HP Pavilion Notebook PC (model numbers used: 14-al000 through 14-al099)

Maintenance and Service Guide
IMPORTANT! This document is intended for HP authorized service providers only.

© Copyright 2016 HP Development Company, L.P.

Product notice

Bluetooth is a trademark owned by its proprietor and used by HP Inc. under license. Intel, Core, and Pentium are U.S. registered trademarks of Intel Corporation. Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries. SD Logo is a trademark of its proprietor.

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 of Windows 10. This computer may require upgraded and/or separately purchased hardware, drivers and/or software to take full advantage of Windows 10 functionality. See http://www.microsoft.com for details.

The information contained herein is subject to change without notice. The only warranties for HP products and services are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. HP shall not be liable for technical or editorial errors or omissions contained herein.

First Edition: April 2016

Document Part Number: 854535-001

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).

Table of contents

1 Product description 1

2 External component identification 4

Locating hardware 4

Locating software 4

Display 5

Buttons and speakers 6

Keys 7

Lights 8

TouchPad 9

Left side 10

Right side 11

Bottom 12

3 Illustrated parts catalog 13

Service tag 13

Computer major components 14

Display components 23

Miscellaneous parts 25

4 Removal and replacement procedures preliminary requirements 26

Tools required 26

Service considerations 26

Plastic parts 26

Cables and connectors 26

Drive handling 27

Grounding guidelines 28

Electrostatic discharge damage 28

Packaging and transporting guidelines 29

Workstation guidelines 29

Equipment guidelines 30

5 Removal and replacement procedures 31

Component replacement procedures 31

Bottom cover 31

Battery 33

Hard drive 34
TouchPad 35
Memory module 36
WLAN module 37
RTC battery 39
Card reader board 40
Solid-state drive 42
Fan 43
System board 44
Heat sink 47
TouchPad cable 50
Speakers 51
Power connector cable 52
Display assembly 53

6 Using Setup Utility (BIOS) 62
Starting Setup Utility (BIOS) 62
Updating Setup Utility (BIOS) 62
Determining the BIOS version 62
Downloading a BIOS update 63

7 Using HP PC Hardware Diagnostics (UEFI) 64
Downloading HP PC Hardware Diagnostics (UEFI) to a USB device 64

8 Specifications 66
Computer specifications 66

9 Backing up, restoring, and recovering 68
Creating recovery media and backups 68
Creating HP Recovery media (select products only) 68
Using Windows tools 69
Restore and recovery 70
Recovering using HP Recovery Manager 70
What you need to know before you get started 70
Using the HP Recovery partition (select products only) 71
Using HP Recovery media to recover 71
Changing the computer boot order 72
Removing the HP Recovery partition (select products only) 73

10 Power cord set requirements 74
Requirements for all countries 74
Requirements for specific countries and regions 74

11 Recycling 76

Index 77

1 Product description

Category	Description
Product Name	HP Pavilion Notebook PC (model numbers used: 14-al000 through 14-al099)
Processors	• Intel™ Core® i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W • Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W • Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W • Intel Pentium® 4405U 2.10-GHz processor (2133-MHz FSB, 2.0-MB L3 cache, dual core, 15-W
Chipset	Integrated soldered-on-chip (SOC)
Graphics	**Hybrid graphics:** nVIDIA N16S-GTR (GeForce 940MXM) with up to 4.0-GB of discrete video memory (512-MB × 16 DDR3 × 4 pieces, on computer models equipped with an Intel i7-6500U or an Intel i5-6200U processor) nVIDIA N16S-GTR (GeForce 940MXM) with up to 2.0-GB of discrete video memory (256-MB × 16 DDR3 × 4 pieces, on computer models equipped with an Intel i3-6100U or an Intel Pentium 4405U processor) **Internal graphics:** Intel HD Graphics 520 on computer models equipped with an Intel i7-6500U, Intel i5-6200U processor, or an Intel i3-6100U processor Intel HD Graphics 510 on computer models equipped with an Intel Pentium 4405U processor Universal memory architecture (UMA) graphics Support for HD decode, DX12, and high-definition multimedia interface (HDMI) Support for Optimus Support for GPU Performance Scaling (GPS)
Panel	• 14.0-in, full high-definition (FHD), liquid crystal display (LCD), BrightView (1920×1080), UWVA, eDP, slim-flat (3.0-mm), TouchScreen display; typical brightness: 220 nits • 14.0-in, FHD, LCD, BrightView (1920×1080), UWVA, eDP, slim-flat (3.0-mm), non-TouchScreen display; typical brightness: 250 nits • 14.0-in, high-definition (HD), LCD, BrightView (1366×768), UWVA, eDP, slim-flat (3.0-mm), TouchScreen display; typical brightness: 200 nits • 14.0-in, HD, LCD, BrightView (1366×768), UWVA, eDP, slim-flat (3.0-mm), non-TouchScreen display; typical brightness: 220 nits MultiTouch enabled
Memory	Two SODIMM slots, non-accessible/non-upgradeable Support for DDR4-2133 dual channel **Support for up to 16.0-GB maximum system memory in the following configurations:** • 16384-MB: 8192-MB × 2

Category	Description
Memory *(continued)*	• 12288-MB: 8192-MB × 1 + 4096-MB × 1 • 8192-MB: 8192-MB × 1 or 4096-MB × 2 • 6144-MB: 4096-MB × 1 + 2048-MB × 1 • 4096-MB: 4096-MB × 1 or 2048-MB × 2
Hard drive	Support for all 9.5-mm and 7.0-mm, SATA, 2.5-in hard drives Support for Accelerometer hard drive protection Support for the following hard drive configurations: • 2-TB, 5400-rpm, 9.5-mm hard drive • 1-TB, 5400-rpm, 9.5-mm hard drive • 500-GB, 7200-rpm, 7.2-mm hard drive Support for a 500-GB, 5400-rpm, SATA, 7.0-mm, 8.0-GB NAND hybrid solid-state hard drive
Solid-state drive	Support for a 256-MB, M2.2280, SATA-3, solid-state drive supporting triple-level cell (TLC) and a 128-MB, M2.2280, SATA-3, solid-state drive
Audio and video	HP Wide Vision HD webcam with indicator light, 720p by 30 frames per second, BSI sensor, f2.0, 88° wide field of vision Support for B & O Play Dual speakers HD Audio (Conexant CX7700) Integrated dual-array microphones with appropriate beam-forming, echo-cancellation, and noise suppression software Support for Smart Amp Support for voice recognition
Ethernet	Integrated 10/100 network interface controller (NIC)
Wireless	Integrated wireless local area network (WLAN) options by way of wireless module Support for the Broadcom BCM43142 802.11 bgn Wi-Fi M.2 Combo Adapter and Intel 3165NGWG 1 ac 1×1 + Bluetooth 4.0 LE PCIe+USB NGFF 2230 Combo Adapter Two WLAN antennas Support for Intel WiDi Compatible with Miracast-certified devices
External media cards	Micro-Secure Digital (SD) media reader slot
Ports	• Audio-in (mono microphone)/audio-out (stereo headphone) combination • AC Smart Pin adapter plug • High-definition multimedia interface (HDMI) v1.4 supporting up to 1920×1080 (4K/2K) @ 60 Hz • RJ-45/Ethernet • USB 2.0 port • USB 3.0 port
Keyboard/pointing devices	Textured, island-style, backlit keyboard

Category	Description
Keyboard/pointing devices *(continued)*	Textured, island-style, non-backlit keyboard TouchPad requirements: • ClickPad with image sensor • Multitouch gestures enabled • Support for Windows modern trackpad gestures • Taps enabled as default
Power requirements	Support for the following AC adapters: • 65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm) • 65-W HP Smart AC adapter (non-PFC, S-3P, 4.5-mm) • 45-W HP Smart AC adapter (RC, 4.5-mm, slim) Support for a C5 receptacle, 1.0-m (3.2-ft), 3-wire conductor power cord Support for a 4-cell, 55-Wh, 3.62-Ah, Li-ion battery
Security	Support for Trusted Platfom Module (TPM) 2.0 Support for security cable lock
Operating system	**Preinstalled:** Windows 10 and Windows 10 Professional **For Developed Market (ML):** Windows 10 Home ML and Windows 10 Home High End ML **For Emerging Market (EM/SL):** • Windows 10 Home China Language Edition/CPPP • Windows 10 Home EM/SL • Windows 10 Home High End/SEAP • Windows 10 Home High End EM/SL/China • Windows 10 Home Single Language Edition/SEAP • FreeDOS 2.0
Serviceability	**End user replaceable part**: AC adapter

2 External component identification

Locating hardware

To find out what hardware is installed on your computer:

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

  A list displays all the devices installed on your computer.

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

Locating software

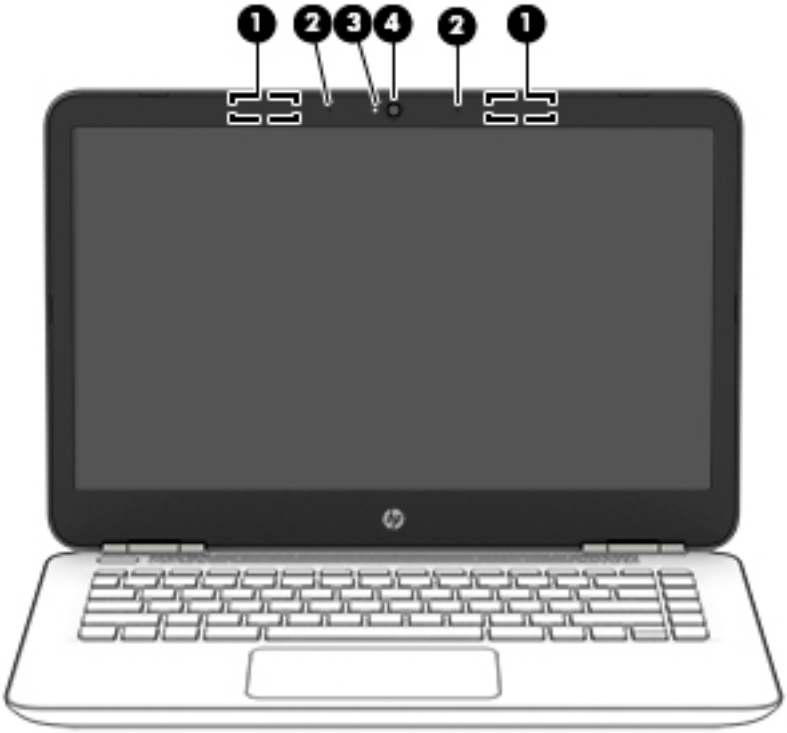
To find out what software is installed on your computer:

- Select the **Start** button, and then select **All apps**.

  – or –

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

Display



Item	Component	Description
(1)	WLAN antennas*	Send and receive wireless signals to communicate with WLANs.
(2)	Internal microphones	Record sound.
(3)	Webcam light	On: The webcam is in use.
(4)	Webcam	Allows you to video chat, record video, or record still images. Some also provide HD or 3D capability, apps for gaming, or facial recognition software like Windows Hello. To use your webcam: ▲ Type `camera` in the taskbar search box, and then select **Camera**.

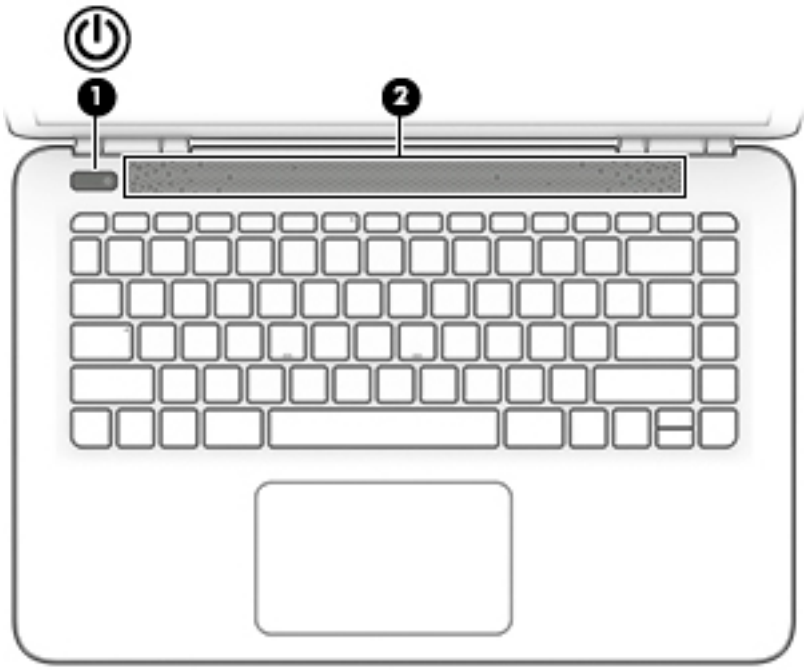
*The antennas are not visible from the outside of the computer. For optimal transmission, keep the areas immediately around the antennas free from obstructions.

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

To access this guide:

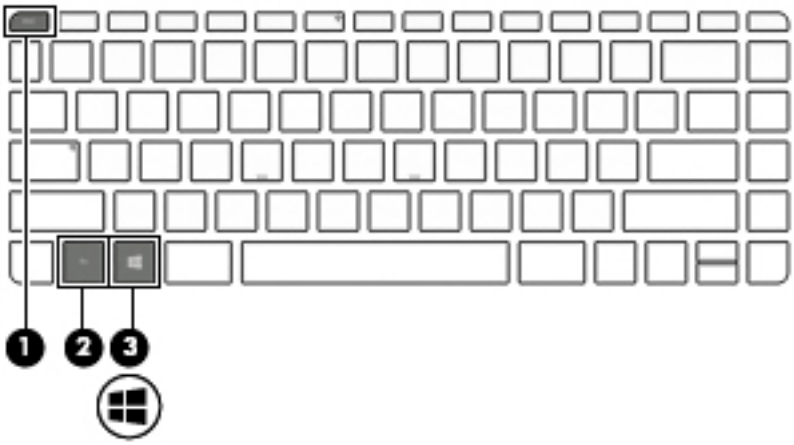
▲ Select the **Start** button, select **All apps**, select **HP Help and Support**, and then select **HP Documentation**.

