HP Pavilion 17 Laptop PC (model numbers 17-ar001 through 17-ar099)

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

Product notice

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

Not all features are available in all editions 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 for http://www.microsoft.com details.

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

Category	Description
Product Name	HP Pavilion 17 Laptop PC (model numbers 17-ar001 through 17-ar099)
Processors	AMD® A12-9720P 2.70-GHz (turbo up to 3.60-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W)
	AMD A10-9620P 2.50-GHz (turbo up to 3.40-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W)
Chipset	AMD integrated SoC (SoC) fusion controller hub (FCH)
Graphics	**Internal graphics:**
	AMD Radeon™ R7 Graphics subsystem with UMA video memory (only on computer models equipped with an AMD A12-9720P processor)
	AMD Radeon R5 Graphics subsystem with UMA video memory (only on computer models equipped with an AMD A10-9620P processor)
Panel	17.3-in, full high-definition (FHD), white light-emitting (WLED), AntiGlare (1920×1080), flat-flat (4.0-mm), UWVA, eDP, 300 nits, 16:9 ultra wide aspect ratio, display assembly
	17.3-in, high-definition+ (HD+), WLED, BrightView (1600×900), flat-flat (4.0-mm), SVA, eDP, 220 nits, 16:9 ultra wide aspect ratio, display assembly
Memory	Two SODIMM memory module slots, non-customer-accessible/non-upgradable
	DDR4-1866 dual channel support
	Supports up to 16-GB of system memory
	Supports the following configurations:
	● 16384-MB (8192-MB × 2)
	● 12288-MB (8192-MB + 4096-MB)
	● 8192-MB (8192-MB × 1 or 4096-MB × 2)
	● 6144-MB (4096-MB + 2048-MB)
	● 4096-MB (4096-MB × 1)
Storage	Support for hard drive
	Support for **6.35-cm** (2.5-in) hard drives in **7.2-mm** (.28 in) and **9.5-mm** (.37 in) thicknesses (all hard drives use the same bracket)
	Support for Accelerometer hard drive protection
	Support for 2-TB, 5400-rpm, 7.2-/9.5-mm and 1-TB, 5400-rpm, 7.2-/9.5-mm hard drives
Optical drive	Support for 9.0-mm tray load, SATA, fixed (not modular) optical drive
	DVD±RW Double Layer SuperMulti Drive
	Support for zero power optical drive
	Support for M-disc
Audio and video	**Audio:**
	B&O Play
	Support for B&O Play Audio Control

Category	Description
Audio and video *(continued)*	Support for dual speakers
	Support for HP Audio Boost
	Microphones: Dual array digital microphones with appropriate beam-forming, echo-cancellation, noise-suppression software
	Video: HP Wide Vision HD infrared camera with indicator light, USB 2.0, HD BSI sensor, f2.0, wide dynamic range (WDR), 88° WFOV, 720p by 30 frames per second
Ethernet	10/100/1000 network interface card (NIC)
Wireless	**WLAN:**
	Integrated wireless local area network (WLAN) options by way of wireless module
	Dual M.2/PCIe WLAN antennas built into display assembly
	Integrated wireless personal area network (PAN) supported by Bluetooth® 4.2 combo card
	Support for the Intel Dual band wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) WLAN module format
	Compatible with Miracast-certified devices
External media cards	Micro-Secure Digital (SD®) media reader slot
Ports	● AC Smart Pin adapter plug
	● Audio-out (headphone)/audio-in (microphone) combo jack
	● HDMI v1.4 supporting up to 1920×1080 @ 60Hz
	● RJ45 (network)
	● USB 3.x ports (2)
	● USB Type-C port
Keyboard/ pointing devices	Full-sized, backlit, island-style keyboard with numeric keypad
	ClickPad requirements:
	● ClickPad with image sensor
	● MultiTouch gestures enabled
	● Support for Modern TrackPad gestures
	● Taps enabled as default
Power requirements	Support for a 3-cell, 41-WHr, 3.6-AHr, Li-ion battery
	Support for a 45-W HP Smart AC adapter (non-PFC, RC, 4.5-mm, non-slim)
	Support for a 1.00-m power cord with a C5 connector in North America
Security	Support for security cable lock
	Support for Trusted Platform Module (TPM) 2.0
Operating system	**Preinstalled:** Windows 10 and Windows 10 Professional
	For developed market (ML): Windows 10 Home ML and Windows 10 Home Plus ML
	FreeDOS 2.0
Serviceability	**End user replaceable part:** AC adapter and optical drive

2 Getting to know your computer

Locating hardware

To find out what hardware is installed on your computer:

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

A list displays all the devices installed on your computer.

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

Locating software

To find out what software is installed on your computer:

▲ Select the **Start** button.

– or –

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

Right side

Component			Description
(1)		Power light	• On: The computer is on.
			• Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.
			• Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Drive light (select products only)	• Blinking white: The hard drive is being accessed.
			• Amber: HP 3D DriveGuard has temporarily parked the hard drive.
(3)		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.
(4)	*SS⟵*	USB 3.x SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(5)		Optical drive	Depending on your computer model, reads an optical disc or reads and writes to an optical disc.
			NOTE: For disc compatibility information, type `help` in the taskbar search box, select **Help and Support**, and then type `disc compatibility` in the search box.
(6)		Optical drive eject button	Releases the optical drive disc tray.
(7)		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.

Component		Description
(7)	AC adapter and battery light *(continued)*	• Off: The battery is not charging.
(8)	Power connector	Connects an AC adapter.

Left side

Component			Description
(1)		Security cable slot	Attaches an optional security cable to the computer.
			NOTE: The security cable is designed to act as a deterrent, but it may not prevent the computer from being mishandled or stolen.
(2)		RJ-45 (network) jack/status lights	Connects a network cable.
			● White: The network is connected.
			● Amber: Activity is occurring on the network.
(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)		USB 3.x SuperSpeed port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer.
(5)		USB Type-C port	Connects a USB device, such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer.
			NOTE: Cables and/or adapters (purchased separately) may be required.
(6)		Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speakers, headphones, earbuds, a headset, or a television audio cable. Also connects an optional headset microphone. This jack does not support optional standalone microphones.
			WARNING! To reduce the risk of personal injury, adjust the volume before putting on headphones, earbuds, or a headset. For additional safety information, refer to the *Regulatory, Safety, and Environmental Notices*.
			To access this guide:
			▲ Select the **Start** button, select **HP Help and Support**, and then select **HP Documentation**.
			NOTE: When a device is connected to the jack, the computer speakers are disabled.

Display
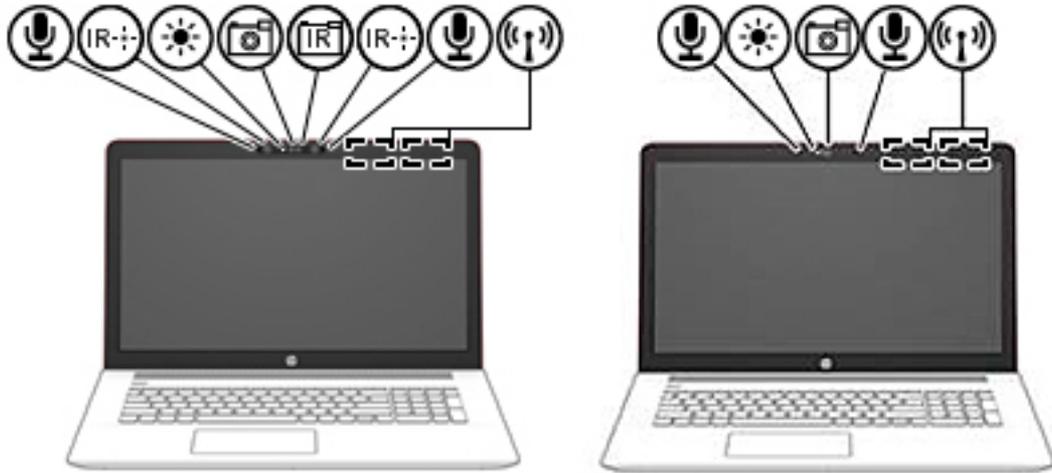
Component		Description
🎤	Internal microphones (2)	Record sound.
IR☀	Infrared camera lights (2; select products only)	On: The infrared camera is in use.
☀	Camera light	On: The camera is in use.
📷	Camera	Allows you to video chat, record video, and record still images.
IR	Infrared camera (select products only)	Allows a facial recognition logon to Windows, instead of a password logon.
((γ))	WLAN antennas* (2)	Send and receive wireless signals to communicate with WLANs.

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

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

To access this guide:

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

Keyboard area

TouchPad

Component		Description
(1)	TouchPad zone	Reads your finger gestures to move the pointer or activate items on the screen.
(2)	Left control zone	Textured area that allows you to perform additional gestures.
(3)	Right control zone	Textured area that allows you to perform additional gestures.

Lights

Component			Description
(1)	⏻	Power light	• On: The computer is on. • Blinking: The computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components. • Off: The computer is off or in Hibernation. Hibernation is a power-saving state that uses the least amount of power.
(2)		Caps lock light	On: Caps lock is on, which switches the key input to all capital letters.
(3)	🔇	Mute light	• On: Computer sound is off. • Off: Computer sound is on.

Button and speakers

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.
			▲ Right-click the **Start** button, and then select **Power Options**.
(2)		Speakers	Produce sound.

Special keys

Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows key	Opens the **Start** menu. **NOTE:** Pressing the Windows key again will close the **Start** menu.
(4)	Action keys	Execute frequently used system functions. **NOTE:** On select products, the f5 action key turns the keyboard backlight feature off or on.
(5)	num lock key	Alternates between the navigational and numeric functions on the integrated numeric keypad.
(6)	Integrated numeric keypad	A separate keypad to the right of the alphabet keyboard. When num lock is pressed, the keypad can be used like an external numeric keypad. **NOTE:** If the keypad function is active when the computer is turned off, that function is reinstated when the computer is turned back on.

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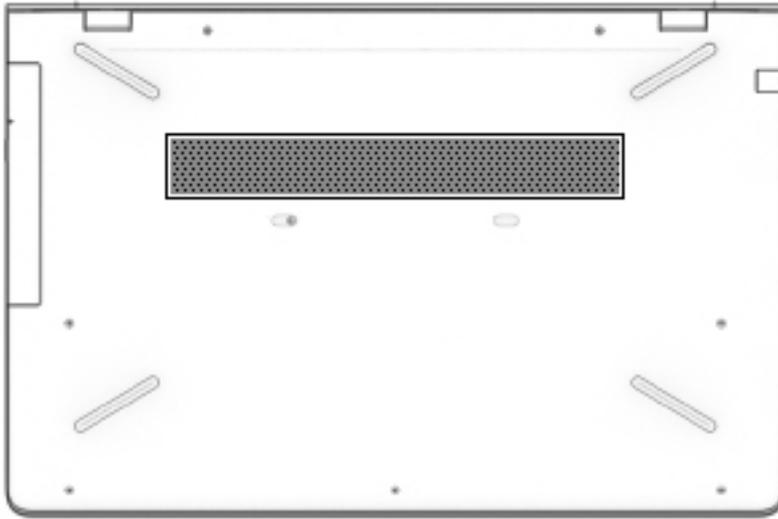
Component	Description
Vents	Enable airflow to cool internal components.
	NOTE: The computer fan starts up automatically to cool internal components and prevent overheating. It is normal for the internal fan to cycle on and off during routine operation.

