Maintenance and Service Guide

HP Spectre Folio 13 Convertible PC
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Product notice

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

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

To access the latest user guides, go to http://www.hp.com/support, and follow the instructions to find your product. Then select **User Guides**.

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By installing, copying, downloading, or otherwise using any software product preinstalled on this computer, you agree to be bound by the terms of the HP End User License Agreement (EULA). If you do not accept these license terms, your sole remedy is to return the entire unused product (hardware and software) within 14 days for a full refund subject to the refund policy of your seller.

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

Safety warning notice

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

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1 Product description

Category	Description
Product Name	HP Spectre Folio 13 Convertible PC (model number 13-ak0xxx)
Processors	Intel® Core™ i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W) Intel Core i5-8200Y 1.30-GHz (turbo up to 3.90-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W)
Chipset	Intel integrated soldered-on-circuit (SoC)
Graphics	**Internal graphics:** Intel ultra high-definition (UHD) Graphics 625 and Intel full high-definition (FHD) Graphics 615 graphics subsystem with universal memory architecture (UMA) video memory
Panel	• 13.3-in, UHD (3840×2160), BrightView, white light-emitting (WLED), UWVA, 400 nits, eDP+PSR, wedge, TouchScreen display panel with narrow bezel • 13.3-in, UHD (3840×2160), BrightView, WLED, UWVA, 340 nits, eDP+PSR, ultraslim, TouchScreen display panel with narrow bezel • 13.3-in, FHD (1920×1080), BrightView, WLED, UWVA, 400 nits, eDP 1.4+PSR2, ultraslim, TouchScreen display panel with narrow bezel • 13.3-in, FHD (1920×1080), BrightView, WLED, UWVA, 300 nits, eDP+PSR, ultraslim, TouchScreen display panel with narrow bezel All display panels feature direct bonding.
Memory	System memory built into system board Support for LPDDR4X-2666 and LPDDR3-1866 system memory Support for up to 16-GB of system memory in the following configurations: • LPDDR4X-2666 16384-MB (64-MB × 64) • LPDDR3-1866 16384-MB (256-MB × 64 × 4 pieces) • LPDDR4X-2666 8192-MB (64-MB × 64) • LPDDR3-1866 8192-MB (256-MB × 64 × 4 pieces)
Storage	**Support for the following solid-state drives:** • 2-TB, M.2 2280, Peripheral Component Interconnect Express (PCIe)-3×4, Non-Volatile Memory Express (NVMe), SuperSpeed (SS) solid-state drive with triple level cell (TLC) • 1-TB, M.2 2280, PCIe-3×4, NVMe, SS solid-state drive with TLC • 512-GB, M.2 2280, PCIe-3×4, NVMe solid-state drive with TLC • 256-GB, M.2 2280, PCIe-3×4, NVMe solid-state drive with TLC
Audio and video	**Audio:** Bang & Olufsen Support for HP Audio Boost 2.0 Support for quad-speaker assembly **Camera:** HP FHD camera **Microphone:** Dual-array digital microphone

Category	Description
Wireless	Integrated wireless local area network (WLAN) option by way of wireless module built into system board Dual PCIe WLAN antennas built into speaker assembly Support for Intel Dual Band Wireless-AC 8265 802.11AC 2×2 WiFi + Bluetooth® 4.2 Combo Adapter (non-vPro) and Intel 9560 ac 2×2 MU-MIMO + BT 5.0 non-vPro CNVi WLAN modules Integrated wireless wide area network (WWAN) option by way of wireless module Dual PCIe WWAN antennas built into display assembly Support for Intel XMM 7560 LTE-Advanced Pro WWAN module
Ports	• Audio-out (headphone)/Audio-in (microphone) combo jack • USB Type-C port 3.1 Gen 2 with Thunderbolt™ Gen 3 technology (2) • USB Type-C port 3.1 Gen 1 (3)
Power requirements	Support for a 6-cell, 54.28-WHr battery Support for 65 W AC adapter (non-PFC, USB Type-C, 1.8-m, slim, straight) and 65 W AC adapter (non-PFC, USB Type-C, 1.8-m, C6NS, NP) AC adapters Support for a 1.00-m power cord with a C5 connector
Media card reader	Nano-SIM slot
Sensors	Accelerometer + eCompass + Gyroscope Integrated sensor hub
Security	Trusted Platform Module (TPM) 2.0 Firmware Universal 2nd Factor Authentication

2 External component identification

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

Locating hardware

To find out what hardware is installed on the computer:

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

  A list displays all the devices installed on the computer.

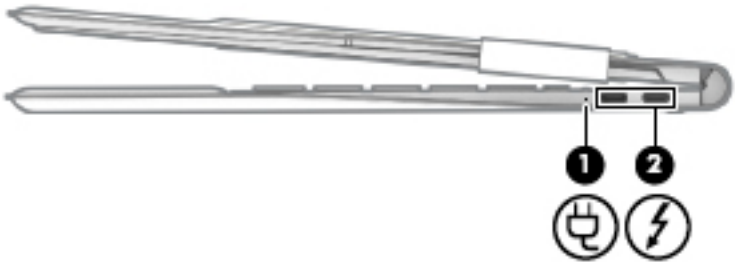
For information about system hardware components and the system BIOS version number, press fn+esc (select products only).

Locating software

To find out what software is installed on the computer:

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

Right side

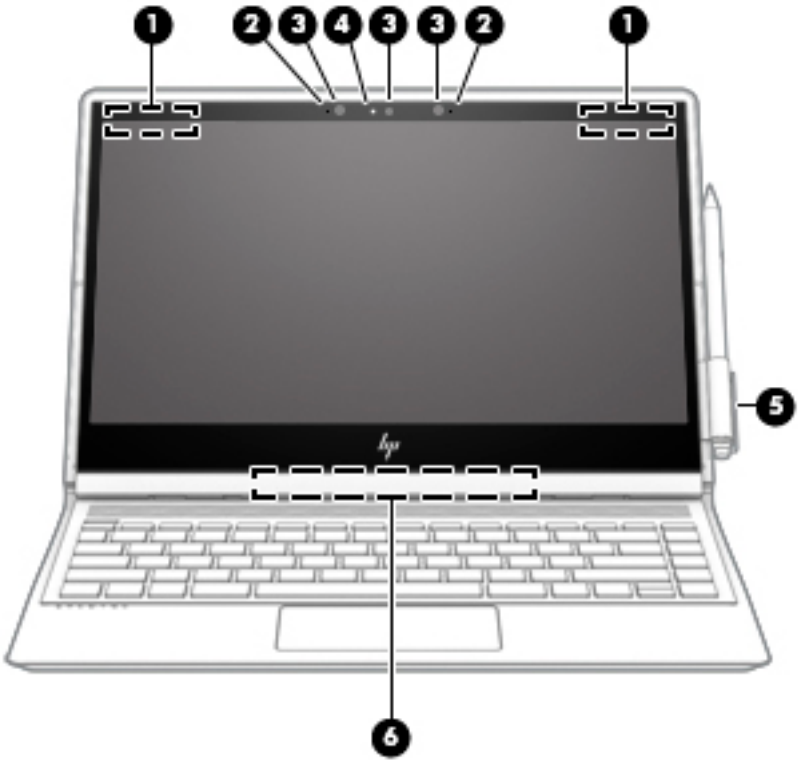


Component		Description
(1)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging or the computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.
(2)	USB Type-C power connectors and Thunderbolt ports with HP Sleep and Charge	Connect an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Even when the computer is off, connect and charge most USB devices that have a Type-C connector, such as a cell phone, camera, activity tracker, or smartwatch, and provides high-speed data transfer when the system is on. – and – Connect a display device that has a USB Type-C connector, providing DisplayPort output. NOTE: Your computer may also support a Thunderbolt docking station. NOTE: Cables and/or adapters (purchased separately) may be required.

Left side

Component		Description
(1)	Audio-out (headphone)/Audio-in (microphone) combo jack	Connects optional powered stereo speaker assembly, 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 speaker assembly are disabled.
(2)	USB Type-C power connector and port with HP Sleep and Charge	Connects an AC adapter that has a USB Type-C connector, supplying power to the computer and, if needed, charging the computer battery. – and – Even when the computer is off, charges most products such as a cell phone, camera, activity tracker, or smartwatch, and provides data transfer. – and – Connects a display device that has a USB Type-C connector, providing DisplayPort output. NOTE: Cables and/or adapters (purchased separately) may be required.
(3)	AC adapter and battery light	• White: The AC adapter is connected and the battery is fully charged. • Blinking white: The AC adapter is disconnected and the battery has reached a low battery level. • Amber: The AC adapter is connected and the battery is charging. • Off: The battery is not charging or the computer is in the Sleep state, a power-saving state. The computer shuts off power to the display and other unneeded components.

Display



Component		Description
(1)	WWAN antennas*	Send and receive wireless signals to communicate with wireless wide area networks (WWANs).
(2)	Internal microphones	Record sound.
(3)	Camera light(s)	On: One or more cameras are in use.
(4)	Camera	Allows the computer to video chat, record video, and record still images. Some cameras also allow a facial recognition logon to Windows, instead of a password logon. NOTE: Camera functions vary depending on the camera hardware and software installed on the computer.
(5)	Pen loop	The leather pen loop is included in the product box. Follow the instructions on the pen loop label to install the pen loop. NOTE: Attach the loop to the plastic, not the leather cover. For more information about the pen, see the documentation provided with the pen.
(6)	WLAN antennas*	Send and receive wireless signals to communicate with wireless local area networks (WLANs).

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

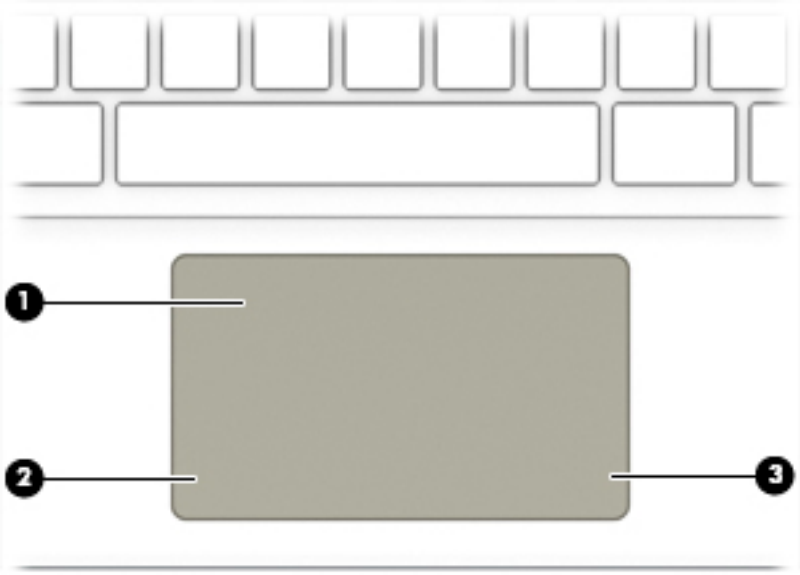
For wireless regulatory notices, see the section of the *Regulatory, Safety, and Environmental Notices* that applies to the country or region.

To access this guide:

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

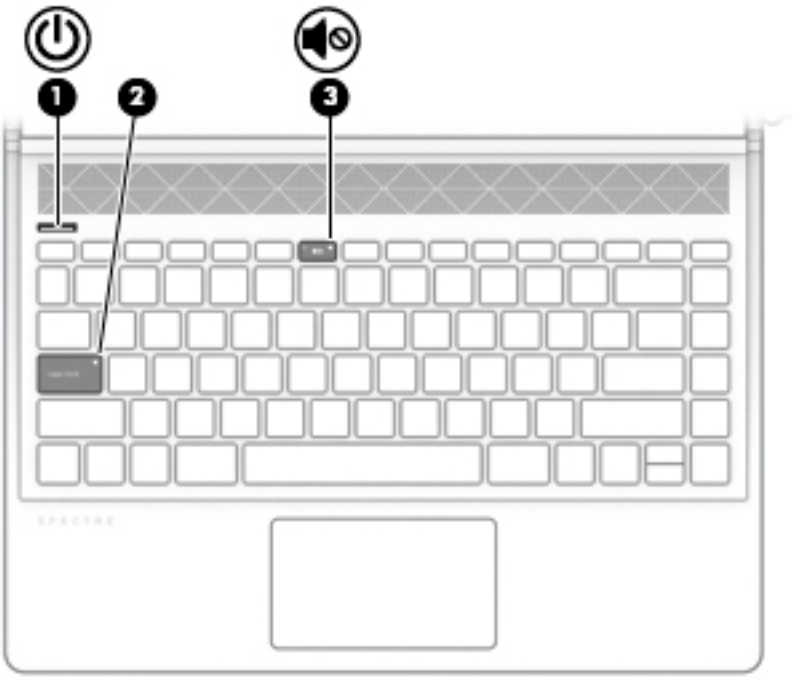
Keyboard area

TouchPad



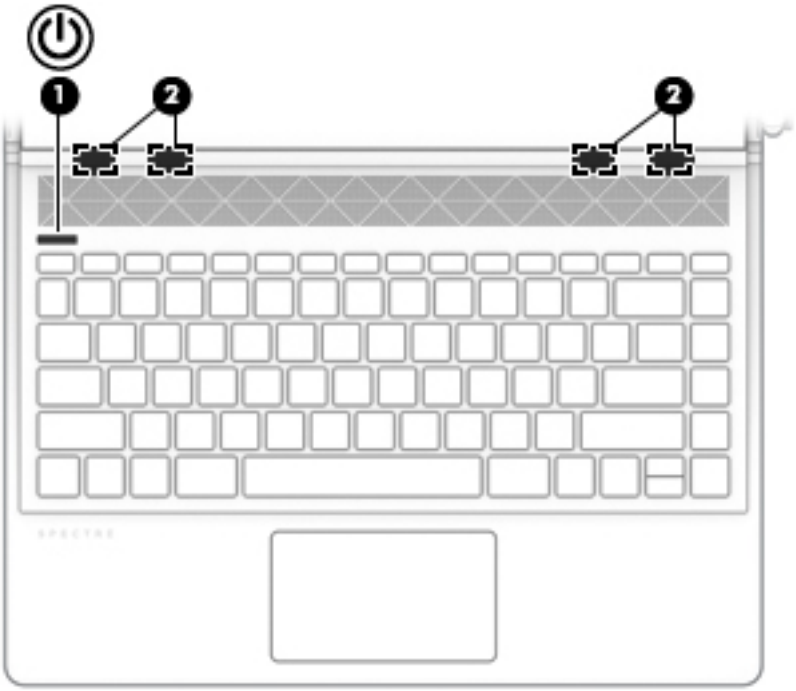
Component		Description
(1)	TouchPad zone	Reads finger gestures to move the pointer or activate items on the screen.
(2)	Left TouchPad button	Functions like the left button on an external mouse.
(3)	Right TouchPad button	Functions like the right button on an external mouse.

Lights



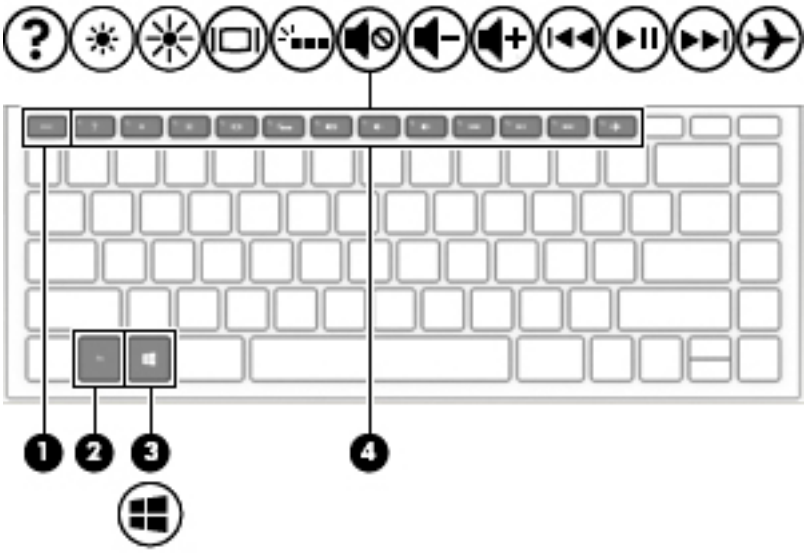
Component		Description
(1)	Power light	• On: The computer is on. • Off: The computer is off, in the Sleep state, or in Hibernation. Sleep state is a power-saving state that shuts off power to the display and other unneeded components. Hibernation is a power-saving state that uses the least amount of 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 speaker assembly



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 (select products only). • 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.
(2)	Speakers	Produce sound.

