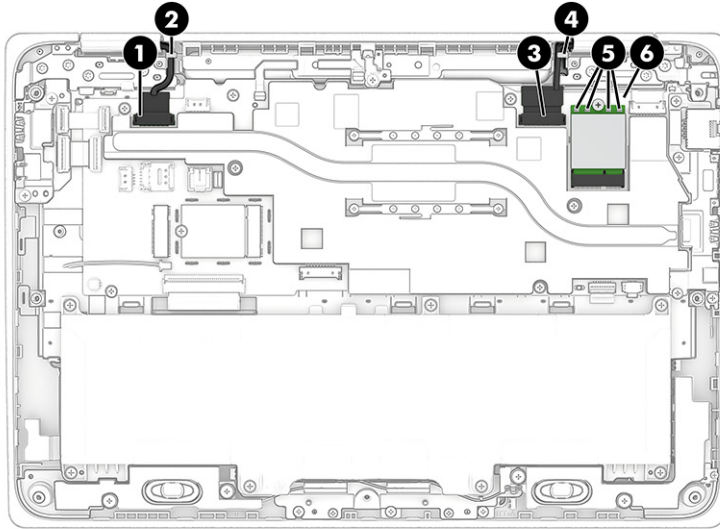
7.   Remove the seven Phillips M2.5 × 5.2 screws that secure the display assembly to the computer.
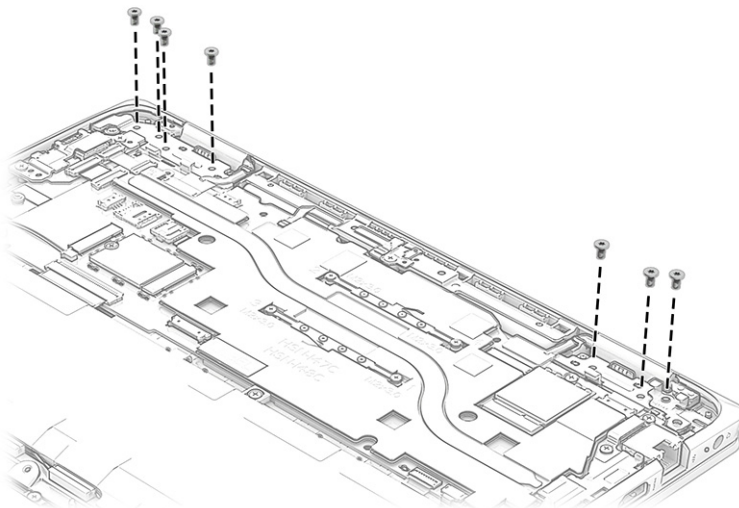
8.   Rotate the display hinges up and back **(1)**.

9.   Rotate the display assembly away from the top cover/keyboard **(2)**.

10. Separate the display assembly from the top cover/keyboard **(3)**.
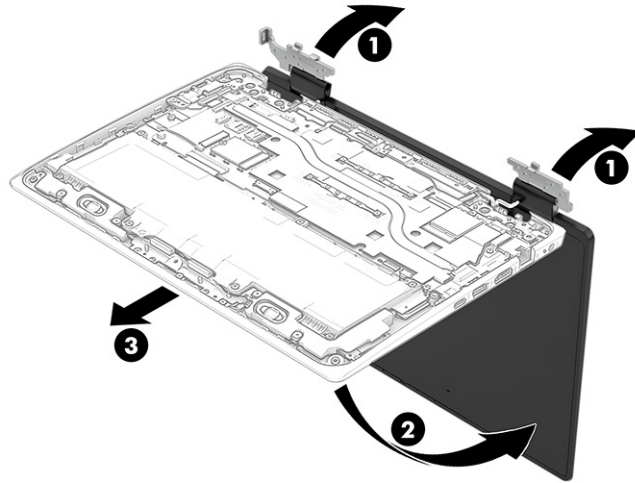
Reverse this procedure to replace the display assembly.

Speakers

To remove the speakers, use this procedure and illustration.