3   Illustrated parts catalog

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

Locating the model number, serial number, product number, and warranty information

The model number **(1)**, serial number **(2)**, product number **(3)**, and warranty information **(4)** are located on the bottom of the computer. This information may be needed when travelling internationally or when contacting support.
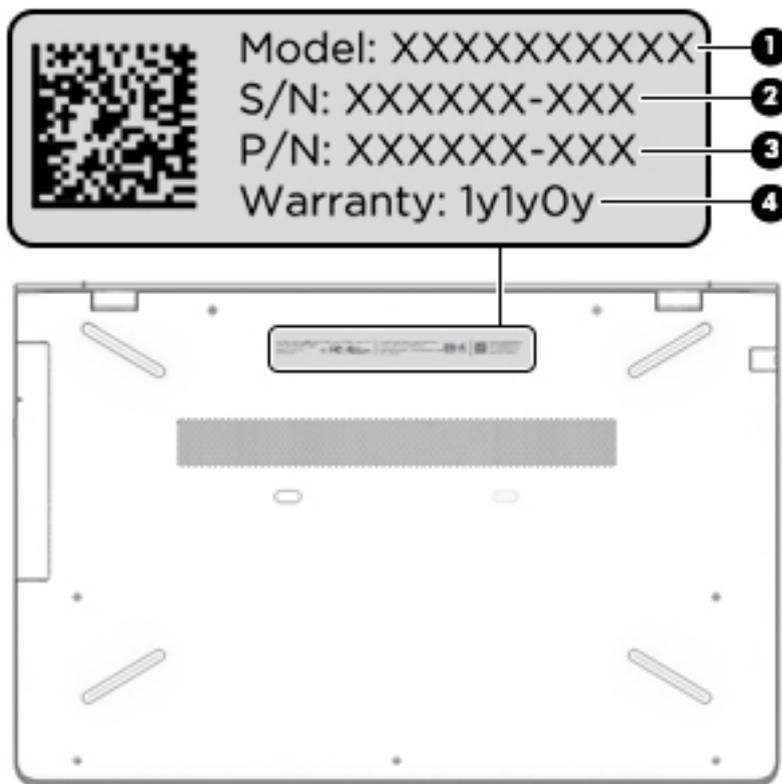
Computer components
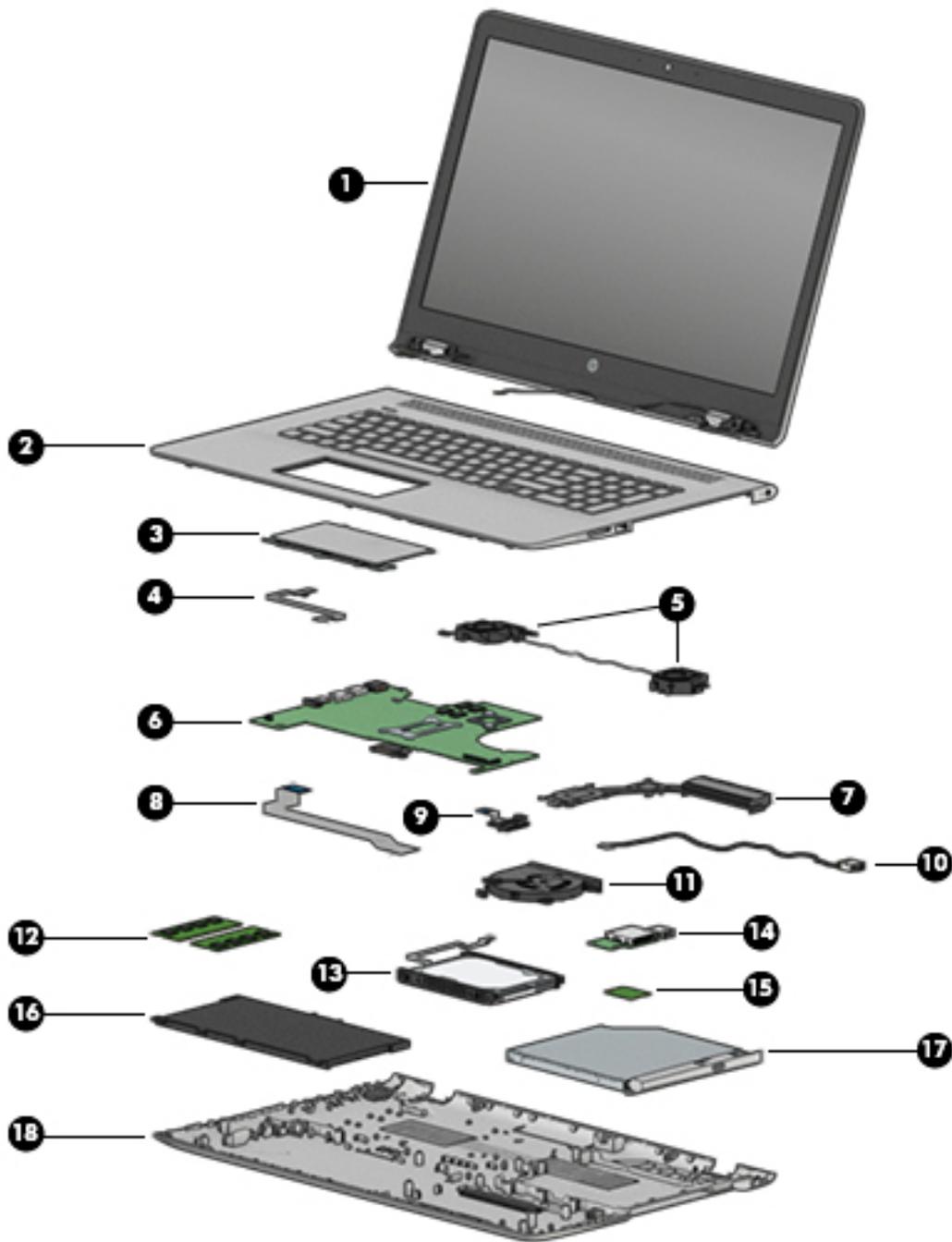
Item	Component	Spare part number
(1)	**Display assembly**: The display assembly is spared at the subcomponent level only. For more display assembly spare part information, see Display assembly components on page 17.	
(2)	**Keyboard/top cover** (includes backlight cable and keyboard cable):	
	For use in Canada	933724-DB1
	For use in the United States	933724-001

| Item	Component	Spare part number
(3)	**TouchPad** (does not include TouchPad bracket or TouchPad cable)	926853-001
	TouchPad bracket (not illustrated)	933471-001
(4)	**TouchPad cable** (includes double-sided adhesive)	933467-001
(5)	**Speakers** (includes cables and four rubber isolators)	933478-001
(6)	**System board** (includes processor and replacement thermal material):	
	Equipped with an AMD A12-9720P 2.70-GHz (turbo up to 3.60-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R7 Graphics subsystem with UMA video memory, and the Windows 10 operating system	931278-601
	Equipped with an AMD A12-9720P 2.70-GHz (turbo up to 3.60-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R7 Graphics subsystem with UMA video memory, and a non-Windows operating system	931278-001
	Equipped with an AMD A10-9620P 2.50-GHz (turbo up to 3.40-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R5 Graphics subsystem with UMA video memory, and the Windows 10 operating system	931727-601
	Equipped with an AMD A10-9620P 2.50-GHz (turbo up to 3.40-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R5 Graphics subsystem with UMA video memory, and a non-Windows operating system	931727-001
	USB Type-C port bracket (not illustrated)	926849-001
(7)	**Heat sink** (includes replacement thermal material)	933470-001
(8)	**Connector board cable** (includes double-sided adhesive)	933466-001
(9)	**Optical drive cable**	933469-001
(10)	**Power connector cable**	810327-006
(11)	**Fan** (includes cable)	926845-001
(12)	**Memory modules** (2, SODIMM, DDR4-2400, 1.2-V):	
	8-MB	862398-855
	4-MB	862397-855
	2-MB	864271-855
(13)	**Hard drive** (does not include hard drive bracket or hard drive cable):	
	2-TB, 5400-rpm, SATA, 7.0-mm hard drive	912487-855
	1-TB, 5400-rpm, SATA, 7.0-mm hard drive	778192-005
	NOTE: The hard drive bracket is available using spare part number 926848-001. The hard drive cable is available using spare part number 933468-001.	
(14)	**Connector board** (includes memory card reader and USB port; does not include cable)	933475-001
(15)	**Intel Dual band wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) WLAN module**	863934-855
(16)	**Battery** (3-cell, 41-WHr, 3.6-AHr, Li-ion)	920070-855
(17)	**DVD±RW Double Layer SuperMulti Drive** (does not include the optical drive bezel, optical drive bracket, optical drive cable, or optical drive gate Mylar)	920417-012

Item	Component	Spare part number
	NOTE: The optical drive components are available using the following spare part numbers:	
	● Optical drive bezel – 933477-001	
	● Optical drive bracket – 933472-001	
	● Optical drive cable – 933469-001	
	● Optical drive Mylar screw cover – 933473-001	
(18)	**Bottom cover**	933463-001
	Rubber Foot Kit (not illustrated, includes bottom cover rubber feet)	926855-001

Display assembly components
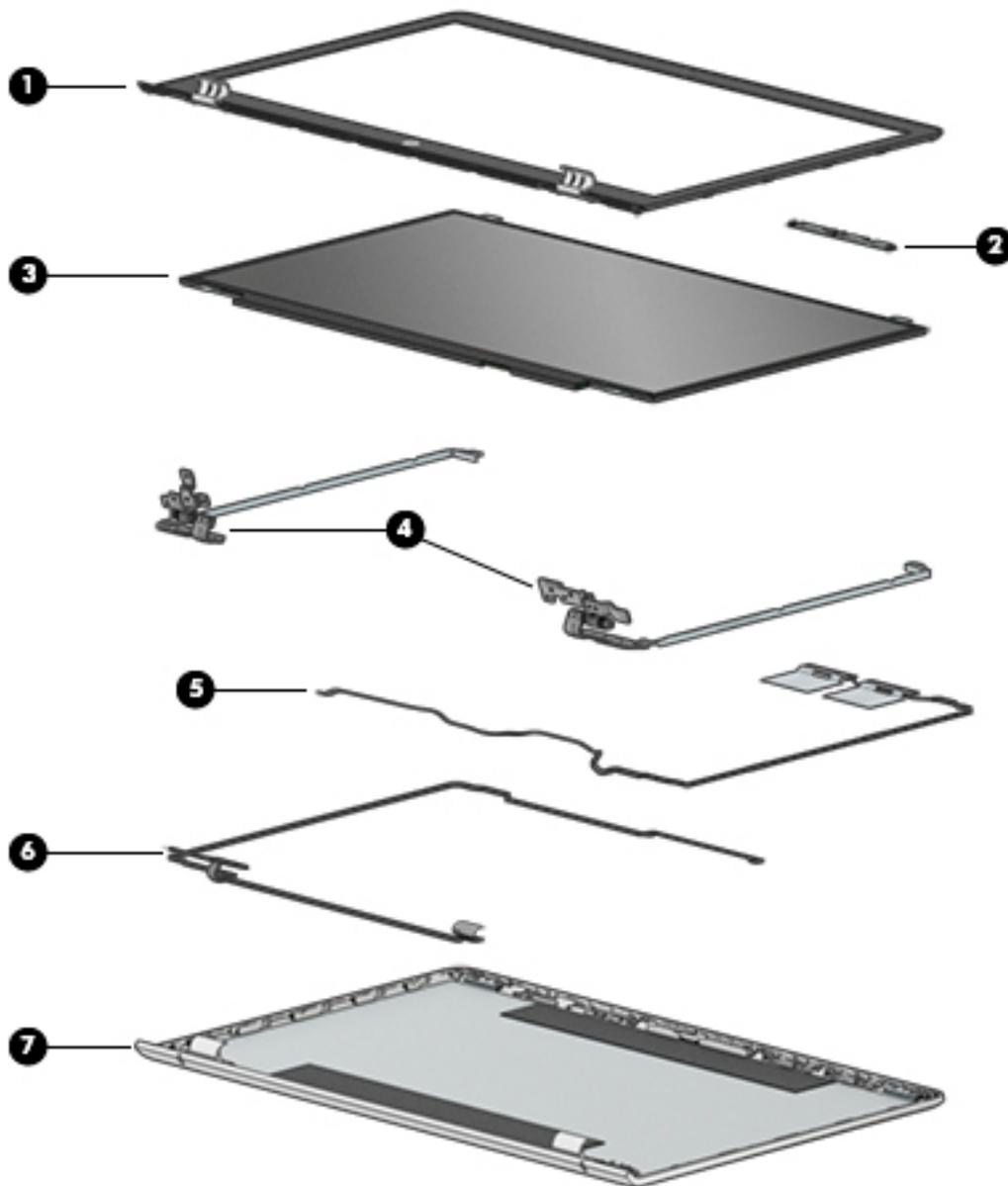
Item	Component	Spare part number
(1)	**Display bezel** (includes double-sided adhesive)	933464-001
(2)	**Webcam/microphone module** (includes double-sided adhesive)	919573-007
(3)	**Display panel:**	
	17.3-in, FHD, WLED, AntiGlare (1920×1080), UWVA, f-flat (4.0-mm), eDP display panel	798926-013
	17.3-in, HD+, WLED, BrightView (1600×900), SVA, f-flat (4.0-mm), eDP display panel	851051-007
(4)	**Hinges** (2, include left and right display hinges)	933474-001
(5)	**Wireless Antenna Kit** (includes left and right wireless antenna cables and transceivers)	933461-001