Special keys



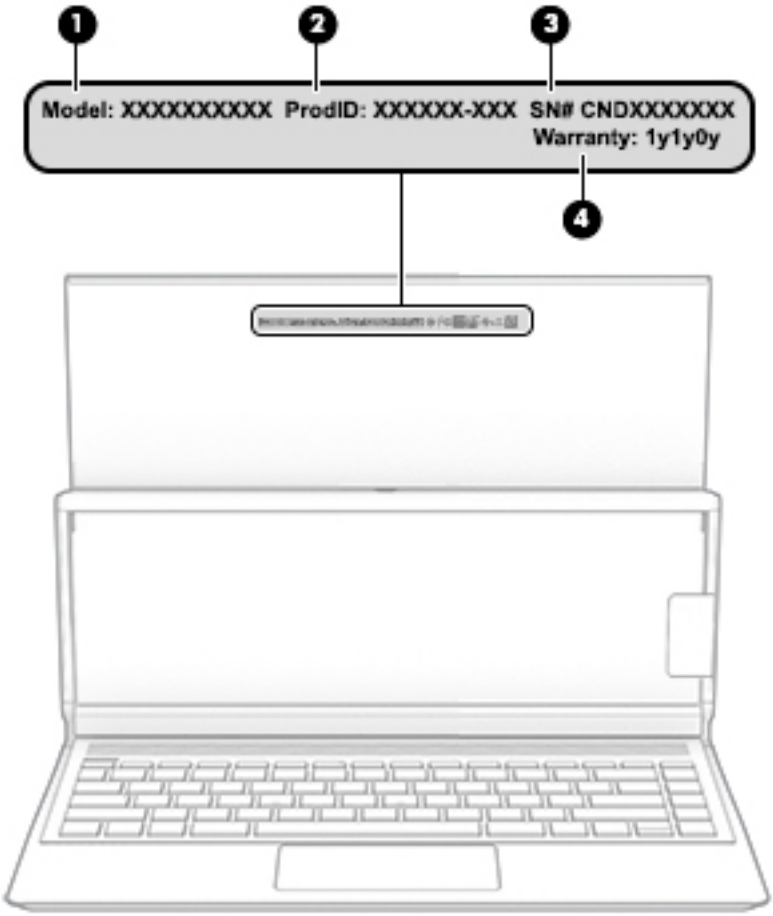
Component		Description
(1)	esc key	Displays system information when pressed in combination with the fn key.
(2)	fn key	Executes specific functions when pressed in combination with another key.
(3)	Windows® key	Opens the Start menu. NOTE: Pressing the Windows key again will close the Start menu.
(4)	Action keys	Execute frequently used system functions. NOTE: On select products, the f5 action key turns the keyboard backlight feature off or on.

Labels

The labels affixed to the computer provide information that may be needed when troubleshooting system problems or traveling internationally with the computer. Labels may be in paper form or imprinted on the product.

NOTE: The labels described in this section are provided on the back of the display, under the leather cover. To access, flip the panel/leather cover 360 degrees. After the cover is flipped, the leather is folded in half.

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



Item	Component
(1)	Model number
(2)	Product ID
(3)	Serial number
(4)	Warranty period

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

Inserting a SIM card (select products only)

NOTE: This section applies only to computer models equipped with WWAN capability.

CAUTION: Inserting a SIM card of the wrong size could damage the SIM card or cause the SIM card to become stuck in the slot. The use of SIM card adapters is not recommended. To prevent damage to the SIM card or the connectors, use minimal force when inserting a SIM card.

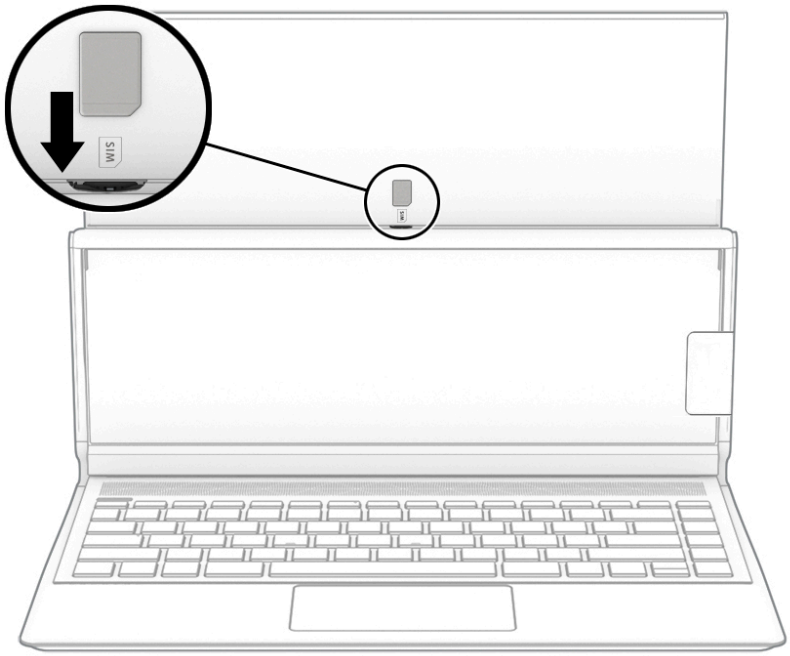
NOTE: Before purchasing a SIM card, follow these instructions to determine the correct SIM card size for the computer:

1. Go to http://www.hp.com/support, and then search for the computer by product name or number.
2. Select **Product Information**.
3. Refer to the listed options to determine which card to purchase.

To insert a SIM card, follow these steps:

1. Turn off the computer by using the Shut down command.
2. Disconnect all external devices connected to the computer.
3. Unplug the power cord from the AC outlet.
4. Flip the panel/leather cover 360 degrees to access the SIM card slot. After the cover is flipped, the leather is folded in half.
5. Insert the SIM card into the SIM card slot, and then press in on the SIM card until it is firmly seated.

NOTE: The SIM card in the computer may look slightly different from the illustration in this section.



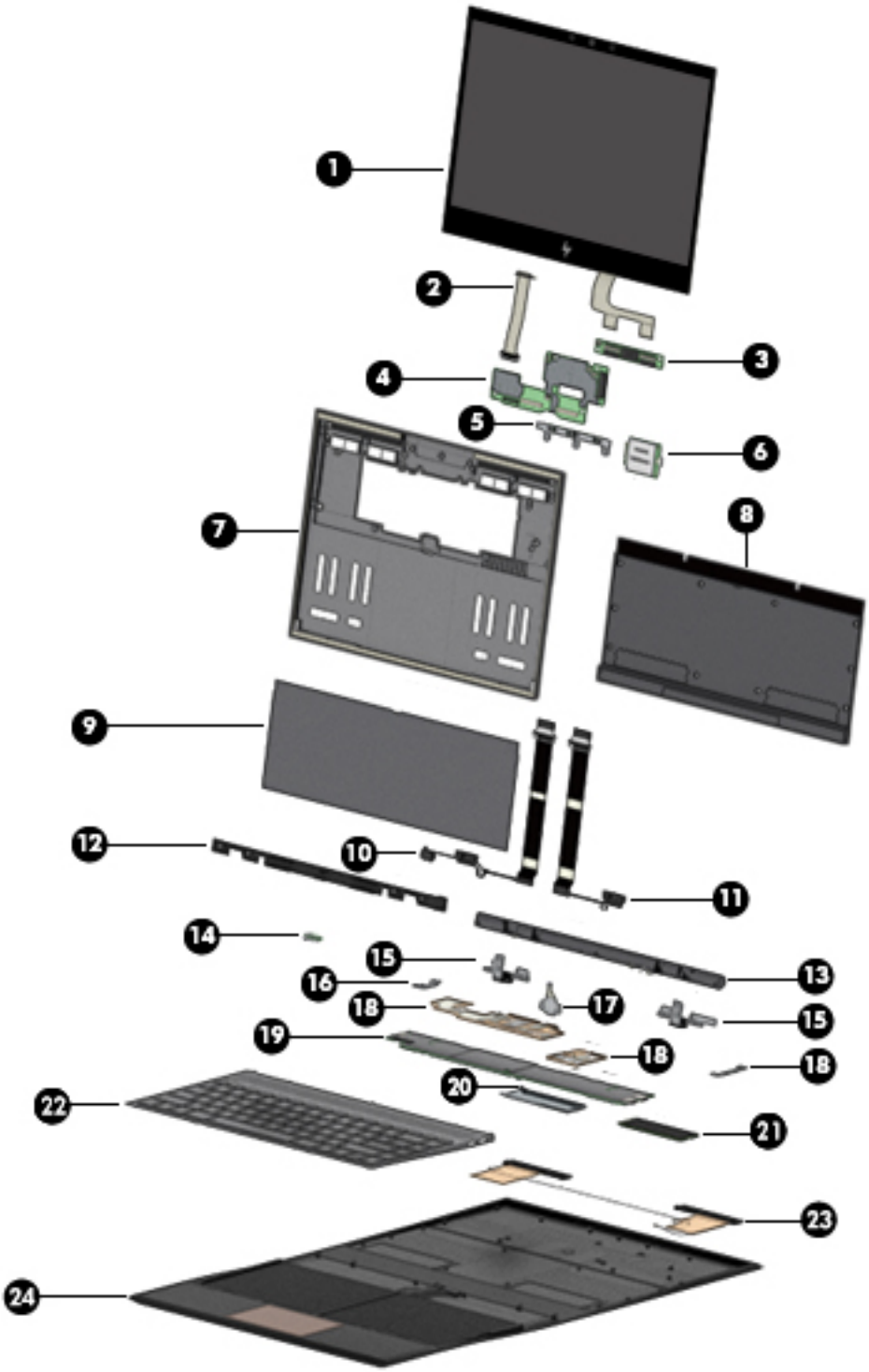
To remove a SIM card, press in on the SIM card, and then remove it from the slot.

3 Illustrated parts catalog

Computer major components

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

NOTE: Details about the computer, including model, serial number, product key, and length of warranty, are on the service tag affixed to the computer. See Labels on page 11 for more information.



Item	Component	Spare part number
(1)	**Display panel** (13.3-in, BrightView, WLED, UWVA TouchScreen display panel with narrow bezel):	
	UHD (3840×2160), 400, eDP+PSR, wedge display panel	L38698-001
	FHD (1920×1080), 400, eDP 1.4+PSR2, ultraslim display panel	L38696-001

Item	Component	Spare part number
	FHD (1920×1080), 300, eDP+PSR, ultraslim display panel	L38697-001
(2)	**Display EDP cable:**	
	For use only on computer models equipped with WLAN	L43279-001
	For use only on computer models equipped with WWAN	L38678-001
(3)	**Touch control board**	L38692-001
	Touch control board cable (not illustrated)	L38673-001
(4)	**Transfer board:**	
	For use only on computer models equipped with WLAN	L43332-001
	For use only on computer models equipped with WWAN	L38694-001
(5)	**FHD, infrared webcam** (includes bracket)	L38705-001
	Webcam Cable Kit (not illustrated, includes left and right webcam cables)	L38674-001
(6)	**Intel XMM 7560 LTE-Advanced Pro with GPS M.2 WWAN module**	L27188-001
	Wireless module support bracket (not illustrated):	
	For use only on computer models equipped with WLAN	L43334-001
	For use only on computer models equipped with WWAN	L38683-001
(7)	**Display back cover:**	
	For use only on computer models equipped with WLAN	L38687-001
	For use only on computer models equipped with WWAN	L38686-001
(8)	**Lower frame** (includes retention band with adhesive and magnets)	L43335-001
(9)	**Lower frame cover** (included in the Mylar/Rubber/Tape Kit, spare part number L38695-001; includes adhesive)	
(10)	**Display panel cable** (includes audio jack cable):	
	For use only on computer models equipped with a UHD (3840×2160), 400, eDP+PSR, wedge display panel	L38681-001
	For use only on computer models equipped with an FHD (1920×1080), 400, eDP 1.4+PSR2, ultraslim display panel	L38679-001
	For use only on computer models equipped with an FHD (1920×1080), 300, eDP+PSR, ultraslim display panel	L38680-001
	Audio jack bracket (not illustrated)	L43333-001
(11)	**Transfer board cable:**	
	For use only on computer models equipped with WLAN	L38677-001
	For use only on computer models equipped with WWAN	L38676-001
(12)	**Hinge cover:**	
	For use only on computer models equipped with WLAN	L38689-001
	For use only on computer models equipped with WWAN	L38688-001
(13)	**Speaker assembly** (includes left and right speaker assembly and cables and WLAN antenna cables and transceivers)	L38700-001

Item	Component	Spare part number
(14)	**Hinges** (2, includes left and right hinges)	L38690-001
(15)	**I/O brackets** (2, includes left and right I/O brackets)	L38684-001
(16)	**Heat sinks** (2, includes processor heat sink and graphics subsystem heat sink and replacement thermal material)	L39050-001
(17)	**SIM card slot assembly** (includes cable)	L38675-001
(18)	**Power button board**	L38691-001
(19)	**System board** (includes replacement thermal material):	
	Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 16-GB of system memory, and the Windows 10 operating system	L38707-601
	Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 16-GB of system memory, and a non-Windows 10 operating system	L38707-001
	Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, WWAN capability, 8-GB of system memory, and the Windows 10 operating system	L38708-601
	Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, WWAN capability, 8-GB of system memory, and a non-Windows 10 operating system	L38708-001
	Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and the Windows 10 operating system	L44606-601
	Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows 10 operating system	L44606-001
	Equipped with an Intel Core i5-8200Y 1.30-GHz (turbo up to 3.90-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and the Windows 10 operating system	L38706-601
	Equipped with an Intel Core i5-8200Y 1.30-GHz (turbo up to 3.90-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows 10 operating system	L38706-001
(20)	**Solid-state drive shield** (includes shielding tape)	L38682-001
(21)	**Solid-state drive:**	
	2-TB, M.2 2280, PCIe-3×4, NVMe, SuperSpeed solid-state drive with TLC	L38703-001
	1-TB, M.2 2280, PCIe-3×4, NVMe, SuperSpeed solid-state drive with TLC	L38701-001
	512-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC	L38704-001
	256-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC	L38702-001
(22)	**Keyboard** with backlight (includes backlight cable and backlight cable):	
	For use in Belgium	L38709-A41
	For use in the Canada	L38709-DB1
	For use in the Czech Republic and Slovakia	L38709-FL1

Item	Component	Spare part number
	For use in Denmark, Finland, and Norway	L38709-DH1
	For use in France	L38709-051
	For use in Germany	L38709-041
	For use in Greece	L38709-151
	For use in Hungary	L38709-211
	For use in Israel	L38709-BB1
	For use in Italy	L38709-061
	For use in Japan	L38709-291
	For use in Latin America	L38709-161
	For use in the Netherlands	L38709-B31
	For use in Portugal	L38709-131
	For use in Russia	L38709-251
	For use in Saudi Arabia	L38709-171
	For use in South Korea	L38709-AD1
	For use in Spain	L38709-071
	For use in Switzerland	L38709-BG1
	For use in Taiwan	L38709-AB1
	For use in Thailand	L38709-281
	For use in Turkey	L38709-141
	For use in the United Kingdom	L38709-031
	For use in the United States	L38709-001
(23)	**WWAN Antenna Kit** (includes left and right WWAN antenna cables and transceivers)	L38671-001
(24)	**Leather cover** (includes 6-cell battery and TouchPad):	
	IMPORTANT: Do not clean the leather cover with alcohol. It may discolor the leather.	
	For use only on computer models equipped with WLAN capability	L38672-001
	For use only on computer models equipped with WWAN capability	L22011-001

Miscellaneous parts

Component	Spare part number
AC adapter:	
65 W AC adapter (non-PFC, USB Type-C, 1.8-m, slim, straight)	L04650-850
65 W AC adapter (non-PFC, USB Type-C, 1.8-m, C6NS, NP)	L42836-001
Adapter:	

Component	Spare part number
Duck head adapter for use in India	L33135-001
Duck head adapter for use in Japan	L33157-001
Duck head adapter for use in the People's Republic of China	L33131-001
HP USB Type-C–to–HDMI 2.0 adapter	935325-001
HP USB Type-C–to–RJ45 adapter	855560-001
HP USB Type-C–to–USB-A dongle	833960-001
HP USB Type-C–to–VGA adapter	831751-001
Hub:	
HP USB Type-C–to–MultiPort hub	919666-001
HP USB Type-C–to–USB-A hub	916838-001
Pen accessories:	
Pen in ash silver finish (Impreza)	929863-001
Pen in dark ash silver finish (Sunwoda, MS, active stylus)	920241-001
Pen loop	L38685-001
Pen tip (Cadillac/Sunwoda)	L04536-001
Pen tip (Impreza/Sunwoda)	L04536-002
Impreza-C–to–A cable	L12232-001
Power cord (C5 connector, 1.00-m, striker, premium):	
For use in Argentina	L42493-001
For use in Australia	L42486-001
For use in Denmark	L42487-001
For use in Europe	L42488-001
For use in India	L42484-001
For use in Israel	L42489-001
For use in Japan	L42490-001
For use in North America	L42492-001
For use in the People's Republic of China	L42485-001
For use in South Korea	L42491-001
For use in Switzerland	L42494-001
For use in Taiwan	L42496-001
For use in Thailand	L42495-001
For use in the United Kingdom	L42497-001
Mylar/Rubber/Tape Kit	L38695-001
Screw Kit	L38699-001

4 Removal and replacement procedures preliminary requirements

Tools required

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

- Case utility tool or a similar thin plastic tool
- Heating gun
- Magnetic screwdriver
- Phillips P0 and P1 screwdrivers
- Suction cups

Service considerations

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

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

Plastic parts

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

Cables and connectors

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

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

Drive handling

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

Before removing or inserting a hard drive, shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.

