



OMEN by HP Laptop PC

Maintenance and Service Guide

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Product notice

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

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

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Important Notice about Customer Self-Repair Parts

 **CAUTION:** Your computer includes Customer Self-Repair parts and parts that should only be accessed by an authorized service provider. See Chapter 5, "Removal and replacement procedures for Customer Self-Repair parts," for details. Accessing parts described in Chapter 6, "Removal and replacement procedures for authorized service provider parts," can damage the computer or void your warranty.

Processor information

 **IMPORTANT:** This version of Windows running with the processor or chipsets used in this system has limited support from Microsoft. For more information about Microsoft's support, please see Microsoft's Support Lifecycle FAQ at <https://support.microsoft.com/lifecycle>.

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	1
2 External component identification	4
Right side	4
Left side	5
Display	7
Top	9
TouchPad	9
Lights	9
Button and speakers	10
Keys	12
Using the action keys	12
Bottom	14
Rear	15
Labels	15
3 Illustrated parts catalog	17
Computer major components	17
Display assembly subcomponents	21
Mass storage devices	22
Miscellaneous parts	23
4 Removal and replacement procedures preliminary requirements	24
Tools required	24
Service considerations	24
Plastic parts	24
Cables and connectors	25
Drive handling	25
Grounding guidelines	26
Electrostatic discharge damage	26
Packaging and transporting guidelines	27
Workstation guidelines	27
Equipment guidelines	28
5 Removal and replacement procedures for Customer Self-Repair parts	29
Component replacement procedures	29

Service door	29
Memory module	31

6 Removal and replacement procedures for authorized service provider parts 33

Component replacement procedures	33
Base enclosure	33
Battery	35
Hard drive	37
SSD (M.2)	39
Front speakers	40
WLAN module	42
Fans	44
Heatsink	45
System board	47
RTC battery	51
USB board	53
Power button board	55
Rear speakers	57
TouchPad board	59
Power in connector	61
Display assembly	63
Camera	69

7 Using Setup Utility (BIOS) 71

Starting Setup Utility (BIOS)	71
Updating Setup Utility (BIOS)	71
Determining the BIOS version	71
Downloading a BIOS update	72

8 Using HP PC Hardware Diagnostics (UEFI) 73

Downloading HP PC Hardware Diagnostics (UEFI) to a USB device	73
Additional BIOS crisis recovery tool	74

9 Backing up, restoring, and recovering 75

Creating recovery media and backups	75
Creating HP Recovery media (select products only)	75
Using Windows tools	76
Restore and recovery	77
Recovering using HP Recovery Manager	77
What you need to know before you get started	77

Using the HP Recovery partition (select products only)	78
Using HP Recovery media to recover	78
Changing the computer boot order	79
Removing the HP Recovery partition (select products only)	80
10 Specifications	81
Computer specifications	81
43.94 cm (17.3 in) display specifications	82
Hard drive specifications	82
11 Power cord set requirements	83
Requirements for all countries	83
Requirements for specific countries and regions	84
12 Recycling	86
Index	87

1 Product description

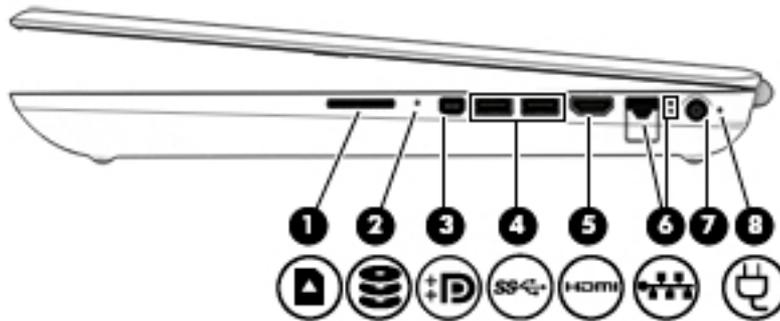
Category	Description
Product Name	OMEN by HP Laptop PC
Processors	Intel® Core™ i7-6700HQ (2.6 GHz, turbo up to 3.5 GHz), 2133 MHz/6 MB L3, Quad cTDP 35 W Intel Core i5-6300HQ (2.3 GHz, turbo up to 3.2 GHz), 2133 MHz/6 MB L3, Quad cTDP 35 W (for use with products with NVIDIA® N17E-G1 graphics only)
Chipset	Intel HM170
Graphics	Internal graphics: <ul style="list-style-type: none">Intel HD Graphics 530 NVIDIA graphics: <ul style="list-style-type: none">NVIDIA N17E-G2 (GeForce® GTX 1070) with up to 8192 MB of dedicated video memory (256 M x 32 GDDR5 x 8 PCs), 8 Gbps VRAM is requiredNVIDIA N17E-G1 (GeForce GTX 1060) with up to 6144 MB of dedicated video memory (256 M x 32 GDDR5 x 6 PCs), 8 Gbps VRAM is required Supports HD Decode, DX12, and HDMI; Optimus; dynamic switching; and GPU Performance Scaling (GPS), internal and external G-Sync Virtual Reality support
Panel	43.94 cm (17.3") 16:9 Ultra Wide Aspect Ratio panel: <ul style="list-style-type: none">Full High Definition (FHD), WLED AntiGlare (1920 x 1080) flat-flat (4.2 mm) UWVA, eDP, typical brightness 300 nits (cd/m²)Ultra High Definition (UHD) WLED AntiGlare (3840 x 2160) flat-flat (4.2mm) UWVA, eDP+PSR, typical brightness 300 nits (cd/m²). Bridge panel LCD 17.3 inch UHD (3840x2160) Anti-Glare WLED UWVA 95%cg 300nits eDP 1.3 + PSR flat for cNB", 300nits Supports eDP1.3+PSR
Memory	Two SODIMM slots , customer accessible: <ul style="list-style-type: none">DDR4-2133 dual channel support (DDR4-2400 bridge to DDR4-2133) Supports up to 16 GB max system memory with the following: <ul style="list-style-type: none">4096 MB (4096 MB x 1)6144 MB (2048 MB x 1 + 4096 MB x 1), no support for 32-bit OS8192 MB (4096 MB x 2) or 8192 MB (8192 MB x 1), no support for 32-bit OS12288 MB (8192 MB +4096 MB), no support for 32-bit OS16384 MB (8192 MB x 2), no support for 32-bit OS or Windows® 7 Home Basic
Hard drive	Single HDD configurations: <ul style="list-style-type: none">1 TB (7200) 9.5 mm2 TB (5400) 9.5 mm Hybrid HDD configurations: <ul style="list-style-type: none">1 TB 5400 RPM 9.5 mm SSHD with 8 GB NAND

Category	Description
	<p>Dual Storage Configurations:</p> <ul style="list-style-type: none"> • 1 TB + 128 GB value solid-state drive (SSD) • 2 TB + 128 GB value SSD • 1 TB + 256 GB PCIe SSD <p>PCIe NVMe (TLC) M.2 SSD:</p> <ul style="list-style-type: none"> • 256 GB • 512 GB <p>Supports all 7 mm/9.5 mm, SATA 2.5" HDDs</p> <p>HP 3D DriveGuard</p> <p>Support for second drive</p> <p>7 mm and 9.5 mm share the same bracket</p>
Optical drive, external	<p>Supports DVD+/-RW Double-Layer SuperMulti</p> <p>Supports M-disc</p>
Audio and video	<p>Quad speakers</p> <p>Bang & Olufsen</p> <p>Supports HP Audio Boost</p> <p>Supports HP Noise Cancellation</p> <p>Dual array digital microphones</p> <p>with appropriate software - beam forming, echo cancellation, noise suppression</p> <p>Cameras:</p> <ul style="list-style-type: none"> • HP Wide Vision HD: HD camera - indicator LED, USB 2.0, BSI sensor, f2.0, 88° WFOV <ul style="list-style-type: none"> — 720p by 30 frames per second • Intel RealSense 3D camera - indicator LED, USB 3.0, 85° WFOV <ul style="list-style-type: none"> — 1080p by 30 frames per second, 4x depth resolution — Supports Windows Hello
Ethernet	<p>Integrated 10/100/1000 NIC</p>
Wireless	<p>Intel Dual Band Wireless-AC 7265 802.11 ac 2x2 WiFi + Bluetooth® 4.2 Combo Adapter (non vPRO)</p> <p>Integrated wireless options with dual antenna (M.2/PCIe)</p> <p>Compatible with Miracast-certified devices, for Windows 10</p>
External media cards	<p>HP Multi-Format Digital Media Card Reader</p> <p>Supports SD/SDHC/SDXC</p> <p>Push-Push insertion/removal</p>
Ports	<p>Hot Plug / Unplug and auto detect for correct output to wide-aspect vs. standard aspect video (auto adjust panel resolution to fit embedded panel and external monitor connected)</p> <p>HDMI v2.0 supporting: up to 4096x2160 @ 60 Hz</p> <p>Headphone / Line out</p> <p>Microphone input</p>

Category	Description
	Mini Dual-Mode DisplayPort 3 USB 3.0 ports (one on right side and two on left side) RJ-45/Ethernet port AC Smart Pin adapter plug
Keyboard/ pointing devices	Full-size standard 3-coat paint island-style backlit keyboard with numeric keypad in Dragon Red Clickpad with image sensor Multitouch gestures enabled Supports Modern Trackpad Gestures Taps enabled as default
Power requirements	6-cell Polymer battery – 95.8 Whr 230 W AC adapter with 1.8 M length power cord
Security	TPM 2.0 Security lock slot
Operating system	Pre-installed Windows 10 Professional Windows 10 Home ML Windows 10 Home High End ML Windows 10 Home EM/SL (with i7 processors + 4GB, or, any processors + ≥1080p screen + ≥ 8GB) Windows 10 Home High End EM/SL/China (with i7 processors + 4GB, or, any processors + ≥1080p screen + ≥ 8GB) SEAP Windows 10 Home (select products only) SEAP Windows 10 Home High End (prohibited to Win10 Home with Office 365 AFO OS AVs, and only available to China and 100% attach) CPPP Windows 10 Home China Language Edition (with i7 processors + 4GB, or, any processors + ≥1080p screen + ≥ 8GB)
Serviceability	End user replaceable parts: AC adapter Memory

2 External component identification

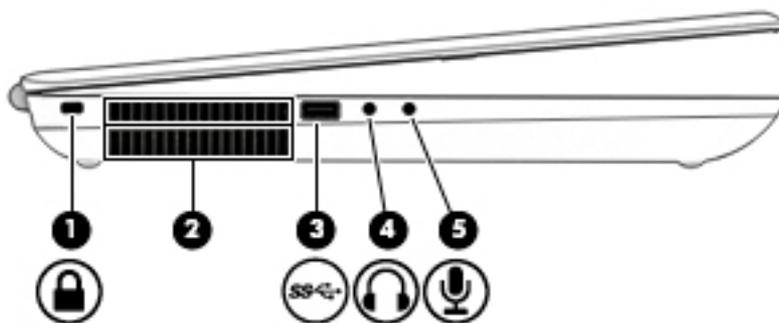
Right side



Component	Description
(1)  Memory card reader	<p>Reads optional memory cards that enable you to store, manage, share, or access information.</p> <p>To insert a card:</p> <ol style="list-style-type: none">1. Hold the card label-side up, with connectors facing the computer.2. Insert the card into the memory card reader, and then press in on the card until it is firmly seated. <p>To remove a card:</p> <ul style="list-style-type: none">▲ Press in on the card, and then remove it from the memory card reader.
(2)  Drive light (select products only)	<ul style="list-style-type: none">• Blinking white: The hard drive is being accessed.• Amber: HP 3D DriveGuard has temporarily parked the hard drive (select products only).
(3)  Mini Dual-Mode DisplayPort	Connects an optional digital display device, such as a high-performance monitor or projector.
(4)  USB 3.0 ports (2)	Connect an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(5)  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.
(6)  RJ-45 (network) jack/status lights	<p>Connects a network cable.</p> <ul style="list-style-type: none">• White: The network is connected.• Amber: Activity is occurring on the network.

Component	Description
(7) Power connector	Connects an AC adapter.
(8)  AC adapter and battery light	<ul style="list-style-type: none"> • White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging.

Left side



Component	Description
(1) Security cable slot	<p>Attaches an optional security cable to the computer.</p> <p>NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.</p>
(2) Vents	<p>Enable airflow to cool internal components.</p> <p>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.</p>
(3)  USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner or USB hub.
(4)  Audio-out (headphone) jack	<p>Connects optional powered stereo speakers, headphones, earbuds, or a television audio cable.</p> <p>WARNING! To reduce the risk of personal injury, adjust the volume before using headphones, earbuds, or a headset. For additional safety information, see the <i>Regulatory, Safety and Environmental Notices</i>.</p> <p>To access this guide:</p> <ul style="list-style-type: none"> ▲ Select the Start button, select All apps (required on some products), select HP Help and Support, and then select HP Documentation.

Component	Description
(5)  Audio-in (microphone) jack	NOTE: When a device is connected to a headphone jack, the computer speakers are disabled. Connects an optional computer headset microphone, stereo array microphone, or monaural microphone.

Display

 **NOTE:** Refer to the illustration that most closely matches your computer.



Component	Description
(1) Internal microphones	Record sound.
(2) Camera light	On: The camera is in use.
(3) Camera	Allows you to video chat, record video, and record still images.
(4) WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).
(5) 3D camera light	On: The 3D camera is in use.
(6) 3D camera	Allows you to video chat and scan or capture 3D images. 3D apps for gaming, security, and immersive collaboration are available to maximize your 3D camera experience.

*The antennas are not visible from the outside of the computer, and antenna location varies. 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:

- ▲ Select the **Start** button, select **All apps** (required on some products), select **HP Help and Support**, and then select **HP Documentation**.



Component	Description
(1) Internal microphones	Record sound.
(2) Camera	<p>Allows you to video chat, record video, or record still images. Some products also provide HD (high-definition) or 3D capability, apps for gaming, or facial recognition software like Windows Hello.</p> <p>To use your camera:</p> <ol style="list-style-type: none"> 1. Type <code>camera</code> in the taskbar search box, and then select Camera. 2. Type <code>Intel RealSense</code> in the taskbar search box to explore additional features, demos, and apps. <p>When the light is on, the camera is in use.</p>
(3) 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, and antenna location varies. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

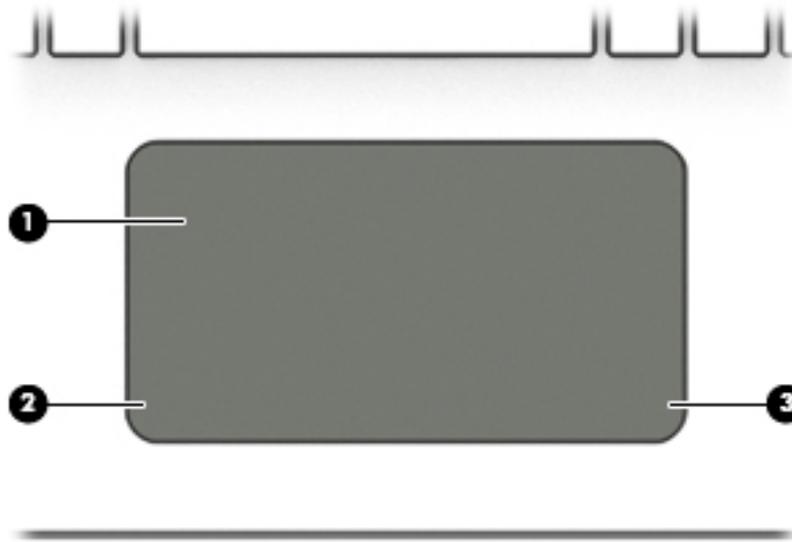
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to your country or region.