Table 5-11 Speaker description and part number

Description	Spare part number
Speakers (includes cables and 4 rubber isolator grommets)	N02671-001

Before removing the speakers, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the speakers:

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

2. Release the speaker cable from the rubber routing channels **(2)** built into the top cover/keyboard.

3. Remove the four Phillips M2.0 × 6.4 shoulder screws **(3)** that secure the speakers to the computer.

4. Remove the speakers **(4)**.

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

Reverse this procedure to install the speakers.

RTC battery

To remove the RTC battery, use this procedure and illustration.

Table 5-12 RTC battery description and part number

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

Before removing the RTC battery, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the RTC battery:

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

2. Release the RTC battery cable from the retention clips **(2)** and routing channel built into the top cover/ keyboard.

3.   Remove the RTC battery **(3)**.
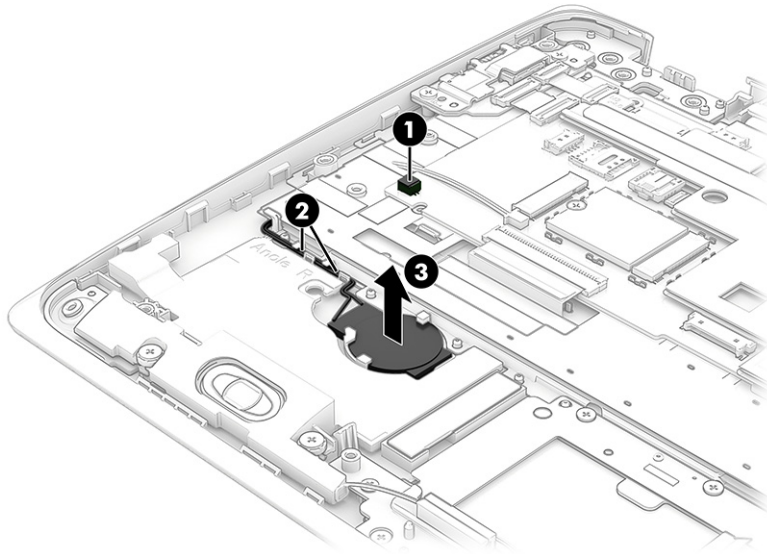
To insert the RTC battery, reverse the removal procedures.

Touchpad cable

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

📝 NOTE: The touchpad spare part kit does not include the touchpad cable. The touchpad cable is included in the Cable Kit, spare part number N05697-001.

Before removing the touchpad cable, follow these steps:

1.   Prepare the computer for disassembly (see Preparation for disassembly on page 42).

2.   Remove the bottom cover (see Bottom cover on page 42).

3.   Remove the battery (see Battery on page 43).

Remove the touchpad cable:

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

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

3. Detach the touchpad cable **(3)** from the touchpad and the top cover/keyboard. (The touchpad cable is attached to the touchpad and the top cover/keyboard with double-sided adhesive.)
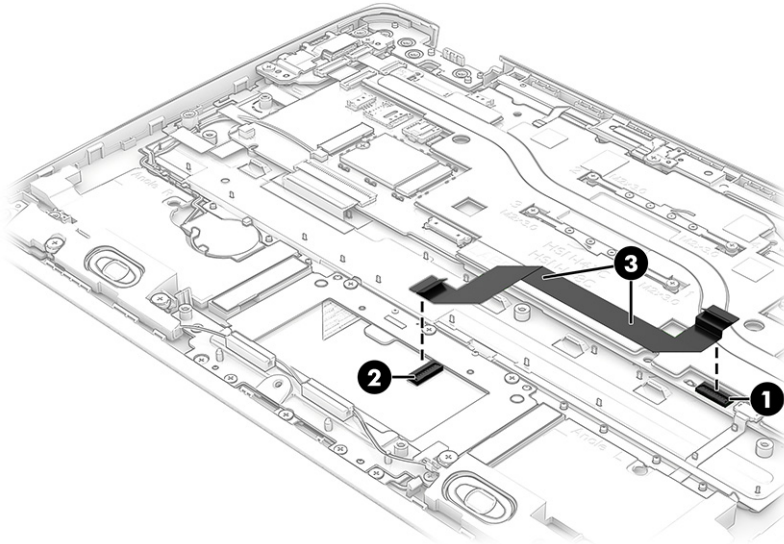
4. Remove the touchpad cable.

