HP EliteBook 1040 G4 Notebook PC

Maintenance and Service Guide
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Product notice

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

Not all features are available in all editions of Windows. This computer may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows functionality. Go to http://www.microsoft.com for details.

In accordance with Microsoft's support policy, HP does not support the Windows 8 or Windows 7 operating system on this product or provide any Windows 8 or Windows 7 drivers on http://www.hp.com/support.

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

Safety warning notice

⚠ **WARNING!** To reduce the possibility of heat-related injuries or of overheating the device, do not place the device directly on your lap or obstruct the device air vents. Use the device only on a hard, flat surface. Do not allow another hard surface, such as an adjoining optional printer, or a soft surface, such as pillows or rugs or clothing, to block airflow. Also, do not allow the AC adapter to contact the skin or a soft surface, such as pillows or rugs or clothing, during operation. The device and the AC adapter comply with the user-accessible surface temperature limits defined by the International Standard for Safety of Information Technology Equipment (IEC 60950-1).

Table of contents

1 Product description

Category	Description
Product Name	HP EliteBook 1040 G4 Notebook PC
	HP EliteBook 1040 G4
Processors	**7th Generation Intel® Core™ i5 Processor, Kabylake U, dual-core, BGA**
	i5-7200U (Kit processor)
	i5-7300U (Roadmap processor)
	7th Generation Intel® Core™ i7 Processor, Kabylake U, dual-core, BGA:
	i7-7500U (Kit processor)
	i7-7600U (Roadmap processor)
	7th Generation Intel® Core™ i7 H-Processor Line), Kabylake , Quad-core, BGA:
	i7-7820HQ (Roadmap processor)
Chipset	Intel Kaby Lake Premium Chipset
	Chipset - PCH QM175
Graphics	**Intel UMA Graphics - with shared video memory**
Panel	**14.0" (LED backlight):**
	FHD (1920 x 1080) UWVA eDP 1.3 + PSR, AG, 72%, 340 nits with camera
	FHD (1920 x 1080) UWVA eDP 1.3 + PSR, AG, 72%, 340 nits with camera, fWWAN
	FHD (1920 x 1080) UWVA eDP 1.3 + PSR 72%, 340 nits with camera, touch
	FHD (1920 x 1080) UWVA eDP 1.3 + PSR 72%, 340 nits with camera, fWWAN, touch
	FHD (1920 x 1080) UWVA eDP 1.3 + PSR, AG, 72%, 300 nits with camera, fWWAN, PRIVACY
	FHD (1920 x 1080) UWVA eDP 1.3 + PSR AG 72%, 300 nits with camera, fWWAN, touch, PRIVACY
	UHD (3840 x 2160) UWVA eDP 1.3 + PSR, AG, 72%, 400 nits with camera, fWWAN
	UHD (3840 x 2160) UWVA eDP 1.3 + PSR AG 72%, 400 nits with camera, fWWAN, touch
Memory	Memory soldered down
	DDR4 PC4, system runs at 2133
	Supports Dual Channel Memory
	Supports up to 16GB
	System Supports the following configurations:
	DDR4 2400:

Category	Description
	8192 MB Total System Memory (512Mx16) QTY 8
	16384 MB Total System Memory (512Mx16x2) QTY 8
Primary M.2 Storage	M.2 (NGFF) 2280 Solid State Drive
	128 GB SATA-3 SS TLC
	256 GB PCIe Gen 3x4 NVMe SS TLC
	256 GB SATA-3 SS TLC (Opal 2)
	360 GB PCIe Gen 3x4 SS TLC (Intel)
	512 GB PCIe Gen 3x4 NVMe SS TLC
	512 GB PCIe Gen 3x4 NVMe SS MLC
	512 GB SATA-3 SS TLC FIPS (test only)
	1 TB PCIe Gen 3x4 NVMe SS TLC
Audio and video	HP Bang & Olufsen Audio
	Microphone (Dual Array)
	IR and RGB camera (720 p) camera (supports IR "Hello" facial recognition via Win 10 OS)
	Premium Stereo Speakers (6)
Ethernet	No direct Ethernet Support - Ethernet via accessories
	Support HBMA (via UEFI PXE boot and Windows OS)
	Support S3 wake on LAN
Wireless	**WPAN Bluetooth:**
	BT 4.2 supported via Windstorm Peak combo module
	WLAN:
	WLAN options via soldered assembly:
	Intel Dual band wireless-AC 8265 802.11AC 2x2 WiFi + BT 4.2 Combo Adaptor (vPro) (Windstorm Peak Vpro)
	WLAN Antennas (2) (configured with panel on all units)
	Supports Bluetooth Disabled IOPT
	Support for Miracast
	Support for S3/S4 wake on Wireless LAN
	Support for WiFi SAR in BIOS
	Support for HP Connection Optimizer
	NFC:
	NFC Mirage module (NXP NPC300 I2C 10mmx17mm)
	NFC Antenna (configured on NFC SKU only)
	Supports "No NFC" option
	WWAN:
	SIM Module (3FF/micro SIM): (user Accessible on side of unit)
	WWAN options via connector:

Category	Description
	Foxconn HP It4120 LTE/EVDO/HSPA+ w/GPS M.2
	Huawei HP It4132 - LTE/HSPA+ w/GPS M.2
	Fibocom HP hs3210 WW HSPA+ w/o GPS
	WWAN Antennas (2) (world wide 5 band, configured at top of panel on all units)
	Supports "No WWAN" option
Ports	HDMI (1.4a)
	(2) USB 3.0 Charging Ports
	(2) USB-C Ports - Guest Protocol - USB 3.1, DP, PD (TI), Thunderbolt
	Headphone/Microphone Combo
Docking	Dock support via Thunderbolt/USB Type C connector or USB Type C Connector
Keyboard/pointing devices	**Keyboard:**
	Backlit
	Backlit - Privacy
	DuraKeys
	Function Keys
	F1 - Display Switch
	F2 - Blank
	F3 - Brightness Down
	F4 - Brightness Up
	F5 - Speaker Mute
	F6 - Volume Down
	F7 - Volume Up
	F8 - Mic Mute
	F9 - Keyboard Backlight
	F10 - NumLock
	F11 - Wireless
	F12 - Calendar
	Other top row function keys
	Present/Share
	Call Answer
	Call Decline
	Delete
	ClickPad requirements:
	ClickPad (Glass Cover)
	Taps enabled as default
	Gestures enabled by default

Category	Description
Power requirements	**Battery:**
	6-cell Long Life Polymer 67 WHr (2.90 Ahr)
	AC adapter
	65W USB-Type C AC Adapter
	90W USB-Type C AC Adapter
	Power Cord (localized)
	65W USB-Type C Power cord:
	Duckhead
	Duckhead Power Cord Length: 1.0m
	90W USB-Type C Power cord:
	Standard Power cord Length 1.0m
Security	Support Kensington Security Lock
	TPM 2.0 (Infineon; soldered down)
	Drive encryption pre-boot (Password)
	Power-on Authentication (Password)
	Touch Fingerprint Sensor (Landed, Touch w/ 8x8 sensor)
	Preboot Authentication (Password)
Operating system	**Operating System Version:**
	Windows 10 (Redstone 2)
	Preinstalled:
	Win 10 Home 64 Plus
	Win 10 Home 64 Plus Single Language
	Win 10 Home 64 Chinese Market - CPPP Plus
	Win 10 Pro 64
	Win 10 Pro 64 StF MSNA Plus (Only available with (i7 processor AND more than 4 GB RAM) OR more than or equal to 8 GB RAM)
	FreeDOS 2.0
	NeoKylin 64-bit, only available for the People's Republic of China. Not available with Touch, WWAN, or (2.5 inch HDD/SSD if M.2 SSD is selected)
	Restore Media:
	Win 10 DRDVD
	NeoKylin Linux (Only available with NeoKylin OS)
	Win 10 DRUSB
	OSDVD:
	Win 10 Pro 64
	Microsoft WHQL: Win 10 64
	Web Support:

Category	Description	
	Win 10 Enterprise 64	
	Win 10 Enterprise 64 LTSB 1507	
	Test and Document	
	Win 7 Enterprise 64	
	Win 7 Professional 64	
Configurable Software	Office Home & Business 2016 JP	
	Office Professional 2016 JP	
	Office Personal 2016 JP	
Serviceability	**End user replaceable parts:**	
	AC Adapter	

2 External component identification

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

Locating hardware

To find out what hardware is installed on your computer:

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

  A list displays all the devices installed on your computer.

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

Locating software

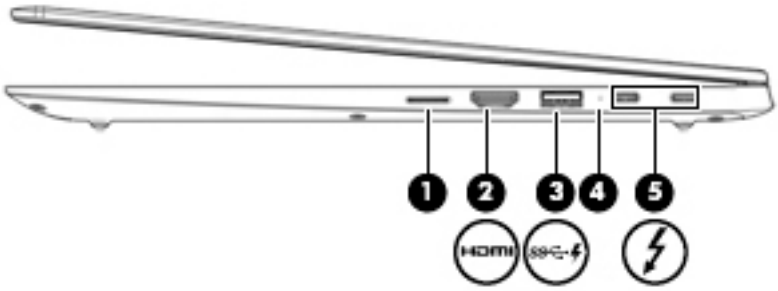
To find out what software is installed on your computer:

- Select the **Start** button.

  – or –

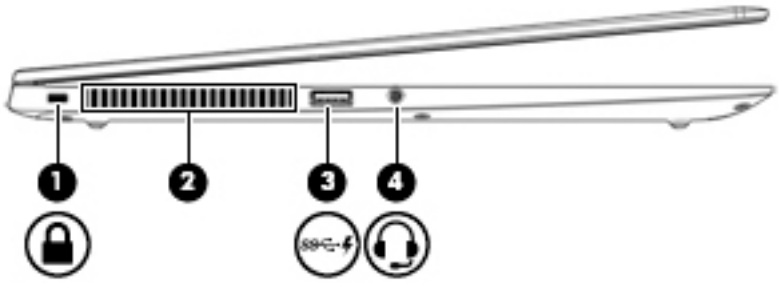
  Right-click the **Start** button, and then select **Apps and Features**.

Right side



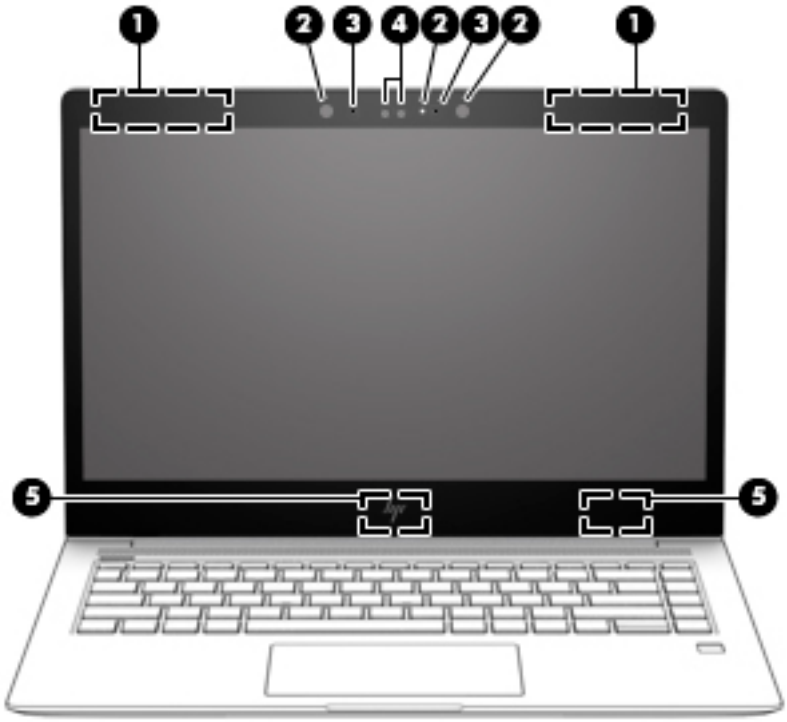
Component			Description
(1)		Micro SIM card slot	Supports a wireless subscriber identity module (SIM) card.
(2)		HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed High Definition Multimedia Interface (HDMI) device.
(3)		USB 3.x SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(4)		Battery light	When AC power is connected: • White: The battery charge is greater than 90 percent. • Amber: The battery charge is from 0 to 90 percent. • Off: The battery is not charging. When AC power is disconnected (battery not charging): • Blinking amber: The battery has reached a low battery level. When the battery has reached a critical battery level, the battery light begins blinking rapidly. • Off: The battery is not charging.
(5)		USB Type-C power connector and Thunderbolt port with HP Sleep and Charge (2)	Connect an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Connect and charge most USB devices that have a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer. **NOTE:** Cables and/or adapters (purchased separately) may be required. – and – Connect a display device that has a USB Type-C connector, providing DisplayPort output. **NOTE:** Your computer may also support a Thunderbolt docking station.