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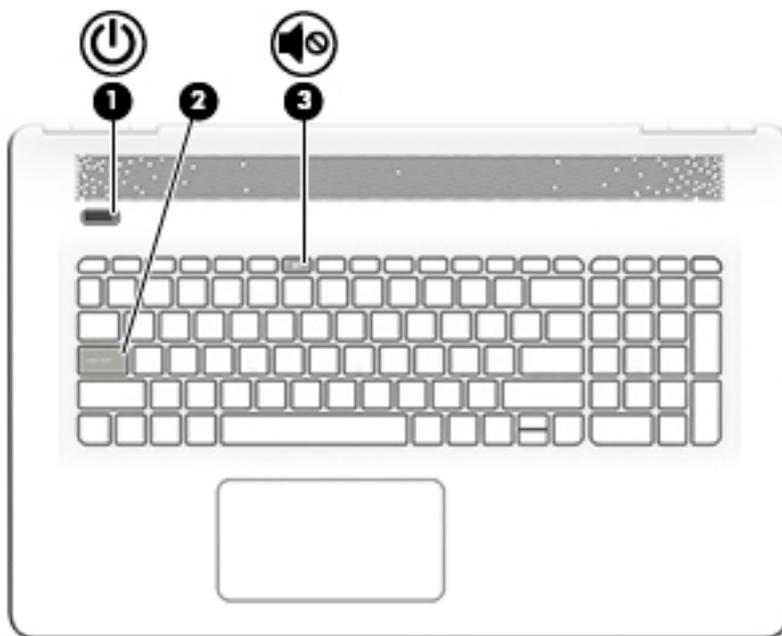
Top

TouchPad



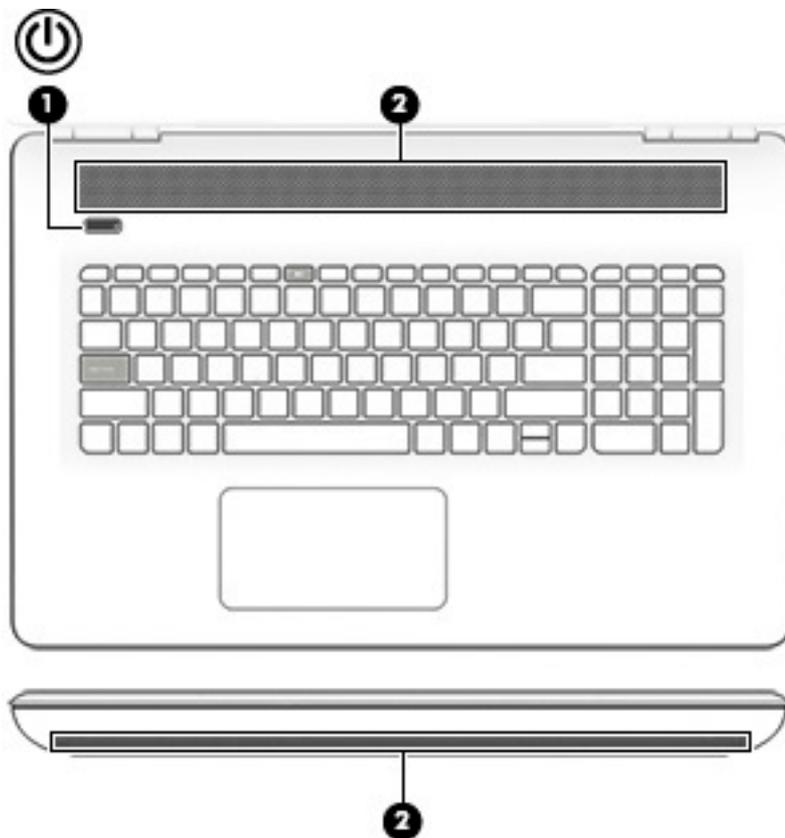
Component	Description
(1) TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2) Left TouchPad button	Functions like the left button on an external mouse.
(3) Right TouchPad button	Functions like the right button on an external mouse.

Lights



Component	Description
(1)  Power light	<ul style="list-style-type: none"> • 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)  Mute light	<ul style="list-style-type: none"> • Amber: Computer sound is off. • Off: Computer sound is on.

Button and speakers



Component	Description
(1)  Power button	<ul style="list-style-type: none"> • 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.

Component	Description
(2)	Speakers Produce sound.

- 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.

If the computer has stopped responding and shutdown procedures are ineffective, press and hold the power button down for at least 5 seconds to turn off the computer.

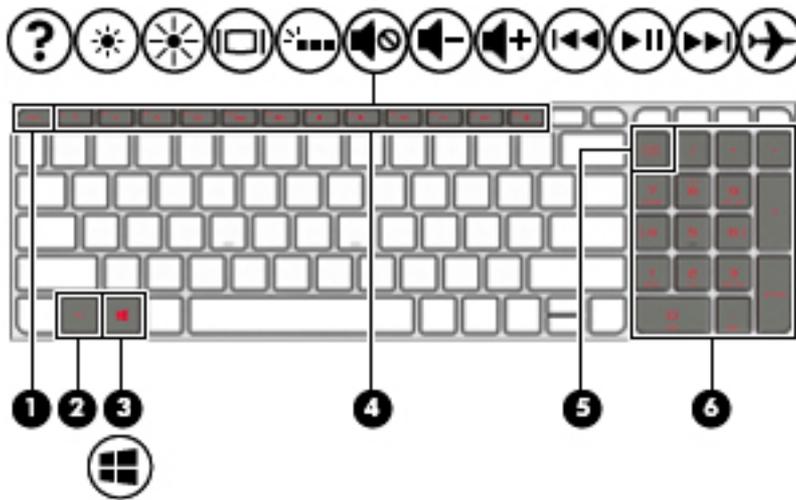
To learn more about your power settings, see your power options.

- ▲ Type `power` in the taskbar search box, and then select **Power and sleep settings**.

– or –

Right-click the **Start** button, and then select **Power Options**.

Keys



Component	Description
(1) <code>esc</code> key	Displays system information when pressed in combination with the <code>fn</code> key.
(2) <code>fn</code> key	Executes specific system functions when pressed in combination with the <code>esc</code> key or the <code>spacebar</code> .
(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. NOTE: On select products, the <code>f5</code> action key turns the keyboard backlight feature off or on.
(5) <code>num lock</code> key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6) Integrated numeric keypad	When <code>num lock</code> is on, the keypad can be used like an external numeric keypad.

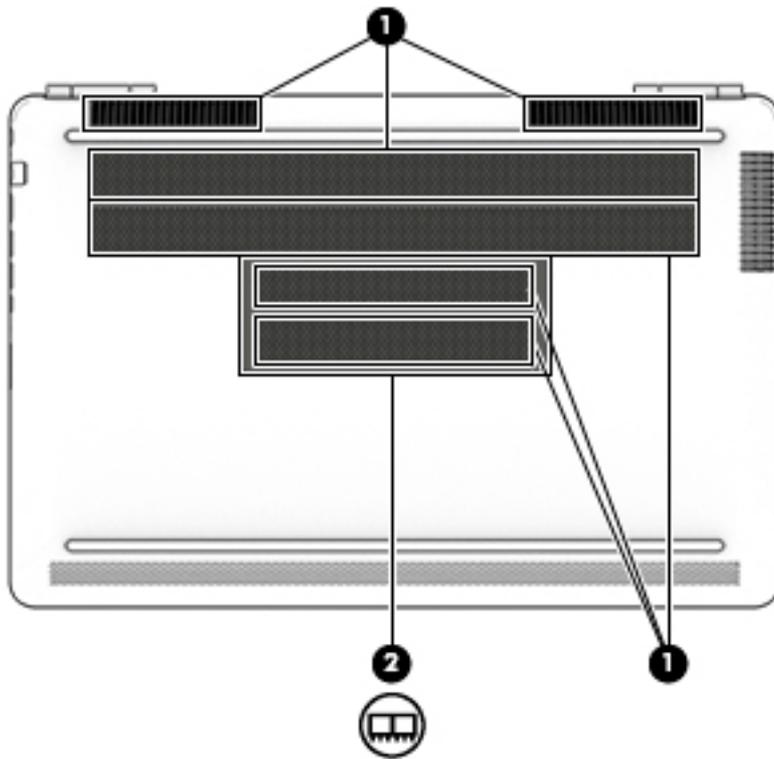
Using the action keys

- An action key performs an assigned function.
- The icon on each action key illustrates the function for that key.

Icon	Description
	Opens the Get started app, which provides a broad range of how-to information and troubleshooting tips.
	Decreases the screen brightness incrementally as long as you hold down the key.

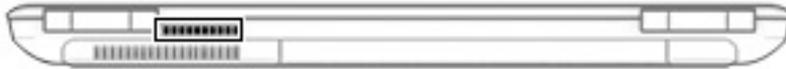
Icon	Description
	Increases the screen brightness incrementally as long as you hold down the key.
	Switches the screen image between display devices connected to the system. For example, if a monitor is connected to the computer, repeatedly pressing this key alternates the screen image from the computer display to the monitor display to a simultaneous display on both the computer and the monitor.
	Turns the keyboard backlight off or on. NOTE: To conserve battery power, turn off this feature.
	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.
	Plays the previous track of an audio CD or the previous section of a DVD or a Blu-ray Disc (BD).
	Starts, pauses, or resumes playback of an audio CD, a DVD, or a BD.
	Plays the next track of an audio CD or the next section of a DVD or a BD.
	Turns the airplane mode and wireless feature on or off. NOTE: The airplane mode key is also referred to as the wireless button. NOTE: A wireless network must be set up before a wireless connection is possible.

Bottom



Component		Description
(1)	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.
(2)	Service door	Provides access to the memory modules.

Rear



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

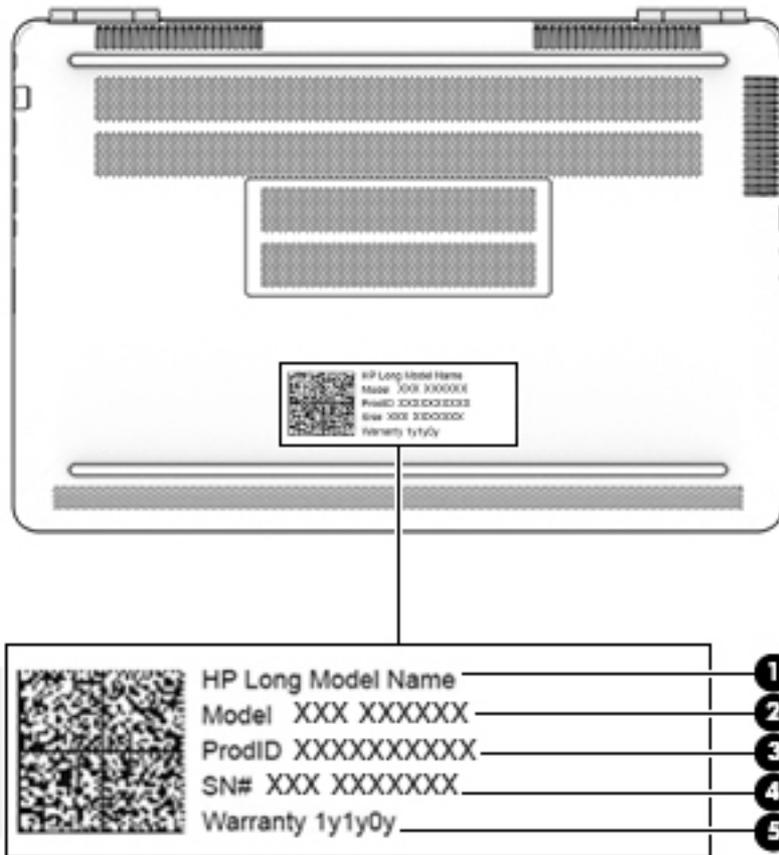
Labels

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

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

- Service label—Provides important information to identify your computer. When contacting support, you will probably be asked for the serial number, and possibly for the product number or the model number. Locate these numbers before you contact support.

The service label is located on the bottom of computer.



Component

-
- (1) Model long name (select products only)

 - (2) Model name (select products only)

 - (3) Product number

 - (4) Serial number

 - (5) Warranty period

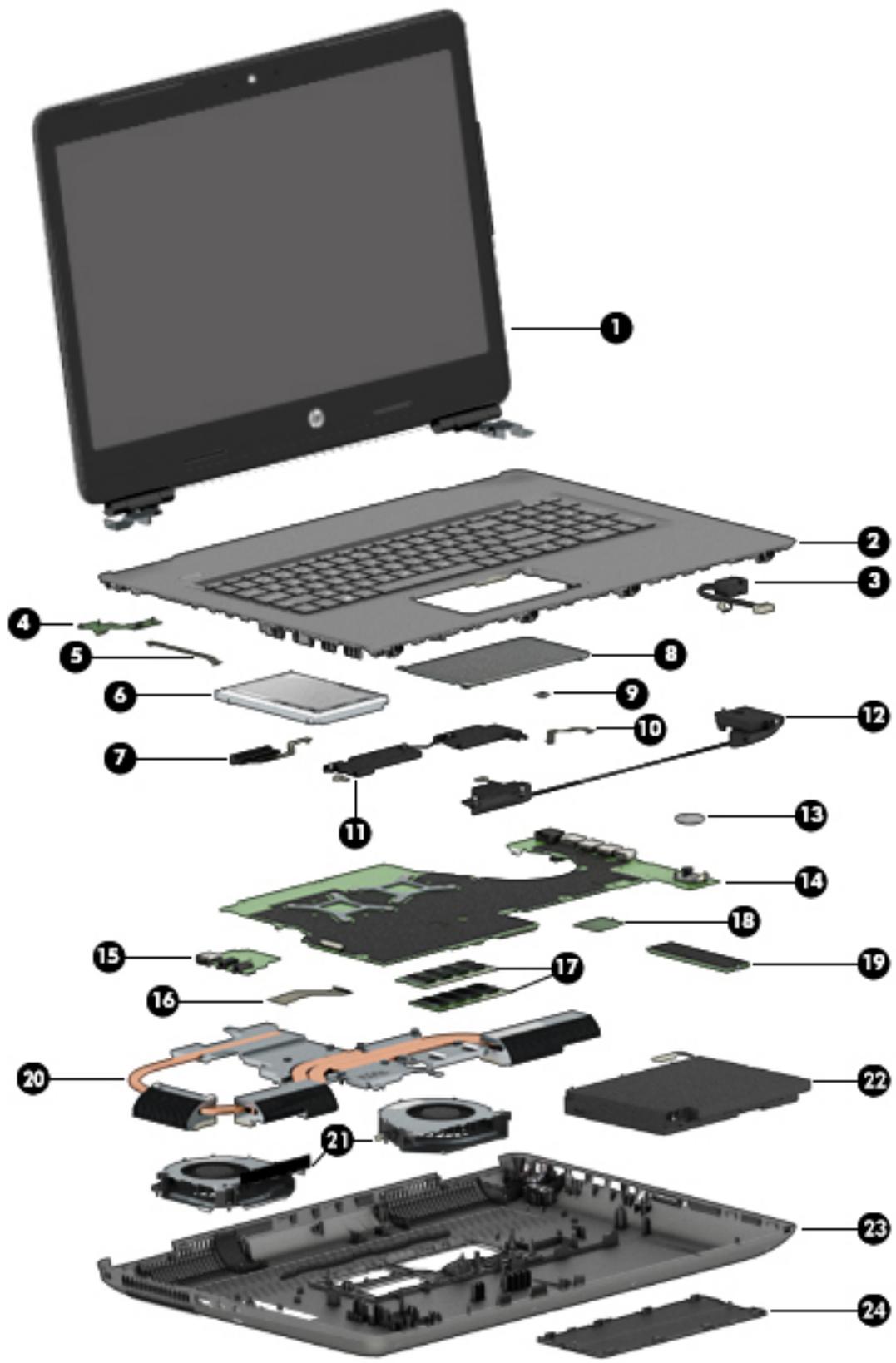
- Regulatory label(s)—Provide(s) regulatory information about the computer.
- Wireless certification label(s)—Provide(s) information about optional wireless devices and the approval markings for the countries or regions in which the devices have been approved for use.