Buttons and speakers



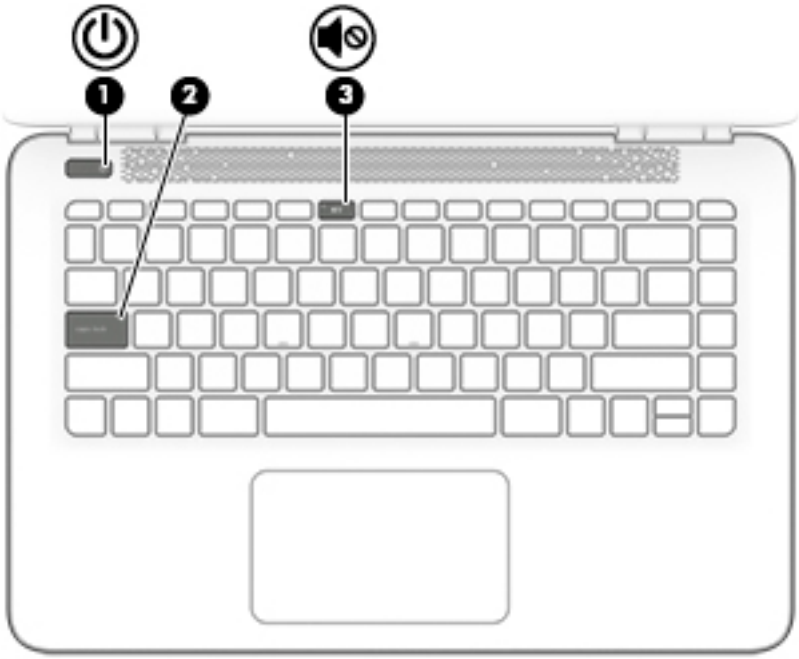
Item	Component	Description
(1)	Power button	• When the computer is off, press the button to turn on the computer. • When the computer is on, press the button briefly to initiate Sleep. • When the computer is in the Sleep state, press the button briefly to exit Sleep. • When the computer is in Hibernation,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

Keys



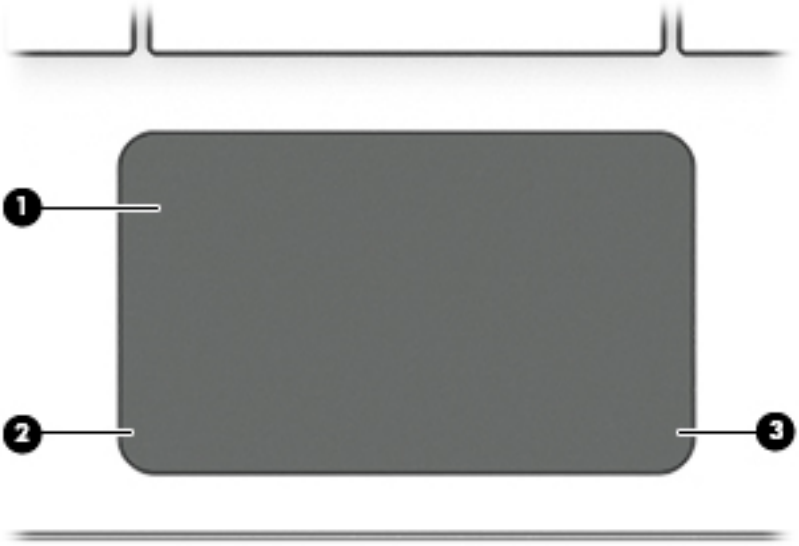
Item	Component	Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Displays system information when pressed in combination with the esc key.
(3)	Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the **Start** menu.

Lights



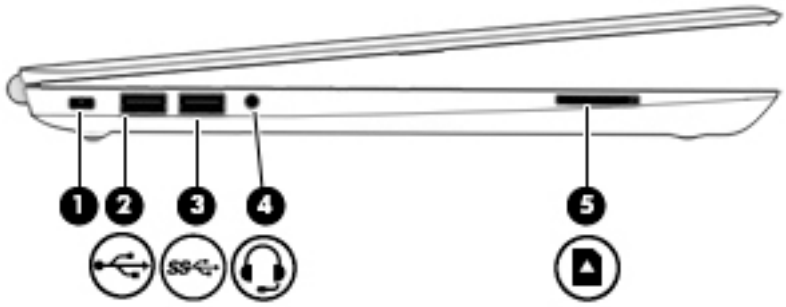
Item	Component	Description
(1)	Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(2)	Mute light	• Amber: Computer sound is off. • Off: Computer sound is on.

TouchPad



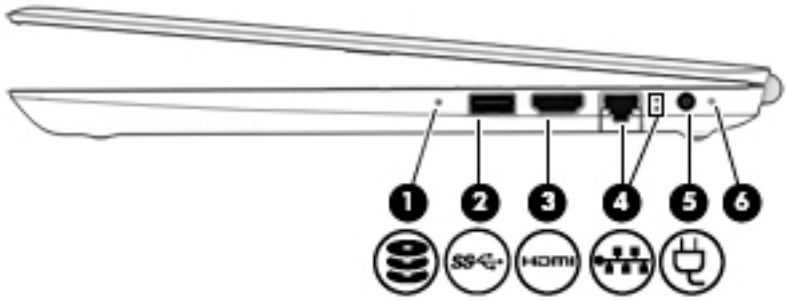
Item	Component	Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Left side



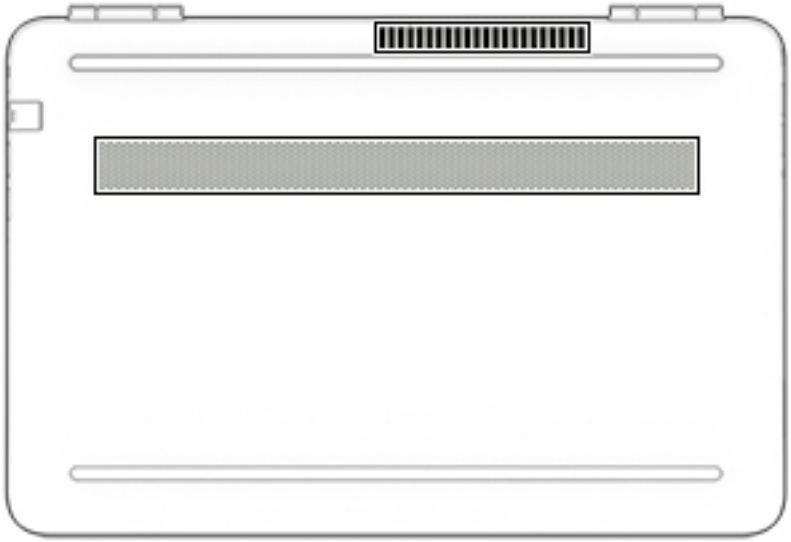
Item	Component	Description
(1)	Security cable slot	Attaches an optional security cable to the computer. **NOTE:** The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)	USB 2.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner, or USB hub.
(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)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects **WARNING!** To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*. To access this guide: ▲ Select the **Start** button, select **All apps**, select **HP Help and Support**, and then select **HP Documentation**. **NOTE:** When a device is connected to the jack, the computer speakers are disabled.
(5)	Memory card reader	Reads optional memory cards that enable you to store, manage, share, or access information. To insert a card: 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. To remove a card: ▲ Press in on the card, and then remove it from the memory card reader.

Right side



Item	Component	Description
(1)	Drive light (select products only)	• Blinking white: The hard drive is being accessed. • Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(2)	USB 3.0 port	Connects an optional USB device, such as a keyboard, mouse, external drive, printer, scanner, or USB hub.
(3)	HDMI port	Connects an optional video or audio device, such as a high-definition television, any compatible digital or audio component, or a high-speed HDMI device.
(4)	RJ-45 (network) jack/status lights	Connects a network cable. • White: The network is connected. • Amber: Activity is occurring on the network
(5)	Power connector	Connects an AC adapter.
(6)	AC adapter and battery light	• 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.

Bottom

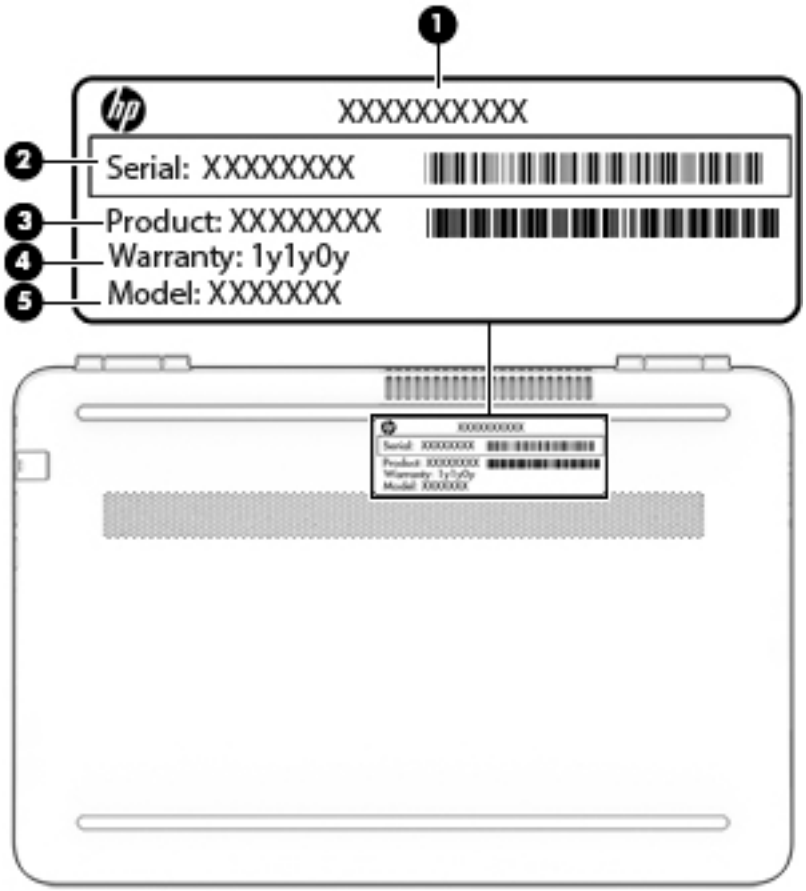


Component	Description
Vents (2)	Enable airflow to cool internal components. **NOTE:** The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

3 Illustrated parts catalog

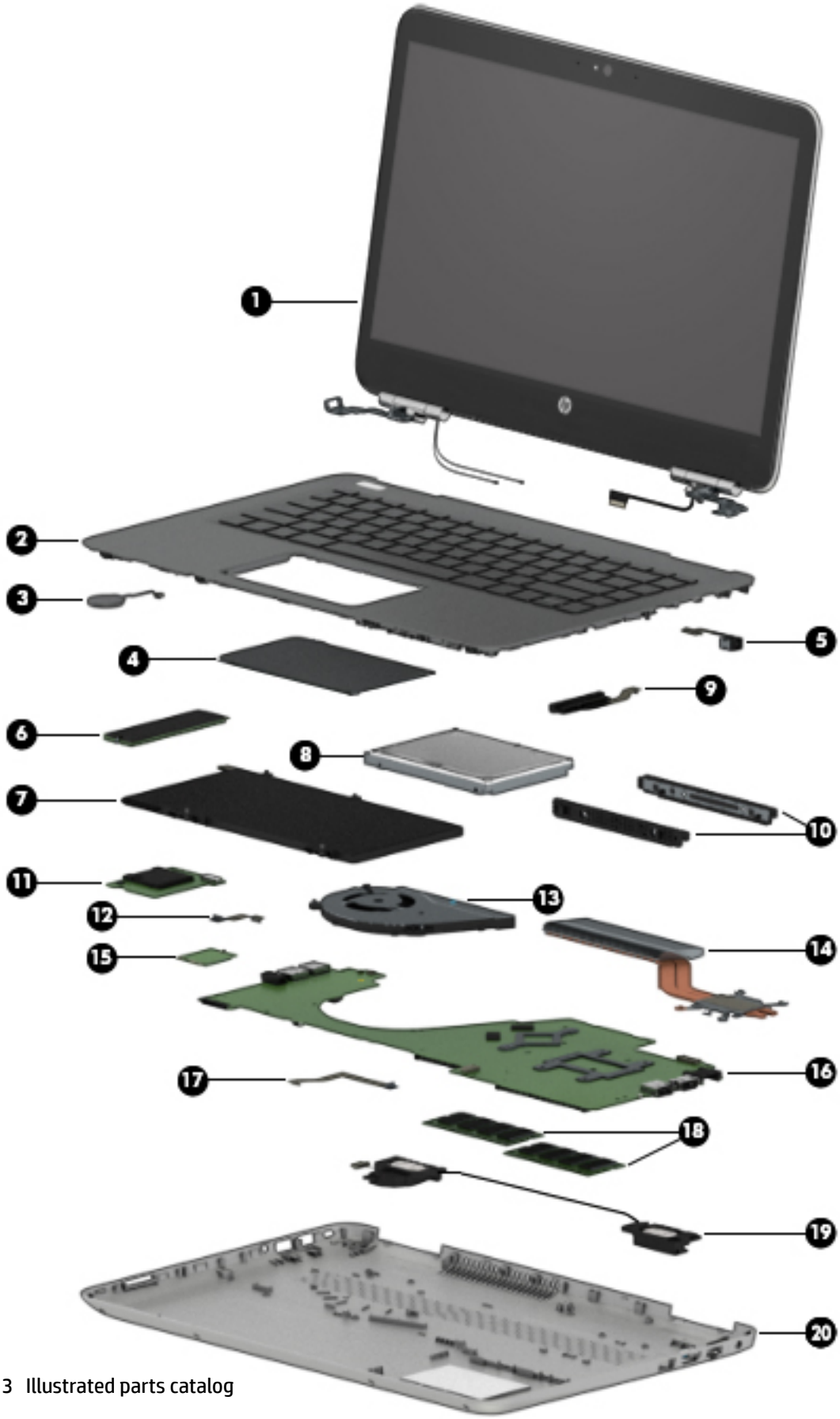
Service tag

When ordering parts or requesting information, provide the computer serial number and model number provided on the service tag.



Item	Description	Function
(1)	Model description	This is the alphanumeric identifier used to locate documents, drivers, and support for the computer.
(2)	Serial number (s/n)	This is an alphanumeric identifier that is unique to each product.
(3)	Part number/Product number (p/n)	This number provides specific information about the product's hardware components. The part number helps a service technician to determine what components and parts are needed.
(4)	Warranty period	This number describes the duration of the warranty period for the computer.

Computer major components



Item	Component	Spare part number
(1)	**Display assembly**: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display components on page 23.	
(2)	**Keyboard/top cover** with backlight and pointing stick (includes backlight cable, keyboard cable, and pointing stick cable):	
	In cardinal red finish:	
	For use in Belgium	856191-A41
	For use in Bulgaria	856191-261
	For use in Canada	856191-DB1
	For use in the Czech Republic and Slovakia	856191-FL1
	For use in Denmark, Finland, and Norway	856191-DH1
	For use in France	856191-051
	For use in Germany	856191-041
	For use in Greece	856191-151
	For use in Hungary	856191-211
	For use in Israel	856191-BB1
	For use in Italy	856191-061
	For use in Latin America	856191-161
	For use in the Netherlands	856191-B31
	For use in Portugal	856191-131
	For use in Romania	856191-271
	For use in Russia	856191-251
	For use in Saudi Arabia	856191-171
	For use in Slovenia	856191-BA1
	For use in South Korea	856191-AD1
	For use in Spain	856191-071
	For use in Switzerland	856191-BG1
	For use in Taiwan	856191-AB1
	For use in Thailand	856191-281
	For use in Turkey	856191-141
	For use in the United Kingdom	856191-031
	For use in the United States	856191-001
	In modern gold finish:	
	For use in Belgium	856190-A41
	For use in Bulgaria	856190-261
	For use in Canada	856190-DB1

Item	Component	Spare part number
	For use in the Czech Republic and Slovakia	856190-FL1
	For use in Denmark, Finland, and Norway	856190-DH1
	For use in France	856190-051
	For use in Germany	856190-041
	For use in Greece	856190-151
	For use in Hungary	856190-211
	For use in Israel	856190-BB1
	For use in Italy	856190-061
	For use in Latin America	856190-161
	For use in the Netherlands	856190-B31
	For use in Portugal	856190-131
	For use in Romania	856190-271
	For use in Russia	856190-251
	For use in Saudi Arabia	856190-171
	For use in Slovenia	856190-BA1
	For use in South Korea	856190-AD1
	For use in Spain	856190-071
	For use in Switzerland	856190-BG1
	For use in Taiwan	856190-AB1
	For use in Thailand	856190-281
	For use in Turkey	856190-141
	For use in the United Kingdom	856190-031
	For use in the United States	856190-001
	In natural silver finish:	
	For use in Belgium	856189-A41
	For use in Bulgaria	856189-261
	For use in Canada	856189-DB1
	For use in the Czech Republic and Slovakia	856189-FL1
	For use in Denmark, Finland, and Norway	856189-DH1
	For use in France	856189-051
	For use in Germany	856189-041
	For use in Greece	856189-151
	For use in Hungary	856189-211
	For use in Israel	856189-BB1