Before handling a drive, be sure that you are discharged of static electricity. While handling a drive, avoid touching the connector.

Before removing an optical drive, be sure that a disc is not in the drive and be sure that the optical drive tray is closed.

Handle drives on surfaces covered with at least one inch of shock-proof foam.

Avoid dropping drives from any height onto any surface.

After removing a hard drive or an optical drive, place it in a static-proof bag.

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

Avoid exposing a drive to temperature extremes or liquids.

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

Electrostatic discharge 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 tablet 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 tabletop workstations with ground cords of one megohm resistance
- Static-dissipative tables or floor mats with hard ties to the ground
- Field service kits
- Static awareness labels
- Material-handling packages
- Nonconductive plastic bags, tubes, or boxes
- Metal tote boxes
- Electrostatic voltage levels and protective materials

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

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

5 Removal and replacement procedures

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 Labels on page 11 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 63 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.

Display panel

Description	Spare part number
13.3-in, UHD (3840×2160), BrightView, WLED, UWVA, 400 nits, eDP+PSR, wedge TouchScreen display panel with narrow bezel	L38698-001
13.3-in, FHD (1920×1080), BrightView, WLED, UWVA, 400 nits, eDP 1.4+PSR2, ultraslim TouchScreen display panel with narrow bezel	L38696-001
13.3-in, FHD (1920×1080), BrightView, WLED, UWVA, 300 nits, eDP+PSR, ultraslim TouchScreen display panel with narrow bezel	L38697-001

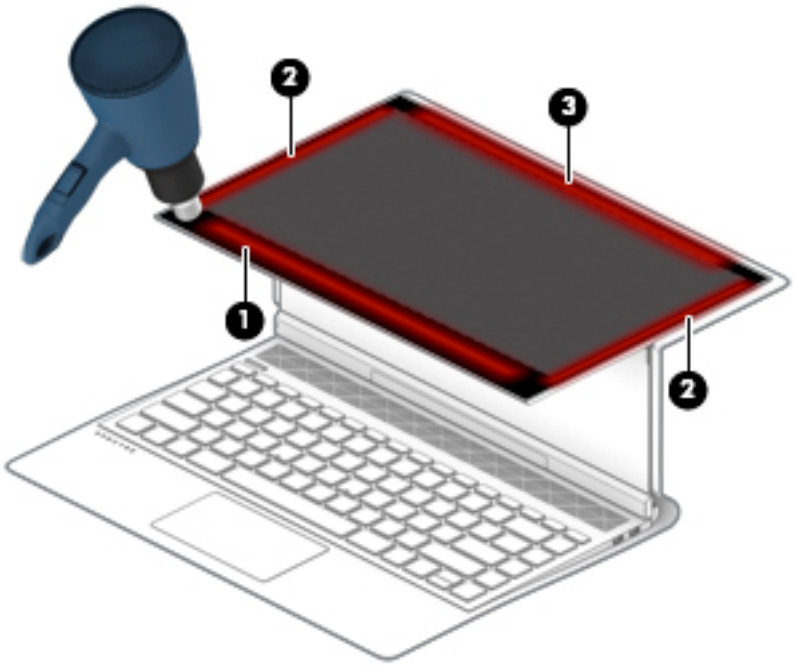
Before disassembling the computer, follow these steps:

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 display panel:

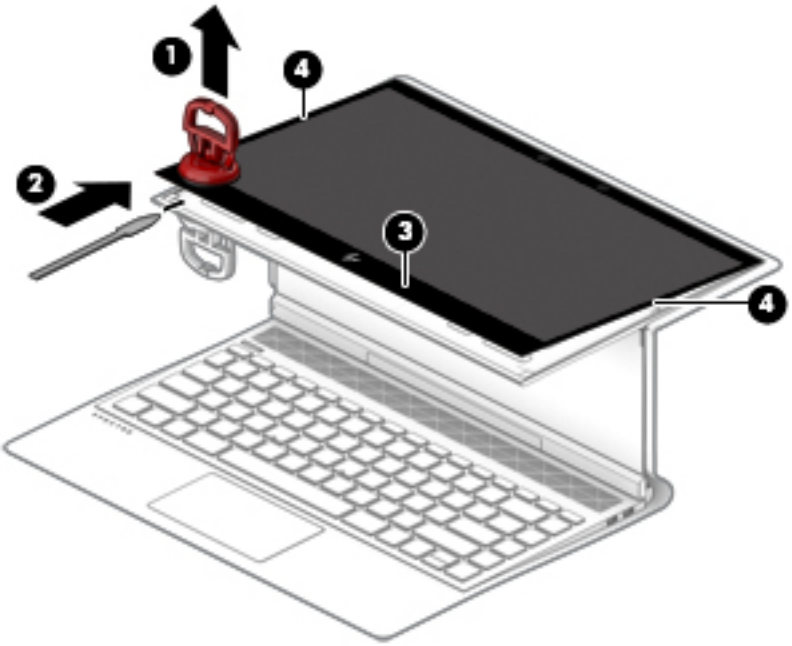
NOTE: When using the heating gun in the following steps to dissolve the adhesive that secures the display assembly, the heating gun temperature should be set to 60°C and the heating duration per edge should be approximately 90 seconds.

1. Use a heating gun to apply heat to the bottom **(1)**, left **(2)** and right, and top edges **(3)** of the display panel to dissolve the adhesive that secures the display assembly.

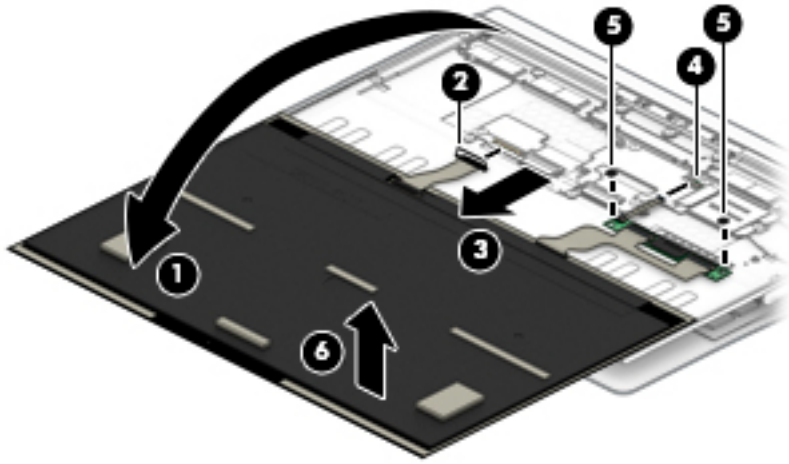


2. Attach suction cups to the front left corners of the display panel and the display back cover.

3. Use the suction cups to carefully separate **(1)** the front left corner of the display panel from the display back cover.
4. Detach the suction cups from the display panel and the display back cover.
5. Insert a case utility tool **(2)** or a similar thin plastic tool between the display panel and the display back cover.
6. Use the case utility tool to separate the bottom edge **(3)** of the display panel from the display back cover.
7. Use the case utility tool to separate the left and right edges **(4)** of the display panel from the display back cover.



8. Swing the top edge of the display panel **(1)** up and forward until it rests upside down in front of the computer.
9. Release the security bar **(2)** on the display EDP cable, and then disconnect the display EDP cable **(3)** from the transfer board.
10. Release the zero insertion force (ZIF) connector **(4)** to which the transfer board cable is connected, and then disconnect the transfer board cable from the transfer board.
11. Remove the two Phillips M2.0×1.8 broad head screws **(5)** that secure the touch control board to the display panel.
12. Remove the display panel **(6)** and touch control board.



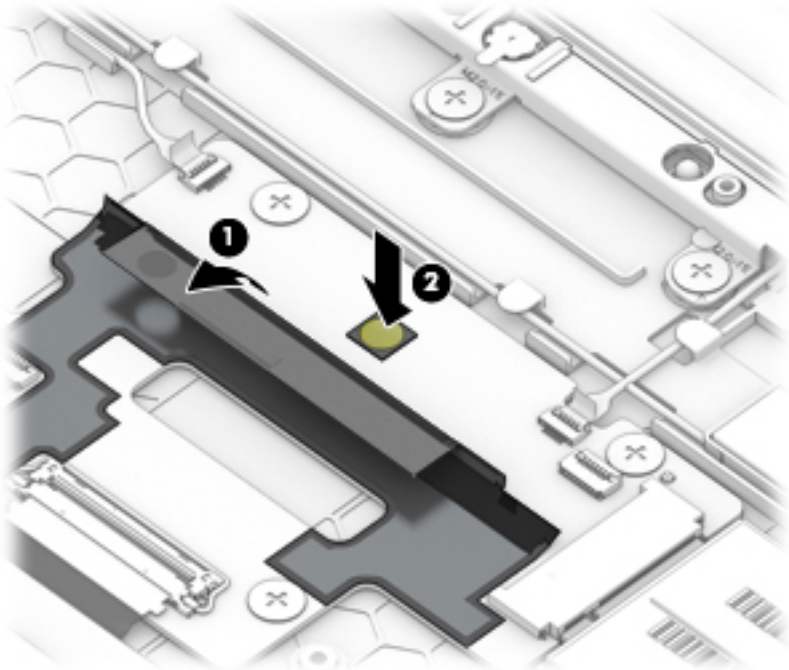
⚠ WARNING! Do not proceed with the computer disassembly without performing the following steps. Failure to follow this warning can result in injury and damage to the computer.

⚠ WARNING! After the display panel has been removed:

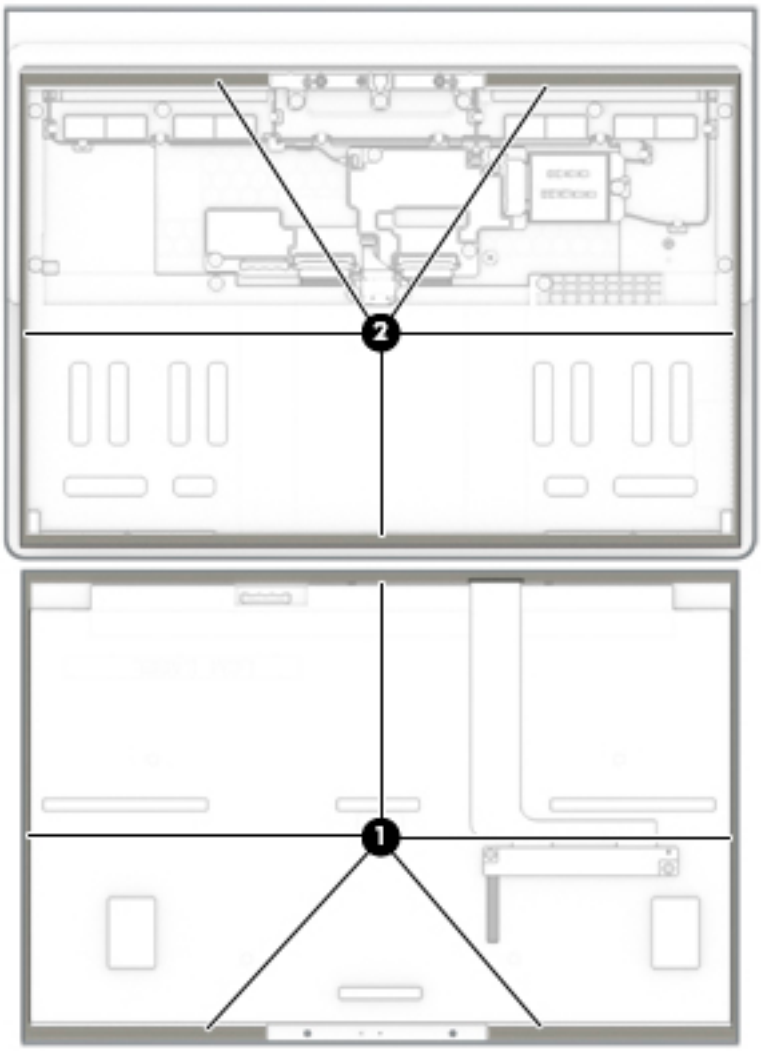
a. Fold back the shielding material **(1)** that covers the internal power button.

b. Press the internal power button **(2)** to turn off power to the computer.

c. Verify that power has been turned off by pressing the external power button.



NOTE: The adhesive residue must be thoroughly cleaned from the surfaces of the display panel **(1)** and the display back cover **(2)** each time the display panel is removed. Replacement adhesive is included with the display panel and the display back cover spare part kits.



Reverse this procedure to install the bottom cover.

Display EDP cable

NOTE: The display EDP cable includes adhesive.

Description	Spare part number
For use only on computer models equipped with WLAN	L43279-001
For use only on computer models equipped with WWAN	L38678-001

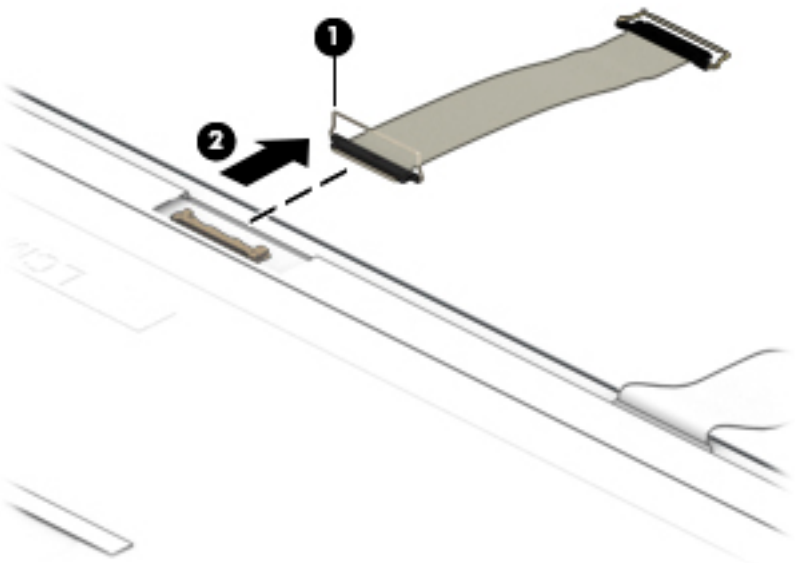
Before removing the display EDP cable, follow these steps:

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 display panel (see Display panel on page 25).

Remove the display EDP cable:

1. Release the security bar **(1)** that secures the display EDP cable to the display panel.
2. Disconnect the display EDP cable **(2)** from the display panel.



Reverse this procedure to install the display EDP cable.

Touch control board

Description	Spare part number
Touch control board (does not include cable)	L38692-001

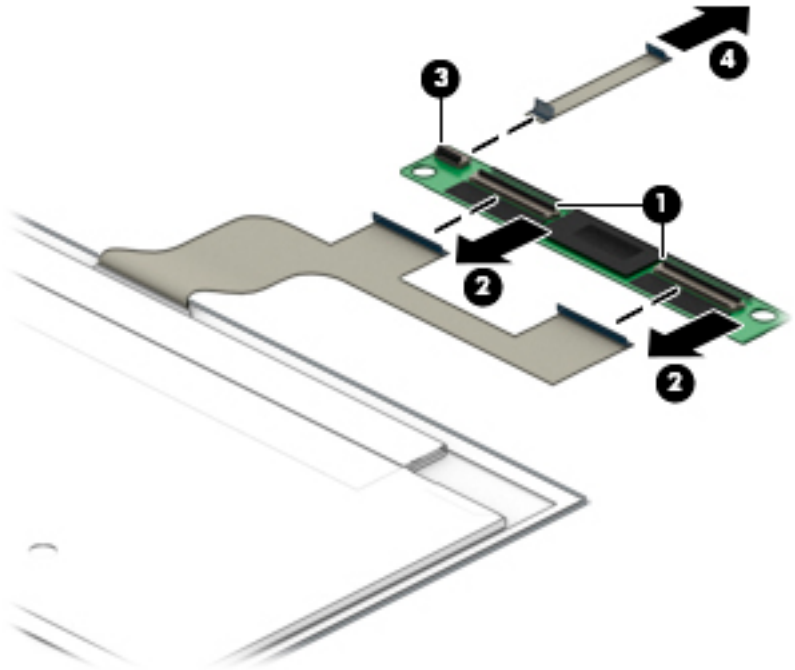
Before removing the touch control board, follow these steps:

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 display panel (see Display panel on page 25).