3 Illustrated parts catalog

Computer major components

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

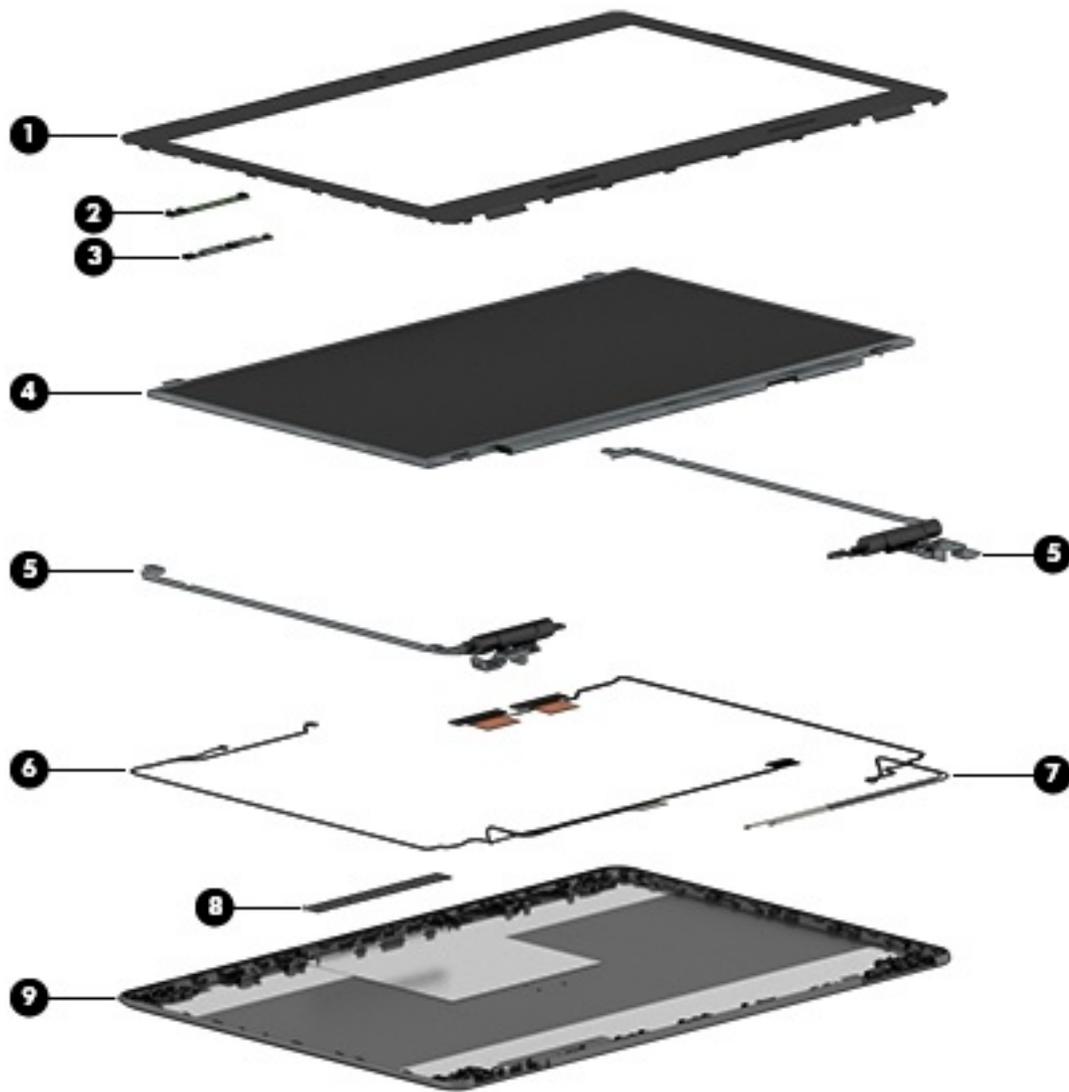
 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 15](#) for details.



Item	Component	Spare part number																																																								
(1)	Display (spared at the component level; see Display assembly subcomponents on page 21)																																																									
(2)	Top cover with keyboard and TouchPad in Onyx Black, with Carbon Fiber pattern (full-size standard 3-coat paint island-style backlit with numeric keypad)	862973-xxx																																																								
	<table border="1"> <thead> <tr> <th>Country</th> <th>Spare part number</th> <th>Country</th> <th>Spare part number</th> </tr> </thead> <tbody> <tr> <td>For use in Belgium</td> <td>-A41</td> <td>For use in Latin America</td> <td>-161</td> </tr> <tr> <td>For use in Bulgaria</td> <td>-261</td> <td>For use in Nordic Regions</td> <td>-DH1</td> </tr> <tr> <td>For use in Canada</td> <td>-DB1</td> <td>For use in Portugal</td> <td>-131</td> </tr> <tr> <td>For use in Czech/Slovakia</td> <td>-FL1</td> <td>For use in Romania</td> <td>-271</td> </tr> <tr> <td>For use in France</td> <td>-051</td> <td>For use in Russia</td> <td>-251</td> </tr> <tr> <td>For use in Germany</td> <td>-041</td> <td>For use in Saudi Arabia</td> <td>-171</td> </tr> <tr> <td>For use in Greece</td> <td>-151</td> <td>For use in Slovenia</td> <td>-BA1</td> </tr> <tr> <td>For use in Hungary</td> <td>-211</td> <td>For use in Spain</td> <td>-071</td> </tr> <tr> <td>For use Internationally</td> <td>-B31</td> <td>For use in Switzerland</td> <td>-BG1</td> </tr> <tr> <td>For use in Israel</td> <td>-BB1</td> <td>For use in Thailand</td> <td>-281</td> </tr> <tr> <td>For use in Italy</td> <td>-061</td> <td>For use in Turkey</td> <td>-141</td> </tr> <tr> <td>For use in Japan</td> <td>-291</td> <td>For use in the United Kingdom</td> <td>-031</td> </tr> <tr> <td>For use in Korea</td> <td>-AD1</td> <td>For use in the United States</td> <td>-001</td> </tr> </tbody> </table>	Country	Spare part number	Country	Spare part number	For use in Belgium	-A41	For use in Latin America	-161	For use in Bulgaria	-261	For use in Nordic Regions	-DH1	For use in Canada	-DB1	For use in Portugal	-131	For use in Czech/Slovakia	-FL1	For use in Romania	-271	For use in France	-051	For use in Russia	-251	For use in Germany	-041	For use in Saudi Arabia	-171	For use in Greece	-151	For use in Slovenia	-BA1	For use in Hungary	-211	For use in Spain	-071	For use Internationally	-B31	For use in Switzerland	-BG1	For use in Israel	-BB1	For use in Thailand	-281	For use in Italy	-061	For use in Turkey	-141	For use in Japan	-291	For use in the United Kingdom	-031	For use in Korea	-AD1	For use in the United States	-001	
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For use in Italy	-061	For use in Turkey	-141																																																							
For use in Japan	-291	For use in the United Kingdom	-031																																																							
For use in Korea	-AD1	For use in the United States	-001																																																							
(3)	Power in connector	907562-001																																																								
(4)	Power button board	862970-001																																																								
(5)	Power button board cable	862965-001																																																								
(6)	Hard drive																																																									
	1 TB 5400 RPM SATA RAW HYBRID 8 GB	731999-005																																																								
	2 TB 5400 RPM SATA RAW 9.5 mm	801808-005																																																								
	1 TB 7200 RPM SATA RAW 9.5 mm	766644-005																																																								
(7)	Hard drive cable	862964-001																																																								
(8)	TouchPad board	862959-001																																																								
(9)	TouchPad rubber click button	910443-001																																																								
(10)	Touchpad board cable	862966-001																																																								
(11)	Rear speakers , part of the speaker kit, which includes left and right speakers for front and rear	862958-001																																																								
(12)	Front speakers , part of the speaker kit, which includes left and right speakers for front and rear	862958-001																																																								
(13)	RTC battery	857380-001																																																								
(14)	System board (includes processor and replacement thermal material):																																																									

Item	Component	Spare part number
	NVIDIA N17E-G1 (GeForce GTX 1060), 6 GB, i7-6700HQ	862261-601
	NVIDIA N17E-G1 (GeForce GTX 1060), 6 GB, i5-6300HQ	862262-601
	NVIDIA N17E-G2 (GeForce GTX 1070), 8 GB, i7-6700HQ	862263-601
(15)	USB board	862971-001
(16)	USB board cable	862967-001
(17)	Memory	
	2 GB 2400 MHz 1.2 v DDR4 shared	864271-850
	4 GB 2400 MHz 1.2 v DDR4 shared	862397-850
	8 GB 2400 MHz 1.2 v DDR4 shared	862398-850
(18)	WLAN Intel Dual Band Wireless-AC 7265 802.11 ac 2x2 WiFi + BT 4.2 Combo Adapter (non vPRO)	793840-005
(19)	M.2 SATA SSD, PCIe NVMe TLC	
	128 GB 2280 M2 SATA-3 Value PA	827560-026
	256 GB 2280 M2 PCIe 3x4SS NVMe TLC PA	847109-002
	512 GB 2280 M2 PCIe 3x4SS NVMe TLC PA	847110-004
(20)	Heatsink , includes thermal pads, thermal plastic, and spacer sponges	903131-001
(21)	Fans (includes left and right fans)	910440-001
(22)	Battery , 6 cell, 95 WH, 4.15 Ah, LI	853294-855
(23)	Base enclosure in Twinkle Black	862961-001
(24)	Service door , memory access	908719-001

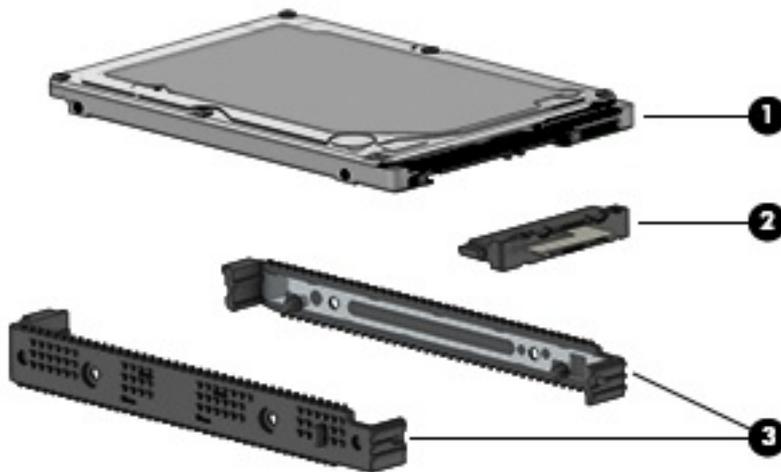
Display assembly subcomponents



Item	Component	Spare part number
(1)	Display bezel	
	For products with 3D camera	857451-001
	For products with HD camera	857450-001
(2)	Microphone board	862969-001
(3)	Camera	
	3D camera	781624-005
	HD camera	846006-003
(4)	43.94 cm (17.3") raw panel	
	<ul style="list-style-type: none"> Non-touch screen, FHD, AG, UWVA, 300 eDP, Flat, G-Sync 	903815-001
	<ul style="list-style-type: none"> Non-touch screen, UHD, AG, UWVA, 300 eDP, 1.3PSR, Flat, G-Sync 	903816-001

Item	Component	Spare part number
(5)	Hinge kit (includes left and right hinges)	862956-001
	Hinge caps	862955-001
(6)	Display cable	
	For products with non-touch FHD screen and HD camera	857456-001
	For products with non-touch FHD screen and 3D camera	857458-001
	For products with non-touch UHD screen and HD camera	857459-001
	For products with non-touch UHD screen and 3D camera	857461-001
(7)	Dual antennas	857443-001
(8)	HD camera frame	857475-001
(9)	Back cover in Shadow Mesh, includes dual antenna	862968-001

Mass storage devices



Item	Component	Spare part number
(1)	Hard drive	
	1 TB 5400 RPM SATA RAW HYBRID 8 GB	731999-005
	2 TB 5400 RPM SATA RAW 9.5 mm	801808-005
	1 TB 7200 RPM SATA RAW 9.5 mm	766644-005
(2)	Hard drive back connector and hard drive cable	862964-001
(3)	Hard drive brackets with rubber	911227-001

Miscellaneous parts

Component	Spare part number
AC adapter , 230 W PFC, Smart, slim, 4.5 mm	693706-001
External USB ODD , DVD+/-RW DL SuperMulti, 9.5 mm tray load, SATA	747080-001
HDMI to VGA adapter	701943-001
Power cord (black, 1.8 m):	
For use in Australia and New Zealand	100661-001
For use in China	286496-001
For use in Denmark	130627-008
For use in Europe	100614-009
For use in Japan	653326-001
For use in Israel	398062-001
For use in North America and Latin America	121565-001
For use in South Africa	187487-005
For use in South Korea	231216-001
For use in Switzerland	150304-008
For use in Thailand	285052-001
For use in the United Kingdom and Singapore	100613-008
Screw covers	912492-001
Screw kit	862957-001

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

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			
Event	Relative humidity		
	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 $\pm 10\%$ 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 Customer Self-Repair parts

This chapter provides removal and replacement procedures for Customer Self-Repair parts.

 **NOTE:** The Customer Self-Repair program is not available in all locations. Installing a part not supported by the Customer Self-Repair program may void your warranty. Check your warranty to determine if Customer Self-Repair is supported in your location.

Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 15](#) 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 two screws that must be removed, replaced, and/or loosened when servicing Customer Self-Repair parts. Make special note of the screw sizes and locations during removal and replacement.

Service door

Description	Spare part number
Service door, memory access	908719-001

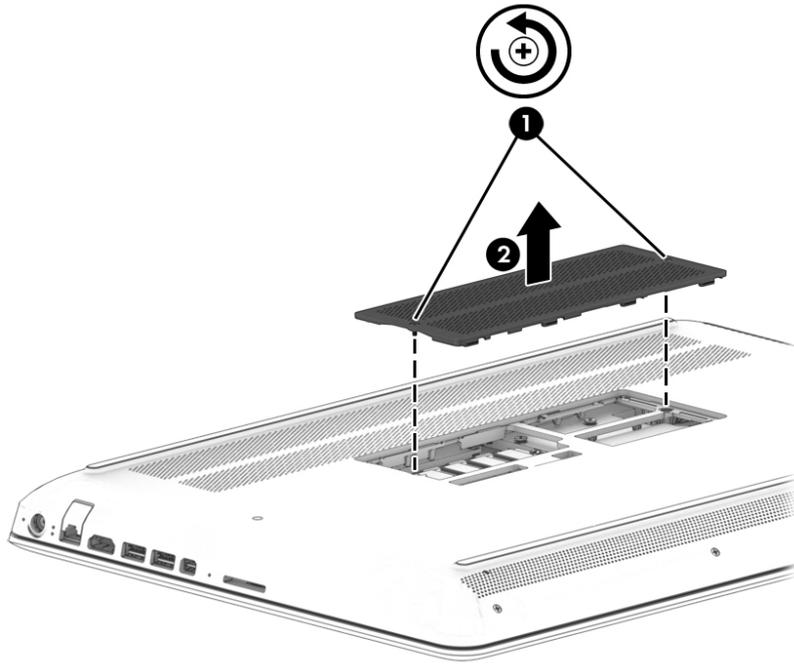
Before removing the service door, follow these steps:

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

Remove the service door:

1. Release the two captive Phillips screws **(1)** securing the service door to the base enclosure.

2. Insert a thin plastic tool around the service door to release the clips, and then lift the service door **(2)** to remove it.



Reverse this procedure to replace the service door.

Memory module

Description	Spare part number
Memory	
2 GB 2400 MHz 1.2 v DDR4 shared	864271-850
4 GB 2400 MHz 1.2 v DDR4 shared	862397-850
8 GB 2400 MHz 1.2 v DDR4 shared	862398-850

Update BIOS before adding memory modules

Before adding new memory, make sure you update the computer to the latest BIOS.

 **CAUTION:** Failure to update the computer to the latest BIOS prior to installing new memory may result in various system problems.

To update BIOS:

1. Navigate to <http://www.hp.com>.
2. Select **Support**, and then select **Software & drivers**.
3. In the **Enter my HP model number** box, type the computer model information, and then select **Find my product**.
-or-
Select **Identify now**.
4. Select the link for the computer model.
5. Select the language and the operating system.
6. Under the downloads heading, select the **BIOS** link.
7. Select the link for the most recent BIOS.
8. Select the **Download** button, and then follow the on-screen instructions.

Before removing a memory module, follow these steps:

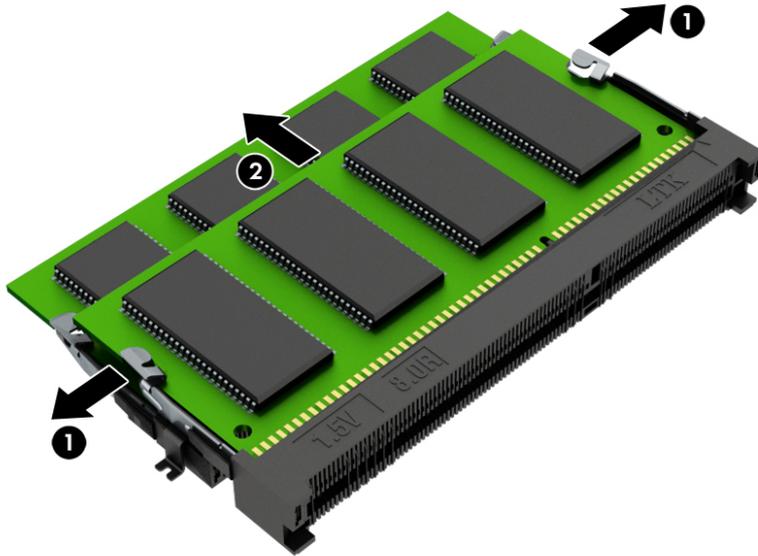
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - ▲ Service door (see [Service door on page 29](#))

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The memory module tilts up.)

2. Remove the memory module **(2)** by pulling the module away from the slot at an angle.

 **NOTE:** Memory modules are designed with a notch to prevent incorrect insertion into the memory module slot.



 **NOTE:** To remove the primary memory module, repeat steps 1 and 2.

Reverse this procedure to install a memory module.

6 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.