Item	Component	Spare part number
	For use in Italy	856189-061
	For use in Latin America	856189-161
	For use in the Netherlands	856189-B31
	For use in Portugal	856189-131
	For use in Romania	856189-271
	For use in Russia	856189-251
	For use in Saudi Arabia	856189-171
	For use in Slovenia	856189-BA1
	For use in South Korea	856189-AD1
	For use in Spain	856189-071
	For use in Switzerland	856189-BG1
	For use in Taiwan	856189-AB1
	For use in Thailand	856189-281
	For use in Turkey	856189-141
	For use in the United Kingdom	856189-031
	For use in the United States	856189-001
	Keyboard/top cover without backlight (includes keyboard cable):	
	In cardinal red finish:	
	For use in Belgium	856188-A41
	For use in Bulgaria	856188-261
	For use in Canada	856188-DB1
	For use in the Czech Republic and Slovakia	856188-FL1
	For use in Denmark, Finland, and Norway	856188-DH1
	For use in France	856188-051
	For use in Germany	856188-041
	For use in Greece	856188-151
	For use in Hungary	856188-211
	For use in Israel	856188-BB1
	For use in Italy	856188-061
	For use in Latin America	856188-161
	For use in the Netherlands	856188-B31
	For use in Portugal	856188-131
	For use in Romania	856188-271
	For use in Russia	856188-251

Item	Component	Spare part number
	For use in Saudi Arabia	856188-171
	For use in Slovenia	856188-BA1
	For use in South Korea	856188-AD1
	For use in Spain	856188-071
	For use in Switzerland	856188-BG1
	For use in Taiwan	856188-AB1
	For use in Thailand	856188-281
	For use in Turkey	856188-141
	For use in the United Kingdom	856188-031
	For use in the United States	856188-001
	In modern gold finish:	
	For use in Belgium	856187-A41
	For use in Bulgaria	856187-261
	For use in Canada	856187-DB1
	For use in the Czech Republic and Slovakia	856187-FL1
	For use in Denmark, Finland, and Norway	856187-DH1
	For use in France	856187-051
	For use in Germany	856187-041
	For use in Greece	856187-151
	For use in Hungary	856187-211
	For use in Israel	856187-BB1
	For use in Italy	856187-061
	For use in Latin America	856187-161
	For use in the Netherlands	856187-B31
	For use in Portugal	856187-131
	For use in Romania	856187-271
	For use in Russia	856187-251
	For use in Saudi Arabia	856187-171
	For use in Slovenia	856187-BA1
	For use in South Korea	856187-AD1
	For use in Spain	856187-071
	For use in Switzerland	856187-BG1
	For use in Taiwan	856187-AB1
	For use in Thailand	856187-281

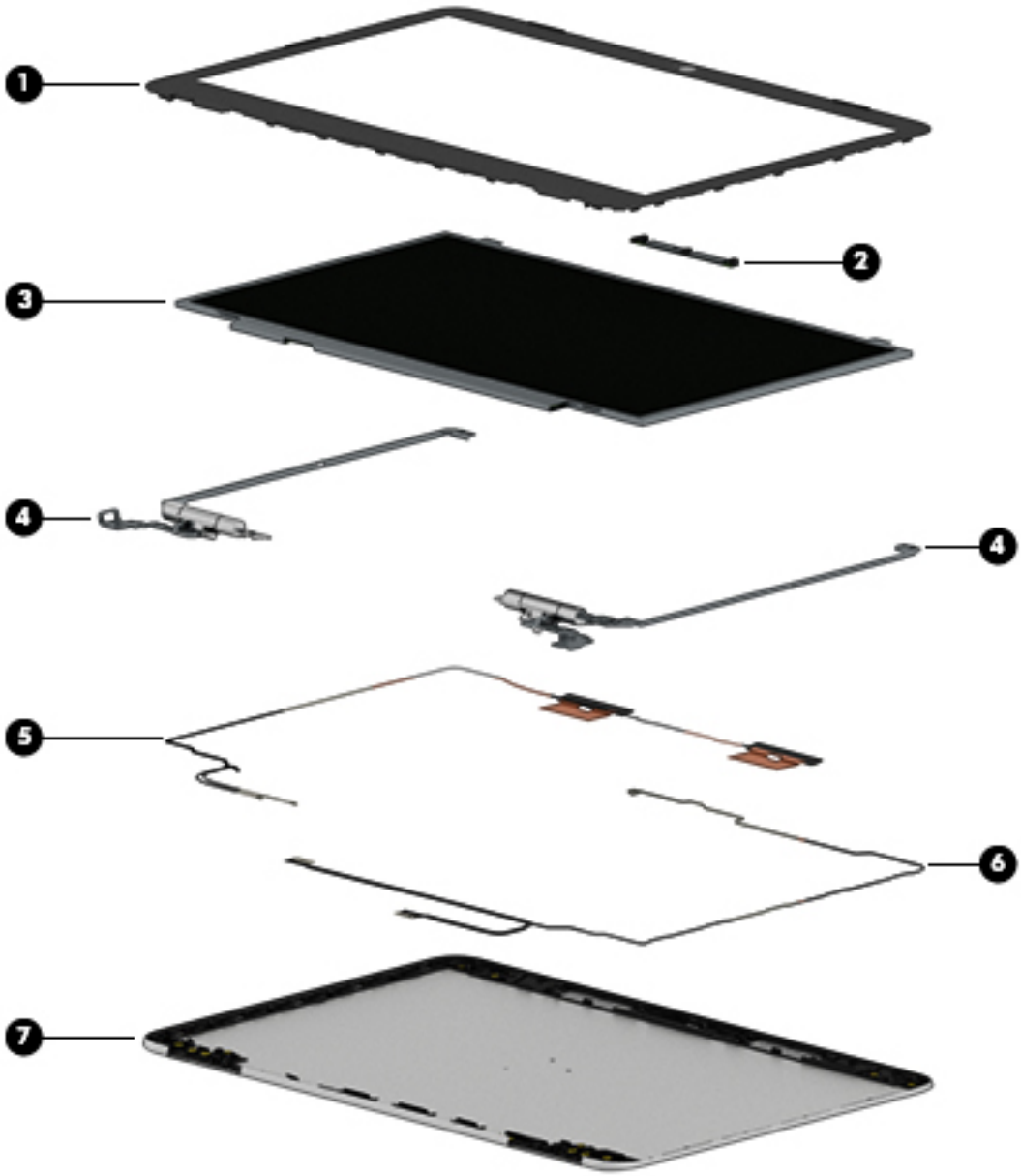
Item	Component	Spare part number
	For use in Turkey	856187-141
	For use in the United Kingdom	856187-031
	For use in the United States	856187-001
	In natural silver finish:	
	For use in Belgium	856186-A41
	For use in Bulgaria	856186-261
	For use in Canada	856186-DB1
	For use in the Czech Republic and Slovakia	856186-FL1
	For use in Denmark, Finland, and Norway	856186-DH1
	For use in France	856186-051
	For use in Germany	856186-041
	For use in Greece	856186-151
	For use in Hungary	856186-211
	For use in Israel	856186-BB1
	For use in Italy	856186-061
	For use in Latin America	856186-161
	For use in the Netherlands	856186-B31
	For use in Portugal	856186-131
	For use in Romania	856186-271
	For use in Russia	856186-251
	For use in Saudi Arabia	856186-171
	For use in Slovenia	856186-BA1
	For use in South Korea	856186-AD1
	For use in Spain	856186-071
	For use in Switzerland	856186-BG1
	For use in Taiwan	856186-AB1
	For use in Thailand	856186-281
	For use in Turkey	856186-141
	For use in the United Kingdom	856186-031
	For use in the United States	856186-001
(3)	**RTC battery** (includes cable and double-sided adhesive)	857380-001
(4)	**TouchPad** (includes bracket) **NOTE:** The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is available using spare part number 856203-001.	856209-001
(5)	**Power connector cable**	808155-010

Item	Component	Spare part number
(6)	**Solid-state drive**	
	256-GB, M2.2280, SATA-3, supporting TLC	760615-027
	128-GB, M2.2280, SATA-3	827560-015
	Solid-state drive bracket (not illustrated)	856067-001
(7)	**Battery** (4-cell, 55-Wh, 3.62-Ah, Li-ion battery; includes cable)	849908-850
(8)	**Hard drive:** **NOTE:** The hard drive spare part kit does not include the hard drive brackets or the hard drive cable. The hard drive brackets are not spared separately. The hard drive cable is available using spare part number 856205-001. The solid-state hard drive cable is available using spare part number 856202-001.	
	2-TB, 5400-rpm, SATA, 9.5-mm hard drive	801808-005
	1-TB, 5400-rpm, SATA, 9.5-mm hard drive	778192-005
	500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778186-005
	500-GB, 5400-rpm, SATA, 7.0-mm, 8.0-GB NAND hybrid solid-state hard drive	732000-005
(9)	**Hard drive cable** (includes double-sided adhesive)	856205-001
	Solid-state hard drive cable (includes double-sided adhesive)	856202-001
(10)	**Hard drive brackets** (2; not spared separately)	
	Solid-state hard drive connector board (not illustrated)	856210-001
(11)	**Card reader board**	856208-001
(12)	**Card reader board cable** (includes double-sided adhesive)	856204-001
(13)	**Fan** (includes cable)	856206-001
(14)	**Heat sink** (includes replacement thermal material):	
	For use only on computer models equipped with a graphics subsystem with discrete memory	855840-001
	For use only on computer models equipped with a graphics subsystem with UMA memory	855841-001
(15)	**WLAN module:**	
	Broadcom BCM43142 802.11 bgn Wi-Fi M.2 Combo Adapter	792608-005
	Intel 3165NGWG 1 ac 1×1 + Bluetooth 4.0 LE PCIe+USB NGFF 2230 Combo Adapter	806723-005
(16)	**System board** (includes processor and replacement thermal material):	
	Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, fH+S, and the Windows 10 Professional operating system	855838-601
	Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, fH+S, and a non-Windows operating system	855838-001
	Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and the Windows 10 Professional operating system	855836-601

Item	Component	Spare part number
	Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and a non-Windows operating system	855836-001
	Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and the Windows 10 Professional operating system	855833-601
	Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855833-001
	Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and the Windows 10 Professional operating system	855837-601
	Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and a non-Windows operating system	855837-001
	Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and the Windows 10 Professional operating system	855834-601
	Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855834-001
	Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and the Windows 10 Professional operating system	855830-601
	Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855830-001
	Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855835-601
	Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855835-001
	Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855831-601
	Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855831-001
	Equipped with an Intel Pentium 4405U 2.10-GHz processor (2133-MHz FSB, 2.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855832-001
	Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855832-001
(17)	**TouchPad cable** (includes double-sided adhesive)	856203-001

Item	Component	Spare part number
(18)	**Memory modules (2):**	
	8-GB (2133, 1.2-V, DDR4)	820570-005
	4-GB (2133, 1.2-V, DDR4)	820569-005
	2-GB (2133, 1.2-V, DDR4)	851379-005
(19)	**Speakers** (includes cable)	856220-001
(20)	**Bottom cover** (includes front rubber feet, retention magnets, shielding, and vents):	
	In cardinal red finish	856198-001
	In modern gold finish	856197-001
	In natural silver finish	856196-001
	Rubber Kit (not illustrated, includes bottom cover rubber foot strip and screw covers):	
	In cardinal red finish	856218-001
	In modern gold finish	856217-001
	In natural silver finish	856216-001

Display components



Item	Component	Spare part number
(1)	**Display bezel**	856199-001
(2)	**Webcam/microphone module** (includes double-sided adhesive)	846006-003
(3)	**Display panel:**	
	14.0-in, FHD, LCD, BrightView (1920×1080), UWVA, eDP, TOP, slim-flat (3.0-mm), TouchScreen display panel	847662-001
	14.0-in, HD, LCD, BrightView (1366×768), SVA, eDP, TOP, slim-flat (3.0-mm), TouchScreen display panel	809611-005

Item	Component	Spare part number
	14.0-in, FHD, LCD, BrightView (1920×1080), UWVA, eDP, slim-flat (3.0-mm), non-TouchScreen display panel	847660-001
	14.0-in, HD, LCD, BrightView (1366×768), SVA, eDP, slim-flat (3.0-mm), non-TouchScreen display panel	847664-001
(4)	**Display hinges** (2)	856207-001
(#)	**Display hinge caps** (2)	856211-001
(5)	**Antenna Kit** (includes antenna auxiliary and main cables and transceivers)	856192-001
(6)	**Display panel cable** (includes webcam/microphone module cable, adhesive support strip, and double-sided adhesive):	
	For use only on computer models equipped with an FHD TouchScreen display assembly	858822-001
	For use only on computer models equipped with an FHD non-TouchScreen display assembly	858821-001
	For use only on computer models equipped with an HD TouchScreen display assembly	856201-001
	For use only on computer models equipped with an HD non-TouchScreen display assembly	856200-001
(7)	**Back cover:**	
	In cardinal red finish	856195-001
	In modern gold finish	856194-001
	In natural silver finish	856193-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
65-W HP Smart AC adapter (non-PFC, EM, 4.5-mm)	714635-850
65-W HP Smart AC adapter (non-PFC, S-3P, 4.5-mm)	710412-001
45-W HP Smart AC adapter (RC, 4.5-mm, slim)	741553-850
HP external DVD±RW DL SuperMulti Drive	747080-001
HP HDMI-to-VGA adapter	701943-001
Power cord (C5 receptacle, 1.0-m (3.2-ft), 3-wire conductor):	
For use in Australia	213356-008
For use in Denmark	213353-008
For use in Europe	213350-009
For use in India	404827-003
For use in Israel	398063-003
For use in Italy	213352-008
For use in North America	213349-009
For use in the People's Republic of China	286497-008
For use in South Korea	267836-008
For use in Switzerland	213354-008
For use in Taiwan	393313-003
For use in Thailand	285096-006
For use in the United Kingdom and Singapore	213351-008
Power cord (Option 917, 1.0-m (3.2-ft), 3-wire conductor, ROHS)	361240-002
Screw Kit	856219-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Case utility tool or similar plastic, flat-edged tool
- Flat-bladed screwdriver
- Magnetic screwdriver
- Phillips P00, P0, and P1 screwdrivers
- Torx T4 screwdriver

Service considerations

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

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

Plastic parts

CAUTION: Using excessive force during disassembly and reassembly can damage plastic parts. Use care when handling the plastic parts. Apply pressure only at the points designated in the maintenance instructions.

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 a diskette drive or optical drive, be sure that a diskette or 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.

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

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

Avoid exposing a drive to temperature extremes or liquids.

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

Grounding guidelines

Electrostatic discharge damage

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

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

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

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

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

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

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

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

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

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

Typical electrostatic voltage levels

	Relative humidity		
Event	**10%**	**40%**	**55%**
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tube	2,000 V	700 V	400 V
Removing DIPS from vinyl tray	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	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 Styrofoam.
- Handle ESD-sensitive components, parts, and assemblies by the case or PCM laminate. Handle these items only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting or removing connectors or test equipment.

Equipment guidelines

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

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

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

Component replacement procedures

NOTE: Details about the computer, including model, serial number, product key, and length of warranty, are on the service tag on the back of the computer. See Service tag on page 13 for details.

This chapter provides removal and replacement procedures.

There are as many as 52 screws that must be removed, replaced, and/or loosened when servicing the computer. Make special note of each screw size and location during removal and replacement.