Reverse this procedure to install the touchpad cable.

Touchpad

To remove the touchpad, use this procedure and illustration.

Table 5-13 Touchpad descriptions and part numbers

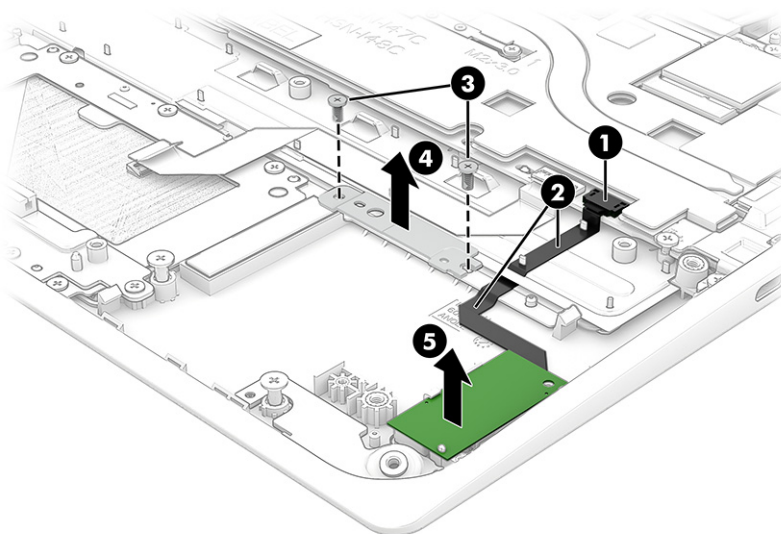| Description	Spare part number
Touchpad in jellyfish blue finish	N00443-001
Touchpad in jet black finish	N00442-001
The touchpad spare part kit does not include the touchpad bracket or touchpad cable. The touchpad bracket is included in the Bracket Kit, spare part number N00429-001. The touchpad cable is included in the Cable Kit, spare part number N05697-001.	

Before removing the touchpad, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

4. Remove the touchpad cable (see).

Remove the touchpad:

1. Remove the four Phillips M2.0 × 3.0 screws **(1)** that secure the touchpad bracket to the computer.

2. Remove the touchpad bracket **(2)**.

   The touchpad bracket is included in the Bracket Kit, spare part number N00429-001.
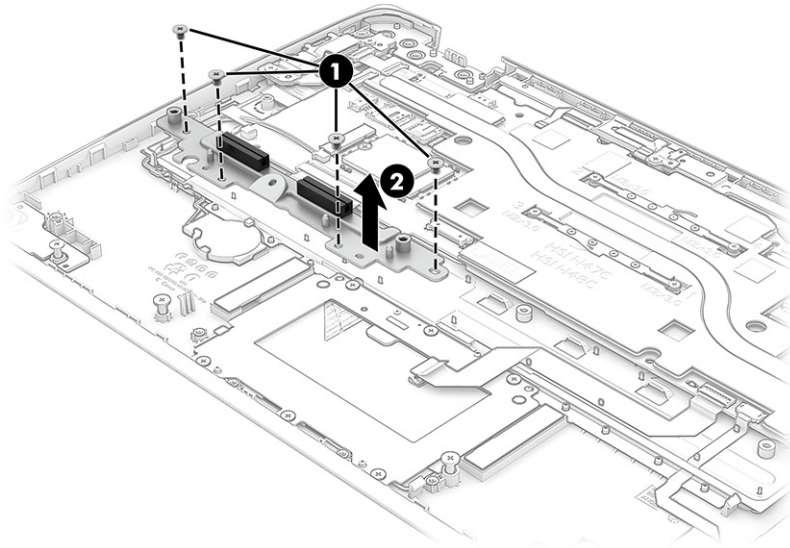
3. Remove the six Phillips M2.0 × 2.3 screws **(1)** that secure the touchpad to the top cover/keyboard.