Left side



Component			Description
(1)		Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)		Vent	Enables airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.
(3)		USB 3.x SuperSpeed port with HP Sleep and Charge	Connects a USB device, provides high-speed data transfer, and even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch.
(4)		Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones. **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this guide: 1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app. – or – Click the question mark icon in the taskbar. 2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.

Display



Component		Description
(1)	WWAN antennas*	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).
(2)	Camera lights	On: One or more cameras are in use.
(3)	Internal microphones	Record sound.
(4)	Cameras	Allow 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.
(5)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

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

To access this guide:

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

   – or –

   Click the question mark icon in the taskbar.

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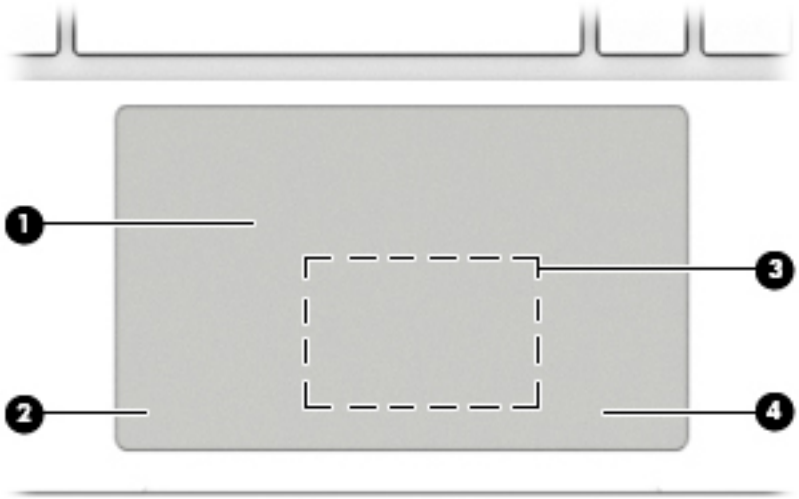
Keyboard area

TouchPad



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)	Near Field Communications (NFC) tapping area and antenna* (select products only)	Allows you to wirelessly share information when you tap it with an NFC-enabled device.
(4)	Right TouchPad button	Functions like the right button on an external mouse.

*The antenna is not visible from the outside of the computer. For optimal transmission, keep the area immediately around the antenna free from obstructions.

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

To access this guide:

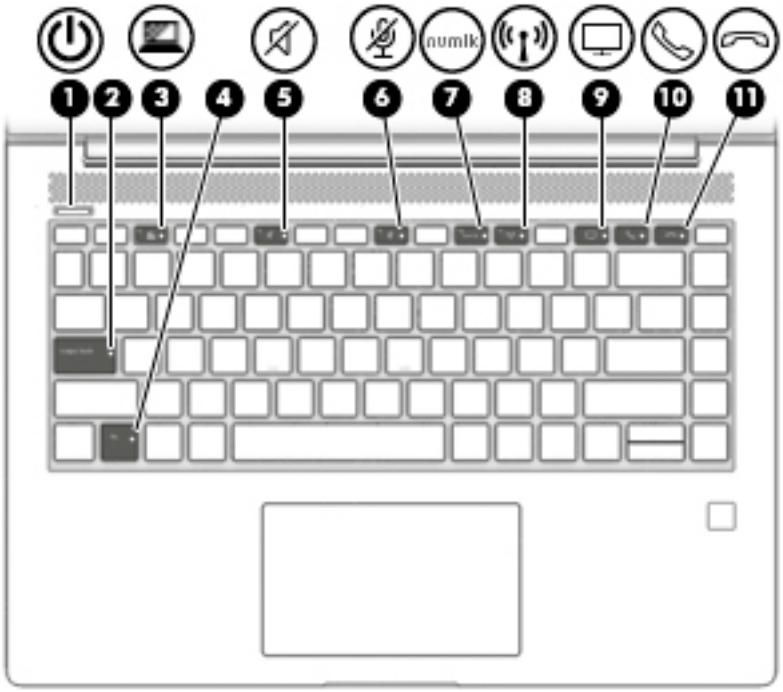
1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.

   – or –

   Click the question mark icon in the taskbar.

2. Select **My PC**, select the **Specifications** tab, and then select **User Guides**.

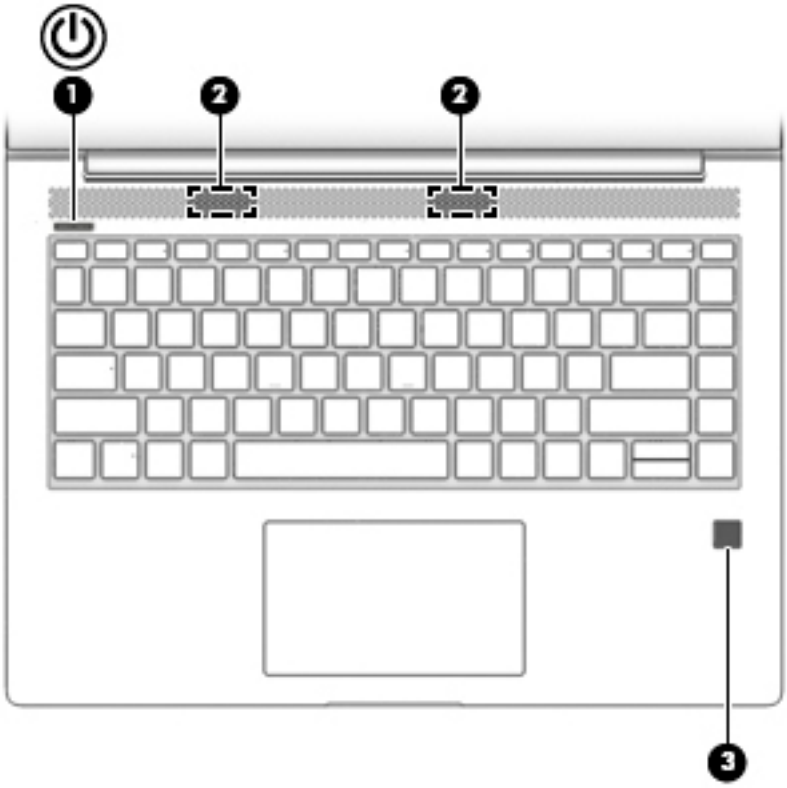
Lights



Component			Description
(1)		Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(3)		Privacy key light (select models only)	On: Privacy screen is on, which helps prevent side-angle viewing.
(4)		Fn lock light	On: The fn key is locked. For more information, see Hot keys (select products only) on page 16.
(5)		Mute light	• On: Computer sound is off. • Off: Computer sound is on.
(6)		Microphone mute light	• On: Microphone is off. • Off: Microphone is on.
(7)	num lk	Num lk light	On: Num lock is on.
(8)		Wireless light	On: An integrated wireless device, such as a wireless local area network (WLAN) device and/or a Bluetooth® device, is on. **NOTE:** On some models, the wireless light is amber when all wireless devices are off.
(9)		Keyboard backlight	Illuminates the keyboard for higher visibility in low-light conditions.

Component		Description
(9)	Sharing or presenting light	On: Sharing is on.
(10)	Call answer light	On: Call answer is on.
(11)	Call end light	On: Call end is on.

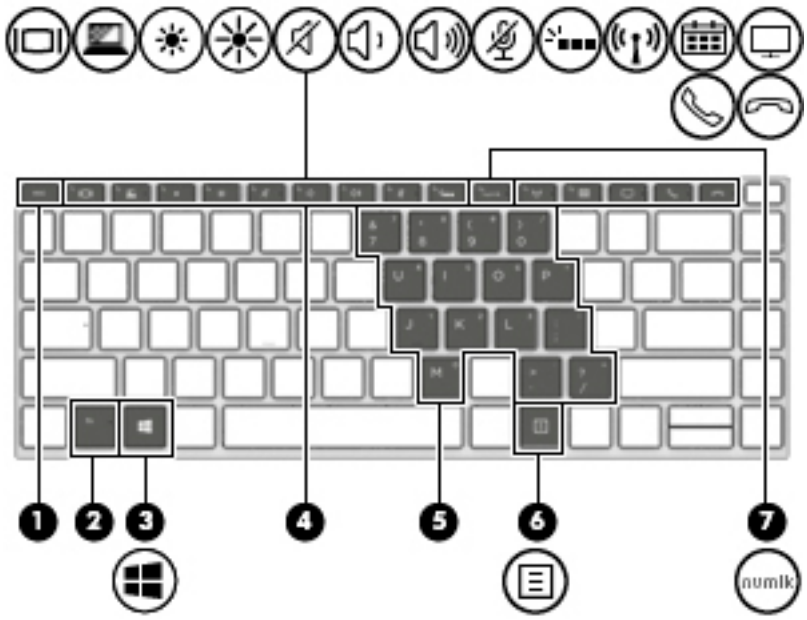
Button, speakers, and fingerprint reader



Component		Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation, press the button briefly to exit Hibernation. **CAUTION:** Pressing and holding down the power button results in the loss of unsaved information.

Component		Description
		If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button for at least 5 seconds to turn off the computer. To learn more about your power settings, see your power options. ▲ Right-click the **Power meter** icon  and then select **Power Options**.
(2)	Speakers	Produce sound.
(3)	Fingerprint reader (select products only)	Allows a fingerprint logon to Windows, instead of a password logon.

Special keys

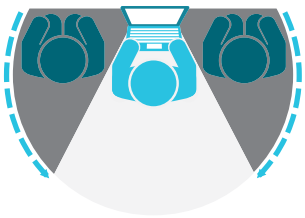


Component			Description
(1)		esc key	Displays system information when pressed in combination with the fn key.
(2)		fn key	Executes frequently used system functions when pressed in combination with another key. Such key combinations are called *hot keys*. See Hot keys (select products only) on page 16.
(3)		Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the **Start** menu.
(4)		Action keys	Execute frequently used system functions. See Action keys on page 15.
(5)		Embedded numeric keypad	A numeric keypad superimposed over the keyboard alphabet keys. When fn+num lk is pressed, the keypad can be used like an external numeric keypad. Each key on the keypad performs the function indicated by the icon in the upper-right corner of the key. **NOTE:** If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.
(6)		Windows application key	Displays options for a selected object.
(7)		num lk key	Turns the embedded numeric keypad on and off when pressed in combination with the fn key.

Action keys

An action key performs the function indicated by the icon on the key. To determine which keys are on your product, see Special keys on page 14.

▲ To use an action key, press and hold the key.

Icon	Description
	Switches the screen image among display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing the key alternates the screen image from computer display to monitor display to simultaneous display on both the computer and monitor.
	Helps prevent side-angle viewing from onlookers (select models only). If needed, decrease or increase brightness for well-lit or darker environments. Press the key again to turn off the privacy screen. **NOTE:** To quickly turn on the highest privacy setting, press fn+p. 
	Decreases the screen brightness incrementally as long as you hold down the key.
	Increases the screen brightness incrementally as long as you hold down the key.
	Mutes or restores speaker sound.
	Decreases speaker volume incrementally while you hold down the key.
	Increases speaker volume incrementally while you hold down the key.
	Mutes the microphone.
	Turns the keyboard backlight off or on. **NOTE:** To conserve battery power, turn off this feature.
num lk key	Turns the embedded numeric keypad on and off.
	Turns the wireless feature on or off. **NOTE:** A wireless network must be set up before a wireless connection is possible.
	Provides quick access to your Skype for Business calendar. **NOTE:** This feature requires Skype® for Business or Lync® 2013 running on Microsoft Exchange or Office 365® servers.

Icon	Description
	Turns the screen sharing function on or off. **NOTE:** This feature requires Skype for Business or Lync 2013 running on Microsoft Exchange or Office 365 servers.
	• Answers a call. • Starts a call during a 1-on-1 chat. • Places a call on hold. **NOTE:** This feature requires Skype for Business or Lync 2013 running on Microsoft Exchange or Office 365 servers.
	• Ends a call. • Declines incoming calls. • Ends screen sharing. **NOTE:** This feature requires Skype for Business or Lync 2013 running on Microsoft Exchange or Office 365 servers.