Remove the touch control board:

1. Release the ZIF connectors **(1)** to which the touch control board cables are connected, and then disconnect the touch control board cables **(2)** from the touch control board.
2. If it is necessary to replace the touch control board cable, release the ZIF connector **(3)** to which the touch control board cable is connected, and then disconnect the touch control board cable **(4)** from the touch control board.

NOTE: The touch control board cable is available using spare part number L38673-001.



Reverse this procedure to install the touch control board and cable.

WWAN module

Description	Spare part number
Intel XMM 7560 LTE-Advanced Pro with GPS M.2 WWAN module	L27188-001

Before removing the WWAN module, follow these steps:

⚠ 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.

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 display panel (see Display panel on page 25).

Remove the WWAN module:

1. Remove the Phillips M2.0×2.3 broad head screw **(1)** that secures the WWAN module and support bracket to the WWAN transfer board.
2. Remove the WWAN support bracket **(2)**.

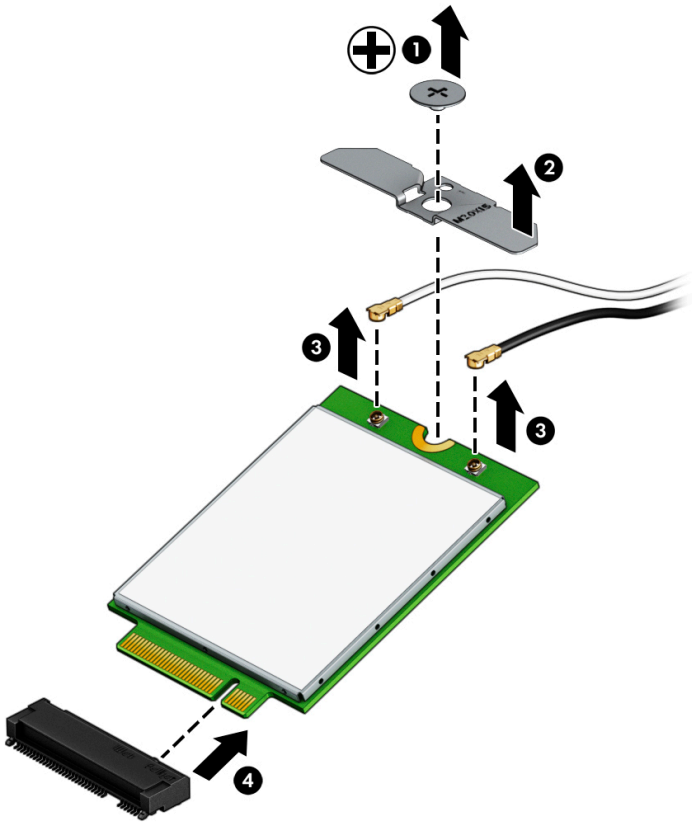
NOTE: The WWAN support bracket is available using spare part number L38683-001.

3. Disconnect the WWAN antenna cables **(3)** from the WWAN module.

NOTE: The #3/red WWAN antenna cable connects to the WWAN module "#3/Main" terminal. The #4/ blue WWAN antenna cable connects to the WWAN module "#4/Aux" terminal.

4. Remove the WWAN module **(4)** by pulling it away from the connector.

NOTE: WWAN modules are designed with a notch to prevent incorrect insertion.



Reverse this procedure to install the WWAN module.

SIM card slot assembly

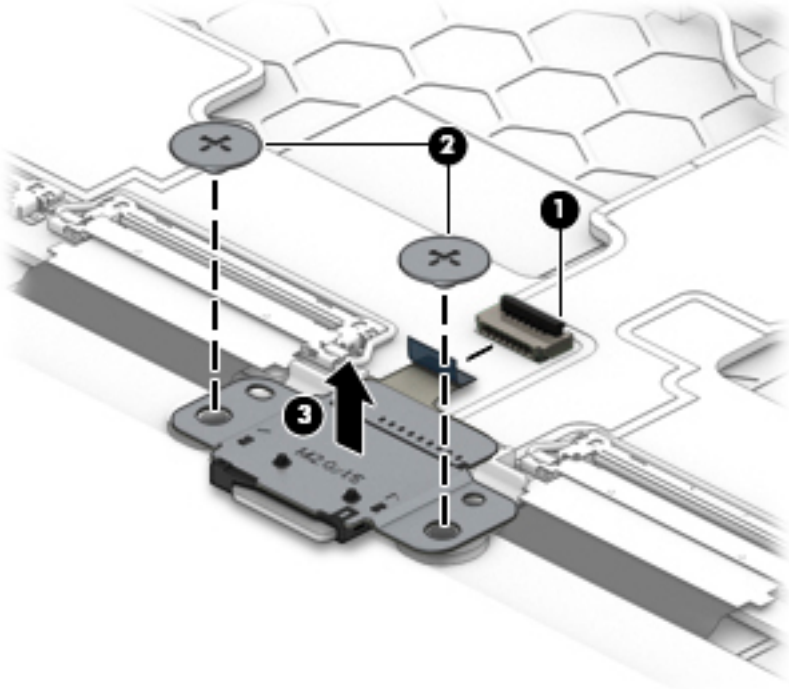
Description	Spare part number
SIM card slot assembly	L38675-001

Before removing the SIM card slot 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 display panel (see Display panel on page 25).

Remove the SIM card slot assembly:

1. Release the ZIF connector **(1)** to which the SIM card slot assembly cable is connected, and then disconnect the SIM card slot assembly cable from the transfer board.
2. Remove the two Phillips M2.0×2.3 broad head screws **(2)** that secure the SIM card slot assembly to the display back cover.
3. Remove the SIM card slot assembly **(3)** and cable.



Reverse this procedure to install the SIM card slot assembly and cable.

Transfer board

Description	Spare part number
For use only on computer models equipped with WLAN	L43332-001
For use only on computer models equipped with WWAN	L38694-001

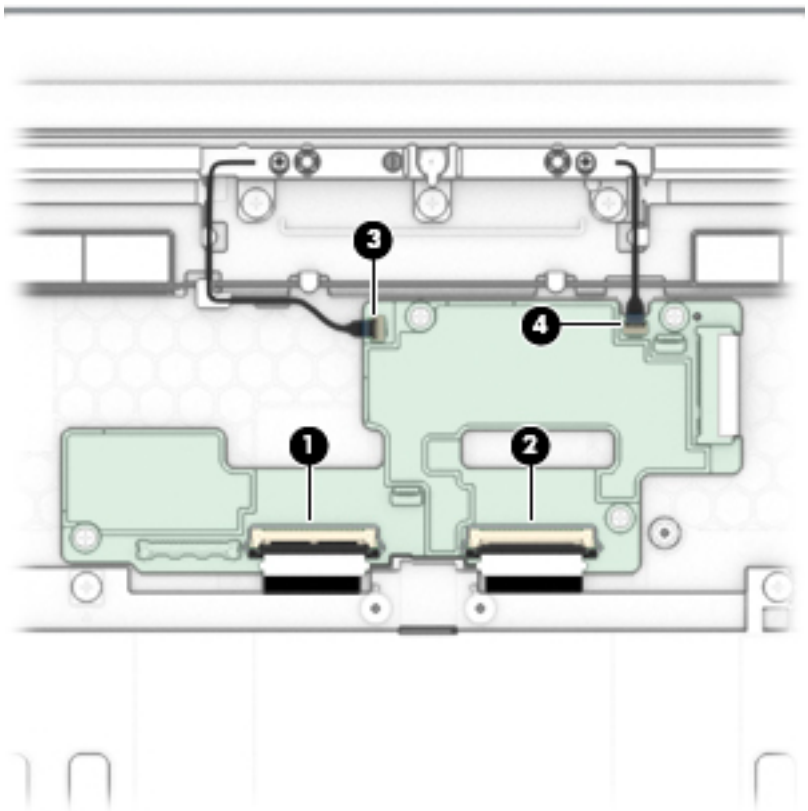
Before removing the transfer board, follow these steps:

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 display panel (see Display panel on page 25).
5. Remove the WWAN module (see WWAN module on page 31).

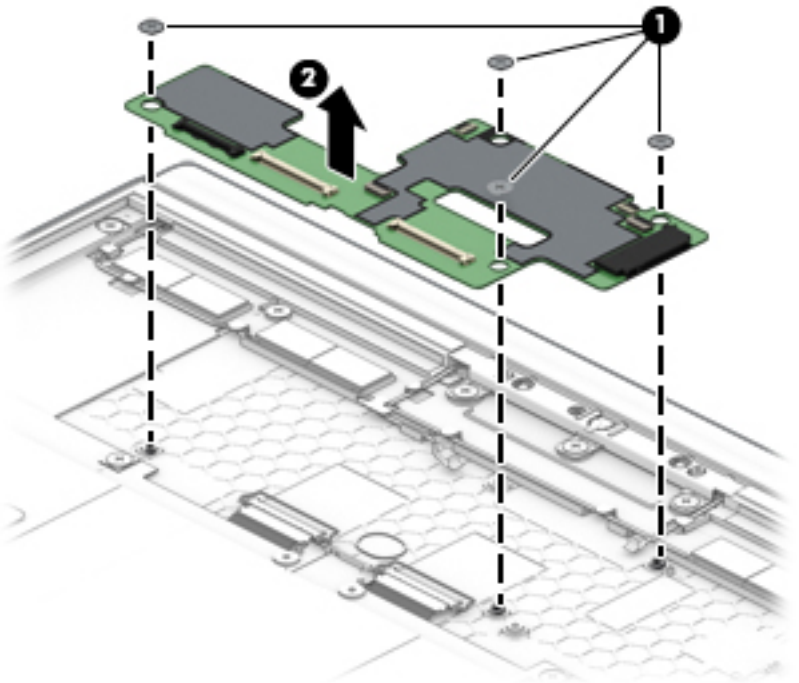
Remove the transfer board:

1. Release the security bar **(1)** on the display panel cable, and then disconnect the display panel cable from the transfer board.
2. Release the ZIF connector **(2)** to which the transfer board cable is connected, and then disconnect the transfer board cable from the transfer board.

3. Disconnect the webcam cables **(3)** and **(4)** from the transfer board.



4. Remove the four Phillips M2.0×2.3 broad head screws **(1)** that secure the transfer board to the display back cover.
5. Remove the transfer board **(2)**.



Reverse this procedure to install the transfer board.

Webcam

Description	Spare part number
FHD, infrared webcam (includes bracket)	L38705-001

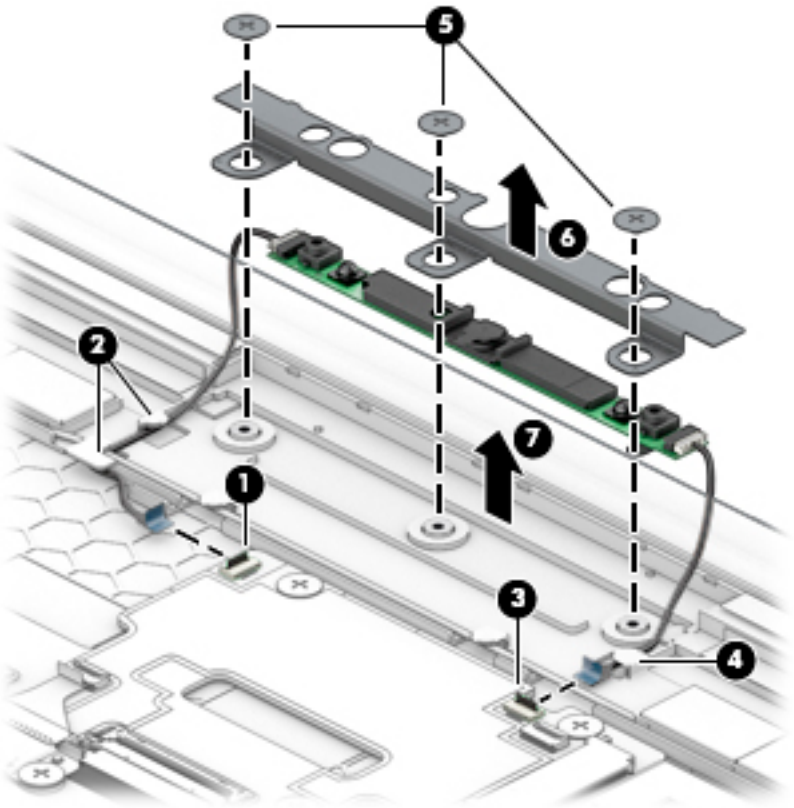
Before removing the webcam, follow these steps:

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 display panel (see Display panel on page 25).

Remove the webcam:

1. Disconnect the left webcam cable **(1)** from the transfer board.
2. Release the left webcam cable from the retention clips **(2)** built into the display back cover.
3. Disconnect the right webcam cable **(3)** from the transfer board.
4. Release the right webcam cable from the retention clip **(4)** built into the display back cover.
5. Remove the three Phillips M2.5×2.3 broad head screws **(5)** that secure the webcam and support bracket to the display back cover.
6. Remove the webcam support bracket **(6)**.

7. Detach the webcam from the display back cover **(7)**. (The webcam is attached to the display back cover with adhesive.)



8. Remove the webcam, bracket, and cables.

Reverse this procedure to install the webcam and cables.

WWAN antenna

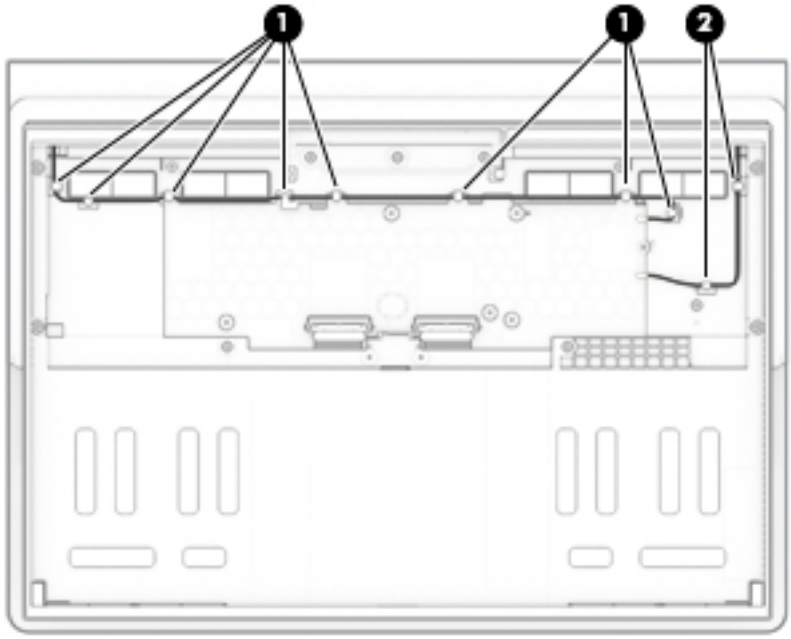
Description	Spare part number
WWAN Antenna Kit (includes left and right WWAN antenna cables and transceivers)	L38671-001

Before removing the WWAN antenna, 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 display panel (see Display panel on page 25).
5. Remove the webcam (see Webcam on page 36).