Item	Component	Spare part number
(6)	**Display panel cable**	933465-001
(7)	**Display back cover** (includes rubber padding and shielding)	933462-001

Miscellaneous parts

Component	Spare part number
45-W HP Smart AC adapter (non-PFC, RC, 4.5-mm, non-slim)	741553-850
HP HDMI-to-VGA adapter	701943-001
USB Type-C–to–USB Type-A dongle	833960-001
Power cord (C5 connector, 1.00-m) for use in North America	920688-001
Rubber Foot Kit (includes bottom cover rear foot strip)	926855-001
Screw Kit	933479-001

4 Removal and replacement preliminary requirements

Tools required

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

- Flat-bladed screw driver
- Magnetic screw driver
- Phillips P0 screw driver

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 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.

After removing drive, place it in a static-proof bag.

Avoid exposing a 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, screw drivers, and vacuums.

- When fixtures must directly contact dissipative surfaces, use fixtures made only of static-safe materials.

- Keep the work area free of nonconductive materials, such as ordinary plastic assembly aids and 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

This chapter provides removal and replacement procedures for Authorized Service Provider only parts.

⚠ **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.

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

Component replacement procedures

📝 **NOTE:**   Details about your computer, including model, serial number, product key, and length of warranty, are on the service tag at the bottom of your computer. See Locating the model number, serial number, product number, and warranty information on page 13 for details.

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

There are as many as 60 screws that must be removed, replaced, and/or loosened when servicing Authorized Service Provider only parts. Make special note of each screw size and location during removal and replacement.

Optical drive

Description	Spare part number
DVD±RW Double Layer SuperMulti Drive (does not include the optical drive bezel, optical drive bracket, optical drive cable, or optical drive gate Mylar)	920417-012

**NOTE:**   The optical drive components are available using the following spare part numbers:

- Optical drive bezel – 933477-001
- Optical drive bracket – 933472-001
- Optical drive cable – 933469-001
- Optical drive Mylar screw cover – 933473-001

Before disassembling the computer, follow these steps:

1.   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.

2.   Disconnect all external devices connected to the computer.

3.   Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

Remove the optical drive:

1. Remove the optical drive Mylar screw cover **(1)**.

    The optical drive Mylar screw cover is available using spare part number 933473-001.

2. Remove the Phillips PM2.0×10.8 screw **(2)** that secures the optical drive to the computer.

3. Remove the optical drive **(3)**.
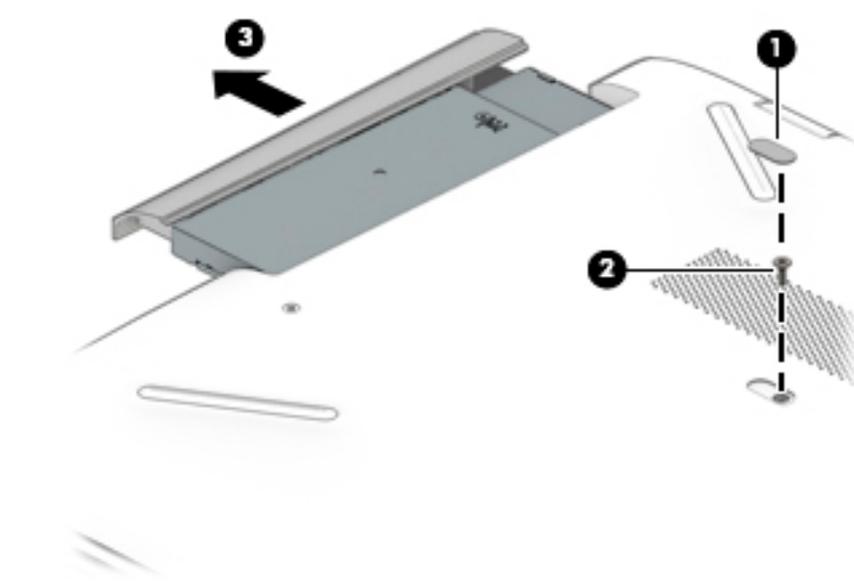
Reverse this procedure to install the optical drive.

Bottom cover

Description	Spare part number
Bottom cover	933463-001

Before disassembling the computer, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see).

Remove the bottom cover:

1. Remove the computer rubber feet **(1)**.

    The rubber feet are included in the Rubber Foot Kit, spare part number 926855-001.

2. Remove the following screws that secure the bottom cover to the computer:

(2) Two Phillips M2.5×6.7 screws under the rear rubber feet

(3) Three Phillips PM2.0×10.8 screws rear edge and middle of computer

(4) Three Phillips M2.0×5.7 screws on the front edge

(5) Four Phillips M2.0×2.8 broad head screws in the optical drive bay
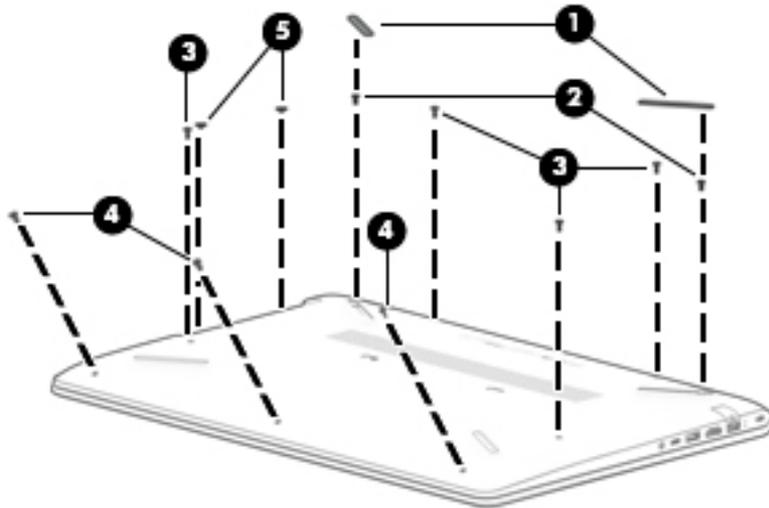
3. Insert a case utility tool **(1)** or similar thin, plastic tool into the display hinge areas of the bottom cover.

4. Separate the rear edge of the bottom cover **(2** from the keyboard/top cover.

5. Separate the tabs **(3)** built into the keyboard/top cover from the slots built into the bottom cover.

6. Remove the bottom cover **(4)**.
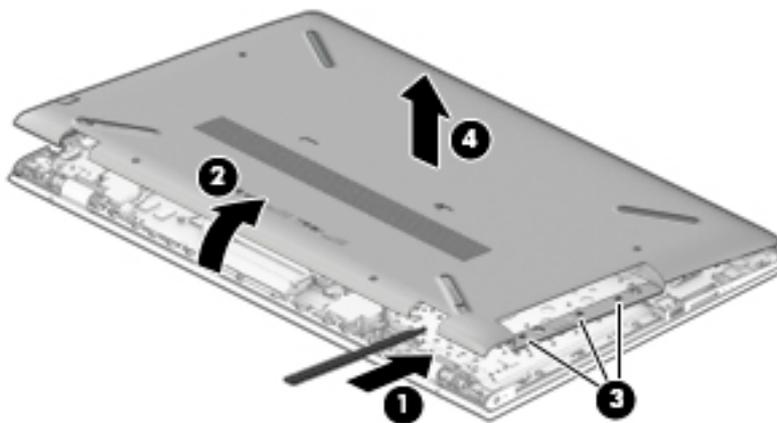
Reverse this procedure to install the bottom cover.

Battery

Description	Spare part number
3-cell, 41-WHr, 3.6-AHr, Li-ion battery	920070-855

Before removing the battery, follow these steps:

1.   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.

2.   Disconnect all external devices connected to the computer.

3.   Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4.   Remove the optical drive (see Optical drive on page 24).

5.   Remove the bottom cover (see Bottom cover on page 25).

Remove the battery:

1.   Remove the four Phillips PM2.0×4.5 screws **(1)** that secure the battery to the keyboard/top cover.

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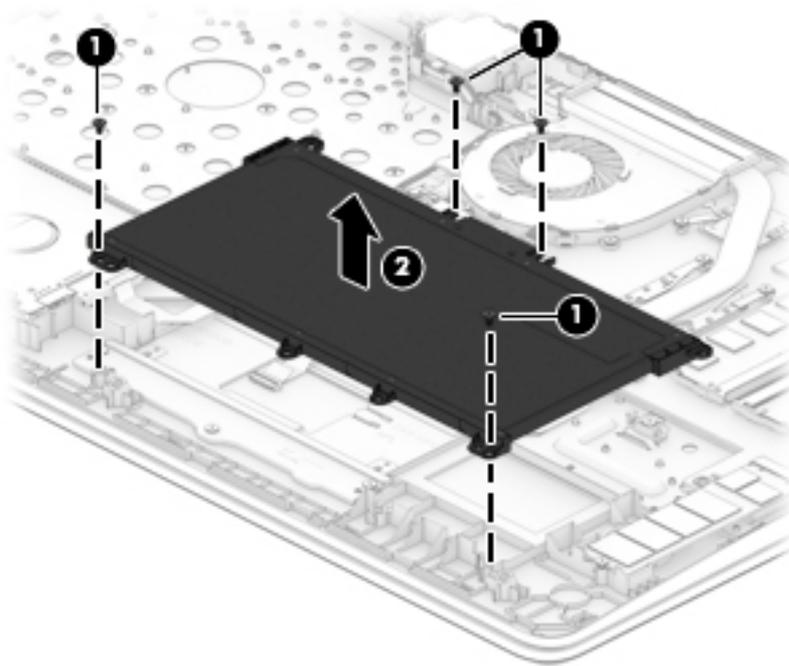
Reverse this procedure to install the battery.

Hard drive

NOTE: The hard drive spare part kit does not include the hard drive bracket or the hard drive cable. The hard drive bracket is available using spare part number 926848-001. The hard drive cable is available using spare part number 933468-001.