NOTE: The action key feature is enabled at the factory. You can disable this feature by pressing and holding the fn key and the shift key. The fn lock light will turn on. After you have disabled the action key feature, you can still perform each function by pressing the fn key in combination with the appropriate action key.

Hot keys (select products only)

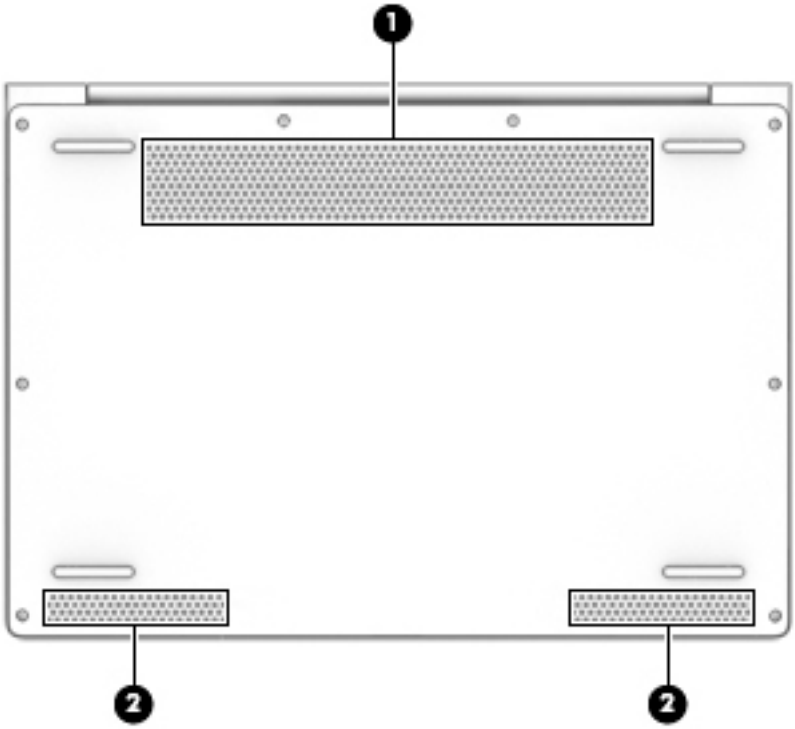
A hot key is the combination of the fn key and another key.

To use a hot key:

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

Key	Description
C	Turns on scroll lock.
E	Turns on the insert function.
P	Turns on the highest privacy setting.
R	Breaks the operation.
S	Sends a programing query.
W	Pauses the operation.

Bottom



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

Rear

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

Locating system information

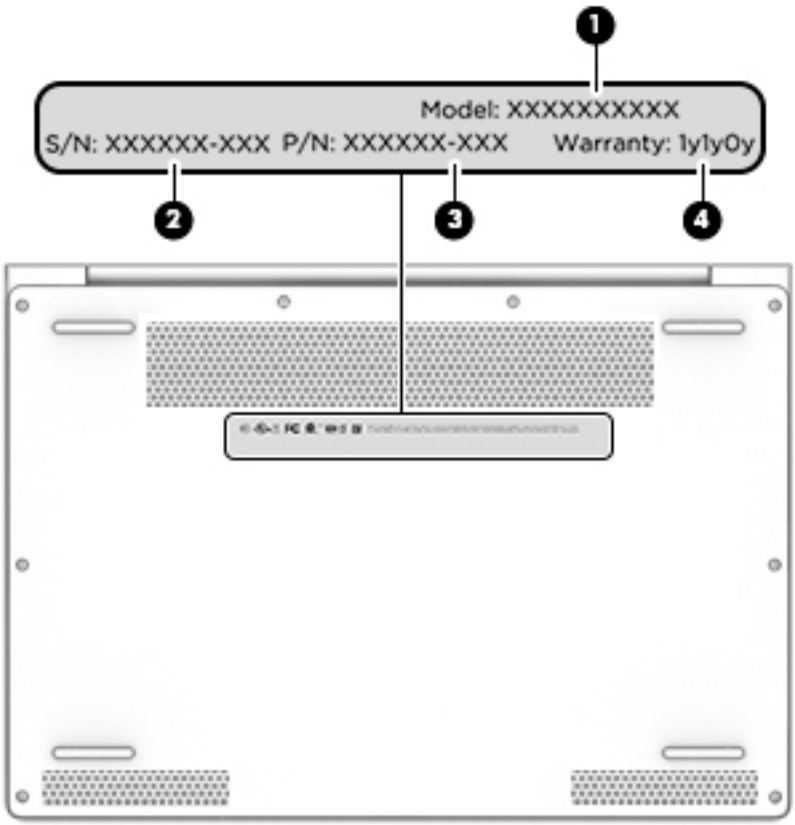
Important system information is located on the bottom edge of the tablet or on the keyboard base. You may need the information when travelling internationally or when you contact support:

(1): Serial number

(2): Product number

(3): Model number

(4): Warranty period



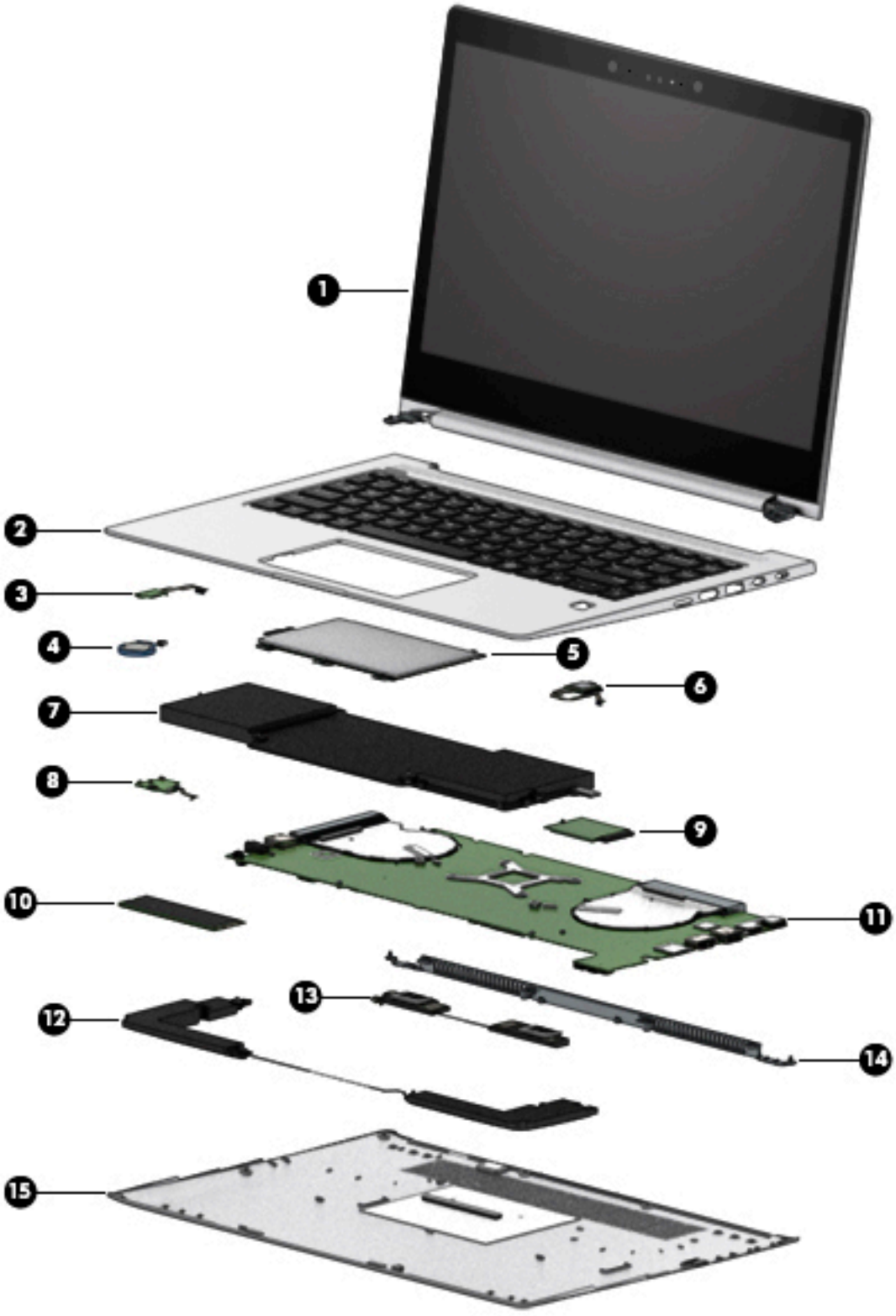
Using Windows, briefly press the fn+esc key combination to display the System Information screen, which provides the product name and serial number of your computer, as well as information about the memory, processor, BIOS, and keyboard.

3 Illustrated parts catalog

Computer major components

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

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Locating system information on page 18 for details.



Item	Component	Spare part number
(1)	**Display panel** (see Display assembly on page 48)	

Item	Component	Spare part number
(2)	**Keyboard with top cover**	
	For use in Belgium	L02267-A41
	For use in Brazil	L02267-201
	For use in Bulgaria	L02267-261
	For use in Canada	L02267-DB1
	For use in the Czech Republic and Slovakia	L02267-FL1
	For use in Denmark	L02267-081
	For use in Denmark, Finland, and Norway	L02267-DH1
	For use in France	L02267-051
	For use in Germany	L02267-041
	For use in Greece	L02267-151
	For use in Hungary	L02267-211
	For use in Iceland	L02267-DD1
	For use in India	L02267-D61
	For use in Israel	L02267-BB1
	For use in Italy	L02267-061
	For use in Japan	L02267-291
	For use in Latin America	L02267-161
	For use in the Netherlands	L02267-B31
	For use in Northwest Africa	L02267-FP1
	For use in Norway	L02267-091
	For use in Portugal	L02267-131
	For use in Romania	L02267-271
	For use in Russia	L02267-251
	For use in Saudi Arabia	L02267-161
	For use in Slovenia	L02267-BA1
	For use in South Korea	L02267-AD1
	For use in Spain	L02267-071
	For use in Sweden and Finland	L02267-B71
	For use in Switzerland	L02267-BG1
	For use in Taiwan	L02267-AB1
	For use in Thailand	L02267-281
	For use in Turkey	L02267-141
	For use in Turkey - F	L02267-541

Item	Component	Spare part number
	For use in the United Kingdom	L02267-031
	For use in the United States	L02267-001
	Top cover with privacy keyboard	
	For use in Belgium	L02268-A41
	For use in Brazil	L02268-201
	For use in Bulgaria	L02268-261
	For use in Canada	L02268-DB1
	For use in the Czech Republic and Slovakia	L02268-FL1
	For use in Denmark	L02268-081
	For use in Denmark, Finland, and Norway	L02268-DH1
	For use in France	L02268-051
	For use in Germany	L02268-041
	For use in Greece	L02268-151
	For use in Hungary	L02268-211
	For use in Iceland	L02268-DD1
	For use in India	L02268-D61
	For use in Israel	L02268-BB1
	For use in Italy	L02268-061
	For use in Japan	L02268-291
	For use in Latin America	L02268-161
	For use in the Netherlands	L02268-B31
	For use in Northwest Africa	L02268-FP1
	For use in Norway	L02268-091
	For use in Portugal	L02268-131
	For use in Romania	L02268-271
	For use in Russia	L02268-251
	For use in Saudi Arabia	L02268-161
	For use in Slovenia	L02268-BA1
	For use in South Korea	L02268-AD1
	For use in Spain	L02268-071
	For use in Sweden and Finland	L02268-B71
	For use in Switzerland	L02268-BG1
	For use in Taiwan	L02268-AB1
	For use in Thailand	L02268-281

Item	Component	Spare part number
	For use in Turkey	L02268-141
	For use in Turkey - F	L02268-541
	For use in the United Kingdom	L02268-031
	For use in the United States	L02268-001
(3)	**NFC module**	L02249-001
(4)	**RTC battery**	L02238-001
(5)	**TouchPad**	L02242-001
(6)	**NFC antenna**	L02244-001
(7)	**Battery**	918108-855
(8)	**Fingerprint reader board**	L02247-001
(9)	**WWAN module** (seeWWAN module on page 38)	
(10)	**Solid-state drive** (see Solid-state drive on page 40)	
(11)	**System board** (see System board on page 41)	
(12)	**Speaker kit**	L02246-001
(13)	**Rear speakers**	
(14)	**Thermal vent**	L02241-001
(15)	**Base enclosure**	L02251-001