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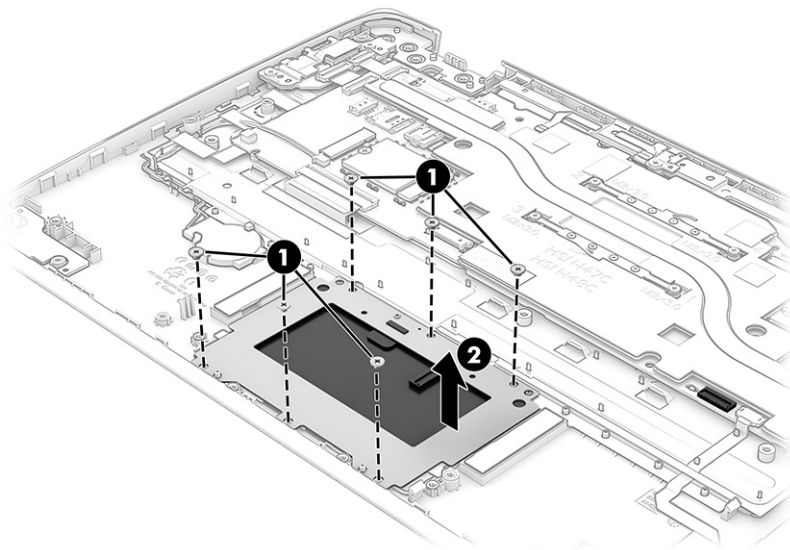
Reverse this procedure to install the touchpad.

Top cover webcam

To remove the top cover webcam, use this procedure and illustration.

Table 5-14 Top cover webcam description and part number

Description	Spare part number
Top cover webcam	N00444-001

The top cover webcam spare part kit does not include the top cover webcam bracket or top cover webcam cable. The top cover webcam bracket is included in the Bracket Kit, spare part number N00429-001. The top cover webcam cable is included in the Cable Kit, spare part number N05697-001.

Before removing the top cover webcam, follow these steps:

1. Prepare the computer for disassembly (see).

2. Remove the bottom cover (see).

3. Remove the battery (see).

Remove the top cover webcam:

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

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

3. Remove the two Phillips M1.5 × 3.8 screws **(3)** that secure the top cover webcam and bracket to the top cover/keyboard.

4. Remove the top cover webcam bracket **(4)**.

   The top cover webcam bracket is included in the Bracket Kit, spare part number N00429-001.

5. Remove the top cover webcam **(5)**.

Reverse this procedure to install the top cover webcam.

Keyboard with top cover

The top cover with keyboard remains after removing all other spare parts from the computer. In this section, the first table provides the main spare part number for the top cover/keyboards. The second table provides the country codes.

Table 5-15 Keyboard with top cover descriptions and part numbers

Description	Spare part number
Spill-resistant top cover/keyboard in jellyfish blue finish equipped with pen cradle and touchpad for use on computer models equipped with a top cover webcam	N00447-xx1
Spill-resistant top cover/keyboard in jellyfish blue finish equipped with pen cradle for use on computer models equipped with a top cover webcam:	N00446-xx1
Spill-resistant top cover/keyboard in jellyfish blue finish equipped with pen cradle and touchpad for use on computer models equipped with a digital pen:	N00448-xx1
Spill-resistant top cover/keyboard in jellyfish blue finish equipped with pen cradle for use on computer models not equipped with a top cover webcam:	N00445-xx1
Spill-resistant top cover/keyboard in jet black finish equipped with pen cradle and touchpad for use on computer models equipped with a top cover webcam:	N00451-xx1
Spill-resistant top cover/keyboard in jet black finish equipped with touchpad for use on computer models equipped with a top cover webcam:	N00450-xx1
Spill-resistant top cover/keyboard in jet black finish equipped with pen cradle and touchpad for use on computer models equipped with a digital pen:	N00452-xx1
Spill-resistant top cover/keyboard in jet black finish equipped with touchpad for use on computer models not equipped with a top cover webcam:	N00449-xx1

Table 5-16 Spare part country codes

For use in country or region	Spare part number	For use in country or region	Spare part number	For use in country or region	Spare part number
Belgium	-A41	India	-D61	Saudi Arabia	-171
Bulgaria	-261	Israel	-BB1	Slovenia	-BA1
Czech Republic/Slovakia	-FL1	Italy	-061	South Korea	-AD1
Denmark	-081	Kazakhstan	-DF1	Spain	-071
Denmark, Finland, and Norway	-DH1	Latin America	-161	Sweden and Finland	-B71
French Canada	-DB1	The Netherlands	-B31	Switzerland	-BG1
France	-051	Northern Africa	-FP1	Taiwan	-AB1
Germany	-041	Norway	-091	Thailand	-281
Greece	-151	Portugal	-131	Turkey	-141
Hungary	-211	Romania	-271	United Kingdom	-031
Iceland	-DD1	Russia	-251	United States	-001

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).