Description	Spare part number
2-TB, 5400-rpm, SATA, 7.0-mm hard drive	912487-855
1-TB, 5400-rpm, SATA, 7.0-mm hard drive	778192-005

Before removing the hard drive, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

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.
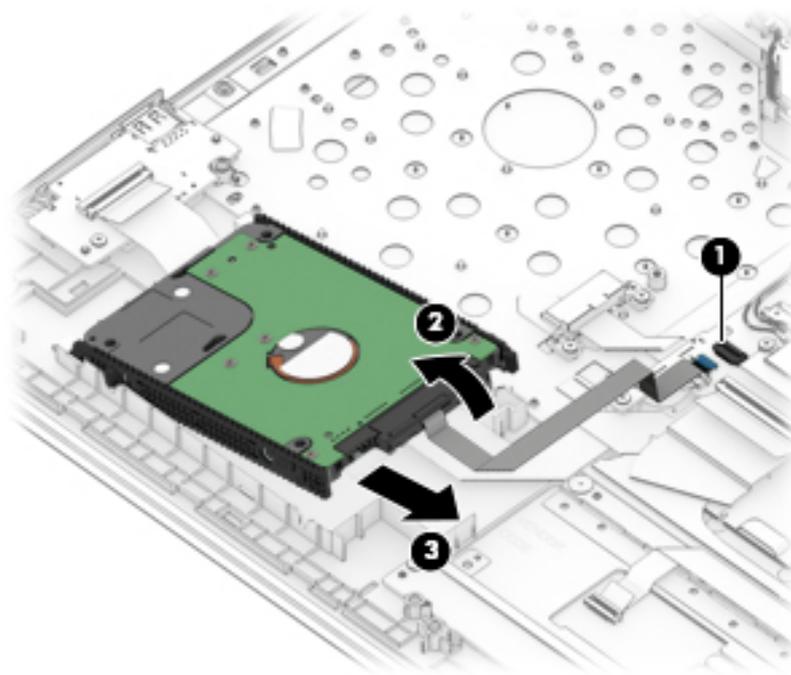
4. If it is necessary to disassemble the hard drive, remove the hard drive brackets **(1)** from the hard drive, and then disconnect the hard drive cable **(2)** from the hard drive.
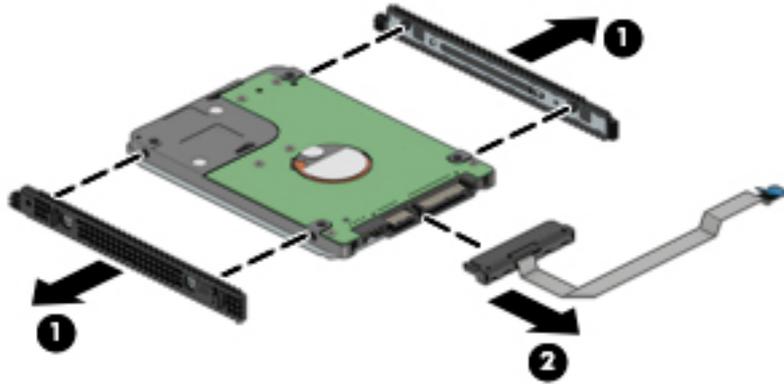
Reverse this procedure to reassemble and install the hard drive.

WLAN module

Description	Spare part number
Intel Dual band wireless-AC 3168 802.11AC 1×1 WiFi + Bluetooth 4.2 Combo Adapter (non-vPro) WLAN module	863934-855

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

Before removing the WLAN module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

3. Disconnect all external devices from the computer.

4. Remove the optical drive (see).

5. Remove the bottom cover (see).

6. Remove the battery (see).

Remove the WLAN module:

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

📝 **NOTE:**   The wireless antenna cable labeled "1/MAIN" connects to the WLAN module "Main" terminal. The wireless antenna cable labeled "2/AUX" connects to the WLAN module "Aux" terminal.

2. Remove the Phillips PM2.0×4.2 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:** WLAN modules are designed with a notch to prevent incorrect insertion.
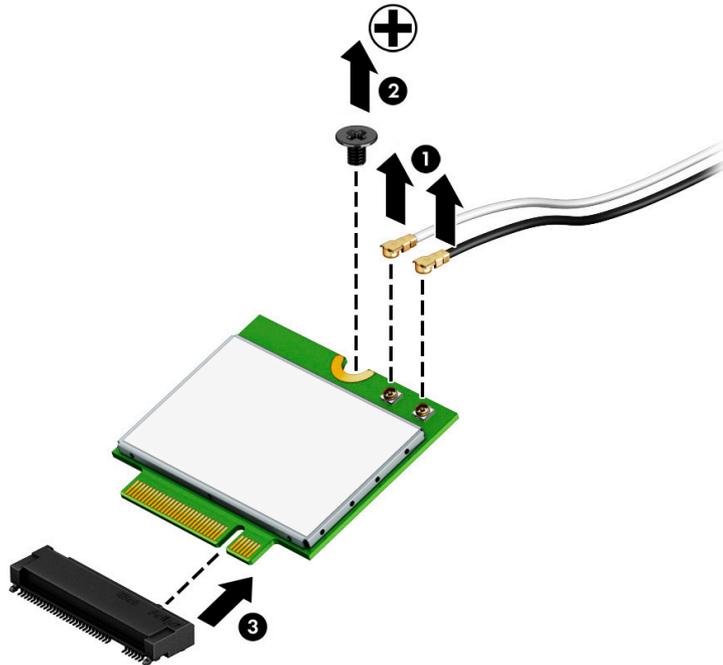
Reverse this procedure to install the WLAN module.

Memory module

📝 **NOTE:** Primary and expansion memory is installed in a side-by-side configuration on the system board. If only one memory module is installed, it must be installed in the socket labeled 1.

Description	Spare part number
8-MB, SODIMM, DDR4-2400, 1.2-V	862398-855
4-MB, SODIMM, DDR4-2400, 1.2-V	862397-855
2-MB, SODIMM, DDR4-2400, 1.2-V	864271-855

Update BIOS before adding memory modules

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

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

To update BIOS:

1. Navigate to www.hp.com.

2. Click **Support & Drivers**, and then click **Drivers & Software**.

3. In the **Enter a product name/number** box, type the computer model information, and then click **Search**.

4. Click the link for the computer model.

5. Select the operating system, and then click **Next**.

6. Under **Step 2: Select a Download**, click the **BIOS** link.

7. Click the link for the most recent BIOS.

8. Click the **Download** button, and then follow the on-screen instructions.

Before removing the memory module, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

3. Disconnect all external devices from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

Remove the memory module:

1. Spread the retaining tabs **(1)** on each side of the memory module slot to release the memory module. (The edge of the module opposite the slot rises away from the computer.)

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

NOTE: Memory modules are designed with a notch to prevent incorrect insertion.
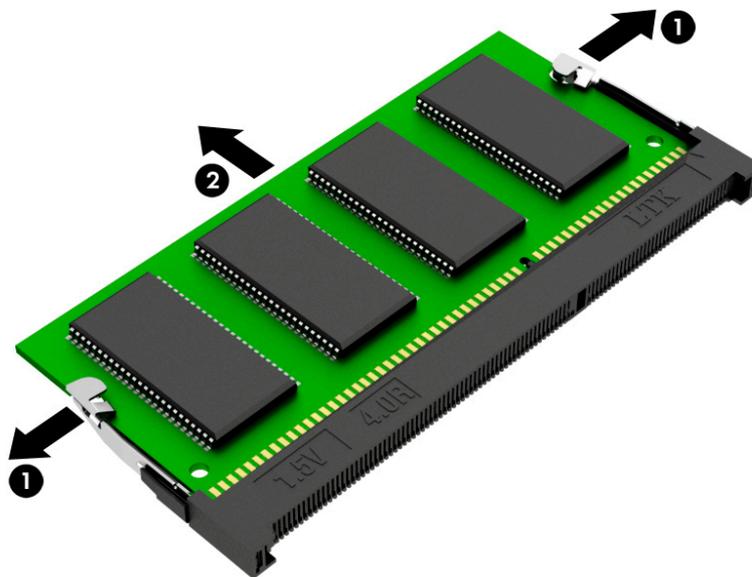
Reverse this procedure to install a memory module.

Connector board

| Description	Spare part number
Connector board (includes memory card reader and USB port; does not include cable)	933475-001

NOTE: The connector board cable is available using spare part number 933466-001.

Before removing the connector board, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

Remove the connector board:

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

2. Remove the Phillips PM2.0×4.2 screw **(2)** that secures the connector board to the keyboard/top cover.

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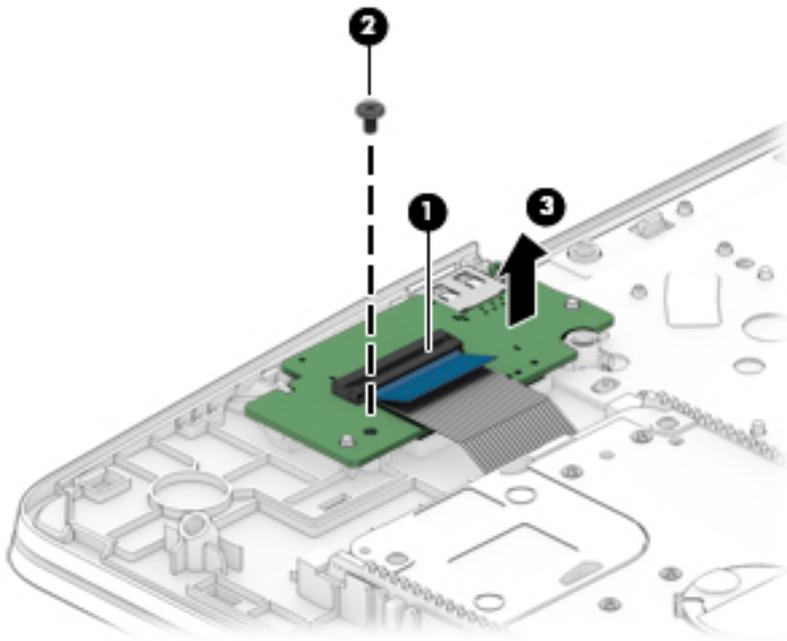
Reverse this procedure to install the connector board.

TouchPad cable

NOTE: The TouchPad spare part kit does not include the TouchPad cable. The TouchPad cable is available using spare part number 933467-001.

Before removing the TouchPad cable, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

Remove the TouchPad cable:

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

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

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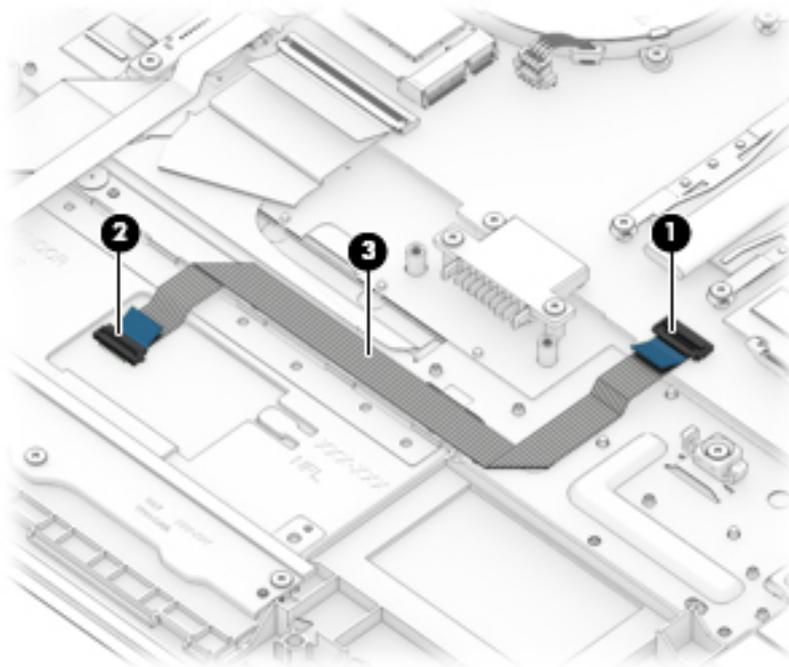
4. Remove the TouchPad cable.

Reverse this procedure to install the TouchPad cable.

TouchPad

NOTE: The TouchPad spare part kit does not include the TouchPad bracket or TouchPad cable. The TouchPad bracket is available using spare part number 933471-001. The TouchPad cable is available using spare part number 933467-001.