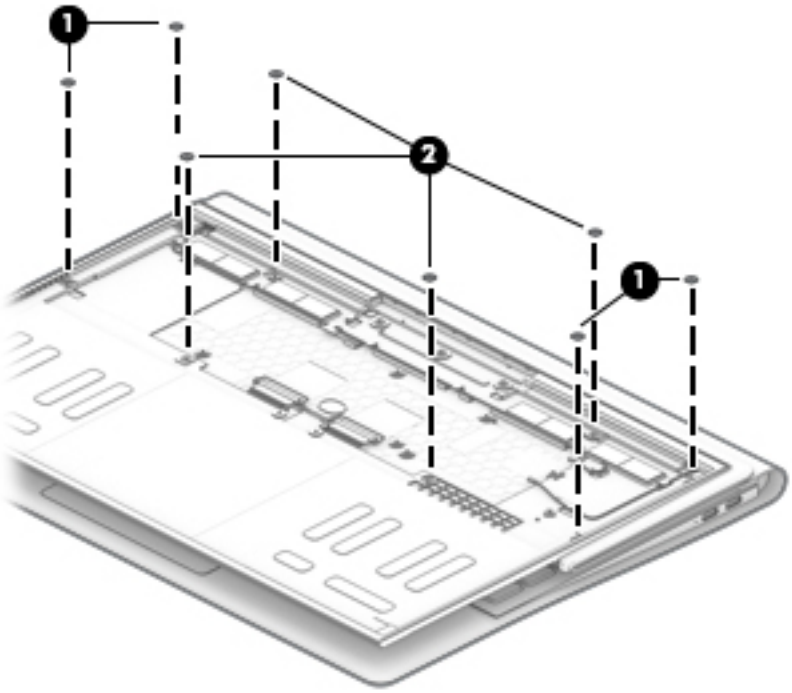
Remove the WWAN antenna:

1. Release the left WWAN antenna cable from the retention clips **(1)** built into the display back cover.
2. Release the right WWAN antenna cable from the retention clips **(2)** built into the display back cover.

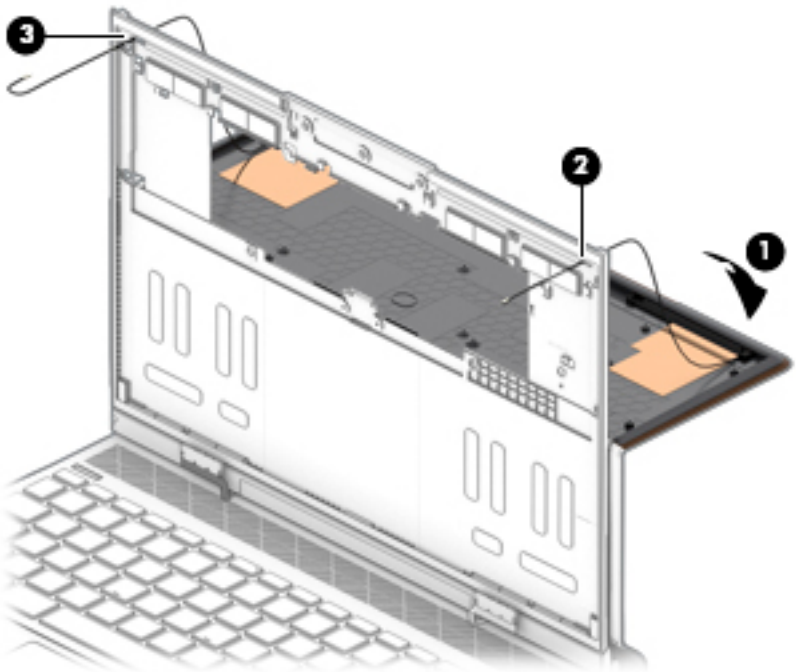


3. Remove the four Phillips M2.5×2.3 broad head screws **(1)** that secure display back cover to the leather cover.

4. Remove the four Phillips M2.5×1.8 broad head screws **(2)** that secure display back cover to the leather cover.

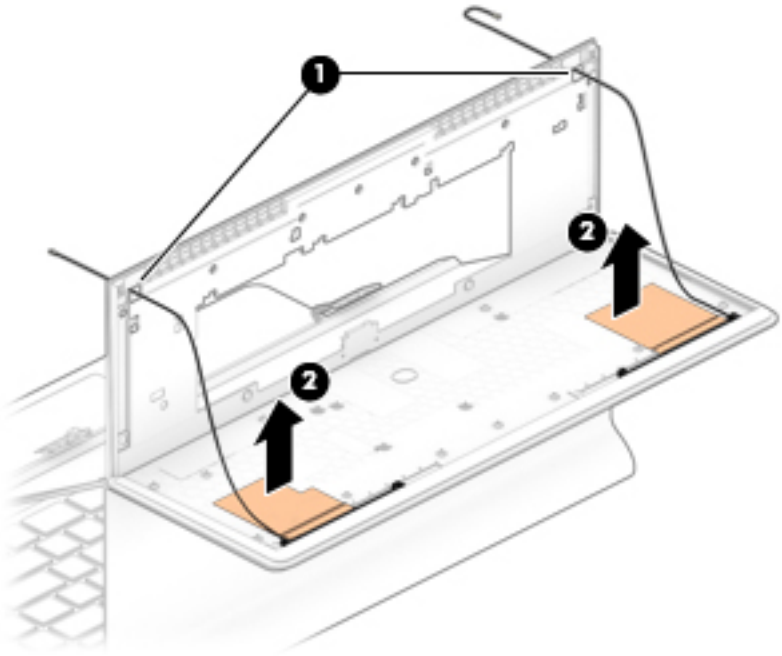


5. Swing the top edge of the leather cover **(1)** down and back.
6. Release the WWAN antenna cables through the openings **(2)** and **(3)** in the display back cover.



7. Release the WWAN antenna cables through the openings **(1)** in the display back cover.

8. Detach the WWAN antenna transceivers **(2)** and **(3)** from the leather cover. (The WWAN antenna transceivers are attached to the leather cover with adhesive.)



9. Remove the WWAN antenna cables and transceivers.

Reverse this procedure to install the WWAN antenna cables and transceivers.

Leather cover

IMPORTANT: Do not clean the leather cover with alcohol. It may discolor the leather.

Description	Spare part number
For use only on computer models equipped with WLAN capability	L38672-001
For use only on computer models equipped with WWAN capability	L22011-001

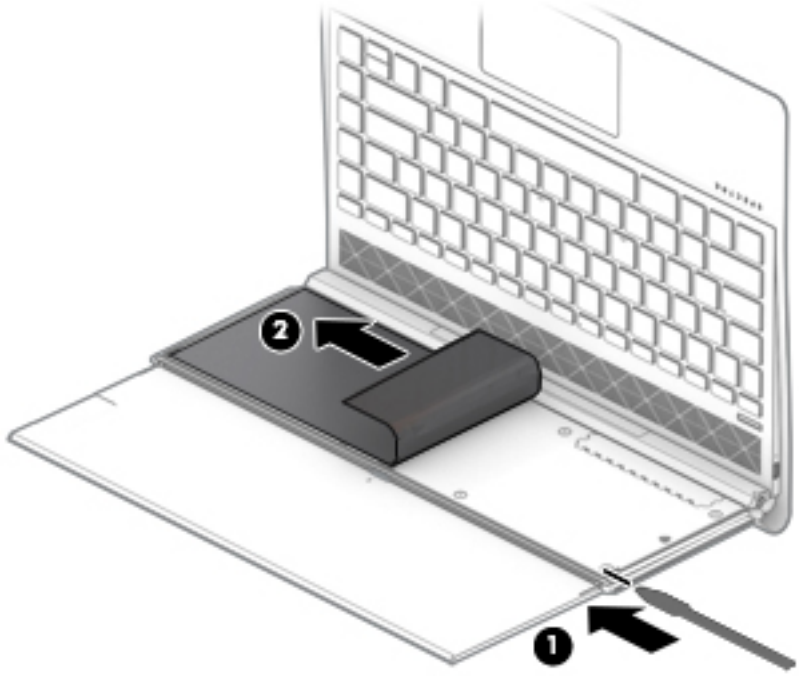
Before removing the leather cover, follow these steps:

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 display panel (see Display panel on page 25).
5. Remove the webcam (see Webcam on page 36).

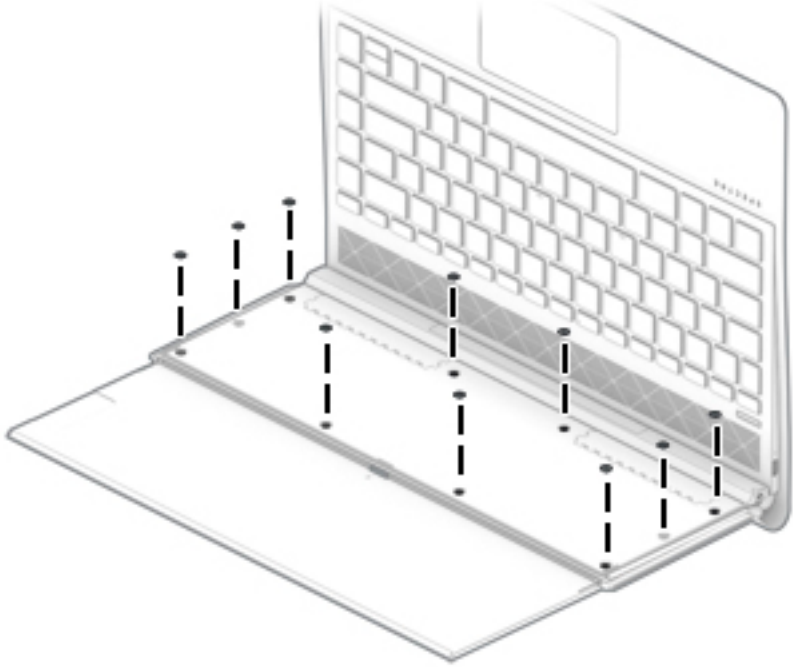
Remove the leather cover:

1. Swing the bottom edge of the display back cover up and forward until the rear panel is accessible.
2. Rest the computer on its back, as shown in the following illustration.
3. Use a case utility tool **(1)** or similar thin plastic tool to detach the lower frame cover **(2)** from the leather cover. (The lower frame cover is attached to the leather cover with adhesive.)

NOTE: The lower frame cover is included in the Mylar/Rubber/Tape Kit, spare part number L38695-001.

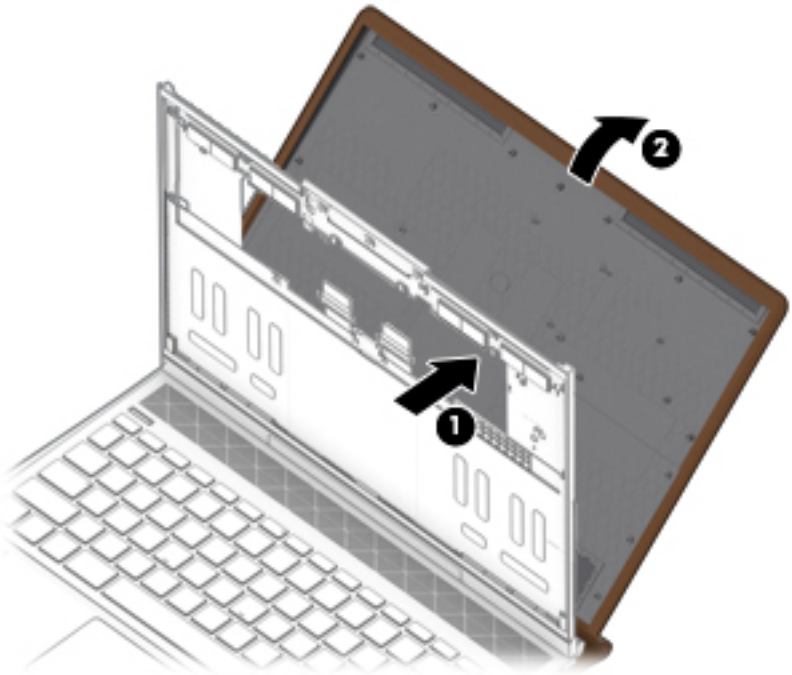


4. Remove the ten Phillips M2.0×1.8 broad head screws that secure display back cover to the leather cover.



5. Position the computer right side up with the front toward you.
6. Swing the top edge of the display back cover **(1)** up and forward **(2)**.

7. Press through the opening in the display back cover **(1)** and separate the leather cover **(2)** away from the back cover until the cover rests behind the computer.



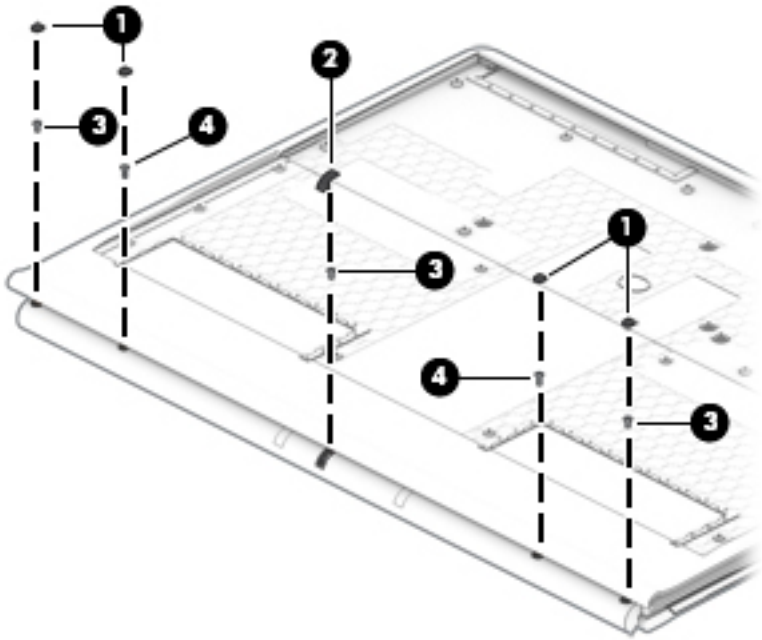
8. Position the computer with the rear panel toward you.

NOTE: The rubber screw covers removed in the following step are different in size and shape. Make note of which rubber screw cover was removed from which cavity.

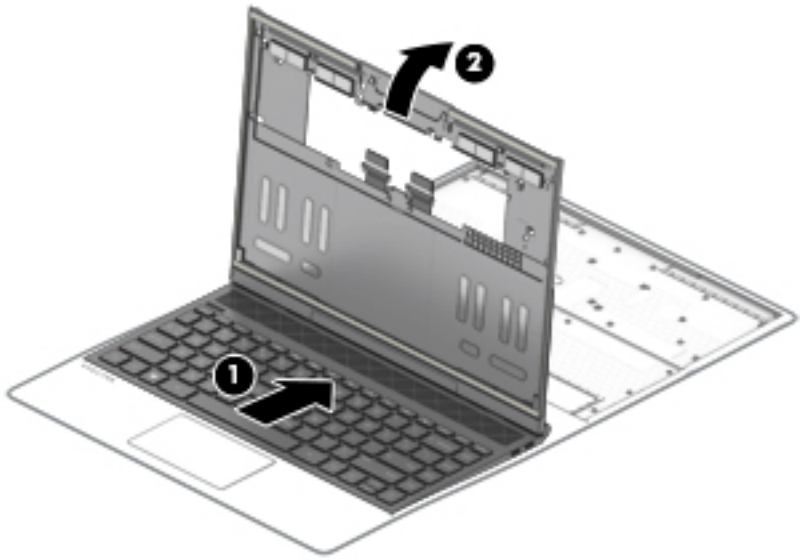
9. Remove the rubber screw covers **(1)** and **(2)** that conceal the display back cover screws.

NOTE: The rubber screw covers are included in the Mylar/Rubber/Tape Kit, spare part number L38695-001.

10. Remove the three Phillips M2.0×3.4 screws **(3)** and the two Phillips M2.0×4.3 screws **(4)** that secure the display back cover to the leather cover.

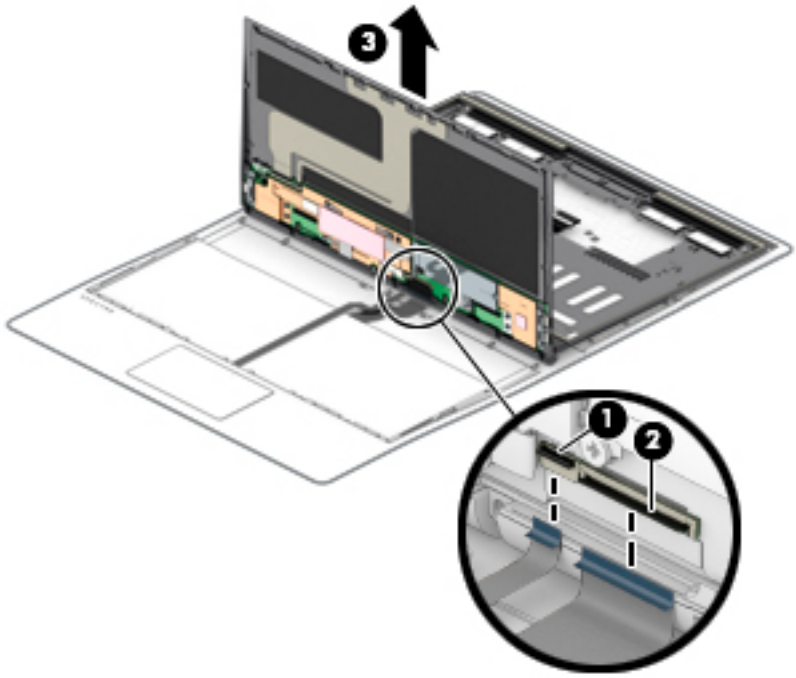


11. Slide the keyboard **(1)** and display back cover away from the leather cover until it disengages from the leather cover.
12. Swing the top edge **(2)** of the keyboard and display back cover back and down until the battery cable ZIF connector and back light cable ZIF connector are accessible.