Bottom cover

Description	Spare part number
In cardinal red finish	856198-001
In modern gold finish	856197-001
In natural silver finish	856196-001

Before disassembling the computer, 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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.

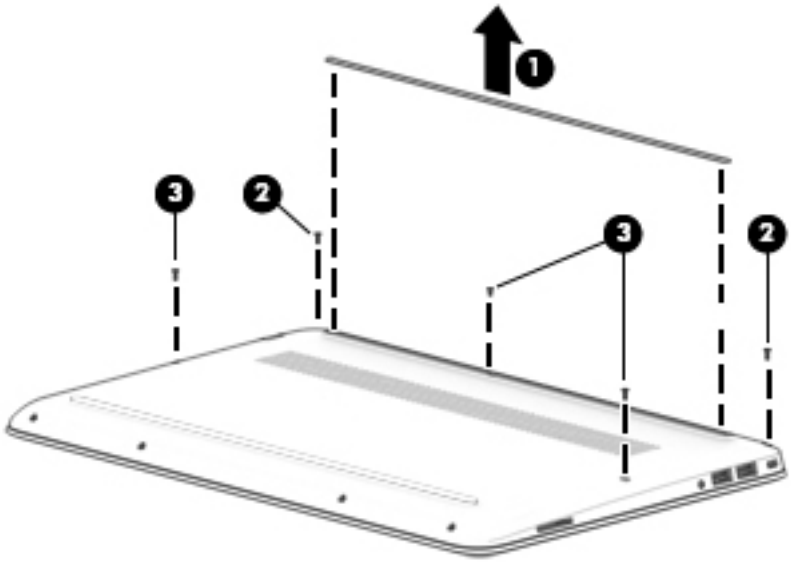
Remove the bottom cover:

1. Close the computer.
2. Turn the computer upside down with the front toward you.
3. Remove the rear rubber foot strip **(1)**.

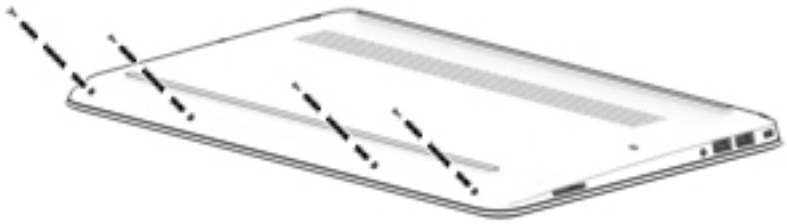
   The rear rubber foot strip is included in the Rubber Kit, using the following spare part numbers:

   - 856218-001 – in cardinal red finish
   - 856217-001 – in modern gold finish
   - 856216-001 – in natural silver finish

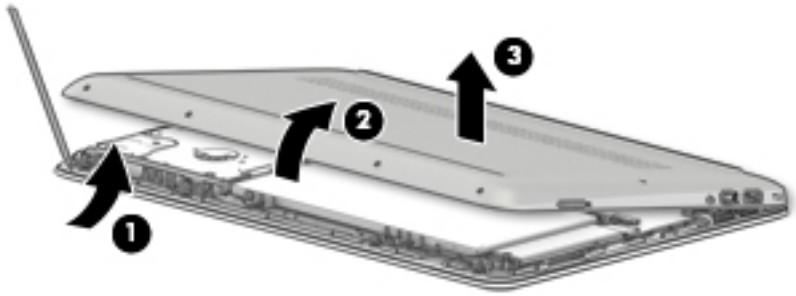
4. Remove the two Phillips M2.5×5.7 screws **(2)** and the three Phillips M2.0×5.7 screws **(3)** that secure the bottom cover to the computer.



5. Remove the four Phillips M2.0×5.7 screws that secure the bottom cover to the computer.



6. Insert a case utility tool **(1)** or similar plastic, flat-edged tool between the bottom cover and the computer.
7. Release the bottom cover front edge **(2)** and swing it up and back until it releases.
8. Remove the bottom cover **(3)**.



Reverse this procedure to install the bottom cover.

Battery

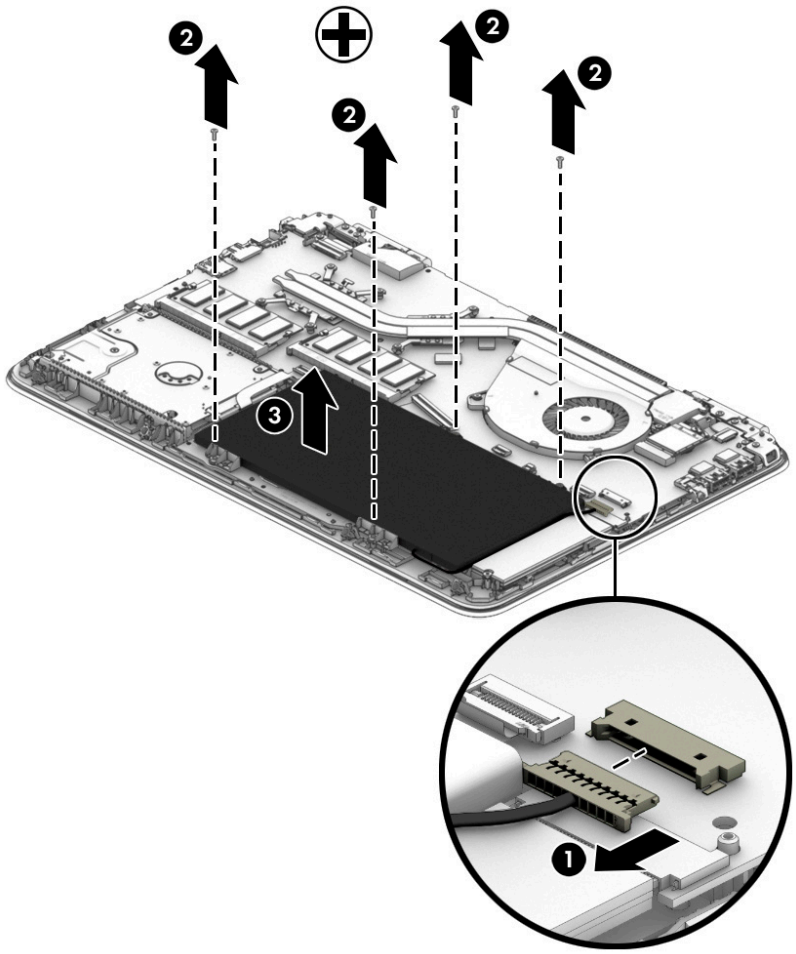
Description	Spare part number
4-cell, 55-Wh, 3.62-Ah, Li-ion battery (includes cable)	849908-850

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).

Remove the battery:

1. Disconnect the battery cable **(1)** from the system board.
2. Remove the six Phillips M2.0×5.7 screws **(2)** that secure the battery to the keyboard/top cover.
3. Remove the battery **(3)**.



Reverse this procedure to install the battery.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive bracket or cable. The hard drive bracket is not spared separately. The hard drive cable is available using spare part number 856205-001. The solid-state hard drive cable is available using spare part number 856202-001.

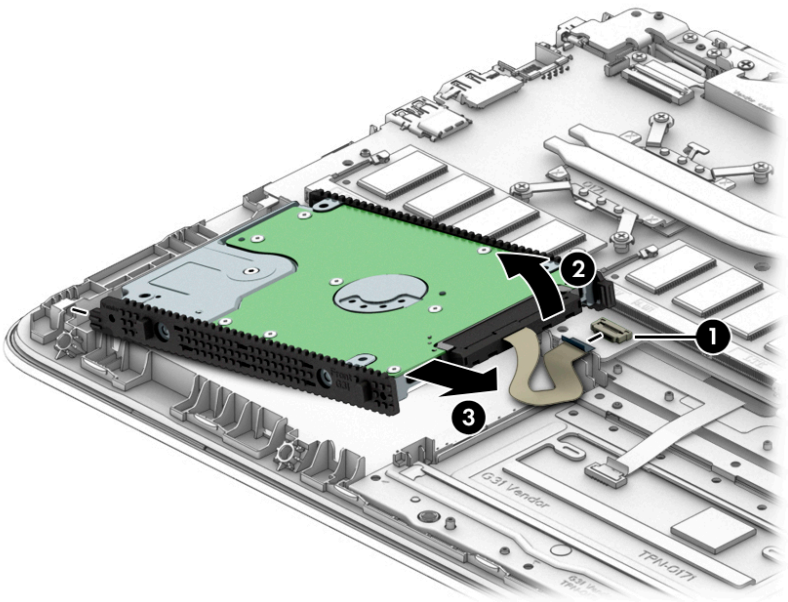
Description	Spare part number
2-TB, 5400-rpm, SATA, 9.5-mm hard drive	801808-005
1-TB, 5400-rpm, SATA, 9.5-mm hard drive	778192-005
500-GB, 5400-rpm, SATA, 7.0-mm hard drive	778186-005
500-GB, 5400-rpm, SATA, 7.0-mm, 8.0-GB NAND hybrid solid-state hard drive	732000-005

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Disconnect the battery cable from the system board (see Battery on page 33).

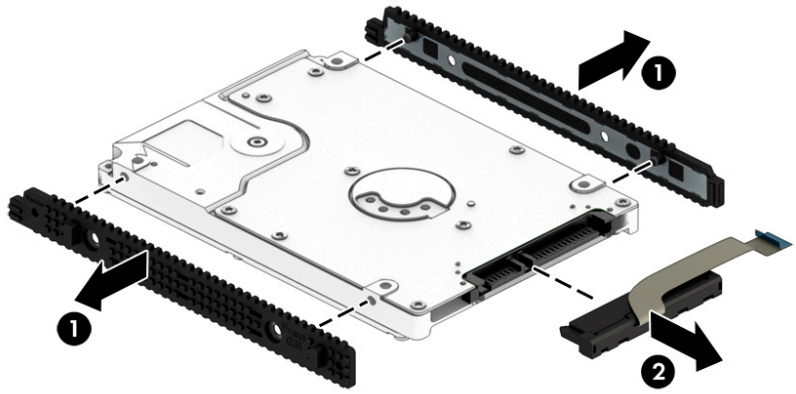
Remove the hard drive:

1. Release the zero insertion force (ZIF) connector **(1)** to which the hard drive cable is connected, and then disconnect the hard drive cable from the system board.
2. Lift the right side of the hard drive **(2)** until it rests at an angle.
3. Remove the hard drive **(3)** by sliding it up and to the right at angle.



4. If it is necessary to replace the hard drive bracket, remove the left and right brackets **(1)**.

5. If it is necessary to replace the hard drive cable, slide the cable **(2)** off of the front end of the hard drive.



Reverse this procedure to reassemble and install the hard drive.

TouchPad

NOTE: The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is available using spare part number 856203-001.

Description	Spare part number
TouchPad (includes bracket)	856209-001

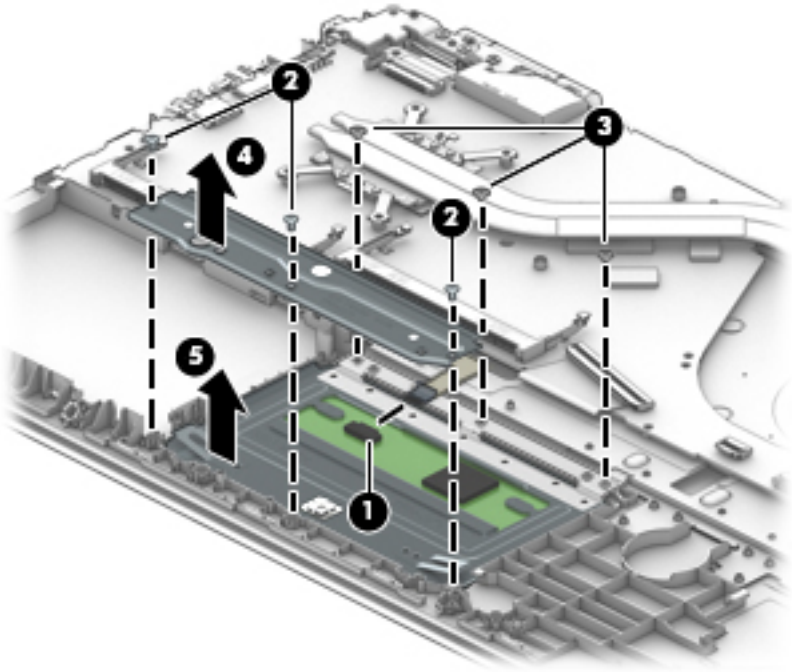
Before removing the TouchPad, follow these steps:

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).

Remove the TouchPad:

1. Release the ZIF connector **(1)** to which the TouchPad cable is connected, and then disconnect the TouchPad cable from the TouchPad board.
2. Remove the three Phillips PM2.0×4.0 screws **(2)** that secure the TouchPad and TouchPad bracket to the keyboard/top cover.
3. Remove the three Phillips PM2.0×2.2 broad head screws **(3)** that secure the TouchPad to the keyboard/top cover.
4. Remove the TouchPad bracket **(4)**.

5. Remove the TouchPad **(5)**.



Reverse this procedure to install the TouchPad.

Memory module

Description	Spare part number
8-GB (2133, 1.2-V, DDR4)	820570-005
4-GB (2133, 1.2-V, DDR4)	820569-005
2-GB (2133, 1.2-V, DDR4)	851379-005

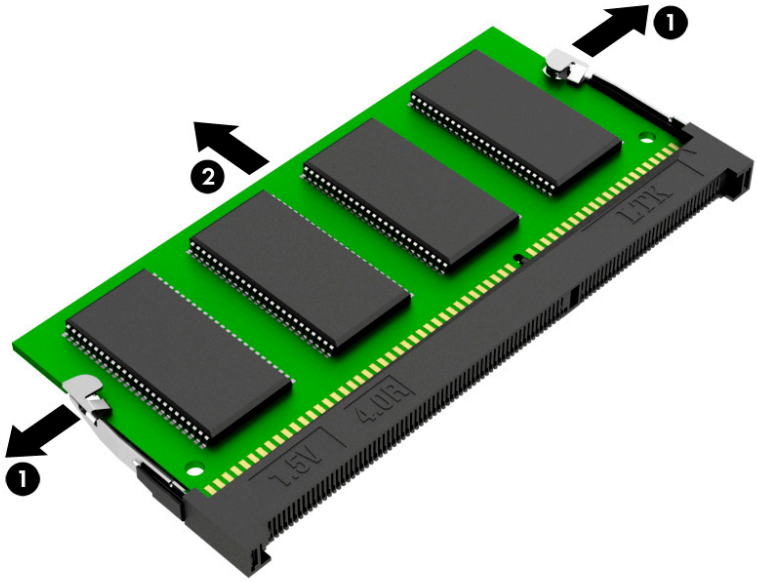
Before removing a memory module, follow these steps:

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Disconnect the battery cable from the system board (see Battery on page 33).

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 it away from the slot at an angle.



Reverse this procedure to install a memory module.