Component replacement procedures

 **NOTE:** Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See [Labels on page 15](#) 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 may be as many as 85 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

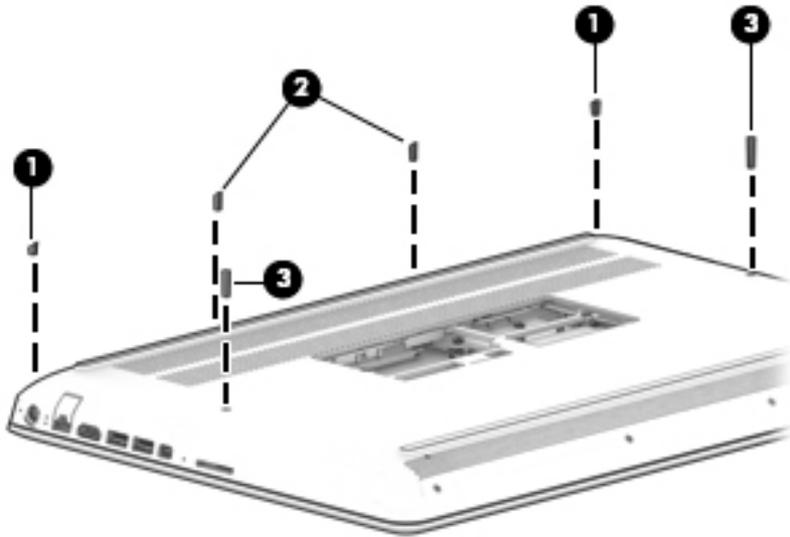
Description	Spare part number
Base enclosure in Twinkle Black	862961-001

Before removing the base enclosure, follow these steps:

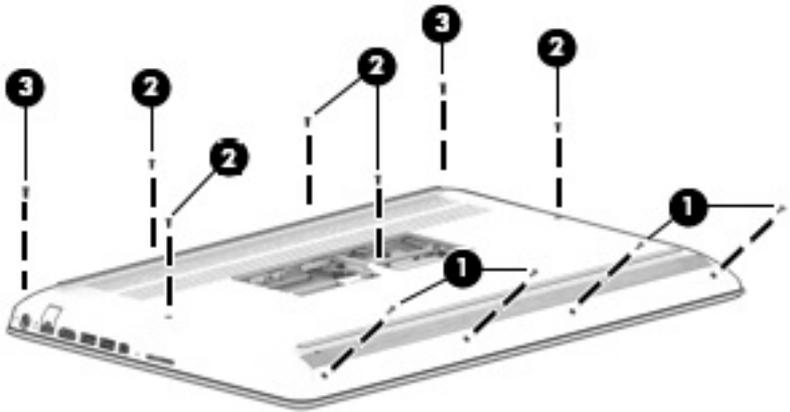
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - ▲ Service door (see [Service door on page 29](#))

Remove the base enclosure:

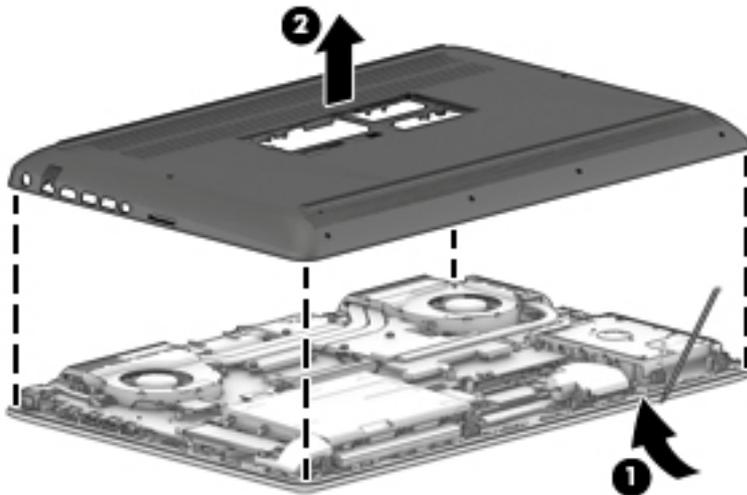
1. Remove the two hinge screw covers **(1)**, two back screw covers **(2)**, and two side screw covers **(3)**.



2. Remove the four front M2x6.0 screws (1), the five M2x6.0 screws (2), and the two M3.25x6.0 screws (3).



3. Insert a thin plastic tool (1) to separate the base enclosure from the top cover, and then remove the base enclosure (2).



Reverse the removal procedures to install the base enclosure.

Battery

Description	Spare part number
Battery 6 cell, 95 WH, 4.15 Ah, LI	853294-855

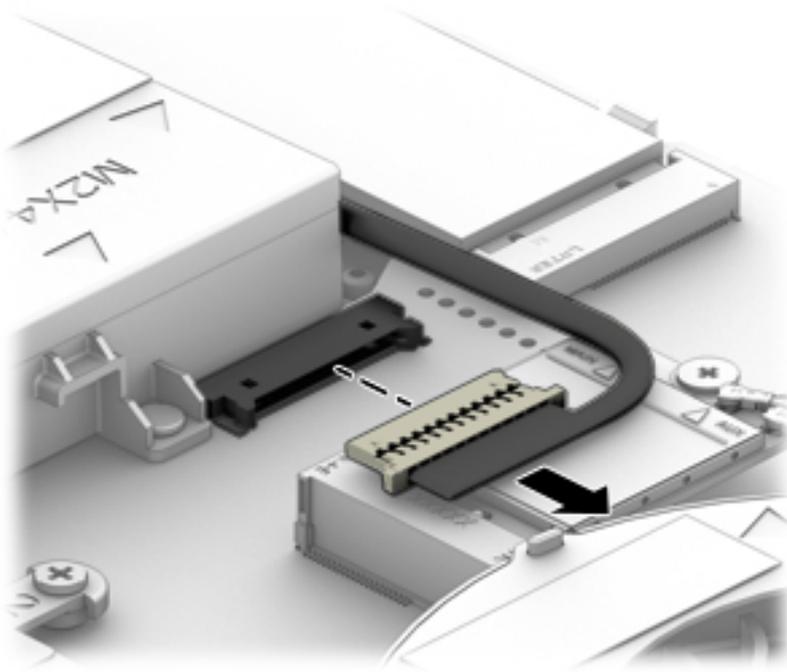
Before removing the battery, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))

Remove the battery:

- ⚠ **WARNING!** To reduce potential safety issues, use only the user-replaceable battery provided with the computer, a replacement battery provided by HP, or a compatible battery purchased from HP.
- ⚠ **CAUTION!** Removing a user-replaceable battery that is the sole power source for the computer can cause loss of information. To prevent loss of information, save your work or shut down the computer through Windows before removing the battery.

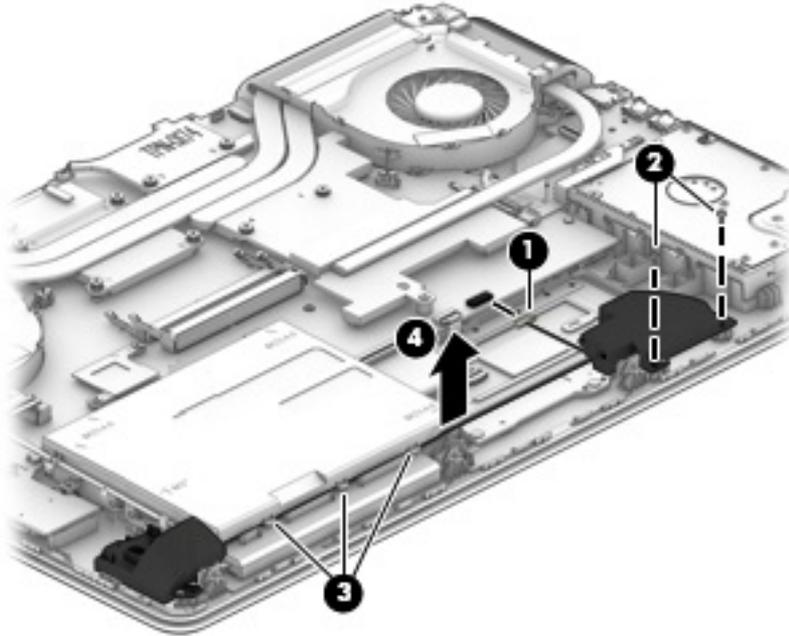
1. Disconnect the battery cable.



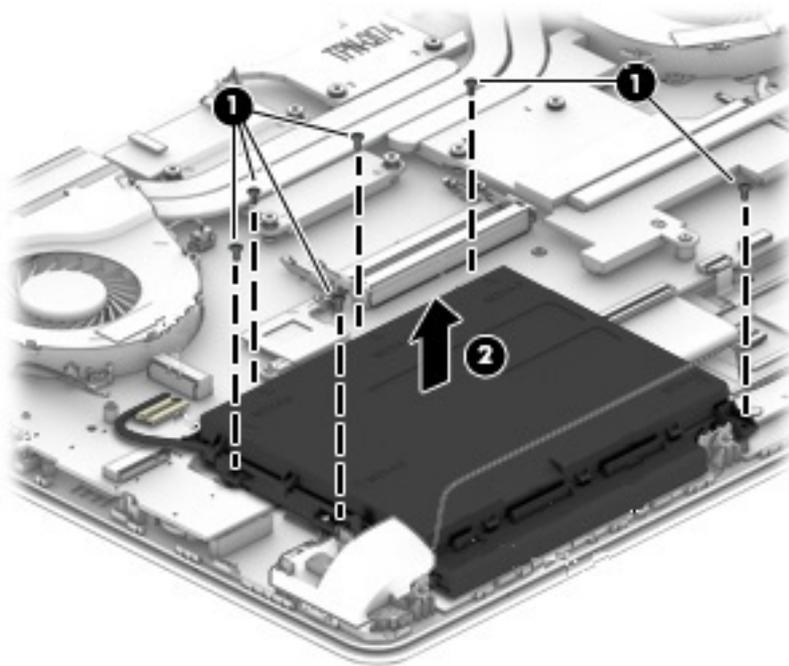
 **IMPORTANT:** Note the cable routing before you remove the cables.

2. Carefully disconnect the right speaker connector (**1**) from the system board.

3. Remove the two Phillips M2x4.0 screws **(2)** securing the right speaker.
4. Release the speaker cable from the routing channels **(3)** on the battery.
5. Lift the speaker cable and right speaker **(4)** to move them away from the battery.



6. Remove the six M2x4.0 screws **(1)** securing the battery. The battery cable may be moved to access two of the battery screws.
7. Remove the battery from the computer **(2)**.



To insert the battery, reverse the removal procedures.

Hard drive

Description	Spare part number
Hard drive	
<ul style="list-style-type: none">1 TB 5400 RPM SATA RAW HYBRID 8 GB	731999-005
<ul style="list-style-type: none">2 TB 5400 RPM SATA RAW 9.5 mm	801808-005
<ul style="list-style-type: none">1 TB 7200 RPM SATA RAW 9.5 mm	766644-005
Hard drive connector and cable	862964-001
Hard drive brackets with rubber	911227-001

Before removing the hard drive, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))

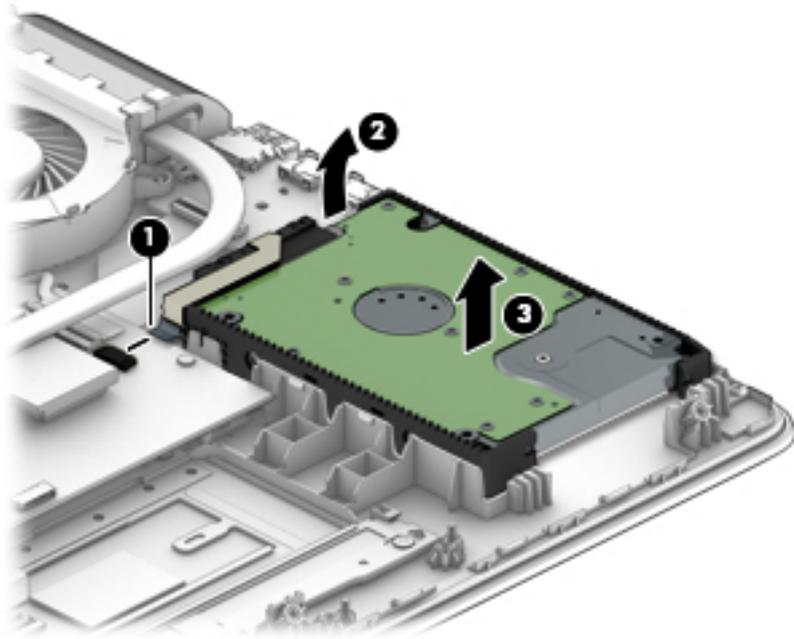
Remove the hard drive:



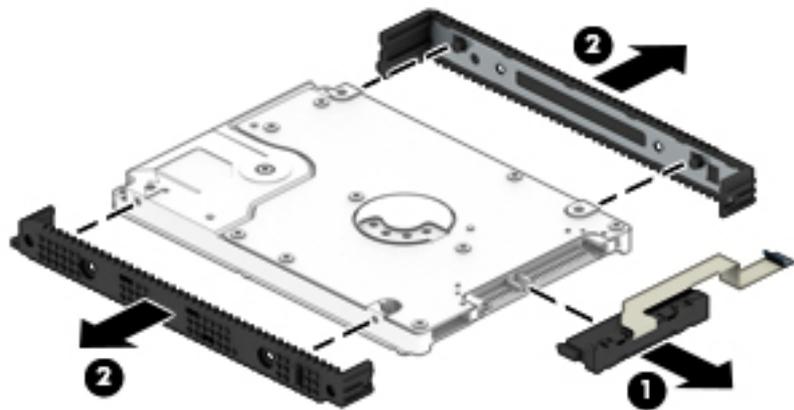
NOTE: Use minimal force when lifting the locking bar up on the ZIF connector and disconnecting the cable.

1. Open the zero insertion force (ZIF) connector **(1)** to release the hard drive cable from the system board.

2. Lift the back of the hard drive **(2)** up, and then remove the drive **(3)**.



3. If it is necessary to disassemble the hard drive, perform the following steps:
 - a. Remove the hard drive cable connector **(1)** from the hard drive.
 - b. Slide the two hard drive brackets **(2)** off the hard drive.



Reverse this procedure to reassemble and install the hard drive.

SSD (M.2)

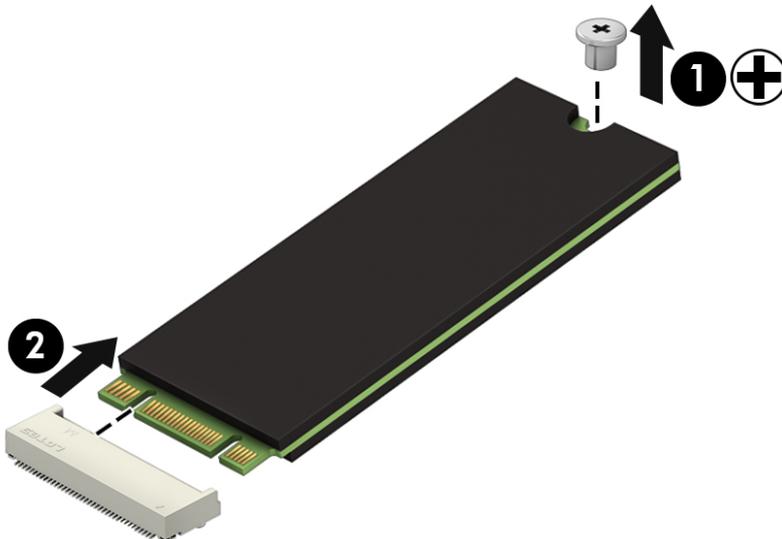
Description	Spare part number
M.2 SATA SSD, PCIe NVMe TLC	
<ul style="list-style-type: none">128 GB 2280 M2 SATA-3 Value PA	827560-026
<ul style="list-style-type: none">256 GB 2280 M2 PCIe 3x4SS NVMe TLC PA	847109-002
<ul style="list-style-type: none">512 GB 2280 M2 PCIe 3x4SS NVMe TLC PA	847110-004

Before removing the SSD, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Front speakers on page 40](#))

Remove the SSD:

1. Remove the Phillips M2.0x3 screw **(1)** that secures the SSD to the system board.
2. Remove the SSD **(2)** by pulling the drive away from the slot at an angle.



Reverse this procedure to install the SSD.