Miscellaneous parts

Component	Spare part number
65W Adapter nPFC RC USB-C 3-pin	860209-850
90W Adapter PFC USB-C 3-pin	904144-850
90W PFC Adapter S-3P 4.5 mm	710413-001
Bracket kit	L02248-001
Cable kit	L02259-001
Dummy SIM card	L02250-001
Essential Top Load Case	679921-001
Heat sink 45W	L02240-001
Heat sink 15W	L08856-001
HP 14.1 Privacy Filter for Touch	857320-001
HP Business Backpack	718548-001
HP Business Slim Top Load Case	718549-001
HP Comfort Grip Wireless Mouse	691922-001

Component	Spare part number
HP Elite Thunderbolt 3 90W Docking Station with 90W adapter	923236-001
HP Elite USB-C Desk Dock	920131-001
HP Elite USB-C Docking Station	844550-001
HP HDMI to VGA Adapter	701943-001
HP Nano Lock	918431-001
HP Thunderbolt 3 Dock	849784-001
HP USB External DVDRW Drive	747080-001
HP USB to Gigabit RJ45 Adapter	829941-001
HP USB Laser Mouse	674318-001
HP USB Travel Mouse	757770-001
HP USB-C to VGA Adapter	831751-001
HP USB-C to DisplayPort Adapter	831753-001
HP USB-C to RJ45 Adapter	855560-001
Miscellaneous kit	L02252-001
Plastics kit	L02245-001
Power cord	
AC power cord, C5-DOM, black	213349-001
AC line, C5-NEMA,1.00m	213349-009
	213349-015
For use in Europe	213350-001
	213350-009
	213350-014
For use in the United Kingdom and Singapore	213351-001
	213351-008
	213351-013
For use in Italy	213352-001
	213352-008
	213352-013
For use in Denmark	213353-008
	213353-013
For use in Switzerland	213354-001
	213354-008
	213354-013
For use in Australia	213356-001
	213356-008

Component	Spare part number
	213356-013
For use in South Korea	267836-001
	267836-008
For use in Thailand	285096-006
	285096-012
For use in the People's Republic of China	286497-001
	286497-008
	286497-013
For use in Japan	349756-001
	349756-002
	349756-006
Power cord , OPT-917 3-COND 1.0-M-LG ROHS	361240-001
	361240-002
For use in South Africa	361240-007
For use in Taiwan	393313-001
	393313-003
	393313-007
For use in Israel	398063-001
	398063-003
	398063-008
For use in Argentina	401300-001
	401300-007
	401300-011
For use in India	404827-001
	404827-003
	404827-008
For use in Brazil	438722-001
	438722-004
	438722-008
Duck head	
For use in the United States	854702-001
For use in Europe and South Korea	854703-001
For use in Australia	914724-001
For use in the People's Republic of China	914725-001

Component	Spare part number
For use in India	914726-001
Screw kit	L02258-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Torx 8 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

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic

Cables and connectors

⚠ **CAUTION:** When servicing the computer, be sure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

Cables must be handled with extreme care to avoid damage. Apply only the tension required to unseat or seat the cables during removal and insertion. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing cables. Be sure that cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced. Handle flex cables with extreme care; these cables tear easily.

Drive handling

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

Before removing or inserting a 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 one 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.”

Grounding guidelines

Electrostatic discharge damage

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

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

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

⚠ **CAUTION:** To prevent damage to the computer when you are removing or installing internal components, observe these precautions:

Keep components in their electrostatic-safe containers until you are ready to install them.

Before touching an electronic component, discharge static electricity by using the guidelines described in this section.

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

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

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

⚠ **CAUTION:** A product can be degraded by as little as 700 V.

Typical electrostatic voltage levels

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

Packaging and transporting guidelines

Follow these grounding guidelines when packaging and transporting equipment:

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

Workstation guidelines

Follow these grounding workstation guidelines:

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

Equipment guidelines

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

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

The following grounding equipment is recommended to prevent electrostatic damage:

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

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

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

5 Removal and replacement procedures for authorized service provider parts

CAUTION: 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.

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

Component replacement procedures

NOTE: Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Locating system information on page 18 for details.

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

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

Base enclosure

Description	Spare part number
Base enclosure	L02251-001

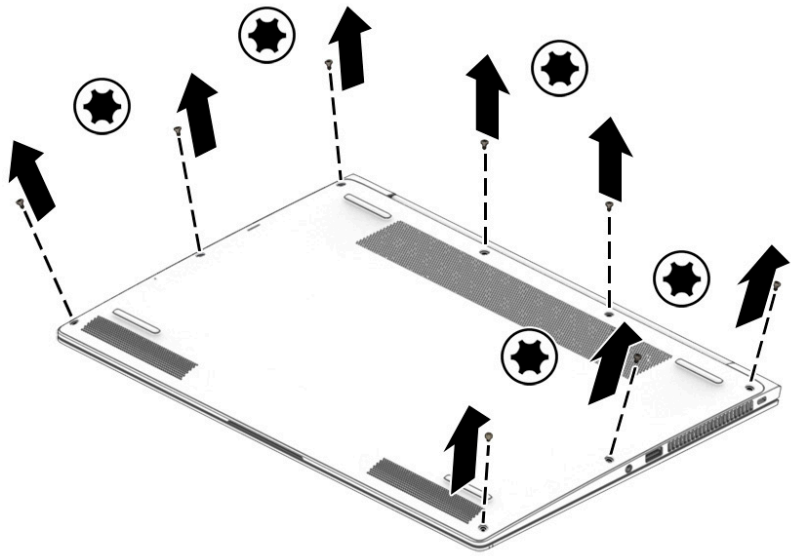
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the base enclosure, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.

Remove the base enclosure:

▲ Remove 8 T8 screws, and then lift the base enclosure to remove it.



Reverse this procedure to install the base enclosure.

Battery

Description	Spare part number
Battery 6-cell Long Life Polymer 67 WHr (2.90 Ahr)	918108-855

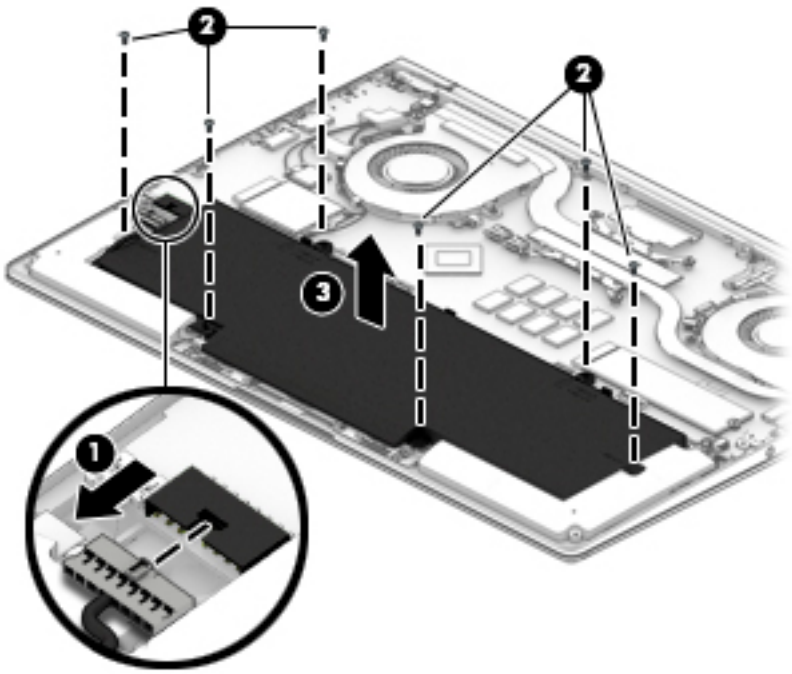
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the battery, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34).

Remove the battery:

1. Disconnect the battery cable from the system board **(1)**.
2. Remove 6 M2.0x4 screws **(2)**, and then lift the battery to remove it **(3)**.



Reverse this procedure to install the battery.

Front speakers

Description	Spare part number
Speaker kit (includes cable	L02246-001

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

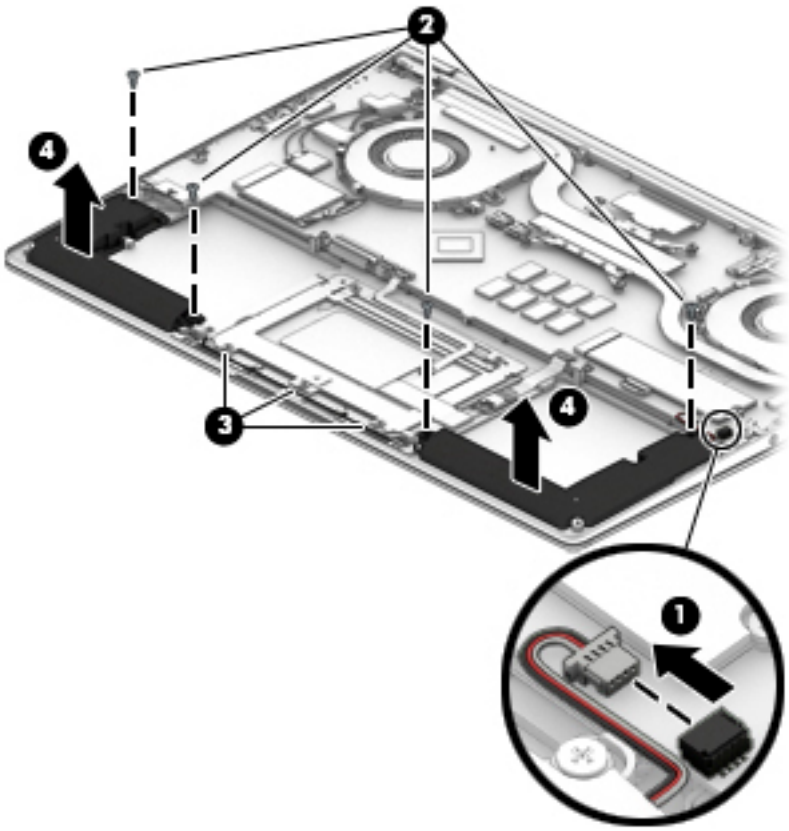
Before removing the speakers, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure(see Base enclosure on page 34), and then remove the following components:

   ▲ Battery(see Battery on page 35).

Remove the front speakers:

1. Disconnect the speaker cable **(1)**.
2. Remove 4 M2.0 x L6.2 (5.2, 0.8 screws **(2)**.
3. Release the speaker cable from the guides **(3)**, and then lift the speakers to remove them **(4)**.



Reverse this procedure to install the front speakers.

WWAN module

Description	Spare part number
WWAN T77W595 LTE M.2 with GPS	800870-005
WWAN HSPA+M.2	918670-855
WWAN WWAN ME906S LTE with GPS M.2	L04413-855

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

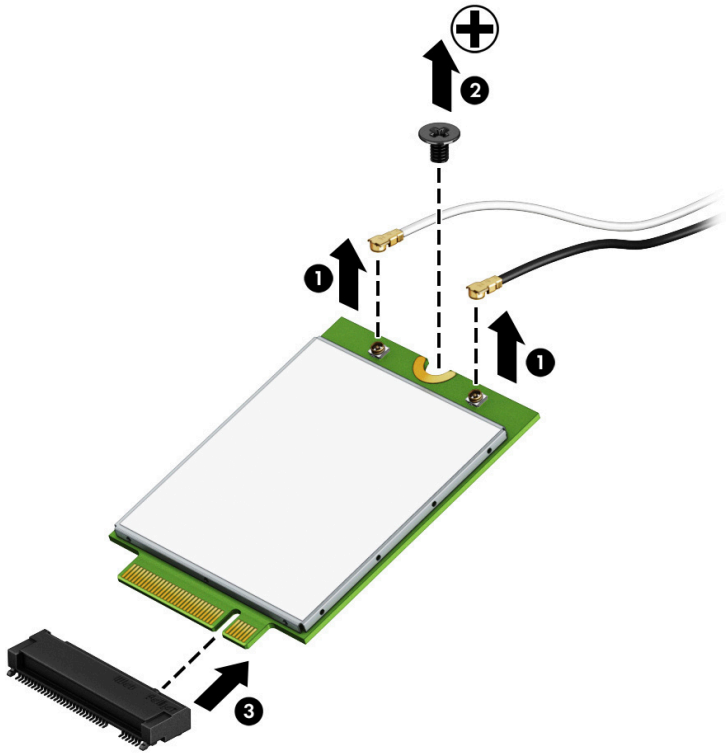
Before removing the WWAN module, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   a. Battery(see Battery on page 35).
   b. Front speakers (see Front speakers on page 36).