  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

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

HP provides several tools to help set up and protect your computer.

Using Computer Setup

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

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

To start Computer Setup, turn on or restart the computer, and when the HP logo appears, press f10 to enter Computer Setup.

Navigating and selecting in Computer Setup

You can navigate and select in Computer Setup using one or more methods.

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

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

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

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

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

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

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

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

1. Start Computer Setup. See <u>Using Computer Setup on page 71</u>.

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

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

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

Updated versions of the BIOS 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 Computer Setup (BIOS), first determine the BIOS version on your computer.

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

1. Start Computer Setup. See <u>Using Computer Setup on page 71</u>.

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

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

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

To check for later BIOS versions, see <u>Preparing for a BIOS update on page 72</u>.

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 on the computer by unplugging the power cord from the AC outlet.

Do not shut down the computer or initiate Sleep.

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

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. 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.

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

Installing a BIOS update

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

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

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

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

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

   The BIOS installation begins.

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

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

Changing the boot order using the f9 prompt

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

1. Access the Boot Device Options menu:

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

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

TPM BIOS settings (select products only)

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

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

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

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Using Computer Setup on page 71.

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

Using HP Sure Start (select products only)

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

HP Sure Start is configured and already enabled so that most users can use the HP Sure Start default configuration. Advanced users can customize the default configuration.

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

8 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, 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 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 76.

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.

> **NOTE:** The options **Remove everything** and then **Fully clean the drive** can take several hours to complete and leave no information on your computer. It is the safest way to reset your computer before you recycle it.

3. Recover using HP Recovery media. For more information, see Recovering using HP Recovery media on page 76.

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 75.

> **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 76 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 operating system (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.

9 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.

Using HP PC Hardware Diagnostics Windows (select products only)

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

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

Using an HP PC Hardware Diagnostics Windows hardware failure ID code

When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit failure ID code is generated for select component tests. For interactive tests, such as keyboard, mouse, or audio and video palette, you must perform troubleshooting steps before you can receive a failure ID.

▲ You have several options after you receive a failure ID:

- Select **Next** to open the Event Automation Service (EAS) page, where you can log the case.

  – or –

- Scan the QR code with your mobile device, which takes you to the EAS page, where you can log the case.

  – or –

- Select the box next to the 24-digit failure ID to copy your failure code and send it to support.

Accessing HP PC Hardware Diagnostics Windows

After HP PC Hardware Diagnostics Windows is installed, you can access it from HP Help and Support, HP Support Assistant, or the Start menu.

Accessing HP PC Hardware Diagnostics Windows from HP Help and Support (select products only)

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

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

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

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

NOTE: To stop a diagnostic test, select **Cancel**.

Accessing HP PC Hardware Diagnostics Windows from Support Assistant

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from 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 **Troubleshooting and fixes**.

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

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

NOTE: To stop a diagnostic test, select **Cancel**.

Accessing HP PC Hardware Diagnostics Windows from the Start menu (select products only)

After HP PC Hardware Diagnostics Windows is installed, follow these steps to access it from the Start menu.

1. Select the **Start** button.

2. Right-click **HP PC Hardware Diagnostics for Windows**, select **More**, and then select **Run as administrator**.

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

NOTE: To stop a diagnostic test, select **Cancel**.

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version from HP

To download HP PC Hardware Diagnostics Windows from HP, follow these steps.

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics Windows**, and then select the specific Windows diagnostics version to download to your computer or a USB flash drive.

The tool downloads to the selected location.

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.

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

You can download HP PC Hardware Diagnostics Windows by product name or number.