Front speakers

 **NOTE:** The speaker spare part kit includes the cable.

Description	Spare part number
Speaker Kit (includes right and left speakers for front and rear)	862958-001

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

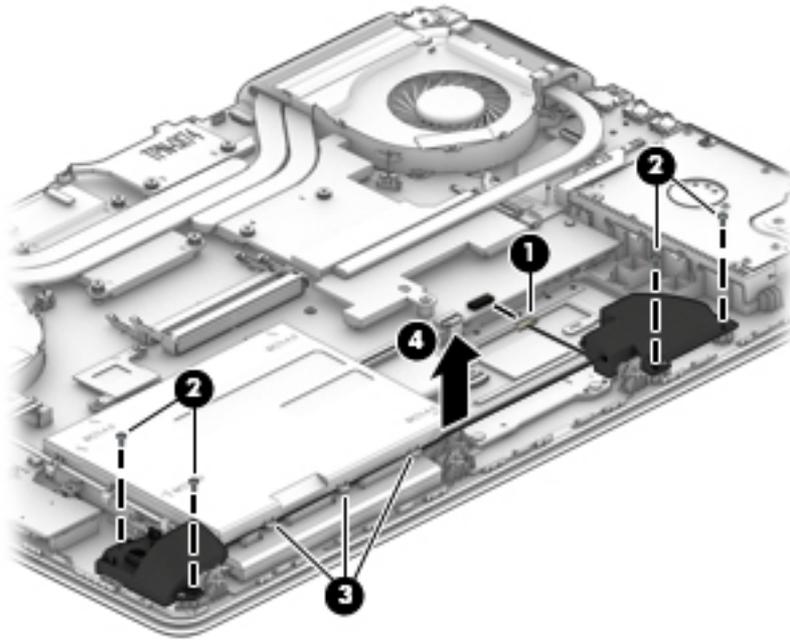
Before removing the speaker, follow these steps:

1. Shut down the computer.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))
 - d. SSD (see [SSD \(M.2\) on page 39](#))

Remove the front speakers:

1. Carefully disconnect the right speaker connector **(1)** from the system board.
2. Remove the four Phillips M2x4.0 screws **(2)** securing the speakers.
3. Release the display cable from the routing channels **(3)** on the battery.

4. Lift the speakers (**4**) to remove them.



Reverse this procedure to install the front speakers.

WLAN module

Description	Spare part number
Intel Dual Band Wireless-AC 7265 802.11 ac 2x2 WiFi + Bluetooth 4.2 Combo Adapter (non vPRO)	793840-005

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

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))

Remove the WLAN module:

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

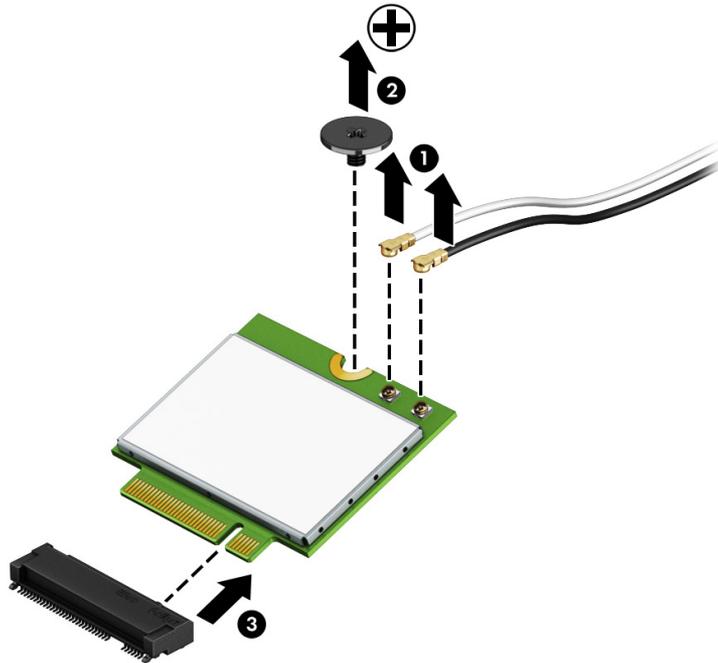


NOTE: The WLAN antenna cable labeled “1” connects to the WLAN module “Main” terminal labeled “1”. The WLAN antenna cable labeled “2” connects to the WLAN module “Aux” terminal labeled “2”.

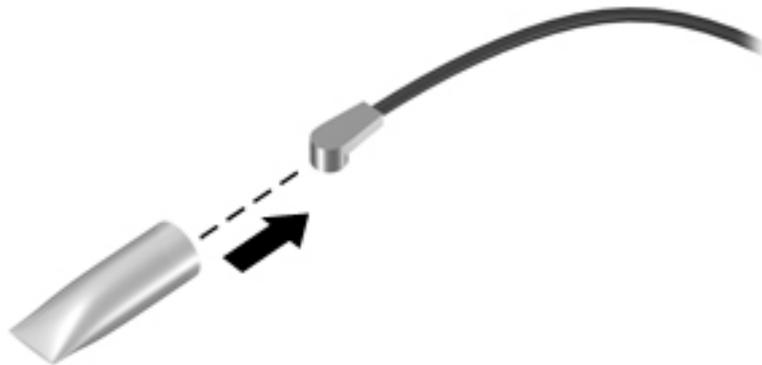
2. Remove the Phillips M2x3.0 screw **(2)** that secures the WLAN module to the system board. (The WLAN module tilts up.)

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

 **NOTE:** WLAN modules are notched to prevent incorrect installation.



 **NOTE:** If the WLAN antenna cables are not connected to the terminals on the WLAN module, protective sleeves should be installed on the antenna connectors, as shown in the following illustration.



Reverse this procedure to install the WLAN module.

Fans

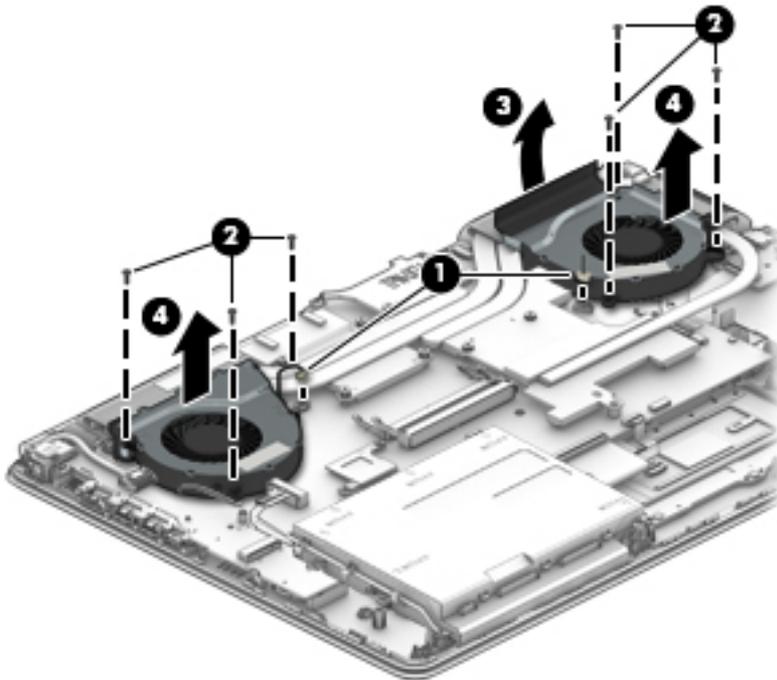
Description	Spare part number
Fans (includes left and right fans, plastic thermal cover, and sponge)	910440-001

Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))

Remove the fans:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the six Phillips M2.0 x 4.5 screws **(2)** that secure the fans to the top cover.
3. Release the plastic thermal cover **(3)** on the left fan from the system board.
4. Remove each fan **(4)**.



Reverse this procedure to install the fans.

Heatsink

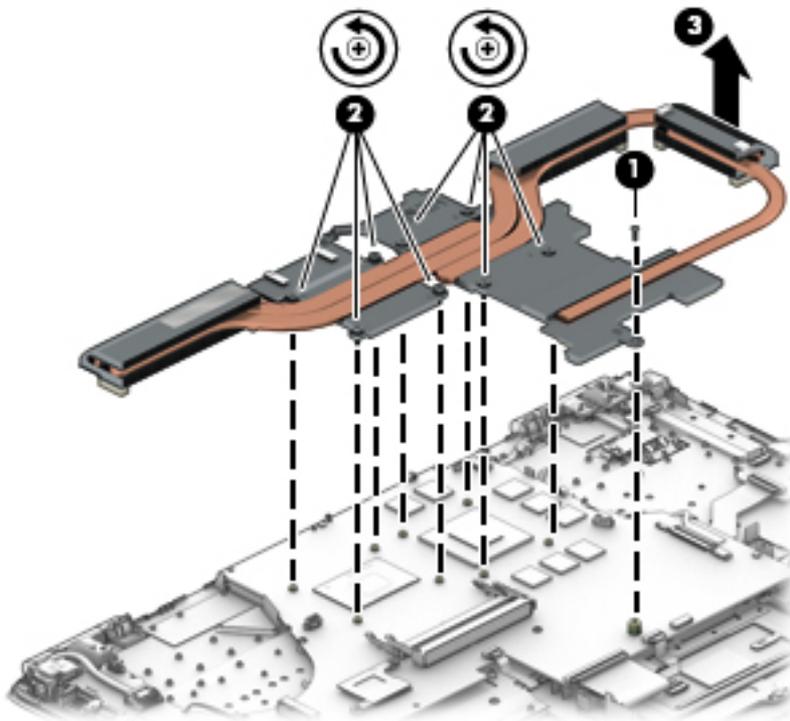
Description	Spare part number
Heatsink, includes thermal pads, thermal plastic, and spacer sponges	903131-001

Before removing the heatsink, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))
 - d. Fans (see [Fans on page 44](#))

Remove the heatsink:

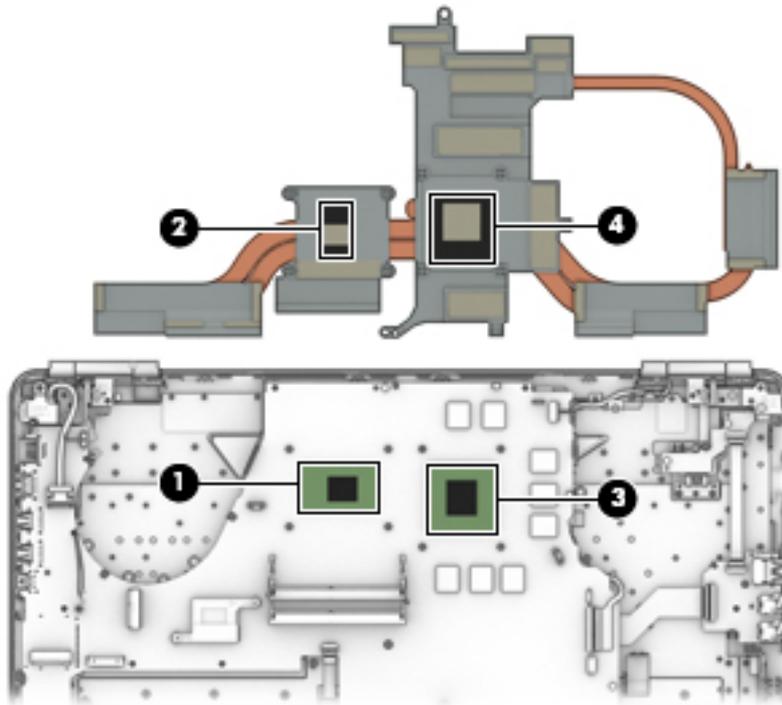
1. Remove the Phillips M2x3.0 screw (1) securing the heatsink to the system board.
2. Release the eight captive Phillips screws (2) securing the heatsink to the system board in the order stamped on the heatsink.
3. Remove the heatsink (3).



4. The following illustration shows the replacement thermal material locations. The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink.

 **NOTE:** If you are replacing the system board, but not the heat sink, remove any thermal pads that remain on the system board and place them on the heat sink. If you are replacing the heatsink, remove any thermal pads that remain on the system board.

Thermal paste is used on the system board components **(1), (2)** and on the heat sink areas **(2), (4)** that service them.



Reverse this procedure to install the heatsink.

System board

Description	Spare part number
System board	
NVIDIA N17E-G1 (GeForce GTX 1060), 6 GB, i7-6700HQ	862261-601
NVIDIA N17E-G1 (GeForce GTX 1060), 6 GB, i5-6300HQ	862262-601
NVIDIA N17E-G2 (GeForce GTX 1070), 8 GB, i7-6700HQ	862263-601

 **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 the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))

 **NOTE:** When replacing the system board, be sure that the following components are removed from the defective system board and installed on the replacement system board:

- WLAN module (see [WLAN module on page 42](#))
- Memory modules (see [Memory module on page 31](#))
- RTC battery (see [RTC battery on page 51](#))
- Thermal pads that remained on the system board should be removed and placed on the heatsink (see [Heatsink on page 45](#))

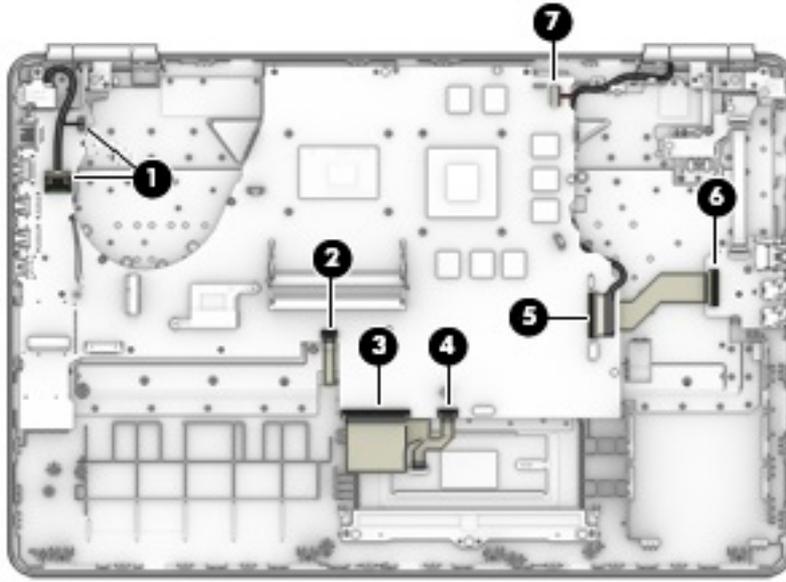
Remove the system board:

1. If they are not already disconnected, disconnect the following cables from the system board (note the routing location of the cables when removing them):

 **NOTE:** Use minimal force when lifting the locking bar up on a ZIF connector and disconnecting the cable.

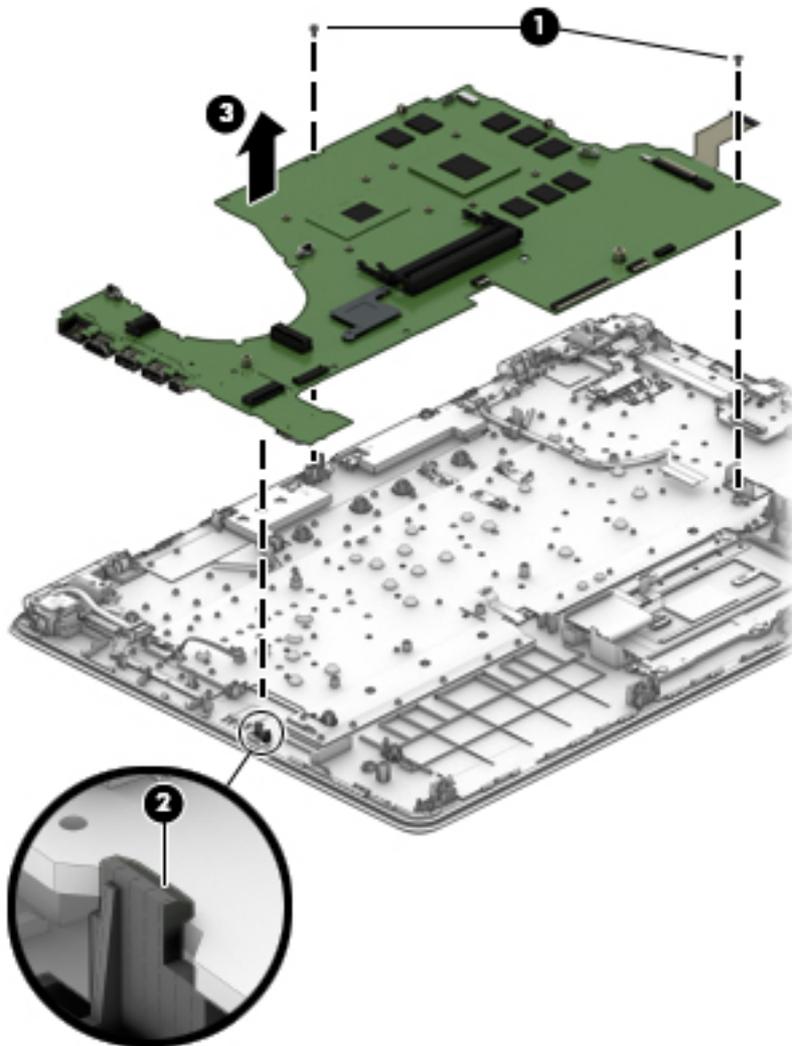
- (1) Power in connection cables

- (2) Backlight cable
- (3) Keyboard cable
- (4) Touchpad cable
- (5) Display cable
- (6) USB board ribbon cable
- (7) Speaker cable



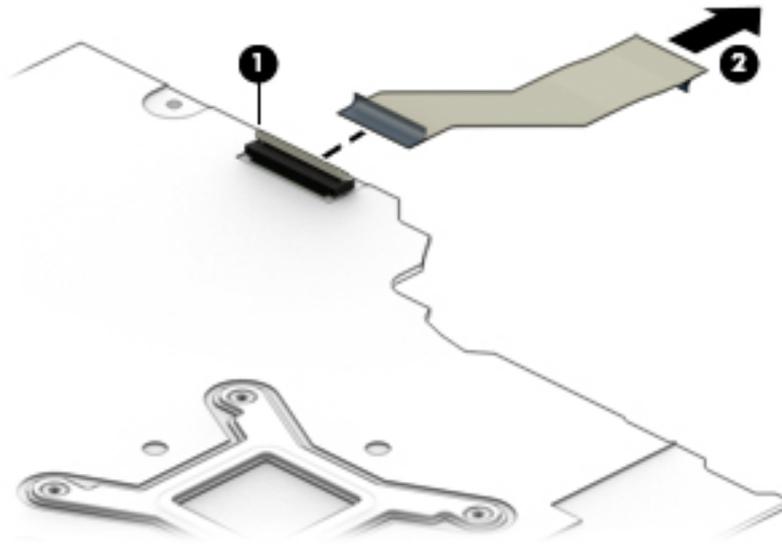
- 2. Remove the two Phillips M2x4.0 screws (1) securing the system board to the computer.
- 3. Release the system board from the latch (2) securing it to the computer.