WLAN module

Description	Spare part number
Broadcom BCM43142 802.11 bgn Wi-Fi M.2 Combo Adapter	792608-005
Intel 3165NGWG 1 ac 1×1 + Bluetooth 4.0 LE PCIe+USB NGFF 2230 Combo Adapter	806723-005

⚠ **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:

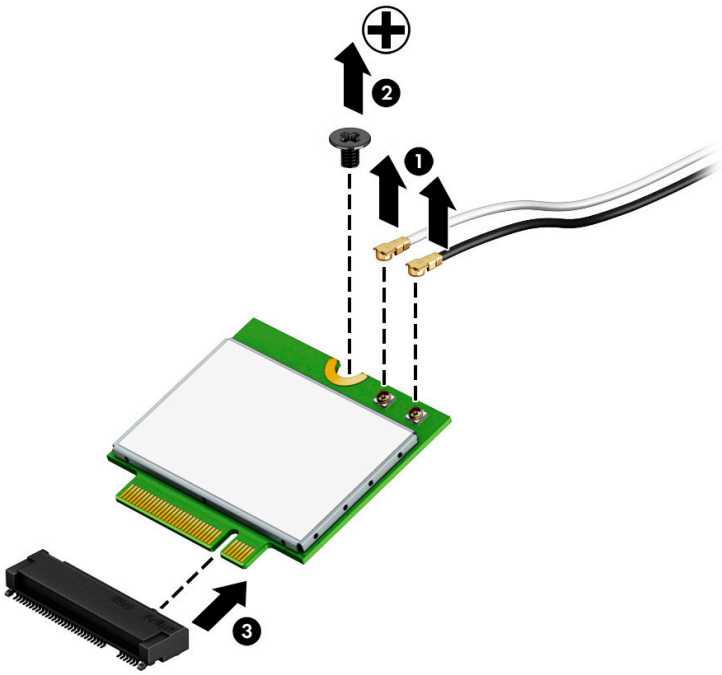
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Disconnect the battery cable from the system board (see Battery on page 33).

Remove the WLAN module:

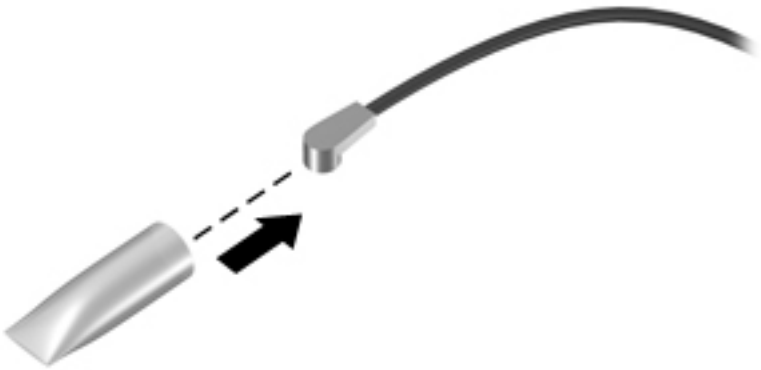
1. Disconnect the WLAN antenna cables **(1)** from the terminals on the WLAN module.

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

2. Remove the Phillips PM2.0×3.8 screw **(2)** that secures the WLAN module to the computer. (The WLAN module tilts up.)
3. Remove the WLAN module **(3)** by pulling the module away from the slot at an angle.



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



Reverse this procedure to install the WLAN module.

RTC battery

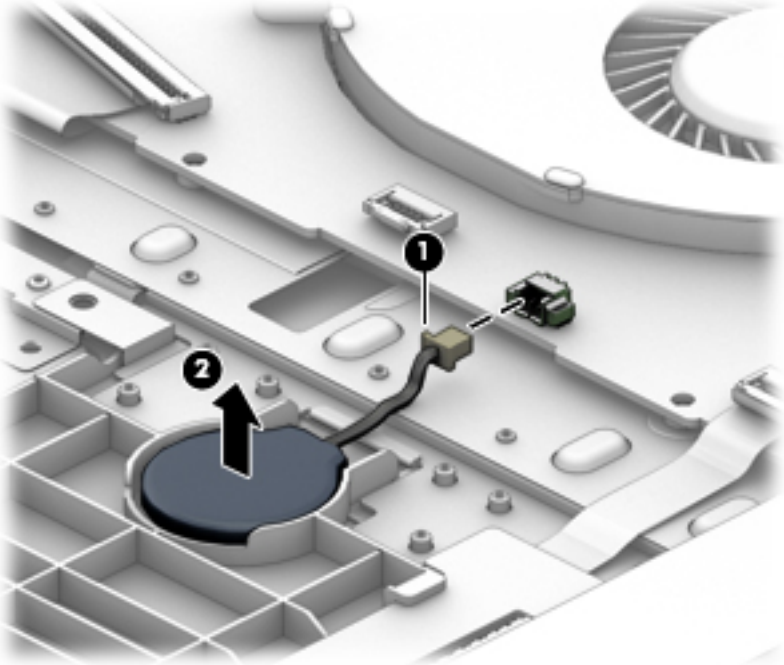
Description	Spare part number
RTC battery (includes cable and double-sided adhesive)	857380-001

Before removing the card reader 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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).

Remove the RTC battery:

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



3. Remove the RTC battery.

Reverse this procedure to install the RTC battery.

Card reader board

NOTE: The card reader board spare part kit does not include the card reader board cable. The card reader board cable is available using spare part number 856204-001.

Description	Spare part number
Card reader board	856208-001

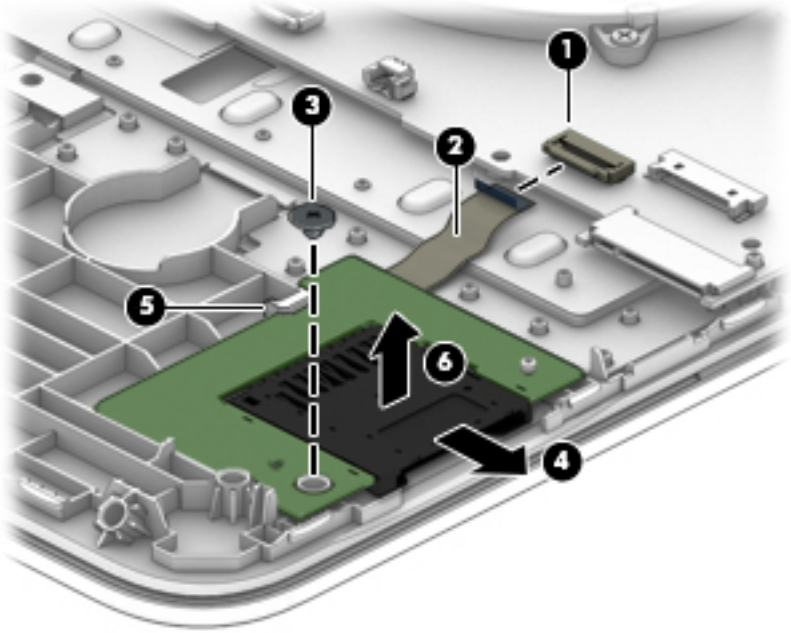
Before removing the card reader board, follow these steps:

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).

Remove the card reader board:

1. Release the ZIF connector **(1)** to which the card reader board cable is connected, and then disconnect the card reader board cable from the system board.
2. Detach the card reader board cable **(2)** from the keyboard/top cover. (The card reader board cable is attached to the keyboard/top cover with double-sided adhesive.)
3. Remove the Phillips PM2.0×2.2 broad head screw **(3)** that secures the card reader board to the keyboard/top cover.
4. Release the card reader board **(4)** by sliding it to the right until it clears the retention clip **(5)** built into the keyboard/top cover.

5. Remove the card reader board **(6)**.



Reverse this procedure to install the card reader board.

Solid-state drive

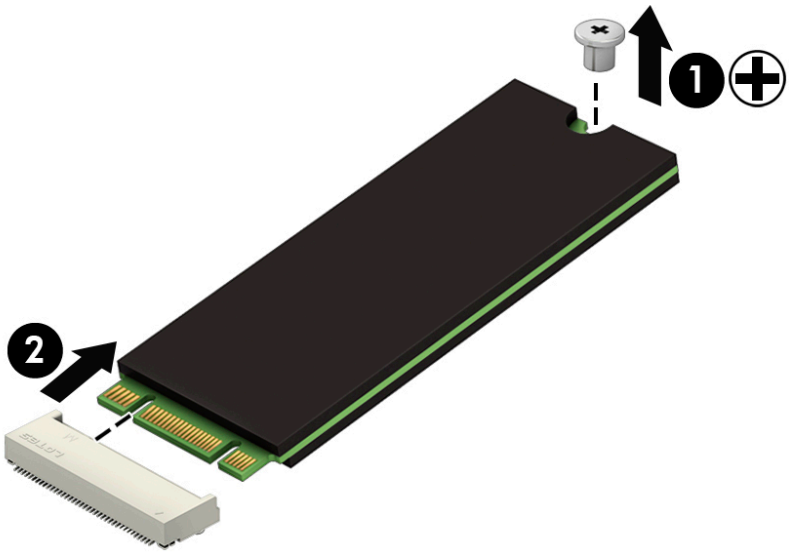
Description	Spare part number
256-GB, M2.2280, SATA-3, supporting TLC	760615-027
128-GB, M2.2280, SATA-3	827560-015

Before removing the solid-state 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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Disconnect the battery cable from the system board (see Battery on page 33).

Remove the solid-state drive:

1. Remove the Phillips PM2.0×3.8 screw **(1)** that secures the solid-state drive to the computer. (The solid-state drive tilts up.)
2. Remove the solid-state drive **(2)** by pulling the drive away from the slot at an angle.



Reverse this procedure to install the solid-state drive.

Fan

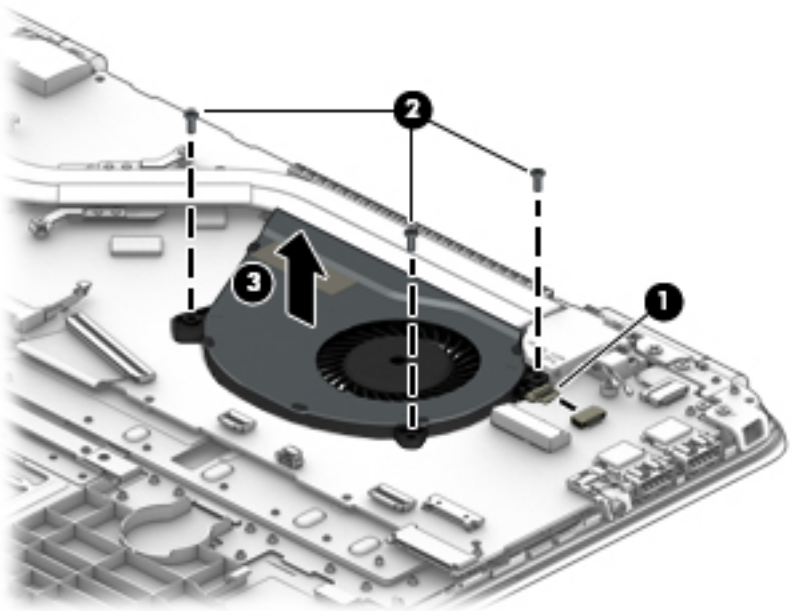
Description	Spare part number
Fan (includes cable)	856206-001

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).
6. Remove the WLAN module (see WLAN module on page 37).

Remove the fan:

1. Disconnect the fan cable **(1)** from the system board.
2. Remove the three Phillips PM2.0×5.7 screws **(2)** that secure the fan to the keyboard/top cover.
3. Remove the fan **(3)**.



Reverse this procedure to install the fan.

System board

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

Description	Spare part number
Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, fH+S, and the Windows 10 Professional operating system	855838-601
Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, fH+S, and a non-Windows operating system	855838-001
Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and the Windows 10 Professional operating system	855836-601
Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and a non-Windows operating system	855836-001
Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and the Windows 10 Professional operating system	855833-601
Equipped with an Intel Core i7-6500U 2.50-GHz (SC turbo up to 3.10-GHz) processor (2133-MHz FSB, 4.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855833-001
Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and the Windows 10 Professional operating system	855837-601
Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 4.0-GB of discrete video memory, and a non-Windows operating system	855837-001
Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and the Windows 10 Professional operating system	855834-601
Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855834-001
Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and the Windows 10 Professional operating system	855830-601
Equipped with an Intel Core i5-6200U 2.30-GHz (SC turbo up to 2.80-GHz) processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855830-001
Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855835-601
Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an nVIDIA N165-GTR (GeForce 940MX) graphics subsystem with 2.0-GB of discrete video memory, and a non-Windows operating system	855835-001
Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855831-601

Description	Spare part number
Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855831-001
Equipped with an Intel Pentium 4405U 2.10-GHz processor (2133-MHz FSB, 2.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855832-001
Equipped with an Intel Core i3-6100U 2.30-GHz processor (2133-MHz FSB, 3.0-MB L3 cache, dual core, 15-W), an Intel HD Graphics 520 or Intel HD Graphics 510 graphics subsystem with UMA memory, and a non-Windows operating system	855832-001

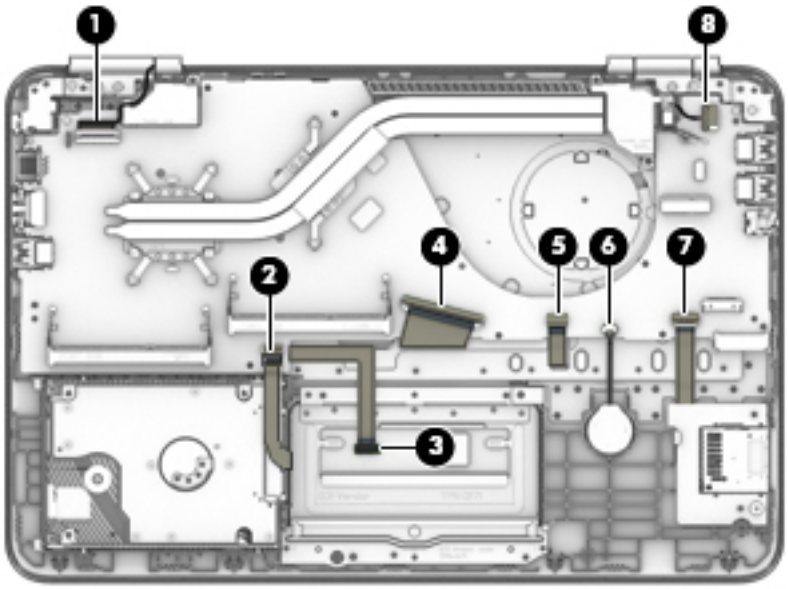
Before removing the system board, follow these steps:

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Solid-state drive (see Solid-state drive on page 42)
   d. Fan (see Fan on page 43)

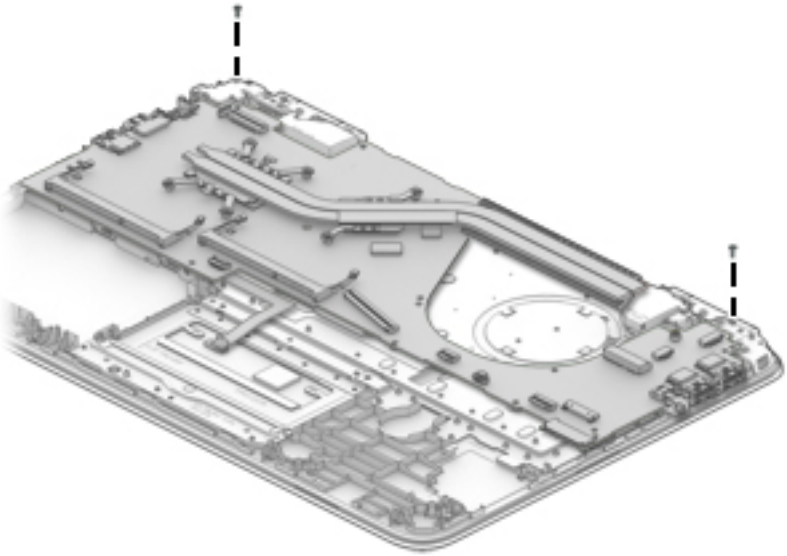
NOTE: When replacing the system board, be sure that the Memory module (see Memory module on page 36) is removed from the defective system board and installed on the replacement system board:

Remove the system board:

1. Disconnect the following cables from the system board:
   (1) Display panel ZIF connector cable
   (2) Hard drive ZIF connector cable
   (3) TouchPad ZIF connector cable
   (4) Keyboard ZIF connector cable
   (5) Keyboard backlight ZIF connector cable
   (6) RTC battery cable
   (7) Card reader board ZIF connector cable
   (8) Speaker cable

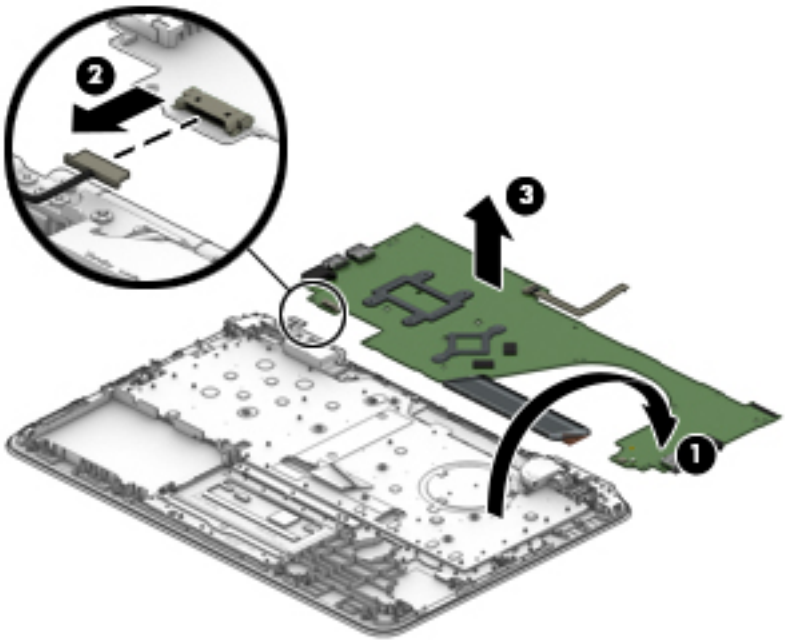


2. Remove the two Phillips PM2.0×5.7 screws that secure the system board to the keyboard/top cover.



3. Release the system board **(1)** by lifting the front edge and swinging it up and back until it rests upside down behind the computer.
4. Disconnect the power connector cable **(2)** from the system board.

5. Remove the system board **(3)**.



Reverse this procedure to install the system board.

Heat sink

NOTE: The heat sink spare part kit includes replacement thermal material.

Description	Spare part number
For use only on computer models equipped with a graphics subsystem with discrete memory	855840-001
For use only on computer models equipped with a graphics subsystem with UMA memory	855841-001

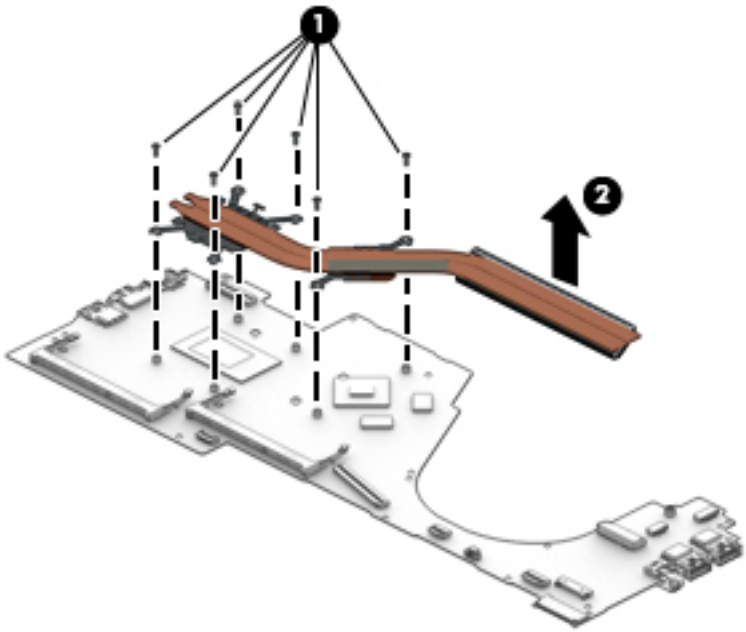
Before removing the heat sink, follow these steps:

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Solid-state drive (see Solid-state drive on page 42)
   d. Fan (see Fan on page 43)
   e. System board (see System board on page 44)

Remove the heat sink:

NOTE: Steps 1 and 2 apply to computer models equipped with a graphics subsystem with discrete memory. See steps 3 and 4 for heat sink removal instructions for computer models equipped with a graphics subsystem with UMA memory.

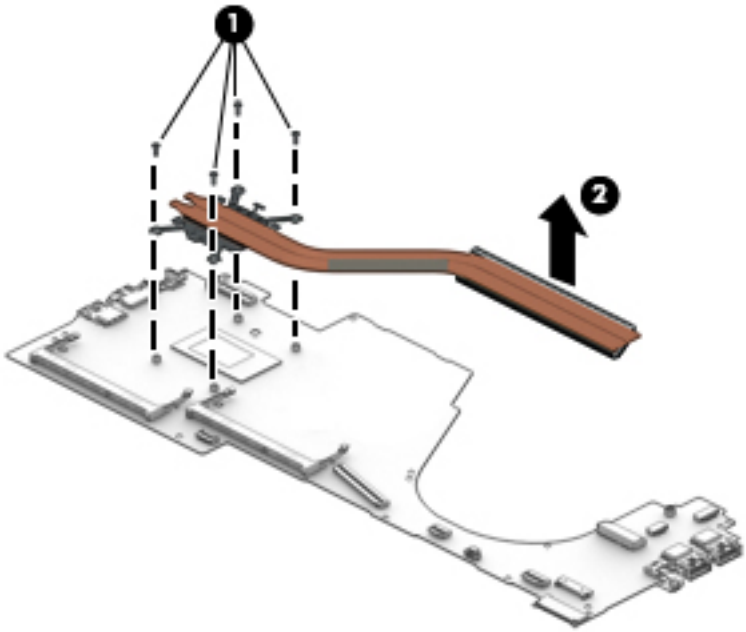
1. Remove the six Phillips PM2.0×6.2 screws **(1)** that secure the heat sink to the system board.
2. Remove the heat sink **(2)**.



NOTE: Steps 3 and 4 apply to computer models equipped with a graphics subsystem with UMA memory. See steps 1 and 2 for heat sink removal instructions for computer models equipped with a graphics subsystem with discrete memory.

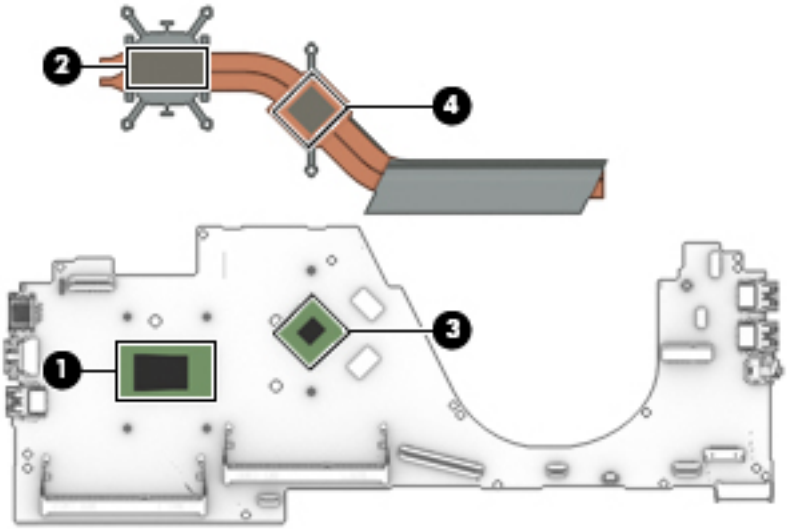
3. Remove the four Phillips PM2.0×6.2 screws **(1)** that secure the heat sink to the system board.

4. Remove the heat sink **(2)**.

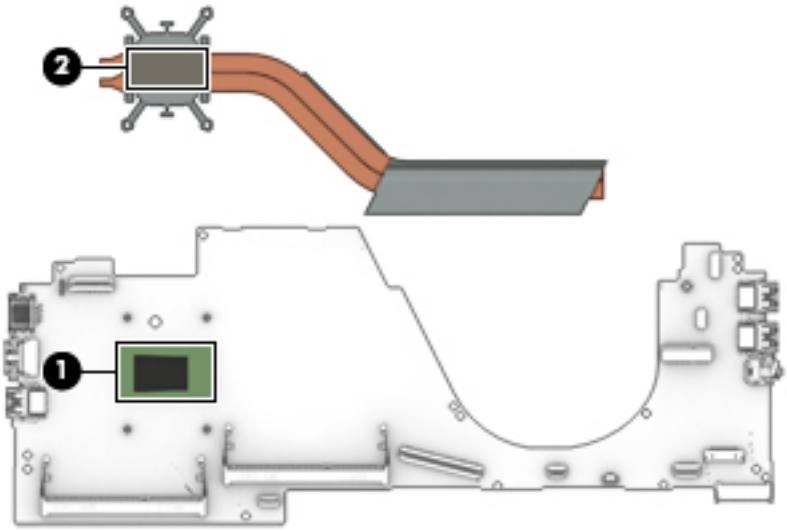


NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board each time the heat sink is removed.

Thermal material is used on the processor **(1)** and the heat sink section **(2)** that services it. Thermal material is also used on the graphics subsystem chip **(3)** and the heat sink section **(4)** that services it. The following illustration shows the thermal material locations on a computer model equipped with a graphics subsystem with discrete memory.



Thermal material is used on the processor **(1)** and the heat sink section **(2)** that services it. The following illustration shows the thermal material locations on a computer model equipped with a graphics subsystem with UMA memory.



Reverse this procedure to install the heat sink.

TouchPad cable

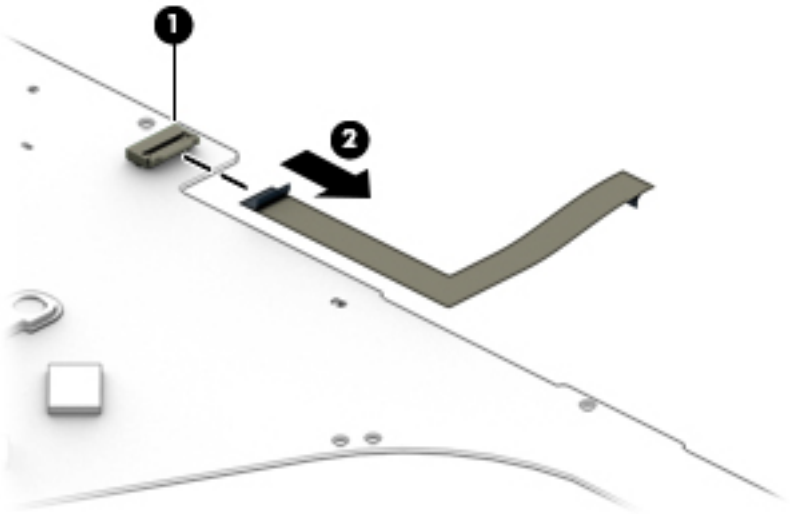
Description	Spare part number
TouchPad cable (includes double-sided adhesive)	856203-001

Before removing the TouchPad cable, 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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Remove the battery (see Battery on page 33).

Remove the TouchPad cable:

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



Reverse this procedure to install the TouchPad cable.

Speakers

Description	Spare part number
Speakers (includes cables)	856220-001

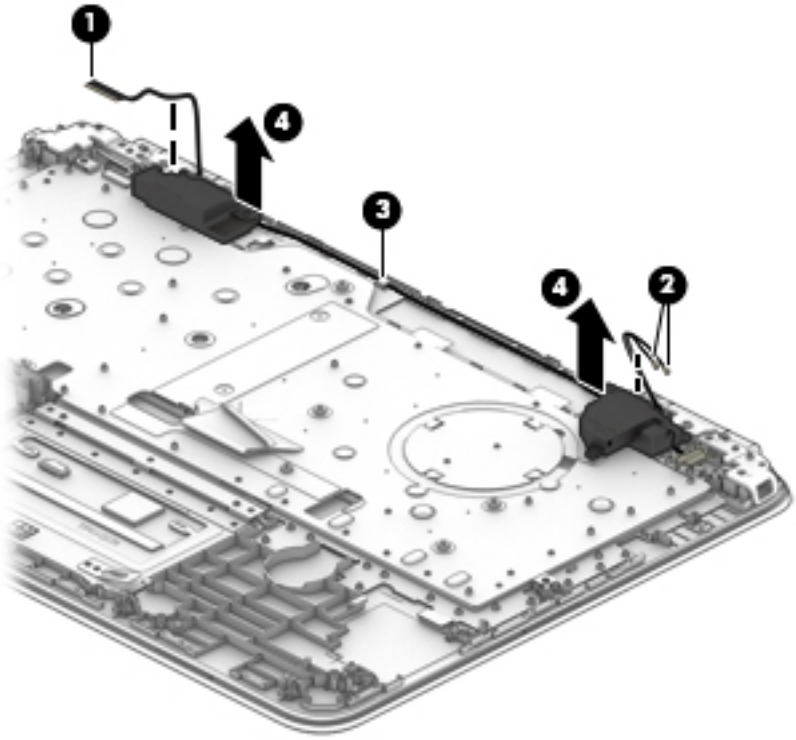
Before removing the speakers, follow these steps:

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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Solid-state drive (see Solid-state drive on page 42)
   d. Fan (see Fan on page 43)
   e. System board (see System board on page 44)

Remove the speakers:

1. Release the display panel cable from the routing channel **(1)** built into the left speaker.
2. Release the wireless antenna cables from the routing channel **(2)** built into the right speaker.

3. Remove the speakers **(3)**.



Reverse this procedure to install the speakers.

Power connector cable

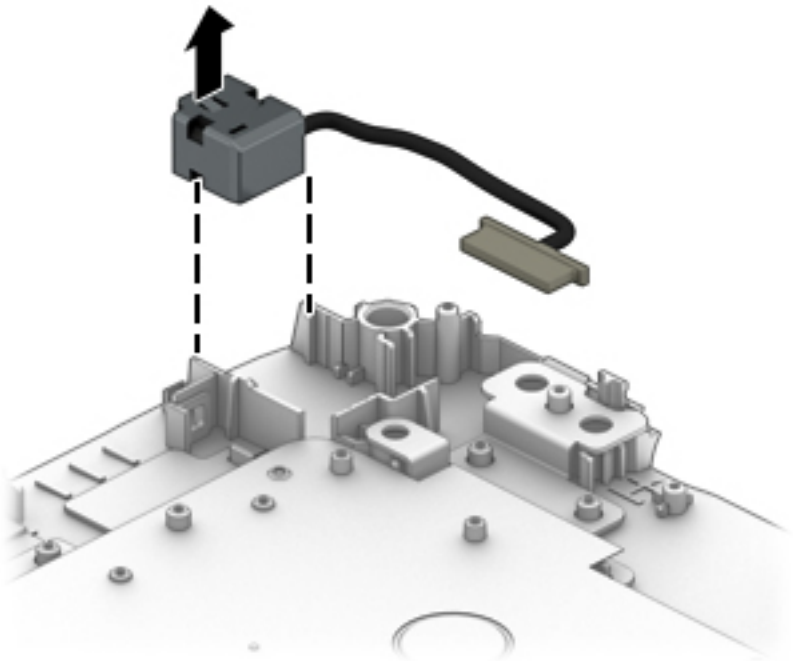
Description	Spare part number
Power connector cable	808155-010

Before removing the power connector cable, 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 unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31), and then remove the following components:
   a. Battery (see Battery on page 33)
   b. WLAN module (see WLAN module on page 37)
   c. Solid-state drive (see Solid-state drive on page 42)
   d. Fan (see Fan on page 43)
   e. System board (see System board on page 44)

Remove the power connector cable:

▲ Remove the power connector cable.