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

1. Go to http://www.hp.com/support.

2. Select **Software and Drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.

3. In the **Diagnostics** section, select **Download**, and then follow the on-screen instructions to select the specific Windows diagnostics version to be downloaded to your computer or USB flash drive.

The tool downloads to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, navigate to the folder on your computer or the USB flash drive where the .exe file downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

HP PC Hardware Diagnostics UEFI (Unified Extensible Firmware Interface) allows you to run diagnostic tests to determine whether the computer hardware is functioning properly. The tool runs outside the operating system so that it can isolate hardware failures from issues that are caused by the operating system or other software components.

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 81.

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

Using an HP PC Hardware Diagnostics UEFI hardware failure ID code

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit failure ID code is generated.

For assistance in solving the problem:

▲ Select **Contact HP**, accept the HP privacy disclaimer, and then use a mobile device to scan the failure ID code that appears on the next screen. The HP Customer Support - Service Center page appears with your failure ID and product number automatically filled in. Follow the on-screen instructions.

‒ or ‒

Contact support, and provide the failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

To start HP PC Hardware Diagnostics UEFI, follow this procedure.

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

2. Press f2.

   The BIOS searches three places for the diagnostic tools, in the following order:

   a. Connected USB flash drive

   > **NOTE:** To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 81.

   b. Hard drive

   c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in some situations.

● HP PC Hardware Diagnostics UEFI is not included in the preinstallation image.

● HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.

● The hard drive is damaged.

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

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive, follow this procedure.

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download HP Diagnostics UEFI**, and then select **Run**.

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

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

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

1. Go to http://www.hp.com/support.

2. Enter the product name or number, select your computer, and then select your operating system.

3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

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

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it might upload results to a preconfigured server.

For more information about Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

HP Remote PC Hardware Diagnostics UEFI is also available as a SoftPaq that you can download to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

You can download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive.

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.

2. Select **Download Remote Diagnostics**, and then select **Run**.

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

You can download HP Remote PC Hardware Diagnostics UEFI by product name or number.

> **NOTE:** For some products, you might have to download the software by using the product name or number.

1. Go to http://www.hp.com/support.

2. Select **Software and Drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.

3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

10   Specifications

This chapter provides specifications for your computer.

Computer specifications

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

Table 10-1 Computer specifications

	Metric	U.S.
Dimensions		
Width	**297.0 mm**	11.7 in
Depth	**203.7 mm**	8.0 in
Height (front to back)	**21.2 mm**	0.8 in
Weight	1.47 kg	3.24 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
Nonoperating	**−15 m to 12,192 m**	−50 ft to 40,000 ft

Table 10-1 Computer specifications (continued)

	Metric	U.S.

NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.

29.6 mm (11.6 in) display specifications

This section provides specifications for your display.

Table 10-2 Display specifications

	Metric	U.S.
Active diagonal size	**29.6 cm**	11.6 in
Resolution	1368 × 768 (HD)	
Surface treatment	Brightview (LED panel)	
Brightness	250 nits (HD, 50% NTSC panel)	
	250 nits (HD, 45% NTSC)	
Viewing angle	UWVA	
	SVA	
Backlight	LED	
Display panel interface	eDP	

11 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**. Select **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:

> 📝 **NOTE:** 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 11-1 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 92.	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 nonfunctional.
DIMM Serial Presence Detect (SPD)	256 bytes per memory module, 128 bytes	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.

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?
configuration data	programmable (not customer accessible)					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 nonfunctional. 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 11-1 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 information on your hard drive. See question and answer 6 for steps to securely erase information.

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.

12 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 three-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 12-1 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

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
Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
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
United Kingdom	ASTA	1
United States	UL	2

1.   The flexible cord must be Type HO5VV-F, three-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, three-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, three-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, three-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 HO5VV-F three-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 three-conductor, 1.25 mm² conductor size. Power cord set fittings (appliance coupler, cable, and wall plug) must bear the BSMI certification mark.

Country/region	Accredited agency	Applicable note number

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 three-conductor, 0.75 mm² or 1.00 mm² conductor size, with plug BS 1363/A with BSI or ASTA marks.

13 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.

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