Remove the WWAN module:

1. Disconnect the antenna wires **(1)**.

2. Remove 1 M2*-I screw **(2)**, and then remove the WWAN module from the connector **(3)**.



Reverse this procedure to install the WWAN module.

Solid-state drive

Description	Spare part number
128 GB M2 SATA 3 TLC	L02260-001
256 GB SATA 3 Self-encrypting drive OPAL2 TLC	L02262-001
256 GB Turbo drive G2 TLC	L02263-001
360 GB Turbo drive G2 TLC	L02266-001
512GB PCIE NVME TLC	L02264-001
1 TB PCIE NVME TLC	L02261-001

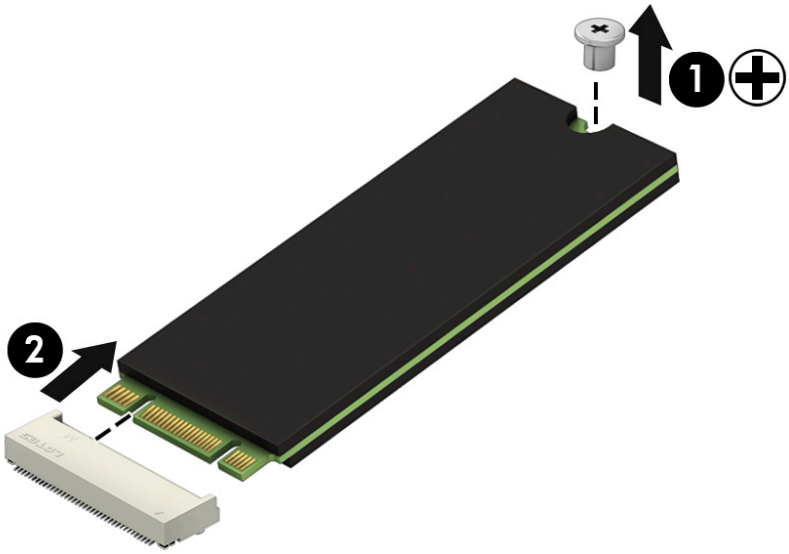
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

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

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   a. Battery(see Battery on page 35).
   b. Front speakers (see Front speakers on page 36).
   c. WWAN module (see WWAN module on page 38).

Remove the solid-state drive:

▲ Remove 1 M2*2-I screw **(1)**, and then remove the solid-state drive from the connector **(2)**.



Reverse this procedure to install the solid-state drive.

System board

Description	Spare part number
i7-7820HQ processor with 16 GB and UMA graphics	L02230-001
i7-7820HQ processor with 16 GB memory, UMA graphics, and the Windows operating system	L02230-601
i5-7200U processor with 8 GB memory and UMA graphics	L02231-001
i5-7200U processor with 8 GB memory, UMA graphics, and the Windows operating system	L02231-601
i5-7300U processor with 16 GB memory and UMA graphics	L02232-001
i5-7300U processor with 16 GB memory, UMA graphics, and the Windows operating system	L02232-601
i5-7300U processor with 8 GB memory and UMA graphics	L02233-001
i5-7300U processor with 8 GB memory, UMA graphics, and the Windows operating system	L02233-601
i7-7500U processor with 16 GB and UMA graphics	L02234-001
i7-7500U processor with 16 GB memory, UMA graphics, and the Windows operating system	L02234-601
i7-7500U processor with 8 GB and UMA graphics	L02235-001
i7-7500U processor with 8 GB memory, UMA graphics, and the Windows operating system	L02235-601
i7-7600U processor with 16 GB and UMA graphics	L02236-001
i7-7600U processor with 16 GB memory, UMA graphics, and the Windows operating system	L02236-601
i7-7600U processor with 8 GB and UMA graphics	L02237-001
i7-7600U processor with 8 GB memory, UMA graphics, and the Windows operating system	L02237-601

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the system board, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   a. Battery (see Battery on page 35).
   b. WWAN module (see WWAN module on page 38).
   c. Solid-state drive (see Solid-state drive on page 40).
   d. Disconnect the following cables from the system board:
      i. WLAN
      ii. WWAN
      iii. Solid-state drive

iv. Display

v. Fan

vi. RTC battery

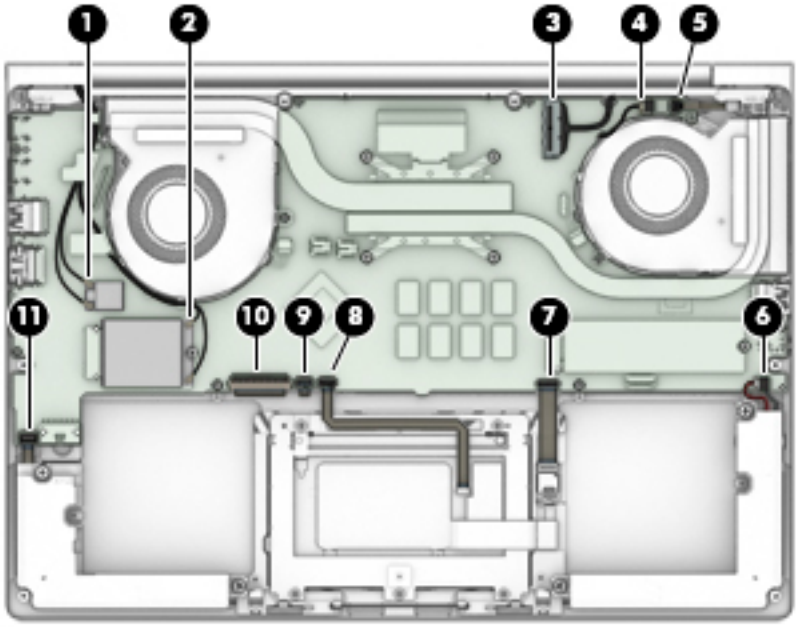
vii. NFC antenna

viii. Rear speaker

ix. TouchPad

x. Keyboard

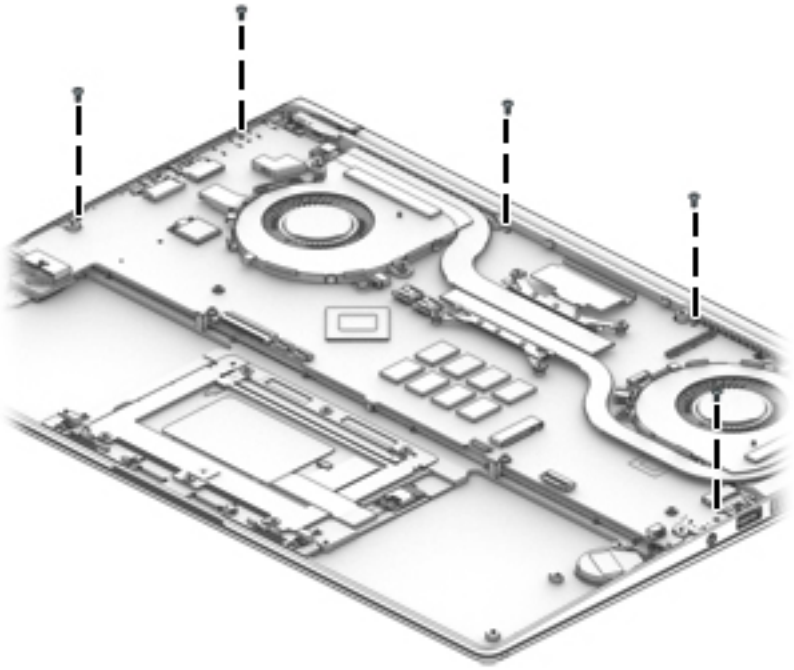
xi. Front speakers



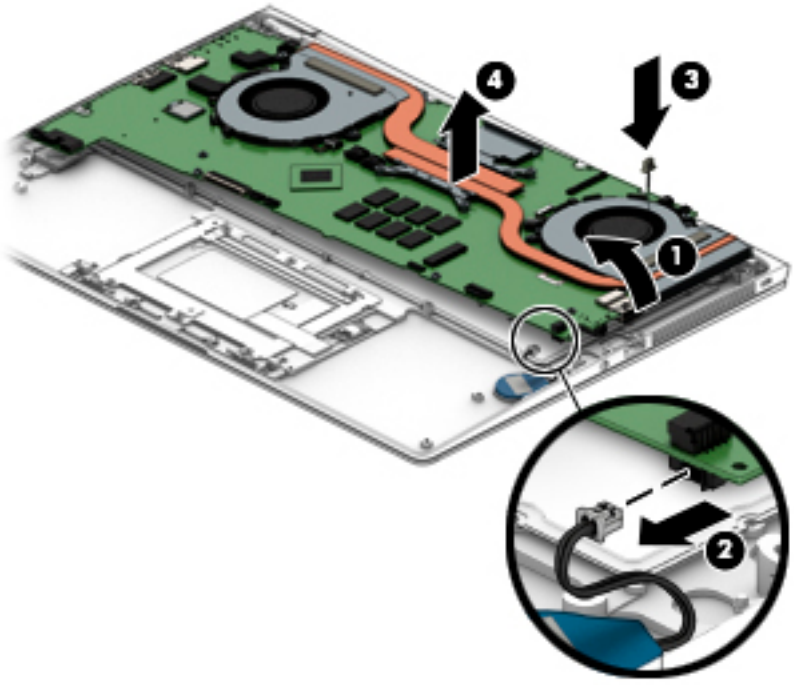
Remove the system board:

NOTE: The U series system board thermal solution has only a left-side fan and a dummy fan on the right side.

1. Remove 5 M2.0*4 screws from the system board.



2. Lift the right side of the system board **(1)**, disconnect the battery cable **(2)**, disconnect the rear speaker cable **(3)**, and then lift the system board to remove it **(4)**.



Reverse this procedure to install the system board.

Fingerprint reader

Description	Spare part number
Fingerprint reader	L02247-001

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

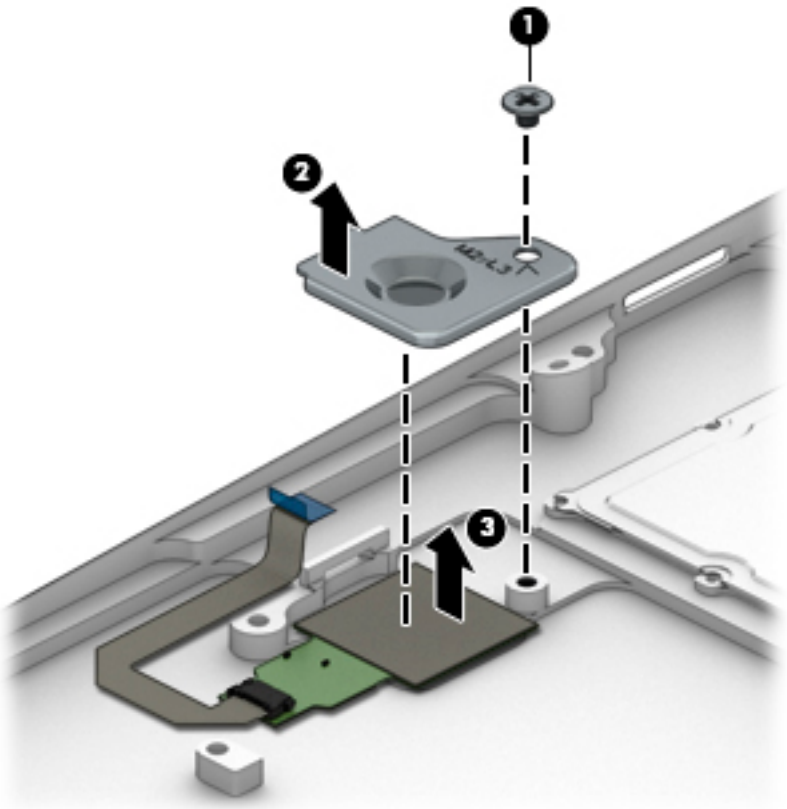
Before removing the fingerprint reader, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:

   ▲ Battery(see Battery on page 35).