4. Lift the system board (3), and then remove it.



5. To remove the USB card cable, carefully place the system board face down.

6. Open the ZIF connector (1) to release the USB card cable from the system board, and then remove the cable (2).



Reverse this procedure to install the system board.

 **IMPORTANT:** After system board replacement, be sure to complete post-installation tasks as required that may include:

- Verifying functionality of the computer
- Updating the BIOS; see [Using Setup Utility \(BIOS\) on page 71](#)

RTC battery

Description	Spare part number
RTC battery	857380-001

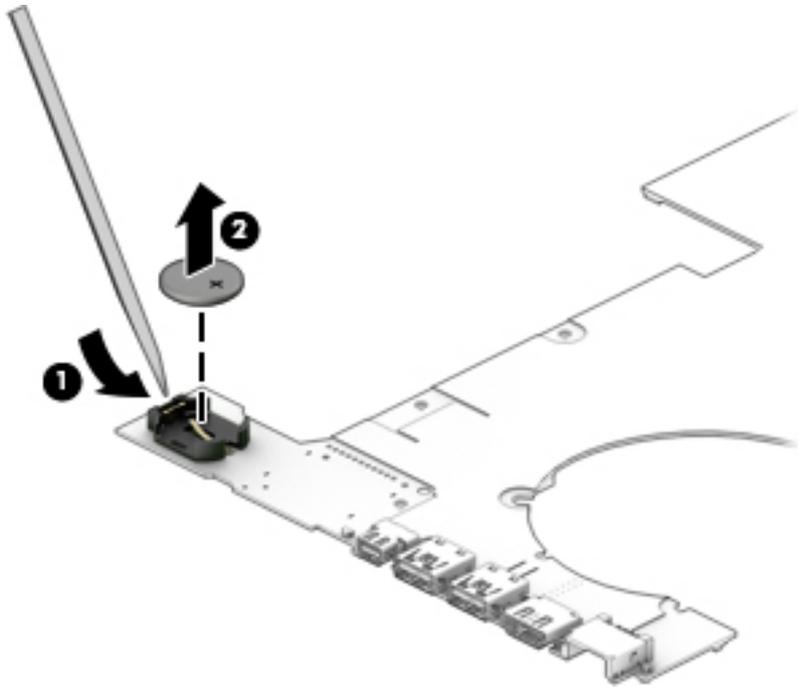
Before removing the RTC battery, follow these steps:

1. Shut down the computer.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))
 - i. System board (see [System board on page 47](#))

Remove the RTC battery:

1. Carefully place the system board face down.

2. Use a thin tool **(1)** to release the battery from the battery holder, and then remove the battery **(2)**.



Reverse this procedure to install the RTC battery.

USB board

Description	Spare part number
USB board	862971-001
USB board cable	862967-001

Before removing the USB board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))
 - d. Fans (see [Fans on page 44](#))
 - e. Heatsink (see [Heatsink on page 45](#))
 - f. Disconnect the USB board cable from the system board (see [System board on page 47](#))

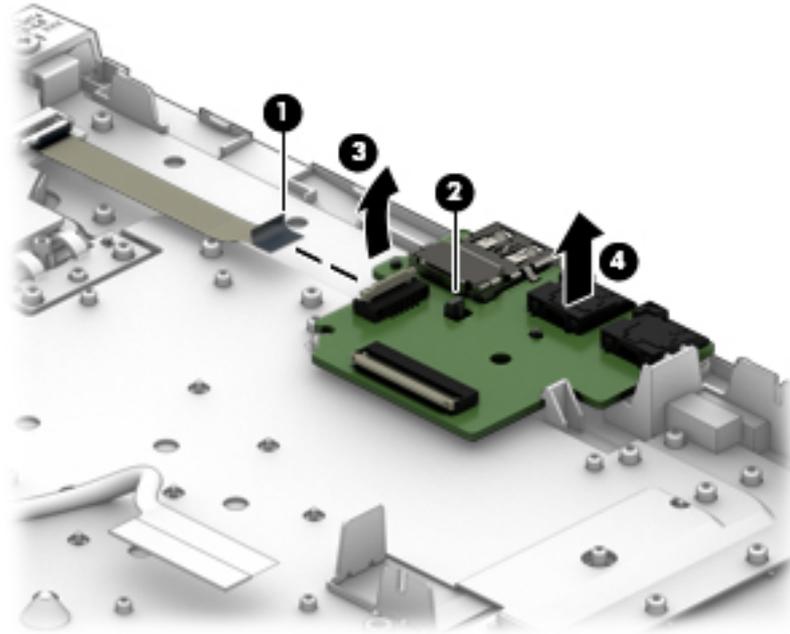
Remove the USB board:

1. Open the ZIF connector **(1)** to release the power button board cable from the USB board.

 **CAUTION:** Do not use force on the security hook. It is part of the top cover.

2. Carefully disengage the USB board from the security hook **(2)** that secures the USB board to the top cover.
3. Lift the back side of the USB board **(3)**.

4. Lift the USB board **(4)** to remove it from the top cover.



Reverse this procedure to install the USB board.

Power button board

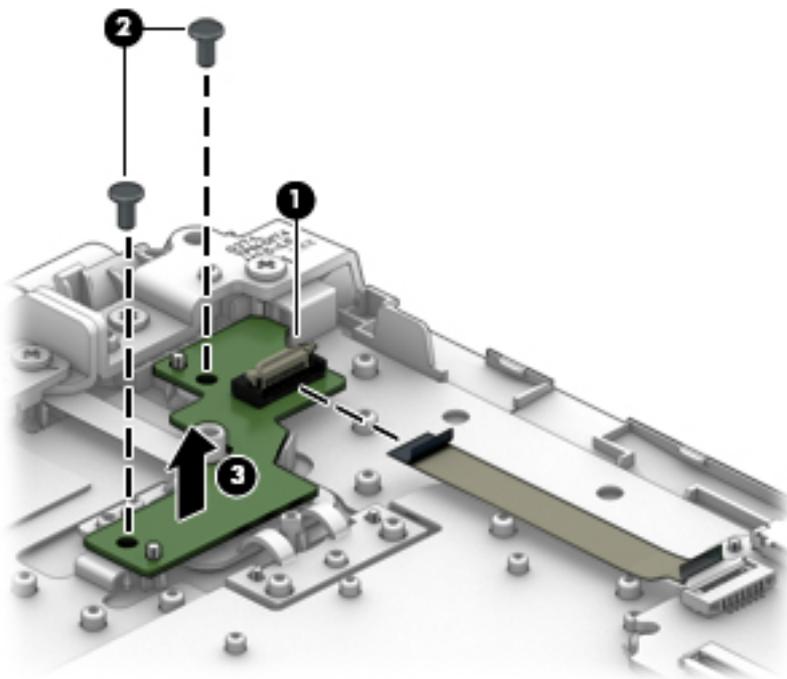
Description	Spare part number
Power button board	862970-001
Power button board cable	862965-001

Before removing the power button board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Disconnect the battery (see [Battery on page 35](#))
 - d. Fans (see [Fans on page 44](#))
 - e. Heatsink (see [Heatsink on page 45](#))

Remove the power button board:

1. Open the ZIF connector (1) to release the power button board cable from the power button board.
2. Remove the two Phillips M2x4.0 screws (2) securing the power button board to the computer.
3. Remove the power button board (3).



Reverse this procedure to install the power button board.

Rear speakers

 **NOTE:** The speaker spare part kit includes the cable.

Description	Spare part number
Speaker Kit (includes right and left speakers for front and rear)	862958-001

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

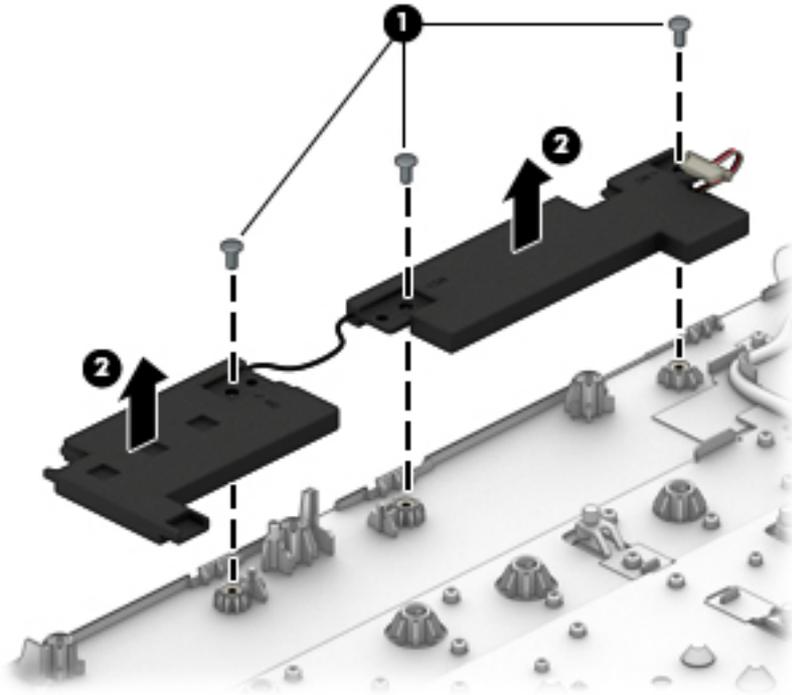
Before removing the speaker, follow these steps:

1. Shut down the computer.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))
 - i. System board (see [System board on page 47](#))

Remove the rear speakers:

1. Remove the three Phillips M2x4.0 screws **(1)** securing the speakers to the top cover.

2. Lift the speakers **(2)** to remove them.



Reverse this procedure to install the rear speakers.

TouchPad board

Description	Spare part number
TouchPad board	862959-001
TouchPad cable	862966-001
TouchPad rubber click button	910443-001

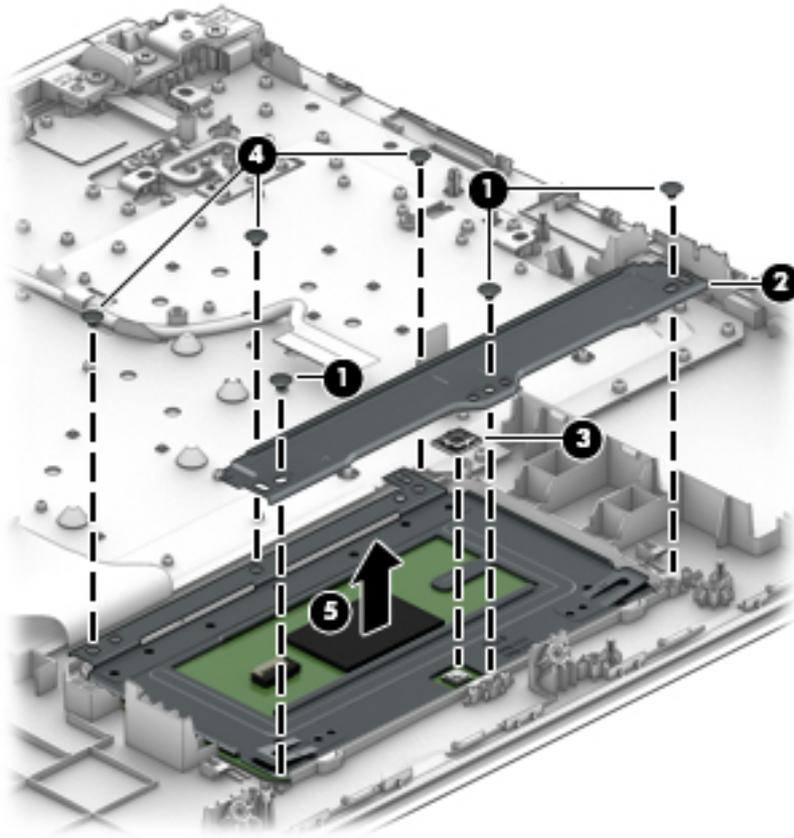
Before removing the TouchPad board, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))
 - i. System board (see [System board on page 47](#))

Remove the TouchPad board:

1. Carefully remove the three Phillips M2x2.5 screws **(1)** that secure the TouchPad bracket to the computer.
2. Remove the TouchPad bracket **(2)** that secures the TouchPad board.
3. If it is necessary to replace the TouchPad rubber click button, lift the rubber button **(3)** away from the TouchPad.

4. Remove the three Phillips M2x2.5 screws **(4)** that secure the TouchPad board, and then remove the TouchPad board **(5)** from the computer.



Reverse this procedure to install the TouchPad board.

Power in connector

Description	Spare part number
Power in connector	907562-001

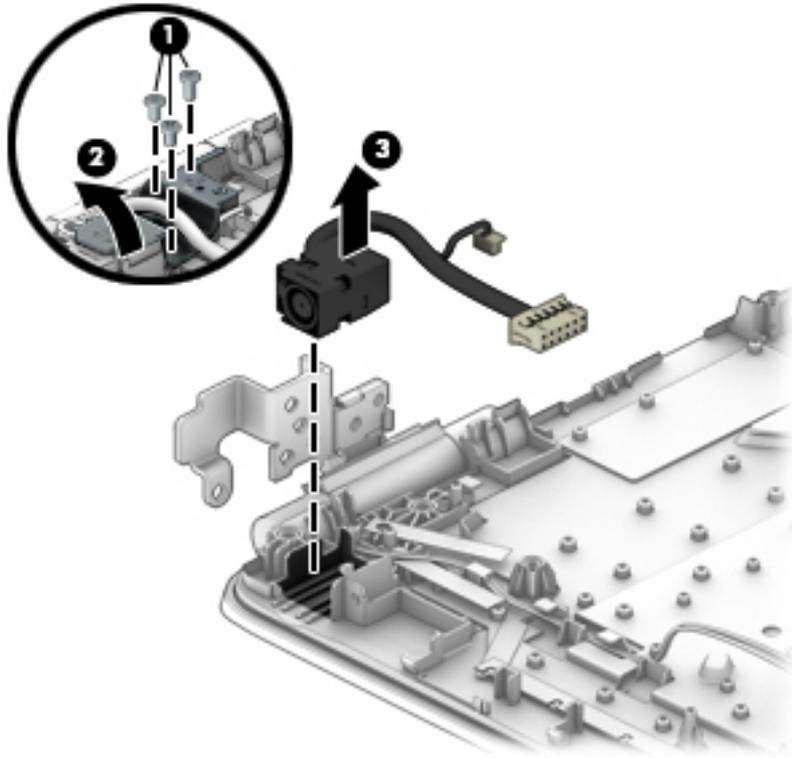
Before removing the power in connector, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices from the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))
 - i. System board (see [System board on page 47](#))

Remove the power in connector:

1. Remove the three Phillips M2.5x3.5 screws **(1)** securing the left display hinge.
2. Lift the left display hinge **(2)** holding the power in connector.

3. Remove the connector (3).



Reverse this procedure to install the power in connector.