Reverse this procedure to install the power connector cable.

Display assembly

NOTE: The display assembly is spared at the subcomponent level only. For display assembly spare part information, see the individual removal subsections.

Before removing the display assembly, follow these steps:

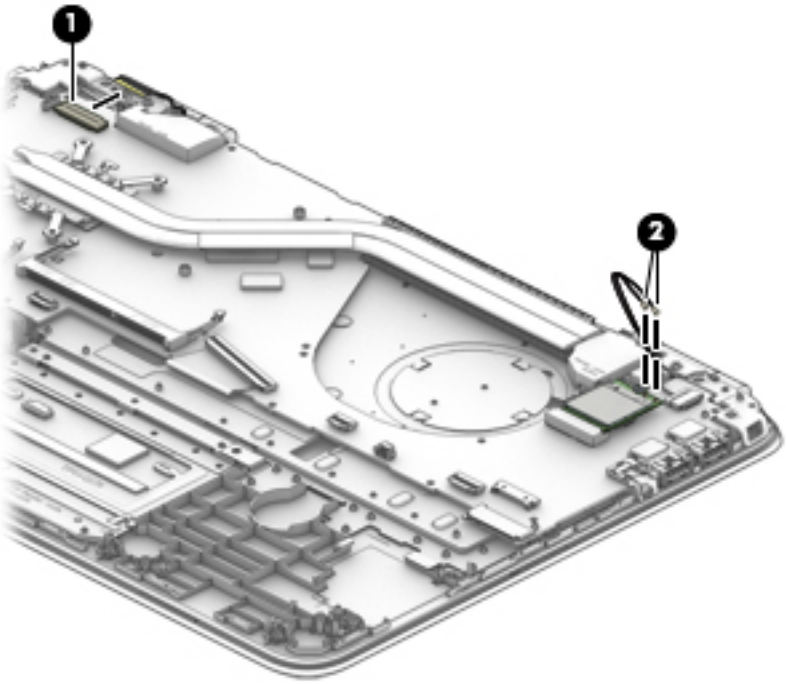
1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect the power from the computer by unplugging the power cord from the computer.
3. Disconnect all external devices from the computer.
4. Remove the bottom cover (see Bottom cover on page 31).
5. Disconnect the battery cable from the system board (see Battery on page 33).

Remove the display assembly:

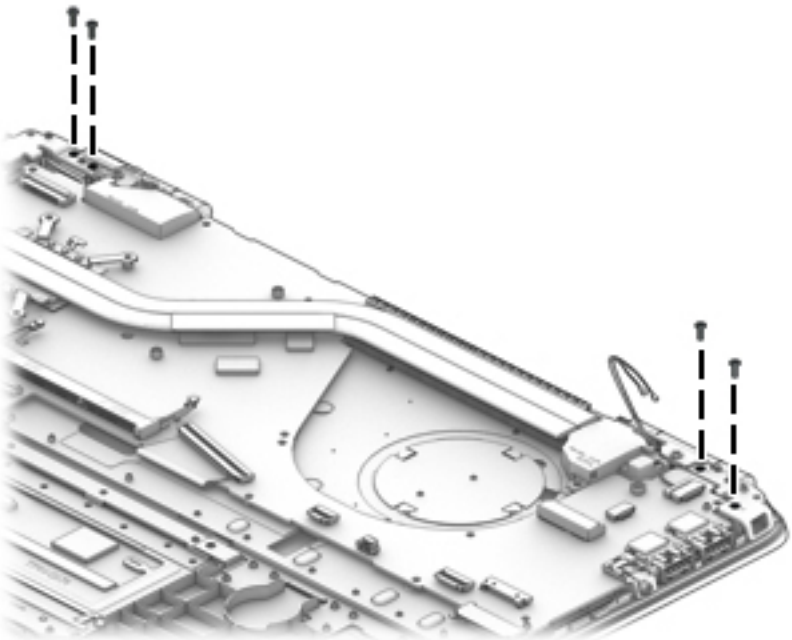
1. Release the ZIF connector **(1)** to which the display panel cable is connected, and then disconnect the display panel cable from the system board.

2. Disconnect the WLAN antenna cables **(2)** from the terminals on the WLAN module.

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

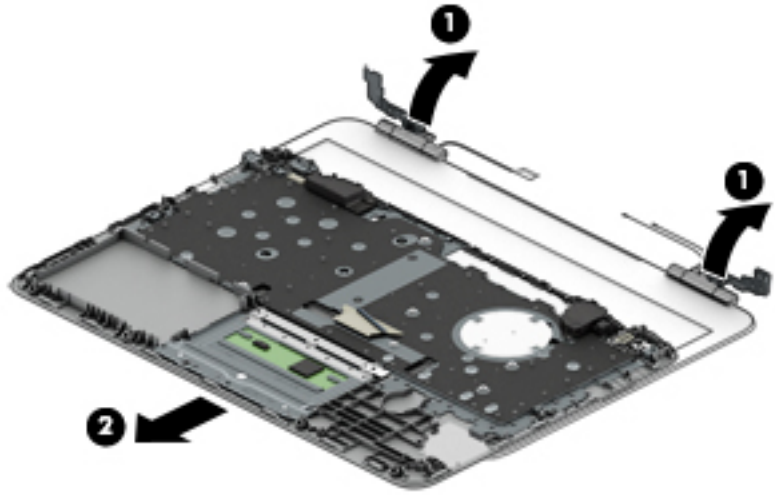


3. Remove the four Phillips PM2.5×5.7 screws that secure the display assembly to the keyboard/top cover.



4. Release the display hinges **(1)** by swinging them up and back.

5. Slide the keyboard/top cover **(2)** forward and separate it from the display assembly.

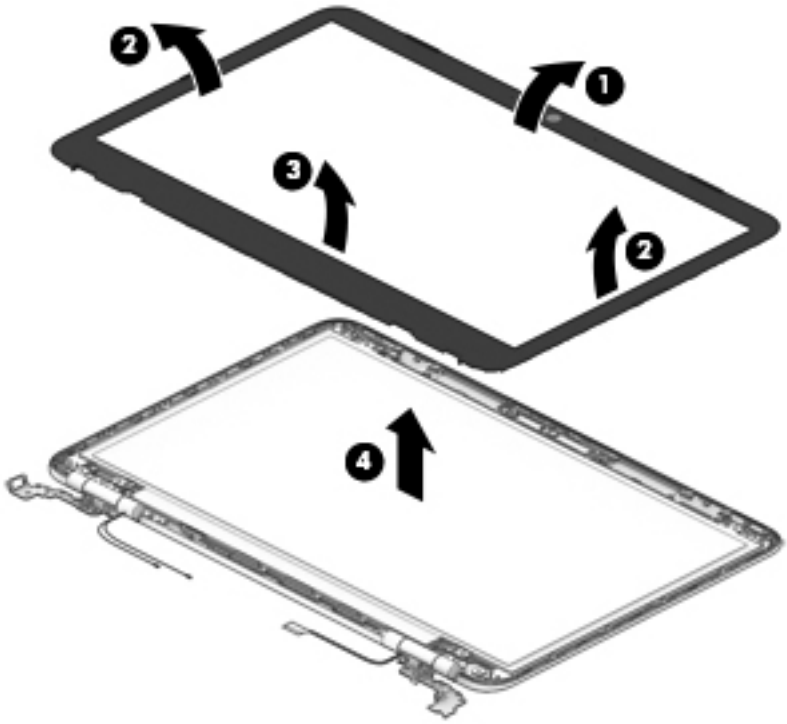


6. If it is necessary to replace the display bezel:

   a. Flex the inside edges of the top edge **(1)**, left **(2)** and right edges, and bottom edge **(3)** of the display bezel until the bezel disengages from the display back cover.

   b. Remove the display bezel **(4)**.

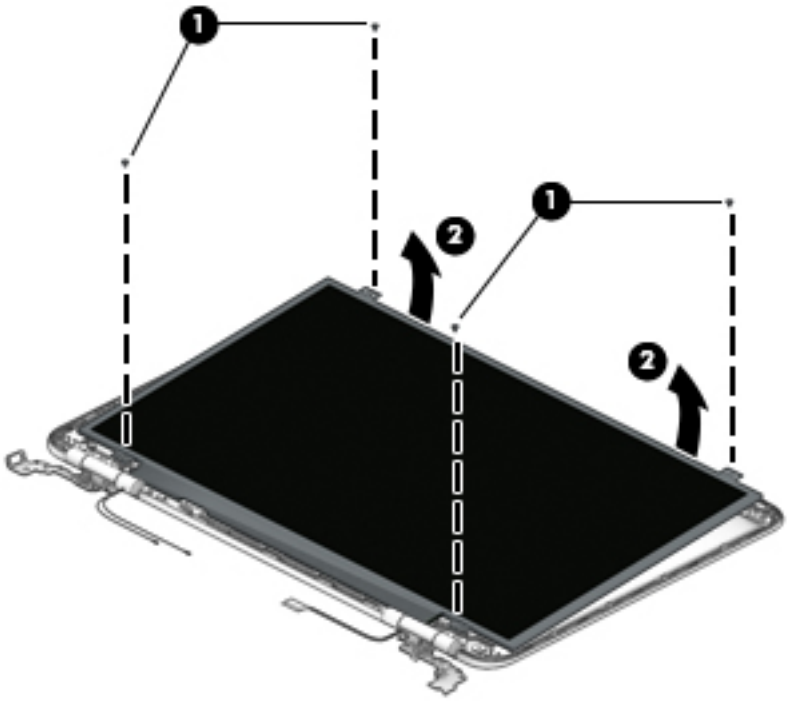
      The display bezel is available using spare part number 856199-001.



7. If it is necessary to replace the display panel:

   a. Remove the display bezel.

b. Remove the four Phillips PM2.0×2.9 screws that secure the display panel to the display back cover.



CAUTION: Before turning the display panel upside down, make sure the work surface is clear of tools, screws, and any other foreign objects. Failure to follow this caution can result in damage to the display panel.

c. Lift the top edge of the display panel **(1)** and swing it up and forward until it rests upside down in front of the display back cover.

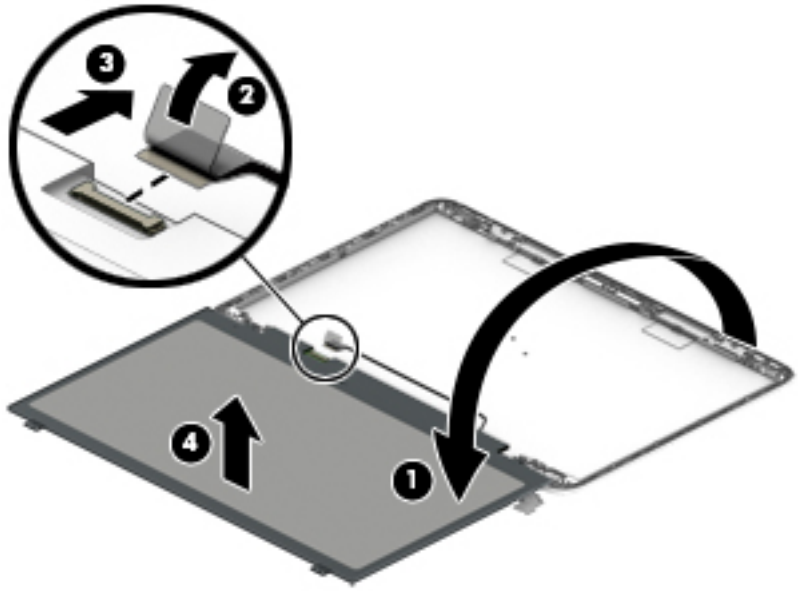
d. Release the adhesive strip **(2)** that secures the display panel cable connector to the display panel.

e. Disconnect the display panel cable **(3)** from the display panel.

f. Remove the display panel **(4)**.

The display panel is available using the following spare part numbers:

- 847662-001 – 14.0-in, FHD, LCD, BrightView (1920×1080), UWVA, eDP, TOP, slim-flat (3.0-mm), TouchScreen display panel
- 809611-005 – 14.0-in, HD, LCD, BrightView (1366×768), SVA, eDP, TOP, slim-flat (3.0-mm), TouchScreen display panel
- 847660-001 – 14.0-in, FHD, LCD, BrightView (1920×1080), UWVA, eDP, slim-flat (3.0-mm), non-TouchScreen display panel
- 847664-001 – 14.0-in, HD, LCD, BrightView (1366×768), SVA, eDP, slim-flat (3.0-mm), non-TouchScreen display panel



8. If it is necessary to replace the display panel cable:

NOTE: The display panel cable includes the webcam/microphone module cable.

a. Remove the display bezel.

b. Remove the display panel.

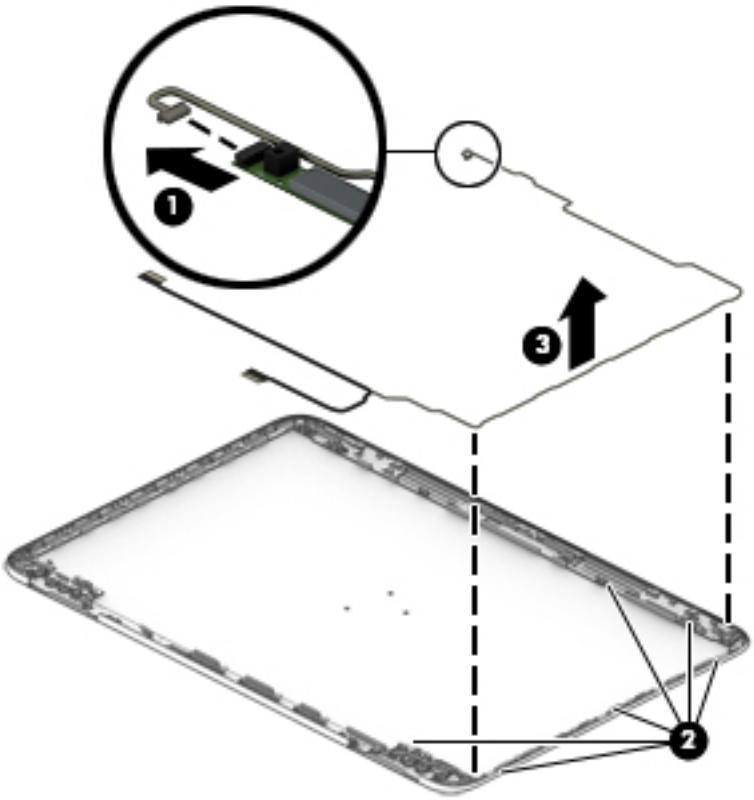
c. Disconnect the display panel cable **(1)** from the webcam/microphone module.

d. Release the display panel cable from the routing clips **(2)** and channels built into the top, right, and bottom edges of the display back cover.

e. Remove the display panel cable **(3)**.