Remove the fingerprint reader:

1. Remove 1 M2*2-I screw **(1)**, and then lift the fingerprint reader cover to remove it **(2)**.
2. Lift the fingerprint reader to remove it **(2)**.



Reverse this procedure to install the fingerprint reader.

Near Field Communication (NFC) module

Description	Spare part number
NFC module	L02249-001

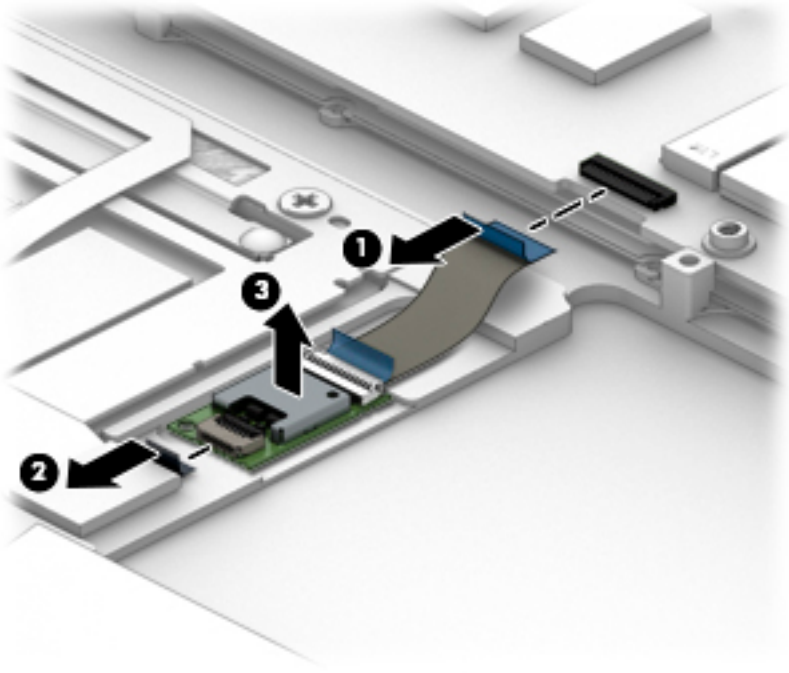
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the NFC module, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   - ▲ Battery(see Battery on page 35).

Remove the NFC module:

1. Disconnect the NFC cable **(1)**, and then disconnect the NFC module from the TouchPad **(2)**.
2. Lift the NFC module to remove it **(3)**.



Reverse this procedure to install the NFC module.

TouchPad

Description	Spare part number
TouchPad	L02242-001

IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

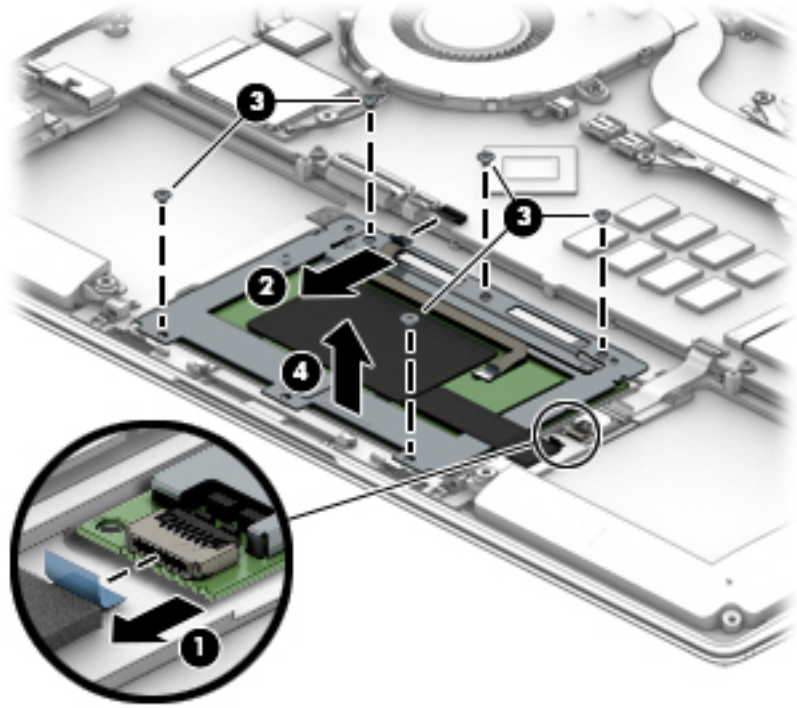
Before removing the TouchPad, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:

   ▲ Battery(see Battery on page 35).

Remove the TouchPad:

1. Disconnect the NFC cable **(1)** and the TouchPad cable **(2)**.
2. Remove 5 M2*2-I screws **(3)**, and then lift the TouchPad to remove it **(4)**.



Reverse this procedure to install the TouchPad.

RTC battery

Description	Spare part number
RTC battery	L02238-001

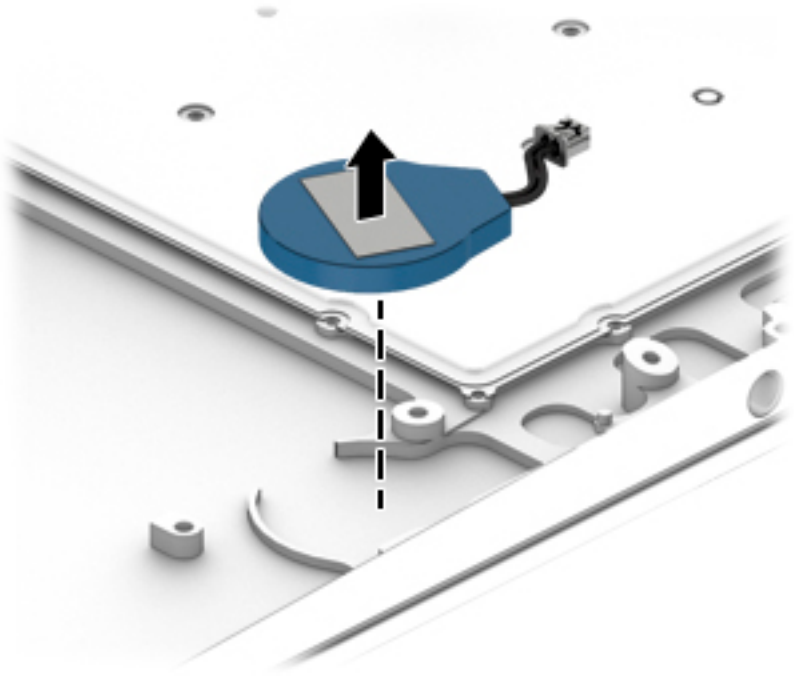
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the RTC battery, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   - Battery(see Battery on page 35).

Remove the RTC battery:

- Disconnect the RTC battery cable, and then lift the battery to remove it..



Reverse this procedure to install the RTC battery.

Display assembly

Description	Spare part number
LCD HU 14 FHD LED with WWAN capability, HDC infrared camera, touch screen, and privacy panel	L02254-001
LCD HU 14 UHD LED with WWAN capability, HDC infrared camera, and touch screen	L02256-001
LCD HU 14 FHD LED with UWVA HDC infrared camera, and touch screen	L04869-001
LCD HU 14 FHD LED with WWAN capability, HDC infrared camera, and touch screen	L04870-001
LCD HU 14 FHD AG LED with WWAN capability, HDC infrared camera, and privacy panel	L02253-001
LCD HU 14 UHD AG LED with WWAN capability, HDC and infrared camera	L02255-001
LCD HU 14 FHD AG LED, UWVA, HDC, with WWAN capability, and infrared camera	L02257-001
LCD HU 14 FHD AG LED, UWVA, HDC, and infrared camera	L04868-001

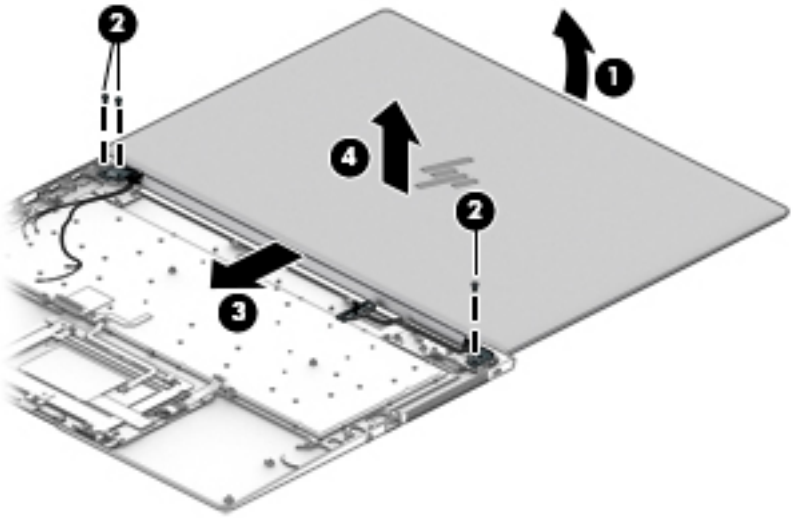
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the display assembly, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   a. Battery(see Battery on page 35).
   b. System board (see System board on page 41).
   c. Fingerprint reader (see Fingerprint reader on page 44).
   d.

Remove the display assembly:

- Open the display **(1)**, remove 2 M2.5*4.5 screws from the left hinge, and 1 2 M2.5*4.5 screw from the right hinge **(2)**, and then slide the display assembly to remove it **(3)**.



Reverse this procedure to install the display assembly.

Thermal vent

Description	Spare part number
Thermal vent	L02238-001

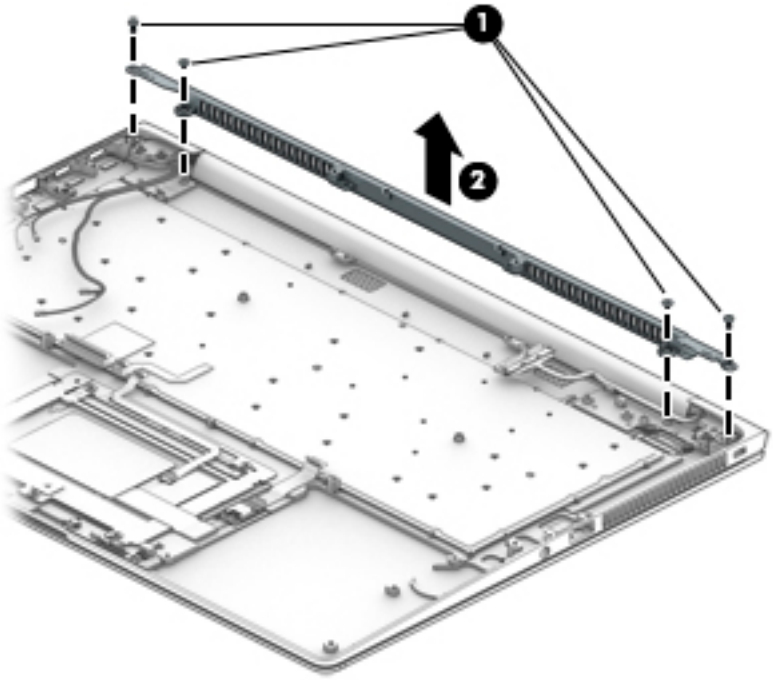
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the RTC battery, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   a. Battery(see Battery on page 35).
   b. System board (see System board on page 41).
   c. Display assembly (see Display assembly on page 48).

Remove the thermal vent:

▲ Remove 4 M2.5*4.5 screws **(1)**, and then lift the thermal vent to remove it **(2)**.



Reverse this procedure to install the thermal vent.