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

15. Remove the keyboard and display back cover (3) from the leather cover.



Reverse this procedure to install the leather cover.

Speaker assembly

Description	Spare part number
Speaker assembly (includes left and right speaker assembly and cables and WLAN antenna cables and transceivers)	L38700-001

Before removing the speaker 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 display panel (see Display panel on page 25).
5. Remove the webcam (see Webcam on page 36).
6. Remove the leather cover (see Leather cover on page 41).

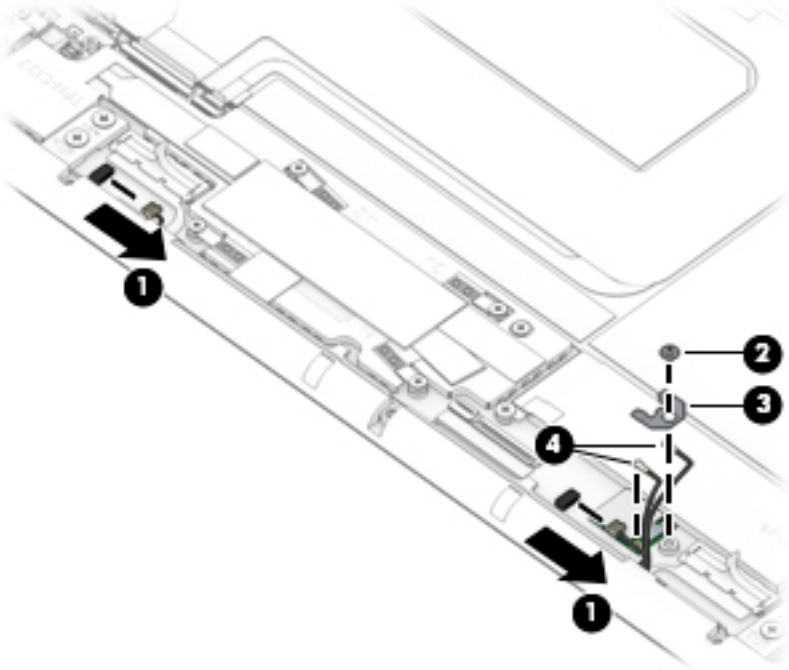
Remove the speaker assembly:

1. Disconnect the speaker cables **(1)** from the system board.
2. Remove the Phillips M2.0×2.3 broad head screw **(2)** that secures WLAN support bracket to the system board.
3. Remove the WLAN module support bracket **(3)**.

NOTE: The WLAN support bracket is available using spare part number L38683-001.

4. Disconnect the WLAN antenna cables **(4)** from the WLAN module built onto the system board.

NOTE: The #1/white WLAN antenna cable connects to the WLAN module "#1/Main" terminal. The #2/black WLAN antenna cable connects to the WLAN module "#2/Aux" terminal.



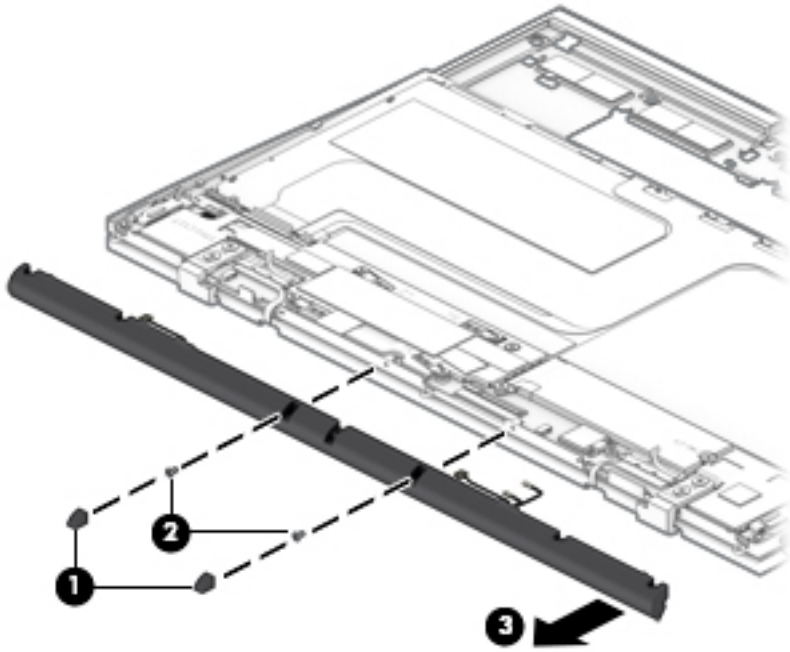
NOTE: The rubber screw covers removed in the following step are different in size and shape. Make note of which rubber screw cover was removed from which cavity.

5. Remove the rubber screw covers **(1)** that conceal the speaker assembly screws.

NOTE: The rubber screw covers are included in the Mylar/Rubber/Tape Kit, spare part number L38695-001.

6. Remove the two Phillips M2.0×3.4 screws **(2)** that secure the speaker assembly to the display back cover.

7. Remove the speaker assembly (3).



Reverse this procedure to install the speaker assembly.

Keyboard

NOTE: The keyboard spare part kit includes the backlight cable and the keyboard cable.

For use in country:	Spare part number	For use in country:	Spare part number
For use in Belgium	L38709-A41	For use in the Netherlands	L38709-B31
For use in Canada	L38709-DB1	For use in Portugal	L38709-131
For use in the Czech Republic and Slovenia	L38709-FL1	For use in Russia	L38709-251
For use in Denmark, Finland, and Norway	L38709-DH1	For use in Saudi Arabia	L38709-171
For use in France	L38709-051	For use in South Korea	L38709-AD1
For use in Germany	L38709-041	For use in Spain	L38709-071
For use in Greece	L38709-151	For use in Switzerland	L38709-BG1
For use in Hungary	L38709-211	For use in Taiwan	L38709-AB1
For use in Israel	L38709-BB1	For use in Thailand	L38709-281
For use in Italy	L38709-061	For use in Turkey	L38709-141
For use in Japan	L38709-291	For use in the United Kingdom	L38709-031
For use in Latin America	L38709-161	For use in the United States	L38709-001

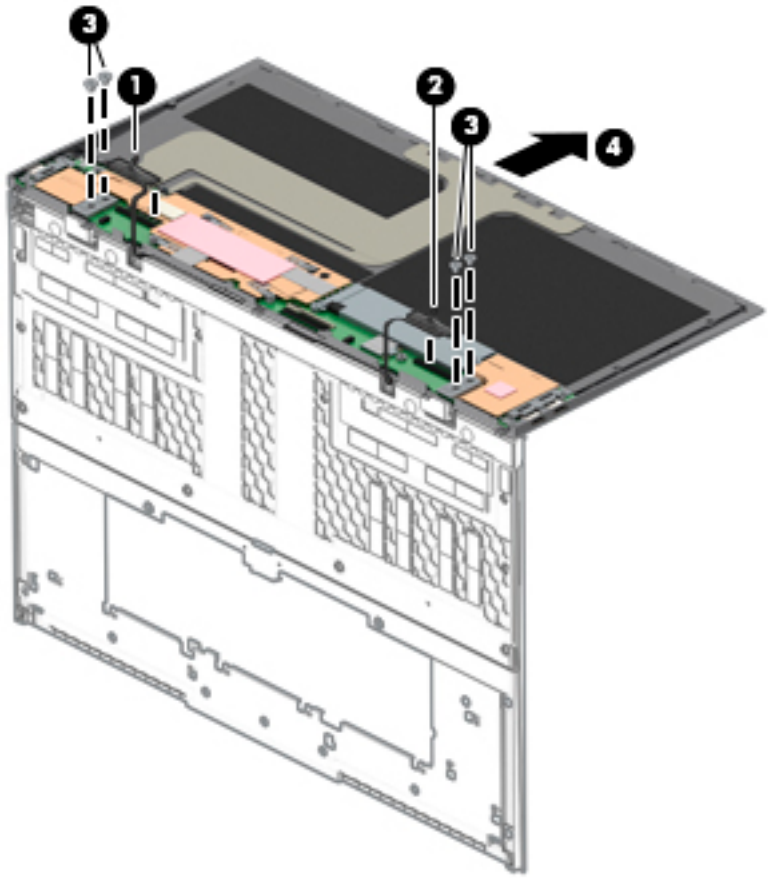
Before removing the keyboard, follow these steps:

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 display panel (see Display panel on page 25), and then remove the following components:
   a. Webcam (see Webcam on page 36)
   b. Leather cover (see Leather cover on page 41)
   c. Speaker assembly (see Speaker assembly on page 46)

Remove the keyboard:

1. Disconnect the display panel cable **(1)** from the system board.
2. Disconnect the transfer board cable **(2)** from the system board.
3. Remove the four Phillips M2.5×3.4 broad head screws **(3)** that secure the display hinges to the keyboard.

4. Remove the keyboard **(4)**.



Reverse this procedure to install the keyboard.

Lower frame

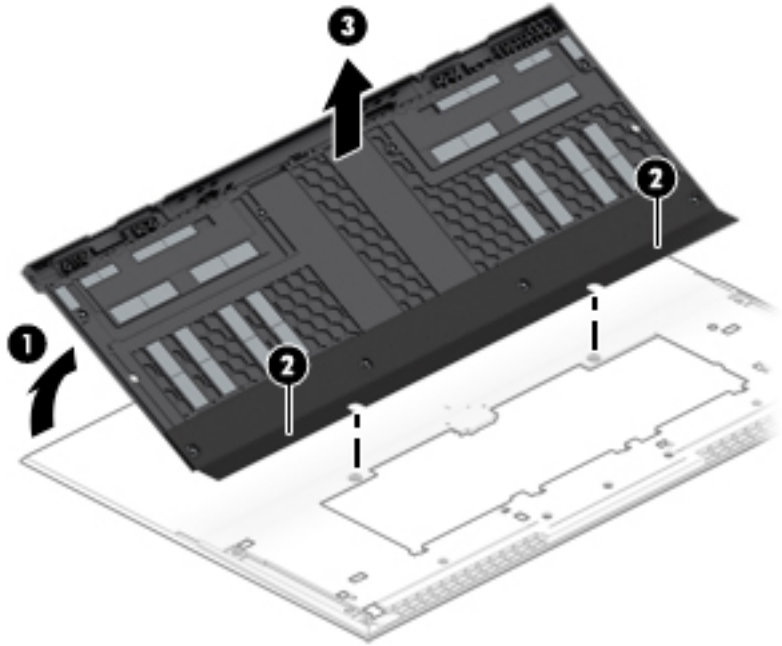
Description	Spare part number
Lower frame (includes retention band with adhesive and magnets)	L43335-001

Before removing the lower frame, 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 display panel (see Display panel on page 25), and then remove the following components:
   a. Webcam (see Webcam on page 36)
   b. Leather cover (see Leather cover on page 41)
   c. Speaker assembly (see Speaker assembly on page 46)
   d. Keyboard (see Keyboard on page 49)

Remove the lower frame:

1. Swing the bottom edge **(1)** of the lower frame up and forward until it disengages from the display back cover.
2. Detach the left and right edges of the retention band **(2)** that secures the lower frame to the display back cover. (The retention band is attached to the lower frame with adhesive.)
3. Remove the lower frame **(3)**.



Reverse this procedure to install the lower frame.

Hinges

Description	Spare part number
Hinges (2, includes left and right hinges)	L38690-001

Before removing the hinges, 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 display panel (see Display panel on page 25), and then remove the following components:
   a. Webcam (see Webcam on page 36)
   b. Leather cover (see Leather cover on page 41)
   c. Speaker assembly (see Speaker assembly on page 46)
   d. Keyboard (see Keyboard on page 49)

Remove the hinges:

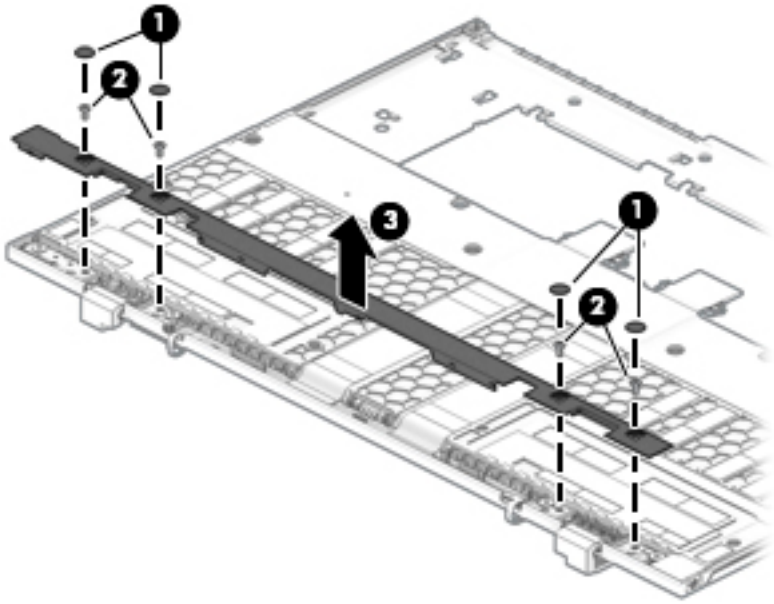
1. Remove the four screw covers **(1)** that conceal the hinge cover screws.

NOTE: The screw covers are included in the Mylar/Rubber/Tape Kit, spare part number L38695-001.

2. Remove the four Phillips M2.0×4.4 screws **(2)** that secure the hinge cover to the lower frame.

NOTE: The hinge cover is available using spare part numbers L38689-001 (for use only on computer models equipped with WLAN) and L38688-001 (for use only on computer models equipped with WWAN).

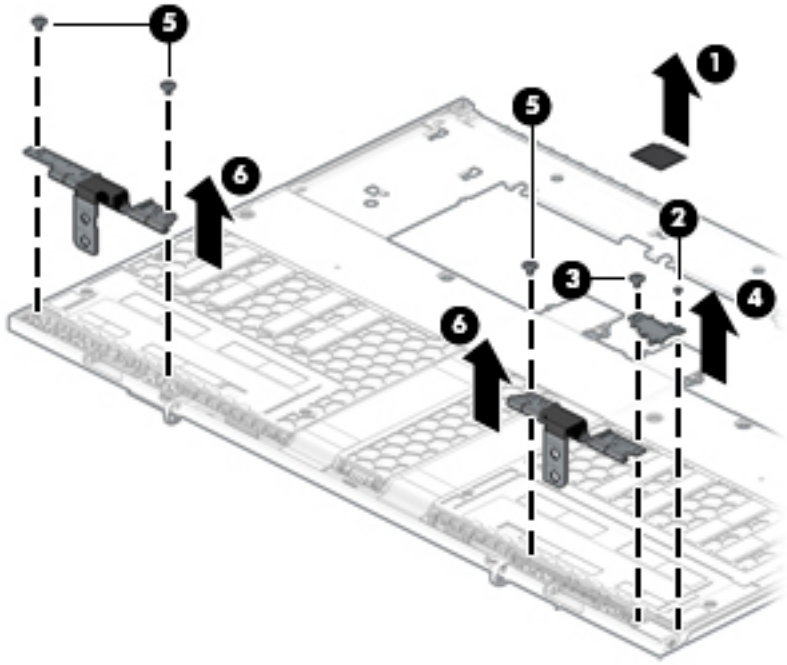
3. Remove the hinge cover **(3)**.



4. Remove the audio jack shield **(1)**.
5. Remove the Phillips M2.0×2.0 screw **(2)** that secures the audio jack bracket to the lower frame.
6. Remove the Phillips M2.0×2.3 broad head screw **(3)** that secures the left display hinge and the audio jack bracket to the lower frame.
7. Remove the audio jack bracket **(4)**.

   The audio jack bracket is available using spare part number xxx.
8. Remove the three Phillips M2.0×2.3 broad head screws **(5)** that secure the display hinges to the lower frame.

9. Remove the hinges (6).



Reverse this procedure to install the hinges.