Description	Spare part number
TouchPad (does not include TouchPad bracket or TouchPad cable)	926853-001

Before removing the TouchPad, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

Remove the TouchPad:

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

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

3. Remove the three Phillips PM2.0×4.2 screws **(3)** that secure the TouchPad and the TouchPad bracket to the keyboard/top cover.

4. Remove the three Phillips PM2.0×2.3 broad head screws **(4)** that secure the TouchPad to the keyboard/top cover.

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

6. Remove the TouchPad **(6)**.
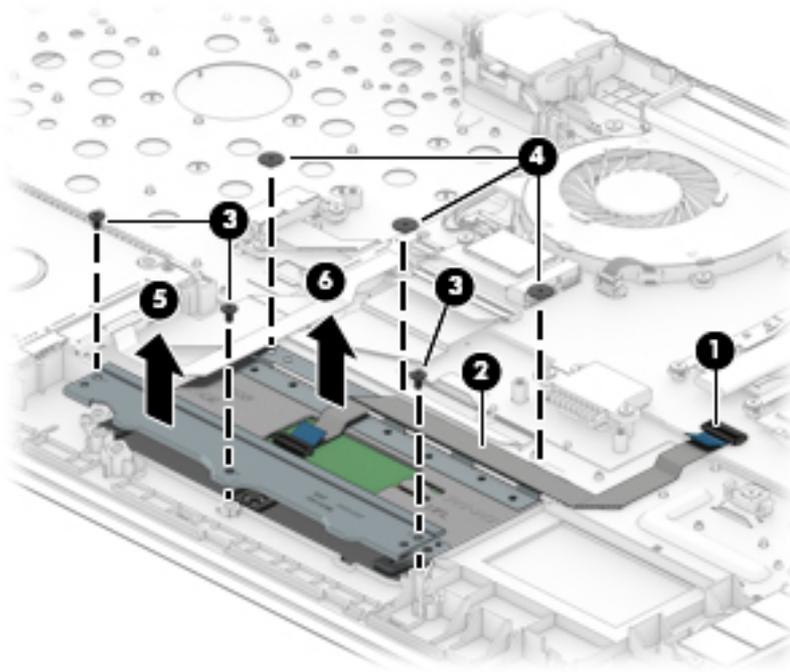
Reverse this procedure to install the TouchPad.

Fan

Description	Spare part number
Fan (includes cable)	926845-001

Before removing the fan, follow these steps:

1. Turn off the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

2. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

3. Disconnect all external devices from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

Remove the fan:

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

2. Remove the three Phillips PM2.0×4.2 screws **(2)** that secure the fan to the keyboard/top cover.

3. Remove the fan **(3)**.
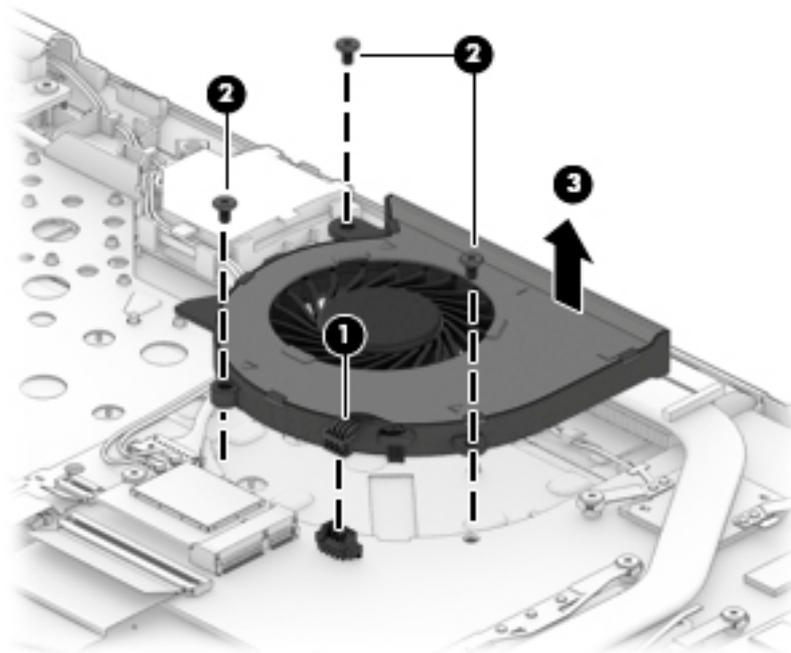
Reverse this procedure to install the fan.

System board

NOTE: All system board spare part kits include a processor and replacement thermal material.

Description	Spare part number
Equipped with an AMD A12-9720P 2.70-GHz (turbo up to 3.60-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R7 Graphics subsystem with UMA video memory, and the Windows 10 operating system	931278-601
Equipped with an AMD A12-9720P 2.70-GHz (turbo up to 3.60-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R7 Graphics subsystem with UMA video memory, and a non-Windows operating system	931278-001
Equipped with an AMD A10-9620P 2.50-GHz (turbo up to 3.40-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R5 Graphics subsystem with UMA video memory, and the Windows 10 operating system	931727-601
Equipped with an AMD A10-9620P 2.50-GHz (turbo up to 3.40-GHz) quad core processor (1866-MHz FSB, 2.0-MB L2 cache, 15-W), an AMD Radeon R5 Graphics subsystem with UMA video memory, and a non-Windows operating system	931727-001

Before removing the system board, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24), and then remove the following components:

   a. Bottom cover (see Bottom cover on page 25)

   b. Battery (see Battery on page 27)

   c. Fan (see Fan on page 36)

When replacing the system board, be sure to remove the following components from the defective system board and install them on the replacement system board:

- WLAN module (see WLAN module on page 29)

- Memory module (see Memory module on page 30)

- Heat sink (see Heat sink on page 40)

- Connector board cable (see Connector board cable on page 42)

- Optical drive cable (see Optical drive cable on page 43)

Remove the system board:

1. Disconnect the following cables from the system board:

   (1) Connector board ZIF connector cable

   (2) Backlight ZIF connector cable

   (3) Wireless antenna cables

**(4)** Power connector cable

(5) Display panel ZIF connector cable

(6) Speaker cable

(7) TouchPad ZIF connector cable

(8) Keyboard ZIF connector cable

2. Detach the connector board cable **(9)** from the keyboard/top cover. (The connector board cable is attached to the keyboard/top cover with double-sided adhesive.)
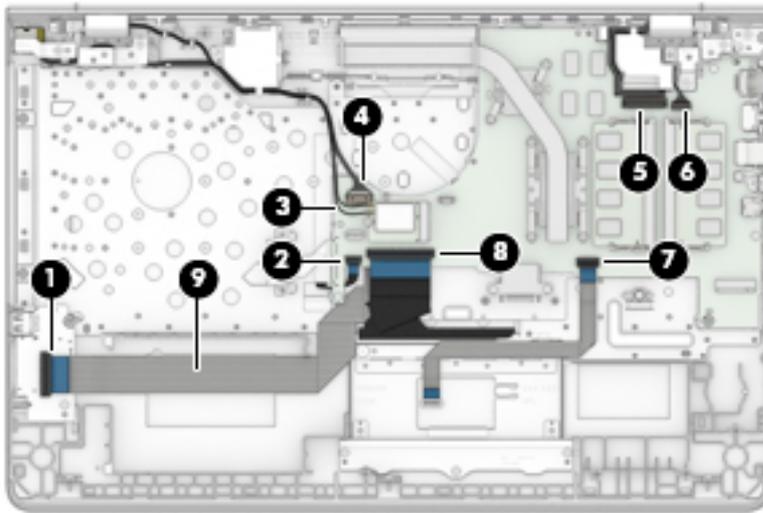
3. Remove the nine Phillips PM2.0×4.2 screws **(1)** that secure the system board to the keyboard/top cover.

4. Remove the USB Type-C port bracket **(2)**.

The USB Type-C port bracket is available using spare part number 926849-001.
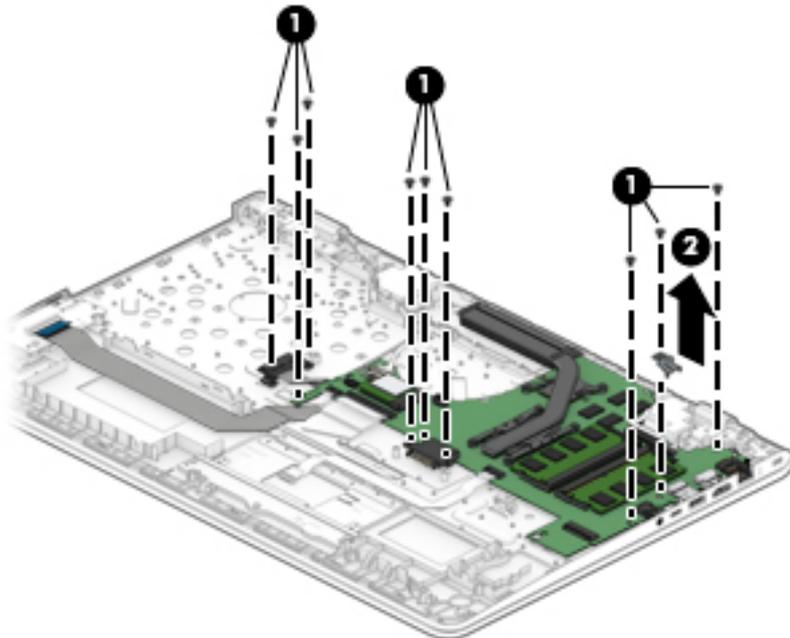
5. Lift the left side of the system board **(1)** until it rests at an angle.

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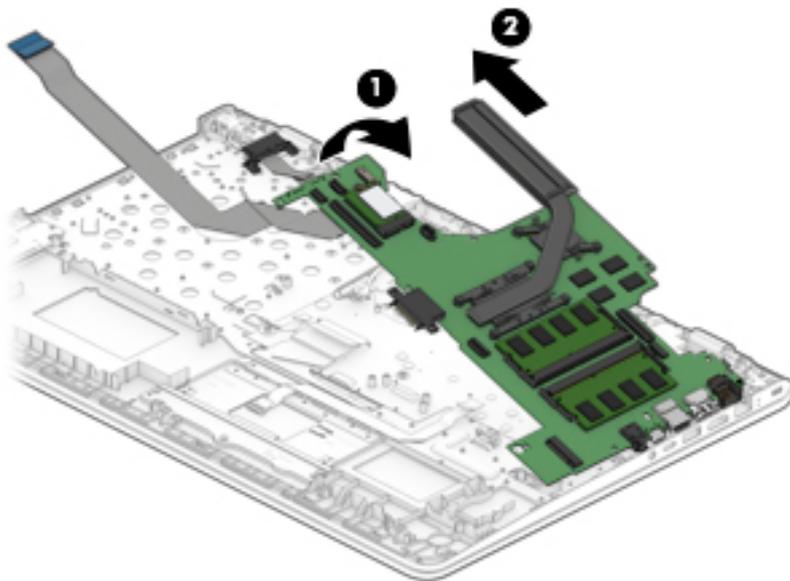
Reverse this procedure to install the system board.