Power button board

Description	Spare part number
Power button board	L02239-001

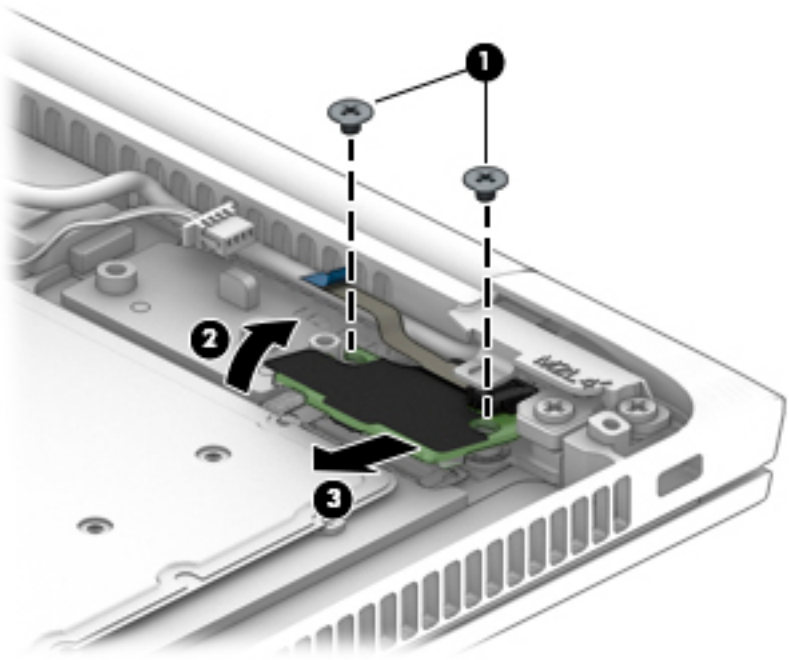
IMPORTANT: Make special note of each screw and screw lock size and location during removal and replacement

Before removing the power button board, follow these steps:

1. Shut down the computer.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
4. Remove the base enclosure (see Base enclosure on page 34), and then remove the following components:
   a. Battery(see Battery on page 35).
   b. System board (see System board on page 41).

Remove the power button board:

▲ Remove 2 M2*2-I screws **(1)**, lift the power button board **(2)**, and then remove it **(3)**.



Reverse this procedure to install the power button board.

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

Using Computer Setup

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

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

Starting Computer Setup

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

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

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

1. Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.
2. Clear the check box for **Fast Boot**.
3. To save your changes and exit, select the **Save** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

– or –

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

Your changes go into effect when the computer restarts.

Navigating and selecting in Computer Setup

- To select a menu or a menu item, use the tab key and the keyboard arrow keys and then press enter, or use a pointing device to select the item.
- To scroll up and down, select the up arrow or the down arrow in the upper-right corner of the screen, or use the up arrow key or the down arrow key on the keyboard.
- To close open dialog boxes and return to the main Computer Setup screen, press esc, and then follow the on-screen instructions.

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

- To exit Computer Setup menus without saving your changes:

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

  – or –

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

- To save your changes and exit Computer Setup menus:

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

  – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

1. Start Computer Setup. See Starting Computer Setup on page 52.
2. Select **Main**, and then select **Apply Factory Defaults and Exit**.

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

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

   – or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Computer Setup. See Starting Computer Setup on page 52.
2. Select **Main**, and then select **System Information**.
3. To exit Computer Setup without saving your changes, select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

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

To check for later BIOS versions, see Downloading a BIOS update on page 54.

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

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

   – or –

   Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.
   b. Follow the on-screen instructions to download your selection to the hard drive.

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

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

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

1. Type `file` in the taskbar search box, and then select **File Explorer**.
2. Select your hard drive designation. The hard drive designation is typically Local Disk (C:).
3. Using the hard drive path you recorded earlier, open the folder that contains the update.
4. Double-click the file that has an .exe extension (for example, *filename*.exe).

   The BIOS installation begins.
5. Complete the installation by following the on-screen instructions.

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

Changing the boot order using the f9 prompt

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

1. Access the Boot Device Options menu:
   - Turn on or restart the computer, and when the HP logo appears, press f9 to enter the Boot Device Options menu.
2. Select a boot device, press enter, and then follow the on-screen instructions.

TPM BIOS settings (select products only)

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

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

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

To access TPM settings in Computer Setup:

1. Start Computer Setup. See Starting Computer Setup on page 52.
2. Select **Security**, select **TPM Embedded Security**, and then follow the on-screen instructions.

Using HP Sure Start (select products only)

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

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

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

7 Using HP PC Hardware Diagnostics (UEFI)

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

When HP PC Hardware Diagnostics (UEFI) detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. This ID code can then be provided to support to help determine how to correct the problem.

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

To start HP PC Hardware Diagnostics (UEFI), follow these steps:

1. Turn on or restart the computer, and quickly press esc.
2. Press f2.

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

   a. Connected USB drive

      NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 57.

   b. Hard drive

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

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

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

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

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

Download the latest UEFI version

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

Download any version of UEFI for a specific product

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

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

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

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

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

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

Customizing Remote HP PC Hardware Diagnostics (UEFI) settings

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

Your changes take effect when the computer restarts.

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

8 Backing up, restoring, and recovering

This chapter provides information about the following processes. The information in the chapter is standard procedure for most products.

- Creating recovery media and backups
- Restoring and recovering your system

For additional information, refer to the HP Support Assistant app.

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

– or –

Select the question mark icon in the taskbar.

IMPORTANT: If you will be performing recovery procedures on a tablet, the tablet battery must be at least 70% charged before you start the recovery process.

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning any recovery process.

Creating recovery media and backups

The following methods of creating recovery media and backups are available on select products only. Choose the available method according to your computer model.

- Use HP Recovery Manager to create HP Recovery media after you successfully set up the computer. This step creates a backup of the HP Recovery partition on the computer. The backup can be used to reinstall the original operating system in cases where the hard drive is corrupted or has been replaced. For information on creating recovery media, see Creating HP Recovery media (select products only) on page 59. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 60.
- Use Windows tools to create system restore points and create backups of personal information.

  For more information, see Recovering using HP Recovery Manager on page 61.

  NOTE: If storage is 32 GB or less, Microsoft System Restore is disabled by default.
- On select products, use the HP Cloud Recovery Download Tool to create a bootable USB drive for your HP recovery media. Go to https://support.hp.com/us-en/document/c05115630?openCLC=true, select your country or region, and follow the on-screen instructions.

Creating HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. Right-click the **Start** menu, select **File Explorer**, and then select **This PC**.

- If your computer does not list the Windows partition and the Recovery partition, you can obtain recovery media for your system from support. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

You can use Windows tools to create system restore points and create backups of personal information, see Using Windows tools on page 60.

- If your computer does list the Recovery partition and the Windows partition, you can use HP Recovery Manager to create recovery media after you successfully set up the computer. HP Recovery media can be used to perform system recovery if the hard drive becomes corrupted. System recovery reinstalls the original operating system and software programs that were installed at the factory and then configures the settings for the programs. HP Recovery media can also be used to customize the system or restore the factory image if you replace the hard drive.
  - Only one set of recovery media can be created. Handle these recovery tools carefully, and keep them in a safe place.
  - HP Recovery Manager examines the computer and determines the required storage capacity for the media that will be required.
  - To create recovery discs, your computer must have an optical drive with DVD writer capability, and you must use only high-quality blank DVD-R, DVD+R, DVD-R DL, or DVD+R DL discs. Do not use rewritable discs such as CD±RW, DVD±RW, double-layer DVD±RW, or BD-RE (rewritable Blu-ray) discs; they are not compatible with HP Recovery Manager software. Or, instead, you can use a high-quality blank USB flash drive.
  - If your computer does not include an integrated optical drive with DVD writer capability, but you would like to create DVD recovery media, you can use an external optical drive (purchased separately) to create recovery discs. If you use an external optical drive, it must be connected directly to a USB port on the computer; the drive cannot be connected to a USB port on an external device, such as a USB hub. If you cannot create DVD media yourself, you can obtain recovery discs for your computer from HP. You can find contact information on the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.
  - Be sure that the computer is connected to AC power before you begin creating the recovery media.
  - The creation process can take an hour or more. Do not interrupt the creation process.
  - If necessary, you can exit the program before you have finished creating all of the recovery DVDs. HP Recovery Manager will finish burning the current DVD. The next time you start HP Recovery Manager, you will be prompted to continue.

To create HP Recovery media:

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

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Create recovery media**, and then follow the on-screen instructions.

If you ever need to recover the system, see Recovering using HP Recovery Manager on page 61.

Using Windows tools

You can create recovery media, system restore points, and backups of personal information using Windows tools.

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

For more information and steps, see the Get help app.

- Select the **Start** button, and then select the **Get Help** app.

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

Restore and recovery

There are several options for recovering your system. Choose the method that best matches your situation and level of expertise:

IMPORTANT: Not all methods are available on all products.

- Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state. For more information see the Get help app.

  ▲ Select the **Start** button, and then select the **Get Help** app.

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

- If you need to correct a problem with a preinstalled application or driver, use the Reinstall drivers and/or applications option (select products only) of HP Recovery Manager to reinstall the individual application or driver.

  ▲ Type `recovery` in the taskbar search box, select **HP Recovery Manager**, select **Reinstall drivers and/or applications**, and then follow the on-screen instructions.

- If you want to recover the Windows partition to original factory content, you can choose the System Recovery option from the HP Recovery partition (select products only) or use the HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 61. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 59.

- On select products, if you want to recover the computer's original factory partition and content, or if you have replaced the hard drive, you can use the Factory Reset option of HP Recovery media. For more information, see Recovering using HP Recovery Manager on page 61.

- On select products, if you want to remove the Recovery partition to reclaim hard drive space, HP Recovery Manager offers the Remove Recovery Partition option.

  For more information, see Removing the HP Recovery partition (select products only) on page 63.

Recovering using HP Recovery Manager

HP Recovery Manager software allows you to recover the computer to its original factory state by using the HP Recovery media that you either created or that you obtained from HP, or by using the HP Recovery partition (select products only). If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 59.

What you need to know before you get started

- HP Recovery Manager recovers only software that was installed at the factory. For software not provided with this computer, you must either download the software from the manufacturer's website or reinstall the software from the media provided by the manufacturer.

  IMPORTANT: Recovery through HP Recovery Manager should be used as a final attempt to correct computer issues.

- HP Recovery media must be used if the computer hard drive fails. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 59.

- To use the Factory Reset option (select products only), you must use HP Recovery media. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 59.
- If your computer does not allow the creation of HP Recovery media or if the HP Recovery media does not work, you can obtain recovery media for your system from support. You can find contact information from the HP website. Go to http://www.hp.com/support, select your country or region, and follow the on-screen instructions.

IMPORTANT: HP Recovery Manager does not automatically provide backups of your personal data. Before beginning recovery, back up any personal data you want to retain.

Using HP Recovery media, you can choose from one of the following recovery options:

NOTE: Only the options available for your computer display when you start the recovery process.

- System Recovery—Reinstalls the original operating system, and then configures the settings for the programs that were installed at the factory.
- Factory Reset—Restores the computer to its original factory state by deleting all information from the hard drive and re-creating the partitions. Then it reinstalls the operating system and the software that was installed at the factory.

The HP Recovery partition (select products only) allows System Recovery only.

Using the HP Recovery partition (select products only)

The HP Recovery partition allows you to perform a system recovery without the need for recovery discs or a recovery USB flash drive. This type of recovery can be used only if the hard drive is still working.

To start HP Recovery Manager from the HP Recovery partition:

IMPORTANT: For a tablet with a detachable keyboard, connect the tablet to the keyboard base before beginning these steps (select products only).

1. Type `recovery` in the taskbar search box, select **HP Recovery Manager**, and then select **Windows Recovery Environment**.

   – or –

   For computers or tablets with keyboards attached, press f11 while the computer boots, or press and hold f11 as you press the power button.

   For tablets without keyboards:

   - Turn on or restart the tablet, and then quickly hold down the volume up button; then select **f11**.

   – or –

   - Turn on or restart the tablet, and then quickly hold down the volume down button; then select **f11**.
2. Select **Troubleshoot** from the boot options menu.
3. Select **Recovery Manager**, and then follow the on-screen instructions.

Using HP Recovery media to recover

You can use HP Recovery media to recover the original system. This method can be used if your system does not have an HP Recovery partition or if the hard drive is not working properly.

1. If possible, back up all personal files.
2. Insert the HP Recovery media, and then restart the computer.

   NOTE: If the computer does not automatically restart in HP Recovery Manager, change the computer boot order. See Changing the computer boot order on page 63.

3. Follow the on-screen instructions.

Changing the computer boot order

If your computer does not restart in HP Recovery Manager, you can change the computer boot order, which is the order of devices listed in BIOS where the computer looks for startup information. You can change the selection to an optical drive or a USB flash drive.

To change the boot order:

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

1. Insert the HP Recovery media.
2. Access the system **Startup** menu.

   For computers or tablets with keyboards attached:

   ▲ Turn on or restart the computer or tablet, quickly press esc, and then press f9 for boot options.

   For tablets without keyboards:

   ▲ Turn on or restart the tablet, and then quickly hold down the volume up button; then select **f9**.