Transfer board cable

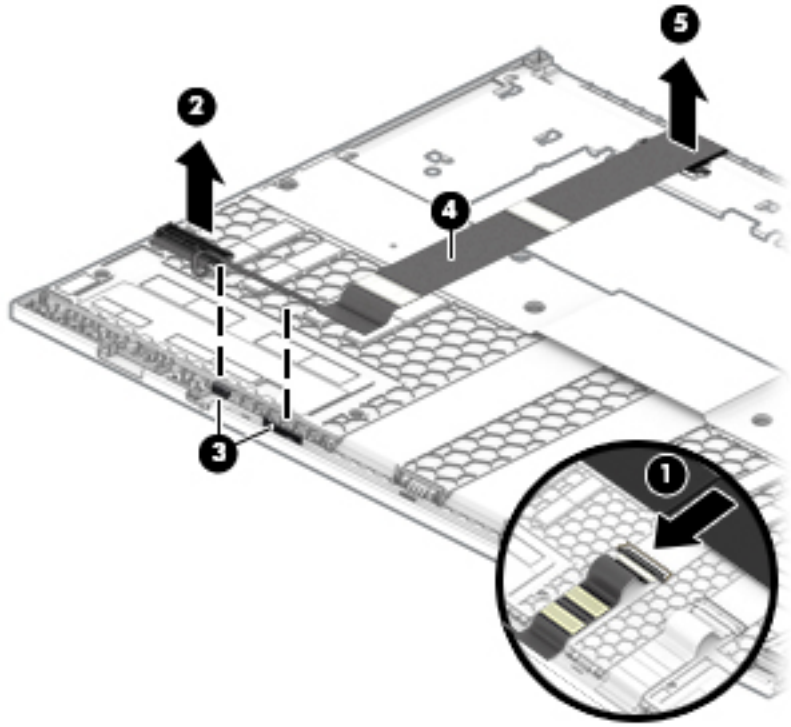
Description	Spare part number
For use only on computer models equipped with WLAN	L38677-001
For use only on computer models equipped with WWAN	L38676-001

Before removing the transfer 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 display panel (see Display panel on page 25), and then remove the following components:
   a. Webcam (see Webcam on page 36)
   b. Leather cover (see Leather cover on page 41)
   c. Speaker assembly (see Speaker assembly on page 46)
   d. Keyboard (see Keyboard on page 49)
   e. Hinges (see Hinges on page 52)

Remove the transfer board cable:

1. Release the transfer board ribbon cable **(1)** from beneath the retention band.
2. Release the transfer board cable **(2)** from the retention clips **(3)** built into the lower frame.
3. Detach the transfer board ribbon cable **(4)** from the lower frame. (The transfer board ribbon cable is attached to the lower frame with adhesive.)
4. Remove the transfer board cable **(5)**.



Reverse this procedure to install the transfer board cable.

Display panel cable

Description	Spare part number
For use only on computer models equipped with a UHD (3840×2160), 400 nits, eDP+PSR, wedge display panel	L38681-001
For use only on computer models equipped with an FHD (1920×1080), 400 nits, eDP 1.4+PSR2, ultraslim display panel	L38679-001
For use only on computer models equipped with an FHD (1920×1080), 300 nits, eDP+PSR, ultraslim display panel	L38680-001

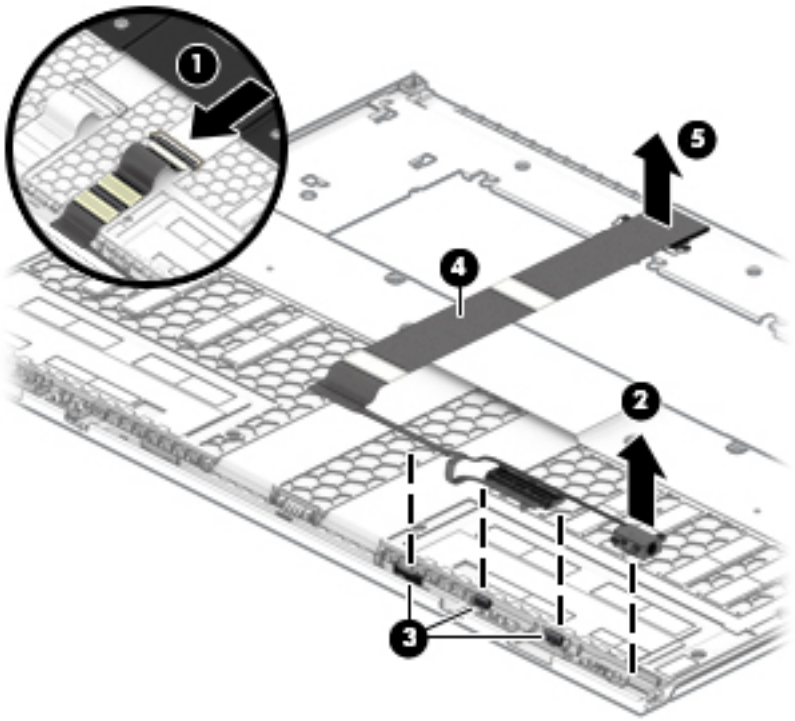
Before removing the display panel cable, follow these steps:

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 display panel (see Display panel on page 25), and then remove the following components:
   a. Webcam (see Webcam on page 36)
   b. Leather cover (see Leather cover on page 41)
   c. Speaker assembly (see Speaker assembly on page 46)
   d. Keyboard (see Keyboard on page 49)
   e. Hinges (see Hinges on page 52)

Remove the display panel cable:

1. Release the display panel ribbon cable **(1)** from beneath the retention band.
2. Release the audio jack **(2)** from the lower frame.
3. Release the display panel cable from the retention clips **(3)** built into the lower frame.
4. Detach the display panel ribbon cable **(4)** from the lower frame. (The display panel ribbon cable is attached to the lower frame with adhesive.)

5. Remove the display panel cable **(5)**.



Reverse this procedure to install the display panel cable.

Solid-state drive

NOTE: The solid-state drive spare part kit includes replacement thermal material and thermal shielding material.

Description	Spare part number
2-TB, M.2 2280, PCIe-3×4, NVMe, SuperSpeed solid-state drive with TLC	L38703-001
1-TB, M.2 2280, PCIe-3×4, NVMe, SuperSpeed solid-state drive with TLC	L38701-001
512-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC	L38704-001
256-GB, M.2 2280, PCIe-3×4, NVMe, solid-state drive with TLC	L38702-001

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

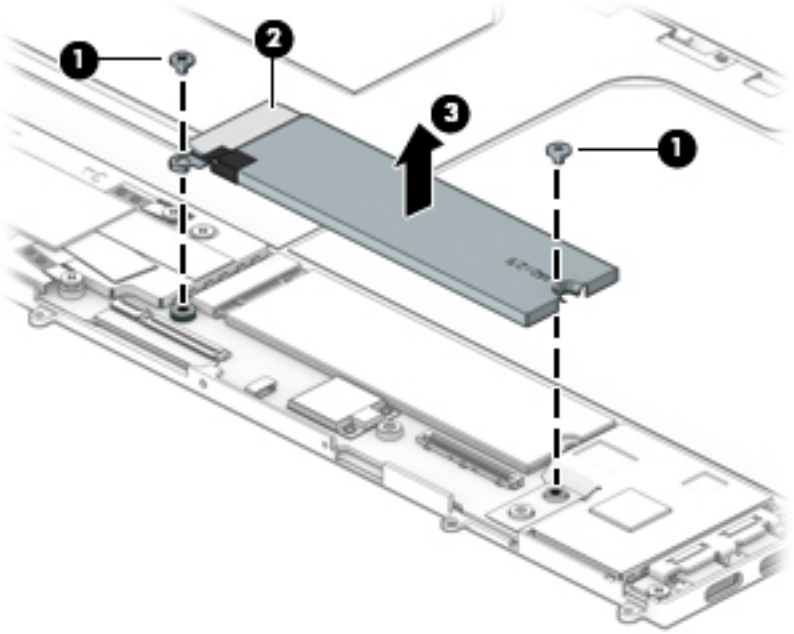
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the display panel (see Display panel on page 25).
5. Remove the webcam (see Webcam on page 36).
6. Remove the leather cover (see Leather cover on page 41).

Remove the solid-state drive:

1. Remove the two Phillips M2.0×2.3 broad head screws **(1)** that secure the solid-state drive and shield to the system board.
2. Remove the thermal tape **(2)** that secures the solid-state drive shield to the heat sink.

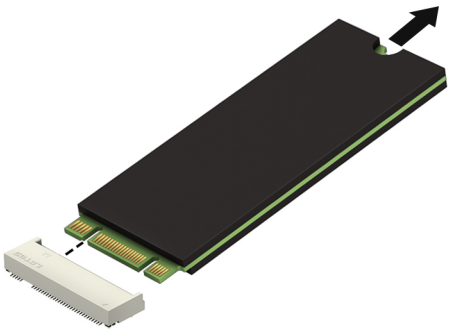
3. Remove the solid-state drive shield (3).

NOTE: The solid-state drive shield is available using spare part number L38682-001.



4. Remove the solid-state drive by pulling it away from the connector.

NOTE: Solid-state drives are designed with notches to prevent incorrect insertion.



Reverse this procedure to install the solid-state drive.

Power button board

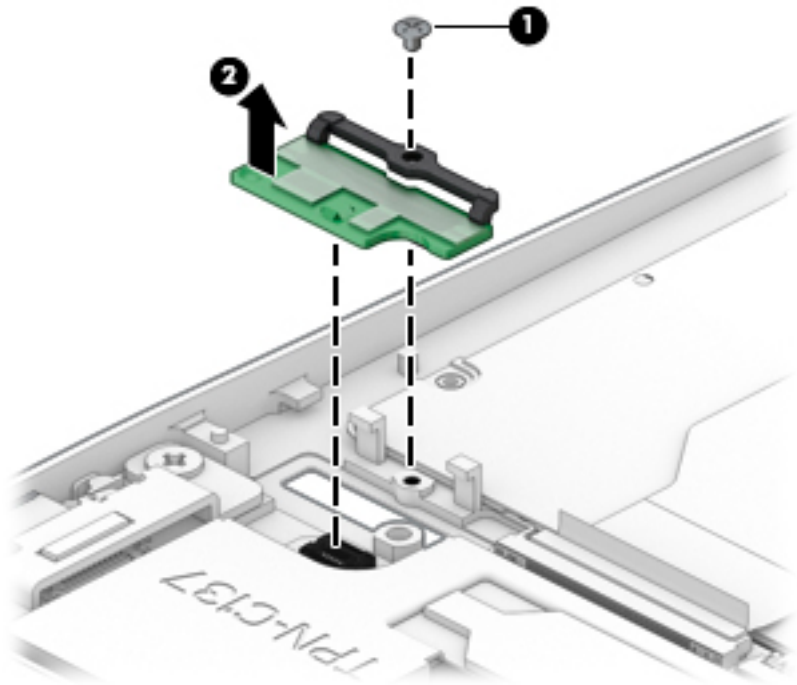
Description	Spare part number
Power button board	L38691-001

Before removing the power button 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 display panel (see Display panel on page 25).
5. Remove the webcam (see Webcam on page 36).
6. Remove the leather cover (see Leather cover on page 41).

Remove the power button board:

1. Remove the Phillips M2.0×2.9 screw **(1)** that secures the power button board to the keyboard.
2. Remove the power button board **(2)**.



Reverse this procedure to install the power button board.

System board

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

Description	Spare part number
Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 16-GB of system memory, and the Windows 10 operating system	L38707-601
Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 16-GB of system memory, and a non-Windows 10 operating system	L38707-001
Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, WWAN capability, 8-GB of system memory, and the Windows 10 operating system	L38708-601
Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, WWAN capability, 8-GB of system memory, and a non-Windows 10 operating system	L38708-001
Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and the Windows 10 operating system	L44606-601
Equipped with an Intel Core i7-8500Y 1.50-GHz (turbo up to 4.20-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows 10 operating system	L44606-001
Equipped with an Intel Core i5-8200Y 1.30-GHz (turbo up to 3.90-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and the Windows 10 operating system	L38706-601
Equipped with an Intel Core i5-8200Y 1.30-GHz (turbo up to 3.90-GHz) dual-core processor (1866-MHz, 4.0 MB L3 cache, 5 W), Intel HD Graphics 625 graphics subsystem with UMA memory, 8-GB of system memory, and a non-Windows 10 operating system	L38706-001

Before removing the system board, follow these steps:

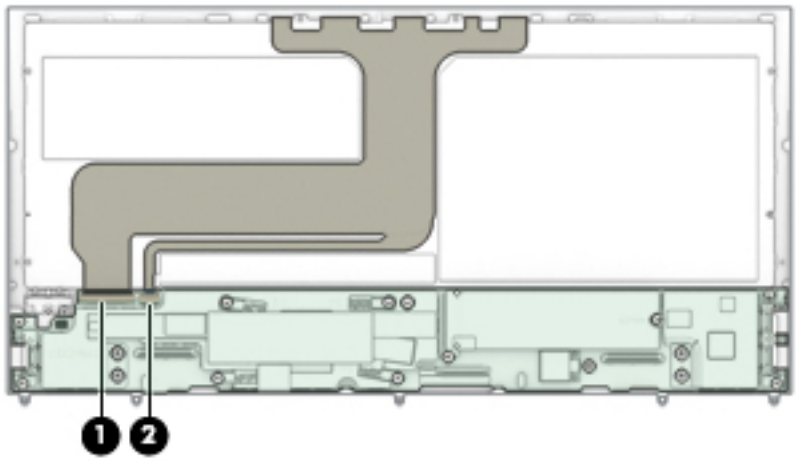
1. Shut down the computer. If you are unsure whether the computer is off or in Hibernation, turn the computer on, and then shut it down through the operating system.
2. Disconnect all external devices connected to the computer.
3. Disconnect the power from the computer by first unplugging the power cord from the AC outlet, and then unplugging the AC adapter from the computer.
4. Remove the display panel (see Display panel on page 25).
5. Remove the webcam (see Webcam on page 36).
6. Remove the leather cover (see Leather cover on page 41).

When replacing the system board, be sure to remove the heat sink (see Heat sink on page 63) from the defective system board and install it on the replacement system board.

Remove the system board:

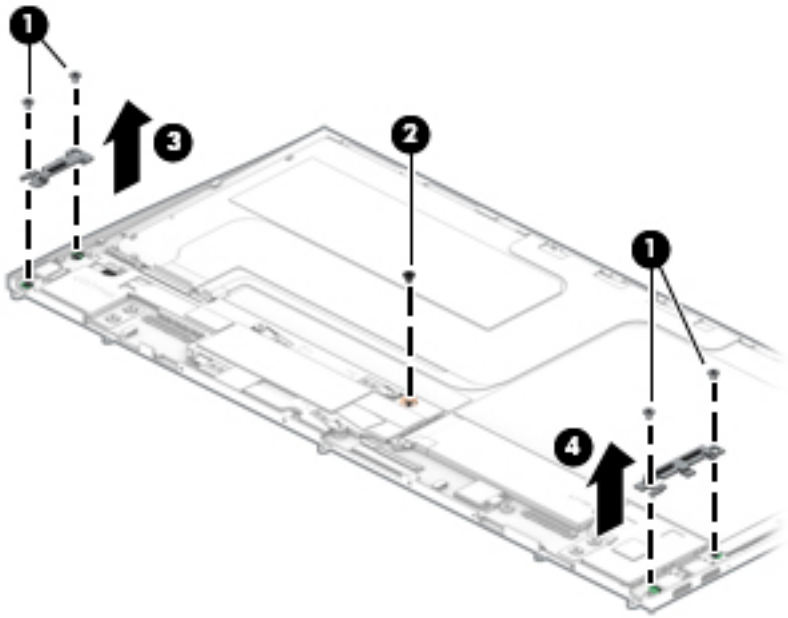
1. Release the ZIF connector **(1)** to which the keyboard cable is connected, and then disconnect the keyboard cable from the system board.

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



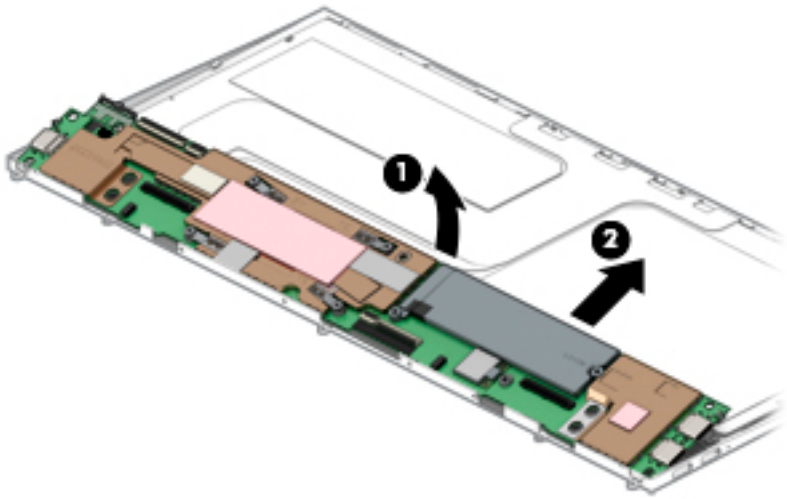
3. Remove the four Phillips M2.0×2.9 screws **(1)** that secure the system board and the left and right I/O brackets to the keyboard.
4. Remove the Phillips M2.0×2.3 broad head screw **(2)** that secures the system board to the keyboard.
5. Remove the left **(3)** and right I/O brackets **(4)**.