The display panel cable is available using the following spare part numbers:

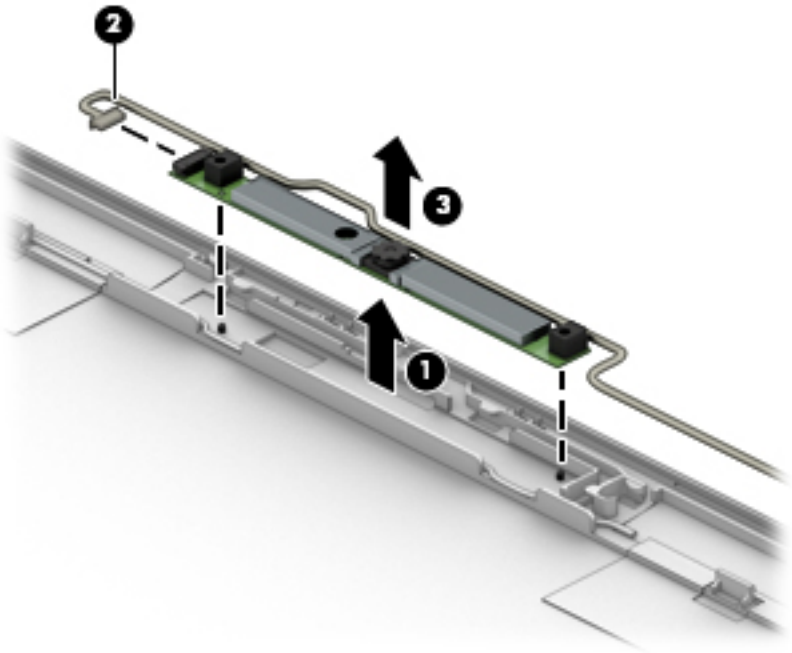
- 858822-001 – For use only on computer models equipped with an FHD TouchScreen display assembly
- 858821-001 – For use only on computer models equipped with an FHD non-TouchScreen display assembly
- 856201-001 – For use only on computer models equipped with an HD TouchScreen display assembly
- 856200-001 – For use only on computer models equipped with an HD non-TouchScreen display assembly



9. If it is necessary to replace the webcam/microphone module:
   a. Remove the display bezel.
   b. Remove the display panel.
   c. Detach the webcam/microphone module **(1)** from the display back cover. The webcam/microphone module is secured to the display back cover with double-sided adhesive.)
   d. Disconnect the webcam/microphone module cable **(2)** from the webcam/microphone module.

e. Remove the webcam/microphone module **(3)**.

The webcam/microphone module is available using spare part number 846006-003.



10. If it is necessary to replace the display hinges:

a. Remove the display bezel.

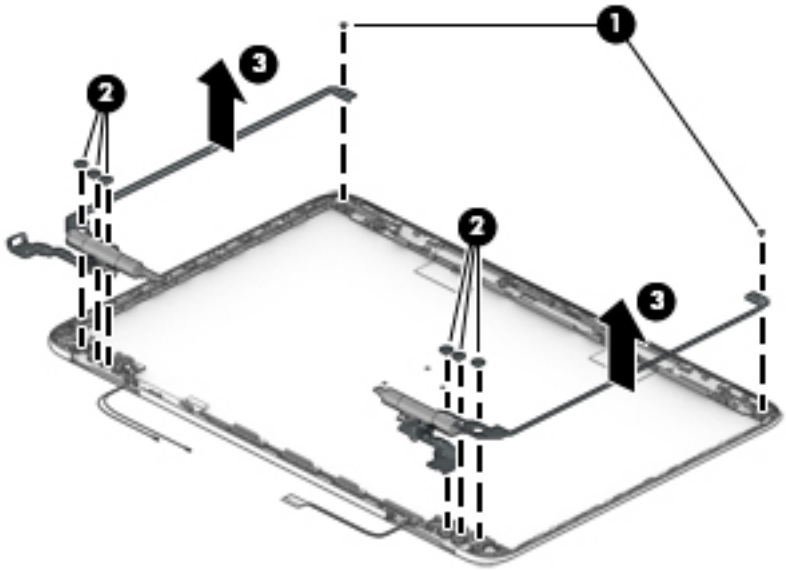
b. Remove the display panel.

c. Remove the two Phillips PM2.0×2.9 screws **(1)** that secure the display hinges to the display back cover.

d. Remove the six Phillips PM2.5×3.2 screws **(2)** that secure the display hinges to the display back cover.

e. Remove the display hinges **(3)**.

The display hinges are available using spare part number 856207-001.



11. If it is necessary to replace the antenna:

NOTE: The antenna includes the auxiliary and main antenna cables and transceivers.

a. Remove the display bezel.

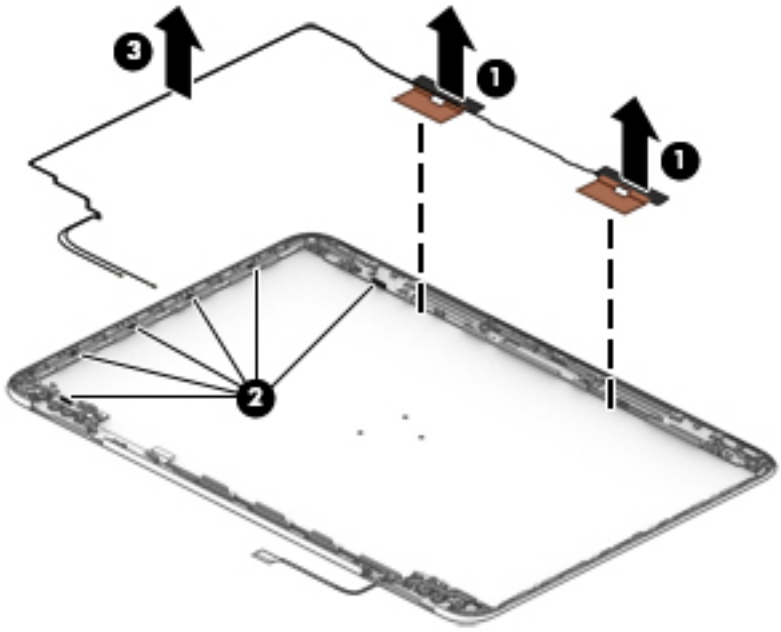
b. Remove the display panel.

c. Detach the antenna transceivers **(1)** from the display back cover. (The antenna transceivers are attached to the display back cover with double-sided adhesive.)

d. Release the antenna cables from the routing clips **(2)** and channels built into the top, left, and bottom edges of the display back cover.

e. Remove the antenna cables **(3)**.

The antenna are available using spare part number 856192-001.



Reverse this procedure to reassemble and install the display assembly.

6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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 62).
  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 63.

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.

7 Using HP PC Hardware Diagnostics (UEFI)

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

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

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

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

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

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

   a. Connected USB drive

      NOTE: To download the HP PC Hardware Diagnostics (UEFI) tool to a USB drive, see Downloading HP PC Hardware Diagnostics (UEFI) to a USB device on page 64.

   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, click the **Download** link, and then select **Run**.

Download any version of UEFI for a specific product

1. Go to http://www.hp.com/support, and then select your country. The HP Support page is displayed.
2. Click **Drivers & Downloads**.

3. Use the categories listed to find your product.

   – or –

   Click **Find 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.

8 Specifications

Computer specifications

The power information in this section may be helpful if you plan to travel internationally with the computer.

The computer operates on DC power, which can be supplied by an AC or a DC power source. The AC power source must be rated at 100–240 V, 50–60 Hz. Although the computer can be powered from a standalone DC power source, it should be powered only with an AC adapter or a DC power source that is supplied and approved by HP for use with this computer.

The computer can operate on DC power within the following specifications. Operating voltage and current varies by platform. The voltage and current for your computer is located on the regulatory label.

	Metric	U.S.
Dimensions		
Width	**33.86 cm**	13.30 in
Depth	**22.43 cm**	8.83 in
Height	**1.95 cm**	0.77 in
Weight (equipped with a hard drive)	**1.78 kg**	3.92 lbs
Weight (equipped with a solid-state drive)	**1.71 kg**	3.77 lbs
Input power		
Operating voltage and current	5 V dc @ 2 A / 12 V dc @ 3 A / 15 V dc @ 3 A – 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 3.75 A / 12 V dc @ 3.75 A / 15 V dc @ 3 A / 20 V dc @ 2.25 A - 45 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5.0 A / 12 V dc @ 5.0 A / 15 V dc @ 4.33 A / 20 V dc @ 3.25 A - 65 W USB-C 5 V dc @ 3 A / 9 V dc @ 3 A / 10 V dc @ 5.0 A / 12 V dc @ 5.0 A / 15 V dc @ 5.0 A / 20 V dc @ 4.5 A - 90 W USB-C 19.5 V dc @ 2.31 A – 45 W 19.5 V dc @ 3.33 A – 65 W 19.5 V dc @ 4.62 A – 90 W 19.5 V dc @ 6.15 A – 120 W 19.5 V dc @ 7.70 A – 150 W 19.5 V dc @ 10.3 A – 200 W	
NOTE: This product is designed for IT power systems in Norway with phase-to-phase voltage not exceeding 240 V rms.		
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Non-operating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (non-condensing)		

	Metric	U.S.
Operating	10% to 90%	
Non-operating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Non-operating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

9 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 68. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 69.
- 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 70.

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 69.

- 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 70.

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 70. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 68.

- 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 70.

- 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 73.

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 68.

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 68.

- 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 68.

- 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 72.

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 68.

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 Power cord set requirements

The wide-range input feature of the slate permits it to operate from any line voltage from 100 to 120 volts AC, or from 220 to 240 volts AC.

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

Power cord sets for use in other countries and regions must meet the requirements of the country or region where the slate 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 amps 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 slate. Requirements for all countries 113

Requirements for specific countries and regions

Country/region	Accredited agency	Applicable note number
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	FIMKO	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	METI	3
The Netherlands	KEMA	1
Norway	NEMKO	1
The People's Republic of China	COC	5

Country/region	Accredited agency	Applicable note number
South Korea	EK	4
Sweden	CEMKO	1
Switzerland	SEV	1
Taiwan	BSMI	4
The United Kingdom	BSI	1
The United States	UL	2

1. The flexible cord must be Type HO5VV-F, 3-conductor, 1.0-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 SPT-3 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) or NEMA 6-15P (15 A, 250 V) configuration.
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 VCT or VCTF, 3-conductor, 1.00-mm² conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (7 A, 125 V) configuration.
4. The flexible cord must be Type RVV, 3-conductor, 0.75-mm² conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country or region where it will be used.
5. The flexible cord must be Type VCTF, 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.

11 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

A

AC adapter light 11
AC adapter, spare part numbers 25
antenna 5
  removal 60
  spare part number 24, 61
audio, product description 2
audio-in jack 10
audio-out jack 10

B

back cover, spare part numbers 24
backups 68
battery
  removal 33
  spare part number 20, 33
battery light 11
BIOS
  determining version 62
  downloading an update 63
  starting the Setup Utility 62
  updating 62
boot order
  changing 72
bottom components 12
bottom cover
  removal 31
  spare part numbers 22, 31
button components 6
buttons
  power 6
  TouchPad 9

C

caps lock light 8
card reader board
  removal 40
  spare part number 20, 40
card reader board cable, spare part number 20, 40
chipset, product description 1
components
  bottom 12
  buttons 6
  display 5
  keys 7
  left side 10
  lights 8
  right side 11
  speakers 6
  TouchPad 9
computer
  major components 14
  specifications 66

D

display assembly, removal 53
display bezel
  removal 55
  spare part number 23, 55
display components 5, 23
display panel
  product description 1
  removal 55
  spare part numbers 23, 56
display panel cable
  removal 57
  spare part numbers 24, 57
drive light 11
DVD±RW DL SuperMulti Drive, spare part number 25

E

esc key 7
Ethernet, product description 2

F

fan
  removal 43
  spare part number 20, 43
fn key 7
foot
  removal 31
  spare part numbers 31

G

graphics, product description 1

H

hard drive
  product description 2
  removal 34
  spare part numbers 20, 34
hard drive bracket
  removal 34
  spare part number 20, 34
hard drive cable
  removal 35
  spare part numbers 20, 34
hard drive connector board, spare part number 20
HDMI port 11
HDMI-to-VGA adapter, spare part number 25
headphone jack 10
heat sink
  removal 47
  spare part numbers 20, 47
hinge
  removal 59
  spare part number 24, 60
hinge cap, spare part number 24
HP PC Hardware Diagnostics (UEFI)
  using 64
HP Recovery Manager
  correcting boot problems 72
  starting 71
HP Recovery media
  creating 68
  recovery 71
HP Recovery partition
  recovery 71
  removing 73

J

jacks
  audio-in 10
  audio-out 10
  headphone 10
  microphone 10
  network 11
  RJ-45 11

K

key components 7
keyboard, product description 2, 3
keyboard/top cover, spare part numbers 15, 17
keys
  esc 7
  fn 7
  Windows 7

L

left-side components 10
light components 8
lights
  AC adapter 11
  battery 11
  caps lock 8
  drive 11
  mute 8
  network status 11
  RJ-45 status 11
  webcam 5
locating information
  hardware 4
  software 4

M

memory card 10
memory card reader 10
memory module
  removal 36
  spare part numbers 22, 36
memory, product description 1, 2
microphone
  location 5
  product description 2
microphone jack 10
minimized image recovery 71
minimized image, creating 70
miscellaneous parts 25
model name 1
mute light 8

N

network jack 11
network status lights 11

O

operating system, product description 3
optical drive, spare part number 25
original system recovery 70

P

pointing device, product description 2, 3
ports
  HDMI 11
  product description 2
  USB 2.0 10
  USB 3.0 10, 11
power button 6
power connector 11
power connector cable
  removal 52
  spare part number 19, 52
power cord
  set requirements 74
  spare part numbers 25
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 2
  keyboard 2, 3
  memory 1, 2
  microphone 2
  operating system 3
  pointing device 2, 3
  ports 2
  power requirements 3
  processors 1
  product name 1
  security 3
  serviceability 3
  solid-state drive 2
  video 2
  wireless 2
product name 1

R

recover
  options 70
recovery
  discs 69, 71
  HP Recovery Manager 70
  media 71
  starting 71
  supported discs 69
  system 70
  USB flash drive 71
  using HP Recovery media 69
recovery media
  creating 68
  creating using HP Recovery Manager 69
recovery partition
  removing 73
removal/replacement procedures 31
right-side components 11
RJ-45 jack 11
RJ-45 status lights 11
RTC battery
  removal 39
  spare part number 39
Rubber Kit, spare part numbers 22, 31

S

Screw Kit, spare part number 25
security cable slot 10
security, product description 3
service tag 13
serviceability, product description 3
slots
  memory card reader 10
  security cable 10
solid-state drive
  product description 2
  removal 42
  spare part numbers 20, 42
solid-state drive bracket, spare part number 20
speaker components 6
speakers
  location 6
  removal 51
  spare part number 22, 51
specifications 66
supported discs, recovery 69
system board
  removal 44
  spare part numbers 20, 44
system recovery 70

system restore point
creating 69
system restore point, creating 68

T
TouchPad
buttons 9
removal 35
spare part number 19, 35
TouchPad cable
removal 50
spare part number 21, 35, 50
TouchPad components 9
TouchPad zone 9

U
USB 2.0 port 10
USB 3.0 port 10, 11

V
vents 12
video, product description 2

W
webcam 5
webcam light 5
webcam/microphone module
removal 58
spare part number 23, 59
Windows
system restore point 68, 69
Windows key 7
Windows tools
using 69
wireless antenna 5
removal 60
spare part number 24, 61
wireless, product description 2
WLAN antenna 5
removal 60
spare part number 24, 61
WLAN module
removal 37
spare part numbers 20, 37