   – or –

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

Removing the HP Recovery partition (select products only)

HP Recovery Manager software allows you to remove the HP Recovery partition to free up hard drive space.

IMPORTANT: After you remove the HP Recovery partition, you will not be able to perform System Recovery or create HP Recovery media from the HP Recovery partition. So before you remove the Recovery partition, create HP Recovery media; see Creating HP Recovery media (select products only) on page 59.

NOTE: The Remove Recovery Partition option is only available on products that support this function.

Follow these steps to remove the HP Recovery partition:

1. Type `recovery` in the taskbar search box, and then select **HP Recovery Manager**.
2. Select **Remove Recovery Partition**, and then follow the on-screen instructions.

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**32.89 cm**	12.95 in
Depth	**23.28 cm**	9.17 in
Height (front to back)	**1.59 cm**	0.63 in
Weight	**1.42 kg** (depending on configuration)	3.14 lb (depending on configuration)
Input power		
Operating voltage and current	5 V dc @ 3 A / 9 V dc @ 3A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A – 65 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5 A / 12 V dc @ 5 A / 15 V dc @ 5 A / 20 V dc @ 4.5 A – 90 W USB-C	
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

35.56 cm (14-in) display specifications

14 inch LCD FHD (1920x1080) Anti-Glare WLED UWVA 72percent cg 340nits eDP 1.3 + PSR ultraslim 2.4mm NB

	Metric	U.S.
Active Area (W x H)	309.37 x 174.02 (mm)	12.18 x 6.85 in
Dimensions (W x H)	**315.41 x 196.17 mm**	12.634 x 8.094 in
Diagonal	**35.56 cm**	13.3 in
Weight	225 g max	
Interface	eDP 1.3 + PSR	
Surface Treatment	Anti-Glare (AG)	
Contrast Ratio	600:1 (typical)	
Refresh Rate	60 Hz	
Brightness	340 nits	
Format	RGB	
Configuration	1920 x 1080 (FHD)	
PPI	157	
Viewing Angle	UWVA 85/85/85/85	

14 inch LCD FHD (1920x1080) Anti-Glare WLED UWVA 72percent cg 700nits eDP 1.3+PSR ultraslim Privacy

	Metric	U.S.
Active Area (W x H)	300.56 x 187.57 (max.) x2.2 (max) (mm)	12.18 x 6.85 in
Dimensions (W x H)	**293.76 x 165.24 mm**	12.634 x 8.094 in
Diagonal	**35.56 cm**	13.3 in
Weight	160 g max	
Interface	eDP 1.3 w/ PSR	
Surface Treatment	BV	
Contrast Ratio	800:1 (typical)	
Refresh Rate	60 Hz	
Brightness	301 nits (typical)	
PPI	167	
Format	RGB	
Configuration	1921 x 1080 (FHD)	
LCD Mode	IPS/FFS/AHVA	
Viewing angle	UWVA 85/85/85/86	

14 inch LCD UHD (3840x2160) Anti-Glare WLED UWVA 72percent cg 400nits eDP 1.3 + PSR ultraslim N.B.

	Metric	U.S.
Active Area (W x H)	300.56 x 187.57 (max.) x2.2 (max) (mm)	12.18 x 6.85 in
Dimensions (W x H)	**293.76 x 165.24 mm**	12.634 x 8.094 in
Diagonal	**35.56 cm**	13.3 in
Thickness	3.0 mm max	
Weight	290 g max	
Interface	eDP 1.3 w/PSR	
Surface Treatment	BV	
Contrast Ratio	800:1 (typical)	
Refresh Rate	60 Hz	
Brightness	400 nits	
PPI	315	
Format	RGB	
Backlight	LED	
Configuration	3840 x 2160 (UHD)	
Viewing angle	UWVA 85/85/85/85	
Touch Enabled	Yes	

M.2 solid-state drive specifications

2280 M2 SATA-3 TLC

	128-GB*	512-GB FIPS*
Dimensions		
Height	0.09 in (2.3 mm)	0.09 in (2.3 mm)
Width	0.87 in (22 mm)	0.87 in (22 mm)
Weight	0.02 lb (10 g)	0.02 lb (10 g)
Interface type	SATA-8, SATA 3.0	ATA-8, SATA 3.0
Transfer rate		
Maximum Sequential Read	Up to 520 MB/s	Up to 530 MB/s
Maximum Sequential Write	Up to 450 MB/s	Up to 450 MB/s
Logical blocks	250,069,680	1,000,215,216
Operating temperature	0° to 70°C (32°F to 158°F)	0° to 70°C (32°F to 158°F)
Features	DIPM; TRIM; DEVSLP	DIPM; TRIM; DEVSLP
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.		
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.		

2280 M2 SATA-3 Self-Encrypted OPAL2 TLC

	256-GB*
Dimensions	
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface type	ATA-8, SATA 3.0
Transfer rate	
Maximum Sequential Read	Up to 530 MB/s
Maximum Sequential Write	Up to 515 MB/s
Logical blocks	500,118,192
Operating temperature	0° to 70°C (32°F to 158°F)
Features	DIPM; TRIM; DEVSLP
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.	
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.	

2280 M2 PCIe-3x4 SS NVMe TLC

	360-GB*	512-GB*	1-TB*
Dimensions			
Height	0.09 in (2.3 mm)	0.09 in (2.3 mm)	0.09 in (2.3 mm)
Width	0.87 in (22 mm)	0.87 in (22 mm)	0.87 in (22 mm)
Weight	0.02 lb (10 g)	0.02 lb (10 g)	0.02 lb (10 g)
Interface type	PCIe NVMe Gen3X4	PCIe NVMe Gen3X4	PCIe NVMe Gen3X4
Transfer rate			
Maximum Sequential Read	Up To 1700 MB/s	Up to 2600 MB/s	Up to 2800 MB/s
Maximum Sequential Write	Up To 600 MB/s	Up to 1400 MB/s	Up to 1600 MB/s
Logical blocks	703,282,608	1,000,215,216	2,000,409,264
Operating temperature	0° to 70°C (32°F to 158°F)	0° to 70°C (32°F to 158°F)	0° to 70°C (32°F to 158°F)
Features	TRIM; L1.2	TRIM; L1.2	TRIM; L1.2
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.			
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.			

2280 M2 PCIe-3x4 SS NVMe

	512-GB*
Dimensions	
Height	0.09 in (2.3 mm)
Width	0.87 in (22 mm)
Weight	0.02 lb (10 g)
Interface type	PCIe NVMe Gen3X4
Transfer rate	
Maximum Sequential Read	Up to 3000 MB/s
Maximum Sequential Write	Up to 1500 MB/s
Logical blocks	1,000,215,216
Operating temperature	0° to 70°C (32°F to 158°F)
Features	TRIM; L1.2
*1 GB = 1 billion bytes when referring to hard drive storage capacity. Actual accessible capacity is less.	
NOTE: Certain restrictions and exclusions apply. Contact technical support for details.	

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least **1.0 m** (3.3 ft) and no more than **2.0 m** (6.5 ft).
- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.
- The power cord sets must have a minimum current capacity of 10 A and a nominal voltage rating of 125 or 250 V ac, as required by the power system of each country or region.
- The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector for mating with the appliance inlet on the back of the computer.

Requirements for specific countries and regions

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

1. The flexible cord must be Type HO5VV-F, 3-conductor, 0.75 mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
2. The flexible cord must be Type SVT/SJT or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15 A, 125 V ac) or NEMA 6-15P (15 A, 250 V ac) configuration. CSA or C-UL mark. UL file number must be on each element.

Country/region	Accredited agency	Applicable note number

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

11 Statement of memory volatility

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

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

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

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

Current BIOS steps

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

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

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

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

   The computer will reboot.

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

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

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

   The computer will reboot.

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

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

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

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

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

   The computer will reboot.

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

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

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

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

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

2. Complete one of the following:

   - Remove and retain the storage drive.

   – or –

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

   – or –

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

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

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

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

   c. Select **Hard Drive Utilities**.

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

   – or –

   - Clear the contents of the drive using the following Disk Sanitizer commands steps:

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

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

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

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

   c. Select **Hard Drive Utilities**.

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

Nonvolatile memory usage

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
HP Sure Start flash (select models only)	8 MBytes	No	Yes	Provides protected backup of critical System BIOS code, EC firmware, and critical computer configuration data for select platforms that support HP Sure Start. For more information, see Using HP Sure Start (select models only) on page 77.	Data cannot be written to this device via the host processor. The content is managed solely by the HP Sure Start Embedded Controller.	This memory is protected by the HP Sure Start Embedded Controller.
Real Time Clock (RTC) battery backed-up CMOS configuration memory	256 Bytes	No	Yes	Stores system date and time and noncritical data.	RTC battery backed-up CMOS is programmed using the Computer Setup (BIOS), or changing the Microsoft Windows date & time.	This memory is not write-protected.
Controller (NIC) EEPROM	64 KBytes (not customer accessible)	No	Yes	Stores NIC configuration and NIC firmware.	NIC EEPROM is programmed using a utility from the NIC vendor that can be run from DOS.	A utility is required to write data to this memory and is available from the NIC vendor. Writing data to this ROM in an inappropriate manner will render the NIC non-functional.
DIMM Serial Presence Detect (SPD) configuration data	256 Bytes per memory module, 128 Bytes programmable (not customer accessible)	No	Yes	Stores memory module information.	DIMM SPD is programmed by the memory vendor.	Data cannot be written to this memory when the module is installed in a computer. The specific write-protection method varies by memory vendor.
System BIOS	9 MBytes	Yes	Yes	Stores system BIOS code and computer configuration data.	System BIOS code is programmed at the factory. Code is updated when the system BIOS is updated. Configuration data and settings are input using the Computer Setup (BIOS) or a custom utility.	**NOTE:** Writing data to this ROM in an inappropriate manner can render the computer non-functional. A utility is required for writing data to this memory and is available on the HP website; go to http://www.hp.com/support. Select **Find your**

Nonvolatile Memory Type	Amount (Size)	Does this memory store customer data?	Does this memory retain data when power is removed?	What is the purpose of this memory?	How is data input into this memory?	How is this memory write-protected?
						product, and then follow the on-screen instructions.
Intel Management Engine Firmware (present only in select Elite or Z models. For more information, go to http://www.hp.com/support. Select **Find your product**, and then follow the on-screen instructions.)	1.5 MBytes or 7 MBytes	Yes	Yes	Stores Management Engine Code, Settings, Provisioning Data and iAMT third-party data store.	Management Engine Code is programmed at the factory. Code is updated via Intel secure firmware update utility. Unique Provisioning Data can be entered at the factory or by an administrator using the Management Engine (MEBx) setup utility. The third party data store contents can be populated by a remote management console or local applications that have been registered by an administrator to have access to the space.	The Intel chipset is configured to enforce hardware protection to block all direct read/write access to this area. An Intel utility is required for updating the firmware. Only firmware updates digitally signed by Intel can be applied using this utility.
Bluetooth flash (select products only)	2 Mbit	No	Yes	Stores Bluetooth configuration and firmware.	Bluetooth flash is programmed at the factory. Tools for writing data to this memory are not publicly available but can be obtained from the silicon vendor.	A utility is required for writing data to this memory and is made available through newer versions of the driver whenever the flash requires an upgrade.
802.11 WLAN EEPROM	4 Kbit to 8 Kbit	No	Yes	Stores configuration and calibration data.	802.11 WLAN EEPROM is programmed at the factory. Tools for writing data to this memory are not made public.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Webcam (select products only)	64 Kbit	No	Yes	Stores webcam configuration and firmware.	Webcam memory is programmed using a utility from the device manufacturer that can be run from Windows.	A utility is required for writing data to this memory and is typically not made available to the public unless a firmware upgrade is necessary to address a unique issue.
Fingerprint reader (select products only)	512 KByte flash	Yes	Yes	Stores fingerprint templates.	Fingerprint reader memory is programmed by user enrollment in HP ProtectTools Security Manager.	Only a digitally signed application can make the call to write to the flash.

Questions and answers

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

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

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

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

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

   c. Follow the on-screen instructions.

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

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

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

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

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

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

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

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

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

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

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

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

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

IMPORTANT: Resetting will result in the loss of information.

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

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

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

c. Follow the on-screen instructions.

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

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

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

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

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

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

Using HP Sure Start (select models only)

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

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

12 Recycling

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

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

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