Heat sink

Description	Spare part number
Heat sink (includes replacement thermal material)	933470-001

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 first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

3. Disconnect all external devices from the computer.

4. Remove the optical drive (see Optical drive on page 24), and then remove the following components:

   a. Bottom cover (see Bottom cover on page 25)

   b. Battery (see Battery on page 27)

   c. Fan (see Fan on page 36)

   d. System board (see System board on page 37)

Remove the heat sink:

1. Remove the six Phillips PM2.0×4.2 screws **(1)** that secure the heat sink to the system board.

2. Remove the heat sink **(2)**.
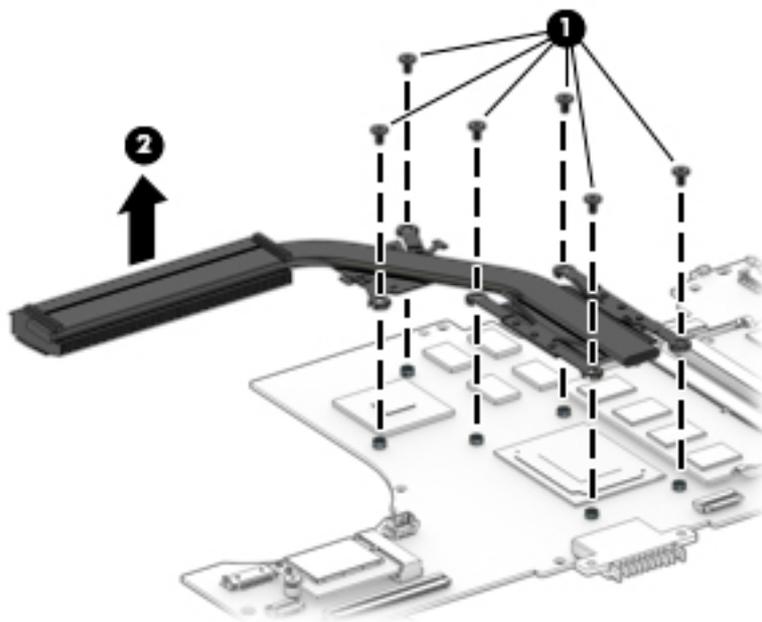
NOTE: The thermal material must be thoroughly cleaned from the surfaces of the heat sink and the system board components each time the heat sink is removed. Replacement thermal material is included with the heat sink and system board spare part kits.

Thermal paste is used on the processor **(1)** and the heat sink section **(2)** that services it. Thermal paste is also used on the VGA component **(3)** and the heat sink section **(4)** that services it.
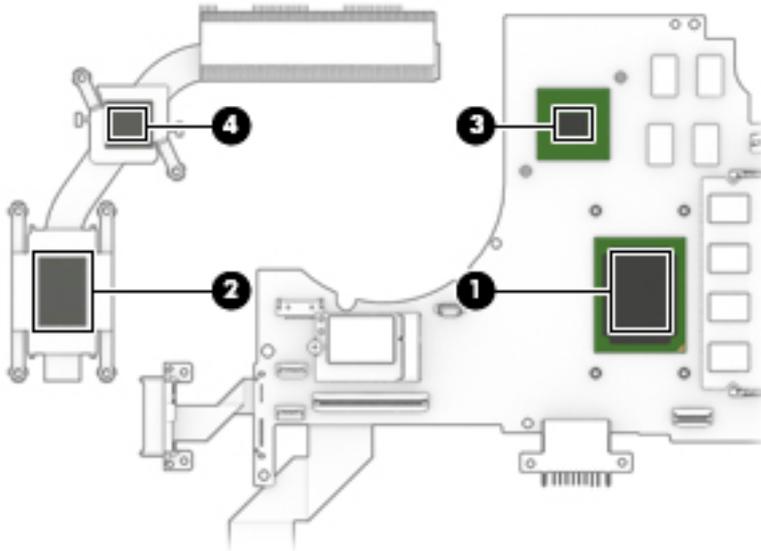
Reverse this procedure to install the heat sink.

Connector board cable

NOTE: The connector board spare part kit does not include the connector board cable. The connector board cable is available using spare part number 933466-001.

Before removing the connector board cable, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24), and then remove the following components:

   a. Bottom cover (see Bottom cover on page 25)

   b. Battery (see Battery on page 27)

   c. Fan (see Fan on page 36)

   d. System board (see System board on page 37)

Remove the connector board cable:

1. Turn the system board upside down with the front toward you.

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

3. Remove the connector board cable **(2)**.
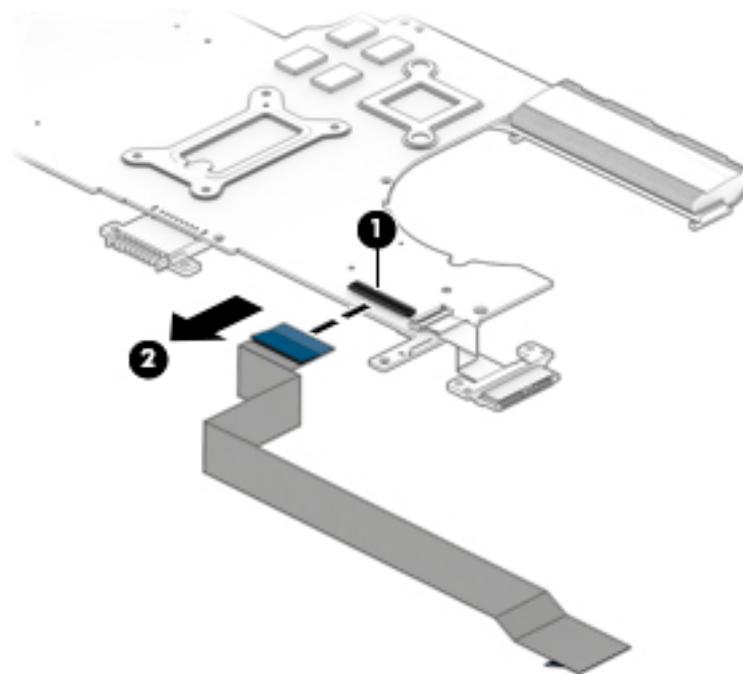
4. Remove the connector board cable.

Reverse this procedure to install the connector board cable.

Optical drive cable

Before removing the optical drive cable, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see), and then remove the following components:

   a. Bottom cover (see)

   b. Battery (see)

   c. Fan (see)

   d. System board (see)

Remove the optical drive cable:

1. Turn the system board upside down with the front toward you.

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

3. Remove the optical drive cable **(2)**.
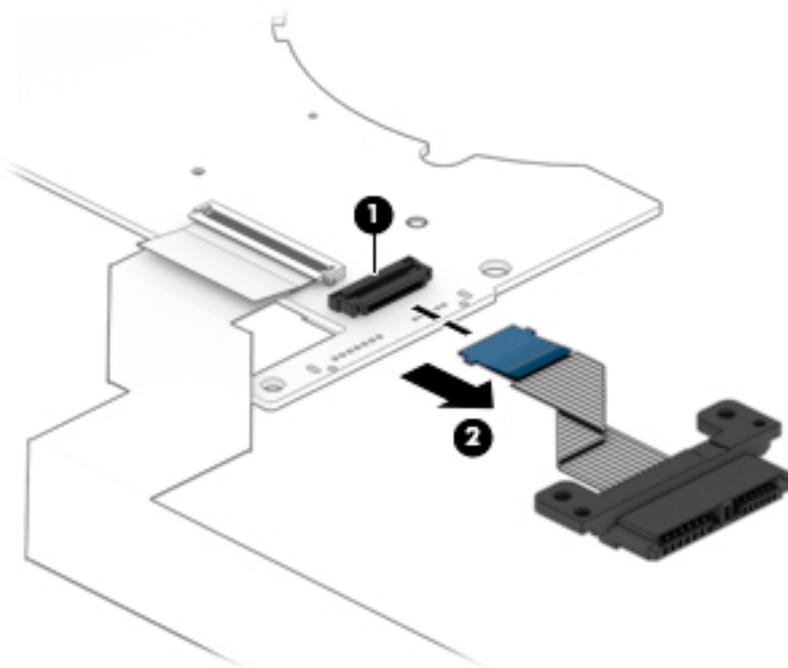
4. Remove the optical drive cable.

Reverse this procedure to install the optical drive cable.

Speakers

Description	Spare part number
Speakers (includes cables and four rubber isolators)	933478-001

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 first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

3. Disconnect all external devices from the computer.

4. Remove the optical drive (see Optical drive on page 24), and then remove the following components:

    a. Bottom cover (see Bottom cover on page 25)

    b. Battery (see Battery on page 27)

    c. Fan (see Fan on page 36)

    d. System board (see System board on page 37)

Remove the speakers:

1. Release the wireless antenna cables from the retention clips **(1)** and routing channel built into the keyboard/top cover and right speaker.

2. Release the display panel cable from the retention clips **(2)** and routing channel built into the left speaker.

3. Release the speaker cable from the retention clips **(3)** and routing channel built into the keyboard/top cover.

4. Remove the Phillips PM2.0×4.2 screw **(4)** that secures the right speaker to the keyboard/top cover.

5. Remove the speakers **(5)**.
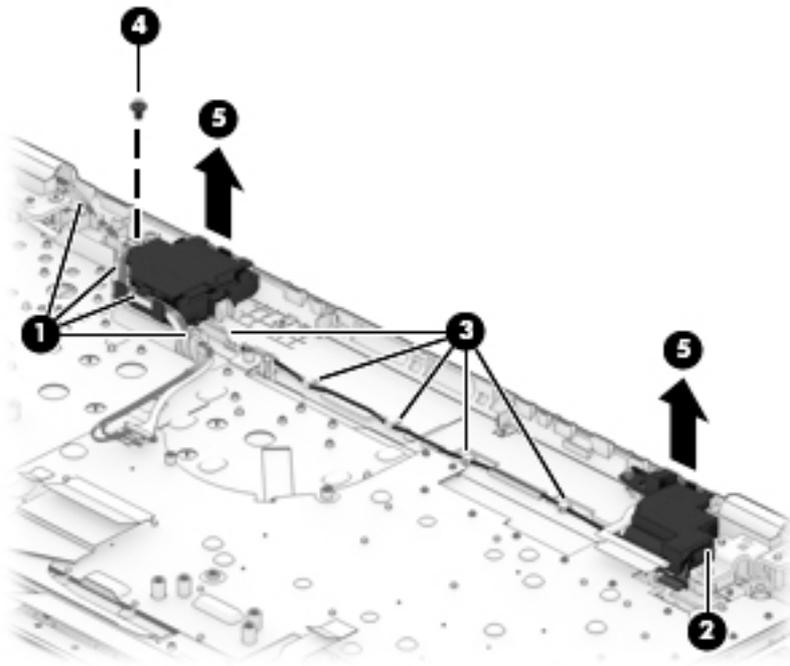
Reverse this procedure to install the speakers.

Display assembly

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

Before removing the display assembly, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24).

5. Remove the bottom cover (see Bottom cover on page 25).

6. Remove the battery (see Battery on page 27).

Remove the display assembly:

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

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

2. Release the wireless antenna cables from the retention clips **(2)** and routing channel built into the keyboard/top cover and right speaker.

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

4. Release the display panel cable from the retention clips **(4)** and routing channel built into the left speaker.
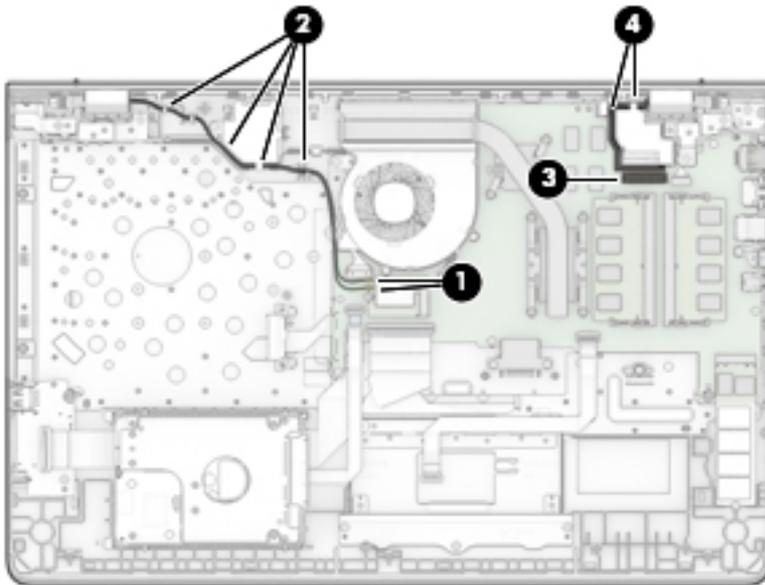
5. Remove the four Phillips PM2.5×6.7 screws **(1)** that secure the display assembly to the keyboard/top cover.