Display assembly

Description	Spare part number
Antenna, dual	857443-001
Back cover in Shadow Mesh, includes dual antenna	862968-001
Display bezel	
• For products with 3D camera	857451-001
• For products with HD camera	857450-001
Display cable	
• For products with non-touch FHD screen with HD camera	857456-001
• For products with non-touch FHD screen and 3D camera	857458-001
• For products with non-touch UHD screen and HD camera	857459-001
• For products with non-touch UHD screen and 3D camera	857461-001
Frame for HD camera	857475-001
Hinge caps	862955-001
Hinge kit (includes left and right hinges)	862956-001
Raw panel 43.94 cm (17.3")	
• Non-touch screen, FHD, AG, UWVA, 300 eDP, Flat, G-Sync	903815-001
• Non-touch screen, UHD, AG, UWVA, 300 eDP, 1.3PSR, Flat GF, G-Sync	903816-001



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

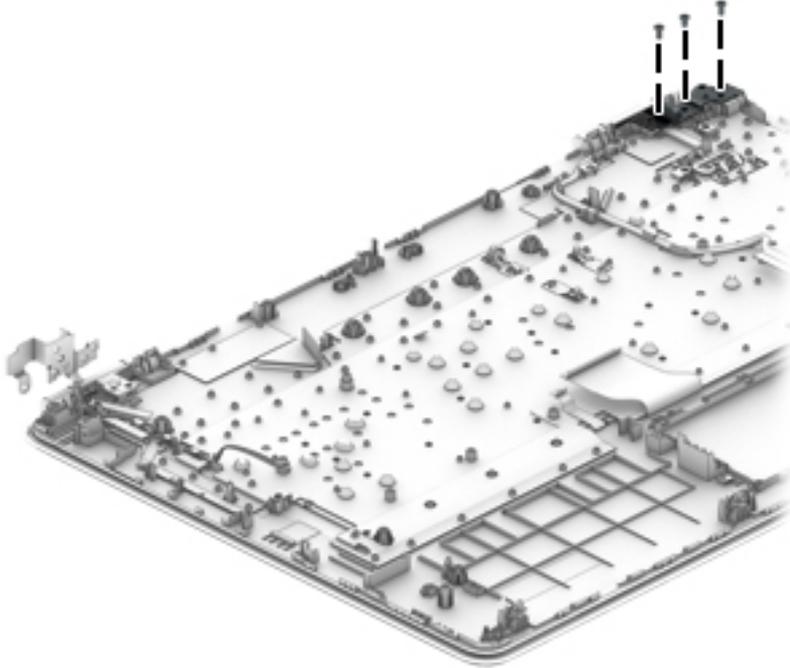
Before removing the display assembly, follow these steps:

1. Shut down the computer.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))

- i. System board (see [System board on page 47](#))
- j. Power in connector (see [Power in connector on page 61](#))

Remove the display assembly:

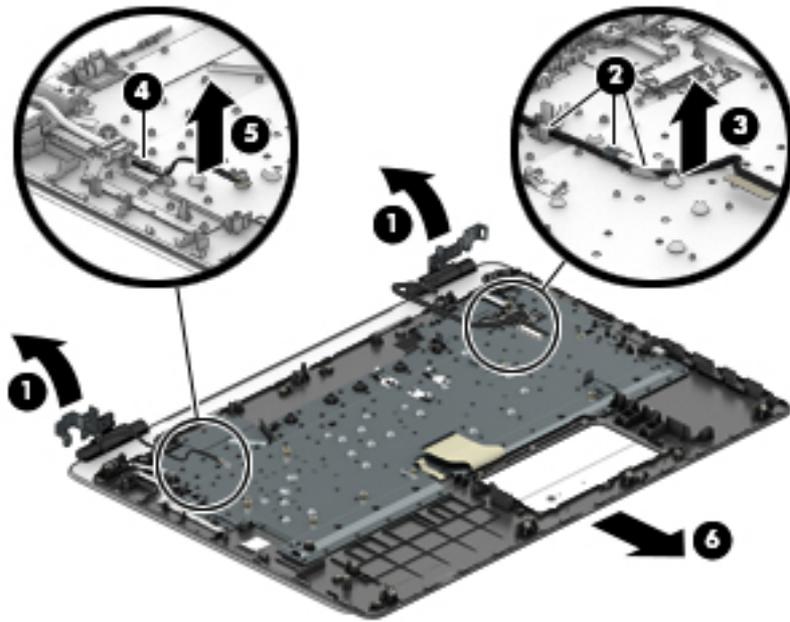
1. Remove the three Phillips screws securing the right hinge.



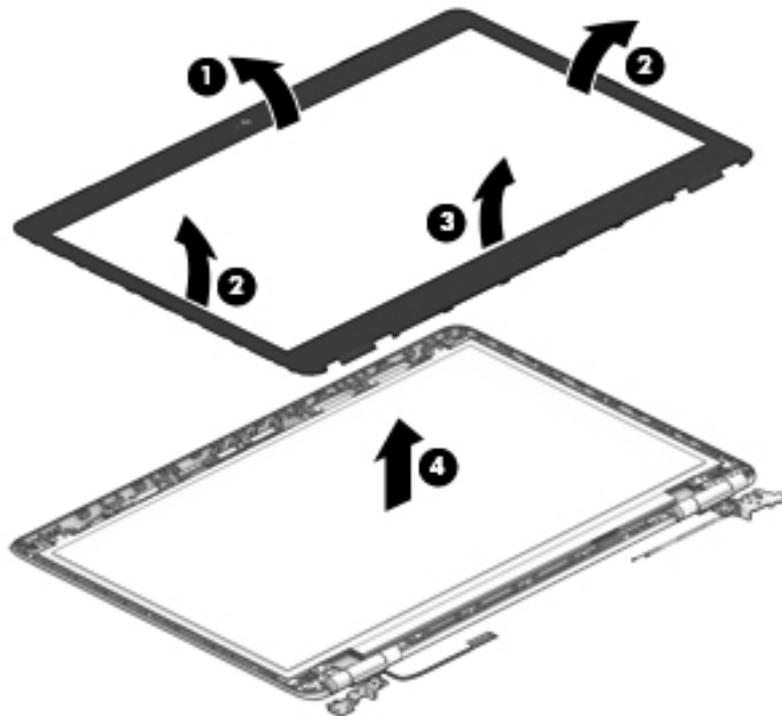
 **NOTE:** Make note of the routing of the cables before removing the cables.

2. Open the hinges **(1)** as wide as possible, release the display cable from the clips **(2)** securing it to the top cover, and then move the display cable **(3)** out of the way.

3. Release the antenna cable from the clips (4) securing it to the top cover, move the antenna cable (5) out of the way, and then remove the display assembly (6).

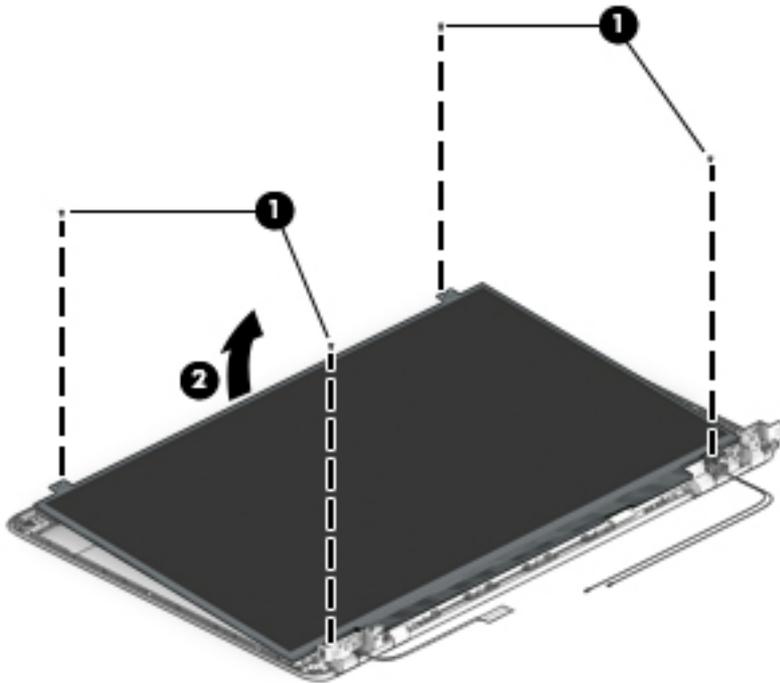


4. If it is necessary to replace the display bezel or any of the LED display assembly subcomponents:
 - a. Use a plastic tool to disengage the bezel starting at the top (1), left and right sides (2), and bottom (3).
 - b. Remove the display bezel (4).

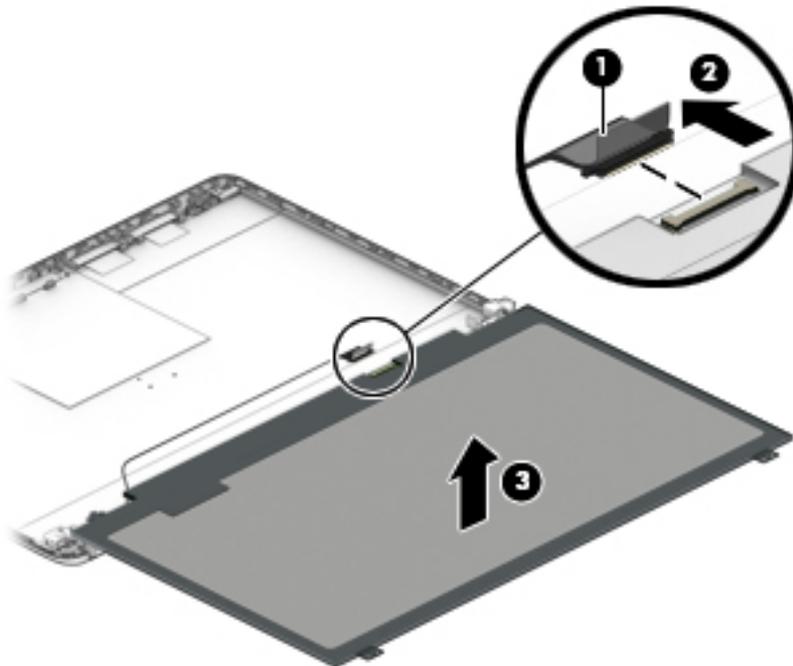


 **NOTE:** The camera and microphone board can be removed after removing the display bezel and before removing the display panel. See [Camera on page 69](#).

5. If it is necessary to replace the raw display panel, remove the four Phillips M2.0 x 3 screws **(1)** that secure the display panel to the display enclosure, and then lift the panel **(2)** to remove it.

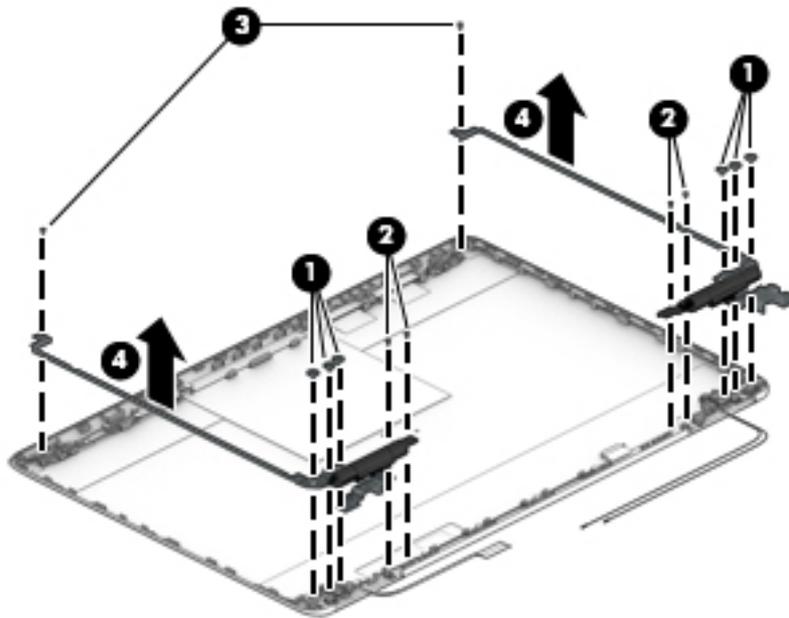


6. Remove the tape **(1)** covering the display panel connector, disconnect the connector **(2)** from the display panel, and then remove the panel **(3)**.

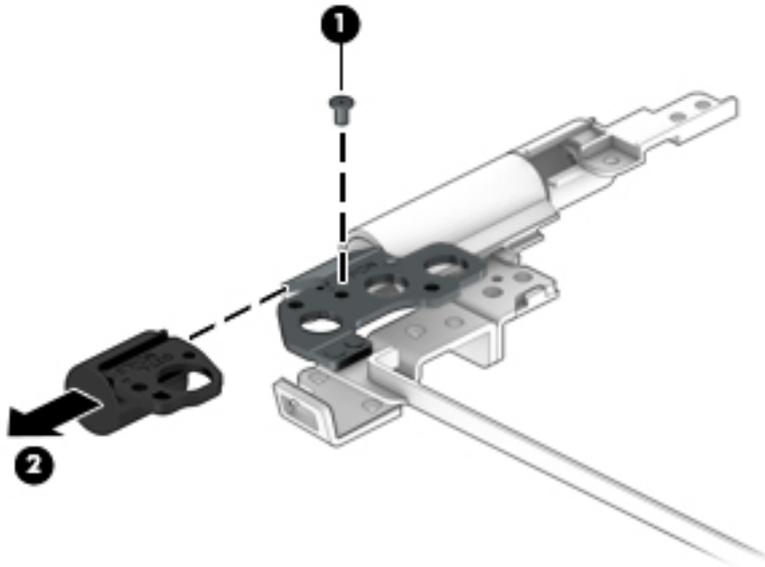


7. If it is necessary to replace the hinge brackets, remove the three Phillips M2.5x3.0 screws **(1)** from the bottom of each hinge bracket, and then remove the two Phillips M2x3.0 screws **(2)** from each bracket.

8. Remove the Phillips M2x3.0 screws **(3)** from the top of each hinge bracket, and then remove the hinge brackets **(4)**.

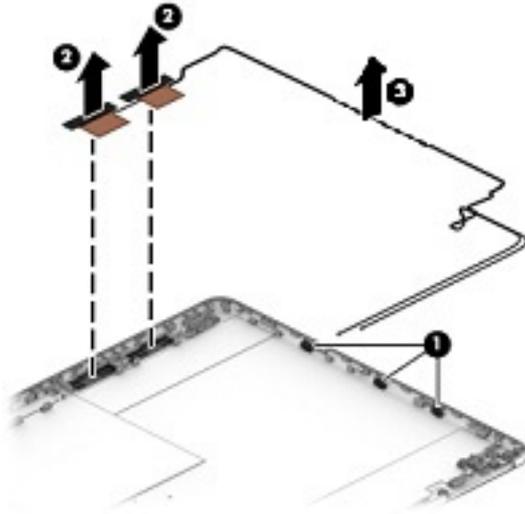


9. Turn the bracket face down, remove the Phillips M2x3.0 screw **(1)** from the top, and then remove the hinge bracket cap **(2)**.

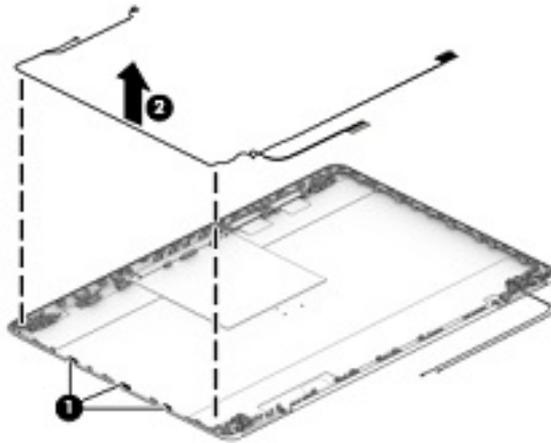


10. If it is necessary to replace the WLAN antennas:
- Release the WLAN antenna cable from the routing path **(1)** of the display enclosure.
 - Carefully peel back the metallic tape **(2)** to release the wireless antenna transceivers from the display enclosure.

- c. Remove the WLAN antenna cable (3) from the display enclosure.



11. If it is necessary to replace the display cable:
- a. Release the cable from the routing path (1) along the display enclosure.
 - b. Remove the cable (2).



 **IMPORTANT:** Use care when handling and installing the new antennas. Accidental bending of the antenna elements will detune the antenna and degrade the computer's performance.

Reverse this procedure to install the display assembly.