NOTE: The I/O brackets are available using spare part number L38684-001.



6. Lift the front edge of the system board **(1)** until it rests at an angle.

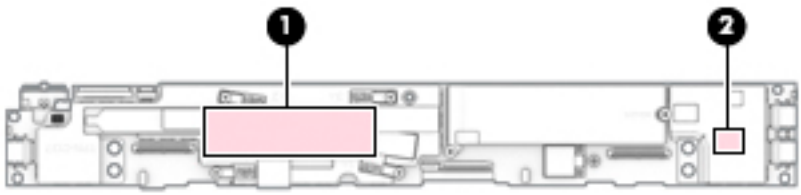
7. Slide the system board **(2)** forward until the rear edge of the system board is clear of the keyboard/top cover.



8. Remove the system board.

NOTE: The thermal material must be thoroughly cleaned from the surface of the system board components each time the system board is removed. Replacement thermal material is included with the system board spare part kits.

Thermal pads are located on the procesor heat sink **(1)** and the graphics subsystem heat sink **(2)**.



Reverse this procedure to install the system board.

Heat sink

Description	Spare part number
Heat sink (2, includes processor heat sink and graphics subsystem heat sink and replacement thermal material)	L39050-001

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 display panel (see Display panel on page 25), and then remove the following components:

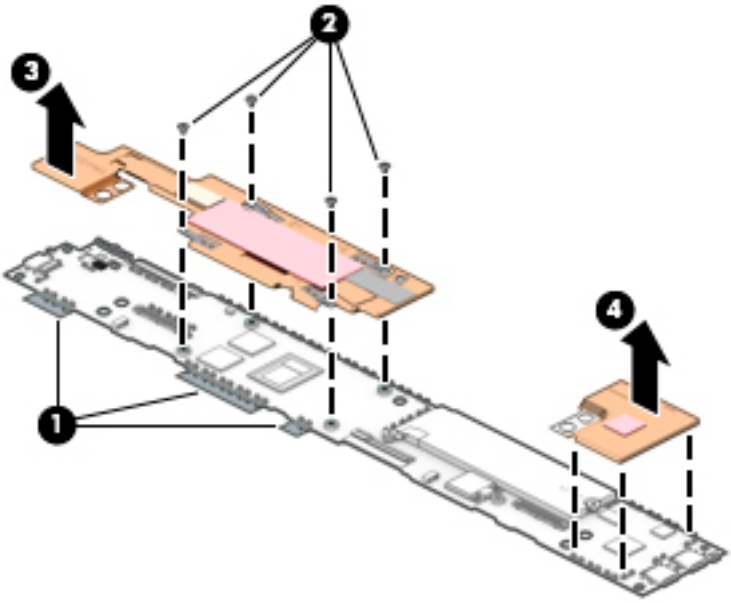
a. Webcam (see Webcam on page 36)

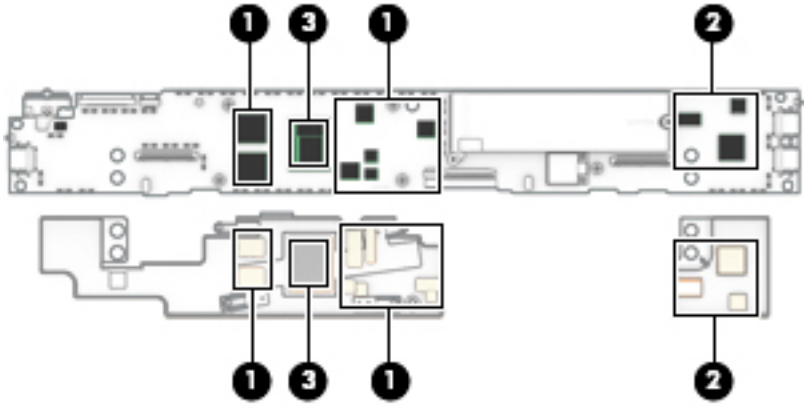
b. Leather cover (see Leather cover on page 41)

c. System board (see System board on page 61)

Remove the heat sink:

1. Release the adhesive foil strips (1) that secure the processor heat sink to the system board.
2. Remove the four Phillips M2.0×2.9 screws (2) that secure the processor heat sink to the system board.
3. Remove the processor heat sink (3).
4. Remove the graphics subsystem heat sink (4).





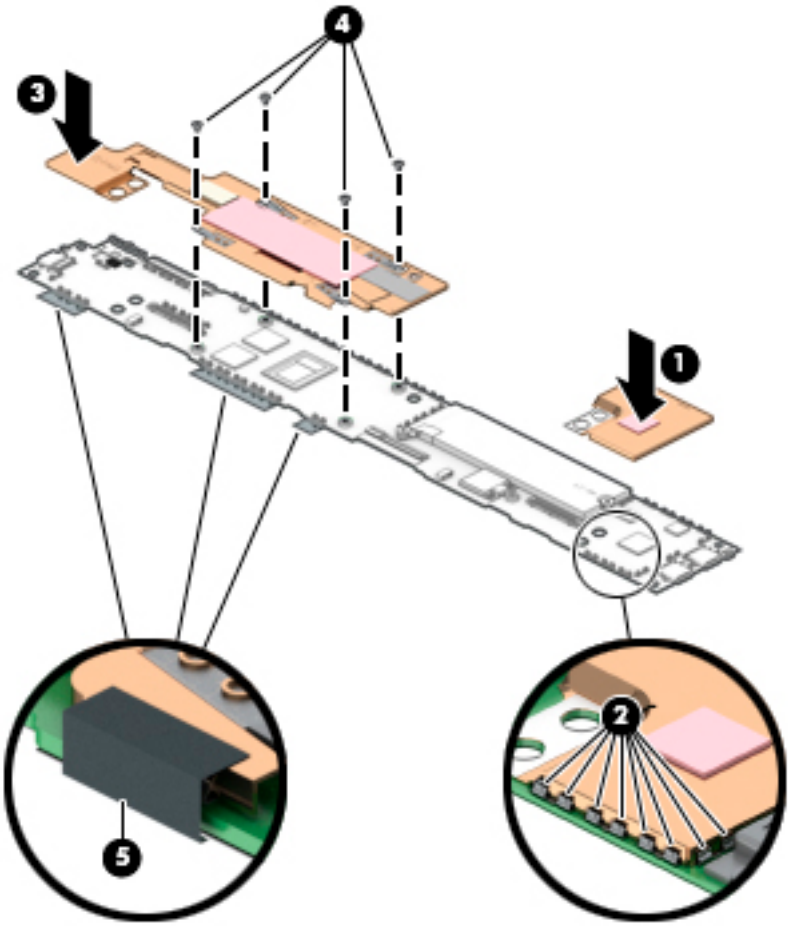
To install the heat sinks:

1. Install the graphics subsystem heat sink (1) onto the system board.

NOTE: When installing the graphics subsystem and processor heat sinks onto the system board, make sure the metal clips (2) on the system board fully engage the heat sinks.

2. Install the processor heat sink (3) onto the system board.

3. Install the four Phillips M2.0×2.9 screws **(4)** that secure the processor heat sink to the system board.
4. Replace the adhesive foil strips **(5)** that secure the processor heat sink to the system board.



6 Using Setup Utility (BIOS)

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

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

Starting Setup Utility (BIOS)

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

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

Updating Setup Utility (BIOS)

Updated versions of Setup Utility (BIOS) may be available on the HP website.

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

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

Determining the BIOS version

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

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

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

     – or –

     Select the question mark icon in the taskbar.
  2. Select **My notebook**, and then select **Specifications**.
- Setup Utility (BIOS)
  1. Start Setup Utility (BIOS) (see Starting Setup Utility (BIOS) on page 66).
  2. Select **Main**, and then make note of the BIOS version.
  3. Select **Exit**, select one of the options, and then follow the on-screen instructions.

To check for later BIOS versions, see Downloading a BIOS update on page 67.

Downloading a BIOS update

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

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

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

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

   – or –

   Select the question mark icon in the taskbar.
2. Select **Updates**, and then select **Check for updates and messages**.
3. Follow the on-screen instructions.
4. At the download area, follow these steps:

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

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

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

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

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

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

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

7 Using HP PC Hardware Diagnostics

Using HP PC Hardware Diagnostics Windows (select products only)

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

If HP PC Hardware Diagnostics Windows is not installed on your computer, first you must download and install it. To download HP PC Hardware Diagnostics Windows, see Downloading HP PC Hardware Diagnostics Windows on page 68.

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

1. To access HP PC Hardware Diagnostics Windows from HP Help and Support:

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

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

   – or –

   To access HP PC Hardware Diagnostics Windows from HP Support Assistant:

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

      – or –

      Select the question mark icon in the taskbar.

   b. Select **Troubleshooting and fixes**.

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

2. When the 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 at any time, select **Cancel**.

3. When HP PC Hardware Diagnostics Windows detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, contact support, and then provide the Failure ID code.

Downloading HP PC Hardware Diagnostics Windows

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

Downloading the latest HP PC Hardware Diagnostics Windows version

To download HP PC Hardware Diagnostics Windows, follow these steps:

1. Go to http://www.hp.com/go/techcenter/pcdiags. The HP PC Diagnostics home page is displayed.
2. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

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

NOTE: For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

To download HP PC Hardware Diagnostics Windows by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, and then enter the product name or number in the search box that is displayed.
3. In the **HP PC Hardware Diagnostics** section, select **Download**, and then select a location on your computer or a USB flash drive.

The tool is downloaded to the selected location.

Installing HP PC Hardware Diagnostics Windows

To install HP PC Hardware Diagnostics Windows, follow these steps:

- Navigate to the folder on your computer or the USB flash drive where the .exe file was downloaded, double-click the .exe file, and then follow the on-screen instructions.

Using HP PC Hardware Diagnostics UEFI

NOTE: For Windows 10 S computers, you must use a Windows computer and a USB flash drive to download and create the HP UEFI support environment because only .exe files are provided. For more information, see Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive on page 70.

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

If your PC will not boot into Windows, you can use HP PC Hardware Diagnostics UEFI to diagnose hardware issues.

When HP PC Hardware Diagnostics UEFI detects a failure that requires hardware replacement, a 24-digit Failure ID code is generated. For assistance in correcting the problem, contact support, and provide the Failure ID code.

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

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

Starting HP PC Hardware Diagnostics UEFI

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

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

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

   a. Connected USB flash drive

NOTE: To download the HP PC Hardware Diagnostics UEFI tool to a USB flash drive, see Downloading the latest HP PC Hardware Diagnostics UEFI version on page 70.

b. Hard drive

c. BIOS

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

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive

Downloading HP PC Hardware Diagnostics UEFI to a USB flash drive can be useful in the following situations:

- HP PC Hardware Diagnostics UEFI is not included in the preinstall image.
- HP PC Hardware Diagnostics UEFI is not included in the HP Tool partition.
- The hard drive is damaged.

NOTE: The HP PC Hardware Diagnostics UEFI 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 provided.

Downloading the latest HP PC Hardware Diagnostics UEFI version

To download the latest HP PC Hardware Diagnostics UEFI version to a USB flash drive:

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 UEFI** section, select **Download UEFI Diagnostics**, and then select **Run**.

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

NOTE: For some products, it may be necessary to download the software to a USB flash drive by using the product name or number.

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

1. Go to http://www.hp.com/support.
2. Enter the product name or number, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the specific UEFI Diagnostics version for your computer.

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

Remote HP PC Hardware Diagnostics UEFI is a firmware (BIOS) feature that downloads HP PC Hardware Diagnostics UEFI to your computer. It can then execute the diagnostics on your computer, and it may upload results to a preconfigured server. For more information on Remote HP PC Hardware Diagnostics UEFI, go to http://www.hp.com/go/techcenter/pcdiags, and then select **Find out more**.

Downloading Remote HP PC Hardware Diagnostics UEFI

NOTE: HP Remote PC Hardware Diagnostics UEFI is also available as a Softpaq that can be downloaded to a server.

Downloading the latest Remote HP PC Hardware Diagnostics UEFI version

To download the latest Remote HP PC Hardware Diagnostics UEFI version, follow these steps:

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 UEFI** section, select **Download Remote Diagnostics**, and then select **Run**.

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

NOTE: For some products, it may be necessary to download the software by using the product name or number.

To download HP Remote PC Hardware Diagnostics UEFI by product name or number, follow these steps:

1. Go to http://www.hp.com/support.
2. Select **Get software and drivers**, select your type of product, enter the product name or number in the search box that is displayed, select your computer, and then select your operating system.
3. In the **Diagnostics** section, follow the on-screen instructions to select and download the **Remote UEFI** version for the product.

Customizing Remote HP PC Hardware Diagnostics UEFI settings

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

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

To customize Remote HP PC Hardware Diagnostics UEFI settings, follow these steps:

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

Your changes take effect when the computer restarts.

8 Backing up, restoring, and recovering

This chapter provides information about the following processes, which are standard procedure for most products:

- **Backing up your personal information**—You can use Windows tools to back up your personal information (see Using Windows tools on page 73).
- **Creating a restore point**—You can use Windows tools to create a restore point (see Using Windows tools on page 73).
- **Creating recovery media** (select products only)—You can use the HP Cloud Recovery Download Tool (select products only) to create recovery media (see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 73.
- **Restoring and recovery**—Windows offers several options for restoring from backup, refreshing the computer, and resetting the computer to its original state (see Using Windows tools on page 73).

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

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

Backing up information and creating recovery media

Using Windows tools

IMPORTANT: Windows is the only option that allows you to back up your personal information. Schedule regular backups to avoid information loss.

You can use Windows tools to back up personal information and create system restore points and recovery media.

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

For more information and steps, see the **Get Help** app.

1. Select the **Start** button, and then select the **Get Help** app.
2. Enter the task you want to perform.

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

Using the HP Cloud Recovery Download Tool to create recovery media (select products only)

You can use the HP Cloud Recovery Download Tool to create HP Recovery media on a bootable USB flash drive, as follows:

1. Go to http://www.hp.com/support.
2. Select **Software and Drivers**, and then follow the on-screen instructions.

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

Restoring and recovery

Restoring, resetting, and refreshing using Windows tools

Windows offers several options for restoring, resetting, and refreshing the computer. For details, (see Using Windows tools on page 73).

Recovering using HP Recovery media

HP Recovery media is used to recover the original operating system and software programs that were installed at the factory. On select products, it can be created on a bootable USB flash drive using the HP Cloud Recovery Download Tool. For details, see Using the HP Cloud Recovery Download Tool to create recovery media (select products only) on page 73.

NOTE: If you cannot create recovery media yourself, contact support to obtain recovery discs. Go to http://www.hp.com/support, select your country or region, and then follow the on-screen instructions.

To recover your system:

- Insert the HP Recovery media, and then restart the computer.

Changing the computer boot order

If your computer does not restart using the HP Recovery media, you can change the computer boot order. This 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, depending on the location of your HP Recovery media.

To change the boot order:

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

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

   For computers or tablets with keyboards attached:

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

   For tablets without keyboards:

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

     – or –

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

9 Specifications

Computer specifications

	Metric	U.S.
Dimensions		
Width	**32.01 cm**	12.60 in
Depth	**23.45 cm**	9.23 in
Height (front to back)	**1.54 cm**	0.60 in
Weight:		
Computer models equipped with WWAN capability	**1.52 kg**	3.35 lb
Computer models equipped with WLAN capability	**1.49 kg**	3.29 in
Input power		
Operating voltage and current	20 V dc @ 3.25 A – 65 W 20 V dc @ 4.50 A – 90 W 20 V dc @ 2.25 A – 45 W	
Temperature		
Operating	**5°C to 35°C**	41°F to 95°F
Nonoperating	**-20°C to 60°C**	-4°F to 140°F
Relative humidity (noncondensing)		
Operating	10% to 90%	
Nonoperating	5% to 95%	
Maximum altitude (unpressurized)		
Operating	**-15 m to 3,048 m**	-50 ft to 10,000 ft
Nonoperating	**-15 m to 12,192 m**	-50 ft to 40,000 ft

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

10 Power cord set requirements

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

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

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

Requirements for all countries

The following requirements are applicable to all countries and regions:

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

Requirements for specific countries and regions

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

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

Country/region	Accredited agency	Applicable note number

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

11 Recycling

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

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

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