6. Swing the display hinges **(2)** up and back.
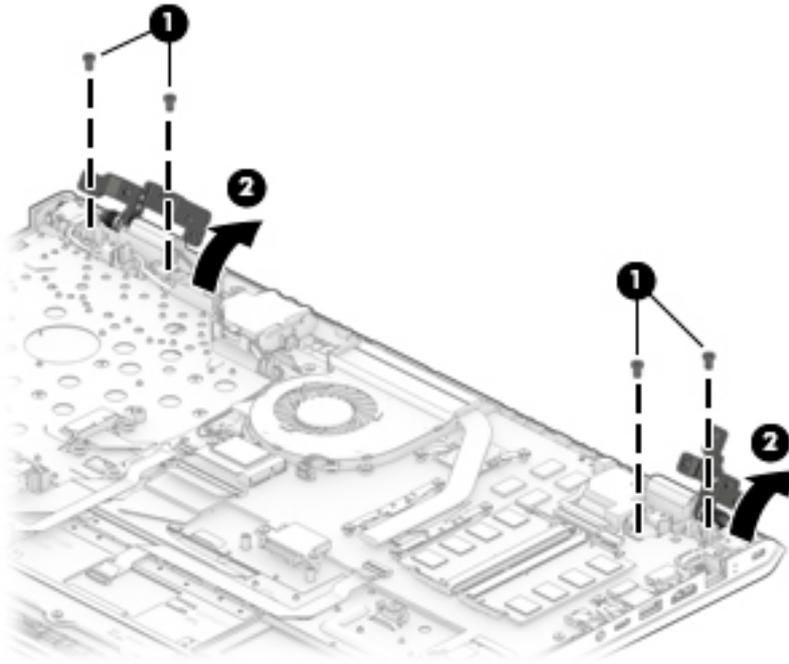
7. Swing the keyboard/top cover **(1)** up and back until it separates from the display assembly.

8. Slide the keyboard/top cover **(2)** up and away at an angle and separate it from the display assembly.
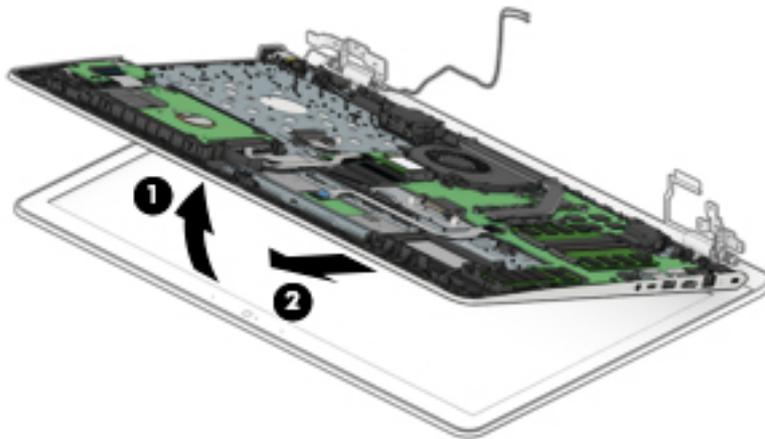

9. If it is necessary to replace the display bezel or any of the display assembly subcomponents:

NOTE: The display panel assembly can be removed and replaced without removing the display assembly from the keyboard/top cover.

a. Release the top edge of the display bezel **(1)** from the display assembly.

b. Release the left and right edges of the display bezel **(2)** from the display assembly.

c. Release the bottom edge of the display bezel **(3)** from the display assembly.

d. Remove the display bezel **(4)** from the display assembly.

The display bezel is available using spare part number 933464-001.
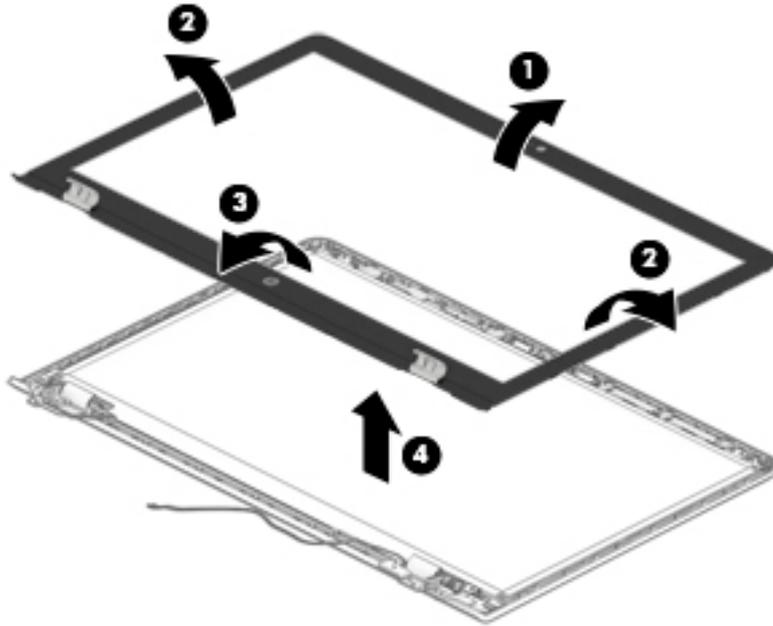
10. If it is necessary to replace the webcam/microphone module:

📝 **NOTE:** The webcam/microphone module can be removed and replaced without removing the display assembly from the keyboard/top cover.

a. Remove the display bezel.

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

c. Detach the webcam/microphone module **(2)** from the display back cover. (The webcam/microphone module is attached to the display back cover with double-sided adhesive.)
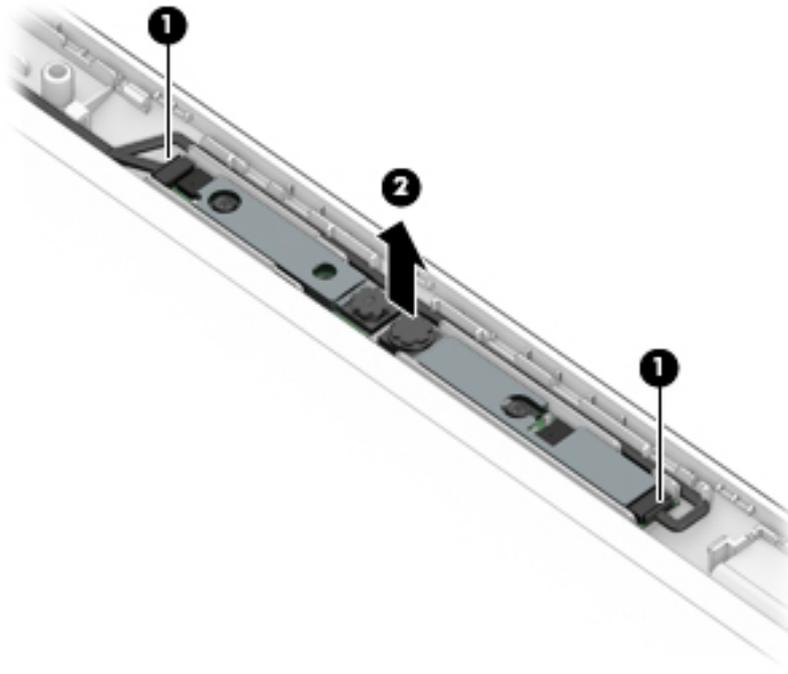
d. Remove the webcam/microphone module.

The webcam/microphone module is available using spare part number 919573-007.

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

a. Remove the display bezel.

b. Remove the four Phillips PM2.0×2.8 screws **(1)** 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. Swing the top edge of the display panel **(2)** up and forward until the display panel rests upside down in front of the display back cover.
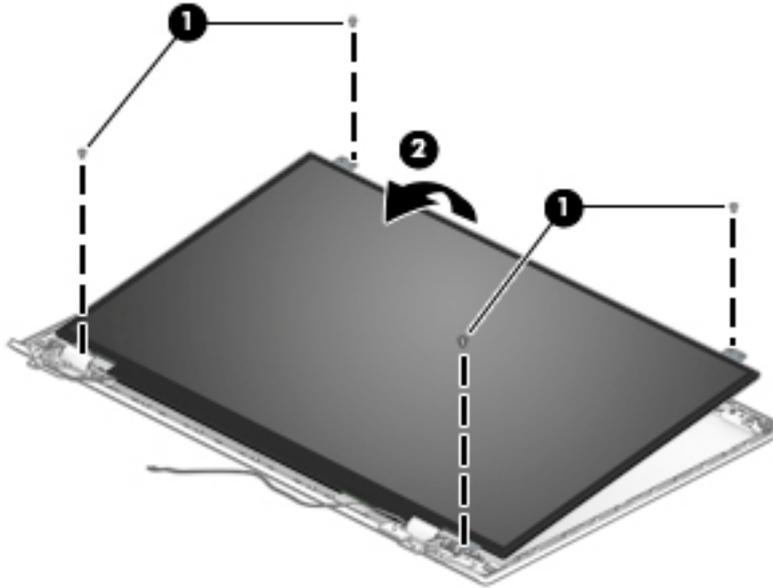
d. Release the adhesive support strip **(1)** that secures the display panel cable connector to the display panel.

e. Disconnect the display panel cable **(2)** from the display panel.

f. Remove the display panel **(3)**.

The display panel is available using spare part numbers 798926-013 (17.3-in, FHD, WLED, AntiGlare (1920×1080), UWVA, f-flat (4.0-mm), eDP display panel) and 851051-007 (17.3-in, HD+, WLED, BrightView (1600×900), SVA, f-flat (4.0-mm), eDP display panel).
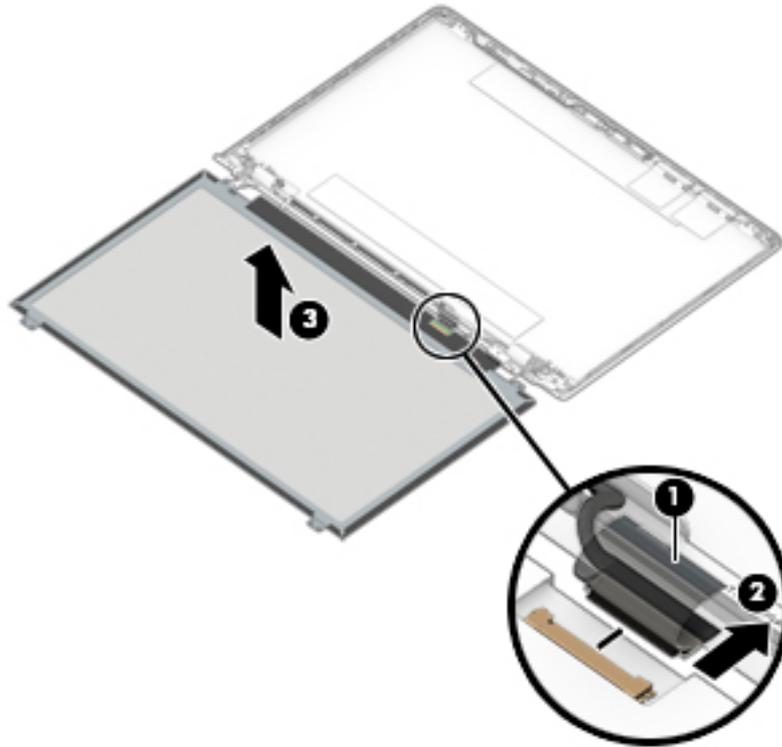
12. If it is necessary to replace the display hinges:

a. Remove the display bezel.

b. Remove the display panel.

c. Remove the two Phillips PM2.0×2.8 screws **(1)** that secure the hinges to the display back cover.

d. Remove the six Phillips PM2.5×4.8 screws **(2)** that secure the hinges to the display back cover.