Camera

Description	Spare part number
Camera	
<ul style="list-style-type: none">• 3D camera	781624-005
<ul style="list-style-type: none">• HD camera	846006-003
Microphone board	862969-001



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

Before removing the camera, follow these steps:

1. Shut down the computer.
2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet and then unplugging the AC adapter from the computer.
3. Disconnect all external devices connected to the computer.
4. Remove the following components:
 - a. Service door (see [Service door on page 29](#))
 - b. Base enclosure (see [Base enclosure on page 33](#))
 - c. Battery (see [Battery on page 35](#))
 - d. Hard drive (see [Hard drive on page 37](#))
 - e. SSD (see [SSD \(M.2\) on page 39](#))
 - f. Front speakers (see [Front speakers on page 40](#))
 - g. Fans (see [Fans on page 44](#))
 - h. Heatsink (see [Heatsink on page 45](#))
 - i. System board (see [System board on page 47](#))
 - j. Power in connector (see [Power in connector on page 61](#))
 - k. Remove the display bezel (see [Display assembly on page 63](#))

Remove the camera:

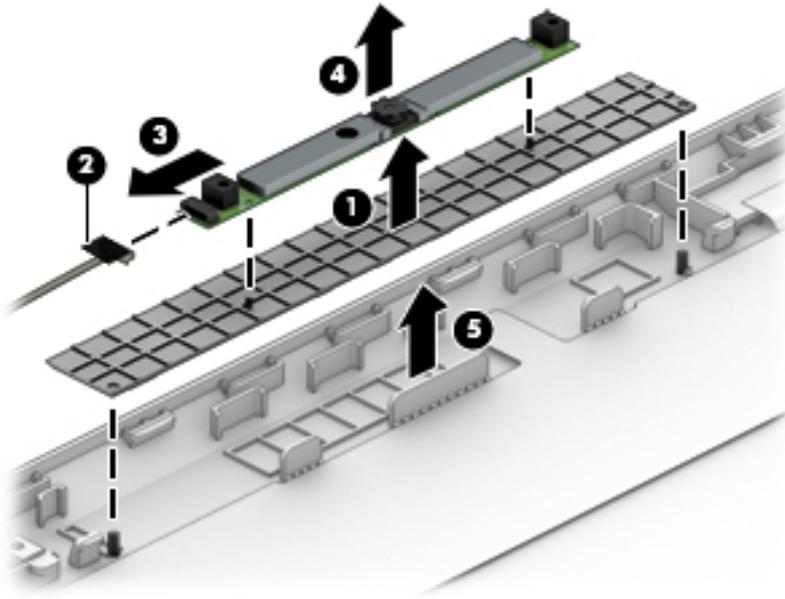
1. If it is necessary to replace the camera module:



CAUTION: Handle the module with caution. This module has a thin profile and is susceptible to damage when not handled carefully.

- a. Lift up the camera module and cable **(1)**.
- b. Lift the tape **(2)** covering the from the module, and remove the cable **(3)**.
- c. Remove the camera module **(4)**.

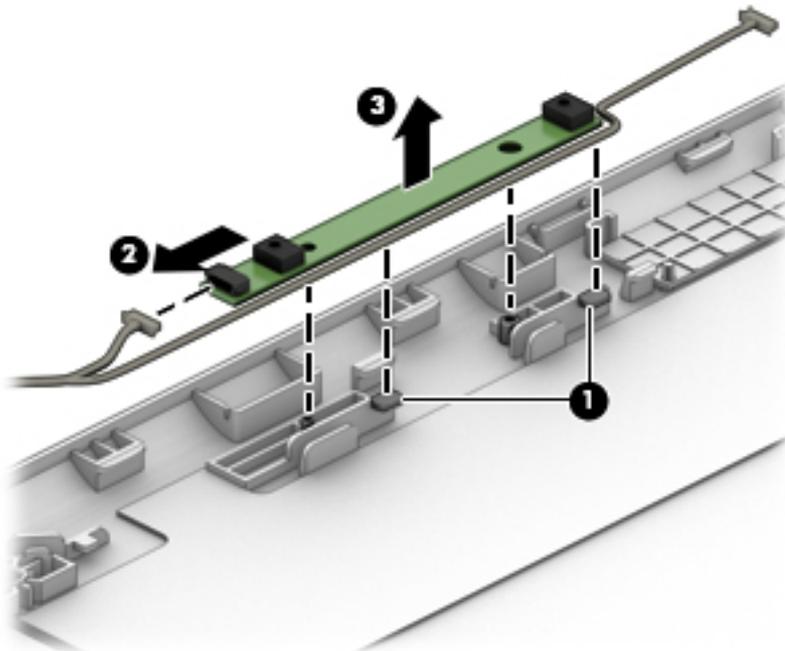
- d. For HD cameras only, lift the frame (5) to remove it from the display enclosure.



2. If it is necessary to replace the microphone module:

CAUTION: Handle the module with caution. This module has a thin profile and is susceptible to damage when not handled carefully.

- Release the module clips (1) from the module, and detach the cable (2).
- Detach the camera or microphone module (3) from the display enclosure. (The module is attached to the display enclosure with double-sided adhesive.)



Reverse this procedure to install the camera.

7 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

- ▲ Turn on or restart the computer, quickly press **esc**, and then press **f10**.

Updating Setup Utility (BIOS)

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

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

- HP Support Assistant
 1. Type `support` in the taskbar search box, and then select the **HP Support Assistant** app.
– or –
Click the question mark icon in the taskbar.
 2. Select **My PC**, and then select **Specifications**.
- Setup Utility (BIOS)
 1. Start Setup Utility (BIOS) (see [Starting Setup Utility \(BIOS\) on page 71](#)).
 2. Select **Main**, select **System Information**, and then make note of the BIOS version.
 3. Select **Exit**, select **No**, and then follow the on-screen instructions.

To check for later BIOS versions, see [Downloading a BIOS update on page 72](#).

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

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

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. Click **Updates**, and then click **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:
 - a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. If the update is more recent than your BIOS version, make a note of the date, name, or other identifier. You 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.

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

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

8 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 73](#).

- 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.

– or –

Select **Identify now** to let HP automatically detect your product.

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.

Additional BIOS crisis recovery tool

HP provides a BIOS crisis recovery tool through the HP PC Hardware Diagnostics 3-in-1 USB key. This tool can be used by HP authorized service providers to recover systems that have failed due to a corrupted BIOS. For more information about using the 3-in-1 USB key for BIOS crisis recovery, go to <http://www.hp.com/go/techcenter/pcdiags>. Additional information is included in the web-based training offered by HP University. See the modules that cover HP PC Hardware Diagnostics (UEFI).

9 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 –

Click 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 keyboard to the keyboard dock 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 75](#). For information on the recovery options that are available using the recovery media, see [Using Windows tools on page 76](#).
- 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 77](#).

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

Creating HP Recovery media (select products only)

If possible, check for the presence of the Recovery partition and the Windows partition. From 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. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also 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 76](#).

- 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. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also 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 keyboard to the keyboard dock 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 77](#).

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 started app.

- ▲ Select the **Start** button, and then select the **Get started** 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 started app.
 - ▲ Select the **Start** button, and then select the **Get started** 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 77](#). If you have not already created recovery media, see [Creating HP Recovery media \(select products only\) on page 75](#).
- 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 77](#).
- 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 80](#).

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 75](#).

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 75](#).
- 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 75](#).
- 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. See the *Worldwide Telephone Numbers* booklet included with the computer. You can also 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 keyboard to the keyboard dock before beginning these steps (select products only).

1. Type `recovery` in the taskbar search box, select **Recovery Manager**, and then select **HP 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 down button; then select **f11**.

- or -

Turn on or restart the tablet, and then quickly hold down the Windows 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 79](#).

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 keyboard to the keyboard dock before beginning these steps.

1. Insert the HP Recovery media.
2. Access BIOS:

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 down button; then select **f9**.

- or -

Turn on or restart the tablet, and then quickly hold down the Windows 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 75](#).



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.

10 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	41.68 cm	16.41 in
Depth	27.95 cm	11.0 in
Height	3.29 cm	1.3 in
Weight	3.35 kg (depending on configuration)	7.39 lbs (depending on configuration)
Input power		
Operating voltage and current	19.5 V dc @ 11.8 A – 230 W	
Temperature		
Operating	5°C to 35°C	41°F to 95°F
Nonoperating	-20°C to 60°C	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	-15 m to 3,048 m	-50 ft to 10,000 ft
Nonoperating	-15 m to 12,192 m	-50 ft to 40,000 ft
NOTE: Applicable product safety standards specify thermal limits for plastic surfaces. The device operates well within this range of temperatures.		

43.94 cm (17.3 in) display specifications

	Metric	U.S.
Dimensions		
Diagonal size	43.94 cm	17.3 in
Thickness	4.2 mm	0.165 in
Brightness	300 nits (cd/m ²)	
Resolution	3840x2160	
Backlight	WLED	
Surface treatment	AntiGlare	
Companion standard	eDP+PSR	
Viewing angle	SVA	

Hard drive specifications

	1 TB*	2 TB*
Dimensions		
Height	9.5 mm	9.5 mm
Width	70 mm	70 mm
Weight	115 g	115 g
Interface type	SATA	SATA
Transfer rate	Synchronous (maximum) 300 MB/s (Drive Capability)	
Security	ATA security	ATA security
Seek times (typical read, including setting)		
Single track	1.4 ms	1.4 ms
Average	10 ms	10 ms
Maximum	12 ms	12 ms
Logical blocks	1,938,921,461	3,877,842,922
Disk rotational speed	7200 rpm	5400 rpm
Operating temperature	0°C to 60°C (0°F to 140°F)	0°C to 60°C (0°F to 140°F)

*Size refers to hard drive storage capacity. Actual accessible capacity is less. Actual drive specifications may differ slightly.

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

11 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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	ISI	1
Israel	SII	1
Italy	IMQ	1
Japan	JIS	3
The Netherlands	KEMA	1
New Zealand	SANZ	1
Norway	NEMKO	1
The People's Republic of China	CCC	4
Saudi Arabia	SASO	7
Singapore	PSB	1
South Africa	SABS	1
South Korea	KTL	5
Sweden	SEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	6
Thailand	TISI	1
The United Kingdom	ASTA	1
The United States	UL	2

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

Country/region	Accredited agency	Applicable note number
		3. The appliance coupler, flexible cord, and wall plug must bear a “T” mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCTF, 3-conductor, 0.75 mm ² or 1.25 mm ² 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 mm ² 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 mm ² 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 mm ² 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 mm ² or 1.00 mm ² conductor size, with plug BS 1363/A with BSI or ASTA marks.

12 Recycling

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

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

Index

Symbols/Numerics

- 3D camera
 - identifying 7
- 3D camera light, identifying 7

A

- AC adapter and battery 5
- AC adapter, spare part number 23
- action keys 12
 - identifying 12
- airplane mode key 13
- antenna, spare part number 63
- antennas
 - removal 67, 68
- antennas, spare part number 22
- audio, product description 2
- audio-in (microphone) jack 6
- audio-out (headphone) jacks 5

B

- back cover, spare part number 22, 63
- backups 75
- base enclosure
 - removal 33
 - spare part numbers 20, 33
- battery
 - removal 35
 - spare part number 20, 35
- BIOS
 - determining version 71
 - downloading an update 72
 - starting the Setup Utility 71
 - updating 71
- Bluetooth label 16
- boot order
 - changing 79
- bottom 16
- buttons
 - left TouchPad 9
 - power 10
 - right TouchPad 9

C

- camera
 - identifying 7
 - removal 69
 - spare part numbers 69
- camera frame
 - spare part number 22, 63
- camera light, identifying 7, 8
- camera module
 - removal 69
- camera, identifying 8
- camera, spare part number 21, 69
- caps lock light, identifying 10
- chipset, product description 1
- components
 - bottom 14
 - display 7
 - left side 5
 - rear 15
 - right side 4
 - top 9
- computer major components 17
- computer specifications 81
- connector, power 5

D

- display
 - specifications 82
- display assembly
 - removal 63
 - spare part numbers 63
 - subcomponents 21
- display bezel
 - removal 65
 - spare part numbers 21, 63
- display cable, spare part numbers 22, 63
- display hinges
 - spare part number 22
- display panel
 - product description 1
- drive light 4

E

- esc key, identifying 12

- Ethernet, product description 2

F

- fan
 - spare part number 20, 44
- fans
 - removal 44
- fn key, identifying 12

G

- graphics, product description 1

H

- hard drive
 - product description 1
 - removal 37
 - spare part numbers 19, 22, 37
 - specifications 82
- hard drive bracket
 - removal 38
- hard drive cable
 - removal 37
 - spare part number 22, 37
 - spare part numbers 19
- hard drive connector
 - removal 37
 - spare part number 37
- HDMI port
 - identifying 4
- HDMI to VGA adapter, spare part number 23
- heatsink
 - removal 45
 - spare part number 20, 45
- hinge caps
 - spare part number 22, 63
- hinge kit
 - spare part number 63
- HP PC Hardware Diagnostics (UEFI) using 73
- HP Recovery Manager
 - correcting boot problems 79
 - starting 78

- HP Recovery media
 - creating 75
 - recovery 78
- HP Recovery partition
 - recovery 78
 - removing 80
- I**
- integrated numeric keypad,
 - identifying 12
- internal microphones, identifying 7, 8
- J**
- jacks
 - audio-in (microphone) 6
 - audio-out (headphone) 5
 - network 4
 - RJ-45 (network) 4
- K**
- keyboard
 - product description 3
 - spare part numbers 19
- keys
 - action 12
 - airplane mode 13
 - esc 12
 - fn 12
 - Windows 12
- L**
- labels
 - Bluetooth 16
 - regulatory 16
 - serial number 15
 - service 15
 - wireless certification 16
 - WLAN 16
- lights
 - AC adapter and battery light 5
 - caps lock 10
 - drive 4
 - mute 10
 - power 10
 - RJ-45 (network) status 4
- M**
- memory
 - spare part numbers 20, 31
- memory card reader, identifying 4
- memory card, identifying 4
- memory module
 - product description 1
 - removal 31
 - spare part numbers 31
- microphone
 - product description 2
- microphone board
 - spare part number 69
- microphone board, spare part
 - number 21
- microphone module
 - removal 69, 70
- mini Dual-Mode DisplayPort
 - identifying 4
- minimized image recovery 78
- minimized image, creating 77
- model name 1
- mute light, identifying 10
- N**
- network jack, identifying 4
- O**
- operating system, product
 - description 3
- optical drive
 - product description 2
- original system recovery 77
- P**
- panel
 - spare part number 63
- pointing device, product
 - description 3
- ports
 - HDMI 4
 - mini Dual-Mode DisplayPort 4
 - product description 2
 - USB 3.0 4, 5
- power board cable
 - spare part numbers 19
- power button board
 - removal 55
 - spare part number 55
 - spare part numbers 19
- power button, identifying 10
- power connector, identifying 5
- power cord
 - requirements for all countries 83
- requirements for specific
 - countries and regions 84
 - set requirements 83
 - spare part numbers 23
- power in connector
 - removal 61
 - spare part number 19, 61
- power lights, identifying 10
- power requirements, product
 - description 3
- processor
 - product description 1
- product description
 - audio 2
 - chipset 1
 - display panel 1
 - Ethernet 2
 - external media cards 2
 - graphics 1
 - hard drive 1
 - keyboard 3
 - memory module 1
 - microphone 2
 - operating system 3
 - optical drive 2
 - pointing device 3
 - ports 2
 - power requirements 3
 - processors 1
 - product name 1
 - security 3
 - serviceability 3
 - video 2
 - wireless 2
- product name 1
- product name and number,
 - computer 15
- R**
- raw panel
 - spare part number 21
- recover
 - options 77
- recovery
 - discs 76, 78
 - HP Recovery Manager 77
 - media 78
 - starting 78
 - supported discs 76
 - system 77

- USB flash drive 78
 - using HP Recovery media 76
- recovery media
 - creating 75
 - creating using HP Recovery Manager 76
- recovery partition
 - removing 80
- regulatory information
 - regulatory label 16
 - wireless certification labels 16
- removal/replacement
 - procedures 29, 33
- RJ-45 (network) jack, identifying 4
- RJ-45 (network) status lights, identifying 4
- RTC battery
 - removal 51
 - spare part number 19, 51

S

- screw covers
 - spare part numbers 23
- screw kit
 - spare part numbers 23
- security cable slot, identifying 5
- security, product description 3
- serial number 15
- serial number, computer 15
- service door
 - removal 29
 - spare part numbers 29
- service door, identifying 14
- service labels, locating 15
- serviceability, product description 3
- slots
 - memory card reader 4
 - security cable 5
- speaker
 - removal 40, 57
 - spare part numbers 40, 57
- speakers
 - identifying 11
 - spare part numbers 19
- specifications
 - computer 81
 - display 82
 - hard drive 82
- SSD
 - removal 39

- spare part number 39
- spare part numbers 20, 39
- supported discs, recovery 76
- system board
 - removal 47
 - spare part numbers 19, 47
- system recovery 77
- system restore point
 - creating 76
- system restore point, creating 75

T

- TouchPad
 - buttons 9
- TouchPad board
 - removal 59
 - spare part number 19, 59
- Touchpad board cable
 - spare part numbers 19
- TouchPad rubber click button
 - spare part number 19
- TouchPad zone, identifying 9
- traveling with the computer 16

U

- USB 3.0 port, identifying 4, 5
- USB board
 - removal 53
 - spare part number 53
 - spare part numbers 20
- USB board cable
 - removal 47
 - spare part numbers 47

V

- vents, identifying 5, 14, 15
- video, product description 2

W

- Windows
 - system restore point 75, 76
- Windows key, identifying 12
- Windows tools
 - using 76
- wireless certification label 16
- wireless, product description 2
- WLAN
 - spare part number 20
- WLAN antennas, identifying 7, 8
- WLAN device 16
- WLAN label 16

- WLAN module
 - removal 42
 - spare part number 42