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

The display hinges are available using spare part number 933474-001.
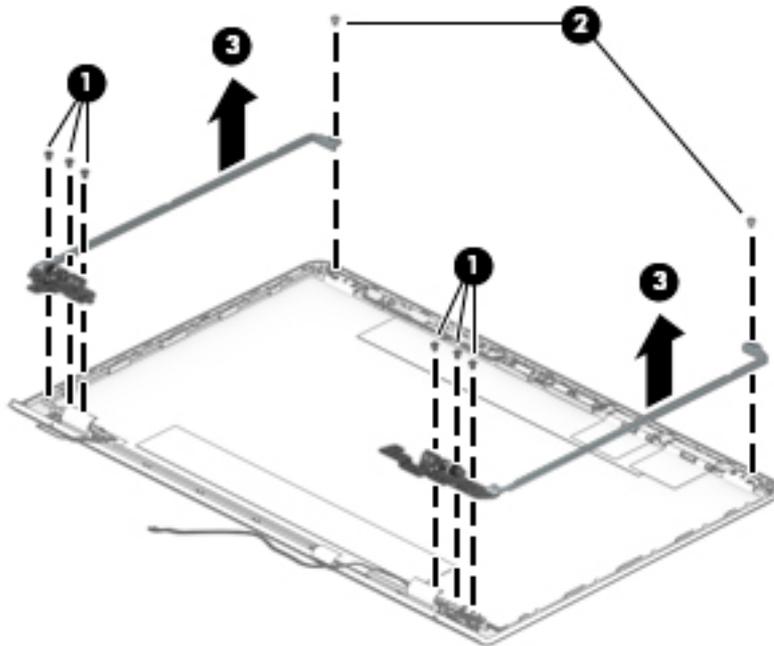
13. If it is necessary to replace the display panel cable:

    a. Remove the display bezel.

    b. Remove the display panel.

    c. Remove the display hinges.

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

    e. Release the display panel cable from the retention clips **(2)** and routing channel built into the top, left, and bottom edges of the display back cover.

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

The display panel cable is available using spare part number 933465-001.
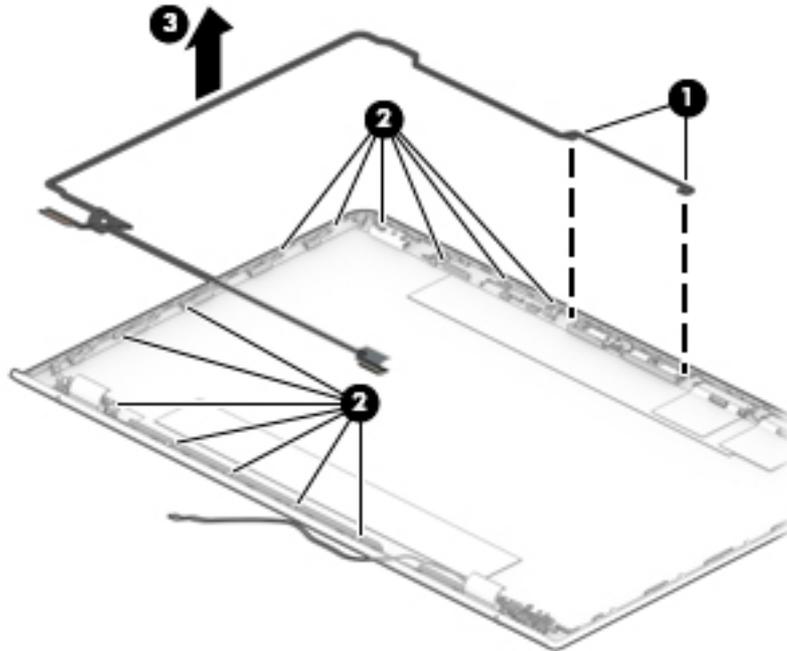
14. If it is necessary to replace the wireless antenna cables and transceivers:

a. Remove the display bezel.

b. Remove the display panel.

c. Remove the display hinges.

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

e. Release the wireless antenna cables from the retention clips **(2)** built into the right and bottom edges of the display back cover.

f. Remove the wireless antenna cables and transceivers **(3)**.

The wireless antenna cables and transceivers are available using spare part number 933461–001.
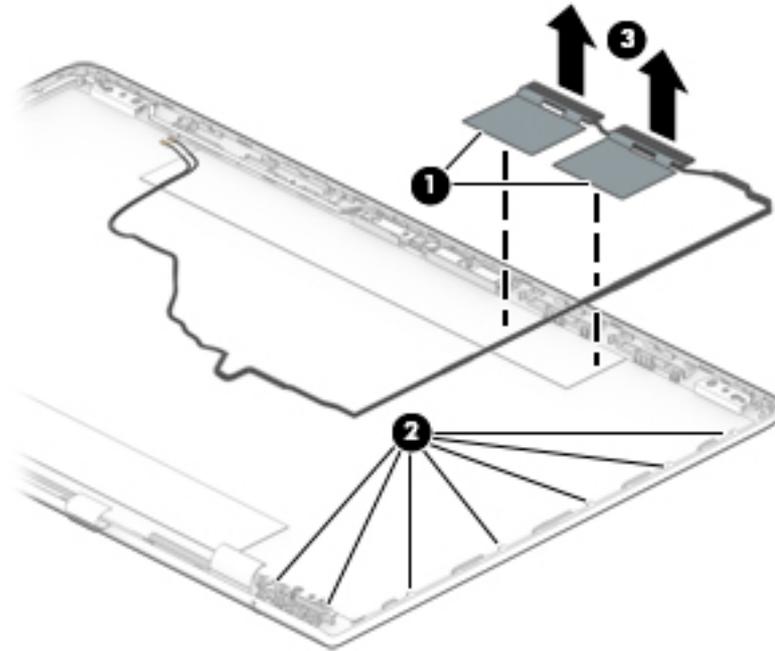
Reverse this procedure to reassemble and install the display assembly.

Power connector cable

Description	Spare part number
Power connector cable	810327-006

Before removing the power connector cable, follow these steps:

1. 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.

2. Disconnect all external devices connected to the computer.

3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.

4. Remove the optical drive (see Optical drive on page 24), and then remove the following components:

    a. Bottom cover (see Bottom cover on page 25)

    b. Battery (see Battery on page 27)

    c. Display assembly (see Display assembly on page 46)

Remove the power connector cable:

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

2. Release the power connector cable from the retention clips **(2)** and routing channel built into the keyboard/top cover and right speaker.

3. Remove the power connector **(3)** from the molding built into the keyboard/top cover.
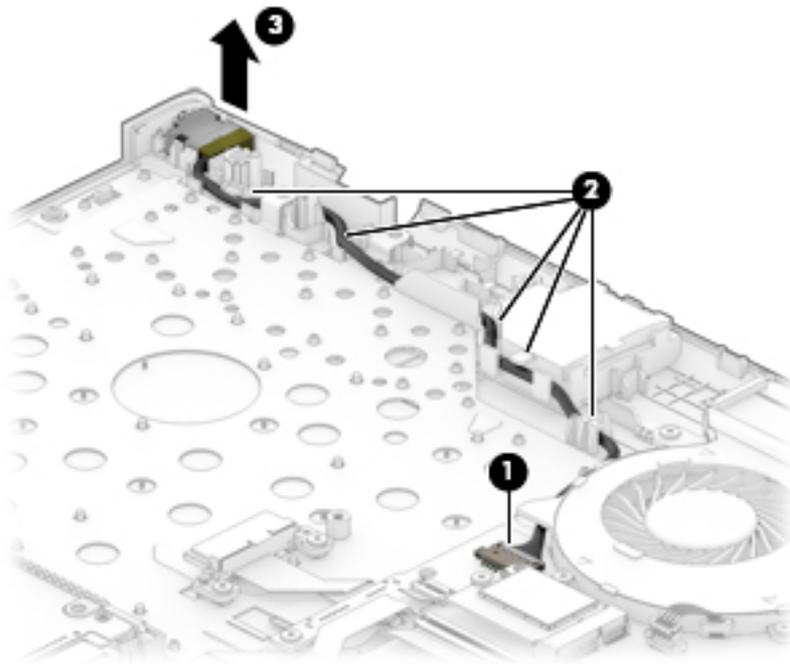
Reverse this procedure to install the power connector cable.

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

Using Computer Setup

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

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

Starting Computer Setup

📝 **NOTE:** An external keyboard or mouse connected to a USB port can be used with Computer Setup only if USB legacy support is enabled.

To start Computer Setup, follow these steps:

▲ Start Computer Setup.

- Computers or tablets with keyboards:

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

- Tablets without keyboards:

  ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **F10** to enter Computer Setup.

Navigating and selecting in Computer Setup

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

  📝 **NOTE:** On tablets without keyboards, you can use your finger to make selections.

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

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

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

- To exit Computer Setup menus without saving your changes:

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

  – or –

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

- To save your changes and exit Computer Setup menus:

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

  – or –

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

Your changes go into effect when the computer restarts.

Restoring factory settings in Computer Setup

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

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

1. Start Computer Setup. See Starting Computer Setup on page 56.

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

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

3. Follow the on-screen instructions.

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

   – or –

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

Your changes go into effect when the computer restarts.

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

Updating the BIOS

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

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

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

Determining the BIOS version

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

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

1. Start Computer Setup. See Starting Computer Setup on page 56.

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

3. To exit Computer Setup without saving your changes, select the **Exit** icon in the lower-right corner of the screen, and then follow the on-screen instructions.

   – or –

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

To check for later BIOS versions, see Downloading a BIOS update on page 58.

Downloading a BIOS update

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

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

Do not shut down the computer or initiate Sleep.

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

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

   – or –

   Select the question mark icon in the taskbar.

2. Select **Updates**, and then select **Check for updates and messages**.

3. Follow the on-screen instructions.

4. At the download area, follow these steps:

   a. Identify the most recent BIOS update and compare it to the BIOS version currently installed on your computer. Make a note of the date, name, or other identifier. You may need this information to locate the update later, after it has been downloaded to your hard drive.

   b. Follow the on-screen instructions to download your selection to the hard drive.

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

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

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

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

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

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

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

    The BIOS installation begins.

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

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

Changing the boot order using the f9 prompt

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

1. Access the Boot Device Options menu:

    - Computers or tablets with keyboards:

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

    - Tablets without keyboards:

        ▲ Turn off the tablet. Press the power button in combination with the volume down button until the Startup menu is displayed, and then tap **F9** to enter the Boot Device Options menu.

2. Select a boot device, then press enter.

TPM BIOS settings (select products only)

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

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

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

To access TPM settings in Computer Setup:

1. Start Computer Setup. See .

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

Using HP Sure Start (select products only)

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

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

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

7   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 is generated. This ID 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, quickly press esc.

   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.

2. Press or tap 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 62.

   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. In the text box, enter the product name, and then click **Go**.

   – 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

	Metric	U.S.
Computer dimensions		
Width	**41.5 cm**	16.3 in
Depth	**27.7 cm**	10.9 in
Height	**2.5 cm**	0.9 in
Weight	**2.8 kg**	6.2 lbs
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

9 Backing up 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 65. For information on the recovery options that are available using the recovery media, see Using Windows tools on page 66.
- 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 67.

  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 66.

- 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 67.

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 67. If you have not already created recovery media, see Creating HP Recovery media (select products only) on page 65.

● 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 67.

● 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 69.

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 65.

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 65.

- 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 65.

- 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 69.

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 65.

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 computer 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 computer 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 computer is used.

Requirements for all countries

The following requirements are applicable to all countries and regions:

- The length of the power cord set must be at least 1.0 m (3.3 ft) and no more than 2.0 m (6.5 ft).

- All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country or region where the power cord set will be used.

- The power cord sets must have a minimum current capacity of 10 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 computer. 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